



## Ottobre 1995

L'Opera Romana per la Preservazione della Fede e la Provvista di Nuove Chiese in Roma, all'interno del progetto "50 Chiese per Roma 2000" avviato dal Papa nell'Aprile 1993, indice il concorso internazionale ad inviti per la Chiesa "Dives in Misericordia"



## October 1995

The Roman Institution for the Preservation of Faith and the Building of new Churches in Rome advertizes an international invitational competition for the construction of "Dives in Misericordia" Church

## June 1996

Of the six presented, it is Richard Meier's project that wins the competition

## February 1997

Richard Meier presents his project to the Pope John Paul II at the Vatican

## March 1998

The foundation stone is laid at the building site of the new Church

## Giugno 1996

### Progetto premiato

*"Le vele bianche ci condurranno verso un mondo nuovo"*  
**Richard Meier**



*"The Church of Mercy for John-Paul II at 'Dives in Misericordia' 1996"*

## Febbraio 1997

L'architetto Richard Meier presenta il suo progetto al Papa in Vaticano



*Estratto dal bando di concorso:*

*"... Perchè accanto ad altri segni, resti nei giorni, un segno del pellegrinaggio per l'Anno santo 2000 e dell'accoglienza da parte della Chiesa che è in Roma, ..."*

Tra i sei progetti presentati viene scelto quello dell'architetto americano Richard Meier. La giuria ha ritenuto questo progetto il più singolare sia da un punto di vista architettonico che da un punto di vista costruttivo e il più rispondente alle problematiche del quartiere Tor Tre Teste

## Marzo 1998

Posa della prima pietra per il cantiere della Chiesa "Dives in Misericordia" con la partecipazione del cardinal Camillo Ruini e delle autorità cittadine



**Italcementi**  
Italcementi Group

Sponsor tecnico della Chiesa "Dives in Misericordia"



Il nuovo cemento **Bianco TX Millennium** utilizzato per la realizzazione dei conci prefabbricati che costituiscono le tre vele, è il risultato di un'innovativa formulazione brevettata Italcementi. L'elemento caratterizzante deriva dalla presenza di particelle di fotocatalizzatori, costituite da una particolare forma di biossido di titanio.

The new **Bianco TX Millennium** white cement, used for executing the precast concrete blocks that form the three sails, originates from an innovative formula patented by Italcementi. The outstanding characteristic of this cement is the incorporation of photocatalytic particles made up of a special form of titanium dioxide.



Al centro della foto, l'approvazione del materiale e della superficie dei conci. Picture center: Mr Meier's written approval of materials and surface finish

L'architetto Richard Meier approva il tipo di materiale e di superficie dando il via ai lavori di realizzazione della Chiesa "Dives in Misericordia"

Architect Richard Meier approves the type of materials and surface finish. Construction of the "Dives in Misericordia" Church can now be started

## Luglio 1999

### MIX-DESIGN DEL CALCESTRUZZO

Aggregato:

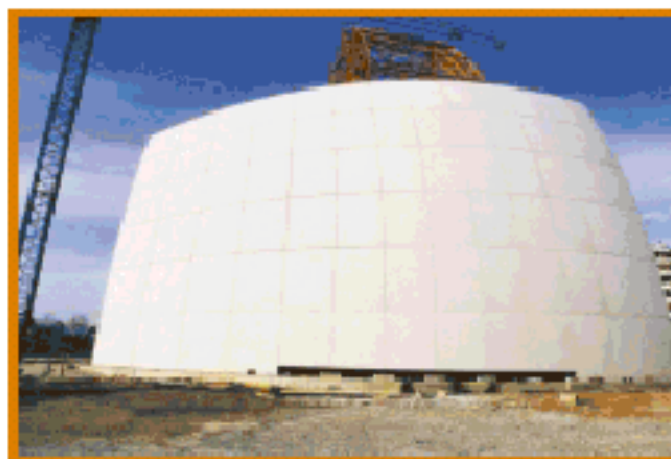
Frantumazione del Marmo di Carrara Kg./mc	
Polvere 0-0,9	(15%) = 278
Raggruppamento 0,9-4 mm	(25%) = 462
Raggruppamento 4-20 mm	(60%) = 1110
Cemento TX Millennium	= 380
Metacaolino preadditivato	(0,2%) = 38,7
Mapefluid X404 (2,4% legante)	= 10,45
Acqua totale	= 160*
Rapporto acqua/legante	= 0,383

\*- L'acqua totale d'impasto può subire variazioni in funzione della temperatura ambientale. In linea di massima si può collocare tra un range di 140-160 l/mc. In ogni caso il dosaggio dell'acqua va effettuato in modo da ottenere una classe di consistenza S5 del calcestruzzo.

## Luglio 2000



## Dicembre 2000



## Marzo 2001



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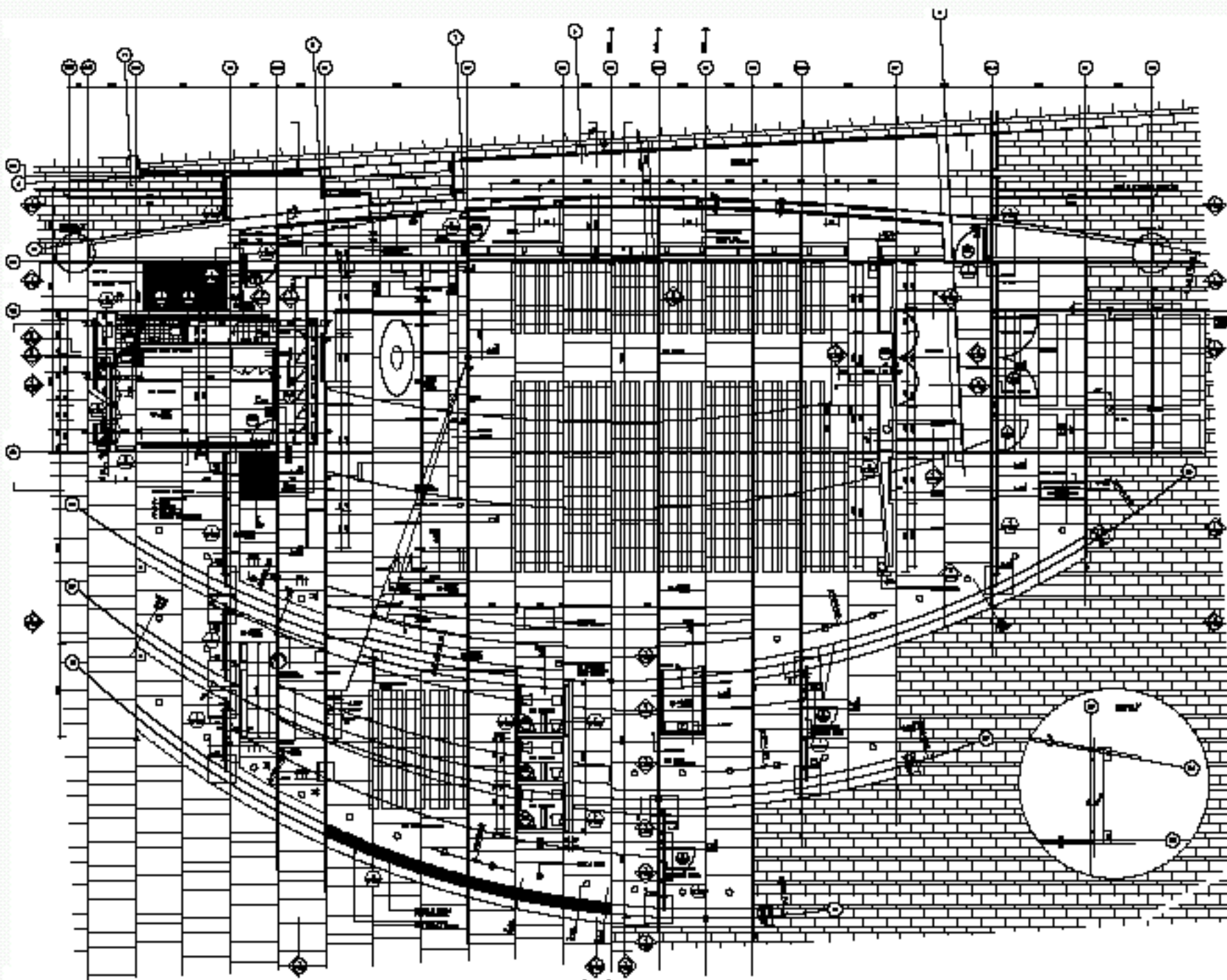
Sponsor tecnico della Chiesa "Dives in Misericordia"





