

SUPERFICIES ARQUITECTÓNICAS SINGULARES

Francisco J. Sanchis Sampedro • Rafael J. Ligorit Tomás

MODALIDAD: CIENTÍFICO TÉCNICO



UNIVERSIDAD  
POLITECNICA  
DE VALENCIA

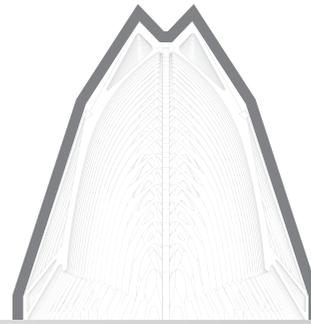
ÁGORA INTERIOR

PAU RUIZ TAMARIT

Grado en Ingeniería de Edificación



Escuela Técnica Superior  
de Gestión en la Edificación



## SUPERFICIES ARQUITECTÓNICAS SINGULARES

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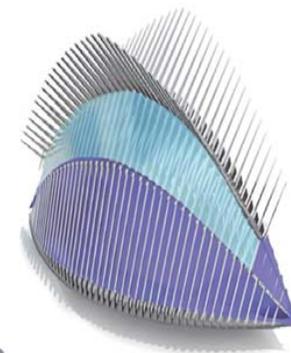
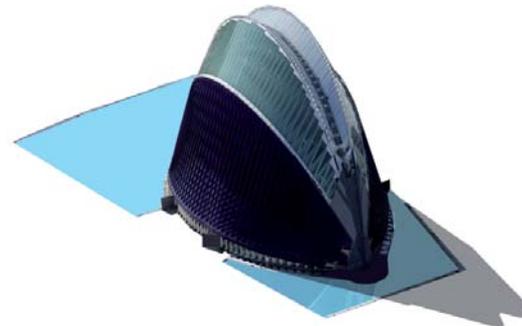
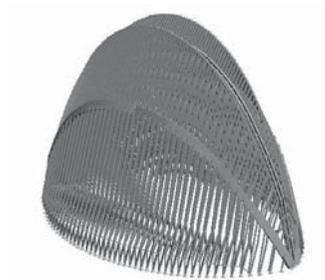
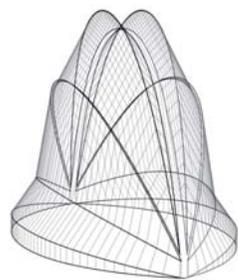
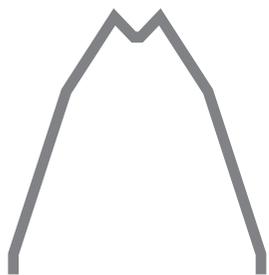
## ÁGORA INTERIOR

PAU RUIZ TAMARIT

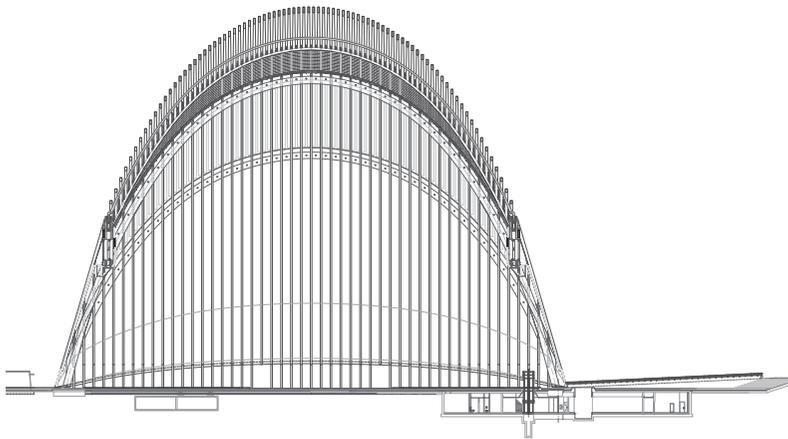
Grado en Ingeniería de Edificación

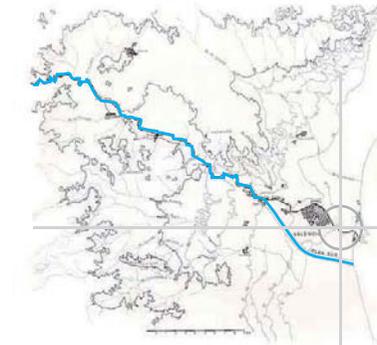








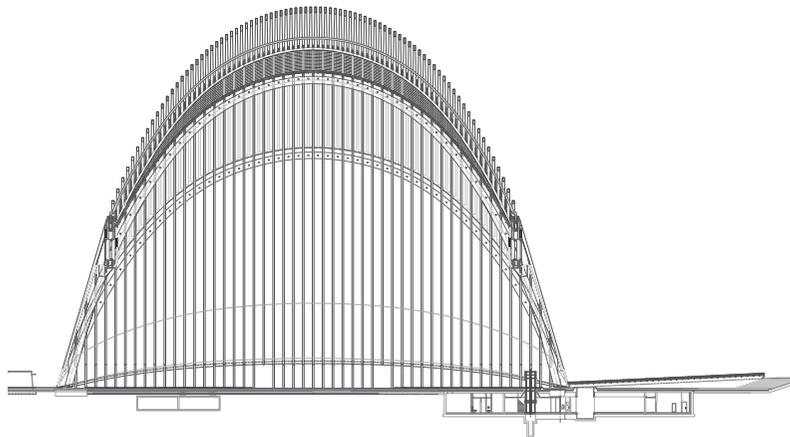


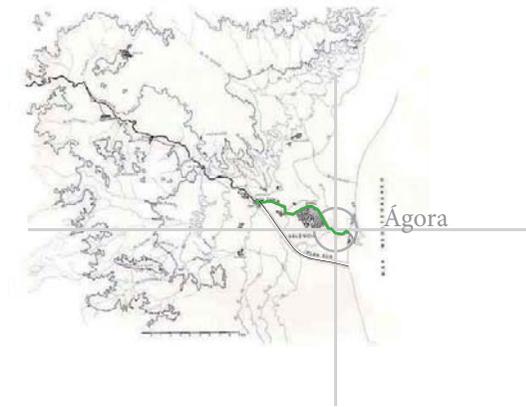


Ágora

○ Situación  
Valencia, C.A.C.

Mapa del plan Sur.  
Aprobado en las Cortes  
Españolas en 1961.

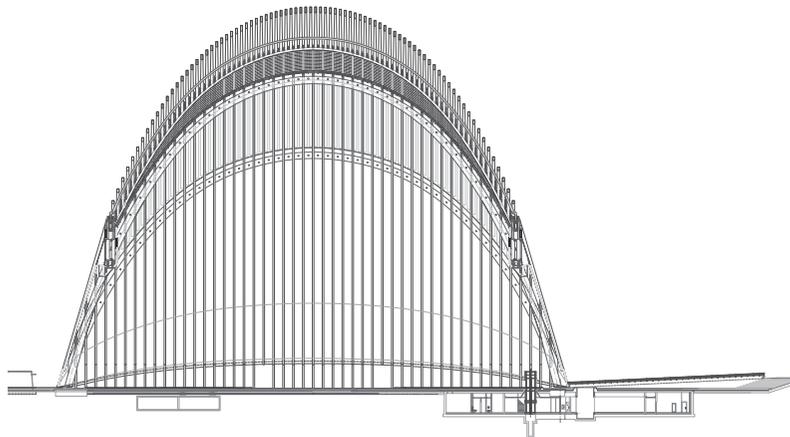




○ Situación  
Valencia, C.A.C.



1981  
Solución verde para el viejo cauce  
del rio Turia.





Ágora

○ Situación  
Valencia, C.A.C.

2005  
Palau de les Arts

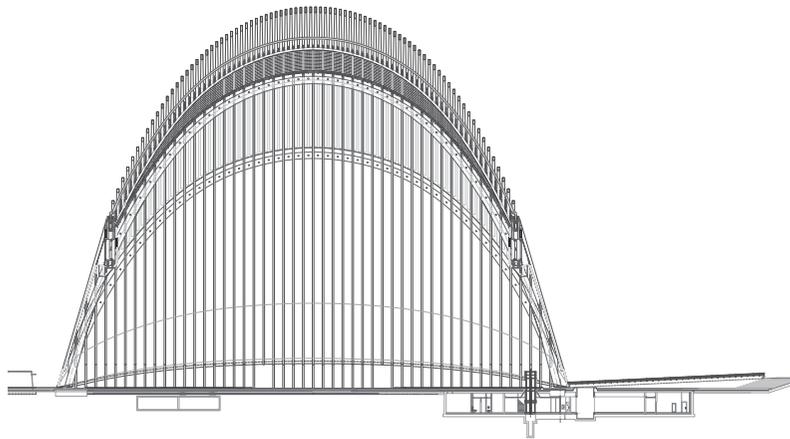
1998  
L'Hemisferic

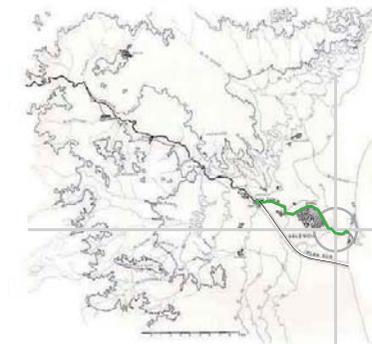
1996  
Se presenta el  
proyecto definitivo  
para la Ciudad de  
las Artes y de las  
Ciencias.

2000  
L'Umbracle

2002  
Oceanogràfic

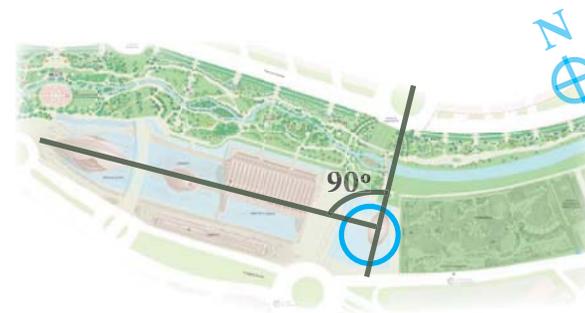
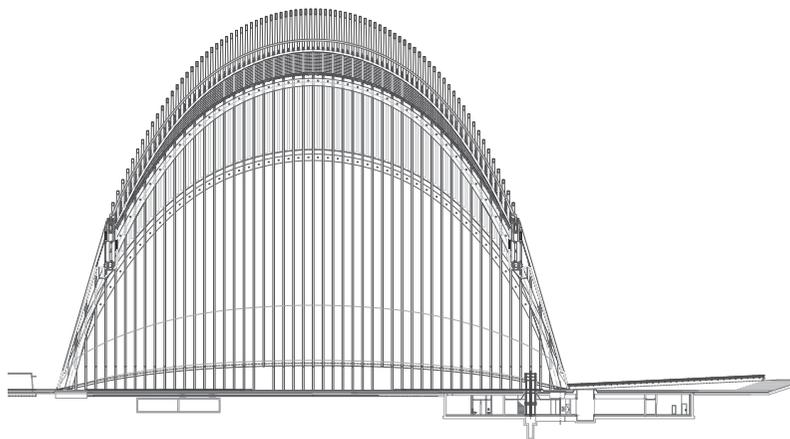
2000  
Museo de las ciencias





Ágora

Situación  
Valencia, C.A.C.



