WASHINGTON STATE UNIVERSITY

World Class. Face to Face.

Composite Materials and Engineering Center

Research Technology Park (RTP) Safety Training

Purpose of Orientation

- **Inform you:**
  - **of the hazards that exist**
  - **how to deal with the hazards**
  - **of your rights as an employee**
  - **how to seek help in an emergency**
  - **what is expected of you as an employee**

Accidents

- **Report Accidents to Supervisor Immediately**
- **WASHINGTON WORKERS' COMPENSATION INSURANCE -- Chapter 296-17 WAC**
  - **Wage and medical benefits to employees who suffer on-the-job injuries or illnesses; and**
  - **Immunity from lawsuits for employers as a result of workplace injuries or illnesses suffered by their employees.**

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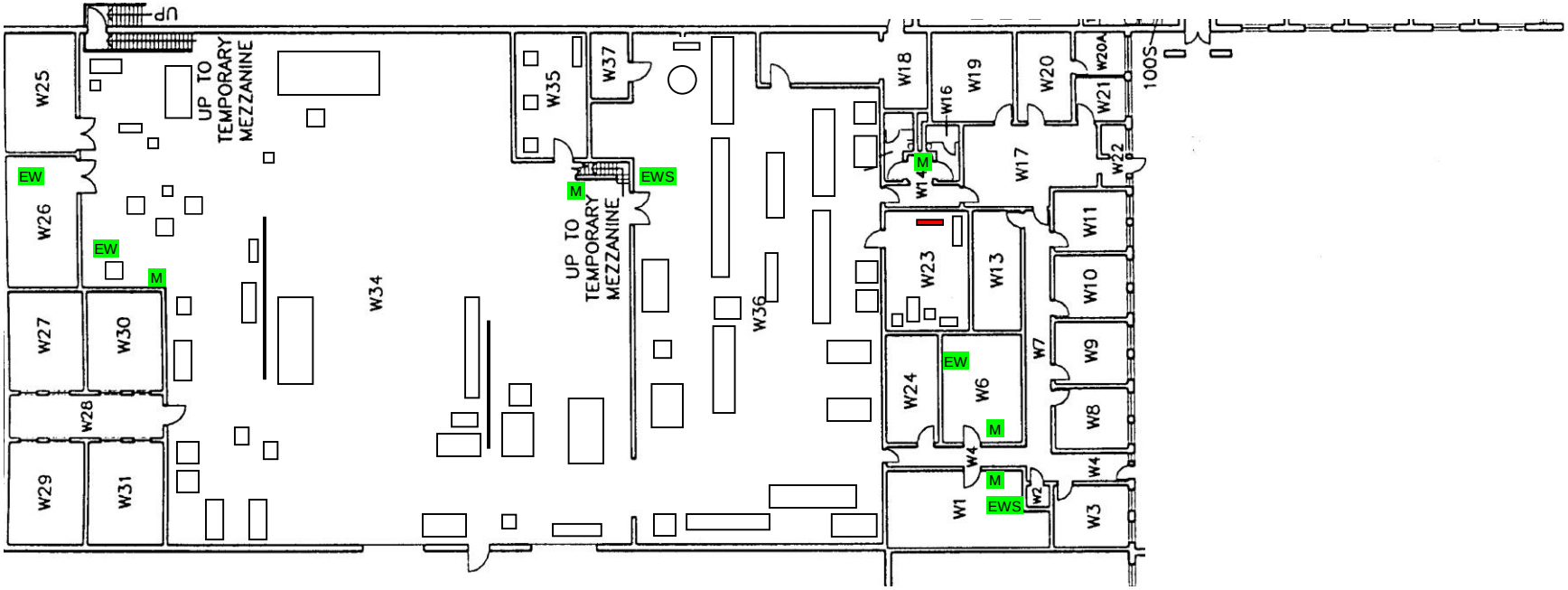
First Aid

Symbol Key

EW – Eye Wash (4)

S – Emergency Shower (2)

M – Medical/First Aid Kit (5)



First Aid

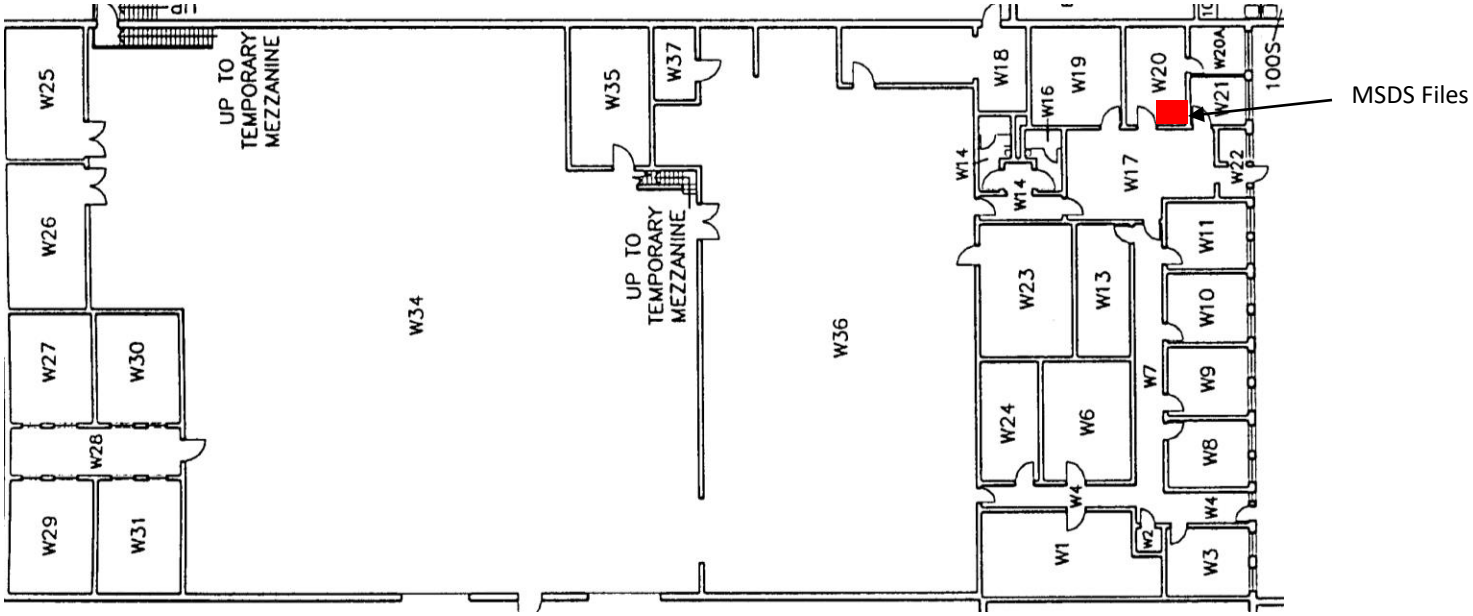
- Obtaining Treatment
- Location and Operation of Equipment
  - Deluge Showers
    - Remove clothing if necessary to reduce contamination
    - Pull handle and remain under shower for 15 minutes
    - Rinse affected area, do not scrub with bare hand
  - Eye Wash Station
    - Remove safety glasses
    - Push handle and continue rinsing for 15 minutes
    - Use free hands to help keep eyes open
  - First Aid Kit
    - Move to injured party if appropriate
    - Use necessary items (notify Safety Coordinator if stock depleted)

First Aid

- **Obtaining Treatment**
- **Location and Operation of Equipment**
- **Location and Names of First Aid Trained Employees, when in the building**
  - **Joshah Jennings – Office PACCAR 133**
  - **Scott Lewis – Office PACCAR 131**

Potential Hazards on the Job

- **Material Safety Data Sheets (MSDS)**
  - **In file cabinet in entrance of Suite C**
  - **Identify hazardous material, contact information, treatment, etc.**
- **Right-To-Know – You have the right to know what you are working with and can ask for a different assignment if not satisfied with hazard controls/risk assessment**



Potential Hazards on the Job

- **What they are:**
  - **Equipment -- ?**
  - **Hazard -- ?**
  - **Hazard Controls – ?**
- **<u>All</u> equipment requires additional training prior to use**
- **Eye protection required in <u>all</u> laboratory work areas**
  - **You/your supervisor are responsible for providing safety glasses**
- **Lockout/Tagout- Unplug or lockout all electrical connections prior to servicing any equipment.**

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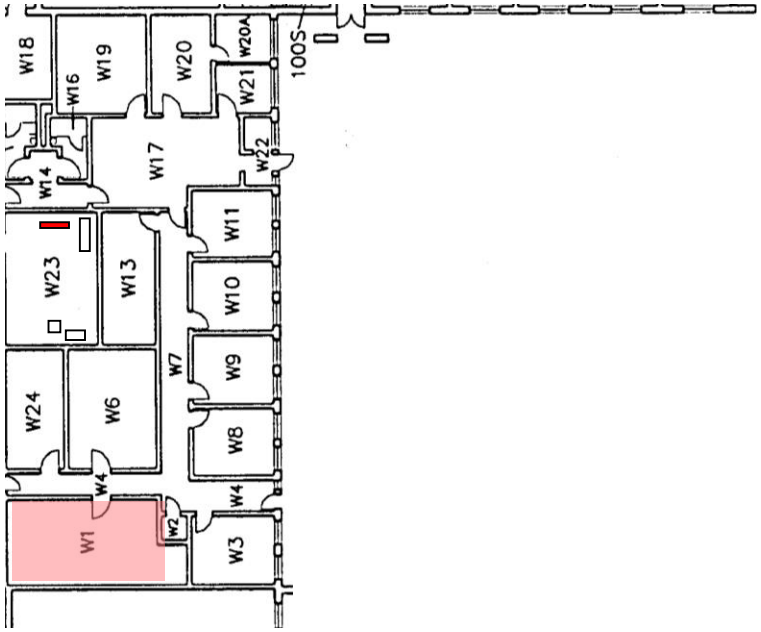
Suite C – Room W1 – Resin Transfer Molding

Equipment:, Resin Transfer Molding

Hazard – Solvents, Resins

Hazard Controls – Eye protection, gloves, lab coat

Properly store and label **all** materials



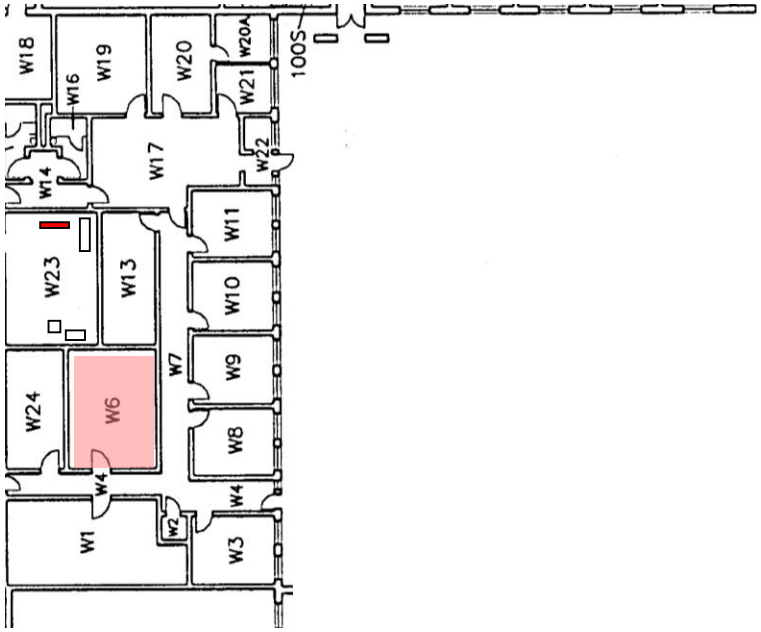
Suite C – Room W6 –

Equipment:, Glassware

Hazard –

Hazard Controls – Eye protection, gloves, lab coat

Properly store and label **all** materials

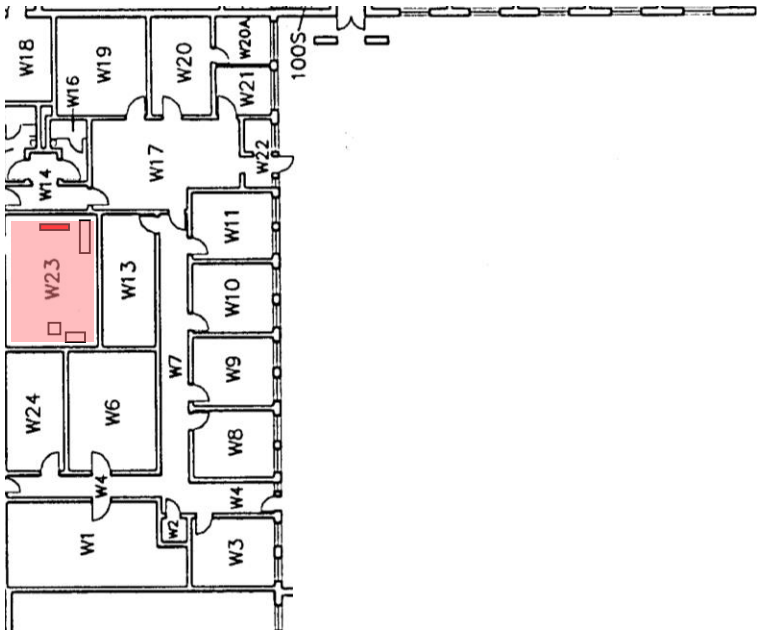


Suite C – Room W23 – NDT

Equipment: Cabinet X-Ray, Water Absorption trays, NDT

Hazard – Ionizing radiation,

Hazard Controls – eye protection, gloves

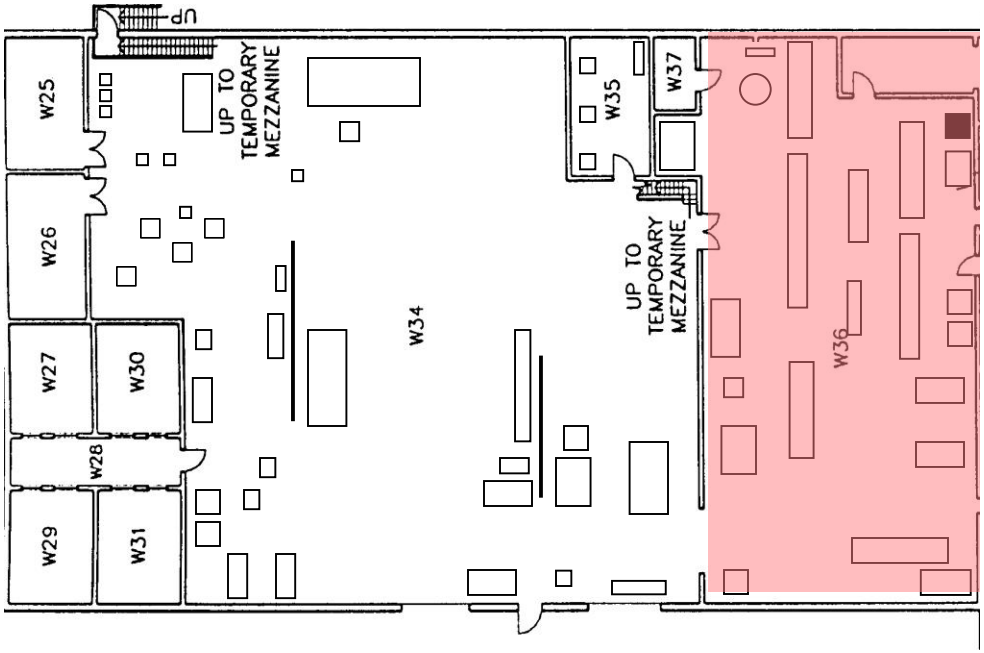


Use of X-Ray machine requires additional training through Radiation Safety Office

