

Accepted Manuscript

Transversely isotropic half-spaces subject to surface pressures

Francesco Marmo, Ferdinando Toraldo, Luciano Rosati

PII: S0020-7683(16)30324-9
DOI: [10.1016/j.ijsolstr.2016.11.001](https://doi.org/10.1016/j.ijsolstr.2016.11.001)
Reference: SAS 9353



To appear in: *International Journal of Solids and Structures*

Received date: 10 April 2016
Revised date: 11 October 2016
Accepted date: 3 November 2016

Please cite this article as: Francesco Marmo, Ferdinando Toraldo, Luciano Rosati, Transversely isotropic half-spaces subject to surface pressures, *International Journal of Solids and Structures* (2016), doi: [10.1016/j.ijsolstr.2016.11.001](https://doi.org/10.1016/j.ijsolstr.2016.11.001)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Transversely isotropic half-spaces subject to surface pressures

Francesco Marmo^{a,*}, Ferdinando Toraldo^a, Luciano Rosati^a

^a*Department of Structures in Engineering and Architecture, University of Naples Federico II, Naples, Italy*

Abstract

We outline a general methodology for proving the equivalence between several solutions available in the literature for the elastic problem of transversely isotropic materials. The proposed methodology is mathematically supported by a novel solution strategy yet arriving at the same expression of the displacement field contributed by Ding et al. [Elasticity of Transversely Isotropic Materials, Springer, 2006].

We further show how to address the case of transversely isotropic half-spaces subject to linearly distributed vertical pressures applied over arbitrary regions of the half-space boundary. In the significant case of polygonal regions, displacements and stresses at arbitrary points of the half-space are evaluated analytically and the relevant singularities are properly accounted for.

The proposed approach has been numerically validated by first solving a basic indentation problem for which an analytical expression of the displacements on the half-space surface is available. Furthermore, the displacement and stress fields induced in a half-space by a polygonal indenter of arbitrary shape subject to a

*Corresponding author.

Email address: f.marmo@unina.it (Francesco Marmo)

Download English Version:

<https://daneshyari.com/en/article/4922681>

Download Persian Version:

<https://daneshyari.com/article/4922681>

[Daneshyari.com](https://daneshyari.com)