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APÊNDICE

A.
Variação das Tensões *In Situ* Iniciais no *Modelo Global A* Após o Processo do *Creep* no Sal

A variação de cada um dos componentes do tensor de tensões no *Modelo Global A* é apresentada a seguir da Figura A.1 até a Figura A.6:

- Tensão Horizontal S11

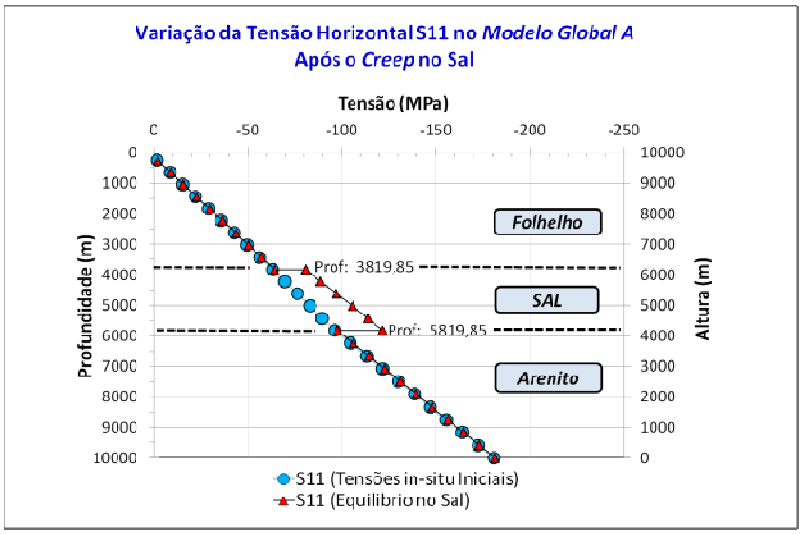


Figura A.1 – Variação da Tensão Horizontal S11 no *Modelo Global A* após o processo do *creep* no *Sal*.

- Tensão Horizontal S22

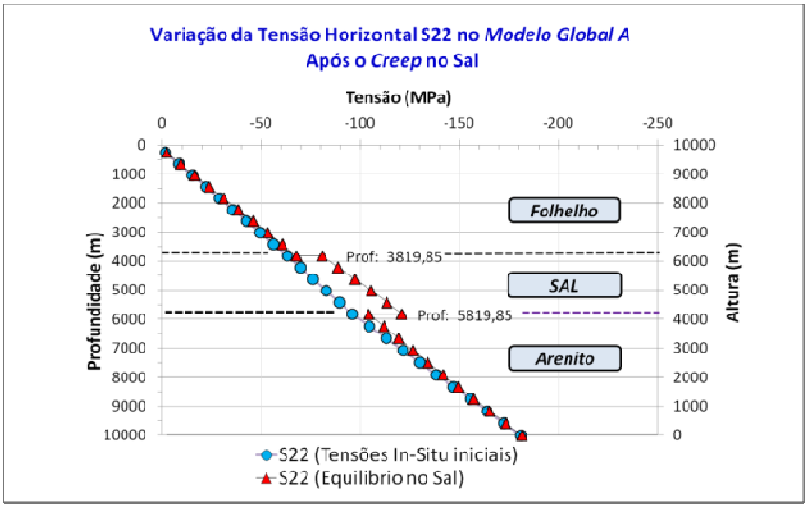


Figura A.2 – Variação da Tensão Horizontal S22 no *Modelo Global A* após o processo do *creep* no *Sal*.

- Tensão Vertical S33

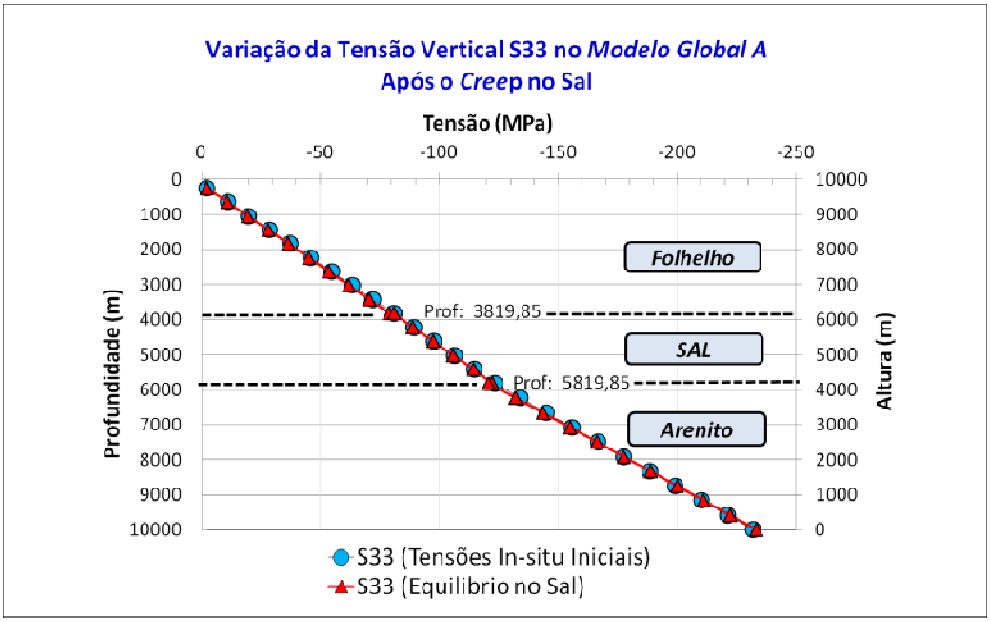


Figura A.3 – Variação da Tensão Vertical S33 no *Modelo Global A* após o processo do *creep* no *Sal*.