Pianta  
della chiesa

Church plan



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18



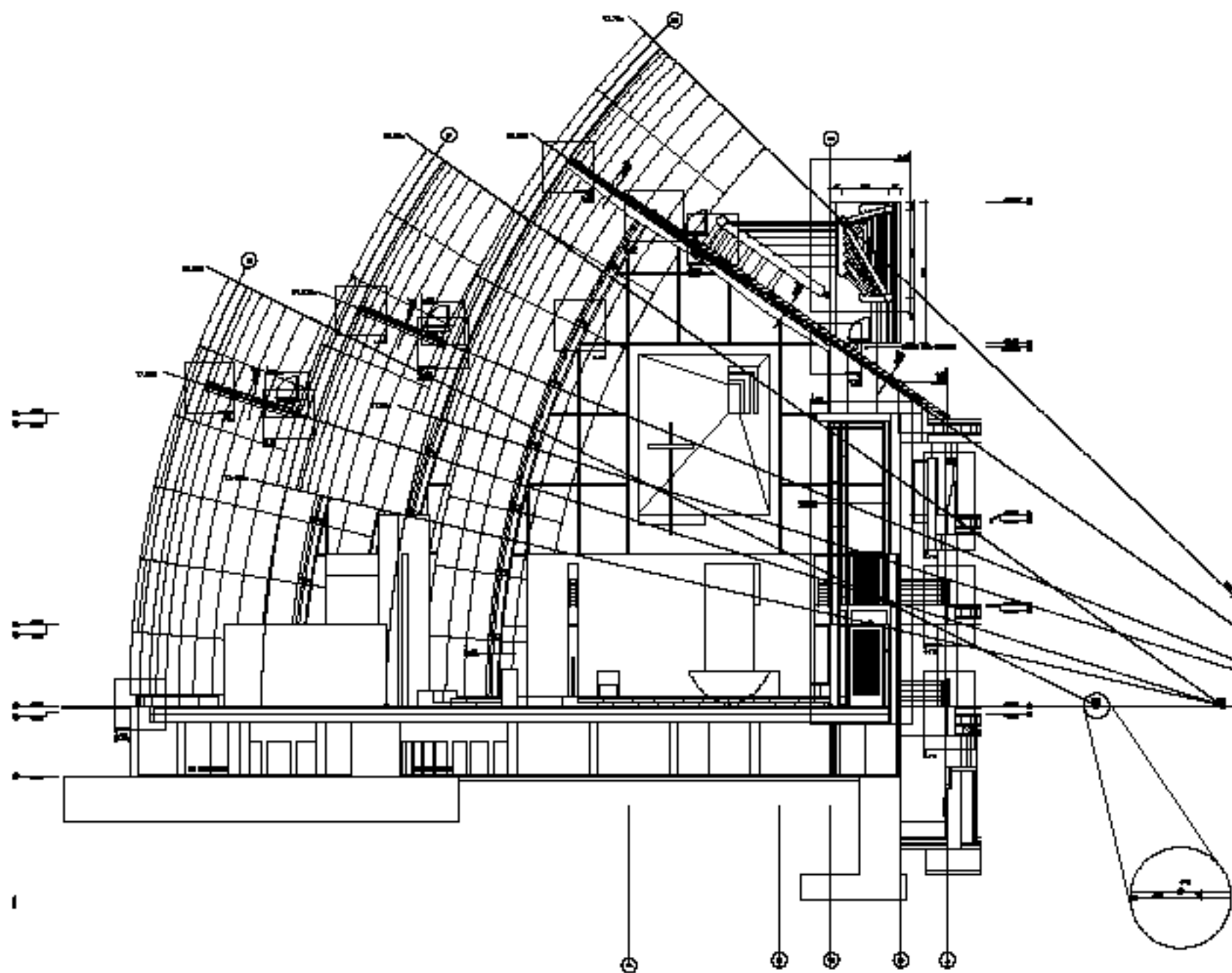
**Italcementi**  
Italcementi Group

Sponsor tecnico della Chiesa "Dives in Misericordia"

INGEGNERIA  
**LAMARO APPLTI S.P.A.**



Sezione  
trasversale  
Cross section



Scale	1:50
Author	...
Designer	...
Architect	...
Structural Engineer	...
Client	...
Date	...

Material	Symbol
Concrete	□
Steel	□
Brick	□
Insulation	□
Roofing	□
Other	□



Client	...
Project Name	...
Location	...
Start Date	...
End Date	...
Architect	...
Structural Engineer	...
Client Representative	...

Scale	1:50
Author	...
Designer	...
Architect	...
Structural Engineer	...
Client	...



**Italcementi**  
Italcementi Group

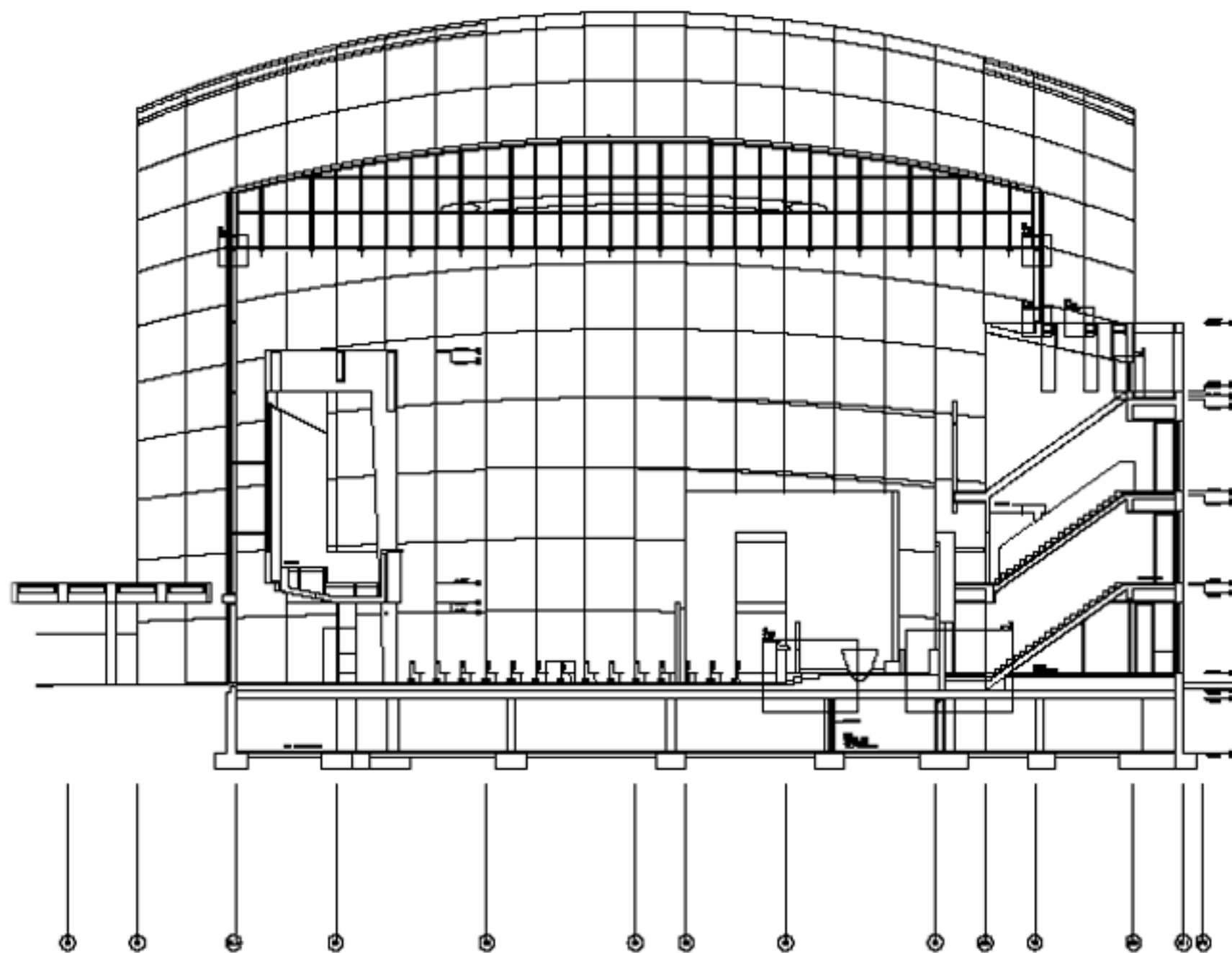
Sponsor tecnico della Chiesa "Dives in Misericordia"

INGEGNERIA STRUTTURALE  
**LAMARO APPLICATI S.P.A.**



**Sezione  
longitudinale**

**Longitudinal  
section**



Legend for the architectural drawing, detailing material and structural specifications. The legend includes symbols for concrete, steel, and other materials, along with their corresponding drawing styles.

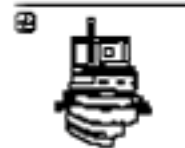


Table of technical specifications for the architectural drawing, listing project details such as the name of the church and the architect's name.

Table of technical specifications for the architectural drawing, listing project details such as the date and the architect's name.