Ágora  
En construcción

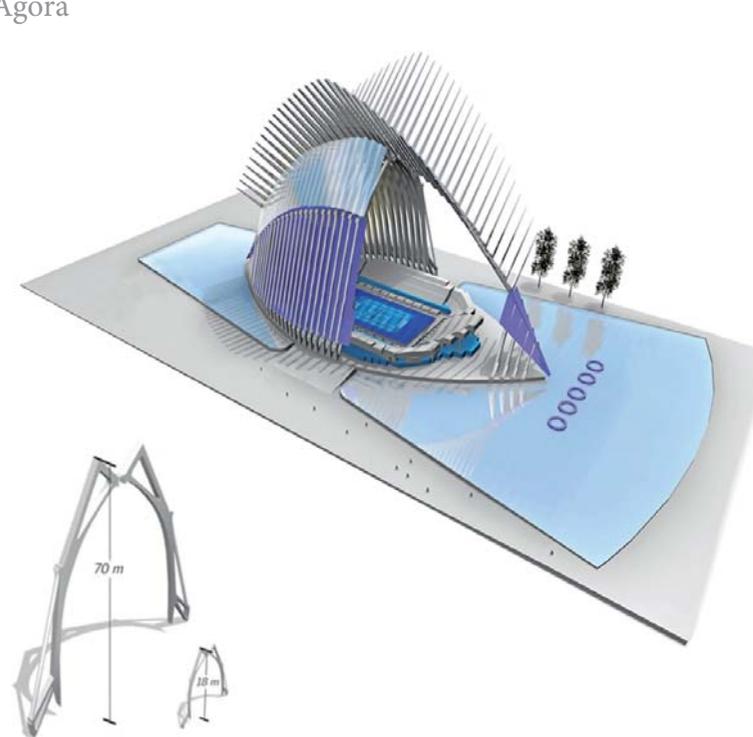
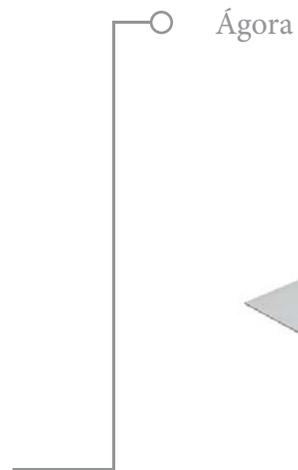
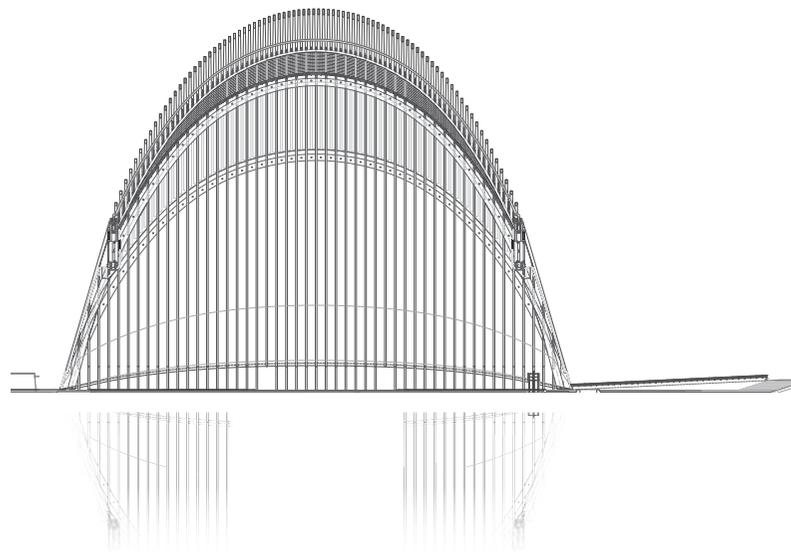


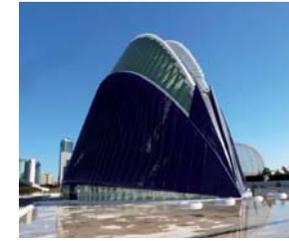
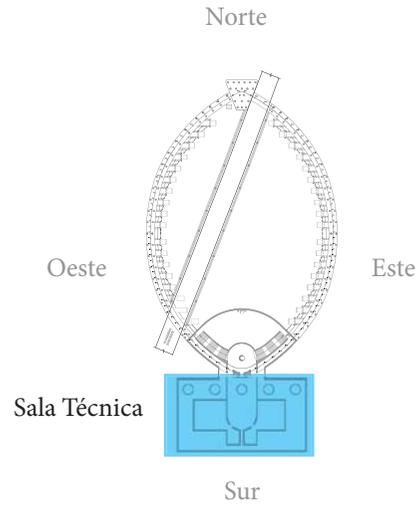
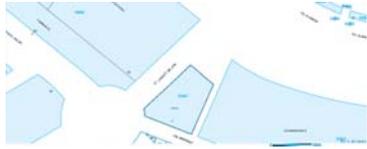


2011



Render de la obra terminada

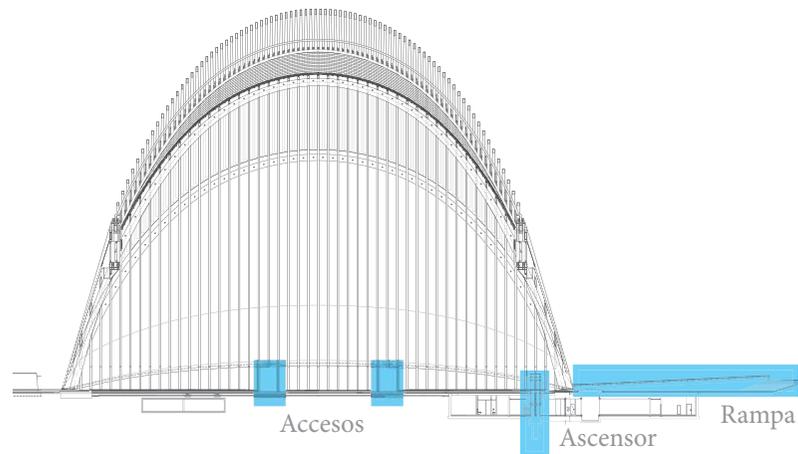




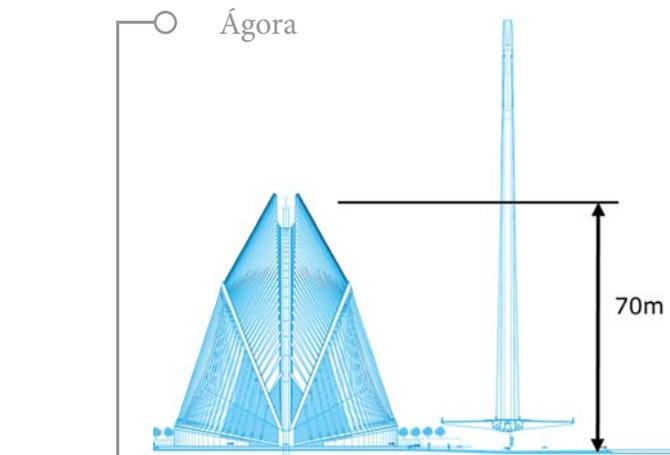
2011



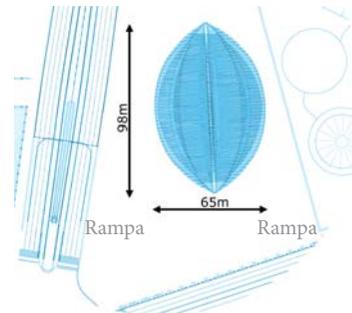
Render de la obra terminada



Alzado Este



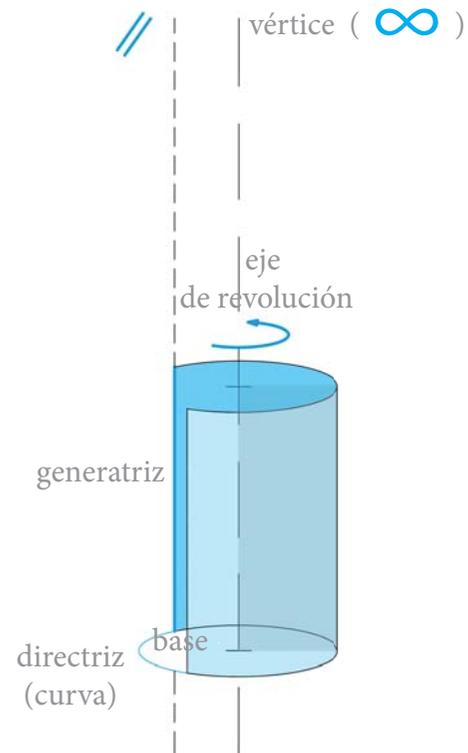
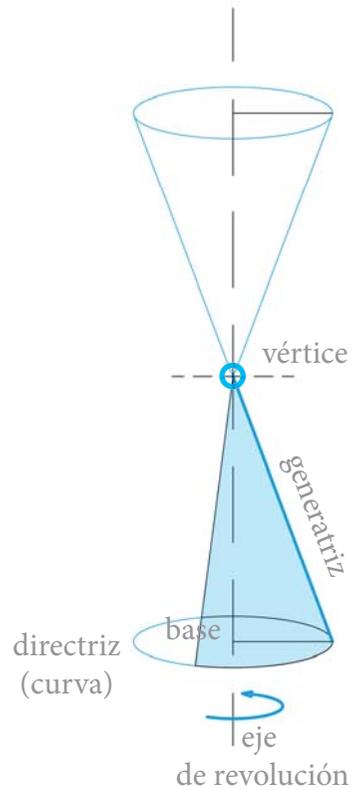
Alzado Sur



Planta





**Generatriz**

Línea recta o curva que construye la forma.  
Depende de la directriz.  
La generatriz puede ser una línea recta o curva.

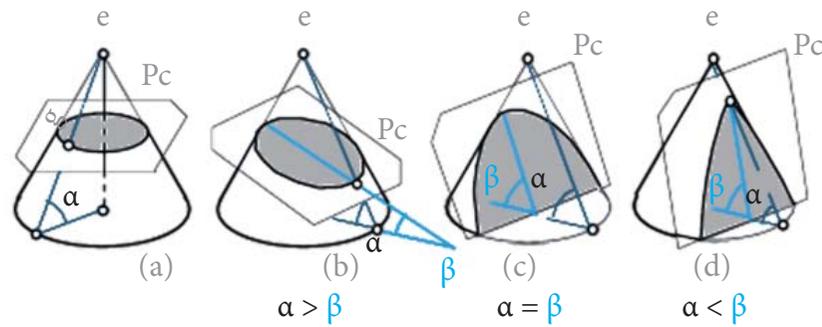
**Directriz**

Línea recta o curva sobre la cual se desplaza la generatriz.

**Plano Director**

Indica la dirección en la que deberán trasladarse las generatrices (paralelas o perpendiculares al mismo.)





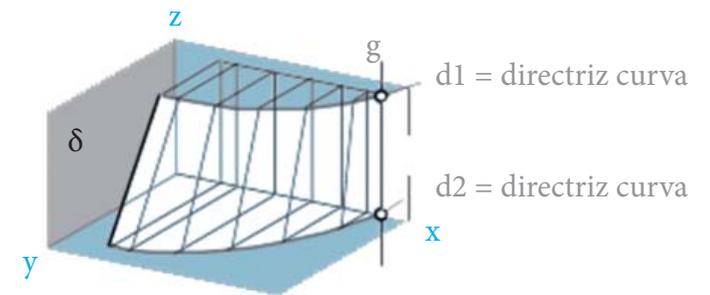
Circunferencia

Elipse

Parábola

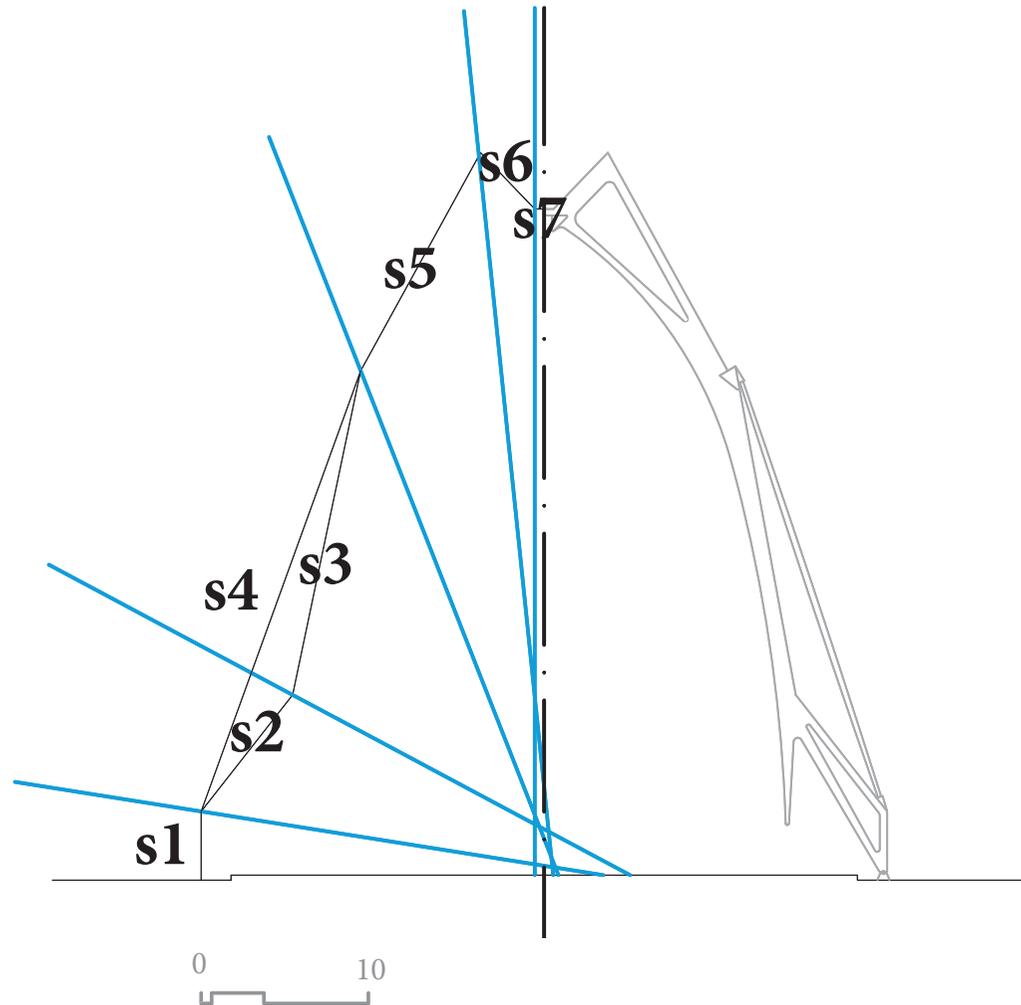
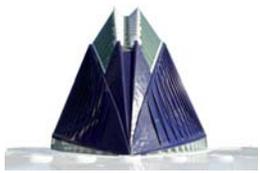
Hipérbola

