Westwood
MECHANICAL INC.

#14-DIAMOND CORE DRILLING-SAFE JOB PROCEDURE (Final Dec.04)

1. PURPOSE:

The purpose of this procedure is to explain the safe step by step instructions in the use of the diamond core drill. These drills are used to cut/core holes through concrete.

2. GENERAL:

This procedure recommends how and where this equipment should be used and identifies the personal protective equipment and other appropriate safe guards. In well trained hands and under normal circumstances this tool offers little risk of injury.

3. SCOPE AND DEFINITION

Diamond core drills are electrically powered and require a constant spray of water on the cutting head for cooling. For this reason a number of precautions are necessary to protect the operator.

4. PROCEDURE:

4.1 Preparation and planning.

Before attempting to core or remove concrete/masonry walls or floors, planning and preparation are required.

- **Review as-built drawings for locations of embedded electrical, mechanical or piping systems or scan if required in contract.**

- **Review structural drawings for reinforcing steel, structural steel, anchors, lintels or similar embedments.**

- **Confirm the above information with occupants, owners or general contractor.**

- De-activate electrical or mechanical systems.

- Drain mechanical systems to relieve pressure in the lines.

Where coring will involve:

- A hole larger than 4 inches in a concrete slab
- A concrete beam or column
- Embedded structural members
- Enlarging an existing opening

A professional engineer or person with technical competence in structural design should review the plans and inspect the site before work is started.

4.2 General Safety Precautions:

Operators should observe the following procedure when using this powered equipment.

- Check extension cords and examine feed cord, switch and other components before using. If tool is double insulated, check motor casing for cracks or damage. Tag c/w description of suspected defect and return any defective tools to your supervisor.

- Protect extension cords from damage in traffic areas.

- Unless the tool is double insulated, the power source must be grounded. Power feeds must be approved three-wire cord with three –prong plugs and is used only in properly grounded three -pole receptacles. Never cut off or bend back the ground pin to allow use in a two-pole receptacle and never use cheaters (two-prong/tree prong adapters).

4.3 Concrete Coring

4.3.1 Core Drills

Because the core drill is electrically powered and requires a constant spray of water on the cutting head for cooling, a number of precautions are necessary to protect the operator.

- Observe the precautions as per general safety precautions.
- Use a wet vacuum to clean up wastes from the drilling head
- **When drilling a vertical surface do not use the vacuum pad to hold the unit in place. The unit must be supported with anchor bolts or from above by a safety cable or chain.**
- **When coring a horizontal surface the drill should be anchored to the surface before drilling begins. Bolt, shore or clamp the unit in place to provide a stable drilling platform and prevent binding of the core drill.**
- **When core drilling floors above grade, protect the area below. Concrete cores usually drop out of the drill on completion of the cut. Barricade off the area underneath and post warning signs. Remove or protect any materials or equipment that could be damaged.**

- **With large cores it may be necessary to station a helper underneath to receive the core when it is released, and to ensure that the area is clear of anyone.**

4.3.2 Coring procedure

Read all operating instructions

1. Select and install bit as per instructions

2. Secure the rig to the work surface using one of the methods described.

3. With the motor off, adjust the gear to either high speed for smaller bits or low speed for larger bits. **DO NOT SHIFT SPEEDS WHEN THE MOTOR IS RUNNING.**

4. Connect the water hose to the drill shut-off valve and to the water supply. Make sure the seal is watertight. Use a standard garden hose if you require additional length. Set up a water collection system.

5. Turn the drill motor on. Turn the water on so it flows freely through the water shut-off valve.

6. While holding the handle, slightly loosen the cradle lock handle and slowly rotate the handle to lower the bit into the workplace, supplying steady, even pressure. **To help reduce bit wandering, always use a light load to start the hole and wait for the tip of the bit to penetrate the work surface completely before increasing the load.**

7. Use sufficient pressure so the bit cuts constantly. Use the ammeter on the meter box as a guide for proper pressure.

NOTE: If the rig shifts during coring, stop the motor, reposition the rig and resume coring.

8. Monitor the water flow. Generally, water should flow at the rate of approximately one to two gallons per minute. If the water flow is to high the two holes in the spindle will leak. If that happens, reduce the water flow. Water flow is adequate when the water and cuttings are flushed in a circular pattern about ½ inch around the bit. Keep the work area dry. Also a correct water flow will appear as a milky consistency.

9. When the cut is complete, keep the drill motor ON and rotate the handle clockwise to remove the bit. The bit may become stuck in the hole if you turn the motor OFF before the bit is completely removed. Once the bit is removed from the work surface, turn the motor OFF. Tighten the cradle lock handle.

