TENSOCRET

SISTEMAS PREFABRICADOS EN HORMIGÓN ARMADO Y PRETENSADO

www.tensocret.cl

INNOVATION AND TECHNOLOGY

PREFABRICATED BUILDINGS IN SEISMIC ZONES

REAL CASES

DIEGO MELLADO NOGUEIRA

A land of natural beauty

And modern buildings

Santiago de Chile - October 25, 2019

27F Chile Earthquake

Magnitud Mw=8.8

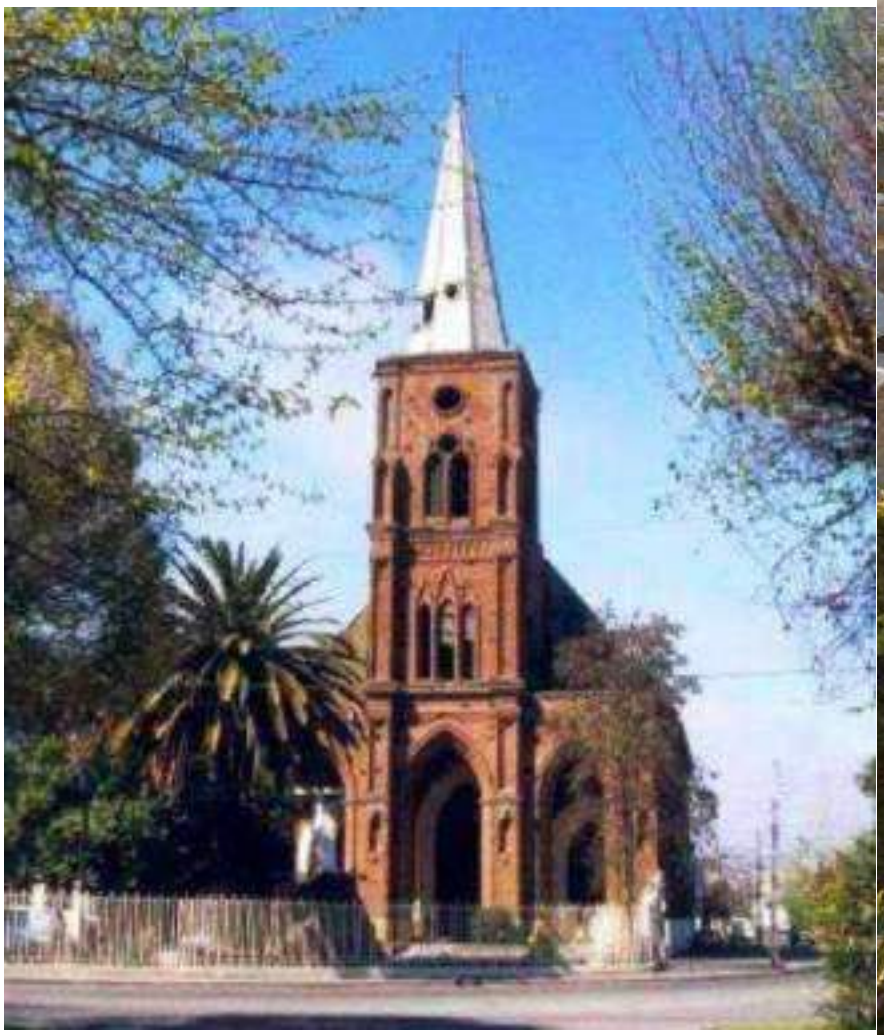
Epicenter: Cobquecura

Depth: 35 Km

Date: 27 Feb. 2010

Time: 3:35 AM

Church in Curico



Building - Concepción

Non structural damage

Tsunami damage

Precast Structures

Precast Claadding Panels

THE FACTS

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1.- Extensive damage in non engineered structures

Unreinforced Masonry

Adobe construction

Near 500 fatalities, most of them on adobe construction

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2.- Limited damage in concrete buildings

Very good performance with less than 2% of buildings damaged (9 stories and up)
4 buildings collapsed
Less than 20 people died in structures with seismic a design
Less than 40 of them had to be demolished

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3.- Limited damage in precast structures

Good performance in general
Some damage mostly related to large displacement demands (bad soils)
Cinematic compatibility issues

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Good performance in general
Some damage mostly related to large displacement demands (bad soils)
Cinematic compatibility issues

4.- Tsunami was a game changer

Near 200 fatalities can be attributed to the tsunami

THE MOST IMPORTANT LESSON…

Life safety is paramount …

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Life safety is paramount …

but is not enough

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but is not enough any more …

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Life safety is paramount …

but is not enough any more …

Resilience should be the goal !!!

THE MOST IMPORTANT LESSON…

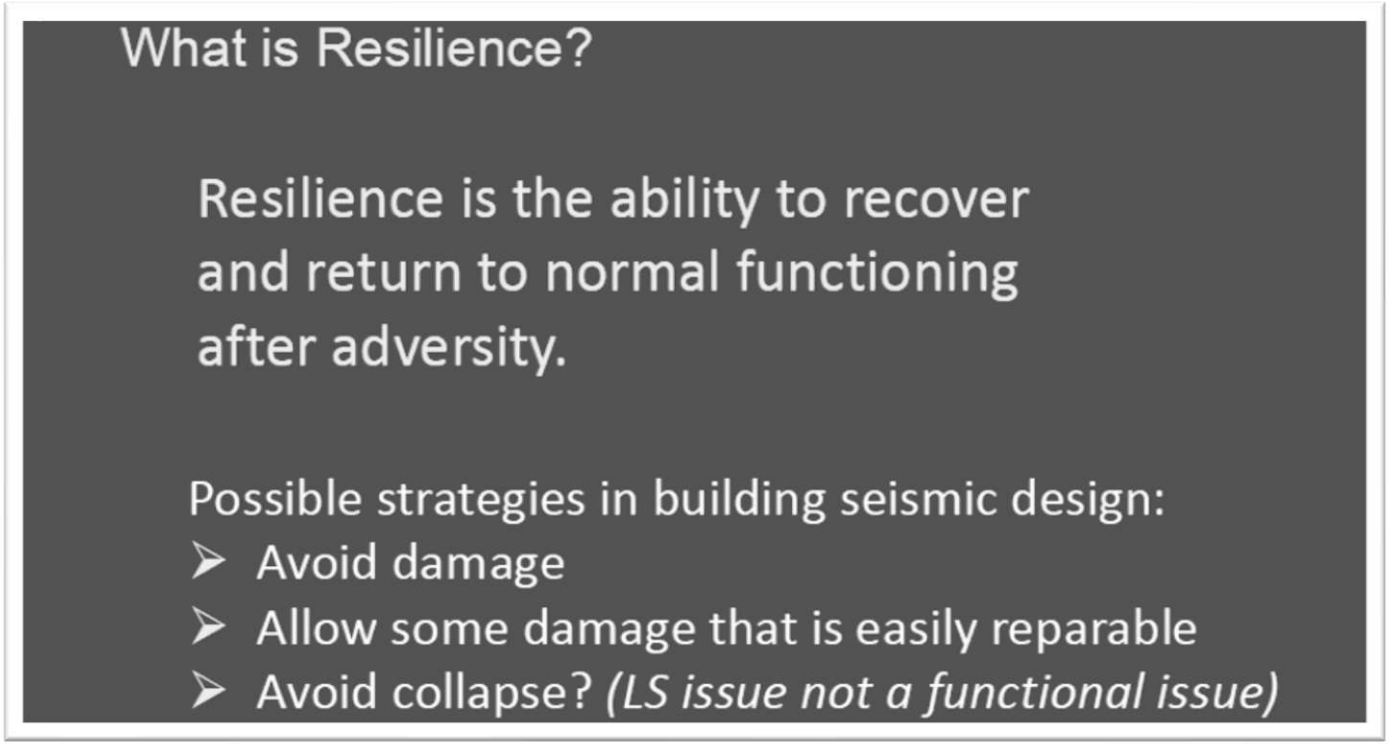
What is Resilience?

Resilience is the ability to recover and return to normal functioning after adversity.

Possible strategies in building seismic design:

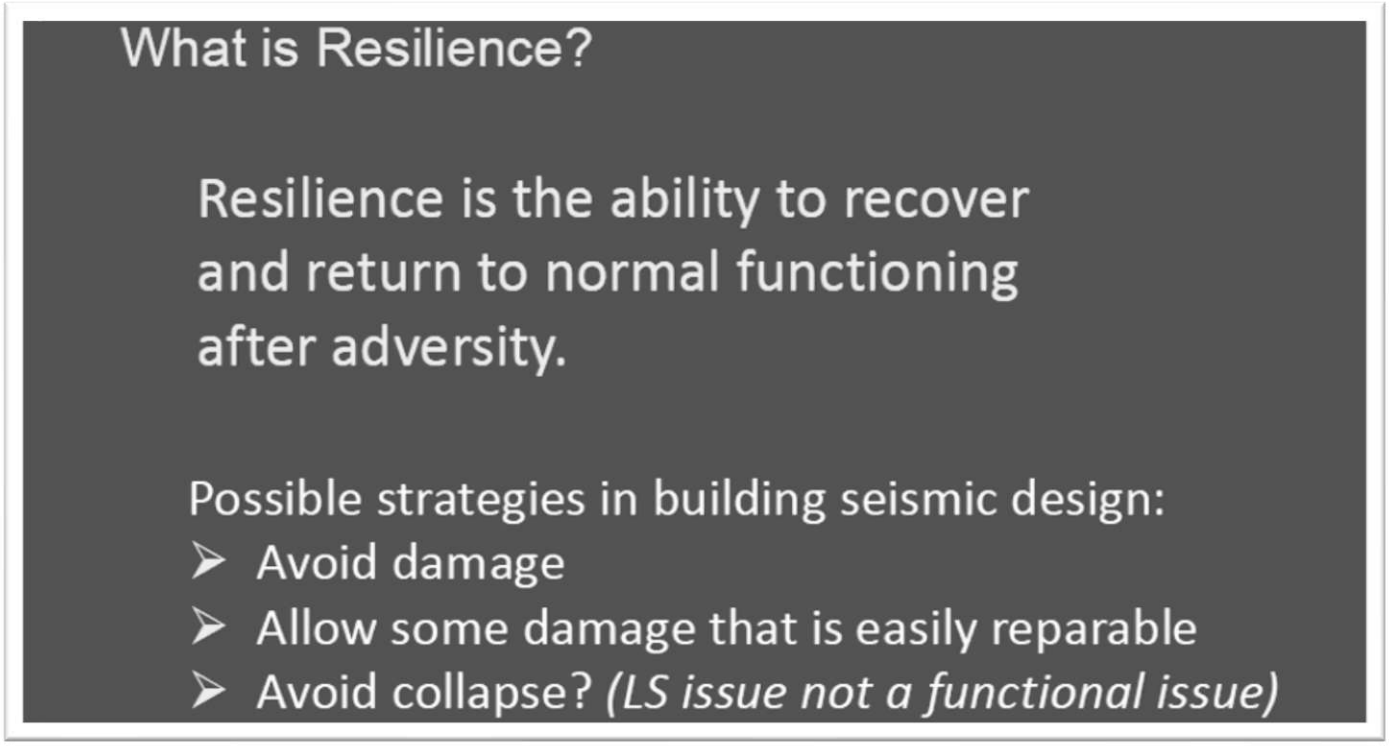
- Avoid damage
- Allow some damage that is easily reparable
- Avoid collapse? *(LS issue not a functional issue)*

THE MOST IMPORTANT LESSON…



Is it possible …?

THE MOST IMPORTANT LESSON…



Is it possible …?

We believe the answer is YES

but, more important, is our responsibility to try and make it happen.

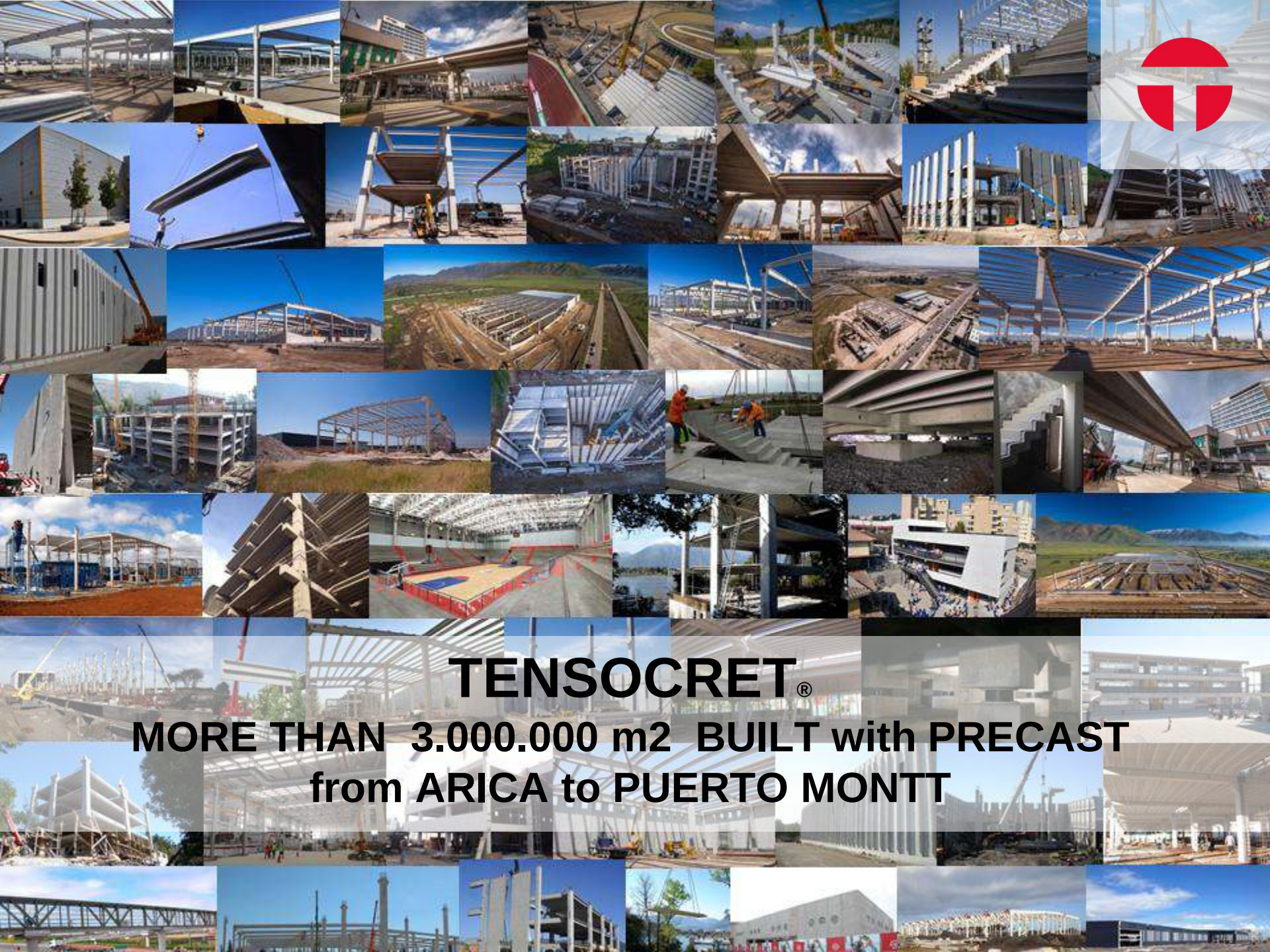
Let’s see our experience…

TIPOLOGÍAS DE GRADERÍAS : ESTADIOS – CENTROS DEPORTIVOS – PISCINAS – COLEGIOS - GIMNASIOS

TIPOLOGÍAS DE ENTREPISOS : EDIFICIOS DE OFICINAS – UNIVERSIDADES –COLEGIOS – VIVIENDA - ESTACIONAMIENTOS

TIPOLOGÍAS DE NAVES : SUPERMERCADOS – MALLS – CENTROS DE DISTRIBUCIÓN – NAVES INDUSTRIALES

TIPOLOGÍAS ESPECIALES : ESCALERAS – PASARELAS –PUENTES –PROTECCIÓN SÍSMICA –CELOSÍAS



TENSOCRET®

MORE THAN 3.000.000 m2 BUILT with PRECAST
from ARICA to PUERTO MONTT

CONTRIBUTIONS OF PRECAST CONCRETE SYSTEMS TO THE CONSTRUCTION MARKET

- Su calidad es fácilmente verificable al ser un proceso productivo controlado
- Tiene una elevada masa térmica que permite reducir el consumo energético de la edificación para calefacción y enfriamiento
- Garantiza un reducido impacto ambiental durante su etapa de construcción, montaje y uso final pudiendo ser reciclado y reutilizado
- Disminuye considerablemente los plazos de construcción y su impacto en el entorno

- Garantiza una buena acústica
- Requiere una mínima mantención
- Tiene un elevado albedo, lo que permite reducir los consumos energéticos de la edificación y sus emisiones de CO_2
- Garantiza la mejor resistencia al fuego
- Permite un drenaje sostenible y la reutilización de las aguas lluvia

TENSOCRET® precast building system

EXPERIENCE BUILDING in continental CHILE 1983-2019

5 SEISMIC EVENTS OF CONSIDERABLE MAGNITUDE

3 EARTHQUAKES OF HIGH MAGNITUDE

I Región	II Región	IV Región	RM	VI Región	VIII Región
08/08/1987 Ms=**7.1**	05/03/1987 Ms=**7.3**	16/09/2015 Ms=8.4	03/03/1985 Ms=**7.8**	08/04/1985 Ms=**7.5**	27/02/2010 Ms=8.8
08/06/2005 **Ms=7.8**	30/07/1995 Ms=**7.3**				

Ms= Richter Magnitude determined with surface seismic waves

1995 – Iquique – 1ª Etapa Terminal Diego Aracena	2003 – Arica - Tienda Comercial Mega Johnson´s	1998 – Iquique North College	1984 – RM Stadio Italiano
	2005 – RM Bodeflex Flexcenter	2004 – VIII Región Pasarela Brisas del Sol	1984 – VIII Región Louissiana Pacific

PREFABRICATED BUILDUINGS IN SEISMIC ZONES

TENSOCRET® precast building system

MORE THAN 3.00.000 M2 BUILT
WITH OUR PRECAST STRUCTURES

1984 – RM
Stadio Italiano

2003 – Arica - Tienda
Comercial Mega Johnson´s

2000 – Iquique
North College

1995 – Iquique – 1ª Etapa
Terminal Diego Aracena

TENSOCRET® precast building system

MORE THAN 3.00.000 M2 BUILT
WITH OUR PRECAST STRUCTURES

2004 – VIII Región
Pasarela Brisas del Sol

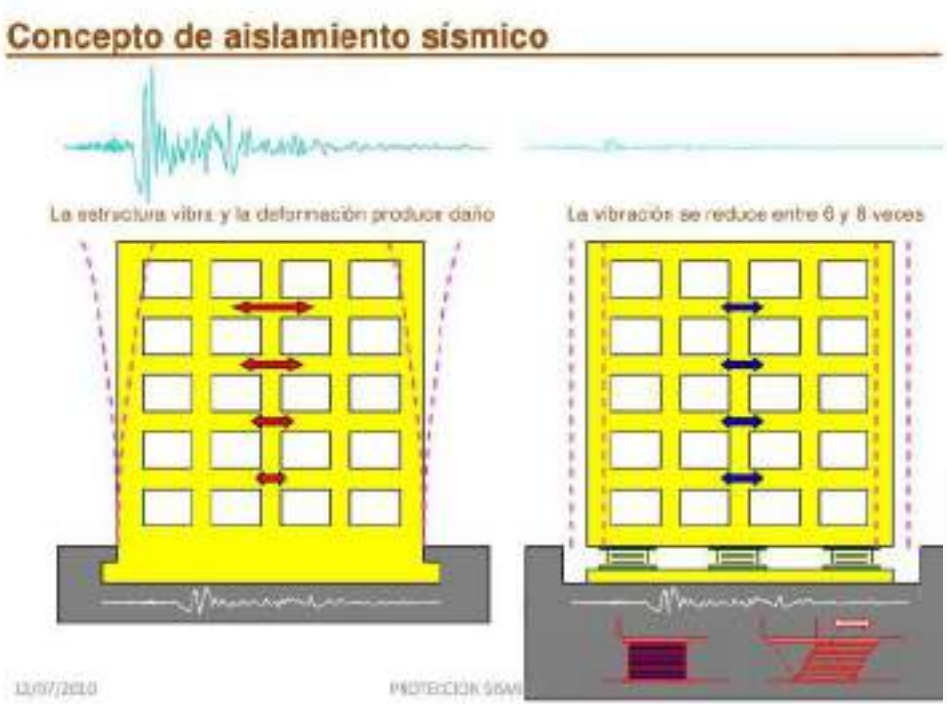
2010 – V Región – Colegio Alborada del Mar