**CURVAS CÓNICAS**



**SUPERFICIE  
CILINDROIDE (CONVOLUTA)**





**AZUL**

Planos de corte que contienen a las directrices de las superficies

**NEGRO**

Generatrices que forman las superficies



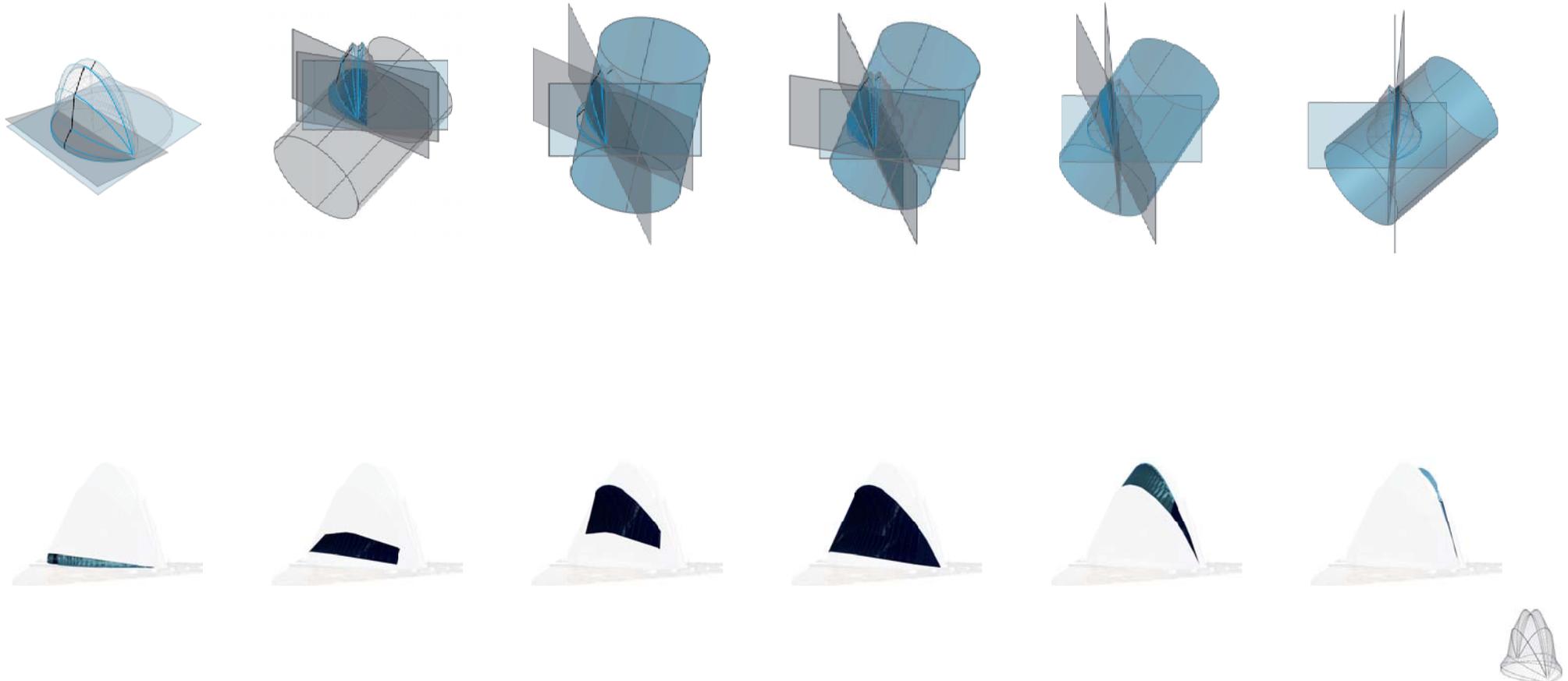
## Directrices curvas

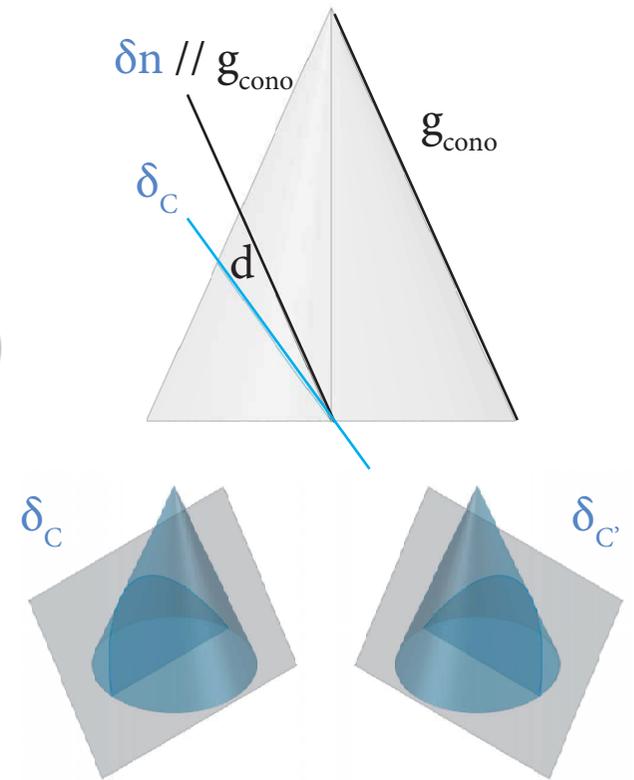
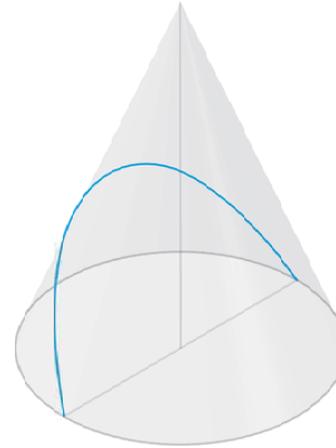
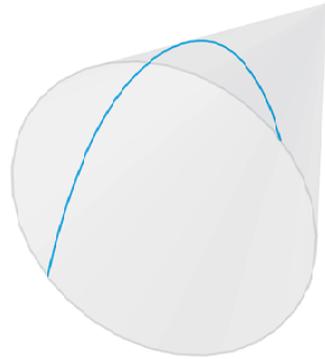
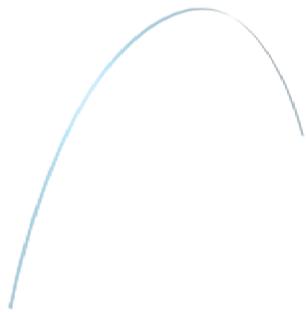
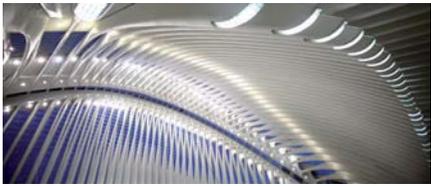
Circunferencia (1 en la Superficie 1)

Elipses (Todas las restantes de las 7 superficies analizadas)

## Generatrices

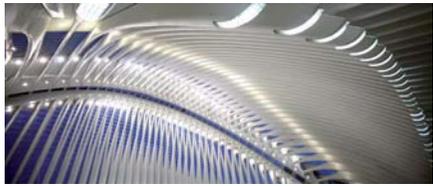
Rectas





Planos de corte





$d_1 - d_1'$   
 Ambas son elipses,  
 ninguna pertenece a un plano  
 paralelo a la base del cilindro

Directrices curvas

$d_1$   
 $d_1'$   
 $g$

Las generatrices rectas están  
 contenidas en planos paralelos  
 y conforman la superficie  $\gamma$  al  
 unir ambas directrices.

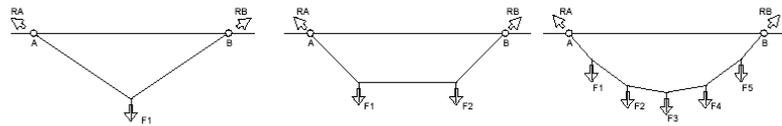
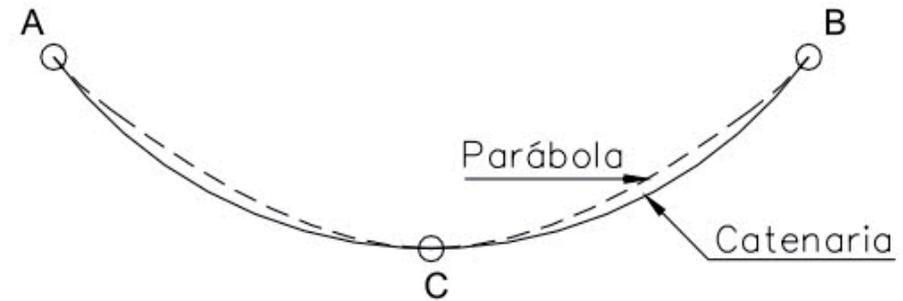
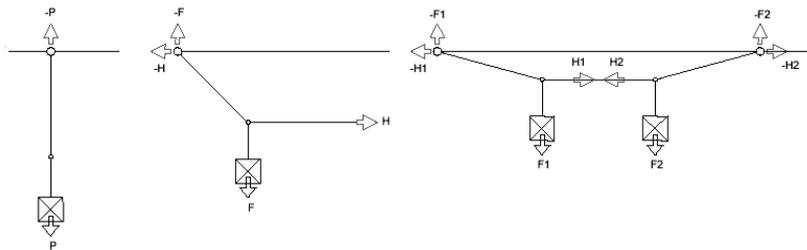
Generatrices rectas





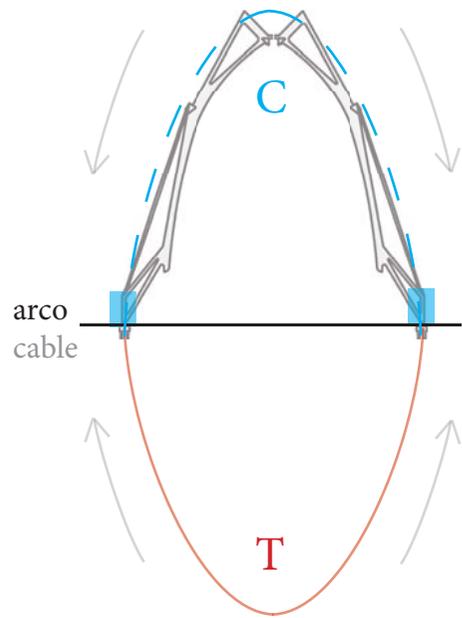


Aplicación de la catenaria

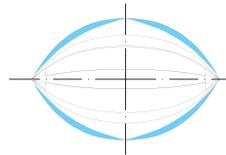


**Catenaria**, cada porción de cable recibe el mismo esfuerzo.

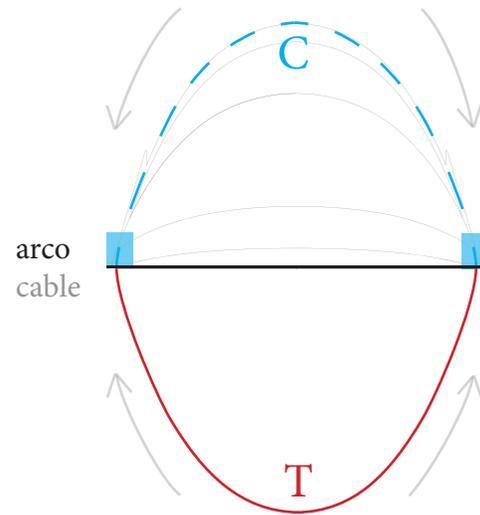
**Parábola** cada porción de cable absorbe diferentes esfuerzos.