- Tensão Cisalhante S12

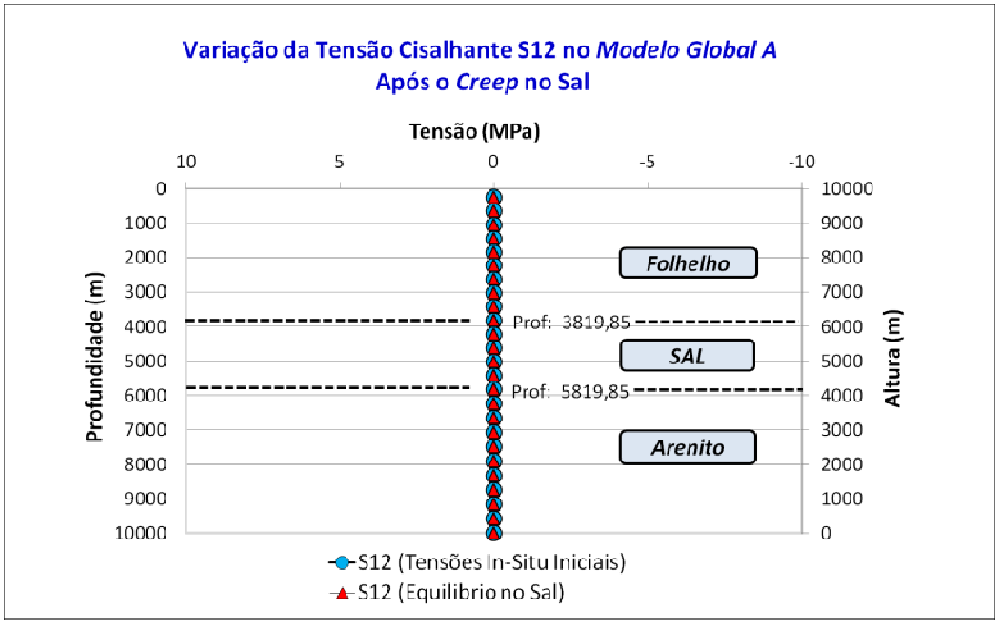


Figura A.4 – Variação da Tensão Cisalhante S12 no *Modelo Global A* após o processo do *creep* no *Sal.*

- Tensão Cisalhante S13

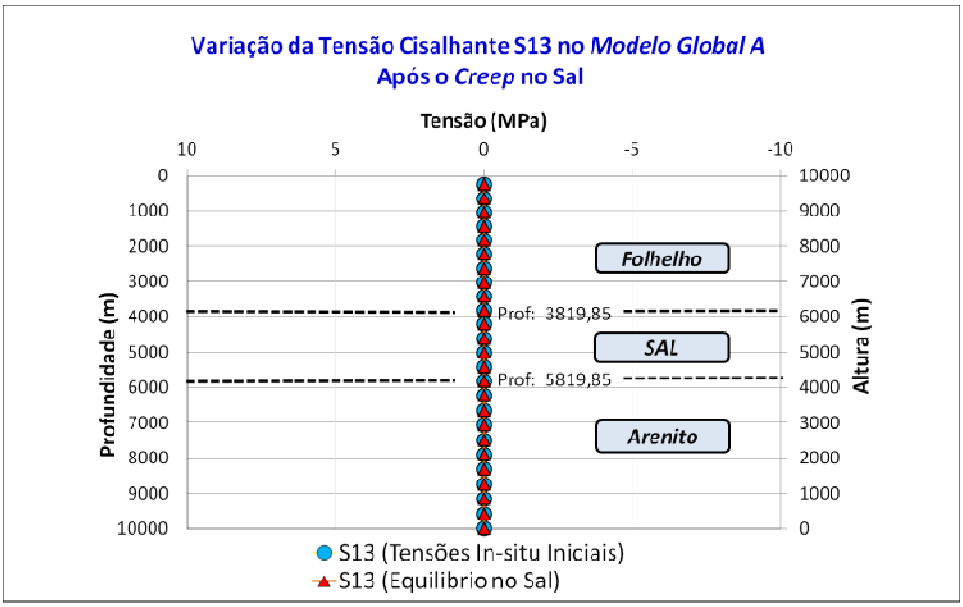


Figura A.5 – Variação da Tensão Cisalhante S13 no *Modelo Global A* após o processo do *creep* no *Sal*.