Suite C – Room W23 – NDT

Cabinet X-Ray

Suite C – Room W36 – Processing

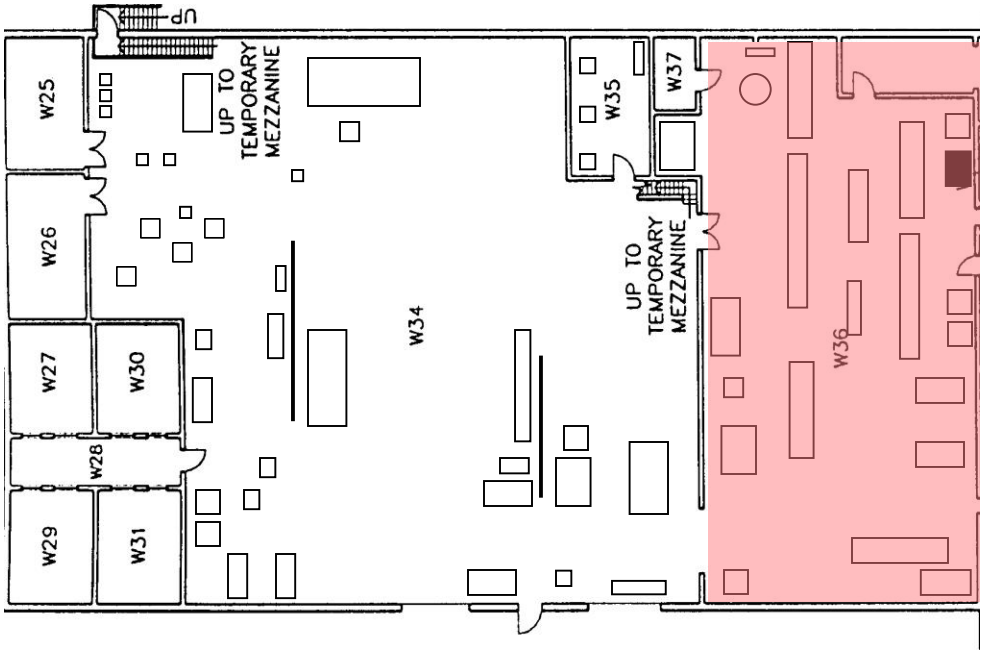


Hazard, by equipment: Forced Air Oven

Hazard -- Heat

Hazard Controls – Eye protection, gloves

Suite C – Room W36 – Processing



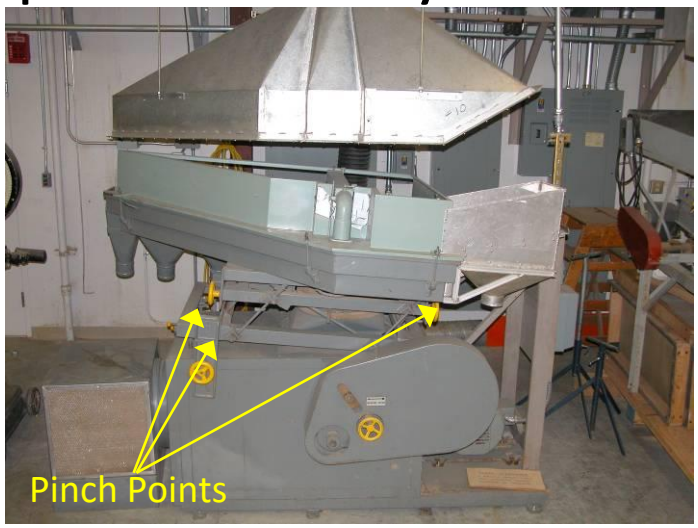
Hazard, by equipment: Distilled Water Tank

Hazard --

Hazard Controls --

Hazard, by equipment: Specific Gravity Table

Suite C – Room W36 – Processing

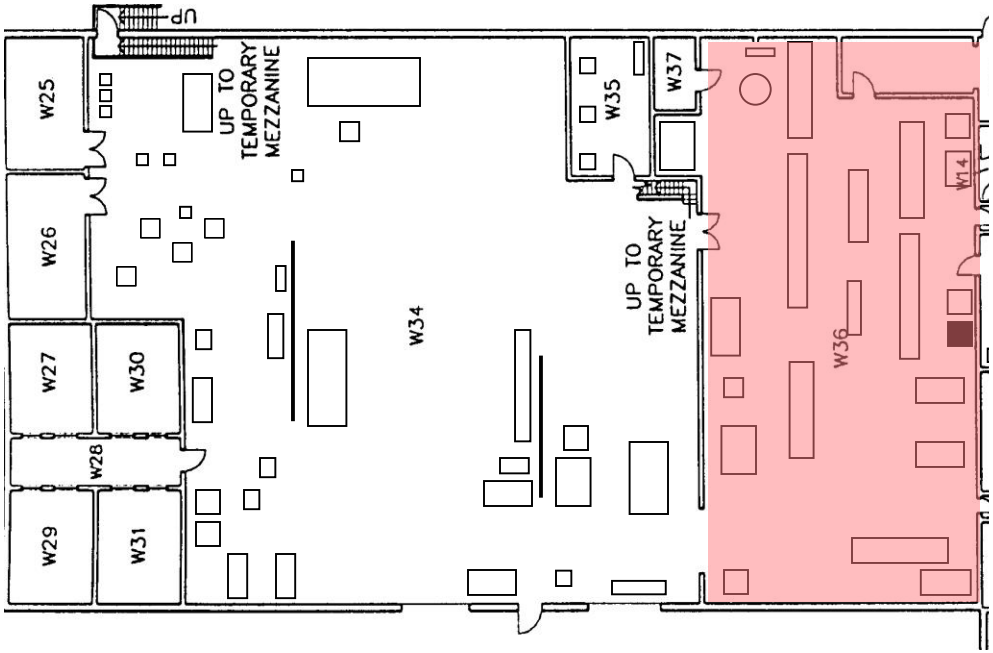


Hazard – Pinch points, noise, flying objects

Hazard Controls – Eye protection, hearing protection, no loose clothing, guards, exhaust fan

Hazard, by equipment: Rotary Crusher

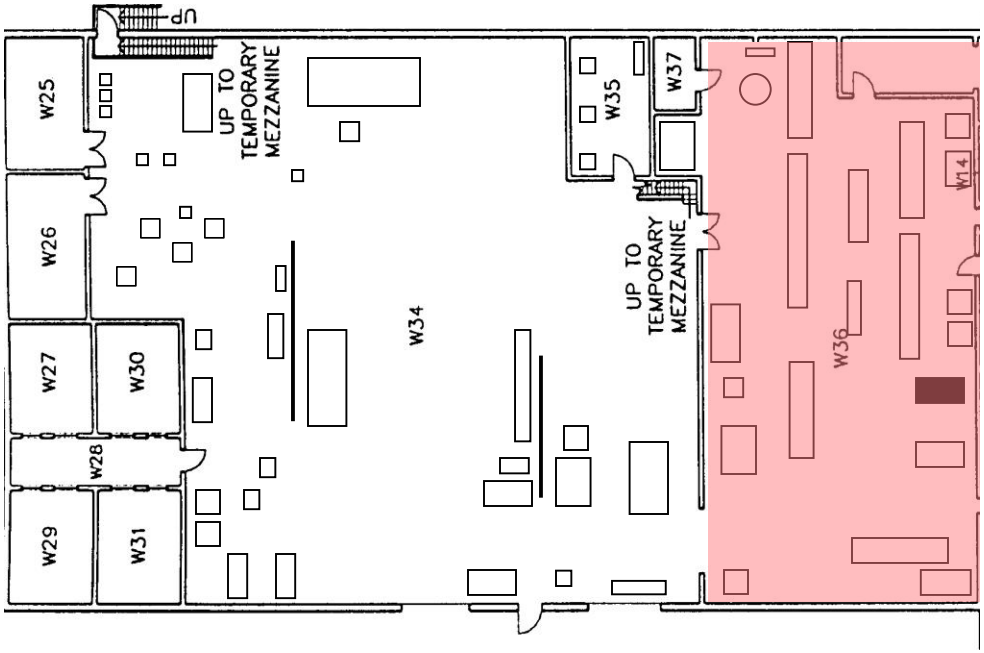
Suite C – Room W36 – Processing



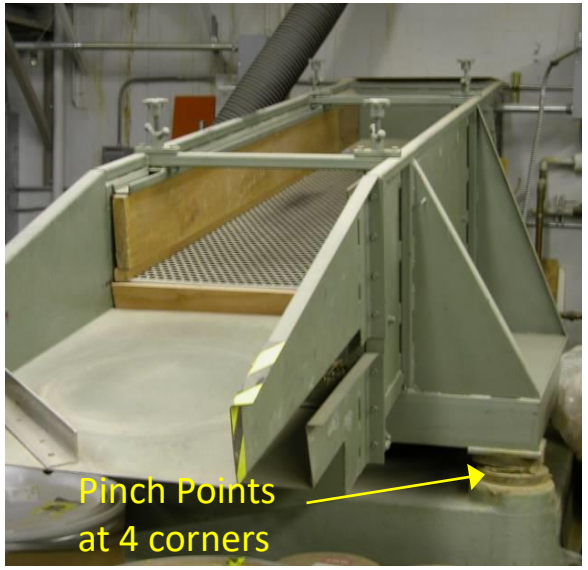
Hazard – Rotating equipment, pinch points, dust

Hazard Controls – No loose clothing, eye protection, dust mask, guards, exhaust fans

Suite C – Room W36 – Processing



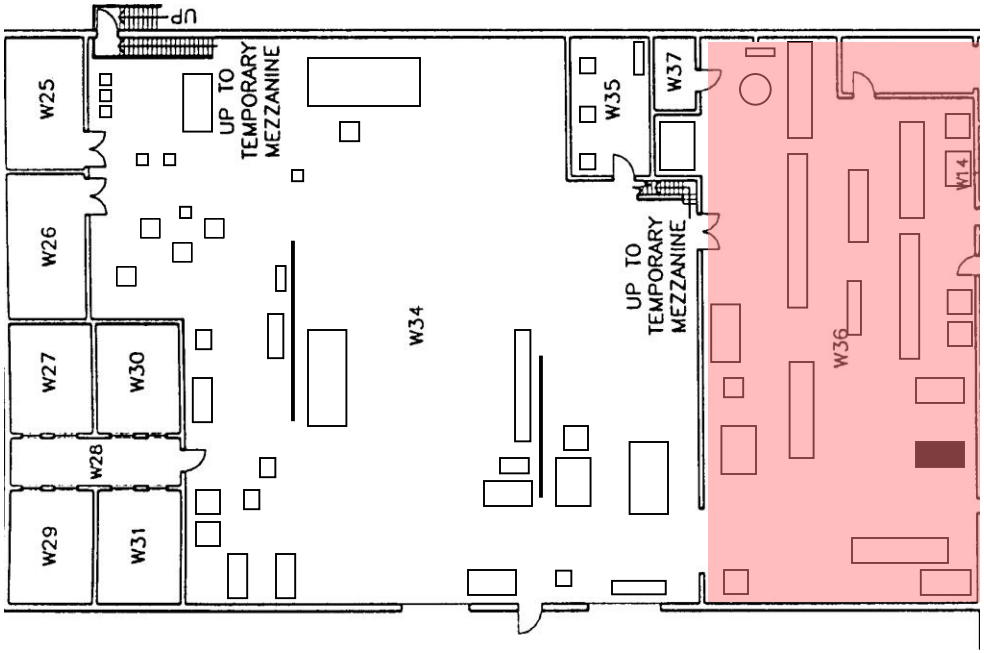
Hazard, by equipment: 2’x8’ Screening Table



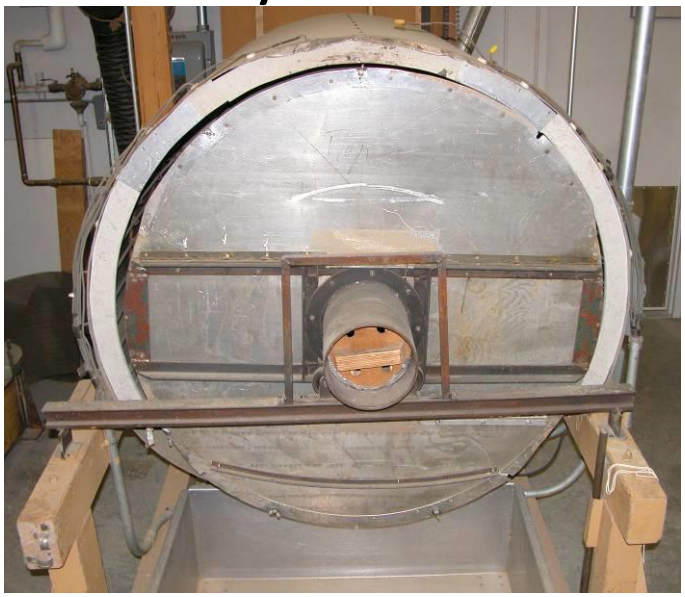
Hazard – Pinch points, flying objects, dust

Hazard Controls – Eye protection, gloves, guards, dust mask, exhaust fans

Suite C – Room W36 – Processing



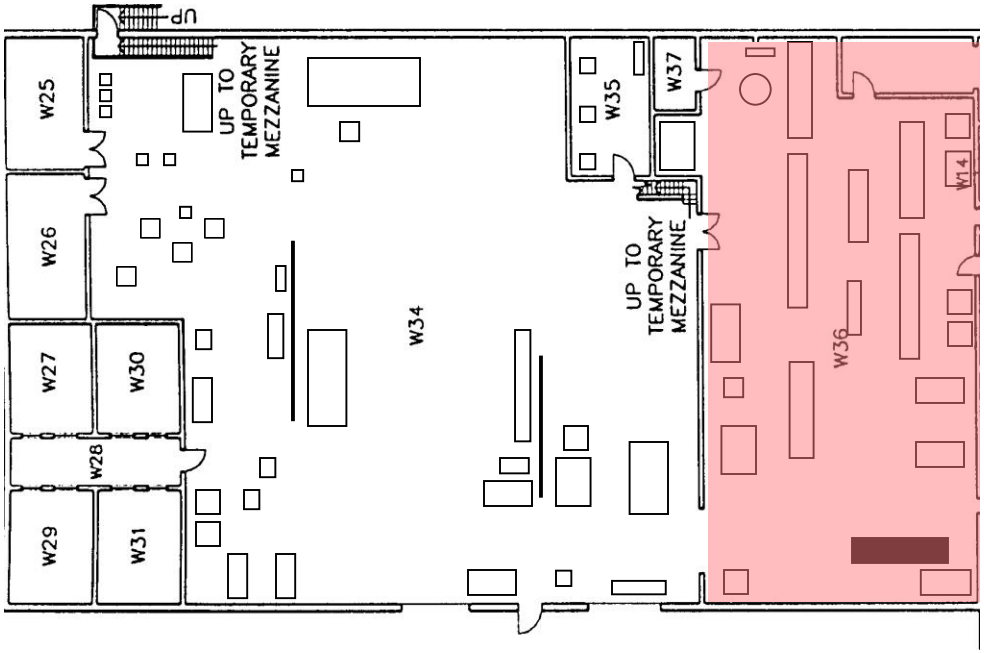
Hazard, by equipment: Drum Dryer



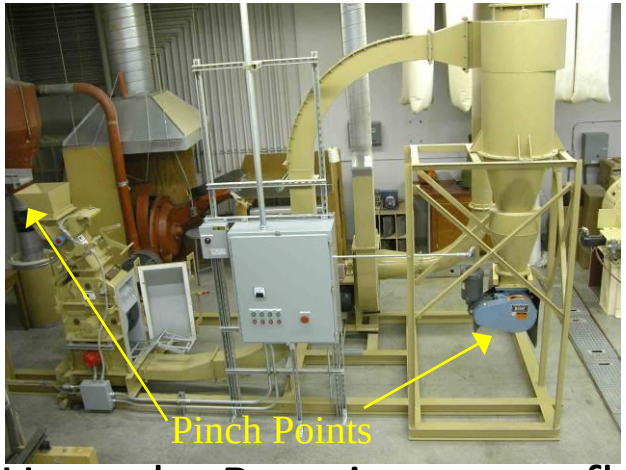
Hazard – Rotating parts, heat

Hazard Controls – Eye protection, gloves, no loose clothing, exhaust fan

Suite C – Room W36 – Processing



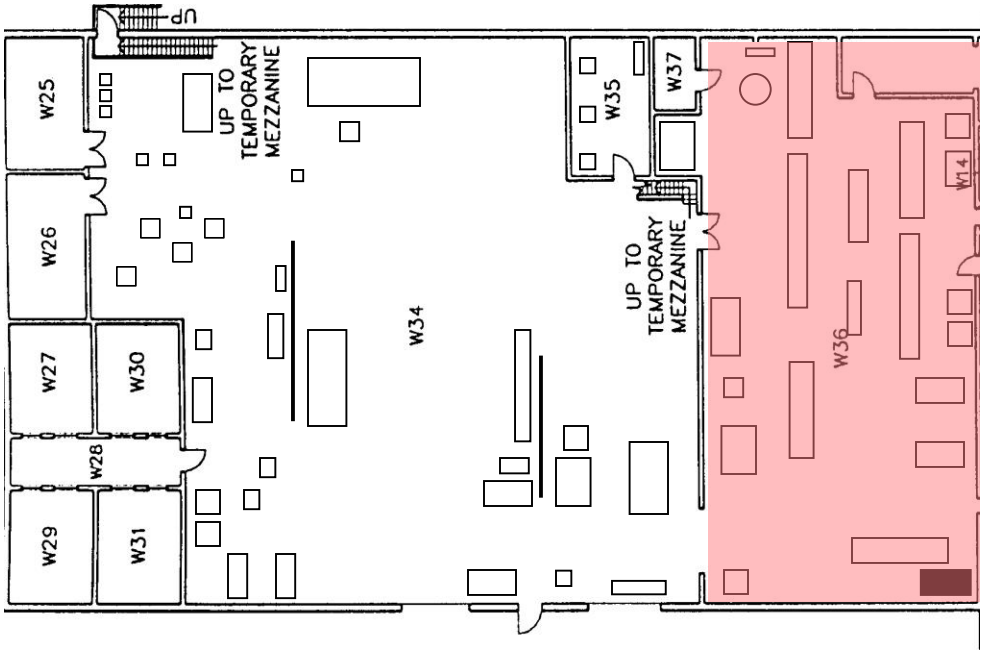
Hazard, by equipment: Bliss Hammer mill



Hazard – Rotating parts, flying objects, dust, noise, pinch points

Hazard Controls – Eye protection, hearing protection, no loose clothing, dust mask, guards, limit switches, exhaust fans

