Se eliminó información del documento, ya que contiene datos personales de conformidad con los artículos 5 fracción XXXVI, 122 y 128 de la Ley de Transparencia y Acceso a la Información Pública del Estado de Chihuahua.

PROYECTO
MEMORIA DESCRIPTIVA

OBRA:
CASA HABITACION
MODELO 166
TRES NIVELES

DATOS GENERALES
PROPIETARIO

UBICACIÓN

REGLAMENTOS UTILIZADOS

A.- Analisis de cargas
" Reglamento de Construcción de la Cd. de Chihuahua, Chih. "

B.- Diseño de elementos de Concreto
" Reglamento de construcciones de concreto "
ACI - 318 - 11

[redacted]

[redacted]

CALCULO :
I.C. MARIO HERNANDEZ ACOSTA
R.D.O. 708
TEL [redacted]
CALLE [redacted]
COL. [redacted]

MARZO 2019

Arq. Carlos E. Rodarte Z.
D.R.O. 1552

LOSA DE AZOTEA

ANALISIS DE CARGAS

CARGAS MUERTAS

| | |
|---|---|
| Impermeabilizante | 10.00 kg/m2 |
| Losa de concreto | 288.00 kg/m2 |
| Instalaciones diversas | 30.00 kg/m2 |
| Peso electrico, hidraulico, pluvial, etc. | |
| Subtotal | 328.00 kg/m2 |

CARGAS VIVAS 150.00 kg/m2

CARGA DE SERVICIO

CARGA ULTIMA

CARGA DE DISEÑO 550.00 kg/m2

[redacted]

DISEÑO DE LOSA DE AZOTEA
CARGA DE DISEÑO 650.00 kg/m2

[redacted]

USAR LOSA ALIGERADA CON CASETON
DE 12 CMS. DE ESPESOR
CASETON DE 60 X 60 X 7 CMS.
CON 5 CMS. DE CONCRETO SOBRE EL CASETON
USAR NERVADURAS DE 15 CMS. DE ANCHO
USAR ARMADO CON 2 VRS. No. 3 EN CADA NERVADURA
EN AMBAS DIRECCIONES
LECHO INFERIOR

LOS BASTONES SERAN No. 3 A CADA 32.5 CMS
DE 1/5 DEL CLARO DE LONGITUD
LOS BASTONES SERAN No. 3 A CADA 32.50 CMS. EN VOLADOS
PERIMETRALES. DE 1/5 DEL CLARO DE LONGITUD

VERIFICAR DETALLES EN PLANOS.

LOSA DE ENTREPISO TIPO 1

Espesor de losa con diseño
Peralte 25 cm - 100
[illegible] 400.00 [illegible]
[illegible] 150.00 [illegible]
[illegible] 10.00 [illegible]
Total 10.00 [illegible]

ANALISIS DE CARGAS

CARGAS MUERTAS
Piso ceramico 20.00 kg/m2
Firme aligerado 288.00 kg/m2
Instalaciones diversas 70.00 kg/m2
Peso propio, acabados, clima etc.
Subtotal 343.00 kg/m2

CARGAS VIVAS 250.00 kg/m2

CARGA DE SERVICIO 593.00 kg/m2
CARGA ULTIMA 781.60 kg/m2

CARGA DE DISEÑO 750.00 kg/m2

[redacted]

DISEÑO DE LOSA DE ENTREPISO
CARGA DE DISEÑO 750.00 kg/m2

[redacted]

USAR LOSA ALIGERADA CON CASETON O BLOCK
DE 15 CMS. DE ESPESOR
CASETON O BLOCK DE 40 X 40 X 10 CMS.
CON 5 CMS. DE CONCRETO SOBRE EL CASETON
USAR NERVADURAS DE 15 CMS. DE ANCHO.
USAR ARMADO CON 2 VRS. No. 3 EN CADA NERVADURA
EN AMBAS DIRECCIONES.
LECHO INFERIOR

LOS BASTONES SERAN No. 3 A CADA 27.50 CMS.
DE 1/5 DEL CLARO DE LONGITUD.
LOS BASTONES SERAN No. 3 A CADA 27.50 CMS. EN VOLADOS
PERIMETRALES DE 1/5 DEL CLARO DE LONGITUD.

VERIFICAR DETALLES EN PLANOS

LOSA DE ENTREPISO TIPO 2

Peralte de losa para tinaco
Peralte = 30
a = 350.00 cms
b = 175.00 cms
Recubrimiento = 10.00 cms
Losa = 10.00 cms

ANALISIS DE CARGAS

CARGAS MUERTAS
Piso ceramico 24.00 kg/m2
Losa aligerada 266.00 kg/m2
Instalaciones ocultas 30.00 kg/m2
Losa, eléctrica, hidraulica, clima, etc
Subtotal = 340.00 kg/m2

CARGAS VIVAS 350.00 kg/m2

CARGA DE SERVICIO 690.00 kg/m2
CARGA ULTIMA= 966.00 kg/m2

CARGA DE DISEÑO 750.00 kg/m2

[redacted]

DISEÑO DE LOSA DE ENTREPISO
CARGA DE DISEÑO 750.00 kg/m2

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

USAR LOSA ALIGERADA CON CASETON O BLOCK
DE 15 CMS. DE ESPESOR + AISLANTE 1"
CASETON O BLOCK DE 40 X 40 X 10 CMS.
CON 5 CMS. DE CONCRETO SOBRE EL CASETON
USAR NERVADURAS DE 15 CMS. DE ANCHO
USAR ARMADO CON 2 VRS. No. 3 EN CADA NERVADURA
EN AMBAS DIRECCIONES
LECHO INFERIOR

