

CONSORCIO PSA CONSULTORES.

MEMORIA DE CÁLCULO ESTRUCTURAL

**CENTRO DE DESARROLLO INFANTIL
- TANQUES DE AGUA Y MUROS DE CONTENCION -**

PROPIETARIO: PRESIDENCIA DE LA REPÚBLICA
CAMILO ESTEBAN BENAVIDES
INGENIERO CALCULISTA

BOGOTA, D.C. OCTUBRE DE 2015

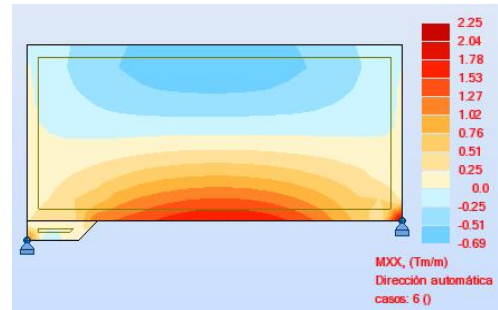
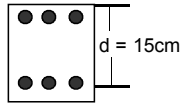
CONSORCIO PSA CONSULTORES.

**CENTRO DE DESARROLLO INFANTIL
- TESALIA. 21M3..-**

DISEÑO DE MUROS TANQUE DE AGUA

MOMENTO (MXX)

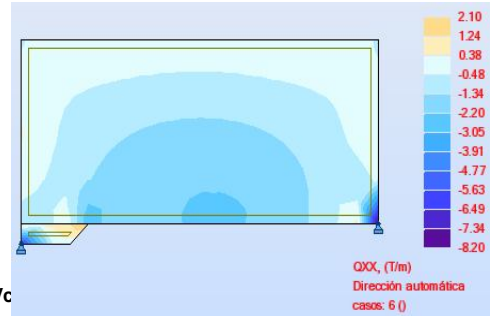
$$\begin{aligned} b &= 100 \text{ cm} \\ h &= 20 \text{ cm} \\ d &= 15 \text{ cm} \\ f_y &= 4200 \text{ Kg/cm}^2 \\ f_c &= 210 \text{ Kg/cm}^2 \\ \text{Momento resistente con} \\ \text{cuantía mínima} &= 2.70 \text{ T-m} \\ \mu &= 2.25 \text{ Tm} \\ \mu &= 225 \text{ Tcm} \\ K = \mu / (b d^2) &= 0.0100 \text{ T/cm}^2 \\ \rho &= 0.0027 \\ A_s = \rho b d &= 4.04 \text{ cm}^2 \end{aligned}$$



CORTANTE (QXX)

$$\begin{aligned} V_u &= 8.20 \text{ T/m} \\ v_u &= 5.47 \text{ Kg/cm}^2 \\ \phi V_c &= 6.52 \text{ Kg/cm}^2 \end{aligned}$$

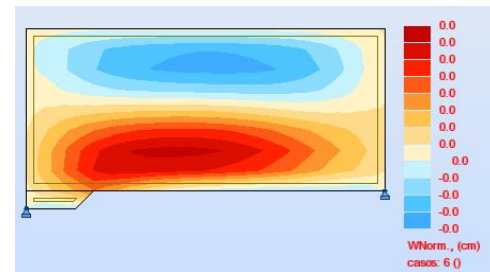
OK, v_u ES MENOR QUE V_c



DEFLEXION EN VOLADIZO

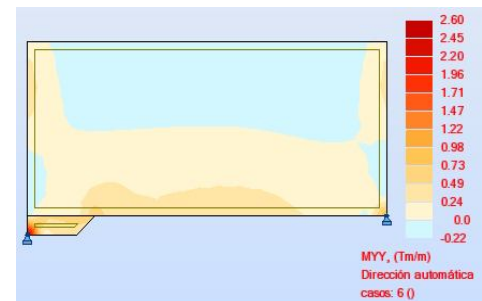
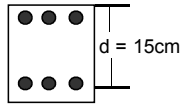
$$\begin{aligned} L &= 3.83 \text{ m} \\ \text{Deflexion} &= 0.10 \text{ cm} \\ \text{Luz / deflexion} &= 7660.00 \text{ Voladizo} \end{aligned}$$

