

PURPOSE/APPLICATION

To provide guidance to workers, who may be required to work on and/or in proximity of matting and mats. Mats/matting are designed and utilized for many applications. Types of mats range from rig mats, to swamp mats to crane mats. The risks, hazard sources and specific hazards vary depending on the mat type, utilization and design.

PPE

- Canadian Plains Energy Services (CPES) minimum requirements

TRAINING

- Review SWP-70 Mats/Matting, SWP-44 Mechanical Mobile Equipment Operations, and SWP-54 Rigging

HAZARD SOURCES & CONCERNS

- Personal injury
- Property damage
- Equipment damage
- Public safety
- Distractions (communication devices, focus on task)



PRECAUTIONS

Mats/matting are often a necessity to provide access to some of our worksites and for the safe execution of our work. The risks and hazards that are introduced by mats/matting must be identified and controlled. Consideration of traffic (human and machine), a stable and sturdy surface is essential to safely complete our work.

Approaching any work involving mats/matting requires the utilization of CPES’s Hazard Identification, Assessment and Control (HIAC) process. For work planning and execution this SWP follows the three stage HIAC process:

1. Before Work Begins on Site
2. Prior to Starting the Task
3. Ongoing During the Execution of Work

THE DO’s for Utilization Mats/Matting

DO Consider use of mats for to access to wet or (potentially wet) projects.

DO Consider mats as a foundation for execution of work including:

- access to worksites;
- stringing pipe without using cone support by placing pipe directly onto the surface of the mat; and

- allow equipment to be stable to both excavate the trench and lower in the pipe.
- DO** Consider mats to excavators while digging trenches or lowering pipe in wet/soft soil.
- Mat selection for digging vs driving operations, are key in the minimization of potential vehicle/equipment, environment, and mat damages.
- DO** Considers mats to support cranes while working on wet/soft ground.
- DO** Consider mats to allow access for roadways into worksites, mat worksites, and cross underground facilities.
- DO** Consider mats to help protect and minimize damage to the environment.
- DO** When placing or spotting mats/mating use the correct equipment, with preference to use rated grapple (i.e. crane, loader, backhoe).
- DO** Remove mats showing damages or holes from service while installing mats.
- DO** Be prepared to work, walk and drive on mats/matting. Know where the edges are and where they may create an uneven surface.
- DO** Be careful when the mats are wet (waterlogged) or have a layer of mud covering them, especially on slopes. They can become very slippery.

THE DON'Ts

- DON'T** Walk or work under a suspended load of mat(s).
- DON'T** Stand in the swing radius or potential drop zone of a mats/matting being moved and/or positioned.
- DON'T** Walk near equipment moving/repositioning on mats, mat joints tend to shift from the weight.
- DON'T** Load mats covered in mud or gravel for transport with out cleaning.
- DON'T** Load or off load mats from transport units in proximity/under overhead powerlines.

1. BEFORE WORK STARTS (PRE-JOB PLANNING)

Review job scope, potential hazard sources with owner and or client

- Complete job site visit

Hold a pre-job meeting with the client

The meeting should be held well enough in advance of the work, to allow for the sourcing of the right labour, equipment, material and for proper planning to take place. Determine the following:

- Do construction activities require the use of mats/matting as hazard control?
- Do construction activities require people and/or equipment to work on/or around mats/matting?
- Who has **prime contractor** responsibility?

Client as Prime Contractor:

- Is the client providing, placing, maintaining and removing the mats/matting?
- Is there a coordination of contractors and activities required?
- Who is responsible for maintaining, repairing and removing mats/matting?

CPES as Prime Contractor:

- Has a review of the style of mats/matting required, supplier and contractor evaluation been completed?
- Have hazards and or hazardous conditions been communicated to contractors
- Who is responsible for placing, maintaining and removing the mats/matting?

Can the project schedule change to eliminate or minimize the need for mats/matting?

Based on requirement complete Site-Specific safety Plan or Project/Job Safety Plan.