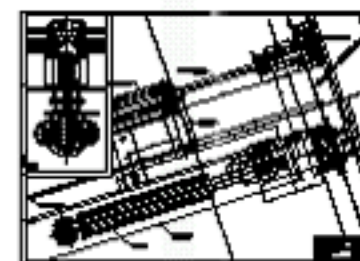
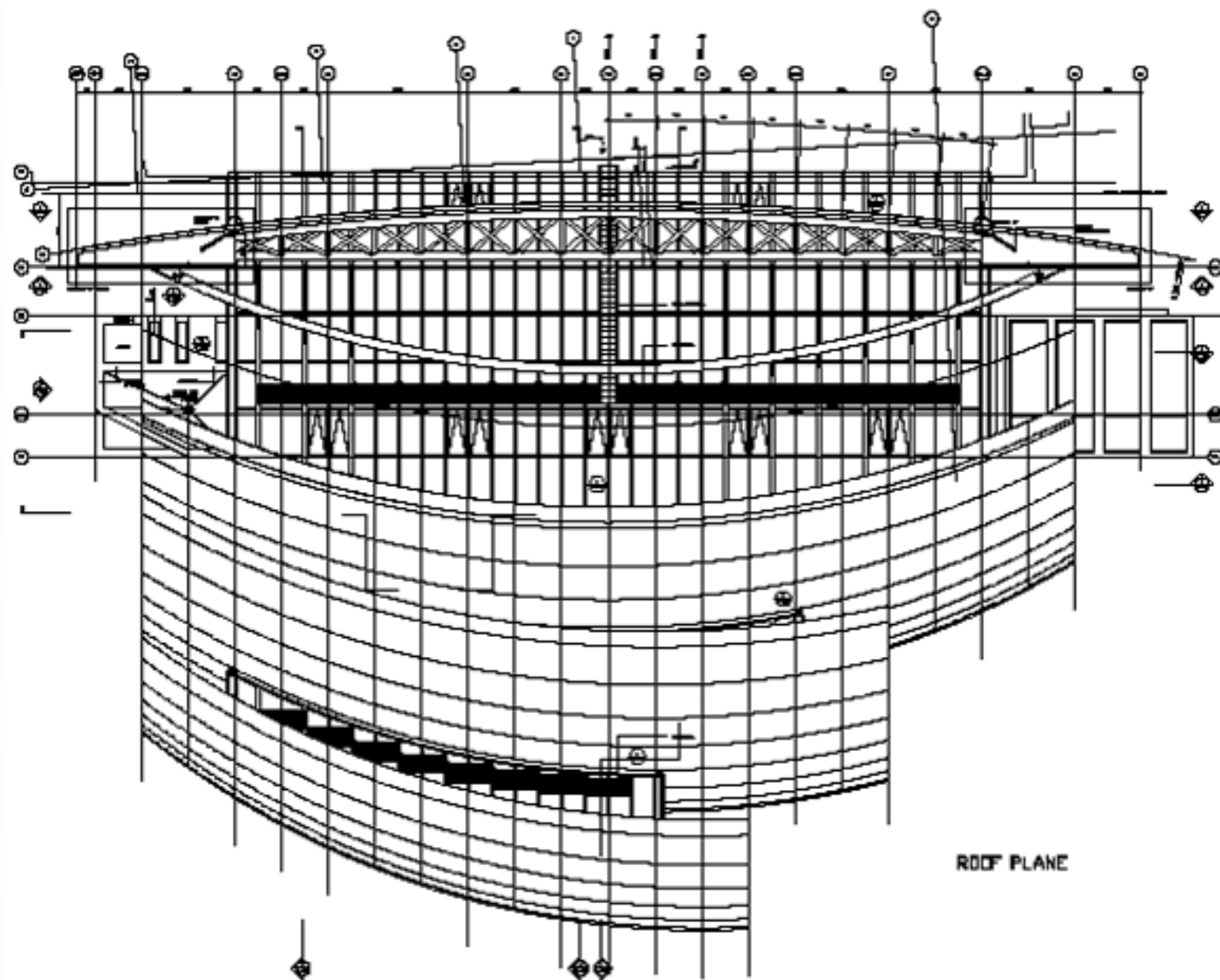
**Italcementi**  
Italcementi Group

Sponsor tecnico della Chiesa "Dives in Misericordia"

**LAMAO APPELLTI S.P.A.**

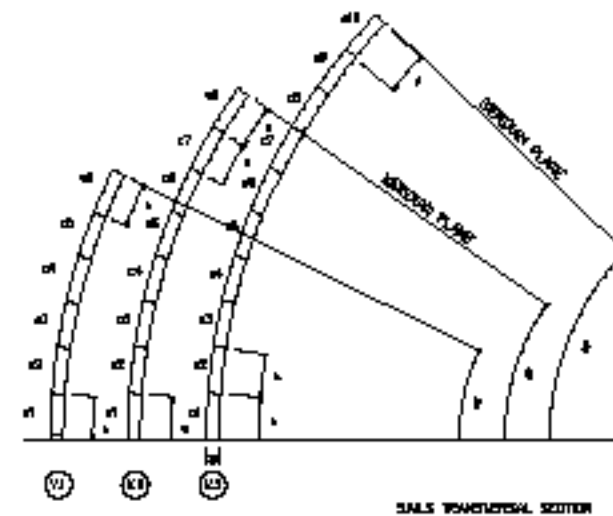
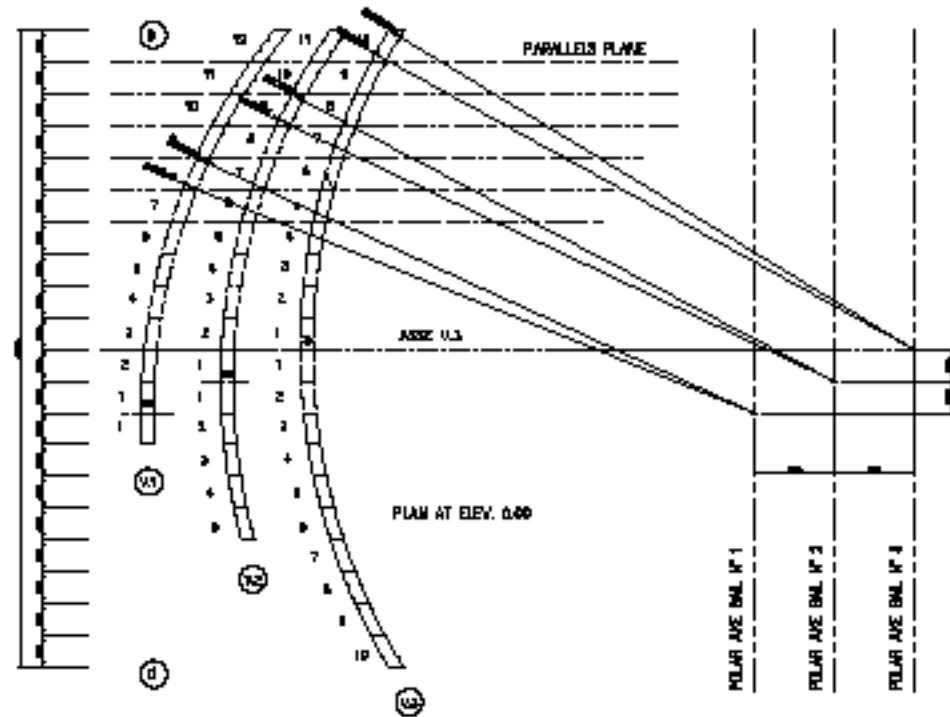
Pianta della  
copertura  
con dettagli  
dei serramenti

Roof plan  
with frame  
details



# Geometria degli elementi prefabbricati e generazione delle vele

# Geometry of the precast elements and sail generation



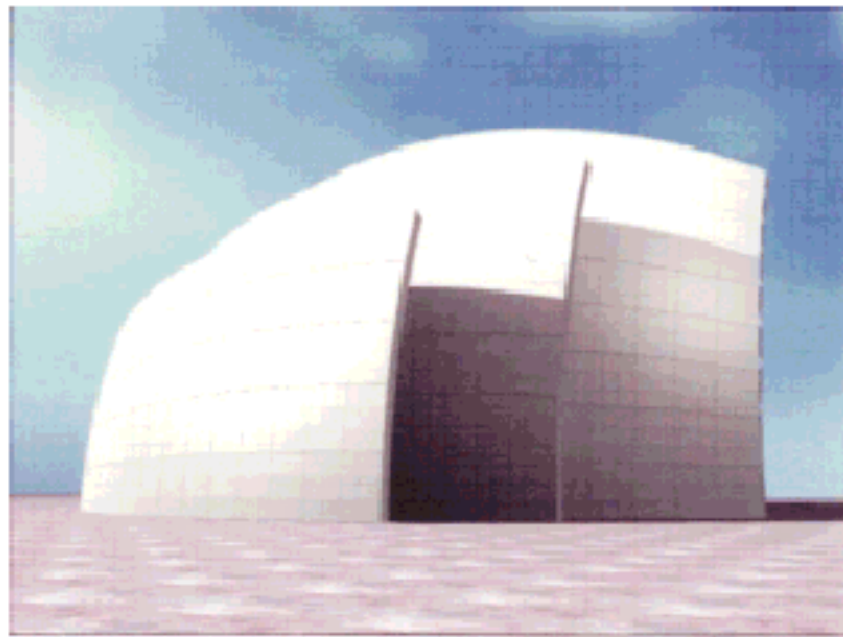
THE CHIMNEY: THE WHOLE OF THE PRECAST ELEMENTS LIMITED BY TWO ADJACENT MERIDIAN PLANES (DOTTED LINE).

THE CHIMNEY: THE WHOLE OF THE PRECAST ELEMENTS LIMITED BY TWO PARALLEL PLANES 2 AND CONSTANT CURVATURE (SOLID LINE).

THE PRECAST JOINT FROM WHICH THE SAIL SURFACE IS GENERATED LAY DOWN ON AN HORIZONTAL PLANE.

THE CHIMNEY IS REPRESENTATIVE FOR THE GEOMETRY OF THE SAILS.

THE POSITIONING OF THE CENTER OF EACH SAIL OF THE CHIMNEY LINES POINTS TO ASSURE THE GEOMETRY OF THE GEOMETRY THAT CHARACTERIZES EACH WHOLE CHIMNEY.