OK



MOMENTO (MY)

$$\begin{aligned} b &= 100 \text{ cm} \\ h &= 20 \text{ cm} \\ d &= 15 \text{ cm} \\ f_y &= 4200 \text{ Kg/cm}^2 \\ f_c &= 210 \text{ Kg/cm}^2 \\ \text{Momento maximo con cuantía} \\ \text{minima} &= 2.70 \text{ T-m} \\ \mu &= 2.60 \text{ Tm} \\ \mu &= 260 \text{ Tcm} \\ K = \mu / (b d^2) &= 0.0116 \text{ T/cm}^2 \\ \rho &= 0.0031 \\ A_s = \rho b d &= 4.69 \text{ cm}^2 \end{aligned}$$



CORTANTE (QY)

$$\begin{aligned} V_u &= 10.65 \text{ T/m} \\ v_u &= 7.10 \text{ Kg/cm}^2 \\ \phi V_c &= 6.52 \text{ Kg/cm}^2 \end{aligned}$$

OJO v_u ES MAYOR QUE V_c

DEFLEXION 1/2 DE LUZ

$$\begin{aligned} L &= 3.83 \text{ m} \\ \text{Deflexion} &= 0.10 \text{ cm} \\ \text{Luz / deflexion} &= 3830.00 \end{aligned}$$

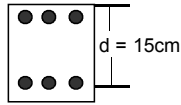
OK



DISEÑO DE PLACA BASE TANQUE DE AGUA

MOMENTO (MXX)

$$\begin{aligned} b &= 100 \text{ cm} \\ h &= 20 \text{ cm} \\ d &= 15 \text{ cm} \\ f_y &= 4200 \text{ Kg/cm}^2 \\ f_c &= 210 \text{ Kg/cm}^2 \\ \text{Momento resistente con} \\ \text{cuantía mínima} &= 2.70 \text{ T-m} \\ \mu_u &= 1.31 \text{ Tm} \\ \mu_u &= 131 \text{ Tcm} \\ K = \mu_u / (b d^2) &= 0.0058 \text{ T/cm}^2 \\ \rho &= 0.0016 \\ A_s = \rho b d &= 2.36 \text{ cm}^2 \end{aligned}$$



CORTANTE (QXX)

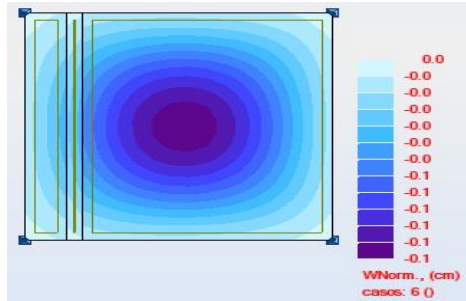
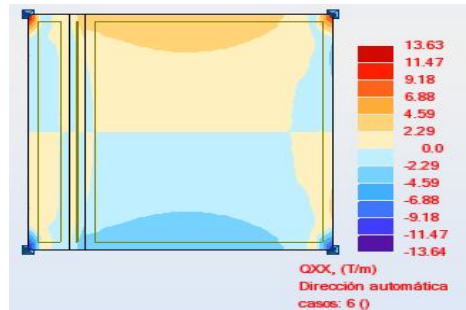
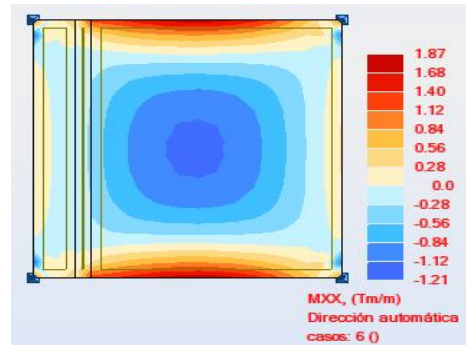
$$\begin{aligned} V_u &= 3.87 \text{ T/m} \\ v_u &= 2.58 \text{ Kg/cm}^2 \\ \phi V_c &= 6.52 \text{ Kg/cm}^2 \end{aligned}$$