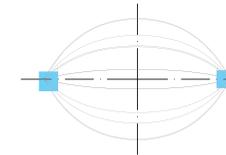
Apoyos pórticos



localización de los apoyos

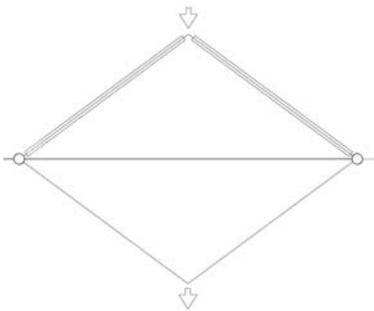


Apoyos arcos

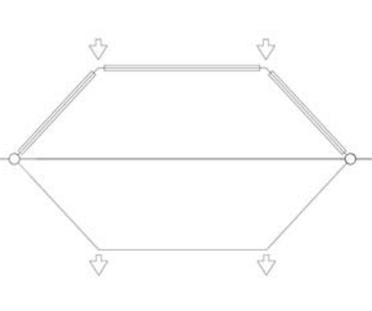


localización de los apoyos

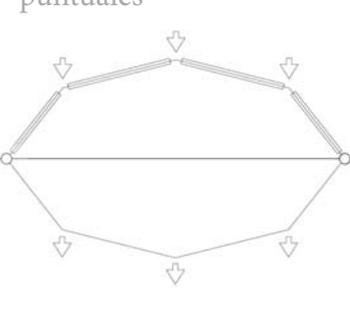
una carga puntual



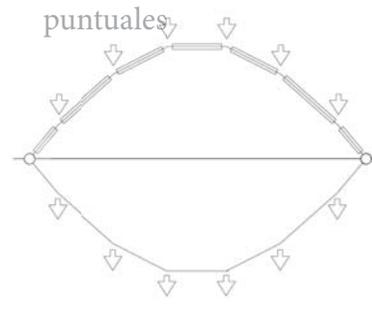
dos carga puntuales



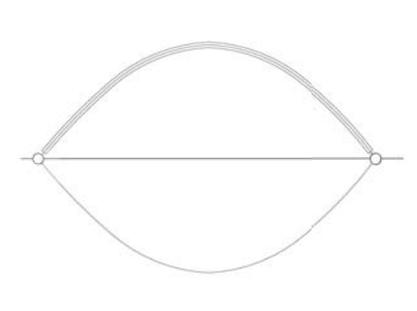
tres cargas puntuales



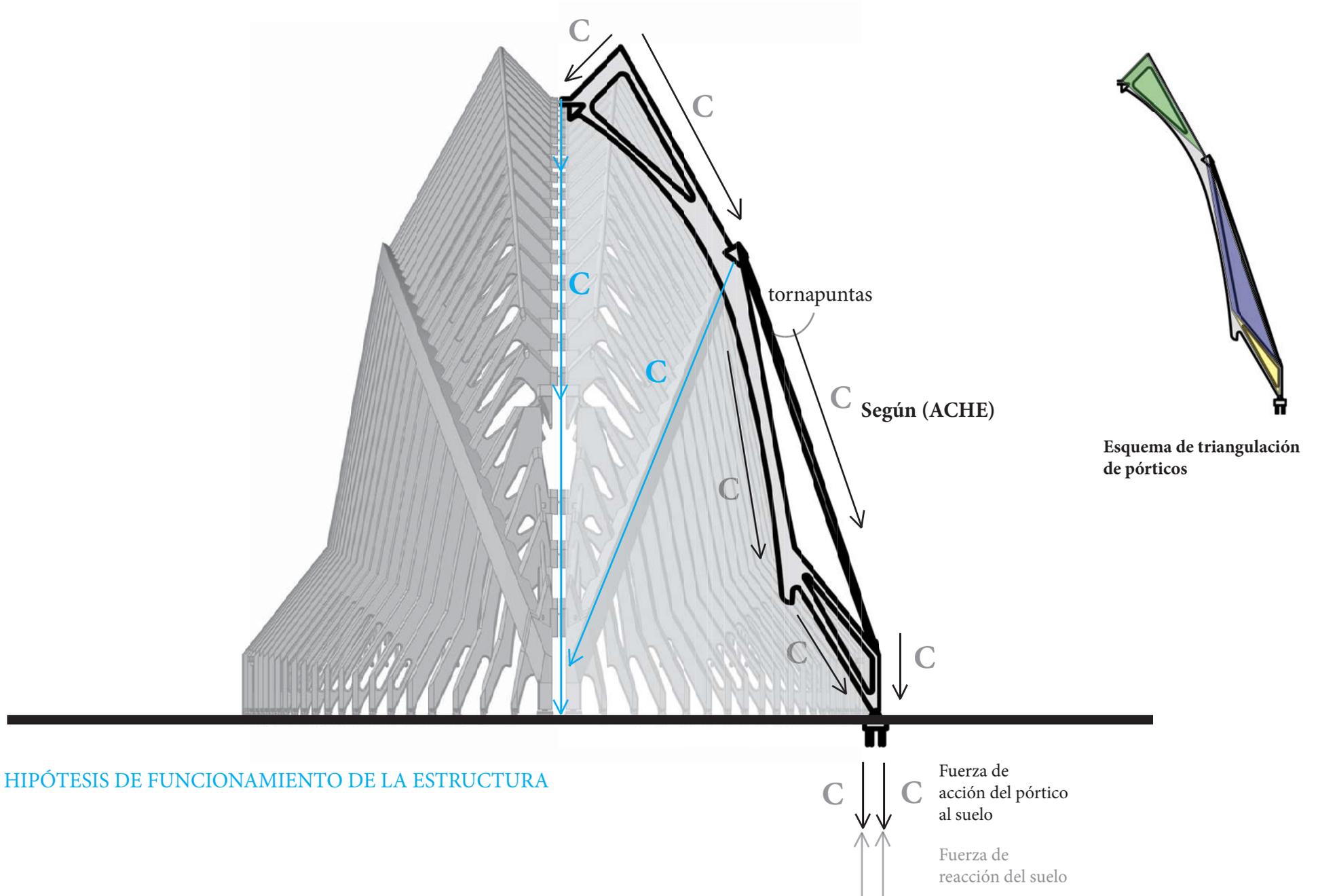
seis cargas puntuales



carga continua

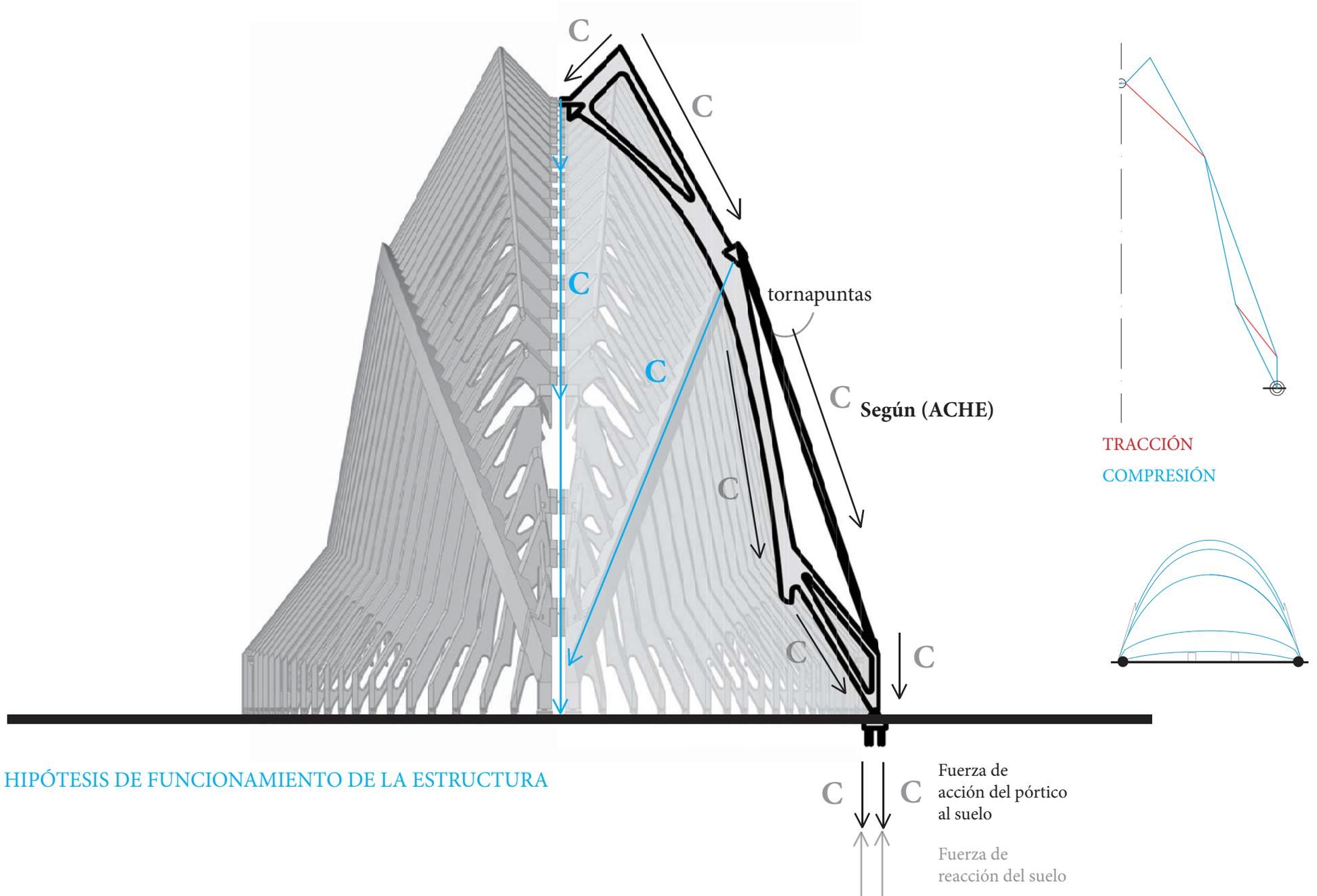


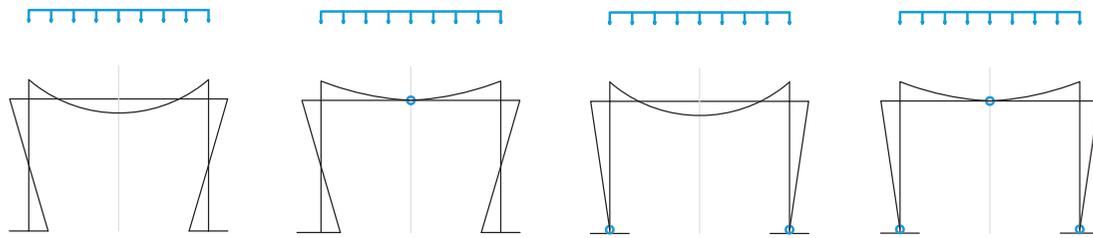
Relación entre arco funicular y cable suspendido



