

Rolling Wheel Compaction

The rolling wheel presents a number of hazards. The weight of the machine makes it difficult for some people to operate and switching direction with the hydraulic control can be challenging.

Hazards:

- Physical weight of wheel
- Exhaust fumes
- Hot asphalt

Protection required:

- Safety Glasses
- Hearing protection
- Leather gloves (recommended for operator, required for assistant)

For operator:

- 1) When starting the rolling compactor, make sure nothing will be crushed if the compactor should start up in gear.
- 2) Be sure other employees are clear of wheel at all times when rolling. Never begin compaction without making eye contact and use hand signals with other employees.
- 3) Always wear hearing protection and eye protection, and gloves are recommended

Rolling Wheel Protocol

In order that the UC Pavement Research Center can achieve repeatability from ingot to ingot, it is necessary to standardize the pattern of passes by the rolling wheel.

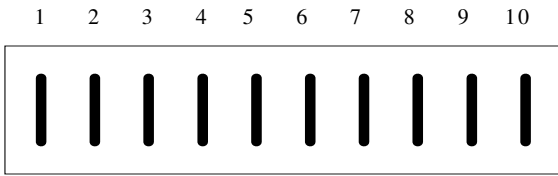
Rolling Wheel and Compaction Mold Preparation:

- 1) Two hours before compaction, when the mix is placed at the compaction temperature, the infrared heat lamps should be placed on top of the compaction mold.
- 2) Just before compaction, the rolling wheels should be wetted (with water) to minimize any sticking of hot mix to the rolling drum. Do not drench the wheel, as too much water will hasten the cooling of the hot mix.

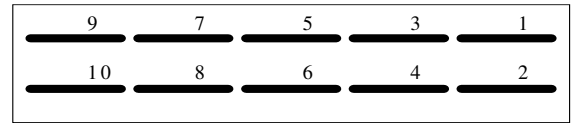
Rodding:

- 1) Spread the mix in the ingot to achieve some kind of even placement of the mix without actually tamping or compacting the mix with the rod. Make sure that the mix is spread into the corners, throughout the mold, and not mounded up too high in any corner so that the air voids content will be consistent throughout the slab.
- 2) Often for relatively low air voids ($AV \sim 3\%$) it is necessary to rod the mix before roller compaction; begin rodding in the following manner. Rod ten times from one end to the other with the blade placed perpendicular to the ingot's longitude. Then rod ten times in the opposite direction with the blade parallel to the ingot's longitude alternately each side:

1) Perpendicular tamps.



2) Parallel tamping.



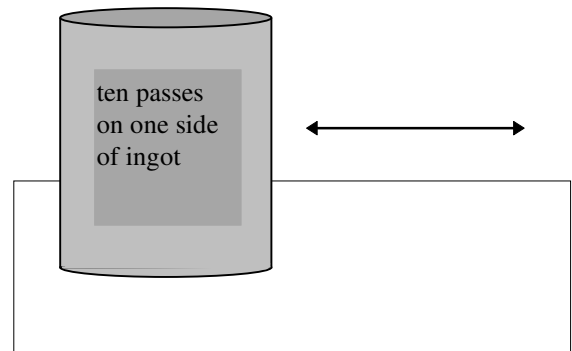
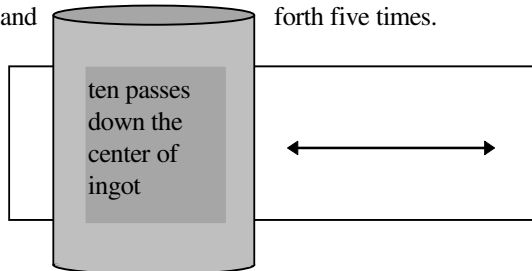
In the case of a slab larger than an ingot, visually divide the area into ingot-size sections and perform the same tamping operation on each portion.

- 3) In the case of a slab larger than the normal ingot, visually divide the area into ingot-sized sections and perform the same tamping operation on each operation.

Rolling:

The main thing here is to have the same number of passes on all sides and directions for every ingot. Start with ten passes dead center to squish down the mix, stopping as needed to move mix back into the mold. Once the first ten passes have been made, run ten passes on one side, with the wheel compacting half the ingot, and then again ten passes center, and then ten passes on the opposite side, again with the wheel compacting half the ingot. Finish with another ten passes down the center.

One pass is the movement of the wheel in one direction over the entire ingot, i.e., ten passes is back and forth five times.



IN SUMMARY, there are a total of fifty passes: ten on center, ten on one side, ten on center, ten on the other side, and ten on center. Note that the desired compaction is achieved as witnessed by the surface of the ingot being level with the surface of the mold. If additional compaction is required, further passes are applied on center only.