Personal Protective Equipment

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Typical Activities

- Pavement maintenance
  - Patching, crack sealing
  - Pavement markings
- Curb maintenance
  - Replacement/repair
  - Painting
- Sign maintenance
  - Inspection
  - Repair/stabilization
  - Replacement
- Mowing
  - Roadside
  - Median
- Drainage maintenance
- What else?
- What PPE is required? Needed? Advisable? Suggested?

Risk Assessment

- Some of these activities expose you to injury or contamination
- Some can result in unexpected conditions
- Which is riskier – the thing you do all the time
  - …or the thing you rarely do
- How much thought do you put to:
  - What risks you face
  - What needs to be done yourself and your co-workers
  - What you need to do to mitigate risks
  - How can you protect yourselves for the thing that will almost never happen

Risk Implications

- Someone gets injured…or worse
  - You or someone else on the crew
  - A nearby “civilian”
  - A visitor to the worksite
- Think about the risk before
- Rather than explain it after

- Don’t accept unnecessary risk
  - Eliminate risk or mitigate it

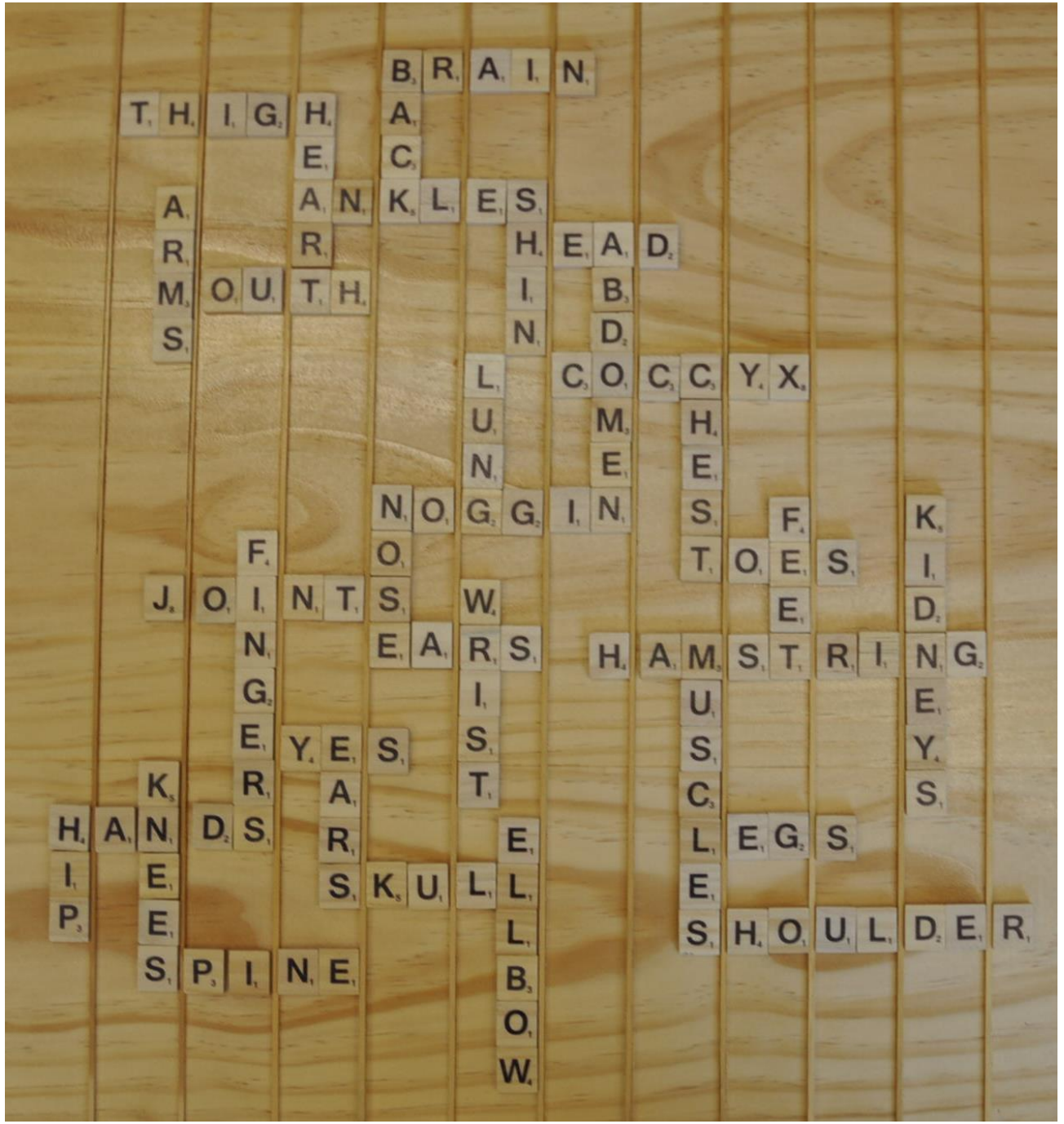
Personal Protective Equipment PPE

Let’s Work Backwards from Risk

Tyrone, you know how much I love watching you work, but I've got my country's 500th anniversary to plan, my wedding to arrange, my wife to murder, and Gilder to frame for it. I'm swamped!

--- Prince Humperdinck

Things You Can Injure



Things What Go Snap

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PPE Policies

- Different agencies, contractors have different policies
- Sometimes driven by liability/insurance concerns
  - Everyone wears a hard hat and safety glasses no matter what they're doing
- Sometimes driven by productivity concerns
  - Don't have time to hook up the arrow board trailer

- Would you wear a hard hat while you mowed a 2-acre meadow?
- How about a balanced approach?
- How about a policy based on what risks are present?