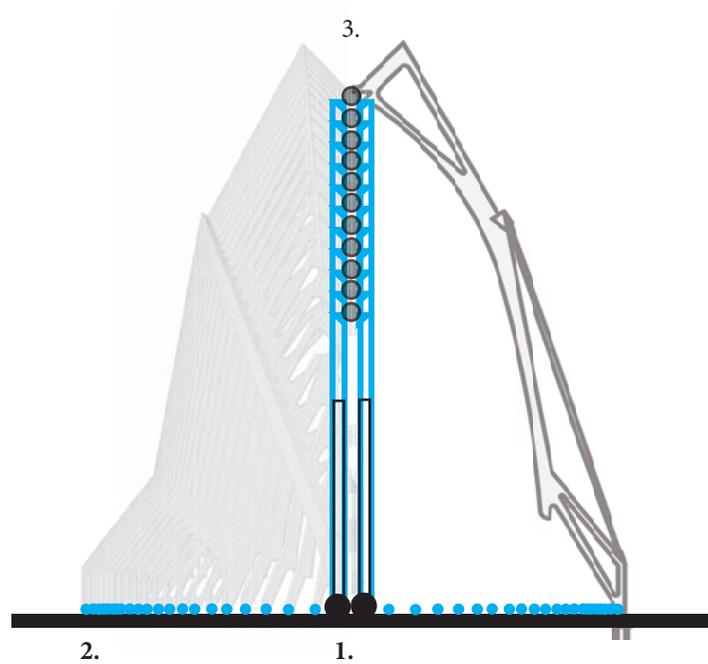
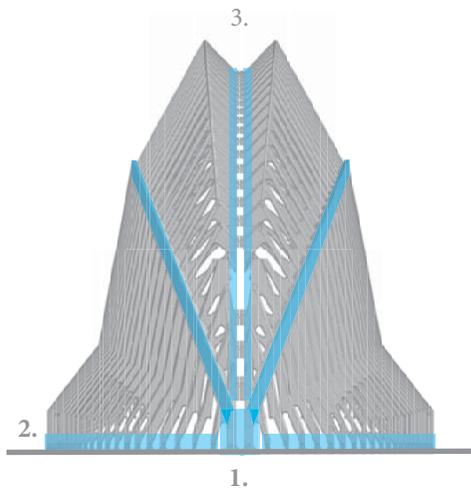
HIPÓTESIS DE FUNCIONAMIENTO DE LA ESTRUCTURA

$C$  ↓ ↓  $C$  Fuerza de acción del pórtico al suelo  
 ↑ ↑ Fuerza de reacción del suelo

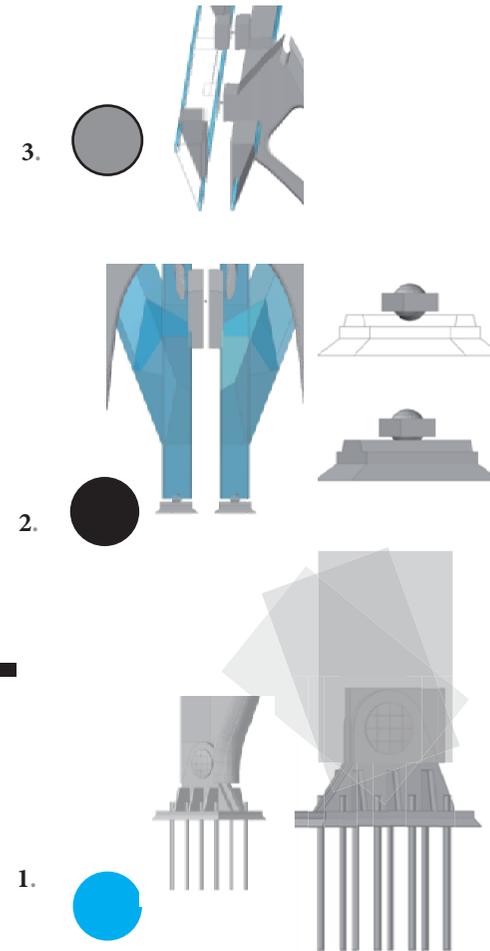


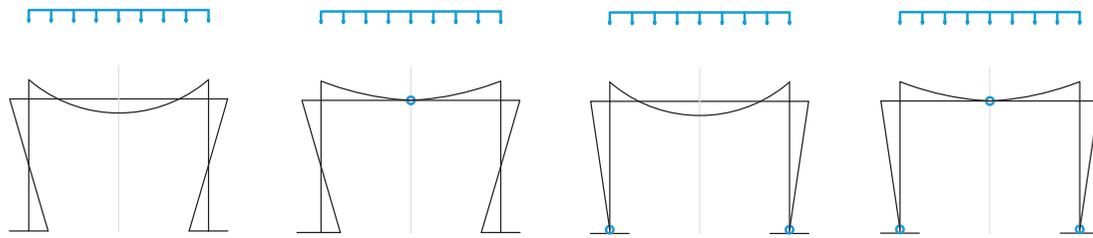


Funcionamiento de las rótula en pórtico simple.

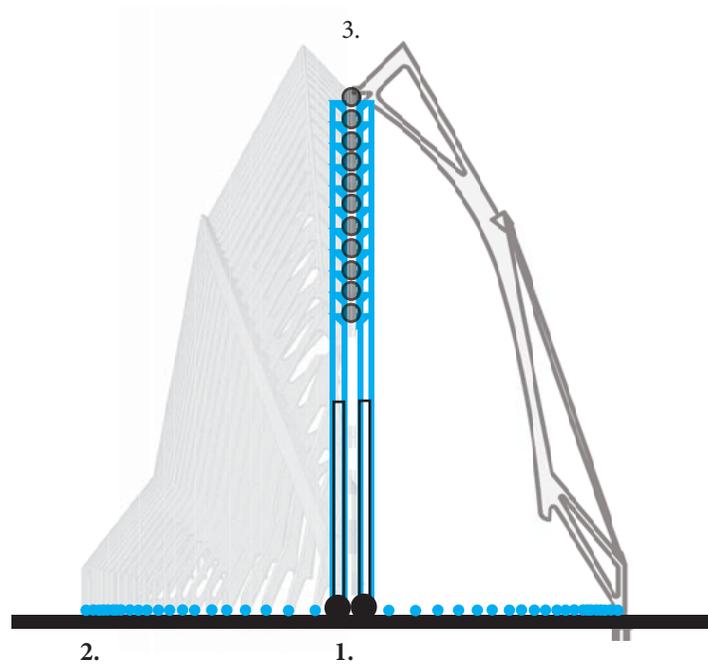
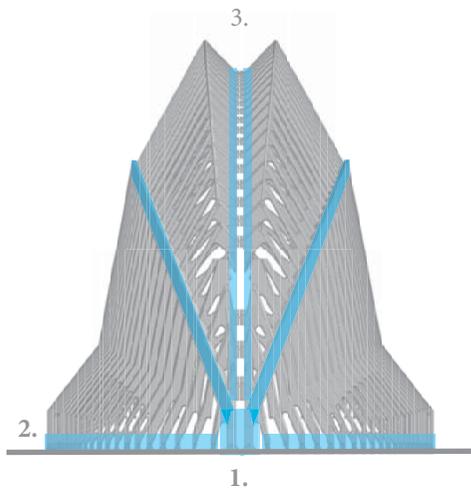


APOYOS - RÓTULAS

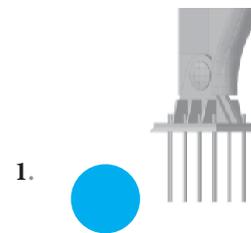
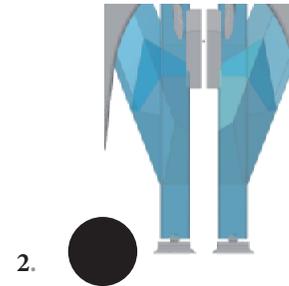
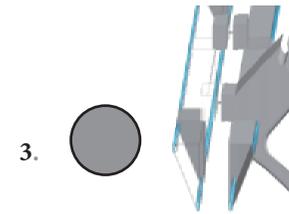


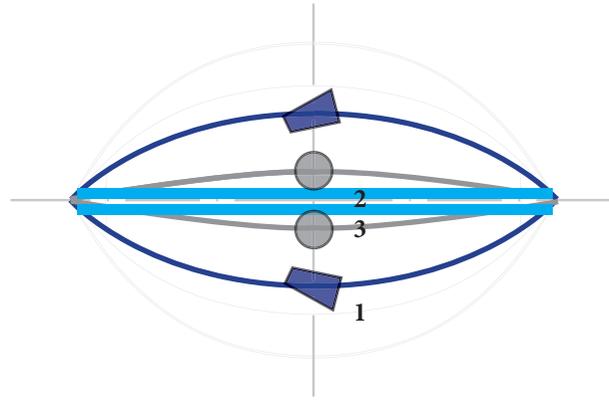


Funcionamiento de las rótula en pórtico simple.

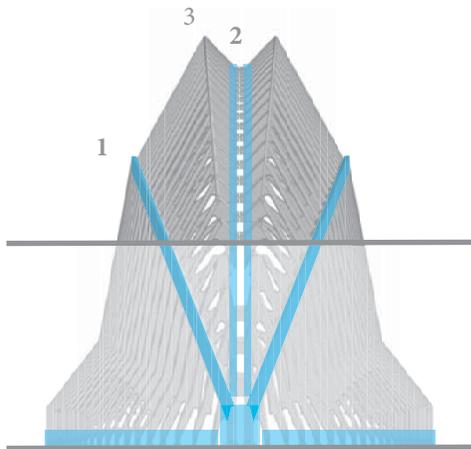
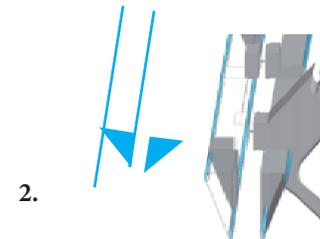
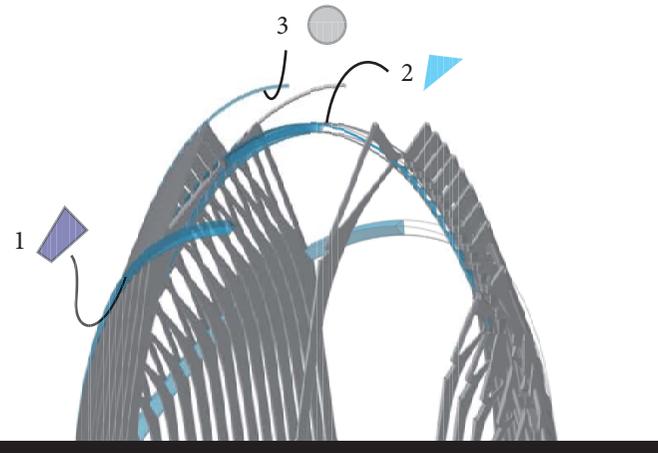
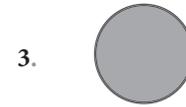


APOYOS - RÓTULAS





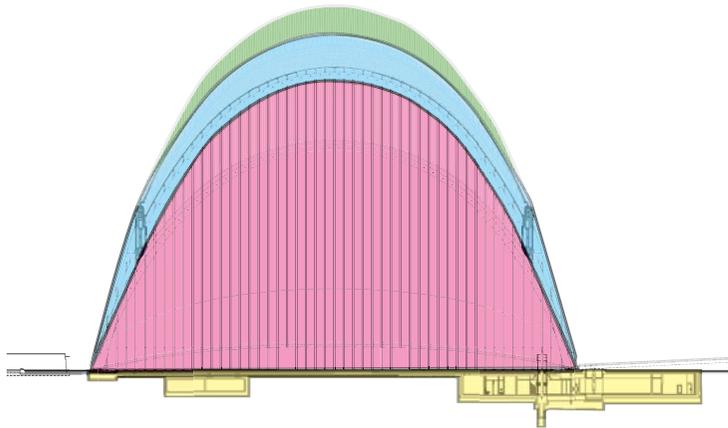
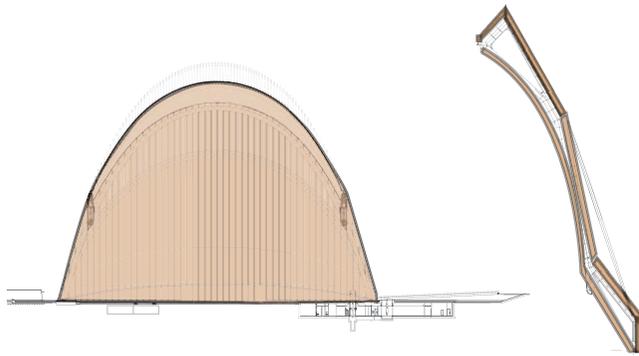
Arco fijo  
Estructura  
móvil



