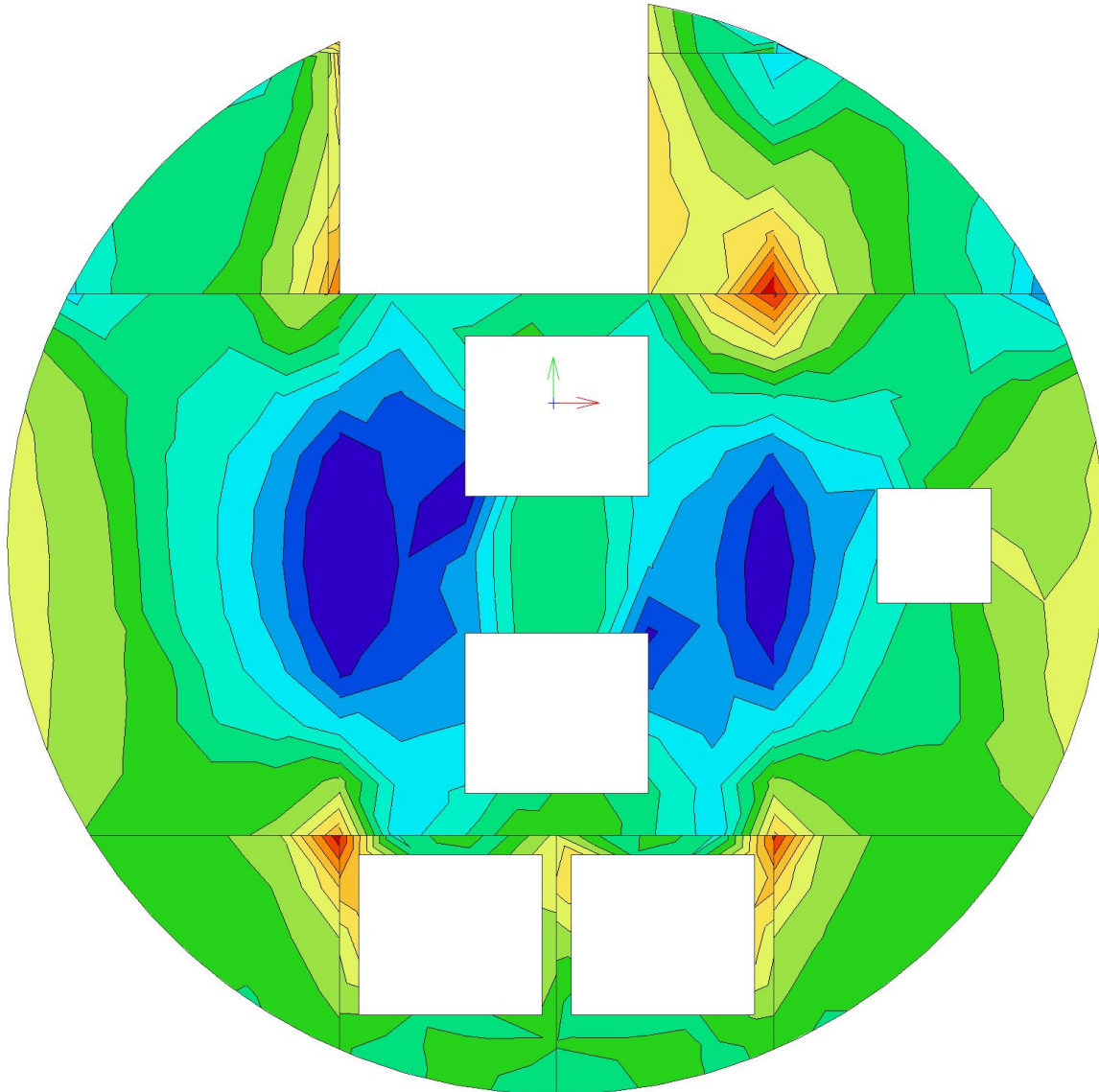
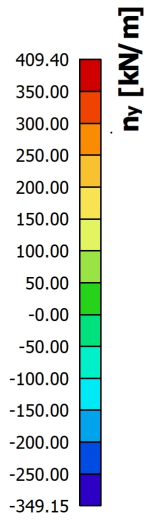


**Project**    **Estação de Campo de Ourique**

**8.3.7. 2D internal forces; - n\_y**

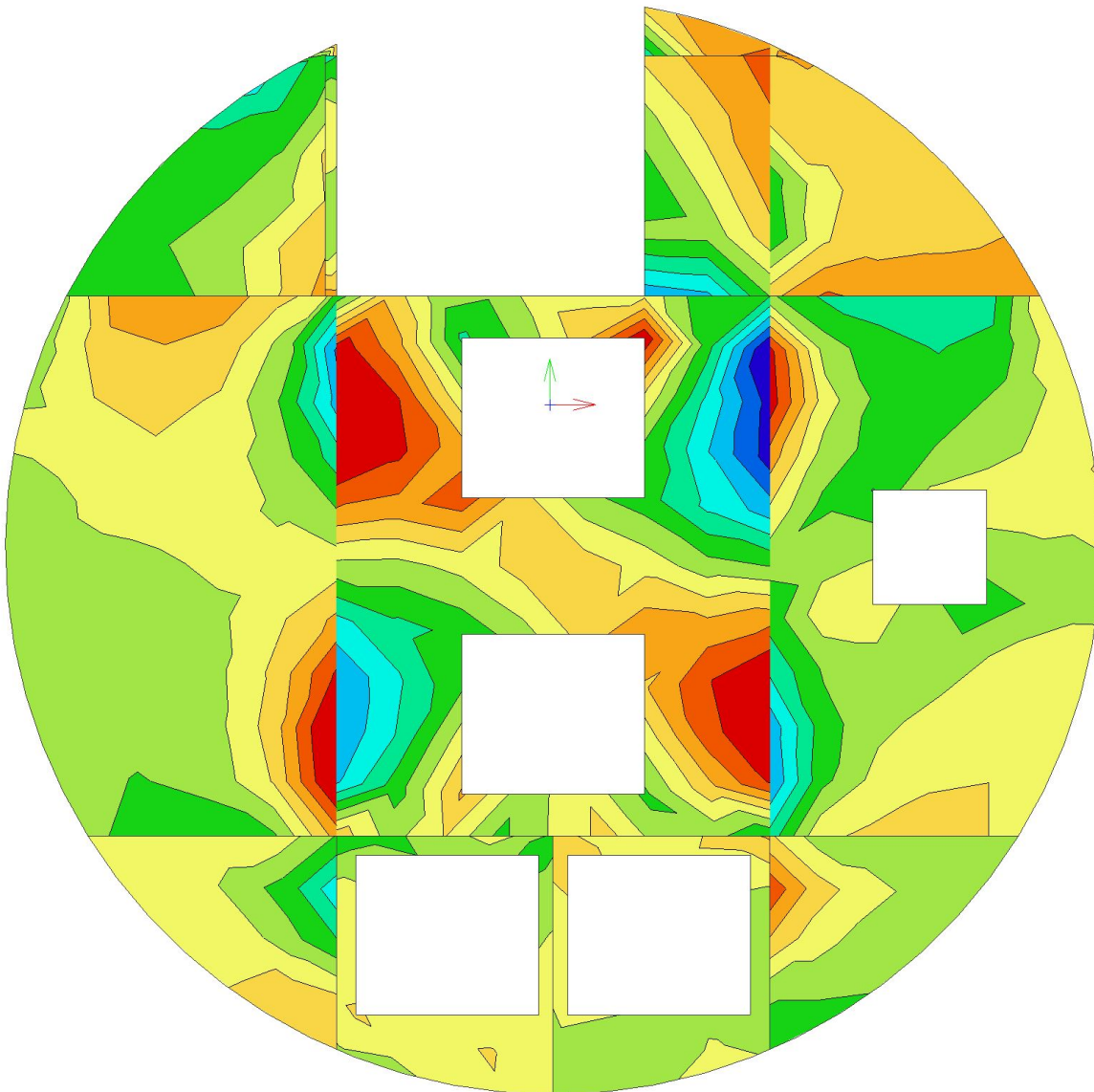
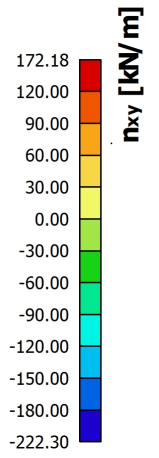
Values: n\_y  
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Top shaft  
 Location: In nodes avg. on macro.  
 System: LCS mesh element



**Project**    **Estação de Campo de Ourique**

**8.3.8. 2D internal forces; - n<sub>xy</sub>**

Values: n<sub>xy</sub>  
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Top shaft  
 Location: In nodes avg. on macro.  
 System: LCS mesh element

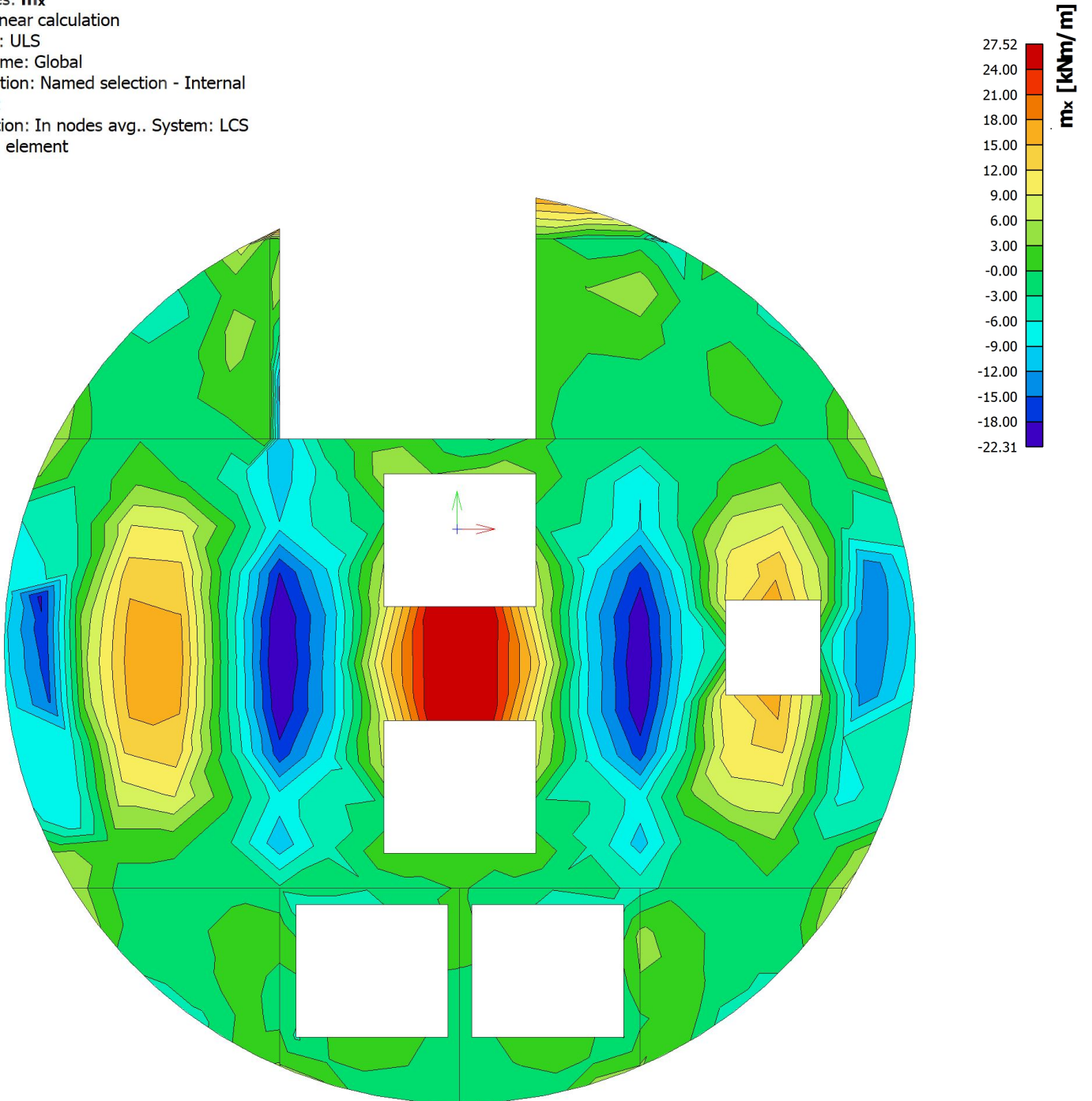


**Project**    **Estação de Campo de Ourique**

**8.4. Result picture generator**

**8.4.1. 2D internal forces; - m<sub>x</sub>**

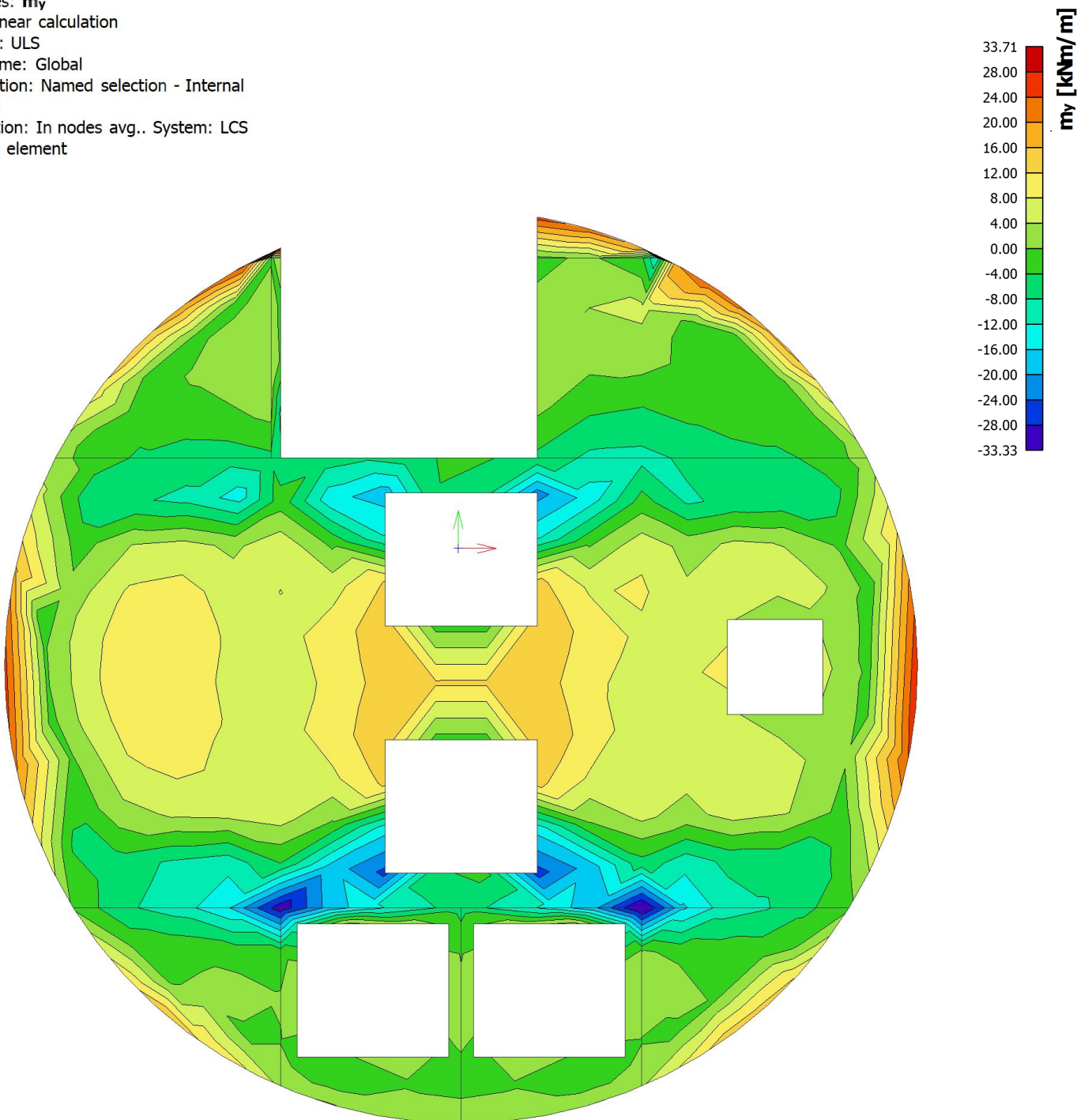
Values: m<sub>x</sub>  
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Internal Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**8.4.2. 2D internal forces; - m<sub>y</sub>**