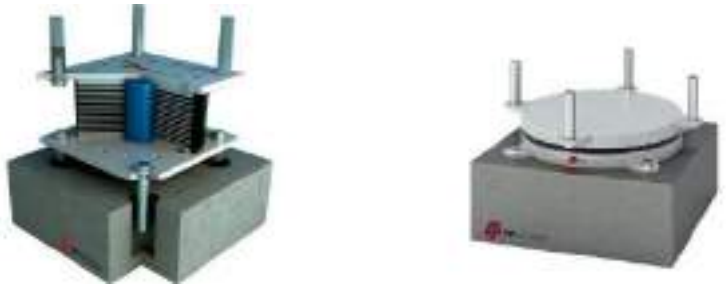
2006 – VIII Región
Louissiana Pacific

2005 /2007/2012/2013 – RM – Centro de Distribución Bodenor Flexcenter

PRECAST STRUCTURE + SEISMIC PROTECTION

BASAL ISOLATION SEISMIC SYSTEM





SEISMIC DEVICES

ELASTOMERIC ISOLATOR

TENSOCRET® precast building system

PRECAST BUILDINGS WITH SEISMIC PROTECTION

TENSOCRET® : Precast Buildings with Seismic Protection Systems

PRECAST BUILDINGS in SEISMIC ZONES

WE WIL SEE THE CONSTRUCTION PROCESS AND DETAILS FOR PROJECTS WITH THE FOLLOWING PRECAST STRUCTURES:

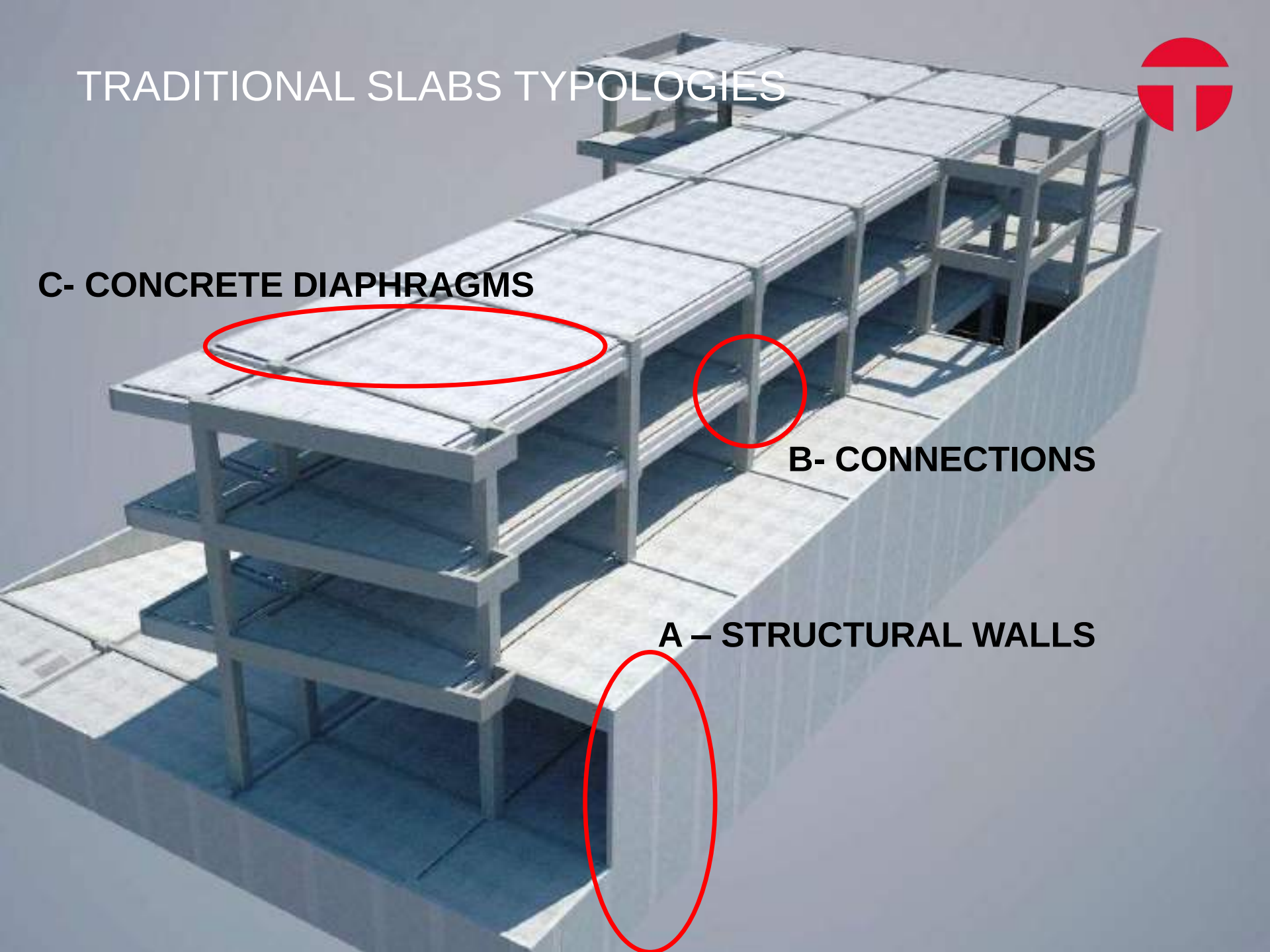
- SLABS TYPOLOGIES WITH STRUCTURAL CONCRETE WALLS
- SLABS TYPOLOGIES WITH SEISMIC PROTECTION

TRADITIONAL SLABS TYPOLOGIES

SLABS TYPOLOGIES WITH STRUCTURAL CONCRETE WALLS

	Uso	: Habitacional, Educacional, Colegios, Oficinas, Centros Comerciales, Multitiendas, Strip centers, Estacionamientos, etc.
	Numero de niveles	: Hasta **6 niveles**.
A.	**Estructuración**	: De Marcos Prefabricados y Muros de Arriostramiento.
B.	**Uniones Viga- Pilar**	: Uniones Rígidas hormigonadas ¨in situ¨
C.	**Diafragmas de piso**	: Sobrelosa estructural continua, hormigonada en sitio sobre losetas prefabricadas TT.

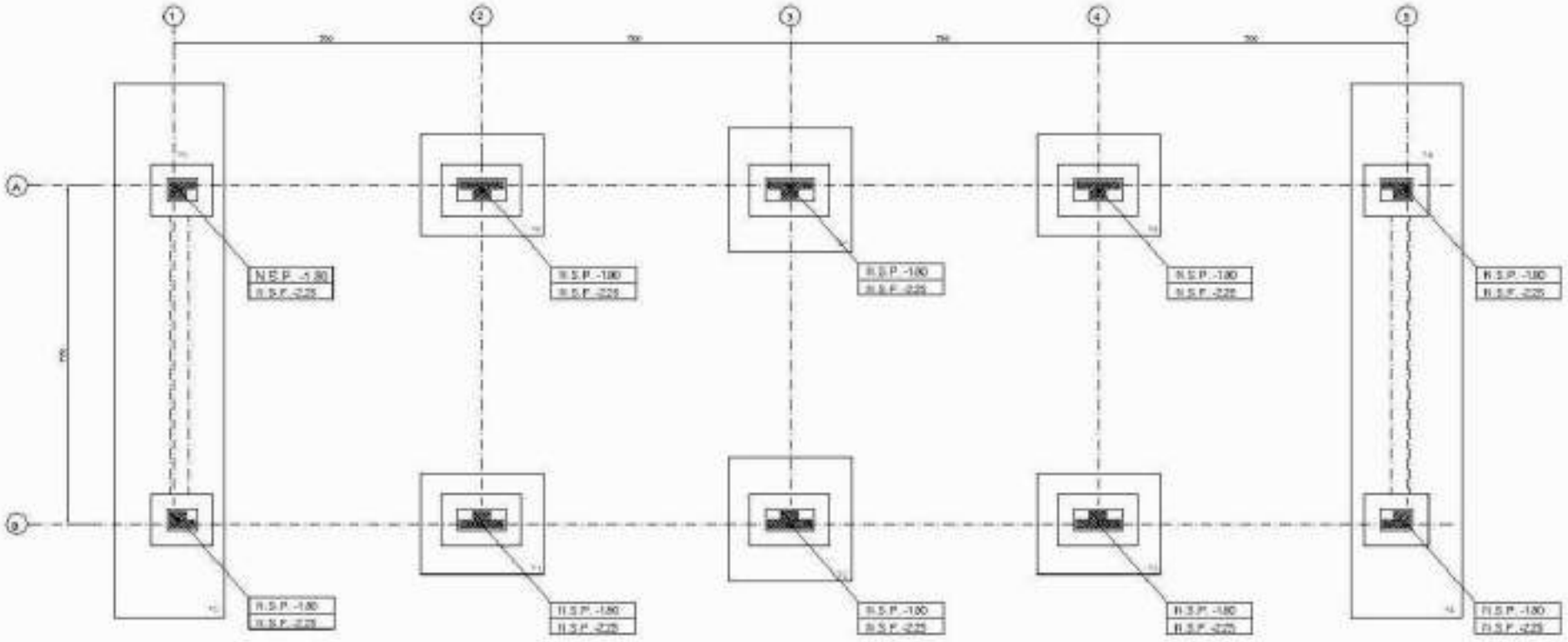
TRADITIONAL SLABS TYPOLOGIES



A STRUCTURAL WALLS

TRADITIONAL SLABS TYPOLOGYE

Foundations Level Plan



TRADITIONAL SLABS TYPOLOGIES

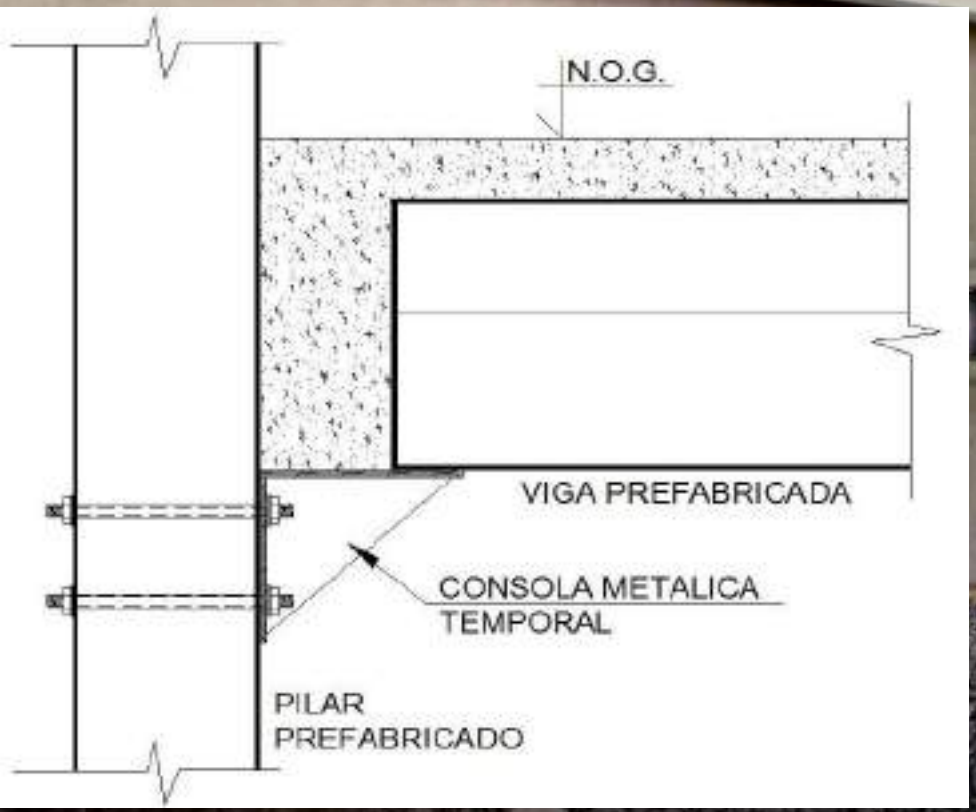
Walls and Columns Assembly

TRADITIONAL SLABS TYPOLOGIES

Walls and Columns Assembly

B

CONNECTIONS: COLUMN/BEAM - FOUNDATION/COLUMN



TRADITIONAL SLABS TYPOLOGIES

Basal Columns Embotting

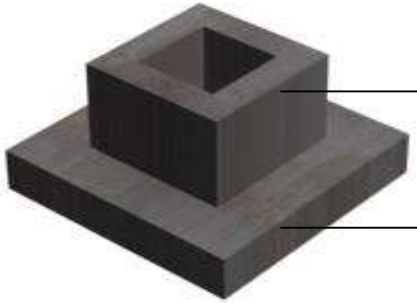
Precast
COLUMN

Concret
Precast Column

Embotting
grout `*in site*´

Leveling Mortar

FOUNDATION
Precast or¨in site¨

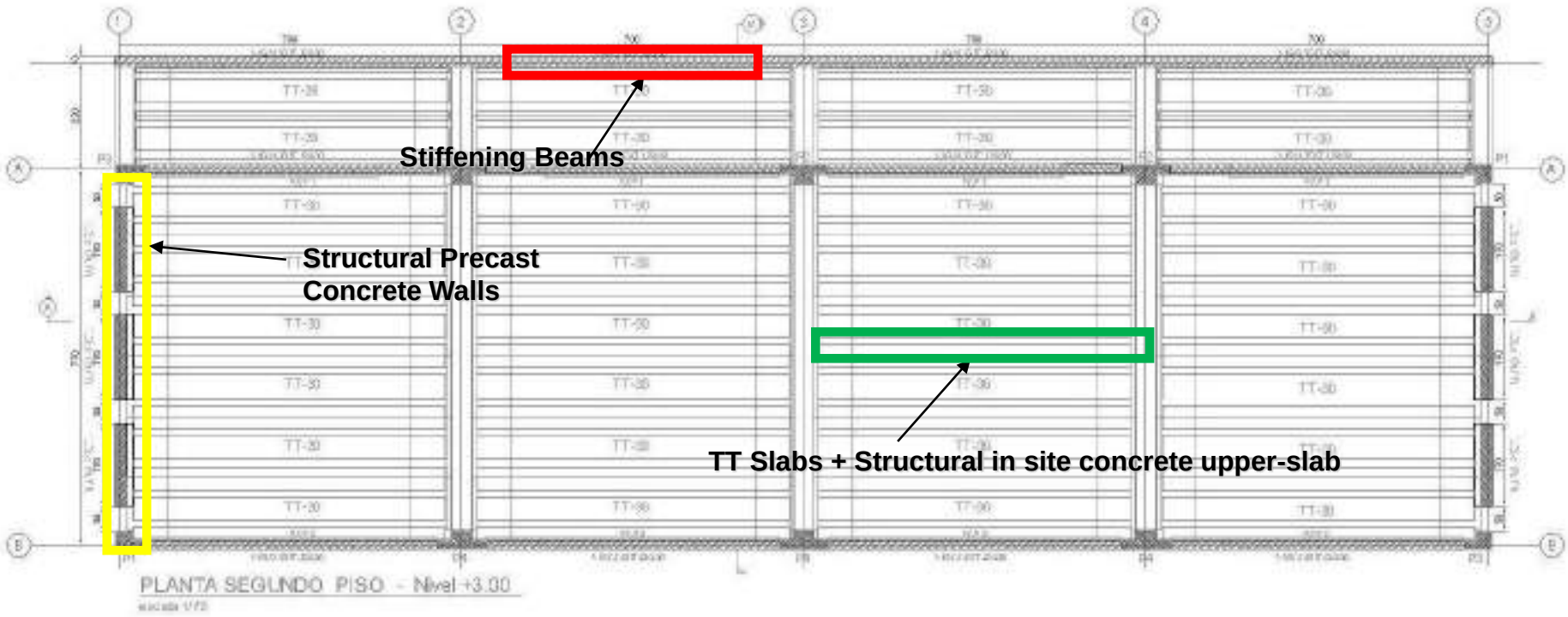


Embedment

Foundation Shoe

C DIAFRAGM

- **For floor slabs modules of 8x8m or similar are recommended and an eventual maximum of 12 meters**
- **TT slabs have only gravitational responsibility**
- **All seismic stresses are absorbed with the structural in site concrete upper-slab and structural prefabricated concrete walls**
- **Each diaphragm module will be framed by beams**



TRADITIONAL SLABS TYPOLOGIES

Precast Columns and Walls Assembly

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Precast Columns and Walls Assembly

TRADITIONAL SLABS TYPOLOGIES

Parking Building MIRADOR PLACERES, Valparaiso.

EDIFICIO DE ESTACIONAMIENTOS VALPARAÍSO

Propietario	: Inmobiliaria Mirador Placeres.
Diseño Estructural	: Vittorio Barbano Ingenieros.
Diseño estructural Prefabricados	: TECNOCRET + LEIVA y Asoc.
Obra gruesa estructural - Uniones	: Constructora ANDESMAR
ESTRUCTURA PREFABRICADA	: Sistema TENSOCRET®

TRADITIONAL SLABS TYPOLOGIES

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Parking Building MIRADOR PLACERES, Valparaiso.

PLAZO FABRICACIÓN + TRANSPORTE + MONTAJE = 84 DÍAS CORRIDOS

PLAZO MONTAJE ESTRUCTURA = 51 DÍAS CORRIDOS

TRADITIONAL SLABS TYPOLOGIES

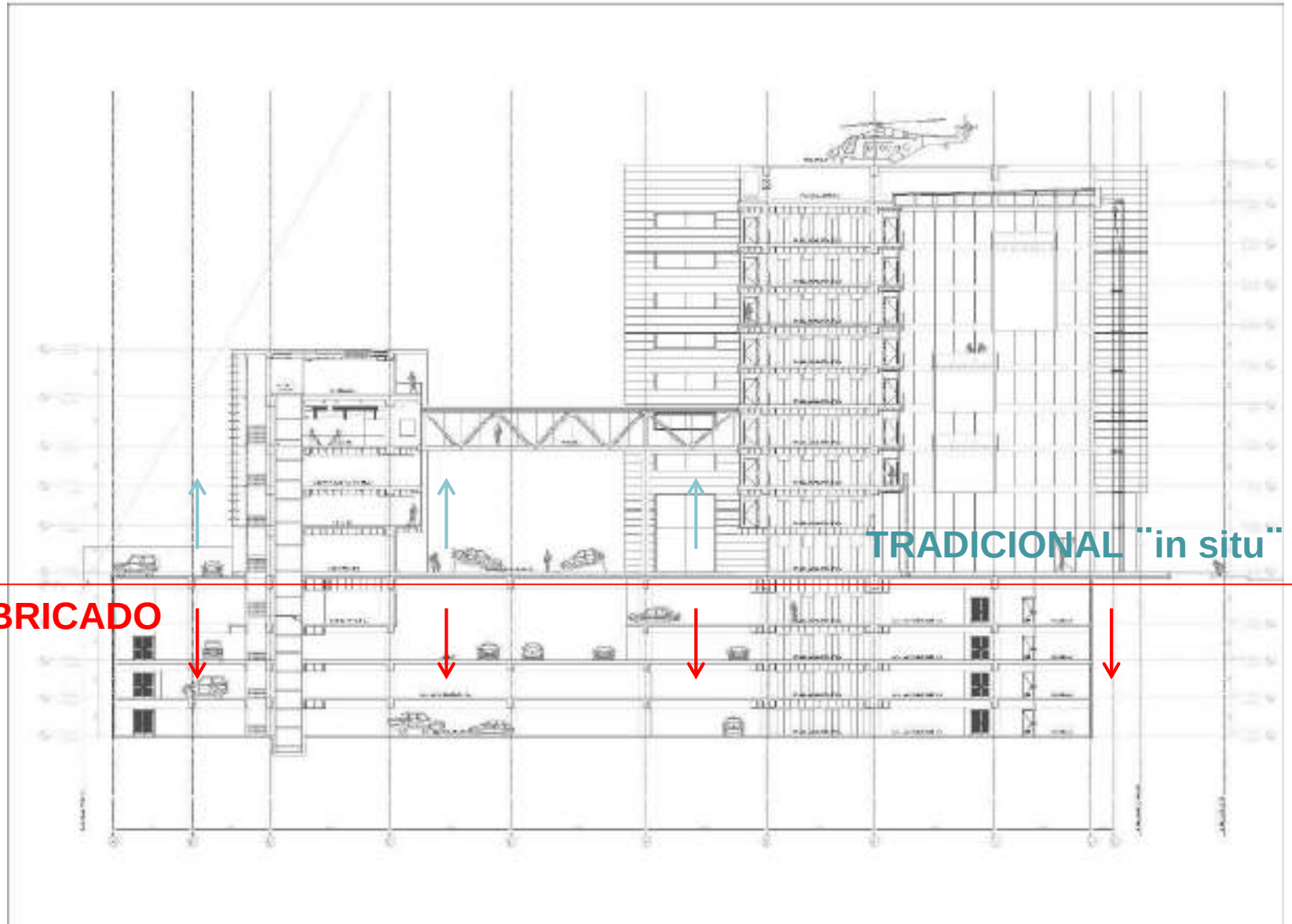
Parking + Offices Building

EDIFICIO DE OFICINAS GILDEMEISTER , Las Condes

Propietario	**: Gildemeister.**
Arquitectos	**: Figueroa + Silva Arqtos.**
Diseño estructural	**: R&G Ingenieros.**
Obras ¨in situ¨	**: CYPCO**
ESTRUCTURA PREFABRICADA	**: Sistema TENSOCRET®**