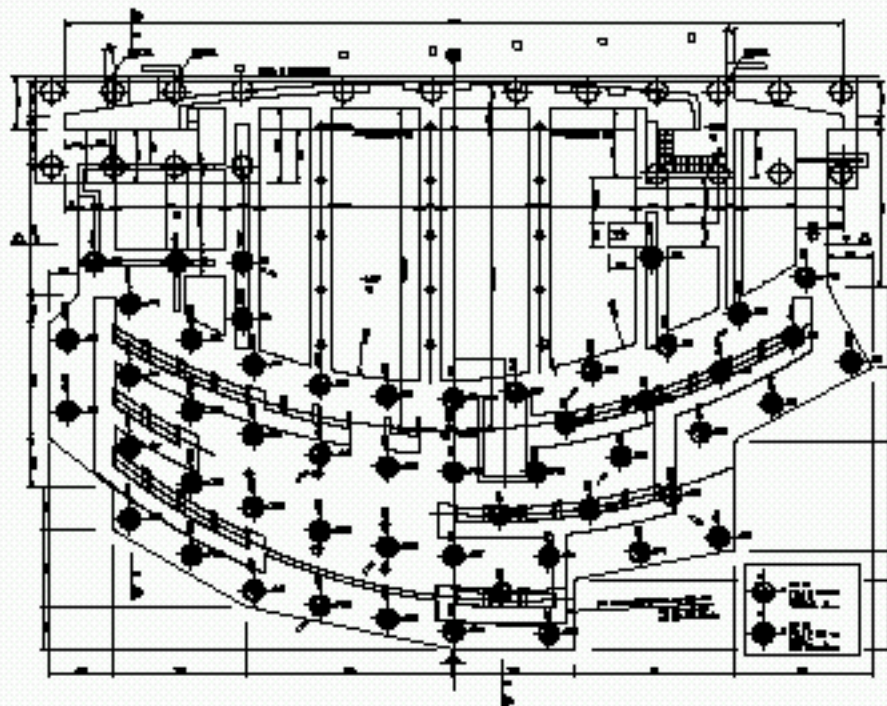




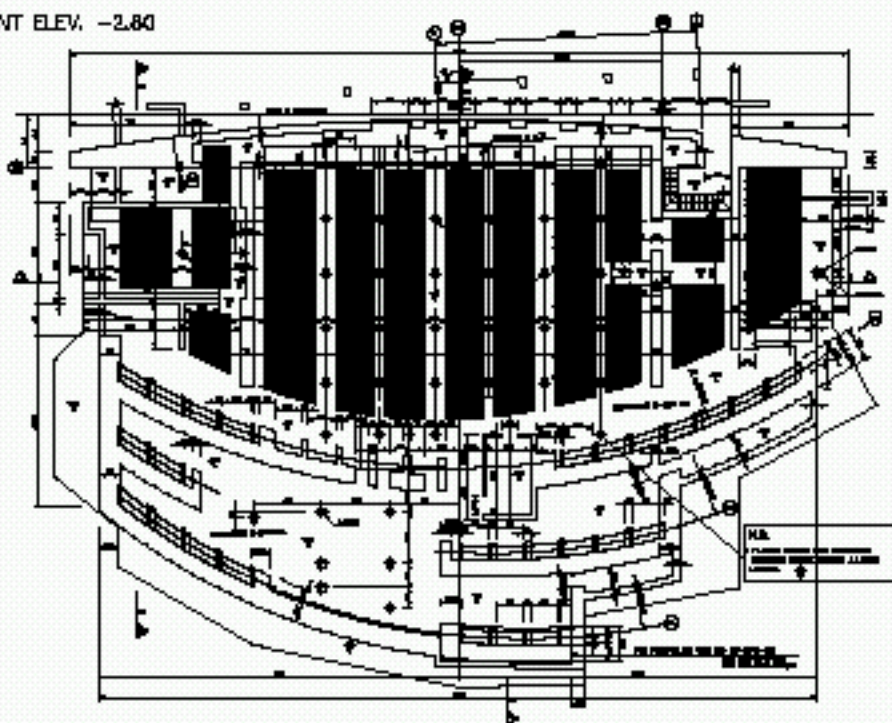


# Fondazioni Foundations

PLAN ELEV. -4.80



PLANT ELEV. -2.80



REINFORCEMENT OF THE FOUNDATION PLATE



CASTING RESTART REINFORCEMENTS AT ELEV. -2.80



DETAIL OF THE MOLDING FOR THE SLIDING BEARING OF THE SAIL N°1



**Italcementi**  
Italcementi Group

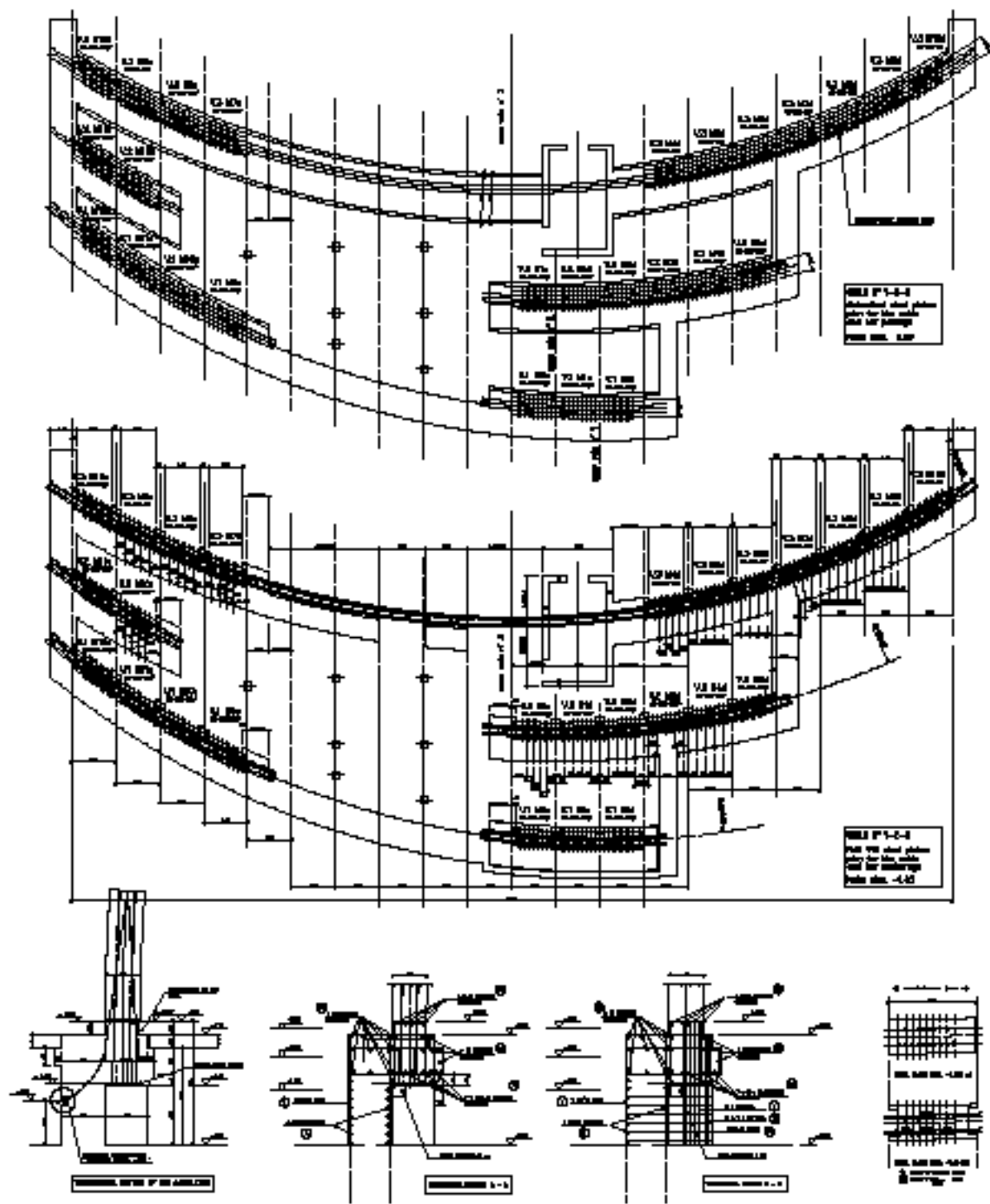
Sponsor tecnico della Chiesa "Dives in Misericordia"

