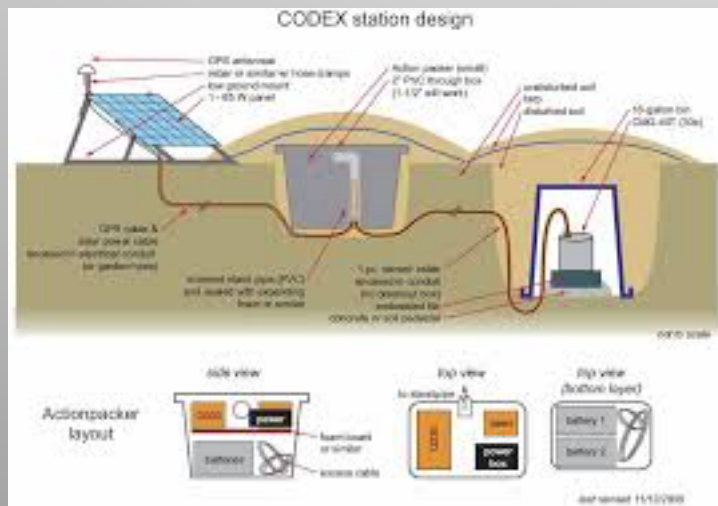


Compass has been adequate for most installations



A Quality compass such as a Brunton transit has azimuth accuracy  $\pm 1/2^\circ$  with  $1^\circ$  graduations, cost is \$350.



## If non-magnetic vault materials used....

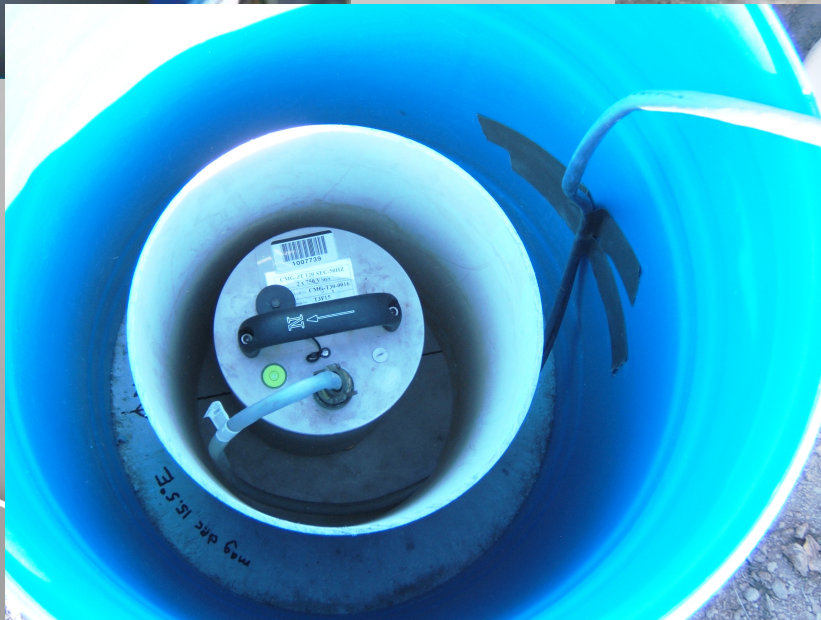
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- Position Compass on center of pier, correct for local declination
- Align plastic ruler and strike a north line with sharpie or 90 degrees to north for a STS2
- Use alignment nubs / rod and align with scored mark





## Some examples...



# Posthole types have to be aligned from the top...





# PICs newest aid is the alignment tool

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- Developed for Trillium postholes deployments
- Prototype for 3Ts, STS2s and T120PAs
  - All aluminum or non-magnetic metals
  - Uses forced mechanical coupling for alignment
  - Steadies and eases compass handling for leveling



\*See the PIC alignment tools here at the TIMs

# What we have tried...

- We have compared alignments with Brunton compasses in Antarctica and verified with the GPS alignment tool:  $< 1$  degree difference on each of 3 station installs as compared to the GPS alignment tool
- The PIC supports 50-70 experiments a year with the PIs supplying their own compasses
- GPS alignment tool accurate to .2 degrees and cost \$7,500 for each kit
- Estimate of upgrade to more accurate GPS tool:
  - 100 units = \$750,000!
  - Octans not considered