Suite C – Room W36 – Processing



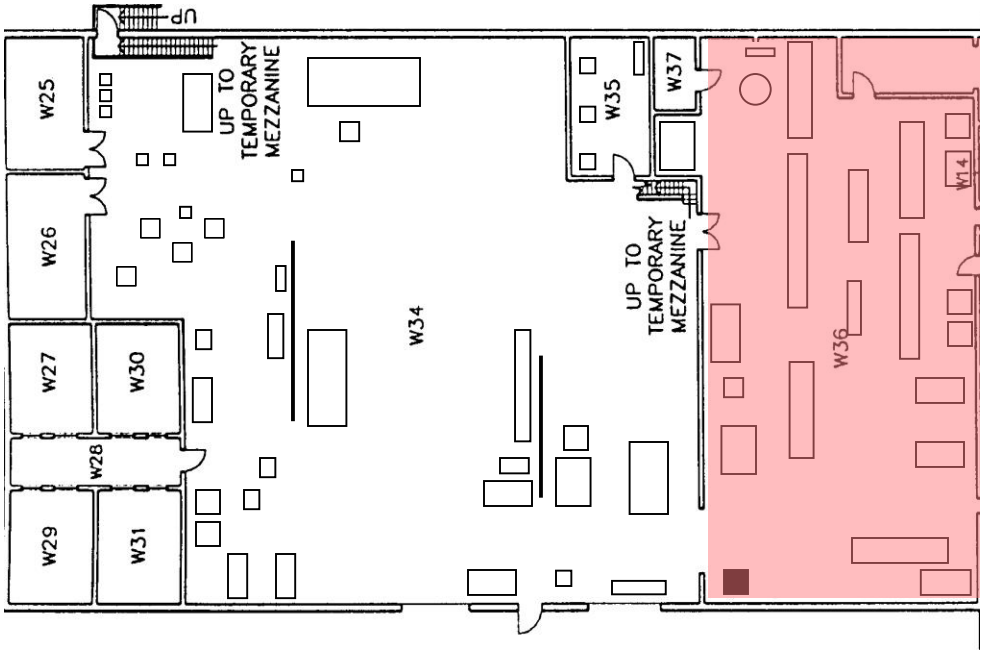
Hazard, by equipment:

Pratter Hammer mill

Hazard – Rotating parts, flying objects, dust, noise

Hazard Controls – Eye protection, hearing protection, no loose clothing, dust mask, exhaust fans

Suite C – Room W36 – Processing



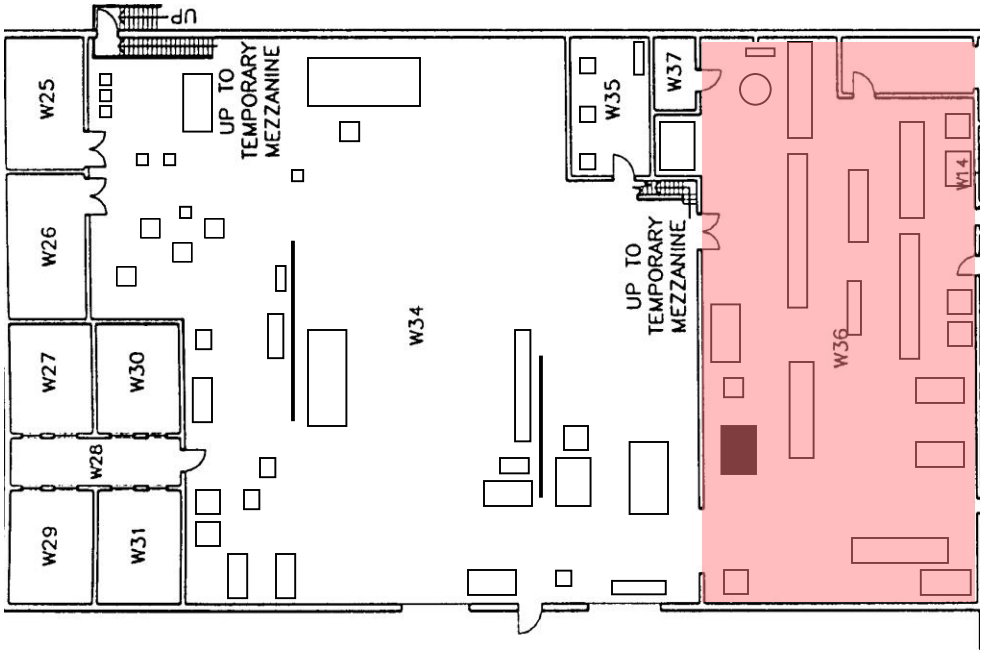
Hazard, by equipment:

Chipper

Hazard – Rotating parts, flying objects, noise, sharp knives

Hazard Controls – Eye protection, hearing protection, no loose clothing, dust mask, exhaust fans

Suite C – Room W36 – Processing



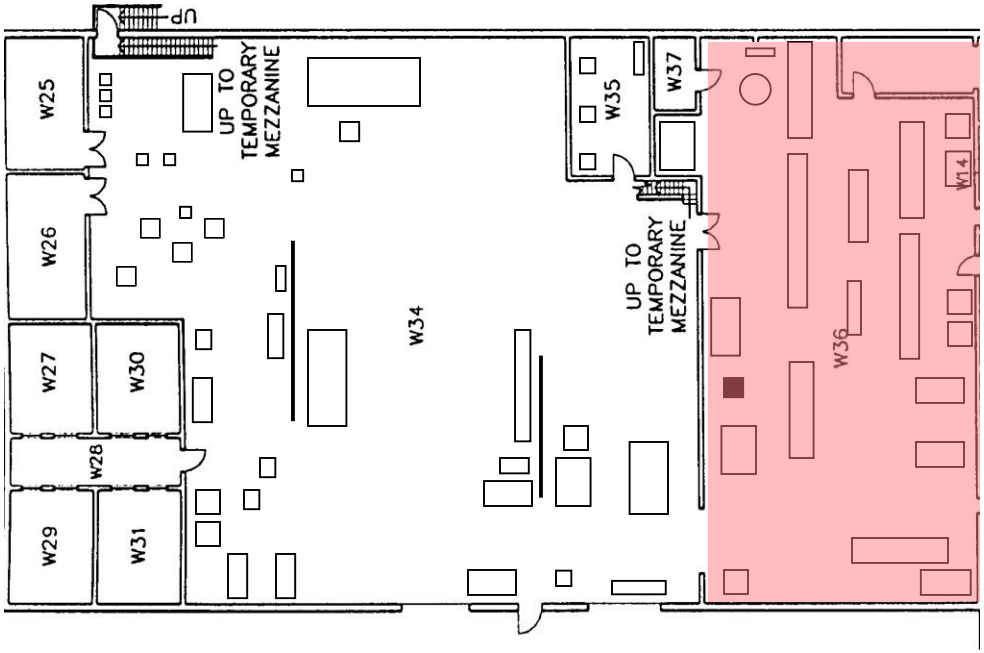
Hazard, by equipment:

Attrition mill

Hazard – Heat, rotating parts, flying objects, dust, noise

Hazard Controls – Eye protection, hearing protection, no loose clothing, gloves, dust mask, exhaust fans

Suite C – Room W36 – Processing



Hazard, by equipment: Steam Generator

Hazard – Heat, pressure vessel

Hazard Controls – Eye protection, gloves

Suite C – Room W36 – Processing

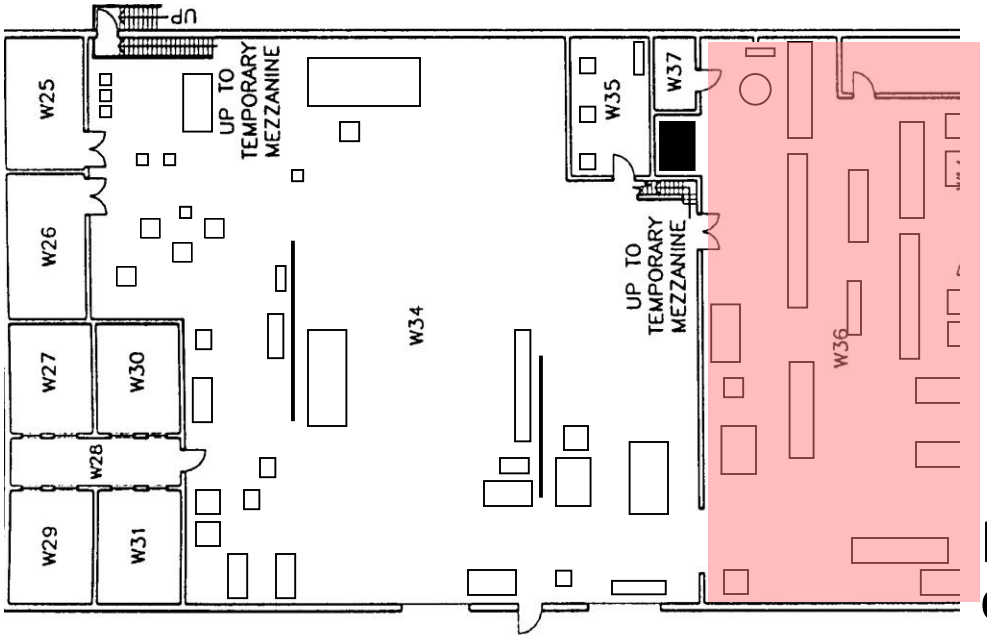
Hazard, by equipment:

CPM Pellet mill

Hazard – Rotating parts, heat, dust, noise

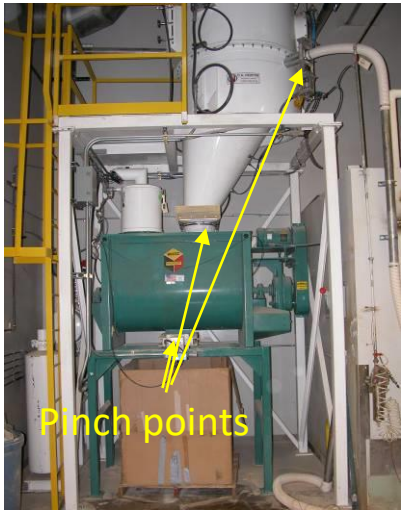
Hazard Controls – Eye protection, hearing protection, no loose clothing, dust mask, gloves, exhaust fans

Suite C – Room W36 – Processing



Hazard, by equipment:

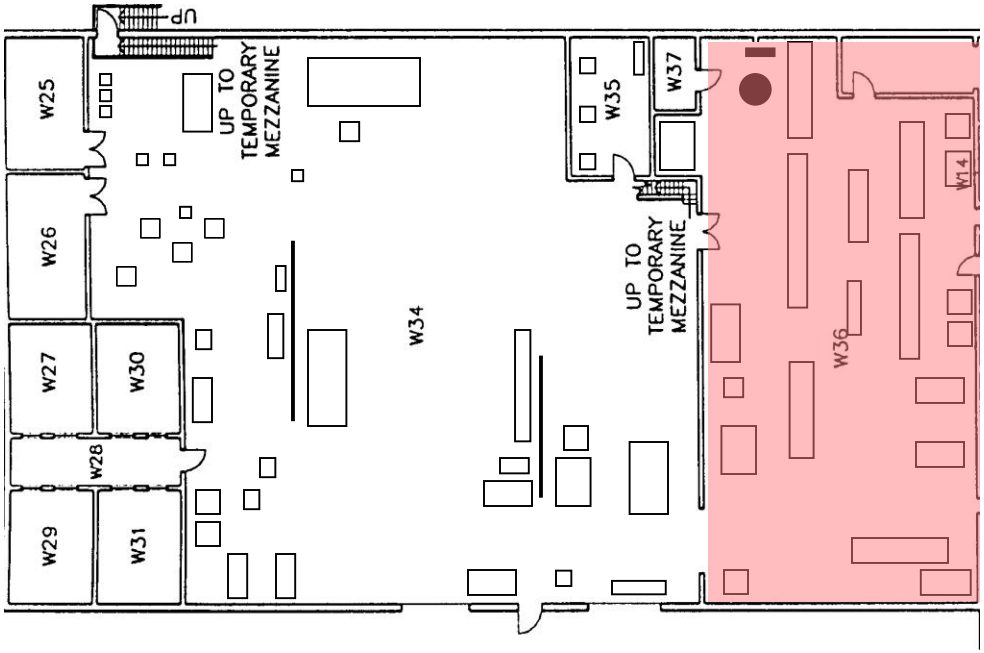
Pneumatic Blending and Conveying



Hazard –Pinch points, crushing, dust

Hazard Controls – Eye protection, dust mask, limit switches, exhaust fans

Suite C – Room W36 – Processing



Hazard, by equipment: Chilled Water System

Hazard – Rotating parts

Hazard Controls – Eye protection, no loose clothing

Suite C – Room W36 – Processing

Hazard, by equipment:

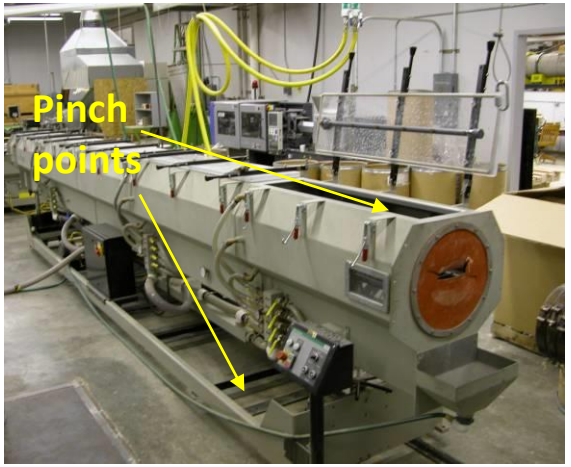
86mm Extruder

Hazard – Heat, compressed gas cylinders, fumes, electric shock

Hazard Controls – Gloves, limit switches, exhaust fans, gas cylinder tie downs

Suite C – Room W36 – Processing

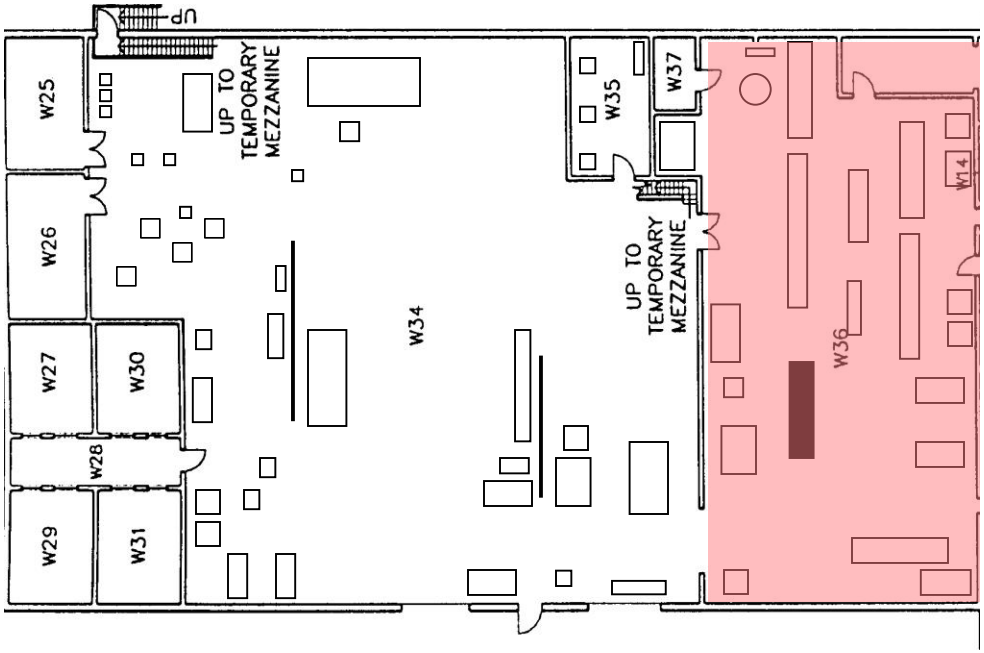
Hazard, by equipment: Profile Cooling Unit



