Escola Politècnica Superior d'Edificació de Barcelona
UNIVERSITAT POLITÈCNICA DE CATALUNYA

ARQUITECTURA TÈCNICA
PROJECTE FINAL DE CARRERA

APLICACIONS DE LES LLOSES POSTTESADES: CRITERIS DE PROJECTE I POSADA EN OBRA
ANNEXOS

Projectista/es: BONILLA RODRÍGUEZ, Rocío
ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana
Director/s: SERRÀ MARTÍN, Isabel
Convocatòria: Febrer 2010

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Escola Politècnica Superior d'Edificació de Barcelona
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ARQUITECTURA TÈCNICA
PROJECTE FINAL DE CARRERA

APLICACIONS DE LES LLOSES POSTTESADES: CRITERIS DE PROJECTE I POSADA EN OBRA
ANNEX 1. PLÀNOLS

Projectista/es: BONILLA RODRÍGUEZ, Rocío
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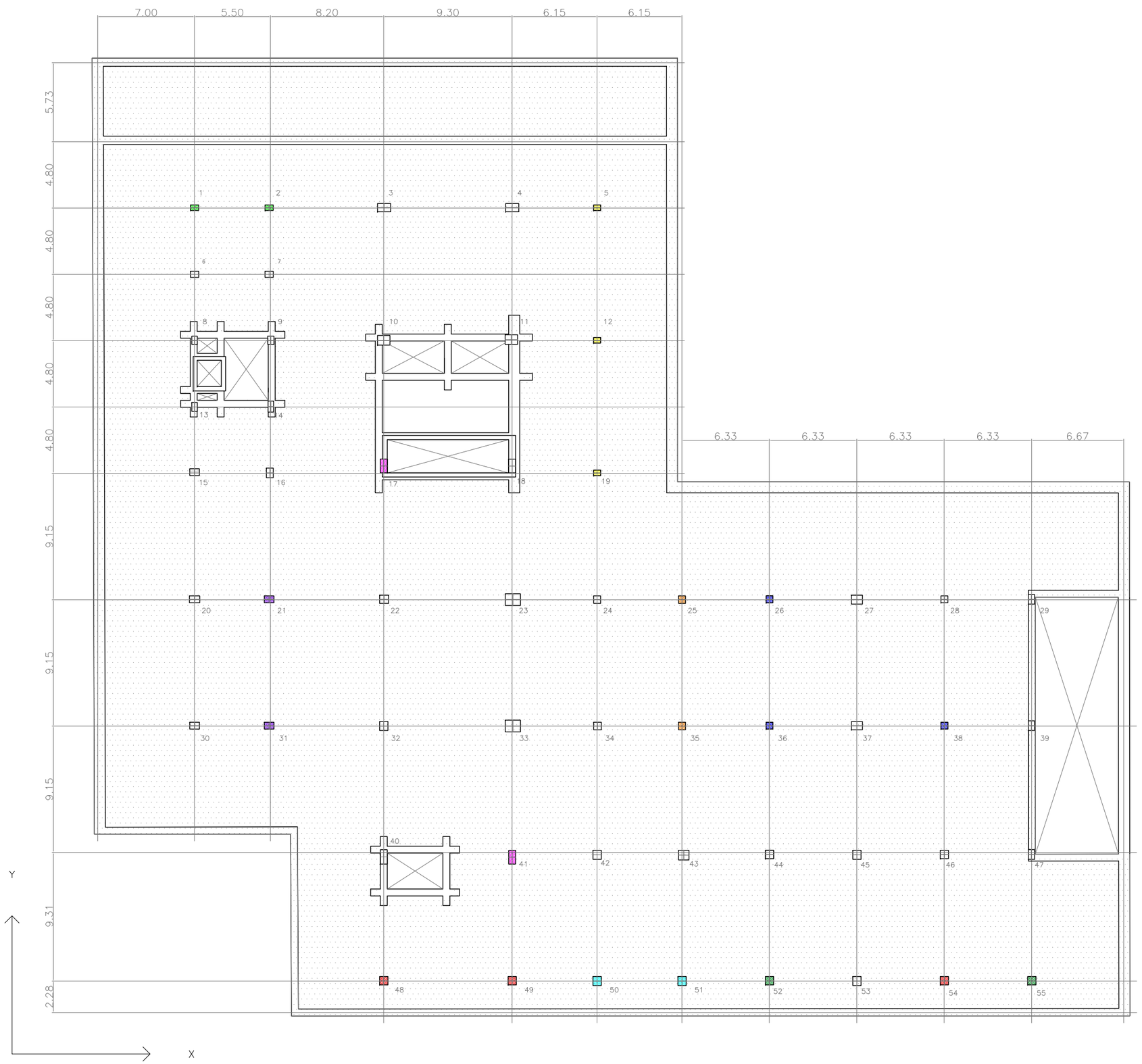
Director/s: SERRÀ MARTÍN, Isabel
Convocatòria: Febrer 2010



LLEGENDA

Llosa posttesada

SUPERFÍCIES

LLOSA POSTTESADA: 3.937,62 m2

TITULACIÓ:
ARQUITECTURA TÈCNICA

Escola Politècnica Superior d'Edificació de Barcelona
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ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana

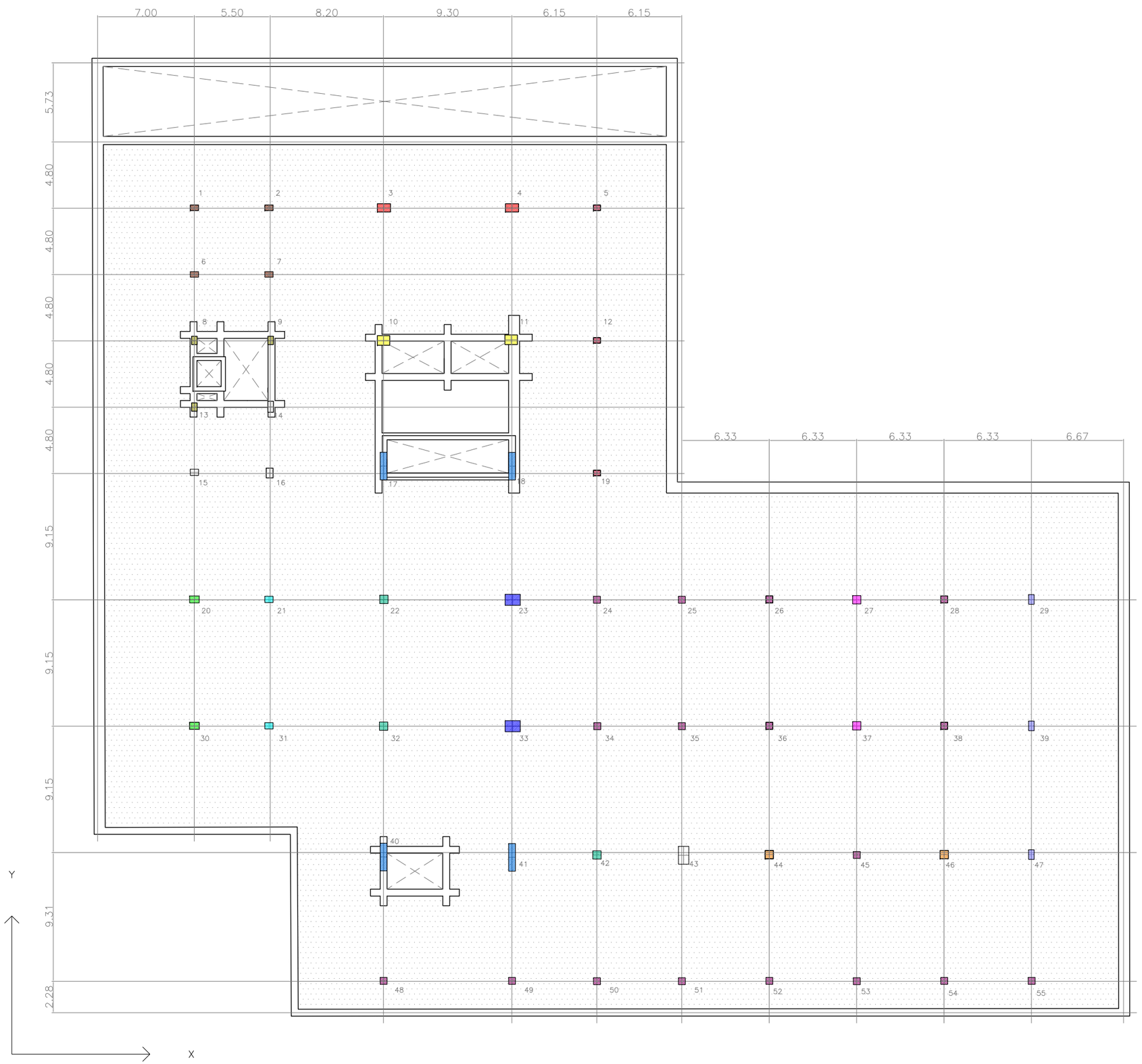
DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:
DESCRIPCIÓ GEOMÈTRICA
PLANTA SOTERRANI -3

PLÀNOL:
1.1

ESCALA:
1/300

CONVOCATÒRIA:
Febrer 2010



N

LLEGENDA

Llosa posttesada

SUPERFÍCIES

LLOSA POSTTESADA: 3.937,62 m2

TITULACIÓ:
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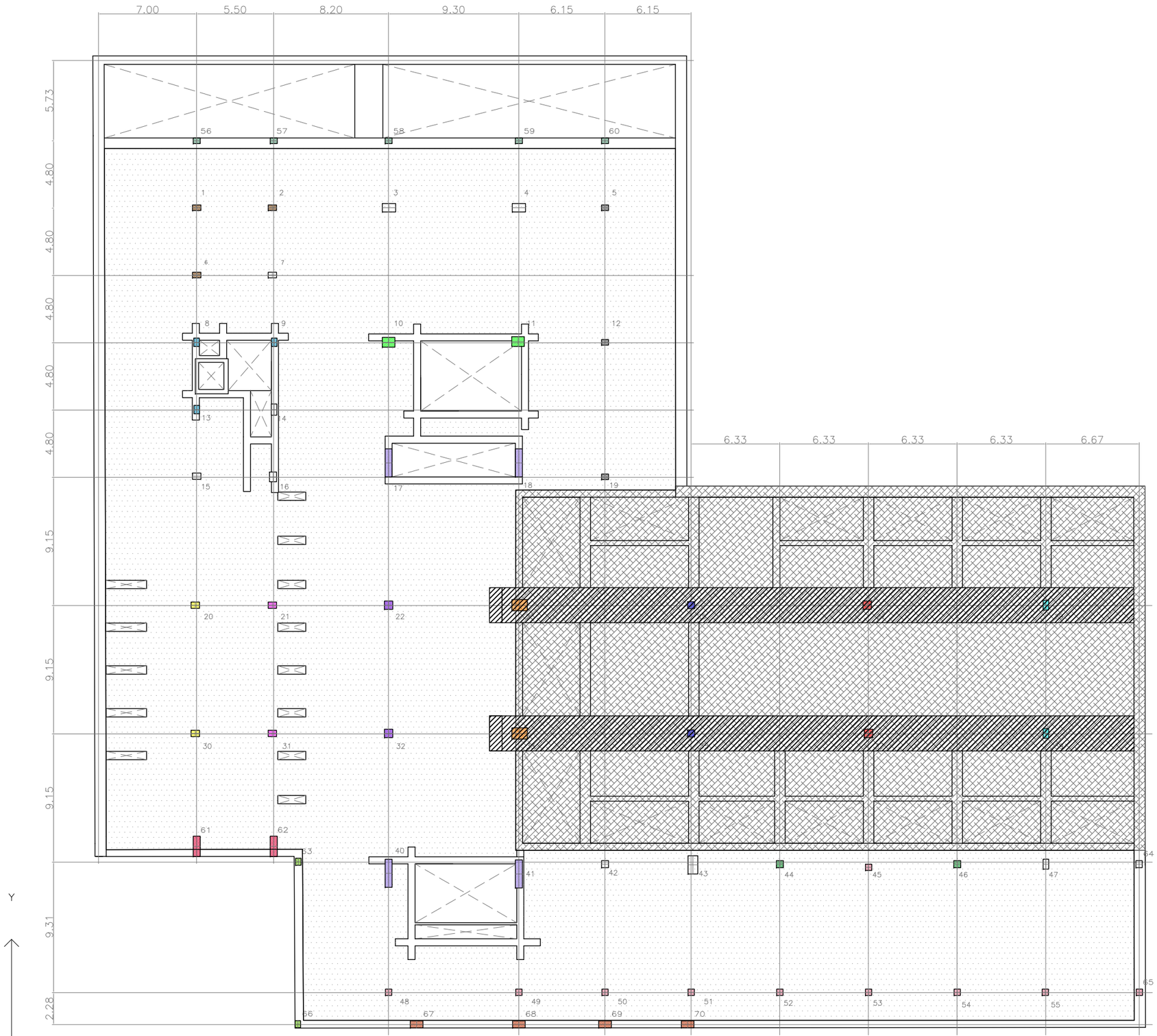
ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana

DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:	PLÀNOL:	ESCALA:	CONVOCATÒRIA:
DESCRIPCIÓ GEOMÈTRICA PLANTA SOTERRANI -2	1.2	1/300	Febrer 2010

N



LLEGENDA

- Llosa posttesada
- Llosa armada
- Jàsseres posttesades 250x60cm

SUPERFÍCIES

LLOSA POSTTESADA: 3.067,06 m2

LLOSA ARMADA: 1.164,14 m2

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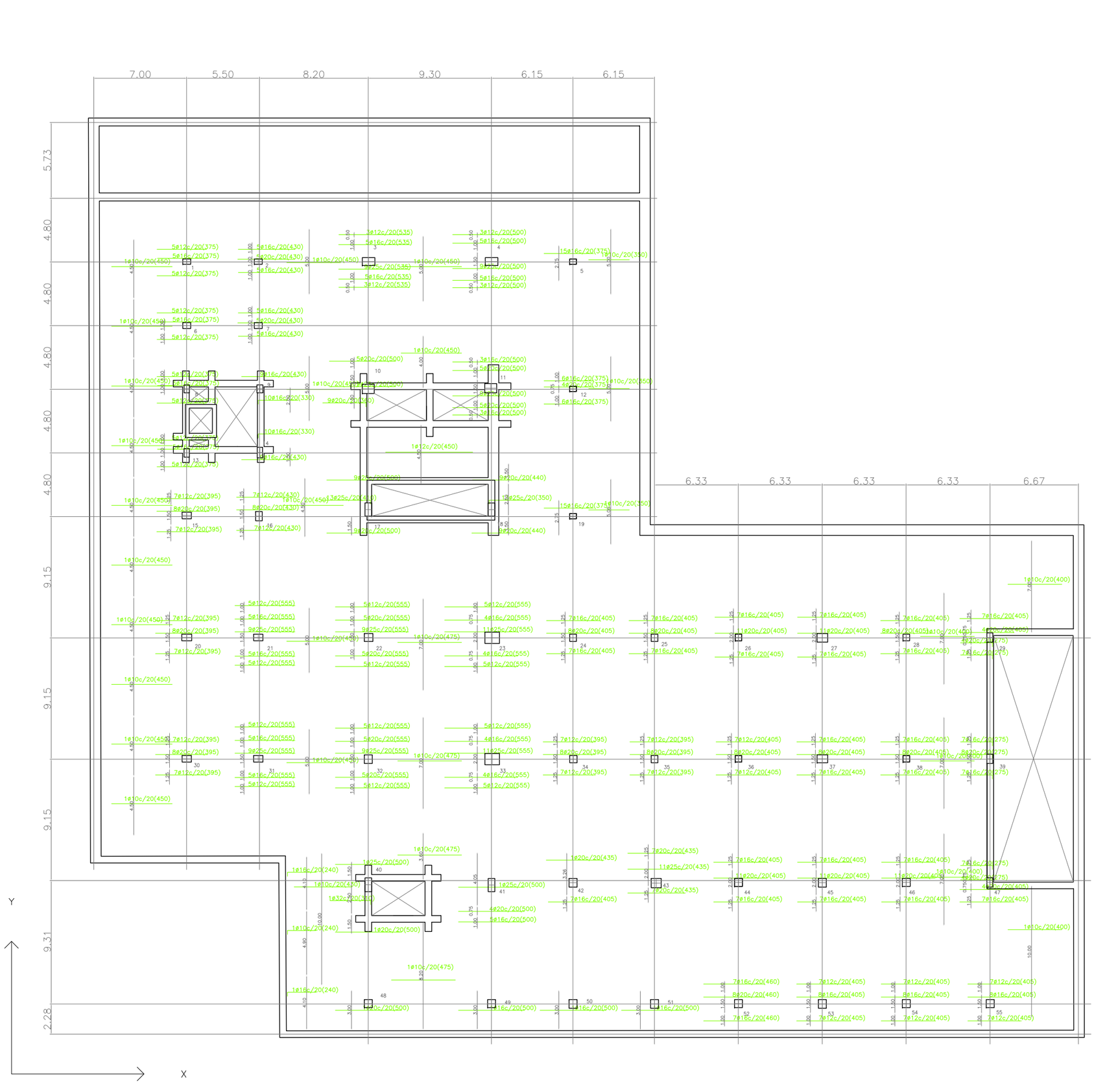
PLÀNOL:
DESCRIPCIÓ GEOMÈTRICA
PLANTA SOTERRANI -1

PLÀNOL: 1.3

ESCALA: 1/300

CONVOCATÒRIA: Febrer 2010



LLEGENDA

Armat longitudinal

NOTA

EXEMPLE: 8ø20c/20(395)
indica que s'utilitzaran 8 rodons del 20 cada 20 cm i que en total hi hauran 395 barres.

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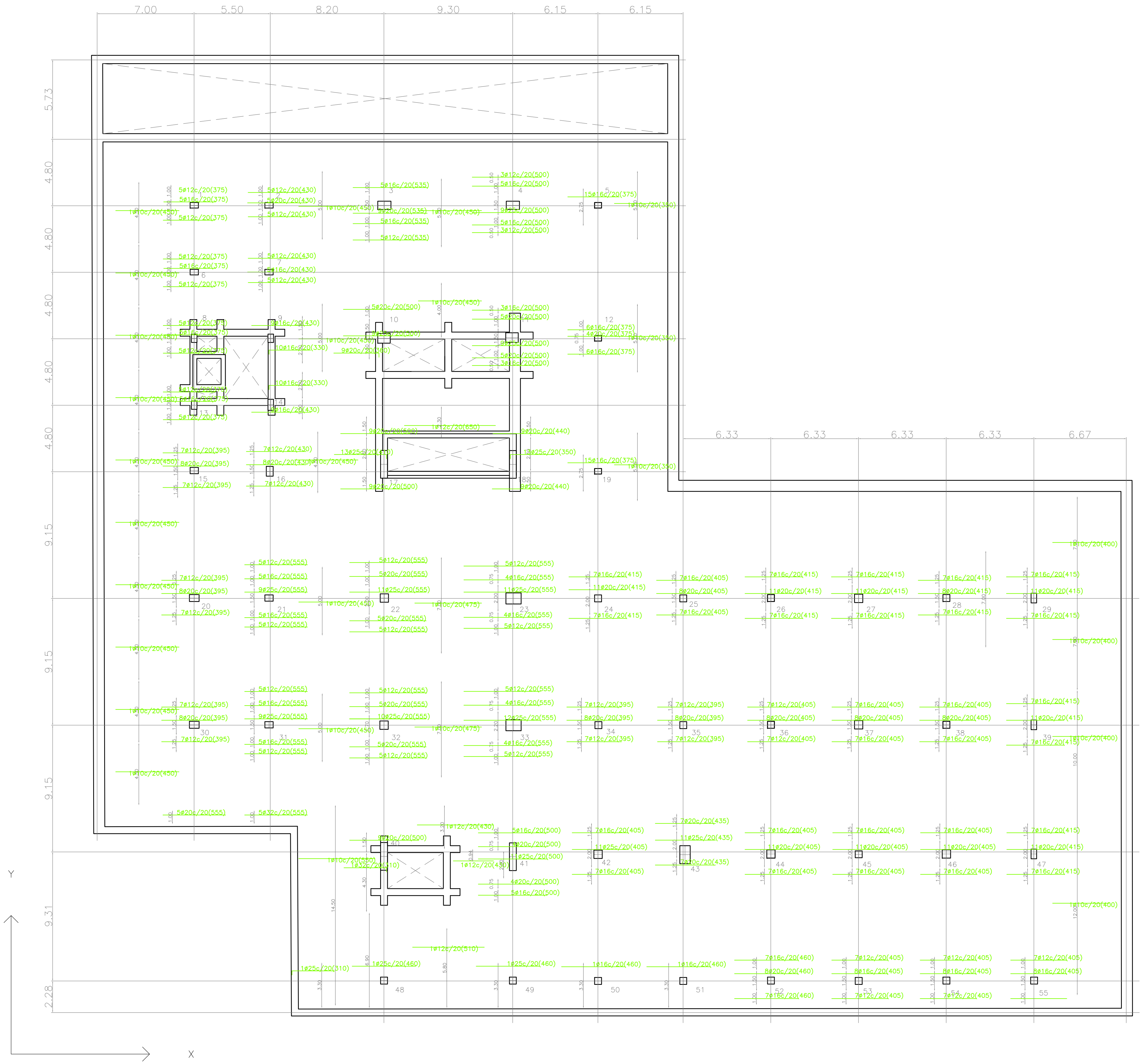
DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:	PLÀNOL:	ESCALA:	CONVOCATÒRIA:
ARMAT LONGITUDINAL PLANTA SOTERRANI -3	2.1	1/300	Febrer 2010



N

LLEGENDA

Armat longitudinal

NOTA

EXEMPLE: 8ø20c/20(405) indica que s'utilitzaran 8 rodons del 20 cada 20 cm i que en total hi hauran 405 barres.

TITULACIÓ:
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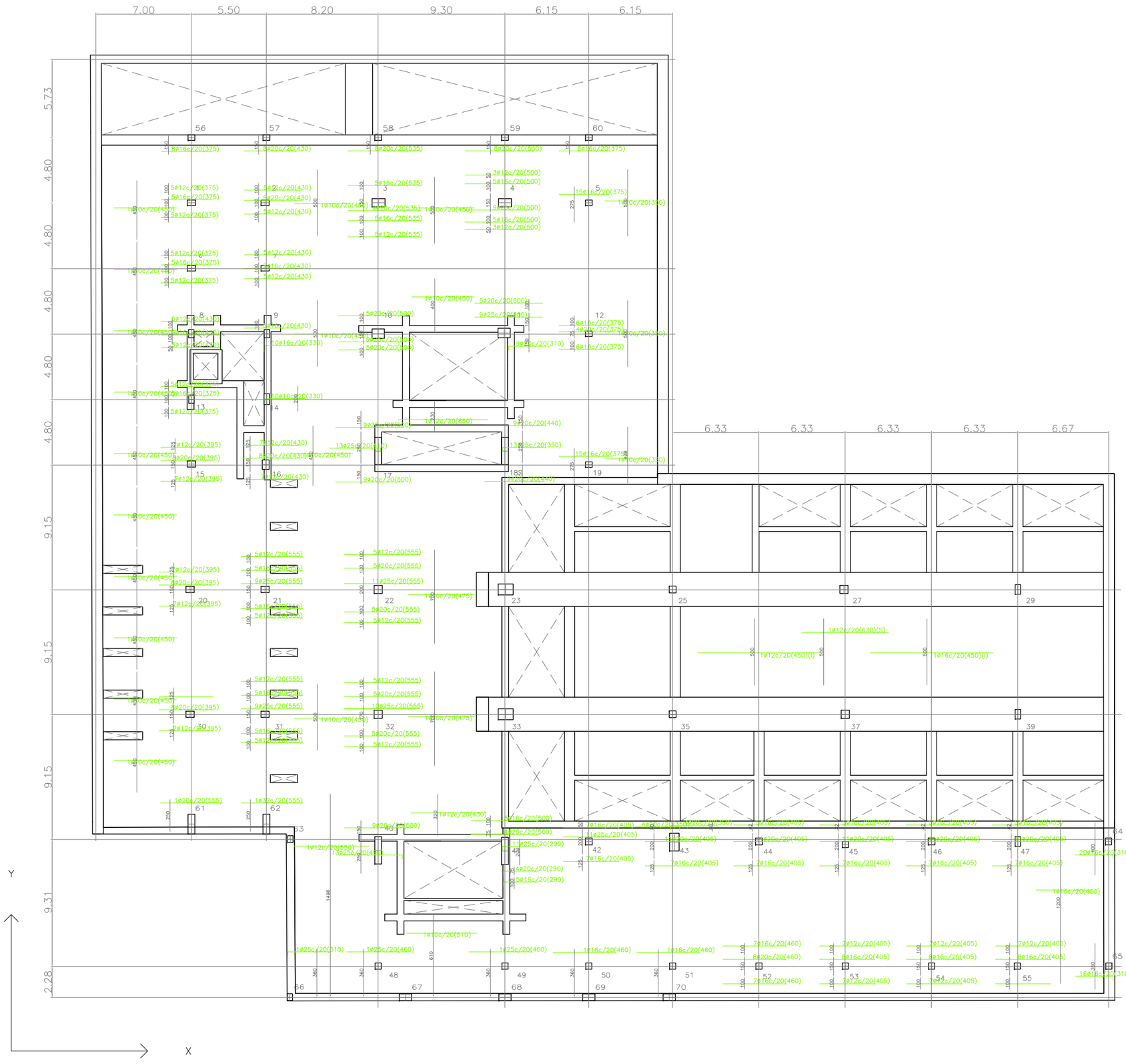
PLÀNOL:	PLÀNOL:	ESCALA:	CONVOCATÒRIA:
ARMAT LONGITUDINAL PLANTA SOTERRANI -2	2.2	1/300	Febrer 2010



LLEGENDA

Armat longitudinal

NOTA

EXEMPLE: 5ø20c/20(555) indica que s'utilitzaran 5 rodons del 20 cada 20 cm i que en total hi hauran 555 barres.

TITULACIÓ:
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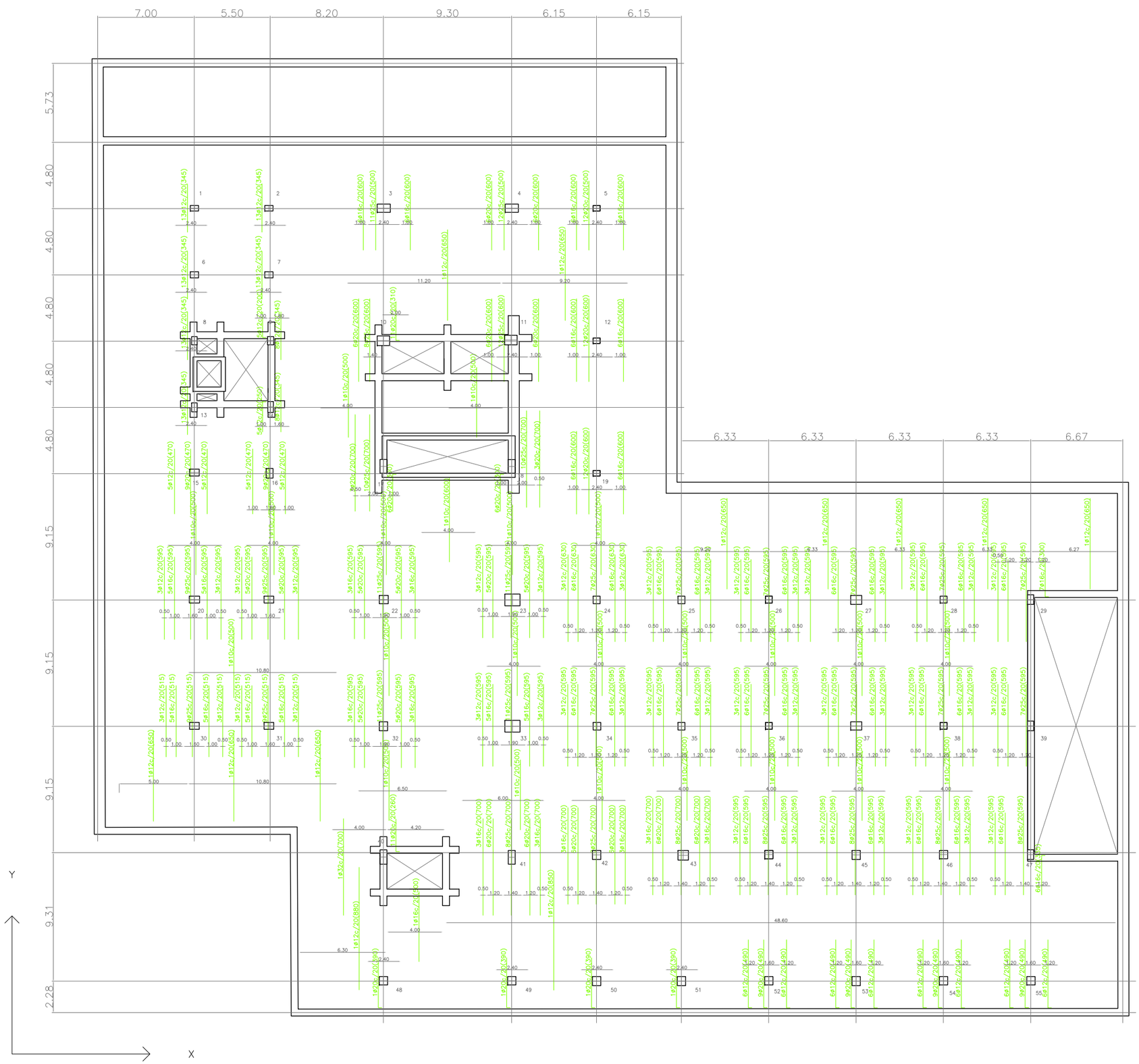
DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:
ARMAT LONGITUDINAL
PLANTA SOTERRANI -1

PLÀNOL: 2.3

ESCALA: 1/300

CONVOCATÒRIA: Febrer 2010



LLEGENDA

Armat transversal

NOTA

EXEMPLE: 3ø12c/20(595) indica que s'utilitzaran 3 rodons del 12 cada 20 cm i que en total hi hauran 595 barres.

TITULACIÓ:
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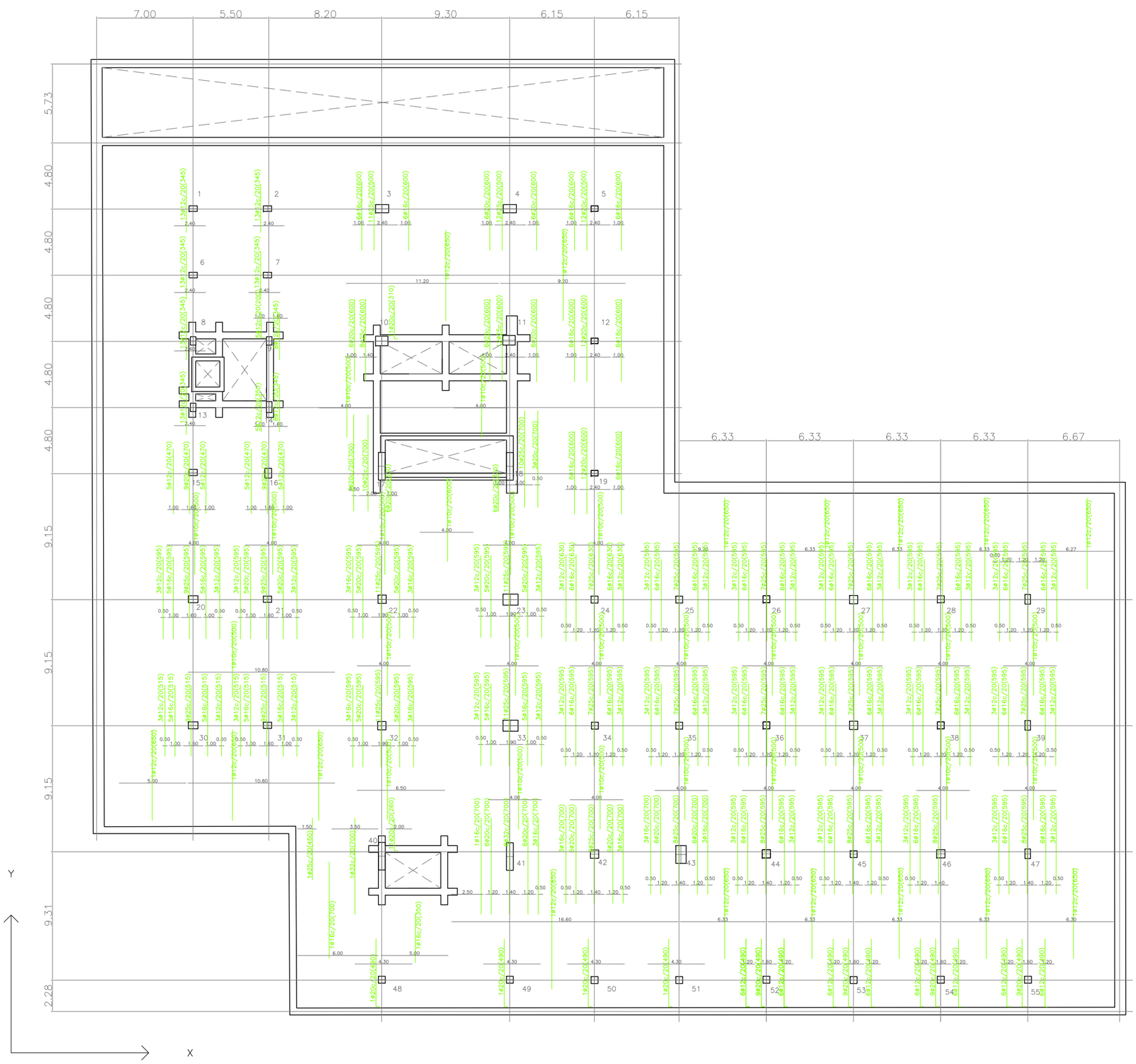
DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:	PLÀNOL:	ESCALA:	CONVOCATÒRIA:
ARMAT TRANSVERSAL PLANTA SOTERRANI -3	3.1	1/300	Febrer 2010



N

LLEGENDA

Armat transversal

NOTA

EXEMPLE: 3ø12c/20(595) indica que s'utilitzaran 3 rodons del 12 cada 20 cm i que en total hi hauran 595 barres.

TITULACIÓ:
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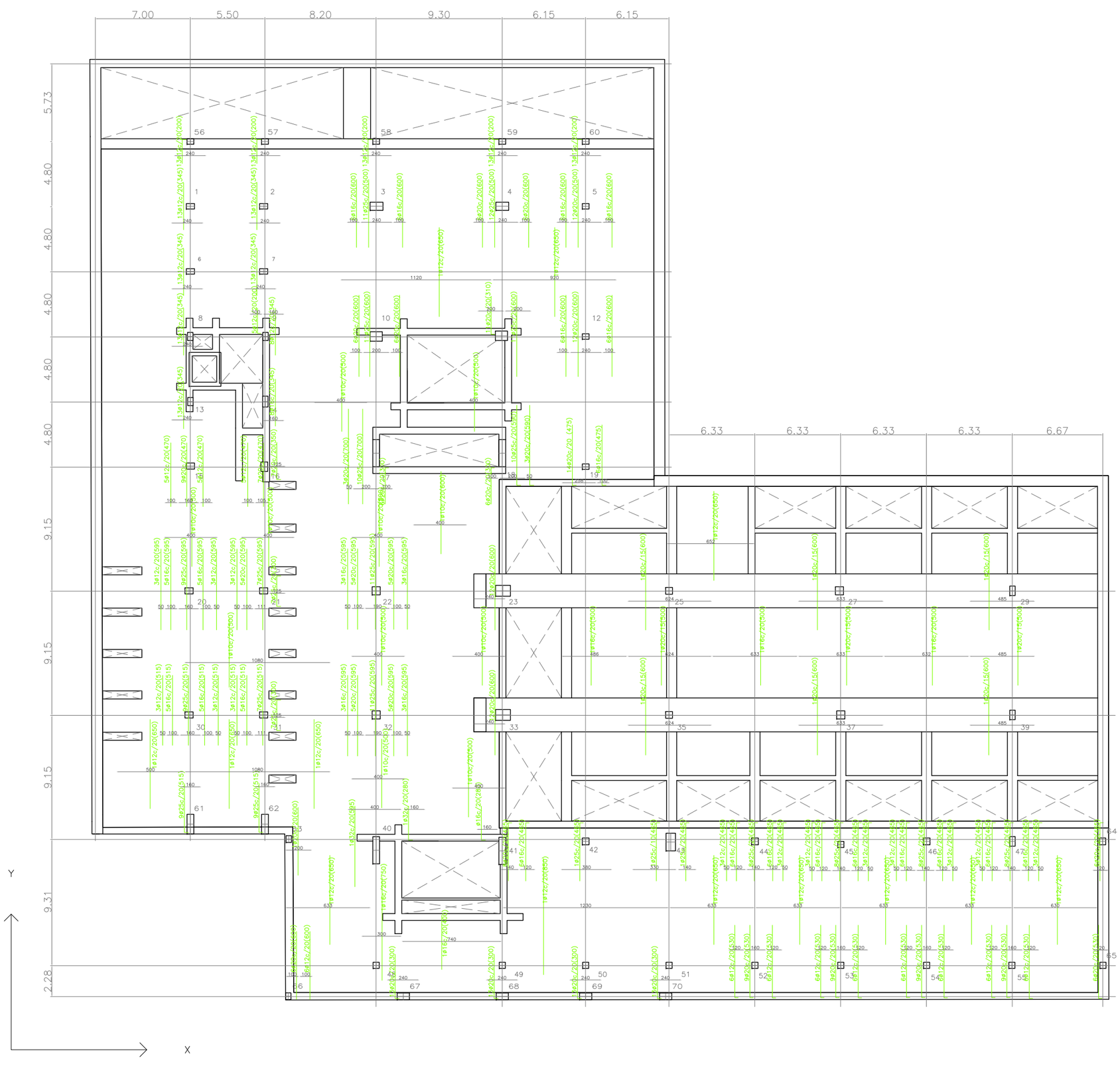
DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:	PLÀNOL:	ESCALA:	CONVOCATÒRIA:
ARMAT TRANSVERSAL PLANTA SOTERRANI -2	3.2	1/300	Febrer 2010



N

LLEGENDA

Armat transversal

NOTA

EXEMPLE: 3ø12c/20(515) indica que s'utilitzaran 3 rodons del 12 cada 20 cm i que en total hi hauran 515 barres.

TITULACIÓ:
ARQUITECTURA TÈCNICA

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PROJECTISTES:
BONILLA RODRÍGUEZ, Rocío
ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana

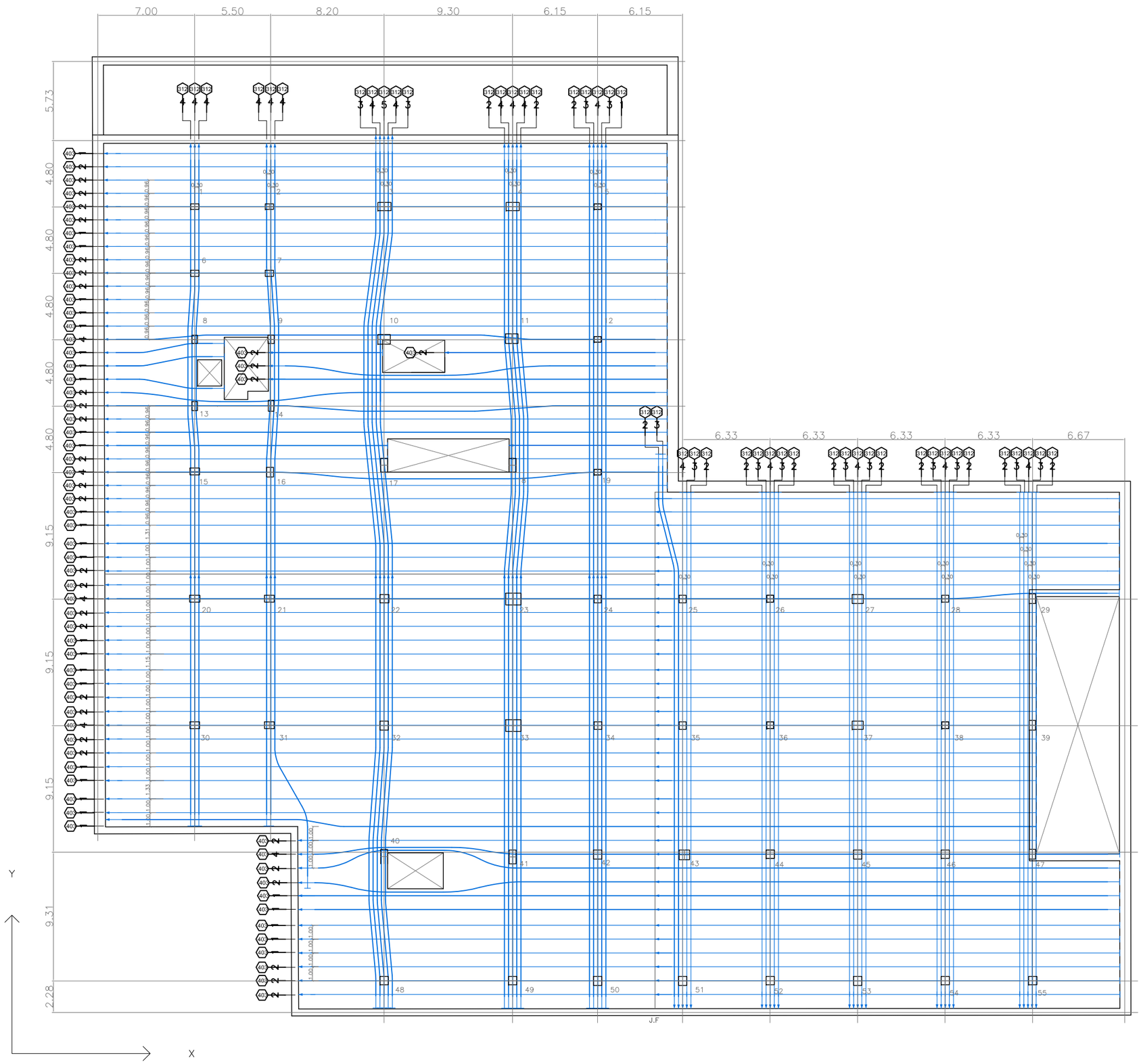
DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:
ARMAT TRANSVERSAL
PLANTA SOTERRANI -1

PLÀNOL: 3.3

ESCALA: 1/300

CONVOCATÒRIA: Febrer 2010



N

LLEGENDA

- Ancoratge actiu
- Ancoratge passiu
- Armat posttesat

NOTA

En planta, l'armat de posttesat longitudinal (X) està distribuït al llarg de tota la superfície i l'armat de posttesat transversal (Y) està concentrat sobre la línia de pilars seguint el model banda – uniforme.

NOTA

La numeració indicada als tendons correspon al número de tendons real que hi ha a cada un dels dibuixats.

TITULACIÓ:
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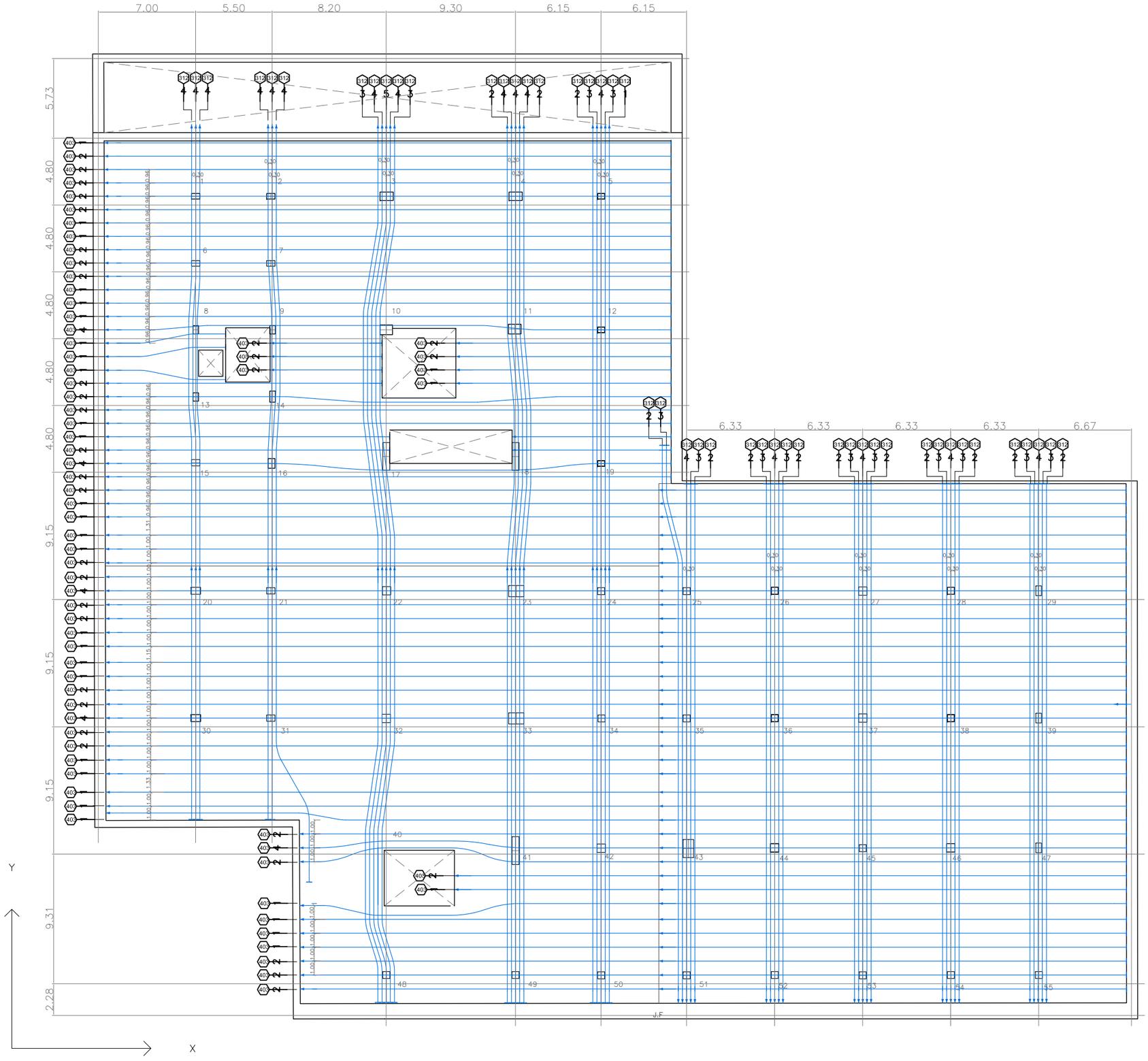
BONILLA RODRÍGUEZ, Rocío
ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana

DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:	PLÀNOL:	ESCALA:	CONVOCATÒRIA:
POSTTESAT X I Y PLANTA SOTERRANI -3	4.1	1/300	Febrer 2010



N

LLEGENDA

- Ancoratge actiu
- Ancoratge passiu
- Armat posttesat

NOTA

En planta, l'armat de posttesat longitudinal (X) està distribuït al llarg de tota la superfície i l'armat de posttesat transversal (Y) està concentrat sobre la línia de pilars seguint el model banda – uniforme.

NOTA

La numeració indicada als tendons correspon al número de tendons real que hi ha a cada un dels dibuixats.

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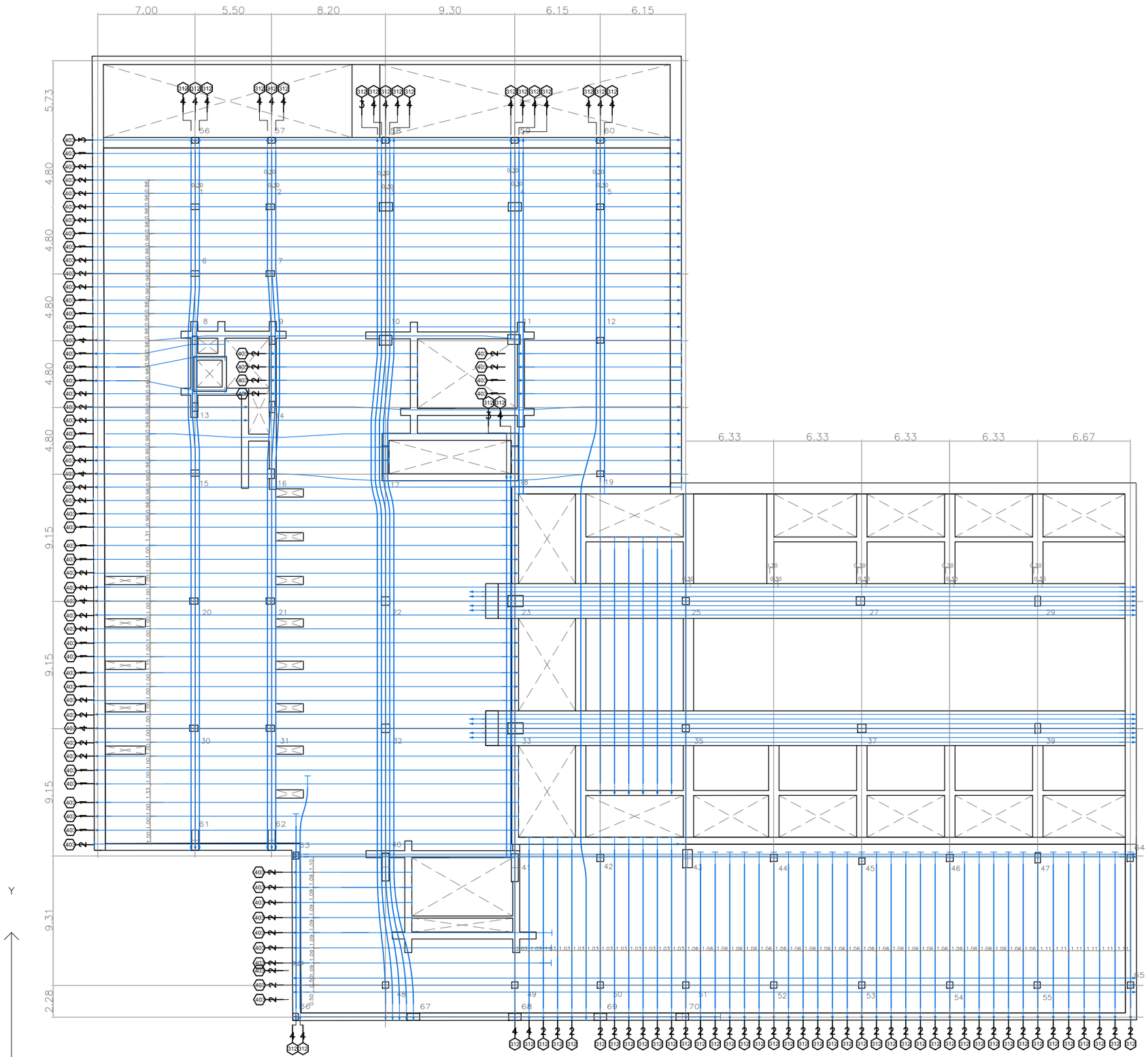
DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:
POSTTESAT X I Y
PLANTA SOTERRANI -2

PLÀNOL:
4.2

ESCALA:
1/300

CONVOCATÒRIA:
Febrer 2010



LLEGENDA

- Ancoratge actiu
- Ancoratge passiu
- Armat posttesat

NOTA

En planta, l'armat de posttesat longitudinal (X), a la zona dels edificis A i B, està distribuït al llarg de tota la superfície i a la zona de l'edifici C està concentrat sobre la línia de pilars. L'armat de posttesat transversal (Y) està concentrat sobre la línia de pilars a la zona dels edificis A i B i de repartit al llarg de tota la superfície a la zona de l'edifici C, seguint el model banda – uniforme.

NOTA

La numeració indicada als tendons correspon al número de tendons real que hi ha a cada un dels dibuixats.

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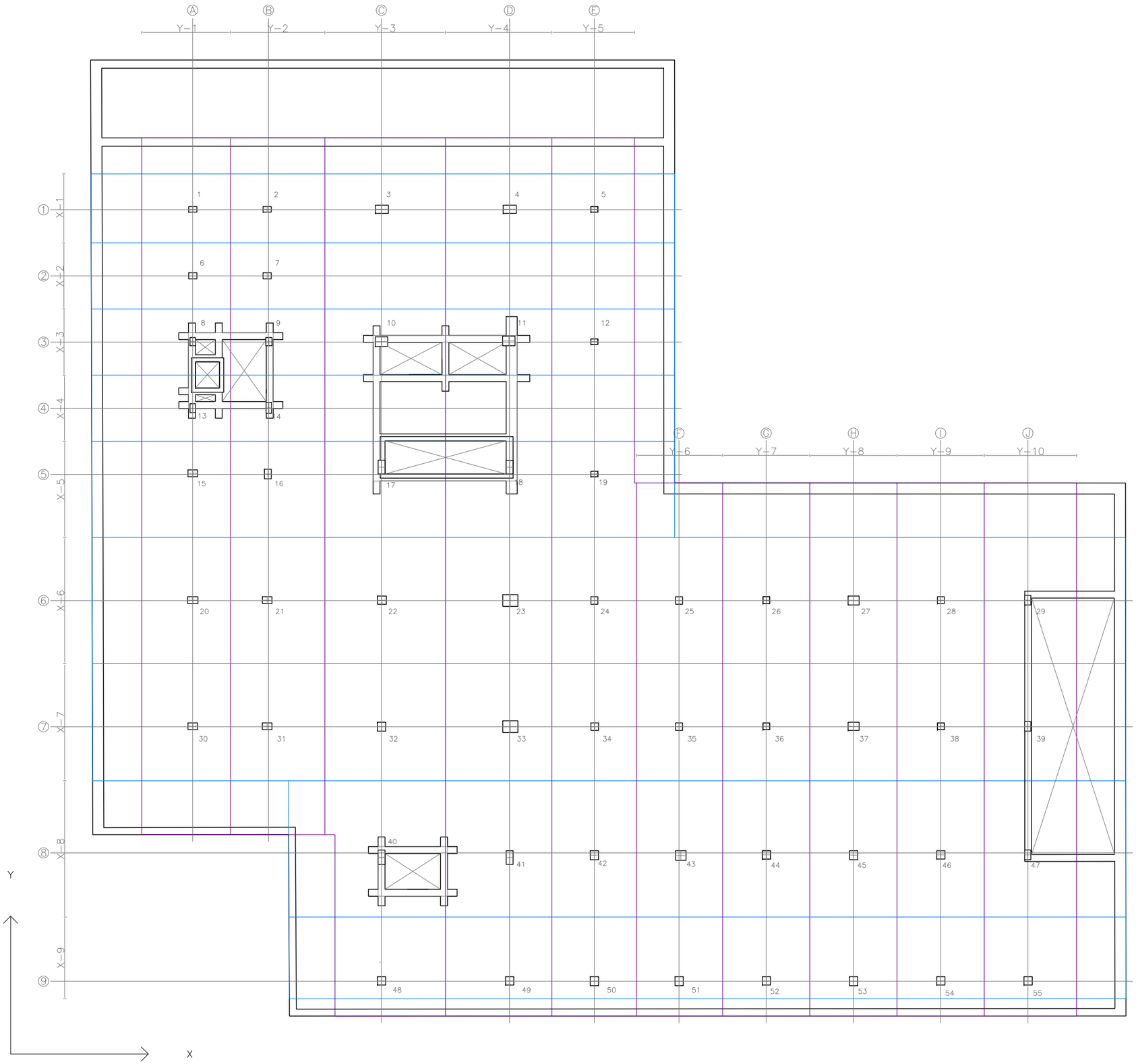
ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana

DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:	PLÀNOL:	ESCALA:	CONVOCATÒRIA:
POSTTESAT X I Y PLANTA SOTERRANI -1	4.3	1/300	Febrer 2010

N



LLEGENDA

— Pòrtics longitudinals (X)

— Pòrtics transversals (Y)

NOTA

Els pòrtics longitudinals (X) estan anomenats amb lletres de la A a la J i la distància entre ells està indicada a les cotes amb la nomenclatura Y–1, Y–2, ..., Y–10.

Els pòrtics transversals (Y) estan anomenats amb números de l'1 al 9 i la distància entre ells està indicada a les cotes amb la nomenclatura X–1, X–2, ..., X–10.

TITULACIÓ:
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ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana

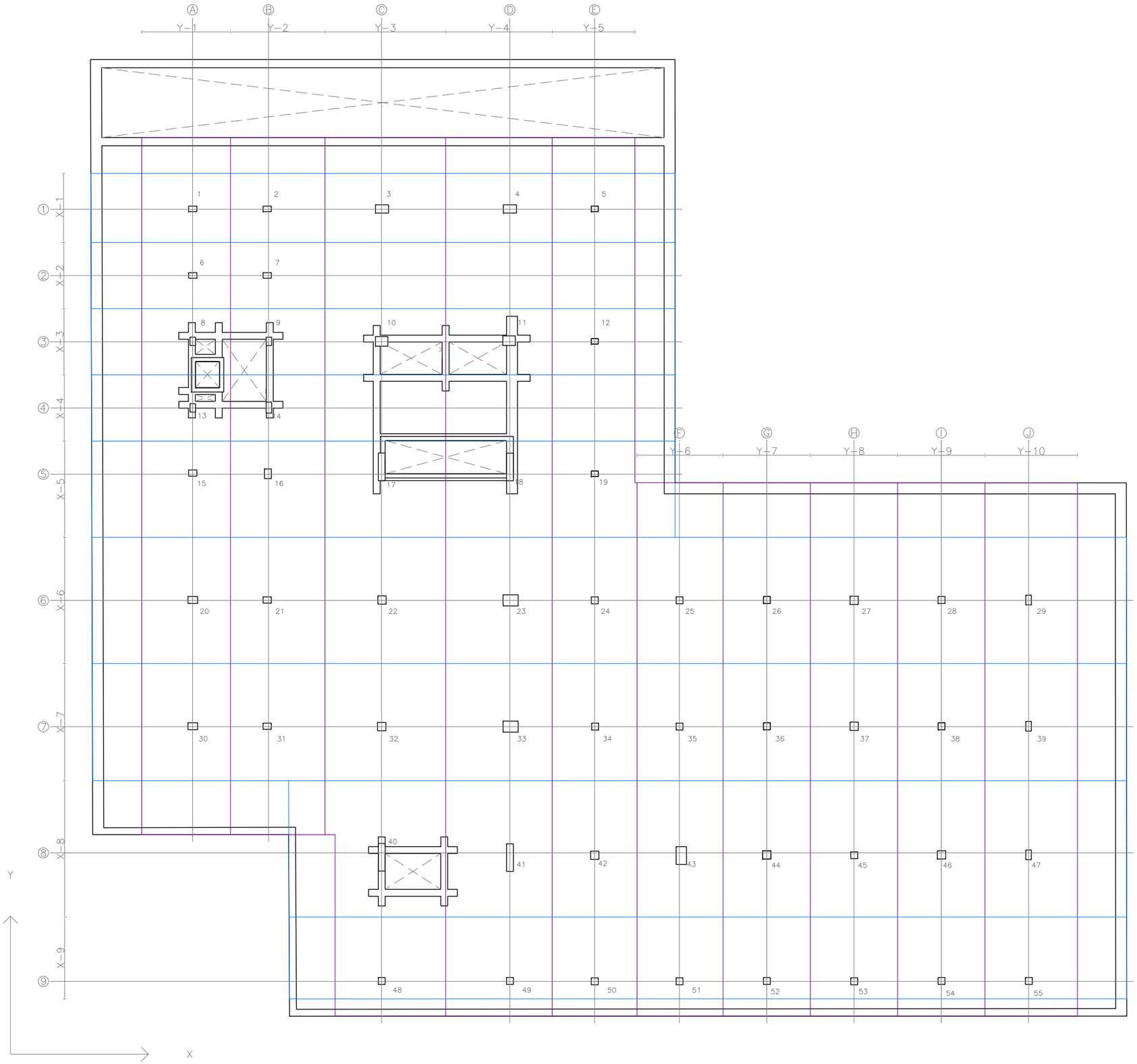
DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:
PÒRTICS VIRTUALS
PLANTA SOTERRANI -3

PLÀNOL: 5.1

ESCALA: 1/300

CONVOCATÒRIA: Febrer 2010



N

LLEGENDA

— Pòrtics longitudinals (X)

— Pòrtics transversals (Y)

NOTA

Els pòrtics longitudinals (X) estan anomenats amb lletres de la A a la J i la distància entre ells està indicada a les cotes amb la nomenclatura Y–1, Y–2, ..., Y–10.

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DIRECTOR:
SERRÀ MARTÍN, Isabel

PLÀNOL:
PÒRTICS VIRTUALS
PLANTA SOTERRANI -2

PLÀNOL: 5.2

ESCALA: 1/300

CONVOCATÒRIA: Febrer 2010

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ARQUITECTURA TÈCNICA
PROJECTE FINAL DE CARRERA

APLICACIONS DE LES LLOSES POSTTESADES: CRITERIS DE PROJECTE I POSADA EN OBRA
ANNEX 2. MEMÒRIA DE CÀLCUL

Projectista/es: BONILLA RODRÍGUEZ, Rocío
ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana
Director/s: SERRÀ MARTÍN, Isabel
Convocatòria: Febrer 2010

PROJECTE EXECUTIU SOTA-RASANT D'UN NOU EDIFICI PER L'E.T.S.E.I.B.

