NPS Sweep Magnet Field-Mapping

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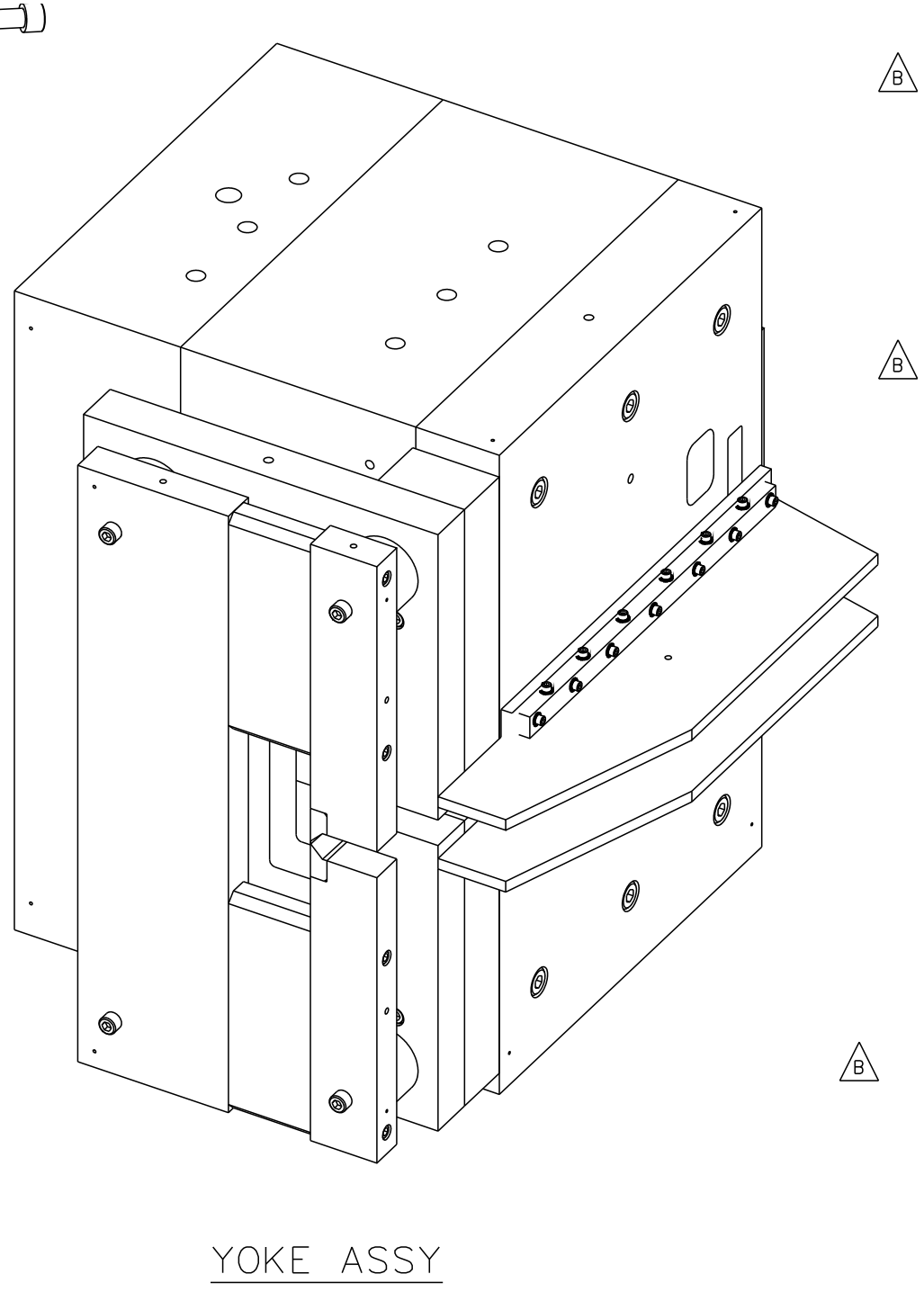
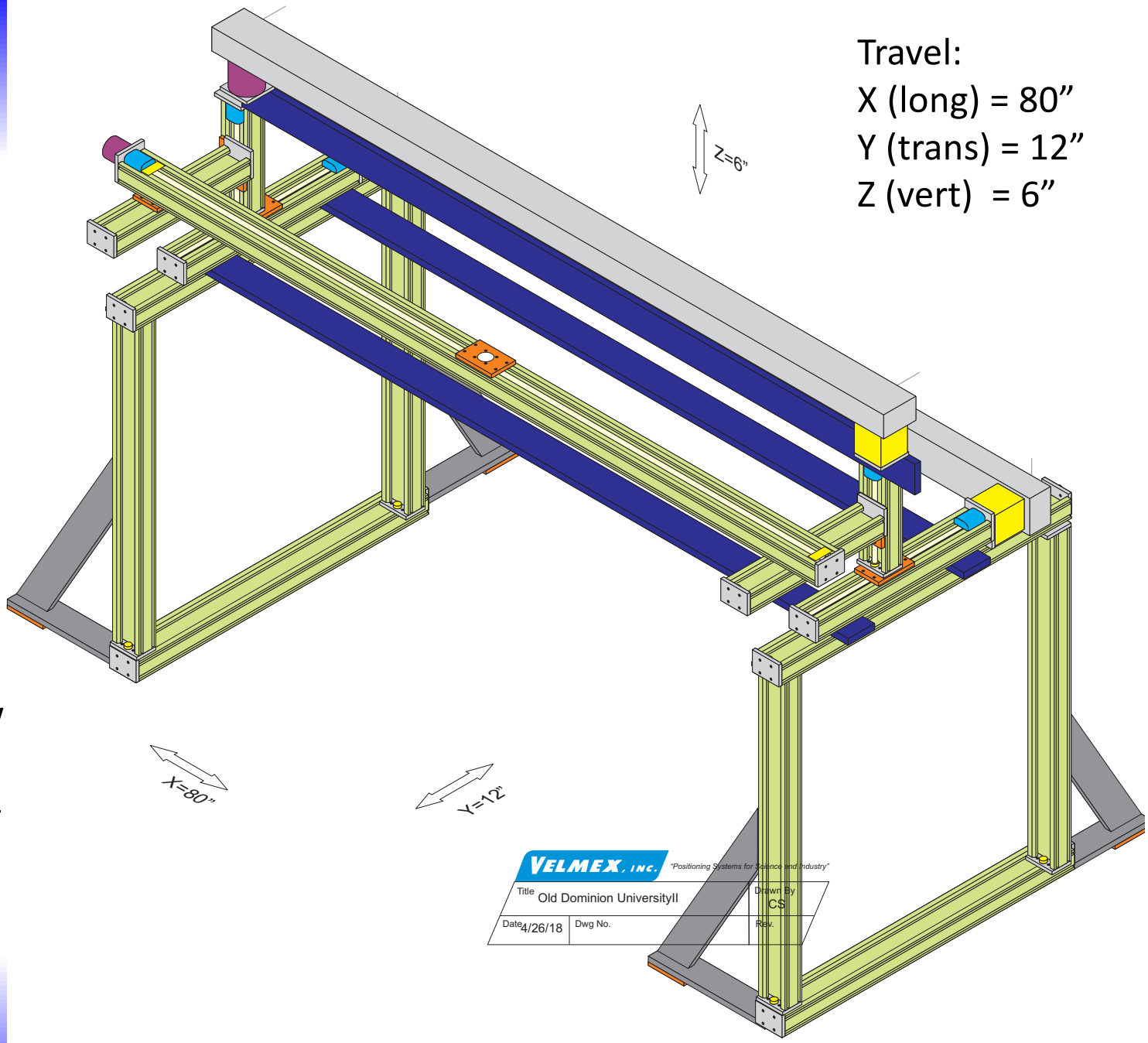