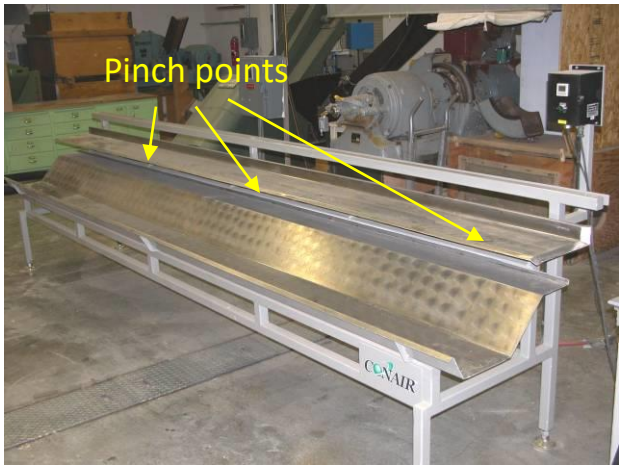
Hazard –Pinch points

Hazard Controls – Gloves

Suite C – Room W36 – Processing



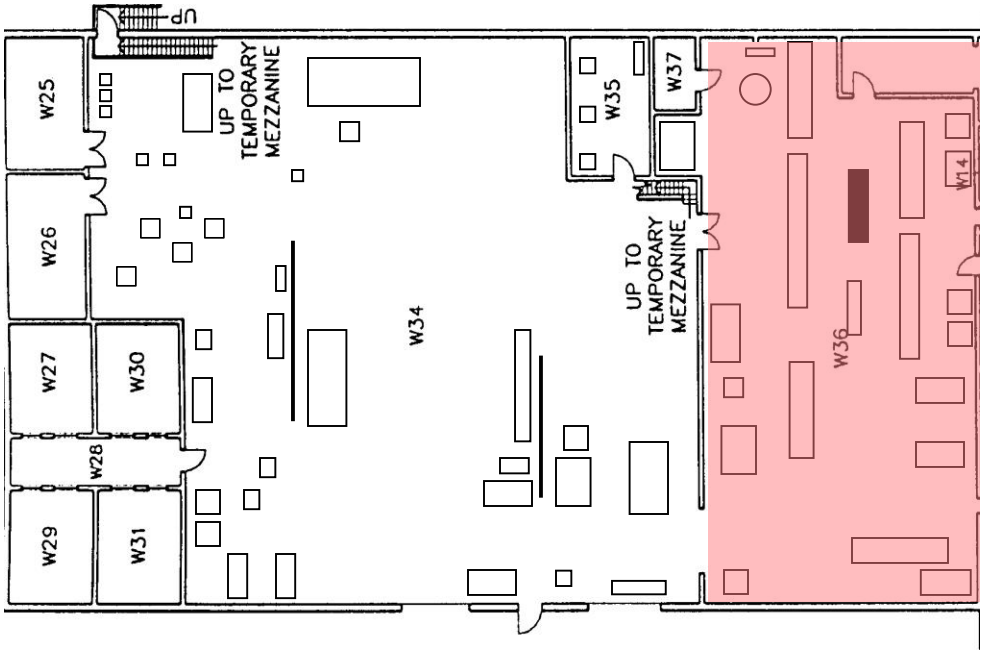
Hazard, by equipment: Dump Table



Hazard – Pinch points (automatic start), crushing

Hazard Controls – Gloves

Suite C – Room W36 – Processing



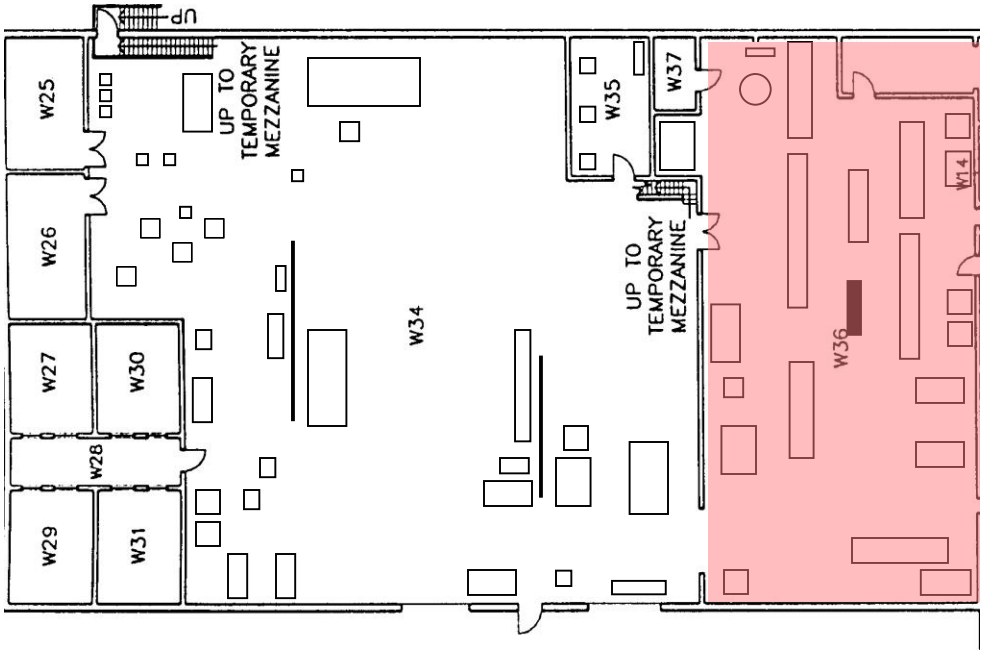
Hazard, by equipment:

35mm Extruder

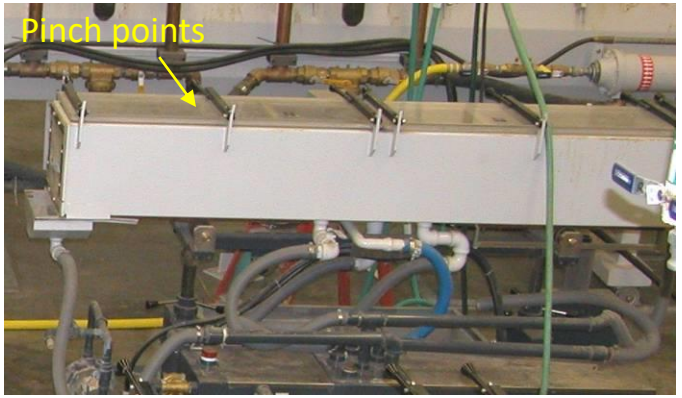
Hazard – Heat, fumes, compressed gas cylinders

Hazard Controls – Gloves, eye protection, limit switches, exhaust fans, gas cylinder tie downs

Suite C – Room W36 – Processing



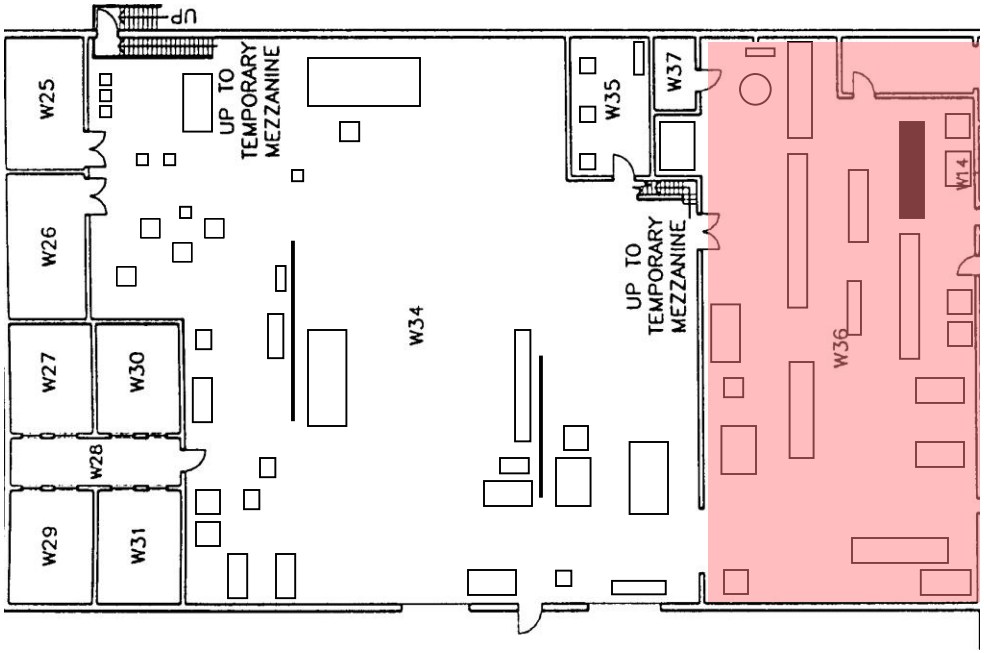
Hazard, by equipment: Profile Cooling Unit



Hazard –Pinch points

Hazard Controls – Gloves

Suite C – Room W36 – Processing

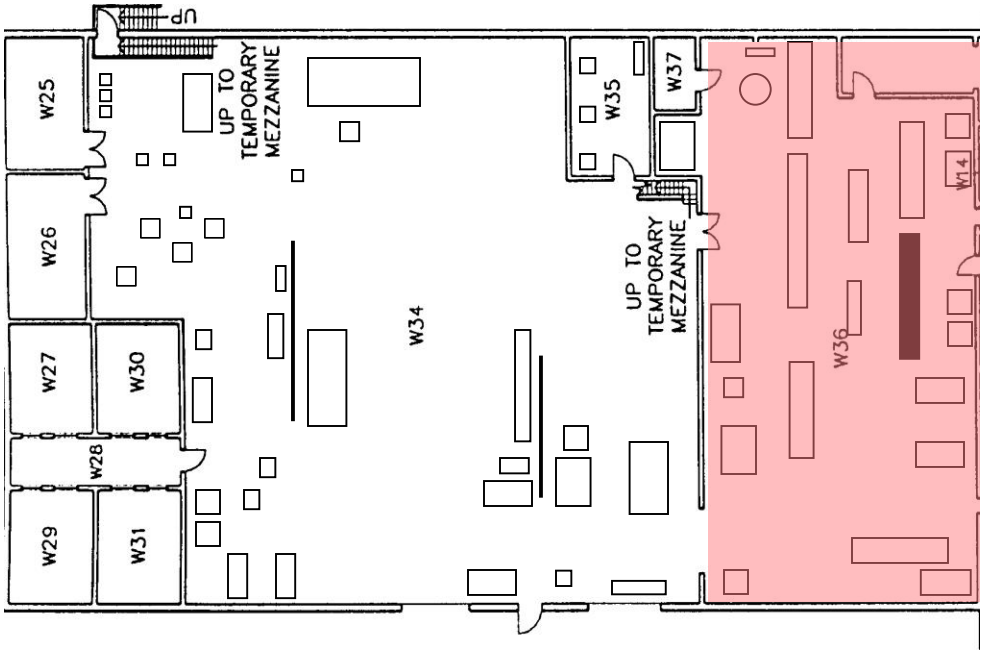


Hazard, by equipment: 55mm Extruder

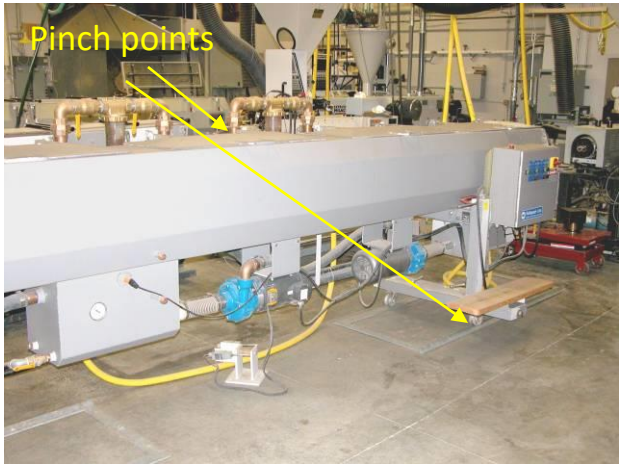
Hazard – Heat, fumes, compressed gas cylinders

Hazard Controls – Gloves, limit switches, exhaust fans, gas cylinder tie downs

Suite C – Room W36 – Processing



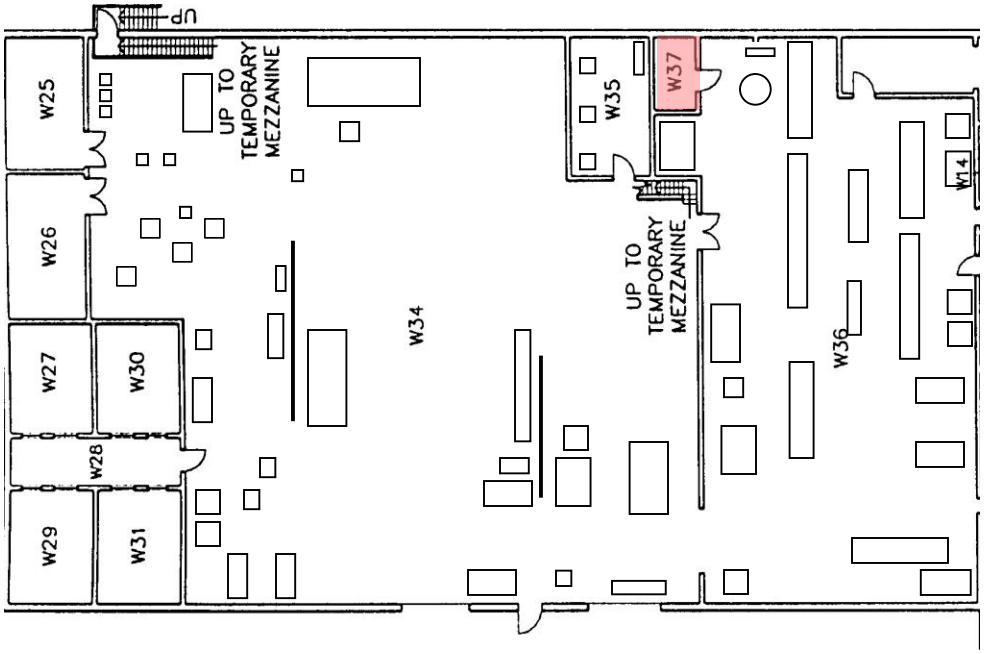
Hazard, by equipment: Profile Cooling Unit



Hazard –Pinch points

Hazard Controls – Gloves

Suite C – Room W37 – Cold Storage

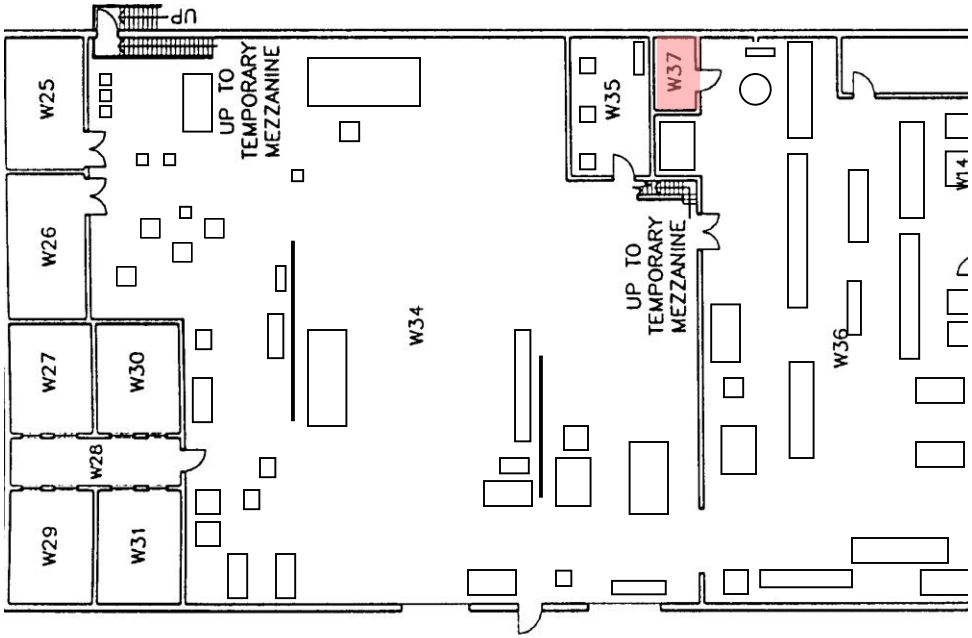


Resin Storage: Formaldehyde and Isocyanate based resins

Hazard: Known carcinogen (formaldehyde), adhesion. Avoid skin contact, avoid inhalation/ingestion.