PROJECTE EXECUTIU

Estructures Formigó Posttesat

FORCIMSA

CTT-Stronghold SA (Grup VSL)

Novembre de 2008

CTT-Stronghold, S.A., Paseo de Gracia 11, Esc. B, 1º, 08007, Barcelona
TE: 93 289 23 30, FAX: 93 289 23 31, www.vsl.com

INDICE

1. INTRODUCCIÓN

El presente anejo tiene como objeto la justificación y descripción de los cálculos, realizados en hormigón postesado, de los tres forjados bajo-rasante de un nuevo edificio para la ETSEIB.

El proyecto contempla la ejecución de tres sótanos, al lado de la actual escuela de Ingeniería Industrial de Barcelona, perteneciente a la UPC y ubicada en la Avenida Diagonal 647.

La estructura, en general, se ha resuelto mediante losas postesadas bidireccionalmente, de 25 cm de espesor, soportadas en pilares de hormigón.

Excepto en la zona de la Plaza, donde se han diseñado unas vigas postesadas de 250x60 cm en una dirección unidas por una losa de HA. Debido a que la sobrecarga a considerar es muy elevada y las luces de cálculo de unos 12 m aproximadamente.

En losas postesadas, en Estado límite de Servicio evitamos la fisuración, mediante dos mecanismos:

1. Limitar las tensiones de tracción para que en la fibra mas traccionada no se alcance la tensión de fisuración del hormigón ($f_{ct,m}$)
2. Garantizar una pre-compresión media mínima de 0.9 MPa, que se dispone para evitar la fisuración por temperatura y retracción (equivalente a la cuantía geométrica mínima en hormigón armado)
3. Garantizar la descompresión en la fibra inferior con cargas cuasi permanentes.

2. MATERIALES Y COEFICIENTES DE SEGURIDAD

Los materiales considerados para los forjados postesados han sido:

HORMIGÓN:		
Hormigón H-30	f_{ck} = 30 N/mm^2	γ_c = 1.50
ACERO PASIVO: B 500 S	f_{yk} = 500 N/mm^2	γ_s = *1.15*
ACERO ACTIVO: Y 1860S7	$f_{p,máx}$ = 1860 N/mm^2 Área= 140 mm^2 Diámetro= 15.2 mm (0.6")	γ_s = *1.15*

VAINA MONOCORDÓN DE POLIPROPILENO (SISTEMA ADHERENTE):

Coeficiente de rozamiento en curva	μ=0.15 rad^{-1}
Coeficiente de perdidas de tensión por ml	k =0.0012 m^{-1}
Penetración de las cuñas	g =6 mm

VAINA MULTICORDÓN DE ACERO (SISTEMA ADHERENTE):

Coeficiente de rozamiento en curva	μ=0.22 rad^{-1}
Coeficiente de perdidas de tensión por ml.	k =0.0012 m^{-1}
Penetración de las cuñas	g =6 mm

Los coeficientes de pérdida indicados surgen de la experimentación. De todas maneras coinciden con los coeficientes indicados por la EHE para el "pretensado exterior", ya que para el postesado clásico, esta normativa solo hace mención a las vainas metálicas.

Los coeficientes de mayoración de acciones considerados han sido:

Control de Nivel:	INTENSO
Carga permanente	γ_g = 1.35
Sobrecargas	γ_g = 1.50

3. CARGAS CONSIDERADAS

Las cargas consideradas para los cálculos del forjado postesado han sido las siguientes:

SOSTRE SOTERRANI -1

Peso Propio	$\gamma = 25.0$ kN/m^3
Losa Maciza e = 25cm	6.25 kN/m^2
Carga Muerta Adicional	1.5 kN/m^2
Sobrecarga de uso	4.0 kN/m^2
<u>Excepto en la Plaza:</u>	
Carga Muerta Adicional	3.0 kN/m^2
Sobrecarga de uso	20.0 kN/m^2

SOSTRE SOTERRANI -2

Peso Propio	$\gamma = 25.0$ kN/m^3
Losa Maciza e = 25cm	6.25 kN/m^2
Carga Muerta Adicional	1.5 kN/m^2
Sobrecarga de uso	4.0 kN/m^2

SOSTRE SOTERRANI -3

Peso Propio	$\gamma = 25.0$ kN/m^3
Losa Maciza e = 25cm	6.25 kN/m^2
Carga Muerta Adicional	0.5 kN/m^2
Sobrecarga de uso	4.0 kN/m^2

4. VALORES REPRESENTATIVOS DE LAS ACCIONES

- Tanto la IAP como la EHE indican las combinaciones a considerar para las verificaciones de los Estados Límites de Servicio. En el caso del hormigón pretensado en ambiente IIa, se debe verificar la fisuración en la combinación Frecuente y la descompresión en la combinación cuasi permanente. Al estar la cara superior impermeabilizada, sólo se chequeará la descompresión en la cara inferior.

- Los valores de los coeficientes Ψ para obtener el valor representativo de las acciones variables en las distintas combinaciones para la verificación de los estados límites de servicio son:

Valor de Combinación:	$\Psi_0 = 0.70$
Valor Frecuente:	$\Psi_1 = 0.70$
Valor Cuasi-permanente:	$\Psi_2 = 0.60$

5. NORMATIVA UTILIZADA

- **CTE**: Código Técnico de la Edificación en su documento Básico SE-AE Seguridad Estructural, Acciones en la Edificación
- Instrucción para el Proyecto y la Ejecución de Obras de Hormigón en armado **EHE**.
- Norma de Construcción Sismorresistente **NCSR 02** Parte General y Edificación.
- Norma básica de edificación NBE-CPI/96. Condiciones de Protección contra Incendios de los Edificios.
- Eurocode 2: Design of Concrete Structures.
- Recomendaciones para el proyecto y construcción de losas postesadas con tendones no adherentes **H.P.9-96**" manual E-5 de la ATEP
- ACI BUILDING CODE **ACI 318–02**
- Design Fundamentals of Post-Tensioned Concrete Floors, del PTI (Post-Tensioning Institute).

- **IAP**: Instrucción sobre las acciones a considerar en el proyecto de puentes de carretera.

6. PROGRAMAS UTILIZADOS

Para el cálculo de los forjados postesados se han utilizado los siguientes programas: ADAPT-PT y CEDRUS

- **Forjados**. Para la generalidad de los casos, los forjados se encuentran apoyados en una cuadrícula lo suficientemente uniforme como para poder emplear el método de los Pórticos Virtuales. Además, la relación entre sobrecargas y cargas permanentes, resulta también adecuada para emplear este método.

  La normativa que con mayor detalle especifica este método, es el código americano ACI-318. La normativa española EHE también lo contempla, aunque no con tanto detalle, existiendo una total concordancia entre las dos normas. Por esta razón, emplearemos ACI-318 para la obtención de esfuerzos en los forjados y los armaremos con la norma española EHE. La razón del empleo de estas dos normas conjuntamente es debida sobre todo al modelo de punzonamiento americano (American Concrete Institute), pero la vigente instrucción EHE utiliza el del Código Modelo (CEB-FIB Model Code).

  Para ello, emplearemos el programa ADAPT-PT (Software for Analisys and Design of Post-Tensioned Concrete Structures) de ADAPT Corporation.

  En el caso de que las cargas actuantes sean realmente importantes (cargas de instalaciones, etc), o de que existan claras desalineaciones de los pilares, emplearemos un modelo de emparrillado plano. Mas concretamente un modelo de elementos finitos tipo placa (según la teoría de Lagrange). El programa a utilizar será el programa CEDRUS Software (de CUBUS Software, Zurich). Este programa está orientado al cálculo elástico de losas isótropas u ortótropas de hormigón armado y postesado. El programa obtiene los momentos en forma de isolineas, o definiendo además unas secciones de integración de esfuerzos, para la obtención de armaduras en bandas.

  Con los esfuerzos obtenidos se han reforzado aquellas zonas que eran necesarias, completando así el diseño obtenido con el análisis realizado previamente, planta por planta, con el programa CEDRUS:

- **Secciones.** Para el análisis y cálculo de secciones de vigas y losas se ha utilizado el programa FAGUS, desarrollado por D. CUBUS Software, que permite el análisis y dimensionamiento de secciones con geometría cualquiera de hormigón armado y postesado. En algunos casos se utilizaron planillas excel de desarrollo propio.

6. RESULTADOS

EXPLICACION DE LOS ARCHIVOS DE RESULTADOS DEL PROGRAMA ADAPT – PT

A continuación se explican los puntos más significativos que aparecen en el archivo de resultados del programa ADAPT-PT. Este es un programa de diseño específico para vigas y losas postesadas. Se realiza una modelización por ejes en la losa, y cada eje es resuelto en forma independiente según el método de los pórticos equivalentes.

1- PARAMETROS DE DISEÑO GENERALES

Se detallan los materiales, recubrimientos y los parámetros con los cuales se realizará el diseño tales como *Creep*, Tensiones admisibles de tracción y compresión en el Hormigón, etc.

Los datos generales del sistema de postesado con adherencia (monocordón adherente), también se detallan en esta sección:

2- GEOMETRIA DEL DISEÑO

En esta sección se detallan las características geométricas de la losa, vigas y/o capiteles según el caso y de las columnas.

Se numeran los distintos vanos correspondientes al eje que se está modelando, con sus respectivas luces y geometrías de las secciones transversales (viga, losa y capiteles). Asimismo se indican la altura y secciones de las columnas y tabiques inferiores y superiores.

3- CARGAS

Se detallan las cargas que actúan en cada uno de los vanos del pórtico que se está modelando. El peso propio lo calcula el programa según los datos geométricos. Las cargas muertas adicionales al peso propio y la sobrecarga de uso se definen en el punto 3.

4- PROPIEDADES DE LA SECCION

Para cada tramo que compone el pórtico que se está modelando, se calculan las propiedades geométricas de la sección, es decir, se calcula el área, la inercia y el centro de gravedad.

5- MOMENTOS, CORTES Y REACCIONES DE CARGA MUERTA

En este capítulo se detallan los esfuerzos (momentos y cortantes) que se producen, debido a la carga muerta total, en la viga / losa y las reacciones en las columnas.

6- MOMENTOS, CORTES Y REACCIONES DE CARGA VIVA

En este capítulo se detallan los esfuerzos (momentos y cortantes) que se producen, debido a la carga viva ó sobrecarga de uso, en la viga / losa y las reacciones en las columnas.

7- MOMENTOS REDUCIDOS EN LA CARA DE LOS APOYOS

Para los efectos de diseño es que se han incorporado en este capítulo, los momentos de la losa reducidos en la cara de los apoyos modelados.

8- SUMA DE MOMENTOS DE CARGA MUERTA Y VIVA

Con el fin de chequear el estado de servicio de la losa, es que se detalla en este capítulo la suma de momentos de carga viva y muerta, sin mayorar.

9- FUERZAS FINALES Y PERFILES DE LOS CORDONES EN CADA VANO

9.1- Tipos de perfiles y parámetros:

Se detallan los distintos tipos de trazados en altura posibles para los cordones. El trazado en altura mas utilizado es el de *"reversed parabola".*

9.2- Perfil de los cordones:

Se detallan el tipo de trazado en altura elegido y la localización de los puntos de inflexión de los cordones, para cada vano del eje modelado.

9.3- Fuerzas y Perfiles de los cordones:

En este punto se detallan las fuerzas finales de los cordones y las alturas del centro de gravedad en los extremos y el centro de cada vano, respecto al cero de referencia (que generalmente coincide con la cara superior de la losa). Se indica además la pre-compresión media en la losa (P/A) y la carga de balanceo promedio para cada vano.

9.5- Fuerza mínima de postesado requerida:

En este punto se detalla la mínima fuerza de postesado que se requiere en cada vano por condiciones de pre-compresión (mínima y máxima) y por condiciones de limitación de tensiones en las fibras extremas de la losa.

9.6- Tensiones de Servicio:

Se detallan las tensiones en servicio en las fibras superior e inferior de la losa, en los apoyos izquierdo y derecho y en el centro de vano. Estas tensiones deben estar dentro del rango de tensiones admisibles del hormigón. El cálculo de esta tensión considera el momento de carga muerta, viva y momento balanceado de postesado.

9.7- Momentos, Cortes y Reacciones de la Carga de Balanceo:

Se detallan en este punto, los momentos balanceados en la losa, con sus respectivos cortes y reacciones en apoyos que generan los momentos hiperestáticos de postesado. Estos valores se obtienen de aplicar las correspondientes cargas de balanceo en el pórtico modelado.

10- MOMENTOS Y REACCIONES MAYORADOS

Los momentos y reacciones debidos a las cargas gravitatorias, se combinan y se ponderan para obtener los esfuerzos últimos. También se incorporan los momentos secundarios (debidos a las reacciones hiperestáticas por el postesado) en la combinación del momento último, con un factor 1.0 ya que no está sujeto a variaciones.

11- ARMADURA PASIVA REQUERIDA EN LA LOSA

Se detallan las áreas de acero pasivo obtenidas en los apoyos y vanos del pórtico modelado. Se calculan las armaduras correspondientes al estado límite último y las armaduras mínimas reglamentarias y se adopta el mayor de los dos valores.

12- VERIFICACION AL CORTE O AL PUNZONAMIENTO (según corresponda)

Para las losas postesadas se realiza una verificación al punzonamiento en los puntos donde la losa apoya sobre pilares. Se evalúa la reacción última en el apoyo que debe transmitir la losa, y se evalúa la capacidad que tiene el hormigón postesado de transmitir esfuerzo de corte. En caso que el coeficiente de estas tensiones sea mayor que 1.0 se requiere colocar un refuerzo por punzonamiento en la losa.
Para el caso de vigas se evalúan en 20 puntos de cada vano, el corte último, y la tensión de corte que admite el hormigón. La diferencia se absorbe con estribos que aumentan la capacidad nominal al corte de la sección.

13- DEFORMACIONES MÁXIMAS

En este capítulo se evalúan las deformaciones del pórtico modelado. Se incluye para cada vano, las máximas deformaciones por carga muerta, carga viva, postesado y *creep*, con las siguientes combinaciones:

Carga Muerta
Carga Muerta + Postesado
(Carga Muerta + Postesado) + Creep
Carga Viva
(Carga Muerta + Postesado) + Creep + Carga Viva

Se evalúa al mismo tiempo el cociente entre la longitud del vano y la deformación (L/d). Este valor va indicado entre paréntesis.

16- EVALUACIÓN DE PERDIDAS INSTANTÁNEAS Y DIFERIDAS

Se calculan las pérdidas instantáneas (rozamiento y penetración de cuñas) y las diferidas (acortamiento elástico del hormigón, reatracción y fluencia del hormigón y relajación del acero de postesado), así como las elongaciones de los cordones. Se indican las tensiones resultantes en los cordones.

ARCHIVOS GRÁFICOS DE RESULTADOS DEL PROGRAMA CEDRUS.

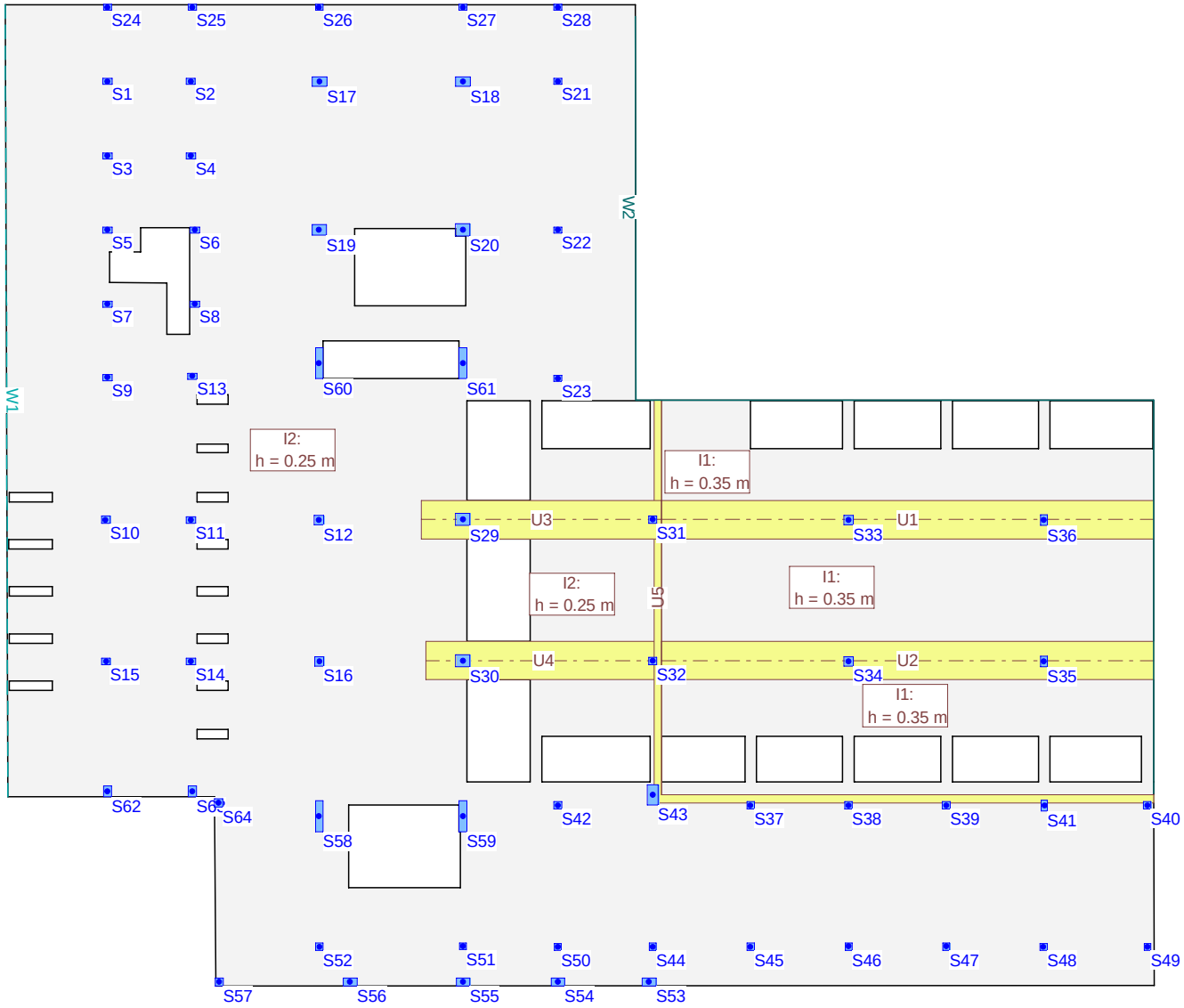
Se ha modelado la estructura del techo del sótano-1 con el software de elementos finitos (CUBUS SOFTWARE CEDRUS).

Los resultados del análisis que se adjuntan son los siguientes:

1- ESTRUCTURA
2- TRAZADO TIPO EN PLANTA
3- CARGAS
4- MOMENTOS EN ELU

Structure

Scale 1 :435.6



Nr.:

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PGX: Tendon group X

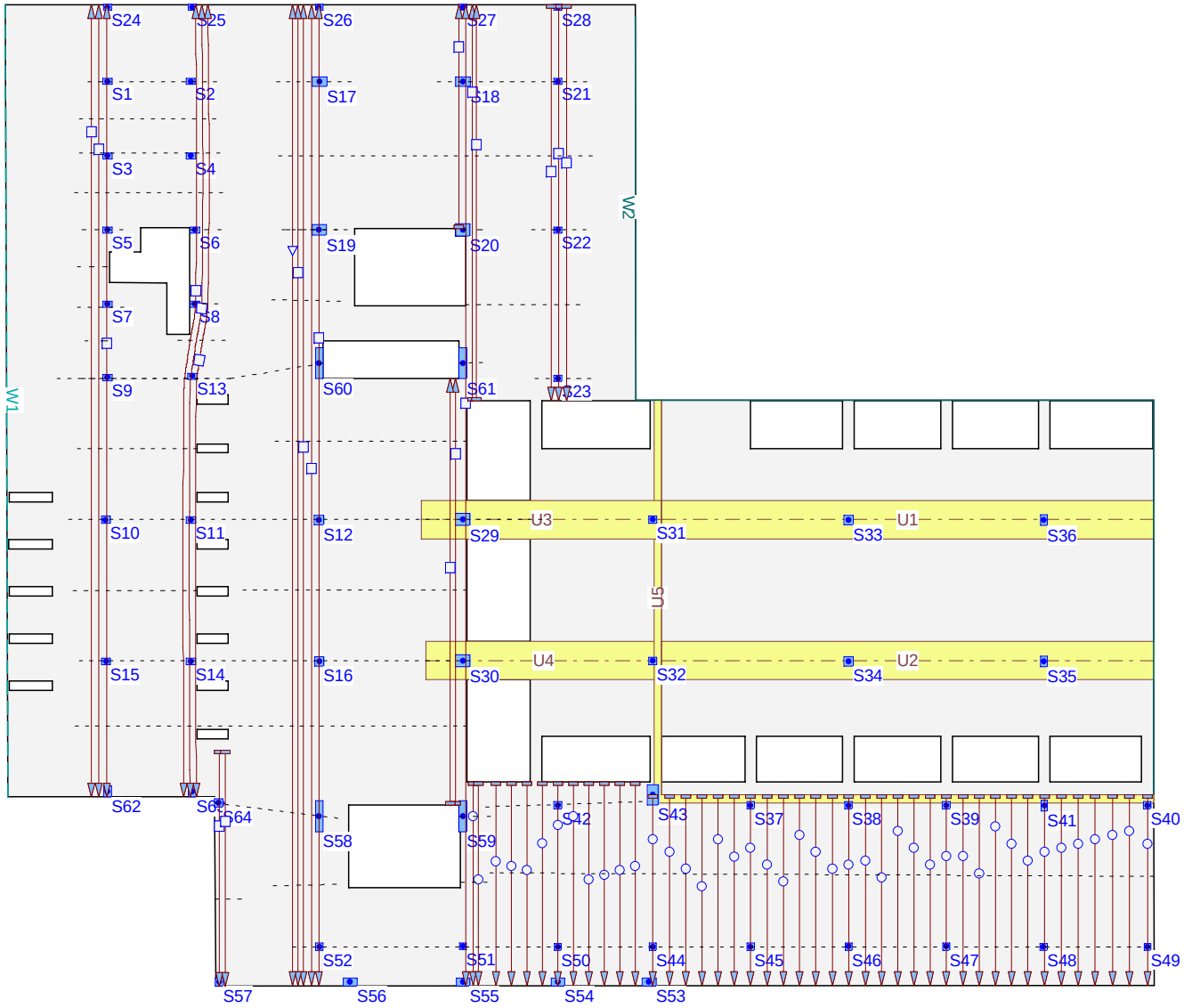
Scale 1 :435.6

Nr.:

C:\CUBDATA\UPC\UPC_SPS1_A.C5P

PGY: Tendon group Y

Scale 1 :435.6



Nr.:

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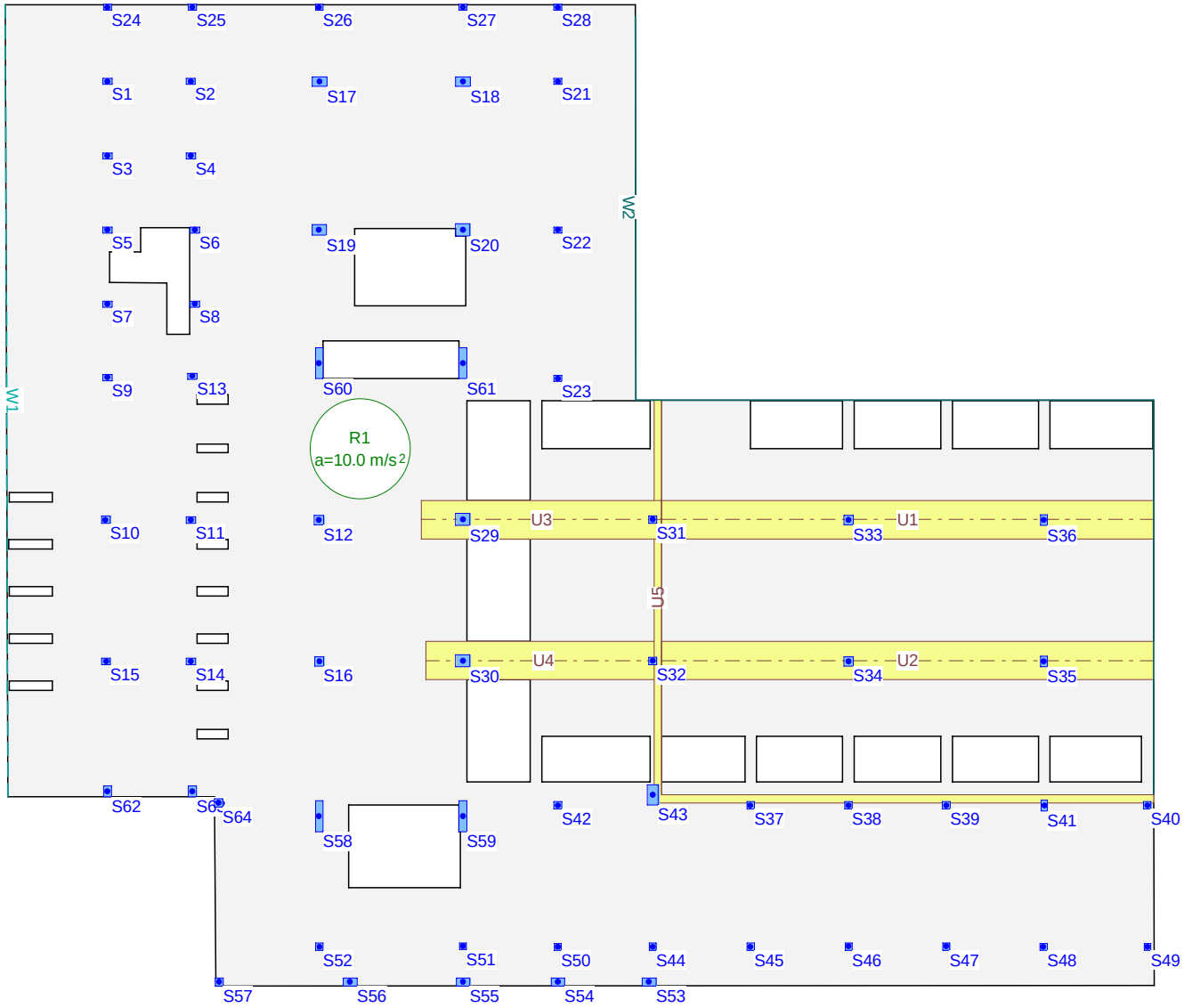
Load case 1PP: Peso Propio

Scale 1 :435.6



Nr.:

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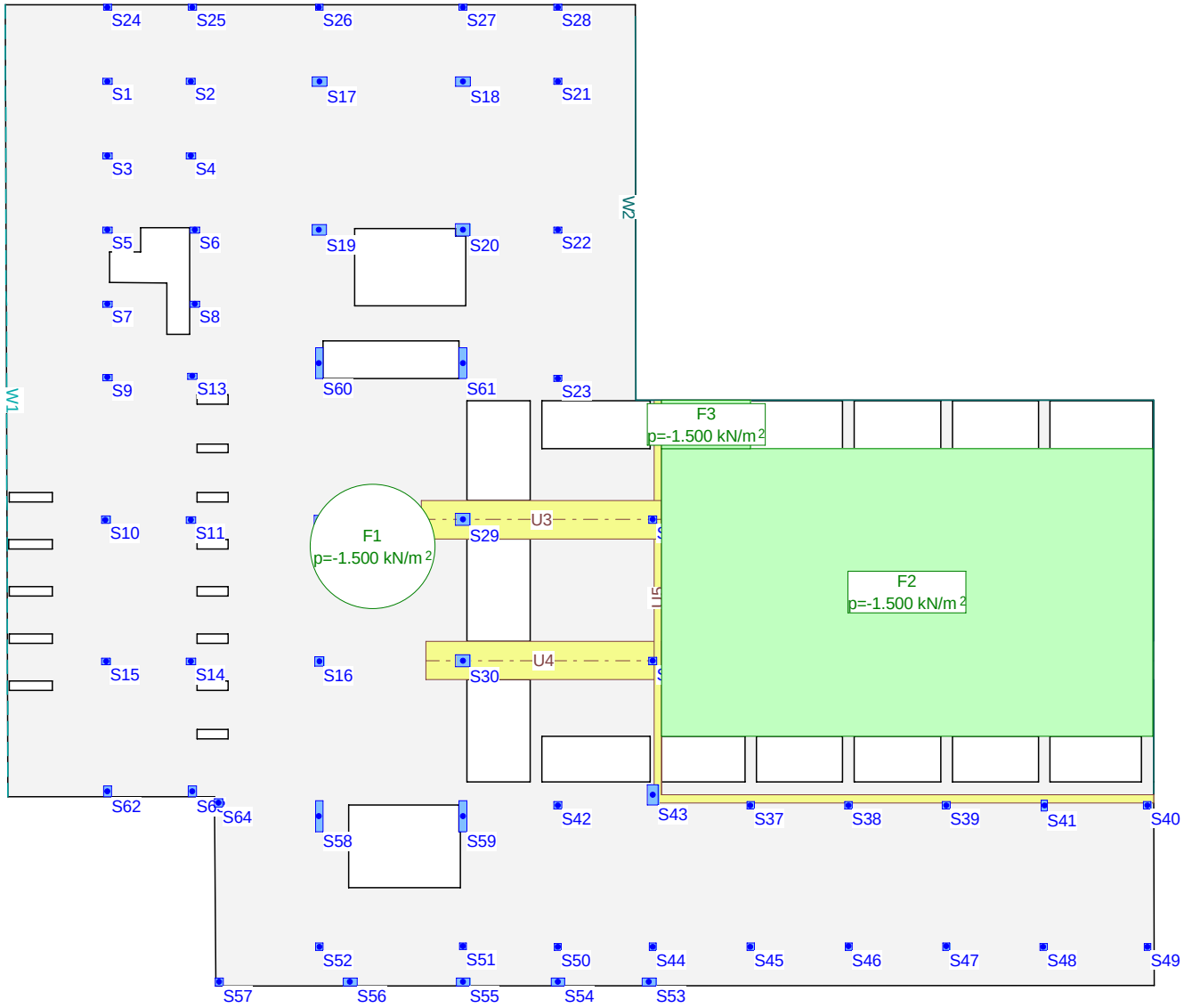
Load case 2CMA: Carga Muerta Adicional

Scale 1 :435.6

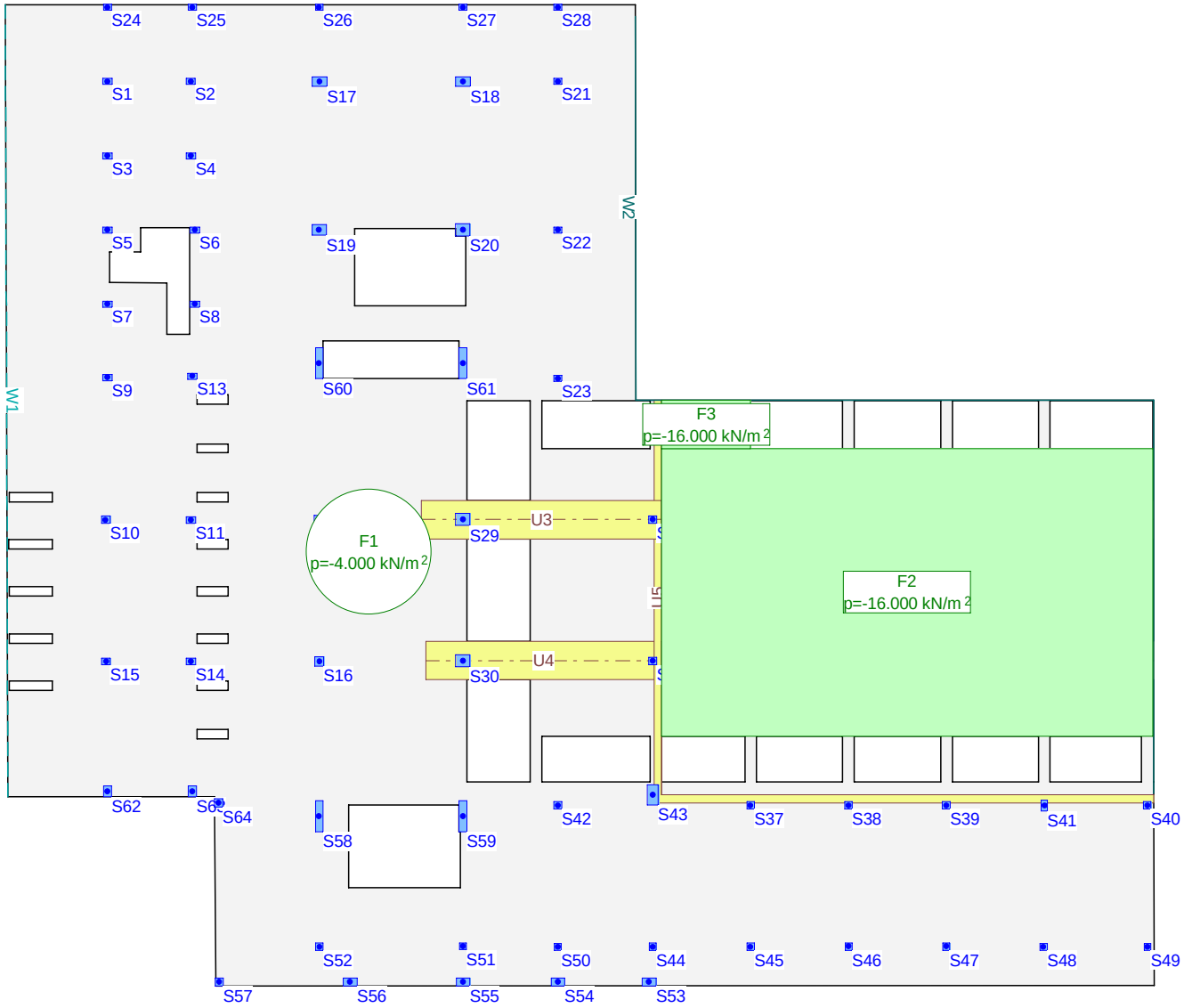


Nr.:

C:\CUBDATA\UPC\UPC_SPS1_A.C5P

Load case 3SCU: Sobrecarga de Uso

Scale 1 :435.6



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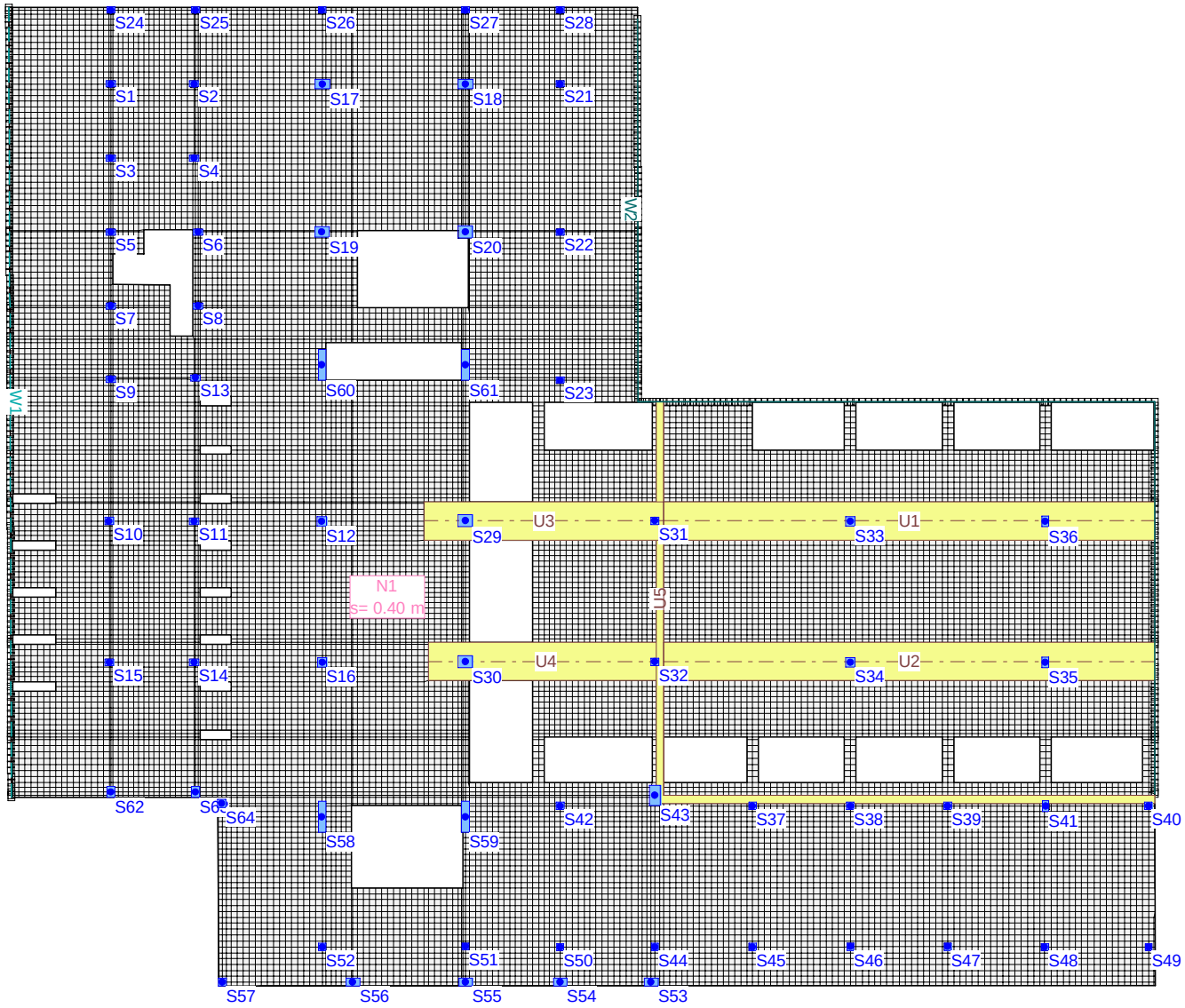
FE mesh

Scale 1 :435.6



Nr.:

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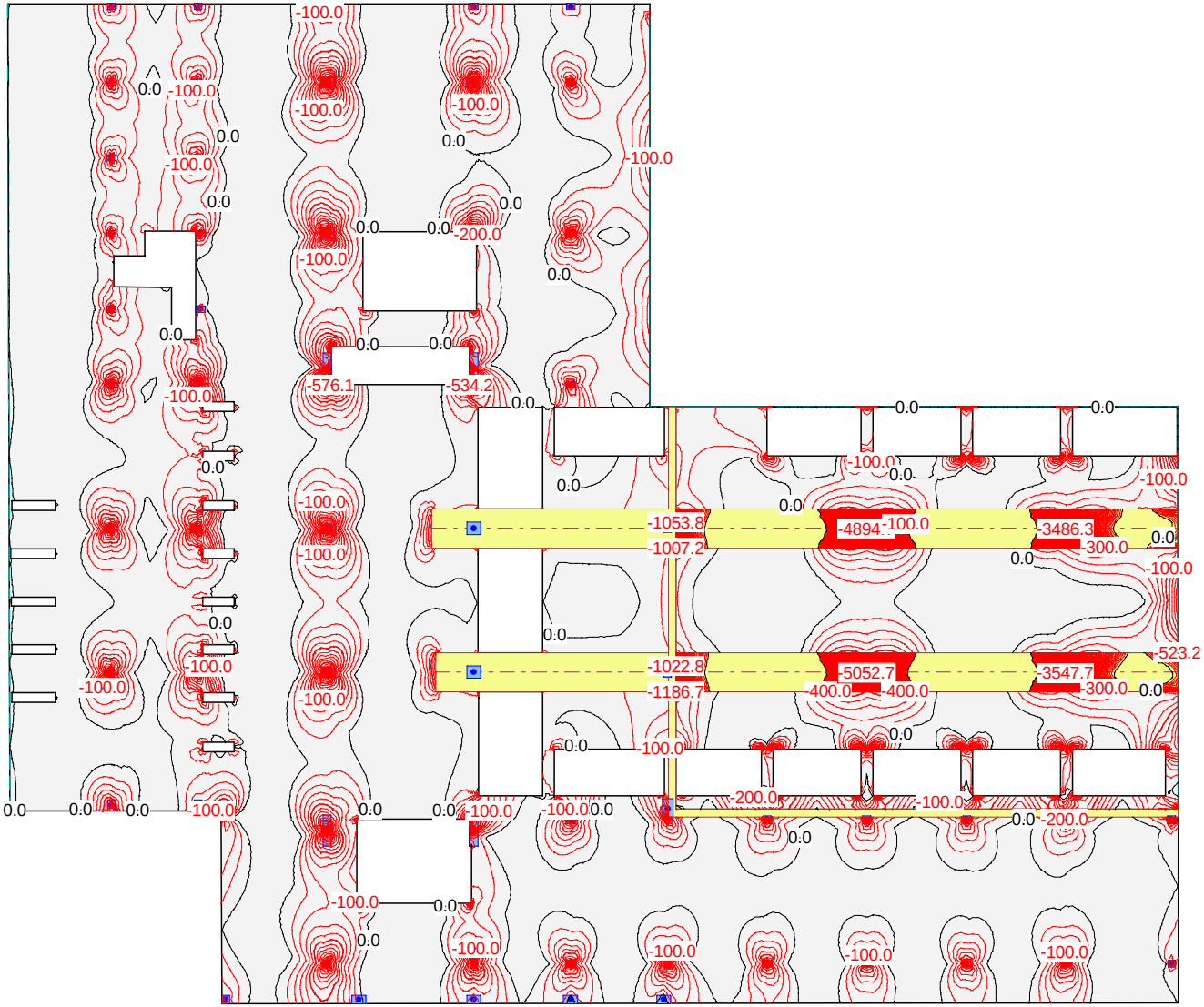
Reinforcement moments m_{xt}: Limit state specification: ELUsinPT
Equidistance: 20.0 kN, Reference line: 0.0 kN

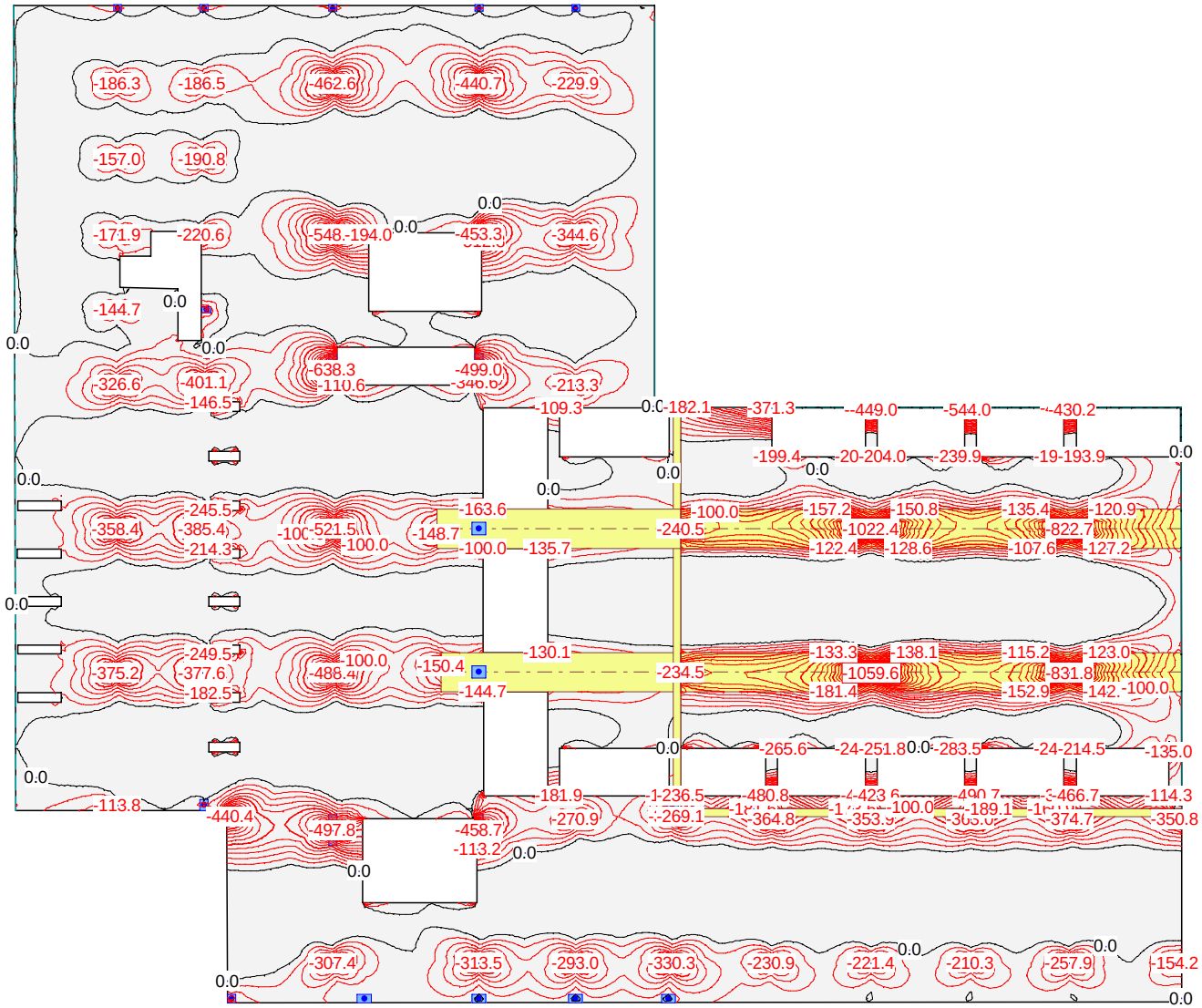
Scale 1 :436.9



Nr.:

Reinforcement moments ma_{yt}: Limit state specification: ELUsinPT
Equidistance: 20.0 kN, Reference line: 0.0 kN

Scale 1 :438.6



Nr.:

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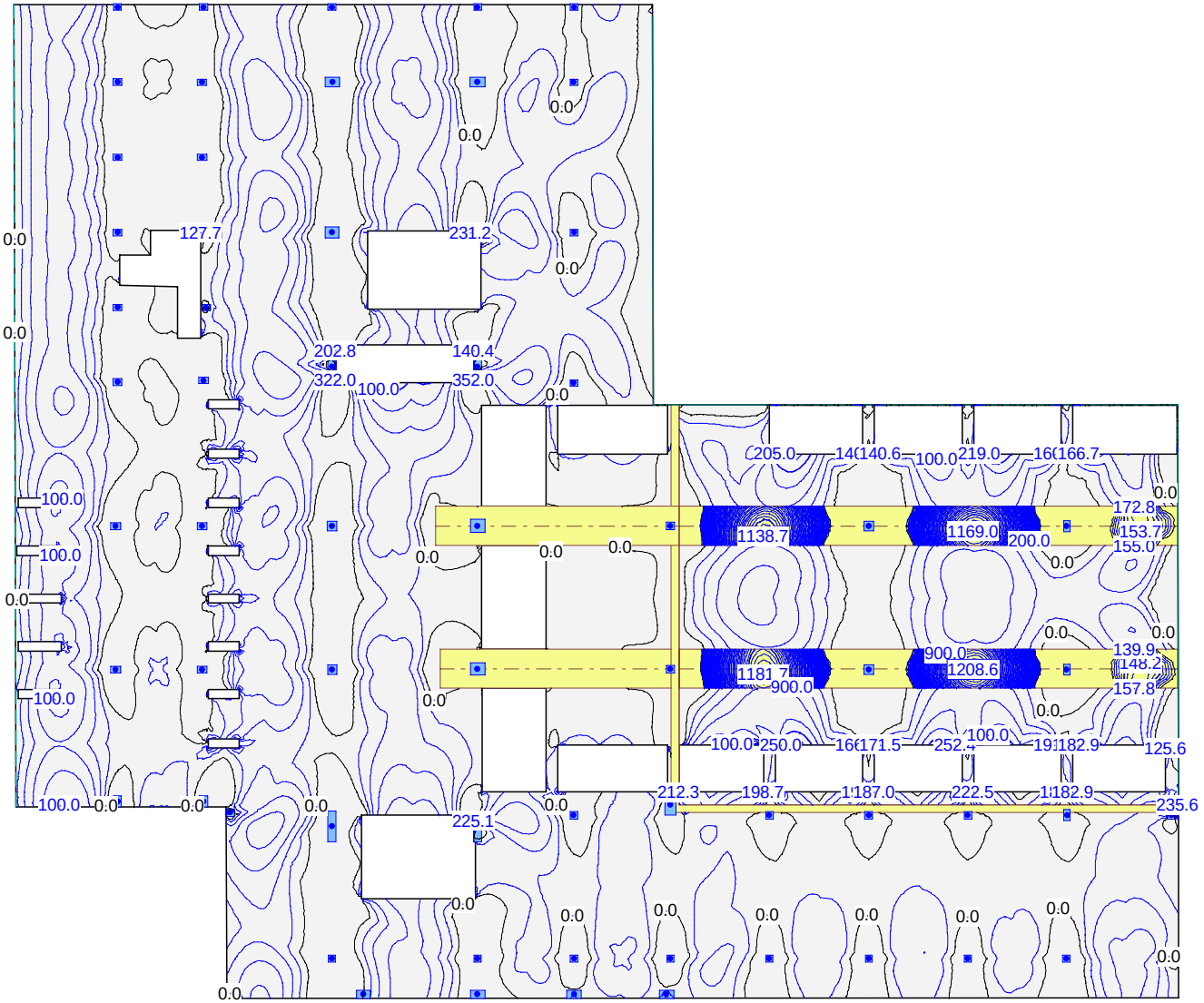
Reinforcement moments ma_{xb}: Limit state specification: ELUsinPT
Equidistance: 20.0 kN, Reference line: 0.0 kN

Scale 1 :438.3



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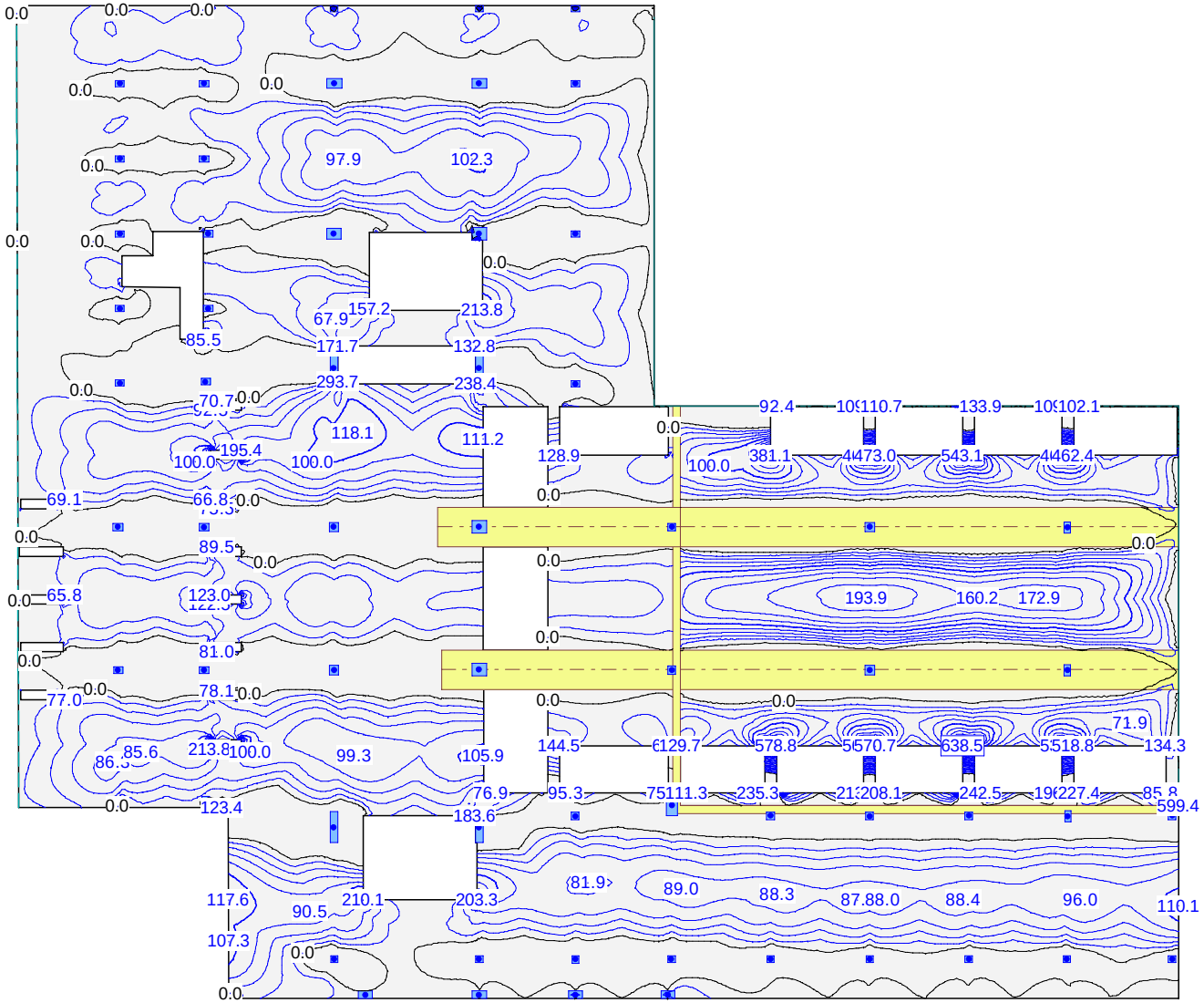
Reinforcement moments ma_{yb}: Limit state specification: ELUsinPT
Equidistance: 20.0 kN, Reference line: 0.0 kN

Scale 1 :440.7



Nr.:

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```
|                            ADAPT CORPORATION                                |
|                    STRUCTURAL CONCRETE SOFTWARE SYSTEM                      |
|        1733 Woodside Road, Suite 220, Redwood City, California 94061        |
|                ADAPT-PT FOR POST-TENSIONED BEAM/SLAB DESIGN                 |
|                Version 7.00  AMERICAN (ACI 318-99/UBC-77)                   |
|           ADAPT CORPORATION - Structural Concrete Software System           |
|        1733 Woodside Road, Suite 220, Redwood City, California 94061        |
|                 Phone: (650)306-2400,  Fax: (650)364-4678                   |
|      Email: Support@AdaptSoft.com, Web site: http://www.AdaptSoft.com       |
```

DATE AND TIME OF PROGRAM EXECUTION: Nov 27,2008 At Time: 21:12
PROJECT FILE: TPS3_EJE6

P R O J E C T T I T L E:
UPC
TECHO SOTANO 3 EJE 6

1 - USER SPECIFIED G E N E R A L D E S I G N P A R A M E T E R S

CONCRETE:
STRENGTH at 28 days, for BEAMS/SLABS ..... 30.00 N/mm^2
for COLUMNS ..... 30.00 N/mm^2

MODULUS OF ELASTICITY for BEAMS/SLABS ..... 25743.00 N/mm^2
for COLUMNS ..... 25743.00 N/mm^2

CREEP factor for deflections for BEAMS/SLABS 2.00
CONCRETE WEIGHT ..... NORMAL

SELF WEIGHT ..... 2500.00 Kg/m^3

TENSION STRESS limits (multiple of (f'c)1/2)
At Top ..... .529
At Bottom ..... .529

COMPRESSION STRESS limits (multiple of (f'c))
At all locations ..... .450

REINFORCEMENT:
YIELD Strength ..... 500.00 N/mm^2
Minimum Cover at TOP ..... 40.00 mm
Minimum Cover at BOTTOM ..... 40.00 mm

POST-TENSIONING:
SYSTEM ..... BONDED
Ultimate strength of strand ..... 1860.00 N/mm^2
Average effective stress in strand (final) ..... 1200.00 N/mm^2
Strand area..... 140.000 mm^2
Min CGS of tendon from TOP..... 55.00 mm
Min CGS of tendon from BOTTOM for INTERIOR spans.. 55.00 mm

Min CGS of tendon from BOTTOM for EXTERIOR spans.. 55.00 mm
Min average precompression ..... .90 N/mm^2
Max spacing between strands (factor of slab depth) 8.00
Tendon profile type and support widths..... (see section 9)

ANALYSIS OPTIONS USED:
Structural system ..... TWO-WAY
Moment of Inertia over support is ..... NOT INCREASED
Moments REDUCED to face of support ..... YES

2 - I N P U T G E O M E T R Y

2.1.1 PRINCIPAL SPAN DATA OF UNIFORM SPANS

SPAN	TYPE	FORM	LENGTH m	WIDTH mm	DEPTH mm	TOP FLANGE width mm	TOP FLANGE thick. mm	BOTTOM/MIDDLE FLANGE width mm	BOTTOM/MIDDLE FLANGE thick. mm	REF HEIGHT mm	MULTIPLIER left	MULTIPLIER right
1	U	1	6.50	7000	250					0	.50	.50
2	U	1	5.50	7000	250					0	.50	.50
3	U	1	8.20	9400	250					0	.50	.50
4	U	1	9.30	4700	250					0	.00	1.00
5	U	1	6.15	9400	250					0	.50	.50
6	U	1	5.00	9400	250					0	.50	.50

LEGEND:
1 - SPAN
C = Cantilever
2 - TYPE
U = Uniform; prismatic
N = Nonuniform section
3 - FORM
1 = Rectangular section
2 = T or Inverted L section
3 = I section
4 = Extended T or L section
7 = Joist
8 = Waffle
11 - Top surface to reference line

2.2 - S U P P O R T W I D T H A N D C O L U M N D A T A

JOINT	SUPPORT WIDTH mm	LOWER COLUMN LENGTH m	LOWER COLUMN B(DIA) mm	LOWER COLUMN D mm	LOWER COLUMN CBC*	UPPER COLUMN LENGTH m	UPPER COLUMN B(DIA) mm	UPPER COLUMN D mm	UPPER COLUMN CBC*
1	500	4.00	500	500	(2)	.00	0	0	(3)

2	500	4.00	500	500	(2)	.00	0	0	(3)
3	500	4.00	500	500	(2)	.00	0	0	(3)
4	500	4.00	500	500	(2)	.00	0	0	(3)
5	500	4.00	500	500	(2)	.00	0	0	(3)
6	500	4.00	500	500	(2)	.00	0	0	(3)
7	500	4.00	500	500	(2)	.00	0	0	(3)

*THE COLUMN BOUNDARY CONDITION CODES (CBC)
Fixed at both ends ...(STANDARD) ..... = 1
Hinged at near end, fixed at far end ..... = 2
Fixed at near end, hinged at far end ..... = 3
Fixed at near end, roller with rotational fixity at far end .. = 4

3 - I N P U T A P P L I E D L O A D I N G

<---CLASS---> <--------------TYPE------------------->
D = DEAD LOAD U = UNIFORM P = PARTIAL UNIFORM
L = LIVE LOAD C = CONCENTRATED M = APPLIED MOMENT
Li= LINE LOAD
SW= SELF WEIGHT Computed from geometry input and treated as dead loading
Unit selfweight W = 2500.0 Kg/m^3

SPAN	CLASS	TYPE	Intensity kN/m^2	(From ... m	To) m	(M or C ...At) (kN-m or kN...m)	Total on Trib kN/m
1	L	U	4.000	.00	6.50		28.000
1	D	U	1.500	.00	6.50		10.500
1	SW	U		.00	6.50		42.919
2	L	U	4.000	.00	5.50		28.000
2	D	U	1.500	.00	5.50		10.500
2	SW	U		.00	5.50		42.919
3	L	U	4.000	.00	8.20		37.600
3	D	U	1.500	.00	8.20		14.100
3	SW	U		.00	8.20		57.634
4	L	U	4.000	.00	9.30		18.800
4	D	U	1.500	.00	9.30		7.050
4	SW	U		.00	9.30		28.817
5	L	U	4.000	.00	6.15		37.600
5	D	U	1.500	.00	6.15		14.100
5	SW	U		.00	6.15		57.634

6	L	U	4.000	.00	5.00		37.600
6	D	U	1.500	.00	5.00		14.100
6	SW	U		.00	5.00		57.634

NOTE: LIVE LOADING is SKIPPED with a skip factor of .70

3.1 - LOADING AS APPEARS IN USER`S INPUT SCREEN PRIOR TO PROCESSING

SPAN	CLASS	TYPE	UNIFORM (kN/m^2), LINE(kN/m)	(CON. or PART.) (kN@m or m-m)	(M O M E N T) (kN-m @ m)
1	L	U	4.000		
1	D	U	1.500		
2	L	U	4.000		
2	D	U	1.500		
3	L	U	4.000		
3	D	U	1.500		
4	L	U	4.000		
4	D	U	1.500		
5	L	U	4.000		
5	D	U	1.500		
6	L	U	4.000		
6	D	U	1.500		

NOTE: SELFWEIGHT INCLUSION REQUIRED
LIVE LOADING is SKIPPED with a skip factor of .70

4 - C A L C U L A T E D S E C T I O N P R O P E R T I E S

4.1 For Uniform Spans and Cantilevers only

SPAN	AREA mm^2	I mm^4	Yb mm	Yt mm
1	1750000.00	.9115E+10	125.00	125.00
2	1750000.00	.9115E+10	125.00	125.00
3	2350000.00	.1224E+11	125.00	125.00
4	1175000.00	.6120E+10	125.00	125.00
5	2350000.00	.1224E+11	125.00	125.00
6	2350000.00	.1224E+11	125.00	125.00

Note:
--- = Span/Cantilever is Nonuniform, see block 4.2

5 - D E A D L O A D M O M E N T S, S H E A R S & R E A C T I O N S

SPAN	< 5.1 S P A N M O M E N T S (kNm) > M(l)*	Midspan	M(r)*	< 5.2 SPAN SHEARS (kN) > SH(l)	SH(r)
1	.00	191.85	-180.55	-145.83	201.39
2	-180.55	-29.43	-282.29	-128.40	165.40
3	-282.29	295.28	-333.01	-287.92	300.29
4	-333.01	110.15	-222.22	-178.69	154.87
5	-222.22	114.97	-226.12	-219.95	221.22
6	-226.12	111.11	.00	-224.56	134.11

Note:
* = Centerline moments

JOINT	< 5.3 REACTIONS (kN) >	<- 5.4 COLUMN MOMENTS (kNm) -> Lower columns	Upper columns
1	145.83	.00	.00
2	329.79	.00	.00
3	453.32	.00	.00
4	478.99	.00	.00
5	374.81	.00	.00
6	445.78	.00	.00
7	134.11	.00	.00

6 - L I V E L O A D M O M E N T S, S H E A R S & R E A C T I O N S

<-- 6.1 L I V E L O A D SPAN MOMENTS (kNm) and SHEAR FORCES (kN) -->

SPAN	<----- left* -----> max	min	<--- midspan ---> max	min	<---- right* -----> max	min	<--SHEAR FORCE--> left	right
1	.00	.00	100.56	-15.93	-94.63	-2.15	-76.44	105.56
2	-94.64	-2.15	53.62	-64.41	-147.97	2.35	-70.78	86.70
3	-147.96	2.35	154.77	-39.56	-174.55	-46.27	-150.92	157.40
4	-174.55	-46.27	67.95	-27.53	-116.48	-.43	-93.66	81.18
5	-116.48	-.42	89.10	-46.92	-118.52	-15.16	-115.29	115.95
6	-118.52	-15.16	74.67	-33.90	.00	.00	-117.71	70.29

Note:
* = Centerline moments

<-- 6.2 REACTIONS (kN) -> <-------- 6.3 COLUMN MOMENTS (kNm) -------->
<--- LOWER COLUMN ---> <--- UPPER COLUMN --->

JOINT	max	min	max	min	max	min
1	83.44	-7.00	.00	.00	.00	.00
2	212.02	42.00	.00	.00	.00	.00
3	282.74	41.87	.00	.00	.00	.00
4	266.19	90.84	.00	.00	.00	.00
5	227.33	81.39	.00	.00	.00	.00
6	264.09	83.58	.00	.00	.00	.00
7	89.67	-19.37	.00	.00	.00	.00

Note: Block 6.1 through 6.3 values are maxima of all skipped loading cases

7 - M O M E N T S REDUCED TO FACE-OF-SUPPORT

7.1 R E D U C E D DEAD LOAD MOMENTS (kNm)

SPAN	<- left* ->	<- midspan ->	<- right* ->
1	34.79	191.80	-131.90
2	-150.10	-29.43	-242.60
3	-212.50	295.30	-260.20
4	-289.50	110.20	-184.60
5	-169.50	115.00	-173.10
6	-172.20	111.10	31.29

Note:
* = face-of-support

7.2 R E D U C E D LIVE LOAD MOMENTS (kNm)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	-1.23	18.24	100.60	-15.93	-71.72	-2.07
2	-78.68	4.50	53.62	-64.41	-127.20	10.99
3	-111.40	.42	154.80	-39.56	-136.40	-22.93
4	-151.70	-45.04	67.95	-27.53	-96.77	-1.66
5	-88.83	14.72	89.10	-46.92	-90.71	-17.74
6	-90.27	1.23	74.67	-33.90	-3.39	16.40

Note:
* = face-of-support

8 - SUM OF DEAD AND LIVE MOMENTS (kNm)

Maxima of dead load and live load span moments combined
for serviceability checks (1.00DL + .70LL)

<----- left* ------> <---- midspan ----> <----- right* ----->

SPAN	max	min	max	min	max	min
1	33.93	47.56	262.22	180.65	-182.10	-133.35
2	-205.18	-146.95	8.10	-74.52	-331.64	-234.91
3	-290.48	-212.21	403.66	267.61	-355.68	-276.25
4	-395.69	-321.03	157.76	90.93	-252.34	-185.76
5	-231.68	-159.20	177.37	82.16	-236.60	-185.52
6	-235.39	-171.34	163.37	87.37	28.92	42.77

Note:
* = face-of-support

9 - SELECTED POST-TENSIONING FORCES AND TENDON PROFILES

9.1 PROFILE TYPES AND PARAMETERS

LEGEND:

For Span:
- 1 = reversed parabola
- 2 = simple parabola with straight portion over support
- 3 = harped tendon

For Cantilever:
- 1 = simple parabola
- 2 = partial parabola
- 3 = harped tendon

9.2 T E N D O N P R O F I L E

SPAN	TYPE	X1/L	X2/L	X3/L	A/L
1	1	.100	.500	.100	.000
2	1	.100	.500	.100	.000
3	1	.100	.500	.100	.000
4	1	.100	.500	.100	.000
5	1	.100	.500	.100	.000
6	1	.100	.500	.100	.000

9.3 - SELECTED POST-TENSIONING FORCES AND TENDON DRAPE

Tendon editing mode selected: TENDON SELECTION

SPAN	SELECTED VALUES FORCE (kN/-)	DISTANCE OF CGS (mm) Left	Center	Right	CALCULATED VALUES P/A (N/mm^2)	Wbal (kN/-)	Wbal (%DL)
1	2587.798	-125.00	-165.00	-55.00	1.48	36.750	69
2	2730.160	-55.00	-125.00	-55.00	1.56	50.542	95
3	2642.757	-55.00	-195.00	-55.00	1.12	44.020	61
4	2448.909	-55.00	-165.00	-55.00	2.08	24.917	69
5	2357.933	-55.00	-155.00	-55.00	1.00	49.874	70
6	2212.436	-55.00	-155.00	-125.00	.94	46.019	64

Approximate weight of strand ..... 686.7 Kg

9.35 - TENDON SELECTION DATA:

TYPE	SEL. FORCE (kN)	TENDON EXTENTS <1>	<2>	<3>	<4>	<5>	<6>
A	15 167.19	<=	=	=	=	=	=

9.5 R E Q U I R E D MINIMUM P O S T - T E N S I O N I N G FORCES (kN)

SPAN	BASED ON STRESS CONDITIONS LEFT*	CENTER	RIGHT*	BASED ON MINIMUM P/A LEFT	CENTER	RIGHT
1	.00	556.55	.00	1575.00	1575.00	1575.00
2	.00	.00	1182.57	1575.00	1575.00	1575.00
3	65.16	1066.61	620.75	2115.00	2115.00	2115.00
4	2140.89	189.87	1082.62	1057.50	1057.50	1057.50
5	.00	.00	.00	2115.00	2115.00	2115.00
6	.00	.00	.00	2115.00	2115.00	2115.00

Note:
* = face-of-support

9.6 S E R V I C E S T R E S S E S (N/mm^2) (tension shown positive)

	LEFT * TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C	RIGHT * TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C
1	-----	-1.90	-----	-.90	-----	-1.17	-----	-2.21
2	-----	-1.00	-----	-2.54	1.12	-.20	-----	-3.93
3	.40	-.40	-----	-2.46	.89	-----	-----	-2.86
4	2.59	-----	-----	-6.45	.63	-.73	-----	-4.32
5	.15	-.59	-----	-2.00	.31	-.21	-----	-2.08
6	.33	-.32	-----	-2.08	-----	-1.23	-----	-.58

Note:
* = face-of-support

	CENTER TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C

1	-----	-3.33	.67	-.45
2	.04	-1.09	-----	-2.85
3	-----	-3.42	1.39	-----
4	-----	-3.21	-----	-1.90
5	-----	-1.85	.04	-.93
6	-----	-1.79	.10	-.68

9.7 POST-TENSIONING B A L A N C E D M O M E N T S, SHEARS & REACTIONS

	<-- S P A N M O M E N T S (kNm) -->			<-- SPAN SHEARS (kN) -->	
SPAN	left*	midspan	right*	SH(l)	SH(r)
1	-5.04	-129.10	133.00	7.88	7.88
2	133.50	-34.55	163.80	-6.07	-6.07
3	167.20	-187.00	191.10	-3.88	-3.88
4	193.80	-102.40	145.60	3.96	3.96
5	140.40	-94.43	132.90	.25	.25
6	130.10	-78.61	-4.54	-4.89	-4.89

Note:
* = face-of-support

	<--REACTIONS (kN)-->	<-- COLUMN MOMENTS (kNm) -->	
joint		Lower columns	Upper columns
1	-7.884	.000	.000
2	13.960	.000	.000
3	-2.195	.000	.000
4	-7.840	.000	.000
5	3.712	.000	.000
6	5.143	.000	.000
7	-4.892	.000	.000

10 - F A C T O R E D M O M E N T S & R E A C T I O N S

Calculated as (1.35D + 1.50L + 1.00 secondary moment effects)

10.1 FACTORED DESIGN MOMENTS (kNm)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	43.16	72.36	384.21	209.49	-334.92	-230.45
2	-370.38	-245.61	6.16	-170.89	-537.66	-330.38
3	-470.84	-303.10	628.84	337.34	-542.90	-372.70
4	-605.43	-445.43	246.14	102.92	-416.30	-273.63
5	-385.05	-229.73	265.18	61.14	-394.15	-284.70
6	-391.12	-253.87	249.77	86.91	35.93	65.62

Note:
* = face-of-support

10.2 SECONDARY MOMENTS (kNm)

SPAN	<-- left* -->	<- midspan ->	<-- right* -->
1	-1.97	-25.62	-49.28
2	-49.73	-34.54	-19.35
3	-16.86	-1.94	12.97
4	12.95	-4.49	-21.93
5	-22.98	-23.69	-24.40
6	-23.24	-12.23	-1.22

Note:
* = face-of-support

	10.3 FACTORED REACTIONS (kN)		10.4 FACTORED COLUMN MOMENTS (kNm)			
			<-- LOWER column -->		<-- UPPER column -->	
JOINT	max	min	max	min	max	min
1	314.11	178.44	.00	.00	.00	.00
2	777.19	522.19	.00	.00	.00	.00
3	1033.81	672.57	.00	.00	.00	.00
4	1038.11	775.07	.00	.00	.00	.00
5	850.64	631.78	.00	.00	.00	.00
6	1003.12	732.34	.00	.00	.00	.00
7	310.65	147.09	.00	.00	.00	.00

11 - M I L D S T E E L

Support cut-off length for minimum steel(length/span) ... .17
Span cut-off length for minimum steel(length/span) ... .33

Top bar extension beyond where required ..... 500.00 mm
Bottom bar extension beyond where required ..... 500.00 mm

REINFORCEMENT based on NO REDISTRIBUTION of factored moments

11.1 TOTAL WEIGHT OF REBAR = 9.1 Kg AVERAGE = .0 Kg/m^2
TOTAL AREA COVERED = 309.60 m^2

11.2.1 S T E E L A T M I D - S P A N

	T O P		B O T T O M	
SPAN	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT-----TENS-------->	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT-----TENS-------->

1	0	(	0	0	0)	0	(	0	0	0)
2	0	(	0	0	0)	0	(	0	0	0)
3	0	(	0	0	0)	0	(	0	0	0)
4	0	(	0	0	0)	0	(	0	0	0)
5	0	(	0	0	0)	0	(	0	0	0)
6	0	(	0	0	0)	0	(	0	0	0)

11.3.1 S T E E L A T S U P P O R T S

	TOP					BOTTOM				
JOINT	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		MIN--------->		As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		MIN--------->	
1	0	(	0	0	0)	0	(	0	0	0)
2	0	(	0	0	0)	0	(	0	0	0)
3	0	(	0	0	0)	0	(	0	0	0)
4	400	(	400	0	0)	0	(	0	0	0)
5	0	(	0	0	0)	0	(	0	0	0)
6	0	(	0	0	0)	0	(	0	0	0)
7	0	(	0	0	0)	0	(	0	0	0)

11.2.2 & 11.3.2 LISTING OF THE ENTIRE PROVIDED REBAR

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]	AREA [mm^2]
4	1	T	4	# 16 x	1000	796

Notes:
Bar location - T = Top, B = Bottom.
NUM - Number of bars.
For two-way systems a minimum of 4 bars is specified over the supports.
Refer to tables 11.5.1,11.5.2 and PTsum graphical display for
positioning of bars.

11.5.1 ARRANGEMENT OF TOP BARS

SPAN	TOP STEEL ID	LOCATION	NUM	BAR	LENGTH [mm]
4	1	LEFT	4	# 16 x	1000

11.5.2 ARRANGEMENT OF BOTTOM BARS

SPAN	BOTTOM STEEL ID	LOCATION	NUM	BAR	LENGTH [mm]

12 - P U N C H I N G S H E A R C H E C K

LEGEND:
CONDITION... 1 = INTERIOR COLUMN
2 = END COLUMN
3 = CORNER COLUMN
4 = EDGE COLUMN (PARALLEL TO SPAN)
5 = EDGE BEAM, WALL, OR OTHER NON-CONFORMING GEOMETRY
PERFORM SHEAR CHECK MANUALLY
6 = STRIP TOO NARROW TO DEVELOP PUNCHING SHEAR

CASE..... 1 = STRESS WITHIN SECTION #1 GOVERNS (COL.CAP OR SLAB)
2 = STRESS WITHIN SECTION #2 GOVERNS (DROP PANEL OR SLAB)

JNT	COND.	FACTORED ACTIONS shear kN	moment kN-m	<- PUNCHING SHEAR STRESSES IN N/mm^2 -> due to shear	due to moment	TOTAL	allow-able	STRESS RATIO	CASE
1	2	314.11	.00	.83	.00	.83	1.55	.53	1
2	1	777.19	.00	1.39	.00	1.39	1.75	.79	1
3	1	1033.81	.00	1.85	.00	1.85	1.75	1.06	1
4	4	1038.11	.00	2.73	.00	2.73	1.55	1.77	1
5	4	850.64	.00	2.24	.00	2.24	1.55	1.45	1
6	1	1003.12	.00	1.79	.00	1.79	1.61	1.12	1
7	2	310.65	.00	.82	.00	.82	1.55	.53	1

PUNCHING SHEAR STRESS IN ONE OR MORE LOCATIONS EXCEEDS THE PERMISSIBLE VALUE. PROVIDE SHEAR REINFORCEMENT, OR ENLARGE THE SECTION RESISTING THE PUNCHING SHEAR

13 - MAXIMUM S P A N D E F L E C T I O N S

Concrete`s modulus of elasticity ..... Ec = 25743 N/mm^2
Creep factor ..... K = 2.00
Ieffective/Igross...(due to cracking)..... K = 1.00

Where stresses exceed 0.5(fc`)^1/2 cracking of section is allowed for.
Values in parentheses are (span/max deflection) ratios

SPAN	<.....DEFLECTION ARE ALL IN mm , DOWNWARD POSITIVE.....> DL	DL+PT	DL+PT+CREEP	LL	DL+PT+LL+CREEP
1	3.3	1.3	4.0(1644)	1.7(3789)	5.7(1146)
2	-1.1	-.8	-2.5(2234)	-.6(9950)	-3.0(1824)
3	5.2	2.3	6.9(1186)	2.7(3027)	9.6(852)
4	3.1	.0	.1(70578)	1.6(5668)	1.8(5247)
5	.9	.2	.6(9822)	.5(13509)	1.1(5687)
6	.8	.3	.8(6101)	.4(12621)	1.2(4113)

14 - I N I T I A L CONDITION STRESS CHECK & REINFORCEMENT REQUIREMENTS

14.1 Parameters specified as input for initial stress checks:

		Tensile stresses divided by (f`c)^1/2	
Concrete f`c (initial/final)	.75	Top fiber	.25
PT force (initial/final) ...	1.10	Bottom fiber	.25
Dead loading (initial/final)	1.00		
Live loading (initial/final)	.00	Compression as ratio of f`c	.60

Note: Reinforcement reported in this data block is in
addition to that reported in data block 11 for
minimum strength reinforcement required by code.

14.2 NO added MILD REINFORCEMENT is required at MID-SPAN or SUPPORT

14.3 Compressive stresses

COMPRESSIVE stresses are within allowable limit (.60 * f`ci)
MAXIMUM stress..... = .21 * f`ci

(f`ci = initial concrete strength)

16 - FRICTION, ELONGATION AND LONG TERM STRESS LOSSES

16.6 LONG TERM STRESS LOSS CALCULATIONS

16.6.1 INPUT PARAMETERS :

Type of strand	LOW LAX	
Modulus of elasticity of strand	200000.00	N/mm^2
Average weight of concrete	NORMAL	
Estimate age of concrete at stressing	7	days
Modulus of elasticity of concrete at stressing	23322.00	N/mm^2
Modulus of elasticity of concrete at 28 days	25743.00	N/mm^2
Estimate of average relative humidity	80.00	%
Volume to surface ratio of member	150.00	mm

16.6.2 CALCULATED LONG-TERM STRESS LOSS(average of all tendons) :

	<----- STRESS (N/mm^2) ----->		
SPAN	start	center	right
1	63.56	61.76	65.57

2	65.57	73.50	59.85
3	56.55	52.71	46.65
4	53.14	70.61	55.94
5	45.24	47.36	39.19
6	39.19	41.67	42.44

16.7 FRICTION AND ELONGATION CALCULATIONS

16.7.1 INPUT PARAMETERS :

Coefficient of angular friction (meu)	.220	/rad
Coefficient of wobble friction (K)	.0012	/m
Ultimate strength of strand	1860.0	N/mm^2
Ratio of jacking stress to strand's ultimate strength	.800	
Anchor set	6.000	mm
Cross-sectional area of strand	140.000	mm^2

16.7.2 CALCULATED STRESSES(average of all tendons) :

	LENGTH		<TENDON HEIGHT(mm)>			Horizontal ratios			<-- STRESS(N/mm^2)-->		
SPAN	m	P	start	center	right	X1/L	X2/L	X3/L	start	center	right
1	6.50	1	-125.	-165.	-55.	.10	.50	.10	1210.22	1232.28	1269.58
2	5.50	1	-55.	-125.	-55.	.10	.50	.10	1269.58	1300.08	1297.90
3	8.20	1	-55.	-195.	-55.	.10	.50	.10	1301.20	1258.46	1225.47
4	9.30	1	-55.	-165.	-55.	.10	.50	.10	1218.97	1166.15	1152.53
5	6.15	1	-55.	-155.	-55.	.10	.50	.10	1163.24	1122.83	1098.91
6	5.00	1	-55.	-155.	-125.	.10	.50	.10	1098.91	1053.54	1038.97

Note: P= tendon profile (refer to legend of data block 9)
Stresses at each location are the average of strands after anchor set, and after long-term losses

16.8 TENDON SELECTION AND DATA:

			<------ TENDON EXTENTS ------>		ELONGATION		Stress ratios	
TYPE	OFF	FORCE	CAN	<------ S P A N S ----->	CAN	LEFT (mm)	RIGHT (mm)	Anch.	Max.
				<1><2><3><4><5><6>					
A	15	167.19		<==========|		255.	0.	.73	.74

Note: Force is the average value per strand (kN)
Stress ratios are at anchorage (7) and maximum along tendon (8)

ADAPT CORPORATION
STRUCTURAL CONCRETE SOFTWARE SYSTEM
1733 Woodside Road, Suite 220, Redwood City, California 94061

ADAPT-PT FOR POST-TENSIONED BEAM/SLAB DESIGN
Version 7.00 AMERICAN (ACI 318-99/UBC-77)
ADAPT CORPORATION - Structural Concrete Software System
1733 Woodside Road, Suite 220, Redwood City, California 94061
Phone: (650)306-2400, Fax: (650)364-4678
Email: Support@AdaptSoft.com, Web site: http://www.AdaptSoft.com

DATE AND TIME OF PROGRAM EXECUTION: Nov 27,2008 At Time: 21:14
PROJECT FILE: TPS3_EJE7

P R O J E C T T I T L E:
UPC
TECHO SOTANO 3 EJE 7

1 - USER SPECIFIED G E N E R A L D E S I G N P A R A M E T E R S

CONCRETE:

STRENGTH at 28 days, for BEAMS/SLABS	30.00	N/mm^2
for COLUMNS	30.00	N/mm^2
MODULUS OF ELASTICITY for BEAMS/SLABS	25743.00	N/mm^2
for COLUMNS	25743.00	N/mm^2
CREEP factor for deflections for BEAMS/SLABS	2.00	
CONCRETE WEIGHT	NORMAL	
SELF WEIGHT	2500.00	Kg/m^3

TENSION STRESS limits (multiple of (f'c)1/2)

At Top	.529	
At Bottom	.529	

COMPRESSION STRESS limits (multiple of (f'c))

At all locations	.450	

REINFORCEMENT:

YIELD Strength	500.00	N/mm^2
Minimum Cover at TOP	40.00	mm
Minimum Cover at BOTTOM	40.00	mm

POST-TENSIONING:

SYSTEM	BONDED	
Ultimate strength of strand	1860.00	N/mm^2
Average effective stress in strand (final)	1200.00	N/mm^2
Strand area.....	140.000	mm^2
Min CGS of tendon from TOP.....	55.00	mm
Min CGS of tendon from BOTTOM for INTERIOR spans..	55.00	mm
Min CGS of tendon from BOTTOM for EXTERIOR spans..	55.00	mm
Min average precompression	.90	N/mm^2

Max spacing between strands (factor of slab depth) 8.00
Tendon profile type and support widths..... (see section 9)

ANALYSIS OPTIONS USED:
Structural system ..... TWO-WAY
Moment of Inertia over support is ..... NOT INCREASED
Moments REDUCED to face of support ..... YES

2 - I N P U T G E O M E T R Y

2.1.1 PRINCIPAL SPAN DATA OF UNIFORM SPANS

SPAN	TYPE	FORM	LENGTH m	WIDTH mm	DEPTH mm	TOP FLANGE width	TOP FLANGE thick. mm	BOTTOM/MIDDLE FLANGE width mm	BOTTOM/MIDDLE FLANGE thick. mm	REF HEIGHT mm	MULTIPLIER left	MULTIPLIER right
1	U	1	7.00	9150	250					0	.50	.50
2	U	1	5.50	9150	250					0	.50	.50
3	U	1	8.20	9150	250					0	.50	.50
4	U	1	9.30	9150	250					0	.50	.50
5	U	1	6.15	9150	250					0	.50	.50
6	U	1	6.15	9150	250					0	.50	.50
7	U	1	6.33	9150	250					0	.50	.50
8	U	1	6.33	9150	250					0	.50	.50
9	U	1	6.33	9150	250					0	.50	.50
10	U	1	6.33	9150	250					0	.50	.50
11	U	1	6.33	9150	250					0	.50	.50

LEGEND:
1 - SPAN
C = Cantilever
2 - TYPE
U = Uniform; prismatic
N = Nonuniform section
3 - FORM
1 = Rectangular section
2 = T or Inverted L section
3 = I section
4 = Extended T or L section
7 = Joist
8 = Waffle
11 - Top surface to reference line

2.2 - S U P P O R T W I D T H A N D C O L U M N D A T A

JOINT	SUPPORT WIDTH mm	LOWER COLUMN LENGTH m	LOWER COLUMN B(DIA) mm	LOWER COLUMN D mm	LOWER COLUMN CBC*	UPPER COLUMN LENGTH m	UPPER COLUMN B(DIA) mm	UPPER COLUMN D mm	UPPER COLUMN CBC*
1	500	4.00	500	500	(2)	.00	0	0	(3)
2	500	4.00	500	500	(2)	.00	0	0	(3)
3	500	4.00	500	500	(2)	.00	0	0	(3)
4	500	4.00	500	500	(2)	.00	0	0	(3)
5	500	4.00	500	500	(2)	.00	0	0	(3)
6	500	4.00	500	500	(2)	.00	0	0	(3)
7	500	4.00	500	500	(2)	.00	0	0	(3)
8	500	4.00	500	500	(2)	.00	0	0	(3)
9	500	4.00	500	500	(2)	.00	0	0	(3)
10	500	4.00	500	500	(2)	.00	0	0	(3)
11	500	4.00	500	500	(2)	.00	0	0	(3)
12	500	4.00	500	500	(2)	.00	0	0	(3)

*THE COLUMN BOUNDARY CONDITION CODES (CBC)
Fixed at both ends ...(STANDARD) ..... = 1
Hinged at near end, fixed at far end ..... = 2
Fixed at near end, hinged at far end ..... = 3
Fixed at near end, roller with rotational fixity at far end .. = 4

3 - I N P U T A P P L I E D L O A D I N G

<---CLASS---> <----------TYPE----------->
D = DEAD LOAD U = UNIFORM P = PARTIAL UNIFORM
L = LIVE LOAD C = CONCENTRATED M = APPLIED MOMENT
Li= LINE LOAD
SW= SELF WEIGHT Computed from geometry input and treated as dead loading
Unit selfweight W = 2500.0 Kg/m^3

SPAN	CLASS	TYPE	Intensity kN/m^2	From ... m	To ... m	M or C ...At (kN-m or kN...m)	Total on Trib kN/m
1	L	U	4.000	.00	7.00		36.600
1	D	U	1.500	.00	7.00		13.725
1	SW	U		.00	7.00		56.101
2	L	U	4.000	.00	5.50		36.600
2	D	U	1.500	.00	5.50		13.725
2	SW	U		.00	5.50		56.101
3	L	U	4.000	.00	8.20		36.600
3	D	U	1.500	.00	8.20		13.725
3	SW	U		.00	8.20		56.101
4	L	U	4.000	.00	9.30		36.600
4	D	U	1.500	.00	9.30		13.725
4	SW	U		.00	9.30		56.101

5	L	U	4.000	.00	6.15	36.600
5	D	U	1.500	.00	6.15	13.725
5	SW	U		.00	6.15	56.101
6	L	U	4.000	.00	6.15	36.600
6	D	U	1.500	.00	6.15	13.725
6	SW	U		.00	6.15	56.101
7	L	U	4.000	.00	6.33	36.600
7	D	U	1.500	.00	6.33	13.725
7	SW	U		.00	6.33	56.101
8	L	U	4.000	.00	6.33	36.600
8	D	U	1.500	.00	6.33	13.725
8	SW	U		.00	6.33	56.101
9	L	U	4.000	.00	6.33	36.600
9	D	U	1.500	.00	6.33	13.725
9	SW	U		.00	6.33	56.101
10	L	U	4.000	.00	6.33	36.600
10	D	U	1.500	.00	6.33	13.725
10	SW	U		.00	6.33	56.101
11	L	U	4.000	.00	6.33	36.600
11	D	U	1.500	.00	6.33	13.725
11	SW	U		.00	6.33	56.101

NOTE: LIVE LOADING is SKIPPED with a skip factor of .70

3.1 - LOADING AS APPEARS IN USER`S INPUT SCREEN PRIOR TO PROCESSING

SPAN	CLASS	TYPE	UNIFORM (kN/m^2), LINE(kN/m)	(CON. or PART.) (kN@m or m-m)	(M O M E N T) (kN-m @ m)
1	L	U	4.000		
1	D	U	1.500		
2	L	U	4.000		
2	D	U	1.500		
3	L	U	4.000		
3	D	U	1.500		
4	L	U	4.000		
4	D	U	1.500		
5	L	U	4.000		
5	D	U	1.500		
6	L	U	4.000		
6	D	U	1.500		
7	L	U	4.000		
7	D	U	1.500		
8	L	U	4.000		
8	D	U	1.500		
9	L	U	4.000		
9	D	U	1.500		
10	L	U	4.000		
10	D	U	1.500		
11	L	U	4.000		
11	D	U	1.500		

NOTE: SELFWEIGHT INCLUSION REQUIRED
LIVE LOADING is SKIPPED with a skip factor of .70

4 - C A L C U L A T E D S E C T I O N P R O P E R T I E S

4.1 For Uniform Spans and Cantilevers only

SPAN	AREA mm^2	I mm^4	Yb mm	Yt mm
1	2287500.00	.1191E+11	125.00	125.00
2	2287500.00	.1191E+11	125.00	125.00
3	2287500.00	.1191E+11	125.00	125.00
4	2287500.00	.1191E+11	125.00	125.00
5	2287500.00	.1191E+11	125.00	125.00
6	2287500.00	.1191E+11	125.00	125.00
7	2287500.00	.1191E+11	125.00	125.00
8	2287500.00	.1191E+11	125.00	125.00
9	2287500.00	.1191E+11	125.00	125.00
10	2287500.00	.1191E+11	125.00	125.00
11	2287500.00	.1191E+11	125.00	125.00

Note:
--- = Span/Cantilever is Nonuniform, see block 4.2

5 - D E A D L O A D M O M E N T S, S H E A R S & R E A C T I O N S

SPAN	< 5.1 S P A N M O M E N T S (kNm) > M(l)*	Midspan	M(r)*	< 5.2 SPAN SHEARS (kN) > SH(l)	SH(r)
1	.01	276.66	-302.06	-201.24	287.54
2	-302.07	-8.35	-242.69	-202.82	181.23
3	-242.69	208.82	-513.45	-253.27	319.31
4	-513.45	299.73	-396.90	-337.22	312.16
5	-396.91	46.25	-170.85	-251.47	177.96
6	-170.85	125.01	-239.38	-203.57	225.86

7	-239.38	114.95	-230.19	-222.45	219.55
8	-230.19	115.67	-237.93	-219.78	222.22
9	-237.93	122.68	-216.17	-224.44	217.56
10	-216.17	93.91	-295.48	-208.47	233.53
11	-295.48	202.00	.01	-267.68	174.32

Note:
* = Centerline moments

JOINT	< 5.3 REACTIONS (kN) >	<- 5.4 COLUMN MOMENTS (kNm) ->	
		Lower columns	Upper columns
1	201.24	.00	.00
2	490.36	.00	.00
3	434.49	.00	.00
4	656.53	.00	.00
5	563.63	.00	.00
6	381.53	.00	.00
7	448.31	.00	.00
8	439.32	.00	.00
9	446.66	.00	.00
10	426.03	.00	.00
11	501.21	.00	.00
12	174.32	.00	.00

6 - L I V E L O A D M O M E N T S, S H E A R S & R E A C T I O N S

<-- 6.1 L I V E L O A D SPAN MOMENTS (kNm) and SHEAR FORCES (kN) -->

SPAN	<----- left* -----> max	min	<--- midspan ---> max	min	<---- right* -----> max	min	<--SHEAR FORCE--> left	right
1	.00	.00	145.01	-21.73	-158.33	-10.45	-105.48	150.72
2	-158.33	-10.45	77.10	-80.16	-146.12	18.99	-106.31	95.12
3	-146.12	18.99	131.54	-54.93	-269.13	-65.00	-132.75	167.37
4	-269.13	-65.00	157.11	-45.64	-208.04	-6.04	-176.76	163.62
5	-208.04	-6.04	90.00	-73.04	-113.46	-5.81	-131.81	96.25
6	-113.46	-5.81	90.19	-44.32	-125.47	-24.32	-106.70	118.39
7	-125.47	-24.32	85.57	-43.39	-120.66	-27.77	-116.60	115.08
8	-120.66	-27.77	85.47	-43.03	-124.71	-29.20	-115.20	116.48
9	-124.71	-29.20	86.69	-41.68	-113.31	-20.40	-117.64	114.04
10	-113.31	-20.40	81.40	-46.94	-154.88	-36.15	-109.27	122.41
11	-154.88	-36.15	105.88	-27.11	.00	.00	-140.31	91.37

Note:
* = Centerline moments

JOINT	<- 6.2 REACTIONS (kN) -> max	min	<-------- 6.3 COLUMN MOMENTS (kNm) -------> <--- LOWER COLUMN ---> max	min	<--- UPPER COLUMN ---> max	min
1	114.35	-8.87	.00	.00	.00	.00
2	296.11	67.54	.00	.00	.00	.00
3	300.08	39.50	.00	.00	.00	.00
4	364.04	144.98	.00	.00	.00	.00
5	335.95	78.53	.00	.00	.00	.00
6	270.75	64.40	.00	.00	.00	.00
7	273.99	90.77	.00	.00	.00	.00
8	267.68	95.55	.00	.00	.00	.00
9	272.82	97.50	.00	.00	.00	.00
10	267.44	85.58	.00	.00	.00	.00
11	280.65	106.90	.00	.00	.00	.00
12	103.61	-12.24	.00	.00	.00	.00

Note: Block 6.1 through 6.3 values are maxima of all skipped loading cases

7 - M O M E N T S REDUCED TO FACE-OF-SUPPORT

7.1 R E D U C E D DEAD LOAD MOMENTS (kNm)

SPAN	<- left* ->	<- midspan ->	<- right* ->
1	48.13	276.70	-232.40
2	-253.50	-8.35	-199.60
3	-181.60	208.80	-435.80
4	-431.30	299.70	-321.00
5	-336.20	46.25	-128.50
6	-122.10	125.00	-185.10
7	-185.90	114.90	-177.50
8	-177.40	115.70	-184.60
9	-184.00	122.70	-164.00
10	-166.20	93.91	-239.30
11	-230.70	202.00	41.40

Note:
* = face-of-support

7.2 R E D U C E D LIVE LOAD MOMENTS (kNm)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	-1.55	25.23	145.00	-21.73	-121.80	-10.08
2	-132.90	.20	77.10	-80.16	-123.10	28.82
3	-118.20	15.27	131.50	-54.93	-228.40	-42.01
4	-226.10	-63.42	157.10	-45.64	-168.30	-7.63
5	-176.20	8.49	90.00	-73.04	-90.20	5.62
6	-90.94	8.60	90.19	-44.32	-97.02	-9.05
7	-97.47	-18.68	85.57	-43.39	-93.03	-11.79

8	-93.00	-13.02	85.47	-43.03	-96.74	-13.31
9	-96.45	-12.99	86.69	-41.68	-89.17	-4.70
10	-89.44	-10.62	81.40	-46.94	-125.40	-19.67
11	-120.90	-32.59	105.90	-27.11	-2.14	21.70

Note:
* = face-of-support

8 - SUM OF DEAD AND LIVE MOMENTS (kNm)

Maxima of dead load and live load span moments combined
for serviceability checks (1.00DL + .70LL)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	47.04	65.79	378.20	261.49	-317.66	-239.46
2	-346.53	-253.36	45.62	-64.46	-285.77	-179.43
3	-264.34	-170.91	300.85	170.35	-595.68	-465.21
4	-589.57	-475.69	409.67	267.75	-438.81	-326.34
5	-459.54	-330.26	109.25	-4.88	-191.64	-124.56
6	-185.76	-116.08	188.13	93.98	-253.01	-191.44
7	-254.13	-198.98	174.80	84.53	-242.62	-185.75
8	-242.50	-186.51	175.53	85.58	-252.32	-193.92
9	-251.51	-193.09	183.38	93.52	-226.42	-167.29
10	-228.81	-173.63	150.89	61.05	-327.08	-253.07
11	-315.33	-253.51	276.13	183.02	39.90	56.59

Note:
* = face-of-support

9 - SELECTED POST-TENSIONING FORCES AND TENDON PROFILES

9.1 PROFILE TYPES AND PARAMETERS

LEGEND:
For Span:
1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon

For Cantilever:
1 = simple parabola
2 = partial parabola
3 = harped tendon

9.2 T E N D O N P R O F I L E

	TYPE	X1/L	X2/L	X3/L	A/L

1	1	.100	.500	.100	.000
2	1	.100	.500	.100	.000
3	1	.100	.500	.100	.000
4	1	.100	.500	.100	.000
5	1	.100	.500	.100	.000
6	1	.100	.500	.100	.000
7	1	.100	.500	.100	.000
8	1	.100	.500	.100	.000
9	1	.100	.500	.100	.000
10	1	.100	.500	.100	.000
11	1	.100	.500	.100	.000

9.3 - SELECTED POST-TENSIONING FORCES AND TENDON DRAPE

Tendon editing mode selected: TENDON SELECTION

SPAN	<-------- SELECTED VALUES --------> FORCE (kN/-)	<- DISTANCE OF CGS (mm) -> Left	Center	Right	<--- CALCULATED VALUES ---> P/A (N/mm^2)	Wbal (kN/-)	Wbal (%DL)
1	2764.930	-125.00	-195.00	-55.00	1.21	47.399	68
2	2918.110	-55.00	-125.00	-55.00	1.28	54.021	77
3	2769.295	-55.00	-195.00	-55.00	1.21	46.127	66
4	2629.325	-55.00	-195.00	-55.00	1.15	34.048	49
5	2475.156	-55.00	-125.00	-55.00	1.08	36.647	52
6	2461.910	-55.00	-125.00	-55.00	1.08	36.451	52
7	2568.158	-55.00	-125.00	-55.00	1.12	35.892	51
8	2677.800	-55.00	-125.00	-55.00	1.17	37.425	54
9	2792.100	-55.00	-125.00	-55.00	1.22	39.022	56
10	2898.617	-55.00	-125.00	-55.00	1.27	40.511	58
11	2723.374	-55.00	-195.00	-125.00	1.19	57.093	82

Approximate weight of strand ..... 1318.0 Kg

9.35 - TENDON SELECTION DATA:

TYPE	SEL.	FORCE (kN)	START	END
A	16	168.42	1	11

9.5 R E Q U I R E D MINIMUM P O S T - T E N S I O N I N G FORCES (kN)

SPAN	<- BASED ON STRESS CONDITIONS -> LEFT*	CENTER	RIGHT*	<- BASED ON MINIMUM P/A -> LEFT	CENTER	RIGHT
1	.00	902.49	384.83	2058.80	2058.80	2058.80

2	658.27	.00	97.83	2058.80	2058.80	2058.80
3	.00	233.27	2397.70	2058.80	2058.80	2058.80
4	2310.57	1314.86	1519.84	2058.80	2058.80	2058.80
5	1743.14	.00	.00	2058.80	2058.80	2058.80
6	.00	.00	.00	2058.80	2058.80	2058.80
7	.00	.00	.00	2058.80	2058.80	2058.80
8	.00	.00	.00	2058.80	2058.80	2058.80
9	.00	.00	.00	2058.80	2058.80	2058.80
10	.00	.00	467.53	2058.80	2058.80	2058.80
11	358.78	.00	.00	2058.80	2058.80	2058.80

Note:
* = face-of-support

9.6 S E R V I C E S T R E S S E S (N/mm^2) (tension shown positive)

	L E F T *				R I G H T *			
	TOP		BOTTOM		TOP		BOTTOM	
	max-T	max-C	max-T	max-C	max-T	max-C	max-T	max-C
1	-----	-1.70	-----	-.61	.46	-.36	-----	-2.68
2	.74	-.24	-----	-3.00	.34	-.78	-----	-2.60
3	.10	-.88	-----	-2.33	2.82	-----	-----	-4.96
4	2.75	-----	-----	-4.86	2.01	-----	-----	-4.03
5	2.29	-----	-----	-4.30	.24	-.47	-----	-2.16
6	.20	-.53	-----	-2.11	.66	-----	-----	-2.64
7	.66	-----	-----	-2.66	.52	-.07	-----	-2.59
8	.51	-.07	-----	-2.60	.46	-.15	-----	-2.61
9	.45	-.16	-----	-2.62	.35	-.27	-----	-2.60
10	.34	-.23	-----	-2.61	.51	-.27	-----	-2.75
11	.42	-.23	-----	-2.63	-----	-1.58	-----	-.68

Note:
* = face-of-support

	C E N T E R			
	TOP		BOTTOM	
	max-T	max-C	max-T	max-C
1	-----	-3.19	1.02	-.21
2	-----	-1.43	-----	-2.03
3	-----	-2.56	.38	-.99
4	-----	-3.85	1.78	-----
5	-----	-1.66	-----	-1.48
6	-----	-2.23	.29	-.70
7	-----	-2.17	.14	-.80
8	-----	-2.19	.09	-.86
9	-----	-2.20	.00	-.94
10	-----	-2.23	-----	-.99
11	-----	-2.16	.02	-.96

9.7 POST-TENSIONING B A L A N C E D M O M E N T S, SHEARS & REACTIONS

	<-- S P A N M O M E N T S (kNm) -->			<-- SPAN SHEARS (kN) -->	
SPAN	left*	midspan	right*	SH(l)	SH(r)
1	-5.21	-197.30	186.80	1.07	1.07
2	187.10	-21.25	162.10	5.00	5.00
3	164.90	-178.20	249.80	-12.34	-12.34
4	252.40	-157.50	167.80	8.53	8.53
5	161.90	-48.61	86.29	11.55	11.55
6	84.10	-75.50	106.20	-2.81	-2.81
7	106.90	-71.98	104.80	1.62	1.62
8	104.70	-74.31	117.50	-.88	-.88
9	116.60	-87.07	95.12	4.91	4.91
10	97.94	-52.05	191.10	-15.98	-15.98
11	189.10	-191.40	-6.01	-.23	-.23

Note:
* = face-of-support

	<--REACTIONS (kN)-->	<-- COLUMN MOMENTS (kNm) -->	
joint		Lower columns	Upper columns
1	-1.072	.000	.000
2	-3.928	.000	.000
3	17.340	.000	.000
4	-20.870	.000	.000
5	-3.023	.000	.000
6	14.360	.000	.000
7	-4.425	.000	.000
8	2.499	.000	.000
9	-5.796	.000	.000
10	20.890	.000	.000
11	-15.750	.000	.000
12	-.232	.000	.000

10 - F A C T O R E D M O M E N T S & R E A C T I O N S

Calculated as (1.35D + 1.50L + 1.00 secondary moment effects)

10.1 FACTORED DESIGN MOMENTS (kNm)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	62.38	102.55	587.25	337.15	-503.68	-336.10
2	-550.33	-350.69	83.12	-152.77	-487.86	-259.98
3	-454.38	-254.18	494.81	215.11	-867.83	-588.24
4	-857.35	-613.34	666.82	362.69	-696.81	-455.80

5	-734.20	-457.17	148.77	-95.79	-390.08	-246.35
6	-384.74	-235.44	228.45	26.68	-463.12	-331.16
7	-464.58	-346.40	211.43	17.99	-455.97	-334.11
8	-455.97	-336.00	209.97	17.23	-466.12	-340.98
9	-465.88	-340.68	208.55	15.99	-456.56	-329.85
10	-457.17	-338.94	196.82	4.31	-516.62	-358.03
11	-494.21	-361.74	430.78	231.30	52.62	88.38

Note:
* = face-of-support

10.2 SECONDARY MOMENTS (kNm)

SPAN	<-- left* -->	<- midspan ->	<-- right* -->
1	-.27	-3.75	-7.24
2	-8.75	-21.25	-33.75
3	-31.92	15.59	63.10
4	64.05	26.52	-11.01
5	-16.03	-48.67	-81.31
6	-83.50	-75.60	-67.70
7	-67.41	-72.10	-76.80
8	-76.98	-74.39	-71.80
9	-72.80	-87.11	-101.40
10	-98.64	-52.06	-5.47
11	-1.41	-.74	-.06

Note:
* = face-of-support

10.3 FACTORED REACTIONS (kN)

10.4 FACTORED COLUMN MOMENTS (kNm)

JOINT	<-- LOWER column --> max	<-- LOWER column --> min	<-- UPPER column --> max	<-- UPPER column --> min
1	442.00	257.24	.00	.00	.00	.00
2	1102.26	759.42	.00	.00	.00	.00
3	1054.06	663.16	.00	.00	.00	.00
4	1411.41	1082.91	.00	.00	.00	.00
5	1261.69	875.63	.00	.00	.00	.00
6	935.43	625.98	.00	.00	.00	.00
7	1011.78	736.93	.00	.00	.00	.00
8	997.10	738.88	.00	.00	.00	.00
9	1006.45	743.50	.00	.00	.00	.00
10	997.09	724.36	.00	.00	.00	.00
11	1081.92	821.22	.00	.00	.00	.00
12	390.47	216.71	.00	.00	.00	.00

11 - M I L D S T E E L

Support cut-off length for minimum steel(length/span) ... .17
Span cut-off length for minimum steel(length/span) ... .33
Top bar extension beyond where required ..... 900.00 mm
Bottom bar extension beyond where required ..... 900.00 mm

REINFORCEMENT based on NO REDISTRIBUTION of factored moments

11.1 TOTAL WEIGHT OF REBAR = 99.5 Kg AVERAGE = .1 Kg/m^2
TOTAL AREA COVERED = 676.64 m^2

11.2.1 S T E E L A T M I D - S P A N

SPAN	TOP As (mm^2)	TOP DIFFERENT REBAR CRITERIA <---ULT-----TENS-------->			BOTTOM As (mm^2)	BOTTOM DIFFERENT REBAR CRITERIA <---ULT-----TENS-------->		
1	0	(0	0	0)	0	(0	0	0)
2	0	(0	0	0)	0	(0	0	0)
3	0	(0	0	0)	0	(0	0	0)
4	0	(0	0	0)	0	(0	0	0)
5	0	(0	0	0)	0	(0	0	0)
6	0	(0	0	0)	0	(0	0	0)
7	0	(0	0	0)	0	(0	0	0)
8	0	(0	0	0)	0	(0	0	0)
9	0	(0	0	0)	0	(0	0	0)
10	0	(0	0	0)	0	(0	0	0)
11	0	(0	0	0)	0	(0	0	0)

11.3.1 S T E E L A T S U P P O R T S

JOINT	TOP As (mm^2)	TOP DIFFERENT REBAR CRITERIA <---ULT-----MIN--------->			BOTTOM As (mm^2)	BOTTOM DIFFERENT REBAR CRITERIA <---ULT-----MIN--------->		
1	0	(0	0	0)	0	(0	0	0)
2	0	(0	0	0)	0	(0	0	0)
3	0	(0	0	0)	0	(0	0	0)
4	2709	(2709	0	0)	0	(0	0	0)
5	917	(917	0	0)	0	(0	0	0)
6	0	(0	0	0)	0	(0	0	0)
7	0	(0	0	0)	0	(0	0	0)
8	0	(0	0	0)	0	(0	0	0)
9	0	(0	0	0)	0	(0	0	0)
10	0	(0	0	0)	0	(0	0	0)
11	0	(0	0	0)	0	(0	0	0)
12	0	(0	0	0)	0	(0	0	0)

11.2.2 & 11.3.2 LISTING OF THE ENTIRE PROVIDED REBAR

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]	AREA [mm^2]
3	1	T	7	# 16 x	2680	1393

3	2	T	7 # 16 x	2220	1393
4	3	T	5 # 16 x	2100	995

Notes:
Bar location - T = Top, B = Bottom.
NUM - Number of bars.
For two-way systems a minimum of 4 bars is specified over the supports.
Refer to tables 11.5.1,11.5.2 and PTsum graphical display for
positioning of bars.

11.5.1 ARRANGEMENT OF TOP BARS

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]
3	1	RIGHT	7	# 16 x	1309
3	2	RIGHT	7	# 16 x	1309
4	1	LEFT	7	# 16 x	1365
4	3	RIGHT	5	# 16 x	900
4	2	LEFT	7	# 16 x	900
5	3	LEFT	5	# 16 x	1207

11.5.2 ARRANGEMENT OF BOTTOM BARS

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]

12 - P U N C H I N G S H E A R C H E C K

LEGEND:
CONDITION... 1 = INTERIOR COLUMN
2 = END COLUMN
3 = CORNER COLUMN
4 = EDGE COLUMN (PARALLEL TO SPAN)
5 = EDGE BEAM, WALL, OR OTHER NON-CONFORMING GEOMETRY
PERFORM SHEAR CHECK MANUALLY
6 = STRIP TOO NARROW TO DEVELOP PUNCHING SHEAR

CASE..... 1 = STRESS WITHIN SECTION #1 GOVERNS (COL.CAP OR SLAB)
2 = STRESS WITHIN SECTION #2 GOVERNS (DROP PANEL OR SLAB)

		FACTORED ACTIONS		<- PUNCHING SHEAR STRESSES IN N/mm^2 ->				
		shear	moment	due to	due to		allow-	STRESS
JNT	COND.	kN	kN-m	shear	moment	TOTAL	able	RATIO CASE

-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-
1	2	442.00	.00	1.16	.00	1.16	1.55	.75	1
2	1	1102.26	.00	1.97	.00	1.97	1.68	1.17	1
3	1	1054.07	.00	1.88	.00	1.88	1.68	1.12	1
4	1	1411.41	.00	2.52	.00	2.52	1.66	1.52	1
5	1	1261.69	.00	2.25	.00	2.25	1.64	1.37	1
6	1	935.44	.00	1.67	.00	1.67	1.63	1.03	1
7	1	1011.78	.00	1.81	.00	1.81	1.64	1.10	1
8	1	997.10	.00	1.78	.00	1.78	1.65	1.08	1
9	1	1006.45	.00	1.80	.00	1.80	1.66	1.08	1
10	1	997.09	.00	1.78	.00	1.78	1.67	1.06	1
11	1	1081.92	.00	1.93	.00	1.93	1.67	1.15	1
12	2	390.47	.00	1.03	.00	1.03	1.55	.66	1

PUNCHING SHEAR STRESS IN ONE OR MORE LOCATIONS EXCEEDS THE PERMISSIBLE
VALUE. PROVIDE SHEAR REINFORCEMENT, OR ENLARGE THE SECTION RESISTING THE
PUNCHING SHEAR

13 - MAXIMUM S P A N D E F L E C T I O N S

Concrete`s modulus of elasticity ..... Ec = 25743 N/mm^2
Creep factor ..... K = 2.00
Ieffective/Igross...(due to cracking)..... K = .99

Where stresses exceed 0.5(fc`)^1/2 cracking of section is allowed for.
Values in parentheses are (span/max deflection) ratios

	<.....DEFLECTION ARE ALL IN mm , DOWNWARD POSITIVE.....>				
SPAN	DL	DL+PT	DL+PT+CREEP	LL	DL+PT+LL+CREEP
1	4.2	1.4	4.3(1626)	2.2(3200)	6.5(1078)
2	-.7	-.4	-1.1(5116)	-.4(15502)	-1.4(3846)
3	3.1	.5	1.4(5904)	1.6(5026)	3.0(2715)
4	6.1	3.3	9.9(937)	3.2(2886)	13.1(707)
5	-.5	-.7	-2.2(2848)	-.3(22757)	-2.4(2531)
6	1.1	.5	1.4(4335)	.6(10853)	2.0(3097)
7	.9	.4	1.1(5857)	.5(13054)	1.6(4043)
8	.9	.4	1.1(5808)	.5(12888)	1.6(4004)
9	1.1	.3	.9(7151)	.6(11474)	1.4(4405)
10	.6	.8	2.5(2497)	.3(20679)	2.8(2228)
11	2.4	.2	.7(9413)	1.3(5014)	1.9(3271)

14 - I N I T I A L CONDITION STRESS CHECK & REINFORCEMENT REQUIREMENTS

14.1 Parameters specified as input for initial stress checks:

		Tensile stresses divided by (f`c)^1/2	
Concrete f`c (initial/final)	.75	Top fiber	.25
PT force (initial/final) ...	1.10	Bottom fiber	.25
Dead loading (initial/final)	1.00		
Live loading (initial/final)	.00	Compression as ratio of f`c	.60

Note: Reinforcement reported in this data block is in
addition to that reported in data block 11 for
minimum strength reinforcement required by code.

14.2 NO added MILD REINFORCEMENT is required at MID-SPAN or SUPPORT

14.3 Compressive stresses
COMPRESSIVE stresses are within allowable limit (.60 * f`ci)
MAXIMUM stress..... = .21 * f`ci
(f`ci = initial concrete strength)

16 - FRICTION, ELONGATION AND LONG TERM STRESS LOSSES

16.6 LONG TERM STRESS LOSS CALCULATIONS

16.6.1 INPUT PARAMETERS :

Type of strand	LOW LAX	
Modulus of elasticity of strand	200000.00	N/mm^2
Average weight of concrete	NORMAL	
Estimate age of concrete at stressing	7	days
Modulus of elasticity of concrete at stressing	23322.00	N/mm^2
Modulus of elasticity of concrete at 28 days	25743.00	N/mm^2
Estimate of average relative humidity	80.00	%
Volume to surface ratio of member	150.00	mm

16.6.2 CALCULATED LONG-TERM STRESS LOSS(average of all tendons) :

SPAN	<----- STRESS (N/mm^2) -----> start	center	right
1	57.77	54.84	56.54
2	56.54	68.93	60.98
3	60.98	59.24	39.51
4	39.51	41.95	33.68
5	33.68	47.96	39.21
6	39.21	47.86	39.91
7	39.91	52.59	45.29
8	45.29	57.66	49.70
9	49.70	63.10	56.91
10	56.91	68.79	57.40
11	57.40	59.14	55.89