GRUPPO EDILIZIO  
**LAMARCO APPLTI & P.A.**



Mensole di  
incastro delle  
vele nelle  
fondazioni

Foundation  
restraint  
cantilever  
of the sails



REINFORCEMENT OF THE EAST SIDE CANTILEVER OF THE SAIL N° 3



SAIL N° 3 - SHEATHS FOR THE PASSAGE OF BARS AND VERTICAL CABLES



STEEL PLATES AND SHEATHS OF THE THREE SAILS



**Italcementi**  
Italcementi Group

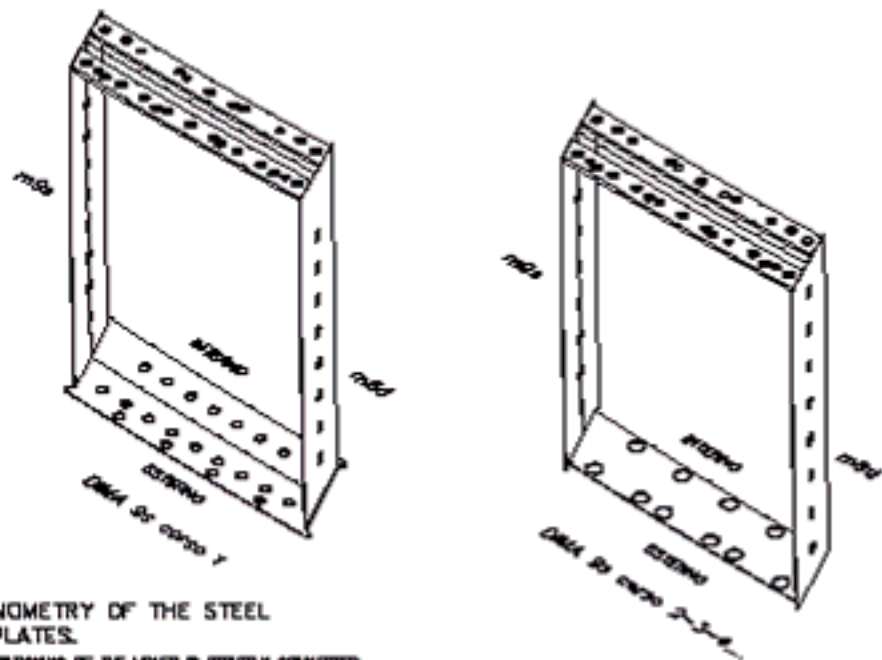
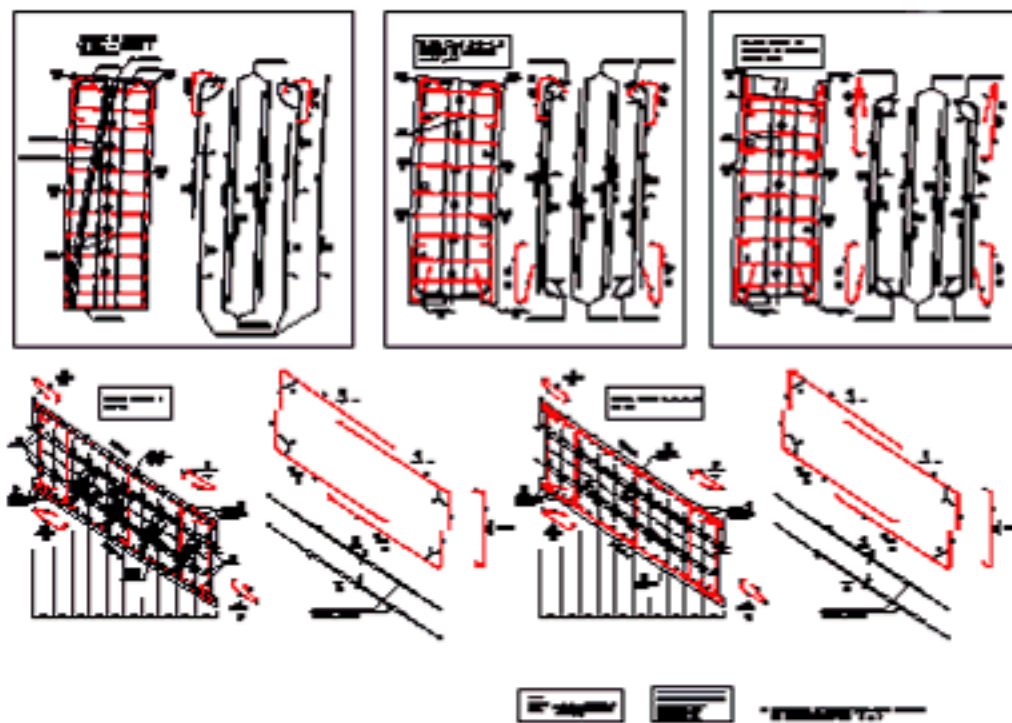
Sponsor tecnico della Chiesa "Dives in Misericordia"

INGEGNERIA STRUTTURALE  
**LANIANO APPALTI S.P.A.**



Il concio:  
armatura ed  
assemblaggio  
nel cantiere di  
prefabbricazione

The block:  
reinforcement  
and assembling  
at the concrete  
precasting plant



AXONOMETRY OF THE STEEL  
TEMPLATES.

THE POSITIONING OF THE HOLES IS STRICTLY CONNECTED  
TO THE LAY-OUT OF THE BARS AND THE CABLES.

BLOCK REINFORCEMENT - POSITIONING OF THE SHEATHS



LAYING FOR THE STEEL FE B44K AND INOX REINFORCEMENT



THE FINISHED CAGE IS POSITIONED IN THE FORMWORK



**Italcementi**  
Italcementi Group

Sponsor tecnico della Chiesa "Dives in Misericordia"

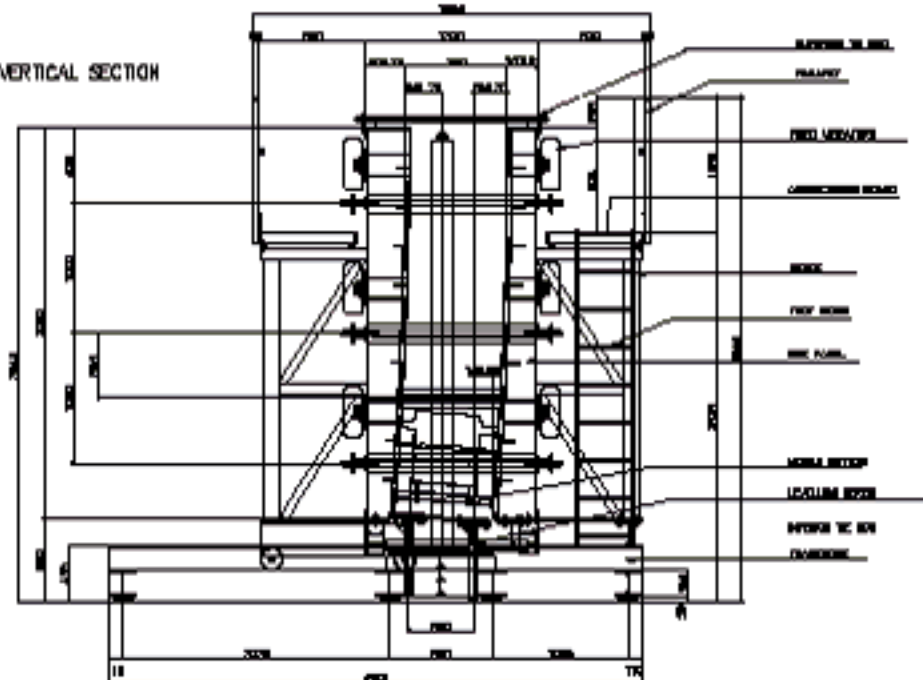
SPERIMENTAZIONE  
**LAMARO APPLICATI S.P.A.**



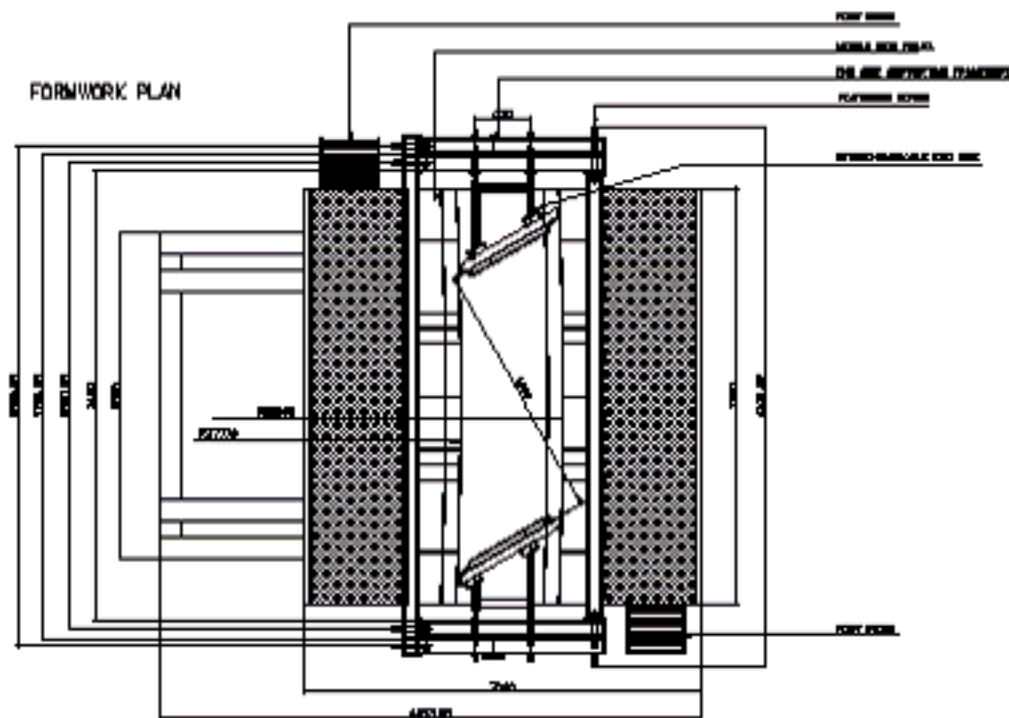
# Il cassero e il sistema di vibrazione ad aghi