Hazard Controls – Gloves, eye protection, rinse with lots of water (formaldehyde only). Avoid water (Isocyanate only), dust mask

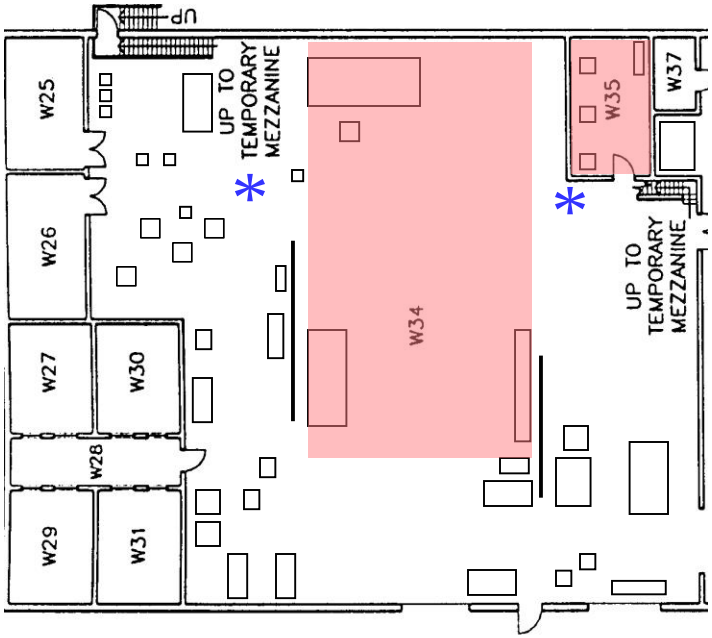
Suite C – Room W37 – Cold Storage



Resin Storage: Formaldehyde and Isocyanate based resins

Resin Disposal: Follow all University regulations and safety guidelines. CMEC disposal storage location is in chemical lockers in storage warehouse

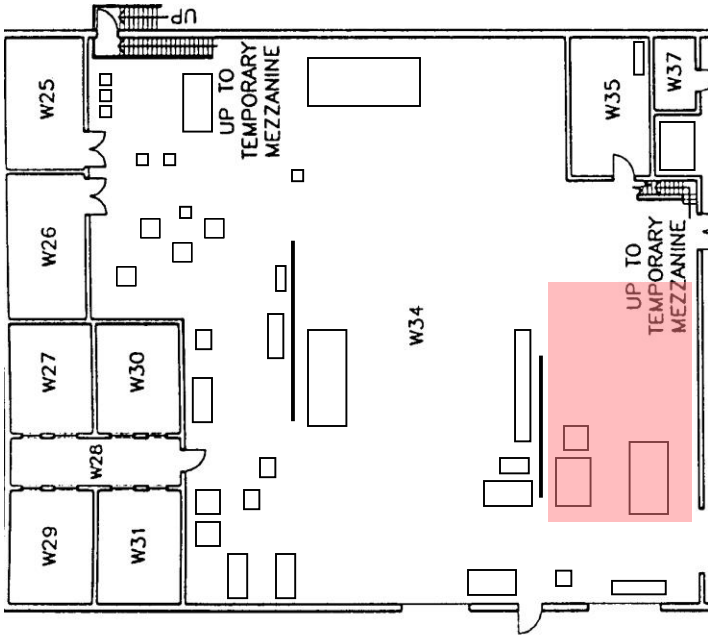
Suite C – Room W34 and Room W35



Equipment: Hydraulic power supply system

Hazard Controls – Emergency shutoff for hydraulics*

Suite C – Room W34 – Hot Pressing

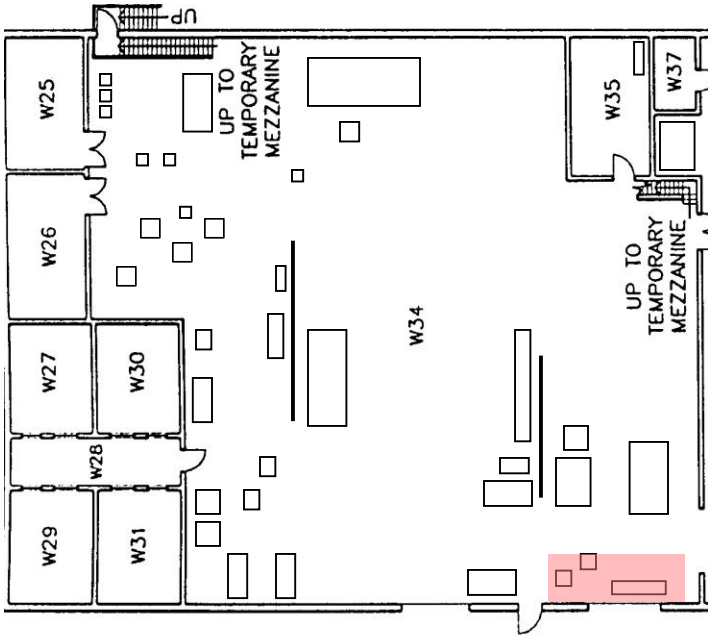


Equipment: Hot Presses, hydraulics power supply

Hazard: Heat, crushing, resins, fumes, falling

Hazard Controls – Gloves, eye protection, rinse with lots of water (formaldehyde only). Avoid water (Isocyanate only), dust mask, exhaust fan, pit covers in place

Suite C – Room W34 – Processing

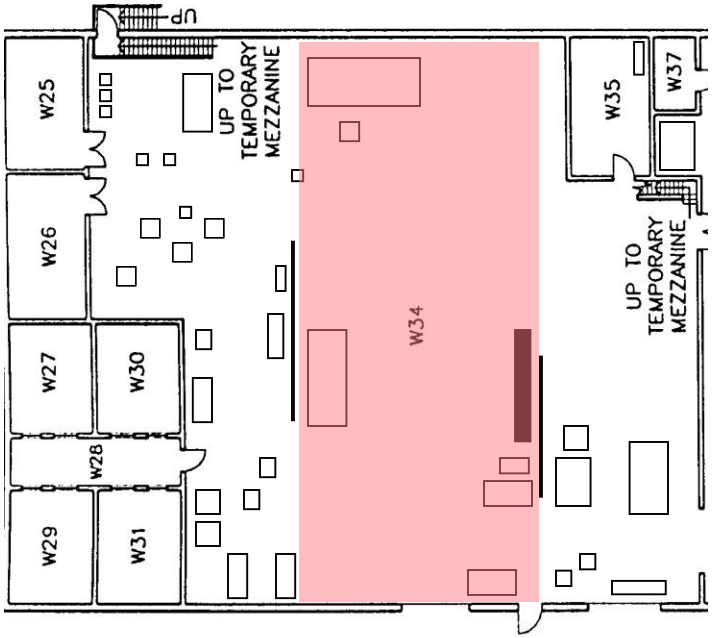


Equipment: Panel Sander, Brush Sander

Hazard: Heat, abrasion, dust, fumes

Hazard Controls – Gloves, eye protection, guards, dust collection system, no loose clothing

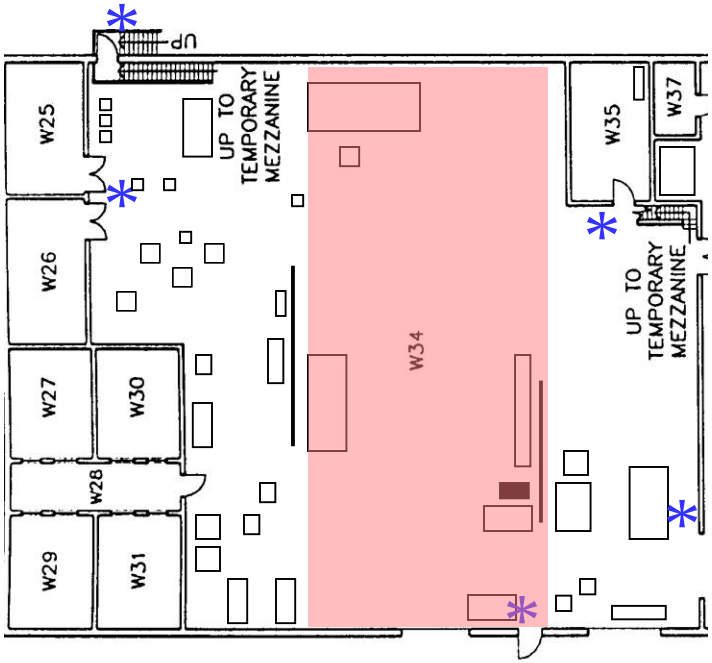
Suite C – Room W34 – Strongback Floor



Hazard, by equipment: Steam Tube Dryer

Hazard – Heat, dust, rotating parts
Hazard Controls – Eye protection, gloves, dust mask, no loose clothing, guards, exhaust fans, dust collection system

Suite C – Room W34 – Strongback Floor



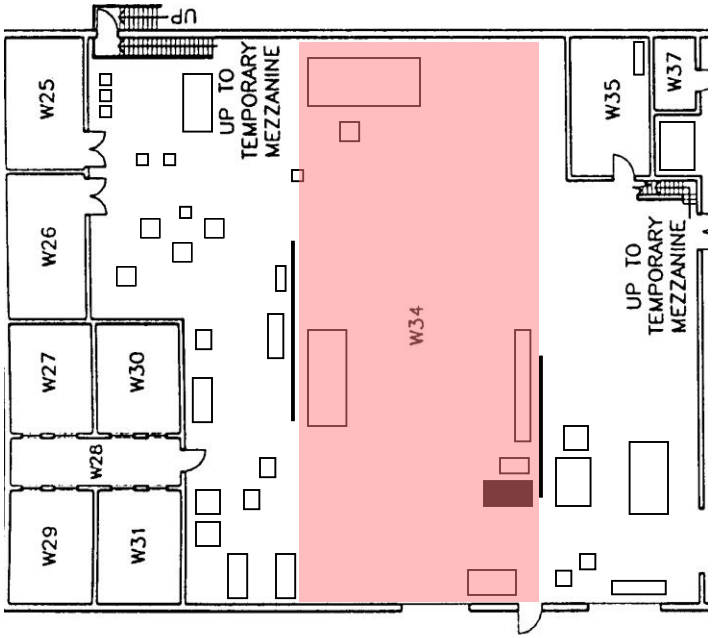
Hazard, by equipment: Boiler for Steam Tube Dryer

Hazard – Heat, pressure vessel

Hazard Controls – Eye protection, gloves,

Emergency shutoff locations *

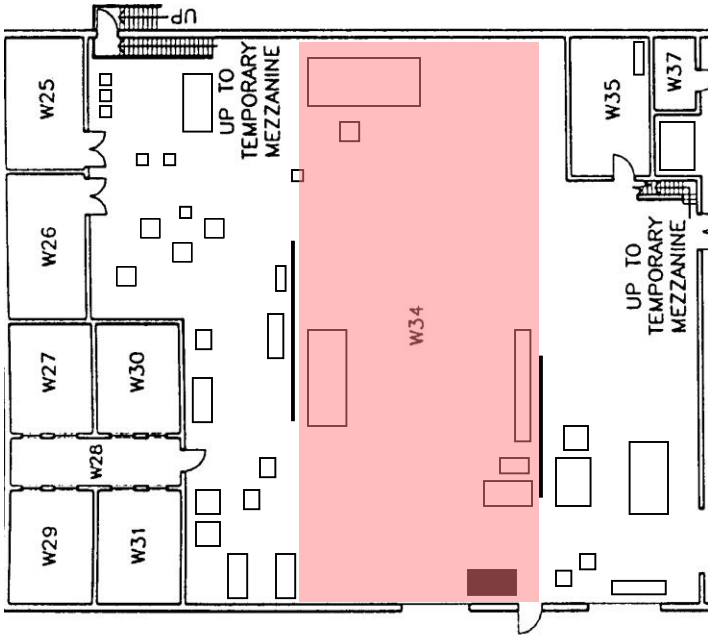
Suite C – Room W34 – Strongback Floor



Hazard, by equipment: Hot Oil Unit for presses

Hazard – Heat,
Hazard Controls – Eye protection, gloves, limit switches

Suite C – Room W34 – Strongback Floor

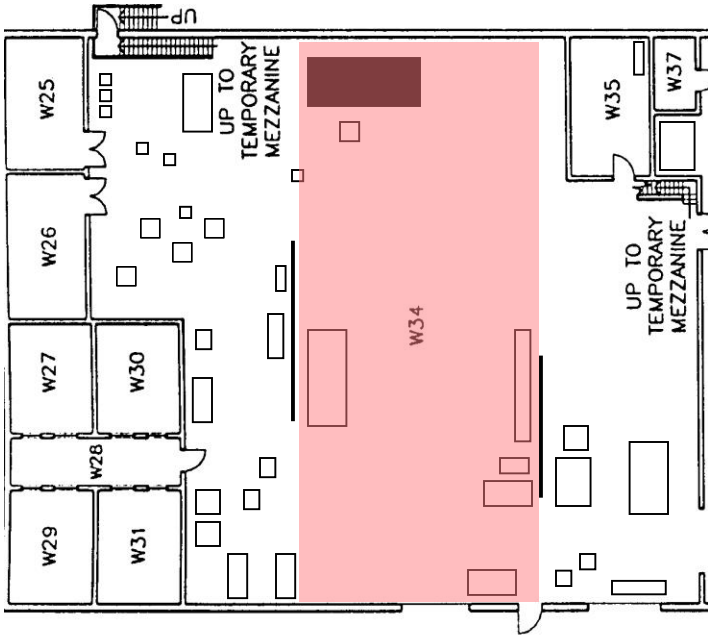


Hazard, by equipment:
16” Radial arm saw

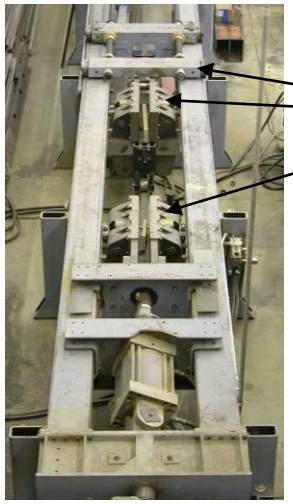
Hazard – Laceration, noise

Hazard Controls – Gloves, eye protection, hearing protection, no loose clothing, guards, dust collection system

Suite C – Room W34 – Strongback Floor



Hazard, by equipment: 200,000lb hydraulic tension machine

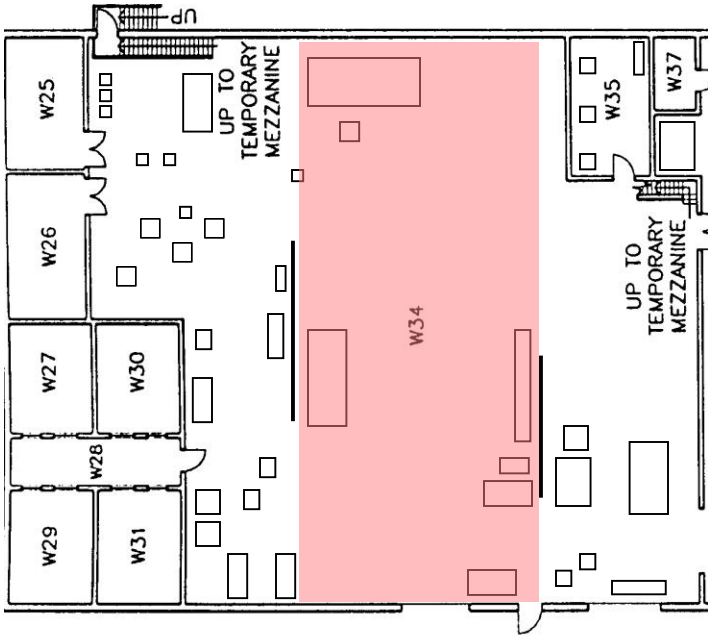


Pinch points, both sides

Hazard – pinch points, pressure

Hazard Controls – Eye protection, gloves, no loose clothing, emergency shutoff

Suite C – Room W34 – Strongback Floor

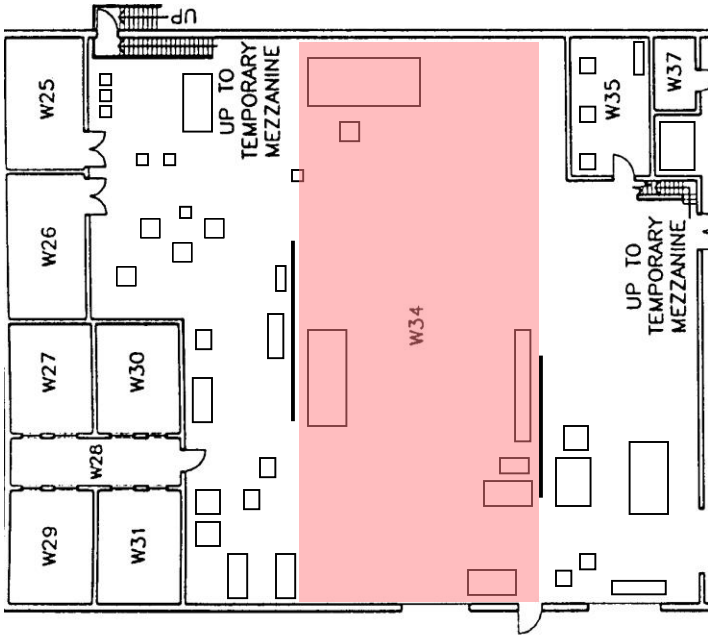


Hazard, by equipment: H-Frame

Hazard – Pressure, flying objects

Hazard Controls – Eye protection, emergency shutoff

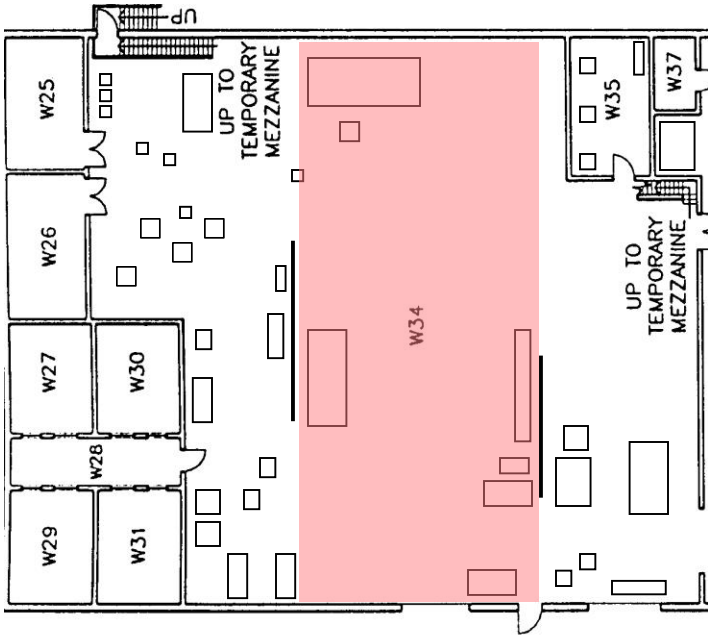
Suite C – Room W34 – Strongback Floor



Hazard, by equipment:
S-Frame

Hazard – Pressure, flying objects
Hazard Controls – Eye protection, emergency shutoff