2. PRIOR TO EXECUTION OF WORK

Review the Site-Specific safety Plan or Project/Job Safety Plan

- Review the site/location/right of way requirements to determine where all mats/matting will be placed or will be utilized.
- Identify control measures to eliminate or control the hazard(s). Obtain a safe work permit from the client prior to any activity at the job site where required.

Determine the style, type and use of mats/matting

- **Swamp mats** – also called bog mats, tend to be made out of laminate wood and can be purchased/supplied in a variety of configurations. They are used to for lay down yards, right of ways and/or roads.
- **Rig mats** – have a variety of shapes and sizes including interlocking frames. These mats usually have a metal frame and laminate wood deck. They are used to provide a secure base for drilling rigs, tank/camp foundation and environmentally sensitive areas such as creek and ephemeral draw crossings.
- **Crane/timber mats** – usually made from fir, oak or mixed hardwoods. These mats are usually reinforced with steel shafts throughout the mat which may be used for hooking onto for transporting, lifting or dragging. These mats are used, along with rig mats or swamp mats, to level an uneven surface for the cranes/excavators to sit on. These mats may also be used to walk excavators down a muskeg right of way. Common sizes of the timbers are 8"x8", 10"x10", 12"x12" and 16"x16". They are designed to bare a significant amount of weight and come in 4'x10' widths and 8'x40' lengths.
- **Others mat types** – steel frame digging mats (no decking) are used for the excavator to sit on while digging a trench. The excavator sits on two mats and swings third mat in front to move forward onto. Mats/matting manufactured from recycled material (tires) and or plastic based mats are also utilized in industry.

When determining what mats/matting should be utilized, consider the possible equipment, material and/or loads that will be borne; excavators, buildings, side-booms, truck-loads, cranes, process equipment (i.e. vessels, tanks, compressors, modules, etc.).

3. EXECUTION OF WORK

Complete the HIAC

- Ensure all hazard sources and hazards have been identified prior to starting work.

Communicate details, tasks and hazards

- When conducting a tailgate meeting, specifically referring to mats/matting:

- Discuss mats/matting locations and use.
- Review the specific hazards and appropriate controls.
- Review the potential risks, hazard sources and hazards while working on and/or around mats/matting. These include:
 - Matting becomes very slippery under wet muddy conditions especially in soils that contain a high silt or clay component.
 - Mud covered, wet or icy mats become very slippery to walk on and can also become nearly impossible to drive on.
 - Matting that is not interlocking can also shift creating gaps and an unstable working surface.
 - Once mud builds up on the mat surface slip/trip/fall hazards increase as you cannot blade the mud off without damaging the mat.
 - Uneven joints create tripping hazards.
 - Mats that are placed on a change in slope/grade will require additional controls to prevent both workers and equipment/vehicles from slippage and or sliding.
 - Boards sometimes dislodge from wear, tear and ageing. The steel pins that hold the boards together may protrude, and could cause tripping hazards, puncture injuries and damage to tires.
 - When equipment is used to position mats (especially in the case of timber mats) risks are created with lifting, swinging, and dropping.
- Manage Human Factors (mind on task, clear communication between spotter and equipment operators/workers) when moving mats/matting.
- Review the emergency preparedness and response plans to determine options if matting limits access or egress from a worksite.
- Monitor and communicate changing atmospheric conditions (i.e. temperature, humidity, wind, sleet, snow and rain).
- Re-assess mats/matting hazards when new work is introduced or when planned scope of work changes.

Implement hazard control measures

- Install mats/matting to ensure a level working surface.
- Flag areas that may pose a risk to workers and/or equipment. Add gravel or clay around edges to control and/or eliminate tripping hazards to soften out the elevation difference.
- Install fall prevention devices (i.e. handrails) if a fall risk and/or risk of injury is created by the workplace design. See Images 6 & 7.
- If mud builds up on the mat surface and slip/trip/fall hazards increase, remove the mud from the mats/matting. In certain situations, mud cannot be bladed off without damaging the mat, therefore other controls must be implemented.
- If ice/snow builds on mats/matting, address the at-risk conditions.
- Interlocking mats can shift even when interlocked properly.
- As mats/matting is worked on and/or driven on with various equipment, damage is inevitable, especially with tracked machines. This damage could be gouges and rips in the matting which

may create tripping hazards. Controls may vary from placing plywood down over the cracks and crevices, to replacing the mats/matting. Make sure the matting is maintained or replaced when necessary.