ARCOS

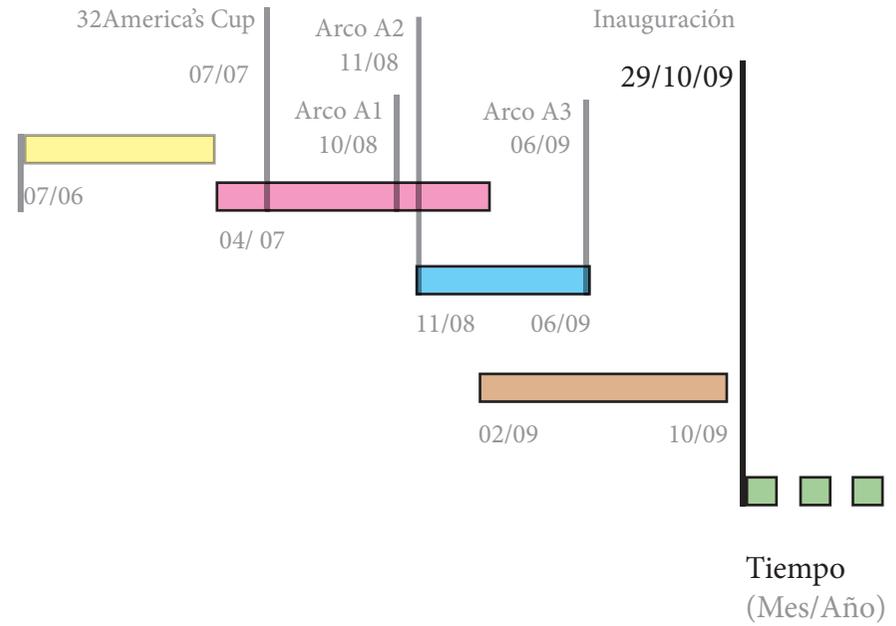




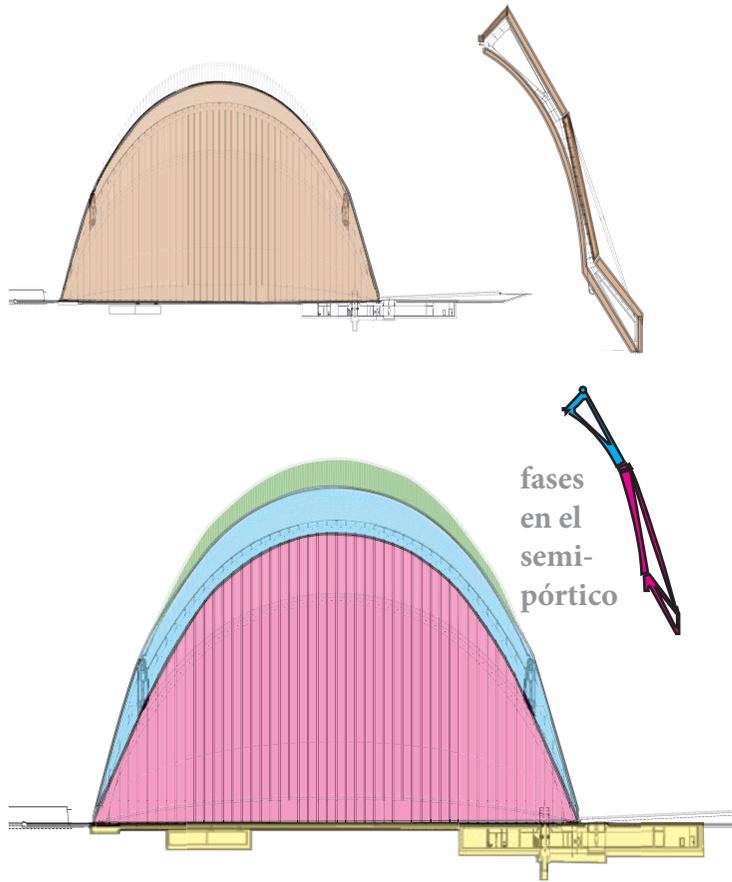


Fases

- Cimentación
- Estructura inferior
- Estructura superior
- Acabados
- Estructura móvil

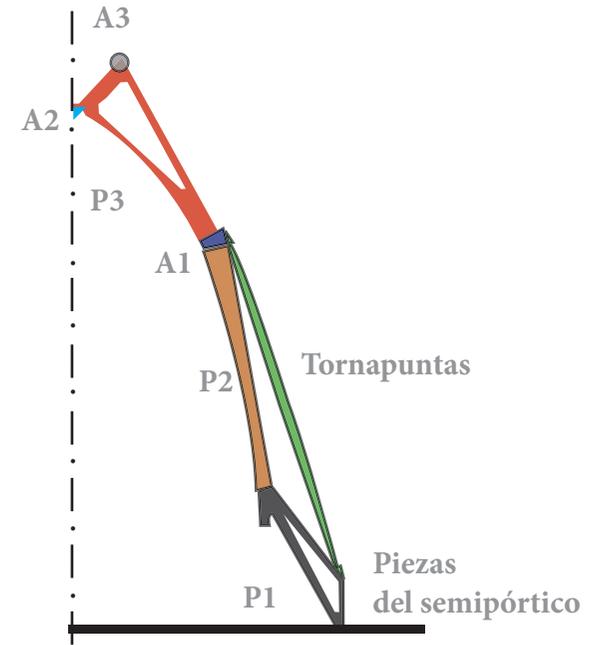


Tiempo  
(Mes/Año)



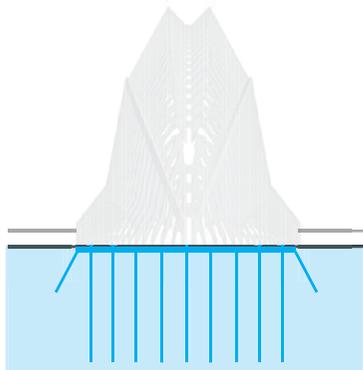
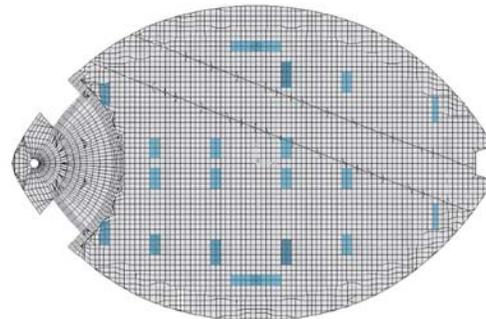
Fases

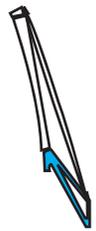
- Cimentación
- Estructura inferior
- Estructura superior
- Acabados
- Estructura móvil



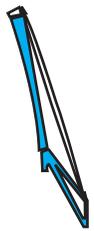


Cimentación

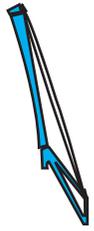




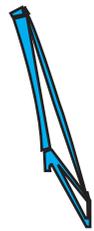
P1



P2



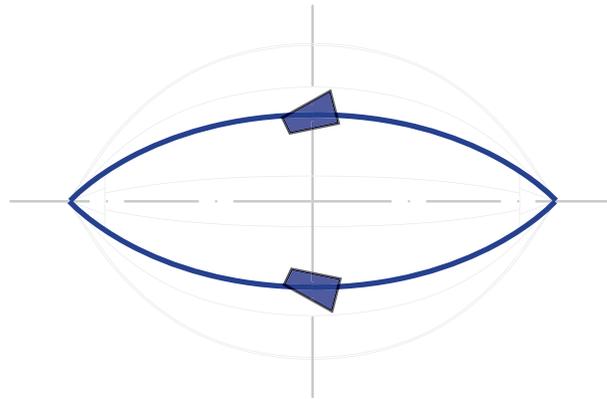
A1



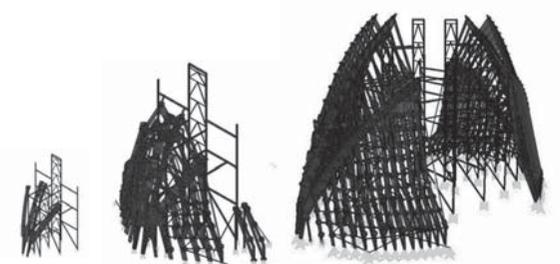
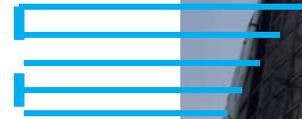
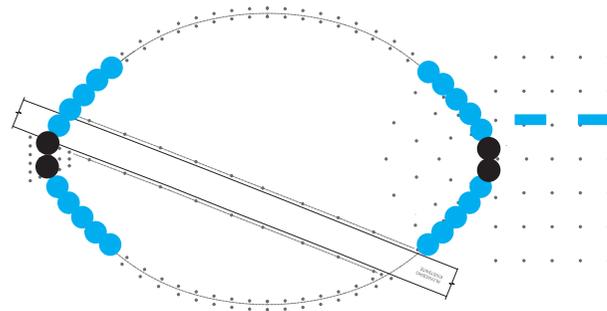
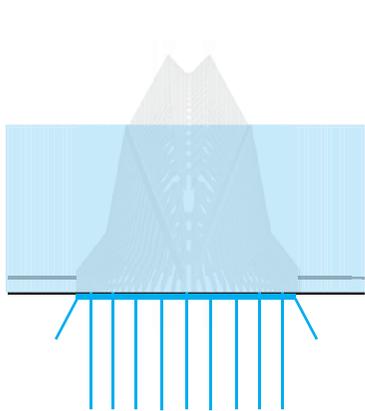
Tornapuntas

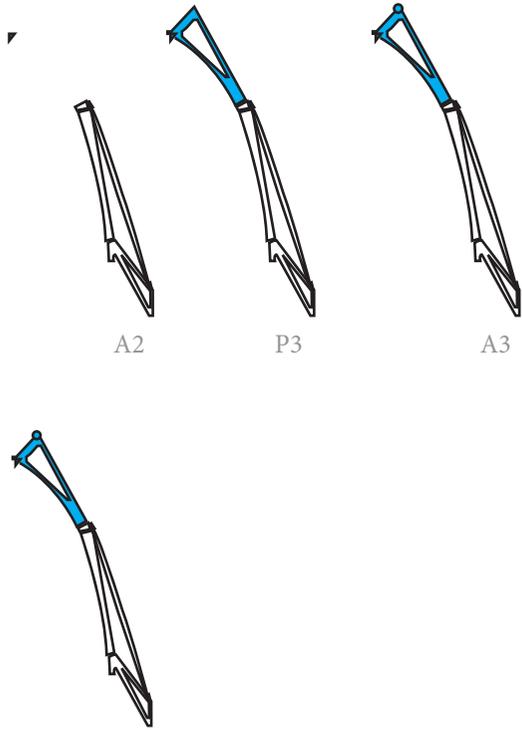


A1

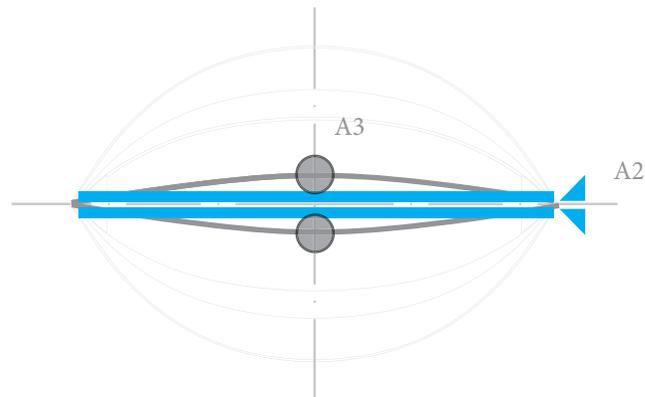
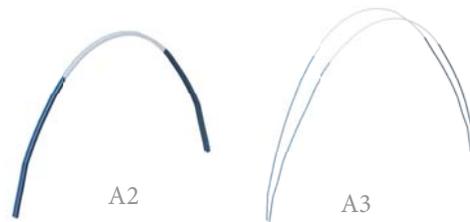
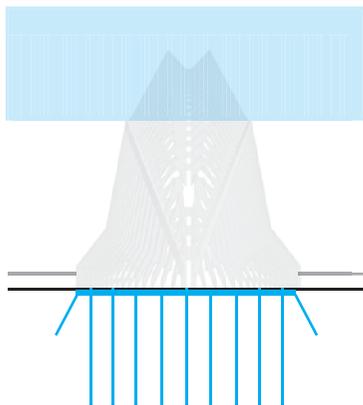