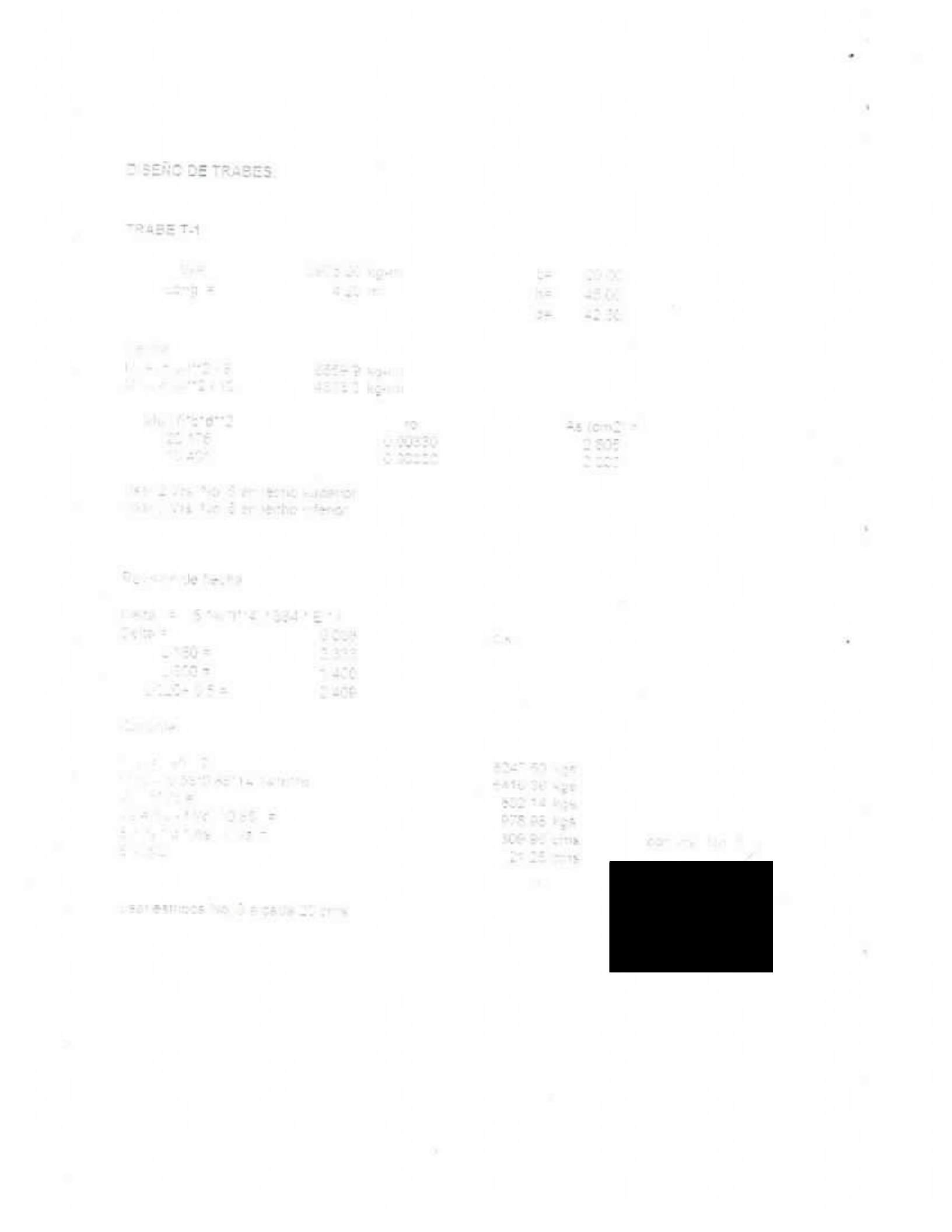
[redacted]

LOS BASTONES SERAN No. 3 A CADA 27.50 CMS
DE 1/5 DEL CLARO DE LONGITUD.
LOS BASTONES SERAN No. 3 A CADA 27.50 CMS. EN VOLADOS
PERIMETRALES. DE 1/5 DEL CLARO DE LONGITUD.

VERIFICAR DETALLES EN PLANOS

DISEÑO DE TRABES.

TRABE T-1



TRABE T-2

| | | | |
|---|---|---|---|
| MV= | 1700.00 kg-m | b= | 30.00 |
| Long.= | 4.50 m | h= | 40.00 |
| | | d= | 37.50 |

| | |
|---|---|
| | 4496.1 kg-m |
| | 3897.7 kg-m |

| | ro | As (cm2) = |
|---|---|---|
| | 0.00330 | 3.675 |
| | 0.00330 | 3.675 |

Usar 2 var. de 5 en lecho superior
Usar 2 var. de 5 en lecho inferior

| | | |
|---|---|---|
| | 0.040 | a= |
| | 2.550 | |
| | 1.530 | |
| | 2.597 | |

Cortante

| | |
|---|---|
| | 3910.00 kgs |
| | 4775.25 kgs |
| | -865.25 kgs |
| | 1027.48 kgs |
| | -262.12 cms |
| | 18.75 cms |

con as. No. 3 @

[redacted]

Usar estribos No. 3 a cada 20 cms

TRABE T-4

| | | | |
|---|---|---|---|
| Alf | 2040.00 kg-m | b= | 60.00 |
| Long. = | 4.10 m | h= | 15.00 |
| | | d= | 12.50 |

| | |
|---|---|
| | 4286.0 kg-m |
| | 2857.7 kg-m |

| | | |
|---|---|---|
| | fo | As (cm2) = |
| 58.103 | 0.00705 | 7.000 |
| 38.402 | 0.00400 | 4.000 |

Usar 2 vs. No. 5 en lecho superior
Usar 5 vs. No. 4 en lecho inferior

Revisión por flecha

| | |
|---|---|
| | 0.166 |
| | 0.216 |
| | 1.367 |
| | 2.584 |

Cortante

| | |
|---|---|
| | 4162.00 kgs |
| | 6071.10 kgs |
| | 2189.20 kgs |
| | 2575.31 kgs |
| | 34.22 cms |
| | 8.22 cms |

[redacted]

Usar estribos No. 2 a cada 15 cms.

TRABE T-5

| | | | |
|---|---|---|---|
| [illegible] | 1300.00 kg-mt | [illegible] | 40.00 |
| [illegible] | 1.60 mt | [illegible] | 10.00 |
| | | [illegible] | 12.60 |

[illegible]

| | |
|---|---|
| [illegible] | 523.5 kg-mt |
| [illegible] | 351.0 kg-mt |

| [illegible] | P | As (cm2) = |
|---|---|---|
| 0.900 | 0.004400 | 2.000 |
| 0.240 | 0.002930 | 1.850 |

[illegible]

[illegible]

[illegible]

| | | |
|---|---|---|
| [illegible] | 0.028 | cm |
| [illegible] | 1.000 | |
| [illegible] | 3.600 | |
| [illegible] | 1.318 | |

[illegible]

| | |
|---|---|
| [illegible] | 1170.00 kgs |
| [illegible] | 5185.81 kgs |
| [illegible] | 2015.91 kgs |
| [illegible] | 207.19 kgs |
| [illegible] | 37.64 cms |
| [illegible] | 8.26 cms |

[illegible] [illegible] No. 3

[redacted]

[illegible]

CASTILLO C-1

PROPIEDADES DE SECCION

| | | |
|---|---|---|
| Base | 15.00 | |
| Peralte | 15.00 | |
| Recubrimiento | 2.00 | |
| Concreto | 200.00 | |
| Acero | 4200.00 | |
| Modulo | 800.10 | |
| Inercia | 13335.00 | |
| Bd | 1.00 | |
| Lx | 1.00 | |
| Area | 225.00 | |
| Ix | 13335.00 | |
| Radio | 8.46 | |
| Esbelles | 35.00 | mayor 22 |

DATOS DE COLUMNA

| | | | | |
|---|---|---|---|---|
| Columna | c-1 | | | |
| Pu | 3000.00 | kg | | |
| Mu | 450.00 | kg-ml | | |
| Momentos | Minimos ACI | | | |
| excentricidad minima | 2.500 | | | |
| | | M2 min | | 11.430 k-cm |
| | | M2 min | | 0.114 k-ml |
| M2 | 9681.250 | mayor O.K. | | |
| CARGA Po | 4050.000 | K | | |
| Cmx | 1.000 | | 0.750 | 3037.50 k |
| Delta | 1.300 | mayor a 1 | | |
| MOMENTO AMPLIFICADO | | | | |
| Mc | 12.573 | real | | 1.500 |
| e/u | 0.19884 | | | |

FACTORES

Phi Pn / Ag x e/H

0.2223225678 x 0.112994932 = 0.0288765 x Phi Mn / Ag x H

Phi x Pn / Ag

Phi x Mn / Ag x H

[redacted]

| | |
|---|---|
| Valor | 0.140 |
| Area gruesa | 2.8400 |
| Area de refuerzo transversal | |
| Separacion maxima d/2 | 7.487 |

USAR 15 x 15 CMS . ARMADO CON 4 No. 3 Y Estribos No. 2 a cada 20.0 cms.