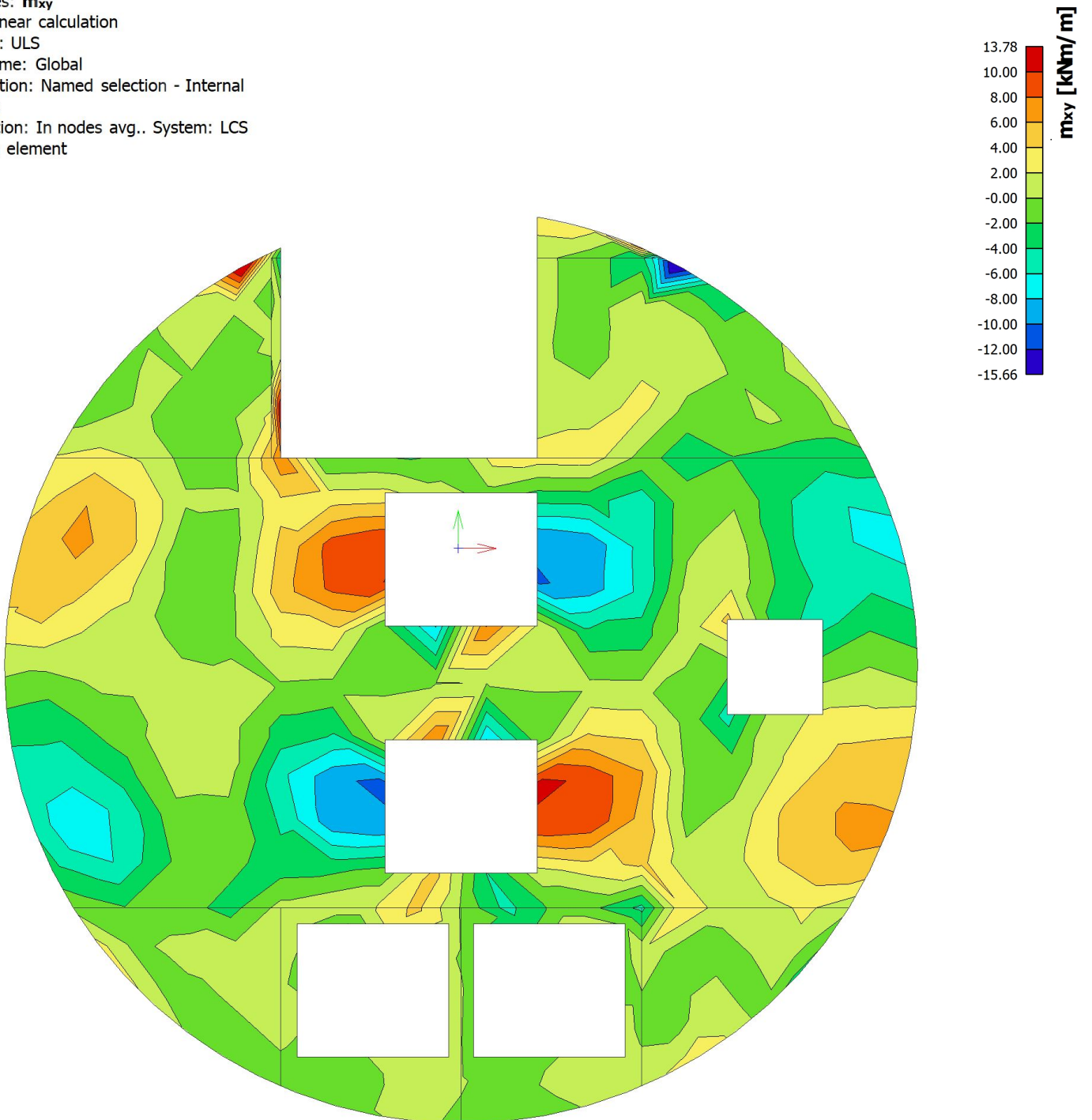
Values: m<sub>y</sub>  
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Internal Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**8.4.3. 2D internal forces; - m<sub>xy</sub>**

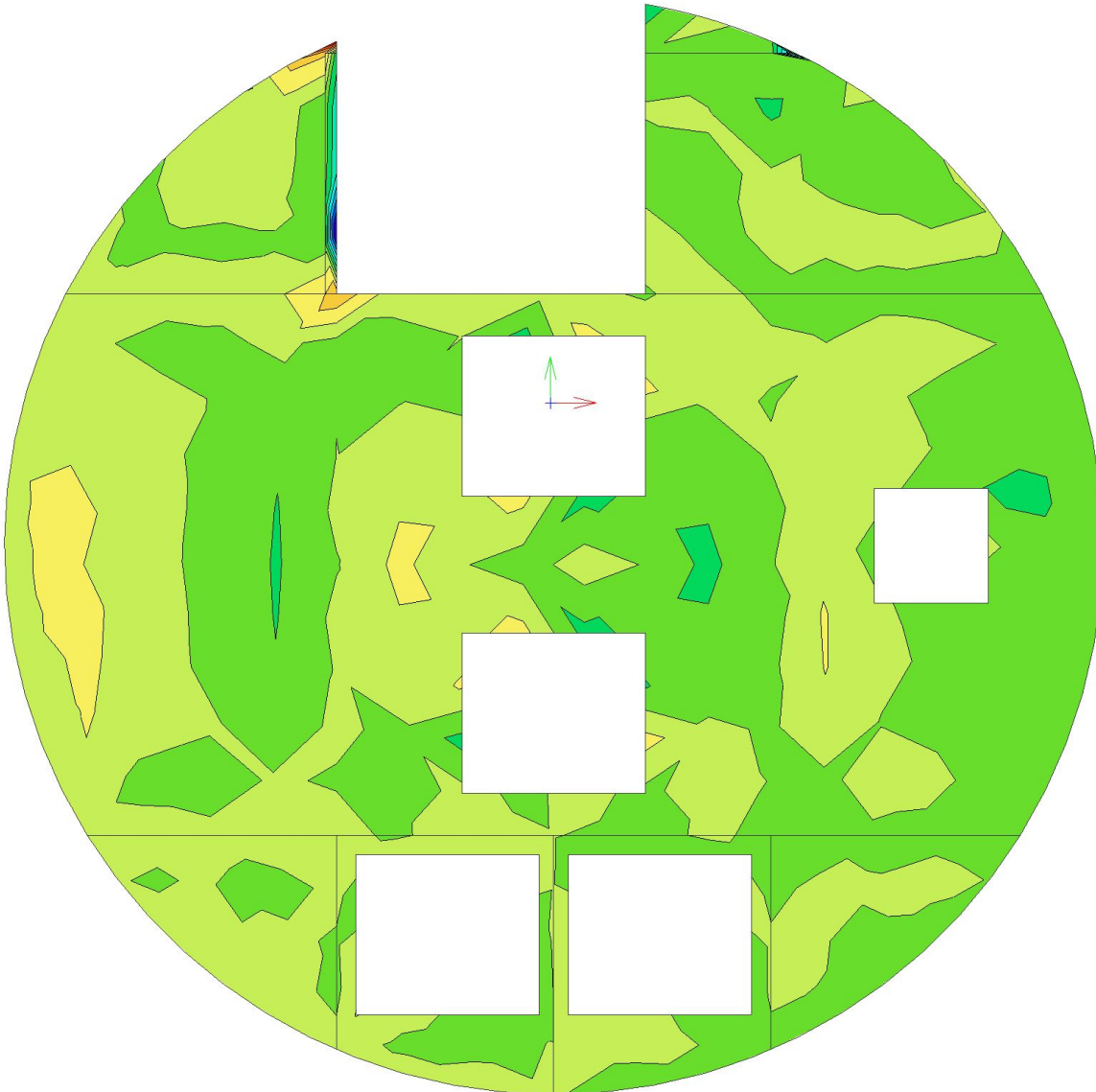
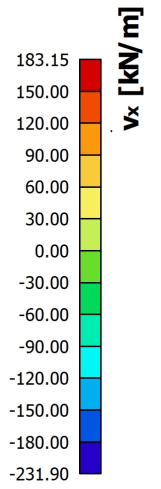
Values: **m<sub>xy</sub>**  
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Internal Shaft  
 Location: In nodes avg.. System: LCS mesh element



**Project**    **Estação de Campo de Ourique**

**8.4.4. 2D internal forces; - v\_x**

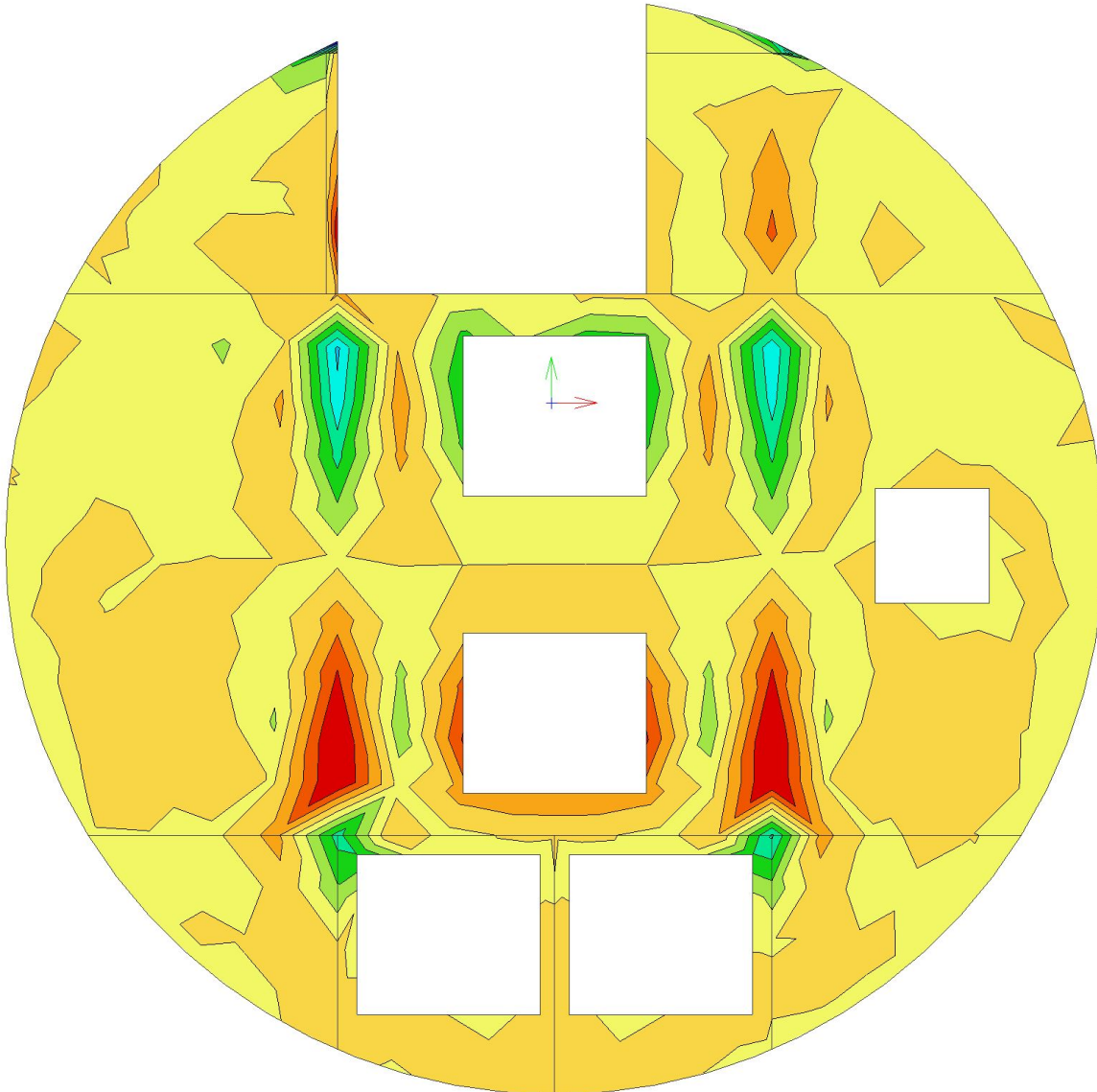
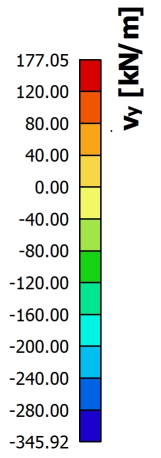
Values:  $v_x$   
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Internal  
 Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**8.4.5. 2D internal forces; - v\_y**

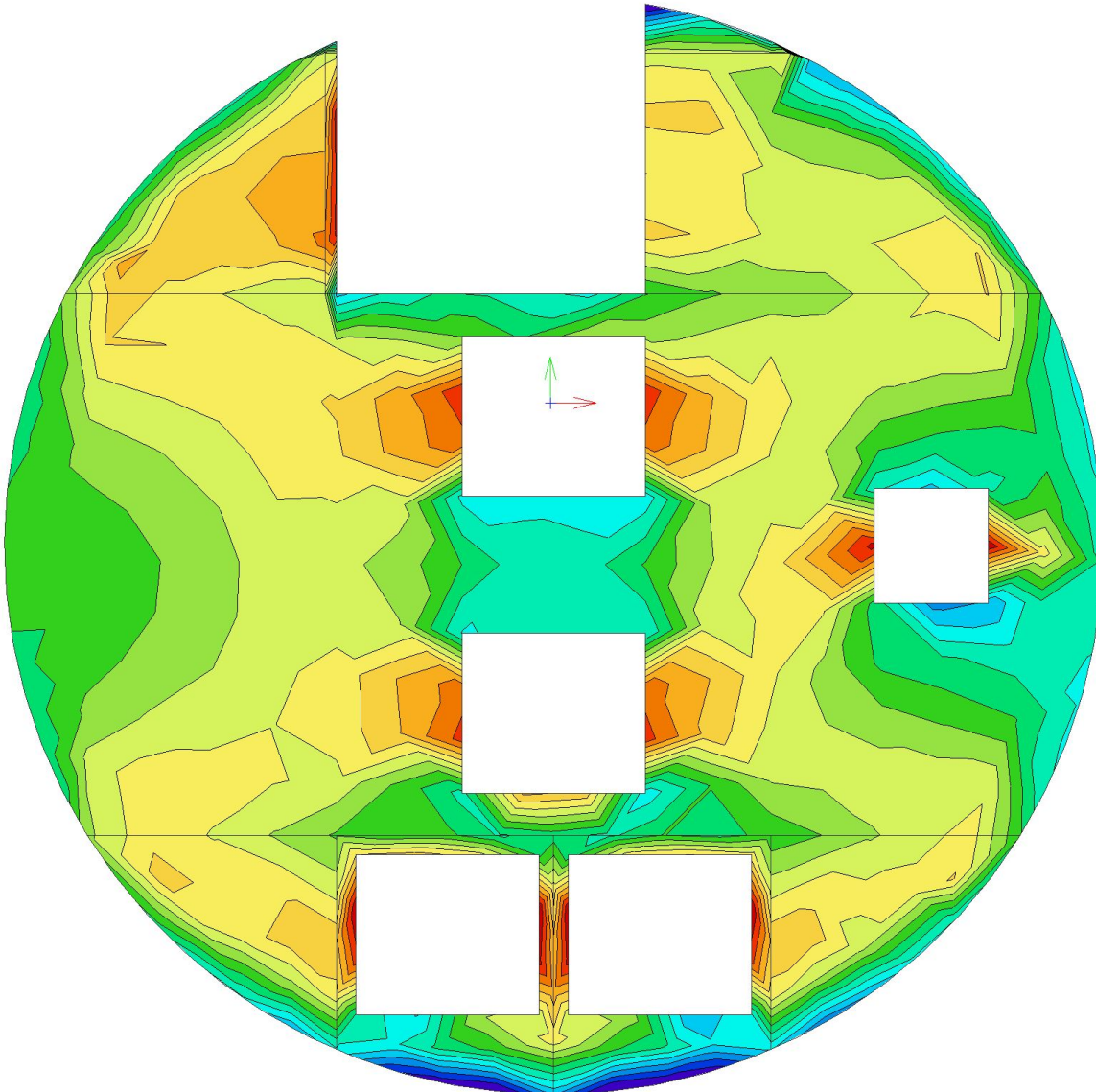
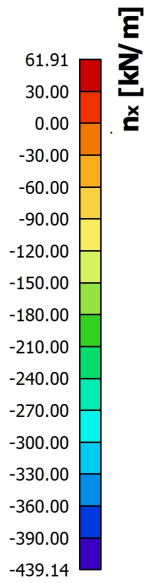
Values: v\_y  
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Internal  
 Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**8.4.6. 2D internal forces; - n\_x**