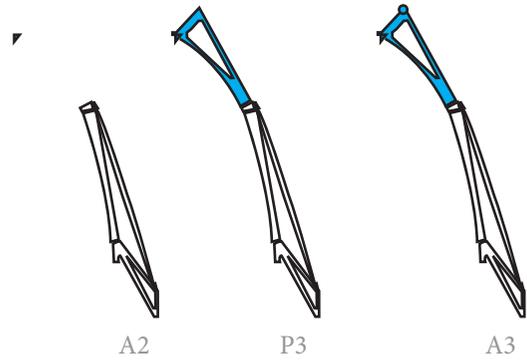
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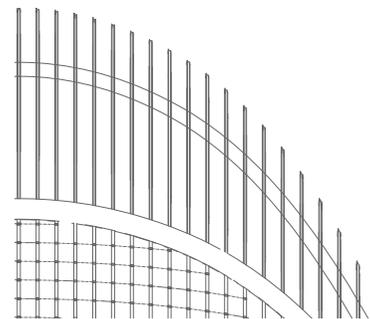
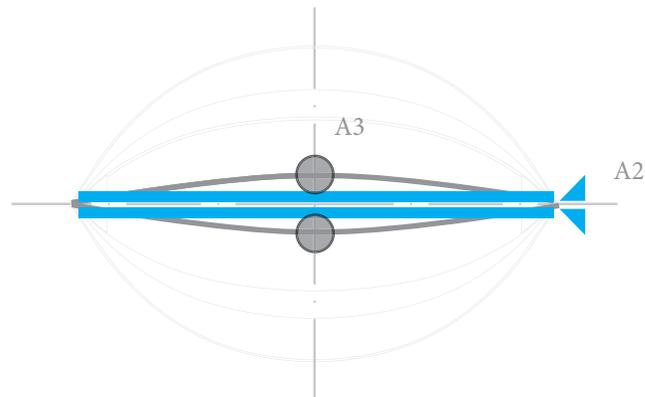
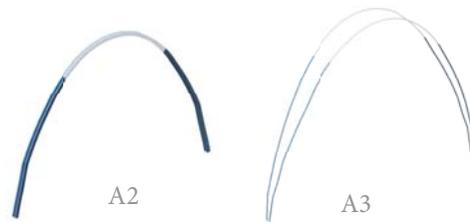
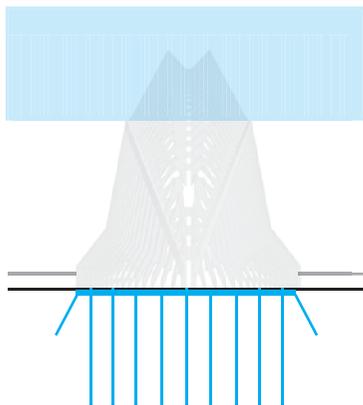


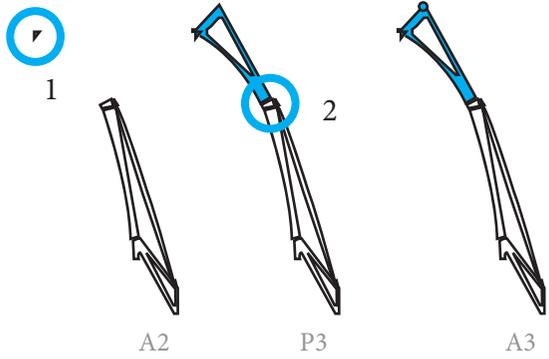
Estructura superior





Estructura superior ■





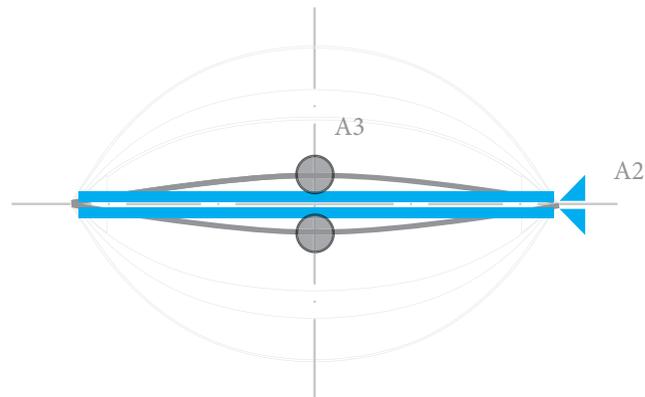
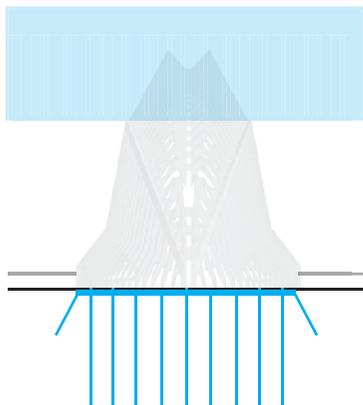
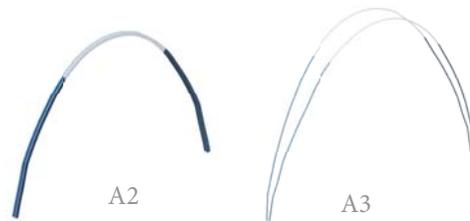
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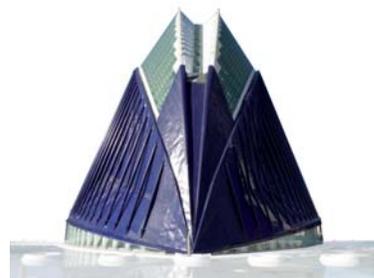
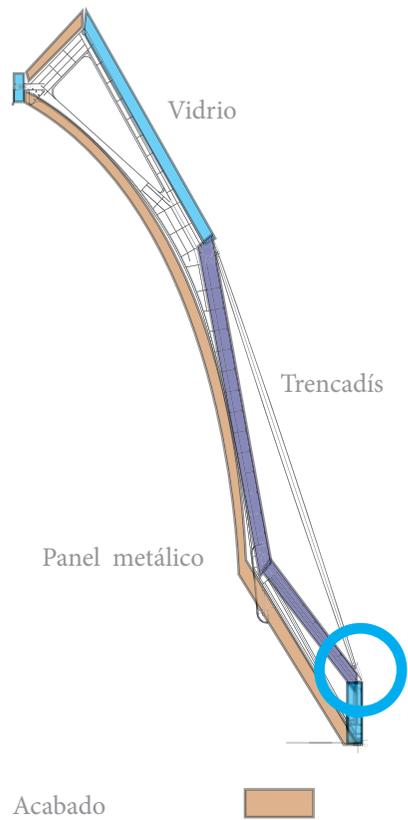


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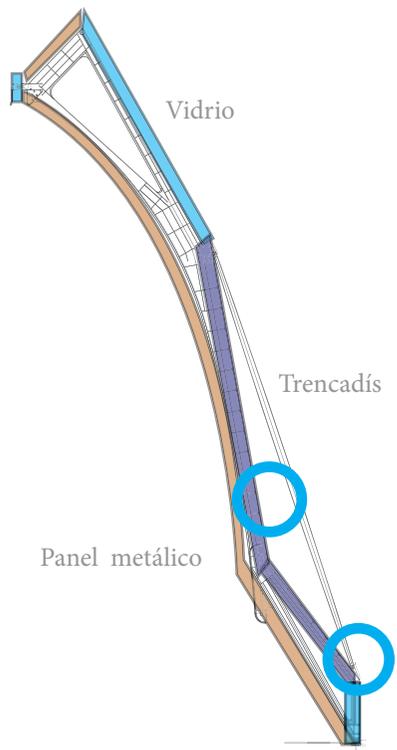


Estructura superior

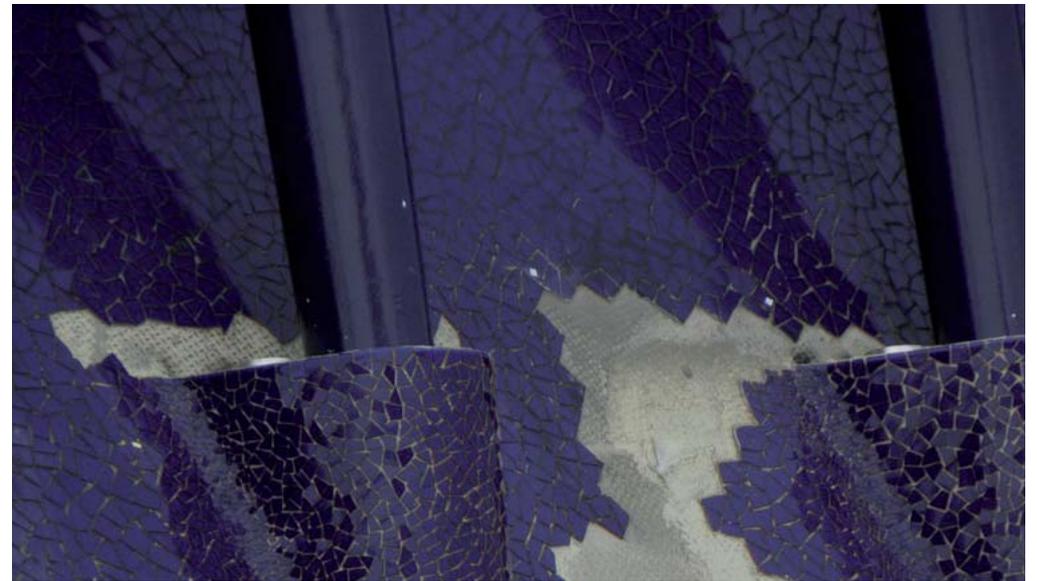
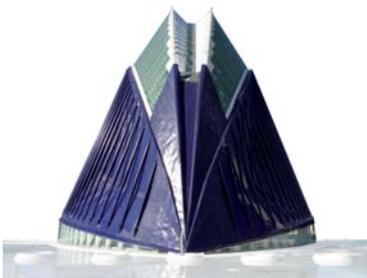




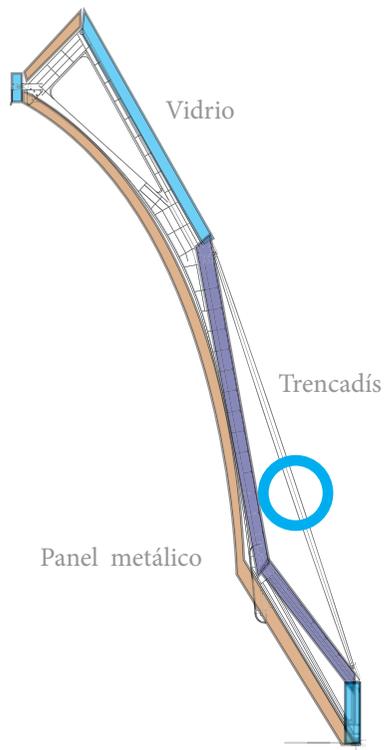
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OCULTO



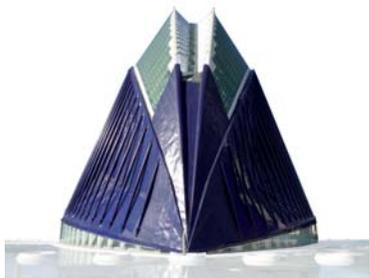
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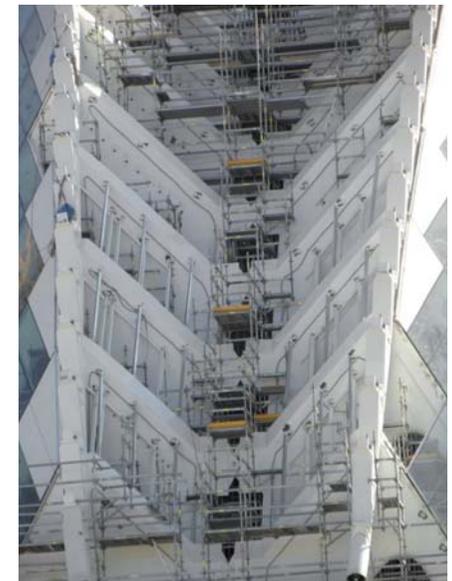
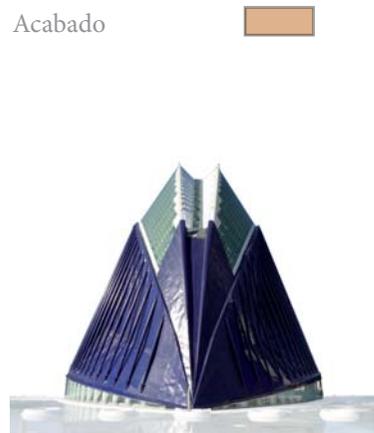
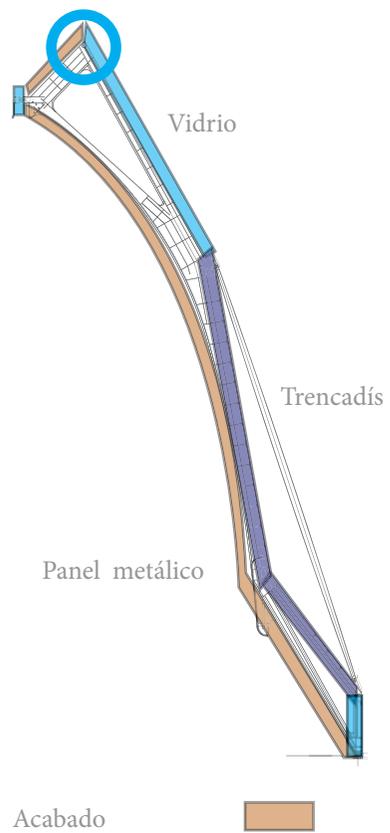
TRENCADÍS