Suite C – Room W34 – Strongback Floor

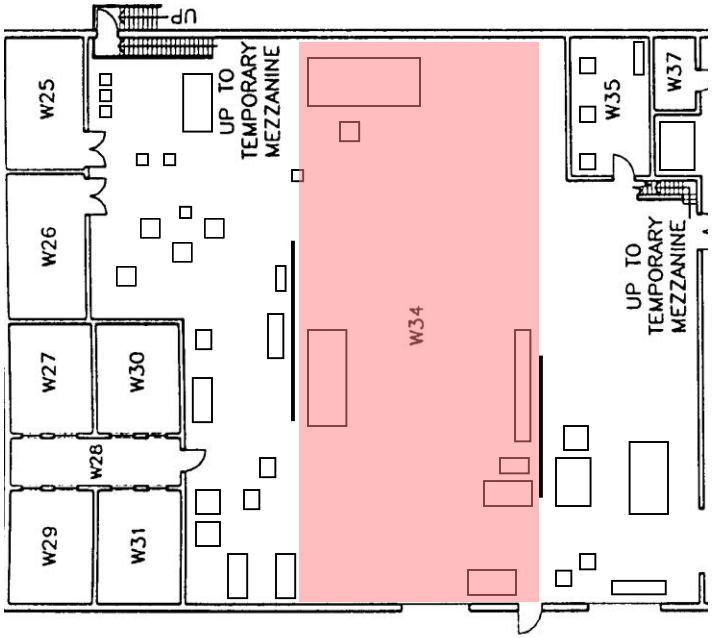


Hazard, by equipment: Strongback floor

Hazard – Pressure, flying objects

Hazard Controls – Eye protection, emergency shutoff

Suite C – Room W34 – Strongback Floor



Hazard, by equipment:

Bridge crane

Hazard – Crushing, pinning

Hazard Controls –

Additional training required

Suite C – Room W34 – Strongback Floor

Hazard, by equipment: Lift Truck

Hazard – Crushing, pinning falling objects, LP gas

Hazard Controls – Eye Protection, gloves

Additional training (licensing) required

Suite C – Room W34 – Flaking Area

Hazard, by equipment: Hombak Flaker, CAE Flaker

Hazard – Rotating parts, flying objects, noise, sharp knives

Hazard Controls – Eye protection, hearing protection, no loose clothing

Suite C – Room W34 – Flaking Area

Hazard, by equipment: Knife Strander

Hazard – Rotating parts, flying objects, noise, sharp knives

Hazard Controls – Eye protection, hearing protection, no loose clothing

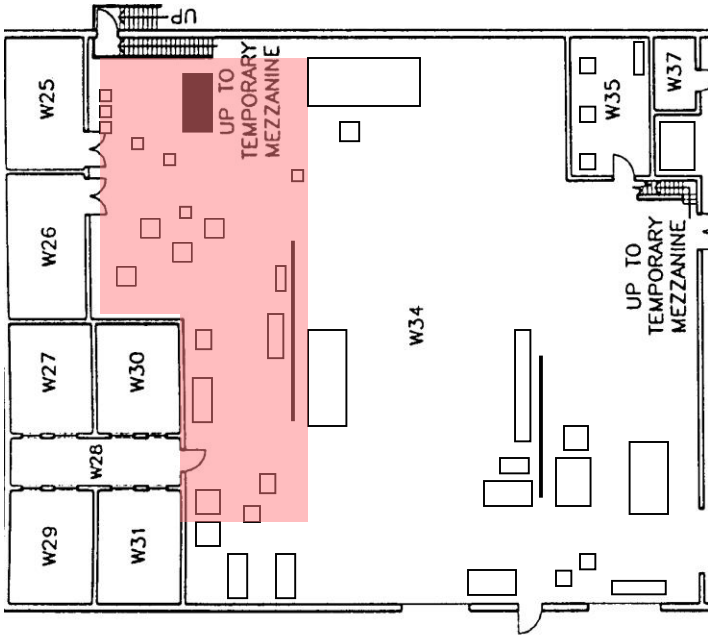
Suite C – Room W34 – Flaking Area

Hazard, by equipment: Ring Mill

Hazard – Rotating parts, flying objects, noise, sharp knives

Hazard Controls – Eye protection, hearing protection, no loose clothing

Suite C – Room W34 – Wood/Metal Shop

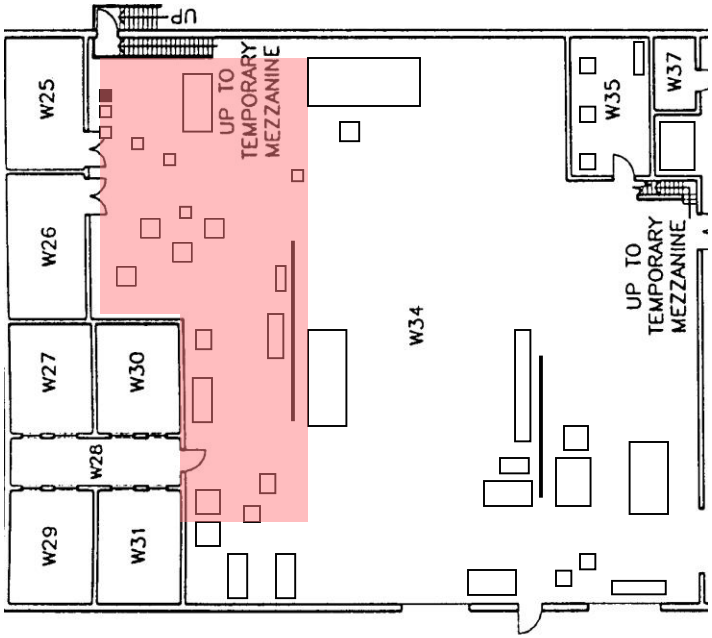


Equipment: Tool Room -- hand tools (screwdrivers, wrenches, saws, etc.), cordless and corded drills and saws