# The formwork and the immersion vibration system

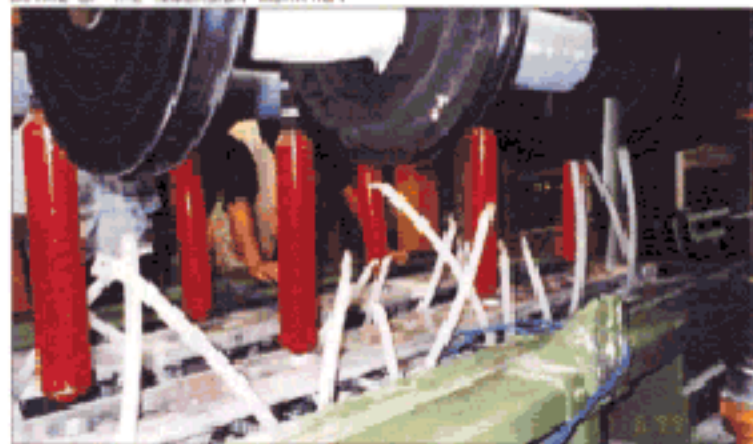
FORMWORK VERTICAL SECTION



FORMWORK PLAN



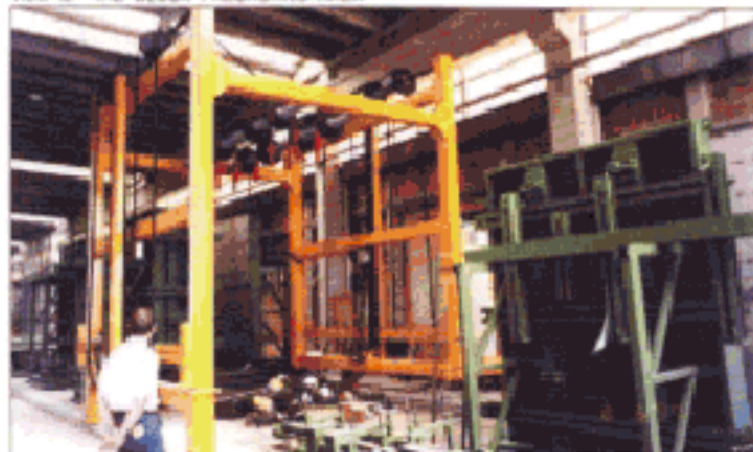
DETAIL OF THE IMMERSION VIBRATION



VIEW OF THE SIDE PANEL OF THE FORMWORK



VIEW OF THE BLOCK PRECASTING AREA



**Italcementi**  
Italcementi Group

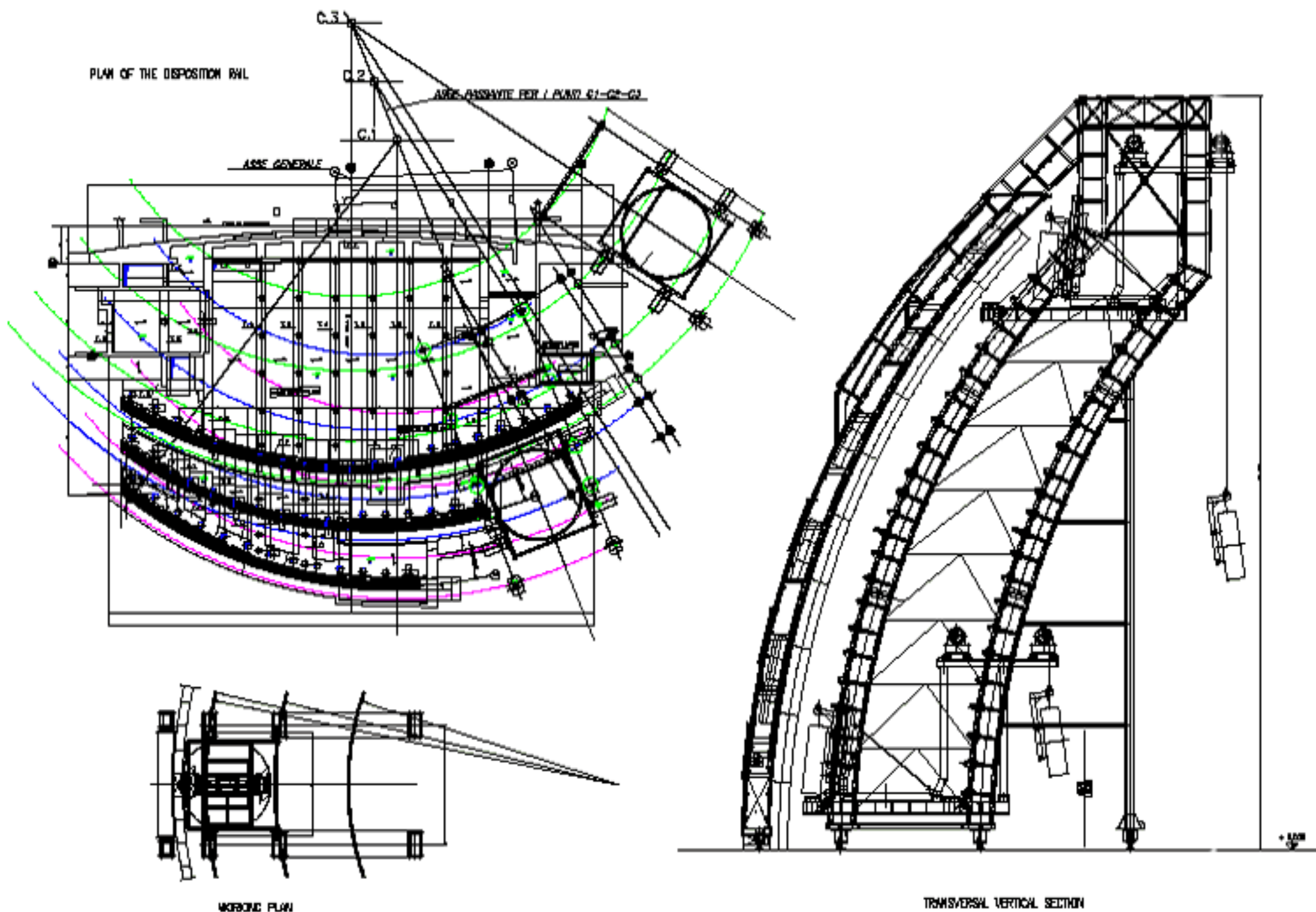
Sponsor tecnico della Chiesa "Dives in Misericordia"

REPRIMA IMPRESA  
**LAMARO APPLICATI S.P.A.**



Progetto  
della macchina  
di montaggio  
dei conci

Block-  
assembling  
machine  
design



**Italcementi**  
Italcementi Group

Sponsor tecnico della Chiesa "Dives in Misericordia"

INGEGNERIA E ARCHITETTURA  
**LAMARO APPLICATI S.P.A.**



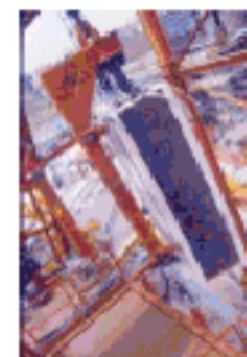
VICARIATO DI ROMA

# La macchina di montaggio dei conci

# The block assembling machine



Vista aerea della macchina di montaggio dei conci  
Top view of the block positioning machine



Sollevamento del concho  
Block winching



Concho adagato sulla "manina"  
Block positioning



Pulitura dei fori delle guaine  
Block cleaning



Vista laterale del montaggio delle vele  
Side view of sail assembling



Vista laterale della "manina" di posizionamento dei conci  
Side view of the device for block positioning



Piano di lavoro visto da sotto  
Bottom view of the working platform

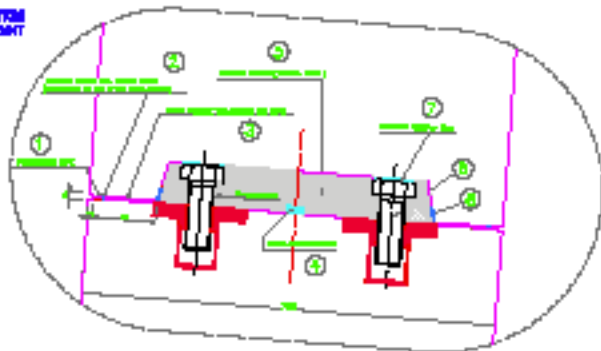


**Italcementi**  
Italcementi Group

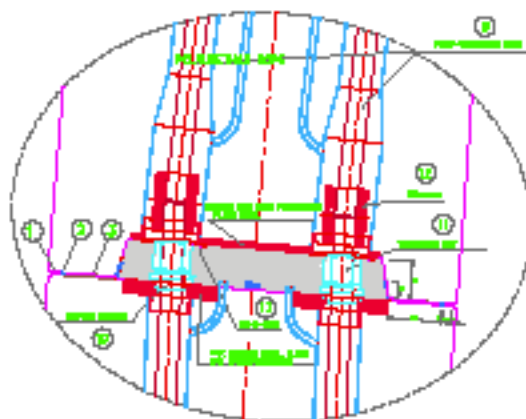
Sponsor tecnico della Chiesa "Dives in Misericordia"