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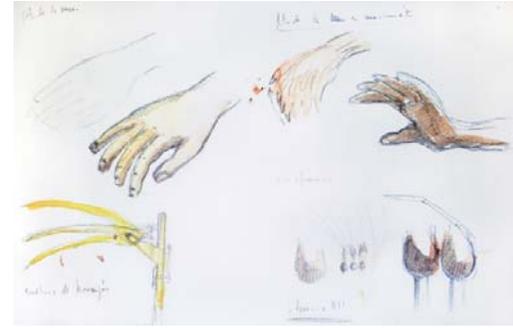
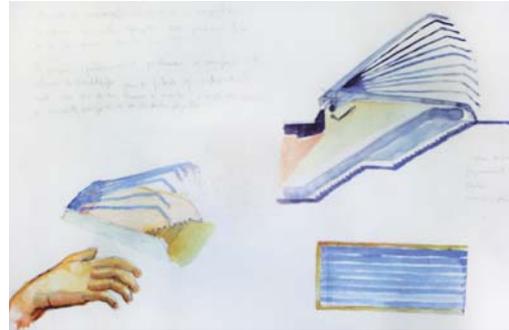


TORNAPUNTAS

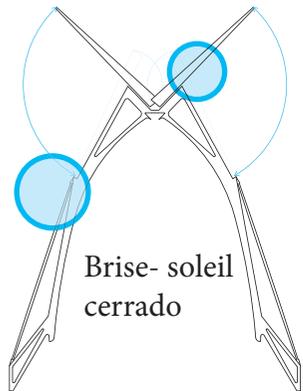


PANELES METÁLICOS



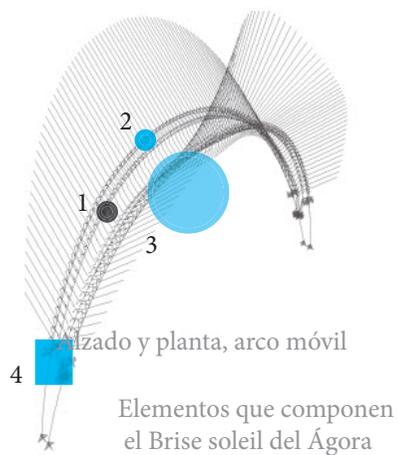
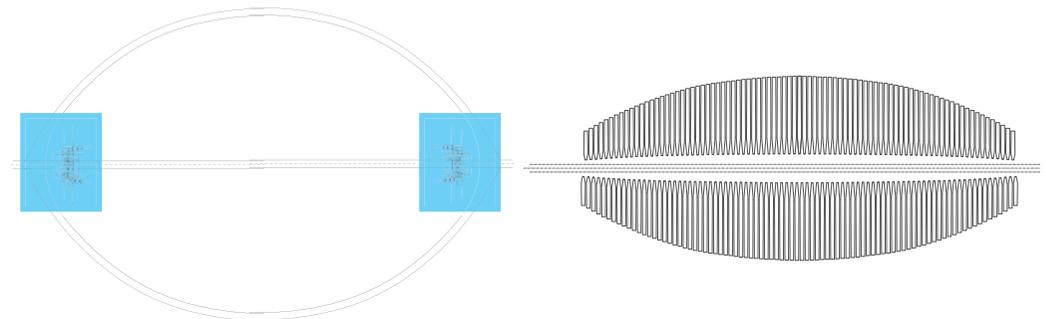
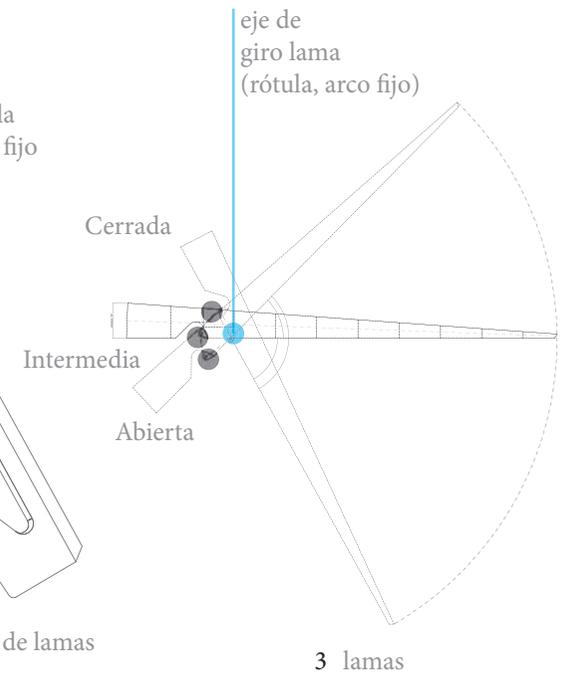
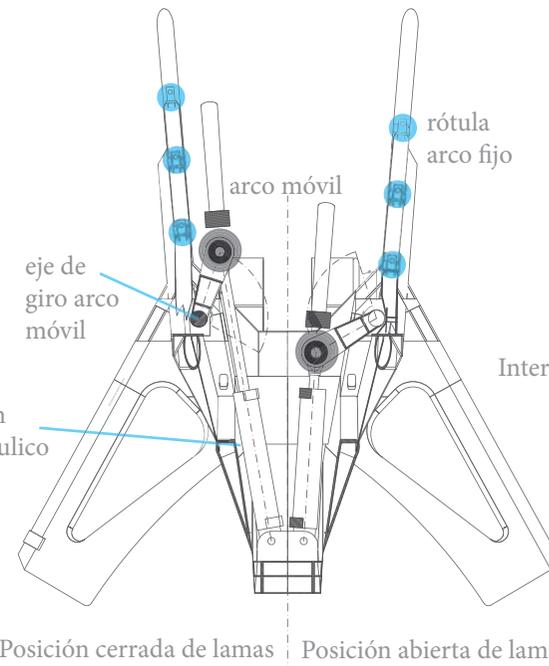
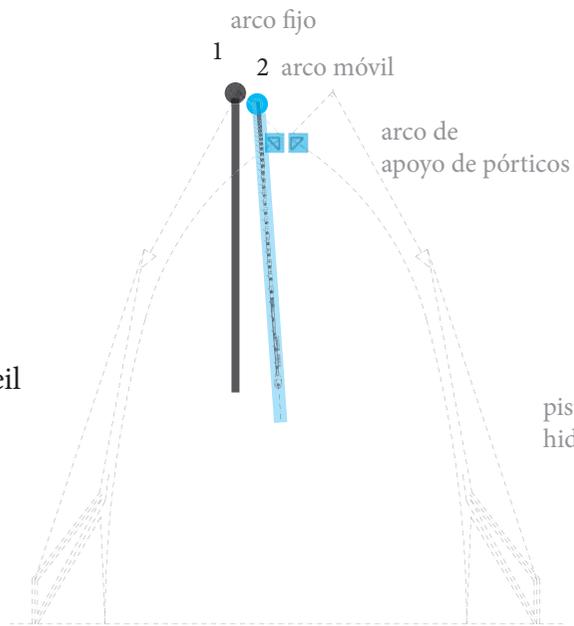
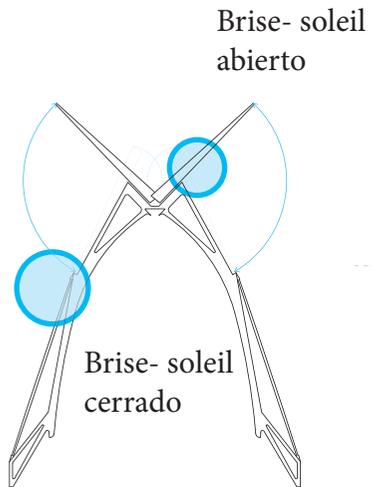


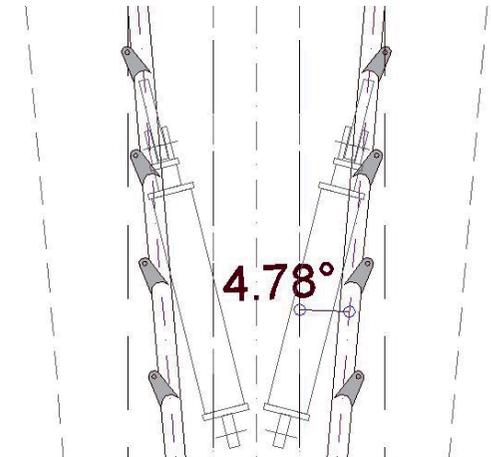
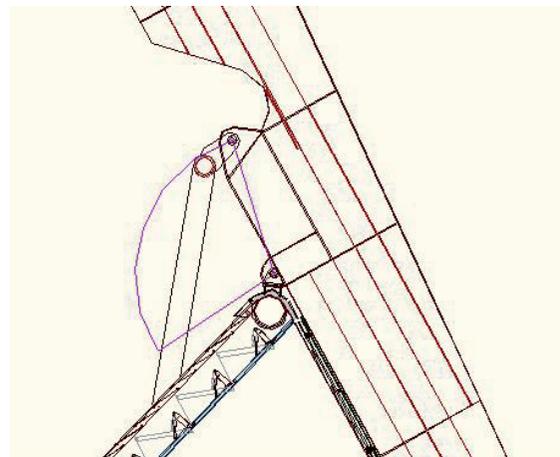
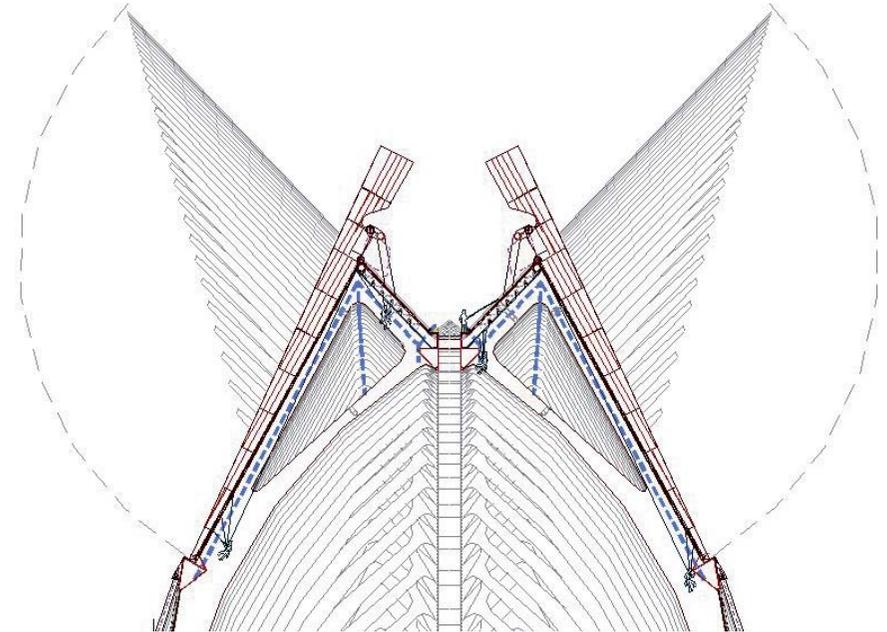
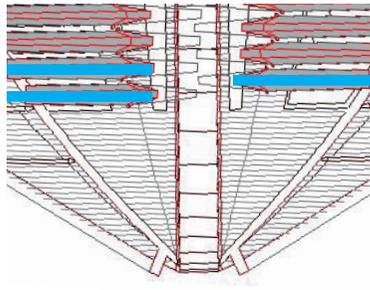
Brise-soleil  
abierto



Brise-soleil  
cerrado











Historia, forma, geometría, vanguardia en cálculo estructural y conocimiento del material son los ingredientes que combinados conforman esta nueva arquitectura.

El conocimiento de todos ellos y su interrelación para la planificación de la construcción da como resultado el objeto de análisis que ha sido este proyecto. Con la realización del mismo hemos entendido las motivaciones que han llevado a que el Ágora sea tal como es actualmente y con ello una parte de la nueva arquitectura de nuestro tiempo.