- Tensão Cisalhante S23

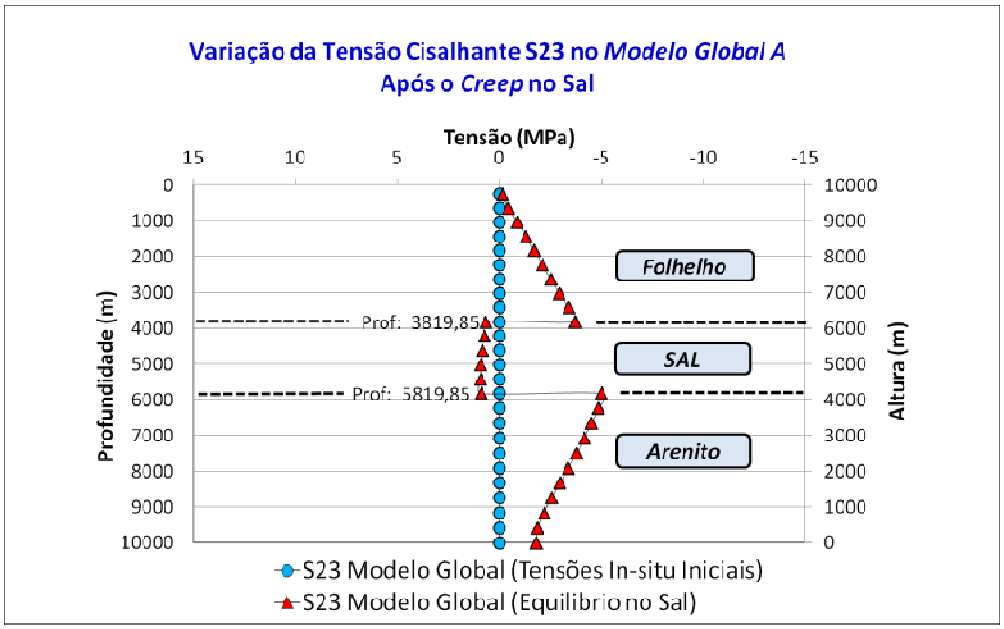
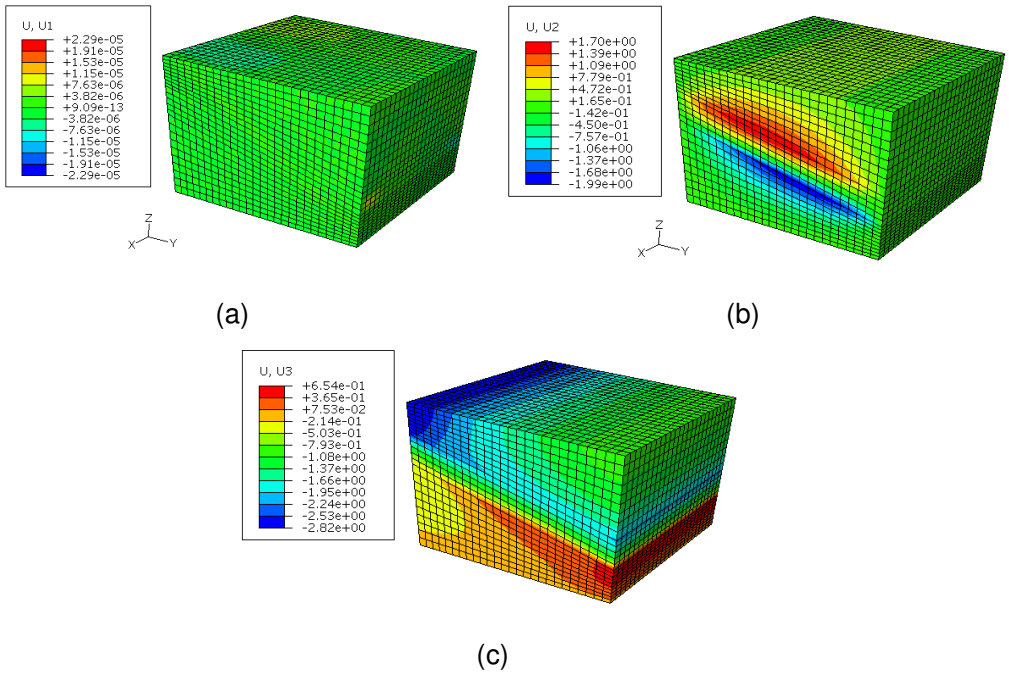


Figura A.6 – Variação da Tensão Cisalhante S23 no Modelo Global A após o processo do *creep* no *Sal.*

B.
Deslocamentos no *Modelo Global A* após o processo do *Creep* na Camada de Sal

Durante o processo de *creep* no *Sal*, a malha experimenta deslocamentos e deformações. Apresenta-se a seguir na Figura B.1 os deslocamentos nas direções X (U1), Y (U2) e Z (U3) gerados na malha do modelo global:



(a) (b)

