Currently, the HCPH Installer Manual requires 12” depth to plastic soils in a basal area before chiseling. We cannot find any regulation specifying a minimum depth in OAC 3701-29.

OAC 3701-29-15 Appendix B V(C) specifies no basal prep shall be allowed when there is risk of smearing or compaction of soil.

Current equipment has a much lower Ground Pressure Loading than was used in years past.

A tracked Cat 304.5E2 XTC Mini Excavator with cab, long stick weighing 8996 lbs. has a ground pressure as per Caterpillars specifications of 4.3 psi.

Let us compare this loading to foot traffic over the basal area.
Parameters:

Installer weighing 200 lbs
Installer wearing boots with 48 sq in. surface area (12” long sole x avg 4” wide)
200 lbs / 48 sq in. sole area = 4.16 psi

Our conclusion: If an installer is careful and not bounce the tracked excavator traversing the basal while chiseling, the compaction will be negligible and roughly equivalent to foot traffic across the basal.

Using sand on basal areas at preparation

OAC 3701-29-15 Appendix B V (F) state that sand may be incorporated into the basal area during the preparation process.

Having an installer place 3-4 in. of sand on the basal prior to chiseling would

1) Increase the contact surface depth to plastic soils
2) Help protect soil pore space
3) Sand would trickle into the chisel slit resulting in a better infiltrative surface. This is especially important during the drier times of the year when soil at the top of the profile breaks into dust when chiseled.

This reminder could be on each design:

BASAL PREP: See Section 10.4 Hamilton County Installer’s Manual for detailed instructions.

Each basal prep to be carefully evaluated by the installer and sanitarian and the best course of action enacted for the site conditions.

- *Clean Basal area of organic matter as much as possible. If wooded, remove brush and cut any trees flush with the ground surface.*
- *Basal to have no plastic soils to 8" soil depth.*
- *Record the highest point along contour where lateral is flagged. Final sand thickness as per the design specification on depth of sand will be measured from this point.*
- *Place 2-3 inches of sand on basal before chiseling.*
- *The depth of chiseling the basal area depends on site conditions:*

  Turf: No Deeper than the root zone

  Wooded: Assuming all leaf litter is removed, just go down a couple inches to avoid bringing up tree roots. If a tree root is caught, stop, raise up chisel, reset, then continue chiseling.

  Surface Compaction: Chisel deep enough to penetrate to good structure.

If a slightly wetter area is identified during the pre-chisel investigation, it is recommended that this area is outlined, and a thinner depth of sand be placed over that designated area. Careful and shallower chiseling can then be done in that area. A small area could even be left unchiseled as the basal area exceeds the minimum area.

General Guidance: Chisel no deeper than necessary to create a sand to soil interface to soil with good structure. Avoid overworking the site at all costs.

AVOID Unnecessary foot traffic across the Basal

AVOID Excess tracking with the excavator when traversing the basal

AVOID Sudden or jerking movement or bouncing of the excavator when moving or when chiseling

Each basal prep to be carefully evaluated by the Installer and Sanitarian and the best course of action enacted for the site conditions present on that day.

After chiseling, apply sand to the basal so that sand under the gravel bed is at the elevation previously defined to be TOS.

The counties we design in have recognized 8" depth to plastic soils as a depth which has and continues to work well for them. We know Clermont County has used this depth since Ralph developed the adoption of mound technology in the 90's.

We consulted with Soil Scientist Dan Michael, Retired Sanitarian Ralph Benson, and current Head Sanitarian at CCGHD Doug Disbennett. Doug stated he makes the determination of the soil conditions of the mound basal and identifies marginal areas and deals with the prep as we previously outlined. All 3 professionals support 8" to plastic soils and the adoption of the use of sand during basal prep and each one stated they have seen no disadvantage in using sand on each basal prep as outlined. The sand/soil

interface is always deemed as having been improved by the incorporation of sand at the interface at time of chiseling.

Perry Shoemaker

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