Values:  $n_x$   
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Internal Shaft  
 Location: In nodes avg.. System: LCS mesh element

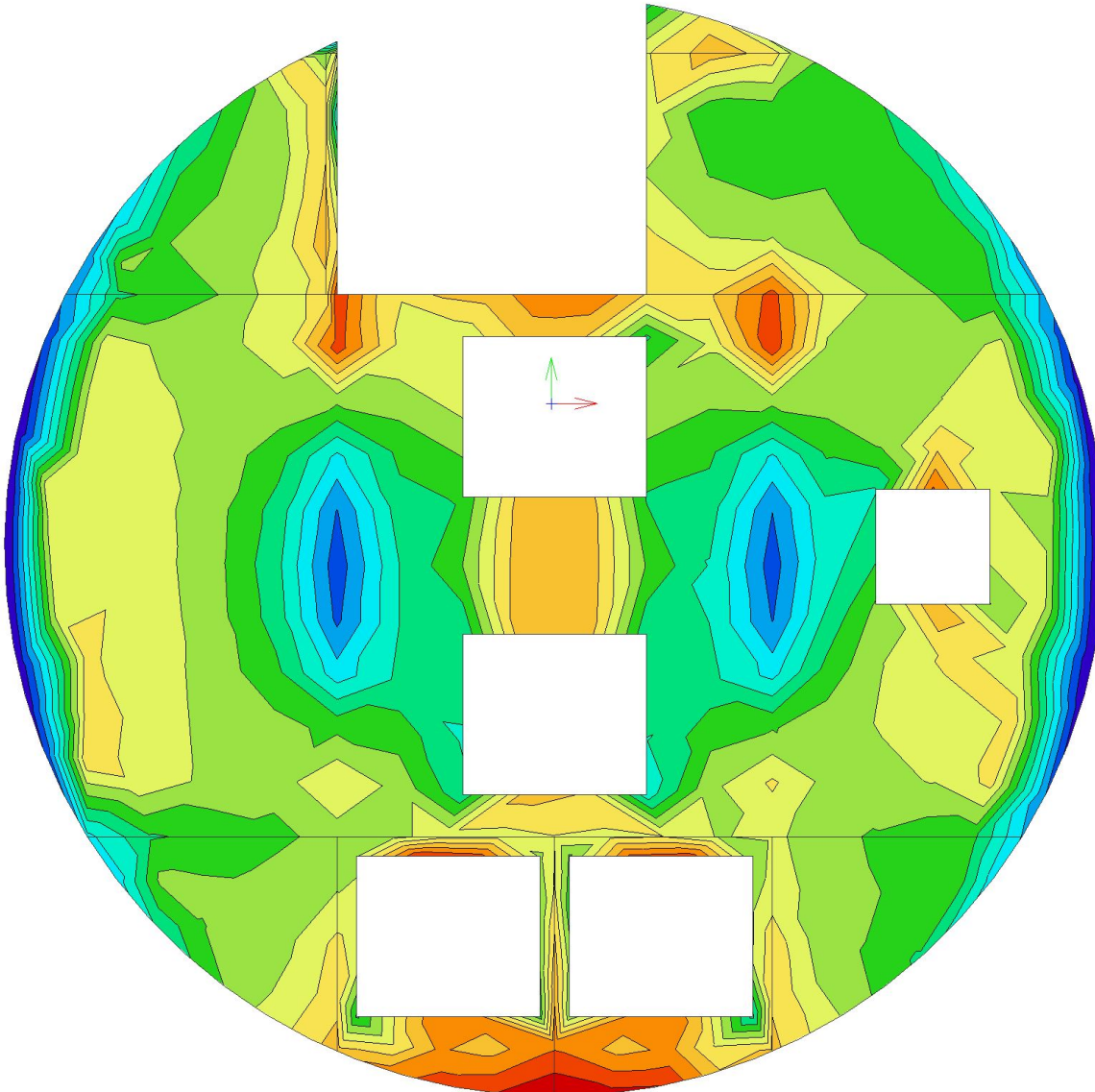
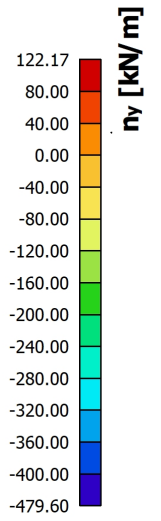




**Project**    **Estação de Campo de Ourique**

**8.4.7. 2D internal forces; - n<sub>y</sub>**

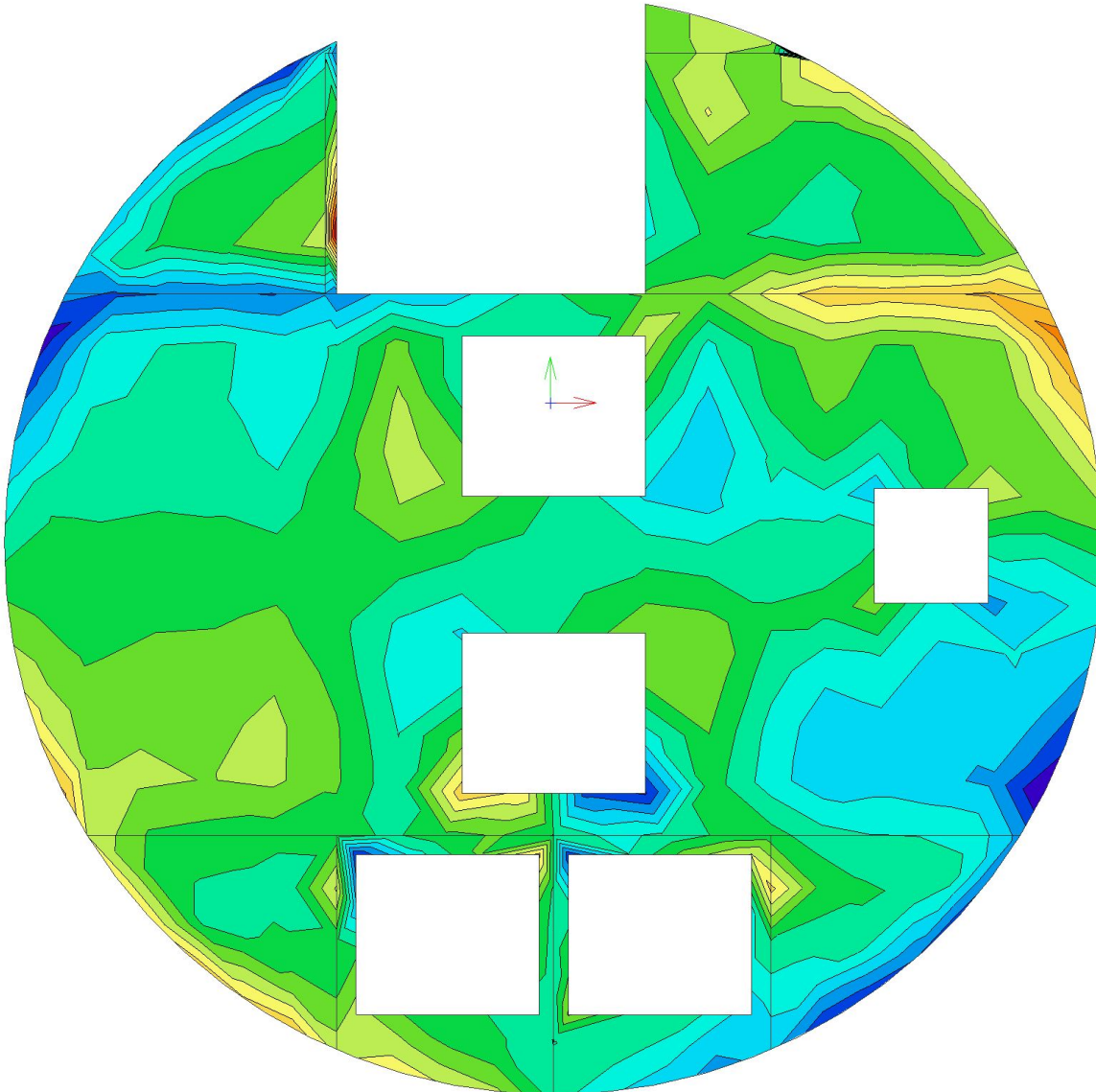
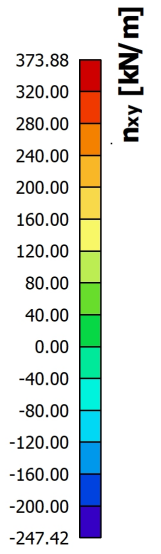
Values: n<sub>y</sub>  
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Internal  
 Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**8.4.8. 2D internal forces; - n<sub>xy</sub>**

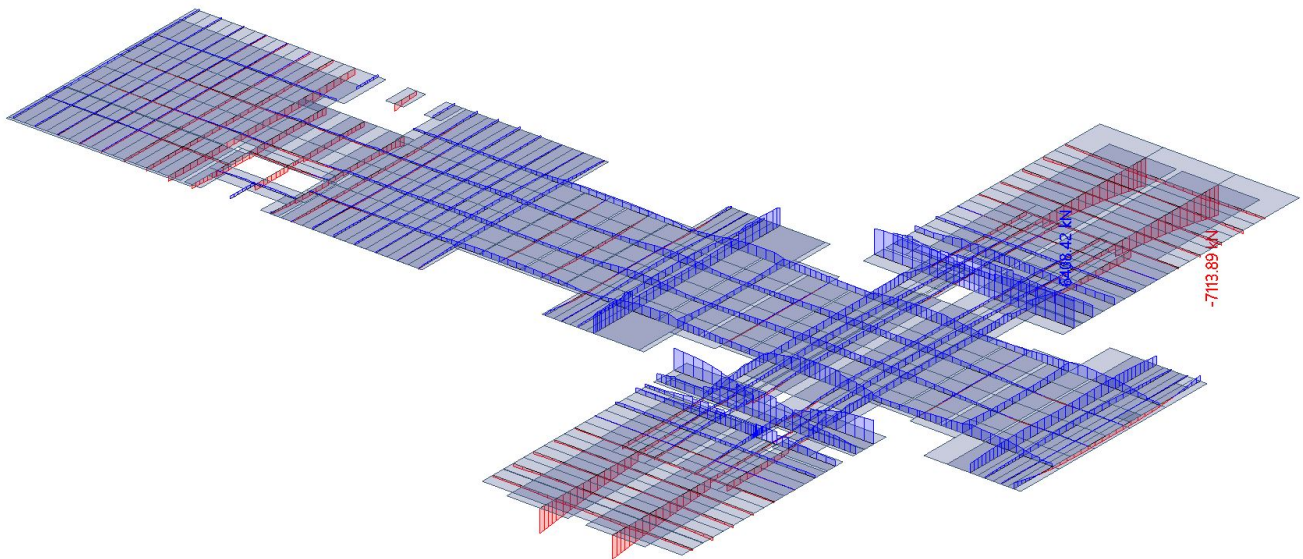
Values: n<sub>xy</sub>  
 Nonlinear calculation  
 Class: ULS  
 Extreme: Global  
 Selection: Named selection - Internal Shaft  
 Location: In nodes avg.. System: LCS mesh element



### 8.5. Result picture generator

#### 8.5.1. 1D internal forces; - N

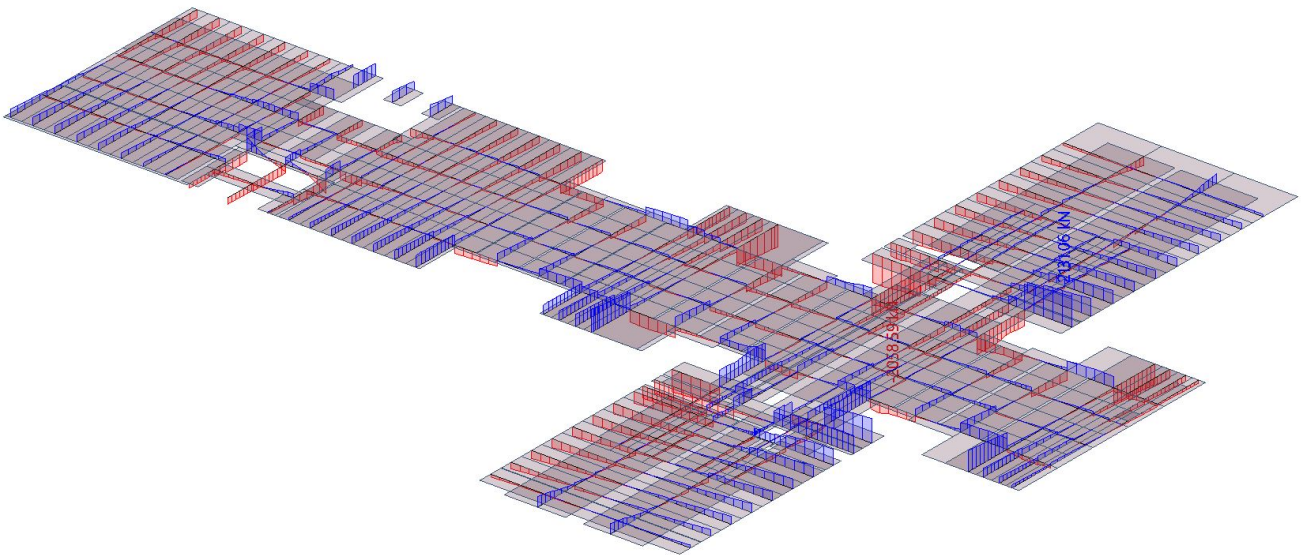
Values: **N**  
Nonlinear calculation  
Class: ULS  
Coordinate system: Principal  
Extreme 1D: Global  
Selection: Named selection - Beams



**Project**    **Estação de Campo de Ourique**

**8.5.2. 1D internal forces; - V<sub>z</sub>**

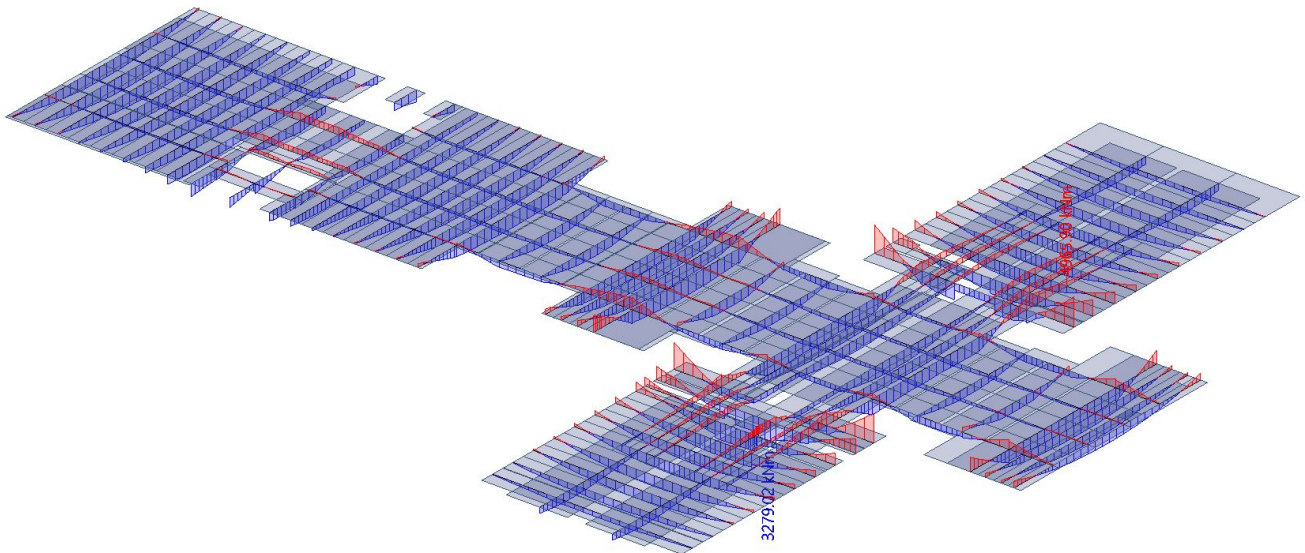
Values: **V<sub>z</sub>**  
Nonlinear calculation  
Class: ULS  
Coordinate system: Principal  
Extreme 1D: Global  
Selection: Named selection - Beams