16.7 FRICTION AND ELONGATION CALCULATIONS

16.7.1 INPUT PARAMETERS :

Coefficient of angular friction (meu)	.220	/rad
Coefficient of wobble friction (K)	.0012	/m
Ultimate strength of strand	1860.0	N/mm^2
Ratio of jacking stress to strand's ultimate strength	.800	
Anchor set	6.000	mm
Cross-sectional area of strand	140.000	mm^2

16.7.2 CALCULATED STRESSES(average of all tendons) :

SPAN	LENGTH m	P	<TENDON HEIGHT(mm)> start	center	right	Horizontal ratios X1/L	X2/L	X3/L	<-- STRESS(N/mm^2)--> start	center	right
1	7.00	1	-125.	-195.	-55.	.10	.50	.10	1201.75	1234.34	1280.39
2	5.50	1	-55.	-125.	-55.	.10	.50	.10	1280.39	1302.73	1280.58
3	8.20	1	-55.	-195.	-55.	.10	.50	.10	1280.58	1236.29	1217.43

4	9.30	1	-55.	-195.	-55.	.10	.50	.10	1217.43	1173.81	1148.61
5	6.15	1	-55.	-125.	-55.	.10	.50	.10	1148.61	1104.98	1090.24
6	6.15	1	-55.	-125.	-55.	.10	.50	.10	1090.24	1099.07	1135.19
7	6.33	1	-55.	-125.	-55.	.10	.50	.10	1135.19	1146.50	1182.75
8	6.33	1	-55.	-125.	-55.	.10	.50	.10	1182.75	1195.45	1233.67
9	6.33	1	-55.	-125.	-55.	.10	.50	.10	1233.67	1246.47	1284.28
10	6.33	1	-55.	-125.	-55.	.10	.50	.10	1284.28	1294.03	1268.96
11	6.33	1	-55.	-195.	-125.	.10	.50	.10	1268.96	1215.79	1187.50

Note: P= tendon profile (refer to legend of data block 9)
Stresses at each location are the average of strands after anchor set, and after long-term losses

16.8 TENDON SELECTION AND DATA:

			<------ TENDON EXTENTS ------>		ELONGATION		Stress ratios	
TYPE	OFF	FORCE	CAN<------ S P A N S ----->	CAN	LEFT (mm)	RIGHT (mm)	Anch.	Max.
A	16	168.42	<==========>		414.	51.	.72	.74

Note: Force is the average value per strand (kN)
Stress ratios are at anchorage (7) and maximum along tendon (8)

ADAPT CORPORATION
STRUCTURAL CONCRETE SOFTWARE SYSTEM
1733 Woodside Road, Suite 220, Redwood City, California 94061

ADAPT-PT FOR POST-TENSIONED BEAM/SLAB DESIGN
Version 7.00 AMERICAN (ACI 318-99/UBC-77)
ADAPT CORPORATION - Structural Concrete Software System

1733 Woodside Road, Suite 220, Redwood City, California 94061
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DATE AND TIME OF PROGRAM EXECUTION: Nov 27,2008 At Time: 21:15
PROJECT FILE: TPS3_EJE9

P R O J E C T T I T L E:
UPC
TECHO SOTANO 3 EJE 9

1 - USER SPECIFIED G E N E R A L D E S I G N P A R A M E T E R S

CONCRETE:
STRENGTH at 28 days, for BEAMS/SLABS ..... 30.00 N/mm^2
for COLUMNS ..... 30.00 N/mm^2

MODULUS OF ELASTICITY for BEAMS/SLABS ..... 25743.00 N/mm^2
for COLUMNS ..... 25743.00 N/mm^2

CREEP factor for deflections for BEAMS/SLABS 2.00
CONCRETE WEIGHT ..... NORMAL

SELF WEIGHT ..... 2500.00 Kg/m^3

TENSION STRESS limits (multiple of (f'c)1/2)
At Top ..... .529
At Bottom ..... .529

COMPRESSION STRESS limits (multiple of (f'c))
At all locations ..... .450

REINFORCEMENT:
YIELD Strength ..... 500.00 N/mm^2
Minimum Cover at TOP ..... 40.00 mm
Minimum Cover at BOTTOM ..... 40.00 mm

POST-TENSIONING:
SYSTEM ..... BONDED
Ultimate strength of strand ..... 1860.00 N/mm^2
Average effective stress in strand (final) ..... 1200.00 N/mm^2
Strand area..... 140.000 mm^2
Min CGS of tendon from TOP..... 55.00 mm
Min CGS of tendon from BOTTOM for INTERIOR spans.. 55.00 mm
Min CGS of tendon from BOTTOM for EXTERIOR spans.. 55.00 mm
Min average precompression ..... .90 N/mm^2

Max spacing between strands (factor of slab depth) 8.00
Tendon profile type and support widths..... (see section 9)

ANALYSIS OPTIONS USED:
Structural system ..... TWO-WAY
Moment of Inertia over support is ..... NOT INCREASED
Moments REDUCED to face of support ..... YES

2 - I N P U T G E O M E T R Y

2.1.1 PRINCIPAL SPAN DATA OF UNIFORM SPANS

SPAN	TYP	FORM	LENGTH m	WIDTH mm	DEPTH mm	TOP FLANGE width mm	TOP FLANGE thick. mm	BOTTOM/MIDDLE FLANGE width mm	BOTTOM/MIDDLE FLANGE thick. mm	REF HEIGHT mm	MULTIPLIER left	MULTIPLIER right
1	U	1	6.20	9250	250					0	.50	.50
2	U	1	9.30	9250	250					0	.50	.50
3	U	1	6.15	9250	250					0	.50	.50
4	U	1	6.15	9250	250					0	.50	.50
5	U	1	6.33	9250	250					0	.50	.50
6	U	1	6.33	9250	250					0	.50	.50
7	U	1	6.33	9250	250					0	.50	.50
8	U	1	6.33	9250	250					0	.50	.50
9	U	1	6.33	9250	250					0	.50	.50

LEGEND:
1 - SPAN
C = Cantilever
2 - TYPE
U = Uniform; prismatic
N = Nonuniform section
3 - FORM
1 = Rectangular section
2 = T or Inverted L section
3 = I section
4 = Extended T or L section
7 = Joist
8 = Waffle
11 - Top surface to reference line

2.2 - S U P P O R T W I D T H A N D C O L U M N D A T A

JOINT	SUPPORT WIDTH mm	LOWER COLUMN LENGTH m	LOWER COLUMN B(DIA) mm	LOWER COLUMN D mm	LOWER COLUMN CBC*	UPPER COLUMN LENGTH m	UPPER COLUMN B(DIA) mm	UPPER COLUMN D mm	UPPER COLUMN CBC*
1	500	4.00	500	500	(2)	.00	0	0	(3)
2	500	4.00	500	500	(2)	.00	0	0	(3)
3	500	4.00	500	500	(2)	.00	0	0	(3)
4	500	4.00	500	500	(2)	.00	0	0	(3)
5	500	4.00	500	500	(2)	.00	0	0	(3)
6	500	4.00	500	500	(2)	.00	0	0	(3)
7	500	4.00	500	500	(2)	.00	0	0	(3)
8	500	4.00	500	500	(2)	.00	0	0	(3)
9	500	4.00	500	500	(2)	.00	0	0	(3)
10	500	4.00	500	500	(2)	.00	0	0	(3)

*THE COLUMN BOUNDARY CONDITION CODES (CBC)
Fixed at both ends ...(STANDARD) ..... = 1
Hinged at near end, fixed at far end ..... = 2
Fixed at near end, hinged at far end ..... = 3
Fixed at near end, roller with rotational fixity at far end .. = 4

3 - I N P U T A P P L I E D L O A D I N G

<---CLASS---> <----------TYPE----------->
D = DEAD LOAD U = UNIFORM P = PARTIAL UNIFORM
L = LIVE LOAD C = CONCENTRATED M = APPLIED MOMENT
Li= LINE LOAD
SW= SELF WEIGHT Computed from geometry input and treated as dead loading
Unit selfweight W = 2500.0 Kg/m^3

SPAN	CLASS	TYPE	Intensity kN/m^2	From ... m	To ... m	M or C ...At (kN-m or kN...m)	Total on Trib kN/m
1	L	U	4.000	.00	6.20		37.000
1	D	U	1.500	.00	6.20		13.875
1	SW	U		.00	6.20		56.714
2	L	U	4.000	.00	9.30		37.000
2	D	U	1.500	.00	9.30		13.875
2	SW	U		.00	9.30		56.714
3	L	U	4.000	.00	6.15		37.000
3	D	U	1.500	.00	6.15		13.875
3	SW	U		.00	6.15		56.714
4	L	U	4.000	.00	6.15		37.000
4	D	U	1.500	.00	6.15		13.875
4	SW	U		.00	6.15		56.714
5	L	U	4.000	.00	6.33		37.000
5	D	U	1.500	.00	6.33		13.875
5	SW	U		.00	6.33		56.714

6	L	U	4.000	.00	6.33	37.000
6	D	U	1.500	.00	6.33	13.875
6	SW	U		.00	6.33	56.714
7	L	U	4.000	.00	6.33	37.000
7	D	U	1.500	.00	6.33	13.875
7	SW	U		.00	6.33	56.714
8	L	U	4.000	.00	6.33	37.000
8	D	U	1.500	.00	6.33	13.875
8	SW	U		.00	6.33	56.714
9	L	U	4.000	.00	6.33	37.000
9	D	U	1.500	.00	6.33	13.875
9	SW	U		.00	6.33	56.714

NOTE: LIVE LOADING is SKIPPED with a skip factor of .70

3.1 - LOADING AS APPEARS IN USER`S INPUT SCREEN PRIOR TO PROCESSING

SPAN	CLASS	TYPE	UNIFORM (kN/m^2), LINE(kN/m)	(CON. or PART.) (kN@m or m-m)	(M O M E N T) (kN-m @ m)
1	L	U	4.000		
1	D	U	1.500		
2	L	U	4.000		
2	D	U	1.500		
3	L	U	4.000		
3	D	U	1.500		
4	L	U	4.000		
4	D	U	1.500		
5	L	U	4.000		
5	D	U	1.500		
6	L	U	4.000		
6	D	U	1.500		
7	L	U	4.000		
7	D	U	1.500		
8	L	U	4.000		
8	D	U	1.500		
9	L	U	4.000		
9	D	U	1.500		

NOTE: SELFWEIGHT INCLUSION REQUIRED
LIVE LOADING is SKIPPED with a skip factor of .70

4 - C A L C U L A T E D S E C T I O N P R O P E R T I E S

4.1 For Uniform Spans and Cantilevers only

SPAN	AREA mm^2	I mm^4	Yb mm	Yt mm
1	2312500.00	.1204E+11	125.00	125.00
2	2312500.00	.1204E+11	125.00	125.00
3	2312500.00	.1204E+11	125.00	125.00
4	2312500.00	.1204E+11	125.00	125.00
5	2312500.00	.1204E+11	125.00	125.00
6	2312500.00	.1204E+11	125.00	125.00
7	2312500.00	.1204E+11	125.00	125.00
8	2312500.00	.1204E+11	125.00	125.00
9	2312500.00	.1204E+11	125.00	125.00

Note:
--- = Span/Cantilever is Nonuniform, see block 4.2

5 - D E A D L O A D M O M E N T S, S H E A R S & R E A C T I O N S

SPAN	< 5.1 S P A N M O M E N T S (kNm) > M(l)*	Midspan	M(r)*	< 5.2 SPAN SHEARS (kN) > SH(l)	SH(r)
1	-.01	105.20	-467.96	-143.35	294.30
2	-467.97	320.42	-417.50	-333.67	322.81
3	-417.49	40.80	-168.37	-257.57	176.55
4	-168.36	127.97	-243.16	-204.90	229.22
5	-243.16	115.77	-232.40	-225.11	221.71
6	-232.40	117.05	-240.61	-222.12	224.71
7	-240.61	123.99	-218.51	-226.91	219.92
8	-218.51	94.94	-298.71	-210.74	236.08
9	-298.71	204.19	.00	-270.60	176.22

Note:
* = Centerline moments

JOINT	< 5.3 REACTIONS (kN) >	<- 5.4 COLUMN MOMENTS (kNm) -> Lower columns	Upper columns
1	143.35	.00	.00
2	627.97	.00	.00
3	580.38	.00	.00
4	381.45	.00	.00
5	454.34	.00	.00
6	443.83	.00	.00
7	451.62	.00	.00
8	430.67	.00	.00

9	506.69	.00	.00
10	176.22	.00	.00

6 - L I V E L O A D M O M E N T S, S H E A R S & R E A C T I O N S

<-- 6.1 L I V E L O A D SPAN MOMENTS (kNm) and SHEAR FORCES (kN) -->

	<----- left* ----->		<--- midspan --->		<---- right* ----->		<--SHEAR FORCE-->	
SPAN	max	min	max	min	max	min	left	right
1	.00	.00	103.72	-65.12	-245.29	-41.46	-75.14	154.26
2	-245.29	-41.46	167.95	-34.55	-218.84	-12.36	-174.89	169.21
3	-218.83	-12.36	87.03	-72.06	-113.03	-3.57	-135.01	96.01
4	-113.03	-3.57	90.70	-43.74	-127.46	-25.03	-107.40	120.15
5	-127.46	-25.03	86.22	-43.74	-121.81	-27.90	-118.00	116.21
6	-121.81	-27.90	86.37	-43.42	-126.12	-29.57	-116.42	117.79
7	-126.12	-29.57	87.62	-42.12	-114.53	-20.61	-118.94	115.27
8	-114.53	-20.61	82.28	-47.44	-156.57	-36.54	-110.46	123.75
9	-156.57	-36.54	107.03	-27.40	.00	.00	-141.84	92.37

Note:
* = Centerline moments

<- 6.2 REACTIONS (kN) -> <-------- 6.3 COLUMN MOMENTS (kNm) -------->

			<--- LOWER COLUMN --->		<--- UPPER COLUMN --->	
JOINT	max	min	max	min	max	min
1	105.15	-30.01	.00	.00	.00	.00
2	340.13	126.38	.00	.00	.00	.00
3	336.88	85.22	.00	.00	.00	.00
4	271.37	61.89	.00	.00	.00	.00
5	277.84	92.38	.00	.00	.00	.00
6	270.68	96.37	.00	.00	.00	.00
7	275.84	98.63	.00	.00	.00	.00
8	270.35	86.50	.00	.00	.00	.00
9	283.72	108.07	.00	.00	.00	.00
10	104.74	-12.37	.00	.00	.00	.00

Note: Block 6.1 through 6.3 values are maxima of all skipped loading cases

7 - M O M E N T S REDUCED TO FACE-OF-SUPPORT

7.1 R E D U C E D DEAD LOAD MOMENTS (kNm)

SPAN	<- left* ->	<- midspan ->	<- right* ->
1	33.63	105.20	-396.60

2	-386.80	320.40	-339.00
3	-355.30	40.80	-126.40
4	-119.30	128.00	-188.10
5	-189.10	115.80	-179.20
6	-179.10	117.00	-186.60
7	-186.10	124.00	-165.70
8	-168.00	94.94	-241.90
9	-233.30	204.20	41.85

Note:
* = face-of-support

7.2 R E D U C E D LIVE LOAD MOMENTS (kNm)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	-5.25	17.63	103.70	-65.12	-207.90	-20.53
2	-202.70	-41.09	168.00	-34.55	-177.70	-13.26
3	-186.20	2.65	87.03	-72.06	-89.83	5.04
4	-90.35	10.88	90.70	-43.74	-98.57	-9.51
5	-99.11	-18.69	86.22	-43.74	-93.92	-11.78
6	-93.86	-13.06	86.37	-43.42	-97.83	-13.44
7	-97.54	-13.19	87.62	-42.12	-90.13	-4.74
8	-90.41	-10.74	82.28	-47.44	-126.80	-19.88
9	-122.30	-32.95	107.00	-27.40	-2.16	21.93

Note:
* = face-of-support

8 - SUM OF DEAD AND LIVE MOMENTS (kNm)

Maxima of dead load and live load span moments combined
for serviceability checks (1.00DL + .70LL)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	29.95	45.97	177.79	59.62	-542.13	-410.97
2	-528.69	-415.56	438.00	296.21	-463.39	-348.28
3	-485.64	-353.44	101.72	-9.64	-189.28	-122.87
4	-182.54	-111.68	191.49	97.38	-257.10	-194.76
5	-258.48	-202.18	176.15	85.18	-244.94	-187.45
6	-244.80	-188.24	177.46	86.61	-255.08	-196.01
7	-254.38	-195.33	185.33	94.52	-228.79	-169.02
8	-231.29	-175.52	152.54	61.73	-330.66	-255.82
9	-318.91	-256.36	279.10	185.02	40.34	57.20

Note:
* = face-of-support

9 - SELECTED POST-TENSIONING FORCES AND TENDON PROFILES

9.1 PROFILE TYPES AND PARAMETERS

LEGEND:

For Span:
- 1 = reversed parabola
- 2 = simple parabola with straight portion over support
- 3 = harped tendon

For Cantilever:
- 1 = simple parabola
- 2 = partial parabola
- 3 = harped tendon

9.2 TENDON PROFILE

SPAN	TENDON TYPE	X1/L	X2/L	X3/L	A/L
1	1	.100	.500	.100	.000
2	1	.100	.500	.100	.000
3	1	.100	.500	.100	.000
4	1	.100	.500	.100	.000
5	1	.100	.500	.100	.000
6	1	.100	.500	.100	.000
7	1	.100	.500	.100	.000
8	1	.100	.500	.100	.000
9	1	.100	.500	.100	.000

9.3 - SELECTED POST-TENSIONING FORCES AND TENDON DRAPE

Tendon editing mode selected: TENDON SELECTION

SPAN	SELECTED VALUES: FORCE (kN/-)	DISTANCE OF CGS (mm) Left	Center	Right	CALCULATED VALUES: P/A (N/mm^2)	Wbal (kN/-)	Wbal (%DL)
1	2702.663	-125.00	-195.00	-55.00	1.17	59.059	84
2	2914.881	-55.00	-195.00	-55.00	1.26	37.746	53
3	2744.376	-55.00	-125.00	-55.00	1.19	40.633	58
4	2629.996	-55.00	-125.00	-55.00	1.14	38.940	55
5	2511.479	-55.00	-145.00	-55.00	1.09	45.129	64
6	2615.497	-55.00	-145.00	-55.00	1.13	46.998	67
7	2752.677	-55.00	-145.00	-55.00	1.19	49.463	70
8	2897.160	-55.00	-145.00	-55.00	1.25	52.059	74
9	2719.691	-55.00	-195.00	-125.00	1.18	57.015	81

Approximate weight of strand ..... 1063.0 Kg

9.35 - TENDON SELECTION DATA:

TYPE	SEL.	FORCE (kN)	START	END
A	16	170.62	1	9

9.5 REQUIRED MINIMUM POST-TENSIONING FORCES (kN)

SPAN	BASED ON STRESS CONDITIONS: LEFT*	CENTER	RIGHT*	BASED ON MINIMUM P/A: LEFT	CENTER	RIGHT
1	.00	.00	1987.09	2081.30	2081.30	2081.30
2	1867.35	1554.26	1704.25	2081.30	2081.30	2081.30
3	1942.68	.00	.00	2081.30	2081.30	2081.30
4	.00	.00	.00	2081.30	2081.30	2081.30
5	.00	.00	.00	2081.30	2081.30	2081.30
6	.00	.00	.00	2081.30	2081.30	2081.30
7	.00	.00	.00	2081.30	2081.30	2081.30
8	.00	.00	449.76	2081.30	2081.30	2081.30
9	345.83	.00	.00	2081.30	2081.30	2081.30

Note:
* = face-of-support

9.6 SERVICE STRESSES (N/mm^2) (tension shown positive)

SPAN	LEFT* TOP max-T	LEFT* TOP max-C	LEFT* BOTTOM max-T	LEFT* BOTTOM max-C	RIGHT* TOP max-T	RIGHT* TOP max-C	RIGHT* BOTTOM max-T	RIGHT* BOTTOM max-C
1	-----	-1.48	-----	-.75	2.15	-----	-----	-4.34
2	1.92	-----	-----	-4.15	1.94	-----	-----	-4.15
3	2.24	-----	-----	-4.43	.06	-.63	-----	-2.17
4	.02	-.72	-----	-2.11	.50	-.15	-----	-2.52
5	.51	-.07	-----	-2.52	.29	-.31	-----	-2.27
6	.27	-.31	-----	-2.27	.26	-.36	-----	-2.34
7	.25	-.37	-----	-2.35	.04	-.58	-----	-2.23
8	.04	-.54	-----	-2.25	.40	-.37	-----	-2.61
9	.31	-.34	-----	-2.49	-----	-1.58	-----	-.66

Note:
* = face-of-support

CENTER

TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C

1	-----	-1.44	-----	-1.89
2	-----	-4.03	1.76	-----
3	-----	-1.61	-----	-1.68
4	-----	-2.31	.26	-.72
5	-----	-1.91	-----	-.99
6	-----	-2.00	-----	-.98
7	-----	-2.00	-----	-1.09
8	-----	-1.94	-----	-1.25
9	-----	-2.25	.13	-.85

9.7 POST-TENSIONING B A L A N C E D M O M E N T S, SHEARS & REACTIONS

SPAN	<-- S P A N M O M E N T S (kNm) --> left*	midspan	right*	<-- SPAN SHEARS (kN) --> SH(l)	SH(r)
1	-3.47	-155.90	254.90	-10.72	-10.72
2	262.50	-176.40	189.10	8.35	8.35
3	182.50	-54.90	90.68	14.22	14.22
4	88.94	-75.49	123.80	-7.52	-7.52
5	124.90	-96.36	135.40	-1.97	-1.97
6	135.80	-92.54	144.40	.10	.10
7	143.50	-106.90	132.40	3.58	3.58
8	134.60	-82.19	206.30	-12.30	-12.30
9	204.60	-183.00	-5.36	2.32	2.32

Note:
* = face-of-support

joint	<--REACTIONS (kN)-->	<-- COLUMN MOMENTS (kNm) --> Lower columns	Upper columns
1	10.720	.000	.000
2	-19.070	.000	.000
3	-5.874	.000	.000
4	21.750	.000	.000
5	-5.556	.000	.000
6	-2.073	.000	.000
7	-3.470	.000	.000
8	15.880	.000	.000
9	-14.630	.000	.000
10	2.321	.000	.000

10 - F A C T O R E D M O M E N T S & R E A C T I O N S

Calculated as (1.35D + 1.50L + 1.00 secondary moment effects)

10.1 FACTORED DESIGN MOMENTS (kNm)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	40.20	74.53	330.83	77.57	-783.48	-502.43
2	-761.85	-519.43	712.13	408.38	-733.30	-486.64
3	-773.71	-490.43	130.70	-107.93	-400.49	-258.19
4	-393.37	-241.53	233.28	31.62	-456.06	-322.47
5	-455.84	-335.21	239.44	44.49	-423.27	-300.06
6	-422.58	-301.38	247.27	52.59	-439.24	-312.66
7	-439.06	-312.53	246.89	52.28	-421.22	-293.14
8	-422.57	-303.06	227.33	32.74	-505.15	-344.77
9	-484.30	-350.27	443.55	241.90	53.83	89.97

Note:
* = face-of-support

10.2 SECONDARY MOMENTS (kNm)

SPAN	<-- left* -->	<- midspan ->	<-- right* -->
1	2.68	33.23	63.78
2	64.38	27.64	-9.10
3	-14.75	-54.93	-95.11
4	-96.79	-75.53	-54.27
5	-51.89	-46.18	-40.47
6	-40.01	-40.30	-40.59
7	-41.51	-51.92	-62.33
8	-60.15	-24.27	11.61
9	14.11	7.35	.58

Note:
* = face-of-support

JOINT	10.3 FACTORED REACTIONS (kN) max	min	10.4 FACTORED COLUMN MOMENTS (kNm) <-- LOWER column --> max	min	<-- UPPER column --> max	min
1	361.83	159.16	.00	.00	.00	.00
2	1338.88	1018.33	.00	.00	.00	.00
3	1283.02	905.50	.00	.00	.00	.00
4	943.88	629.61	.00	.00	.00	.00
5	1024.45	746.32	.00	.00	.00	.00
6	1003.11	741.61	.00	.00	.00	.00
7	1019.89	754.14	.00	.00	.00	.00
8	1002.78	727.08	.00	.00	.00	.00
9	1094.96	831.57	.00	.00	.00	.00
10	397.24	221.64	.00	.00	.00	.00

11 - M I L D S T E E L

Support cut-off length for minimum steel(length/span) ... .17
Span cut-off length for minimum steel(length/span) ... .33
Top bar extension beyond where required ..... 900.00 mm
Bottom bar extension beyond where required ..... 900.00 mm

REINFORCEMENT based on NO REDISTRIBUTION of factored moments

11.1 TOTAL WEIGHT OF REBAR = 99.6 Kg AVERAGE = .2 Kg/m^2
TOTAL AREA COVERED = 549.91 m^2

11.2.1 S T E E L A T M I D - S P A N

SPAN	TOP As (mm^2)	TOP DIFFERENT REBAR CRITERIA ULT	TOP TENS	BOTTOM As (mm^2)	BOTTOM DIFFERENT REBAR CRITERIA ULT	BOTTOM TENS
1	0	0	0	0	0	0
2	0	0	0	483	483	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0

11.3.1 S T E E L A T S U P P O R T S

JOINT	TOP As (mm^2)	TOP DIFFERENT REBAR CRITERIA ULT	TOP MIN	BOTTOM As (mm^2)	BOTTOM DIFFERENT REBAR CRITERIA ULT	BOTTOM MIN
1	0	0	0	0	0	0
2	1661	1661	0	0	0	0
3	1406	1406	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0

11.2.2 & 11.3.2 LISTING OF THE ENTIRE PROVIDED REBAR

SPAN	ID	LOCATION	NUM BAR	LENGTH [mm]	AREA [mm^2]
1	1	T	5 # 16 x	2420	995
1	2	T	4 # 16 x	2120	796

2	3	T	8 # 16 x	2100	1592
2	4	B	2 # 16 x	3200	398
2	5	B	1 # 16 x	2740	199

Notes:
Bar location - T = Top, B = Bottom.
NUM - Number of bars.
For two-way systems a minimum of 4 bars is specified over the supports.
Refer to tables 11.5.1,11.5.2 and PTsum graphical display for positioning of bars.

11.5.1 ARRANGEMENT OF TOP BARS

SPAN	ID	LOCATION	NUM BAR	LENGTH [mm]
1	1	RIGHT	5 # 16 x	1519
1	2	RIGHT	4 # 16 x	1210
2	1	LEFT	5 # 16 x	900
2	3	RIGHT	8 # 16 x	900
2	2	LEFT	4 # 16 x	900
3	3	LEFT	8 # 16 x	1207

11.5.2 ARRANGEMENT OF BOTTOM BARS

SPAN	ID	LOCATION	NUM BAR	LENGTH [mm]
2	4	CENTER	2 # 16 x	3195
2	5	CENTER	1 # 16 x	2730

12 - P U N C H I N G S H E A R C H E C K

LEGEND:
CONDITION... 1 = INTERIOR COLUMN
2 = END COLUMN
3 = CORNER COLUMN
4 = EDGE COLUMN (PARALLEL TO SPAN)
5 = EDGE BEAM, WALL, OR OTHER NON-CONFORMING GEOMETRY
PERFORM SHEAR CHECK MANUALLY
6 = STRIP TOO NARROW TO DEVELOP PUNCHING SHEAR

CASE..... 1 = STRESS WITHIN SECTION #1 GOVERNS (COL.CAP OR SLAB)
2 = STRESS WITHIN SECTION #2 GOVERNS (DROP PANEL OR SLAB)

JNT	COND.	FACTORED ACTIONS shear kN	moment kN-m	<- PUNCHING SHEAR STRESSES IN N/mm^2 -> due to shear	due to moment	TOTAL	allow- able	STRESS RATIO	CASE
1	2	361.83	.00	.95	.00	.95	1.55	.62	1
2	1	1338.88	.00	2.39	.00	2.39	1.67	1.43	1
3	1	1283.02	.00	2.29	.00	2.29	1.67	1.37	1
4	1	943.88	.00	1.69	.00	1.69	1.65	1.02	1
5	1	1024.45	.00	1.83	.00	1.83	1.64	1.12	1
6	1	1003.11	.00	1.79	.00	1.79	1.64	1.09	1
7	1	1019.89	.00	1.82	.00	1.82	1.65	1.10	1
8	1	1002.78	.00	1.79	.00	1.79	1.67	1.07	1
9	1	1094.97	.00	1.96	.00	1.96	1.67	1.17	1
10	2	397.24	.00	1.05	.00	1.05	1.55	.68	1

PUNCHING SHEAR STRESS IN ONE OR MORE LOCATIONS EXCEEDS THE PERMISSIBLE VALUE. PROVIDE SHEAR REINFORCEMENT, OR ENLARGE THE SECTION RESISTING THE PUNCHING SHEAR

13 - MAXIMUM S P A N D E F L E C T I O N S

Concrete`s modulus of elasticity ..... Ec = 25743 N/mm^2
Creep factor ..... K = 2.00
Ieffective/Igross...(due to cracking)..... K = 1.00

Where stresses exceed 0.5(fc`)^1/2 cracking of section is allowed for.
Values in parentheses are (span/max deflection) ratios

SPAN	DL	DL+PT	DL+PT+CREEP	LL	DL+PT+LL+CREEP
	<.....DEFLECTION ARE ALL IN mm , DOWNWARD POSITIVE.....>				
1	.9	-.7	-2.0(3134)	.5(12628)	-1.5(4168)
2	6.7	3.6	10.7(869)	3.5(2650)	14.2(654)
3	-.6	-.8	-2.5(2443)	-.3(19932)	-2.8(2177)
4	1.1	.5	1.6(3734)	.6(10717)	2.2(2769)
5	.9	.1	.4(16778)	.5(13291)	.9(7416)
6	.9	.2	.7(8799)	.5(12995)	1.2(5246)
7	1.0	.2	.5(13363)	.5(11597)	1.0(6209)
8	.6	.2	.5(13164)	.3(20883)	.8(8074)
9	2.4	.4	1.2(5423)	1.2(5066)	2.4(2619)

14 - I N I T I A L CONDITION STRESS CHECK & REINFORCEMENT REQUIREMENTS

14.1 Parameters specified as input for initial stress checks:

		Tensile stresses divided by (f`c)^1/2	
Concrete f`c (initial/final)	.75	Top fiber	.25
PT force (initial/final) ...	1.10	Bottom fiber	.25
Dead loading (initial/final)	1.00		
Live loading (initial/final)	.00	Compression as ratio of f`c	.60

Note: Reinforcement reported in this data block is in addition to that reported in data block 11 for minimum strength reinforcement required by code.

14.2 NO added MILD REINFORCEMENT is required at MID-SPAN or SUPPORT

14.3 Compressive stresses
COMPRESSIVE stresses are within allowable limit (.60 * f`ci)
MAXIMUM stress..... = .21 * f`ci
(f`ci = initial concrete strength)

16 - FRICTION, ELONGATION AND LONG TERM STRESS LOSSES

16.6 LONG TERM STRESS LOSS CALCULATIONS

16.6.1 INPUT PARAMETERS :

Type of strand	LOW LAX	
Modulus of elasticity of strand	200000.00	N/mm^2
Average weight of concrete	NORMAL	
Estimate age of concrete at stressing	7	days
Modulus of elasticity of concrete at stressing	23322.00	N/mm^2
Modulus of elasticity of concrete at 28 days	25743.00	N/mm^2
Estimate of average relative humidity	80.00	%
Volume to surface ratio of member	150.00	mm

16.6.2 CALCULATED LONG-TERM STRESS LOSS(average of all tendons) :

SPAN	<----- STRESS (N/mm^2) -----> start	center	right
1	55.61	64.18	48.35
2	48.35	54.85	44.76
3	44.76	60.90	51.28
4	51.28	55.47	43.04
5	43.04	48.95	44.87
6	44.87	53.52	50.27
7	50.27	60.64	58.38
8	58.38	68.33	58.42
9	58.42	57.92	55.64

16.7 FRICTION AND ELONGATION CALCULATIONS

16.7.1 INPUT PARAMETERS :

Coefficient of angular friction (meu)	.220	/rad
Coefficient of wobble friction (K)	.0012	/m
Ultimate strength of strand	1860.0	N/mm^2
Ratio of jacking stress to strand's ultimate strength	.800	
Anchor set	6.000	mm
Cross-sectional area of strand	140.000	mm^2

16.7.2 CALCULATED STRESSES(average of all tendons) :

SPAN	LENGTH m	P	<TENDON HEIGHT(mm)> start	center	right	Horizontal ratios X1/L	X2/L	X3/L	<-- STRESS(N/mm^2)--> start	center	right
1	6.20	1	-125.	-195.	-55.	.10	.50	.10	1183.15	1206.55	1274.62
2	9.30	1	-55.	-195.	-55.	.10	.50	.10	1274.62	1301.29	1274.06
3	6.15	1	-55.	-125.	-55.	.10	.50	.10	1274.06	1225.17	1208.59
4	6.15	1	-55.	-125.	-55.	.10	.50	.10	1208.59	1174.11	1161.49
5	6.33	1	-55.	-145.	-55.	.10	.50	.10	1161.49	1121.20	1146.27

6	6.33	1	-55.	-145.	-55.	.10	.50	.10	1146.27	1167.63	1207.54
7	6.33	1	-55.	-145.	-55.	.10	.50	.10	1207.54	1228.87	1269.85
8	6.33	1	-55.	-145.	-55.	.10	.50	.10	1269.85	1293.38	1265.07
9	6.33	1	-55.	-195.	-125.	.10	.50	.10	1265.07	1214.15	1184.88

Note: P= tendon profile (refer to legend of data block 9)
Stresses at each location are the average of strands after anchor set, and after long-term losses

16.8 TENDON SELECTION AND DATA:

TYPE	OFF	FORCE	<------ TENDON EXTENTS ------> CAN	<------ S P A N S ----->	CAN	ELONGATION LEFT (mm)	RIGHT (mm)	Stress ratios Anch.	Max.
A	16	170.62		<==========>		346.	33.	.71	.73

Note: Force is the average value per strand (kN)
Stress ratios are at anchorage (7) and maximum along tendon (8)

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STRUCTURAL CONCRETE SOFTWARE SYSTEM
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ADAPT-PT FOR POST-TENSIONED BEAM/SLAB DESIGN
Version 7.00 AMERICAN (ACI 318-99/UBC-77)

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P R O J E C T T I T L E:
UPC
TECHO SOTANO 3 EJE C

1 - USER SPECIFIED G E N E R A L D E S I G N P A R A M E T E R S

CONCRETE:
STRENGTH at 28 days, for BEAMS/SLABS ..... 30.00 N/mm^2
for COLUMNS ..... 30.00 N/mm^2

MODULUS OF ELASTICITY for BEAMS/SLABS ..... 25743.00 N/mm^2
for COLUMNS ..... 25743.00 N/mm^2

CREEP factor for deflections for BEAMS/SLABS 2.00
CONCRETE WEIGHT ..... NORMAL

SELF WEIGHT ..... 2500.00 Kg/m^3

TENSION STRESS limits (multiple of (f'c)1/2)
At Top ..... .529
At Bottom ..... .529

COMPRESSION STRESS limits (multiple of (f'c))
At all locations ..... .450

REINFORCEMENT:
YIELD Strength ..... 500.00 N/mm^2
Minimum Cover at TOP ..... 40.00 mm
Minimum Cover at BOTTOM ..... 40.00 mm

POST-TENSIONING:
SYSTEM ..... BONDED
Ultimate strength of strand ..... 1860.00 N/mm^2
Average effective stress in strand (final) ..... 1200.00 N/mm^2
Strand area..... 140.000 mm^2
Min CGS of tendon from TOP..... 55.00 mm
Min CGS of tendon from BOTTOM for INTERIOR spans.. 55.00 mm
Min CGS of tendon from BOTTOM for EXTERIOR spans.. 55.00 mm
Min average precompression ..... .90 N/mm^2

Max spacing between strands (factor of slab depth) 8.00
Tendon profile type and support widths..... (see section 9)

ANALYSIS OPTIONS USED:
Structural system ..... TWO-WAY
Moment of Inertia over support is ..... NOT INCREASED
Moments REDUCED to face of support ..... YES

2 - I N P U T G E O M E T R Y

2.1.1 PRINCIPAL SPAN DATA OF UNIFORM SPANS

SPAN	TYP	FORM	LENGTH m	WIDTH mm	DEPTH mm	TOP FLANGE width mm	TOP FLANGE thick. mm	BOTTOM/MIDDLE FLANGE width mm	BOTTOM/MIDDLE FLANGE thick. mm	REF HEIGHT mm	MULTIPLIER left	MULTIPLIER right
1	U	1	4.80	6850	250					0	.50	.50
2	U	1	4.80	6850	250					0	.50	.50
3	U	1	4.80	6850	250					0	.50	.50
4	U	1	4.80	6850	250					0	.50	.50
5	U	1	4.80	6850	250					0	.50	.50
6	U	1	9.15	6850	250					0	.50	.50
7	U	1	9.15	6850	250					0	.50	.50
8	U	1	7.35	6850	250					0	.50	.50

LEGEND:
1 - SPAN
C = Cantilever
2 - TYPE
U = Uniform; prismatic
N = Nonuniform section
3 - FORM
1 = Rectangular section
2 = T or Inverted L section
3 = I section
4 = Extended T or L section
7 = Joist
8 = Waffle
11 - Top surface to reference line

2.2 - S U P P O R T W I D T H A N D C O L U M N D A T A

JOINT	SUPPORT WIDTH mm	LOWER COLUMN LENGTH m	LOWER COLUMN B(DIA) mm	LOWER COLUMN D mm	LOWER COLUMN CBC*	UPPER COLUMN LENGTH m	UPPER COLUMN B(DIA) mm	UPPER COLUMN D mm	UPPER COLUMN CBC*
1	500	4.00	500	500	(2)	.00	0	0	(3)
2	500	4.00	500	500	(2)	.00	0	0	(3)
3	500	4.00	500	500	(2)	.00	0	0	(3)

4	500	4.00	500	500	(2)	.00	0	0	(3)
5	500	4.00	500	500	(2)	.00	0	0	(3)
6	500	4.00	500	500	(2)	.00	0	0	(3)
7	500	4.00	500	500	(2)	.00	0	0	(3)
8	500	4.00	500	500	(2)	.00	0	0	(3)
9	500	4.00	500	500	(2)	.00	0	0	(3)

*THE COLUMN BOUNDARY CONDITION CODES (CBC)
Fixed at both ends ...(STANDARD) ..... = 1
Hinged at near end, fixed at far end ..... = 2
Fixed at near end, hinged at far end ..... = 3
Fixed at near end, roller with rotational fixity at far end .. = 4

3 - I N P U T A P P L I E D L O A D I N G

<---CLASS---> <--------------TYPE------------------->
D = DEAD LOAD U = UNIFORM P = PARTIAL UNIFORM
L = LIVE LOAD C = CONCENTRATED M = APPLIED MOMENT
Li= LINE LOAD
SW= SELF WEIGHT Computed from geometry input and treated as dead loading
Unit selfweight W = 2500.0 Kg/m^3

SPAN	CLASS	TYPE	Intensity kN/m^2	From ... m	To m	(M or C ...At) (kN-m or kN...m)	Total on Trib kN/m
1	L	U	4.000	.00	4.80		27.400
1	L	U	4.000	.00	4.80		27.400
1	D	U	1.500	.00	4.80		10.275
1	D	U	1.500	.00	4.80		10.275
1	SW	U		.00	4.80		41.999
2	L	U	4.000	.00	4.80		27.400
2	L	U	4.000	.00	4.80		27.400
2	D	U	1.500	.00	4.80		10.275
2	D	U	1.500	.00	4.80		10.275
2	SW	U		.00	4.80		41.999
3	L	U	4.000	.00	4.80		27.400
3	L	U	4.000	.00	4.80		27.400
3	D	U	1.500	.00	4.80		10.275
3	D	U	1.500	.00	4.80		10.275
3	SW	U		.00	4.80		41.999
4	L	U	4.000	.00	4.80		27.400
4	L	U	4.000	.00	4.80		27.400
4	D	U	1.500	.00	4.80		10.275
4	D	U	1.500	.00	4.80		10.275

4	SW	U		.00	4.80	41.999
5	L	U	4.000	.00	4.80	27.400
5	L	U	4.000	.00	4.80	27.400
5	D	U	1.500	.00	4.80	10.275
5	D	U	1.500	.00	4.80	10.275
5	SW	U		.00	4.80	41.999
6	L	U	4.000	.00	9.15	27.400
6	D	U	1.500	.00	9.15	10.275
6	SW	U		.00	9.15	41.999
7	L	U	4.000	.00	9.15	27.400
7	D	U	1.500	.00	9.15	10.275
7	SW	U		.00	9.15	41.999
8	L	U	4.000	.00	7.35	27.400
8	D	U	1.500	.00	7.35	10.275
8	SW	U		.00	7.35	41.999

NOTE: LIVE LOADING is SKIPPED with a skip factor of .70

3.1 - LOADING AS APPEARS IN USER`S INPUT SCREEN PRIOR TO PROCESSING

SPAN	CLASS	TYPE	UNIFORM (kN/m^2), LINE(kN/m)	(CON. or PART.) (kN@m or m-m)	(M O M E N T) (kN-m @ m)
1	L	U	4.000		
1	L	U	4.000		
1	D	U	1.500		
1	D	U	1.500		
2	L	U	4.000		
2	L	U	4.000		
2	D	U	1.500		
2	D	U	1.500		
3	L	U	4.000		
3	L	U	4.000		
3	D	U	1.500		
3	D	U	1.500		
4	L	U	4.000		
4	L	U	4.000		
4	D	U	1.500		
4	D	U	1.500		
5	L	U	4.000		
5	L	U	4.000		
5	D	U	1.500		
5	D	U	1.500		
6	L	U	4.000		

6	D	U	1.500
7	L	U	4.000
7	D	U	1.500
8	L	U	4.000
8	D	U	1.500

NOTE: SELFWEIGHT INCLUSION REQUIRED
LIVE LOADING is SKIPPED with a skip factor of .70

4 - C A L C U L A T E D S E C T I O N P R O P E R T I E S

4.1 For Uniform Spans and Cantilevers only

SPAN	AREA mm^2	I mm^4	Yb mm	Yt mm
1	1712500.00	.8919E+10	125.00	125.00
2	1712500.00	.8919E+10	125.00	125.00
3	1712500.00	.8919E+10	125.00	125.00
4	1712500.00	.8919E+10	125.00	125.00
5	1712500.00	.8919E+10	125.00	125.00
6	1712500.00	.8919E+10	125.00	125.00
7	1712500.00	.8919E+10	125.00	125.00
8	1712500.00	.8919E+10	125.00	125.00

Note:
--- = Span/Cantilever is Nonuniform, see block 4.2

5 - D E A D L O A D M O M E N T S, S H E A R S & R E A C T I O N S

SPAN	< 5.1 S P A N M O M E N T S (kNm) > M(l)*	Midspan	M(r)*	< 5.2 SPAN SHEARS (kN) > SH(l)	SH(r)
1	.00	103.67	-152.94	-118.25	181.98
2	-152.94	49.50	-108.34	-159.41	140.83
3	-108.34	59.07	-133.79	-144.82	155.42
4	-133.79	74.95	-76.60	-162.03	138.20
5	-76.60	1.88	-279.93	-107.76	192.48
6	-279.93	212.80	-388.60	-227.28	251.03
7	-388.60	176.48	-352.58	-243.09	235.22
8	-352.58	176.71	.00	-240.08	144.14

Note:
* = Centerline moments

JOINT	< 5.3 REACTIONS (kN) >	<- 5.4 COLUMN MOMENTS (kNm) -> Lower columns	Upper columns
1	118.25	.00	.00
2	341.39	.00	.00
3	285.64	.00	.00
4	317.45	.00	.00
5	245.96	.00	.00
6	419.76	.00	.00
7	494.12	.00	.00
8	475.29	.00	.00
9	144.14	.00	.00

6 - L I V E L O A D M O M E N T S, S H E A R S & R E A C T I O N S

<-- 6.1 L I V E L O A D SPAN MOMENTS (kNm) and SHEAR FORCES (kN) -->

SPAN	<----- left* -----> max	min	<--- midspan ---> max	min	<---- right* -----> max	min	<--SHEAR FORCE--> left	right
1	.00	.00	91.03	-23.50	-133.59	-31.36	-103.69	159.35
2	-133.59	-31.36	70.57	-40.64	-96.53	-16.51	-139.24	123.80
3	-96.53	-16.51	75.48	-37.70	-111.19	-23.20	-128.46	134.58
4	-111.19	-23.20	80.37	-40.17	-104.74	-10.30	-136.02	127.02
5	-104.74	-10.30	85.35	-62.69	-161.31	.54	-116.58	146.46
6	-161.31	.54	115.17	-40.82	-199.77	-51.77	-121.15	129.56
7	-199.77	-51.77	117.45	-51.71	-185.90	-40.10	-126.87	123.84
8	-185.90	-40.10	109.47	-45.01	.00	.00	-125.99	75.40

Note:
* = Centerline moments

JOINT	<- 6.2 REACTIONS (kN) -> max	min	<-------- 6.3 COLUMN MOMENTS (kNm) --------> <--- LOWER COLUMN ---> max	min	<--- UPPER COLUMN ---> max	min
1	117.68	-13.99	.00	.00	.00	.00
2	318.38	121.80	.00	.00	.00	.00
3	301.91	95.29	.00	.00	.00	.00
4	316.75	107.24	.00	.00	.00	.00
5	318.64	84.20	.00	.00	.00	.00
6	314.16	90.34	.00	.00	.00	.00
7	280.34	111.21	.00	.00	.00	.00
8	269.40	104.86	.00	.00	.00	.00
9	92.90	-17.50	.00	.00	.00	.00

Note: Block 6.1 through 6.3 values are maxima of all skipped loading cases

7 - M O M E N T S REDUCED TO FACE-OF-SUPPORT

7.1 R E D U C E D DEAD LOAD MOMENTS (kNm)

SPAN	<- left* ->	<- midspan ->	<- right* ->
1	27.61	103.70	-109.40
2	-115.00	49.50	-75.09
3	-74.10	59.07	-96.89
4	-95.24	74.95	-44.00
5	-51.61	1.88	-233.80
6	-224.70	212.80	-327.50
7	-329.50	176.50	-295.40
8	-294.20	176.70	34.40

Note:
* = face-of-support

7.2 R E D U C E D LIVE LOAD MOMENTS (kNm)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	-2.45	24.21	91.03	-23.50	-95.47	-22.27
2	-100.50	-12.88	70.57	-40.64	-70.22	-5.67
3	-70.09	.76	75.48	-37.70	-79.26	-10.44
4	-78.90	-5.63	80.37	-40.17	-78.68	6.56
5	-77.44	4.20	85.35	-62.69	-126.40	16.88
6	-131.90	-1.18	115.20	-40.82	-168.20	-33.14
7	-168.90	-43.64	117.50	-51.71	-155.80	-40.73
8	-155.30	-21.71	109.50	-45.01	-3.06	17.99

Note:
* = face-of-support

8 - SUM OF DEAD AND LIVE MOMENTS (kNm)

Maxima of dead load and live load span moments combined
for serviceability checks (1.00DL + .70LL)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	25.90	44.56	167.42	87.25	-176.23	-124.99
2	-185.35	-124.02	98.90	21.05	-124.24	-79.06
3	-123.16	-73.57	111.91	32.68	-152.37	-104.20
4	-150.47	-99.18	131.21	46.83	-99.08	-39.41
5	-105.82	-48.67	61.62	-42.00	-322.28	-221.98
6	-317.03	-225.53	293.44	184.23	-445.24	-350.70
7	-447.73	-360.05	258.75	140.30	-404.46	-323.91

8	-402.91	-309.40	253.35	145.19	32.26	46.99

Note:
* = face-of-support

9 - SELECTED POST-TENSIONING FORCES AND TENDON PROFILES

9.1 PROFILE TYPES AND PARAMETERS

LEGEND:
For Span:
1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon

For Cantilever:
1 = simple parabola
2 = partial parabola
3 = harped tendon

9.2 T E N D O N P R O F I L E

	TYPE	X1/L	X2/L	X3/L	A/L
1	1	.100	.500	.100	.000
2	1	.100	.500	.100	.000
3	1	.100	.500	.100	.000
4	1	.100	.500	.100	.000
5	1	.100	.500	.100	.000
6	1	.100	.500	.100	.000
7	1	.100	.500	.100	.000
8	1	.100	.500	.100	.000

9.3 - SELECTED POST-TENSIONING FORCES AND TENDON DRAPE

Tendon editing mode selected: TENDON SELECTION

	<-------- SELECTED VALUES -------->				<--- CALCULATED VALUES --->		
	FORCE	<- DISTANCE OF CGS (mm) ->			P/A	Wbal	Wbal
SPAN	(kN/-)	Left	Center	Right	(N/mm^2)	(kN/-)	(%DL)
1	2019.474	-125.00	-145.00	-55.00	1.18	38.566	62
2	2146.532	-55.00	-125.00	-55.00	1.25	52.173	83
3	2103.262	-55.00	-125.00	-55.00	1.23	51.121	82
4	1996.910	-55.00	-125.00	-55.00	1.17	48.536	78
5	1945.846	-55.00	-125.00	-55.00	1.14	47.295	76
6	2070.878	-55.00	-195.00	-55.00	1.21	27.703	53
7	2189.511	-55.00	-195.00	-55.00	1.28	29.290	56

8	2086.752	-55.00	-195.00	-125.00	1.22	32.447	62

Approximate weight of strand ..... 668.0 Kg

9.35 - TENDON SELECTION DATA:

TYPE	SEL. FORCE (kN)	<1>	<2>	<3>	<4>	<5>	<6>	<7>	<8>
A	12 173.36	<==========							

9.5 R E Q U I R E D MINIMUM P O S T - T E N S I O N I N G FORCES (kN)

SPAN	<- BASED ON STRESS CONDITIONS -> LEFT*	CENTER	RIGHT*	<- BASED ON MINIMUM P/A -> LEFT	CENTER	RIGHT
1	.00	.00	.00	1541.30	1541.30	1541.30
2	.00	.00	.00	1541.30	1541.30	1541.30
3	.00	.00	.00	1541.30	1541.30	1541.30
4	.00	.00	.00	1541.30	1541.30	1541.30
5	.00	.00	1061.52	1541.30	1541.30	1541.30
6	986.89	836.79	1880.46	1541.30	1541.30	1541.30
7	1909.37	546.74	1542.79	1541.30	1541.30	1541.30
8	1534.67	456.08	.00	1541.30	1541.30	1541.30

Note:
* = face-of-support

9.6 S E R V I C E S T R E S S E S (N/mm^2) (tension shown positive)

	L E F T * TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C	R I G H T * TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C
1	-----	-1.61	-----	-.75	.22	-.50	-----	-2.38
2	.33	-.53	-----	-2.54	-----	-1.03	-----	-1.89
3	-----	-1.08	-----	-1.86	-----	-.70	-----	-2.15
4	-----	-.74	-----	-2.11	-----	-1.27	-----	-1.63
5	-----	-1.16	-----	-1.67	1.79	-----	-----	-3.88
6	1.59	-----	-----	-3.72	2.84	-----	-----	-5.07
7	2.85	-----	-----	-5.11	2.15	-----	-----	-4.44
8	2.19	-----	-----	-4.44	-----	-1.70	-----	-.64

Note:
* = face-of-support

	C E N T E R TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C

1	-----	-2.59	.46	-.66
2	-----	-1.80	-----	-1.55
3	-----	-1.93	-----	-1.39
4	-----	-2.10	.01	-1.18
5	.01	-1.44	-----	-2.05
6	-----	-3.58	1.41	-.12
7	-----	-3.30	1.00	-.66
8	-----	-3.05	.86	-.65

9.7 POST-TENSIONING B A L A N C E D M O M E N T S, SHEARS & REACTIONS

SPAN	<-- S P A N M O M E N T S (kNm) --> left*	midspan	right*	<-- SPAN SHEARS (kN) --> SH(l)	SH(r)
1	-4.77	-65.13	92.90	10.31	10.31
2	91.88	-56.71	78.91	3.01	3.01
3	78.64	-58.95	84.76	-2.08	-2.08
4	84.33	-62.12	62.77	3.40	3.40
5	65.55	-34.99	133.60	-14.70	-14.70
6	141.80	-128.20	181.10	-3.60	-3.60
7	182.10	-116.80	188.20	-.71	-.71
8	184.60	-126.20	-2.03	5.40	5.40

Note:
* = face-of-support

joint	<--REACTIONS (kN)--> 2	<-- COLUMN MOMENTS (kNm) --> Lower columns	Upper columns
1	-10.310	.000	.000
2	7.293	.000	.000
3	5.093	.000	.000
4	-5.478	.000	.000
5	18.100	.000	.000
6	-11.110	.000	.000
7	-2.890	.000	.000
8	-6.106	.000	.000
9	5.399	.000	.000

10 - F A C T O R E D M O M E N T S & R E A C T I O N S

Calculated as (1.35D + 1.50L + 1.00 secondary moment effects)

10.1 FACTORED DESIGN MOMENTS (kNm)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min

-1	2	3	4	5	6	7
1	31.02	71.01	251.75	79.96	-337.80	-228.01
2	-356.24	-224.81	115.95	-50.87	-269.92	-173.10
3	-268.62	-162.34	133.97	-35.79	-304.21	-200.98
4	-301.77	-191.88	159.58	-21.23	-246.86	-119.00
5	-252.45	-130.00	95.57	-126.50	-508.61	-293.69
6	-499.99	-303.92	476.79	242.80	-662.11	-459.52
7	-664.79	-476.90	450.87	197.13	-592.98	-420.38
8	-591.79	-391.40	422.60	190.88	43.20	74.78

Note:
* = face-of-support

10.2 SECONDARY MOMENTS (kNm)

SPAN	<-- left* -->	<- midspan ->	<-- right* -->
1	-2.58	-24.74	-46.91
2	-50.24	-56.73	-63.22
3	-63.45	-58.99	-54.52
4	-54.85	-62.15	-69.44
5	-66.62	-35.00	-3.38
6	1.20	16.76	32.31
7	33.39	36.45	39.51
8	38.33	19.84	1.35

Note:
* = face-of-support

10.3 FACTORED REACTIONS (kN) 10.4 FACTORED COLUMN MOMENTS (kNm)

JOINT	max	min	<-- LOWER column --> max	<-- LOWER column --> min	<-- UPPER column --> max	<-- UPPER column --> min
1	325.95	128.41	.00	.00	.00	.00
2	945.78	650.88	.00	.00	.00	.00
3	843.50	533.59	.00	.00	.00	.00
4	898.20	583.95	.00	.00	.00	.00
5	828.10	476.50	.00	.00	.00	.00
6	1026.92	691.13	.00	.00	.00	.00
7	1084.59	830.95	.00	.00	.00	.00
8	1039.65	792.90	.00	.00	.00	.00
9	339.28	173.68	.00	.00	.00	.00

11 - M I L D S T E E L

Support cut-off length for minimum steel(length/span) ... .17
Span cut-off length for minimum steel(length/span) ... .33
Top bar extension beyond where required ..... 900.00 mm
Bottom bar extension beyond where required ..... 900.00 mm

REINFORCEMENT based on NO REDISTRIBUTION of factored moments

11.1 TOTAL WEIGHT OF REBAR = 109.3 Kg AVERAGE = .3 Kg/m^2
TOTAL AREA COVERED = 340.10 m^2

11.2.1 S T E E L A T M I D - S P A N

SPAN	TOP As (mm^2)	TOP DIFFERENT REBAR CRITERIA <---ULT-----TENS-------->			BOTTOM As (mm^2)	BOTTOM DIFFERENT REBAR CRITERIA <---ULT-----TENS-------->		
1	0	(0	0	0)	0	(0	0	0)
2	0	(0	0	0)	0	(0	0	0)
3	0	(0	0	0)	0	(0	0	0)
4	0	(0	0	0)	0	(0	0	0)
5	0	(0	0	0)	0	(0	0	0)
6	0	(0	0	0)	0	(0	0	0)
7	0	(0	0	0)	0	(0	0	0)
8	0	(0	0	0)	0	(0	0	0)

11.3.1 S T E E L A T S U P P O R T S

JOINT	TOP As (mm^2)	TOP DIFFERENT REBAR CRITERIA <---ULT-----MIN--------->			BOTTOM As (mm^2)	BOTTOM DIFFERENT REBAR CRITERIA <---ULT-----MIN--------->		
1	0	(0	0	0)	0	(0	0	0)
2	0	(0	0	0)	0	(0	0	0)
3	0	(0	0	0)	0	(0	0	0)
4	0	(0	0	0)	0	(0	0	0)
5	0	(0	0	0)	0	(0	0	0)
6	191	(191	0	0)	0	(0	0	0)
7	2204	(2204	0	0)	0	(0	0	0)
8	1286	(1286	0	0)	0	(0	0	0)
9	0	(0	0	0)	0	(0	0	0)

11.2.2 & 11.3.2 LISTING OF THE ENTIRE PROVIDED REBAR

SPAN	ID	LOCATION	NUM BAR	LENGTH [mm]	AREA [mm^2]
5	1	T	4 # 16 x	1800	796
6	2	T	6 # 16 x	2720	1194
6	3	T	6 # 16 x	1800	1194
7	4	T	4 # 16 x	2620	796
7	5	T	3 # 16 x	2160	597

Notes:
Bar location - T = Top, B = Bottom.
NUM - Number of bars.

For two-way systems a minimum of 4 bars is specified over the supports.
Refer to tables 11.5.1,11.5.2 and PTsum graphical display for
positioning of bars.

11.5.1 ARRANGEMENT OF TOP BARS

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]
		TOP STEEL			
5	1	RIGHT	4	# 16 x	1800
6	1	LEFT	2	# 16 x	900
6	2	RIGHT	6	# 16 x	1357
6	3	RIGHT	6	# 16 x	900
7	2	LEFT	6	# 16 x	1357
7	4	RIGHT	4	# 16 x	1357
7	3	LEFT	6	# 16 x	900
7	5	RIGHT	3	# 16 x	900
8	4	LEFT	4	# 16 x	1267
8	5	LEFT	3	# 16 x	1267

11.5.2 ARRANGEMENT OF BOTTOM BARS

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]
		BOTTOM STEEL			

12 - P U N C H I N G S H E A R C H E C K

LEGEND:
CONDITION... 1 = INTERIOR COLUMN
2 = END COLUMN
3 = CORNER COLUMN
4 = EDGE COLUMN (PARALLEL TO SPAN)
5 = EDGE BEAM, WALL, OR OTHER NON-CONFORMING GEOMETRY
PERFORM SHEAR CHECK MANUALLY
6 = STRIP TOO NARROW TO DEVELOP PUNCHING SHEAR

CASE..... 1 = STRESS WITHIN SECTION #1 GOVERNS (COL.CAP OR SLAB)
2 = STRESS WITHIN SECTION #2 GOVERNS (DROP PANEL OR SLAB)

JNT	COND.	FACTORED ACTIONS shear kN	FACTORED ACTIONS moment kN-m	<- PUNCHING SHEAR STRESSES IN N/mm^2 -> due to shear	due to moment	TOTAL	allow- able	STRESS RATIO	CASE
1	2	325.95	.00	.86	.00	.86	1.55	.55	1

2	1	945.78	.00	1.69	.00	1.69	1.67	1.01	1
3	1	843.50	.00	1.51	.00	1.51	1.67	.90	1
4	1	898.20	.00	1.60	.00	1.60	1.66	.96	1
5	1	828.10	.00	1.48	.00	1.48	1.65	.90	1
6	1	1026.92	.00	1.83	.00	1.83	1.66	1.11	1
7	1	1084.60	.00	1.94	.00	1.94	1.68	1.16	1
8	1	1039.65	.00	1.86	.00	1.86	1.68	1.11	1
9	2	339.28	.00	.89	.00	.89	1.55	.58	1

PUNCHING SHEAR STRESS IN ONE OR MORE LOCATIONS EXCEEDS THE PERMISSIBLE
VALUE. PROVIDE SHEAR REINFORCEMENT, OR ENLARGE THE SECTION RESISTING THE
PUNCHING SHEAR

13 - MAXIMUM S P A N D E F L E C T I O N S

Concrete`s modulus of elasticity ..... Ec = 25743 N/mm^2
Creep factor ..... K = 2.00
Ieffective/Igross...(due to cracking)..... K = .99

Where stresses exceed 0.5(fc`)^1/2 cracking of section is allowed for.
Values in parentheses are (span/max deflection) ratios

SPAN	DL	DL+PT	DL+PT+CREEP	LL	DL+PT+LL+CREEP
	<.....DEFLECTION ARE ALL IN mm , DOWNWARD POSITIVE.....>				
1	1.0	.4	1.3(3794)	.8(5744)	2.1(2285)
2	.2	-.1	-.2(29315)	.2(23048)	.0(*****)
3	.4	.0	.1(47900)	.3(13785)	.4(10704)
4	.6	.2	.5(9386)	.4(12090)	.9(5284)
5	-.5	-.6	-1.9(2547)	-.1(42691)	-2.0(2404)
6	5.6	2.5	7.5(1225)	2.7(3420)	10.1(902)