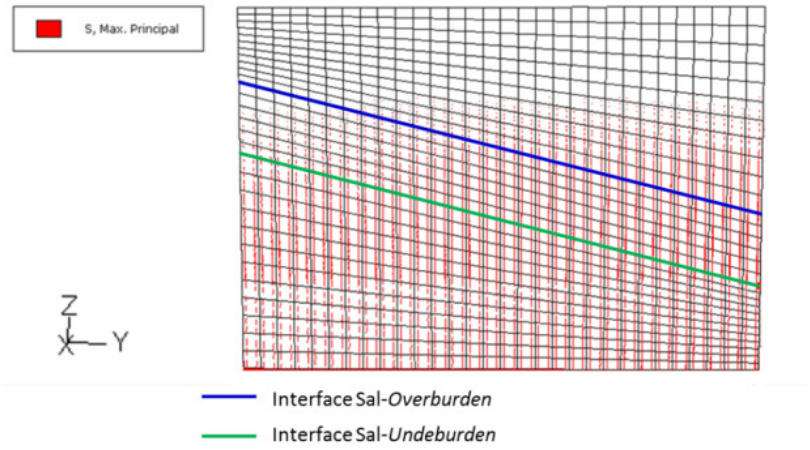
(c)

Figura B.1 – Deslocamentos finais após o *creep* na zona de *Sal* no *Modelo Global A*: (a) deslocamentos na direção horizontal X (U1); (b) deslocamentos na direção horizontal Y (U2); (c) deslocamentos na direção vertical Z (U3).

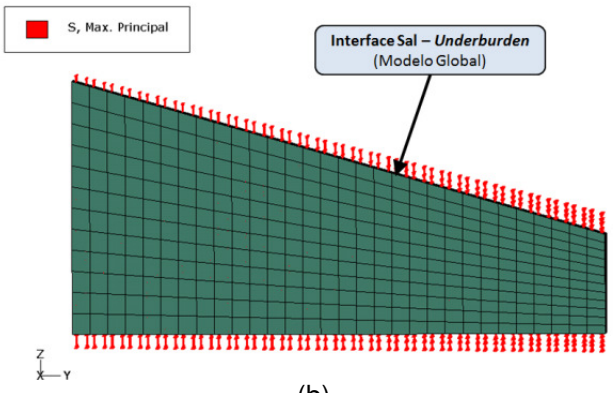
Os anteriores deslocamentos apresentados na Figura B.1 foram verificados depois do processo do *creep* no modelo global, os quais foram considerados relativamente mínimos em comparação com a escala do modelo global. Portanto, foi considerado nesta dissertação que as deformações da malha devidas ao anterior processo do *creep* no sal são desprezíveis. Deste modo, os cálculos foram realizados empregando uma *análise geométrica linear*, a qual corresponde a uma análise de pequenas deformações no Abaqus (*Abaqus "small displacement" analisys*). Detalhes sobre a anterior análise podem ser aprofundados no Manual do Abaqus (2010).

C.
Evidencia de Rotação de Tensões Principais no *Modelo Global B*

Em continuação serão apresentadas as orientações de cada uma das tensões principais máxima, intermediária e mínima no *Modelo Global B*, antes e depois de acontecer o processo do *creep* na zona de sal, e com ênfase na distribuição das tensões principais no plano da interface *Sal-Underburden*. Na Figura C.1 (a) e (b), apresenta-se a orientação da tensão principal máxima (entendida neste capitulo como aquela que possui o maior valor de compressão) antes do *creep* na zona de sal. Essa tensão corresponde à tensão vertical atuando na direção do eixo *Z*. Nota-se que esta tensão inicialmente só atua na direção vertical. No entanto, uma vez que ocorra o processo do *creep* no sal, esta tensão reorienta-se na interface *Sal-Underburden*, ficando perpendicular a essa superfície, como mostrado na Figura C.2 (b):

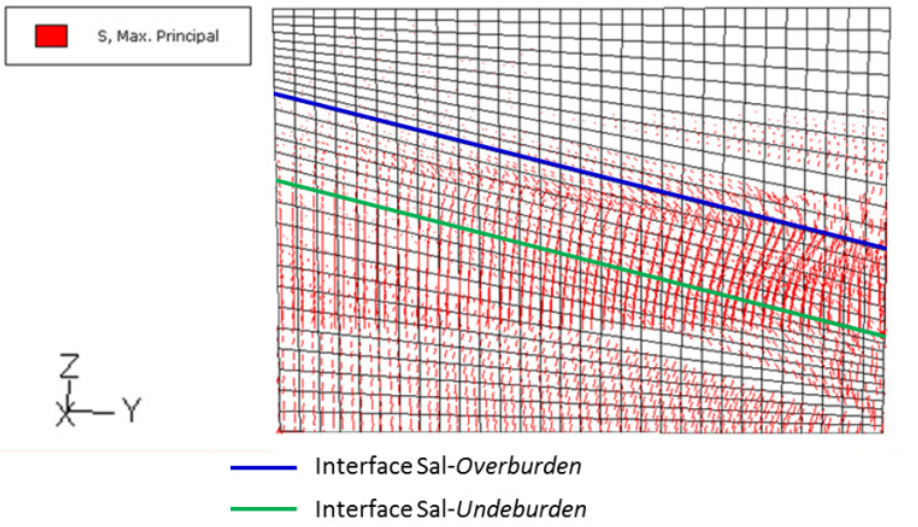


(a)