**Project**    **Estação de Campo de Ourique**

**8.5.3. 1D internal forces; - M<sub>y</sub>**

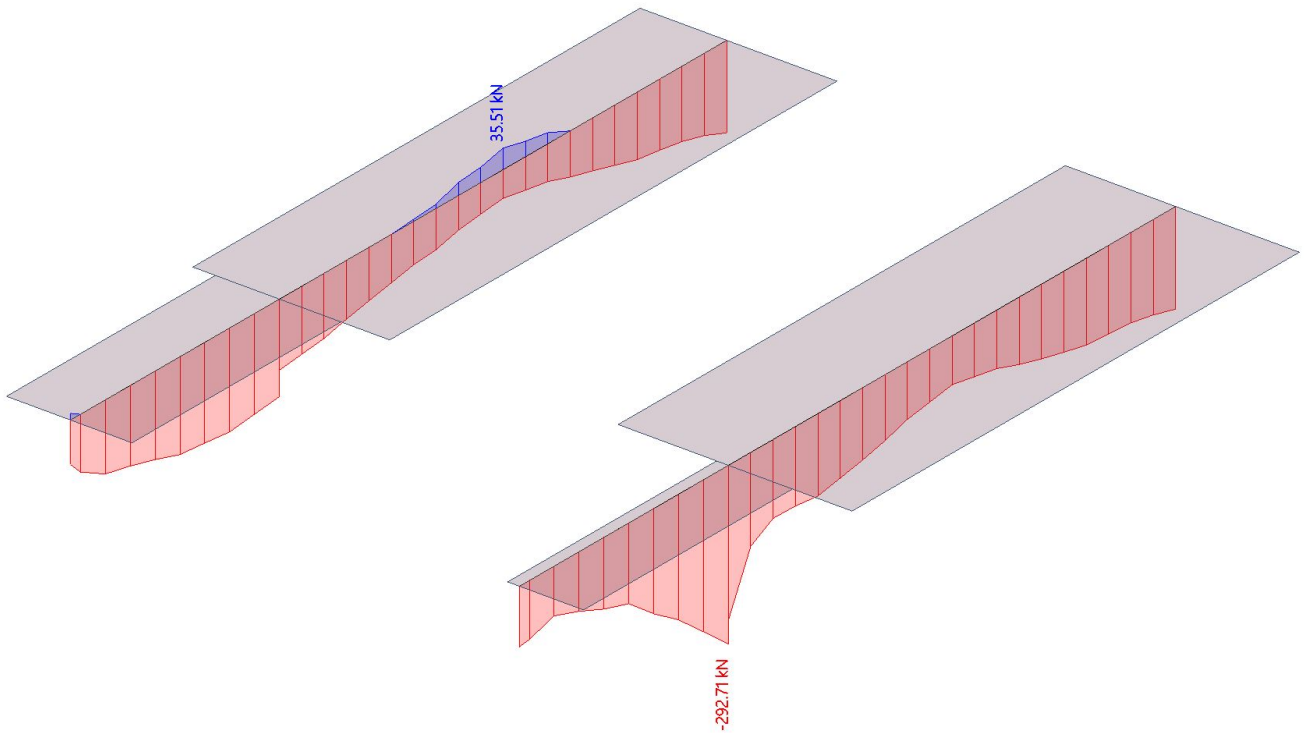
Values: **M<sub>y</sub>**  
Nonlinear calculation  
Class: ULS  
Coordinate system: Principal  
Extreme 1D: Global  
Selection: Named selection - Beams



### 8.6. Result picture generator

#### 8.6.1. 1D internal forces; - N

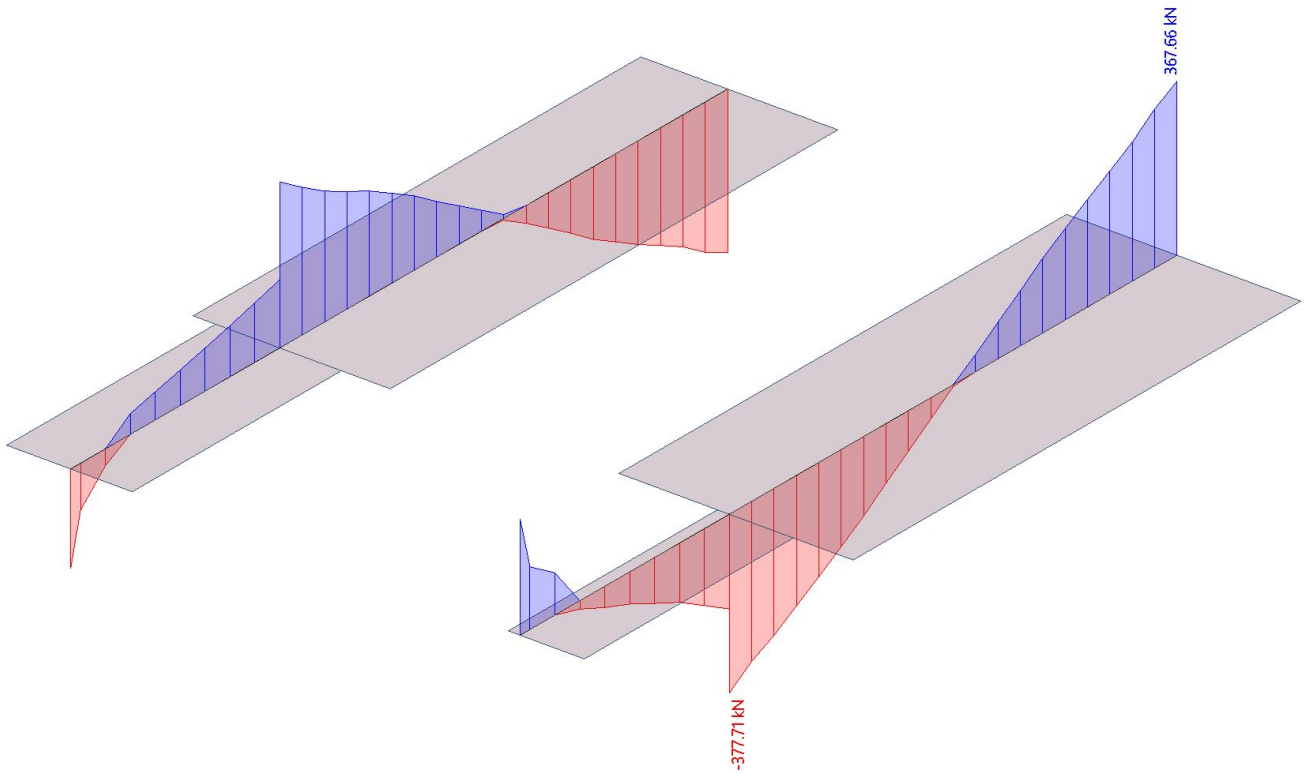
Values: **N**  
Nonlinear calculation  
Class: ULS  
Coordinate system: Principal  
Extreme 1D: Global  
Selection: Named selection - Beams  
Shaft



**Project**    **Estação de Campo de Ourique**

**8.6.2. 1D internal forces; - V<sub>z</sub>**

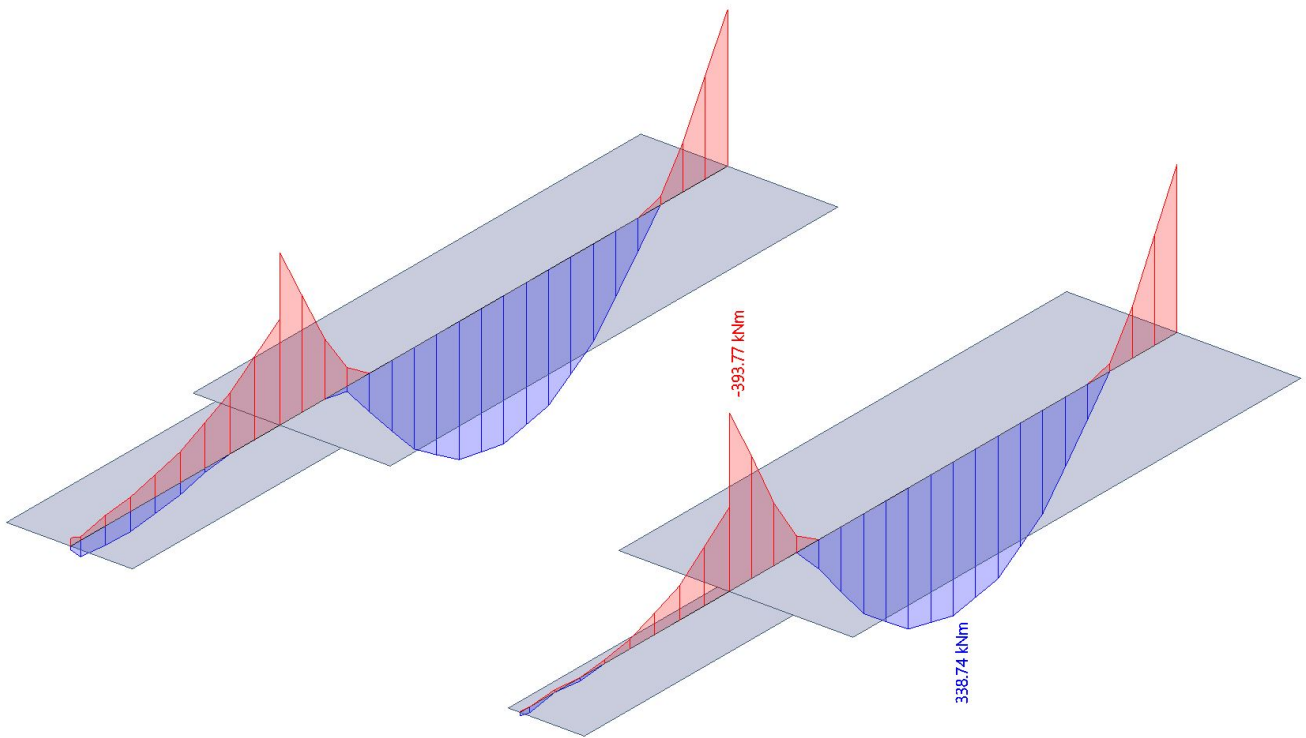
Values: **V<sub>z</sub>**  
Nonlinear calculation  
Class: ULS  
Coordinate system: Principal  
Extreme 1D: Global  
Selection: Named selection - Beams  
Shaft



**Project**    **Estação de Campo de Ourique**

**8.6.3. 1D internal forces; - M<sub>y</sub>**

Values: **M<sub>y</sub>**  
 Nonlinear calculation  
 Class: ULS  
 Coordinate system: Principal  
 Extreme 1D: Global  
 Selection: Named selection - Beams  
 Shaft



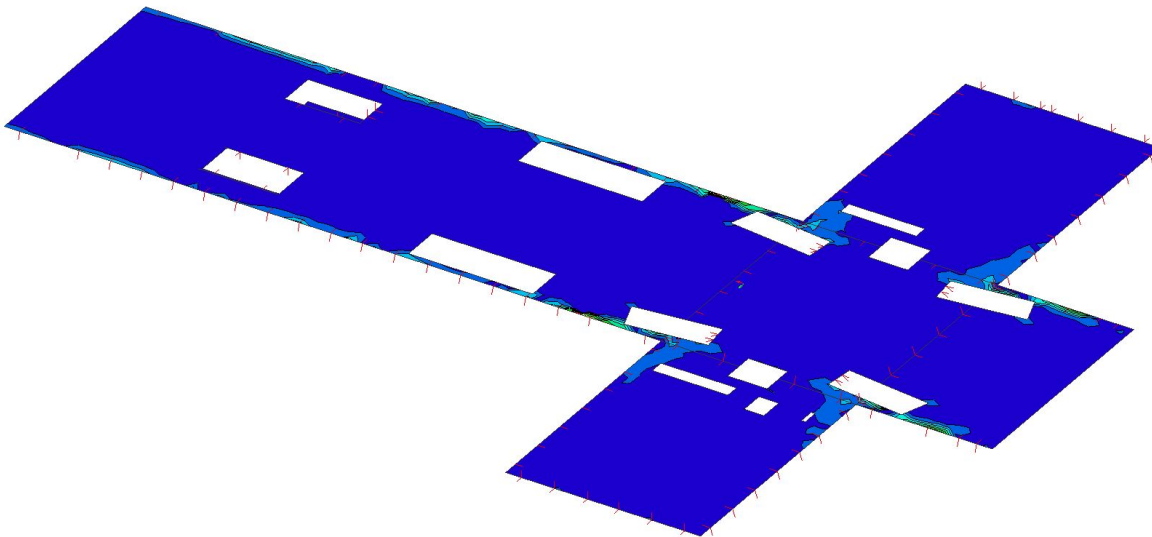
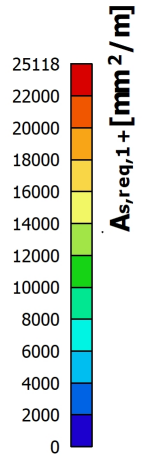


## 9. Reinforcement

### 9.1. Result picture generator

#### 9.1.1. Reinforcement design (ULS+SLS); - $A_{s,req,1+}$

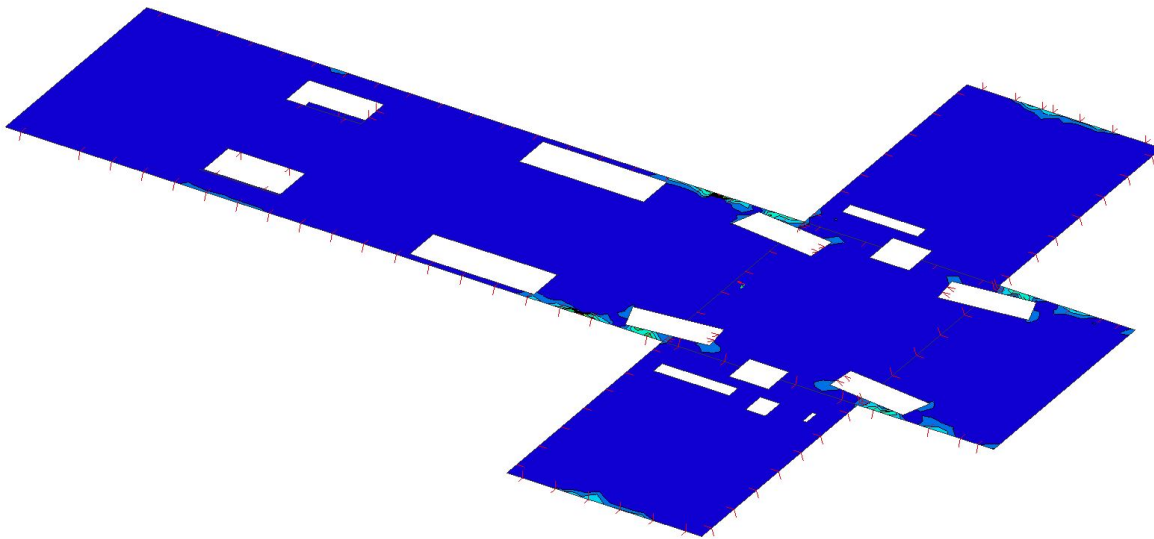
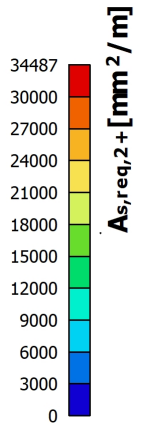
Values:  $A_{s,req,1+}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection -  
 Concourse  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.1.2. Reinforcement design (ULS+SLS); -  $A_{s,req,2+}$**