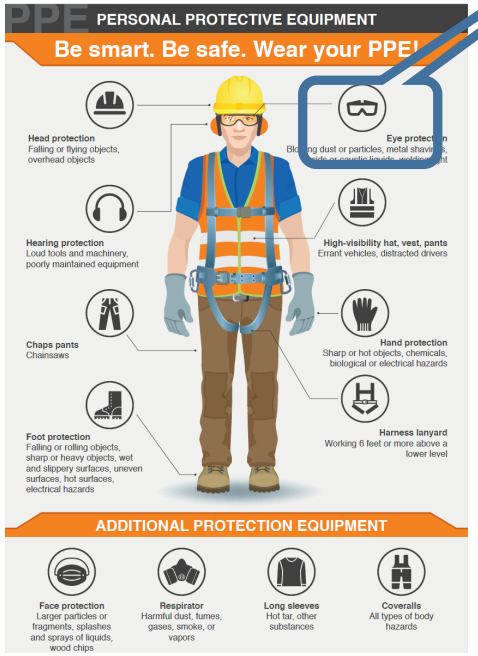
Thanks, Minnesota LTAP

- They put together this interactive chart to guide you through
- Now, some of the shalls are driven by Minnesota law or by virtue that Minnesota is an OSHA “state plan state”
- So, a lot of these shalls are only shalls if your agency adopts those standards

- http://www.mnltap.umn.edu/publications/exchange/2018/December/personal/

Interactive

- A click on the safety glasses takes you to this OSHA standard on eye and face protection



UNITED STATES DEPARTMENT OF LABOR

Find it in OSHA

A TO Z INDEX

Occupational Safety and Health Administration

English | Spanish

OSHA | WORKER | EMPLOYER | STANDARDS | ENFORCEMENT | CONSTRUCTION | TOPIC | NEWS/RESOURCES | DATA | TRAINING

By Standard Number / 1910.133 - Eye and face protection.

- **Part Number:** 1910
- **Part Number Title:** Occupational Safety and Health Standards
- **Subpart:** 1910 Subpart I
- **Subpart Title:** Personal Protective Equipment
- **Standard Number:** 1910.133
- **Title:** Eye and face protection.
- **GPO Source:** e-CFR

1910.133(a)
General requirements.

1910.133(a)(1)
The employer shall ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

1910.133(a)(2)
The employer shall ensure that each affected employee uses eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g. clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.

1910.133(a)(3)
The employer shall ensure that each affected employee who wears prescription lenses while engaged in operations that involve eye hazards wears eye protection that incorporates the prescription in its design, or wears eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

1910.133(a)(4)
Eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer.

1910.133(a)(5)
The employer shall ensure that each affected employee uses equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation. The following is a listing of appropriate shade numbers for various operations.

Filter Lenses for Protection Against Radiant Energy			
Operations	**Electrode Size 1/32 in.**	**Arc Current**	**Minimum* Protective Shade**
Shielded metal arc welding	Less than 3	Less than 60	7
	3-5	60-160	8
	5-8	160-250	10
	More than 8	250-550	11

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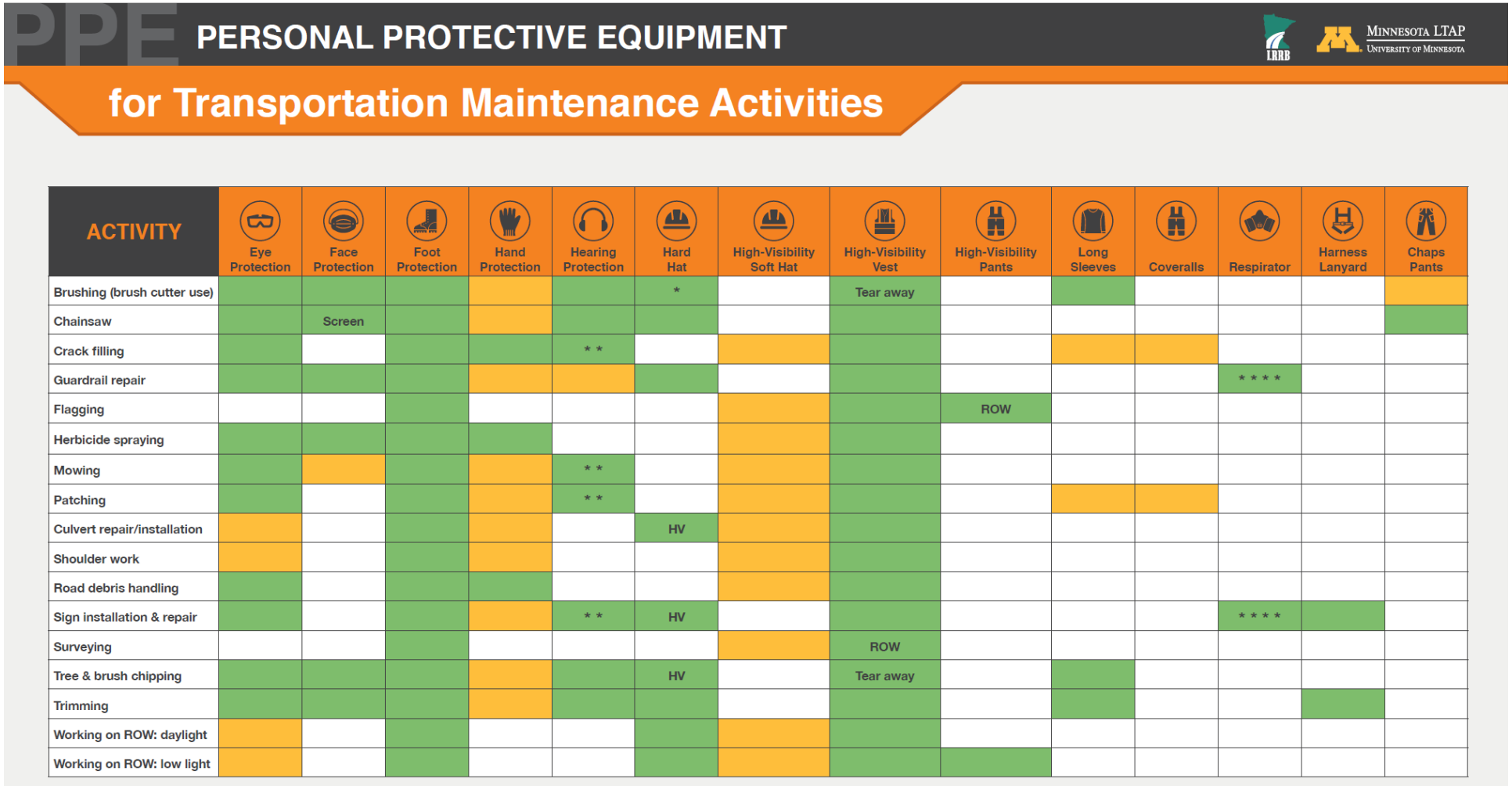
Related Minnesota Product