ation, crushing, noise

Hazard Controls – Eye protection, hearing protection, gloves, guards

Suite C – Room W34 – Wood/Metal Shop

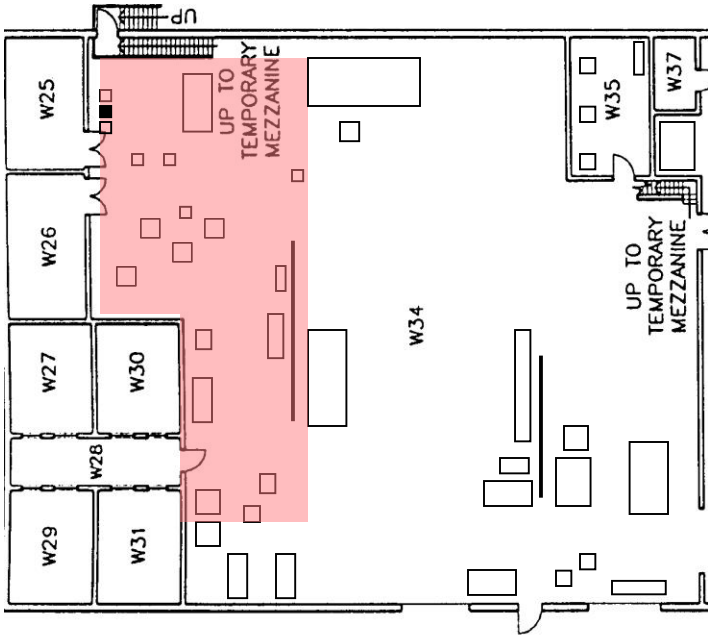


Hazard, by equipment: milling machine

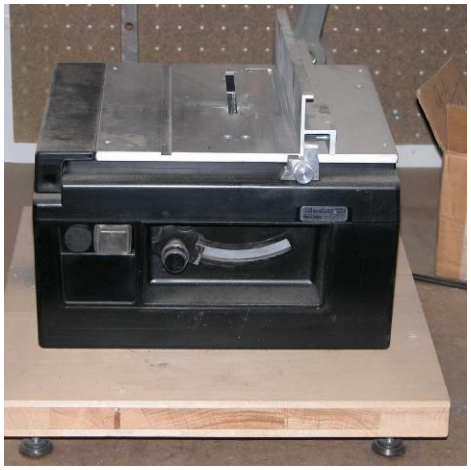
Hazard – Heat, flying objects

Hazard Controls – Eye protection, gloves

Suite C – Room W34 – Wood/Metal Shop



Hazard, by equipment: mini table saw



Hazard – Laceration, flying objects, kick back

Hazard Controls – Eye protection, guards

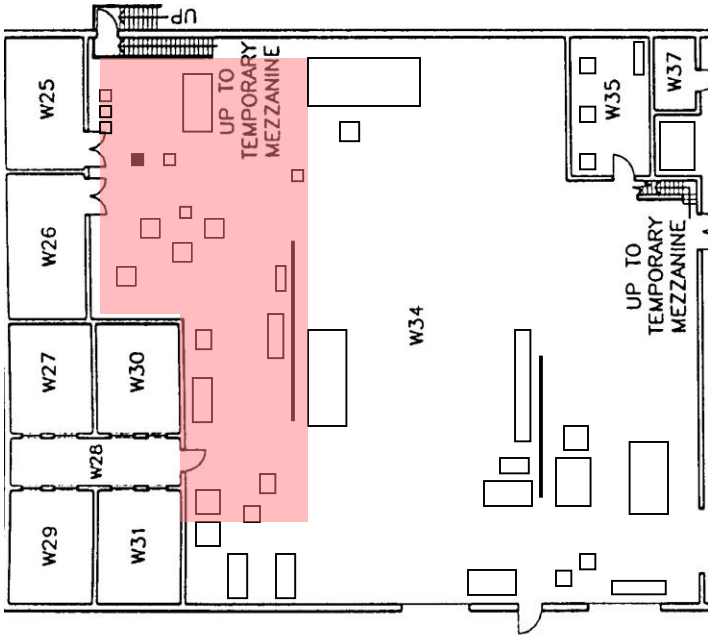
Suite C – Room W34 – Wood/Metal Shop

Hazard, by equipment: router table

Hazard – Laceration, flying objects, noise

Hazard Controls – Eye protection, hearing protection, guards, feed direction

Suite C – Room W34 – Wood/Metal Shop



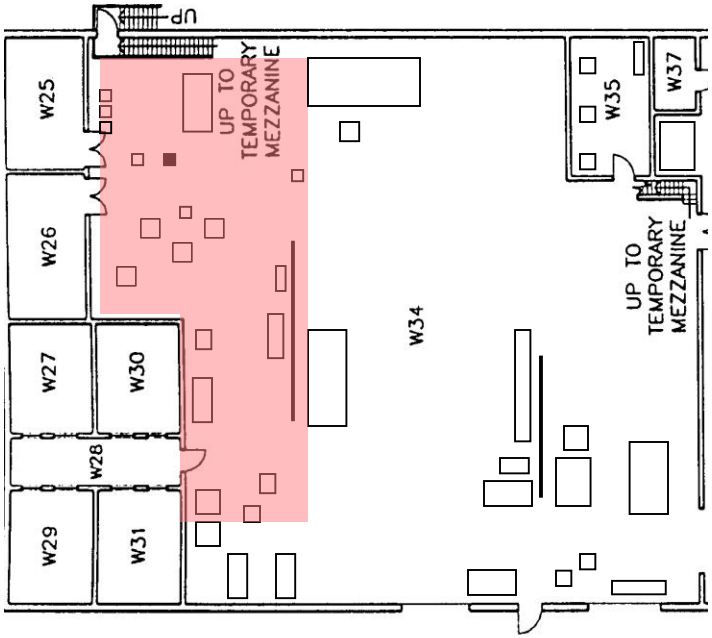
Hazard, by equipment: metal grinder

Hazard – Heat, ignition source, flying objects

Hazard Controls – Eye protection, gloves

Fire watch following use

Suite C – Room W34 – Wood/Metal Shop

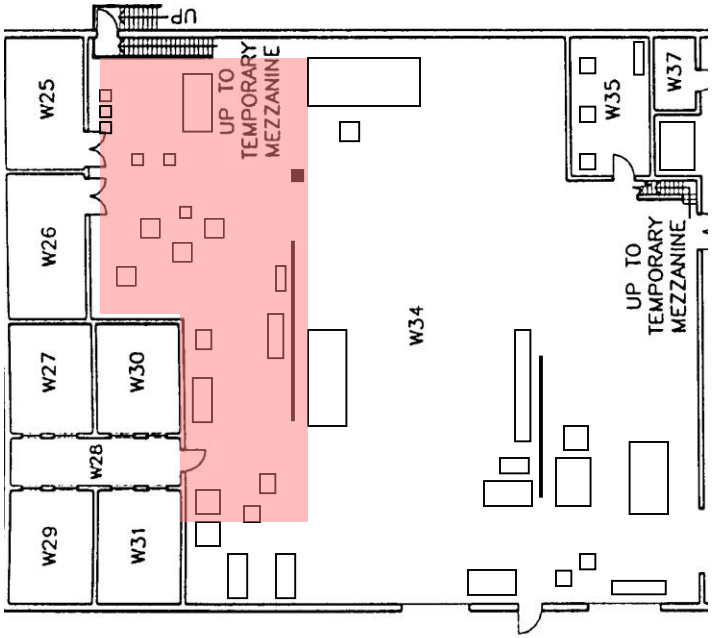


Hazard, by equipment: 12” compound miter saw

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, guards

Suite C – Room W34 – Wood/Metal Shop



Hazard, by equipment: drill press

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, no loose clothing, guards

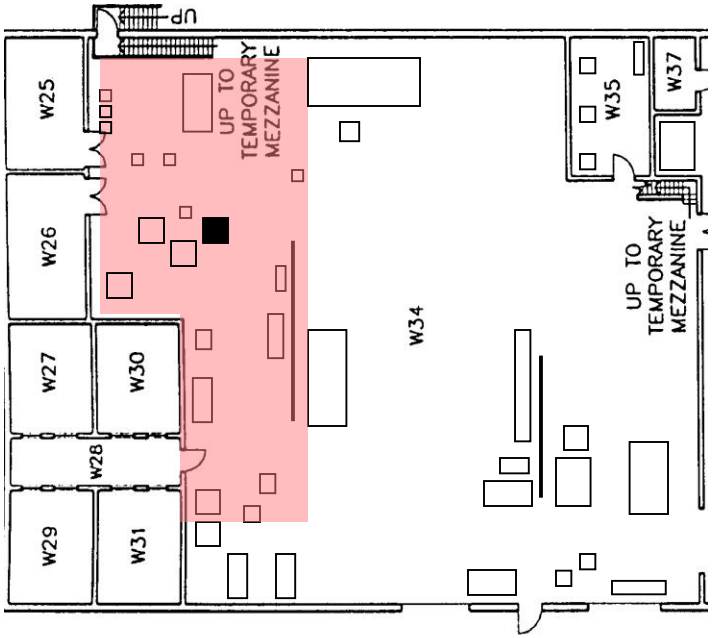
Suite C – Room W34 – Wood/Metal Shop

Hazard, by equipment: belt sander

Hazard – Abrasion, flying objects

Hazard Controls – Eye protection, no loose clothing, guards

Suite C – Room W34 – Wood/Metal Shop

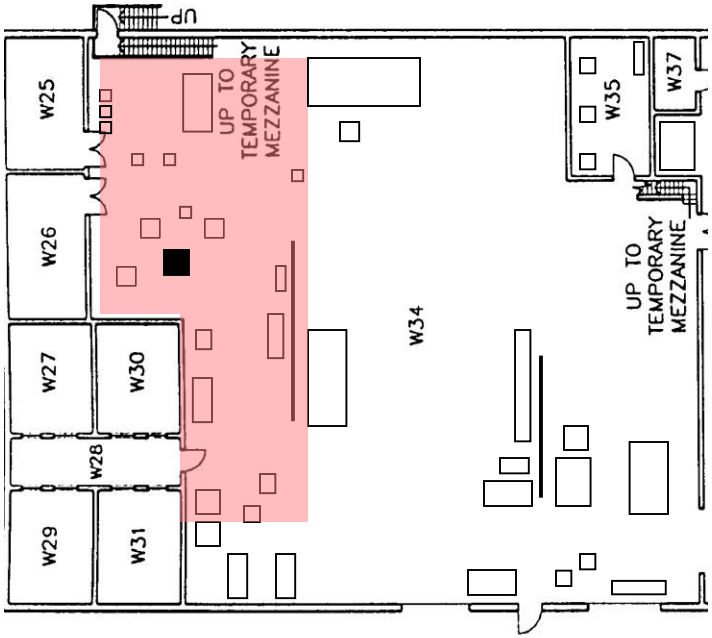


Hazard, by equipment: 10” table saw

Hazard – Laceration, flying objects, kick back

Hazard Controls – Eye protection, guards

Suite C – Room W34 – Wood/Metal Shop

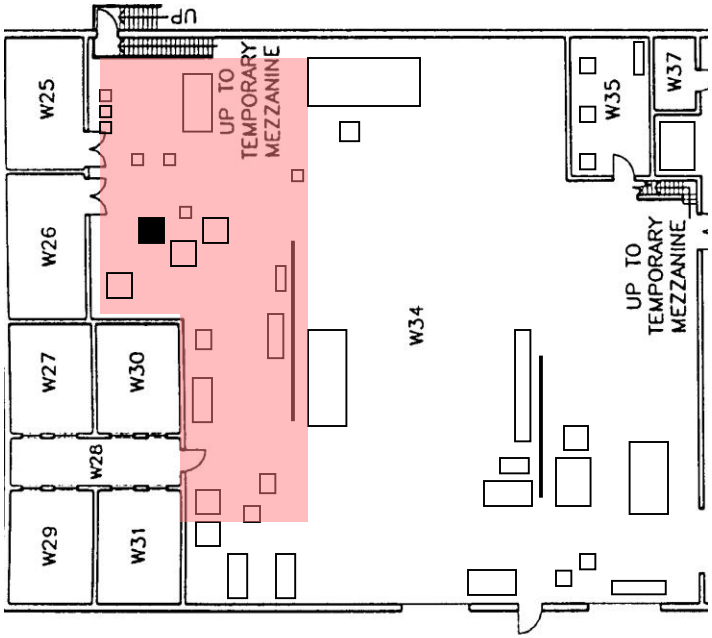


Hazard, by equipment: 20” band saw

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, guards

Suite C – Room W34 – Wood/Metal Shop



Hazard, by equipment: 14” sliding table saw

Hazard – Laceration, flying objects, kick back

Hazard Controls – Eye protection, guards

Suite C – Room W34 – Wood/Metal Shop

Hazard, by equipment: Finger retainer table saw

Hazard – Laceration, flying objects

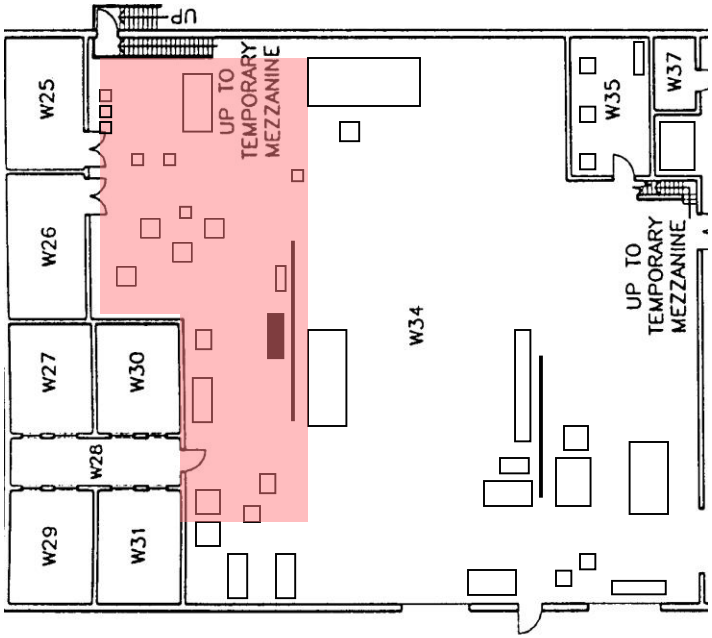
Hazard Controls – Eye protection, guards

Suite C – Room W34 – Wood/Metal Shop

Hazard, by equipment:
6” jointer

Hazard – Laceration, flying objects
Hazard Controls – Eye protection, guards

Suite C – Room W34 – Wood/Metal Shop

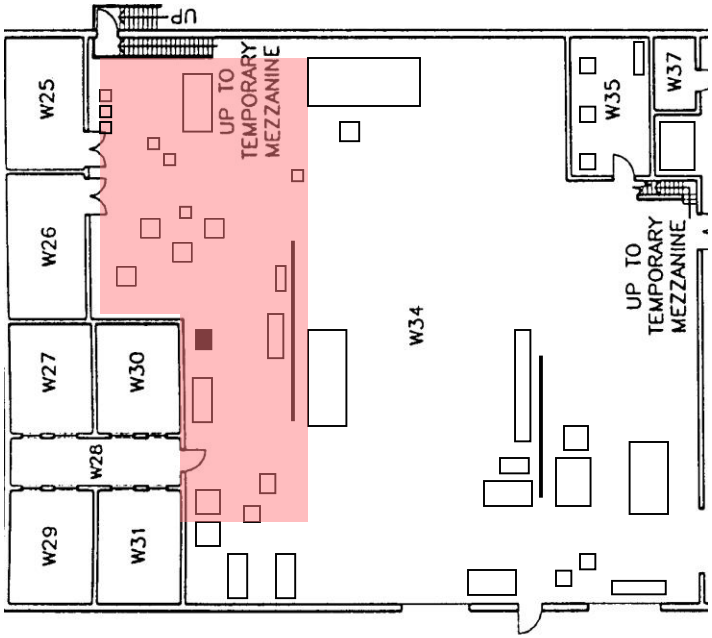


Hazard, by equipment: 8” jointer

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, guards

Suite C – Room W34 – Wood/Metal Shop



Hazard, by equipment:
38” band saw

Hazard – Laceration, flying objects
Hazard Controls – Eye protection, guards

Suite C – Room W34 – Wood/Metal Shop

Hazard, by equipment: 10” radial arm saw

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, guards

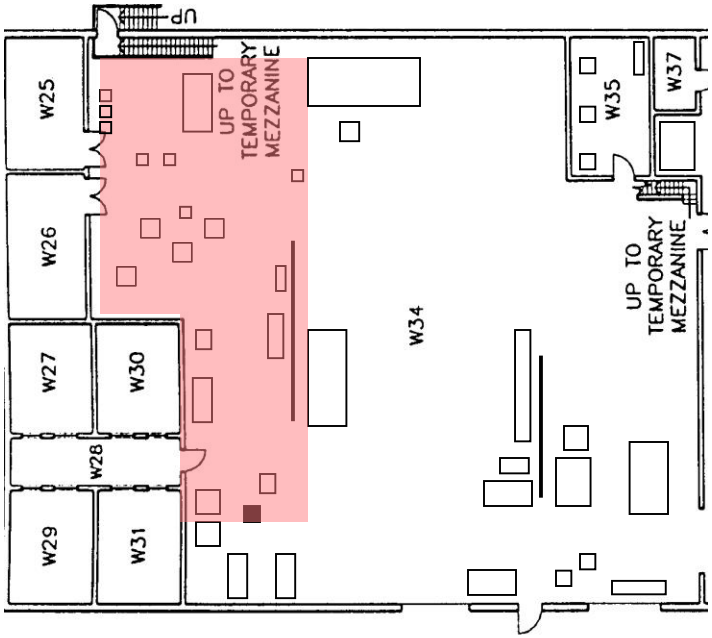
Suite C – Room W34 – Wood/Metal Shop

Hazard, by equipment: shaper table

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, no loose clothing, guards, feed direction

Suite C – Room W34 – Wood/Metal Shop



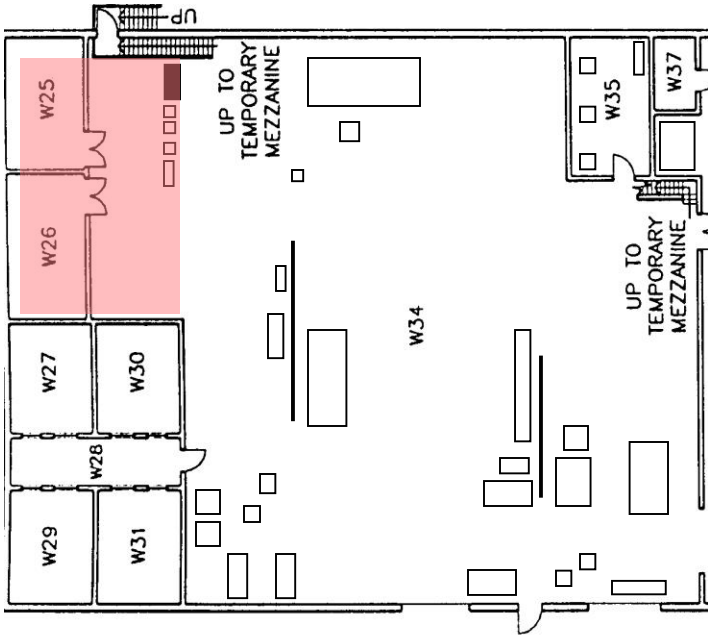
Hazard, by equipment: metal band saw

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, guards

Fire watch following use

Suite C – Room W34 – Mezzanine

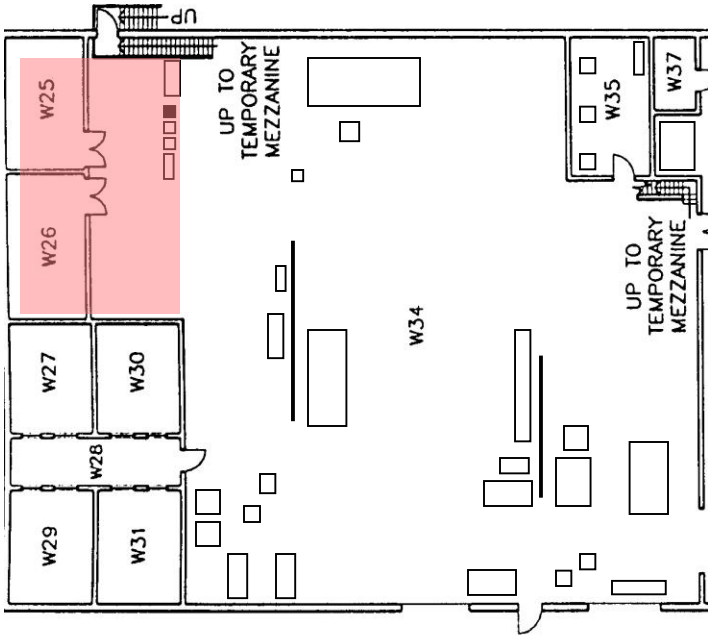


Hazard, by equipment: metal lathe

Hazard – Laceration, flying objects, heat

Hazard Controls – Eye protection, gloves, no loose clothing, guards

Suite C – Room W34 – Mezzanine

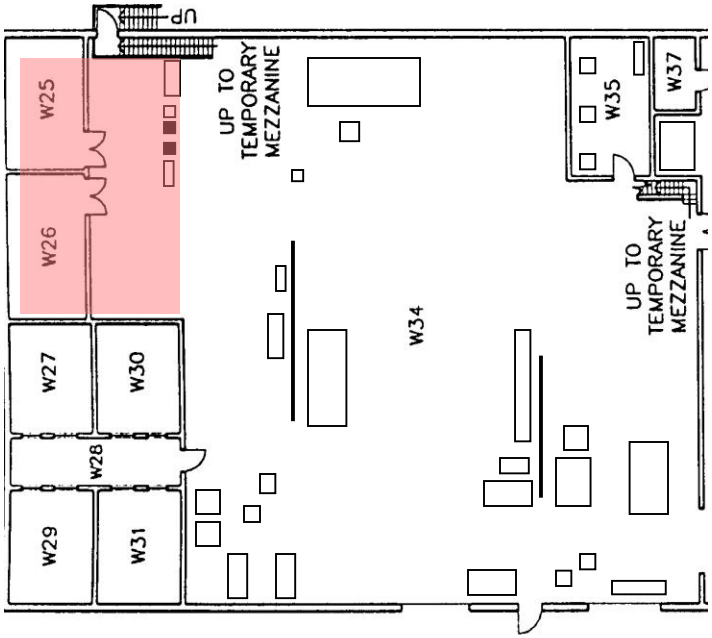


Hazard, by equipment: jig saw

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, guards

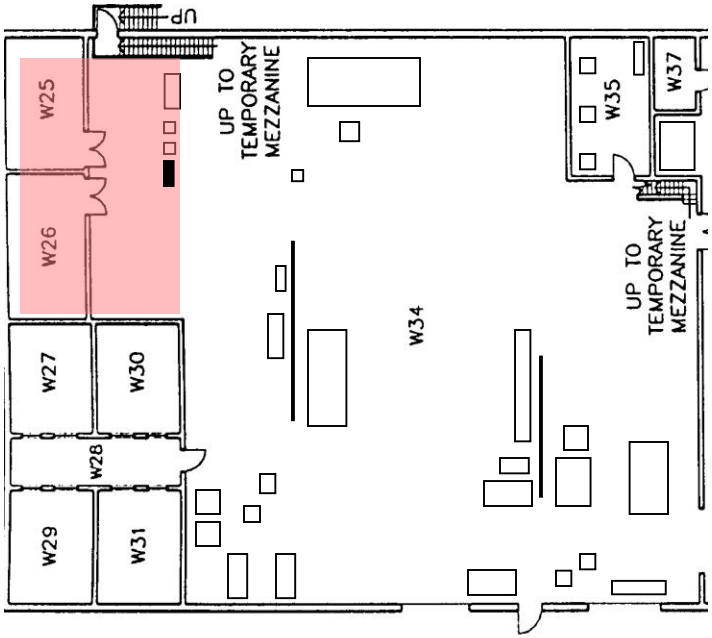
Suite C – Room W34 – Mezzanine



Hazard, by equipment:
5” jointer (2)

Hazard – Laceration, flying objects
Hazard Controls – Eye protection, guards

Suite C – Room W34 – Mezzanine

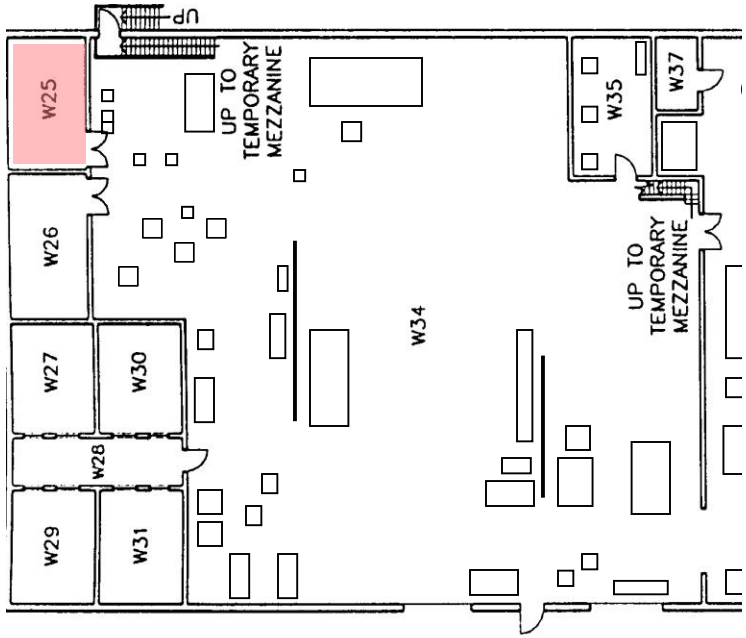


Hazard, by equipment: Wood Lathe

Hazard – Laceration, flying objects

Hazard Controls – Eye protection, no loose clothing, guards

Suite C – Room W25 – Hydraulics

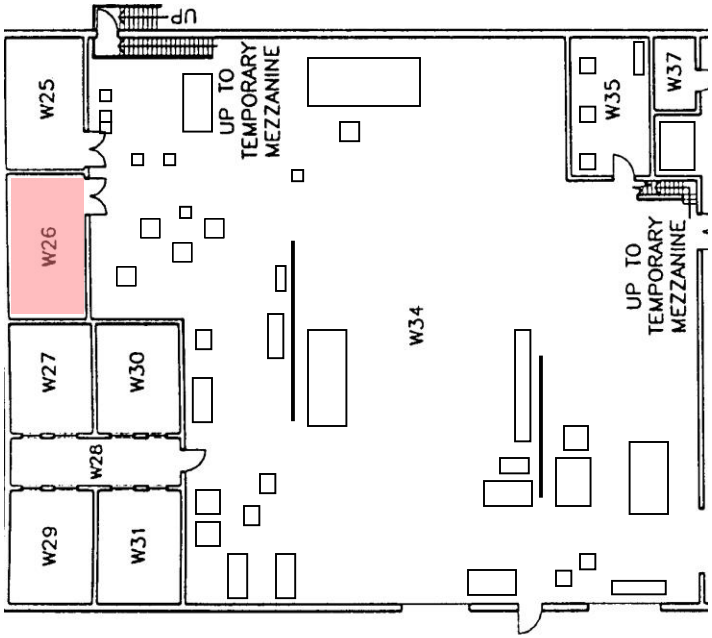


Equipment: Hydraulics power supply, air compressor

Hazard – Noise, high pressure fluid and air

Hazard Controls – Eye protection, hearing protection

Suite C – Room W26 – Boilers



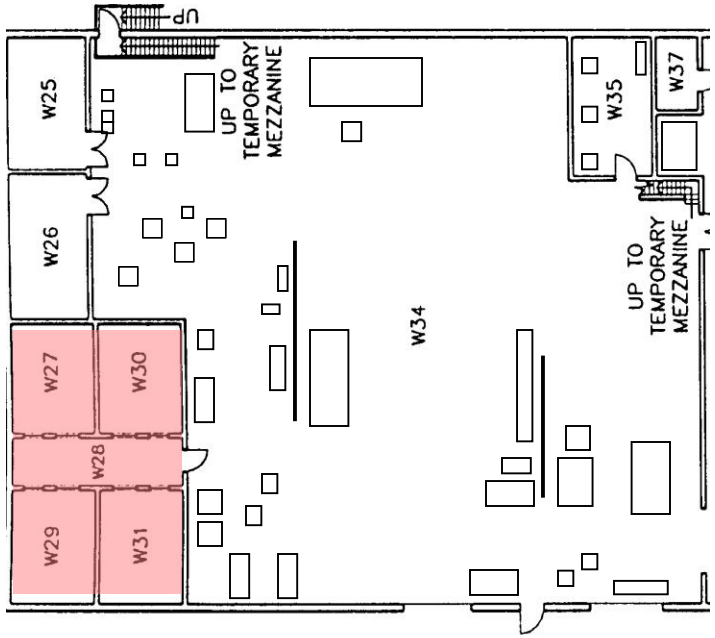
Equipment: Natural gas fired boilers (2)