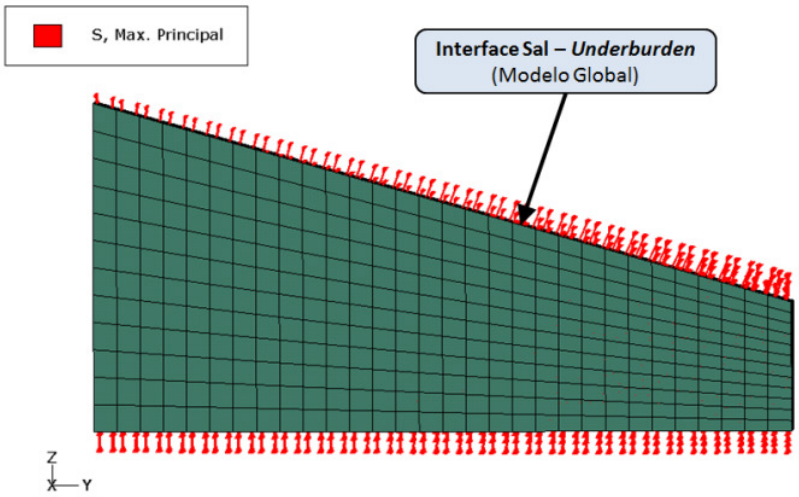


(b)

Figura C.1 – Orientação da Tensão Principal Máxima no *Modelo Global B* antes do processo de *creep* no sal (Paralela ao eixo Z): (a) modelo global completo (plano Y-Z); (b) interface *Sal-Underburden* do modelo global (plano Y-Z).



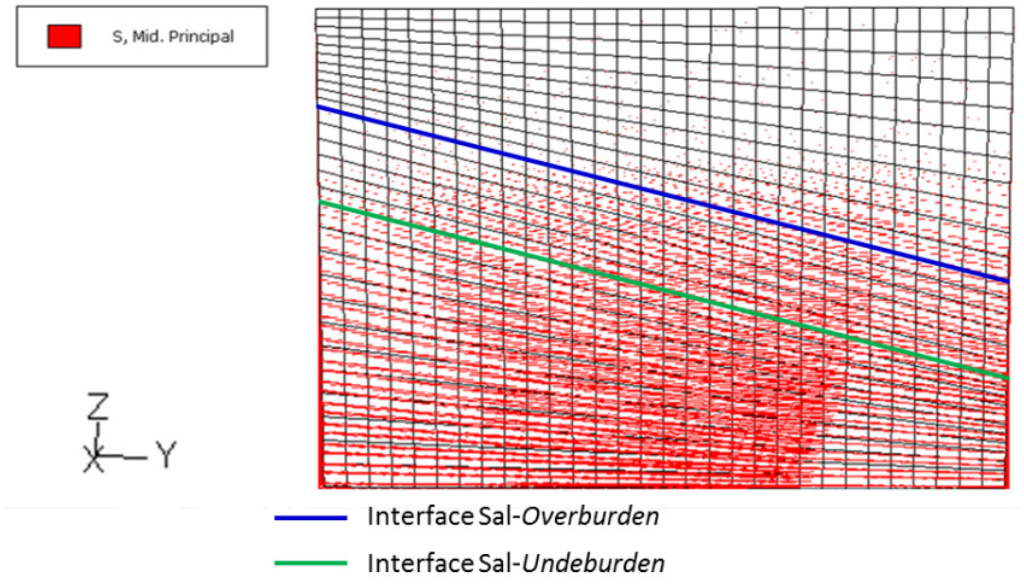
(a)



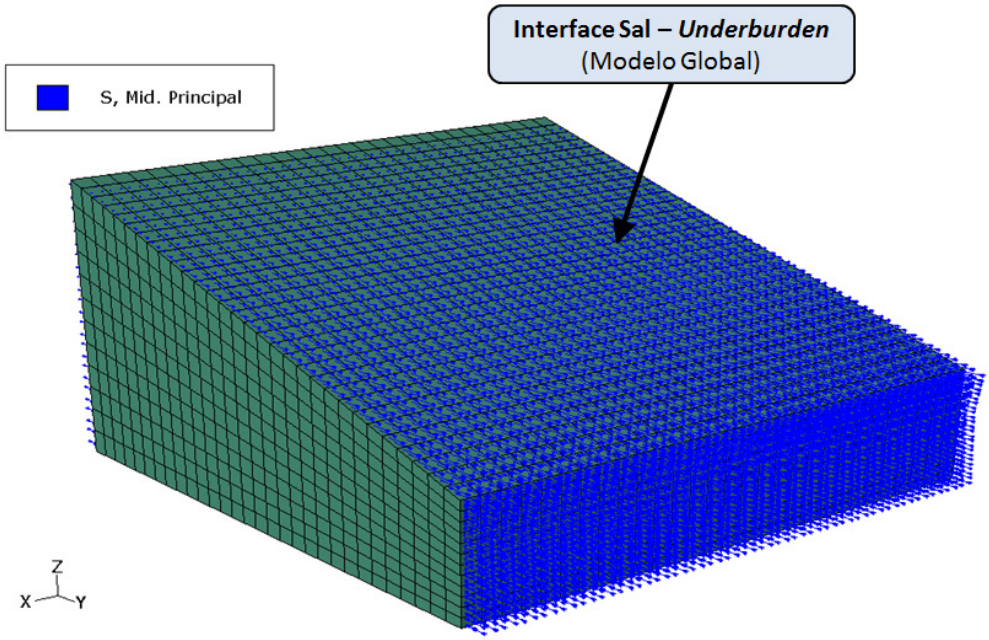
(b)