PPE

PERSONAL PROTECTIVE EQUIPMENT

for Transportation Maintenance Activities

LRRB

Minnesota LTAP
University of Minnesota

ACTIVITY	Eye Protection	Face Protection	Foot Protection	Hand Protection	Hearing Protection	Hard Hat	High-Visibility Soft Hat	High-Visibility Vest	High-Visibility Pants	Long Sleeves	Coveralls	Respirator	Harness Lanyard	Chaps Pants
Brushing (brush cutter use)						*		Tear away						
Chainsaw		Screen												
Crack filling					* *									
Guardrail repair												* * * *		
Flagging									ROW					
Herbicide spraying														
Mowing					* *									
Patching					* *									
Culvert repair/installation						HV								
Shoulder work														
Road debris handling														
Sign installation & repair					* *	HV						* * * *		
Surveying								ROW						
Tree & brush chipping						HV		Tear away						
Trimming														
Working on ROW: daylight														
Working on ROW: low light														

http://www.mnltap.umn.edu/publications/exchange/2018/December/personal/

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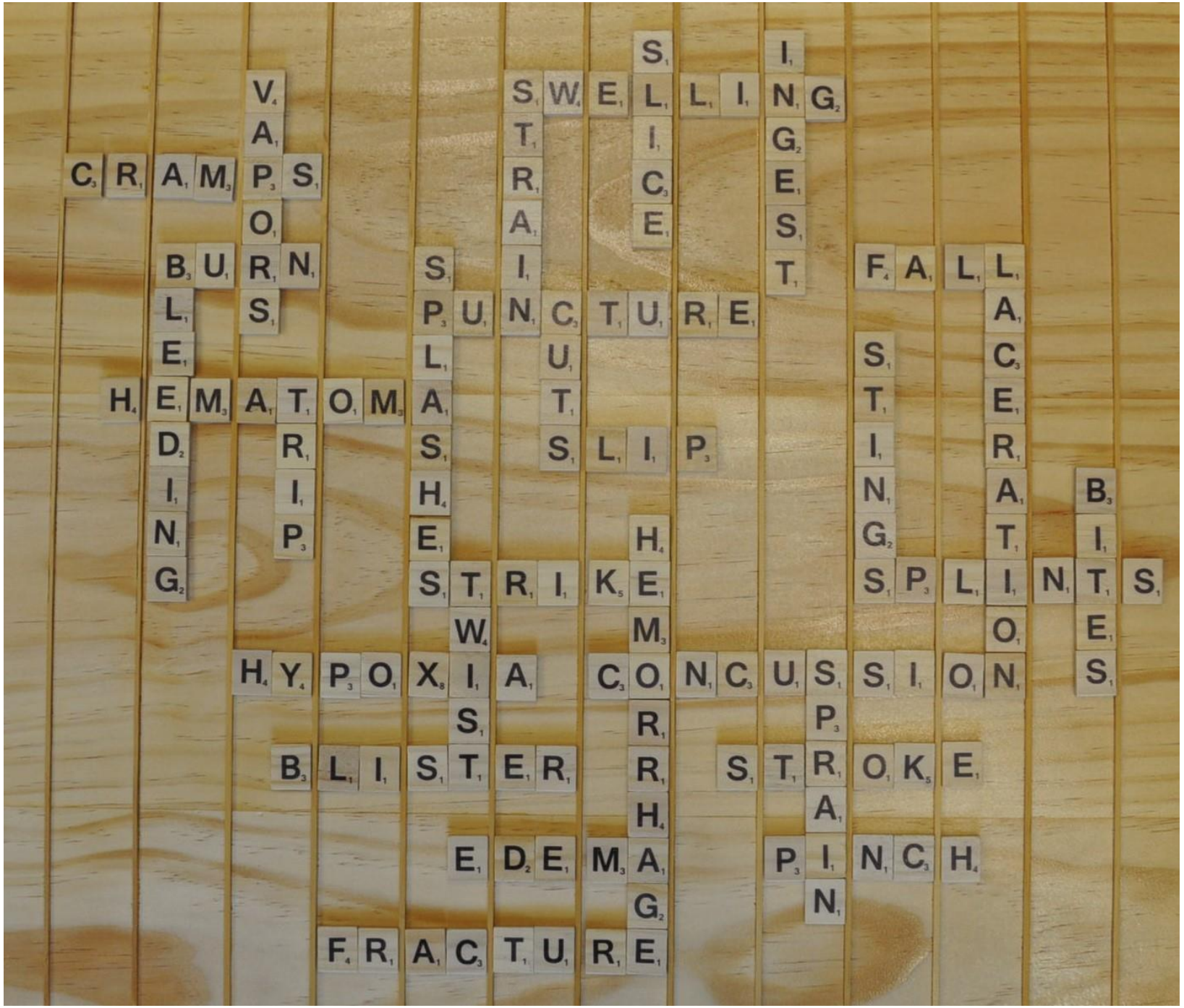
Maladies



Ailments

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Footwear

- Water resistant at least
- Comfortable
- “Grippy” sole
- Chemical resistant
- Steel toe
- Steel shank?
- Metatarsal guard?

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Pants, shirts

- Long pants or shorts?
- Long sleeves or short?
- What's the policy?
- What are you going to be doing?
  - Eating weeds? Maybe long pants good option
  - Welding and cutting? You will want long sleeves

- Match the PPE to the risk

High-Visibility Safety Apparel

All workers, including emergency responders, within the right-of-way who are exposed either to traffic (vehicles using the highway for purposes of travel) or to work vehicles and construction equipment within the TTC zone shall wear high-visibility safety apparel that meets or exceeds the Performance Class 2 or 3 requirements of the ANSI/ISEA 107–2004 publication entitled "American National Standard for High-Visibility Safety Apparel and Headwear" (see Section 1A.11), or equivalent revisions, and labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure, except as provided in Paragraph 5. A person designated by the employer to be responsible for worker safety shall make the selection of the appropriate class of garment. – DE MUTCD Section 6D.03 ¶04.

Not ANSI

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High-Visibility Safety Apparel

At all times, flaggers shall wear high-visibility safety apparel that meets or exceeds the Performance Class 3 requirements of the ANSI/ISEA 107–2004 publication entitled "American National Standard for High-Visibility Safety Apparel and Headwear" (see Section 1A.11), or equivalent revisions, and labeled as meeting the ANSI 107-2004 standard performance for Class 3 risk exposure (see Section 6E.02 High Visibility Safety Apparel for Flagger Control).