10. When coring holes that are longer than the core bit follow the following steps:

- Begin coring the hole as usual. When you have cored to the length of the bit, stop the drill and remove the bit.
- Remove the core by driving a chisel or slender wedge into the cut between the core and the work surface. You may also use a special core tongs, bent wire or anchor bolts to remove the core.

- After removing the core, reinstall the bit or use a bit extension and continue coring. Removing cores with diameters greater than their length can be difficult. One method to remove such cores is to first break the core into smaller pieces and then remove the pieces.

- Electric hammers and chisels are ideal for breaking cores.

4.3.2 Drill Hazards and Safeguards

- Avoid accidental starting.

- Be sure your tool is turned off before plugging it in.

- Do not use tool if the power switch does not turn the tool on or off.

- Do not carry a plugged –in tool with your fingers on the switch.

DO NOT FORCE TOOL

Your tool will perform best at the rate for which it was designed. Excessive force only causes operator fatigue, increased wear and reduced control. Some drills have a colour indicator light, which identifies the pressure being applied to the bit use this as your indictor for the correct force to be applied.

KEEP HANDS AWAY FROM ALL CUTTING EDGES AND MOVING PARTS.

DO NOT ABUSE CORD

Never carry your tool by its cord or unplug it by yanking the cord from the outlet. Pull on the plug rather than the cord to reduce risk of damage. Keep the cord away from heat, oil, sharp objects, cutting edges and moving parts.

#14-DIAMOND CORE DRILLING-SAFE JOB PROCEDURE

DO NOT OVER REACH, MAINTAIN CONTROL.

Keep proper footing and balance at all times. Maintain a firm grip. Use extra care when using tools on ladders, roofs, scaffolds etc.

STAY ALERT.

Watch what you are doing, and use common sense. Do not use a tool when you are tired, distracted or under the influence of drugs, alcohol or any medication causing decreased control.

UNPLUG TOOL.

When it is not in use, before changing accessories or performing recommended maintenance.

MAINTAIN TOOLS CAREFULLY.

Keep handles dry, clean and free from oil and grease. Keep cutting edges sharp and clean. Follow instructions for lubricating and changing accessories. Have any damaged parts repaired or replaced.

MAINTAN LABELS AND NAMEPLATES.

These carry important information. If unreadable or missing contact your supervisor for replacement.

The hazards associated with these tools fall in three main groups:

1. **Eye injuries from airborne dust and concrete chips.**
2. **Electrical hazards associated with the use of defective tools and equipment.**

Eye Protection (mandatory):

Safety goggles give the best wrap-around protection from flying particles. Safety glasses with side shields offer some protection but are not as effective.

1. **Inspect the work area before starting and remove obstructions, if possible.**
2. **Don't over power. Choose a drill that matches the job- adequate for the bit size and speed required.**
3. **Avoid ladders. Working from a scaffold provides better footing and less chance of a fall should the drill bit jam.**

4. **Clean the drill-hole frequently by withdrawing the rotating bit from the work.**

5. **Ensure that the core bit has not been damaged.**

6. **Ensure that the unit is adequately secured to the working surface.**

Electrical Hazards:

Observe the safety precautions as listed previously, in particular, inspect or test the electrical tool and fittings before using.

DO NOT USE DEFECTIVE ELECTRICAL EQUIPEMENT.

5. EQUIPMENT/MATERIALS REQUIRED

Proper clothing shall be worn at all times when using the core drill. Wear sturdy, close fitting apparel; avoid wearing loose –fitting jackets, jewelry and cuffed pants.

The following is a list of PPE that should be worn when using the core drill.

- Approved hard hat
- Approved safety footwear, rubber boots with sole protection against electrical shocks and punctures and toe protection.
- Hearing protection is recommended especially for work in enclosed areas and during extended use.

- **Use a dust mask for dusty conditions**
- **Eye protection that will provide wrap-around protection from flying particles**

6. SPECIAL CONSIDERATIONS

6.1 Training

All operators shall be instructed in the operations of the core drill.

They should receive oral and demonstration instructions.

6.2 Dermatitis

A common risk in all-concrete coring and removal of cement is dermatitis.

Cement dermatitis is an allergic reaction to ingredients in Portland Cement, and can result in severe skin rashes or sores that are difficult to heal.

During concrete coring the skin is exposed to wet cutting particles, although cement dust can combine with sweat to create a similar exposure.

Precautions include personal hygiene and sensible work clothing. Clothing should be laundered frequently to remove cement particles. Wash dust or paste off exposed skin at the job site. A lanolin cream can provide a barrier on the skin. Don't work in shorts or sleeveless shirts and wear work gloves to protect your hands