Figura C.2 – Orientação da Tensão Principal Máxima no *Modelo Global B* depois do processo de *creep* no sal: (a) modelo global completo (plano Y-Z); (b) Interface *Sal-Underburden* do modelo global (plano Z-Y).

Na Figura C.2 (b) foi constatado que uma das tensões principais fica perpendicular ao plano que divide o *Sal* do *Underburden*. Similarmente, assim como foi verificada uma mudança na orientação da tensão principal máxima no *Modelo Global B*, também foi evidenciada uma mudança nas orientações das tensões principais intermediária e mínima, as quais depois de ocorrer o processo de *creep* no sal, ficaram paralelas ao plano *Sal-Underburden* e, por consequência, perpendiculares à tensão principal máxima nesse plano, como apresentado a seguir da Figura C.3 até a Figura C.6:

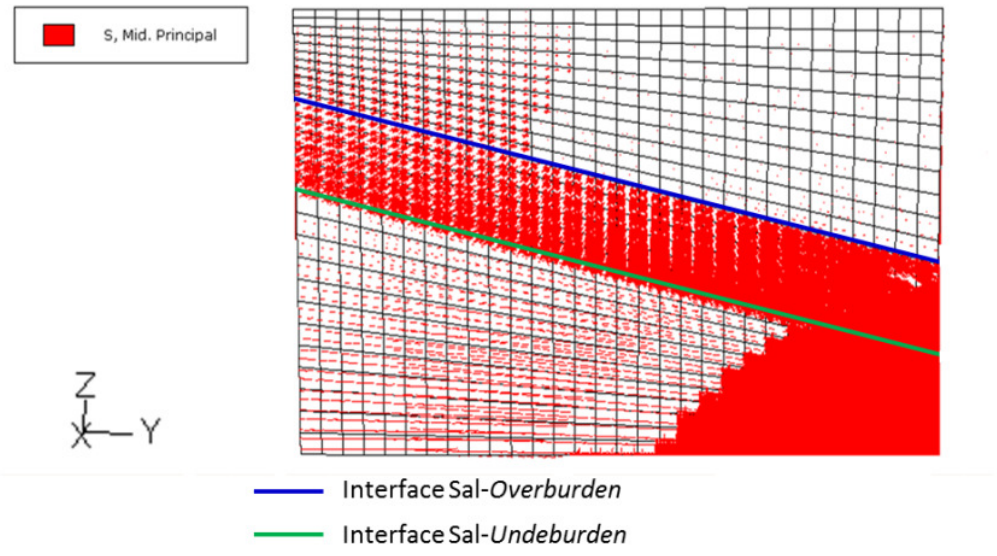


(a)

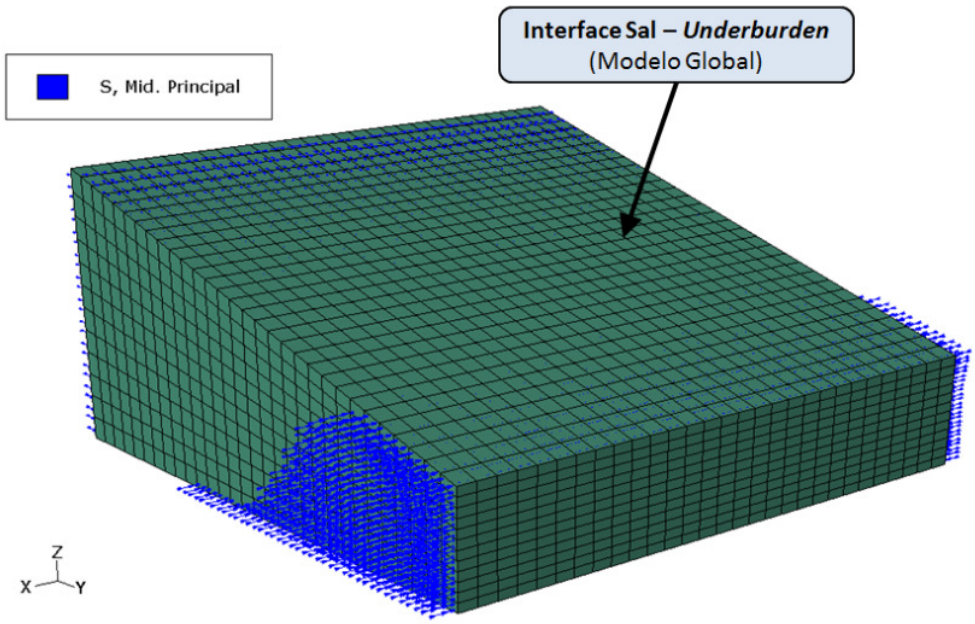


(b)