OLD DOMINION
UNIVERSITY

Velmex

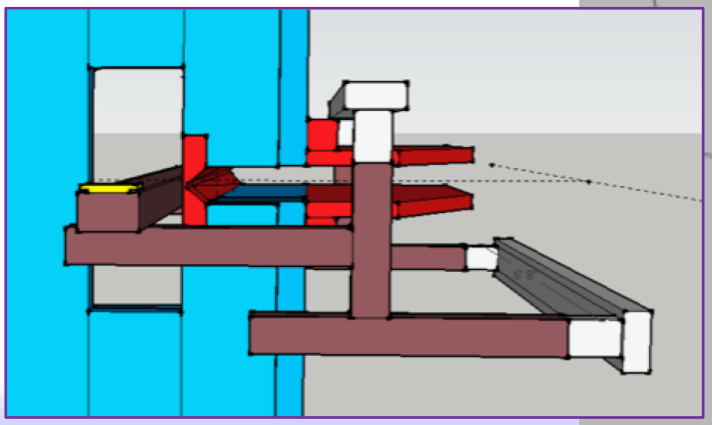
- Labview readout of positioning.
- Measure field in gap and (separately) along beam-line
- Only long track is in magnet gap.
  - Revising P.O. with Velmex to replace Stainless Steel drive screw with (mostly) non ferrous belt-drive
- Hall Probe sensor required



Travel:
X (long) = 80”
Y (trans) = 12”
Z (vert) = 6”

Mapper in Magnet

- Mapper, support structure, and magnet



Mapping Strategy

- Develop Lab View app to control sensor and record Hall probe readings.
- Install mapper in main gap
- Power magnet at full Test-Lab current.
  - Repeat at 50% current for linearity test.
  - De-Gauss procedure? Can we reverse polarity?
- Record transverse field in 1 cm steps in X,Y,Z
  - Repeat 3 times for reproducibility
  - Longitudinal field as cross check?
- Install mapper in beam-line area
  - Map transverse field in midline plane (Y=0) in 1 cm steps in X and Z
- Repeat in Hall-C at full power when available.

Anticipated Timeline

- Mechanical assembly available Oct 1.
- Software operational mid-Nov.
- 1 week for mapping