TRADITIONAL SLABS TYPOLOGIES

Parking + Offices Building



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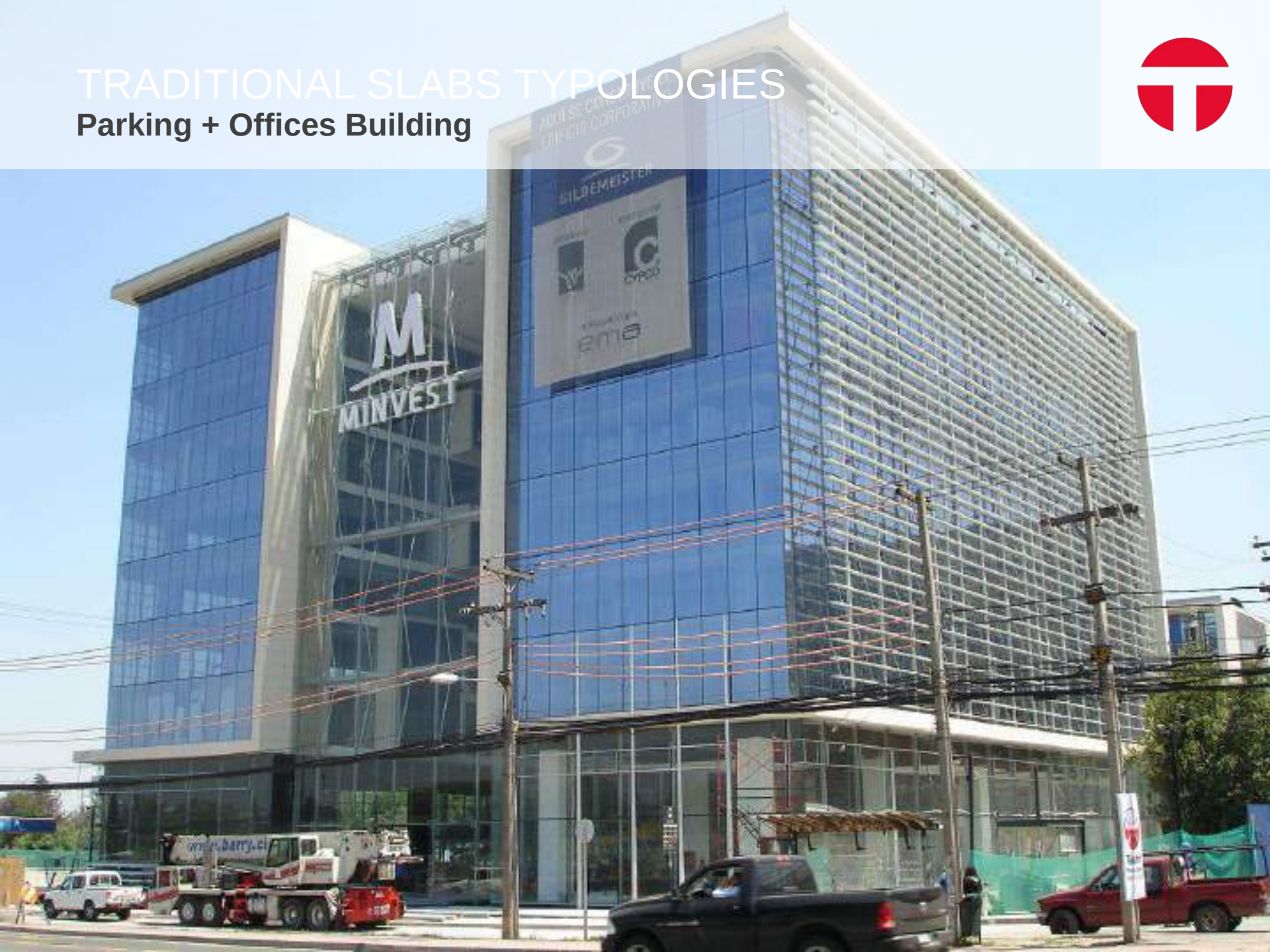

PREFABRICATION + SEISMIC PROTECTION

First Precast Concrete Building with Seismic Protection in America

OFFICES BUILDING VULCO San Bernardo.

Propietario : Wheir Minerals - Vulco.

Arquitectos : Marzolo Arqtos.

Diseño estructural : SIRVE.

Obra gruesa estructural - Uniones : TENSOCRET®

ESTRUCTURA PREFABRICADA : Sistema TENSOCRET®

1 first

COLLABORATION

VULCO | TENSOCRET® | SIRVE

2005

PREFABRICATION + SEISMIC PROTECTION

Isolation Devices

PREFABRICATION + SEISMIC PROTECTION

Isoltaion Devices + Precast TT Concrete Slabs TENSOCRET®

PREFABRICATION + SEISMIC PROTECTION

Precast Pannels Installation

PREFABRICATION + SEISMIC PROTECTION

Precast Pannels Installation

PREFABRICATION + SEISMIC PROTECTION

First Precast Concrete Building with Seismic Protection in America

PREFABRICATION + SEISMIC PROTECTION

Offices Building CHACAY, Temuco

EDIFICIO DE OFICINAS CHACAY.

	Uso	: Oficinas	Ubicación	: Temuco, IX Región.
	Numero de niveles	: **6 pisos**.	Modulación	: 8 x 7.5m
	Superficie	: 1.000m2. aprox		
A.	**Protección sísmica**	: Aisladores Elastomericos		
B.	**Estructuración**	: Marcos Prefabricados.		
C.	**Uniones viga-columna**	: conectores LENTON-REBAR.		
D.	**Diafragmas de piso**	: Sobrelosa estructural continua, hormigonada en sitio sobre Losetas Prefabricadas TT.		

PREFABRICATION + SEISMIC PROTECTION

Offices Building CHACAY, Temuco

EDIFICIO CHACAY - Temuco, IX Región.

Cálculo estructural : SIRVE.

Fabricación, Transporte y Montaje : TENSOCRET®

Constructora : Momenta

ESTRUCTURA PREFABRICADA : Sistema Constructivo TENSOCRET

PREFABRICATION + SEISMIC PROTECTION

Transport od Precast Concrete Elements / TENSOCRET® precast building system

PREFABRICATION + SEISMIC PROTECTION

Precast Concrete Installation / 6 levels

PREFABRICATION + SEISMIC PROTECTION

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Precast Concrete Installation / 6 levels

PREFABRICATION + SEISMIC PROTECTION

Precast TT Slabs Installation TENSOCRET® precast building system

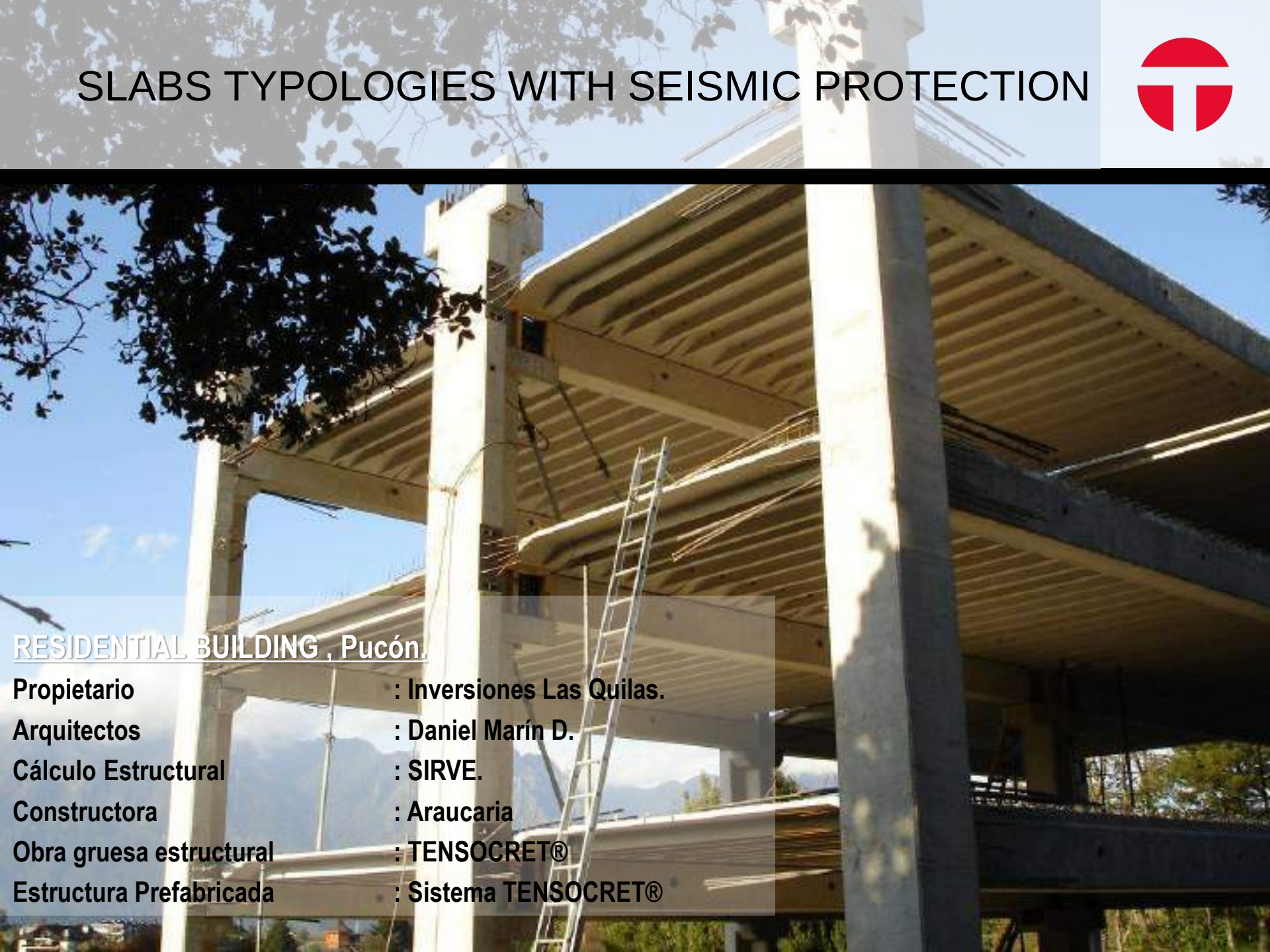
PREFABRICATION + SEISMIC PROTECTION

Precast TT Slabs Installation TENSOCRET® precast building system

PREFABRICATION+ SEISMIC PROTECTION

TENSOCRET® **precast building system**

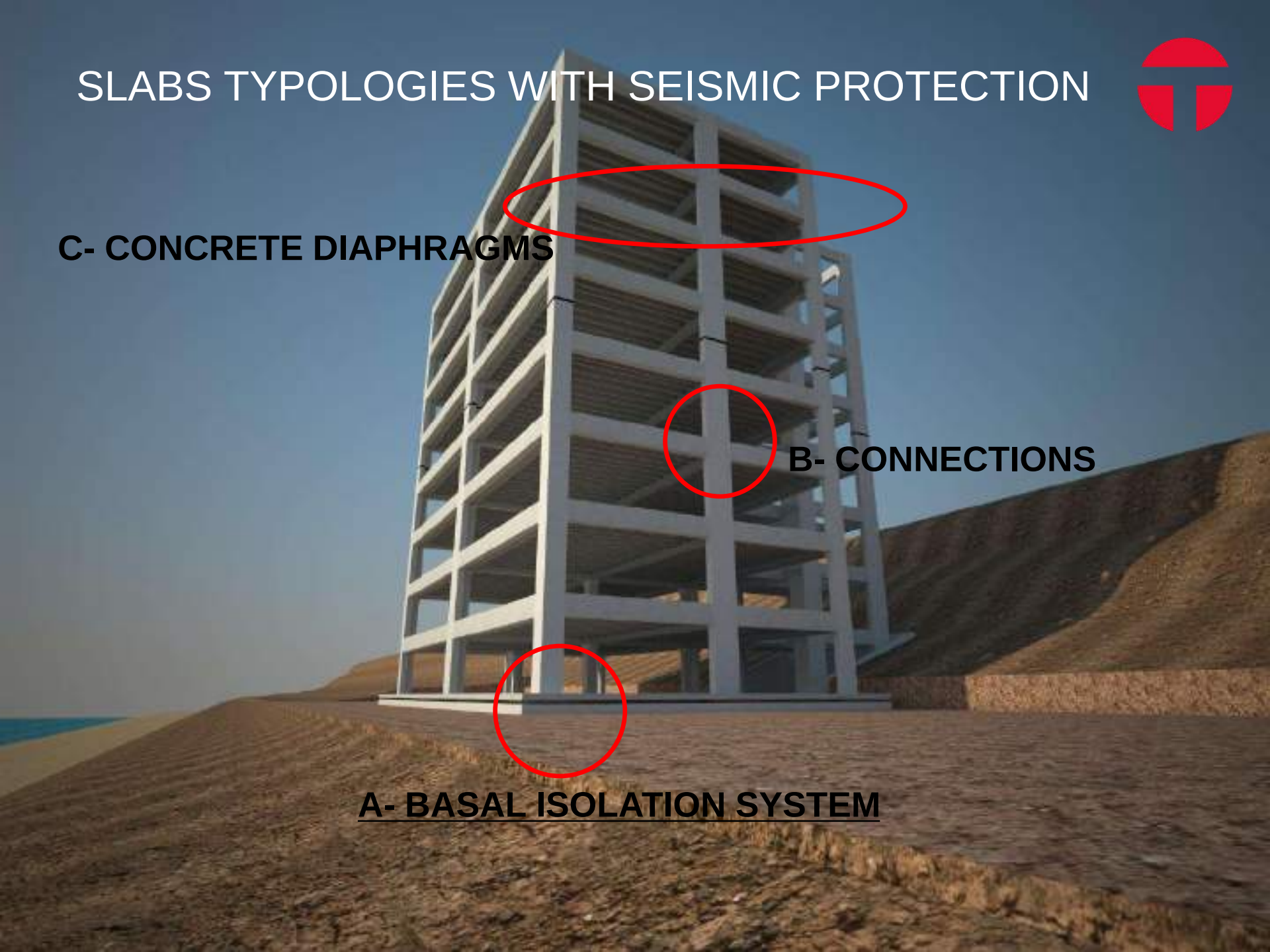
SLABS TYPOLOGIES WITH SEISMIC PROTECTION



RESIDENTIAL BUILDING , Pucón.

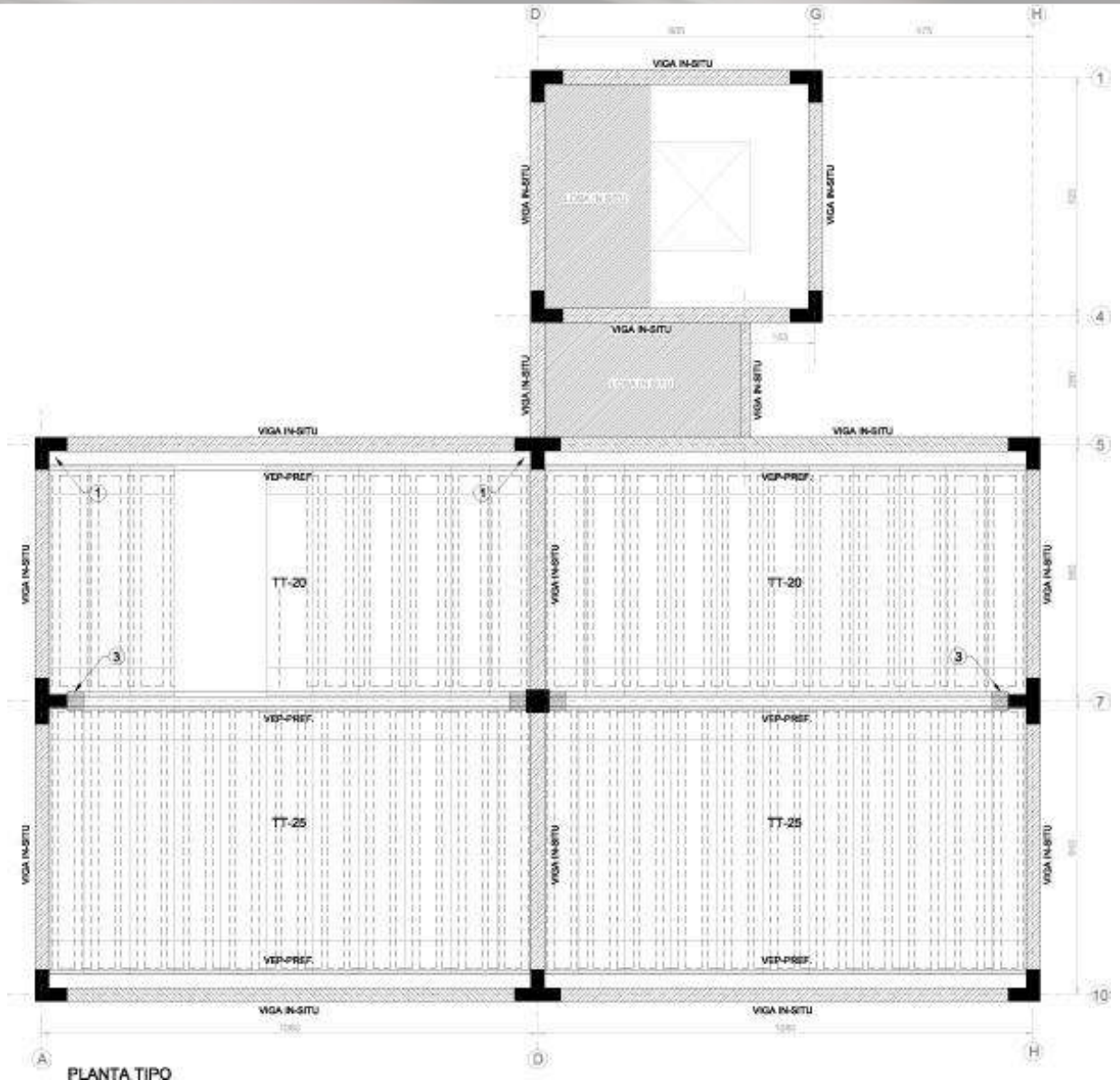
Propietario	: Inversiones Las Quilas.
Arquitectos	: Daniel Marín D.
Cálculo Estructural	: SIRVE.
Constructora	: Araucaria
Obra gruesa estructural	: TENSOCRET®
Estructura Prefabricada	: Sistema TENSOCRET®