Hazard – Heat, ignition source, caustic chemical

Hazard Controls – Eye protection, gloves

Do not enter

Suite C – Room W27-W31 – Conditioning Chambers



Equipment: Conditioning Chambers

Hazard – None

Hazard Controls – Eye protection

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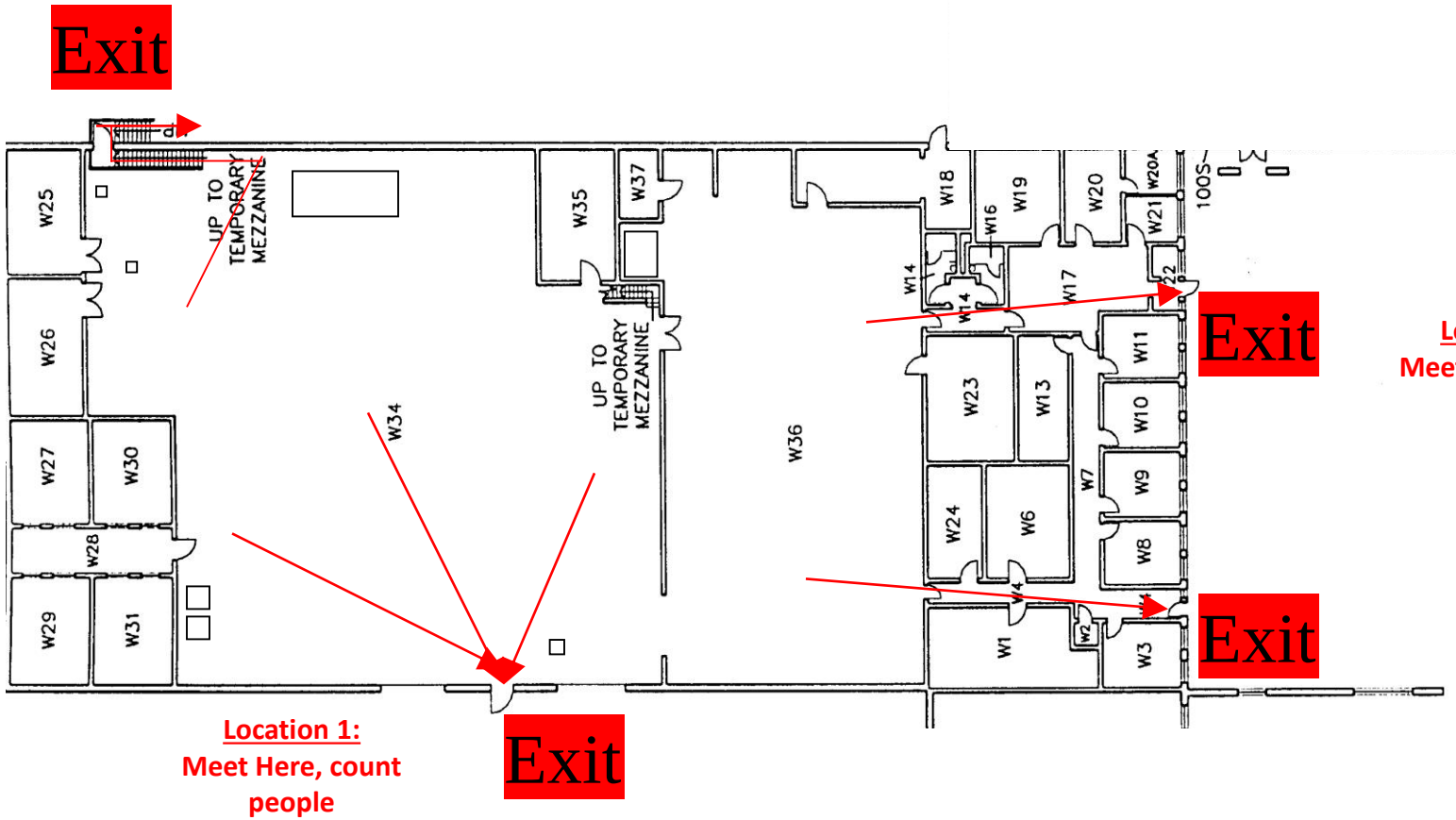
Exit locations and evacuation routes



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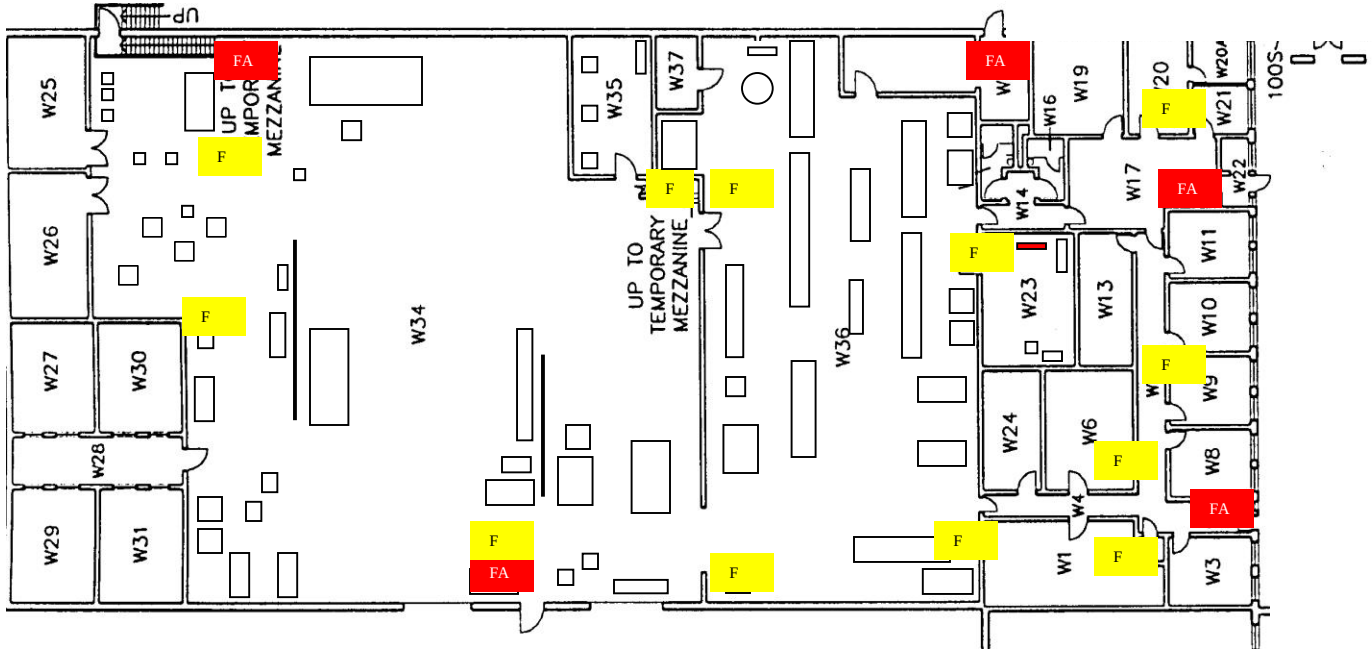
Location of fire alarms and extinguishers

Symbol Key

FA – Fire Alarm (5)

F – Fire Extinguisher (15)



What to do in the event of an emergency

- Exit locations and evacuation routes
- Location and operation of fire alarms and extinguishers
  - Operation of fire extinguisher
    - Remove from holder, bring to fire, point nozzle at base of fire, remove pin in handle, squeeze handle and empty extinguisher.
    - If not successful, notify Emergency Services (911 or Fire Alarm)
  - Operation of Fire Alarms
    - Pull handle downward

What to do in the event of an emergency

- Exit locations and evacuation routes
- Location and operation of fire alarms and extinguishers
- Specific procedures for medical, chemical fire emergencies and use of 911
  - All telephones in facility can reach emergency service by dialing 911
    - Identify yourself, state your location and the nature of the emergency, stay on phone if possible to assist with emergency

What to do in the event of an emergency

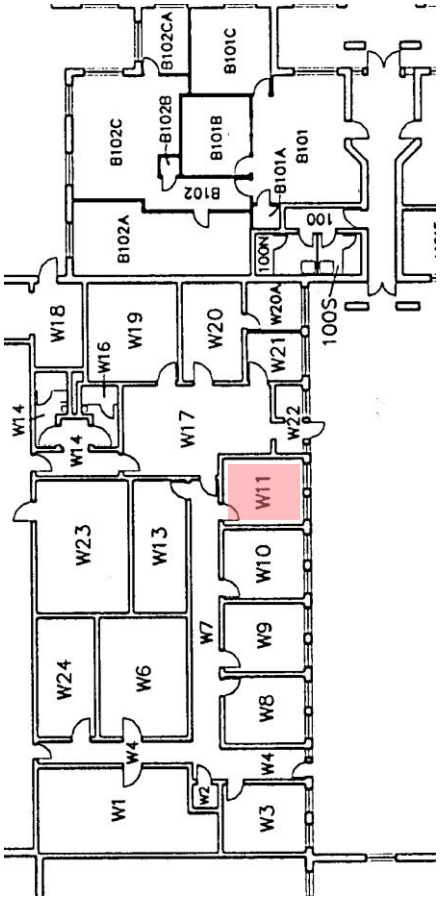
- Exit locations and evacuation routes
- Location and operation of fire alarms and extinguishers
- Specific procedures for medical, chemical fire emergencies and use of 911
- When possible, shut down all experiments and notify emergency personnel of potential hazards
- Emergency response plans in place

The Total Safety Program

- **Function of safety committee and meetings**
  - **Safety committee and associated meeting are responsible for training, education, discussion of safety issues and concerns**

The Total Safety Program

- **Function of safety committee and meetings**
- **Safety Committee Representative**
  - **Joshah Jennings, PACCAR 133**
  - **Scott Lewis, Office PACCAR 131**



The Total Safety Program

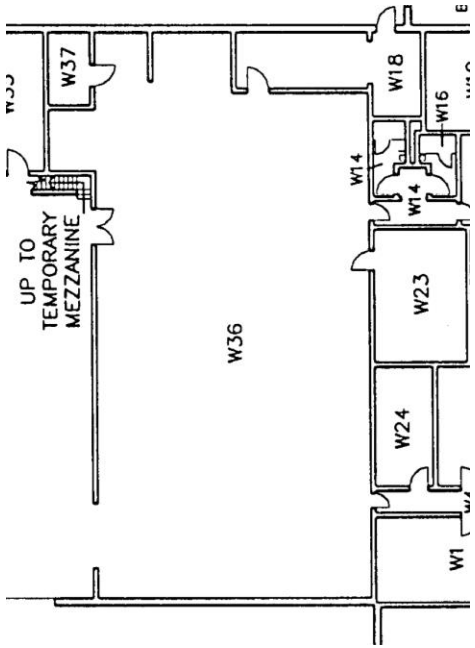
- **Function of safety committee and meetings**
- **Safety Committee Representative**
- **Safety policies and rules and their value**
  - **Ensure the safety of ALL employees and visitors in our facility and at the University.**
  - **Goal: *Everyone goes home every day with no accidents or injuries***

The Total Safety Program

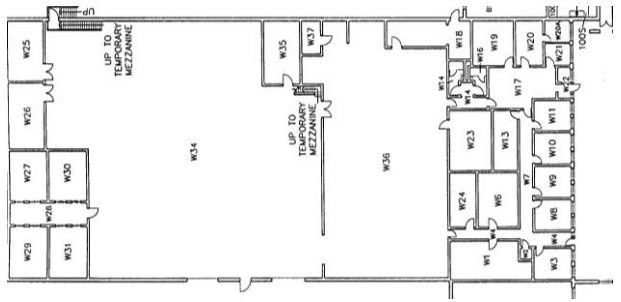
- **Function of safety committee and meetings**
- **Safety Committee Representative**
- **Safety policies and rules and their value**
- **Safety division resources**
  - Police, Fire, Safety Services and Environmental Health Services
    - Here to help and assist us with all of our health and safety needs

Personal work habits

- **Proper lifting techniques, avoiding slips and falls**
  - Lift with your legs, not your back
  - Rotate your upper and lower body together
  - Room W36 gets slippery with wood flour dust and plastic



Personal work habits



Dumpster Area →

- **Proper lifting techniques, avoiding slips and falls**
- **Good housekeeping**
  - Keep walkways clear, minimize/secure trip hazards
  - Your must clean your work area prior to leaving the lab for the day
  - Clean your own work area
  - Empty trash containers into dumpsters in rear of building on a daily basis
  - This is a shared work area and you are responsible for cleaning to minimize hazards for others
  - ‘Clean as you go’ to improve safety for everyone

Personal work habits

- **Proper lifting techniques, avoiding slips and falls**
- **Good housekeeping**
- **Safe work procedures**
  - You will be instructed and observed on safe work procedures prior to using any equipment in the lab.
  - Do NOT blow yourself off with compressed air, air bubbles may enter your blood stream and cause death.

Specific Training

- **You must receive operation and safety training on all equipment prior to use.**
- **All woodworking tools require a key to operate and you must have training to receive a key**

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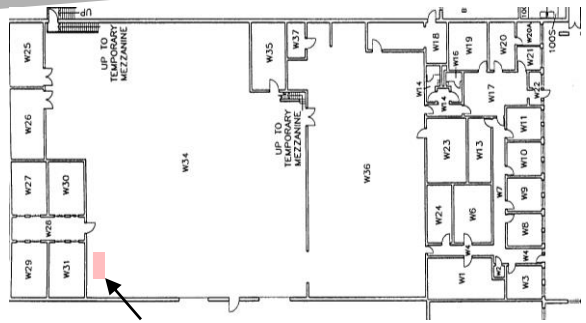
Specific Training



- **GENERAL LABORATORY SAFETY GUIDELINES**
- **WEARING EYE PROTECTION is NOT AN OPTION!** Eye protection with side shields or goggles MUST be worn when cutting, grinding, or handling hazardous material. Protective eyewear is NOT intended to protect the forehead or hair.
- Hard hats must be worn when exposed to the possibility of falling or flying objects. For example, if you are working four feet below another work area, then you must wear a hard hat.
- Open-toed shoes are not permitted in the laboratory.
- All accidents must be reported to an immediate supervisor as soon as possible, regardless how minor they may appear. Unsafe practices, or anything that may constitute a potential hazard, must be reported to the safety representative or your supervisor immediately.
- Allow enough time to clean up your work area when finished *before* leaving the laboratory.
- All tools used during the regular work hours must be returned to their proper storage area before you leave for the day.
- Any power tool connected to the dust collector must have the collector turned on while the tool is in operation. At the conclusion of the job, **TURN THE DUST COLLECTOR OFF!**

Specific Training

- **GENERAL LABORATORY SAFETY GUIDELINES (*continued*)**
- Never proceed to use equipment with uncertainty. If you have any questions about safety or laboratory operations, please ask for assistance or clarification from either Scott Lewis or Joshah Jennings.
- All WSU facilities comply with the "Drug-Free Workplace Act of 1988," which prohibits the consumption of controlled substances in the workplace. Controlled substances include any mind-altering substances, i.e., antihistamines, and prescriptions with warnings about using machinery while taking the drugs. We expect everyone who has an association with the laboratory to honor our compliance and act responsibly for their safety and that of others.

Specific Training

- **The CMEC Two-People Rule**
  - There must always be at least two people present in the laboratory whenever (*including before, during, and after regular work hours, weekends, or holidays*) you plan to be working in the laboratory:
  - The *Two-People Rule* is for your own protection and must be observed. For example, it would be difficult to call 911 if your body is pinned by an MTS hydraulic actuator, or you are suddenly missing fingers, or lying flat on your back unconscious or unable to move.

Building Security

- **The building should remain locked after regular business hours and on weekends and holidays.**
  - **Personal safety**
  - **Equipment and data security**

On-the-job Training

- **You will be observed regularly during your employment and will be instructed on necessary changes to your work procedures**
- **Take 5**
  - **Take 1 – Take time to evaluate what you are doing**
  - **Take 2 – Take time to clear the work area**
  - **Take 3 – Take time to re-evaluate what you are doing**
  - **Take 4 – Take time to perform your work**
  - **Take 5 – Take time to clean up when finished**

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NEMO Equipment System

- **Everyone using equipment needs to use NEMO to reserve, check-out, and check-in equipment.**
- **NEMO helps us keep track equipment hours which is used for budgeting but also writing and securing grants.**
- **Please go here for a quick tutorial on using NEMO.**
- **You can access NEMO from any device, including mobile phone.**

nemo.cmec.cee.wsu.edu

Safety Training

- **If you have any questions or concerns contact Joshah Jennings 509-335-6266**