– DE MUTCD Section 6D.03 ¶04B.

Probably Not ANSI Class 3

Probably ANSI Class 3

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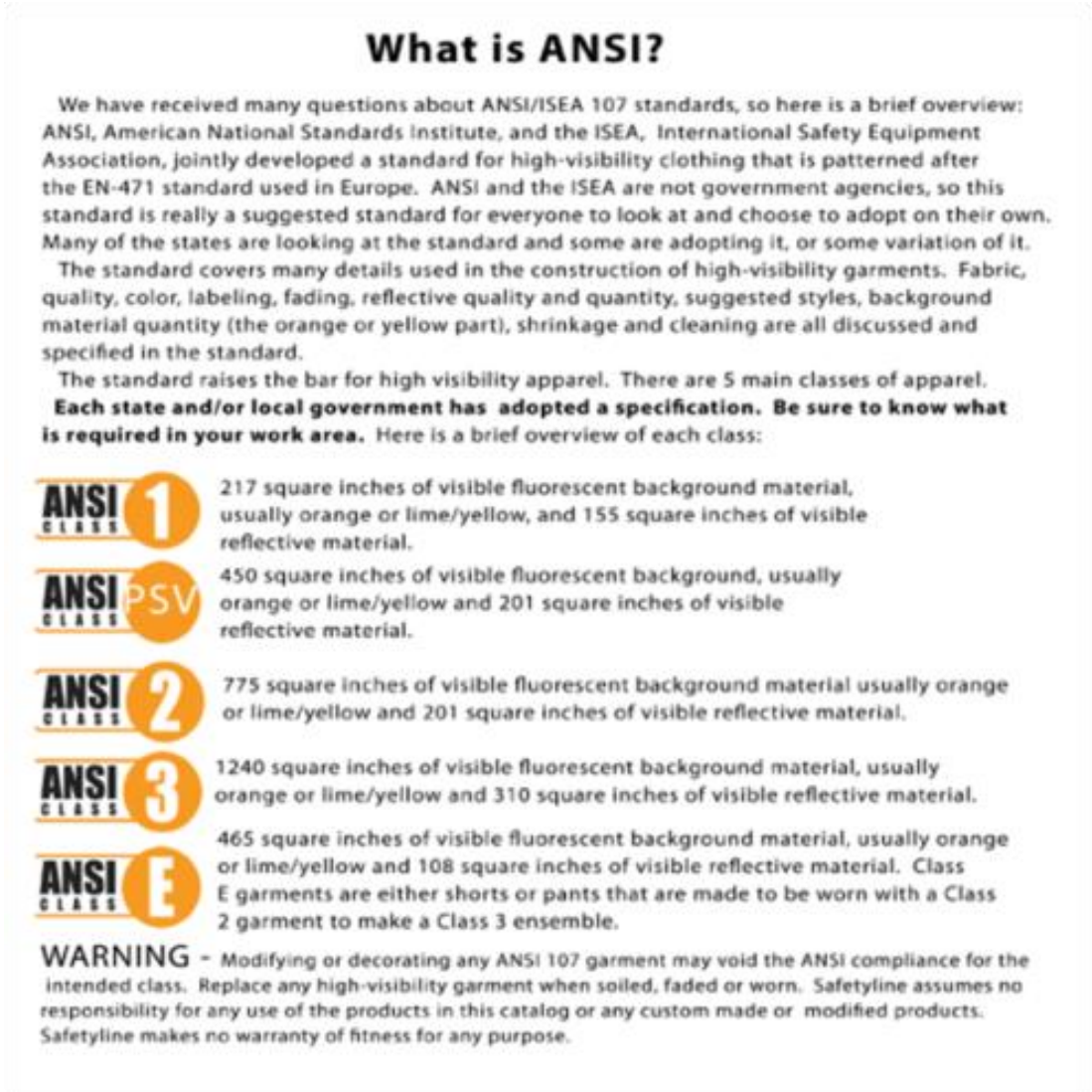
High-Visibility Safety Apparel

- ANSI 2:
  - 450 sq.in. visible fluorescent background material
  - 201 sq.in. visible reflective material
- ANSI 3:
  - 1240 sq.in. visible fluorescent background material
  - 310 sq.in. visible reflective material
- Short answer – just get ANSI 3



What is ANSI?

We have received many questions about ANSI/ISEA 107 standards, so here is a brief overview: ANSI, American National Standards Institute, and the ISEA, International Safety Equipment Association, jointly developed a standard for high-visibility clothing that is patterned after the EN-471 standard used in Europe. ANSI and the ISEA are not government agencies, so this standard is really a suggested standard for everyone to look at and choose to adopt on their own. Many of the states are looking at the standard and some are adopting it, or some variation of it.

The standard covers many details used in the construction of high-visibility garments. Fabric, quality, color, labeling, fading, reflective quality and quantity, suggested styles, background material quantity (the orange or yellow part), shrinkage and cleaning are all discussed and specified in the standard.

The standard raises the bar for high visibility apparel. There are 5 main classes of apparel. **Each state and/or local government has adopted a specification. Be sure to know what is required in your work area.** Here is a brief overview of each class:

ANSI CLASS 1 — 217 square inches of visible fluorescent background material, usually orange or lime/yellow, and 155 square inches of visible reflective material.

ANSI CLASS PSV — 450 square inches of visible fluorescent background, usually orange or lime/yellow and 201 square inches of visible reflective material.

ANSI CLASS 2 — 775 square inches of visible fluorescent background material usually orange or lime/yellow and 201 square inches of visible reflective material.

ANSI CLASS 3 — 1240 square inches of visible fluorescent background material, usually orange or lime/yellow and 310 square inches of visible reflective material.

ANSI CLASS E — 465 square inches of visible fluorescent background material, usually orange or lime/yellow and 108 square inches of visible reflective material. Class E garments are either shorts or pants that are made to be worn with a Class 2 garment to make a Class 3 ensemble.

WARNING - Modifying or decorating any ANSI 107 garment may void the ANSI compliance for the intended class. Replace any high-visibility garment when soiled, faded or worn. Safetyline assumes no responsibility for any use of the products in this catalog or any custom made or modified products. Safetyline makes no warranty of fitness for any purpose.