SLABS TYPOLOGIES WITH SEISMIC PROTECTION



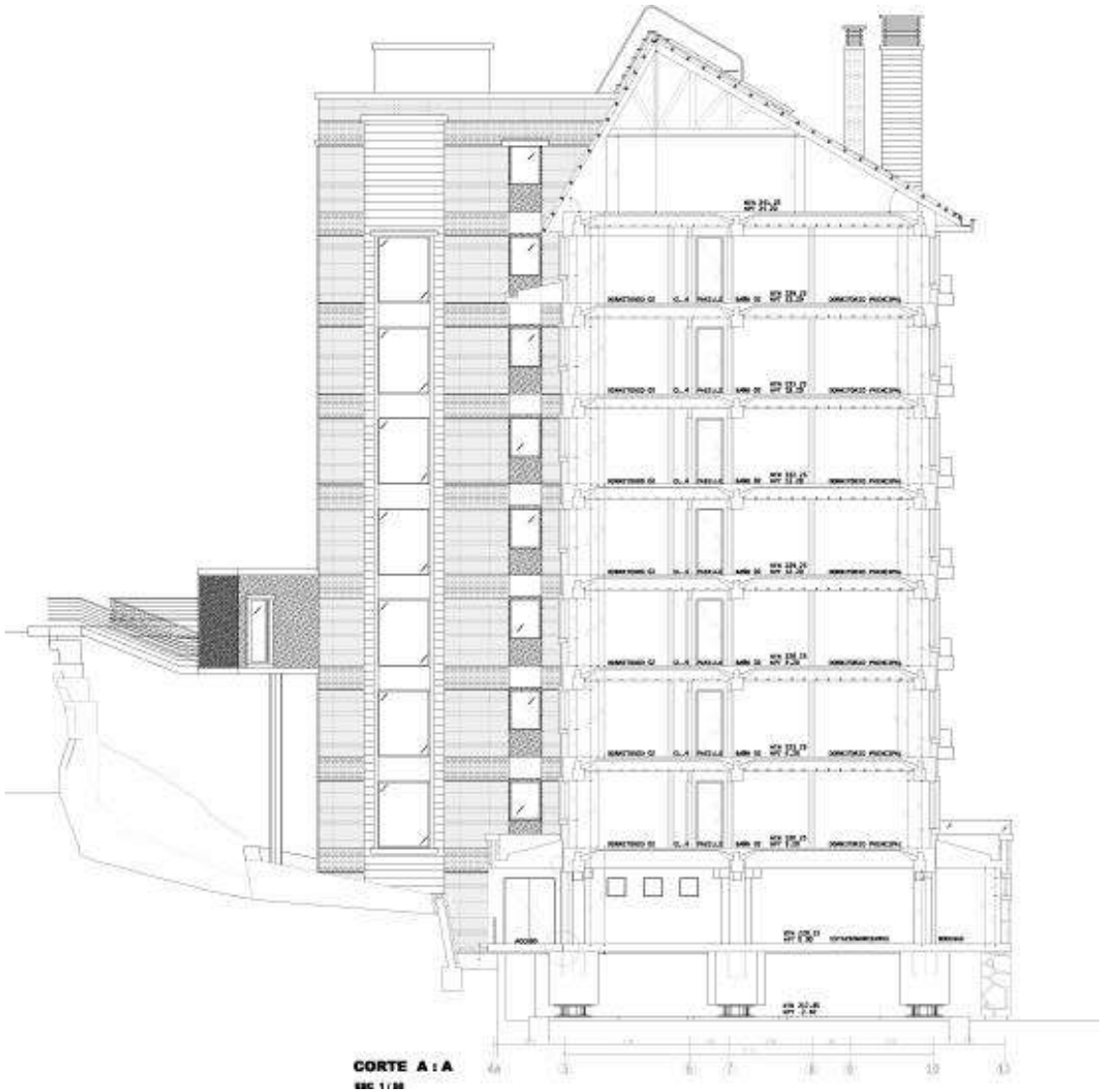
PREFABRICATION + SEISMIC PROTECTION

Precast Structure Plant



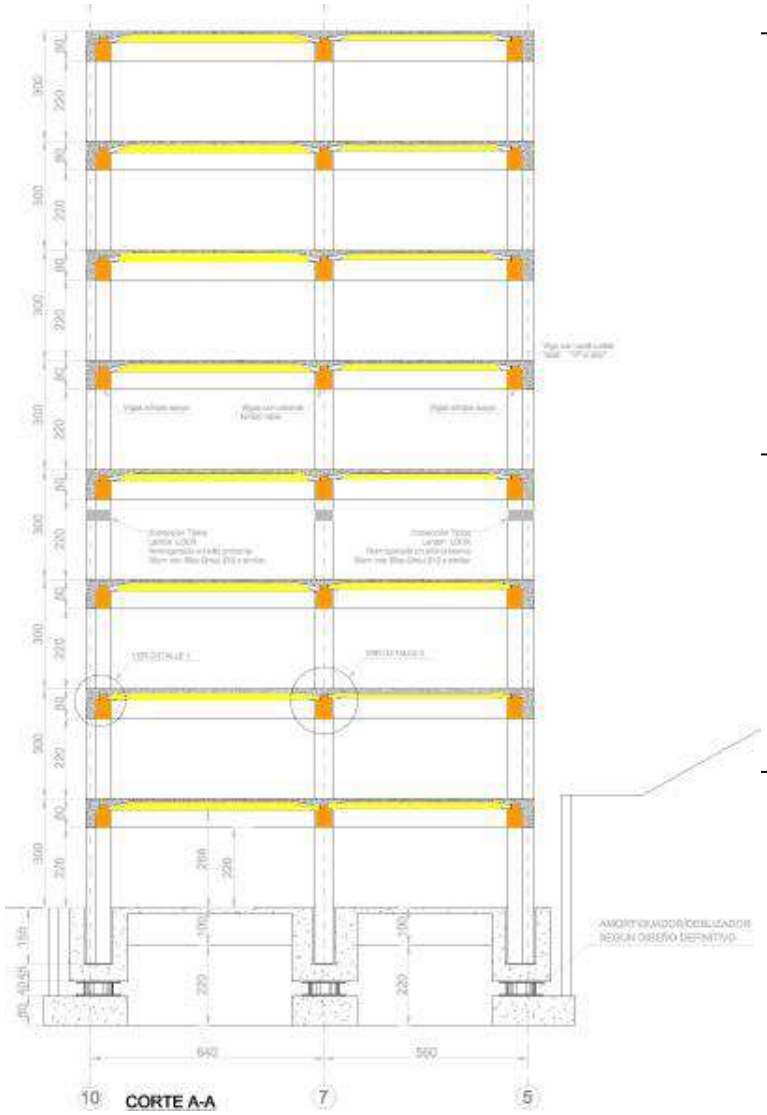
PREFABRICATION + SEISMIC PROTECTION

Architecture Section



PREFABRICATION+ SEISMIC PROTECTION

Precast Structure Section



TENTH ROOF LEVEL + 10

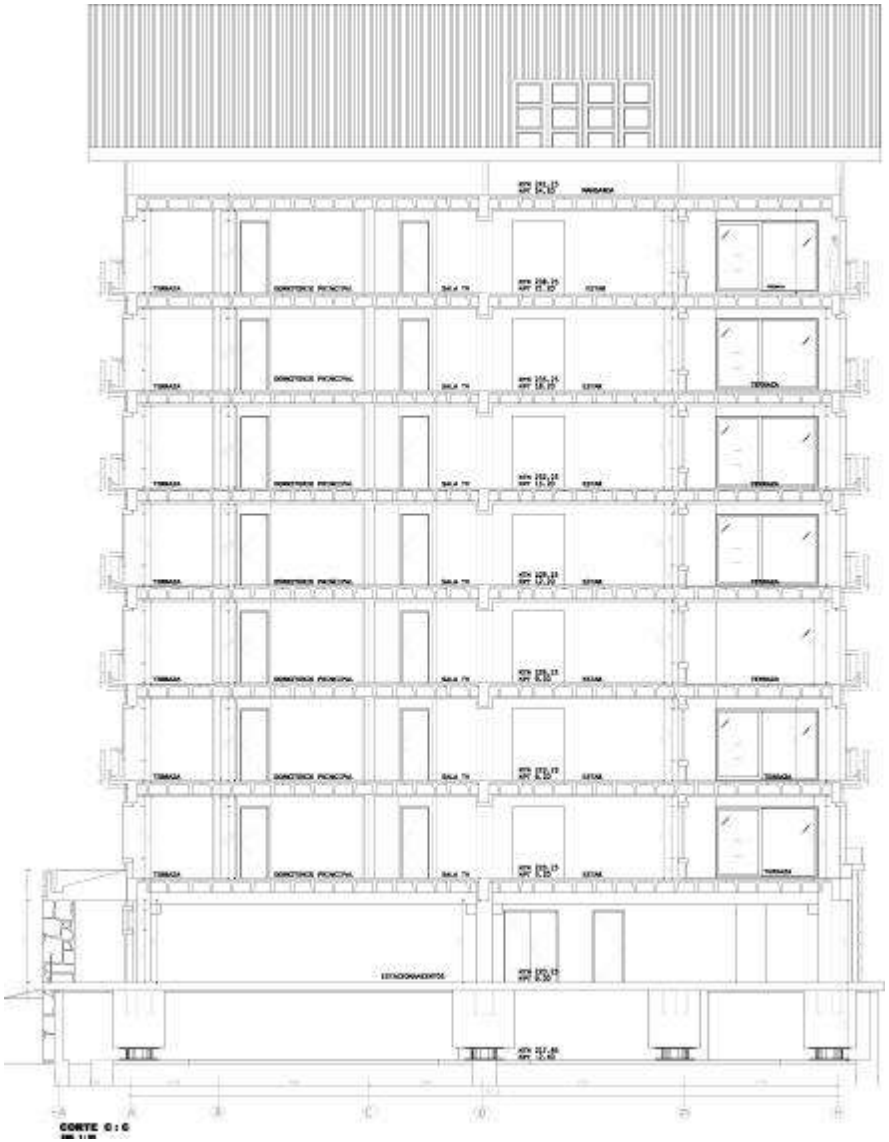
NINTH LEVEL + 9

FOURTH LEVEL + 5

UNDERGROUND LEVEL+1

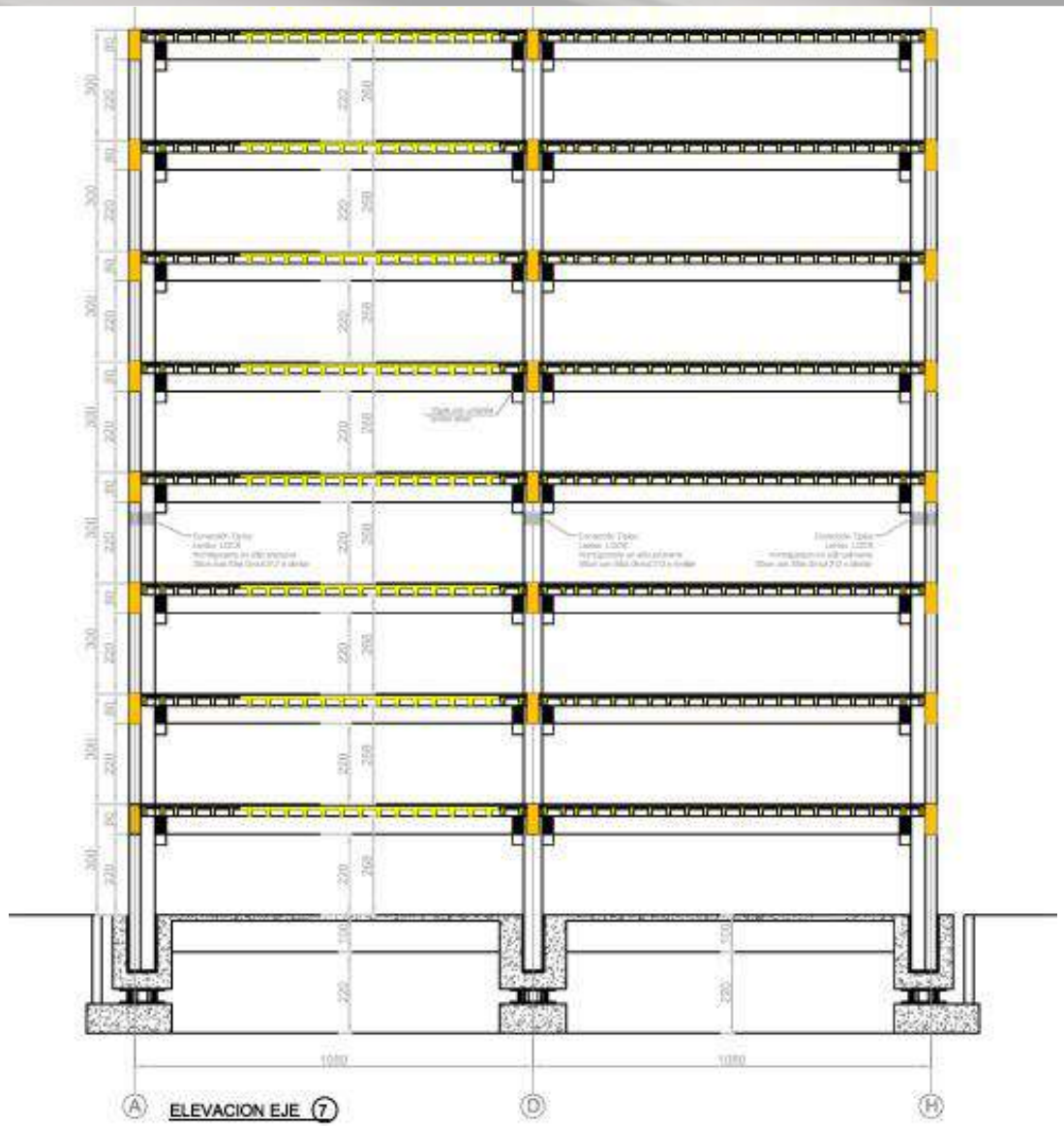
PREFABRICATION + SEISMIC PROTECTION

Architecture Section



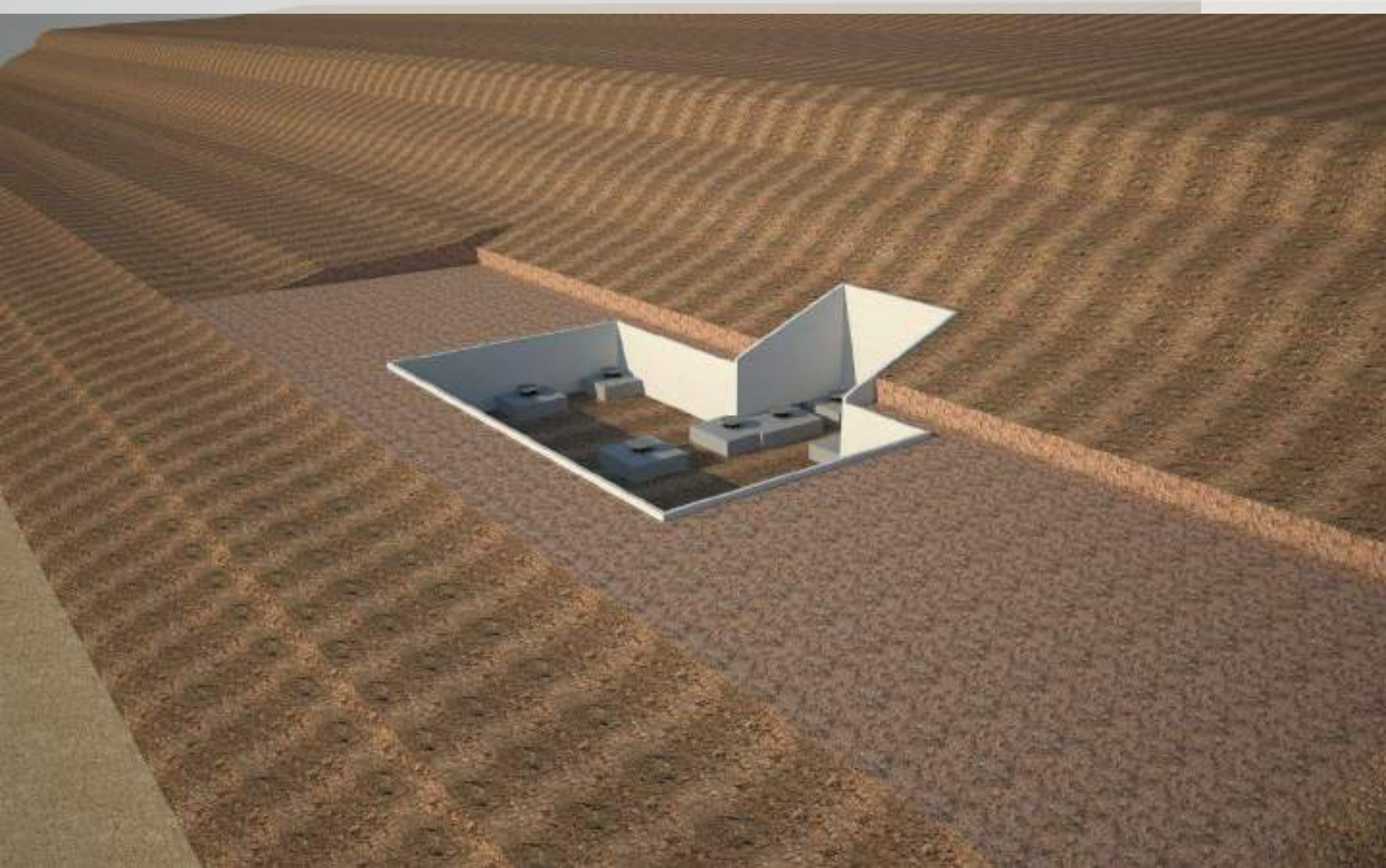
PREFABRICATION+ SEISMIC PROTECTION

Precast Structure Section



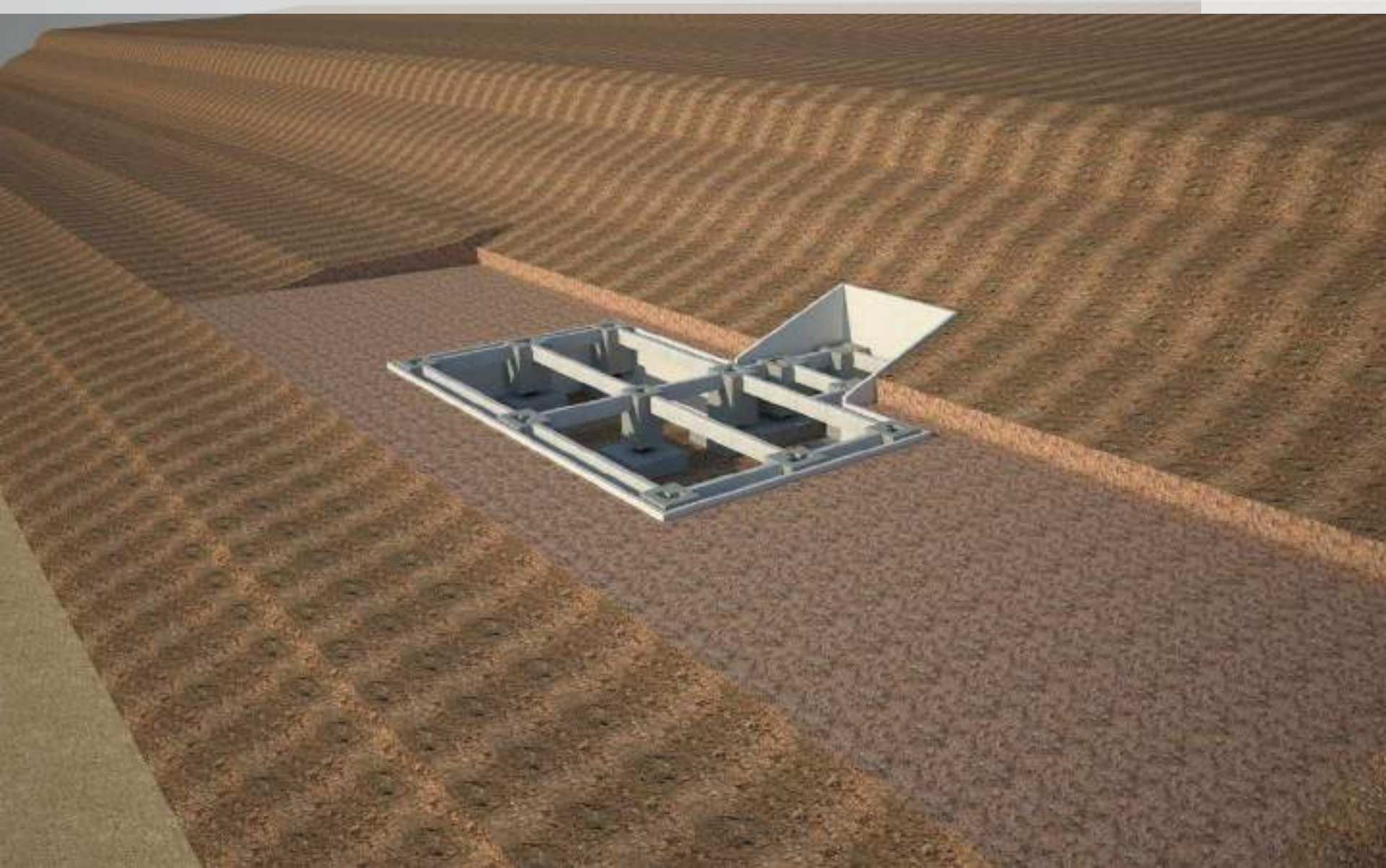
PREFABRICATION + SEISMIC PROTECTION

ASSEMBLY SEQUENCE – Isolation Devices