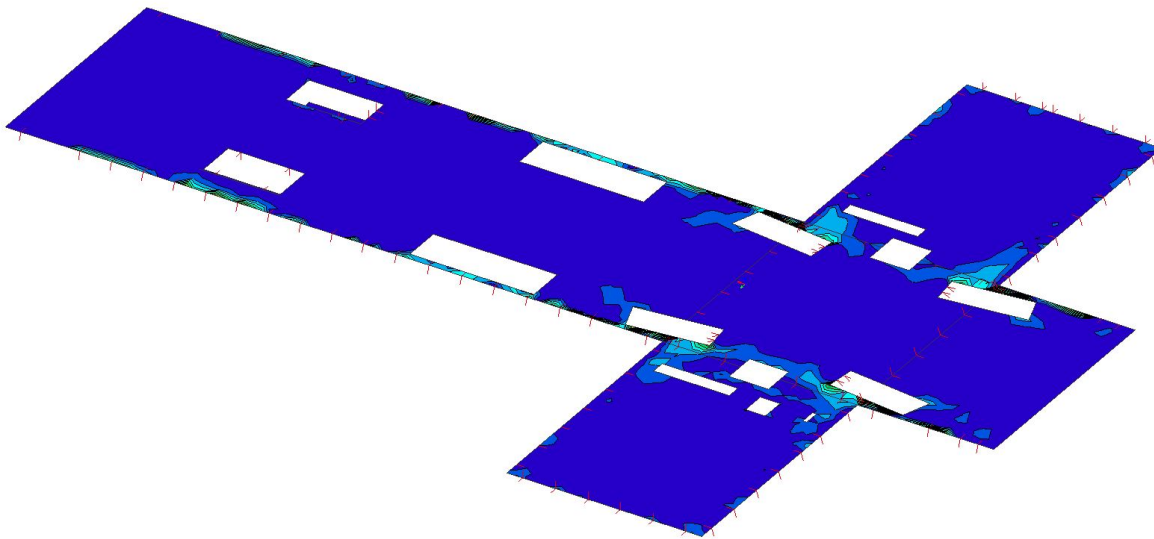
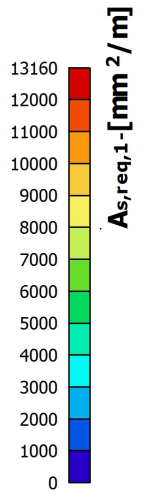
Values:  $A_{s,req,2+}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection -  
 Concourse  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.1.3. Reinforcement design (ULS+SLS); -  $A_{s,req,1}$ -**

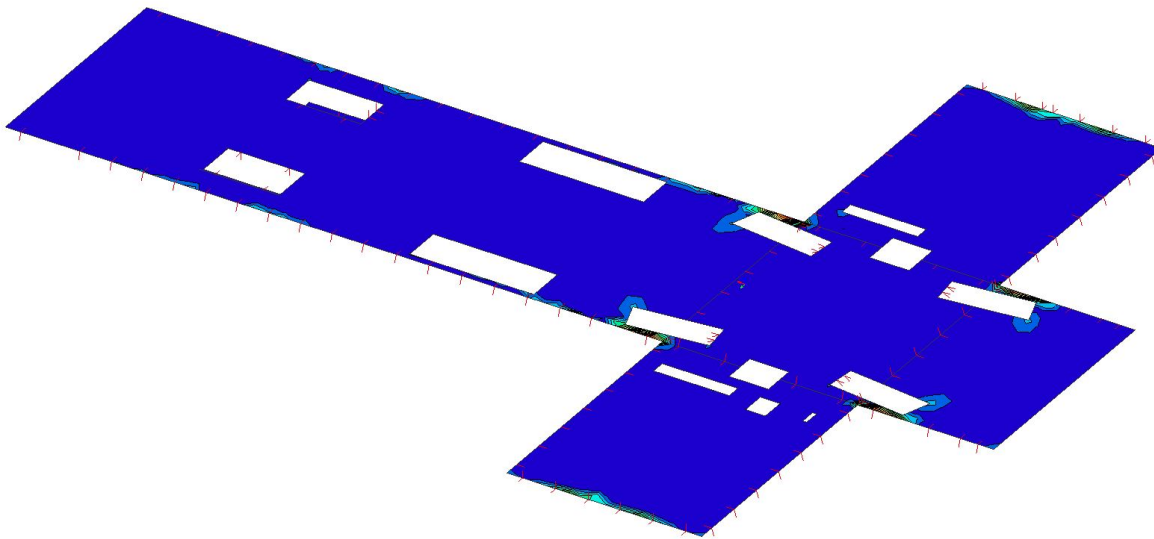
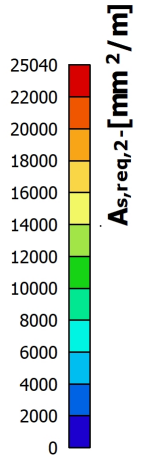
Values:  $A_{s,req,1}$ -  
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection -  
 Concourse  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.1.4. Reinforcement design (ULS+SLS); -  $A_{s,req,2}$ -**

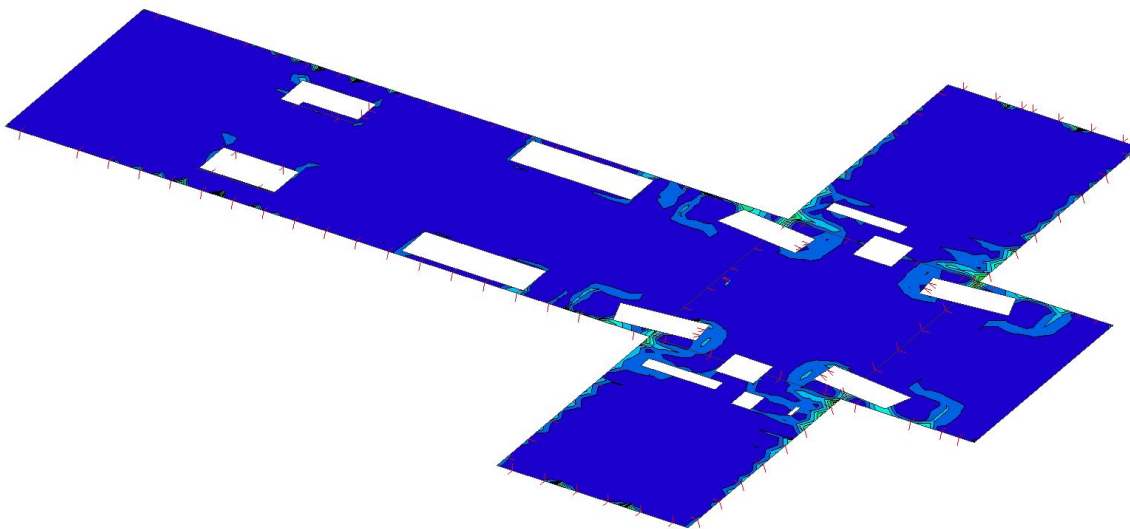
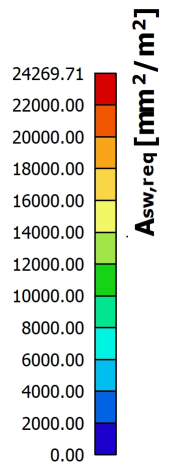
Values:  $A_{s,req,2}$ -  
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection -  
 Concourse  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.1.5. Reinforcement design (ULS+SLS); -  $A_{sw,req}$**

Values:  $A_{sw,req}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection -  
 Concourse  
 Location: In nodes avg.. System: LCS  
 mesh element

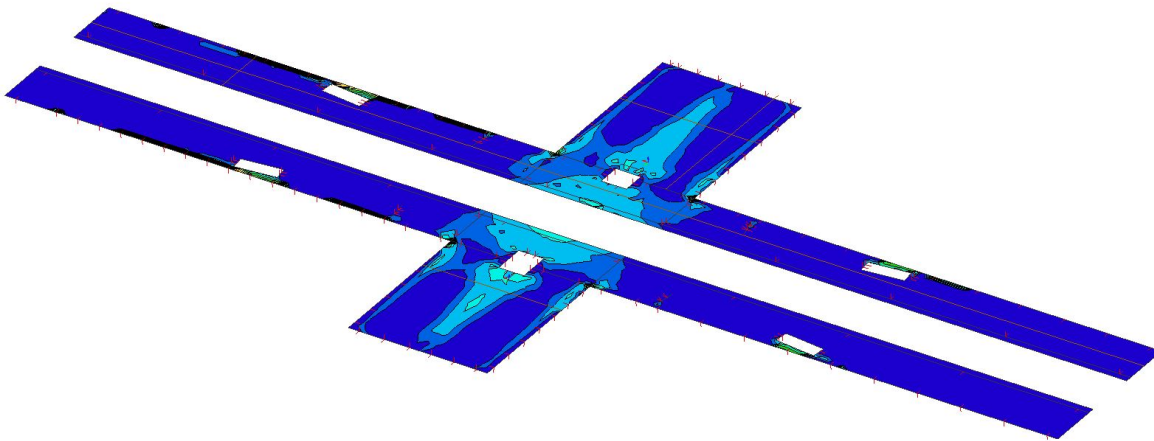
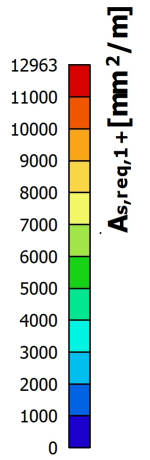


**Project**    **Estação de Campo de Ourique**

**9.2. Result picture generator**

**9.2.1. Reinforcement design (ULS+SLS); -  $A_{s,req,1+}$**

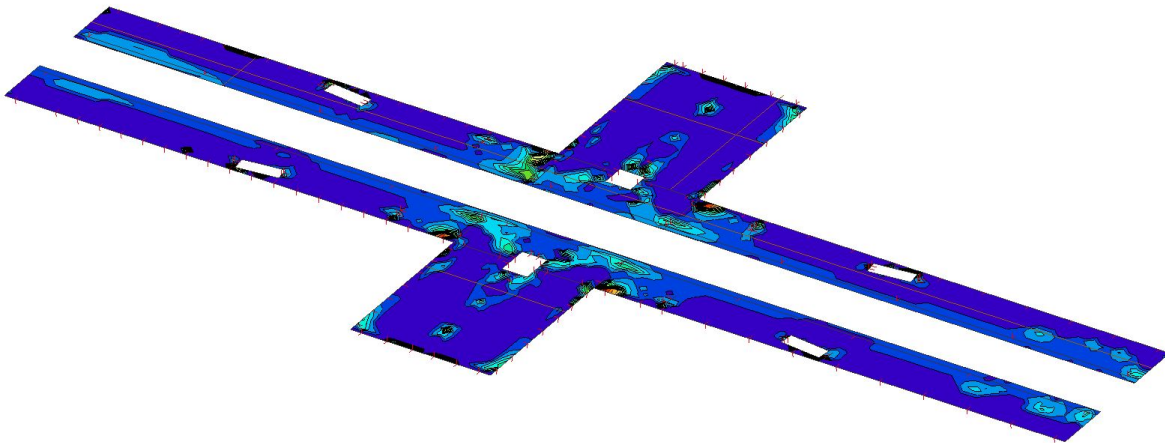
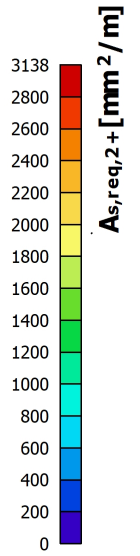
Values:  $A_{s,req,1+}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Platform  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.2.2. Reinforcement design (ULS+SLS); -  $A_{s,req,2+}$**

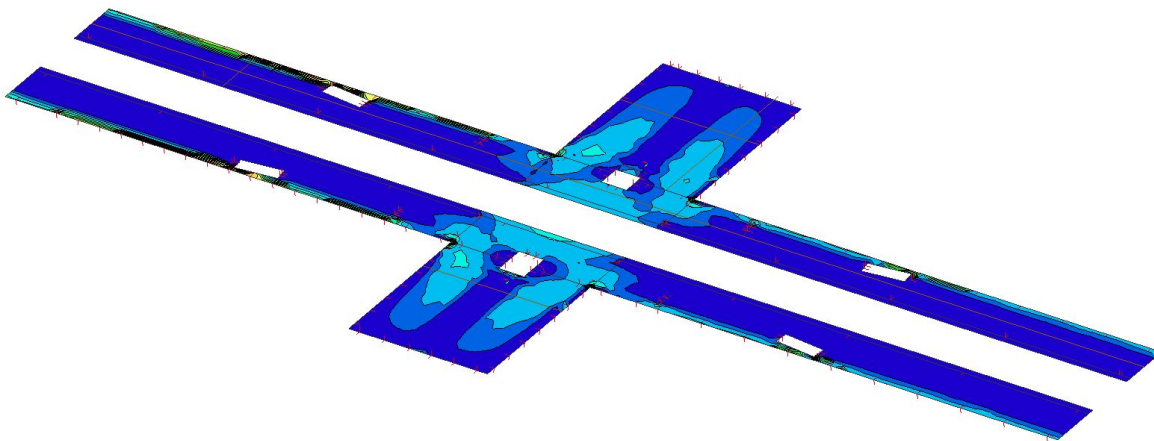
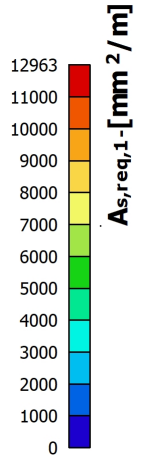
Values:  $A_{s,req,2+}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Platform  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.2.3. Reinforcement design (ULS+SLS); -  $A_{s,req,1}$ -**

Values:  $A_{s,req,1}$ -  
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Platform  
 Location: In nodes avg.. System: LCS  
 mesh element

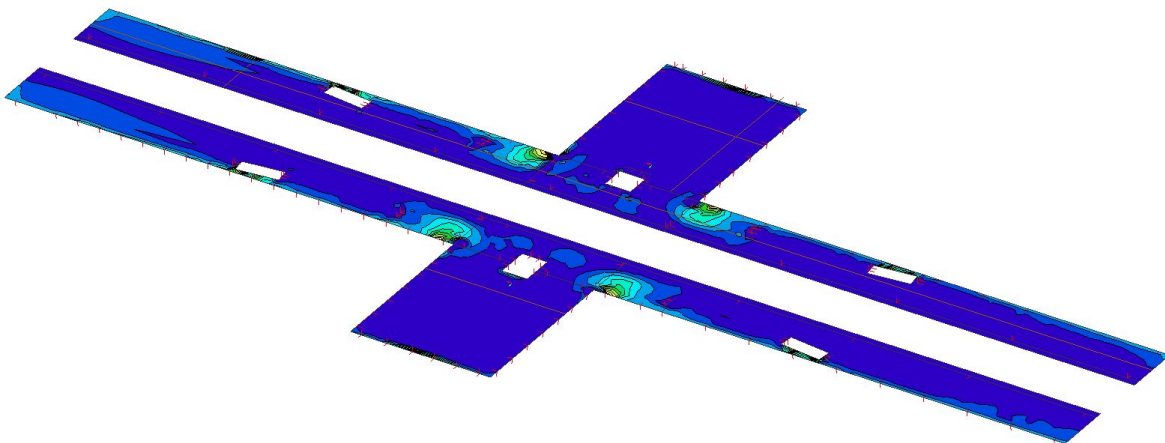
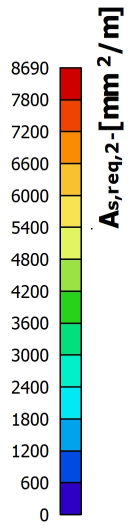