7	3.9	1.5	4.4(2088)	2.1(4339)	6.5(1409)
8	3.6	1.2	3.6(2038)	1.9(3897)	5.5(1338)

14 - I N I T I A L CONDITION STRESS CHECK & REINFORCEMENT REQUIREMENTS

14.1 Parameters specified as input for initial stress checks:

		Tensile stresses divided by (f`c)^1/2	
Concrete f`c (initial/final)	.75	Top fiber	.25
PT force (initial/final) ...	1.10	Bottom fiber	.25
Dead loading (initial/final)	1.00		
Live loading (initial/final)	.00	Compression as ratio of f`c	.60

Note: Reinforcement reported in this data block is in
addition to that reported in data block 11 for
minimum strength reinforcement required by code.

14.2 NO added MILD REINFORCEMENT is required at MID-SPAN or SUPPORT

14.3 Compressive stresses
COMPRESSIVE stresses are within allowable limit (.60 * f`ci)
MAXIMUM stress..... = .21 * f`ci
(f`ci = initial concrete strength)

16 - FRICTION, ELONGATION AND LONG TERM STRESS LOSSES

16.6 LONG TERM STRESS LOSS CALCULATIONS

16.6.1 INPUT PARAMETERS :

Type of strand	LOW LAX	
Modulus of elasticity of strand	200000.00	N/mm^2
Average weight of concrete	NORMAL	
Estimate age of concrete at stressing	7	days
Modulus of elasticity of concrete at stressing	23322.00	N/mm^2
Modulus of elasticity of concrete at 28 days	25743.00	N/mm^2
Estimate of average relative humidity	80.00	%
Volume to surface ratio of member	150.00	mm

16.6.2 CALCULATED LONG-TERM STRESS LOSS(average of all tendons) :

	<----- STRESS (N/mm^2) ----->		
SPAN	start	center	right
1	55.94	56.56	57.32
2	57.32	66.92	64.92
3	64.92	63.22	55.12
4	55.12	57.59	53.72
5	53.72	54.13	42.23
6	42.23	51.68	45.82
7	45.82	62.41	48.95
8	48.95	55.97	59.25

16.7 FRICTION AND ELONGATION CALCULATIONS

16.7.1 INPUT PARAMETERS :

Coefficient of angular friction (meu)	.220	/rad
Coefficient of wobble friction (K)	.0012	/m
Ultimate strength of strand	1860.0	N/mm^2
Ratio of jacking stress to strand's ultimate strength	.800	
Anchor set	6.000	mm
Cross-sectional area of strand	140.000	mm^2

16.7.2 CALCULATED STRESSES(average of all tendons) :

	LENGTH		<TENDON HEIGHT(mm)>			Horizontal ratios			<-- STRESS(N/mm^2)-->		
SPAN	m	P	start	center	right	X1/L	X2/L	X3/L	start	center	right
1	4.80	1	-125.	-145.	-55.	.10	.50	.10	1188.59	1202.07	1244.68
2	4.80	1	-55.	-125.	-55.	.10	.50	.10	1244.68	1277.70	1289.38
3	4.80	1	-55.	-125.	-55.	.10	.50	.10	1289.38	1251.94	1228.20
4	4.80	1	-55.	-125.	-55.	.10	.50	.10	1228.20	1188.64	1162.33
5	4.80	1	-55.	-125.	-55.	.10	.50	.10	1162.33	1158.24	1206.42
6	9.15	1	-55.	-195.	-55.	.10	.50	.10	1206.42	1232.67	1281.92

7	9.15	1	-55.	-195.	-55.	.10	.50	.10	1281.92	1303.28	1295.25
8	7.35	1	-55.	-195.	-125.	.10	.50	.10	1295.25	1242.11	1209.96

Note: P= tendon profile (refer to legend of data block 9)
Stresses at each location are the average of strands after anchor set, and after long-term losses

16.8 TENDON SELECTION AND DATA:

			<------ TENDON EXTENTS ------>			ELONGATION		Stress ratios	
TYPE	OFF	FORCE	CAN<------ S P A N S ----->			CAN	LEFT	RIGHT	Anch. Max.
			<1><2><3><4><5><6><7><8>				(mm)	(mm)	
-1	---2	---3	----------	----------	---4	----------	---5	---6	---7	---8
A	12	173.36	<==========	==========	========>		288.	34.	.73	.74

Note: Force is the average value per strand (kN)
Stress ratios are at anchorage (7) and maximum along tendon (8)

ADAPT CORPORATION
STRUCTURAL CONCRETE SOFTWARE SYSTEM
1733 Woodside Road, Suite 220, Redwood City, California 94061

ADAPT-PT FOR POST-TENSIONED BEAM/SLAB DESIGN
Version 7.00 AMERICAN (ACI 318-99/UBC-77)
ADAPT CORPORATION - Structural Concrete Software System
1733 Woodside Road, Suite 220, Redwood City, California 94061
Phone: (650)306-2400, Fax: (650)364-4678
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DATE AND TIME OF PROGRAM EXECUTION: Nov 27,2008 At Time: 21:17
PROJECT FILE: TPS3_EJED

P R O J E C T T I T L E:
UPC
TECHO SOTANO 3 EJE D

1 - USER SPECIFIED G E N E R A L D E S I G N P A R A M E T E R S

CONCRETE:
STRENGTH at 28 days, for BEAMS/SLABS ..... 30.00 N/mm^2
for COLUMNS ..... 30.00 N/mm^2

MODULUS OF ELASTICITY for BEAMS/SLABS ..... 25743.00 N/mm^2
for COLUMNS ..... 25743.00 N/mm^2

CREEP factor for deflections for BEAMS/SLABS 2.00
CONCRETE WEIGHT ..... NORMAL

SELF WEIGHT ..... 2500.00 Kg/m^3

TENSION STRESS limits (multiple of (f'c)1/2)
At Top ..... .529
At Bottom ..... .529

COMPRESSION STRESS limits (multiple of (f'c))
At all locations ..... .450

REINFORCEMENT:
YIELD Strength ..... 500.00 N/mm^2
Minimum Cover at TOP ..... 40.00 mm
Minimum Cover at BOTTOM ..... 40.00 mm

POST-TENSIONING:
SYSTEM ..... BONDED
Ultimate strength of strand ..... 1860.00 N/mm^2
Average effective stress in strand (final) ..... 1200.00 N/mm^2
Strand area..... 140.000 mm^2
Min CGS of tendon from TOP..... 55.00 mm
Min CGS of tendon from BOTTOM for INTERIOR spans.. 55.00 mm
Min CGS of tendon from BOTTOM for EXTERIOR spans.. 55.00 mm
Min average precompression ..... .90 N/mm^2

Max spacing between strands (factor of slab depth) 8.00
Tendon profile type and support widths..... (see section 9)

ANALYSIS OPTIONS USED:
Structural system ..... TWO-WAY
Moment of Inertia over support is ..... NOT INCREASED
Moments REDUCED to face of support ..... YES

2 - I N P U T G E O M E T R Y

2.1.1 PRINCIPAL SPAN DATA OF UNIFORM SPANS

SPAN	TYPE	FORM	LENGTH m	WIDTH mm	DEPTH mm	TOP FLANGE width mm	TOP FLANGE thick. mm	BOTTOM/MIDDLE FLANGE width mm	BOTTOM/MIDDLE FLANGE thick. mm	REF HEIGHT mm	MULTIPLIER left	MULTIPLIER right
1	U	1	4.80	8750	250					0	.50	.50
2	U	1	9.60	8750	250					0	.50	.50
3	U	1	9.60	8750	250					0	.50	.50
4	U	1	9.15	8750	250					0	.50	.50
5	U	1	9.15	8750	250					0	.50	.50
6	U	1	9.30	8750	250					0	.50	.50
7	U	1	9.30	8750	250					0	.50	.50
8	U	1	2.30	8750	250					0	.50	.50

LEGEND:
1 - SPAN
C = Cantilever
2 - TYPE
U = Uniform; prismatic
N = Nonuniform section
3 - FORM
1 = Rectangular section
2 = T or Inverted L section
3 = I section
4 = Extended T or L section
7 = Joist
8 = Waffle
11 - Top surface to reference line

2.2 - S U P P O R T W I D T H A N D C O L U M N D A T A

JOINT	SUPPORT WIDTH mm	LOWER COLUMN LENGTH m	LOWER COLUMN B(DIA) mm	LOWER COLUMN D mm	LOWER COLUMN CBC*	UPPER COLUMN LENGTH m	UPPER COLUMN B(DIA) mm	UPPER COLUMN D mm	UPPER COLUMN CBC*
1	500	4.00	500	500	(2)	.00	0	0	(3)
2	500	4.00	500	500	(2)	.00	0	0	(3)
3	500	4.00	500	500	(2)	.00	0	0	(3)
4	500	4.00	500	500	(2)	.00	0	0	(3)
5	500	4.00	500	500	(2)	.00	0	0	(3)
6	500	4.00	500	500	(2)	.00	0	0	(3)
7	500	4.00	500	500	(2)	.00	0	0	(3)
8	500	4.00	500	500	(2)	.00	0	0	(3)
9	500	4.00	500	500	(2)	.00	0	0	(3)

*THE COLUMN BOUNDARY CONDITION CODES (CBC)
Fixed at both ends ...(STANDARD) ..... = 1
Hinged at near end, fixed at far end ..... = 2
Fixed at near end, hinged at far end ..... = 3
Fixed at near end, roller with rotational fixity at far end .. = 4

3 - I N P U T A P P L I E D L O A D I N G

<---CLASS---> <--------------TYPE------------------->
D = DEAD LOAD U = UNIFORM P = PARTIAL UNIFORM
L = LIVE LOAD C = CONCENTRATED M = APPLIED MOMENT
Li= LINE LOAD
SW= SELF WEIGHT Computed from geometry input and treated as dead loading
Unit selfweight W = 2500.0 Kg/m^3

SPAN	CLASS	TYPE	Intensity kN/m^2	From ... m	To ... m	M or C ...At (kN-m or kN...m)	Total on Trib kN/m
1	L	U	4.000	.00	4.80		35.000
1	D	U	1.500	.00	4.80		13.125
1	SW	U		.00	4.80		53.648
2	L	U	4.000	.00	9.60		35.000
2	D	U	1.500	.00	9.60		13.125
2	SW	U		.00	9.60		53.648
3	L	U	4.000	.00	9.60		35.000
3	D	U	1.500	.00	9.60		13.125
3	SW	U		.00	9.60		53.648
4	L	U	4.000	.00	9.15		35.000
4	D	U	1.500	.00	9.15		13.125
4	SW	U		.00	9.15		53.648
5	L	U	4.000	.00	9.15		35.000
5	D	U	1.500	.00	9.15		13.125
5	SW	U		.00	9.15		53.648
6	L	U	4.000	.00	9.30		35.000
6	D	U	1.500	.00	9.30		13.125

6	SW	U		.00	9.30	53.648
7	L	U	4.000	.00	9.30	35.000
7	D	U	1.500	.00	9.30	13.125
7	SW	U		.00	9.30	53.648
8	L	U	4.000	.00	2.30	35.000
8	D	U	1.500	.00	2.30	13.125
8	SW	U		.00	2.30	53.648

NOTE: LIVE LOADING is SKIPPED with a skip factor of .70

3.1 - LOADING AS APPEARS IN USER`S INPUT SCREEN PRIOR TO PROCESSING

SPAN	CLASS	TYPE	UNIFORM (kN/m^2), LINE(kN/m)	(CON. or PART.) (kN@m or m-m)	(M O M E N T) (kN-m @ m)
1	L	U	4.000		
1	D	U	1.500		
2	L	U	4.000		
2	D	U	1.500		
3	L	U	4.000		
3	D	U	1.500		
4	L	U	4.000		
4	D	U	1.500		
5	L	U	4.000		
5	D	U	1.500		
6	L	U	4.000		
6	D	U	1.500		
7	L	U	4.000		
7	D	U	1.500		
8	L	U	4.000		
8	D	U	1.500		

NOTE: SELFWEIGHT INCLUSION REQUIRED
LIVE LOADING is SKIPPED with a skip factor of .70

4 - C A L C U L A T E D S E C T I O N P R O P E R T I E S

4.1 For Uniform Spans and Cantilevers only

SPAN	AREA mm^2	I mm^4	Yb mm	Yt mm
1	2187500.00	.1139E+11	125.00	125.00
2	2187500.00	.1139E+11	125.00	125.00
3	2187500.00	.1139E+11	125.00	125.00
4	2187500.00	.1139E+11	125.00	125.00
5	2187500.00	.1139E+11	125.00	125.00
6	2187500.00	.1139E+11	125.00	125.00
7	2187500.00	.1139E+11	125.00	125.00
8	2187500.00	.1139E+11	125.00	125.00

Note:
--- = Span/Cantilever is Nonuniform, see block 4.2

5 - D E A D L O A D M O M E N T S, S H E A R S & R E A C T I O N S

SPAN	< 5.1 S P A N M O M E N T S (kNm) > M(l)*	Midspan	M(r)*	< 5.2 SPAN SHEARS (kN) > SH(l)	SH(r)
1	.01	-4.28	-393.18	-78.34	242.17
2	-393.16	297.54	-550.23	-304.15	336.87
3	-550.23	253.61	-481.01	-327.72	313.30
4	-481.01	227.66	-461.29	-307.64	303.33
5	-461.29	234.46	-467.40	-304.82	306.16
6	-467.40	233.80	-508.81	-306.04	314.95
7	-508.81	275.90	-383.20	-324.00	296.99
8	-383.21	-147.45	.01	-243.40	-89.82

Note:
* = Centerline moments

JOINT	< 5.3 REACTIONS (kN) >	<- 5.4 COLUMN MOMENTS (kNm) -> Lower columns	Upper columns
1	78.34	.00	.00
2	546.32	.00	.00
3	664.60	.00	.00
4	620.95	.00	.00
5	608.15	.00	.00
6	612.20	.00	.00
7	638.95	.00	.00
8	540.39	.00	.00
9	-89.82	.00	.00

6 - L I V E L O A D M O M E N T S, S H E A R S & R E A C T I O N S

<-- 6.1 L I V E L O A D SPAN MOMENTS (kNm) and SHEAR FORCES (kN) -->

<----- left* -----> <--- midspan ---> <---- right* -----> <--SHEAR FORCE-->

SPAN	max	min	max	min	max	min	left	right
1	.00	.00	79.15	-80.72	-206.09	17.18	-62.38	126.94
2	-206.08	17.18	161.61	-52.44	-288.41	-79.84	-159.42	176.58
3	-288.41	-79.84	174.65	-81.60	-252.13	-47.21	-171.78	164.22
4	-252.13	-47.20	171.16	-87.63	-241.79	-52.91	-161.26	158.99
5	-241.79	-52.91	169.91	-83.88	-244.99	-51.24	-159.77	160.48
6	-244.99	-51.25	162.66	-76.88	-266.70	-62.88	-160.42	165.08
7	-266.70	-62.88	144.62	-38.69	-200.86	46.42	-169.83	155.67
8	-200.86	46.42	39.41	-93.51	.00	.00	-127.58	-81.32

Note:
* = Centerline moments

	6.2 REACTIONS (kN)		6.3 COLUMN MOMENTS (kNm)			
			LOWER COLUMN		UPPER COLUMN	
JOINT	max	min	max	min	max	min
1	89.11	-48.05	.00	.00	.00	.00
2	321.66	58.17	.00	.00	.00	.00
3	379.88	155.34	.00	.00	.00	.00
4	379.20	125.96	.00	.00	.00	.00
5	377.21	129.67	.00	.00	.00	.00
6	371.68	128.62	.00	.00	.00	.00
7	362.85	139.38	.00	.00	.00	.00
8	336.02	-14.73	.00	.00	.00	.00
9	69.08	-116.16	.00	.00	.00	.00

Note: Block 6.1 through 6.3 values are maxima of all skipped loading cases

7 - M O M E N T S REDUCED TO FACE-OF-SUPPORT

7.1 R E D U C E D DEAD LOAD MOMENTS (kNm)

SPAN	left*	midspan	right*
1	17.51	-4.28	-334.70
2	-319.20	297.50	-468.10
3	-470.40	253.60	-404.80
4	-406.20	227.70	-387.50
5	-387.20	234.50	-392.90
6	-393.00	233.80	-432.20
7	-429.90	275.90	-311.00
8	-324.40	-147.40	-24.54

Note:
* = face-of-support

7.2 R E D U C E D LIVE LOAD MOMENTS (kNm)

SPAN	left* max	left* min	midspan max	midspan min	right* max	right* min
1	-8.41	14.83	79.15	-80.72	-175.40	30.22
2	-167.30	13.55	161.60	-52.44	-245.40	-53.33
3	-246.60	-58.61	174.70	-81.60	-212.20	-46.23
4	-212.90	-24.99	171.20	-87.63	-203.10	-30.63
5	-202.90	-31.40	169.90	-83.88	-206.00	-28.91
6	-206.00	-41.97	162.70	-76.88	-226.50	-59.50
7	-225.30	-38.50	144.60	-38.69	-163.00	41.85
8	-170.10	47.65	39.41	-93.51	-20.33	11.32

Note:
* = face-of-support

8 - SUM OF DEAD AND LIVE MOMENTS (kNm)

Maxima of dead load and live load span moments combined
for serviceability checks (1.00DL + .70LL)

SPAN	left* max	left* min	midspan max	midspan min	right* max	right* min
1	11.62	27.89	51.13	-60.78	-457.48	-313.55
2	-436.31	-309.71	410.62	260.79	-639.88	-505.43
3	-643.02	-511.43	375.89	196.48	-553.34	-437.16
4	-555.23	-423.69	347.54	166.36	-529.67	-408.94
5	-529.23	-409.18	353.43	175.78	-537.10	-413.14
6	-537.20	-422.38	347.69	179.98	-590.75	-473.85
7	-587.61	-456.85	377.12	248.82	-425.10	-281.70
8	-443.47	-291.05	-119.81	-212.86	-38.77	-16.62

Note:
* = face-of-support

9 - SELECTED POST-TENSIONING FORCES AND TENDON PROFILES

9.1 PROFILE TYPES AND PARAMETERS

LEGEND:
For Span:
1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon

For Cantilever:
1 = simple parabola

2 = partial parabola
3 = harped tendon

9.2 T E N D O N P R O F I L E

SPAN	TYPE	X1/L	X2/L	X3/L	A/L
1	1	.100	.500	.100	.000
2	1	.100	.500	.100	.000
3	1	.100	.500	.100	.000
4	1	.100	.500	.100	.000
5	1	.100	.500	.100	.000
6	1	.100	.500	.100	.000
7	1	.100	.500	.100	.000
8	1	.100	.500	.100	.000

9.3 - SELECTED POST-TENSIONING FORCES AND TENDON DRAPE

Tendon editing mode selected: TENDON SELECTION

SPAN	SELECTED VALUES: FORCE (kN/-)	DISTANCE OF CGS (mm): Left	Center	Right	CALCULATED VALUES: P/A (N/mm^2)	Wbal (kN/-)	Wbal (%DL)
1	3264.282	-125.00	-125.00	-55.00	1.49	39.670	59
2	3474.732	-55.00	-195.00	-55.00	1.59	42.228	63
3	3346.367	-55.00	-195.00	-55.00	1.53	40.668	61
4	3159.135	-55.00	-195.00	-55.00	1.44	42.261	63
5	3230.491	-55.00	-195.00	-55.00	1.48	43.216	65
6	3418.316	-55.00	-195.00	-55.00	1.56	44.265	66
7	3426.904	-55.00	-195.00	-110.00	1.57	35.660	53
8	3286.138	-110.00	-125.00	-125.00	1.50	37.272	56

Approximate weight of strand ..... 1340.7 Kg

9.35 - TENDON SELECTION DATA:

TYPE	SEL. FORCE (kN)	TENDON EXTENTS <1>	<2>	<3>	<4>	<5>	<6>	<7>	<8>
A	19 175.47	<===	====	====	====	====	====	====	===>

9.5 R E Q U I R E D MINIMUM P O S T - T E N S I O N I N G FORCES (kN)

SPAN	BASED ON STRESS CONDITIONS: LEFT*	CENTER	RIGHT*	BASED ON MINIMUM P/A: LEFT	CENTER	RIGHT
1	.00	.00	1814.90	1968.80	1968.80	1968.80

2	1593.96	1402.39	2950.78	1968.80	1968.80	1968.80
3	2939.59	1160.01	2352.75	1968.80	1968.80	1968.80
4	2354.36	846.33	2107.56	1968.80	1968.80	1968.80
5	2122.24	915.50	2168.38	1968.80	1968.80	1968.80
6	2189.19	842.33	2747.94	1968.80	1968.80	1968.80
7	2695.18	1268.12	1790.69	1968.80	1968.80	1968.80
8	2117.78	.00	.00	1968.80	1968.80	1968.80

Note:
* = face-of-support

9.6 S E R V I C E S T R E S S E S (N/mm^2) (tension shown positive)

SPAN	LEFT * TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C	RIGHT * TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C
1	-----	-1.64	-----	-1.22	1.51	-.07	-----	-4.25
2	1.18	-.21	-----	-3.96	2.64	-----	-----	-5.51
3	2.68	-----	-----	-5.51	2.08	-----	-----	-4.79
4	2.13	-----	-----	-4.80	1.92	-----	-----	-4.49
5	1.90	-----	-----	-4.50	1.78	-----	-----	-4.50
6	1.76	-----	-----	-4.52	2.35	-----	-----	-5.25
7	2.31	-----	-----	-5.18	1.70	-----	-----	-4.45
8	2.09	-----	-----	-4.82	-----	-1.29	-----	-1.65

Note:
* = face-of-support

C E N T E R

SPAN	TOP max-T	TOP max-C	BOTTOM max-T	BOTTOM max-C
1	-----	-1.83	-----	-2.08
2	-----	-3.78	.92	-.72
3	-----	-3.69	.94	-1.03
4	-----	-3.34	.74	-1.25
5	-----	-3.42	.77	-1.18
6	-----	-3.28	.47	-1.37
7	-----	-3.94	1.12	-.29
8	.41	-.61	-----	-3.12

9.7 POST-TENSIONING B A L A N C E D M O M E N T S, SHEARS & REACTIONS

SPAN	SPAN MOMENTS (kNm): left*	midspan	right*	SPAN SHEARS (kN): SH(l)	SH(r)
1	-.74	-7.12	216.30	2.96	2.96
2	224.40	-218.40	298.50	-8.14	-8.14
3	300.00	-183.00	267.10	2.63	2.63
4	266.20	-179.60	263.70	-.64	-.64

5	263.90	-180.50	278.90	-.25	-.25
6	278.90	-196.70	271.60	.89	.89
7	273.50	-162.70	161.10	-8.34	-8.34
8	142.60	57.99	12.60	50.42	50.42

Note:
* = face-of-support

	<--REACTIONS (kN)-->	<-- COLUMN MOMENTS (kNm) -->	
joint	2	Lower columns 3	Upper columns 4
1	-2.964	.000	.000
2	11.100	.000	.000
3	-10.770	.000	.000
4	3.276	.000	.000
5	-.395	.000	.000
6	-1.140	.000	.000
7	9.232	.000	.000
8	-58.760	.000	.000
9	50.420	.000	.000

10 - F A C T O R E D M O M E N T S & R E A C T I O N S

Calculated as (1.35D + 1.50L + 1.00 secondary moment effects)

10.1 FACTORED DESIGN MOMENTS (kNm)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	10.29	45.14	105.84	-133.97	-728.43	-420.01
2	-694.06	-422.79	668.92	347.85	-938.20	-650.09
3	-941.72	-659.74	655.58	271.21	-825.53	-576.58
4	-828.97	-547.11	605.59	217.40	-783.51	-524.80
5	-782.58	-525.33	616.95	236.27	-792.78	-527.14
6	-793.07	-547.03	602.17	242.86	-884.59	-634.09
7	-877.83	-597.63	666.58	391.61	-550.45	-243.18
8	-589.69	-263.07	-81.96	-281.34	-51.01	-3.54

Note:
* = face-of-support

10.2 SECONDARY MOMENTS (kNm)

SPAN	<-- left* -->	<- midspan ->	<-- right* -->
1	-.74	-7.11	-13.49
2	-12.19	24.83	61.84
3	63.22	51.24	39.25

4	38.75	41.51	44.27
5	44.49	45.57	46.64
6	46.48	42.55	38.63
7	40.49	77.19	113.90
8	103.40	57.98	12.61

Note:
* = face-of-support

10.3 FACTORED REACTIONS (kN) — 10.4 FACTORED COLUMN MOMENTS (kNm)

			<-- LOWER column -->		<-- UPPER column -->	
JOINT	max	min	max	min	max	min
1	236.46	30.72	.00	.00	.00	.00
2	1231.16	835.86	.00	.00	.00	.00
3	1456.29	1119.39	.00	.00	.00	.00
4	1410.29	1030.49	.00	.00	.00	.00
5	1386.48	1015.23	.00	.00	.00	.00
6	1382.88	1018.23	.00	.00	.00	.00
7	1416.08	1080.98	.00	.00	.00	.00
8	1174.78	648.68	.00	.00	.00	.00
9	32.78	-245.14	.00	.00	.00	.00

11 - M I L D S T E E L

Support cut-off length for minimum steel(length/span) ... .17
Span cut-off length for minimum steel(length/span) ... .33
Top bar extension beyond where required ..... 900.00 mm
Bottom bar extension beyond where required ..... 900.00 mm

REINFORCEMENT based on NO REDISTRIBUTION of factored moments

11.1 TOTAL WEIGHT OF REBAR = 171.8 Kg AVERAGE = .3 Kg/m^2
TOTAL AREA COVERED = 552.99 m^2

11.2.1 S T E E L A T M I D - S P A N

	T O P				B O T T O M			
	As	DIFFERENT REBAR CRITERIA			As	DIFFERENT REBAR CRITERIA		
SPAN	(mm^2)	<---ULT	TENS	-------->	(mm^2)	<---ULT	TENS	-------->
1	0	(0	0	0)	0	(0	0	0)
2	0	(0	0	0)	0	(0	0	0)
3	0	(0	0	0)	0	(0	0	0)
4	0	(0	0	0)	0	(0	0	0)
5	0	(0	0	0)	0	(0	0	0)
6	0	(0	0	0)	0	(0	0	0)
7	0	(0	0	0)	0	(0	0	0)

8	0	(	0	0	0)	0	(	0	0	0)

11.3.1 S T E E L A T S U P P O R T S

	TOP					BOTTOM				
JOINT	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		MIN--------->		As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		MIN--------->	
1	0	(	0	0	0)	0	(	0	0	0)
2	0	(	0	0	0)	0	(	0	0	0)
3	2330	(	2330	0	0)	0	(	0	0	0)
4	859	(	859	0	0)	0	(	0	0	0)
5	283	(	283	0	0)	0	(	0	0	0)
6	392	(	392	0	0)	0	(	0	0	0)
7	1583	(	1583	0	0)	0	(	0	0	0)
8	840	(	840	0	0)	0	(	0	0	0)
9	0	(	0	0	0)	0	(	0	0	0)

11.2.2 & 11.3.2 LISTING OF THE ENTIRE PROVIDED REBAR

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]	AREA [mm^2]
2	1	T	6	# 16 x	2760	1194
2	2	T	6	# 16 x	1800	1194
3	3	T	5	# 16 x	1800	995
4	4	T	4	# 16 x	1800	796
5	5	T	4	# 16 x	1800	796
6	6	T	8	# 16 x	1800	1592
7	7	T	3	# 16 x	2260	597
7	8	T	2	# 16 x	2140	398

Notes:
Bar location - T = Top, B = Bottom.
NUM - Number of bars.
For two-way systems a minimum of 4 bars is specified over the supports.
Refer to tables 11.5.1,11.5.2 and PTsum graphical display for positioning of bars.

11.5.1 ARRANGEMENT OF TOP BARS

SPAN	ID	TOP STEEL LOCATION	NUM	BAR	LENGTH [mm]
2	1	RIGHT	6	# 16 x	1379
2	2	RIGHT	6	# 16 x	1800
3	1	LEFT	6	# 16 x	1380

3	3	RIGHT	5	# 16 x 900
3	2	LEFT	6	# 16 x 900
4	3	LEFT	3	# 16 x 900
4	4	RIGHT	4	# 16 x 900
5	4	LEFT	2	# 16 x 900
5	5	RIGHT	4	# 16 x 900
6	5	LEFT	2	# 16 x 900
6	6	RIGHT	8	# 16 x 900
7	6	LEFT	4	# 16 x 900
7	7	RIGHT	3	# 16 x 900
7	8	RIGHT	2	# 16 x 900
8	7	LEFT	3	# 16 x 1360
8	8	LEFT	2	# 16 x 1245

11.5.2 ARRANGEMENT OF BOTTOM BARS

SPAN	ID	BOTTOM STEEL LOCATION	NUM	BAR	LENGTH [mm]

12 - P U N C H I N G S H E A R C H E C K

LEGEND:
CONDITION... 1 = INTERIOR COLUMN
2 = END COLUMN
3 = CORNER COLUMN
4 = EDGE COLUMN (PARALLEL TO SPAN)
5 = EDGE BEAM, WALL, OR OTHER NON-CONFORMING GEOMETRY
PERFORM SHEAR CHECK MANUALLY
6 = STRIP TOO NARROW TO DEVELOP PUNCHING SHEAR

CASE..... 1 = STRESS WITHIN SECTION #1 GOVERNS (COL.CAP OR SLAB)
2 = STRESS WITHIN SECTION #2 GOVERNS (DROP PANEL OR SLAB)

JNT	COND.	FACTORED ACTIONS shear kN	moment kN-m	<- PUNCHING SHEAR STRESSES IN N/mm^2 -> due to shear	due to moment	TOTAL	allow- able	STRESS RATIO	CASE
1	2	236.46	.00	.62	.00	.62	1.55	.40	1
2	1	1231.16	.00	2.20	.00	2.20	1.76	1.25	1
3	1	1456.29	.00	2.60	.00	2.60	1.76	1.48	1
4	1	1410.29	.00	2.52	.00	2.52	1.74	1.45	1
5	1	1386.48	.00	2.48	.00	2.48	1.73	1.43	1
6	1	1382.88	.00	2.47	.00	2.47	1.75	1.41	1

7	1	1416.08	.00	2.53	.00	2.53	1.75	1.45	1
8	1	1174.78	.00	2.10	.00	2.10	1.75	1.20	1
9	2	245.14	.00	.65	.00	.65	1.55	.42	1

PUNCHING SHEAR STRESS IN ONE OR MORE LOCATIONS EXCEEDS THE PERMISSIBLE VALUE. PROVIDE SHEAR REINFORCEMENT, OR ENLARGE THE SECTION RESISTING THE PUNCHING SHEAR

13 - MAXIMUM S P A N D E F L E C T I O N S

Concrete`s modulus of elasticity ..... Ec = 25743 N/mm^2
Creep factor ..... K = 2.00
Ieffective/Igross...(due to cracking)..... K = 1.00

Where stresses exceed 0.5(fc`)^1/2 cracking of section is allowed for.
Values in parentheses are (span/max deflection) ratios

<.....DEFLECTION ARE ALL IN mm , DOWNWARD POSITIVE.....>

SPAN	DL	DL+PT	DL+PT+CREEP	LL	DL+PT+LL+CREEP
1	-.6	-.3	-.9(5285)	-.3(16061)	-1.2(3976)
2	6.6	2.1	6.2(1543)	3.5(2775)	9.7(992)
3	4.9	1.5	4.6(2080)	2.6(3757)	7.2(1339)
4	3.9	.8	2.5(3614)	2.1(4446)	4.6(1993)
5	4.2	1.1	3.4(2691)	2.2(4188)	5.6(1638)
6	4.1	.6	1.7(5397)	2.2(4287)	3.9(2389)
7	5.7	2.7	8.1(1152)	3.0(3118)	11.1(841)
8	-.4	-.2	-.6(3555)	-.2(12073)	-.8(2746)

14 - I N I T I A L CONDITION STRESS CHECK & REINFORCEMENT REQUIREMENTS

14.1 Parameters specified as input for initial stress checks:

		Tensile stresses divided by (f`c)^1/2	
Concrete f`c (initial/final)	.75	Top fiber	.25
PT force (initial/final) ...	1.10	Bottom fiber	.25
Dead loading (initial/final)	1.00		
Live loading (initial/final)	.00	Compression as ratio of f`c	.60

Note: Reinforcement reported in this data block is in addition to that reported in data block 11 for minimum strength reinforcement required by code.

14.2 NO added MILD REINFORCEMENT is required at MID-SPAN or SUPPORT

14.3 Compressive stresses
COMPRESSIVE stresses are within allowable limit (.60 * f`ci)
MAXIMUM stress..... = .21 * f`ci
(f`ci = initial concrete strength)

16 - FRICTION, ELONGATION AND LONG TERM STRESS LOSSES

16.6 LONG TERM STRESS LOSS CALCULATIONS

16.6.1 INPUT PARAMETERS :

Type of strand	LOW LAX	
Modulus of elasticity of strand	200000.00	N/mm^2
Average weight of concrete	NORMAL	
Estimate age of concrete at stressing	7	days
Modulus of elasticity of concrete at stressing	23322.00	N/mm^2
Modulus of elasticity of concrete at 28 days	25743.00	N/mm^2
Estimate of average relative humidity	80.00	%
Volume to surface ratio of member	150.00	mm

16.6.2 CALCULATED LONG-TERM STRESS LOSS(average of all tendons) :

SPAN	<----- STRESS (N/mm^2) -----> start	center	right
1	65.77	65.85	55.43
2	55.43	67.42	52.43
3	52.43	63.83	47.43
4	47.43	56.66	43.53
5	43.53	59.60	52.22
6	52.22	69.24	55.59
7	55.59	61.95	63.80
8	63.80	67.65	66.01

16.7 FRICTION AND ELONGATION CALCULATIONS

16.7.1 INPUT PARAMETERS :

Coefficient of angular friction (meu)	.220	/rad
Coefficient of wobble friction (K)	.0012	/m
Ultimate strength of strand	1860.0	N/mm^2
Ratio of jacking stress to strand's ultimate strength	.800	
Anchor set	6.000	mm
Cross-sectional area of strand	140.000	mm^2

16.7.2 CALCULATED STRESSES(average of all tendons) :

SPAN	LENGTH m	P	<TENDON HEIGHT(mm)> start	center	right	Horizontal ratios X1/L	X2/L	X3/L	<-- STRESS(N/mm^2)--> start	center	right
1	4.80	1	-125.	-125.	-55.	.10	.50	.10	1222.98	1227.17	1272.36
2	9.60	1	-55.	-195.	-55.	.10	.50	.10	1272.36	1306.29	1312.69
3	9.60	1	-55.	-195.	-55.	.10	.50	.10	1312.69	1258.03	1238.72
4	9.15	1	-55.	-195.	-55.	.10	.50	.10	1238.72	1187.64	1195.13
5	9.15	1	-55.	-195.	-55.	.10	.50	.10	1195.13	1214.47	1264.83
6	9.30	1	-55.	-195.	-55.	.10	.50	.10	1264.83	1285.08	1333.81

7	9.30	1	-55.	-195.	-110.	.10	.50	.10	1333.81	1288.31	1255.07
8	2.30	1	-110.	-125.	-125.	.10	.50	.10	1255.07	1235.39	1234.99

Note: P= tendon profile (refer to legend of data block 9)
Stresses at each location are the average of strands after anchor set, and after long-term losses

16.8 TENDON SELECTION AND DATA:

TYPE	OFF	FORCE	CAN	<------ TENDON EXTENTS ------> <1><2><3><4><5><6><7><8>	CAN	ELONGATION LEFT (mm)	RIGHT (mm)	Stress ratios Anch.	Max.
A	19	175.47		<==========		382.	35.	.75	.75

Note: Force is the average value per strand (kN)
Stress ratios are at anchorage (7) and maximum along tendon (8)

ADAPT CORPORATION
STRUCTURAL CONCRETE SOFTWARE SYSTEM
1733 Woodside Road, Suite 220, Redwood City, California 94061

ADAPT-PT FOR POST-TENSIONED BEAM/SLAB DESIGN
Version 7.00 AMERICAN (ACI 318-99/UBC-77)

ADAPT CORPORATION - Structural Concrete Software System
1733 Woodside Road, Suite 220, Redwood City, California 94061
Phone: (650)306-2400, Fax: (650)364-4678
Email: Support@AdaptSoft.com, Web site: http://www.AdaptSoft.com

DATE AND TIME OF PROGRAM EXECUTION: Nov 27,2008 At Time: 21:19
PROJECT FILE: TPS3_EJEE

P R O J E C T T I T L E:
UPC
TECHO SOTANO 3 EJE E

1 - USER SPECIFIED G E N E R A L D E S I G N P A R A M E T E R S

CONCRETE:
STRENGTH at 28 days, for BEAMS/SLABS ..... 30.00 N/mm^2
for COLUMNS ..... 30.00 N/mm^2

MODULUS OF ELASTICITY for BEAMS/SLABS ..... 25743.00 N/mm^2
for COLUMNS ..... 25743.00 N/mm^2

CREEP factor for deflections for BEAMS/SLABS 2.00
CONCRETE WEIGHT ..... NORMAL

SELF WEIGHT ..... 2500.00 Kg/m^3

TENSION STRESS limits (multiple of (f'c)1/2)
At Top ..... .529
At Bottom ..... .529

COMPRESSION STRESS limits (multiple of (f'c))
At all locations ..... .450

REINFORCEMENT:
YIELD Strength ..... 500.00 N/mm^2
Minimum Cover at TOP ..... 40.00 mm
Minimum Cover at BOTTOM ..... 40.00 mm

POST-TENSIONING:
SYSTEM ..... BONDED
Ultimate strength of strand ..... 1860.00 N/mm^2
Average effective stress in strand (final) ..... 1200.00 N/mm^2
Strand area..... 140.000 mm^2
Min CGS of tendon from TOP..... 55.00 mm
Min CGS of tendon from BOTTOM for INTERIOR spans.. 55.00 mm
Min CGS of tendon from BOTTOM for EXTERIOR spans.. 55.00 mm
Min average precompression ..... .90 N/mm^2

Max spacing between strands (factor of slab depth) 8.00
Tendon profile type and support widths..... (see section 9)

ANALYSIS OPTIONS USED:
Structural system ..... TWO-WAY
Moment of Inertia over support is ..... NOT INCREASED
Moments REDUCED to face of support ..... YES

2 - I N P U T G E O M E T R Y

2.1.1 PRINCIPAL SPAN DATA OF UNIFORM SPANS

SPAN	TYP	FORM	LENGTH m	WIDTH mm	DEPTH mm	TOP FLANGE width mm	TOP FLANGE thick. mm	BOTTOM/MIDDLE FLANGE width mm	BOTTOM/MIDDLE FLANGE thick. mm	REF HEIGHT mm	MULTIPLIER left	MULTIPLIER right
1	U	1	4.80	7750	250					0	.50	.50
2	U	1	9.60	7750	250					0	.50	.50
3	U	1	9.60	7750	250					0	.50	.50
4	U	1	9.15	7750	250					0	.50	.50
5	U	1	9.15	7750	250					0	.50	.50
6	U	1	9.30	7750	250					0	.50	.50
7	U	1	9.30	7750	250					0	.50	.50
8	U	1	2.30	7750	250					0	.50	.50

LEGEND:
1 - SPAN
C = Cantilever
2 - TYPE
U = Uniform; prismatic
N = Nonuniform section
3 - FORM
1 = Rectangular section
2 = T or Inverted L section
3 = I section
4 = Extended T or L section
7 = Joist
8 = Waffle
11 - Top surface to reference line

2.2 - S U P P O R T W I D T H A N D C O L U M N D A T A

JOINT	SUPPORT WIDTH mm	LOWER COLUMN LENGTH m	LOWER COLUMN B(DIA) mm	LOWER COLUMN D mm	LOWER COLUMN CBC*	UPPER COLUMN LENGTH m	UPPER COLUMN B(DIA) mm	UPPER COLUMN D mm	UPPER COLUMN CBC*
1	500	4.00	500	500	(2)	.00	0	0	(3)
2	500	4.00	500	500	(2)	.00	0	0	(3)
3	500	4.00	500	500	(2)	.00	0	0	(3)

4	500	4.00	500	500	(2)	.00	0	0	(3)
5	500	4.00	500	500	(2)	.00	0	0	(3)
6	500	4.00	500	500	(2)	.00	0	0	(3)
7	500	4.00	500	500	(2)	.00	0	0	(3)
8	500	4.00	500	500	(2)	.00	0	0	(3)
9	500	4.00	500	500	(2)	.00	0	0	(3)

*THE COLUMN BOUNDARY CONDITION CODES (CBC)
Fixed at both ends ...(STANDARD) ..... = 1
Hinged at near end, fixed at far end ..... = 2
Fixed at near end, hinged at far end ..... = 3
Fixed at near end, roller with rotational fixity at far end .. = 4

3 - I N P U T A P P L I E D L O A D I N G

<---CLASS---> <--------------TYPE--------------->
D = DEAD LOAD U = UNIFORM P = PARTIAL UNIFORM
L = LIVE LOAD C = CONCENTRATED M = APPLIED MOMENT
Li= LINE LOAD
SW= SELF WEIGHT Computed from geometry input and treated as dead loading
Unit selfweight W = 2500.0 Kg/m^3

SPAN	CLASS	TYPE	Intensity kN/m^2	(From ... m	To) m	(M or C ...At) (kN-m or kN...m)	Total on Trib kN/m
1	L	U	4.000	.00	4.80		31.000
1	D	U	1.500	.00	4.80		11.625
1	SW	U		.00	4.80		47.517
2	L	U	4.000	.00	9.60		31.000
2	D	U	1.500	.00	9.60		11.625
2	SW	U		.00	9.60		47.517
3	L	U	4.000	.00	9.60		31.000
3	D	U	1.500	.00	9.60		11.625
3	SW	U		.00	9.60		47.517
4	L	U	4.000	.00	9.15		31.000
4	D	U	1.500	.00	9.15		11.625
4	SW	U		.00	9.15		47.517
5	L	U	4.000	.00	9.15		31.000
5	D	U	1.500	.00	9.15		11.625
5	SW	U		.00	9.15		47.517
6	L	U	4.000	.00	9.30		31.000
6	D	U	1.500	.00	9.30		11.625

6	SW	U		.00	9.30	47.517
7	L	U	4.000	.00	9.30	31.000
7	D	U	1.500	.00	9.30	11.625
7	SW	U		.00	9.30	47.517
8	L	U	4.000	.00	2.30	31.000
8	D	U	1.500	.00	2.30	11.625
8	SW	U		.00	2.30	47.517

NOTE: LIVE LOADING is SKIPPED with a skip factor of .70

3.1 - LOADING AS APPEARS IN USER`S INPUT SCREEN PRIOR TO PROCESSING

SPAN	CLASS	TYPE	UNIFORM (kN/m^2), LINE(kN/m)	(CON. or PART.) (kN@m or m-m)	(M O M E N T) (kN-m @ m)
1	L	U	4.000		
1	D	U	1.500		
2	L	U	4.000		
2	D	U	1.500		
3	L	U	4.000		
3	D	U	1.500		
4	L	U	4.000		
4	D	U	1.500		
5	L	U	4.000		
5	D	U	1.500		
6	L	U	4.000		
6	D	U	1.500		
7	L	U	4.000		
7	D	U	1.500		
8	L	U	4.000		
8	D	U	1.500		

NOTE: SELFWEIGHT INCLUSION REQUIRED
LIVE LOADING is SKIPPED with a skip factor of .70

4 - C A L C U L A T E D S E C T I O N P R O P E R T I E S

4.1 For Uniform Spans and Cantilevers only

SPAN	AREA mm^2	I mm^4	Yb mm	Yt mm
1	1937500.00	.1009E+11	125.00	125.00

2	1937500.00	.1009E+11	125.00	125.00
3	1937500.00	.1009E+11	125.00	125.00
4	1937500.00	.1009E+11	125.00	125.00
5	1937500.00	.1009E+11	125.00	125.00
6	1937500.00	.1009E+11	125.00	125.00
7	1937500.00	.1009E+11	125.00	125.00
8	1937500.00	.1009E+11	125.00	125.00

Note:
--- = Span/Cantilever is Nonuniform, see block 4.2

5 - D E A D L O A D M O M E N T S, S H E A R S & R E A C T I O N S

< 5.1 S P A N M O M E N T S (kNm) > < 5.2 SPAN SHEARS (kN) >

SPAN	M(l)*	Midspan	M(r)*	SH(l)	SH(r)
1	.00	-3.79	-348.24	-69.39	214.49
2	-348.23	263.53	-487.34	-269.39	298.37
3	-487.34	224.63	-426.04	-290.27	277.50
4	-426.04	201.64	-408.56	-272.49	268.66
5	-408.56	207.68	-413.97	-269.98	271.17
6	-413.97	207.08	-450.67	-271.07	278.96
7	-450.66	244.36	-339.41	-286.97	263.05
8	-339.43	-130.61	.00	-215.59	-79.56

Note:
* = Centerline moments

JOINT	< 5.3 REACTIONS (kN) >	<- 5.4 COLUMN MOMENTS (kNm) ->	
		Lower columns	Upper columns
1	69.39	.00	.00
2	483.88	.00	.00
3	588.64	.00	.00
4	549.98	.00	.00
5	538.65	.00	.00
6	542.23	.00	.00
7	565.93	.00	.00
8	478.64	.00	.00
9	-79.56	.00	.00

6 - L I V E L O A D M O M E N T S, S H E A R S & R E A C T I O N S

<-- 6.1 L I V E L O A D SPAN MOMENTS (kNm) and SHEAR FORCES (kN) -->

<----- left* -----> <--- midspan ---> <---- right* -----> <--SHEAR FORCE-->

SPAN	max	min	max	min	max	min	left	right
1	.00	.00	70.10	-71.49	-182.53	15.21	-55.25	112.43
2	-182.53	15.21	143.14	-46.44	-255.45	-70.72	-141.20	156.40
3	-255.45	-70.72	154.69	-72.27	-223.31	-41.81	-152.15	145.45
4	-223.32	-41.81	151.60	-77.62	-214.15	-46.86	-142.83	140.82
5	-214.15	-46.86	150.49	-74.29	-216.99	-45.38	-141.51	142.14
6	-216.99	-45.39	144.07	-68.09	-236.22	-55.70	-142.08	146.22
7	-236.22	-55.69	128.09	-34.27	-177.90	41.11	-150.42	137.88
8	-177.91	41.12	34.91	-82.83	.00	.00	-113.00	-72.02

Note:
* = Centerline moments

<- 6.2 REACTIONS (kN) -> <-------- 6.3 COLUMN MOMENTS (kNm) -------->
<--- LOWER COLUMN ---> <--- UPPER COLUMN --->

JOINT	max	min	max	min	max	min
1	78.93	-42.56	.00	.00	.00	.00
2	284.90	51.52	.00	.00	.00	.00
3	336.47	137.58	.00	.00	.00	.00
4	335.87	111.57	.00	.00	.00	.00
5	334.10	114.85	.00	.00	.00	.00
6	329.20	113.92	.00	.00	.00	.00
7	321.38	123.45	.00	.00	.00	.00
8	297.63	-13.05	.00	.00	.00	.00
9	61.19	-102.89	.00	.00	.00	.00

Note: Block 6.1 through 6.3 values are maxima of all skipped loading cases

7 - M O M E N T S REDUCED TO FACE-OF-SUPPORT

7.1 R E D U C E D DEAD LOAD MOMENTS (kNm)

SPAN	<- left* ->	<- midspan ->	<- right* ->
1	15.50	-3.79	-296.50
2	-282.70	263.50	-414.60
3	-416.60	224.60	-358.50
4	-359.80	201.60	-343.20
5	-342.90	207.70	-348.00
6	-348.10	207.10	-382.80
7	-380.80	244.40	-275.50
8	-287.40	-130.60	-21.74

Note:
* = face-of-support

7.2 R E D U C E D LIVE LOAD MOMENTS (kNm)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	-7.45	13.14	70.10	-71.49	-155.40	26.76
2	-148.20	12.00	143.10	-46.44	-217.30	-47.24
3	-218.40	-51.91	154.70	-72.27	-187.90	-40.95
4	-188.60	-22.13	151.60	-77.62	-179.90	-27.13
5	-179.70	-27.82	150.50	-74.29	-182.40	-25.61
6	-182.40	-37.17	144.10	-68.09	-200.60	-52.70
7	-199.60	-34.10	128.10	-34.27	-144.40	37.06
8	-150.60	42.21	34.91	-82.83	-18.01	10.03

Note:
* = face-of-support

8 - SUM OF DEAD AND LIVE MOMENTS (kNm)

Maxima of dead load and live load span moments combined
for serviceability checks (1.00DL + .70LL)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	10.29	24.70	45.28	-53.83	-405.28	-277.77
2	-386.44	-274.30	363.67	230.99	-566.71	-447.67
3	-569.48	-452.94	332.89	174.01	-490.03	-387.17
4	-491.82	-375.29	307.72	147.27	-469.13	-362.19
5	-468.69	-362.37	313.05	155.70	-475.68	-365.93
6	-475.78	-374.12	307.97	159.44	-523.22	-419.69
7	-520.52	-404.67	334.07	220.41	-376.58	-249.56
8	-392.82	-257.85	-106.16	-188.58	-34.35	-14.72

Note:
* = face-of-support

9 - SELECTED POST-TENSIONING FORCES AND TENDON PROFILES

9.1 PROFILE TYPES AND PARAMETERS
LEGEND:
For Span:
1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon

For Cantilever:
1 = simple parabola

2 = partial parabola
3 = harped tendon

9.2 T E N D O N P R O F I L E

	TYPE	X1/L	X2/L	X3/L	A/L
1	1	.100	.500	.100	.000
2	1	.100	.500	.100	.000
3	1	.100	.500	.100	.000
4	1	.100	.500	.100	.000
5	1	.100	.500	.100	.000
6	1	.100	.500	.100	.000
7	1	.100	.500	.100	.000
8	1	.100	.500	.100	.000

9.3 - SELECTED POST-TENSIONING FORCES AND TENDON DRAPE

Tendon editing mode selected: TENDON SELECTION

SPAN	<-------- SELECTED VALUES --------> FORCE (kN/-)	<- DISTANCE OF CGS (mm) -> Left	Center	Right	<--- CALCULATED VALUES ---> P/A (N/mm^2)	Wbal (kN/-)	Wbal (%DL)
1	2751.489	-125.00	-125.00	-55.00	1.42	33.438	57
2	2931.115	-55.00	-195.00	-55.00	1.51	35.621	60
3	2822.574	-55.00	-195.00	-55.00	1.46	34.302	58
4	2664.759	-55.00	-195.00	-55.00	1.38	35.648	60
5	2724.903	-55.00	-195.00	-55.00	1.41	36.452	62
6	2883.350	-55.00	-195.00	-55.00	1.49	37.338	63
7	2890.239	-55.00	-195.00	-110.00	1.49	30.075	51
8	2769.906	-110.00	-125.00	-125.00	1.43	31.417	53

Approximate weight of strand ..... 1129.0 Kg

9.35 - TENDON SELECTION DATA:

TYPE	SEL.	FORCE (kN)	<------ TENDON EXTENTS ------> <1>	<2>	<3>	<4>	<5>	<6>	<7>	<8>
A	16	175.69	<=========>							

9.5 R E Q U I R E D MINIMUM P O S T - T E N S I O N I N G FORCES (kN)

SPAN	<- BASED ON STRESS CONDITIONS -> LEFT*	CENTER	RIGHT*	<- BASED ON MINIMUM P/A -> LEFT	CENTER	RIGHT
1	.00	.00	1608.00	1743.80	1743.80	1743.80

2	1411.61	1242.04	2613.48	1743.80	1743.80	1743.80
3	2603.53	1027.47	2083.49	1743.80	1743.80	1743.80
4	2085.88	749.59	1866.91	1743.80	1743.80	1743.80
5	1879.49	810.93	1920.53	1743.80	1743.80	1743.80
6	1939.03	746.07	2434.01	1743.80	1743.80	1743.80
7	2387.98	1123.09	1586.34	1743.80	1743.80	1743.80
8	1875.60	.00	.00	1743.80	1743.80	1743.80

Note:
* = face-of-support

9.6 S E R V I C E S T R E S S E S (N/mm^2) (tension shown positive)

	L E F T *				R I G H T *			
	TOP		BOTTOM		TOP		BOTTOM	
	max-T	max-C	max-T	max-C	max-T	max-C	max-T	max-C
1	-----	-1.57	-----	-1.15	1.68	-----	-----	-4.29
2	1.35	-.04	-----	-4.00	2.85	-----	-----	-5.58
3	2.89	-----	-----	-5.58	2.27	-----	-----	-4.85
4	2.32	-----	-----	-4.86	2.11	-----	-----	-4.56
5	2.08	-----	-----	-4.57	1.97	-----	-----	-4.57
6	1.96	-----	-----	-4.59	2.55	-----	-----	-5.31
7	2.51	-----	-----	-5.24	1.84	-----	-----	-4.46
8	2.23	-----	-----	-4.82	-----	-1.22	-----	-1.59

Note:
* = face-of-support

	C E N T E R			
	TOP		BOTTOM	
	max-T	max-C	max-T	max-C
1	-----	-1.77	-----	-2.01
2	-----	-3.81	1.09	-.55
3	-----	-3.71	1.09	-.88
4	-----	-3.36	.89	-1.10
5	-----	-3.45	.91	-1.04
6	-----	-3.30	.63	-1.21
7	-----	-3.95	1.27	-.14
8	.50	-.52	-----	-3.08

9.7 POST-TENSIONING B A L A N C E D M O M E N T S, SHEARS & REACTIONS

	<-- S P A N M O M E N T S (kNm) -->			<-- SPAN SHEARS (kN) -->	
SPAN	left*	midspan	right*	SH(l)	SH(r)
1	-.63	-6.00	182.50	2.50	2.50
2	189.30	-184.20	251.80	-6.86	-6.86
3	253.00	-154.40	225.30	2.22	2.22
4	224.50	-151.50	222.50	-.54	-.54

5	222.60	-152.30	235.30	-.21	-.21
6	235.20	-165.90	229.10	.75	.75
7	230.60	-137.20	135.90	-7.03	-7.03
8	120.30	48.91	10.63	42.53	42.53

Note:
* = face-of-support

	<--REACTIONS (kN)-->	<-- COLUMN MOMENTS (kNm) -->	
joint	2	Lower columns	Upper columns
1	-2.499	.000	.000
2	9.362	.000	.000
3	-9.085	.000	.000
4	2.761	.000	.000
5	-.332	.000	.000
6	-.959	.000	.000
7	7.784	.000	.000
8	-49.560	.000	.000
9	42.530	.000	.000

10 - F A C T O R E D M O M E N T S & R E A C T I O N S

Calculated as (1.35D + 1.50L + 1.00 secondary moment effects)

10.1 FACTORED DESIGN MOMENTS (kNm)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	9.13	40.01	94.05	-118.35	-644.74	-371.51
2	-614.23	-373.92	591.42	307.05	-833.49	-578.40
3	-836.68	-586.95	578.51	238.07	-732.72	-512.29
4	-735.93	-486.23	534.68	190.85	-695.73	-466.58
5	-694.84	-467.03	544.61	207.44	-704.00	-468.82
6	-704.28	-486.43	531.61	213.36	-785.05	-563.20
7	-779.28	-531.03	587.15	343.61	-492.46	-220.28
8	-526.70	-237.49	-75.05	-251.66	-45.73	-3.67

Note:
* = face-of-support

10.2 SECONDARY MOMENTS (kNm)

SPAN	<-- left* -->	<- midspan ->	<-- right* -->
1	-.62	-6.00	-11.37
2	-10.28	20.95	52.17
3	53.33	43.22	33.11

4	32.70	35.07	37.44
5	37.62	38.51	39.40
6	39.26	35.95	32.63
7	34.20	65.13	96.06
8	87.19	48.91	10.63

Note:
* = face-of-support

10.3 FACTORED REACTIONS (kN) — 10.4 FACTORED COLUMN MOMENTS (kNm)

JOINT	max	min	<-- LOWER column --> max	min	<-- UPPER column --> max	min
1	209.57	27.34	.00	.00	.00	.00
2	1089.98	739.91	.00	.00	.00	.00
3	1290.28	991.92	.00	.00	.00	.00
4	1249.11	912.66	.00	.00	.00	.00
5	1227.93	899.13	.00	.00	.00	.00
6	1224.81	901.86	.00	.00	.00	.00
7	1253.85	957.00	.00	.00	.00	.00
8	1042.95	576.97	.00	.00	.00	.00
9	26.91	-219.23	.00	.00	.00	.00

11 - M I L D S T E E L

Support cut-off length for minimum steel(length/span) ... .17
Span cut-off length for minimum steel(length/span) ... .33
Top bar extension beyond where required ..... 900.00 mm
Bottom bar extension beyond where required ..... 900.00 mm

REINFORCEMENT based on NO REDISTRIBUTION of factored moments

11.1 TOTAL WEIGHT OF REBAR = 217.6 Kg AVERAGE = .4 Kg/m^2
TOTAL AREA COVERED = 489.80 m^2

11.2.1 S T E E L A T M I D - S P A N

	TOP					BOTTOM			
SPAN	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		-----TENS--------->	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		-----TENS--------->	
1	0	(	0	0	0)	0	(	0	0	0)
2	0	(	0	0	0)	0	(	0	0	0)
3	0	(	0	0	0)	0	(	0	0	0)
4	0	(	0	0	0)	0	(	0	0	0)
5	0	(	0	0	0)	0	(	0	0	0)
6	0	(	0	0	0)	0	(	0	0	0)
7	0	(	0	0	0)	0	(	0	0	0)

8	0	(	0	0	0)	0	(	0	0	0)

11.3.1 S T E E L A T S U P P O R T S

	TOP					BOTTOM			
JOINT	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		-----MIN--------->	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		-----MIN--------->	
1	0	(	0	0	0)	0	(	0	0	0)
2	0	(	0	0	0)	0	(	0	0	0)
3	2479	(	2479	0	0)	0	(	0	0	0)
4	1165	(	1165	0	0)	0	(	0	0	0)
5	657	(	657	0	0)	0	(	0	0	0)
6	755	(	755	0	0)	0	(	0	0	0)
7	1804	(	1804	0	0)	0	(	0	0	0)
8	1048	(	1048	0	0)	0	(	0	0	0)
9	0	(	0	0	0)	0	(	0	0	0)

11.2.2 & 11.3.2 LISTING OF THE ENTIRE PROVIDED REBAR

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]	AREA [mm^2]
2	1	T	7	# 16 x	2760	1393
2	2	T	6	# 16 x	1800	1194
3	3	T	6	# 16 x	1800	1194
4	4	T	4	# 16 x	1800	796
5	5	T	4	# 16 x	1800	796
6	6	T	5	# 16 x	2740	995
6	7	T	5	# 16 x	1800	995
7	8	T	3	# 16 x	2260	597
7	9	T	3	# 16 x	2140	597

Notes:
Bar location - T = Top, B = Bottom.
NUM - Number of bars.
For two-way systems a minimum of 4 bars is specified over the supports.
Refer to tables 11.5.1,11.5.2 and PTsum graphical display for positioning of bars.

11.5.1 ARRANGEMENT OF TOP BARS

SPAN	TOP STEEL ID	LOCATION	NUM	BAR	LENGTH [mm]
2	1	RIGHT	7	# 16 x	1379
2	2	RIGHT	6	# 16 x	1800

3	1	LEFT	7 # 16 x 1380
3	3	RIGHT	6 # 16 x 900
3	2	LEFT	6 # 16 x 900
4	3	LEFT	3 # 16 x 900
4	4	RIGHT	4 # 16 x 900
5	4	LEFT	2 # 16 x 900
5	5	RIGHT	4 # 16 x 900
6	5	LEFT	2 # 16 x 900
6	6	RIGHT	5 # 16 x 1365
6	7	RIGHT	5 # 16 x 900
7	6	LEFT	5 # 16 x 1365
7	8	RIGHT	3 # 16 x 900
7	7	LEFT	5 # 16 x 900
7	9	RIGHT	3 # 16 x 900
8	8	LEFT	3 # 16 x 1360
8	9	LEFT	3 # 16 x 1245

11.5.2 ARRANGEMENT OF BOTTOM BARS

SPAN	BOTTOM STEEL ID	LOCATION	NUM	BAR	LENGTH [mm]

12 - P U N C H I N G S H E A R C H E C K

LEGEND:
CONDITION... 1 = INTERIOR COLUMN
2 = END COLUMN
3 = CORNER COLUMN
4 = EDGE COLUMN (PARALLEL TO SPAN)
5 = EDGE BEAM, WALL, OR OTHER NON-CONFORMING GEOMETRY