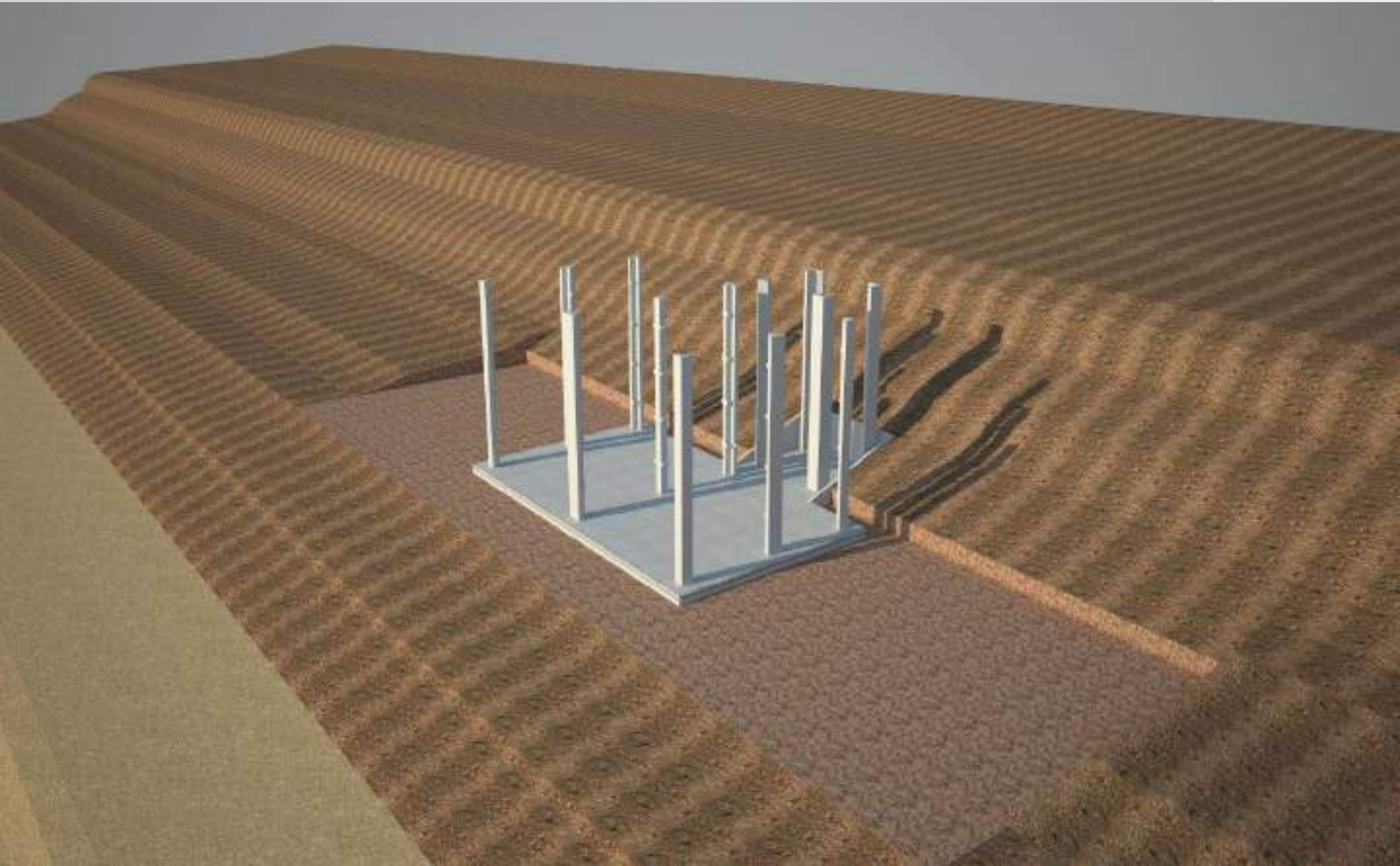
PREFABRICATION + SEISMIC PROTECTION

ASSEMBLY SEQUENCE – Foundations



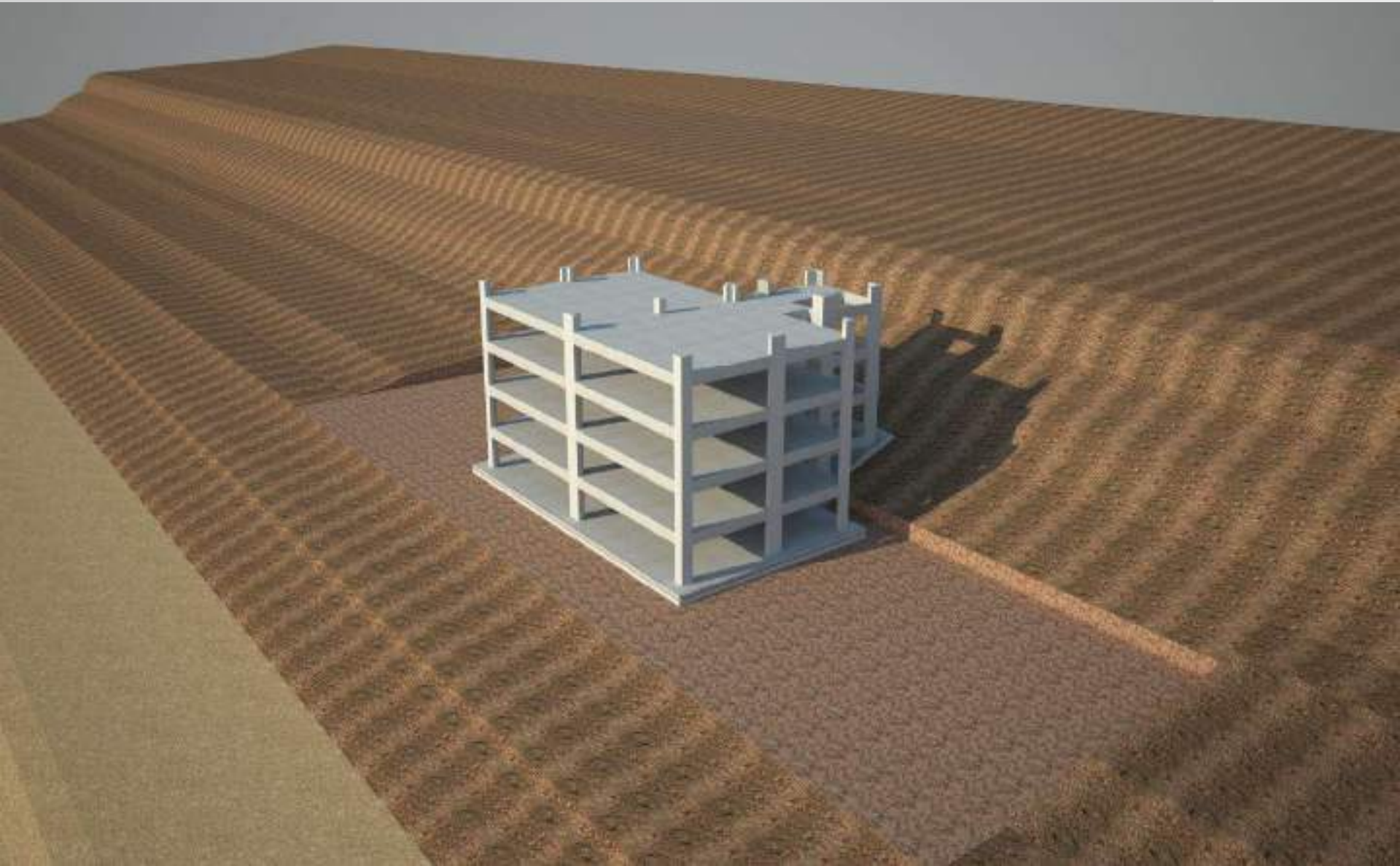
PREFABRICATION + SEISMIC PROTECTION

ASSEMBLY SEQUENCE – Columns first stage – Level +5



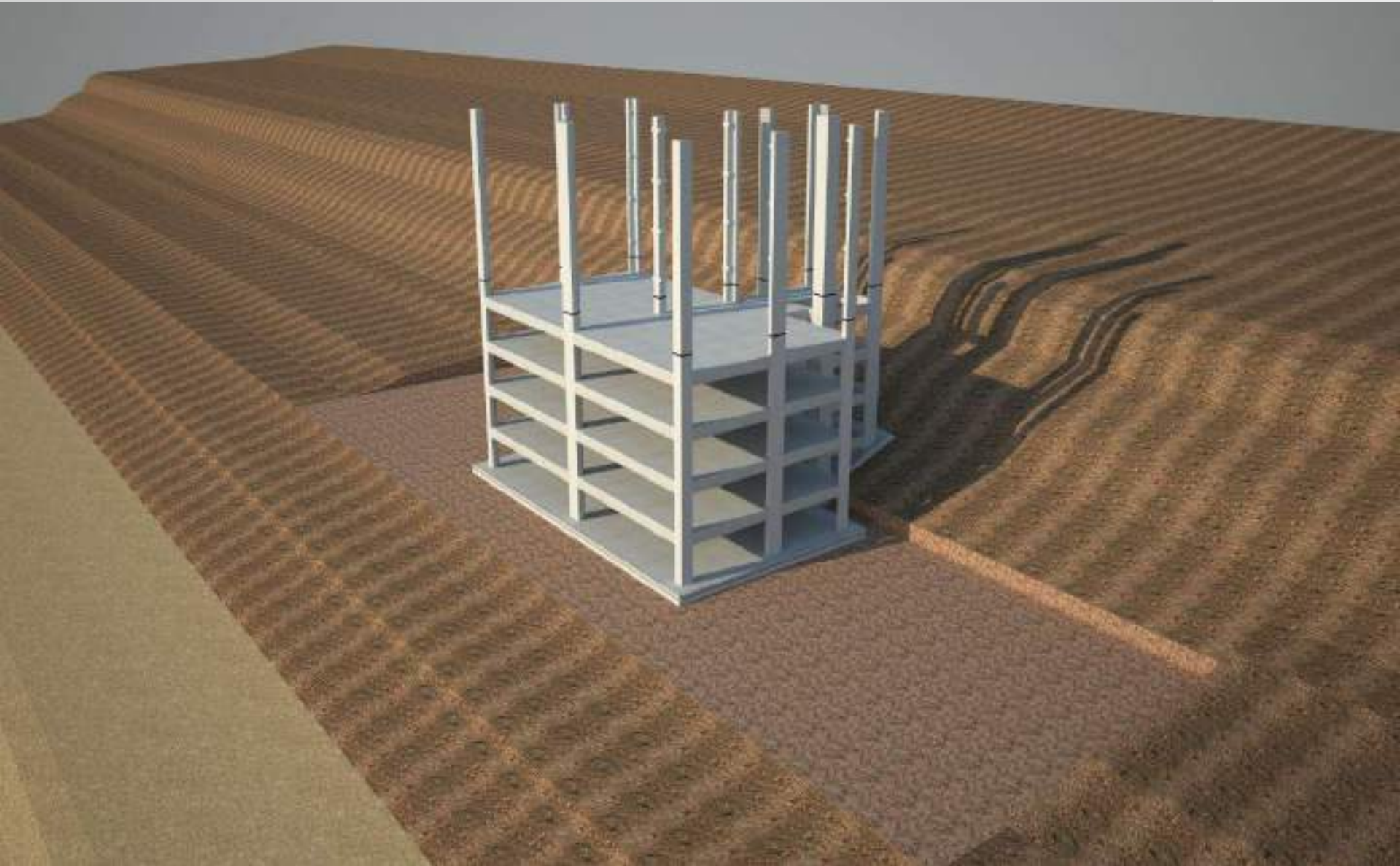
PREFABRICATION + SEISMIC PROTECTION

PRECAST STRUCTURE + STRUCTURAL CONCRETE IN SITE– Level +5



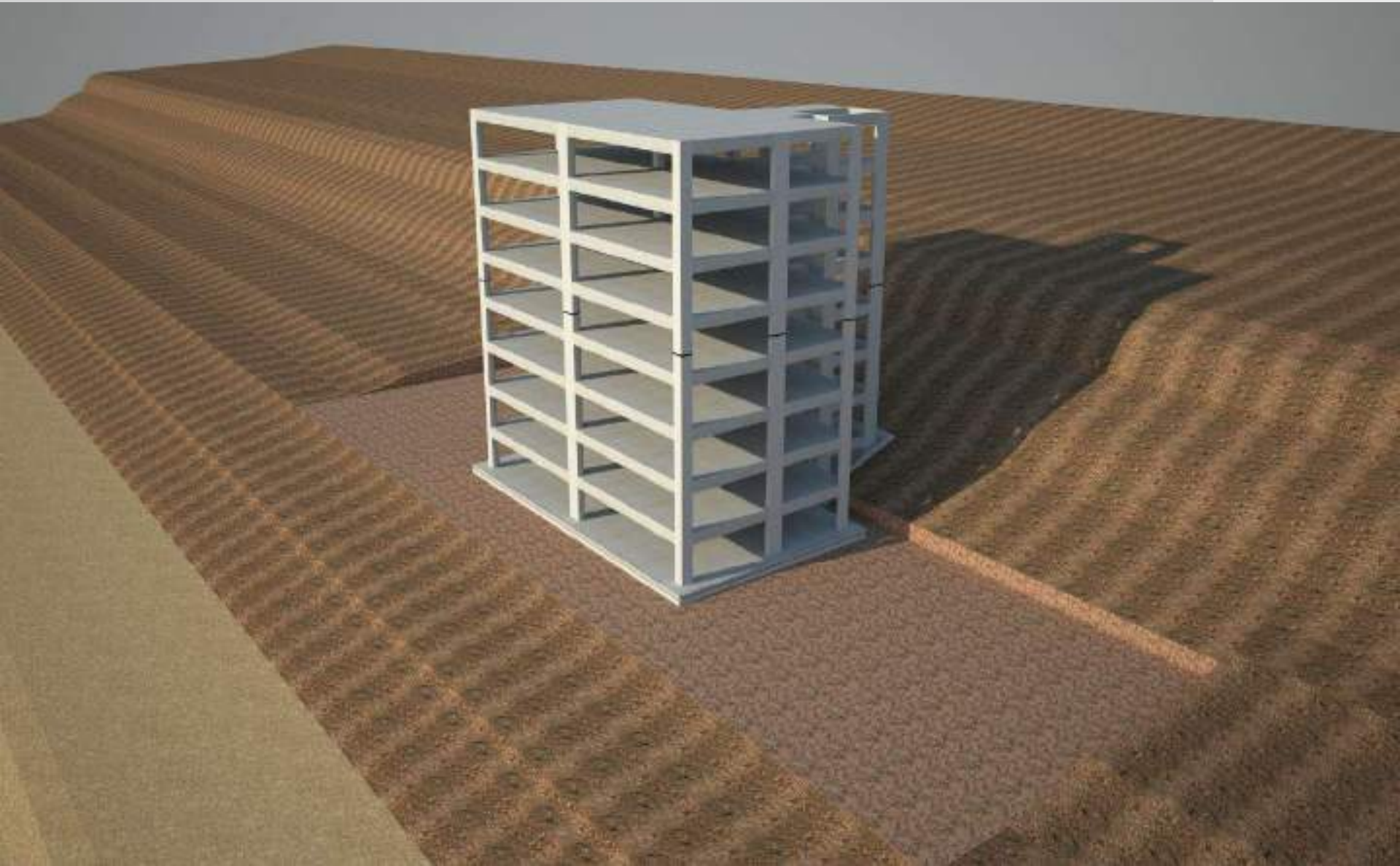
PREFABRICATION + SEISMIC PROTECTION

ASSEMBLY SEQUENCE – Columns second stage – Level +9



PREFABRICATION + SEISMIC PROTECTION

PRECAST STRUCTURE + STRUCTURAL CONCRETE IN SITE– Level +9



A SEISMIC PROTECTION

PREFABRICATION + SEISMIC PROTECTION

Transport of Precast Elements

SANTIAGO ---------- PUCÓN

800 km.

