Equations For Paper

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Abstract

geeblegobble geeblegobble

1 Introduction

mr smoddlebogy says work toward this equation by explaining and defining arclength, dx/dtheta etc

2 Some Stuff

2.1 Relationship of moment and curvature

Distinguish small-deflection and large-deflection solutions here

2.2 Eq. 1: Euler-Bernoulli moment-curvature relationship

$$M = EI\frac{d\theta}{ds}$$

2.3 Eq. 2: Differential Arclength in terms of angle

$$\frac{ds}{d\theta} = \pm\sqrt{\frac{EI}{R}}\frac{1}{\sqrt{cos(\theta-\phi)-cos(\theta^*-\phi)}}$$

2.4 Eq. 5

$$s(\theta) = \sqrt{\frac{EI}{R}} \int_{\alpha}^{\theta} \frac{d\theta'}{\sqrt{cos(\theta' - \phi) - cos(\theta^* - \phi)}}$$

2.5 Eq. 6

$$x(\theta) = \sqrt{\frac{EI}{R}} \int_{\alpha}^{\theta} \frac{cos(\theta')d\theta'}{\sqrt{cos(\theta' - \phi) - cos(\theta^* - \phi)}}$$

2.6 Eq. 7

$$y(\theta) = \sqrt{\frac{EI}{R}} \int_{\alpha}^{\theta} \frac{sin(\theta')d\theta'}{\sqrt{cos(\theta' - \phi) - cos(\theta^* - \phi)}}$$

2.7 Eq. 8

$$\frac{L}{w} = \beta = \frac{\int_{\alpha}^{\theta^*} \frac{d\theta}{\sqrt{\cos(\theta-\phi)-\cos(\theta^*-\phi)}} - \int_{\theta^*}^{0} \frac{d\theta}{\sqrt{\cos(\theta-\phi)-\cos(\theta^*-\phi)}}}{\int_{\alpha}^{\theta^*} \frac{cos(\theta)d\theta}{\sqrt{\cos(\theta-\phi)-\cos(\theta^*-\phi)}} - \int_{\theta^*}^{0} \frac{cos(\theta)d\theta}{\sqrt{\cos(\theta-\phi)-\cos(\theta^*-\phi)}}}$$

2.8 Eq. 9 Thing I integrated to get critical alpha

$$\beta = \frac{\int_{\alpha}^{0} \frac{d\theta}{\sqrt{\cos(\theta)-\cos(\alpha)}}}{\int_{\alpha}^{0} \frac{cos(\theta)d\theta}{\sqrt{\cos(\theta)-\cos(\alpha)}}}$$

2.9 Eq. 10 Bending energy in terms of M, it's in the word doc but could look nicer

$$du = \left(\frac{M^2}{2EI} \right) ds$$

2.10 Eq. 11 Have in another document: bending energy integral, already pasted in

$$U = \frac{EI}{2} \int \left(\frac{d\theta}{ds} \right)^2 ds$$

2.11 Eq. 12 Energy in terms of dtheta –this should contain R

$$U = \frac{\sqrt{REI}}{2} \int \sqrt{cos(\theta - \phi) - cos(\theta^* - \phi)}\, d\theta$$

2.12 Eq. 13 Expression for R

$$\sqrt{R} = \sqrt{EI} \int_{\alpha}^{0} \frac{cos(\theta) d\theta}{\sqrt{cos(\theta - \phi) - cos(\theta^* - \phi)}}$$

2.13 Lists

You can make lists with automatic numbering ...

1. Like this,
2. and like this.

... or bullet points ...

- Like this,
- and like this.