PERFORM SHEAR CHECK MANUALLY
6 = STRIP TOO NARROW TO DEVELOP PUNCHING SHEAR

CASE..... 1 = STRESS WITHIN SECTION #1 GOVERNS (COL.CAP OR SLAB)
2 = STRESS WITHIN SECTION #2 GOVERNS (DROP PANEL OR SLAB)

JNT	COND.	FACTORED ACTIONS shear kN	moment kN-m	<- PUNCHING SHEAR STRESSES IN N/mm^2 -> due to shear	due to moment	TOTAL	allow-able	STRESS RATIO	CASE
1	2	209.57	.00	.55	.00	.55	1.55	.36	1
2	1	1089.98	.00	1.95	.00	1.95	1.74	1.12	1
3	1	1290.28	.00	2.30	.00	2.30	1.74	1.33	1

4	1	1249.11	.00	2.23	.00	2.23	1.72	1.30	1
5	1	1227.93	.00	2.19	.00	2.19	1.71	1.28	1
6	1	1224.81	.00	2.19	.00	2.19	1.73	1.26	1
7	1	1253.85	.00	2.24	.00	2.24	1.73	1.29	1
8	1	1042.95	.00	1.86	.00	1.86	1.73	1.08	1
9	2	219.23	.00	.58	.00	.58	1.55	.37	1

PUNCHING SHEAR STRESS IN ONE OR MORE LOCATIONS EXCEEDS THE PERMISSIBLE VALUE. PROVIDE SHEAR REINFORCEMENT, OR ENLARGE THE SECTION RESISTING THE PUNCHING SHEAR

13 - MAXIMUM S P A N D E F L E C T I O N S

Concrete`s modulus of elasticity ..... Ec = 25743 N/mm^2
Creep factor ..... K = 2.00
Ieffective/Igross...(due to cracking)..... K = .98

Where stresses exceed 0.5(fc`)^1/2 cracking of section is allowed for.
Values in parentheses are (span/max deflection) ratios

SPAN	<.....DEFLECTION ARE ALL IN mm , DOWNWARD POSITIVE.....> DL	DL+PT	DL+PT+CREEP	LL	DL+PT+LL+CREEP
1	-.6	-.3	-1.0(4985)	-.3(15772)	-1.3(3788)
2	6.7	2.3	7.0(1372)	3.5(2726)	10.5(912)
3	5.0	1.7	5.2(1853)	2.6(3691)	7.8(1234)
4	4.0	1.0	3.0(3024)	2.1(4368)	5.1(1787)
5	4.2	1.3	3.9(2342)	2.2(4115)	6.1(1492)
6	4.2	.8	2.3(4092)	2.2(4211)	4.5(2075)
7	5.8	2.9	8.7(1074)	3.0(3063)	11.7(795)
8	-.4	-.2	-.7(3382)	-.2(11860)	-.9(2632)

14 - I N I T I A L CONDITION STRESS CHECK & REINFORCEMENT REQUIREMENTS

14.1 Parameters specified as input for initial stress checks:

		Tensile stresses divided by (f`c)^1/2	
Concrete f`c (initial/final)	.75	Top fiber	.25
PT force (initial/final) ...	1.10	Bottom fiber	.25
Dead loading (initial/final)	1.00		
Live loading (initial/final)	.00	Compression as ratio of f`c	.60

Note: Reinforcement reported in this data block is in
addition to that reported in data block 11 for
minimum strength reinforcement required by code.

14.2 NO added MILD REINFORCEMENT is required at MID-SPAN or SUPPORT

14.3 Compressive stresses
COMPRESSIVE stresses are within allowable limit (.60 * f`ci)
MAXIMUM stress..... = .21 * f`ci
(f`ci = initial concrete strength)

16 - FRICTION, ELONGATION AND LONG TERM STRESS LOSSES

16.6 LONG TERM STRESS LOSS CALCULATIONS

16.6.1 INPUT PARAMETERS :

Type of strand	LOW LAX	
Modulus of elasticity of strand	200000.00	N/mm^2
Average weight of concrete	NORMAL	
Estimate age of concrete at stressing	7	days
Modulus of elasticity of concrete at stressing	23322.00	N/mm^2
Modulus of elasticity of concrete at 28 days	25743.00	N/mm^2
Estimate of average relative humidity	80.00	%
Volume to surface ratio of member	150.00	mm

16.6.2 CALCULATED LONG-TERM STRESS LOSS(average of all tendons) :

	<----- STRESS (N/mm^2) ----->		
SPAN	start	center	right
1	64.60	64.68	53.16
2	53.16	65.18	50.52
3	50.52	61.78	44.97
4	44.97	54.68	41.12
5	41.12	57.59	49.69
6	49.69	67.11	53.04
7	53.04	59.97	62.44
8	62.44	66.48	64.83

16.7 FRICTION AND ELONGATION CALCULATIONS

16.7.1 INPUT PARAMETERS :

Coefficient of angular friction (meu)	.220	/rad
Coefficient of wobble friction (K)	.0012	/m
Ultimate strength of strand	1860.0	N/mm^2
Ratio of jacking stress to strand's ultimate strength	.800	
Anchor set	6.000	mm
Cross-sectional area of strand	140.000	mm^2

16.7.2 CALCULATED STRESSES(average of all tendons) :

	LENGTH		<TENDON HEIGHT(mm)>			Horizontal ratios			<-- STRESS(N/mm^2)-->		
SPAN	m	P	start	center	right	X1/L	X2/L	X3/L	start	center	right
1	4.80	1	-125.	-125.	-55.	.10	.50	.10	1224.14	1228.34	1274.63
2	9.60	1	-55.	-195.	-55.	.10	.50	.10	1274.63	1308.53	1314.61
3	9.60	1	-55.	-195.	-55.	.10	.50	.10	1314.61	1260.08	1241.17
4	9.15	1	-55.	-195.	-55.	.10	.50	.10	1241.17	1189.62	1197.55
5	9.15	1	-55.	-195.	-55.	.10	.50	.10	1197.55	1216.47	1267.36
6	9.30	1	-55.	-195.	-55.	.10	.50	.10	1267.36	1287.21	1336.36

7	9.30	1	-55.	-195.	-110.	.10	.50	.10	1336.36	1290.29	1256.43
8	2.30	1	-110.	-125.	-125.	.10	.50	.10	1256.43	1236.57	1236.16

Note: P= tendon profile (refer to legend of data block 9)
Stresses at each location are the average of strands after anchor set, and after long-term losses

16.8 TENDON SELECTION AND DATA:

			<------ TENDON EXTENTS ------>			ELONGATION		Stress ratios	
TYPE	OFF	FORCE	CAN<------ S P A N S ----->		CAN	LEFT	RIGHT	Anch.	Max.
			<1><2><3><4><5><6><7><8>			(mm)	(mm)		
-1----	2----	3----------	4----------		5------	6-------	7-----	8---	
A	16	175.69	<==========	========>		382.	35.	.75	.75

Note: Force is the average value per strand (kN)
Stress ratios are at anchorage (7) and maximum along tendon (8)

| ADAPT CORPORATION |
| STRUCTURAL CONCRETE SOFTWARE SYSTEM |
| 1733 Woodside Road, Suite 220, Redwood City, California 94061 |

| ADAPT-PT FOR POST-TENSIONED BEAM/SLAB DESIGN |
| Version 7.00 AMERICAN (ACI 318-99/UBC-77) |
| ADAPT CORPORATION - Structural Concrete Software System |
| 1733 Woodside Road, Suite 220, Redwood City, California 94061 |
| Phone: (650)306-2400, Fax: (650)364-4678 |
| Email: Support@AdaptSoft.com, Web site: http://www.AdaptSoft.com |

DATE AND TIME OF PROGRAM EXECUTION: Nov 27,2008 At Time: 21:20
PROJECT FILE: TPS3_EJEEa

P R O J E C T T I T L E:
UPC
TECHO SOTANO 3 EJE Ea

1 - USER SPECIFIED G E N E R A L D E S I G N P A R A M E T E R S

CONCRETE:
STRENGTH at 28 days, for BEAMS/SLABS ..... 30.00 N/mm^2
for COLUMNS ..... 30.00 N/mm^2

MODULUS OF ELASTICITY for BEAMS/SLABS ..... 25743.00 N/mm^2
for COLUMNS ..... 25743.00 N/mm^2

CREEP factor for deflections for BEAMS/SLABS 2.00
CONCRETE WEIGHT ..... NORMAL

SELF WEIGHT ..... 2500.00 Kg/m^3

TENSION STRESS limits (multiple of (f'c)1/2)
At Top ..... .529
At Bottom ..... .529

COMPRESSION STRESS limits (multiple of (f'c))
At all locations ..... .450

REINFORCEMENT:
YIELD Strength ..... 500.00 N/mm^2
Minimum Cover at TOP ..... 40.00 mm
Minimum Cover at BOTTOM ..... 40.00 mm

POST-TENSIONING:
SYSTEM ..... BONDED
Ultimate strength of strand ..... 1860.00 N/mm^2
Average effective stress in strand (final) ..... 1200.00 N/mm^2
Strand area..... 140.000 mm^2
Min CGS of tendon from TOP..... 55.00 mm
Min CGS of tendon from BOTTOM for INTERIOR spans.. 55.00 mm
Min CGS of tendon from BOTTOM for EXTERIOR spans.. 55.00 mm
Min average precompression ..... .90 N/mm^2

Max spacing between strands (factor of slab depth) 8.00
Tendon profile type and support widths..... (see section 9)

ANALYSIS OPTIONS USED:
Structural system ..... TWO-WAY
Moment of Inertia over support is ..... NOT INCREASED
Moments REDUCED to face of support ..... YES

2 - I N P U T G E O M E T R Y

2.1.1 PRINCIPAL SPAN DATA OF UNIFORM SPANS

SPAN	TYPE	FORM	LENGTH m	WIDTH mm	DEPTH mm	TOP FLANGE width mm	TOP FLANGE thick. mm	BOTTOM/MIDDLE FLANGE width mm	BOTTOM/MIDDLE FLANGE thick. mm	REF HEIGHT mm	MULTIPLIER left	MULTIPLIER right
1	U	1	4.80	6150	250					0	.50	.50
2	U	1	9.60	6150	250					0	.50	.50
3	U	1	9.60	6150	250					0	.50	.50
4	U	1	9.15	6150	250					0	.50	.50
5	U	1	9.15	6150	250					0	.50	.50
6	U	1	9.30	6150	250					0	.50	.50
7	U	1	9.30	6150	250					0	.50	.50
8	U	1	2.30	6150	250					0	.50	.50

LEGEND:
1 - SPAN
C = Cantilever
2 - TYPE
U = Uniform; prismatic
N = Nonuniform section
3 - FORM
1 = Rectangular section
2 = T or Inverted L section
3 = I section
4 = Extended T or L section
7 = Joist
8 = Waffle
11 - Top surface to reference line

2.2 - S U P P O R T W I D T H A N D C O L U M N D A T A

JOINT	SUPPORT WIDTH mm	LOWER COLUMN LENGTH m	LOWER COLUMN B(DIA) mm	LOWER COLUMN D mm	LOWER COLUMN CBC*	UPPER COLUMN LENGTH m	UPPER COLUMN B(DIA) mm	UPPER COLUMN D mm	UPPER COLUMN CBC*
1	500	4.00	500	500	(2)	.00	0	0	(3)
2	500	4.00	500	500	(2)	.00	0	0	(3)
3	500	4.00	500	500	(2)	.00	0	0	(3)
4	500	4.00	500	500	(2)	.00	0	0	(3)
5	500	4.00	500	500	(2)	.00	0	0	(3)
6	500	4.00	500	500	(2)	.00	0	0	(3)
7	500	4.00	500	500	(2)	.00	0	0	(3)
8	500	4.00	500	500	(2)	.00	0	0	(3)
9	500	4.00	500	500	(2)	.00	0	0	(3)

*THE COLUMN BOUNDARY CONDITION CODES (CBC)
Fixed at both ends ...(STANDARD) ..... = 1
Hinged at near end, fixed at far end ..... = 2
Fixed at near end, hinged at far end ..... = 3
Fixed at near end, roller with rotational fixity at far end .. = 4

3 - I N P U T A P P L I E D L O A D I N G

<---CLASS---> <----------TYPE----------->
D = DEAD LOAD U = UNIFORM P = PARTIAL UNIFORM
L = LIVE LOAD C = CONCENTRATED M = APPLIED MOMENT
Li= LINE LOAD
SW= SELF WEIGHT Computed from geometry input and treated as dead loading
Unit selfweight W = 2500.0 Kg/m^3

SPAN	CLASS	TYPE	Intensity kN/m^2	From ... m	To ... m	M or C ...At (kN-m or kN...m)	Total on Trib kN/m
1	L	U	4.000	.00	4.80		24.600
1	D	U	1.500	.00	4.80		9.225
1	SW	U		.00	4.80		37.707
2	L	U	4.000	.00	9.60		24.600
2	D	U	1.500	.00	9.60		9.225
2	SW	U		.00	9.60		37.707
3	L	U	4.000	.00	9.60		24.600
3	D	U	1.500	.00	9.60		9.225
3	SW	U		.00	9.60		37.707
4	L	U	4.000	.00	9.15		24.600
4	D	U	1.500	.00	9.15		9.225
4	SW	U		.00	9.15		37.707
5	L	U	4.000	.00	9.15		24.600
5	D	U	1.500	.00	9.15		9.225
5	SW	U		.00	9.15		37.707
6	L	U	4.000	.00	9.30		24.600
6	D	U	1.500	.00	9.30		9.225

6	SW	U		.00	9.30	37.707
7	L	U	4.000	.00	9.30	24.600
7	D	U	1.500	.00	9.30	9.225
7	SW	U		.00	9.30	37.707
8	L	U	4.000	.00	2.30	24.600
8	D	U	1.500	.00	2.30	9.225
8	SW	U		.00	2.30	37.707

NOTE: LIVE LOADING is SKIPPED with a skip factor of .70

3.1 - LOADING AS APPEARS IN USER`S INPUT SCREEN PRIOR TO PROCESSING

SPAN	CLASS	TYPE	UNIFORM (kN/m^2), LINE(kN/m)	(CON. or PART.) (kN@m or m-m)	(M O M E N T) (kN-m @ m)
1	L	U	4.000		
1	D	U	1.500		
2	L	U	4.000		
2	D	U	1.500		
3	L	U	4.000		
3	D	U	1.500		
4	L	U	4.000		
4	D	U	1.500		
5	L	U	4.000		
5	D	U	1.500		
6	L	U	4.000		
6	D	U	1.500		
7	L	U	4.000		
7	D	U	1.500		
8	L	U	4.000		
8	D	U	1.500		

NOTE: SELFWEIGHT INCLUSION REQUIRED
LIVE LOADING is SKIPPED with a skip factor of .70

4 - C A L C U L A T E D S E C T I O N P R O P E R T I E S

4.1 For Uniform Spans and Cantilevers only

SPAN	AREA mm^2	I mm^4	Yb mm	Yt mm
1	1537500.00	.8008E+10	125.00	125.00

2	1537500.00	.8008E+10	125.00	125.00
3	1537500.00	.8008E+10	125.00	125.00
4	1537500.00	.8008E+10	125.00	125.00
5	1537500.00	.8008E+10	125.00	125.00
6	1537500.00	.8008E+10	125.00	125.00
7	1537500.00	.8008E+10	125.00	125.00
8	1537500.00	.8008E+10	125.00	125.00

Note:
--- = Span/Cantilever is Nonuniform, see block 4.2

5 - D E A D L O A D M O M E N T S, S H E A R S & R E A C T I O N S

SPAN	< 5.1 S P A N M O M E N T S (kNm) > M(l)*	Midspan	M(r)*	< 5.2 SPAN SHEARS (kN) > SH(l)	SH(r)
1	.00	-3.00	-276.33	-55.07	170.21
2	-276.33	209.13	-386.72	-213.78	236.77
3	-386.72	178.26	-338.08	-230.34	220.21
4	-338.08	160.02	-324.20	-216.23	213.20
5	-324.20	164.81	-328.51	-214.24	215.18
6	-328.51	164.33	-357.62	-215.10	221.37
7	-357.62	193.92	-269.33	-227.73	208.74
8	-269.33	-103.63	.00	-171.07	-63.13

Note:
* = Centerline moments

JOINT	< 5.3 REACTIONS (kN) >	<- 5.4 COLUMN MOMENTS (kNm) -> Lower columns	Upper columns
1	55.07	.00	.00
2	383.98	.00	.00
3	467.11	.00	.00
4	436.44	.00	.00
5	427.44	.00	.00
6	430.29	.00	.00
7	449.09	.00	.00
8	379.81	.00	.00
9	-63.13	.00	.00

6 - L I V E L O A D M O M E N T S, S H E A R S & R E A C T I O N S

<-- 6.1 L I V E L O A D SPAN MOMENTS (kNm) and SHEAR FORCES (kN) -->

<----- left* -----> <--- midspan ---> <---- right* -----> <--SHEAR FORCE-->

SPAN	max	min	max	min	max	min	left	right
1	.00	.00	55.63	-56.73	-144.84	12.07	-43.84	89.21
2	-144.84	12.07	113.58	-36.85	-202.70	-56.12	-112.05	124.11
3	-202.70	-56.11	122.75	-57.35	-177.21	-33.18	-120.74	115.42
4	-177.21	-33.18	120.30	-61.59	-169.94	-37.18	-113.34	111.75
5	-169.94	-37.18	119.42	-58.95	-172.19	-36.02	-112.30	112.79
6	-172.19	-36.01	114.33	-54.03	-187.45	-44.20	-112.75	116.03
7	-187.45	-44.20	101.64	-27.19	-141.17	32.62	-119.37	109.41
8	-141.17	32.63	27.70	-65.72	.00	.00	-89.67	-57.15

Note:
* = Centerline moments

	<- 6.2 REACTIONS (kN) ->		<-------- 6.3 COLUMN MOMENTS (kNm) -------->			
			<--- LOWER COLUMN --->		<--- UPPER COLUMN --->	
JOINT	max	min	max	min	max	min
1	62.63	-33.77	.00	.00	.00	.00
2	226.08	40.89	.00	.00	.00	.00
3	267.00	109.18	.00	.00	.00	.00
4	266.53	88.53	.00	.00	.00	.00
5	265.12	91.14	.00	.00	.00	.00
6	261.24	90.40	.00	.00	.00	.00
7	255.03	97.97	.00	.00	.00	.00
8	236.17	-10.35	.00	.00	.00	.00
9	48.55	-81.64	.00	.00	.00	.00

Note: Block 6.1 through 6.3 values are maxima of all skipped loading cases

7 - M O M E N T S REDUCED TO FACE-OF-SUPPORT

7.1 R E D U C E D DEAD LOAD MOMENTS (kNm)

SPAN	<- left* ->	<- midspan ->	<- right* ->
1	12.30	-3.00	-235.20
2	-224.40	209.10	-329.00
3	-330.60	178.30	-284.50
4	-285.50	160.00	-272.40
5	-272.10	164.80	-276.20
6	-276.20	164.30	-303.70
7	-302.20	193.90	-218.60
8	-228.00	-103.60	-17.25

Note:
* = face-of-support

7.2 R E D U C E D LIVE LOAD MOMENTS (kNm)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	-5.91	10.42	55.63	-56.73	-123.30	21.24
2	-117.60	9.52	113.60	-36.85	-172.40	-37.49
3	-173.30	-41.20	122.80	-57.35	-149.10	-32.50
4	-149.60	-17.57	120.30	-61.59	-142.80	-21.53
5	-142.60	-22.08	119.40	-58.95	-144.80	-20.32
6	-144.80	-29.51	114.30	-54.03	-159.20	-41.82
7	-158.40	-27.07	101.60	-27.19	-114.60	29.41
8	-119.50	33.49	27.70	-65.72	-14.29	7.96

Note:
* = face-of-support

8 - SUM OF DEAD AND LIVE MOMENTS (kNm)

Maxima of dead load and live load span moments combined
for serviceability checks (1.00DL + .70LL)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	8.16	19.59	35.94	-42.71	-321.51	-220.33
2	-306.72	-217.73	288.62	183.31	-449.68	-355.24
3	-451.91	-359.44	264.26	138.15	-388.87	-307.25
4	-390.22	-297.80	244.21	116.89	-372.36	-287.47
5	-371.92	-287.56	248.38	123.54	-377.56	-290.42
6	-377.56	-296.86	244.31	126.48	-415.14	-332.97
7	-413.08	-321.15	265.02	174.87	-298.82	-198.01
8	-311.65	-204.56	-84.21	-149.60	-27.25	-11.68

Note:
* = face-of-support

9 - SELECTED POST-TENSIONING FORCES AND TENDON PROFILES

9.1 PROFILE TYPES AND PARAMETERS

LEGEND:
For Span:
1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon

For Cantilever:
1 = simple parabola

2 = partial parabola
3 = harped tendon

9.2 T E N D O N P R O F I L E

SPAN	TYPE	X1/L	X2/L	X3/L	A/L
1	1	.100	.500	.100	.000
2	1	.100	.500	.100	.000
3	1	.100	.500	.100	.000
4	1	.100	.500	.100	.000
5	1	.100	.500	.100	.000
6	1	.100	.500	.100	.000
7	1	.100	.500	.100	.000
8	1	.100	.500	.100	.000

9.3 - SELECTED POST-TENSIONING FORCES AND TENDON DRAPE

Tendon editing mode selected: TENDON SELECTION

SPAN	<-- SELECTED VALUES --> FORCE (kN/-)	<- DISTANCE OF CGS (mm) -> Left	Center	Right	<-- CALCULATED VALUES --> P/A (N/mm^2)	Wbal (kN/-)	Wbal (%DL)
1	2234.603	-125.00	-125.00	-55.00	1.45	27.157	58
2	2379.647	-55.00	-195.00	-55.00	1.55	28.919	62
3	2291.624	-55.00	-195.00	-55.00	1.49	27.850	59
4	2163.454	-55.00	-195.00	-55.00	1.41	28.942	62
5	2212.302	-55.00	-195.00	-55.00	1.44	29.595	63
6	2340.934	-55.00	-195.00	-55.00	1.52	30.314	65
7	2346.660	-55.00	-195.00	-110.00	1.53	24.419	52
8	2249.562	-110.00	-125.00	-125.00	1.46	25.515	54

Approximate weight of strand ..... 917.3 Kg

9.35 - TENDON SELECTION DATA:

TYPE	SEL. FORCE (kN)	<-- TENDON EXTENTS --> <1>	<2>	<3>	<4>	<5>	<6>	<7>	<8>
A	13 175.59	<=							=>

9.5 R E Q U I R E D MINIMUM P O S T - T E N S I O N I N G FORCES (kN)

SPAN	<- BASED ON STRESS CONDITIONS -> LEFT*	CENTER	RIGHT*	<- BASED ON MINIMUM P/A -> LEFT	CENTER	RIGHT
1	.00	.00	1275.22	1383.80	1383.80	1383.80

2	1120.78	985.62	2073.59	1383.80	1383.80	1383.80
3	2065.93	815.32	1653.32	1383.80	1383.80	1383.80
4	1654.64	594.89	1482.05	1383.80	1383.80	1383.80
5	1491.32	643.53	1524.61	1383.80	1383.80	1383.80
6	1538.67	592.05	1930.89	1383.80	1383.80	1383.80
7	1895.05	891.29	1258.80	1383.80	1383.80	1383.80
8	1487.74	.00	.00	1383.80	1383.80	1383.80

Note:
* = face-of-support

9.6 S E R V I C E S T R E S S E S (N/mm^2) (tension shown positive)

	L E F T *				R I G H T *			
	TOP		BOTTOM		TOP		BOTTOM	
	max-T	max-C	max-T	max-C	max-T	max-C	max-T	max-C
1	-----	-1.60	-----	-1.18	1.60	-----	-----	-4.27
2	1.27	-.12	-----	-3.98	2.75	-----	-----	-5.54
3	2.79	-----	-----	-5.55	2.18	-----	-----	-4.82
4	2.23	-----	-----	-4.83	2.02	-----	-----	-4.53
5	2.00	-----	-----	-4.54	1.88	-----	-----	-4.54
6	1.87	-----	-----	-4.56	2.46	-----	-----	-5.28
7	2.42	-----	-----	-5.22	1.78	-----	-----	-4.45
8	2.17	-----	-----	-4.82	-----	-1.26	-----	-1.62

Note:
* = face-of-support

	C E N T E R			
	TOP		BOTTOM	
	max-T	max-C	max-T	max-C
1	-----	-1.80	-----	-2.04
2	-----	-3.80	1.01	-.63
3	-----	-3.70	1.02	-.95
4	-----	-3.35	.82	-1.17
5	-----	-3.44	.85	-1.10
6	-----	-3.29	.55	-1.29
7	-----	-3.95	1.20	-.21
8	.46	-.56	-----	-3.09

9.7 POST-TENSIONING B A L A N C E D M O M E N T S, SHEARS & REACTIONS

SPAN	<-- S P A N M O M E N T S (kNm) --> left*	midspan	right*	<-- SPAN SHEARS (kN) --> SH(l)	SH(r)
1	-.51	-4.88	148.20	2.03	2.03
2	153.70	-149.60	204.40	-5.57	-5.57
3	205.40	-125.30	182.90	1.80	1.80
4	182.30	-123.00	180.60	-.44	-.44

5	180.70	-123.60	191.00	-.17	-.17
6	191.00	-134.70	186.00	.61	.61
7	187.30	-111.40	110.30	-5.71	-5.71
8	97.64	39.71	8.63	34.53	34.53

Note:
* = face-of-support

joint	<--REACTIONS (kN)-->	<-- COLUMN MOMENTS (kNm) --> Lower columns	Upper columns
1	-2.032	.000	.000
2	7.604	.000	.000
3	-7.376	.000	.000
4	2.242	.000	.000
5	-.269	.000	.000
6	-.780	.000	.000
7	6.321	.000	.000
8	-40.240	.000	.000
9	34.530	.000	.000

10 - F A C T O R E D M O M E N T S & R E A C T I O N S

Calculated as (1.35D + 1.50L + 1.00 secondary moment effects)

10.1 FACTORED DESIGN MOMENTS (kNm)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	7.23	31.73	74.52	-94.02	-511.72	-294.91
2	-487.70	-297.02	469.69	244.04	-660.41	-458.04
3	-662.97	-464.82	459.85	189.71	-580.85	-405.96
4	-583.29	-385.25	424.91	152.08	-551.59	-369.68
5	-550.73	-369.96	432.85	165.29	-558.11	-371.39
6	-558.22	-385.29	422.50	169.96	-622.33	-446.26
7	-617.83	-420.84	467.12	273.87	-389.02	-173.01
8	-416.26	-186.78	-58.64	-198.78	-36.09	-2.71

Note:
* = face-of-support

10.2 SECONDARY MOMENTS (kNm)

SPAN	<-- left* -->	<- midspan ->	<-- right* -->
1	-.51	-4.88	-9.25
2	-8.36	16.99	42.34
3	43.29	35.08	26.87

4	26.53	28.44	30.35
5	30.50	31.23	31.96
6	31.85	29.16	26.47
7	27.74	52.87	77.99
8	70.79	39.71	8.63

Note:
* = face-of-support

JOINT	10.3 FACTORED REACTIONS (kN) max	min	10.4 FACTORED COLUMN MOMENTS (kNm) <-- LOWER column --> max	min	<-- UPPER column --> max	min
1	166.26	21.66	.00	.00	.00	.00
2	865.15	587.34	.00	.00	.00	.00
3	1023.71	787.01	.00	.00	.00	.00
4	991.13	724.18	.00	.00	.00	.00
5	974.37	713.43	.00	.00	.00	.00
6	971.93	715.73	.00	.00	.00	.00
7	995.11	759.56	.00	.00	.00	.00
8	826.79	456.96	.00	.00	.00	.00
9	22.13	-173.16	.00	.00	.00	.00

11 - M I L D S T E E L

Support cut-off length for minimum steel(length/span) ... .17
Span cut-off length for minimum steel(length/span) ... .33
Top bar extension beyond where required ..... 900.00 mm
Bottom bar extension beyond where required ..... 900.00 mm

REINFORCEMENT based on NO REDISTRIBUTION of factored moments

11.1 TOTAL WEIGHT OF REBAR = 161.7 Kg AVERAGE = .4 Kg/m^2
TOTAL AREA COVERED = 388.68 m^2

11.2.1 S T E E L A T M I D - S P A N

SPAN	TOP As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT-----TENS-------->			BOTTOM As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT-----TENS-------->		
1	0	(0	0	0)	0	(0	0	0)
2	0	(0	0	0)	0	(0	0	0)
3	0	(0	0	0)	0	(0	0	0)
4	0	(0	0	0)	0	(0	0	0)
5	0	(0	0	0)	0	(0	0	0)
6	0	(0	0	0)	0	(0	0	0)
7	0	(0	0	0)	0	(0	0	0)

8	0	(	0	0	0)	0	(	0	0	0)

11.3.1 S T E E L A T S U P P O R T S

	T O P					B O T T O M			
JOINT	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		-----MIN--------->	As (mm^2)	DIFFERENT REBAR CRITERIA <---ULT		-----MIN--------->	
1	0	(	0	0	0)	0	(	0	0	0)
2	0	(	0	0	0)	0	(	0	0	0)
3	1815	(	1815	0	0)	0	(	0	0	0)
4	777	(	777	0	0)	0	(	0	0	0)
5	373	(	373	0	0)	0	(	0	0	0)
6	450	(	450	0	0)	0	(	0	0	0)
7	1284	(	1284	0	0)	0	(	0	0	0)
8	720	(	720	0	0)	0	(	0	0	0)
9	0	(	0	0	0)	0	(	0	0	0)

11.2.2 & 11.3.2 LISTING OF THE ENTIRE PROVIDED REBAR

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]	AREA [mm^2]
2	1	T	5	# 16 x	2760	995
2	2	T	5	# 16 x	1800	995
3	3	T	4	# 16 x	1800	796
4	4	T	4	# 16 x	1800	796
5	5	T	4	# 16 x	1800	796
6	6	T	4	# 16 x	2740	796
6	7	T	3	# 16 x	1800	597
7	8	T	2	# 16 x	2260	398
7	9	T	2	# 16 x	2140	398

Notes:
Bar location - T = Top, B = Bottom.
NUM - Number of bars.
For two-way systems a minimum of 4 bars is specified over the supports.
Refer to tables 11.5.1,11.5.2 and PTsum graphical display for positioning of bars.

11.5.1 ARRANGEMENT OF TOP BARS

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]
		TOP STEEL			
2	1	RIGHT	5	# 16 x	1379
2	2	RIGHT	5	# 16 x	1800
3	1	LEFT	5	# 16 x	1380
3	3	RIGHT	4	# 16 x	900
3	2	LEFT	5	# 16 x	900
4	3	LEFT	2	# 16 x	900
4	4	RIGHT	4	# 16 x	900
5	4	LEFT	2	# 16 x	900
5	5	RIGHT	4	# 16 x	900
6	5	LEFT	2	# 16 x	900
6	6	RIGHT	4	# 16 x	1365
6	7	RIGHT	3	# 16 x	900
7	6	LEFT	4	# 16 x	1365
7	8	RIGHT	2	# 16 x	900
7	7	LEFT	3	# 16 x	900
7	9	RIGHT	2	# 16 x	900
8	8	LEFT	2	# 16 x	1360
8	9	LEFT	2	# 16 x	1245

11.5.2 ARRANGEMENT OF BOTTOM BARS

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]
		BOTTOM STEEL			

12 - P U N C H I N G S H E A R C H E C K

LEGEND:
CONDITION... 1 = INTERIOR COLUMN
2 = END COLUMN
3 = CORNER COLUMN
4 = EDGE COLUMN (PARALLEL TO SPAN)
5 = EDGE BEAM, WALL, OR OTHER NON-CONFORMING GEOMETRY
PERFORM SHEAR CHECK MANUALLY
6 = STRIP TOO NARROW TO DEVELOP PUNCHING SHEAR

CASE..... 1 = STRESS WITHIN SECTION #1 GOVERNS (COL.CAP OR SLAB)
2 = STRESS WITHIN SECTION #2 GOVERNS (DROP PANEL OR SLAB)

		FACTORED ACTIONS		<- PUNCHING SHEAR STRESSES IN N/mm^2 ->					
		shear	moment	due to	due to		allow-	STRESS	
JNT	COND.	kN	kN-m	shear	moment	TOTAL	able	RATIO	CASE
1	2	166.26	.00	.44	.00	.44	1.55	.28	1
2	1	865.15	.00	1.54	.00	1.54	1.74	.89	1
3	1	1023.71	.00	1.83	.00	1.83	1.74	1.05	1

4	1	991.13	.00	1.77	.00	1.77	1.73	1.02	1
5	1	974.37	.00	1.74	.00	1.74	1.72	1.01	1
6	1	971.93	.00	1.74	.00	1.74	1.74	1.00	1
7	1	995.11	.00	1.78	.00	1.78	1.74	1.02	1
8	1	826.79	.00	1.48	.00	1.48	1.74	.85	1
9	2	173.16	.00	.46	.00	.46	1.55	.29	1

PUNCHING SHEAR STRESS IN ONE OR MORE LOCATIONS EXCEEDS THE PERMISSIBLE VALUE. PROVIDE SHEAR REINFORCEMENT, OR ENLARGE THE SECTION RESISTING THE PUNCHING SHEAR

13 - MAXIMUM S P A N D E F L E C T I O N S

Concrete`s modulus of elasticity ..... Ec = 25743 N/mm^2
Creep factor ..... K = 2.00
Ieffective/Igross...(due to cracking)..... K = .99

Where stresses exceed 0.5(fc`)^1/2 cracking of section is allowed for.
Values in parentheses are (span/max deflection) ratios

<.....DEFLECTION ARE ALL IN mm , DOWNWARD POSITIVE.....>

SPAN	DL	DL+PT	DL+PT+CREEP	LL	DL+PT+LL+CREEP
1	-.6	-.3	-.9(5133)	-.3(15951)	-1.2(3883)
2	6.6	2.2	6.6(1451)	3.5(2755)	10.1(950)
3	4.9	1.6	4.9(1957)	2.6(3731)	7.5(1283)
4	4.0	.9	2.8(3281)	2.1(4416)	4.9(1882)
5	4.2	1.2	3.7(2499)	2.2(4158)	5.9(1561)
6	4.2	.7	2.0(4633)	2.2(4255)	4.2(2218)
7	5.7	2.8	8.4(1111)	3.0(3096)	11.4(817)
8	-.4	-.2	-.7(3470)	-.2(11986)	-.9(2691)

14 - I N I T I A L CONDITION STRESS CHECK & REINFORCEMENT REQUIREMENTS

14.1 Parameters specified as input for initial stress checks:

Concrete f`c (initial/final)	.75	Tensile stresses divided by (f`c)^1/2	
PT force (initial/final) ...	1.10	Top fiber	.25
Dead loading (initial/final)	1.00	Bottom fiber	.25
Live loading (initial/final)	.00	Compression as ratio of f`c	.60

Note: Reinforcement reported in this data block is in addition to that reported in data block 11 for minimum strength reinforcement required by code.

14.2 NO added MILD REINFORCEMENT is required at MID-SPAN or SUPPORT

14.3 Compressive stresses
COMPRESSIVE stresses are within allowable limit (.60 * f`ci)
MAXIMUM stress..... = .21 * f`ci
(f`ci = initial concrete strength)

16 - FRICTION, ELONGATION AND LONG TERM STRESS LOSSES

16.6 LONG TERM STRESS LOSS CALCULATIONS

16.6.1 INPUT PARAMETERS :

Type of strand	LOW LAX	
Modulus of elasticity of strand	200000.00	N/mm^2
Average weight of concrete	NORMAL	
Estimate age of concrete at stressing	7	days
Modulus of elasticity of concrete at stressing	23322.00	N/mm^2
Modulus of elasticity of concrete at 28 days	25743.00	N/mm^2
Estimate of average relative humidity	80.00	%
Volume to surface ratio of member	150.00	mm

16.6.2 CALCULATED LONG-TERM STRESS LOSS(average of all tendons) :

SPAN	<----- STRESS (N/mm^2) -----> start	center	right
1	65.14	65.22	54.21
2	54.21	66.21	51.00
3	51.00	62.73	46.11
4	46.11	55.59	42.23
5	42.23	58.52	50.86
6	50.86	68.10	54.22
7	54.22	60.89	63.06
8	63.06	67.02	65.37

16.7 FRICTION AND ELONGATION CALCULATIONS

16.7.1 INPUT PARAMETERS :

Coefficient of angular friction (meu)	.220	/rad
Coefficient of wobble friction (K)	.0012	/m
Ultimate strength of strand	1860.0	N/mm^2
Ratio of jacking stress to strand's ultimate strength	.800	
Anchor set	6.000	mm
Cross-sectional area of strand	140.000	mm^2

16.7.2 CALCULATED STRESSES(average of all tendons) :

SPAN	LENGTH m	P	<TENDON HEIGHT(mm)> start	center	right	Horizontal ratios X1/L	X2/L	X3/L	<-- STRESS(N/mm^2)--> start	center	right
1	4.80	1	-125.	-125.	-55.	.10	.50	.10	1223.60	1227.80	1273.58
2	9.60	1	-55.	-195.	-55.	.10	.50	.10	1273.58	1307.50	1314.12
3	9.60	1	-55.	-195.	-55.	.10	.50	.10	1314.12	1259.13	1240.04
4	9.15	1	-55.	-195.	-55.	.10	.50	.10	1240.04	1188.71	1196.43
5	9.15	1	-55.	-195.	-55.	.10	.50	.10	1196.43	1215.55	1266.19
6	9.30	1	-55.	-195.	-55.	.10	.50	.10	1266.19	1286.23	1335.18

7	9.30	1	-55.	-195.	-110.	.10	.50	.10	1335.18	1289.37	1255.80
8	2.30	1	-110.	-125.	-125.	.10	.50	.10	1255.80	1236.02	1235.62

Note: P= tendon profile (refer to legend of data block 9)
Stresses at each location are the average of strands after anchor set, and after long-term losses

16.8 TENDON SELECTION AND DATA:

TYPE	OFF	FORCE	CAN	<------ TENDON EXTENTS ------> <1><2><3><4><5><6><7><8>	CAN	ELONGATION LEFT (mm)	RIGHT (mm)	Stress ratios Anch.	Max.
A	13	175.59		<==========		382.	35.	.75	.75

Note: Force is the average value per strand (kN)
Stress ratios are at anchorage (7) and maximum along tendon (8)

ADAPT CORPORATION
STRUCTURAL CONCRETE SOFTWARE SYSTEM
1733 Woodside Road, Suite 220, Redwood City, California 94061

ADAPT-PT FOR POST-TENSIONED BEAM/SLAB DESIGN
Version 7.00 AMERICAN (ACI 318-99/UBC-77)

ADAPT CORPORATION - Structural Concrete Software System
1733 Woodside Road, Suite 220, Redwood City, California 94061
Phone: (650)306-2400, Fax: (650)364-4678
Email: Support@AdaptSoft.com, Web site: http://www.AdaptSoft.com

DATE AND TIME OF PROGRAM EXECUTION: Nov 27,2008 At Time: 21:21
PROJECT FILE: TPS3_EJEH

P R O J E C T T I T L E:
UPC
TECHO SOTANO 3 EJE H

1 - USER SPECIFIED G E N E R A L D E S I G N P A R A M E T E R S

CONCRETE:
STRENGTH at 28 days, for BEAMS/SLABS ..... 30.00 N/mm^2
for COLUMNS ..... 30.00 N/mm^2

MODULUS OF ELASTICITY for BEAMS/SLABS ..... 25743.00 N/mm^2
for COLUMNS ..... 25743.00 N/mm^2

CREEP factor for deflections for BEAMS/SLABS 2.00
CONCRETE WEIGHT ..... NORMAL

SELF WEIGHT ..... 2500.00 Kg/m^3

TENSION STRESS limits (multiple of (f'c)1/2)
At Top ..... .529
At Bottom ..... .529

COMPRESSION STRESS limits (multiple of (f'c))
At all locations ..... .450

REINFORCEMENT:
YIELD Strength ..... 500.00 N/mm^2
Minimum Cover at TOP ..... 40.00 mm
Minimum Cover at BOTTOM ..... 40.00 mm

POST-TENSIONING:
SYSTEM ..... BONDED
Ultimate strength of strand ..... 1860.00 N/mm^2
Average effective stress in strand (final) ..... 1200.00 N/mm^2
Strand area..... 140.000 mm^2
Min CGS of tendon from TOP..... 55.00 mm
Min CGS of tendon from BOTTOM for INTERIOR spans.. 55.00 mm
Min CGS of tendon from BOTTOM for EXTERIOR spans.. 55.00 mm
Min average precompression ..... .90 N/mm^2

Max spacing between strands (factor of slab depth) 8.00
Tendon profile type and support widths..... (see section 9)

ANALYSIS OPTIONS USED:
Structural system ..... TWO-WAY
Moment of Inertia over support is ..... NOT INCREASED
Moments REDUCED to face of support ..... YES

2 - I N P U T G E O M E T R Y

2.1.1 PRINCIPAL SPAN DATA OF UNIFORM SPANS

SPAN	TYPE	FORM	LENGTH m	WIDTH mm	DEPTH mm	TOP FLANGE width mm	TOP FLANGE thick. mm	BOTTOM/MIDDLE FLANGE width mm	BOTTOM/MIDDLE FLANGE thick. mm	REF HEIGHT mm	MULTIPLIER left	MULTIPLIER right
1	U	1	7.75	6330	250					0	.50	.50
2	U	1	9.15	6330	250					0	.50	.50
3	U	1	9.30	6330	250					0	.50	.50
4	U	1	9.15	6330	250					0	.50	.50
5	U	1	2.00	6330	250					0	.50	.50

LEGEND:
1 - SPAN
C = Cantilever
2 - TYPE
U = Uniform; prismatic
N = Nonuniform section
3 - FORM
1 = Rectangular section
2 = T or Inverted L section
3 = I section
4 = Extended T or L section
7 = Joist
8 = Waffle
11 - Top surface to reference line

2.2 - S U P P O R T W I D T H A N D C O L U M N D A T A

JOINT	SUPPORT WIDTH mm	LOWER COLUMN LENGTH m	LOWER COLUMN B(DIA) mm	LOWER COLUMN D mm	LOWER COLUMN CBC*	UPPER COLUMN LENGTH m	UPPER COLUMN B(DIA) mm	UPPER COLUMN D mm	UPPER COLUMN CBC*
1	500	4.00	500	500	(2)	.00	0	0	(3)
2	500	4.00	500	500	(2)	.00	0	0	(3)
3	500	4.00	500	500	(2)	.00	0	0	(3)
4	500	4.00	500	500	(2)	.00	0	0	(3)
5	500	4.00	500	500	(2)	.00	0	0	(3)
6	500	4.00	500	500	(2)	.00	0	0	(3)

*THE COLUMN BOUNDARY CONDITION CODES (CBC)
Fixed at both ends ...(STANDARD) ..... = 1
Hinged at near end, fixed at far end ..... = 2
Fixed at near end, hinged at far end ..... = 3
Fixed at near end, roller with rotational fixity at far end .. = 4

3 - I N P U T A P P L I E D L O A D I N G

<---CLASS---> <----------TYPE----------->
D = DEAD LOAD U = UNIFORM P = PARTIAL UNIFORM
L = LIVE LOAD C = CONCENTRATED M = APPLIED MOMENT
Li= LINE LOAD
SW= SELF WEIGHT Computed from geometry input and treated as dead loading
Unit selfweight W = 2500.0 Kg/m^3

SPAN	CLASS	TYPE	Intensity kN/m^2	From ... m	To m	M or C ...At (kN-m or kN...m)	Total on Trib kN/m
1	L	U	4.000	.00	7.75		25.320
1	D	U	1.500	.00	7.75		9.495
1	SW	U		.00	7.75		38.811
2	L	U	4.000	.00	9.15		25.320
2	D	U	1.500	.00	9.15		9.495
2	SW	U		.00	9.15		38.811
3	L	U	4.000	.00	9.30		25.320
3	D	U	1.500	.00	9.30		9.495
3	SW	U		.00	9.30		38.811
4	L	U	4.000	.00	9.15		25.320
4	D	U	1.500	.00	9.15		9.495
4	SW	U		.00	9.15		38.811
5	L	U	4.000	.00	2.00		25.320
5	D	U	1.500	.00	2.00		9.495
5	SW	U		.00	2.00		38.811

NOTE: LIVE LOADING is SKIPPED with a skip factor of .70

3.1 - LOADING AS APPEARS IN USER`S INPUT SCREEN PRIOR TO PROCESSING

SPAN	CLASS	TYPE	UNIFORM (kN/m^2), LINE(kN/m)	(CON. or PART.) (kN@m or m-m)	(M O M E N T) (kN-m @ m)
1	L	U	4.000		
1	D	U	1.500		
2	L	U	4.000		
2	D	U	1.500		
3	L	U	4.000		
3	D	U	1.500		
4	L	U	4.000		
4	D	U	1.500		
5	L	U	4.000		
5	D	U	1.500		

NOTE: SELFWEIGHT INCLUSION REQUIRED
LIVE LOADING is SKIPPED with a skip factor of .70

4 - C A L C U L A T E D S E C T I O N P R O P E R T I E S

4.1 For Uniform Spans and Cantilevers only

SPAN	AREA mm^2	I mm^4	Yb mm	Yt mm
1	1582500.00	.8242E+10	125.00	125.00
2	1582500.00	.8242E+10	125.00	125.00
3	1582500.00	.8242E+10	125.00	125.00
4	1582500.00	.8242E+10	125.00	125.00
5	1582500.00	.8242E+10	125.00	125.00

Note:
--- = Span/Cantilever is Nonuniform, see block 4.2

5 - D E A D L O A D M O M E N T S, S H E A R S & R E A C T I O N S

SPAN	< 5.1 S P A N M O M E N T S (kNm) > M(l)*	Midspan	M(r)*	< 5.2 SPAN SHEARS (kN) > SH(l)	SH(r)
1	.00	188.27	-348.81	-142.18	232.19
2	-348.81	163.17	-335.93	-222.41	219.59
3	-335.93	173.32	-361.91	-221.83	227.42
4	-361.92	189.36	-270.43	-231.00	211.00
5	-270.42	-111.06	.00	-183.52	-86.91

Note:
* = Centerline moments

JOINT	< 5.3 REACTIONS (kN) >	<- 5.4 COLUMN MOMENTS (kNm) -> Lower columns	Upper columns
1	142.18	.00	.00
2	454.60	.00	.00
3	441.42	.00	.00
4	458.41	.00	.00
5	394.52	.00	.00
6	-86.91	.00	.00

6 - L I V E L O A D M O M E N T S, S H E A R S & R E A C T I O N S

<-- 6.1 L I V E L O A D SPAN MOMENTS (kNm) and SHEAR FORCES (kN) -->

SPAN	<----- left* -----> max	min	<--- midspan ---> max	min	<---- right* -----> max	min	<--SHEAR FORCE--> left	right
1	.00	.00	111.12	-42.04	-182.83	-43.89	-74.52	121.71
2	-182.83	-43.89	113.38	-53.51	-176.08	-42.71	-116.58	115.10
3	-176.08	-42.71	115.40	-51.80	-189.70	-43.48	-116.27	119.20
4	-189.70	-43.48	99.26	-27.13	-141.75	35.06	-121.08	110.60
5	-141.74	35.05	26.39	-67.14	.00	.00	-96.19	-67.14

Note:
* = Centerline moments

JOINT	<- 6.2 REACTIONS (kN) -> max	min	<-------- 6.3 COLUMN MOMENTS (kNm) --------> <--- LOWER COLUMN ---> max	min	<--- UPPER COLUMN ---> max	min
1	90.02	-15.50	.00	.00	.00	.00
2	258.28	103.20	.00	.00	.00	.00
3	264.07	98.32	.00	.00	.00	.00
4	260.83	99.11	.00	.00	.00	.00
5	250.35	-19.14	.00	.00	.00	.00
6	50.36	-95.91	.00	.00	.00	.00

Note: Block 6.1 through 6.3 values are maxima of all skipped loading cases

7 - M O M E N T S REDUCED TO FACE-OF-SUPPORT

7.1 R E D U C E D DEAD LOAD MOMENTS (kNm)

SPAN	<- left* ->	<- midspan ->	<- right* ->

1	34.03	188.30	-292.30
2	-294.70	163.20	-282.50
3	-282.00	173.30	-306.60
4	-305.70	189.40	-219.20
5	-226.10	-111.10	-23.23

Note:
* = face-of-support

7.2 R E D U C E D LIVE LOAD MOMENTS (kNm)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	-2.71	17.84	111.10	-42.04	-153.20	-25.86
2	-154.50	-40.51	113.40	-53.51	-148.10	-25.92
3	-147.80	-28.26	115.40	-51.80	-160.70	-43.93
4	-160.20	-26.25	99.26	-27.13	-114.90	31.66
5	-118.50	34.55	26.39	-67.14	-16.78	8.26

Note:
* = face-of-support

8 - SUM OF DEAD AND LIVE MOMENTS (kNm)

Maxima of dead load and live load span moments combined
for serviceability checks (1.00DL + .70LL)

SPAN	<----- left* ------> max	min	<---- midspan ----> max	min	<----- right* -----> max	min
1	32.13	46.52	266.07	158.87	-399.54	-310.40
2	-402.85	-323.06	242.58	125.74	-386.17	-300.64
3	-385.46	-301.78	254.08	137.04	-419.09	-337.35
4	-417.84	-324.08	258.88	170.41	-299.63	-197.04
5	-309.05	-201.91	-92.63	-158.10	-34.98	-17.45

Note:
* = face-of-support

9 - SELECTED POST-TENSIONING FORCES AND TENDON PROFILES

9.1 PROFILE TYPES AND PARAMETERS

LEGEND:
For Span:

1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon

For Cantilever:
1 = simple parabola
2 = partial parabola
3 = harped tendon

9.2 T E N D O N P R O F I L E

	TYPE	X1/L	X2/L	X3/L	A/L
1	1	.100	.500	.100	.000
2	1	.100	.500	.100	.000
3	1	.100	.500	.100	.000
4	1	.100	.500	.100	.000
5	1	.100	.500	.100	.000

9.3 - SELECTED POST-TENSIONING FORCES AND TENDON DRAPE

Tendon editing mode selected: TENDON SELECTION

	<-- SELECTED VALUES -->				<--- CALCULATED VALUES --->		
	FORCE	<- DISTANCE OF CGS (mm) ->			P/A	Wbal	Wbal
SPAN	(kN/-)	Left	Center	Right	(N/mm^2)	(kN/-)	(%DL)
1	2435.259	-125.00	-195.00	-55.00	1.54	34.058	71
2	2541.374	-55.00	-195.00	-55.00	1.61	33.997	70
3	2400.123	-55.00	-195.00	-55.00	1.52	31.080	64
4	2277.698	-55.00	-195.00	-110.00	1.44	24.485	51
5	2186.043	-110.00	-125.00	-125.00	1.38	32.791	68

Approximate weight of strand ..... 590.1 Kg

9.35 - TENDON SELECTION DATA:

TYPE	SEL. FORCE (kN)	<-- TENDON EXTENTS --> <1>	<2>	<3>	<4>	<5>
A	14 171.55	<=				

9.5 R E Q U I R E D MINIMUM P O S T - T E N S I O N I N G FORCES (kN)

	<- BASED ON STRESS CONDITIONS ->			<- BASED ON MINIMUM P/A ->		
SPAN	LEFT*	CENTER	RIGHT*	LEFT	CENTER	RIGHT
1	.00	737.42	1618.25	1424.30	1424.30	1424.30

2	1643.91	537.11	1575.97	1424.30	1424.30	1424.30
3	1557.74	630.86	1883.56	1424.30	1424.30	1424.30
4	1848.43	763.07	1196.25	1424.30	1424.30	1424.30
5	1402.94	.00	.00	1424.30	1424.30	1424.30

Note:
* = face-of-support

9.6 S E R V I C E S T R E S S E S (N/mm^2) (tension shown positive)

	L E F T *				R I G H T *			
	TOP		BOTTOM		TOP		BOTTOM	
	max-T	max-C	max-T	max-C	max-T	max-C	max-T	max-C
1	-----	-2.03	-----	-.89	1.67	-----	-----	-4.51
2	1.66	-----	-----	-4.54	1.64	-----	-----	-4.48
3	1.66	-----	-----	-4.45	2.45	-----	-----	-5.14
4	2.43	-----	-----	-5.08	1.79	-----	-----	-4.32
5	2.16	-----	-----	-4.66	-----	-1.11	-----	-1.64

Note:
* = face-of-support

	C E N T E R			
	TOP		BOTTOM	
	max-T	max-C	max-T	max-C
1	-----	-3.42	.65	-.97
2	-----	-3.24	.35	-1.42
3	-----	-3.31	.58	-1.20
4	-----	-3.75	1.16	-.18
5	.61	-.38	-----	-3.10

9.7 POST-TENSIONING B A L A N C E D M O M E N T S, SHEARS & REACTIONS

	<-- S P A N M O M E N T S (kNm) -->			<-- SPAN SHEARS (kN) -->	
SPAN	left*	midspan	right*	SH(l)	SH(r)
1	-1.98	-146.20	217.60	-6.26	-6.26
2	220.70	-137.70	204.90	1.83	1.83
3	204.50	-139.80	187.80	.79	.79
4	189.10	-107.40	109.30	-6.01	-6.01
5	93.48	39.76	9.94	39.76	39.76

Note:
* = face-of-support

	<--REACTIONS (kN)-->	<-- COLUMN MOMENTS (kNm) -->	
joint		Lower columns	Upper columns
1	6.264	.000	.000

2	-8.091	.000	.000
3	1.040	.000	.000
4	6.802	.000	.000
5	-45.780	.000	.000
6	39.760	.000	.000

10 - F A C T O R E D M O M E N T S & R E A C T I O N S

Calculated as (1.35D + 1.50L + 1.00 secondary moment effects)

10.1 FACTORED DESIGN MOMENTS (kNm)

	<----- left* ------>		<---- midspan ---->		<----- right* ----->	
SPAN	max	min	max	min	max	min
1	43.44	74.27	445.12	215.37	-577.43	-386.42
2	-581.51	-410.52	430.54	180.20	-571.23	-387.96
3	-570.77	-391.46	435.22	184.41	-630.32	-455.16
4	-627.05	-426.13	456.50	266.93	-390.25	-170.41
5	-413.40	-183.83	-70.59	-210.88	-46.59	-9.03

Note:
* = face-of-support

10.2 SECONDARY MOMENTS (kNm)

SPAN	<-- left* -->	<- midspan ->	<-- right* -->
1	1.57	24.27	46.98
2	48.09	40.19	32.29
3	31.63	28.13	24.64
4	25.94	51.98	78.02
5	69.58	39.76	9.94

Note:
* = face-of-support

10.3 FACTORED REACTIONS (kN) — 10.4 FACTORED COLUMN MOMENTS (kNm)

			<-- LOWER column -->		<-- UPPER column -->	
JOINT	max	min	max	min	max	min
1	333.26	174.98	.00	.00	.00	.00
2	993.07	760.42	.00	.00	.00	.00
3	993.08	744.41	.00	.00	.00	.00
4	1016.84	774.31	.00	.00	.00	.00
5	862.24	458.08	.00	.00	.00	.00
6	-2.03	-221.43	.00	.00	.00	.00

11 - M I L D S T E E L

Support cut-off length for minimum steel(length/span) ... .17
Span cut-off length for minimum steel(length/span) ... .33
Top bar extension beyond where required ..... 900.00 mm
Bottom bar extension beyond where required ..... 900.00 mm

REINFORCEMENT based on NO REDISTRIBUTION of factored moments

11.1 TOTAL WEIGHT OF REBAR = 70.9 Kg AVERAGE = .3 Kg/m^2
TOTAL AREA COVERED = 236.42 m^2

11.2.1 S T E E L A T M I D - S P A N

	T O P					B O T T O M				
	As	DIFFERENT REBAR CRITERIA				As	DIFFERENT REBAR CRITERIA			
SPAN	(mm^2)	<---ULT		-TENS	-------->	(mm^2)	<---ULT		-TENS	-------->
1	0	(	0	0	0)	0	(	0	0	0)
2	0	(	0	0	0)	0	(	0	0	0)
3	0	(	0	0	0)	0	(	0	0	0)
4	0	(	0	0	0)	0	(	0	0	0)
5	0	(	0	0	0)	0	(	0	0	0)

11.3.1 S T E E L A T S U P P O R T S

	T O P					B O T T O M				
	As	DIFFERENT REBAR CRITERIA				As	DIFFERENT REBAR CRITERIA			
JOINT	(mm^2)	<---ULT		-MIN	-------->	(mm^2)	<---ULT		-MIN	-------->
1	0	(	0	0	0)	0	(	0	0	0)
2	268	(	268	0	0)	0	(	0	0	0)
3	136	(	136	0	0)	0	(	0	0	0)
4	902	(	902	0	0)	0	(	0	0	0)
5	400	(	400	0	0)	0	(	0	0	0)
6	0	(	0	0	0)	0	(	0	0	0)

11.2.2 & 11.3.2 LISTING OF THE ENTIRE PROVIDED REBAR

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]	AREA [mm^2]
1	1	T	4	# 16 x	1800	796
2	2	T	4	# 16 x	1800	796
3	3	T	5	# 16 x	1800	995
4	4	T	4	# 16 x	2100	796

Notes:
Bar location - T = Top, B = Bottom.
NUM - Number of bars.
For two-way systems a minimum of 4 bars is specified over the supports.
Refer to tables 11.5.1,11.5.2 and PTsum graphical display for
positioning of bars.

11.5.1 ARRANGEMENT OF TOP BARS

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]
		TOP STEEL			
1	1	RIGHT	4	# 16 x	1800
2	1	LEFT	2	# 16 x	900
2	2	RIGHT	4	# 16 x	900
3	2	LEFT	2	# 16 x	900
3	3	RIGHT	5	# 16 x	900
4	3	LEFT	3	# 16 x	900
4	4	RIGHT	4	# 16 x	900
5	4	LEFT	4	# 16 x	1200

11.5.2 ARRANGEMENT OF BOTTOM BARS

SPAN	ID	LOCATION	NUM	BAR	LENGTH [mm]
		BOTTOM STEEL			

12 - P U N C H I N G S H E A R C H E C K

LEGEND:
CONDITION... 1 = INTERIOR COLUMN
2 = END COLUMN
3 = CORNER COLUMN
4 = EDGE COLUMN (PARALLEL TO SPAN)
5 = EDGE BEAM, WALL, OR OTHER NON-CONFORMING GEOMETRY
PERFORM SHEAR CHECK MANUALLY
6 = STRIP TOO NARROW TO DEVELOP PUNCHING SHEAR

CASE..... 1 = STRESS WITHIN SECTION #1 GOVERNS (COL.CAP OR SLAB)
2 = STRESS WITHIN SECTION #2 GOVERNS (DROP PANEL OR SLAB)

JNT	COND.	FACTORED ACTIONS shear kN	moment kN-m	<- PUNCHING SHEAR STRESSES IN N/mm^2 -> due to shear	due to moment	TOTAL	allow-able	RATIO	CASE
1	2	333.26	.00	.88	.00	.88	1.55	.57	1
2	1	993.07	.00	1.77	.00	1.77	1.76	1.01	1
3	1	993.08	.00	1.77	.00	1.77	1.76	1.01	1
4	1	1016.84	.00	1.82	.00	1.82	1.74	1.05	1
5	1	862.25	.00	1.54	.00	1.54	1.72	.90	1
6	2	221.43	.00	.58	.00	.58	1.55	.38	1

PUNCHING SHEAR STRESS IN ONE OR MORE LOCATIONS EXCEEDS THE PERMISSIBLE
VALUE. PROVIDE SHEAR REINFORCEMENT, OR ENLARGE THE SECTION RESISTING THE
PUNCHING SHEAR

13 - MAXIMUM S P A N D E F L E C T I O N S

Concrete`s modulus of elasticity ..... Ec = 25743 N/mm^2
Creep factor ..... K = 2.00
Ieffective/Igross...(due to cracking)..... K = 1.00

Where stresses exceed 0.5(fc`)^1/2 cracking of section is allowed for.
Values in parentheses are (span/max deflection) ratios

SPAN	DL	DL+PT	DL+PT+CREEP	LL	DL+PT+LL+CREEP
	<.....DEFLECTION ARE ALL IN mm , DOWNWARD POSITIVE.....>				
1	4.6	1.3	3.9(1968)	2.4(3187)	6.4(1217)
2	3.9	.8	2.3(4044)	2.0(4534)	4.3(2137)
3	4.4	.8	2.5(3783)	2.3(4075)	4.7(1961)
4	5.1	2.5	7.5(1213)	2.7(3394)	10.2(893)