OK, v_u ES MENOR QUE V_c

DEFLEXION EN VOLADIZO

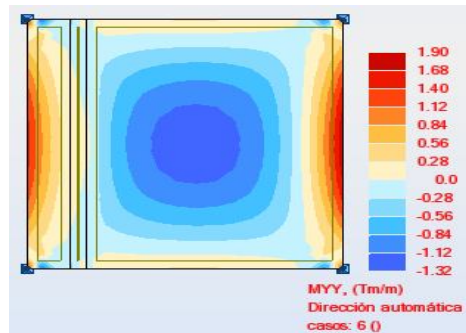
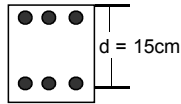
$$\begin{aligned} L &= 3.83 \text{ m} \\ \text{Deflexion} &= 0.36 \text{ cm} \\ \text{Luz / deflexion} &= 2127.78 \text{ Voladizo} \end{aligned}$$

OK



MOMENTO (MYX)

$$\begin{aligned} b &= 100 \text{ cm} \\ h &= 20 \text{ cm} \\ d &= 15 \text{ cm} \\ f_y &= 4200 \text{ Kg/cm}^2 \\ f_c &= 210 \text{ Kg/cm}^2 \\ \text{Momento maximo con cuantía} \\ \text{minima} &= 2.70 \text{ T-m} \\ \mu_u &= 1.31 \text{ Tm} \\ \mu_u &= 131 \text{ Tcm} \\ K = \mu_u / (b d^2) &= 0.0058 \text{ T/cm}^2 \\ \rho &= 0.0016 \\ A_s = \rho b d &= 2.36 \text{ cm}^2 \end{aligned}$$



CORTANTE (QYY)

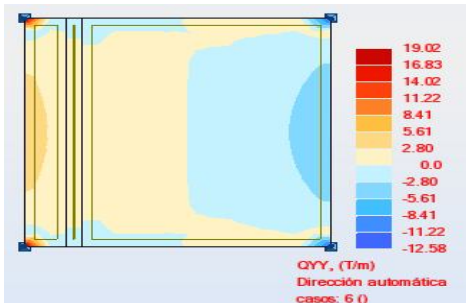
$$\begin{aligned} V_u &= 1.63 \text{ T/m} \\ v_u &= 1.09 \text{ Kg/cm}^2 \\ \phi V_c &= 6.52 \text{ Kg/cm}^2 \end{aligned}$$

OK, v_u ES MENOR QUE V_c

DEFLEXION 1/2 DE LUZ

$$\begin{aligned} L &= 3.83 \text{ m} \\ \text{Deflexion} &= 0.36 \text{ cm} \\ \text{Luz / deflexion} &= 1063.89 \end{aligned}$$

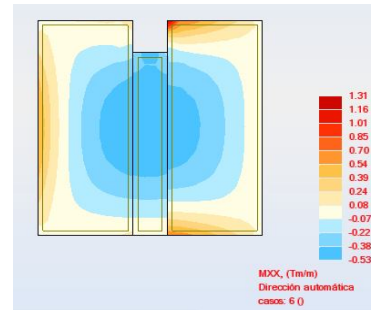
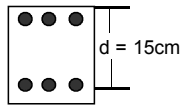
OK



DISEÑO DE TAPA TANQUE DE AGUA

MOMENTO (MXX)

