Plugin for Tunneling and Geotechnical Analysis in Abaqus

A. Fioranelli Jr, A. Cavalcante
T. Pessoa, A. Ferreira
anselmo@smarttech.com.br
05/17/2012
Agenda

• SMARTTECH
• Abaqus for Geotechnical Simulation
• The Plugin
• Example
• Conclusion
• Next Steps
Buenos Aires
São Paulo
Rio de Janeiro

- Incorporated 1997
- Employees - 45+
- Customers - 300+

Holambra
Rio de Janeiro
São Paulo
Buenos Aires
• SIMULIA reseller in Brazil, since 2005
  – In Argentina since 2009
• Engineer company
  – Tests and Simulation
• Geotechnical + Simulation Team
Abaqus for Geotechnical Simulation

- One of the best FEA
- Implicit + Explicit
- Non-linearities
  - Materials
  - Contact
  - Fracture
- Construction Steps
- Big models
Why develop a plugin?

• Help geotechnical models
• Make constructions steps easier
• Help new users
Material Change

Ex: Rock to Concrete

- One material → different fields
  - Confusion on material definition
- Same nodes → different elements
  - No stress on new material
  - CAE can’t do that
- Restart
  - Too much restart for big models
• MODEL CHANGE
  – Activate and Deactivate mesh
  – CAE is ok!
  – Plugin make it easier
• User defines
  – SET
  – Materials
• Example
  – Retaining wall
  – 8 Steps
• Plugin Window
  – Simple
Results for each STEP:

Wall
Conclusion

• The plugin make the process faster!
• It helps new users

• If you have interest /or needs... Let us know

• It needs some improvement... next steps
  – Define tunnel section with rebars
  – More options to change materials
  – More interactive
  – ...
Anselmo – anselmo@smarttech.com.br

RIO DE JANEIRO
Rua da Assembleia, 10 – 35º andar
cj. 3503 – Centro – 20011-901
+55 21 3852.2360

HOLAMBRA
Rua das Dálias, 395
Jd. das Tulipas – 13825-000
+55 19 3802.4662

SÃO PAULO
Av. Brig. Faria Lima, 2894 – 6º andar
cj. 63/64 – Jd. Paulistano – 01451-000
+55 11 3168.3388

BUENOS AIRES
Dardo Rocha, 3168 – Piso 2
Oficina B – Martínez – B1640FTV
+54 11 4717.2717