5	-.3	-.2	-.5(3799)	-.1(13569)	-.7(2968)

14 - I N I T I A L CONDITION STRESS CHECK & REINFORCEMENT REQUIREMENTS

14.1 Parameters specified as input for initial stress checks:

		Tensile stresses divided by (f`c)^1/2	
Concrete f`c (initial/final)	.75	Top fiber	.25
PT force (initial/final) ...	1.10	Bottom fiber	.25
Dead loading (initial/final)	1.00		
Live loading (initial/final)	.00	Compression as ratio of f`c	.60

Note: Reinforcement reported in this data block is in
addition to that reported in data block 11 for
minimum strength reinforcement required by code.

14.2 NO added MILD REINFORCEMENT is required at MID-SPAN or SUPPORT

14.3 Compressive stresses

COMPRESSIVE stresses are within allowable limit (.60 * f`ci)
MAXIMUM stress..... = .21 * f`ci
(f`ci = initial concrete strength)

16 - FRICTION, ELONGATION AND LONG TERM STRESS LOSSES

16.6 LONG TERM STRESS LOSS CALCULATIONS

16.6.1 INPUT PARAMETERS :

Type of strand	LOW LAX	
Modulus of elasticity of strand	200000.00	N/mm^2
Average weight of concrete	NORMAL	
Estimate age of concrete at stressing	7	days
Modulus of elasticity of concrete at stressing	23322.00	N/mm^2
Modulus of elasticity of concrete at 28 days	25743.00	N/mm^2
Estimate of average relative humidity	80.00	%
Volume to surface ratio of member	150.00	mm

16.6.2 CALCULATED LONG-TERM STRESS LOSS(average of all tendons) :

	<----- STRESS (N/mm^2) ----->		
SPAN	start	center	right
1	64.39	63.59	57.86
2	57.86	71.73	55.23
3	55.23	62.68	41.77
4	41.77	48.86	51.60
5	51.60	54.19	54.16

16.7 FRICTION AND ELONGATION CALCULATIONS

16.7.1 INPUT PARAMETERS :

Coefficient of angular friction (meu)	.220	/rad
Coefficient of wobble friction (K)	.0012	/m
Ultimate strength of strand	1860.0	N/mm^2
Ratio of jacking stress to strand's ultimate strength	.800	
Anchor set	6.000	mm
Cross-sectional area of strand	140.000	mm^2

16.7.2 CALCULATED STRESSES(average of all tendons) :

	LENGTH		<TENDON HEIGHT(mm)>			Horizontal ratios			<-- STRESS(N/mm^2)-->		
SPAN	m	P	start	center	right	X1/L	X2/L	X3/L	start	center	right
1	7.75	1	-125.	-195.	-55.	.10	.50	.10	1213.60	1242.48	1292.68
2	9.15	1	-55.	-195.	-55.	.10	.50	.10	1292.68	1296.62	1275.09
3	9.30	1	-55.	-195.	-55.	.10	.50	.10	1275.09	1224.55	1210.04
4	9.15	1	-55.	-195.	-110.	.10	.50	.10	1210.04	1162.09	1135.84
5	2.00	1	-110.	-125.	-125.	.10	.50	.10	1135.84	1115.33	1113.48

Note: P= tendon profile (refer to legend of data block 9)
Stresses at each location are the average of strands after anchor set,
and after long-term losses

16.8 TENDON SELECTION AND DATA:

TYPE	OFF	FORCE	CAN	SPANS	CAN	ELONGATION LEFT (mm)	ELONGATION RIGHT (mm)	Stress ratios Anch.	Stress ratios Max.
				<1><2><3><4><5>					
A	14	171.55	<==========			240.	0.	.73	.74

Note: Force is the average value per strand (kN)
Stress ratios are at anchorage (7) and maximum along tendon (8)

Escola Politècnica Superior d'Edificació de Barcelona
UNIVERSITAT POLITÈCNICA DE CATALUNYA

ARQUITECTURA TÈCNICA
PROJECTE FINAL DE CARRERA

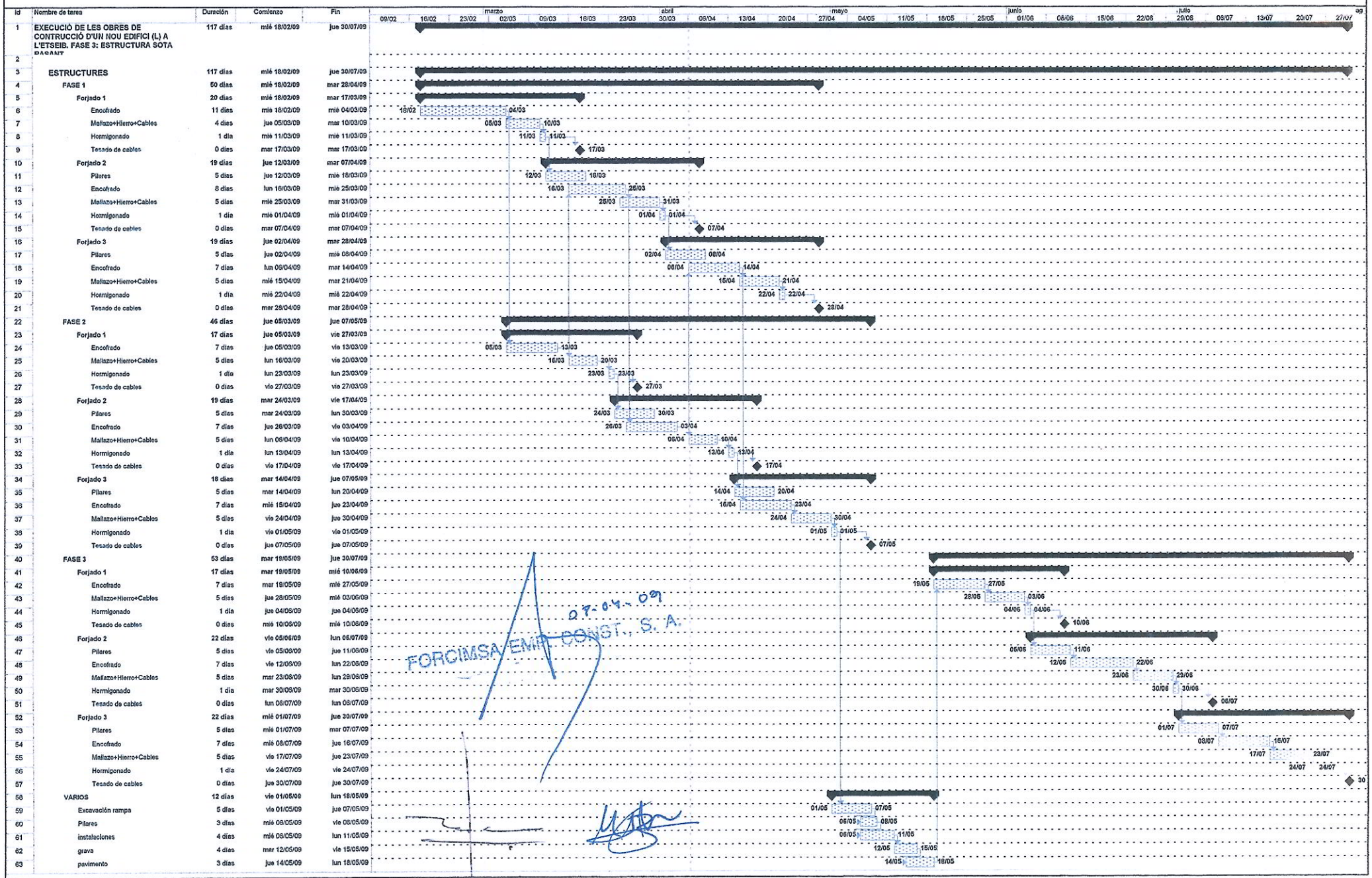
APLICACIONS DE LES LLOSES POSTTESADES: CRITERIS DE PROJECTE I POSADA EN OBRA
ANNEX 3. PLANNING TEÒRIC

Projectista/es: BONILLA RODRÍGUEZ, Rocío
ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana
Director/s: SERRÀ MARTÍN, Isabel
Convocatòria: Febrer 2010

AVD. DIAGONAL 647(UPC) - BARCELONA

Forcimsa

Id	Nombre de tarea	Duración	Comienzo	Fin
1	EXECUCIÓ DE LES OBRES DE CONTRUCCIÓ D'UN NOU EDIFICI (L) A L'ETSEIB. FASE 3: ESTRUCTURA SOTA RASANT	117 días	mié 18/02/09	jue 30/07/09
2				
3	ESTRUCTURES	117 días	mié 18/02/09	jue 30/07/09
4	FASE 1	50 días	mié 18/02/09	mar 28/04/09
5	Forjado 1	20 días	mié 18/02/09	mar 17/03/09
6	Encofrado	11 días	mié 18/02/09	mié 04/03/09
7	Mallazo+Hierro+Cables	4 días	jue 05/03/09	mar 10/03/09
8	Hormigonado	1 día	mié 11/03/09	mié 11/03/09
9	Tesado de cables	0 días	mar 17/03/09	mar 17/03/09
10	Forjado 2	19 días	jue 12/03/09	mar 07/04/09
11	Pilares	5 días	jue 12/03/09	mié 18/03/09
12	Encofrado	8 días	lun 16/03/09	mié 25/03/09
13	Mallazo+Hierro+Cables	5 días	mié 25/03/09	mar 31/03/09
14	Hormigonado	1 día	mié 01/04/09	mié 01/04/09
15	Tesado de cables	0 días	mar 07/04/09	mar 07/04/09
16	Forjado 3	19 días	jue 02/04/09	mar 28/04/09
17	Pilares	5 días	jue 02/04/09	mié 08/04/09
18	Encofrado	7 días	lun 06/04/09	mar 14/04/09
19	Mallazo+Hierro+Cables	5 días	mié 15/04/09	mar 21/04/09
20	Hormigonado	1 día	mié 22/04/09	mié 22/04/09
21	Tesado de cables	0 días	mar 28/04/09	mar 28/04/09
22	FASE 2	46 días	jue 05/03/09	jue 07/05/09
23	Forjado 1	17 días	jue 05/03/09	vie 27/03/09
24	Encofrado	7 días	jue 05/03/09	vie 13/03/09
25	Mallazo+Hierro+Cables	5 días	lun 16/03/09	vie 20/03/09
26	Hormigonado	1 día	lun 23/03/09	lun 23/03/09
27	Tesado de cables	0 días	vie 27/03/09	vie 27/03/09
28	Forjado 2	19 días	mar 24/03/09	vie 17/04/09
29	Pilares	5 días	mar 24/03/09	lun 30/03/09
30	Encofrado	7 días	jue 26/03/09	vie 03/04/09
31	Mallazo+Hierro+Cables	5 días	lun 06/04/09	vie 10/04/09
32	Hormigonado	1 día	lun 13/04/09	lun 13/04/09
33	Tesado de cables	0 días	vie 17/04/09	vie 17/04/09
34	Forjado 3	18 días	mar 14/04/09	jue 07/05/09
35	Pilares	5 días	mar 14/04/09	lun 20/04/09
36	Encofrado	7 días	mié 15/04/09	jue 23/04/09
37	Mallazo+Hierro+Cables	5 días	vie 24/04/09	jue 30/04/09
38	Hormigonado	1 día	vie 01/05/09	vie 01/05/09
39	Tesado de cables	0 días	jue 07/05/09	jue 07/05/09
40	FASE 3	63 días	mar 19/05/09	jue 30/07/09
41	Forjado 1	17 días	mar 19/05/09	mié 10/06/09
42	Encofrado	7 días	mar 19/05/09	mié 27/05/09
43	Mallazo+Hierro+Cables	5 días	jue 28/05/09	mié 03/06/09
44	Hormigonado	1 día	jue 04/06/09	jue 04/06/09
45	Tesado de cables	0 días	mié 10/06/09	mié 10/06/09
46	Forjado 2	22 días	vie 05/06/09	lun 06/07/09
47	Pilares	5 días	vie 05/06/09	jue 11/06/09
48	Encofrado	7 días	vie 12/06/09	lun 22/06/09
49	Mallazo+Hierro+Cables	5 días	mar 23/06/09	lun 29/06/09
50	Hormigonado	1 día	mar 30/06/09	mar 30/06/09
51	Tesado de cables	0 días	lun 06/07/09	lun 06/07/09
52	Forjado 3	22 días	mié 01/07/09	jue 30/07/09
53	Pilares	5 días	mié 01/07/09	mar 07/07/09
54	Encofrado	7 días	mié 08/07/09	jue 16/07/09
55	Mallazo+Hierro+Cables	5 días	vie 17/07/09	jue 23/07/09
56	Hormigonado	1 día	vie 24/07/09	vie 24/07/09
57	Tesado de cables	0 días	jue 30/07/09	jue 30/07/09
58	VARIOS	12 días	vie 01/05/09	lun 18/05/09
59	Excavación rampa	5 días	vie 01/05/09	jue 07/05/09
60	Pilares	3 días	mié 06/05/09	vie 08/05/09
61	instalaciones	4 días	mié 06/05/09	lun 11/05/09
62	grava	4 días	mar 12/05/09	vie 15/05/09
63	pavimento	3 días	jue 14/05/09	lun 18/05/09



07-04-09
FORCIMSA ENTR CONST., S. A.

Escola Politècnica Superior d'Edificació de Barcelona
UNIVERSITAT POLITÈCNICA DE CATALUNYA

ARQUITECTURA TÈCNICA
PROJECTE FINAL DE CARRERA

APLICACIONS DE LES LLOSES POSTTESADES: CRITERIS DE PROJECTE I POSADA EN OBRA
ANNEX 4. REPORTS DE TESAT

Projectista/es: BONILLA RODRÍGUEZ, Rocío
ESBRÍ RODRÍGUEZ-XUÀREZ, Adriana
Director/s: SERRÀ MARTÍN, Isabel
Convocatòria: Febrer 2010

cotca, s.a.
C/. Tuset, 8 , 5º 1ª
08006 BARCELONA

☎ 932.187.146
Fax 934.152.365
control2@cotca.com
www.cotca.com

INFORME FINAL DE LA OBRA:
EDIFICIO L – 3ª FASE – ETSEIB - UPC
AV. DIAGONAL 647. BARCELONA

CONTROL DE MATERIALES: POSTENSADO

cotca, s.a.
C/. Tuset, 8 , 5º 1ª
08006 BARCELONA

☎ 932.187.146
Fax 934.152.365
control2@cotca.com
www.cotca.com

INFORME DOSSIER FINAL DE OBRA – CONTROL DE MATERIALES: POSTENSADO

Obra: EDIFICIO L – 3ª FASE – ETSEIB - UPC

Ref.: C-1801-000

Tema: Dossier final de obra – MATERIALES POSTENSADO

1.- OBJETO

Es objeto del presente documento, recopilar los datos y adjuntar la documentación correspondiente a los controles realizados en la obra "EDIFICIO L – 3ª FASE – ETSEIB" ubicada en la avenida Diagonal 647 de Barcelona.

El promotor de la obra es la UNIVERSITAT POLITÉCNICA DE CATALUNYA.

El proyecto ha sido realizado por el Sr Valentín de Carlos. Arquitecto (IDOM).

La Dirección de obra ha sido realizada por Sr. Josep Molero Espinosa, Arquitecto Técnico.

La ejecución de la obra ha sido realizada FORCIMSA Empresa Constructora S.A.

cotca, s.a.
C/. Tuset, 8 , 5º 1ª
08006 BARCELONA

☎ 932.187.146
Fax 934.152.365
control2@cotca.com
www.cotca.com

4.- ANEXOS

- Copia de los certificados de calidad de cables, emitido por CTT STRONGHOLD.
- Copia ficha con características técnicas del cemento tipo DRAGÓN SR I 42.5 N/SR.
- Copia ficha con características puente de unión - sustitución de cables – PLAKABETON – Multitek adhesivo SDH
- Reportes de tesado de cables con fecha 17/03/2009 – 1/04/2009 – 14/04/2009 – retesado de cables 14/04/2009 – 29/04/2009 adjuntando carta CTT Stronghold con fecha 4 de mayo de 2009 y carta del 12 de mayo de 2009 – 15/06/2009 – 28/07/2009 y 6/07/2009 – 17/08/2009

Barcelona, 16 de diciembre de 2009

Responsable Técnico de Control de Calidad

Vicente Alegre Heitzmann
Ingeniero de Caminos Canales y Puertos

cotca, s.a.
C/. Tuset, 8 , 5º 1ª
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control2@cotca.com
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ANEXOS

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Fax 934.152.365
control2@cotca.com
www.cotca.com

COPIA CERTIFICADOS DE CALIDAD CABLES

	QUALITY CONTROL CERTIFICATE *Certificado control Calidad*	Q.C.: *C.C.:* 09. 1087	DATE *Fecha* 16/02/2009	SHEET *Hoja* 1 / 1	

QUALITY CONTROL OF STRONGHOLD PRESTRESSING SYSTEM

We hereby certify that the following manufactured goods have been produced in strict accordance with STRONGHOLD specifications. Quality Control measures and other verifications have been applied throughout production to ensure that components satisfy all relating standards.

CONTROL DE CALIDAD DE LOS COMPONENTES DE PRETENSADO STRONGHOLD (*)

Certificamos que los materiales detallados a continuación se han fabricado de acuerdo a las normas del sistema STRONGHOLD y que han sido inspeccionados por nuestro departamento de control de calidad, cumpliendo con las normas establecidas.

QUANTITY *Cantidad*	DESCRIPTION *Descripción*	STRONGHOLD DRAWING *Nº Plano*	PRODUCTION CONTROL *Control Producción*	NOTES *Notas*
11.834,00	Cable 0.6" UNE		90025 - -	T09ES002

ADDITIONAL STANDARDS: UNE 36094-97
Normas adicionales:

CERTIFICATE OF DELIVERY

Certificado de expedición

DATE SHIPPED:
Fecha salida: 12/02/2009 Alb.: 910249 Pdo. 90171

DESTINATION: SIGNATURE/Firma:

Destino: Forcimsa Empresa Constructora, SA

Obra / Ref.Cliente: Facultad Industriales UPC

CALIDAD

(*) NORMAS Y HOMOLOGACIONES DEL SISTEMA DE PRETENSADO STRONGHOLD

- Norma UNE-41-184 (ESPAÑA)
- Recomendaciones F.I.P. (Fédération Internationale de la Précontrainte)
- Norma BS-4447 (REINO UNIDO)
- Homologación C.I.P. (Commission Interministérielle de le Précontrainte) (FRANCIA)

Nota: Estas normas, recomendaciones y homologaciones, son requisitos reconocidos nacional e internacionalmente para la aplicación de sistemas de pretensado en las Obras Públicas.

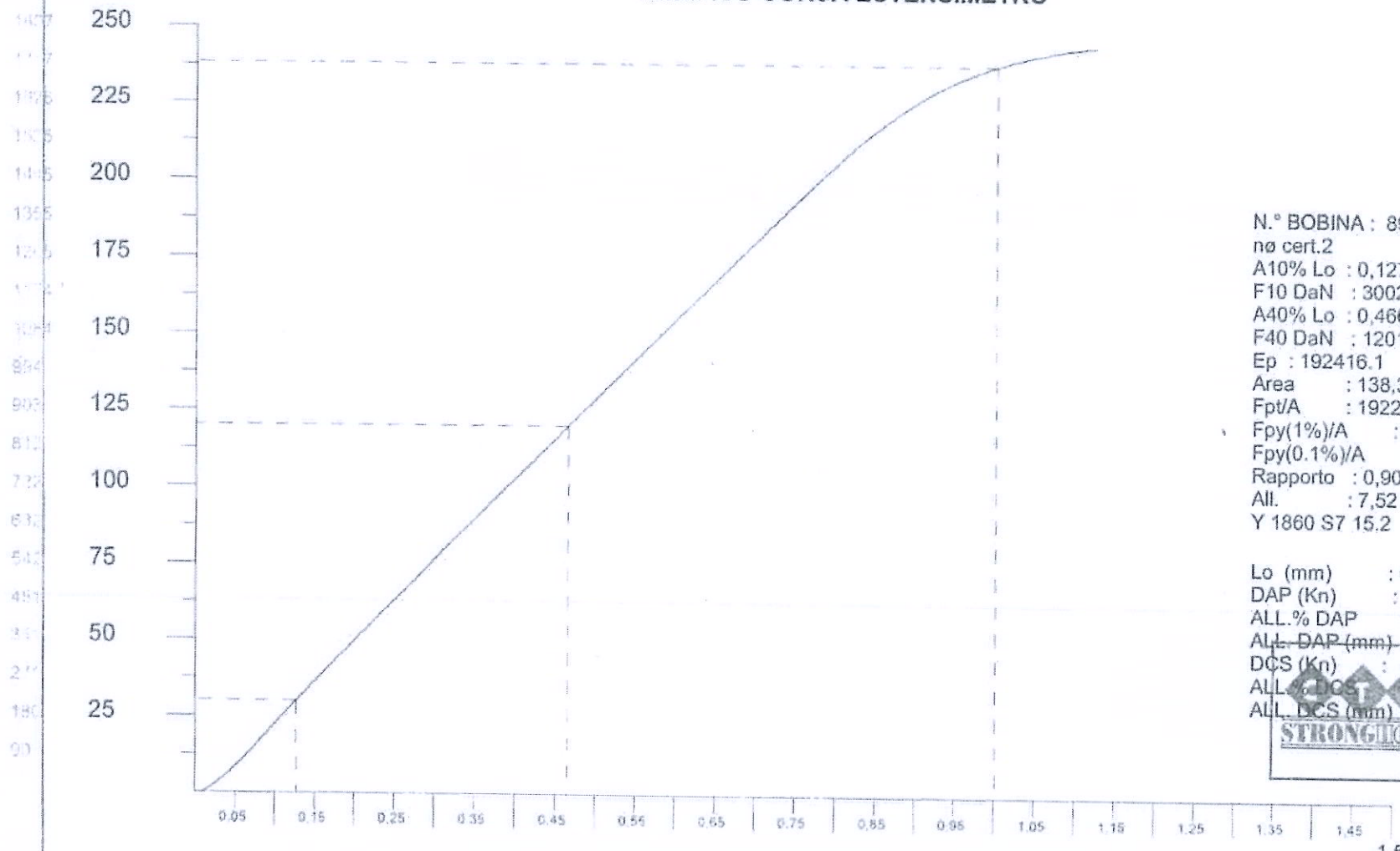
ISO 9001 BUREAU VERITAS Certification

i.t.a.s. S.p.A.
INDUSTRIA TRAFILERIA APPLICAZIONI SPECIALI

I.T.A.S. S.p.A.
Via Brennero, 24
46100 MANTOVA
Tel. 0376 2751
Telefax 0376 370083
E-mail info@itasmn.it
Website www.itasmn.it

DIAGRAMMI SFORZI DEFORMAZIONI - LOAD-EXTENSION DIAGRAMS

GRAFICO CORSA ESTENSIMETRO



N.° BOBINA : 89
nø cert.2
A10% Lo : 0,127
F10 DaN : 3002,9
A40% Lo : 0,466
F40 DaN : 12011,7
Ep : 192416.1 N/mm²
Area : 138,32 N/mm²
Fpt/A : 1922 N/mm²
Fpy(1%)/A : 1729 N/mm²
Fpy(0.1%)/A : 1760 N/mm²
Rapporto : 0,90 %
All. : 7,52 %
Y 1860 S7 15.2

Lo (mm) : 600
DAP (Kn) :
ALL.% DAP :
ALL. DAP (mm) :
DCS (Kn) :
ALL.% DCS :
ALL. DCS (mm) :

STRONGHOLD

Nº DE CONTROL
90025

i.t.a.s. S.p.A.
INDUSTRIA TRAFILERIA APPLICAZIONI SPECIALI

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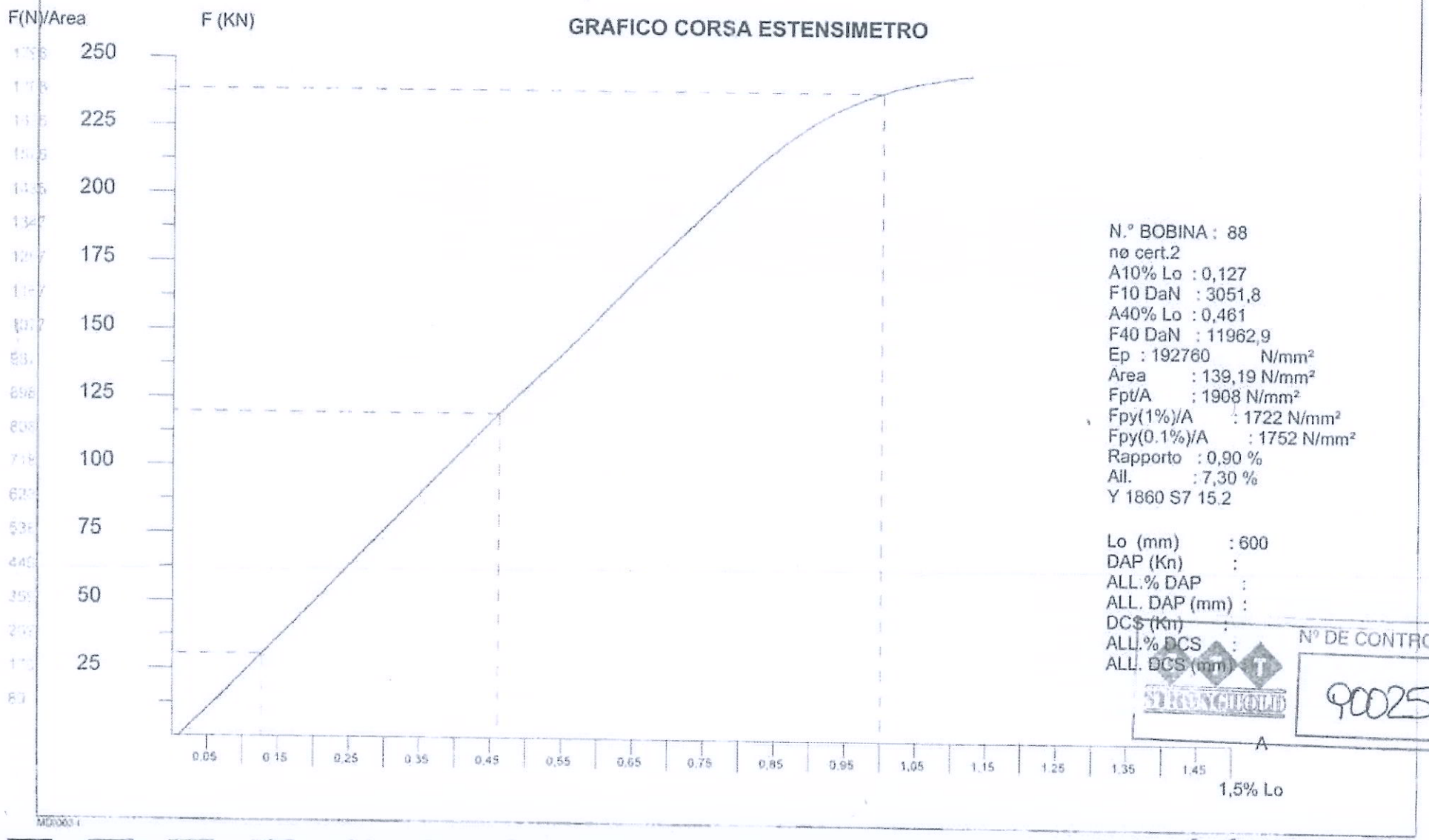
Web-ho:www.itasmn.it

DIAGRAMMI SFORZI DEFORMAZIONI - LOAD-EXTENSION DIAGRAMS



N.° BOBINA : 88
nø cert.2
A10% Lo : 0,127
F10 DaN : 3051,8
A40% Lo : 0,461
F40 DaN : 11962,9
Ep : 192760 N/mm²
Area : 139,19 N/mm²
Fpt/A : 1908 N/mm²
Fpy(1%)/A : 1722 N/mm²
Fpy(0.1%)/A : 1752 N/mm²
Rapporto : 0,90 %
All. : 7,30 %
Y 1860 S7 15.2

Lo (mm) : 600
DAP (Kn) :
ALL.% DAP :
ALL. DAP (mm) :
DCS (Kn) :
ALL.% DCS :
ALL. DCS (mm) :

STRONGHOLD

N° DE CONTROL
90025

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Web site www.itasmn.it

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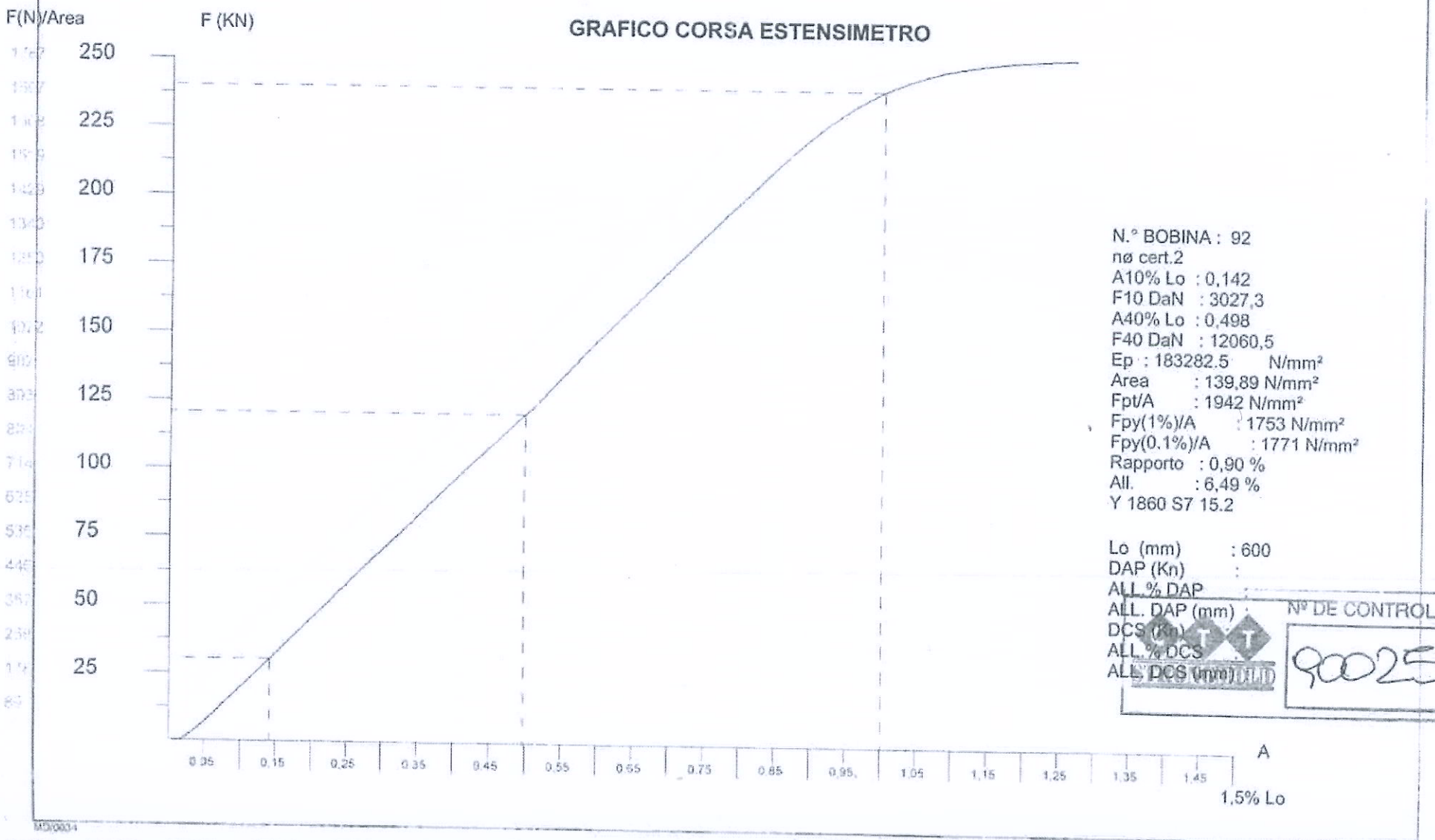
DIAGRAMMI SFORZI DEFORMAZIONI - LOAD-EXTENSION DIAGRAMS



N.° BOBINA : 92
nø cert.2
A10% Lo : 0,142
F10 DaN : 3027,3
A40% Lo : 0,498
F40 DaN : 12060,5
Ep : 183282.5 N/mm²
Area : 139,89 N/mm²
Fpt/A : 1942 N/mm²
Fpy(1%)/A : 1753 N/mm²
Fpy(0.1%)/A : 1771 N/mm²
Rapporto : 0,90 %
All. : 6,49 %
Y 1860 S7 15.2

Lo (mm) : 600
DAP (Kn) :
ALL.% DAP :
ALL. DAP (mm) :
DCS (Kn) :
ALL.% DCS :
ALL. DCS (mm) 0,1.D

Nº DE CONTROL
90025

MD/0834

i.t.a.s S.p.A.
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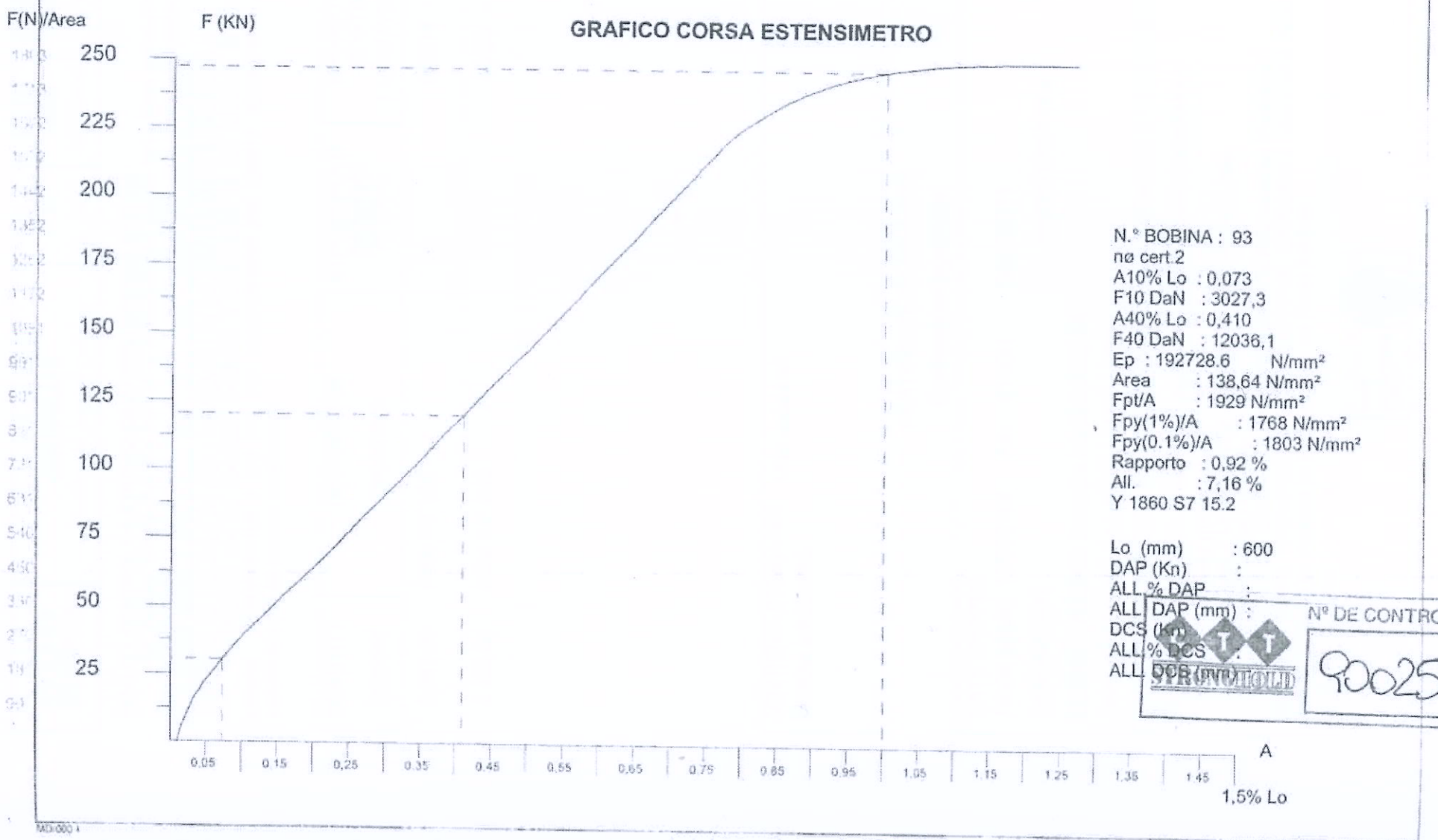
Telefax 0376 370083
E-mail info@itasmn.it
Web site www.itasmn.it

DIAGRAMMI SFORZI DEFORMAZIONI - LOAD-EXTENSION DIAGRAMS



N.° BOBINA : 93
nø cert.2
A10% Lo : 0,073
F10 DaN : 3027,3
A40% Lo : 0,410
F40 DaN : 12036,1
Ep : 192728.6 N/mm²
Area : 138,64 N/mm²
Fpt/A : 1929 N/mm²
Fpy(1%)/A : 1768 N/mm²
Fpy(0.1%)/A : 1803 N/mm²
Rapporto : 0,92 %
All. : 7,16 %
Y 1860 S7 15.2

Lo (mm) : 600
DAP (Kn) :
ALL % DAP :
ALL DAP (mm) :
DCS (Kn) :
ALL % DCS :
ALL DCS (mm) :

STRONGHOLD

Nº DE CONTROL
90025

	QUALITY CONTROL CERTIFICATE *Certificado control Calidad*	Q.C.: *C.C.:* **09. 1088**	DATE *Fecha* 16/02/2009	SHEET *Hoja* 1 / 1	

QUALITY CONTROL OF STRONGHOLD PRESTRESSING SYSTEM

We hereby certify that the following manufactured goods have been produced in strict accordance with STRONGHOLD specifications. Quality Control measures and other verifications have been applied throughout production to ensure that components satisfy all relating standards.

CONTROL DE CALIDAD DE LOS COMPONENTES DE PRETENSADO STRONGHOLD (*)

Certificamos que los materiales detallados a continuación se han fabricado de acuerdo a las normas del sistema STRONGHOLD y que han sido inspeccionados por nuestro departamento de control de calidad, cumpliendo con las normas establecidas.

QUANTITY *Cantidad*	DESCRIPTION *Descripción*	STRONGHOLD DRAWING *Nº Plano*	PRODUCTION CONTROL *Control Producción*	NOTES *Notas*
5.943,00	Cable 0.6" UNE		900014 - -	GS6616404
5.492,00	Cable 0.6" UNE		90025 - -	T09ES002

ADDITIONAL STANDARDS: UNE 36094-97
Normas adicionales:

CERTIFICATE OF DELIVERY

Certificado de expedición

DATE SHIPPED:
Fecha salida: 13/02/2009 Alb.: 910251 Pdo. 90171

DESTINATION: SIGNATURE/Firma:

Destino: Forcimsa Empresa Constructora, SA

Obra / Ref.Cliente: Facultad Industriales UPC

CALIDAD

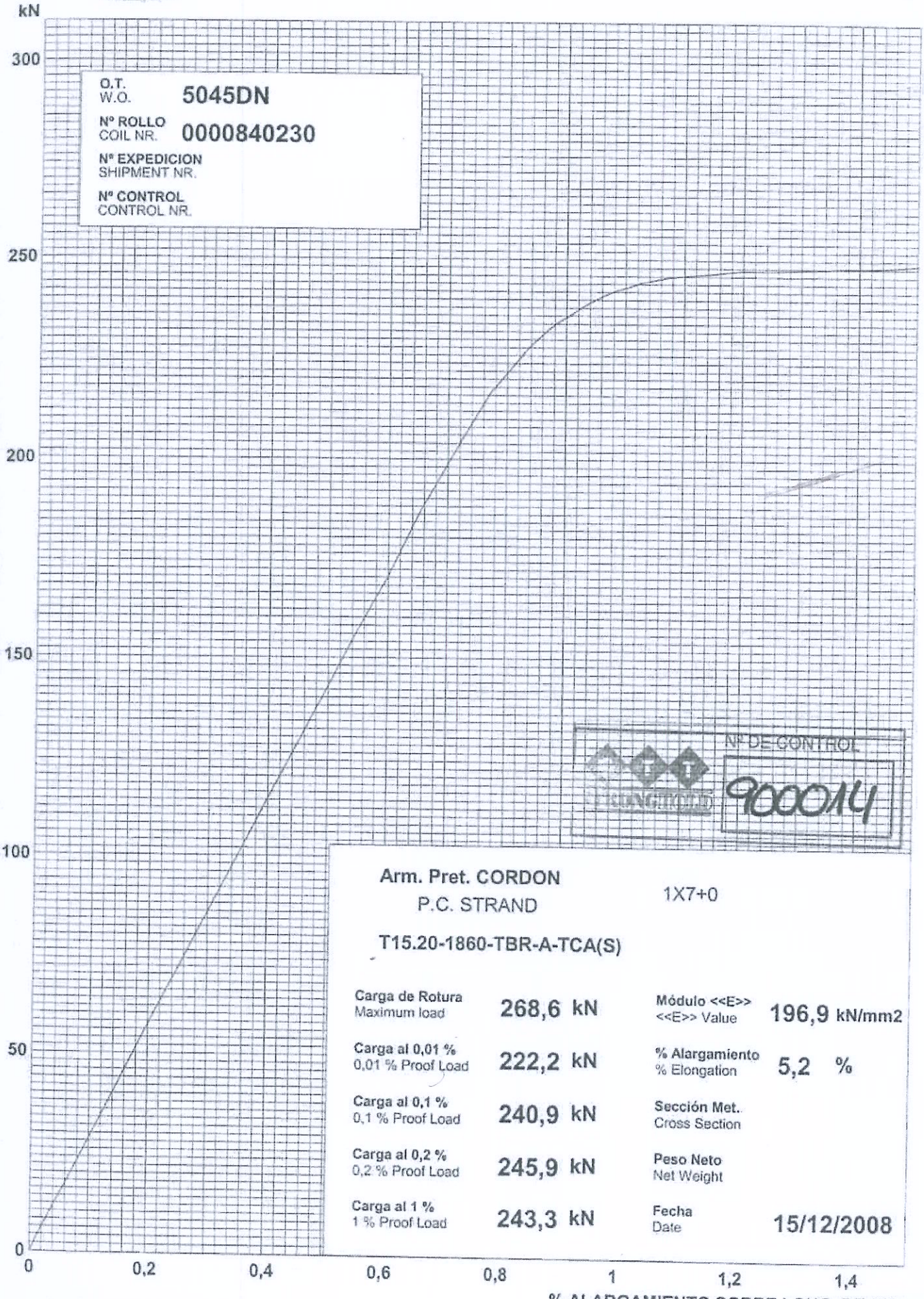
(*) NORMAS Y HOMOLOGACIONES DEL SISTEMA DE PRETENSADO STRONGHOLD

- Norma UNE-41-184 (ESPAÑA)
- Recomendaciones F.I.P. (Fédération Internationale de la Précontrainte)
- Norma BS-4447 (REINO UNIDO)
- Homologación C.I.P. (Commission Interministérielle de le Précontrainte) (FRANCIA)

Nota: Estas normas, recomendaciones y homologaciones, son requisitos reconocidos nacional e internacionalmente para la aplicación de sistemas de pretensado en las Obras Públicas.

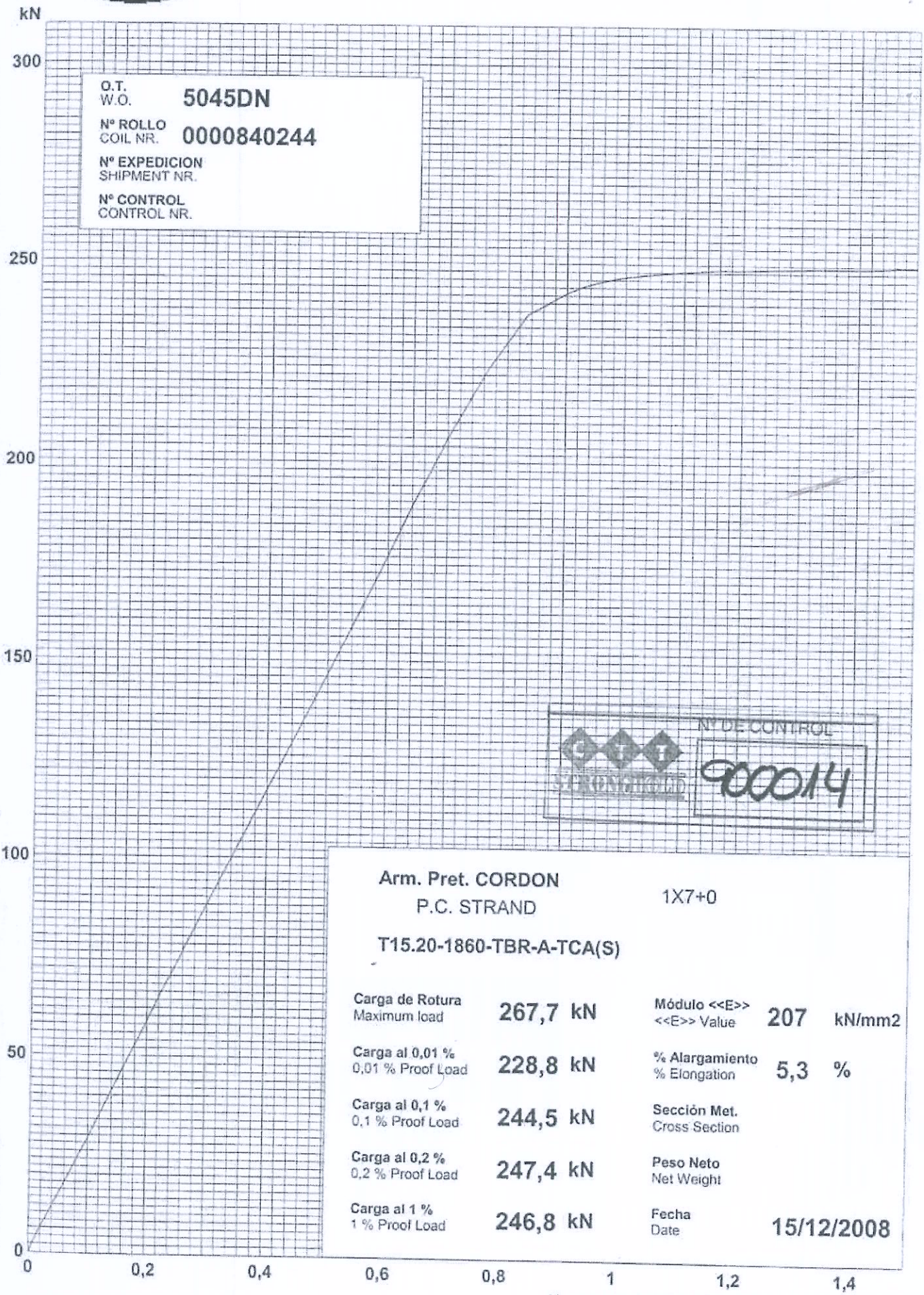
ISO 9001 BUREAU VERITAS Certification

TYCSA PSC
SANTANDER-ESPAÑA



% ALARGAMIENTO SOBRE LONG. DE 610 mm.
% ELONGATION ON 24" GAUGE LENGTH

TYCSA PSC
SANTANDER-ESPAÑA



Arm. Pret. CORDON 1X7+0
P.C. STRAND

T15.20-1860-TBR-A-TCA(S)

Carga de Rotura Maximum load	267,7 kN	**Módulo <<E>>** <<E>> Value	207	kN/mm2
Carga al 0,01 % 0,01 % Proof Load	228,8 kN	**% Alargamiento** % Elongation	5,3	%
Carga al 0,1 % 0,1 % Proof Load	244,5 kN	**Sección Met.** Cross Section		
Carga al 0,2 % 0,2 % Proof Load	247,4 kN	**Peso Neto** Net Weight		
Carga al 1 % 1 % Proof Load	246,8 kN	**Fecha** Date	15/12/2008	

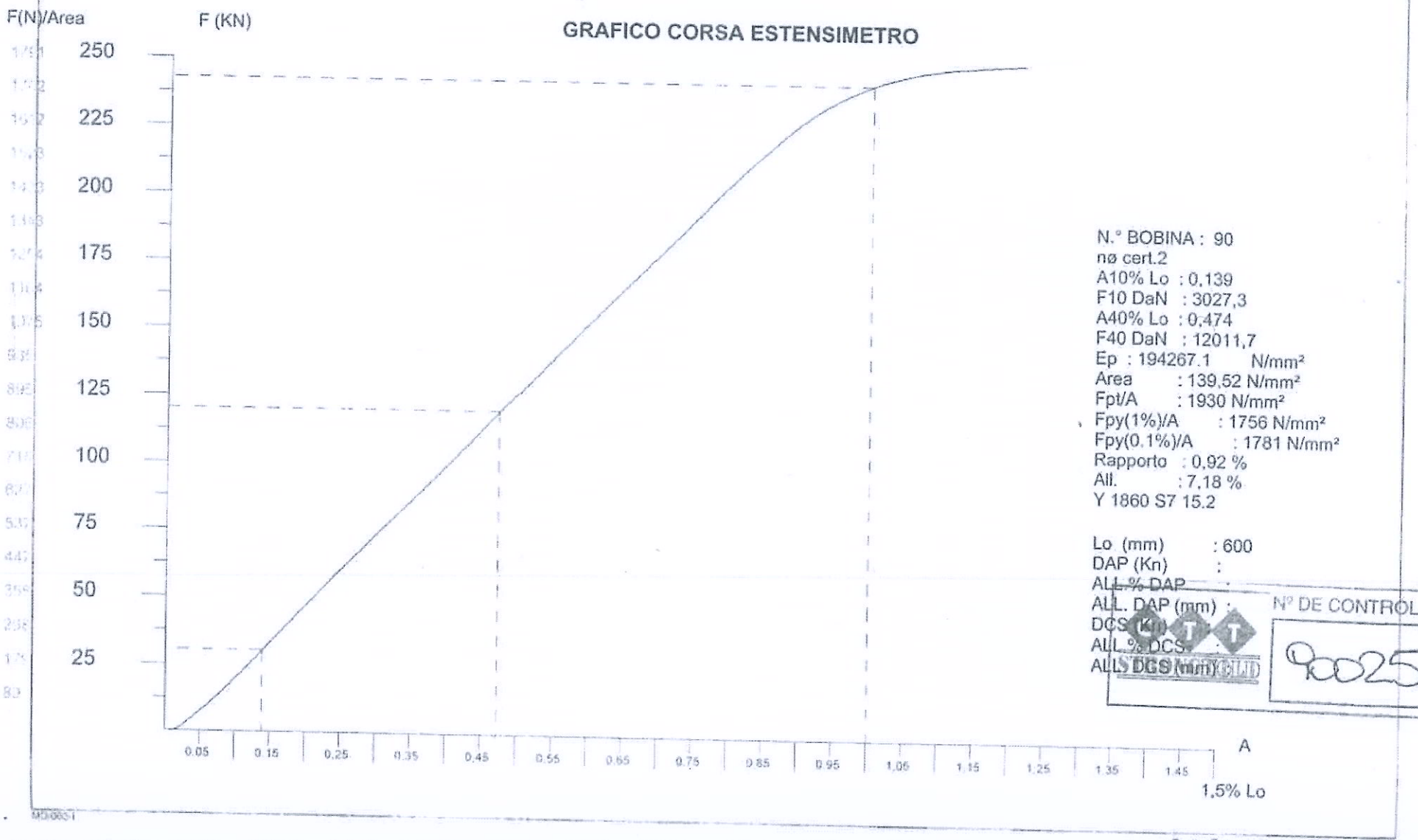
Mod. 3 **DEPARTAMENTO DE CALIDAD**

% ALARGAMIENTO SOBRE LONG. DE 610 mm.
% ELONGATION ON 24" GAUGE LENGTH

I.T.A.S. S.p.A.
Via Brennero, 24
46100 MANTOVA
Tel. 0376 2751
Telefax 0376 370083
E-mail info@itasmn.it
Website www.itasmn.it

i.t.a.s. S.p.A.
INDUSTRIA TRAFILERIA APPLICAZIONI SPECIALI

DIAGRAMMI SFORZI DEFORMAZIONI - LOAD-EXTENSION DIAGRAMS



N.° BOBINA : 90
nø cert.2
A10% Lo : 0,139
F10 DaN : 3027,3
A40% Lo : 0,474
F40 DaN : 12011,7
Ep : 194267.1 N/mm²
Area : 139,52 N/mm²
Fpt/A : 1930 N/mm²
Fpy(1%)/A : 1756 N/mm²
Fpy(0.1%)/A : 1781 N/mm²
Rapporto : 0,92 %
All. : 7,18 %
Y 1860 S7 15.2

Lo (mm) : 600
DAP (Kn) :
ALL.% DAP :
ALL. DAP (mm) :
DCS (Kn) :
ALL.% DCS :
ALL. DCS (mm) :

N° DE CONTROL
90025

i.t.a.s. S.p.A.
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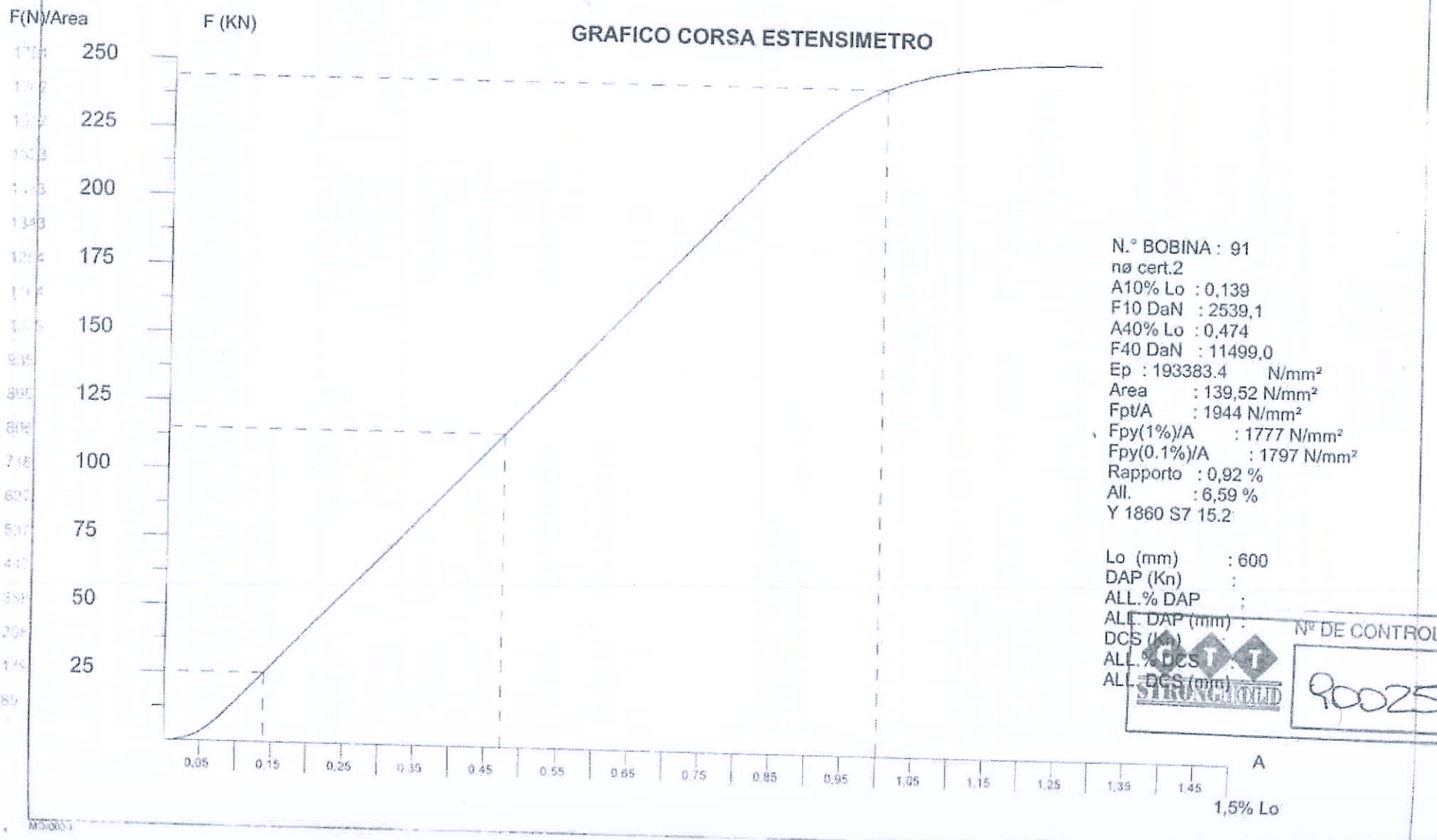
Web site www.itasmn.it

DIAGRAMMI SFORZI DEFORMAZIONI - LOAD-EXTENSION DIAGRAMS



N.° BOBINA : 91
nø cert.2
A10% Lo : 0,139
F10 DaN : 2539,1
A40% Lo : 0,474
F40 DaN : 11499,0
Ep : 193383.4 N/mm²
Area : 139,52 N/mm²
Fpt/A : 1944 N/mm²
Fpy(1%)/A : 1777 N/mm²
Fpy(0.1%)/A : 1797 N/mm²
Rapporto : 0,92 %
All. : 6,59 %
Y 1860 S7 15.2

Lo (mm) : 600
DAP (Kn) :
ALL.% DAP :
ALL. DAP (mm) :
DCS (Kn) :
ALL.% DCS :
ALL. DCS (mm) :

Nº DE CONTROL
90025

	QUALITY CONTROL CERTIFICATE *Certificado control Calidad*	Q.C.: *C.C.:* 09. 1101	DATE *Fecha* 24/02/2009	SHEET *Hoja* 1 / 1	

QUALITY CONTROL OF STRONGHOLD PRESTRESSING SYSTEM

We hereby certify that the following manufactured goods have been produced in strict accordance with STRONGHOLD specifications. Quality Control measures and other verifications have been applied throughout production to ensure that components satisfy all relating standards.

CONTROL DE CALIDAD DE LOS COMPONENTES DE PRETENSADO STRONGHOLD (*)

Certificamos que los materiales detallados a continuación se han fabricado de acuerdo a las normas del sistema STRONGHOLD y que han sido inspeccionados por nuestro departamento de control de calidad, cumpliendo con las normas establecidas.

QUANTITY *Cantidad*	DESCRIPTION *Descripción*	STRONGHOLD DRAWING *Nº Plano*	PRODUCTION CONTROL *Control Producción*	NOTES *Notas*
600,00	Culata S 6 N	108-022-025-b	81011 - A -	SCU
400,00	Cuña UNB 0.6" ARG	108-030-003-d	82054 - D -	659366
200,00	Cuña UNB 0.6" ARG	108-030-003-d	82539 - - 11	64541
20.000,00	Vaina Corrugada VSL		- -	

ADDITIONAL STANDARDS:

Normas adicionales: UNE 36021

CERTIFICATE OF DELIVERY

Certificado de expedición

DATE SHIPPED:

Fecha salida: 23/02/2009 Alb.: 910302 Pdo. 90239

DESTINATION: SIGNATURE/Firma:

Destino: Forcimsa Empresa Constructora, SA

Obra / Ref.Cliente: Facultad Industriales UPC

CALIDAD

(*) NORMAS Y HOMOLOGACIONES DEL SISTEMA DE PRETENSADO STRONGHOLD

- Norma UNE-41-184 (ESPAÑA)
- Recomendaciones F.I.P. (Fédération Internationale de la Précontrainte)
- Norma BS-4447 (REINO UNIDO)
- Homologación C.I.P. (Commission Interministérielle de le Précontrainte) (FRANCIA)

Nota: Estas normas, recomendaciones y homologaciones, son requisitos reconocidos nacional e internacionalmente para la aplicación de sistemas de pretensado en las Obras Públicas.

ISO 9001 BUREAU VERITAS Certification

	QUALITY CONTROL CERTIFICATE *Certificado control Calidad*	Q.C.: *C.C.:* 09. 1190	DATE *Fecha* 06/04/2009	SHEET *Hoja* 1 / 1	

QUALITY CONTROL OF STRONGHOLD PRESTRESSING SYSTEM

We hereby certify that the following manufactured goods have been produced in strict accordance with STRONGHOLD specifications. Quality Control measures and other verifications have been applied throughout production to ensure that components satisfy all relating standards.

CONTROL DE CALIDAD DE LOS COMPONENTES DE PRETENSADO STRONGHOLD (*)

Certificamos que los materiales detallados a continuación se han fabricado de acuerdo a las normas del sistema STRONGHOLD y que han sido inspeccionados por nuestro departamento de control de calidad, cumpliendo con las normas establecidas.

QUANTITY *Cantidad*	DESCRIPTION *Descripción*	STRONGHOLD DRAWING *Nº Plano*	PRODUCTION CONTROL *Control Producción*	NOTES *Notas*
800,00	Culata S 6 N	108-022-025-b	82564 - B -	ST9
100,00	Culata S 6 N	108-022-025-b	82762 - A -	STL
900,00	Cuña UNB 0.6" ARG	108-030-003-d	82539 - - 12	64541
10.000,00	Vaina Corrugada VSL		- -	

ADDITIONAL STANDARDS:

Normas adicionales: UNE 36021

CERTIFICATE OF DELIVERY

Certificado de expedición

DATE SHIPPED:

Fecha salida: 01/04/2009 Alb.: 910550 Pdo. 90430

DESTINATION: SIGNATURE/Firma:

Destino: Forcimsa Empresa Constructora, SA

Obra / Ref.Cliente: Facultad Industriales UPC

CALIDAD

(*) NORMAS Y HOMOLOGACIONES DEL SISTEMA DE PRETENSADO STRONGHOLD

- Norma UNE-41-184 (ESPAÑA)
- Recomendaciones F.I.P. (Fédération Internationale de la Précontrainte)
- Norma BS-4447 (REINO UNIDO)
- Homologación C.I.P. (Commission Interministérielle de le Précontrainte) (FRANCIA)

Nota: Estas normas, recomendaciones y homologaciones, son requisitos reconocidos nacional e internacionalmente para la aplicación de sistemas de pretensado en las Obras Públicas.

ISO 9001 BUREAU VERITAS Certification

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COPIA CARACTERÍSTICAS TÉCNICAS DEL CEMENTO

CARACTERÍSTIQUES DEL CIMENT EXPEDIT

Subministraments del mes: Abril 2009

Client : SOLOMAT S.L.

CIMENT PORTLAND RESISTENT A SULFATS

DRAGON SR

I 42,5 N/SR UNE 80303-1

CARACTERÍSTIQUES DEL CIMENT	Especificacions segons Norma, Instrucció i Reglament	Resultats
Clínquer (%)	95 mín. - 100 màx.	96
Component minoritari (%)	0 mín. - 5 màx.	4
QUÍMIQUES		
Pèrdua per calcinació (%)	5,0 màxim	2,69
Sulfat, SO3 (%)	3,5 màxim	2,81
Clorurs, Cl - (%)	0,10 màxim	0,01
Residu Insoluble (%)	5,0 màxim	0,66
Aluminat Tricàlcic, C3A (%)	5 màxim (al clínquer)	3,6
(C3A + C4AF) (%)	22 màxim (al clínquer)	17,2
FÍSIQUES		
Superficie específica Blaine (cm2/g)	----------	3.345
Expansió Le Chatelier (mm)	10 màxim	1,0
Inici adormiment (minuts)	60 mínim	160
Final adormiment (minuts)	720 màxim	215
MECÀNIQUES		
Compressió a 1 dia (MPa)	----------	13,1
Compressió a 2 dies (MPa)	13,5 mínim	23,7
Compressió a 7 dies (MPa)	----------	38,2
Compressió a 28 dies (MPa)	42,5 mín. - 62,5 màx.	52,6

(Les dades a 28 dies corresponen al mes anterior)

Aquest certificat es refereix al ciment subministrat, a les quantitats que s'indiquen sota les firmes, al nostre client:

SOLOMAT S.L.

Sant Viçenç dels Horts, 13-05-2009

Director Industrial — J. Badell Pau

Director de Qualitat — M. Guillem Ballesteros

	TM (Sobre Destí *)	TM (Sobre Fàbrica **)	TM (Total)
TOTAL CLIENT	0,000	7,350	7,350
OBRA/ES(***) MAGATZEM-TERRASSA	0,000	7,350	7,350

* Ciment subministrat al destí indicat.

** S'adjudica al destí indicat encara que no certifiqui el subministrament per ser el propi client qui controla el transport.

*** Les obres en ordre alfabètic.

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COPIA FICHA TÉCNICA PUENTE DE UNIÓN

INFORME

DE / *FROM* **Conrad Massip** Departamento Técnico Departamento Edificación **CTT-STRONGHOLD, S.A.** Passeig de Gràcia, 11. Esc. B 1ª planta 08007 BARCELONA SPAIN Tel. +34 932 892 330 Fax +34 932 892 331 E-mail cmassip@vslsp.com http://www.vsl-intl.com	**PARA / *TO*** **Enrique Vicente** **FORCIMSA**
FECHA / *DATE* viernes, 17 de abril de 2009 **REF** **Esu410805-014-2009**	Numero de páginas (incluida esta) **1 + 0** *Number of pages (including this page)* **CC:**

Ref. / *Re: Reparación cordones 211C, 215B, 2º vaciado sótano -3*

Una vez sustituidos y tesados los cordones de referencia, puede procederse al relleno de la parte de hormigón que tuvo que eliminarse. Para hacerlo, puede usarse un puente de unión basado en una resina para adherir hormigones y un hormigón HA-30.

Conrad Massip
Ingeniero Industrial
Dirección Técnica
CTT-STRONGHOLD, S.A.
e-mail: cmassip@vslsp.com

PLAKABETON

Fecha : 26/03/03	W+F

Multitek Adhesivo SDH

Multitek Adhesivo SDH : Ficha técnica

1. Descripción y propiedades

MULTITEC ADHESIVO SDH es una resina epoxi de 2 componentes, incolora y sin disolventes, para uso como adhesivo de unión de hormigones.

MULTITEK ADHESIVO SDH, se utiliza como adhesivo en las juntas de hormigonado a fin de mejorar la adherencia de las secciones con diferente edad.

2. Puesta en obra

- Preparación de la superficie, El soporte deberá de ser sólido, libre de incrustaciones, alquitranes, materias grasas, etc. Las lechadas superficiales deberán de ser extraídas mediante la proyección de agua y/o arena a presión.
- Mezclado: Para su correcto mezclado, añadir la totalidad (en ningún caso mezclar parte de alguno de los componentes del juego) del COMPONENTE II en el envase del COMPONENTE I. Utilizando un mezclador de bajas revoluciones, mezclar completamente los dos componentes durante al menos 3 minutos hasta una perfecta homogeneización.
  Durante el mezclado la temperatura deberá estar entre 10 y 20ºC, teniendo en cuenta que a temperaturas superiores el post-life se reduce considerablemente.
- Aplicación. MULTITEK ADHESIVO SDH se aplicará a brocha, rodillo o airless, prestando mucha atención al estado del soporte y la presencia de impurezas tanto en el mezclado como en la aplicación, pues pueden afectar a la adherencia del producto al soporte.
  Si la sección de hormigonado a ejecutar no pudiera aplicarse sobre el producto fresco, deberá realizarse un espolvoreo de arena sobre el producto fresco a fin de mejorar la superficie de contacto. Previo a la colocación de la sección siguiente deberá eliminarse la arena sobrante o no adherida.
- Rendimiento: Apróx. 350 gr/m^2

4. Propiedades

Densidad	1,05 kg/l
Adherencia a tracción	rotura por el hormigón
Viscosidad	400 cps
Endurecimiento Total	7 días
Temp. Mínima de endurecimiento	7ºC
Post-life (horas/temperatura ºC)	1/20
Embalaje	Juegos de 2.5 y 10 kg
Caducidad	12 meses

5. Seguridad e higiene

Este producto, basado en resinas epoxi, puede irritar piel y mucosas. Utilizar guantes y gafas protectoras. En caso de contacto con la piel, lávese ésta con abundante agua. En caso de contacto con los ojos, lávense inmediata y abundantemente con agua y consúltese un especialista. Para más información consulta ficha de seguridad del producto.

C.V.A. PLAKABETON - COFFRATEC S.C.A. Industrielaan, 2 – B 1740 TERNAT
& 32 2 582 29 45 Fax 32 2 582 19 62 e-mail : plakabeton.belgium@skynet.be

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REPORTES DE TESADO DE CABLES

VSL CTT STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

P22-RT

Página 1 de 1

Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO :	09-03-09	FECHA :	17-03-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
101 A	375 bares	222	222			1,00			X	
101 B	375 bares	222	222			1,00			X	
102 A	375 bares	222	221			1,00			X	
102 B	375 bares	222	218			0,98			X	
103 A	375 bares	222	228			1,03			X	
103 B	375 bares	222	218			0,98			X	
104 A	375 bares	222	230			1,04			X	
105 A	375 bares	222	217			0,98			X	
106 A	375 bares	222	222			1,00			X	
107 A	375 bares	222	211			0,95			X	
108 A	375 bares	222	222			1,00			X	
109 A	375 bares	222	235			1,06			X	
109 B	375 bares	222	230			1,04			X	
110 A	375 bares	222	233			1,05			X	
110 B	375 bares	222	228			1,03			X	
111 A	375 bares	222	210			0,95			X	
111 B	375 bares	222	206			0,93			X	
111 C	375 bares	222	210			0,95			X	
111 D	375 bares	222	218			0,98			X	
112 A	375 bares	182	180			0,99			X	
112 B	375 bares	182	185			1,02			X	
113 A	375 bares	182	165			0,91			X	
114 A	375 bares	182	178			0,98			X	
115 A	375 bares	182	174			0,96			X	
116 A	375 bares	182	178			0,98			X	
117 A	375 bares	182	182			1,00			X	
118 A	375 bares	182	185			1,02			X	
118 B	375 bares	182	173			0,95			X	
119 A	375 bares	182	183			1,01			X	
119 B	375 bares	182	182			1,00			X	
120 A	375 bares	182	170			0,93			X	
120 B	375 bares	182	183			1,01			X	
120 C	375 bares	182	177			0,97			X	
120 D	375 bares	182	185			1,02			X	
121 A	375 bares	182	177			0,97			X	
121 B	375 bares	182	185			1,02			X	
122 A	375 bares	182	187			1,03			X	
122 B	375 bares	182	183			1,01			X	
123 A	375 bares	182	188			1,03			X	
124 A	375 bares	182	189			1,04			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

VSL CTT STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

P22-RT

Página 1 de 1

Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO :	09-03-09	FECHA :	17-03-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	f'c' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
125 A	375 bares	182	190			1,04			X	
126 A	375 bares	182	160			0,88			X	
127 A	375 bares	182	173			0,95			X	
127 B	375 bares	182	188			1,03			X	
128 A	375 bares	182	185			1,02			X	
128 B	375 bares	182	183			1,01			X	
129 A	375 bares	182	210			1,15			X	
129 B	375 bares	182	208			1,14			X	
129 C	375 bares	182	204			1,12			X	
129 D	375 bares	182	210			1,15			X	
130 A	375 bares	182	209			1,15			X	
130 B	375 bares	182	209			1,15			X	
131 A	375 bares	175	190			1,09			X	
131 B	375 bares	175	202			1,15			X	
132 A	375 bares	175	168			0,96			X	
133 A	375 bares	175	174			0,99			X	
134 A	375 bares	175	202			1,15			X	
135 A	375 bares	175	194			1,11			X	
136 A	375 bares	175	190			1,09			X	
136 B	375 bares	175	195			1,11			X	
				MEDIA UNIFORMES:		1,02				
222 A	375 bares	209	216			1,03			X	
222 B	375 bares	209	195			0,93			X	
223 A	375 bares	209	208			1,00			X	
223 B	375 bares	209	200			0,96			X	
223 C	375 bares	209	203			0,97			X	
224 A	375 bares	209	198			0,95			X	
224 B	375 bares	209	200			0,96			X	
224 C	375 bares	209	203			0,97			X	
224 D	375 bares	209	209			1,00			X	
225 A	375 bares	209	203			0,97			X	
225 B	375 bares	209	200			0,96			X	
225 C	375 bares	209	210			1,00			X	
226 A	375 bares	209	208			1,00			X	
226 B	375 bares	209	208			1,00			X	
227 A	375 bares	237	215			0,91			X	
227 B	375 bares	237	210			0,89			X	
228 A	375 bares	237	206			0,87			X	
228 B	375 bares	237	201			0,85			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

VSL CTT STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

P22-RT

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO :	09-03-09	FECHA :	17-03-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
228 C	375 bares	237	201			0,85			X	
229 A	375 bares	237	202			0,85			X	
229 B	375 bares	237	202			0,85			X	
230 A	375 bares	237	208			0,88			X	
230 B	375 bares	237	210			0,89			X	
231 A	375 bares	237	220			0,93			X	
231 B	375 bares	237	220			0,93			X	
231 C	375 bares	237	217			0,92			X	
232 A	375 bares	237	206			0,87			X	
232 B	375 bares	237	228			0,96			X	
233 A	375 bares	237	223			0,94			X	
233 B	375 bares	237	220			0,93			X	
234 A	375 bares	237	220			0,93			X	
234 B	375 bares	237	210			0,89			X	
234 C	375 bares	237	218			0,92			X	
235 A	375 bares	237	218			0,92			X	
235 B	375 bares	237	224			0,95			X	
235 C	375 bares	237	217			0,92			X	
235 D	375 bares	237	217			0,92			X	
236 A	375 bares	237	219			0,92			X	
236 B	375 bares	237	230			0,97			X	
236 C	375 bares	237	220			0,93			X	
237 A	375 bares	237	230			0,97			X	
237 B	375 bares	237	222			0,94			X	
238 A	375 bares	237	226			0,95			X	
238 B	375 bares	237	225			0,95			X	
239 A	375 bares	237	235			0,99			X	
239 B	375 bares	237	229			0,97			X	
239 C	375 bares	237	224			0,95			X	
240 A	375 bares	237	228			0,96			X	
240 B	375 bares	237	233			0,98			X	
240 C	375 bares	237	228			0,96			X	
240 D	375 bares	237	228			0,96			X	
241 A	375 bares	237	233			0,98			X	
241 B	375 bares	237	224			0,95			X	
241 C	375 bares	237	229			0,97			X	
242 A	375 bares	237	220			0,93			X	
242 B	375 bares	237	222			0,94			X	
243 A	375 bares	237	220			0,93			X	
243 B	375 bares	237	233			0,98			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

VSL C T T STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO :	09-03-09	FECHA :	17-03-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO P.M	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
244 A	375 bares	237	239			1,01			X	
244 B	375 bares	237	229			0,97			X	
244 C	375 bares	237	239			1,01			X	
245 A	375 bares	237	240			1,01			X	
245 B	375 bares	237	236			1,00			X	
245 C	375 bares	237	240			1,01			X	
245 D	375 bares	237	243			1,03			X	
246 A	375 bares	237	243			1,03			X	
246 B	375 bares	237	245			1,03			X	
246 C	375 bares	237	244			1,03			X	
247 A	375 bares	237	228			0,96			X	
247 B	375 bares	237	228			0,96			X	
				MEDIA BANDAS:		0,95				
				MEDIA TOTAL:		0,99				

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

VSL CTT STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

P22-RT

Página 1 de 1

Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	2º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO:	24-03-09	FECHA :	01-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
101 A	375 bares	166	160			0,96			X	
101 B	375 bares	166	155			0,93			X	
102 A	375 bares	166	160			0,96			X	
102 B	375 bares	166	165			0,99			X	
103 A	375 bares	166	165			0,99			X	
103 B	375 bares	166	160			0,96			X	
104 A	375 bares	166	160			0,96			X	
105 A	375 bares	166	163			0,98			X	
106 A	375 bares	166	160			0,96			X	
107 A	375 bares	166	160			0,96			X	
108 A	375 bares	166	162			0,98			X	
109 A	375 bares	166	150			0,90			X	
109 B	375 bares	166	160			0,96			X	
110 A	375 bares	166	147			0,89			X	
110 B	375 bares	166	155			0,93			X	
111 A	375 bares	166	155			0,93			X	
111 B	375 bares	166	160			0,96			X	
111 C	375 bares	166	151			0,91			X	
111 D	375 bares	166	152			0,92			X	
112 A	375 bares	164	152			0,93			X	
112 B	375 bares	164	145			0,88			X	
113 A	375 bares	256	247			0,96			X	
114 A	375 bares	256	247			0,96			X	
115 A	375 bares	256	245			0,96			X	
116 A	375 bares	256	245			0,96			X	
117 A	375 bares	256	240			0,94			X	
118 A	375 bares	256	255			1,00			X	
118 B	375 bares	256	250			0,98			X	
119 A	375 bares	256	245			0,96			X	
119 B	375 bares	256	250			0,98			X	
120 A	375 bares	256	245			0,96			X	
120 B	375 bares	256	250			0,98			X	
120 C	375 bares	256	245			0,96			X	
120 D	375 bares	256	255			1,00			X	
121 A	375 bares	256	223			0,87			X	
121 B	375 bares	256	220			0,86			X	
122 A	375 bares	256	245			0,96			X	
122 B	375 bares	256	243			0,95			X	
123 A	375 bares	256	240			0,94			X	
124 A	375 bares	256	233			0,91			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

P22-RT			
Página 1 de 1			
Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	2°	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO:	24-03-09	FECHA :	01-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
125 A	375 bares	256	245			0,96			X	
126 A	375 bares	256	233			0,91			X	
127 A	375 bares	256	250			0,98			X	
127 B	375 bares	256	245			0,96			X	
128 A	375 bares	256	250			0,98			X	
128 B	375 bares	256	243			0,95			X	
129 A	375 bares	256	245			0,96			X	
129 B	375 bares	256	240			0,94			X	
129 C	375 bares	256	245			0,96			X	
129 D	375 bares	256	243			0,95			X	
130 A	375 bares	256	232			0,91			X	
130 B	375 bares	256	251			0,98			X	
					MEDIA UNIFORMES:	0,95				
201 A	375 bares	111	115			1,04			X	
201 B	375 bares	111	117			1,05			X	
201 C	375 bares	111	111			1,00			X	
201 D	375 bares	111	115			1,04			X	
202 A	375 bares	111	115			1,04			X	
202 B	375 bares	111	113			1,02			X	
202 C	375 bares	111	117			1,05			X	
202 D	375 bares	111	114			1,03			X	
203 A	375 bares	111	104			0,94			X	
203 B	375 bares	111	110			0,99			X	
203 C	375 bares	111	112			1,01			X	
203 D	375 bares	111	105			0,95			X	
204 A	375 bares	111	115			1,04			X	
204 B	375 bares	111	108			0,97			X	
204 C	375 bares	111	105			0,95			X	
204 D	375 bares	111	100			0,90			X	
205 A	375 bares	111	105			0,95			X	
205 B	375 bares	111	105			0,95			X	
205 C	375 bares	111	112			1,01			X	
205 D	375 bares	111	112			1,01			X	
206 A	375 bares	111	115			1,04			X	
206 B	375 bares	111	105			0,95			X	
206 C	375 bares	111	115			1,04			X	
206 D	375 bares	111	110			0,99			X	
207 A	375 bares	192	190			0,99			X	
207 B	375 bares	192	195			1,02			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

VSL CTT STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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OBRA :	Facultad Industriales UPC	SECTOR :	2º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO:	24-03-09	FECHA :	01-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
207 C	375 bares	192	190			0,99			X	
208 A	375 bares	192	195			1,02			X	
208 B	375 bares	192	197			1,03			X	
208 C	375 bares	192	197			1,03			X	
208 D	375 bares	192	195			1,02			X	
209 A	375 bares	192	198			1,03			X	
209 B	375 bares	192	190			0,99			X	
209 C	375 bares	192	190			0,99			X	
209 D	375 bares	192	192			1,00			X	
209 E	375 bares	192	195			1,02			X	
210 A	375 bares	192	200			1,04			X	
210 B	375 bares	192	200			1,04			X	
210 C	375 bares	192	200			1,04			X	
210 D	375 bares	192	200			1,04			X	
211 A	375 bares	192	197			1,03			X	
211 B	375 bares	192	197			1,03			X	
211 C	375 bares	192	Pendiente						X	
212 A	375 bares	192	185			0,96			X	
212 B	375 bares	192	195			1,02			X	
213 A	375 bares	192	182			0,95			X	
213 B	375 bares	192	190			0,99			X	
213 C	375 bares	192	195			1,02			X	
213 D	375 bares	192	193			1,01			X	
214 A	375 bares	192	193			1,01			X	
214 B	375 bares	192	195			1,02			X	
214 C	375 bares	192	195			1,02			X	
214 D	375 bares	192	190			0,99			X	
215 A	375 bares	192	203			1,06			X	
215 B	375 bares	192	Pendiente						X	
215 C	375 bares	192	209			1,09			X	
215 D	375 bares	192	200			1,04			X	
216 A	375 bares	192	193			1,01			X	
216 B	375 bares	192	207			1,08			X	
217 A	375 bares	192	201			1,05			X	
217 B	375 bares	192	196			1,02			X	
218 A	375 bares	192	199			1,04			X	
218 B	375 bares	192	196			1,02			X	
218 C	375 bares	192	200			1,04			X	
219 A	375 bares	192	195			1,02			X	
219 B	375 bares	192	197			1,03			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión 0 Fecha: 20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	2º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO:	24-03-09	FECHA :	01-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
219 C	375 bares	192	202			1,05			X	
219 D	375 bares	192	197			1,03			X	
220 A	375 bares	192	193			1,01			X	
220 B	375 bares	192	200			1,04			X	
220 C	375 bares	192	212			1,10			X	
221 A	375 bares	192	202			1,05			X	
					MEDIA BANDAS:	1,01				
					MEDIA TOTAL:	0,98				

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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VSL CTT STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO :	08-04-09	FECHA :	14-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
101 A	375 bares	227	225			0,99			X	
101 B	375 bares	227	220			0,97			X	
102 A	375 bares	227	223			0,98			X	
102 B	375 bares	227	220			0,97			X	
103 A	375 bares	227	225			0,99			X	
103 B	375 bares	227	220			0,97			X	
104 A	375 bares	227	222			0,98			X	
105 A	375 bares	227	225			0,99			X	
106 A	375 bares	227	219			0,96			X	
107 A	375 bares	227	230			1,01			X	
108 A	375 bares	227	220			0,97			X	
109 A	375 bares	227	229			1,01			X	
109 B	375 bares	227	222			0,98			X	
110 A	375 bares	227	223			0,98			X	
110 B	375 bares	227	208			0,92			X	
111 A	375 bares	227	232			1,02			X	
111 B	375 bares	227	210			0,93			X	
111 C	375 bares	227	221			0,97			X	
111 D	375 bares	227	220			0,97			X	
112 A	375 bares	227	206			0,91			X	
112 B	375 bares	227	210			0,93			X	
113 A	375 bares	222	222			1,00			X	
114 A	375 bares	222	224			1,01			X	
115 A	375 bares	222	221			1,00			X	
116 A	375 bares	222	222			1,00			X	
117 A	375 bares	222	225			1,01			X	
118 A	375 bares	222	220			0,99			X	
118 B	375 bares	222	217			0,98			X	
119 A	375 bares	222	226			1,02			X	
119 B	375 bares	222	220			0,99			X	
120 A	375 bares	222	227			1,02			X	
120 B	375 bares	222	215			0,97			X	
120 C	375 bares	222	215			0,97			X	
120 D	375 bares	222	218			0,98			X	
121 A	375 bares	222	221			1,00			X	
121 B	375 bares	222	215			0,97			X	
122 A	375 bares	222	232			1,05			X	
122 B	375 bares	222	230			1,04			X	
123 A	375 bares	222	229			1,03			X	
124 A	375 bares	222	231			1,04			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1°	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO :	08-04-09	FECHA :	14-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
125 A	375 bares	222	224			1,01			X	
126 A	375 bares	222	225			1,01			X	
127 A	375 bares	222	225			1,01			X	
127 B	375 bares	222	228			1,03			X	
128 A	375 bares	222	224			1,01			X	
128 B	375 bares	222	215			0,97			X	
129 A	375 bares	222	225			1,01			X	
129 B	375 bares	222	220			0,99			X	
129 C	375 bares	222	223			1,00			X	
129 D	375 bares	222	220			0,99			X	
130 A	375 bares	222	227			1,02			X	
130 B	375 bares	222	220			0,99			X	
131 A	375 bares	222	195			0,88			X	
131 B	375 bares	222	190			0,86			X	
132 A	375 bares	222	190			0,86			X	
133 A	375 bares	222	188			0,85			X	
134 A	375 bares	222	190			0,86			X	
135 A	375 bares	222	195			0,88			X	
136 A	375 bares	222	197			0,89			X	
136 B	375 bares	222	195			0,88			X	
				MEDIA UNIFORMES:		0,97				
222 A	375 bares	240	205			0,85			X	
222 B	375 bares	240	204			0,85			X	
223 A	375 bares	240	207			0,86			X	
223 B	375 bares	240	212			0,88			X	
223 C	375 bares	240	210			0,88			X	
224 A	375 bares	240	220			0,92			X	
224 B	375 bares	240	203			0,85			X	
224 C	375 bares	240	204			0,85			X	