PREFABRICATION + SEISMIC PROTECTION

Precast Columns Installation first stage – Level +5

Precast TT Slabs Installation first stage – Level +5

PREFABRICATION + SEISMIC PROTECTION

Precast TT Slabs Installation first stage – Level +5

PREFABRICATION + SEISMIC PROTECTION

Precast TT Slabs Installation first stage – Level +5

PREFABRICATION + SEISMIC PROTECTION

Precast Structure first stage – Level +5

PREFABRICATION + SEISMIC PROTECTION

Precast Structure first stage – Level +5

B

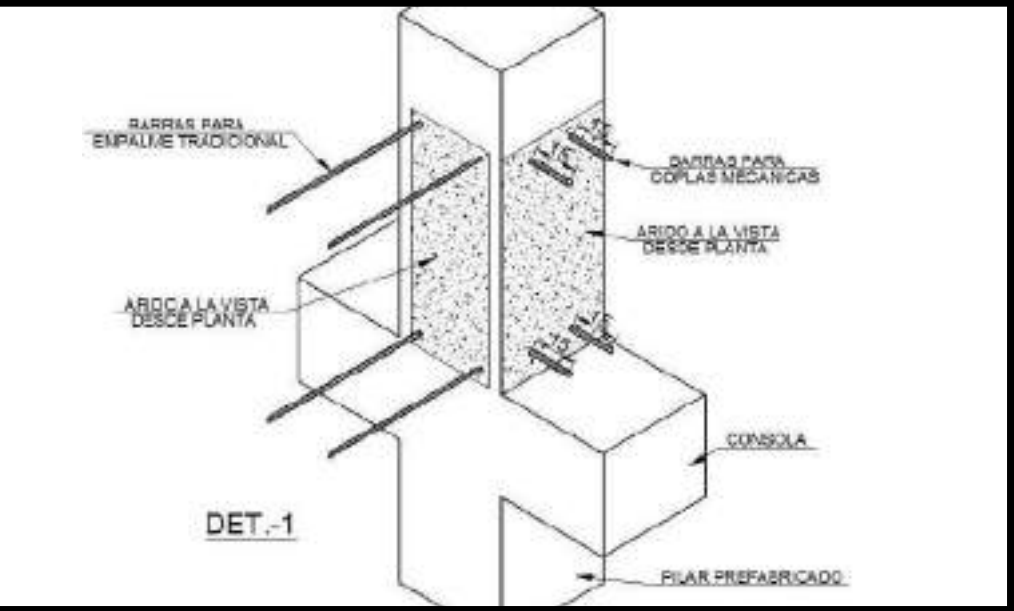
CONNECTIONS: COLUMN/BEAM - FOUNDATION/COLUMN

PREFABRICATION + SEISMIC PROTECTION

COLUMN/BEAM CONNECTION with temporary console support

PREFABRICATION + SEISMIC PROTECTION

COLUMN/BEAM CONNECTION

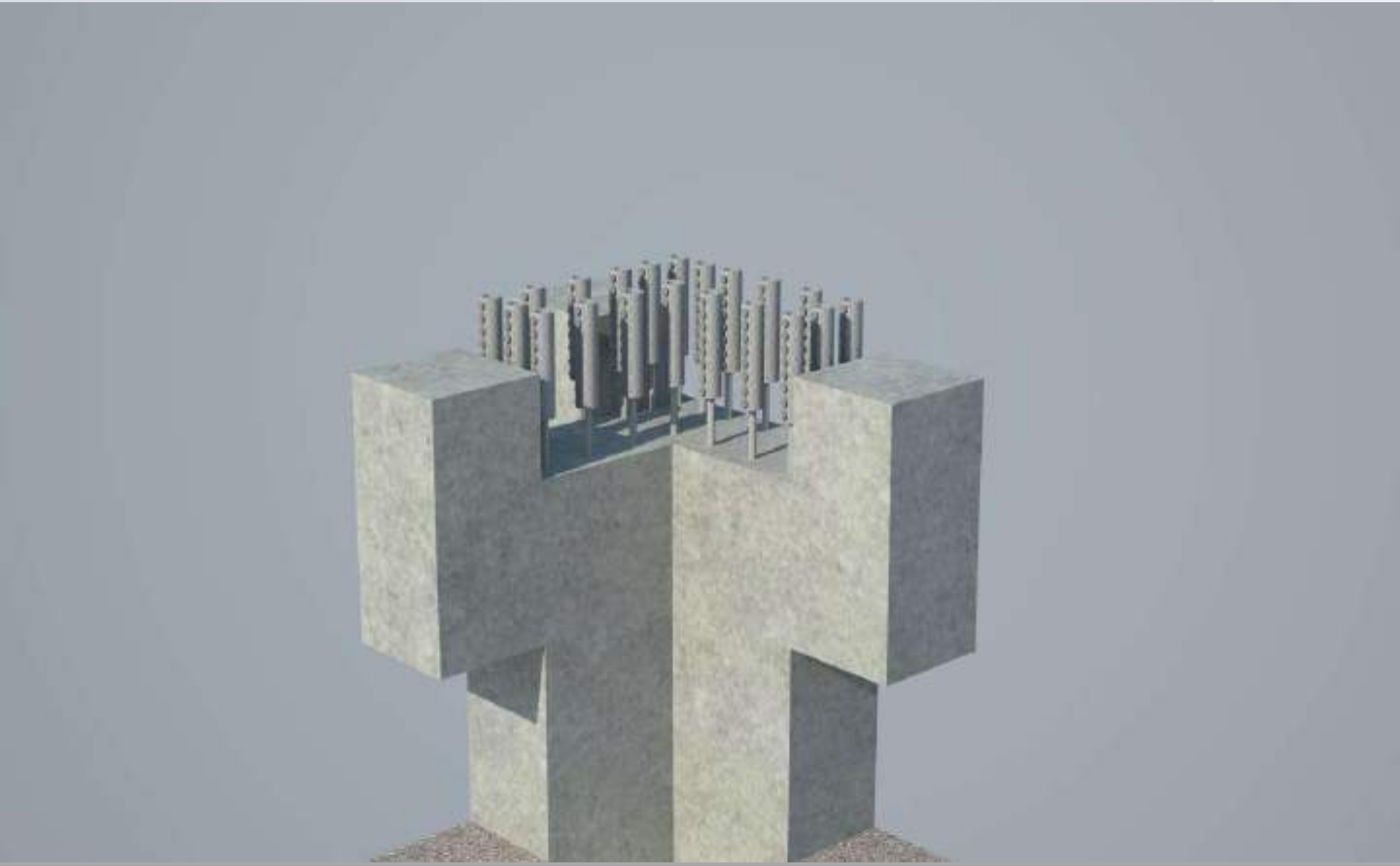


PREFABRICATION + SEISMIC PROTECTION

COLUMN/COLUMN CONNECTION - Cadweld ® Rebar Splices

PREFABRICATION + SEISMIC PROTECTION

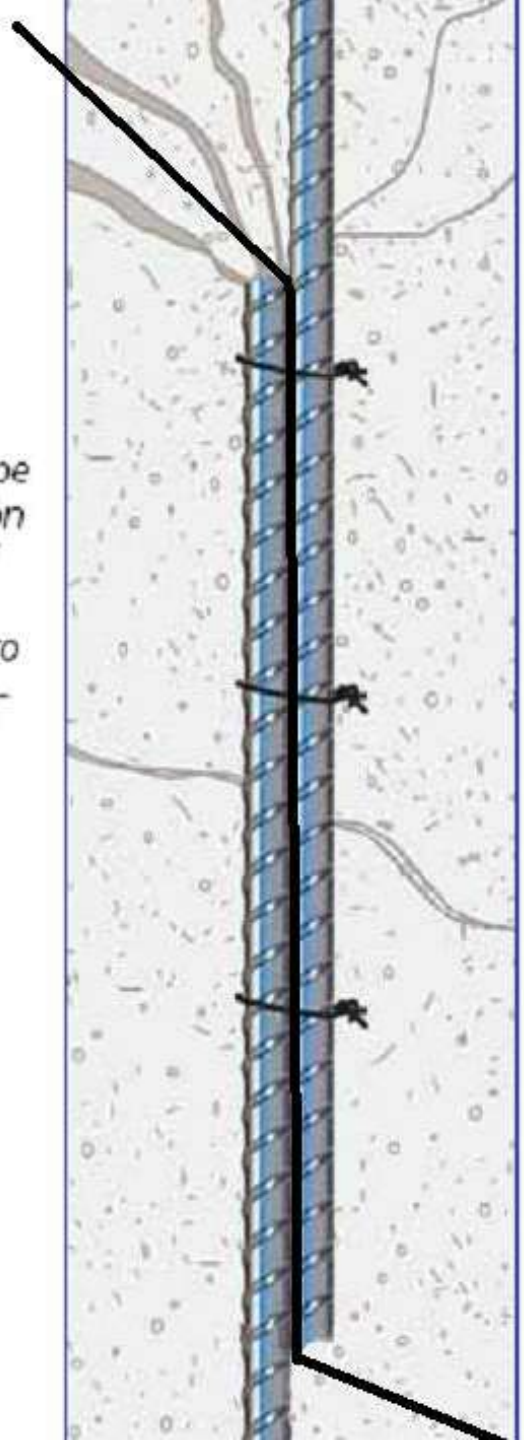
COLUMN/COLUMN CONNECTION - Cadweld ® Rebar Splices

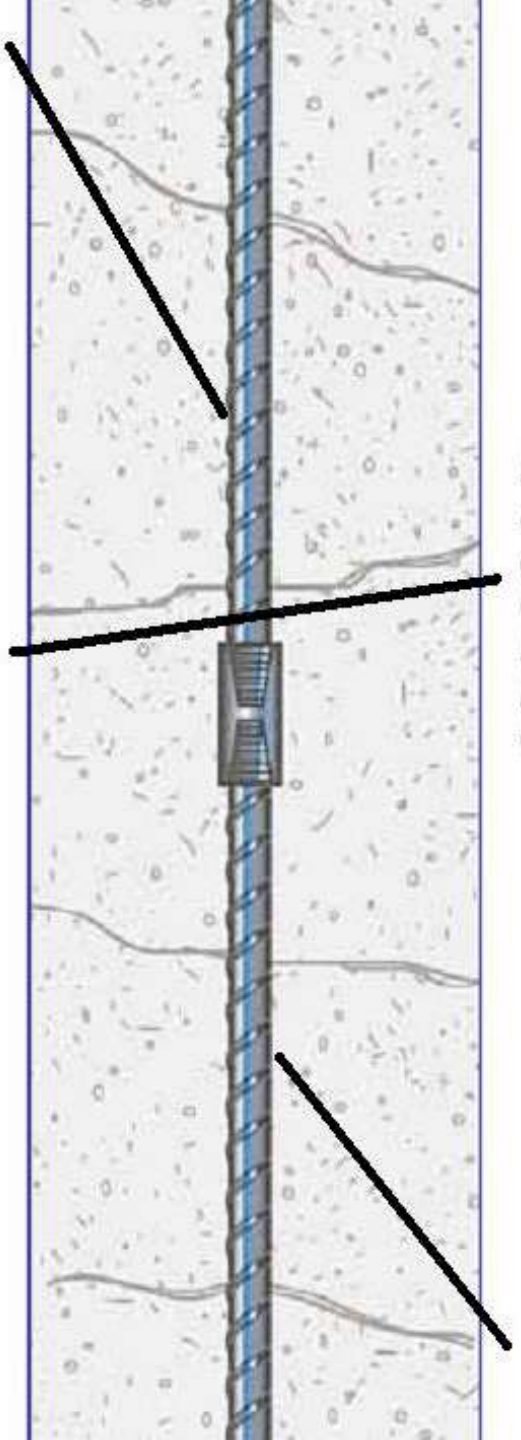


PREFABRICATION + SEISMIC PROTECTION

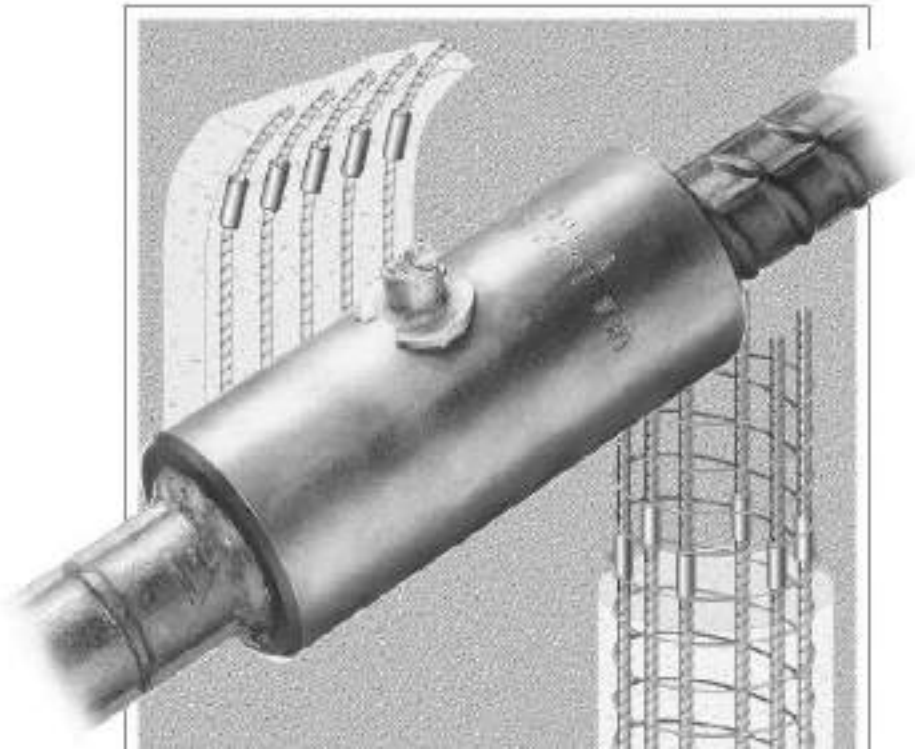
COLUMN/COLUMN CONNECTION - Cadweld ® Rebar Splices

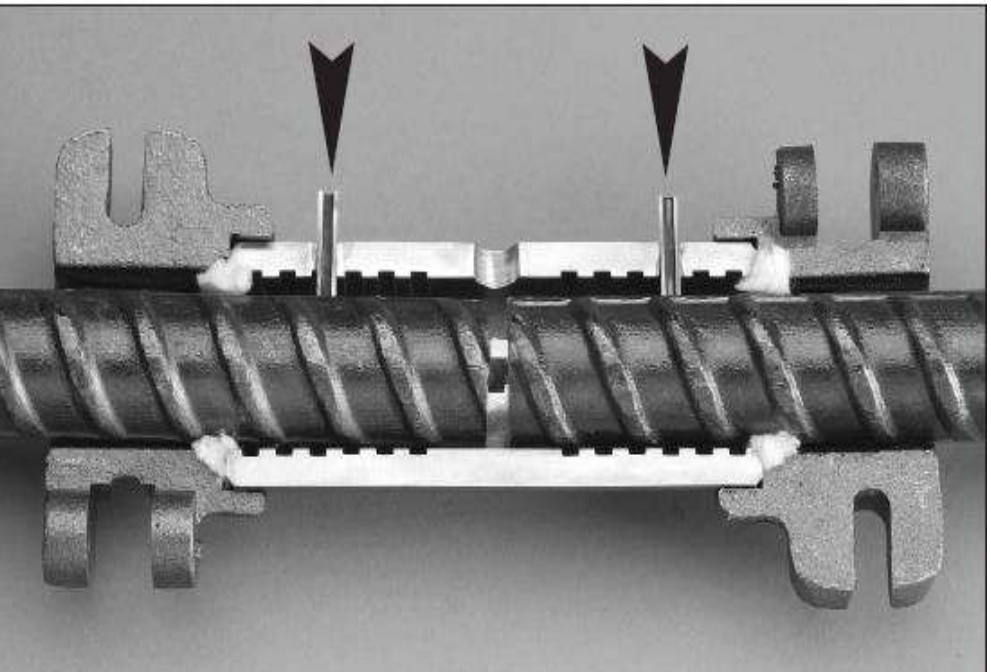
La validez de un solape depende del hormigón por su resistencia, asi que se crea en la construcción un punto de ruptura de su integridad y continuidad estructural.





El empalme mecánico asegura el mantenimiento de la continúa distribución de la carga en la barra, sin depender de la condición o de la existencia del hormigón.





Puede inspeccionarse visualmente.

No requiere preparación especial de extremos.

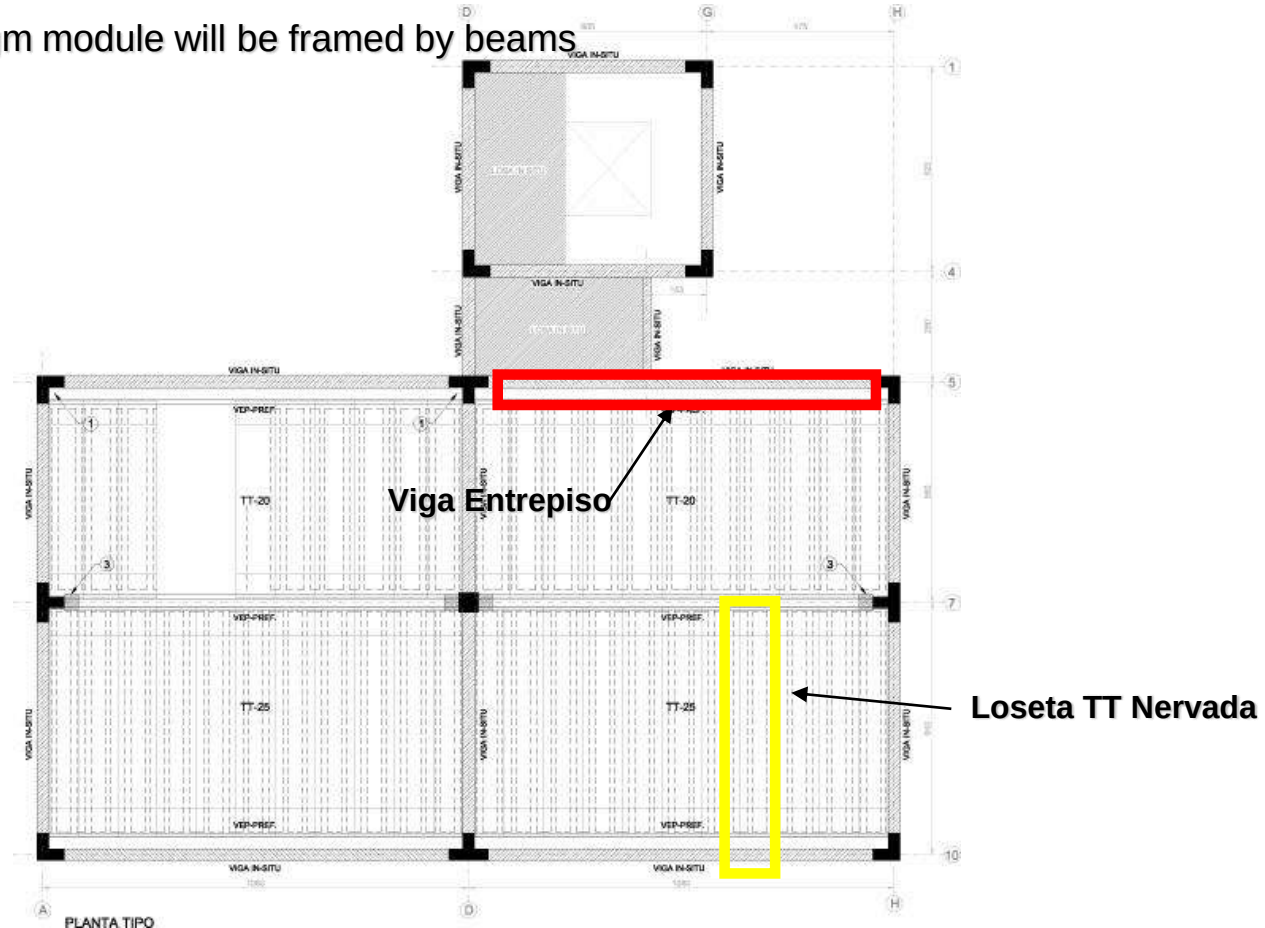
Admite desviaciones de alineamiento, ángulo y cambio de diámetro.

Diseñado para exceder las normas. Consistentemente desarrolla 150% de la fluencia de barras hasta grado 60.

Más de 25.000 ensayos alrededor del mundo.

C DIAFRAGM

- For floor slabs modules of 8x8m or similar are recommended and an eventual maximum of 12 meters
- TT slabs have only gravitational responsibility
- All seismic stresses are absorbed with the structural in site concrete upper-slab and structural prefabricated concrete walls
- Each diaphragm module will be framed by beams

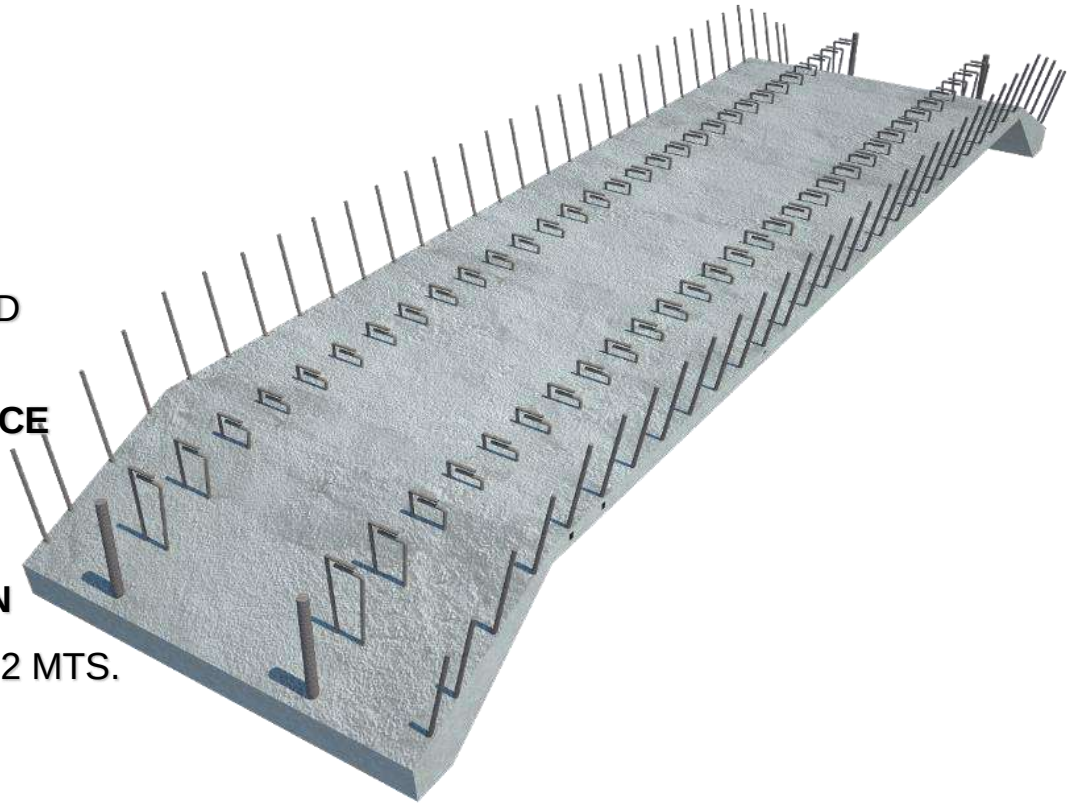


PREFABRICATION + SEISMIC PROTECTION

Precast TT Slab TENSOCRET®

MAIN ADVANTAGES OF USING PRECAST TT SLABS

- **FAST** and EASY **ASSEMBLY**
- DOES NOT REQUIRES **SHORINGS**
- HIGH **RESISTANCE** and SECURITY
- **LOWER EXECUTION TIME** and WORKFORCE
- INDUSTRIAL PRODUCTION and CONTROLLED **QUALITY**
- ONLY PRECAST SLAB WITH **FIRE RESISTANCE F-120** – CERTIFICATE
- **LESS OWN WEIGHT** to the STRUCTURE
- HIGHER THERMAL and ACUSTIC **INSULATION**
- **BIG DISTANCE** BETWEEN SUPPORTS up to 12 MTS.
- **OVERLOAD** up to 2.000 Kg/m2