CASTIILO K-1

PROPIEDADES DE SECCION

| | | |
|---|---|---|
| Base | 15.00 | |
| Peralte | 15.00 | |
| Recubrimiento | 2.00 | |
| Concreto | 200.00 | |
| Acero | 4200.00 | |
| Modulo | 800.10 | |
| Inercia | 13335.00 | |
| Bd | 1.00 | |
| Lx | 1.00 | |
| Area | 225.00 | |
| Ix | 13335.00 | |
| Radio | 8.46 | |
| Esbeltes | 35.00 | mayor 22 |

DATOS DE COLUMNA

| | | | | |
|---|---|---|---|---|
| Columna | k-1 | | | |
| Pu | 3000.00 | kg | | |
| Mu | 450.00 | kg-ml | | |
| Momentos | Minimos ACI | | | |
| excentricidad minima | 2.500 | | | |
| | | M2 min | | 11.430 k-cm |
| | | M2 min | | 0.114 k-ml |
| M2 | 9881.250 | mayor O.K. | | |
| CARGA Po | 4050.000 | K | | |
| Cmx | 1.000 | | 0.750 | 3037.50 k |
| Delta | 1.300 | mayor a 1 | | |

MOMENTO AMPLIFICADO

| | | | |
|---|---|---|---|
| Mc | 12.573 | real | 1.500 |
| e/u | 0.19884 | | |

FACTORES

Phi Pn / Ag x e/H

0.2223225678 x 0.112994932 0.0268765 x Phi Mn / Ag x H

[redacted]

Phi x Pn / Ag

Phi x Mn / Ag x H

| | |
|---|---|
| Valor | 0.140 |
| Area gruesa | 2.8400 |

Area de refuerzo transversal

Separacion maxima d/2 7.487

**USAR 15 x 15 CMS . CON ARMEX 15-15/4**

CASTIILO K-2

PROPIEDADES DE SECCION

| | | |
|---|---|---|
| Base | 15.00 | |
| Peralte | 30.00 | |
| Recubrimiento | 2.00 | |
| Concreto | 200.00 | |
| Acero | 4200.00 | |
| Modulo | 800.10 | |
| Inercia | 13335.00 | |
| Bd | 1.00 | |
| Lx | 1.00 | |
| Area | 450.00 | |
| Ix | 13335.00 | |
| Radio | 8.46 | |
| Esbeltes | 35.00 | mayor 22 |

DATOS DE COLUMNA

| | | | | |
|---|---|---|---|---|
| Columna | k-2 | | | |
| Pu | 3000.00 | kg | | |
| Mu | 450.00 | kg-mi | | |
| Momentos | Minimos ACI | | | |
| exentricidad minima | 2.500 | | | |
| | | M2 min | 11.430 | k-cm |
| | | M2 min | 0.114 | k-mi |
| M2 | 9681.250 | mayor O.K. | | |
| CARGA Po | 4050.000 | K | | |
| Cmx | 1.000 | | 0.750 | 3037.50 k |
| Delta | 1.300 | mayor a 1 | | |
| MOMENTO AMPLIFICADO | | | | |
| Mc | 12.573 | real | 1.500 | |
| e/u | 0.19864 | | | |

FACTORES

Phi Pn / Ag x e/H

0.2223225678 x 0.112994932 0.0289765 x Phi Mn / Ag x H

Phi x Pn / Ag

Phi x Mn / Ag x H

| | |
|---|---|
| Valor | 0.140 |
| Area gruesa | 2.6400 |

Area de refuerzo transversal

Separacion maxima d/2 7.467

[redacted]

**USAR 15 x 30 CMS , ARMADO CON 6 No. 3 Y Estribos No. 2 a cada 20.0 cms.**

CASTIILO K-4

PROPIEDADES DE SECCION

| | | |
|---|---|---|
| Base | 40.00 | |
| Peralte | 40.00 | |
| Recubrimiento | 2.00 | |
| Concreto | 200.00 | |
| Acero | 4200.00 | |
| Modulo | 800.10 | |
| Inercia | 13335.00 | |
| Bd | 1.00 | |
| Lx | 1.00 | |
| Area | 1600.00 | |
| Ix | 13335.00 | |
| Radio | 8.46 | |
| Esbeltes | 35.00 | mayor 22 |

DATOS DE COLUMNA

| | | | |
|---|---|---|---|
| Columna | k-4 | | |
| Pu | 3000.00 | kg | |
| Mu | 450.00 | kg-ml | |
| Momentos | Minimos ACI | | |
| exentricidad minima | 2.500 | | |
| | M2 min | | 11.430 k-cm |
| | M2 min | | 0.114 k-ml |
| M2 | 9881.250 | mayor O.K. | |
| CARGA Po | 4050.000 | K | |
| Cmx | 1.000 | 0.750 | 3037.50 k |
| Delta | 1.300 | mayor a 1 | |
| MOMENTO AMPLIFICADO | | | |
| Mc | 12.573 | real | 1.500 |
| e/u | 0.19884 | | |

FACTORES

Phi Pn / Ag x e/H

0.2223225678 x 0.112994932 0.0283765 x Phi Mn / Ag x H

Phi x Pn / Ag

Phi x Mn / Ag x H

| | | |
|---|---|---|
| Valor | 0.140 | |
| Area gruesa | 2.8400 | |

Area de refuerzo transversal

Separacion maxima d/2 19.987

[redacted]

**USAR 40 x 40 CMS , ARMADO CON 8 No. 4 Y Estribos No. 3 a cada 20.0 cms.**

CASTILLO K-6

PROPIEDADES DE SECCION

| | | |
|---|---|---|
| Base | 13.00 | |
| Peralte | 45.00 | |
| Recubrimiento | 2.00 | |
| Concreto | 200.00 | |
| Acero | 4200.00 | |
| Modulo | 600.10 | |
| Inercia | 13335.00 | |
| Bd | 1.00 | |
| Lx | 1.00 | |
| Area | 585.00 | |
| Ix | 13335.00 | |
| Radio | 8.46 | |
| Esbeltes | 35.00 | mayor 22 |