**Project**    **Estação de Campo de Ourique**

**9.2.4. Reinforcement design (ULS+SLS); -  $A_{s,req,2}$ -**

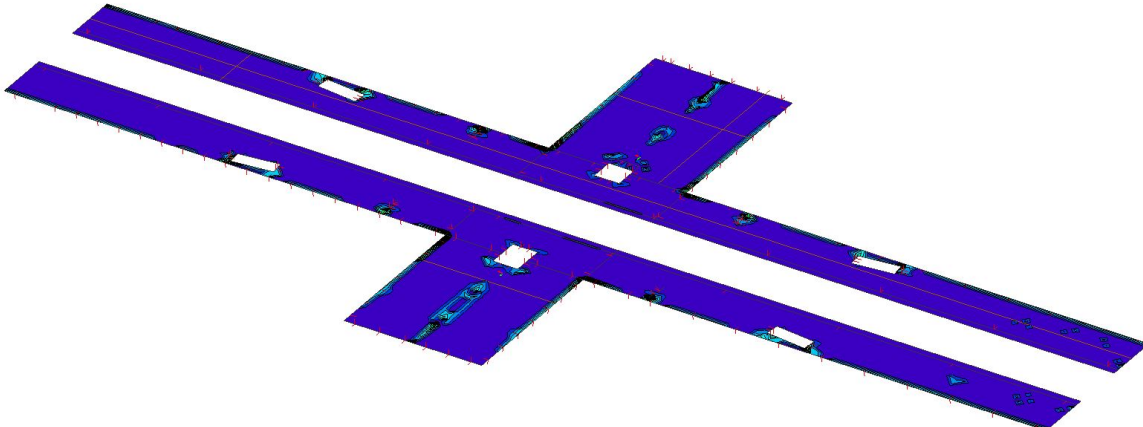
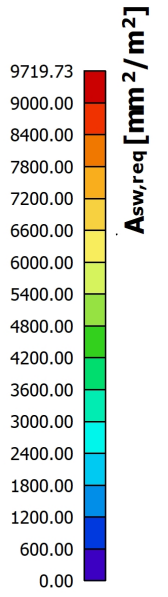
Values:  $A_{s,req,2}$ -  
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Platform  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.2.5. Reinforcement design (ULS+SLS); -  $A_{sw,req}$**

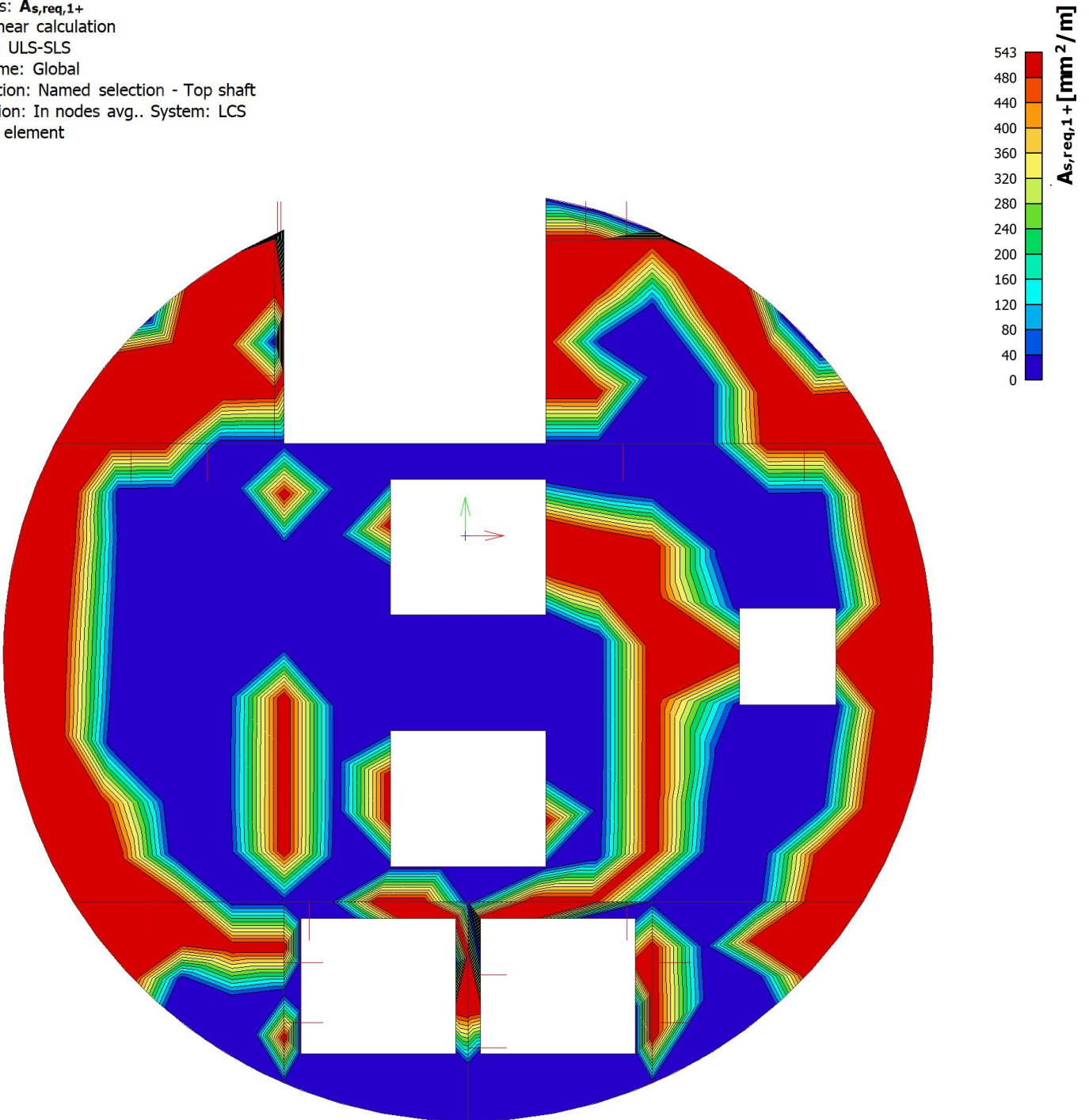
Values:  $A_{sw,req}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Platform  
 Location: In nodes avg.. System: LCS  
 mesh element



### 9.3. Result picture generator

#### 9.3.1. Reinforcement design (ULS+SLS); - $A_{s,req,1+}$

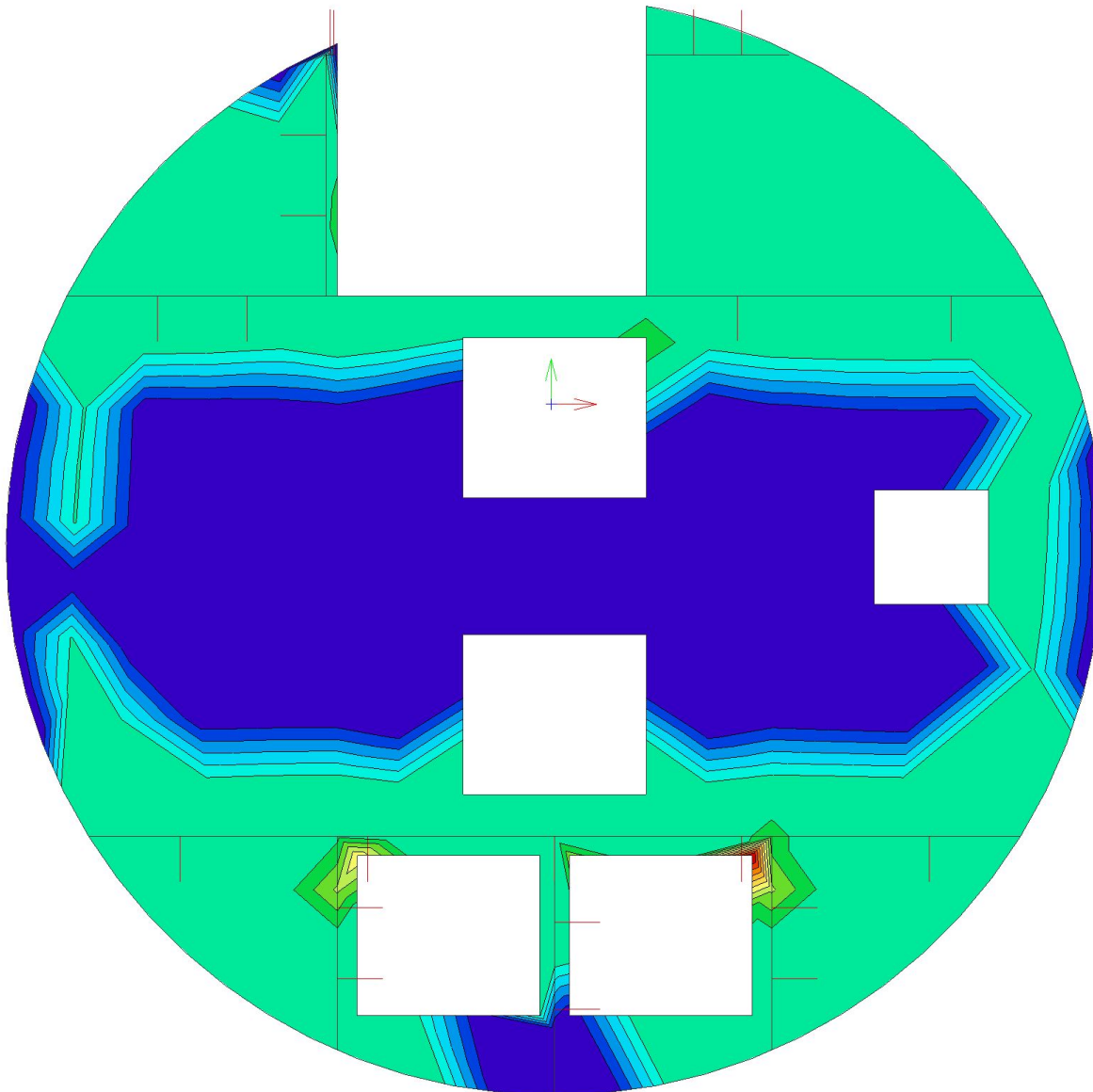
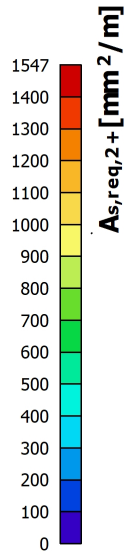
Values:  $A_{s,req,1+}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Top shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.3.2. Reinforcement design (ULS+SLS); -  $A_{s,req,2+}$**

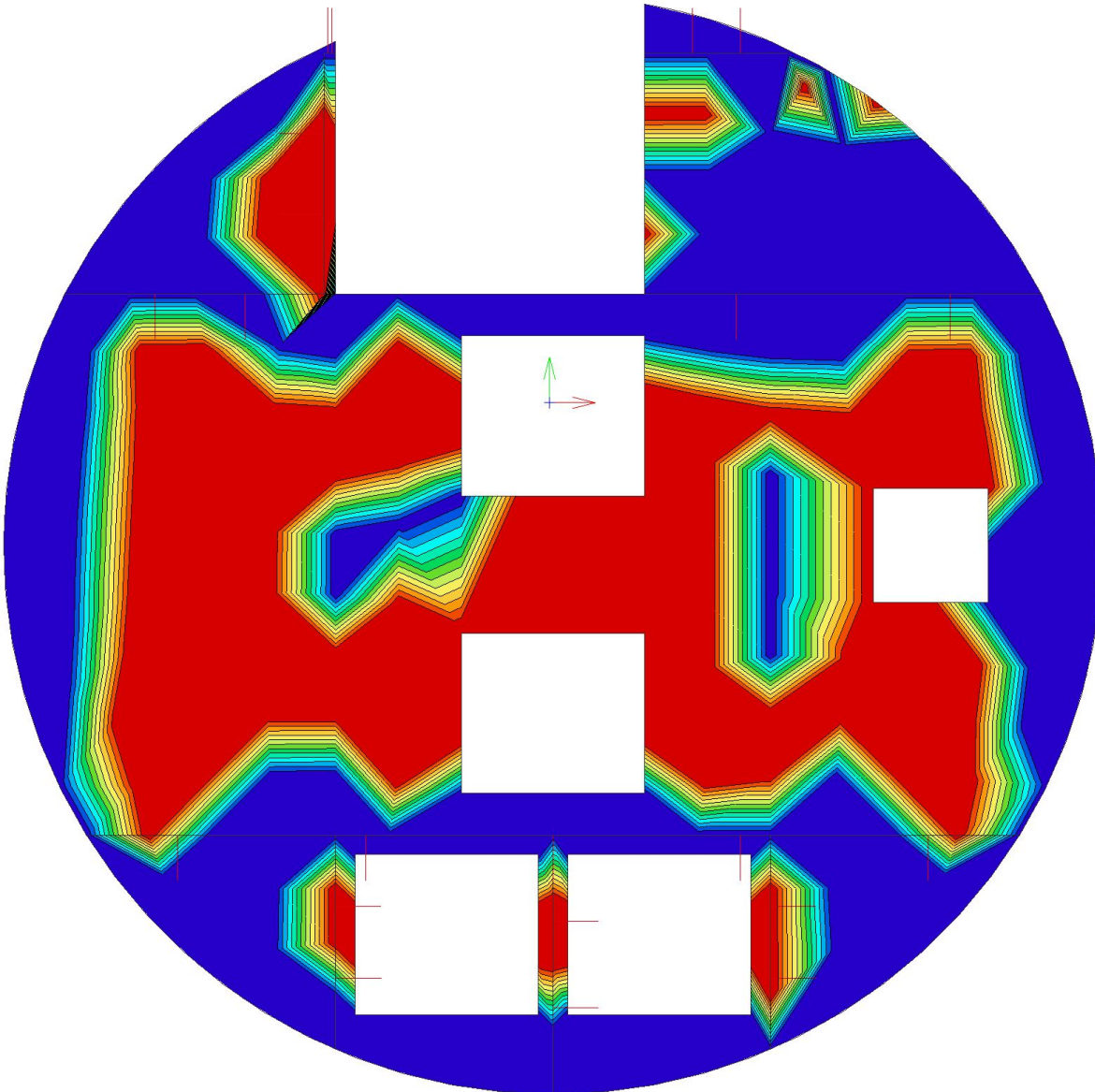
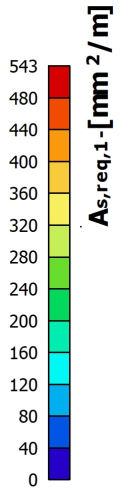
Values:  $A_{s,req,2+}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Top shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.3.3. Reinforcement design (ULS+SLS); -  $A_{s,req,1}$ -**