Image 1: Timber Crane mats

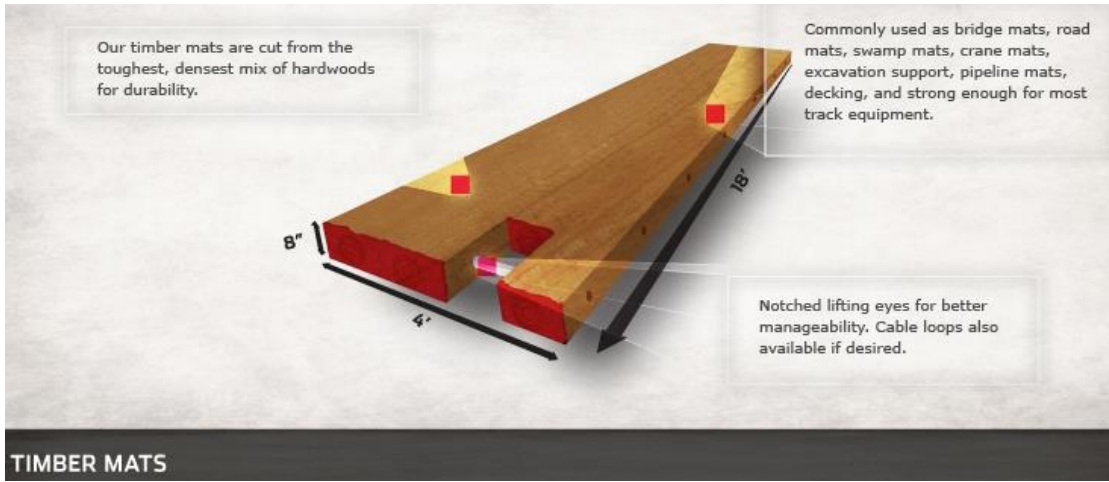


Image 2: Rig mats



Image 3: Application of swamp mats/matting



Image 4: Fall prevention devices



OTHER CONSIDERATIONS

Lessons learned

In recent years, mats/matting have both made our work environment safer and created new risks and hazards.

1. In central Alberta, a driver was reaching down to remove a matting hook from a standard rig mat. There was still some tension on the chain sling. As the worker began reaching to release the matting hook, the hook released striking the worker in the throat area.
2. In two separate incidents, an American pipeline construction worker and a Canadian rig worker were crushed by a rig mat when the rigging used to lift the matting failed to support the weight of the mat. Both workers died from the injuries they sustained.
3. Due to soft ground conditions, a rig mat on a winter access road shifted while it was being driven on. The rig mat struck a nearby worker in the ankle causing a compound leg fracture.\
4. A truck driver in northern Alberta was backing down a muddy lease road. He failed to notice a low spot in the road and was unable to stop his vehicle in time. When the vehicle entered the



dip, the rig mats, which were much longer than the bed of his truck, dug into the muddy road and were forced up into the headache rack of the truck. The top of the cab was crushed pinning the driver against the steering wheel. The worker’s injuries were limited to a bump on the head.

- 5. Near Miss or non-injury events – Workers working on mats/matting have experienced slips, trips and falls events. Equipment and vehicles have slipped on and/or off matting.
- 6. Damage event - Flat tires resulting from loosened, bent or exposed bolts sticking out of the surface of the mats/matting.

REFERENCES / ADDITIONAL INFORMATION

- Industry related Alerts and Guidelines available at <https://www.energysafetycanada.com/Resources>
- Supplier and/or manufacture information.

REGULATIONS

Alberta OHS Code

Part 19 Powered Mobile Equipment

Saskatchewan OHS Regulation

PART XI Powered Mobile Equipment

British Columbia OHS Regulation

Part 16 Mobile Equipment

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