DATOS DE COLUMNA

| | | | | |
|---|---|---|---|---|
| Columna | k-6 | | | |
| Pu | 3000.00 | kg | | |
| Mu | 450.00 | kg-mi | | |
| Momentos | Minimos ACI | | | |
| exentricidad minima | 2.500 | | | |
| | | M2 min | | 11.430 k-cm |
| | | M2 min | | 0.114 k-mi |
| M2 | 9861.250 | mayor O.K | | |
| CARGA Pc | 4050.000 | K | | |
| Cmx | 1.000 | | 0.750 | 3037.50 k |
| Delta | 1.300 | mayor a 1 | | |

MOMENTO AMPLIFICADO

| | | | |
|---|---|---|---|
| Mc | 12.573 | real | 1.500 |
| e/u | 0.19884 | | |

FACTORES

Phi Pn / Ag x e/H

0.2223225676 x 0.112994932 0.0268765 x Phi Mn / Ag x H

Phi x Pn / Ag

Phi x Mn / Ag x H

| | |
|---|---|
| Valor | 0.140 |
| Area gruesa | 2.8400 |

Area de refuerzo transversal

Separacion maxima d/2 6.487

[redacted]

**USAR 13 x 45 CMS . ARMADO CON 8 No. 3 Y Estribos No. 2 a cada 20.0 cms.**

PROCEDIMIENTO DE ANALISIS Y DISEÑO :

LOSA DE PISO

Espesor de losa para diseño
P. P. losa= 25cm x m = 250
[illegible] 250.0 cms
[illegible] 250.0 cms
[illegible] [illegible] cms
usar 13.00 cms

ANALISIS DE CARGAS

CARGAS MUERTAS
Peso propio 288.00 kg/m2

CARGAS VIVAS
Habitacional 250.00 kg/m2

CARGA DE SERVICIO 538.00 kg/m2
CARGA ULTIMA [illegible] kg/m2
CARGA DE DISEÑO 700.00 kg/m2

DISEÑO DE LOSA DE PISO
CARGA DE DISEÑO 700.00 kg/m2

Losa en dos direcciones d= 10.50 cms Mu = [illegible] Acero No. 3
f'c = 4200.0 kg/cm2 a cada
Asmin = Mu / fy x d

| | | m = | Coeficiente |
|---|---|---|---|
| [illegible] | [illegible] | [illegible] | |
| [illegible] | [illegible] | [illegible] | |

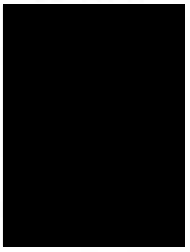
| | | | | | |
|---|---|---|---|---|---|
| Positivo (Cm) | | 0.07920 | [illegible] | [illegible] | [illegible] |
| Negativo (Cv) | | 0.02500 | [illegible] | [illegible] | [illegible] |

[redacted]

USAR LOSA SOLIDA DE 13 CMS. DE ESPESOR
USAR ACERO CON MALLA SOLDADA 66-8/8
EN AMBOS LECHOS
VERIFICAR DETALLES EN PLANOS
f'c=4000.00 kg/cm2
fy=200.00 kg/cm2

CONTRATRABE CT-1 INTERIOR

Usar contratrabe de 20 x 25 cms
Usar Armex 15-20/4
más 2 vns #3 en lecho superior
f'c= 200.00 kg/ cm2 , en armex
f*c= 200.00 kg/cm2



CONTRATRABE CT-2 EXTERIOR

Usar contratrabe de 20 x 25 cms
Usar Armex 15-20/4
Area de acero = 1.28 cm2
fy=6,000.00 kg/ cm2 en armex
f'c= 200.00 kg/cm2

## CONCRETE FOOTING DESIGN

FOOTING ID : zapata aislada ZA-1 COLINDANTE  Code: ACI 318-08

SOIL DATA
Max. Vert. Press. = 120000.000 kgf/M ^2
Max. Flexural Press. = 120000.000 kgf/M ^2
Density = 1441.662 kgf/M ^3
Phi Angle = 0.524 Rad
Coeff. of Friction = 0.333
Cohesion = 0.000 kgf/M ^2

CONCRETE DATA
F'c = 210.921 kgf/cm ^2
Density = 2402.770 kgf/M ^3
Fy = 4218.419 kgf/cm ^2

COLUMN DATA
F'c = 281.228 kgf/cm ^2
X Dim. = 15.000 cm
Z Dim. = 15.000 cm
X Offset = 0.000 M
Z Offset = 0.000 M

SURCHARGE DATA
Ftg. Depth = 0.400 M
FS Uplift = 1.000
+X,+Z Quadrant = 0.000 kgf/M ^2
+X,-Z Quadrant = 0.000 kgf/M ^2

BASE PLATE DATA
FS Overturning = 1.000
FS Sliding = 1.000
-X,-Z Quadrant = 0.000 kgf/M ^2
-X,+Z Quadrant = 0.000 kgf/M ^2
X Dim. = 0.000 cm
Z Dim. = 0.000 cm

### FACTORED LOADS INPUT

| LOAD CASE | VERTICAL LOAD | DL/TOTAL RATIO | MX | MZ | HX | HZ |
|---|---|---|---|---|---|---|
| 1 | -8950.000 kgf | 0.00 | 0.000 M -kgf | 0.000 M -kgf | 0.000 kgf | 0.000 kgf |

FOOTING DESIGN
X Dimension = 0.96 M
Z Dimension = 0.95 M
Thickness = 18.000 cm
Max. Press. = 4702.999 kgf/M ^2
Allow. = 6.545 kgf/cm ^2
Design Controlled by Soil Pressures

SHEAR STRESSES (ONE WAY)
+X Area = 3.106 kgf/cm ^2
-X Area = 3.106 kgf/cm ^2
+Z Area = 5.868 kgf/cm ^2
-Z Area = 5.868 kgf/cm ^2
Allow = 13.093 kgf/cm ^2

SHEAR STRESSES (TWO WAY)
+X Area = 10.925 kgf/cm ^2
-X Area = 10.925 kgf/cm ^2
+Z Area = 10.925 kgf/cm ^2
-Z Area = 10.925 kgf/cm ^2

BOTTOM STEEL DESIGN (Parallel to X Axis)
Moment (+X Area) = 276.484 M -kgf
(-X Area) = 276.484 M -kgf
Steel Required = 2.057 cm^2 (Min)
Dist. to Centroid = 8.890 cm

Typical Spacings
3 #3 Bars at 30.480 cm. Centers (Anchor)
3 #4 Bars at 30.480 cm. Centers (Anchor)