High-Visibility Safety Apparel

- Winter time
- Vest over parka?
- Retroreflective work coat?

Gloves

- General purpose

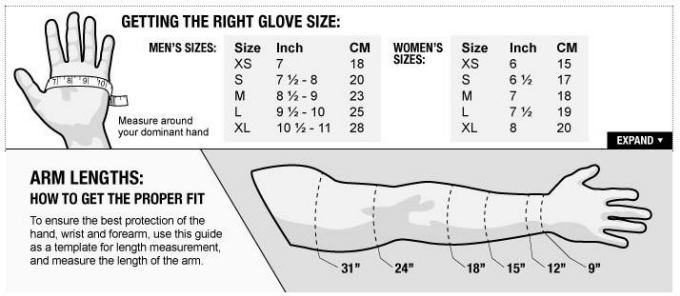
- Welding

- Electrical

- Cut resistant

- Etc.

- Did you know gloves come in sizes?



- Did you know it matters?
  - Better fit, better control
  - Better fit, more likely I'll wear them

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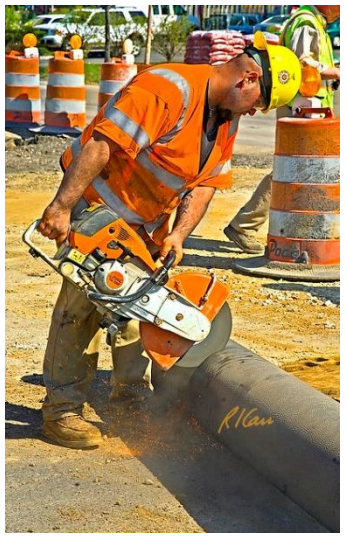
Hard Hats

- When are they needed?
  - When something can hit you on the head
  - From overhead, yeah
  - Side to side too, yes? Let's talk about a concrete chute
- When are they required?
  - When you see risk that they will mitigate
  - When you are directed to do so
  - When you think one is needed
  - When policy dictates

- Hard hats don't improve with age
  - Replace every 5 years
  - Probably replace liner more often
  - Always replace after it has withstood any form of impact or piercing
  - Replace if shell is brittle, chalky appearance, color is faded

Safety Glasses

- Whenever you're cutting
  - Circular saw/wood
  - Chain saw
  - Torch
  - Drill press



- When you're eating weeds or using a blower
- You know, any time debris and chunks of stuff are flying about
- Anytime you'd like to avoid regret in ten minutes that you can't see

Hearing Protection

- Noise exposure
  - f(x) = intensity, duration, distance

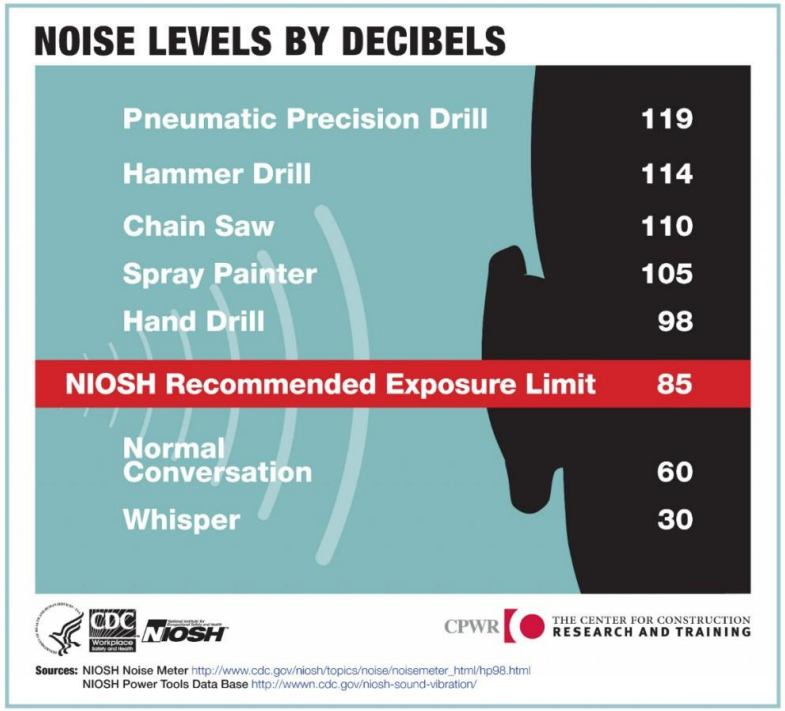


TABLE D-2 - PERMISSIBLE NOISE EXPOSURES

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

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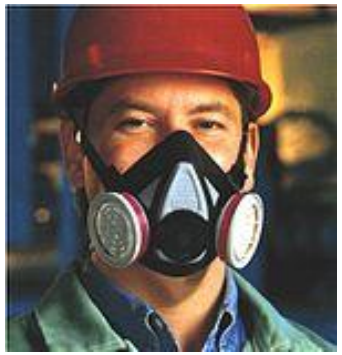
Respiratory Protection

- Basics
  - Dust
  - Silica environments
- For more involved risks, respiratory protection gets more complicated
  - Fumes
  - Vapors
  - Unknown compounds
- Oh, and they have a shelf life also
  - Depends upon the type



Respiratory Protection

- Have you ever heard the term “N95 mask”?
- NIOSH Certification Levels for Particulate Filtering Respirators
  - 10 classes of approved <u>particulate filtering</u> respirators

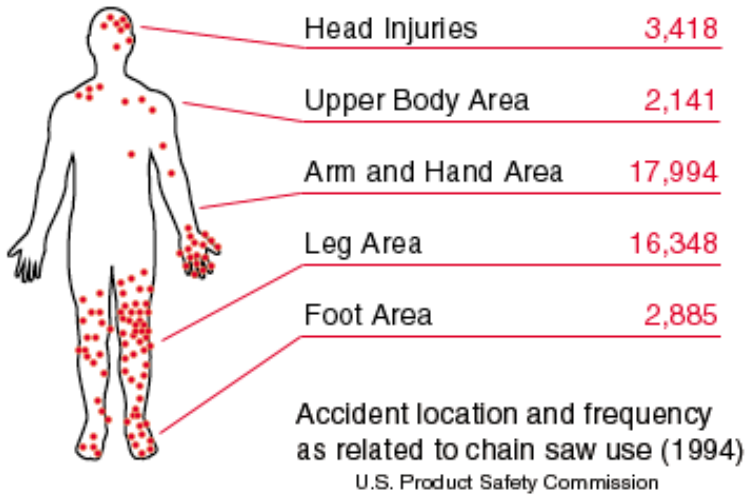
  - N95, N99, N100 – not resistant to oil; filter 95%, 99% or 99.97% of airborne particles
  - R95, R99, R100 – somewhat resistant to oil
  - P95, P99, P100 – highly oil resistant
  - HE (High Efficiency Particulate Air) – only used in powered air purifying respirators (PAPRs); filter 99.97% of airborne particles