Figura C.3 – Orientação da Tensão Principal Intermediária no *Modelo Global B* antes do processo de *creep* no Sal (paralela ao eixo Y): (a) modelo global completo (plano Y-Z); (b) interface *Sal-Underburden* do modelo global.

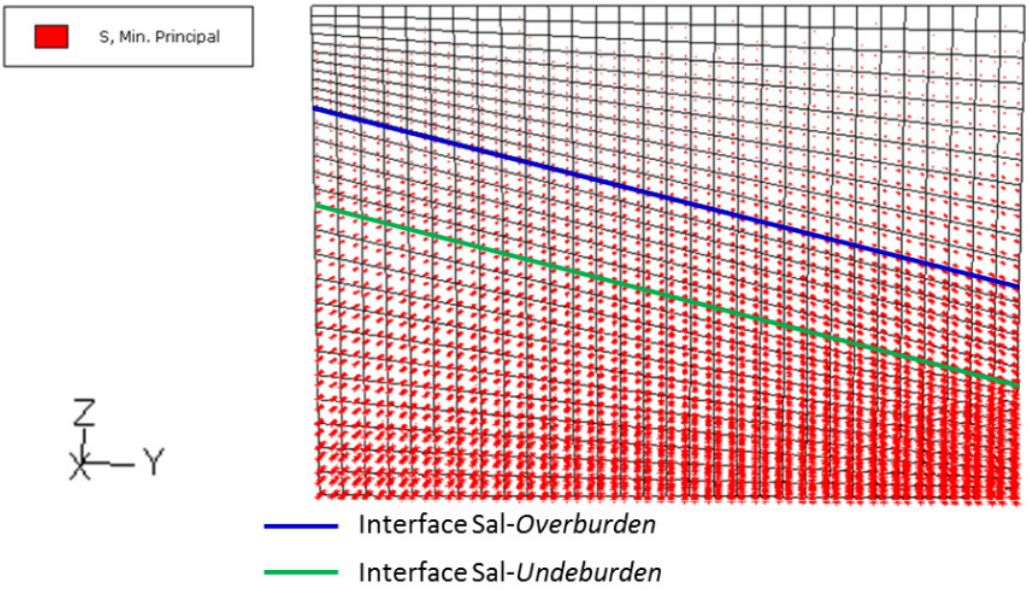


(a)

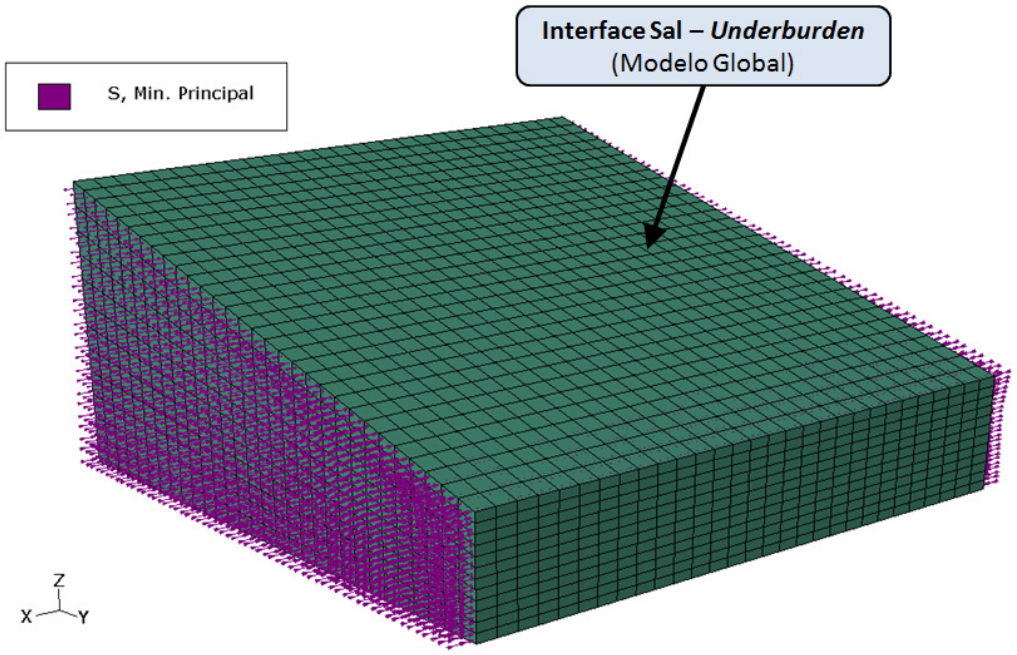


(b)

Figura C.4 – Orientação da Tensão Principal Intermediária no *Modelo Global B* depois do processo de *creep* no Sal: (a) modelo global completo (plano Y-Z); (b) Interface *Sal-Underburden* do modelo global.