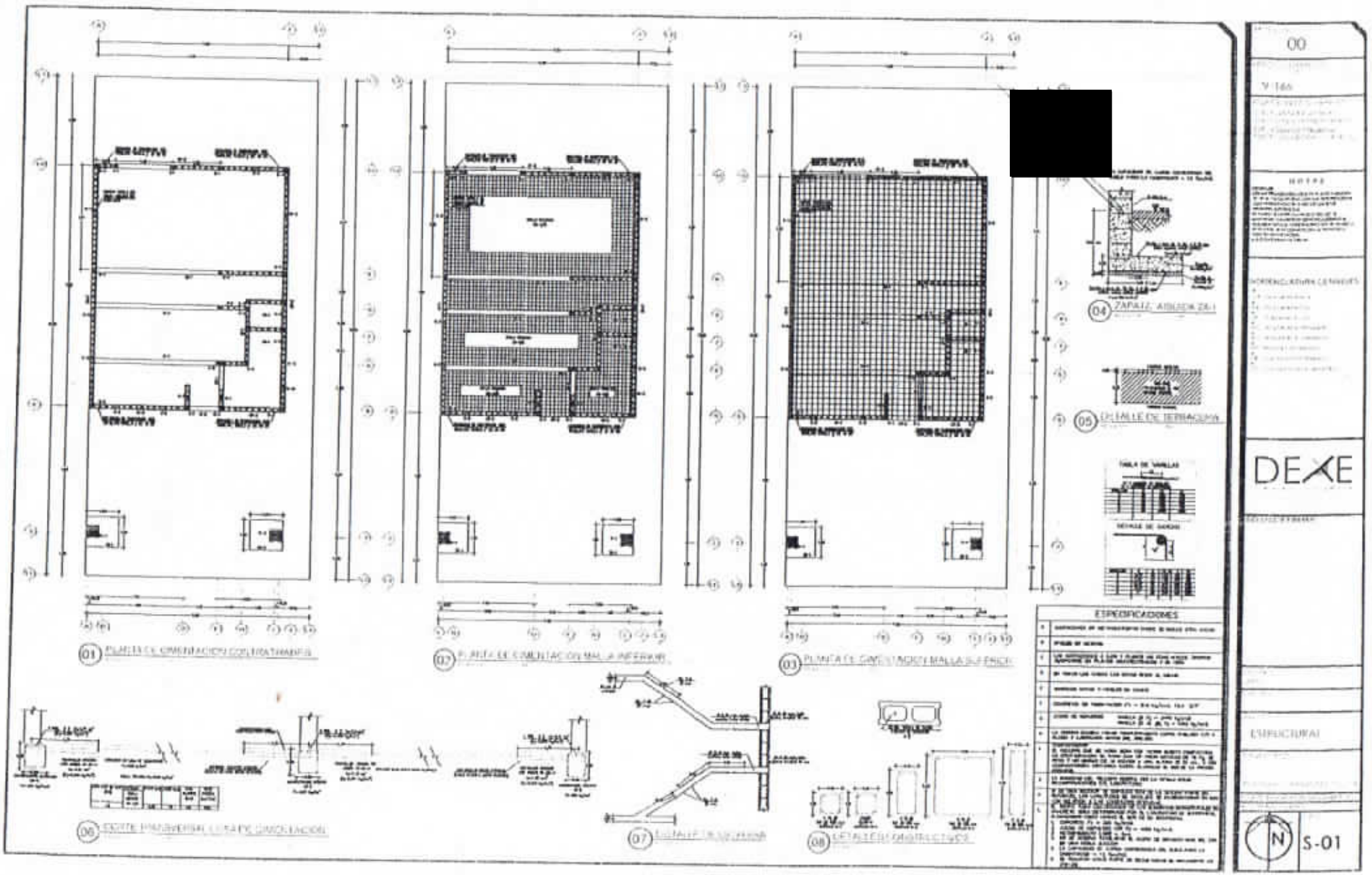
BOTTOM STEEL DESIGN (Parallel to Z Axis)
Moment (+Z Area) = 276.484 M -kgf
(-Z Area) = 276.484 M -kgf
Steel Required = 2.261 cm^2
Dist. to Centroid = 11.430 cm

Typical Spacings
4 #3 Bars at 20.320 cm. Centers (Anchor)

QUANTITIES : 2.066 kgfs of Steel and 0.067 M ^3 of Concrete

USAR ZAPATA DE 1.00 x 1.00 x 0.20 mt.
ARMAR CON VRS. No. 4 @ 20 CMS.
AMBOS SENTIDOS
AMBOS LECHOS

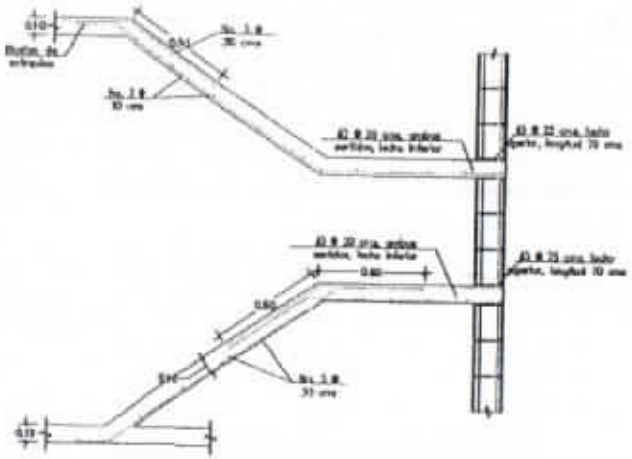
[redacted]


00
V-166
DEXE
ESTRUCTURAL
S-01
ESPECIFICACIONES
01 PLANTA DE CIMENTACION CON LOSA MACIZA
02 PLANTA DE CIMENTACION CON MALLA INFERIOR
03 PLANTA DE CIMENTACION MALLA SUPERIOR
04 ZAPATA AISLADA Z-1
05 DETALLE DE TERRAZA
06 DETALLE DE CIMENTACION
07 DETALLE DE ESCALERA
08 DETALLES ESTRUCTURALES

(01) PLANTA DE CIMENTACION CONTRATRABES

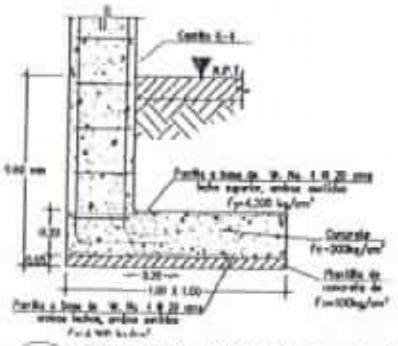
(02) PLANTA DE CIMENTACION MALLA ARE 200R