NIOSH Certified Equipment List

- All approved respirators have an approval number (or TC number) on the product's label within the packaging
- Fraudulent respirators may be labeled with "N95" or the NIOSH logo, but haven't actually gone through NIOSH certification or they've been rejected by NIOSH
- For homework, watch this NIOSH video on fraudulent versus approved respirators.
- Confirm your purchases or stock by checking NIOSH's Certified Equipment List

Chaps

- Wear them



Accident location and frequency as related to chain saw use (1994)
U.S. Product Safety Commission

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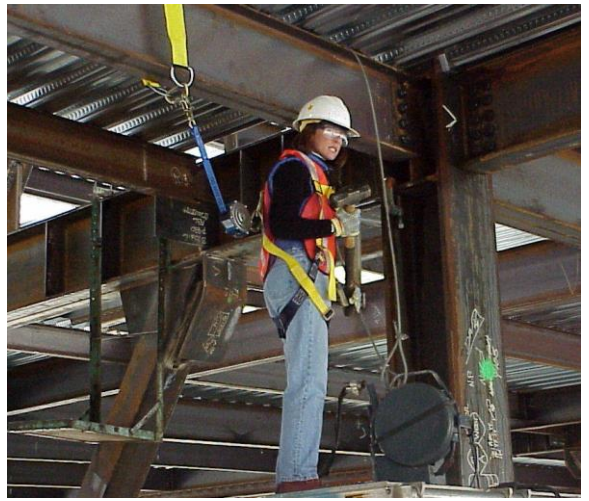
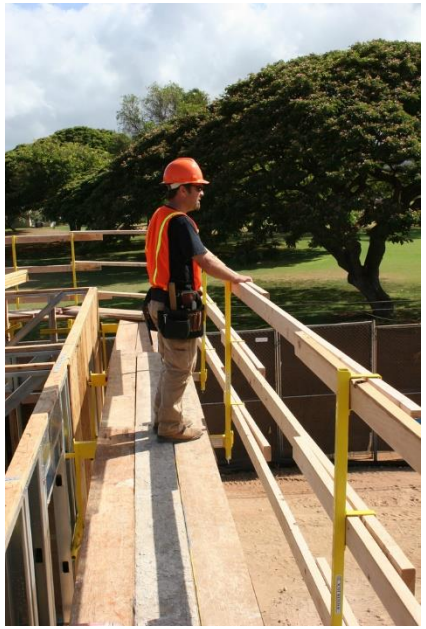
Fall Protection

- Not your everyday PPE
- If you're wearing a harness, it's fitted to YOU
- If you're wearing a harness, you know where it's been, what it's been subjected to, it's age, and so on
  - Otherwise, it's just a false sense of security
  - These are not for show



Fall Protection



- Under OSHA 29 CFR 1910.28
  - Requirements to provide protection for each employee exposed to fall and falling object hazards
  - Does not apply to:
    - Portable ladders
    - Pre and post work assessment, inspection, etc.
    - Powered platforms for building maintenance (29 CFR 1910.66)
    - Aerial lifts (29 CFR 1910.67)
    - Telecommunications work
    - Electric power generation, transmission, distribution
    - Exposed perimeters of entertainment stages, exposed perimeters of rail-station platforms

BUT…
That doesn't mean you can't/shouldn't use fall protection if you assess the need

https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.28

Fall Protection

Okay, but what does it cover?

- Unprotected sides and edges
- Hoist areas
- Holes and openings
- Dangerous equipment (like that you can fall into)
- Fixed ladders (>24’ above lower level)
- Outdoor advertising

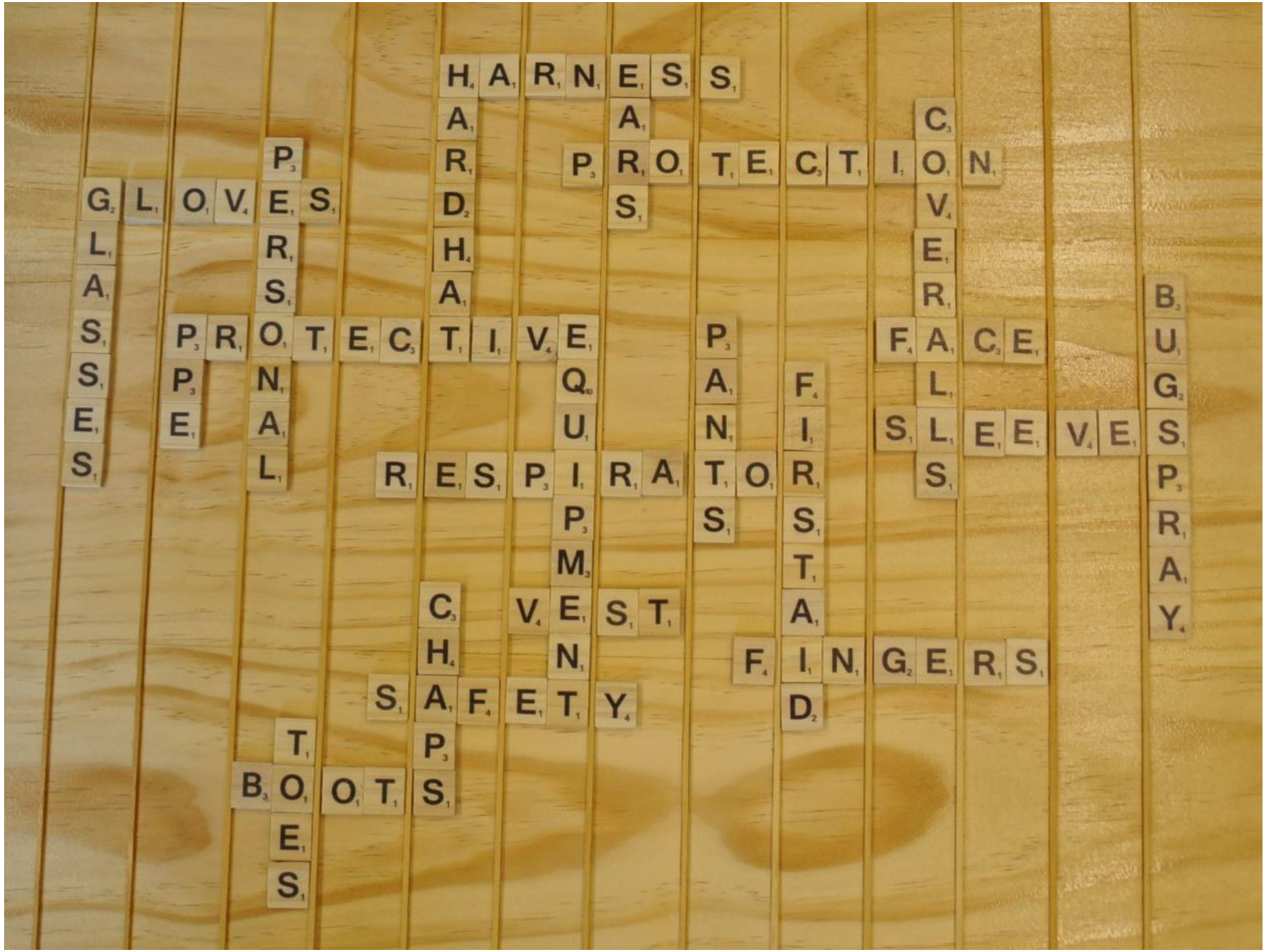
- Scaffolds – this sends us to Construction 29 CFR 1926, Subpart L
- Work on low sloped roofs
- Protection from falling objects