**LAMAR APPELLI S.P.A.**

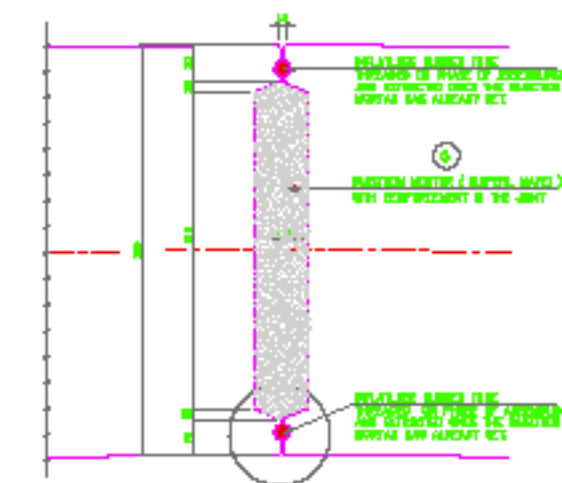
VERTICAL SECTION  
HORIZONTAL JOINT  
scale 1:1



VERTICAL SECTION  
HORIZONTAL JOINT  
scale 1:1



VERTICAL JOINT PLAN  
scale 1:1



OPTICAL  
scale 1:1  
where in "true"



**PROCEDURE FOR ASSEMBLING THE BLOCKS**

**OPERATIONS DURING POSITIONING**

**PRELIMINARY STOPS**

The blocks must be moved from a central long line of edge reinforcement along the edge of the wall in line with the reinforcement to a grid bearing in mind assembly of the reinforcement. The work should be carried out in a way that ensures the reinforcement is laid before the top reinforcement is laid in the previous courses.

- The block may be placed in the position intended to be in the position of the reinforcement.
- The reinforcement bars should be laid in the position intended to be in the position of the reinforcement.
- Check the reinforcement bars are correctly positioned and the reinforcement is laid in the position intended to be in the position of the reinforcement.

Check the block has been positioned correctly. It will be impossible to move the block if it is not in the correct position.

**IN THE HORIZONTAL JOINT**

- The effective length of the reinforcement bars should be checked with other reinforcement.
- Positioning of the reinforcement bars should be checked with other reinforcement.
- Positioning of the reinforcement bars should be checked with other reinforcement.
- Positioning of the reinforcement bars should be checked with other reinforcement.

**IN THE VERTICAL JOINT**

- Positioning of the reinforcement bars should be checked with other reinforcement.
- Positioning of the reinforcement bars should be checked with other reinforcement.

**OPERATIONS REQUIRED ONCE THE BLOCK IS IN POSITION**

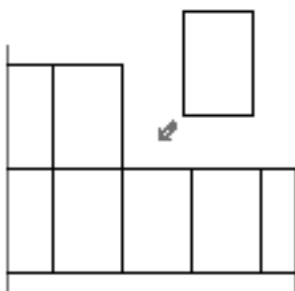
- Positioning of the reinforcement bars should be checked with other reinforcement.
- Positioning of the reinforcement bars should be checked with other reinforcement.
- Positioning of the reinforcement bars should be checked with other reinforcement.
- Positioning of the reinforcement bars should be checked with other reinforcement.

**TENSIONING OF THE BARS AND CABLES**

- Check the tensioning of the reinforcement bars and cables is carried out in accordance with the specifications.
- Positioning of the reinforcement bars should be checked with other reinforcement.
- Positioning of the reinforcement bars should be checked with other reinforcement.

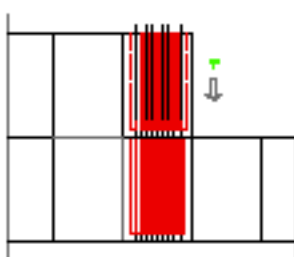
Check the tensioning of the reinforcement bars and cables is carried out in accordance with the specifications.

PHASE ① = APPROACHING OF THE BLOCK



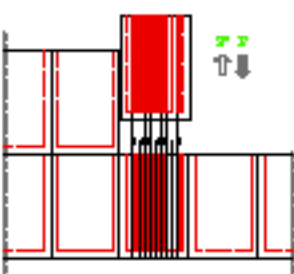
FRONTAL VIEW OF THE BLOCKS

PHASE ② = POSITIONING OF THE BLOCK AND ADVANCEMENT SCREWS



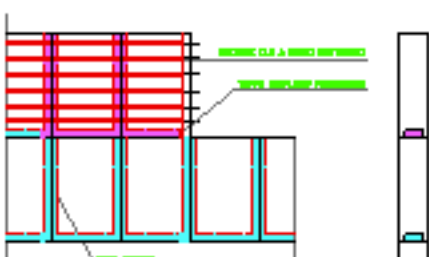
FRONTAL VIEW OF THE BLOCKS

PHASE ③ = WINDING OF THE BLOCK AND TIGHTENING OF THE BARS



FRONTAL VIEW OF THE BLOCKS

PHASE ④ = THE FINAL POSITIONING OF THE BLOCK AND THE REINFORCEMENT OF THE JOINT



FRONTAL VIEW OF THE BLOCKS

SECTION OF THE BLOCKS

Assemblaggio dei conci: particolari dei giunti verticali ed orizzontali

Assembling the blocks: vertical and horizontal joint details



## Fasi di assemblaggio dei conci

## Steps of block assembling



**Pulitura dei fori delle guaine prima del montaggio**  
Cleaning of the sheath holes before block assembling



**Tensionamento delle barre verticali**  
Vertical bar tensioning



**Vista generale dei giunti verticali delle barre e dei tubi d'iniezione**  
General view of the bars and grouting ducts vertical joints



**Preparazione del martinetto per il tensionamento dei cavi**  
Setting the pulling jack for cable tensioning



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Italcementi Group

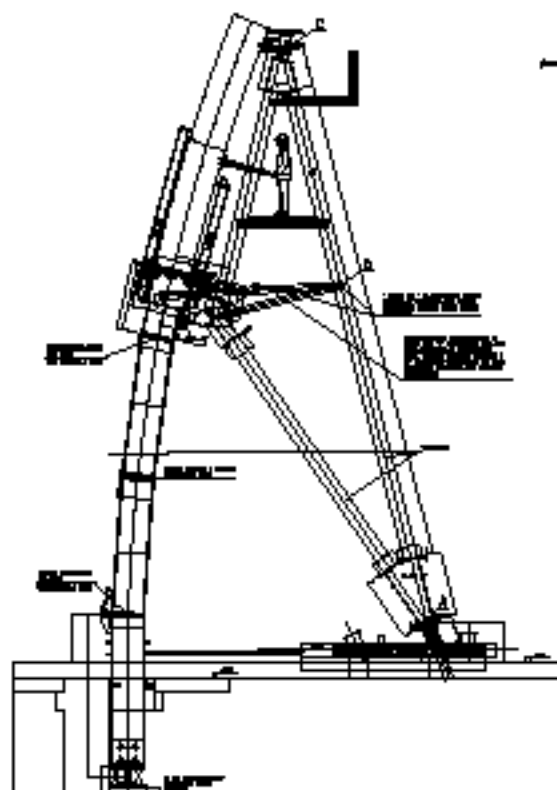
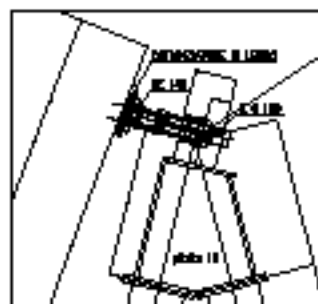
Sponsor tecnico della Chiesa "Dives in Misericordia"

**LAMARO APPALTI S.P.A.**





## VERTICAL SECTION OF THE TYPICAL PILLAR



BRAC PER TRAMBE 240  
PILLAR AND THE LINTEL  
PLAN



TRAMBE PER PILLAR  
SECTION



TRAMBE PER PILLAR  
SECTION



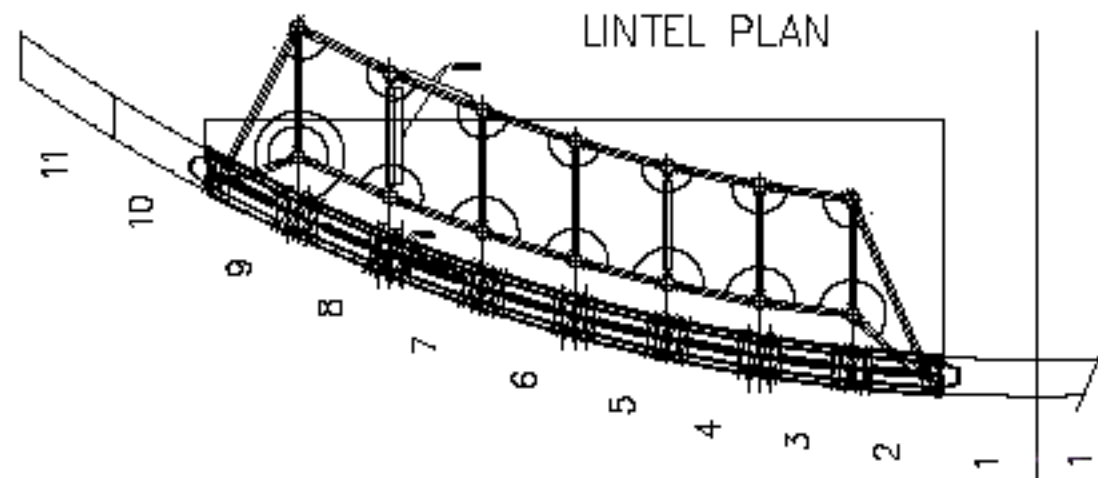
TRAMBE PER PILLAR  
SECTION



LANARD APPELLI S.P.A.