(03) 1ª PLANTA DE CIMENTACION MALLA SUPERIOR

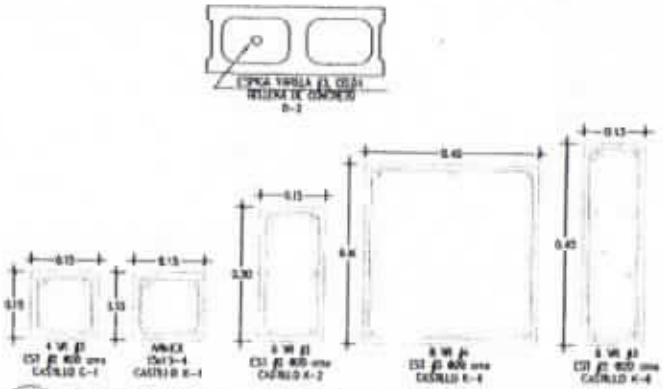


07 DETALLE DE ESCALERA

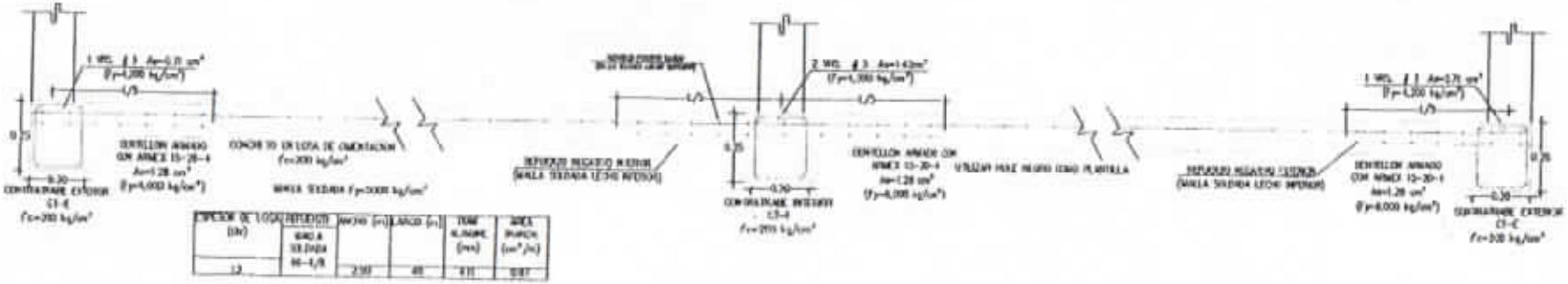
05 DETALLE DE TERRACERIA



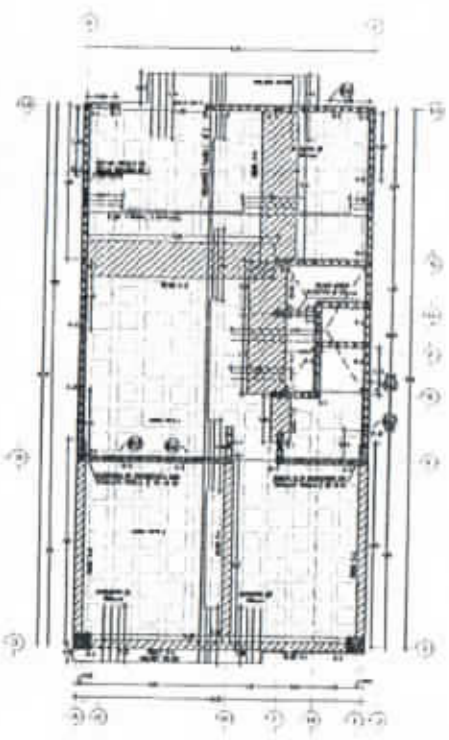
04 ZAPATA AISLADA ZA-1

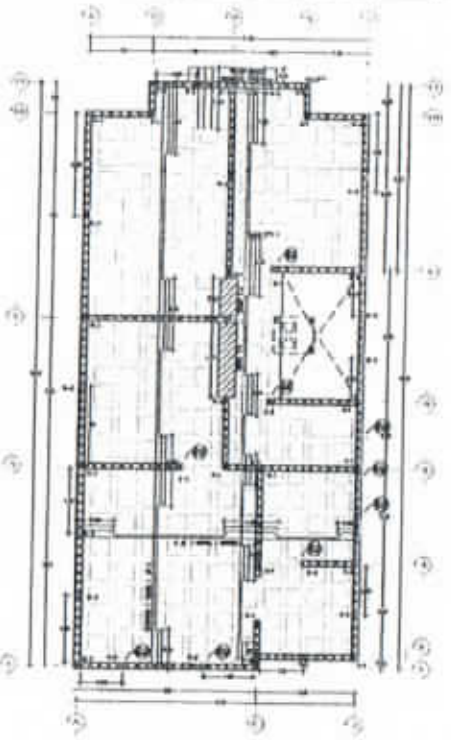


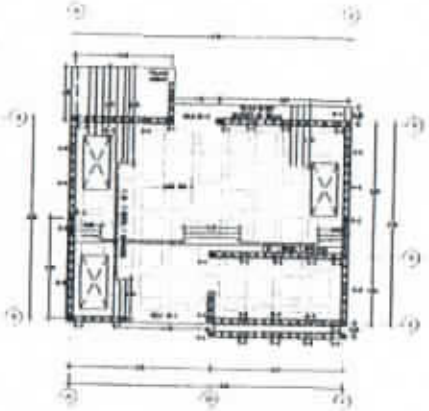
08 DETALLES CONSTRUCTIVOS

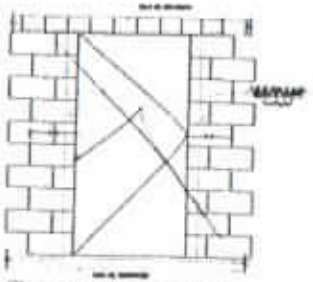


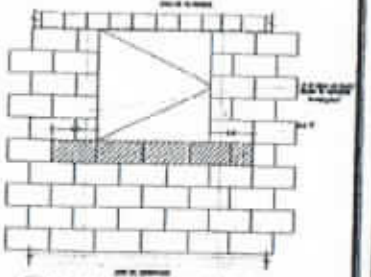
06 CORTE TRANSVERSAL LOSA DE CIMENTACION

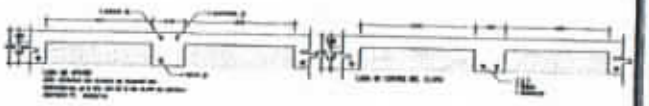


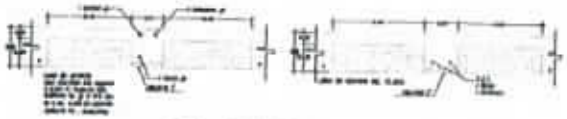


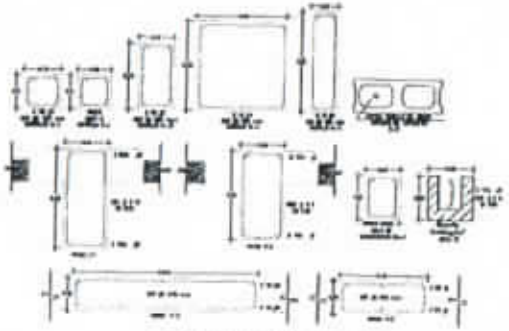


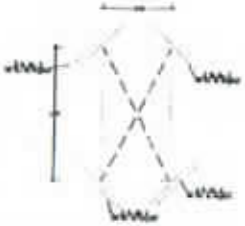












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DEXE

S-02

01 LOSA DE ENTREPISO



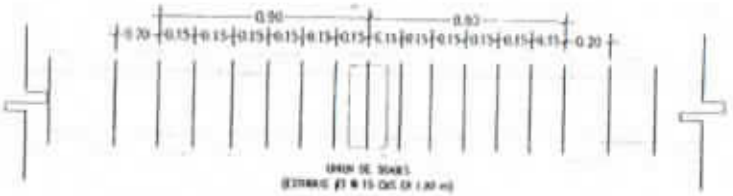
02 LOSA DE ENTREPISO



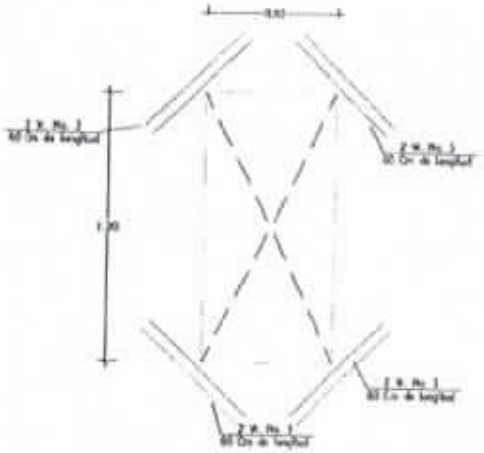
04 LOSA DE AZOTEA



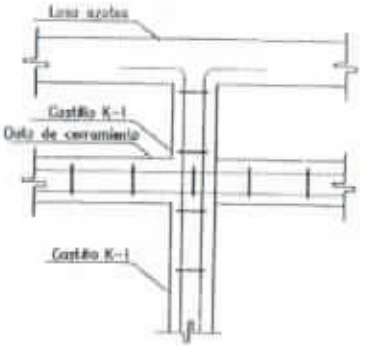
[redacted]