Scaffolds are a whole separate thing – let’s stop there

Body Protection

- Municipal waste collection
- Beach cleanup
- Building or site cleanup
- Working chemicals or paint
- Welding, cutting
- Cloth coveralls?
- Aprons?
- Tyvek (or approved equal)?

Personal Protective Equipment



What's Missing?

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Couple Examples

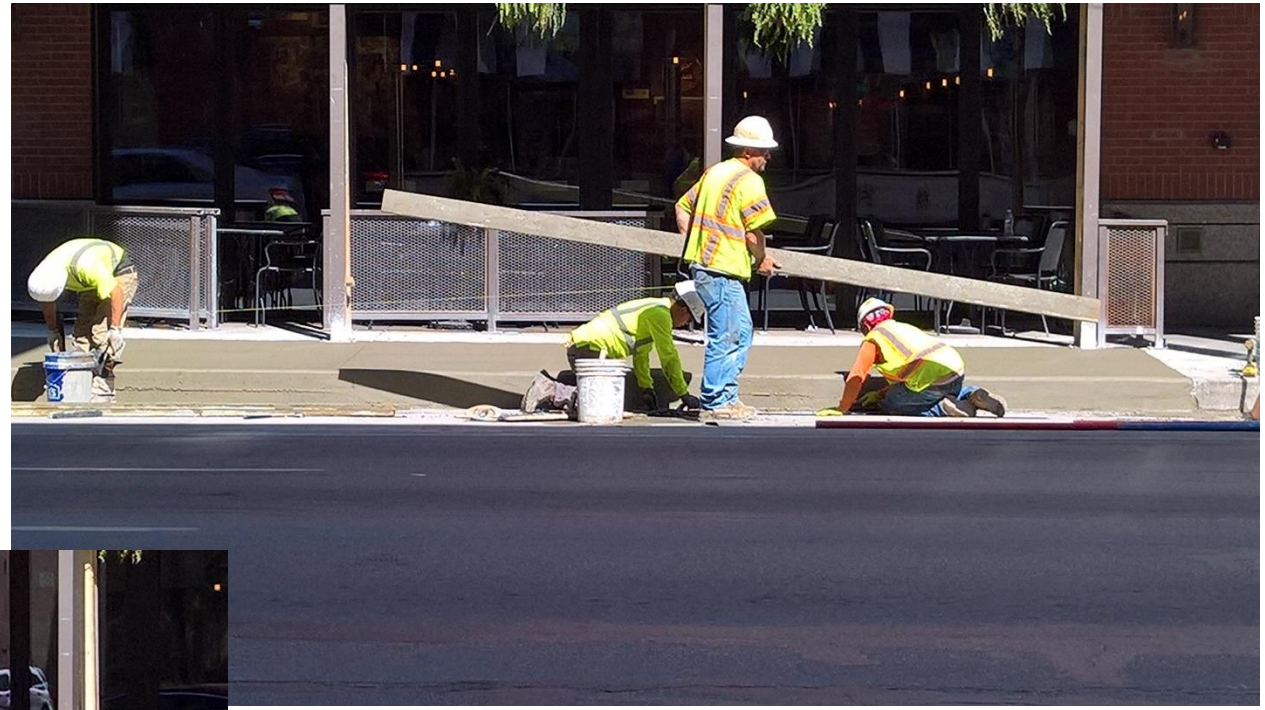
Time to critique and second guess people who are working…