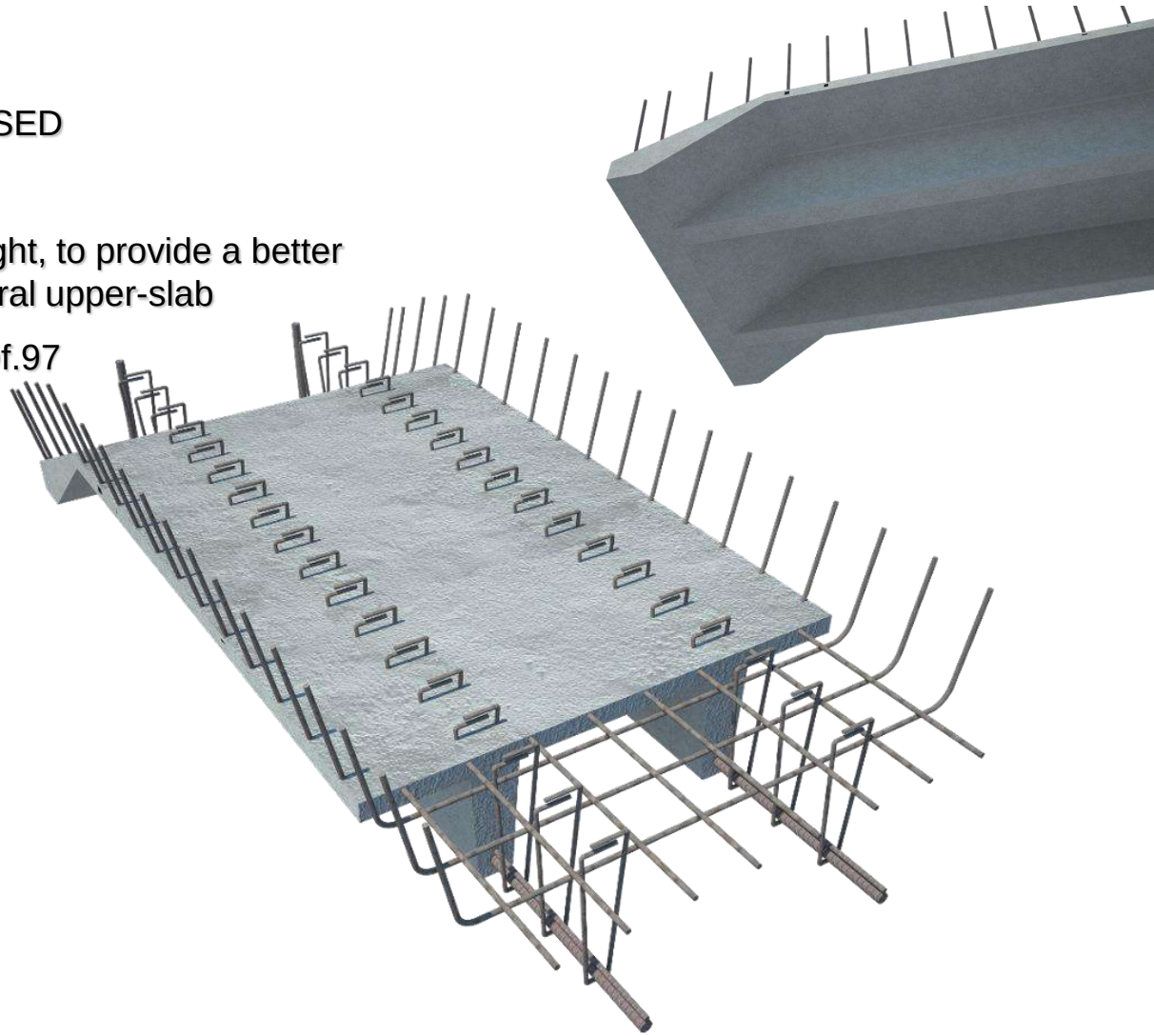


PREFABRICATION + SEISMIC PROTECTION

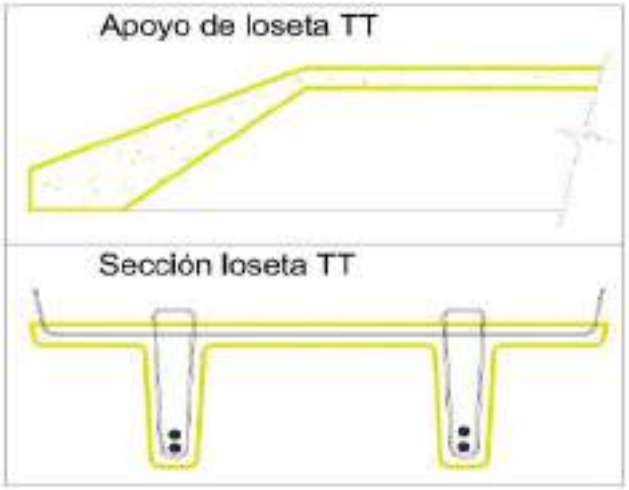
Precast TT Slab TENSOCRET®

GENERAL FEATURES

- **TT Slab**
- Reinforced Concrete, Not PRESTRESSED
- Rough surface for better adherence
- Stirrups and electro welded mesh in sight, to provide a better anchorage to the in site concrete structural upper-slab
- **RF-120** fire certification NCh 935/71 Of.97



Idiem
UN SIGLO DE CONFIANZA Y RESPALDO

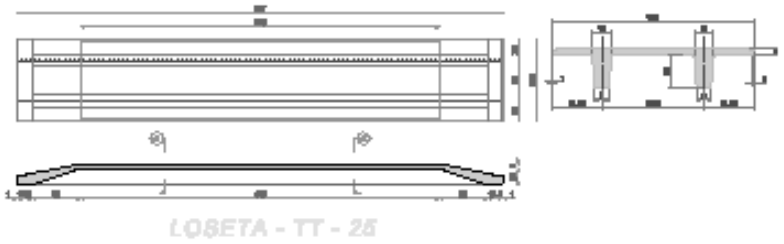


PREFABRICATION + SEISMIC PROTECTION

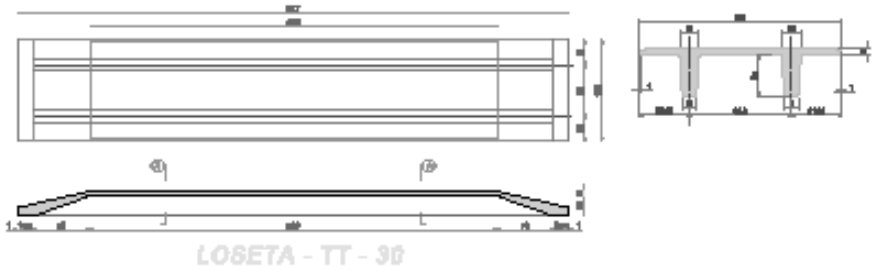
Precast TT Slab TENSOCRET®

PRECAST TT SLABS TYPES

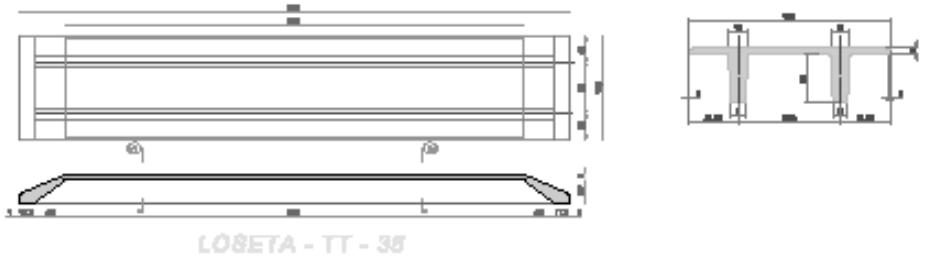
- **BIG DISTANCE** BETWEEN SUPPORTS up to 12 MTS.
- **OVERLOAD** up to 2.000 Kg/m2



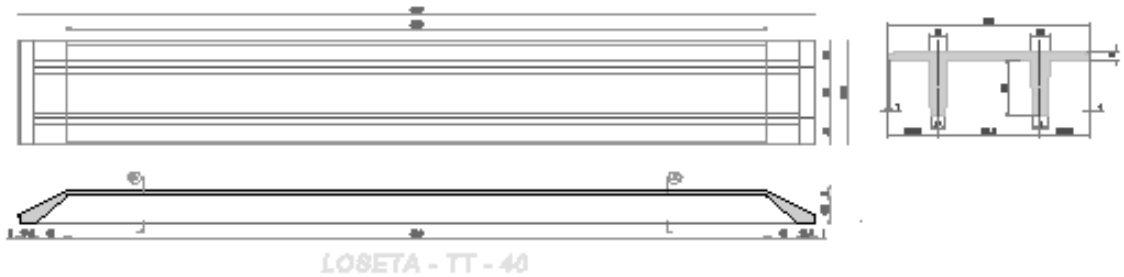
LOSETA - TT - 25



LOSETA - TT - 30



LOSETA - TT - 35



LOSETA - TT - 40

PREFABRICATION + SEISMIC PROTECTION

Precast TT Slab TENSOCRET®

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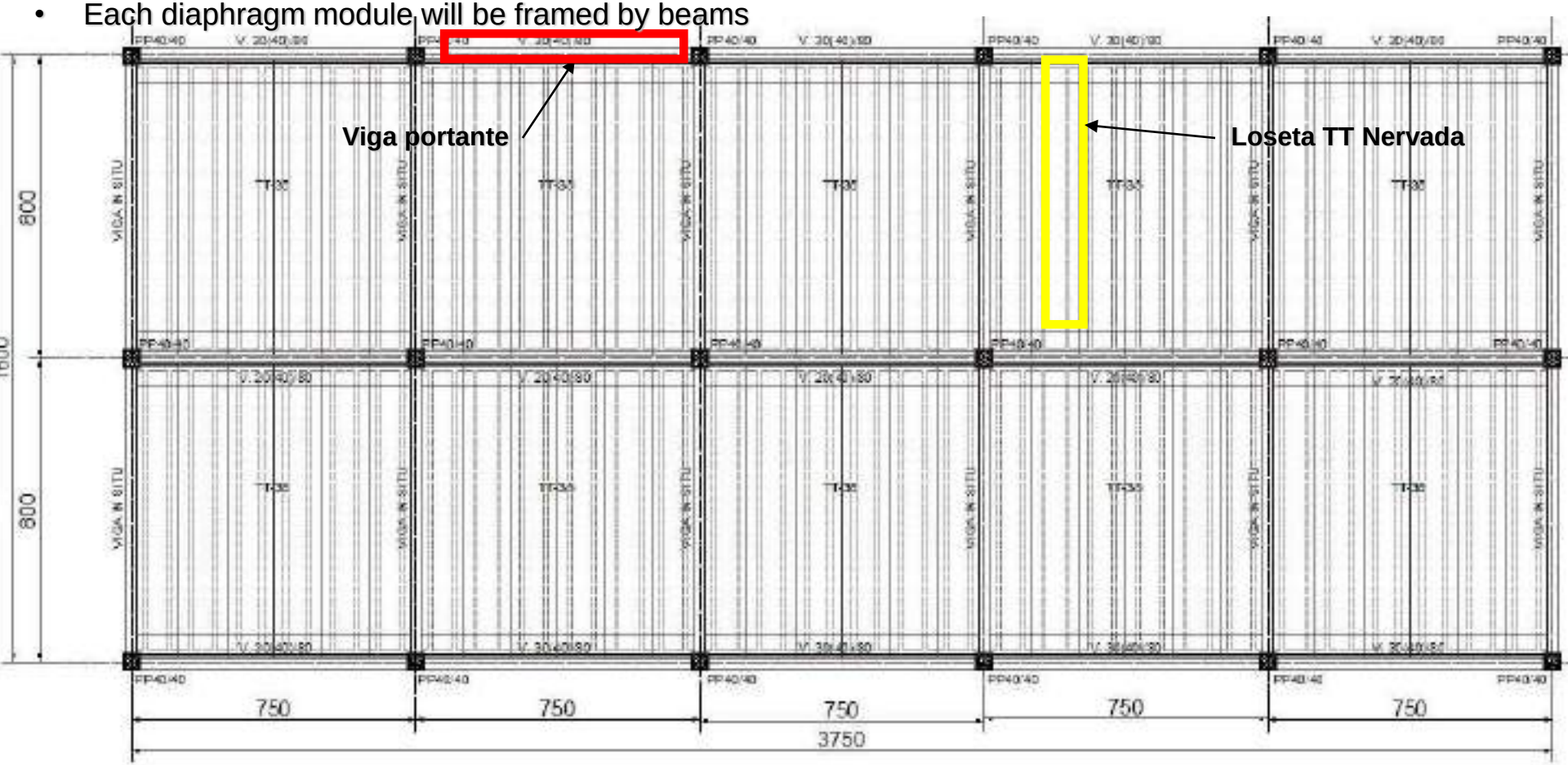
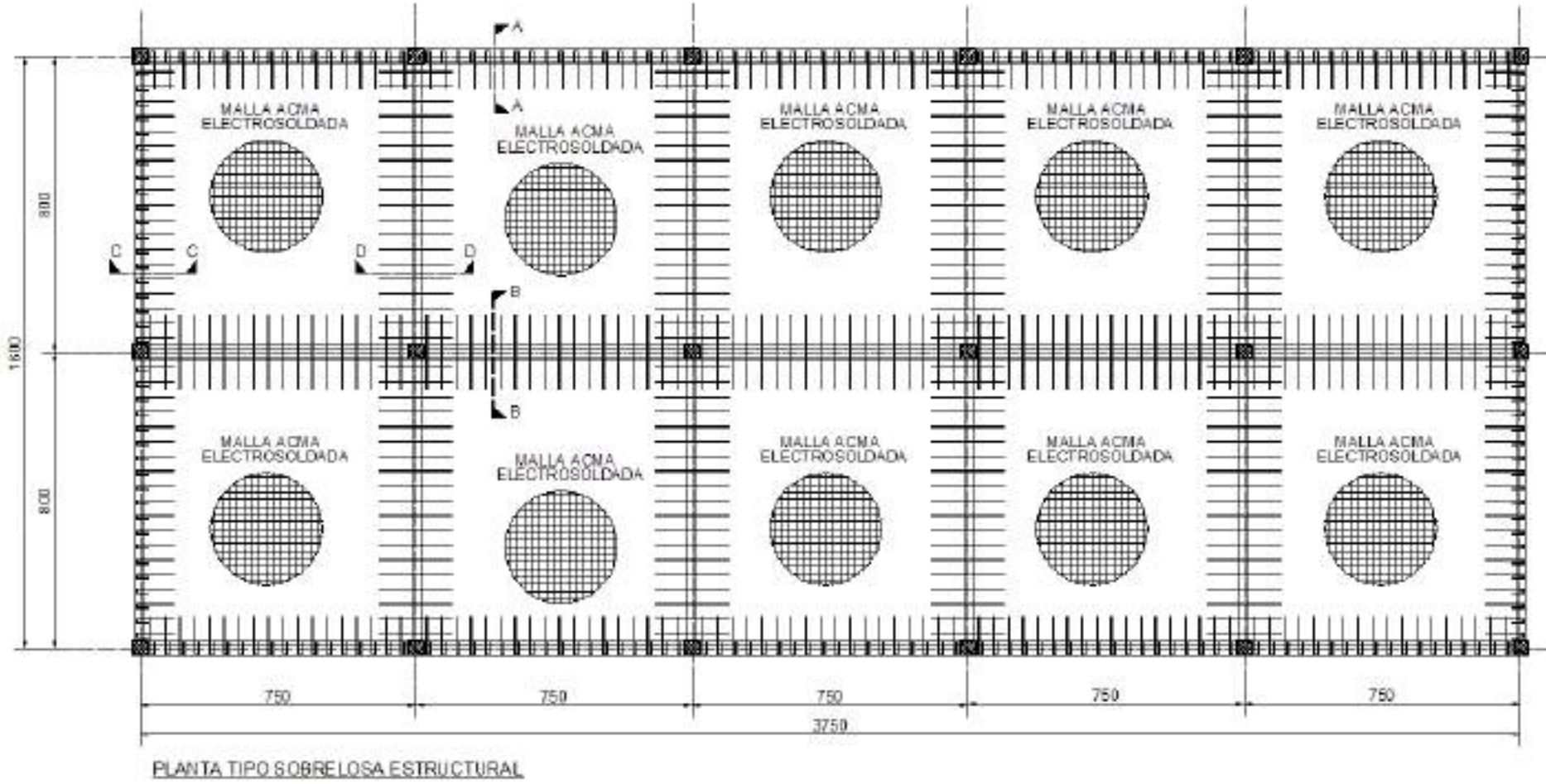


PREFABRICATION + SEISMIC PROTECTION

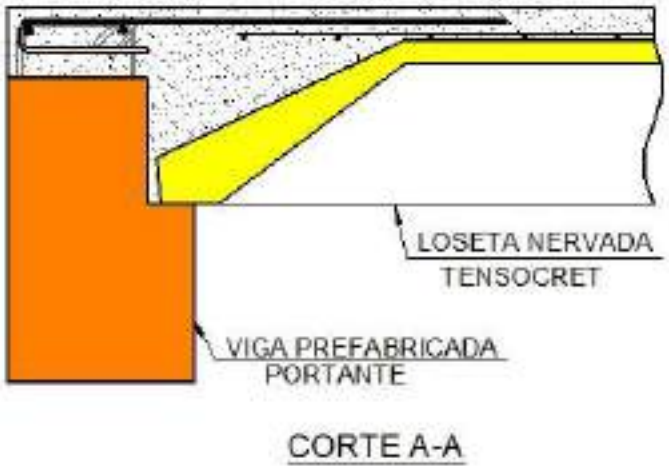
STRUCTURAL UPPER SLAB



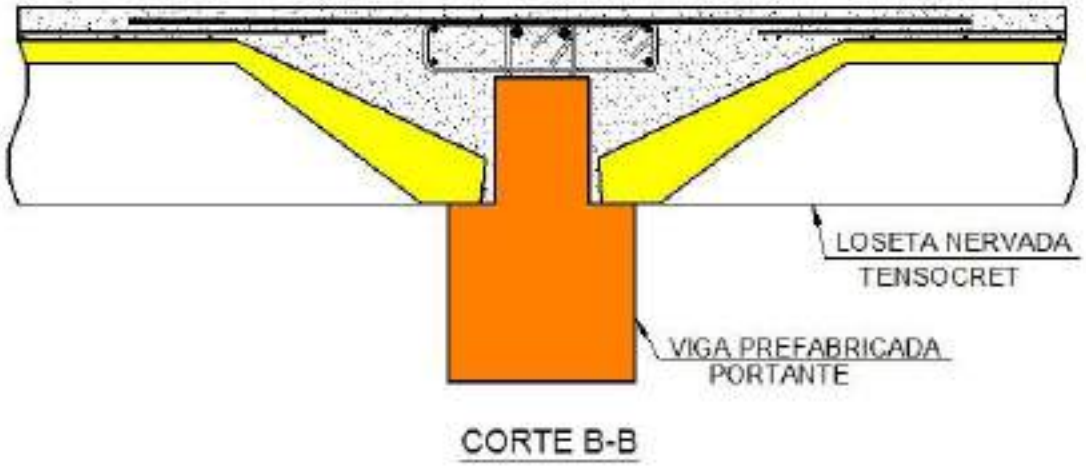
PLANTA TIPO SOBRELOSA ESTRUCTURAL

TRADITIONAL SLABS TYPOLOGIES

TENSOCRET® structural connections



CORTE A-A



CORTE B-B

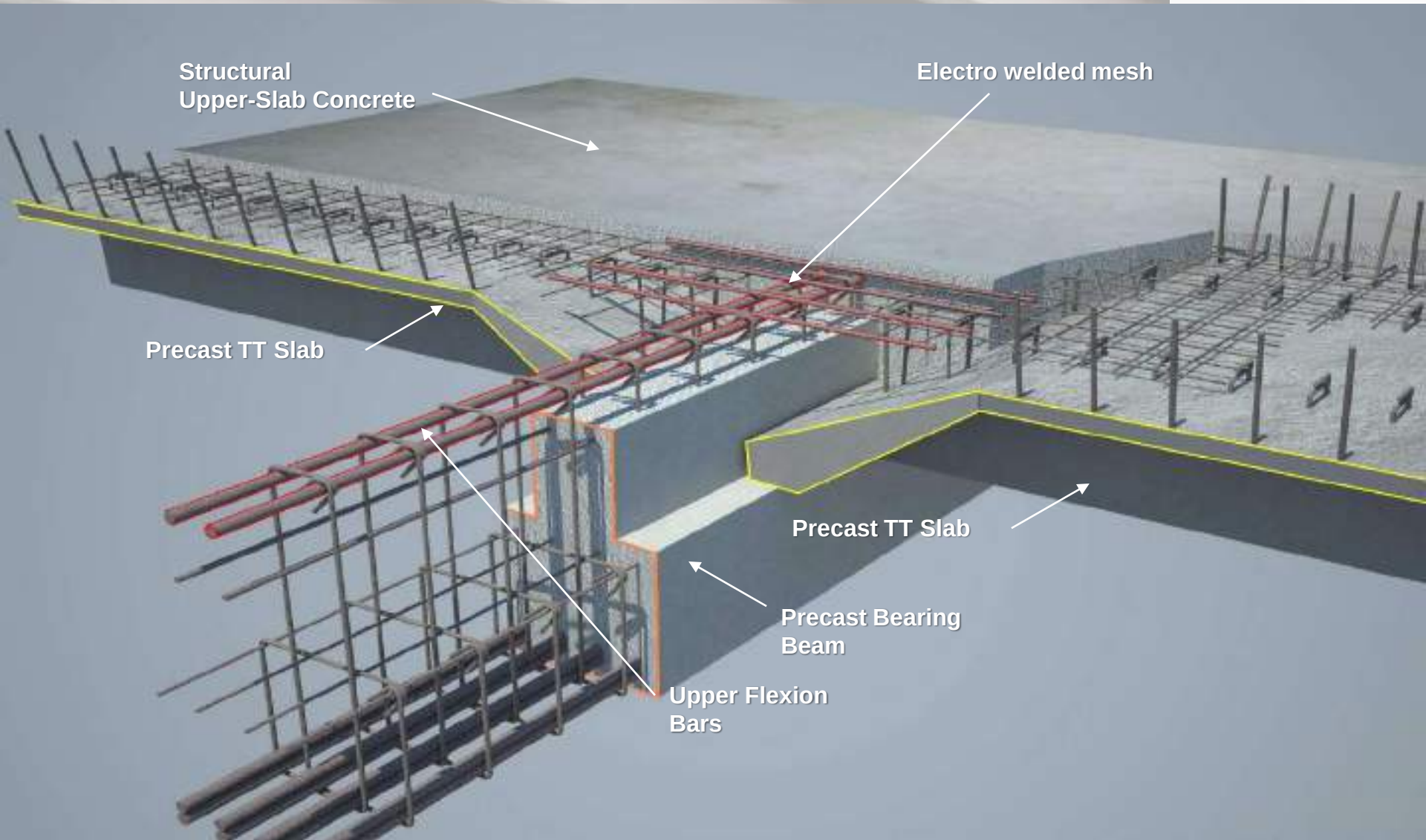
CORTE C-C

CORTE D-D

TRADITIONAL SLABS TYPOLOGIES

CONNECTION: Precast TT Slab – Precast Bearing Beam

IN SITE STRUCTURAL CONCRET UPPER-SLAB



PREFABRICATION + SEISMIC PROTECTION

Precast Structure first stage – Level +5

PREFABRICATION + SEISMIC PROTECTION

Precast Structure second stage – Level +9

PREFABRICATION + SEISMIC PROTECTION

Precast Structure second stage – Level +9

PREFABRICATION + SEISMIC PROTECTION

Building siding and finishes

PREFABRICATION+ SEISMIC PROTECTION

Building Finishes – Isolation Devices Level / TENSOCRET®

PREFABRICATION+ SEISMIC PROTECTION

Building Finishes – Isolation Devices Level / TENSOCRET®

PREFABRICATION+ SEISMIC PROTECTION

Building Finishes – Isolation Devices Level / TENSOCRET®

PREFABRICATION+ SEISMIC PROTECTION

TENSOCRET® **precast building system**

PREFABRICATION+ SEISMIC PROTECTION

TENSOCRET® precast building system

PREFABRICATION+ SEISMIC PROTECTION

TENSOCRET® precast building system

Septiembre – Noviembre 2018

UNIVERSITY BUILDING Universidad AUTÓNOMA DE CHILE sede Talca

INTERDISCIPLINARY TEAM

UNIVERSIDAD AUTÓNOMA	TENSOCRET®	MOMENTA + TENSOCRET®	MAURICIO COZZI
PROPIETARIO	SISTEMA PREFABRICADO	INGENIERÍA	ARQUITECTOS