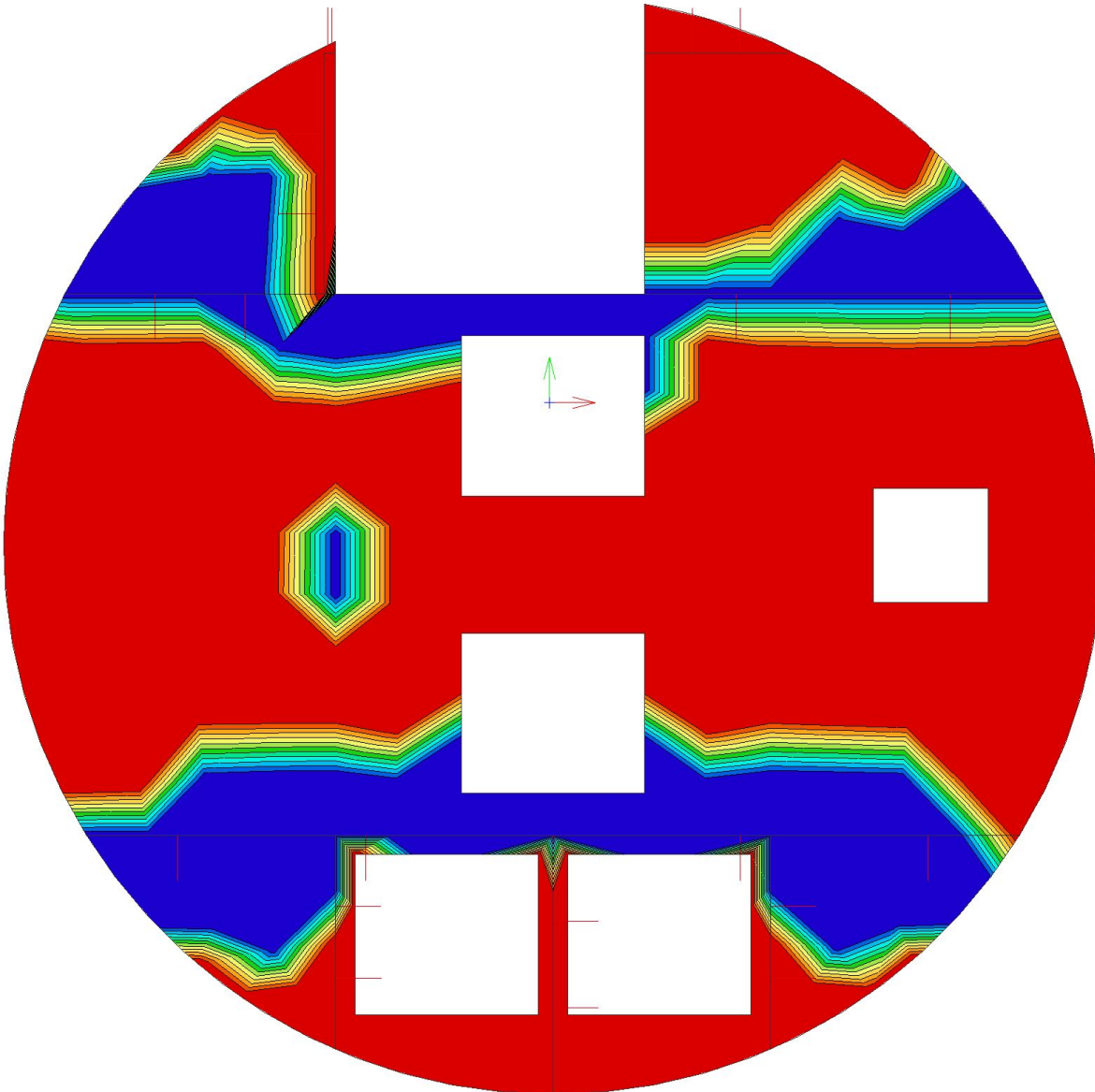
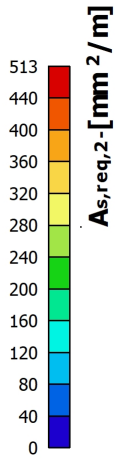
Values:  $A_{s,req,1}$ -  
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Top shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.3.4. Reinforcement design (ULS+SLS); -  $A_{s,req,2}$ -**

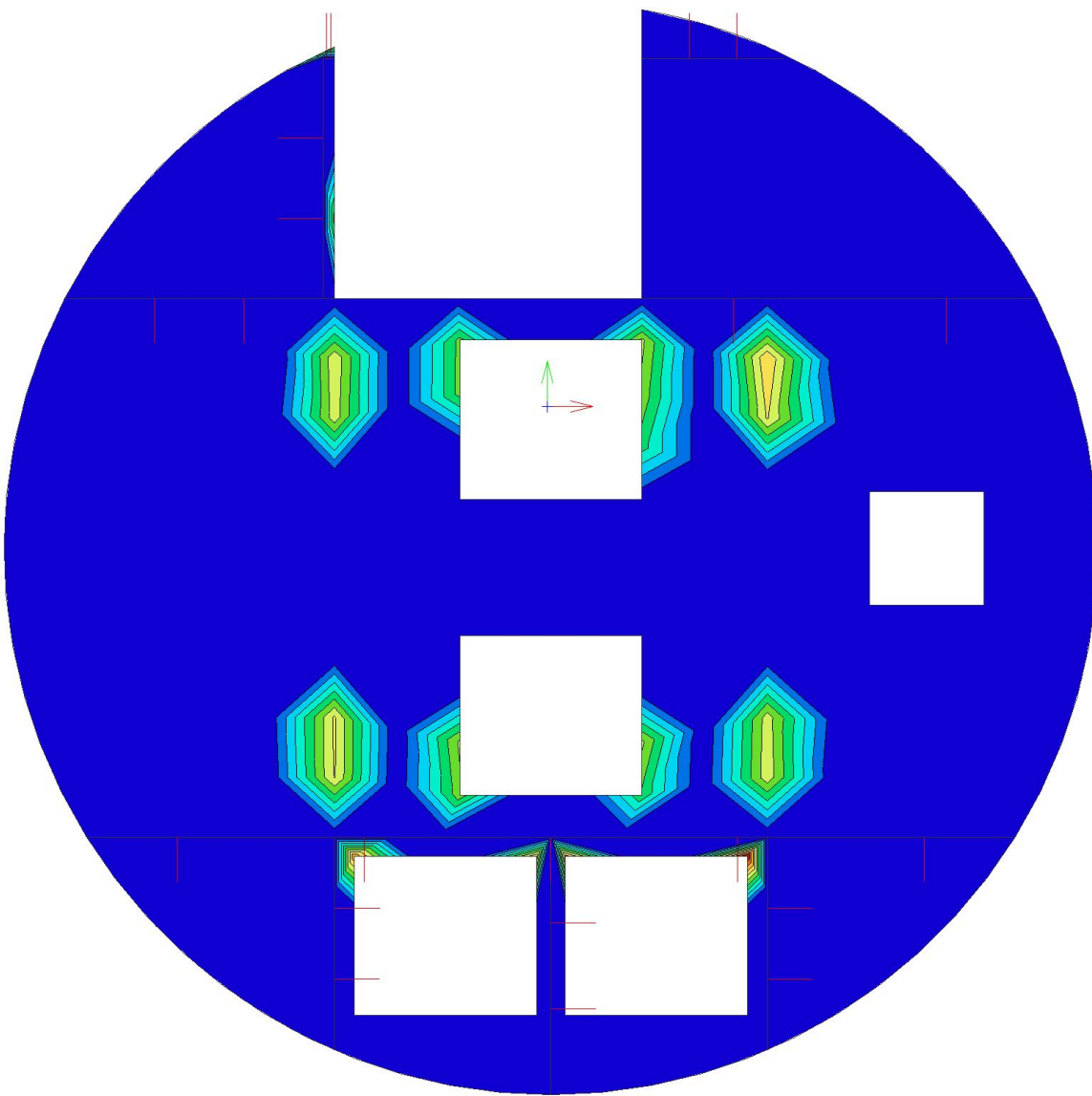
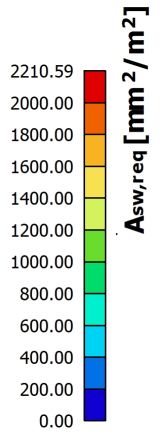
Values:  $A_{s,req,2}$ -  
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Top shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.3.5. Reinforcement design (ULS+SLS); -  $A_{sw,req}$**

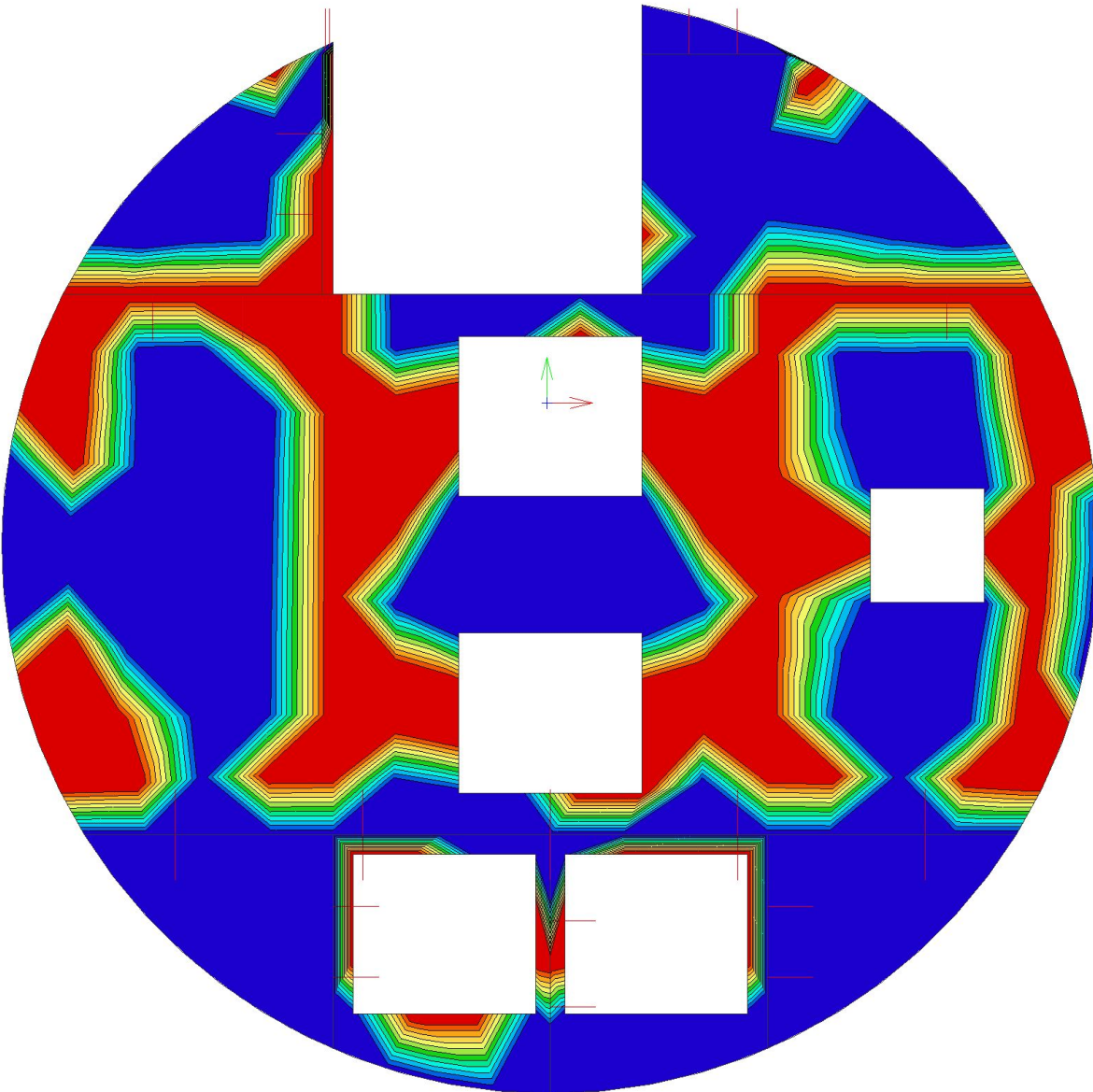
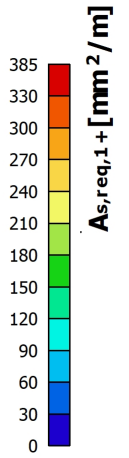
Values:  $A_{sw,req}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Top shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



### 9.4. Result picture generator

#### 9.4.1. Reinforcement design (ULS+SLS); - $A_{s,req,1+}$

Values:  $A_{s,req,1+}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Internal  
 Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element

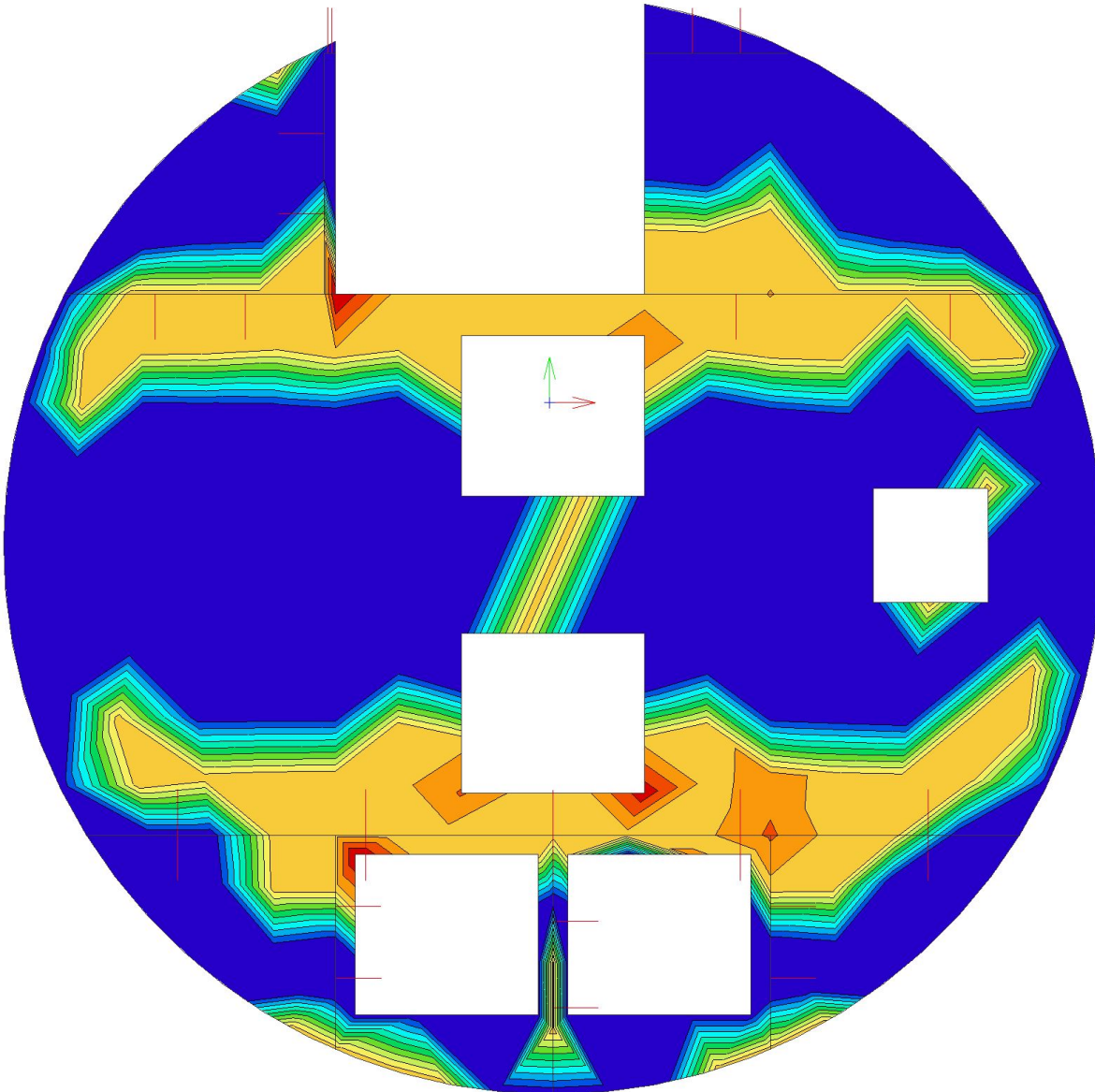
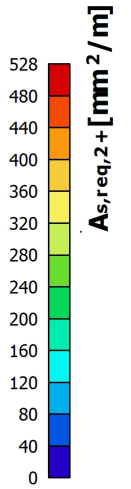