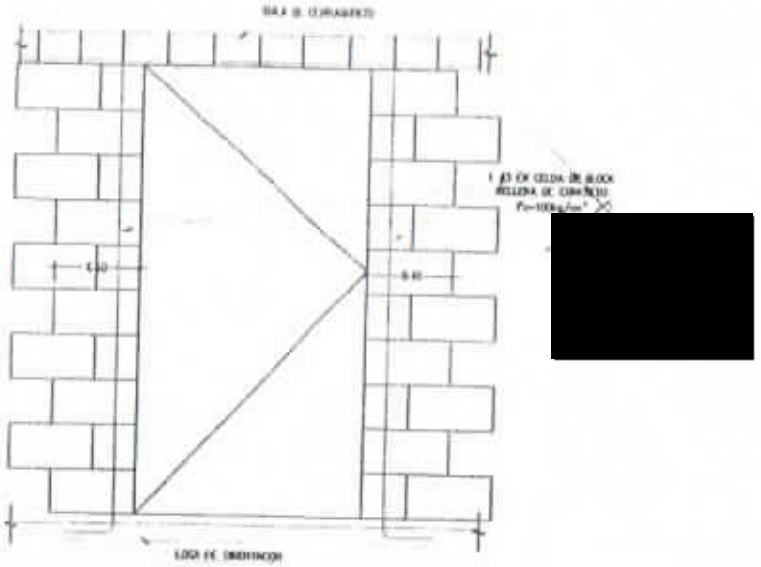
03 CONEXION TRABE CON TRABE



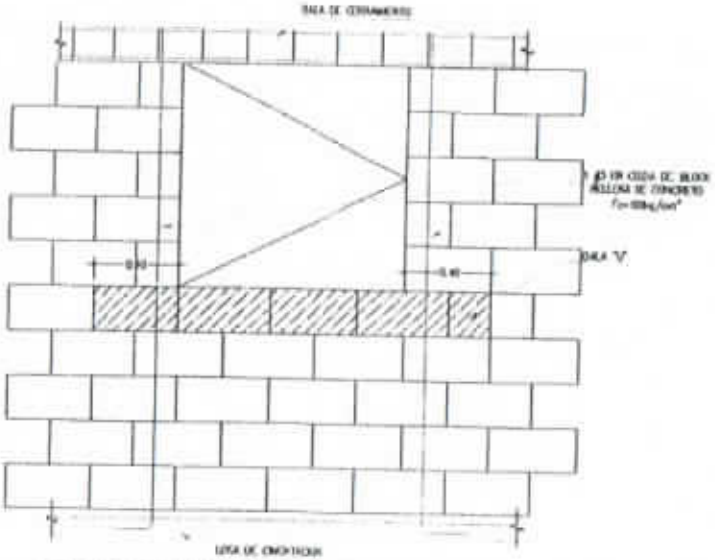
08 DETALLE REFUERZO HUECO PARA DOMO



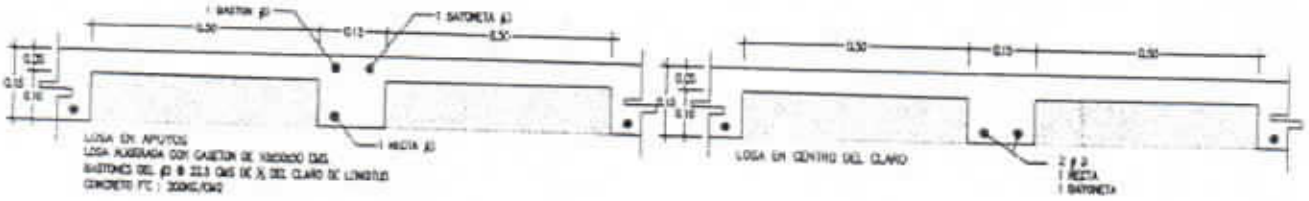

09 DETALLE TIPO DE CASTILLO EN ENRRASE



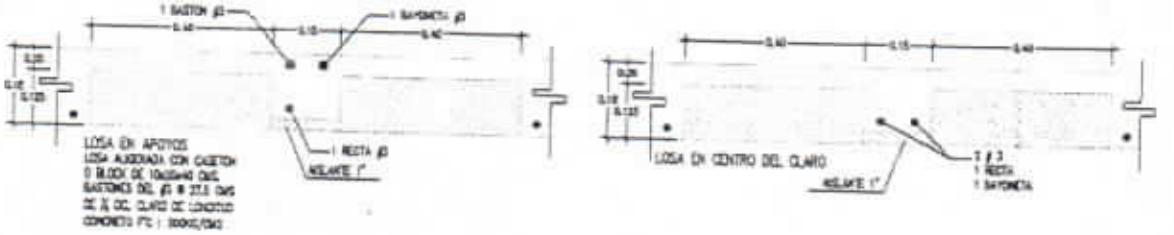
05 DETALLE TIPO EN PUERTAS