	Uso	: Educacional	Ubicación	: Talca
	Numero de niveles	: **6 niveles + 1 zocalo**	Modulación	: 8 x 7.5m
	Superficie	: 5.000 m2 aprox.		
A.	**Protección sísmica**	: Con aisladores y deslizadores.		
B.	**Estructuración**	: Marcos Rígidos Prefabricados TENSOCRET		
C.	**Uniones viga-columna**	: Consolas Metálicas MOMENTA		
D.	**Diafragmas de piso**	: Sobrelosa estructural continua, hormigonada en sitio sobre Losetas TT TENSOCRET		

SLABS TYPOLOGIES WITH SEISMIC PROTECTION

- **Builded Surface 5000 m^2.**
- **6 levels + underground.**
- **Precast reinforced concrete building based on rigid frames and with seismic isolation base system.**
- **6 Elastomeric Isolators , 5 Elastomerics Isolators with steel core y 13sliding isolators,**
- **Columns manufactured in two stages for transpor optimization: First stage 4 levels high second stage 2 levels. Connection on site.**
- **Precast beams with welded connection for lower reinforcement. Without mechanical connectors.**
- **Precast high rigidity TT type slabs.**
- **Structural overslab as a structural seismic diaphragm and for connection of beams (upper reinforcement) with precast columns and slabs.**

PREFABRICATION + SEISMIC PROTECTION

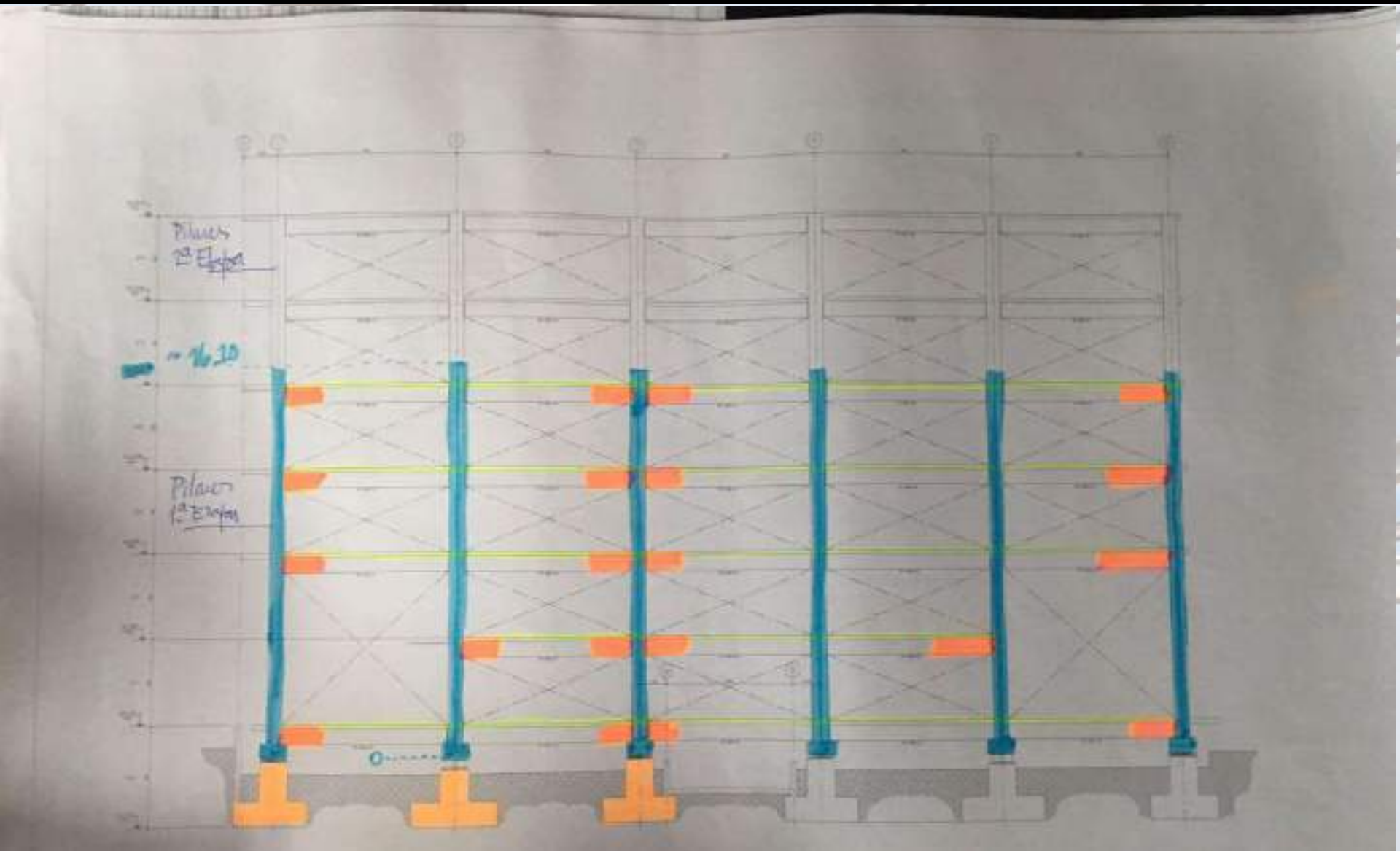
On site Foundations

PREFABRICATION + SEISMIC PROTECTION

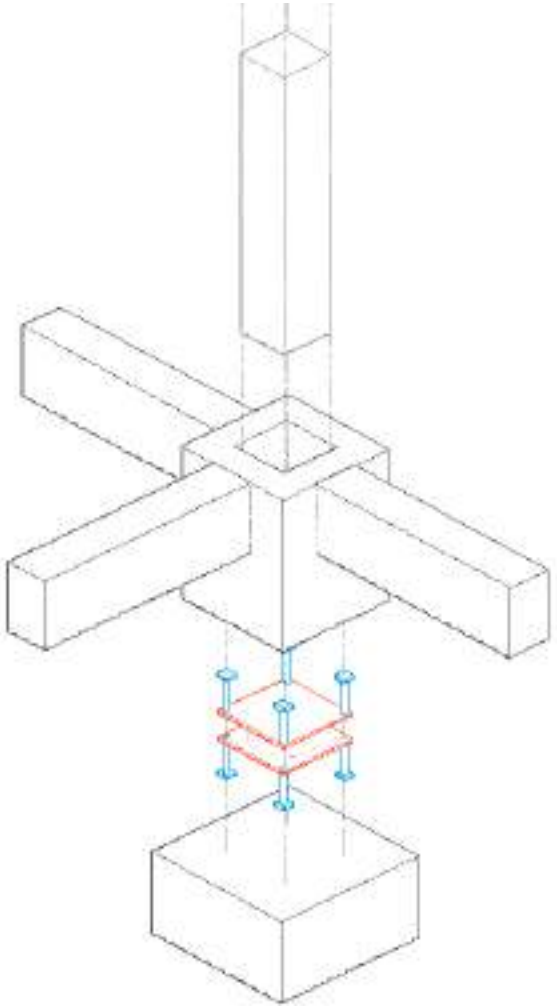
Precast TT TENSOCRET® Slabs

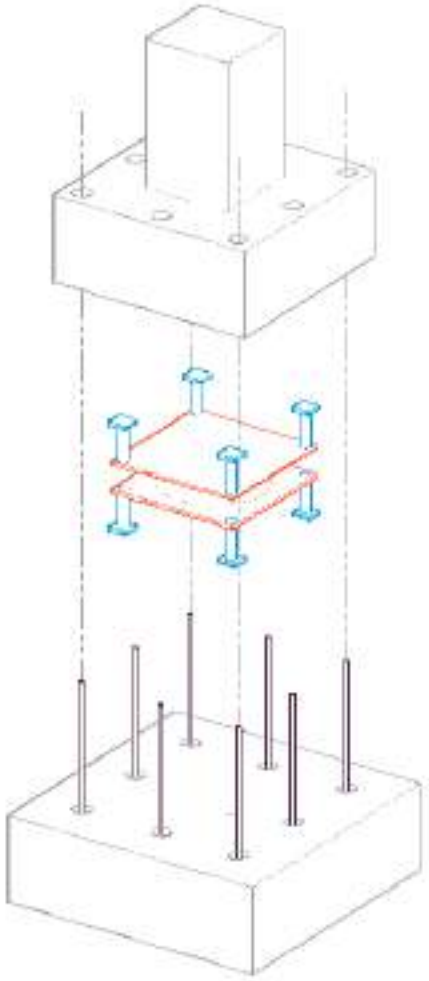
PREFABRICATION + SEISMIC PROTECTION

Precast Structure Section



PREFABRICATION + SEISMIC PROTECTION





TYPES OF SOLUTIONS FOR BASAL ISOLATION SEISMIC CONNECTIONS

PREFABRICATION + SEISMIC PROTECTION

TYPES OF SOLUTIONS FOR BASAL ISOLATION SEISMIC CONNECTIONS

PREFABRICATION + SEISMIC PROTECTION

Transport of Precast Elements

PREFABRICATION + SEISMIC PROTECTION

Transpor of Precast Elements

PREFABRICATION + SEISMIC PROTECTION

Precast Columns Installation

PREFABRICATION + SEISMIC PROTECTION

Precast Columns Installation

PREFABRICATION + SEISMIC PROTECTION

Precast Structure Installation

PREFABRICATION + SEISMIC PROTECTION

Precast Structure Installation

PREFABRICATION + SEISMIC PROTECTION

STRUCTURAL UPPER SLAB

PREFABRICATION + SEISMIC PROTECTION

Precast Structure Installation

PREFABRICATION + SEISMIC PROTECTION

COLUMN/BEAM CONNECTION

PREFABRICATION + SEISMIC PROTECTION

Precast Structure Installation

PREFABRICATION + SEISMIC PROTECTION

Precast Structure Installation

PREFABRICATION + SEISMIC PROTECTION

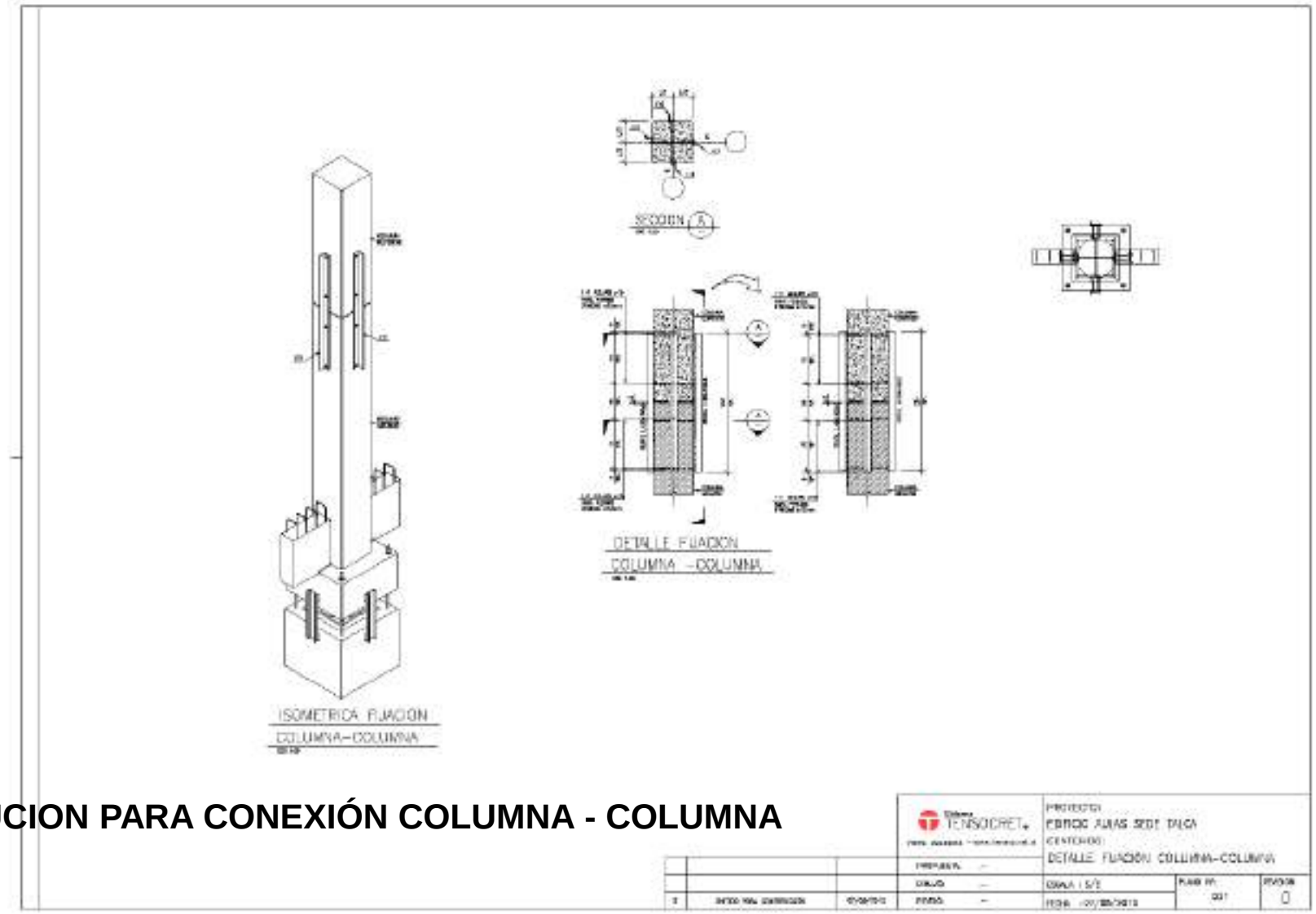
Precast Structure Installation

PREFABRICATION + SEISMIC PROTECTION

COLUMN/COLUMN CONNECTION

PREFABRICATION + SEISMIC PROTECTION

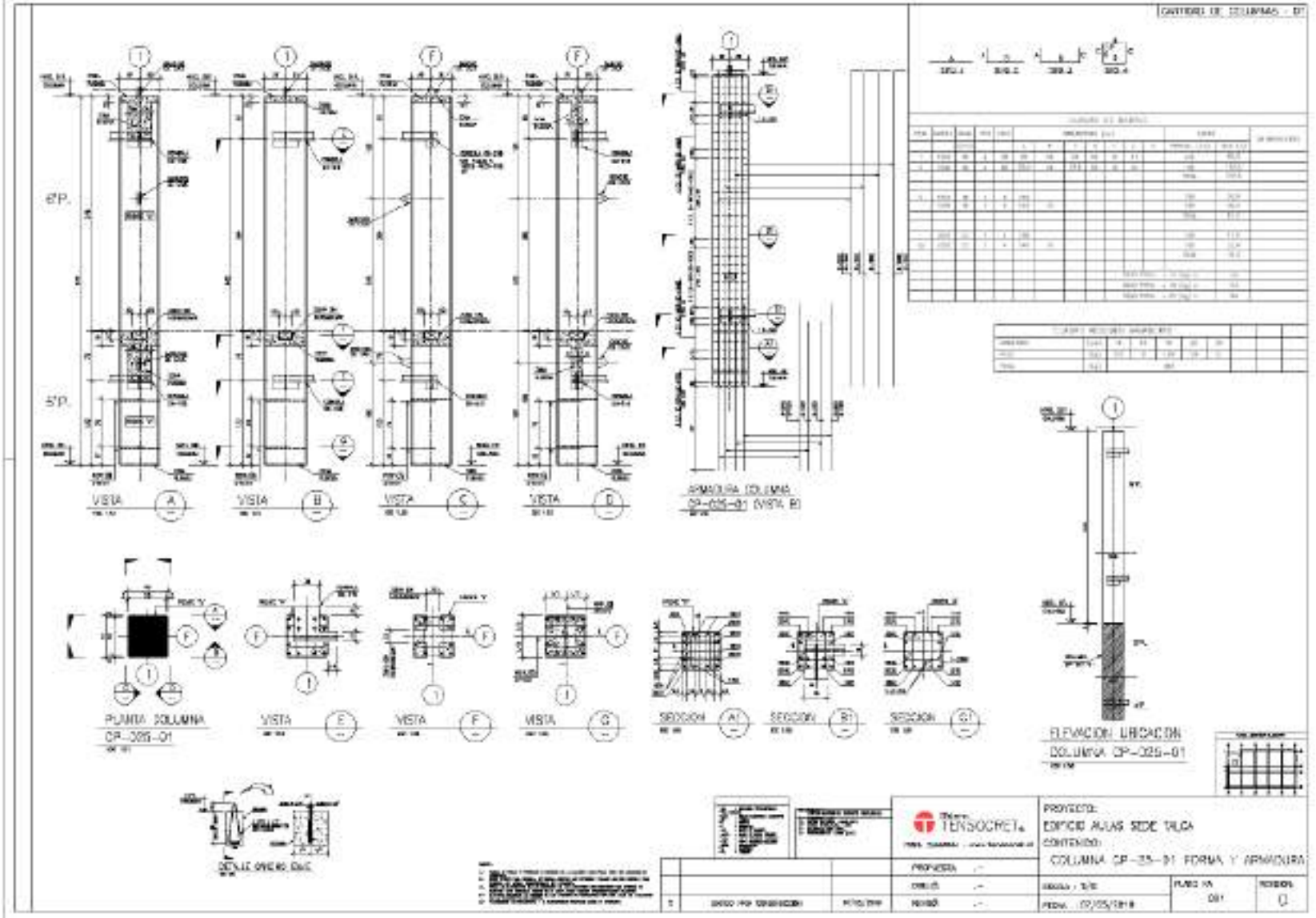
COLUMN/COLUMN CONNECTION



SOLUCION PARA CONEXIÓN COLUMNA - COLUMNA

PREFABRICATION + SEISMIC PROTECTION

COLUMN/COLUMN CONNECTION



PREFABRICATION + SEISMIC PROTECTION

Precast Structure Installation

PREFABRICATION + SEISMIC PROTECTION

Precast Structure Installation

PREFABRICATION+ SEISMIC PROTECTION

TENSOCRET® **precast building system**

PREFABRICATION+ SEISMIC PROTECTION

TENSOCRET® **precast building system**

A new paradigm in the construction sector

The sector presents new technologies and developments …

A

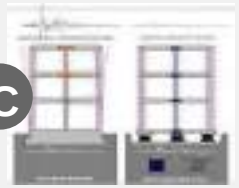
Precast

Consolidation of a Building System of high quality and varied benefits.

B

Coordination

Valuation in terms and costs of the coordination of Architecture + Engineering + Construction.



C

Seismic Protection

High degree of development of these systems an their checked efectiveness allow a new concept of seismic design.

D

Productivity

Constant need to improve productivity in construction sector, in its processes, design and its components.

… wich present us a new way of building …

Prefabricated Building Solutions that save costs and reduce lead times.
We incorporate Technology, optimize the design and construction method, reducing construction times, offering a high standard of seismic safety, lower environmental impact, cost savings and greater profitability for the project.

TENSOCRET® proposal

- **Shorter contruction Times in relation to traditional construction methods (≥30-40%).**
- **Better construction quality, process with industrial control and continuous improvement.**
- **Lower costs, greater coordination, les unforseen-extraordinary works and greater compliance with deadlines.**
- **Lower Environmental Impact, during construction (emisión of dusts, noise and waste)**
- **Guarantees content protection and inmediate operational continuity.**

TENSOCRET®

SISTEMAS PREFABRICADOS EN HORMIGÓN ARMADO Y PRETENSADO

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