**Project**    **Estação de Campo de Ourique**

**9.4.2. Reinforcement design (ULS+SLS); -  $A_{s,req,2+}$**

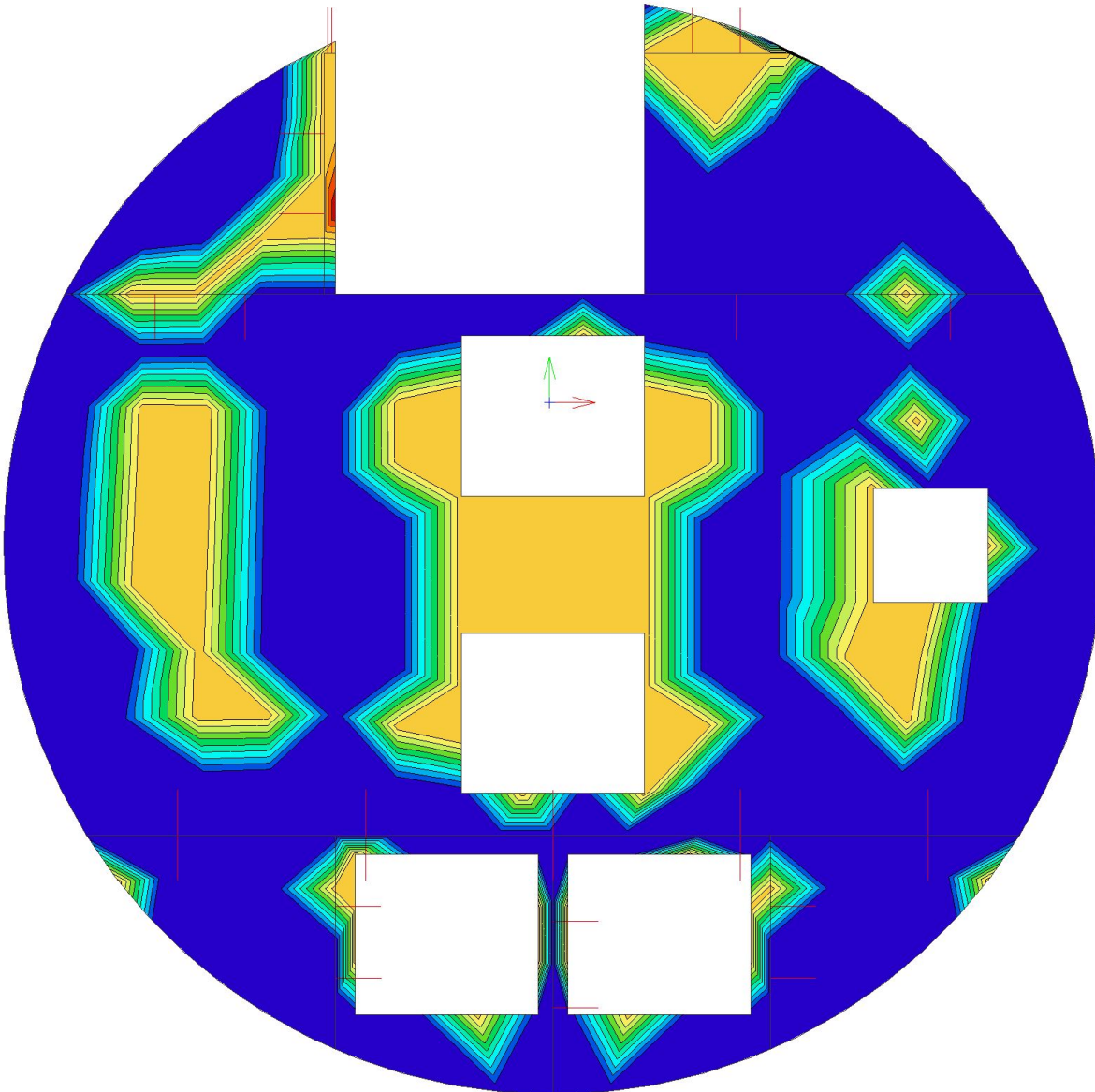
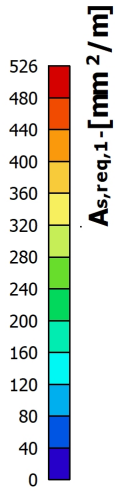
Values:  $A_{s,req,2+}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Internal  
 Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.4.3. Reinforcement design (ULS+SLS); -  $A_{s,req,1}$ -**

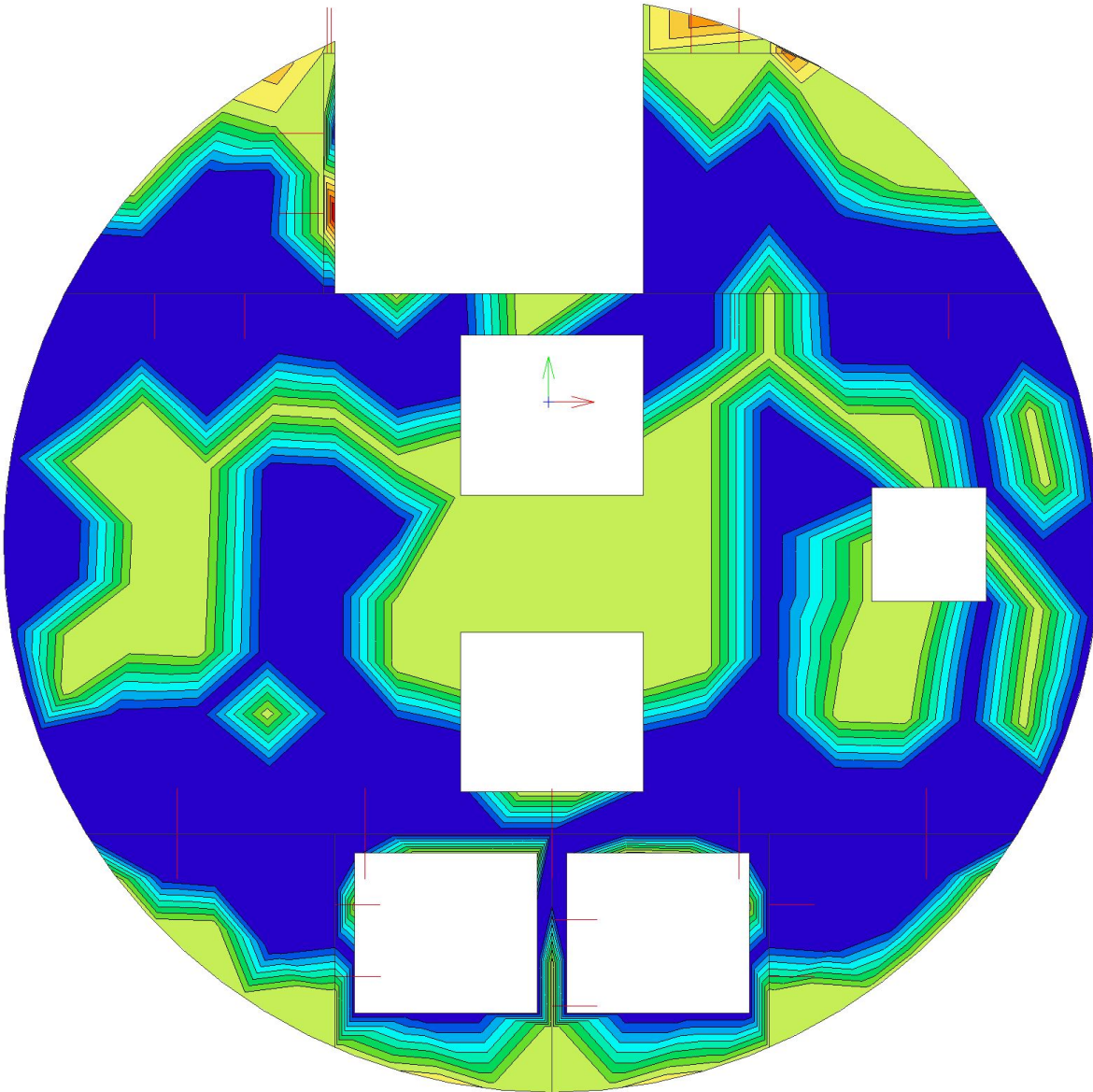
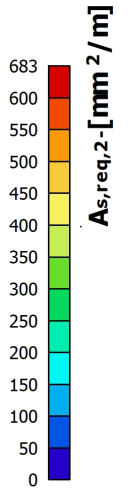
Values:  $A_{s,req,1}$ -  
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Internal  
 Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.4.4. Reinforcement design (ULS+SLS); -  $A_{s,req,2}$ -**

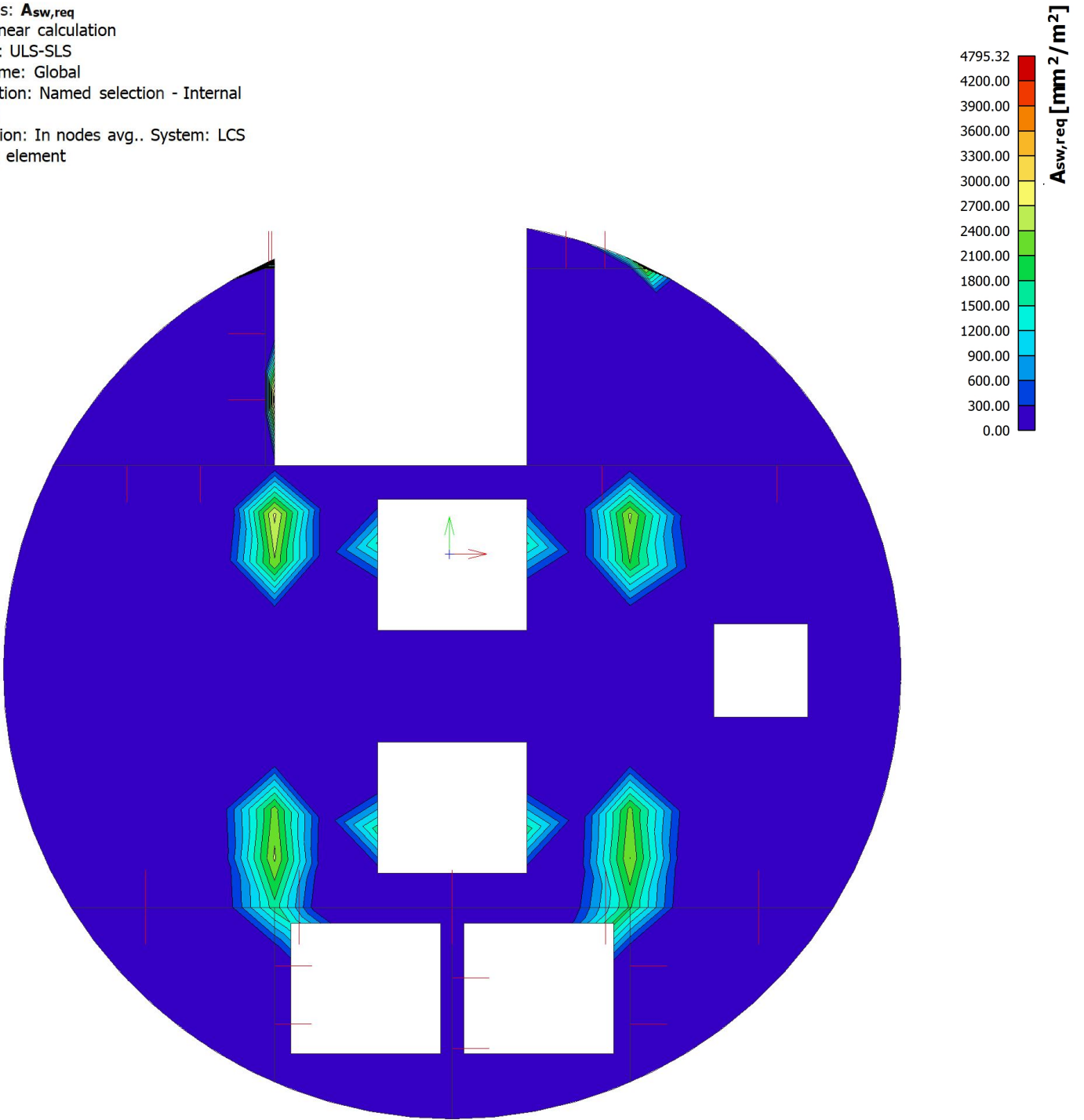
Values:  $A_{s,req,2}$ -  
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Internal  
 Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



**Project**    **Estação de Campo de Ourique**

**9.4.5. Reinforcement design (ULS+SLS); -  $A_{sw,req}$**

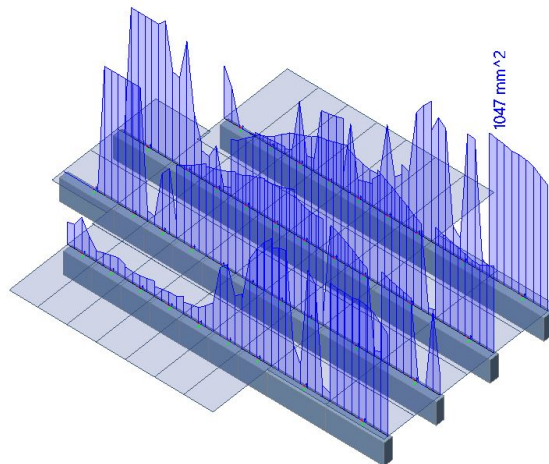
Values:  $A_{sw,req}$   
 Nonlinear calculation  
 Class: ULS-SLS  
 Extreme: Global  
 Selection: Named selection - Internal  
 Shaft  
 Location: In nodes avg.. System: LCS  
 mesh element



### 9.5. Result picture generator

#### 9.5.1. Overall Design (ULS); $A_{sz,req+}$ - $A_{sz,req+}$

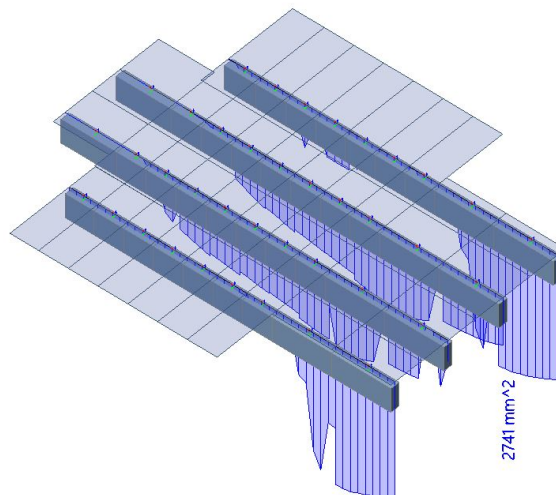
Values:  $A_{sz,req+}$   
Nonlinear calculation  
Class: ULS  
Coordinate system: Member  
Extreme 1D: Global  
Selection: Named selection - Beam1  
Note: Longitudinal reinforcement is designed in the centre of the edges of the cross-section. Checks use the real position of the reinforcement.



Project **Estação de Campo de Ourique**

9.5.2. Overall Design (ULS);  $A_{sz,req+}$  -  $A_{sz,req-}$

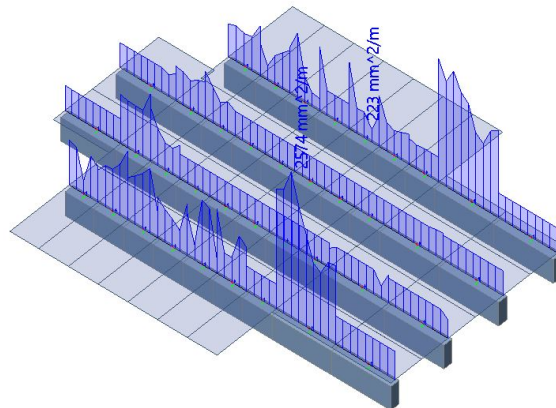
Values:  $A_{sz,req-}$   
Nonlinear calculation  
Class: ULS  
Coordinate system: Member  
Extreme 1D: Global  
Selection: Named selection - Beam1  
Note: Longitudinal reinforcement is designed in the centre of the edges of the cross-section. Checks use the real position of the reinforcement.



**Project**    **Estação de Campo de Ourique**

**9.5.3. Overall Design (ULS);  $A_{sz,req+}$  -  $A_{swm,req}$**

Values:  $A_{swm,req}$   
Nonlinear calculation  
Class: ULS  
Coordinate system: Member  
Extreme 1D: Global  
Selection: Named selection - Beam1  
Note: Longitudinal reinforcement is designed in the centre of the edges of the cross-section. Checks use the real position of the reinforcement.



## 9.6. Result picture generator

### 9.6.1. Overall Design (ULS); - $A_{sz,req+}$

Values:  $A_{sz,req+}$

Nonlinear calculation

Class: ULS

Coordinate system: Member

Extreme 1D: Global

Selection: Named selection - Beam2

Note: Longitudinal reinforcement is designed in the centre of the edges of the cross-section. Checks use the real position of the reinforcement.

