D0 Cradle Temporary Stands

Engineering Note #3740.520-EN-199

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Checked: _____

D0 Cradle Temporary Stands

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While the CC Cryostat is being prepped and loaded with modules it will rest on a transporter in the Clean Room which will eventually be used to move the CC Cryostat and it's cradle onto the Center Beam. Ultimately, the Cryostat/Cradle will rest on roller/jack assemblies at each corner of the Cradle but for convenience purposes, the Cryostat/Cradle will rest on temporary stands until it is placed on the Center Beam.

The stands must supply level support to the Cryostat/Cradle. The stands are designed with removable top plates which could be removed and easily machined to a desired height (thickness) such that the four stands would level the Cryostat. The stands are designed to withstand 400 tons of straight axial compression according to AISC Code. A notch is provided in the bottom surface to accomodate the keyed ways which will be installed in the Center Beam in case the need arises to use these stands when the Cryostat/Cradle is on the Center Beam.

To meet Clean Room requirements, the stands were painted upon completion. Sketches and calculations are included in this report.

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Ø Carriage Temporary Stands

$$A = 2 A_{3 \times 5 \times 1/2} = 2 (6.36) \text{ AISC Manual} = 12.72 \text{ in}^2$$

3" x 5" x 1/2" (2)

$$\begin{aligned} \text{(per stand)} P &= \frac{400 T}{4} \\ &= 100 T \\ &= 200000 \text{ lbs} \end{aligned}$$

$$f_a = \frac{P}{A} = \frac{200000}{12.72} = 15723.3 \text{ psi} \approx 15.8 \text{ ksi} \quad \underline{\underline{OK}}$$

General Purpose Steel ≈ 30 ksi yield (Fermi Stock)

$$\begin{aligned} \text{conservatively } F_y &= (0.9)(30) \\ &= 27 \text{ ksi} \end{aligned}$$

AISC Allowable (axial compression)

$$\begin{aligned} F_a &= 0.60 F_y \\ &= 0.6 (27) = 16.2 \text{ ksi} \end{aligned}$$