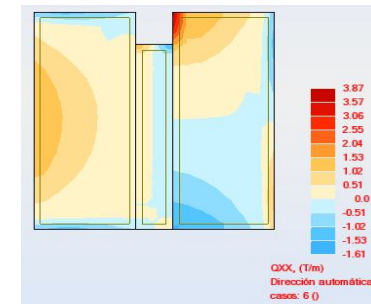
$$\begin{aligned} b &= 100 \text{ cm} \\ h &= 20 \text{ cm} \\ d &= 15 \text{ cm} \\ f_y &= 4200 \text{ Kg/cm}^2 \\ f_c &= 210 \text{ Kg/cm}^2 \\ \text{Momento resistente con} \\ \text{cuantía mínima} &= 2.70 \text{ T-m} \\ \mu &= 1.31 \text{ Tm} \\ \mu &= 131 \text{ Tcm} \\ K = \mu / (b d^2) &= 0.0058 \text{ T/cm}^2 \\ \rho &= 0.0016 \\ A_s = \rho b d &= 2.36 \text{ cm}^2 \end{aligned}$$



CORTANTE (QXX)

$$\begin{aligned} V_u &= 3.87 \text{ T/m} \\ v_u &= 2.58 \text{ Kg/cm}^2 \\ \phi V_c &= 6.52 \text{ Kg/cm}^2 \end{aligned}$$

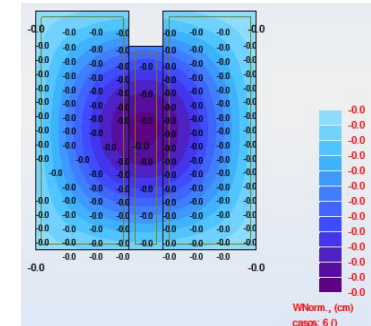
OK, v_u ES MENOR QUE V_c



DEFLEXION EN VOLADIZO

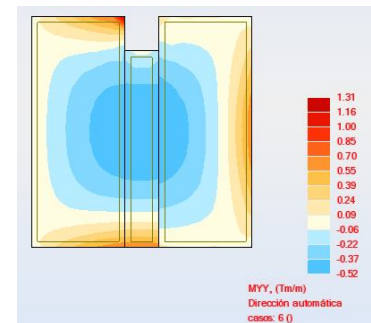
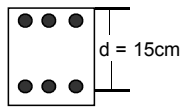
$$\begin{aligned} L &= 3.83 \text{ m} \\ \text{Deflexion} &= 0.36 \text{ cm} \\ \text{Luz / deflexion} &= 2127.78 \text{ Voladizo} \end{aligned}$$

OK



MOMENTO (MYY)

$$\begin{aligned} b &= 100 \text{ cm} \\ h &= 20 \text{ cm} \\ d &= 15 \text{ cm} \\ f_y &= 4200 \text{ Kg/cm}^2 \\ f_c &= 210 \text{ Kg/cm}^2 \\ \text{Momento maximo con cuantía} \\ \text{minima} &= 2.70 \text{ T-m} \\ \mu &= 1.31 \text{ Tm} \\ \mu &= 131 \text{ Tcm} \\ K = \mu / (b d^2) &= 0.0058 \text{ T/cm}^2 \\ \rho &= 0.0016 \\ A_s = \rho b d &= 2.36 \text{ cm}^2 \end{aligned}$$



CORTANTE (QYY)

$$\begin{aligned} V_u &= 1.63 \text{ T/m} \\ v_u &= 1.09 \text{ Kg/cm}^2 \\ \phi V_c &= 6.52 \text{ Kg/cm}^2 \end{aligned}$$

OK, v_u ES MENOR QUE V_c

DEFLEXION 1/2 DE LUZ

$$\begin{aligned} L &= 3.83 \text{ m} \\ \text{Deflexion} &= 0.36 \text{ cm} \\ \text{Luz / deflexion} &= 1063.89 \end{aligned}$$

OK