Puntelli  
provvisori  
dell'architrave  
della 2<sup>a</sup> vela

Temporary  
pillars of sail  
No. 2 lintel



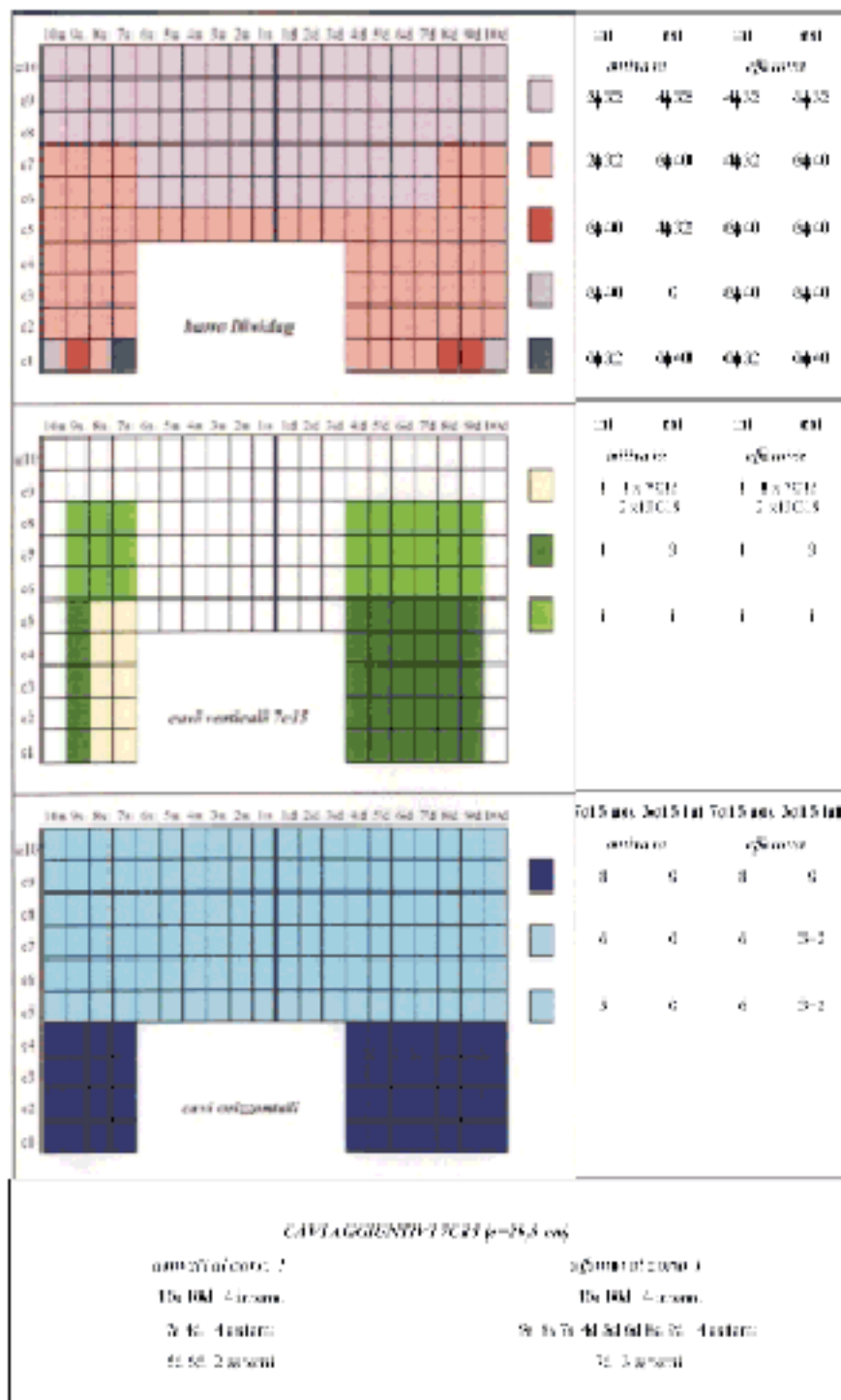
**Italcementi**  
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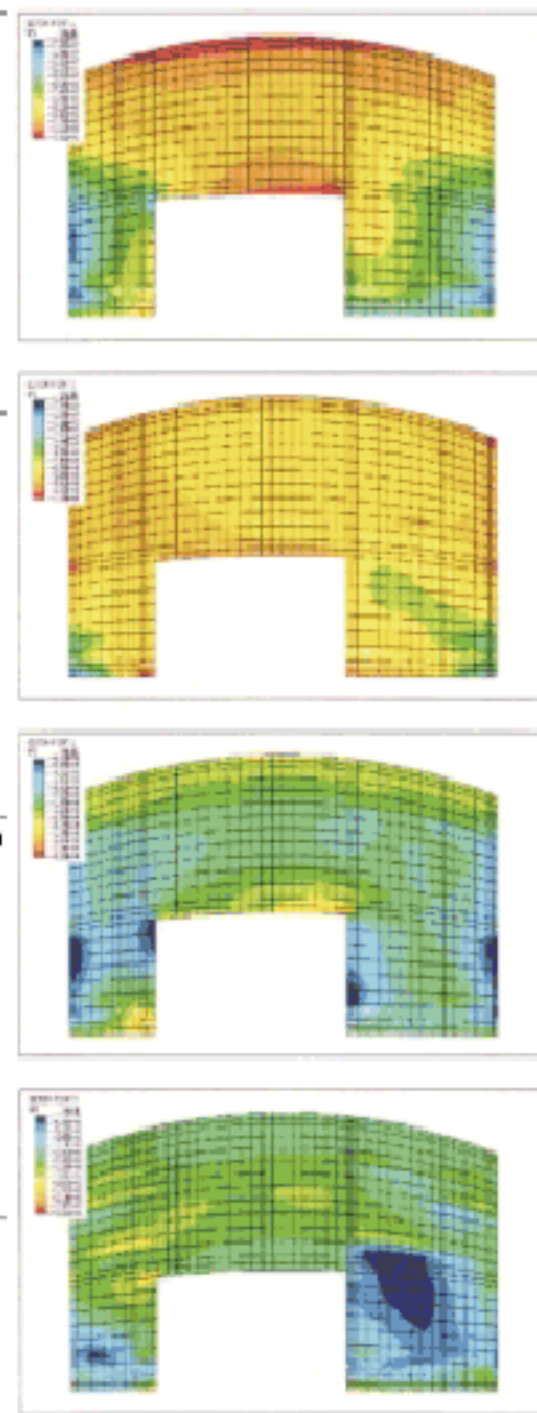


Armatura di post-tensione  
 Sforzi nelle vele  
 Deformazione  
 Post-tensioning reinforcement  
 Sail stresses  
 Stress-strain curves

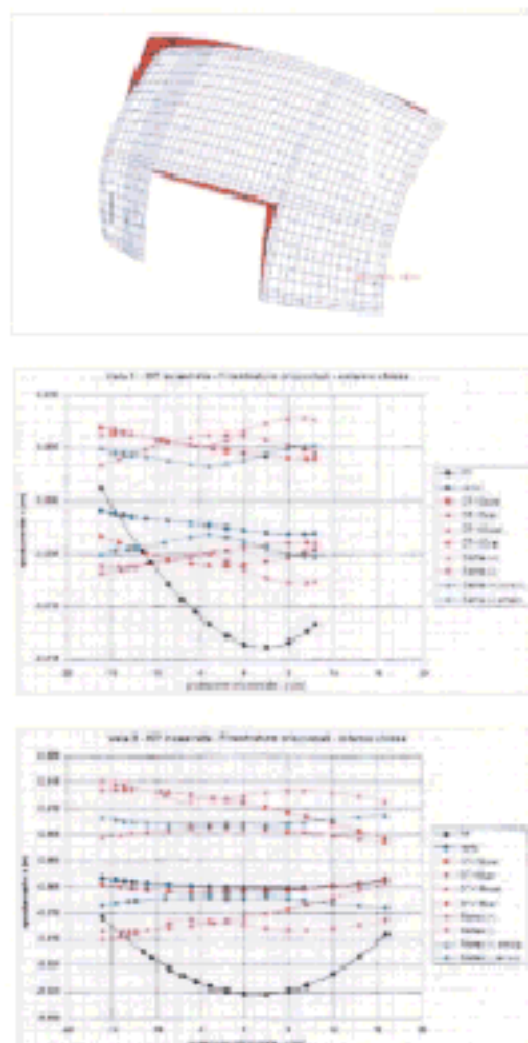
SAIL N° 3 : POST-TENSIONING BARS AND CABLES



LOAD CONDITION : DEAD LOAD, POST-TENSIONING AND WIND



DISTORTION OF THE SAIL N° 3



**PRINCIPALS STRESS**

SP1 = LOWER PRINCIPAL STRESSES  
 ( max. compression )

SP2 = HIGHER PRINCIPAL STRESSES  
 ( min. compression )

SECTION POINT 1 = INTERNAL SURFACE

SECTION POINT 2 = EXTERNAL SURFACE

Unità di misura = PARZIAL  
 $1Pa=1N/m^2 = 10^{-4}$