224 D	375 bares	240	210			0,88			X	
225 A	375 bares	240	208			0,87			X	
225 B	375 bares	240	205			0,85			X	
225 C	375 bares	240	205			0,85			X	
226 A	375 bares	240	213			0,89			X	
226 B	375 bares	240	210			0,88			X	
227 A	375 bares	243	208			0,86			X	
227 B	375 bares	243	221			0,91			X	
228 A	375 bares	243	226			0,93			X	
228 B	375 bares	243	218			0,90			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO :	08-04-09	FECHA :	14-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
228 C	375 bares	243	209			0,86			X	
229 A	375 bares	243	214			0,88			X	
229 B	375 bares	243	215			0,88			X	
230 A	375 bares	243	221			0,91			X	
230 B	375 bares	243	228			0,94			X	
231 A	375 bares	243	218			0,90			X	
231 B	375 bares	243	222			0,91			X	
231 C	375 bares	243	220			0,91			X	
232 A	375 bares	243	220			0,91			X	
232 B	375 bares	243	223			0,92			X	
233 A	375 bares	243	240			0,99			X	
233 B	375 bares	243	233			0,96			X	
234 A	375 bares	243	236			0,97			X	
234 B	375 bares	243	242			1,00			X	
234 C	375 bares	243	248			1,02			X	
235 A	375 bares	243	235			0,97			X	
235 B	375 bares	243	246			1,01			X	
235 C	375 bares	243	230			0,95			X	
235 D	375 bares	243	232			0,95			X	
236 A	375 bares	243	226			0,93			X	
236 B	375 bares	243	240			0,99			X	
236 C	375 bares	243	231			0,95			X	
237 A	375 bares	243	245			1,01			X	
237 B	375 bares	243	238			0,98			X	
238 A	375 bares	243	230			0,95			X	
238 B	375 bares	243	243			1,00			X	
239 A	375 bares	243	245			1,01			X	
239 B	375 bares	243	233			0,96			X	
239 C	375 bares	243	227			0,93			X	
240 A	375 bares	243	235			0,97			X	
240 B	375 bares	243	245			1,01			X	
240 C	375 bares	243	231			0,95			X	
240 D	375 bares	243	248			1,02			X	
241 A	375 bares	243	235			0,97			X	
241 B	375 bares	243	253			1,04			X	
241 C	375 bares	243	240			0,99			X	
242 A	375 bares	243	250			1,03			X	
242 B	375 bares	243	245			1,01			X	
243 A	375 bares	243	250			1,03			X	
243 B	375 bares	243	250			1,03			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO :	08-04-09	FECHA :	14-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
244 A	375 bares	243	245			1,01			X	
244 B	375 bares	243	243			1,00			X	
244 C	375 bares	243	242			1,00			X	
245 A	375 bares	243	230			0,95			X	
245 B	375 bares	243	236			0,97			X	
245 C	375 bares	243	245			1,01			X	
245 D	375 bares	243	250			1,03			X	
246 A	375 bares	243	250			1,03			X	
246 B	375 bares	243	236			0,97			X	
246 C	375 bares	243	240			0,99			X	
247 A	375 bares	243	227			0,93			X	
247 B	375 bares	243	230			0,95			X	
				MEDIA BANDAS:		0,94				
				MEDIA TOTAL:		0,96				

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

Barcelona, 21 de Abril de 2009

REF: ALARGAMIENTOS SÓTANO -2 / VACIADO 1

Adjuntamos report de tesado relativo a esta zona.

Verán que los alargamientos teóricos de los tendones 222 a 226 han sido corregidos, respecto a planos, desde 240mm hasta 203mm.

El motivo de la corrección es el siguiente:
La ejecución de la junta de hormigonado que afecta a la zona de rampa se movió respecto a planos originales sin corregir el cálculo del alargamiento teórico del tendón.

Los tendones 222 a 226 inicialmente (proyecto) tenían las siguientes características:

- Longitud de 36.4 metros (+0,6 metros de corte)
- Alargamiento teórico por cálculo de 240mm

La longitud real de estos tendones es de 30.70 metros, es decir inferior en 5.7 metros a la real.

Con ello, por simple regla de tres, el alargamiento teórico para este cordón es de :

(30,70 metros / 36,40 metros) x 240 mm = **203 mm**

Se adjunta los reports de alargamiento, corregido este valor, para el tesado de la losa.

De acuerdo a la instrucción, los valores reales obtenidos son acordes con los teóricos.

Sin otro particular, y quedando a vuestra disposición para aclarar cualquier duda al respecto, le saluda atentamente.

Pedro Ossó
CTT-Stronghold S.A.

Paseo de Gracia 11, esc B 1° piso (08007) Barcelona, España. Tel:93 289 23 30. Fax: 93 289 23 31

— Retesado de Cables —

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OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410,805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO :	08-04-09	FECHA :	14-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
101 A	375 bares	227	225			0.99			X	
101 B	375 bares	227	220			0.97			X	
102 A	375 bares	227	223			0.98			X	
102 B	375 bares	227	220			0.97			X	
103 A	375 bares	227	225			0.99			X	
103 B	375 bares	227	220			0.97			X	
104 A	375 bares	227	222			0.98			X	
105 A	375 bares	227	225			0.99			X	
106 A	375 bares	227	219			0.96			X	
107 A	375 bares	227	230			1.01			X	
108 A	375 bares	227	220			0.97			X	
109 A	375 bares	227	229			1.01			X	
109 B	375 bares	227	222			0.98			X	
110 A	375 bares	227	223			0.98			X	
110 B	375 bares	227	208			0.92			X	
111 A	375 bares	227	232			1.02			X	
111 B	375 bares	227	210			0.93			X	
111 C	375 bares	227	221			0.97			X	
111 D	375 bares	227	220			0.97			X	
112 A	375 bares	227	206			0.91			X	
112 B	375 bares	227	210			0.93			X	
113 A	375 bares	222	222			1.00			X	
114 A	375 bares	222	224			1.01			X	
115 A	375 bares	222	221			1.00			X	
116 A	375 bares	222	222			1.00			X	
117 A	375 bares	222	225			1.01			X	
118 A	375 bares	222	220			0.99			X	
118 B	375 bares	222	217			0.98			X	
119 A	375 bares	222	226			1.02			X	
119 B	375 bares	222	220			0.99			X	
120 A	375 bares	222	227			1.02			X	
120 B	375 bares	222	215			0.97			X	
120 C	375 bares	222	215			0.97			X	
120 D	375 bares	222	218			0.98			X	
121 A	375 bares	222	221			1.00			X	
121 B	375 bares	222	215			0.97			X	
122 A	375 bares	222	232			1.05			X	
122 B	375 bares	222	230			1.04			X	
123 A	375 bares	222	229			1.03			X	
124 A	375 bares	222	231			1.04			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410,805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO :	08-04-09	FECHA :	14-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
125 A	375 bares	222	224			1.01			X	
126 A	375 bares	222	225			1.01			X	
127 A	375 bares	222	225			1.01			X	
127 B	375 bares	222	228			1.03			X	
128 A	375 bares	222	224			1.01			X	
128 B	375 bares	222	215			0.97			X	
129 A	375 bares	222	225			1.01			X	
129 B	375 bares	222	220			0.99			X	
129 C	375 bares	222	223			1.00			X	
129 D	375 bares	222	220			0.99			X	
130 A	375 bares	222	227			1.02			X	
130 B	375 bares	222	220			0.99			X	
131 A	375 bares	222	195			0.88			X	
131 B	375 bares	222	190			0.86			X	
132 A	375 bares	222	190			0.86			X	
133 A	375 bares	222	188			0.85			X	
134 A	375 bares	222	190			0.86			X	
135 A	375 bares	222	195			0.88			X	
136 A	375 bares	222	197			0.89			X	
136 B	375 bares	222	195			0.88			X	
				MEDIA UNIFORMES:		0.97				
222 A	375 bares	203	205			1.01			X	
222 B	375 bares	203	204			1.00			X	
223 A	375 bares	203	207			1.02			X	
223 B	375 bares	203	212			1.04			X	
223 C	375 bares	203	210			1.03			X	
224 A	375 bares	203	220			1.08			X	
224 B	375 bares	203	203			1.00			X	
224 C	375 bares	203	204			1.00			X	
224 D	375 bares	203	210			1.03			X	
225 A	375 bares	203	208			1.02			X	
225 B	375 bares	203	205			1.01			X	
225 C	375 bares	203	205			1.01			X	
226 A	375 bares	203	213			1.05			X	
226 B	375 bares	203	210			1.03			X	
227 A	375 bares	243	208			0.86			X	
227 B	375 bares	243	221			0.91			X	
228 A	375 bares	243	226			0.93			X	
228 B	375 bares	243	218			0.90			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410,805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO :	08-04-09	FECHA :	14-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
228 C	375 bares	243	209			0.86			X	
229 A	375 bares	243	214			0.88			X	
229 B	375 bares	243	215			0.88			X	
230 A	375 bares	243	221			0.91			X	
230 B	375 bares	243	228			0.94			X	
231 A	375 bares	243	218			0.90			X	
231 B	375 bares	243	222			0.91			X	
231 C	375 bares	243	220			0.91			X	
232 A	375 bares	243	220			0.91			X	
232 B	375 bares	243	223			0.92			X	
233 A	375 bares	243	240			0.99			X	
233 B	375 bares	243	233			0.96			X	
234 A	375 bares	243	236			0.97			X	
234 B	375 bares	243	242			1.00			X	
234 C	375 bares	243	248			1.02			X	
235 A	375 bares	243	235			0.97			X	
235 B	375 bares	243	246			1.01			X	
235 C	375 bares	243	230			0.95			X	
235 D	375 bares	243	232			0.95			X	
236 A	375 bares	243	226			0.93			X	
236 B	375 bares	243	240			0.99			X	
236 C	375 bares	243	231			0.95			X	
237 A	375 bares	243	245			1.01			X	
237 B	375 bares	243	238			0.98			X	
238 A	375 bares	243	230			0.95			X	
238 B	375 bares	243	243			1.00			X	
239 A	375 bares	243	245			1.01			X	
239 B	375 bares	243	233			0.96			X	
239 C	375 bares	243	227			0.93			X	
240 A	375 bares	243	235			0.97			X	
240 B	375 bares	243	245			1.01			X	
240 C	375 bares	243	231			0.95			X	
240 D	375 bares	243	248			1.02			X	
241 A	375 bares	243	235			0.97			X	
241 B	375 bares	243	253			1.04			X	
241 C	375 bares	243	240			0.99			X	
242 A	375 bares	243	250			1.03			X	
242 B	375 bares	243	245			1.01			X	
243 A	375 bares	243	250			1.03			X	
243 B	375 bares	243	250			1.03			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410,805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO :	08-04-09	FECHA :	14-04-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
244 A	375 bares	243	245			1.01			X	
244 B	375 bares	243	243			1.00			X	
244 C	375 bares	243	242			1.00			X	
245 A	375 bares	243	230			0.95			X	
245 B	375 bares	243	236			0.97			X	
245 C	375 bares	243	245			1.01			X	
245 D	375 bares	243	250			1.03			X	
246 A	375 bares	243	250			1.03			X	
246 B	375 bares	243	236			0.97			X	
246 C	375 bares	243	240			0.99			X	
247 A	375 bares	243	227			0.93			X	
247 B	375 bares	243	230			0.95			X	
				MEDIA BANDAS:		0.98				
				MEDIA TOTAL:		0.98				

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	2º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONADO	21/04/2009	FECHA :	29/04/2009	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
101 A	375 bares	169	160			0,95			X	
101 B	375 bares	169	158			0,93			X	
102 A	375 bares	169	162			0,96			X	
102 B	375 bares	169	161			0,95			X	
103 A	375 bares	169	155			0,92			X	
103 B	375 bares	169	155			0,92			X	
104 A	375 bares	169	156			0,92			X	
105 A	375 bares	169	163			0,96			X	
106 A	375 bares	169	165			0,98			X	
107 A	375 bares	169	165			0,98			X	
108 A	375 bares	97	90			0,93			X	
109 A	375 bares	97	89			0,92			X	
109 B	375 bares	97	90			0,93			X	
110 A	375 bares	169	163			0,96			X	
110 B	375 bares	169	162			0,96			X	
111 A	375 bares	169	160			0,95			X	
111 B	375 bares	169	160			0,95			X	
111 C	375 bares	169	162			0,96			X	
111 D	375 bares	169	159			0,94			X	
112 A	375 bares	169	160			0,95			X	
112 B	375 bares	169	159			0,94			X	
113 A	375 bares	256	240			0,94			X	
114 A	375 bares	256	243			0,95			X	
115 A	375 bares	256	243			0,95			X	
116 A	375 bares	256	245			0,96			X	
117 A	375 bares	256	239			0,93			X	
118 A	375 bares	256	239			0,93			X	
118 B	375 bares	256	240			0,94			X	
119 A	375 bares	256	249			0,97			X	
119 B	375 bares	256	243			0,95			X	
120 A	375 bares	256	242			0,95			X	
120 B	375 bares	256	245			0,96			X	
120 C	375 bares	256	241			0,94			X	
120 D	375 bares	256	250			0,98			X	
121 A	375 bares	256	250			0,98			X	
121 B	375 bares	256	239			0,93			X	
122 A	375 bares	256	230			0,90			X	
122 B	375 bares	256	235			0,92			X	
123 A	375 bares	256	243			0,95			X	
124 A	375 bares	256	236			0,92			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	2º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONAD	21/04/2009	FECHA :	29/04/2009	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
125 A	375 bares	256	243			0,95			X	
126 A	375 bares	256	238			0,93			X	
127 A	375 bares	256	239			0,93			X	
127 B	375 bares	256	242			0,95			X	
128 A	375 bares	256	249			0,97			X	
128 B	375 bares	256	250			0,98			X	
129 A	375 bares	256	245			0,96			X	
129 B	375 bares	256	239			0,93			X	
129 C	375 bares	256	239			0,93			X	
129 D	375 bares	256	239			0,93			X	
130 A	375 bares	256	248			0,97			X	
130 B	375 bares	256	249			0,97			X	
				Media Uniformes:		0,95				
201 A	375 bares	124	125			1,01			X	
201 B	375 bares	124	118			0,95			X	
201 C	375 bares	124	122			0,98			X	
201 D	375 bares	124	125			1,01			X	
202 A	375 bares	124	127			1,02			X	
202 B	375 bares	124	126			1,02			X	
202 C	375 bares	124	125			1,01			X	
202 D	375 bares	124	128			1,03			X	
203 A	375 bares	124	118			0,95			X	
203 B	375 bares	124	123			0,99			X	
203 C	375 bares	124	118			0,95			X	
203 D	375 bares	124	124			1,00			X	
204 A	375 bares	124	128			1,03			X	
204 B	375 bares	124	121			0,98			X	
204 C	375 bares	124	123			0,99			X	
204 D	375 bares	124	124			1,00			X	
205 A	375 bares	124	123			0,99			X	
205 B	375 bares	124	122			0,98			X	
205 C	375 bares	124	123			0,99			X	
205 D	375 bares	124	120			0,97			X	
206 A	375 bares	124	128			1,03			X	
206 B	375 bares	124	128			1,03			X	
206 C	375 bares	124	124			1,00			X	
206 D	375 bares	124	122			0,98			X	
207 A	375 bares	211	180			0,85			X	
207 B	375 bares	211	190			0,90			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	2º	Nº OBRA :	410.805
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONAD	21/04/2009	FECHA :	29/04/2009
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409

TIPO DE HORMIGON :
RESISTENCIA 28 DIAS : Kg/cm2
fc' TRANSF. TESADO : Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
207 C	375 bares	211	191			0,91			X	
208 A	375 bares	211	197			0,93			X	
208 B	375 bares	211	198			0,94			X	
208 C	375 bares	211	196			0,93			X	
208 D	375 bares	211	195			0,92			X	
209 A	375 bares	211	195			0,92			X	
209 B	375 bares	211	191			0,91			X	
209 C	375 bares	211	194			0,92			X	
209 D	375 bares	211	190			0,90			X	
209 E	375 bares	211	185			0,88			X	
210 A	375 bares	211	193			0,91			X	
210 B	375 bares	211	196			0,93			X	
210 C	375 bares	211	198			0,94			X	
210 D	375 bares	211	198			0,94			X	
211 A	375 bares	211	199			0,94			X	
211 B	375 bares	211	188			0,89			X	
211 C	375 bares	211	180			0,85			X	
212 A	375 bares	211	189			0,90			X	
212 B	375 bares	211	194			0,92			X	
213 A	375 bares	211	195			0,92			X	
213 B	375 bares	211	195			0,92			X	
213 C	375 bares	211	198			0,94			X	
213 D	375 bares	211	195			0,92			X	
214 A	375 bares	211	197			0,93			X	
214 B	375 bares	211	195			0,92			X	
214 C	375 bares	211	192			0,91			X	
214 D	375 bares	211	197			0,93			X	
215 A	375 bares	211	197			0,93			X	
215 B	375 bares	211	199			0,94			X	
215 C	375 bares	211	196			0,93			X	
215 D	375 bares	211	180			0,85			X	
216 A	375 bares	211	203			0,96			X	
216 B	375 bares	211	196			0,93			X	
217 A	375 bares	211	217			1,03			X	
217 B	375 bares	211	217			1,03			X	
218 A	375 bares	211	218			1,03			X	
218 B	375 bares	211	217			1,03			X	
218 C	375 bares	211	Perdido						X	
219 A	375 bares	211	220			1,04			X	
219 B	375 bares	211	217			1,03			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	2º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGONAD	21/04/2009	FECHA :	29/04/2009	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
219 C	375 bares	211	218			1,03			X	
219 D	375 bares	211	213			1,01			X	
220 A	375 bares	211	200			0,95			X	
220 B	375 bares	211	210			1,00			X	
220 C	375 bares	211	210			1,00			X	
221 A	375 bares	211	205			0,97			X	
					Media Bandas:	0,96				
					MEDIA TOTAL:	0,95				

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

Barcelona, 12 de Mayo de 2009

At.: **ENRIQUE VICENTE**
FORCIMSA

Ref: Tesado 2 vaciado – 2 techo
Aclaración al informe del 4 de Mayo

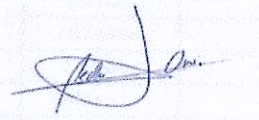
Apreciado Enrique,

En relación al documento que os enviamos el pasado 4 de Mayo con la incidencia en el cordón 218C, adjuntamos información adicional y corrección del número de artículo relativo a la pérdida admisible de sección de acero de postesado por pérdida de armaduras irremplazables (art. 70.3.1 en EHE-08).

Como aclaración al porcentaje de fuerza de postesado originado por la rotura de un elemento irreplazable de la armadura activa, indicar que la cantidad de cordones de bandas corresponde a 72 cordones de los que 1 se ha perdido. La pérdida de sección en bandas es del 1,38%.

De acuerdo al artículo 70.3.1. de EHE-08 la operación de tesado puede darse por satisfactoria en el caso que la pérdida de cordón suponga una pérdida de sección metálica inferior al 2% permitido en la normativa.

Sin otro particular, y quedando a vuestra disposición para aclarar cualquier duda al respecto, le saluda atentamente.



Pedro Ossó

Paseo de Gracia 11, esc B 1° piso (08007) Barcelona, España. Tel:93 289 23 30. Fax: 93 289 23 31

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	11-06-09	FECHA :	15-06-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº:	5409 (375 Bar) 0348 (520 Bar)	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
162 A	375 bares	203	197			0,97			X	
162 B	375 bares	203	198			0,98			X	
162 C	375 bares	203	198			0,98			X	
163 A	375 bares	496	483			0,97			X	
163 B	375 bares	496	467			0,94			X	
163 C	375 bares	496	470			0,95			X	
164 A	375 bares	306	330			1,08			X	
164 B	375 bares	306	310			1,01			X	
101 A	375 bares	395	445			1,13			X	
101 B	375 bares	395	407			1,03			X	
102 A	375 bares	395	414			1,05			X	
102 B	375 bares	395	428			1,08			X	
102 C	375 bares	395	431			1,09			X	
103 A	375 bares	395	423			1,07			X	
103 B	375 bares	395	422			1,07			X	
103 C	375 bares	395	411			1,04			X	
104 A	375 bares	121	128			1,06			X	
104 B	375 bares	121	130			1,07			X	
105 A	375 bares	121	125			1,03			X	
105 B	375 bares	121	130			1,07			X	
106 A	375 bares	121	130			1,07			X	
106 B	375 bares	121	125			1,03			X	
107 A	375 bares	57	62			1,09			X	
107 B	375 bares	57	60			1,05			X	
108 A	375 bares	57	54			0,95			X	
108 B	375 bares	57	55			0,96			X	
109 A	375 bares	57	57			1,00			X	
109 B	375 bares	57	Reparar						X	
110 A	375 bares	57	57			1,00			X	
110 B	375 bares	57	54			0,95			X	
111 A	375 bares	496	465			0,94			X	
111 B	375 bares	496	450			0,91			X	
111 C	375 bares	496	471			0,95			X	
111 D	375 bares	496	472			0,95			X	
112 A	375 bares	202	198			0,98			X	
113 A	375 bares	202	202			1,00			X	
114 A	375 bares	202	180			0,89			X	
115 A	375 bares	202	210			1,04			X	
116 A	375 bares	202	200			0,99			X	
117 A	375 bares	202	190			0,94			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	11-06-09	FECHA :	15-06-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº:	5409 (375 Bar) 0348 (520 Bar)	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
117 B	375 bares	202	200			0,99			X	
118 A	375 bares	202	200			0,99			X	
118 B	375 bares	202	210			1,04			X	
119 A	375 bares	202	200			0,99			X	
119 B	375 bares	202	196			0,97			X	
119 C	375 bares	202	190			0,94			X	
119 D	375 bares	202	200			0,99			X	
120 A	520 bares	202	205			1,01			X	
120 B	520 bares	202	220			1,09			X	
121 A	520 bares	202	190			0,94			X	
121 B	520 bares	202	195			0,97			X	
122 A	375 bares	202	200			0,99			X	
123 A	375 bares	202	202			1,00			X	
124 A	375 bares	202	190			0,94			X	
125 A	375 bares	202	205			1,01			X	
126 A	375 bares	202	200			0,99			X	
126 B	375 bares	202	190			0,94			X	
127 A	375 bares	202	212			1,05			X	
127 B	375 bares	202	200			0,99			X	
128 A	375 bares	202	195			0,97			X	
128 B	375 bares	202	195			0,97			X	
128 C	375 bares	202	190			0,94			X	
128 D	375 bares	202	190			0,94			X	
129 A	375 bares	202	200			0,99			X	
129 B	375 bares	202	192			0,95			X	
				MEDIA UNIFORMES:		1,00				
201 A	375 bares	99	85			0,86			X	
201 B	375 bares	99	87			0,88			X	
201 C	375 bares	99	90			0,91			X	
201 D	375 bares	99	86			0,87			X	
202 A	375 bares	99	85			0,86			X	
202 B	375 bares	99	90			0,91			X	
202 C	375 bares	99	95			0,96			X	
202 D	375 bares	99	99			1,00			X	
204 A	375 bares	87	80			0,92			X	
204 B	375 bares	87	80			0,92			X	
204 C	375 bares	87	90			1,03			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	11-06-09	FECHA :	15-06-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº:	5409 (375 Bar) 0348 (520 Bar)	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
204 D	375 bares	87	88			1,01			X	
205 A	375 bares	87	90			1,03			X	
205 B	375 bares	87	90			1,03			X	
206 A	375 bares	87	91			1,05			X	
206 B	375 bares	87	92			1,06			X	
207 A	375 bares	87	85			0,98			X	
207 B	375 bares	87	93			1,07			X	
208 A	375 bares	87	93			1,07			X	
208 B	375 bares	87	94			1,08			X	
209 A	375 bares	87	84			0,97			X	
209 B	375 bares	87	85			0,98			X	
210 A	375 bares	87	80			0,92			X	
210 B	375 bares	87	80			0,92			X	
211 A	375 bares	87	78			0,90			X	
211 B	375 bares	87	75			0,86			X	
212 A	375 bares	87	90			1,03			X	
212 B	375 bares	87	80			0,92			X	
213 A	375 bares	87	80			0,92			X	
213 B	375 bares	87	85			0,98			X	
214 A	375 bares	87	85			0,98			X	
214 B	375 bares	87	90			1,03			X	
215 A	375 bares	87	80			0,92			X	
215 B	375 bares	87	81			0,93			X	
216 A	375 bares	87	85			0,98			X	
216 B	375 bares	87	80			0,92			X	
217 A	375 bares	87	79			0,91			X	
217 B	375 bares	87	88			1,01			X	
218 A	375 bares	87	77			0,89			X	
218 B	375 bares	87	83			0,95			X	
219 A	375 bares	87	85			0,98			X	
219 B	375 bares	87	88			1,01			X	
220 A	375 bares	87	87			1,00			X	
220 B	375 bares	87	80			0,92			X	
221 A	375 bares	87	78			0,90			X	
221 B	375 bares	87	78			0,90			X	
222 A	375 bares	87	84			0,97			X	
222 B	375 bares	87	82			0,94			X	
223 A	375 bares	87	87			1,00			X	
223 B	375 bares	87	80			0,92			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	11-06-09	FECHA :	15-06-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº:	5409 (375 Bar) 0348 (520 Bar)	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
224 A	375 bares	87	87			1,00			X	
224 B	375 bares	87	85			0,98			X	
225 A	375 bares	87	90			1,03			X	
225 B	375 bares	87	90			1,03			X	
226 A	375 bares	87	85			0,98			X	
226 B	375 bares	87	85			0,98			X	
227 A	375 bares	87	80			0,92			X	
227 B	375 bares	87	80			0,92			X	
228 A	375 bares	87	82			0,94			X	
228 B	375 bares	87	82			0,94			X	
229 A	375 bares	87	85			0,98			X	
229 B	375 bares	87	90			1,03			X	
230 A	375 bares	87	85			0,98			X	
230 B	375 bares	87	77			0,89			X	
231 A	375 bares	87	77			0,89			X	
231 B	375 bares	87	87			1,00			X	
232 A	375 bares	87	88			1,01			X	
232 B	375 bares	87	85			0,98			X	
233 A	375 bares	87	75			0,86			X	
233 B	375 bares	87	80			0,92			X	
234 A	375 bares	87	80			0,92			X	
234 B	375 bares	87	90			1,03			X	
235 A	375 bares	87	87			1,00			X	
235 B	375 bares	87	85			0,98			X	
236 A	375 bares	87	78			0,90			X	
236 B	375 bares	87	82			0,94			X	
237 A	375 bares	87	80			0,92			X	
237 B	375 bares	87	82			0,94			X	
238 A	375 bares	87	80			0,92			X	
238 B	375 bares	87	90			1,03			X	
239 A	375 bares	87	75			0,86			X	
239 B	375 bares	87	80			0,92			X	
240 A	375 bares	77	70			0,91			X	
240 B	375 bares	77	70			0,91			X	
241 A	375 bares	77	70			0,91			X	
241 B	375 bares	77	75			0,97			X	
242 A	375 bares	77	70			0,91			X	
242 B	375 bares	77	75			0,97			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

VSL CTT STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	1º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	11-06-09	FECHA :	15-06-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº:	5409 (375 Bar) 0348 (520 Bar)	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
243 A	375 bares	77	80			1,04			X	
243 B	375 bares	77	88			1,14			X	
244 A	375 bares	87	80			0,92			X	
244 B	375 bares	87	88			1,01			X	
					MEDIA BANDAS:	0,96				
					MEDIA:	0,98				

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR : Viga Eje7-Eje8		Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO: 08-06-09		FECHA :	15-06-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-015-B	MANOM. Nº :	5662	GATO Nº: 5409 (375 Bar) 0348 (520 Bar)		fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
Viga Postesada 250x60 EJE 7										
ACT-ACT										
1	375 bares	297	281	10	291	0,98			X	
2	375 bares	297	286	10	296	1,00			X	
3	375 bares	297	284	11	295	0,99			X	
4	375 bares	297	285	0	285	0,96			X	
5	375 bares	297	285	9	294	0,99			X	
6	375 bares	297	285	3	288	0,97			X	
7	375 bares	297	291	5	296	1,00			X	
8	375 bares	297	289	14	303	1,02			X	
9	375 bares	297	290	10	300	1,01			X	
10	375 bares	297	284	0	284	0,96			X	
11	375 bares	297	285	10	295	0,99			X	
12	375 bares	297	278	0	278	0,94			X	
13	375 bares	297	284	4	288	0,97			X	
14	375 bares	297	284	5	289	0,97			X	
15	375 bares	297	285	2	287	0,97			X	
16	520 bares	297	295			0,99			X	
17	520 bares	297	293			0,99			X	
18	520 bares	297	300			1,01			X	
19	520 bares	297	296			1,00			X	
20	520 bares	297	297			1,00			X	
21	520 bares	297	300			1,01			X	
22	520 bares	297	303			1,02			X	
23	520 bares	297	292			0,98			X	
24	520 bares	297	297			1,00			X	
25	520 bares	297	298			1,00			X	
26	520 bares	297	305			1,03			X	
27	520 bares	297	300			1,01			X	
28	520 bares	297	298			1,00			X	
29	520 bares	297	290			0,98			X	
30	520 bares	297	300			1,01			X	
					MEDIA:	0,99				

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

VSL CTT STRONGHOLD

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR : Viga Eje7-Eje8	Nº OBRA :	410.805	TIPO DE HORMIGON :
PISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO: 08-06-09	FECHA :	15-06-09	RESISTENCIA 28 DIAS : Kg/cm2
UBIC.PLANO Nº :	200-015-B	MANOM. Nº : 5662	GATO Nº: 5409 (375 Bar) 0348 (520 Bar)		fc' TRANSF. TESADO : Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
Viga Postesada 250x60 EJE 8										
ACT-ACT										
1	375 bares	297	277			0,93			X	
2	375 bares	297	285			0,96			X	
3	375 bares	297	285			0,96			X	
4	375 bares	297	283			0,95			X	
5	375 bares	297	285			0,96			X	
6	375 bares	297	285			0,96			X	
7	375 bares	297	293			0,99			X	
8	375 bares	297	290			0,98			X	
9	375 bares	297	284			0,96			X	
10	375 bares	297	280			0,94			X	
11	375 bares	297	285			0,96			X	
12	375 bares	297	291			0,98			X	
13	375 bares	297	275			0,93			X	
14	375 bares	297	277			0,93			X	
15	375 bares	297	281			0,95			X	
16	375 bares	297	290			0,98			X	
17	375 bares	297	288			0,97			X	
18	375 bares	297	292			0,98			X	
19	375 bares	297	290			0,98			X	
20	375 bares	297	300			1,01			X	
21	375 bares	297	295			0,99			X	
22	375 bares	297	290			0,98			X	
23	375 bares	297	292			0,98			X	
24	375 bares	297	308			1,04			X	
25	520 bares	297	295			0,99			X	
26	520 bares	297	290			0,98			X	
27	520 bares	297	305			1,03			X	
28	520 bares	297	306			1,03			X	
29	520 bares	297	303			1,02			X	
30	520 bares	297	290			0,98			X	
					MEDIA:	0,98				

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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OBRA :	Facultad Industriales UPC	SECTOR :	3º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -2	HORMIGON: 20-07-09		FECHA :	28-07-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-003-B / 200-004-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
131 A	375 bares	262	260			0,99			X	
131 B	375 bares	262	255			0,97			X	
132 A	375 bares	262	266			1,02			X	
133 A	375 bares	262	259			0,99			X	
134 A	375 bares	262	263			1,00			X	
135 A	375 bares	262	265			1,01			X	
136 A	375 bares	262	265			1,01			X	
136 B	375 bares	262	264			1,01			X	
137 A	375 bares	280	265			0,95			X	
137 B	375 bares	280	270			0,96			X	
138 A	375 bares	280	261			0,93			X	
138 B	375 bares	280	267			0,95			X	
138 C	375 bares	280	278			0,99			X	
138 D	375 bares	280	277			0,99			X	
139 A	375 bares	142	135			0,95			X	
139 B	375 bares	142	134			0,94			X	
140 A	375 bares	142	133			0,94			X	
141 A	375 bares	280	273			0,98			X	
142 A	375 bares	280	270			0,96			X	
142 B	375 bares	280	270			0,96			X	
143 A	375 bares	280	271			0,97			X	
143 B	375 bares	280	270			0,96			X	
144 A	375 bares	125	130			1,04			X	
144 B	375 bares	125	130			1,04			X	
145 A	375 bares	51	45			0,88			X	
146 A	375 bares	280	275			0,98			X	
146 B	375 bares	280	260			0,93			X	
146 C	375 bares	280	264			0,94			X	
146 D	375 bares	280	260			0,93			X	
147 A	375 bares	219	206			0,94			X	
147 B	375 bares	219	206			0,94			X	
148 A	375 bares	280	256			0,91			X	
149 A	375 bares	280	270			0,96			X	
150 A	375 bares	280	270			0,96			X	
151 A	375 bares	280	265			0,95			X	
151 B	375 bares	280	265			0,95			X	
152 A	375 bares	280	275			0,98			X	
152 B	375 bares	280	276			0,99			X	
153 A	375 bares	280	267			0,95			X	
153 B	375 bares	280	262			0,94			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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OBRA :	Facultad Industriales UPC	SECTOR :	3º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO:	29-06-09	FECHA :	06-07-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
154 A	375 bares	280	270			0,96			X	
155 A	375 bares	280	270			0,96			X	
156 A	375 bares	280	270			0,96			X	
156 B	375 bares	280	266			0,95			X	
157 A	375 bares	280	266			0,95			X	
157 B	375 bares	280	272			0,97			X	
158 A	375 bares	280	267			0,95			X	
158 B	375 bares	280	272			0,97			X	
159 A	375 bares	280	267			0,95			X	
159 B	375 bares	280	270			0,96			X	
160 A	375 bares	280	270			0,96			X	
160 B	375 bares	280	272			0,97			X	
161 A	375 bares	280	275			0,98			X	
301 A	375 bares	76	65			0,86			X	
301 B	375 bares	76	68			0,89			X	
302 A	375 bares	76	70			0,92			X	
303 A	375 bares	96	93			0,97			X	
304 A	375 bares	96	95			0,99			X	
305 A	375 bares	96	84			0,88			X	
305 B	375 bares	96	85			0,89			X	
306 A	375 bares	96	84			0,88				
306 B	375 bares	96	85			0,89				
307 A	375 bares	53	46			0,87				
307 B	375 bares	53	47			0,89				
308 A	375 bares	53	47			0,89				
308 B	375 bares	53	50			0,94				
				TOTAL UNIFORMES:		0,96				
201 A	375 bares	208	222			1,07			X	
201 B	375 bares	208	222			1,07			X	
201 C	375 bares	208	215			1,03			X	
201 D	375 bares	208	215			1,03			X	
202 A	375 bares	208	222			1,07			X	
202 B	375 bares	208	215			1,03			X	
202 C	375 bares	208	210			1,01			X	
202 D	375 bares	208	210			1,01			X	
203 A	375 bares	208	208			1,00			X	
203 B	375 bares	208	216			1,05			X	
203 C	375 bares	208	216			1,04			X	
203 D	375 bares	208	210			1,01			X	
204 A	375 bares	208	207			1,00			X	
204 B	375 bares	208	210			1,01			X	
204 C	375 bares	208	210			1,01			X	

Comentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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OBRA :	Facultad Industriales UPC	SECTOR :	3º	Nº OBRA :	410.805	TIPO DE HORMIGON	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO:	29-06-09	FECHA :	06-07-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm)			ET / EO [%]	CORRECCIONES DE DESVIACIONES		REQUIERE INYECCION	
			EXTR. 1	EXTR. 2	TOTAL (EO)		E x A %	P.Sist. %	SI	NO
204 D	375 bares	208	214			1,03			X	
205 A	375 bares	211	215			1,02			X	
205 B	375 bares	211	217			1,03			X	
205 C	375 bares	211	216			1,02			X	
205 D	375 bares	211	212			1,00			X	
206 A	375 bares	211	220			1,04			X	
206 B	375 bares	211	215			1,02			X	
206 C	375 bares	211	215			1,02			X	
206 D	375 bares	211	215			1,02			X	
207 A	375 bares	215	190			0,88			X	
207 B	375 bares	215	195			0,91			X	
207 C	375 bares	215	201			0,93			X	
208 A	375 bares	215	200			0,93			X	
208 B	375 bares	215	205			0,95			X	
208 C	375 bares	215	209			0,97			X	
208 D	375 bares	215	205			0,95			X	
209 A	375 bares	215	209			0,97			X	
209 B	375 bares	215	205			0,95			X	
209 C	375 bares	215	205			0,95			X	
209 D	375 bares	215	200			0,93			X	
209 E	375 bares	215	210			0,98			X	
210 A	375 bares	215	212			0,99			X	
210 B	375 bares	215	200			0,93			X	
210 C	375 bares	215	195			0,91			X	
210 D	375 bares	215	205			0,95			X	
211 A	375 bares	215	200			0,93			X	
211 B	375 bares	215	200			0,93			X	
211 C	375 bares	215	195			0,91			X	
212 A	375 bares	215	197			0,92			X	
212 B	375 bares	215	200			0,93			X	
213 A	375 bares	215	197			0,92			X	
213 B	375 bares	215	207			0,96			X	
213 C	375 bares	215	207			0,96			X	
213 D	375 bares	215	200			0,93			X	
214 A	375 bares	215	200			0,93			X	
214 B	375 bares	215	205			0,95			X	
214 C	375 bares	215	200			0,93			X	
214 D	375 bares	215	207			0,96			X	
215 A	375 bares	215	205			0,95			X	
215 B	375 bares	215	210			0,98			X	

mentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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OBRA :	Facultad Industriales UPC	SECTOR :	3º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -3	HORMIGONADO:	29-06-09	FECHA :	06-07-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-009-B / 200-010-B	MANOM. Nº :	5662	GATO Nº :	5409	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
215 C	375 bares	215	205			0,95			X	
215 D	375 bares	215	200			0,93			X	
216 A	375 bares	215	202			0,94			X	
216 B	375 bares	215	198			0,92			X	
217 A	375 bares	215	225			1,05			X	
217 B	375 bares	215	226			1,05			X	
218 A	375 bares	215	225			1,05			X	
218 B	375 bares	215	225			1,05			X	
218 C	375 bares	215	222			1,03			X	
219 A	375 bares	215	230			1,07			X	
219 B	375 bares	215	225			1,05			X	
219 C	375 bares	215	226			1,05			X	
219 D	375 bares	215	205			0,95			X	
220 A	375 bares	215	210			0,98			X	
220 B	375 bares	215	208			0,97			X	
220 C	375 bares	215	210			0,98			X	
221 A	375 bares	215	210			0,98			X	
222 A	375 bares	40	35			0,88			X	
222 B	375 bares	40	38			0,95			X	
223 A	375 bares	40	37			0,93			X	
223 B	375 bares	40	38			0,95			X	
223 C	375 bares	40	37			0,93			X	
224 A	375 bares	40	35			0,88			X	
224 B	375 bares	40	37			0,93			X	
224 C	375 bares	40	36			0,90			X	
224 D	375 bares	40	36			0,90			X	
225 A	375 bares	40	37			0,93			X	
225 B	375 bares	40	35			0,88			X	
225 C	375 bares	40	35			0,88			X	
226 A	375 bares	40	36			0,90			X	
226 B	375 bares	40	37			0,93			X	
				MEDIA BANDAS:		0,97				
				MEDIA TOTAL:		0,97				

omentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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OBRA :	Facultad Industriales UPC	SECTOR :	3º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
ISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	10-08-09	FECHA :	17-08-09	RESISTENCIA 28 DIAS :	Kg/cm2
BIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº: 540	0057	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
130 A	375 bares	202	201			1,00			X	
130 B	375 bares	202	200			0,99			X	
131 A	375 bares	202	205			1,01			X	
132 A	375 bares	202	185			0,92			X	
133 A	375 bares	202	185			0,92			X	
134 A	375 bares	202	195			0,97			X	
135 A	375 bares	202	185			0,92			X	
135 B	375 bares	202	195			0,97			X	
136 A	375 bares	280	275			0,98			X	
136 B	375 bares	280	267			0,95			X	
137 A	375 bares	280	270			0,96			X	
137 B	375 bares	280	270			0,96			X	
137 C	375 bares	280	280			1,00			X	
137 D	375 bares	280	270			0,96			X	
138 A	375 bares	142	125			0,88			X	
138 B	375 bares	142	125			0,88			X	
139 A	375 bares	142	125			0,88			X	
140 A	375 bares	282	260			0,92			X	
141 A	375 bares	74	75			1,01			X	
141 B	375 bares	74	75			1,01			X	
142 A	375 bares	74	75			1,01			X	
142 B	375 bares	74	65			0,88			X	
143 A	375 bares	74	65			0,88			X	
143 B	375 bares	74	70			0,95			X	
144 A	375 bares	63	65			1,03			X	
145 A	375 bares	280	265			0,95			X	
145 B	375 bares	280	265			0,95			X	
145 C	375 bares	280	255			0,91			X	
145 D	375 bares	280	265			0,95			X	
146 A	375 bares	219	200			0,91			X	
146 B	375 bares	219	205			0,94			X	
147 A	375 bares	280	280			1,00			X	
148 A	375 bares	280	250			0,89			X	
149 A	375 bares	280	280			1,00			X	
150 A	375 bares	280	280			1,00			X	
150 B	375 bares	280	270			0,96			X	
151 A	375 bares	280	280			1,00			X	
151 B	375 bares	280	280			1,00			X	
152 A	375 bares	280	270			0,96			X	
152 B	375 bares	280	260			0,93			X	

mentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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OBRA :	Facultad Industriales UPC	SECTOR :	3º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
ASO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	10-08-09	FECHA :	17-08-09	RESISTENCIA 28 DIAS :	Kg/cm2
BIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº: 540	0057	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
153 A	520 bares	280	255			0,91			X	
154 A	520 bares	280	250			0,89			X	
155 A	520 bares	280	250			0,89			X	
155 B	520 bares	280	255			0,91			X	
156 A	375 bares	280	255			0,91			X	
156 B	375 bares	280	265			0,95			X	
157 A	375 bares	280	260			0,93			X	
157 B	375 bares	280	255			0,91			X	
158 A	375 bares	280	270			0,96			X	
158 B	375 bares	280	275			0,98			X	
159 A	375 bares	280	265			0,95			X	
159 B	375 bares	280	260			0,93			X	
160 A	375 bares	280	270			0,96			X	
161 A	375 bares	280	270			0,96			X	
161 B	375 bares	280	265			0,95			X	
161 C	375 bares	280	265			0,95			X	
401 A	375 bares	70	70			1,00			X	
401 B	375 bares	70	70			1,00			X	
402 A	375 bares	70	60			0,86			X	
402 B	375 bares	70	75			1,07			X	
403 A	375 bares	70	70			1,00			X	
403 B	375 bares	70	65			0,93			X	
404 A	375 bares	67	65			0,97			X	
405 A	375 bares	67	60			0,90			X	
406 A	375 bares	67	59			0,88			X	
406 B	375 bares	67	65			0,97			X	
407 A	375 bares	67	65			0,97			X	
407 B	375 bares	67	70			1,04			X	
408 A	375 bares	67	65			0,97			X	
408 B	375 bares	67	60			0,90			X	
409 A	375 bares	67	60			0,90			X	
409 B	375 bares	67	60			0,90			X	
				MEDIA UNIFORMES:		0,95				
301 A	375 bares	208	225			1,08			X	
301 B	375 bares	208	210			1,01			X	
301 C	375 bares	208	220			1,06			X	

nentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

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OBRA :	Facultad Industriales UPC	SECTOR :	3º	Nº OBRA :	410.805	TIPO DE HORMIGON :	
ISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	10-08-09	FECHA :	17-08-09	RESISTENCIA 28 DIAS :	Kg/cm2
IBIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº: 540	0057	fci TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
301 D	375 bares	208	225			1,08			X	
302 A	375 bares	208	225			1,08			X	
302 B	375 bares	208	220			1,06			X	
302 C	375 bares	208	210			1,01			X	
302 D	375 bares	208	230			1,11			X	
303 A	375 bares	208	225			1,08			X	
303 B	375 bares	208	215			1,03			X	
303 C	375 bares	208	230			1,11			X	
303 D	375 bares	208	230			1,11			X	
304 A	375 bares	208	238			1,14			X	
304 B	375 bares	208	210			1,01			X	
304 C	375 bares	208	220			1,06			X	
304 D	375 bares	208	215			1,03			X	
305 A	375 bares	208	210			1,01			X	
305 B	375 bares	208	210			1,01			X	
305 C	375 bares	208	220			1,06			X	
305 D	375 bares	208	225			1,08			X	
306 A	375 bares	208	210			1,01			X	
306 B	375 bares	208	215			1,03			X	
306 C	375 bares	208	215			1,03			X	
306 D	375 bares	208	215			1,03			X	
307 A	375 bares	211	240			1,14			X	
307 B	375 bares	211	230			1,09			X	
307 C	375 bares	211	235			1,11			X	
308 A	375 bares	211	240			1,14			X	
308 B	375 bares	211	238			1,13			X	
308 C	375 bares	211	240			1,14			X	
308 D	375 bares	211	237			1,12			X	
309 A	375 bares	211	240			1,14			X	
309 B	375 bares	211	240			1,14			X	
309 C	375 bares	211	240			1,14			X	
309 D	375 bares	211	230			1,09			X	
310 A	375 bares	211	240			1,14			X	
310 B	375 bares	211	240			1,14			X	
310 C	375 bares	211	237			1,12			X	
310 D	375 bares	211	237			1,12			X	
311 A	375 bares	211	237			1,12			X	
311 B	375 bares	211	230			1,09			X	
311 C	375 bares	211	227			1,08			X	
311 D	375 bares	211	230			1,09				

mentarios: Según articulo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección

REPORT DE TESADO (CONTROL DE ALARGAMIENTOS)

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Revisión	0	Fecha:	20/09/2005

OBRA :	Facultad Industriales UPC	SECTOR :	3º	Nº OBRA :	410.605	TIPO DE HORMIGON :	
PISO/NIVEL :	Sostre Planta Soterrani -1	HORMIGONADO:	10-08-09	FECHA :	17-08-09	RESISTENCIA 28 DIAS :	Kg/cm2
UBIC.PLANO Nº :	200-015- B / 200-016-B	MANOM. Nº :	5662	GATO Nº: 540	0057	fc' TRANSF. TESADO :	Kg/cm2

FIRMA RESPONSABLES VSL

CABLE Nº	PRESIÓN DEL MANOMETRO PM	ELONGACIÓN TEORICA (mm) (ET)	ELONGACION OBTENIDA (mm) EXTR. 1	EXTR. 2	TOTAL (EO)	ET / EO [%]	CORRECCIONES DE DESVIACIONES E x A %	P.Sist. %	REQUIERE INYECCION SI	NO
312 A	375 bares	96	80			0,83			X	
312 B	375 bares	96	85			0,89			X	
312 C	375 bares	96	85			0,89			X	
312 D	375 bares	96	80			0,83			X	
313 A	375 bares	211	235			1,11			X	
313 B	375 bares	211	235			1,11			X	
313 C	375 bares	211	228			1,08			X	
313 D	375 bares	211	225			1,07			X	
314 A	375 bares	161	150			0,93			X	
314 B	375 bares	161	140			0,87			X	
314 C	375 bares	161	155			0,96			X	
314 D	375 bares	161	150			0,93			X	
315 A	375 bares	161	150			0,93			X	
315 B	375 bares	161	150			0,93			X	
315 C	375 bares	161	160			0,99			X	
315 D	375 bares	161	160			0,99			X	
316 A	375 bares	161	160			0,99			X	
316 B	375 bares	161	160			0,99			X	
316 C	375 bares	161	160			0,99			X	
316 D	375 bares	161	165			1,02			X	
317 A	375 bares	161	150			0,93			X	
317 B	375 bares	161	160			0,99			X	
317 C	375 bares	161	160			0,99			X	
317 D	375 bares	161	160			0,99			X	
318 A	375 bares	161	160			0,99			X	
318 B	375 bares	161	160			0,99			X	
318 C	375 bares	161	155			0,96			X	
318 D	375 bares	161	160			0,99			X	
319 A	375 bares	49	45			0,92			X	
319 B	375 bares	49	50			1,02			X	
319 C	375 bares	49	50			1,02			X	
320 A	375 bares	49	45			0,92			X	
320 B	375 bares	49	45			0,92			X	
320 C	375 bares	49	50			1,02			X	
320 D	375 bares	49	46			0,94			X	
					MEDIA BANDAS:	1,02				
					MEDIA TOTAL:	0,99				

Comentarios: Según artículo 67.8.4 de la EHE los valores de alargamientos no podrán diferir en más de un 15% por tendón, ni más de un 5% para la suma de todos los valores de tendones en la misma sección