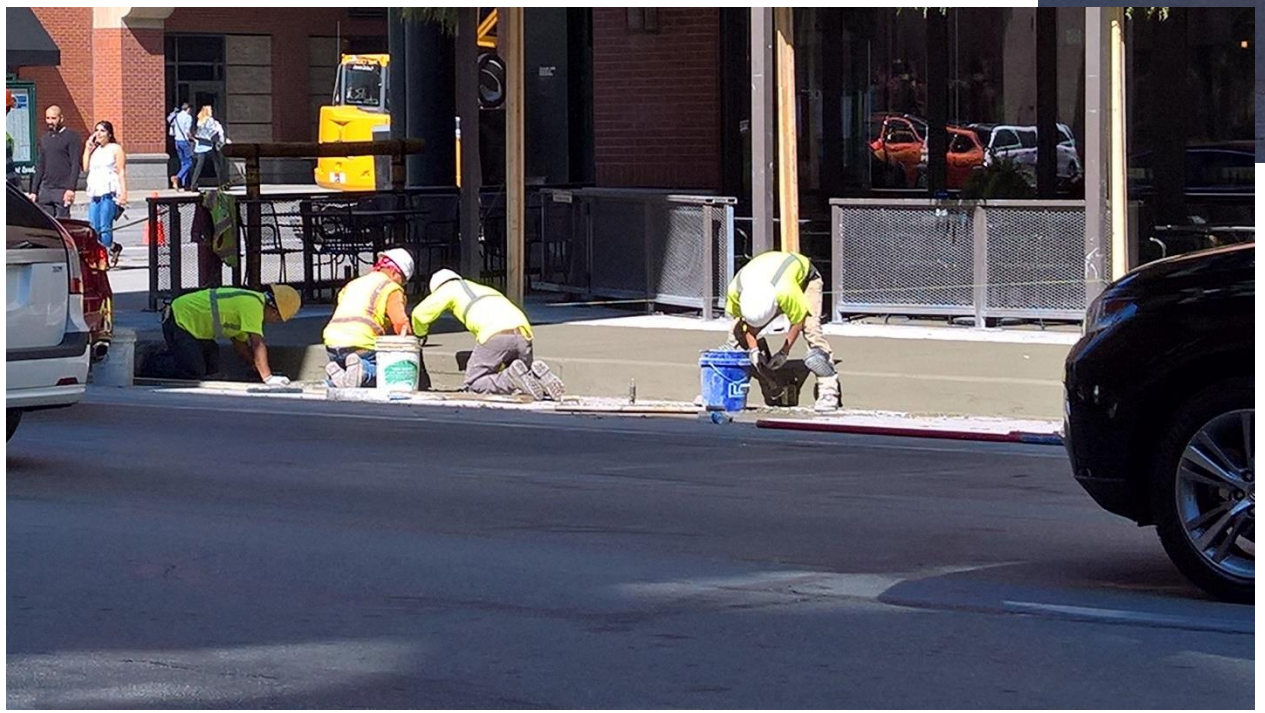
You fell victim to one of the classic blunders – The most famous of which is ‘never get involved in a land war in Asia’

--- Vizzini

Curb and Sidewalk

- What PPE do you see?
- What PPE should you see?





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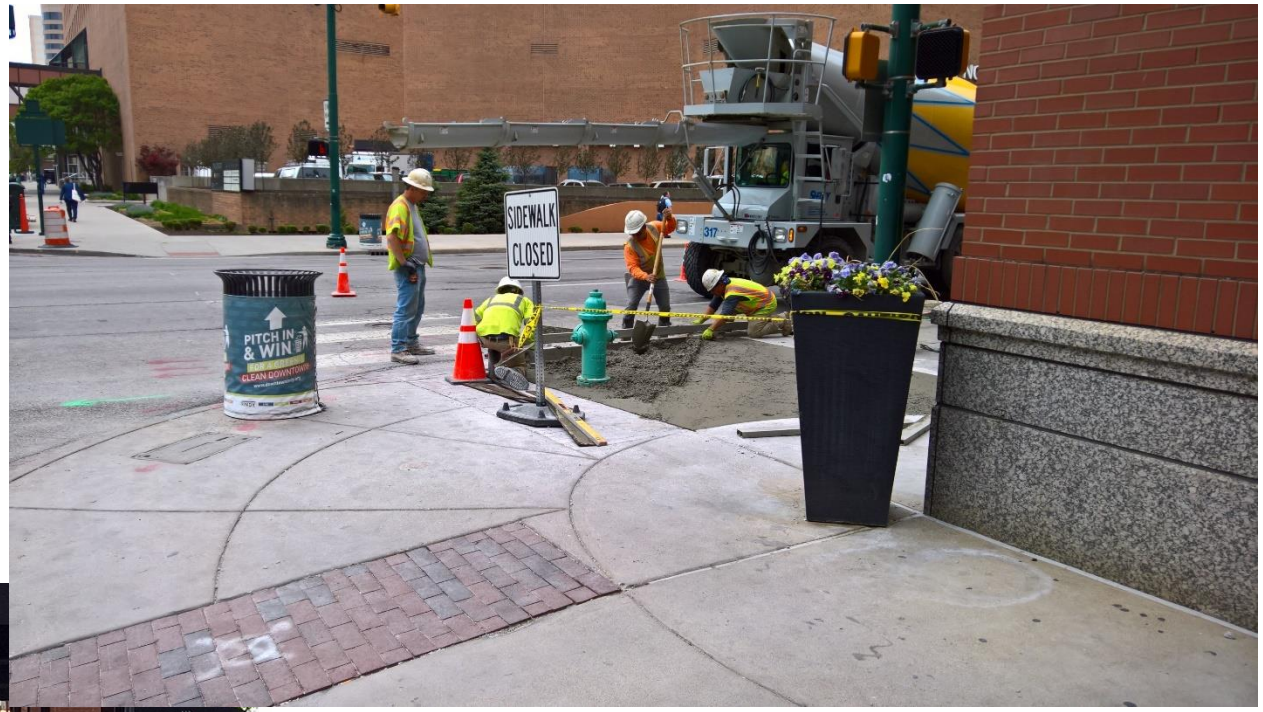
Curb and Sidewalk

- What PPE do you see?
- What PPE should you see?



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Curb and Sidewalk

- What PPE do you see?
- What PPE should you see?

No, it’s a trick question…'Cause Chevy didn't make a 327 in '55. The 327 didn't come out til '62. And it wasn't offered in the Bellaire with the 4-barrel carburetor til '64. However, in 1964 the correct ignition timing would be 4 degrees before top dead center.

--- Mona Lisa Vito

Pavement Repair

- What PPE do you see?
- What PPE should you see?

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Pavement Repair

- What PPE do you see?
- What PPE should you see?

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Final Word About Fit

In other words, it’s almost over…

Let me ‘splain… no, there is too much. let me sum up.
--- Inigo Montoya

Fit and Comfort Matter

- If you want to be effective, if you want your crews to wear their PPE and wear it correctly and consistently…
  - Make sure it fits
  - Make sure it is as comfortable as you can
  - Make sure it will stay on
  - Make sure it's the right kind/type/class
  - Make sure it's not past the shelf life

Think of something else tomorrow? Contact us…

Matt Carter

Municipal Engineering Circuit Rider

Delaware T^2 Center

matheu@udel.edu

(302) 831-7236

http://sites.udel.edu/dct/t2-center/

Have fun stormin' da castle!
--- Miracle Max and Valerie