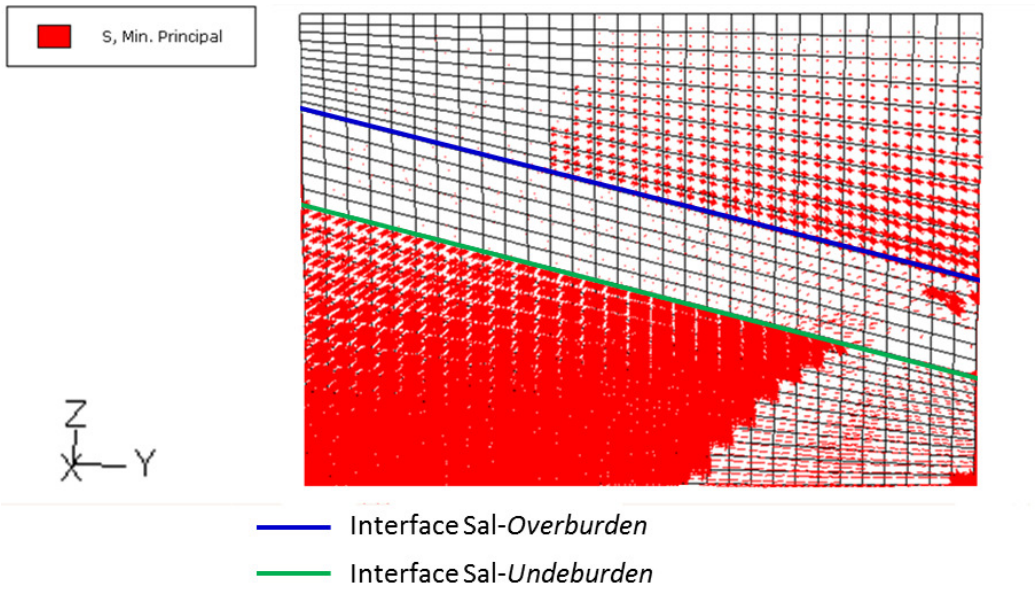


(a)

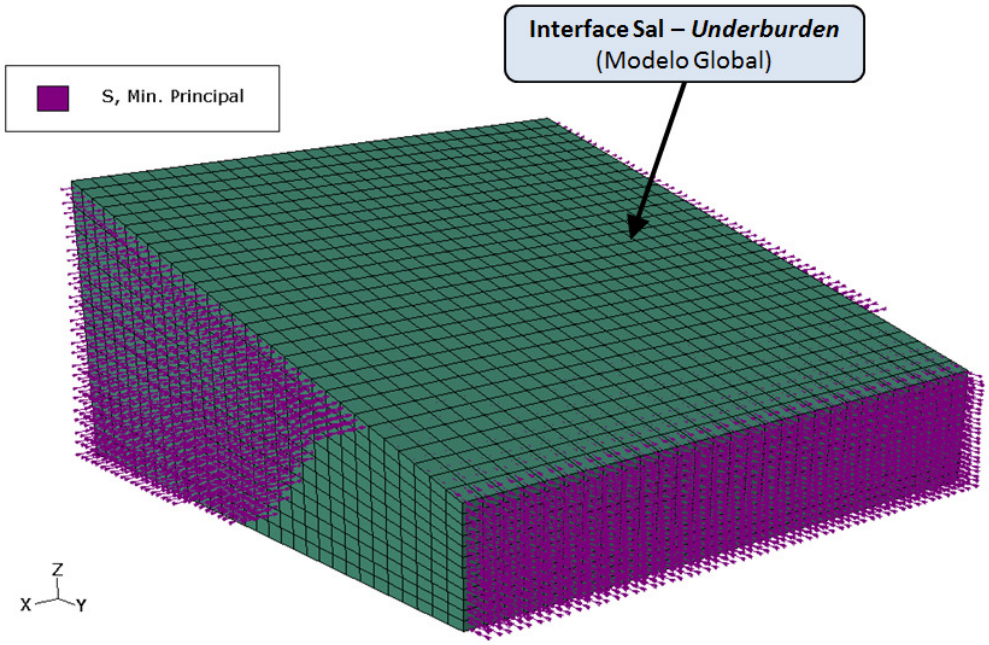


(b)

Figura C.5 – Orientação da Tensão Principal Mínima no *Modelo Global B* antes do processo de *creep* no Sal (paralela ao eixo X): (a) modelo global completo (plano Y-Z); (b) Interface *Sal-Underburden* do modelo global.



(a)



(b)

Figura C.6 – Orientação da Tensão Principal Mínima no *Modelo Global B* depois do processo de *creep* no Sal: (a) modelo global completo (plano Y-Z); (b) Interface Sal-*Underburden* do modelo global.