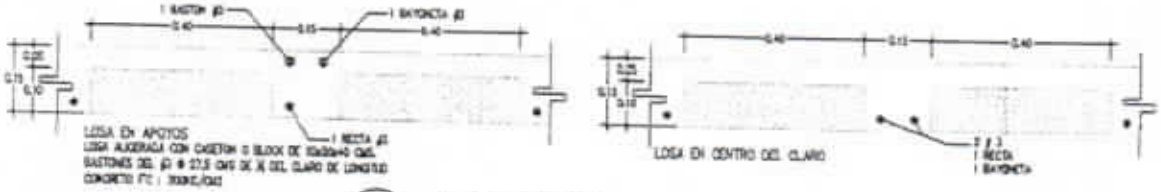
06 DETALLE TIPO EN VENTANAS



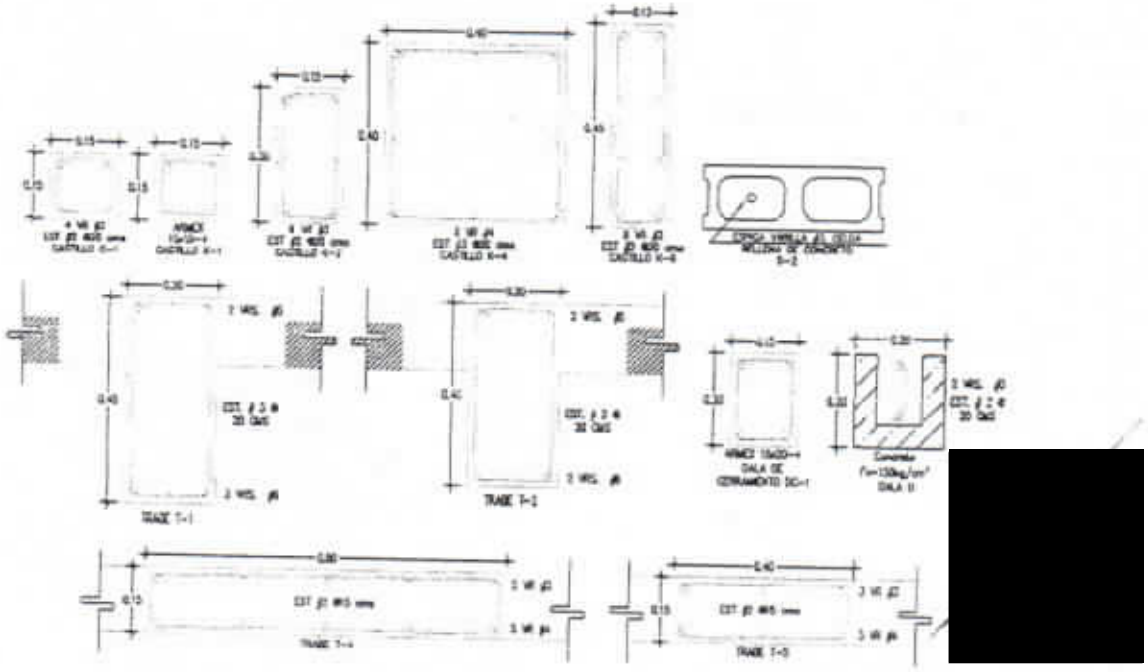
10 LOSA TIPO 3



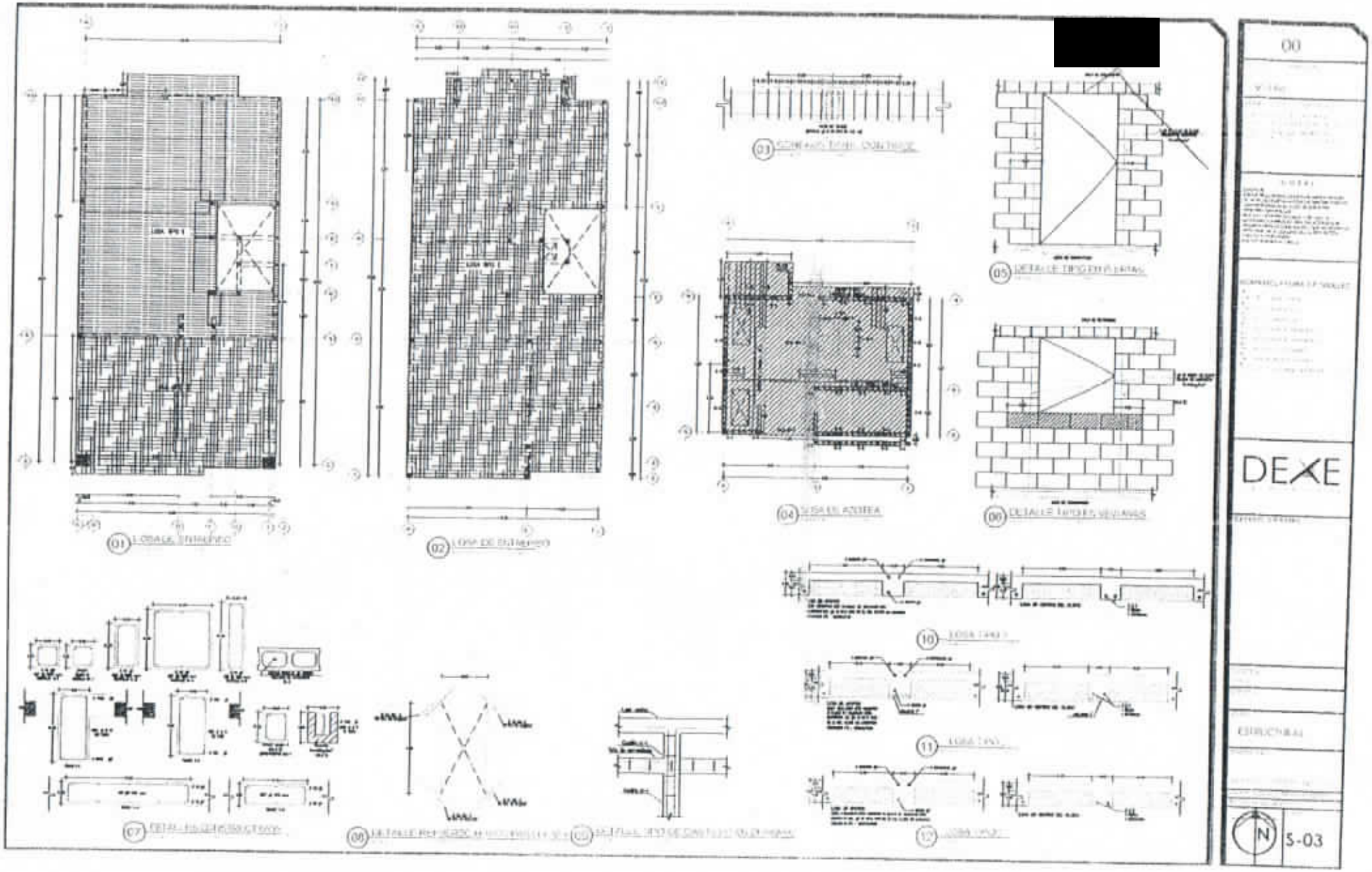
11 LOSA TIPO 2



12 LOSA TIPO 1



07 DETALLES CONSTRUCTIVOS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S-03