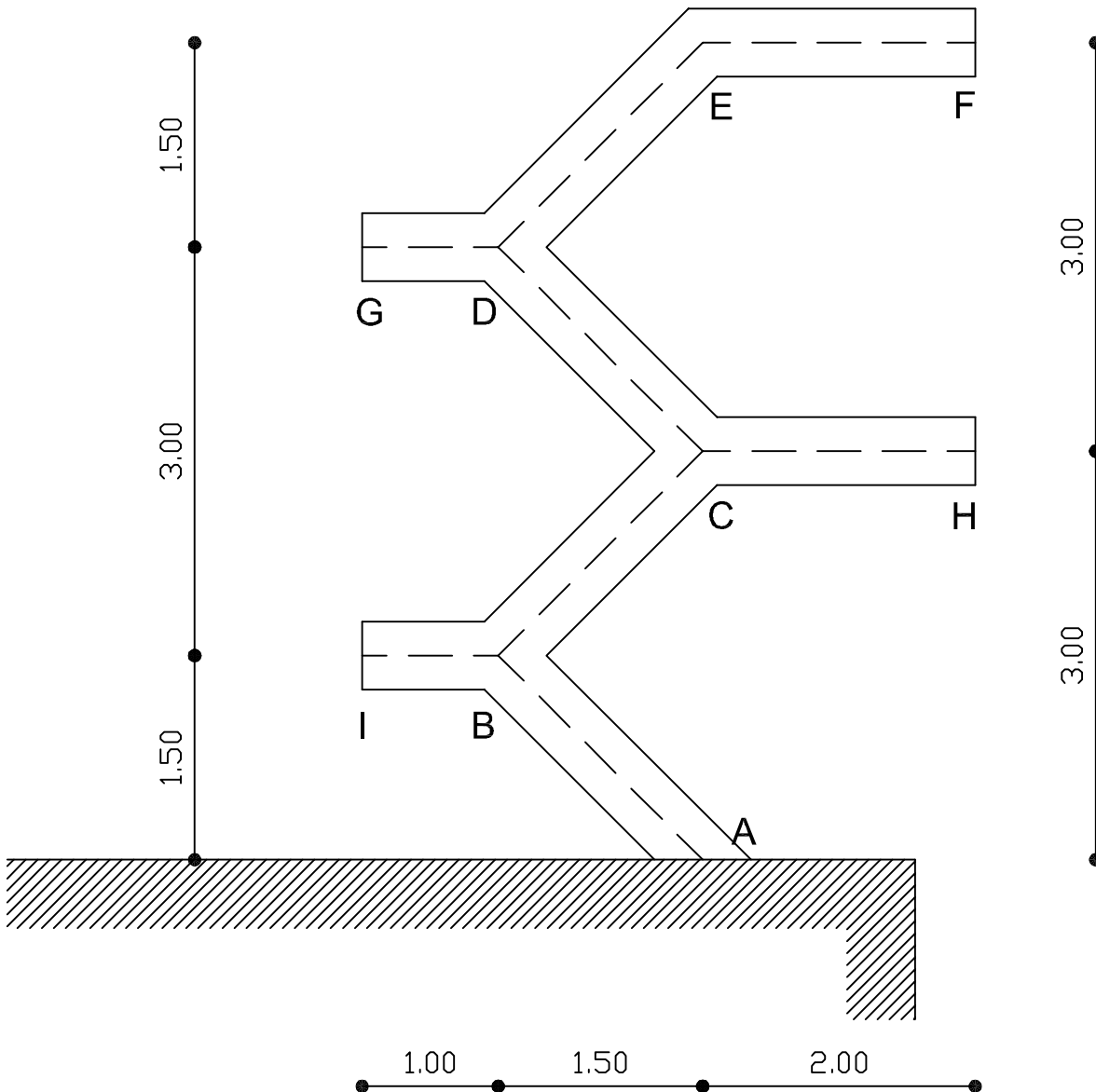
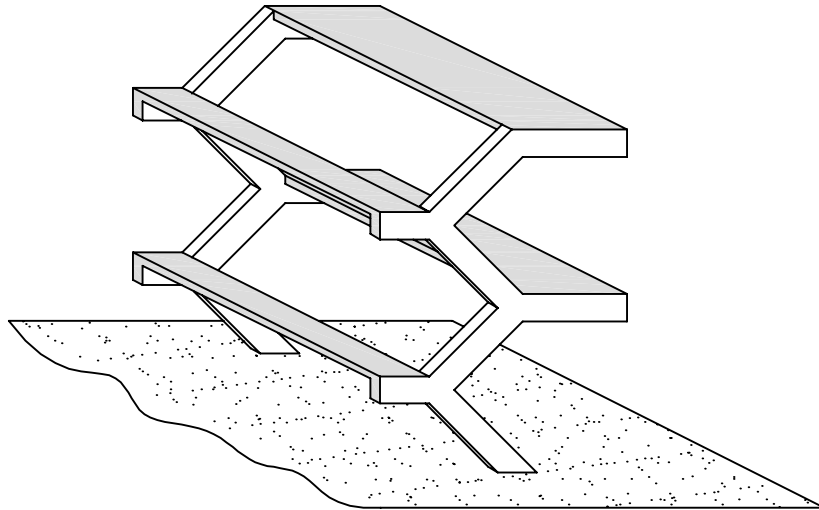


ESTABILIDAD DE LAS CONSTRUCCIONES II  
Solicitaciones en estructuras isostáticas



Estudiar las reacciones en el apoyo de la estructura que se indica por el Método tramo por tramo y confirmar los valores calculando dichas reacciones también por el Método Analítico. Expresar las fuerzas reactivas con su componente horizontal y vertical. Se pide además trazar los diagramas de solicitaciones de todas las barras, hallando valores de Momentos máximos. Todos los tramos tienen una sección constante de 20 x 50 cm. Sobre los tramos IB, CH, GD y EF una losa maciza descarga 400 daN por metro de tramo.

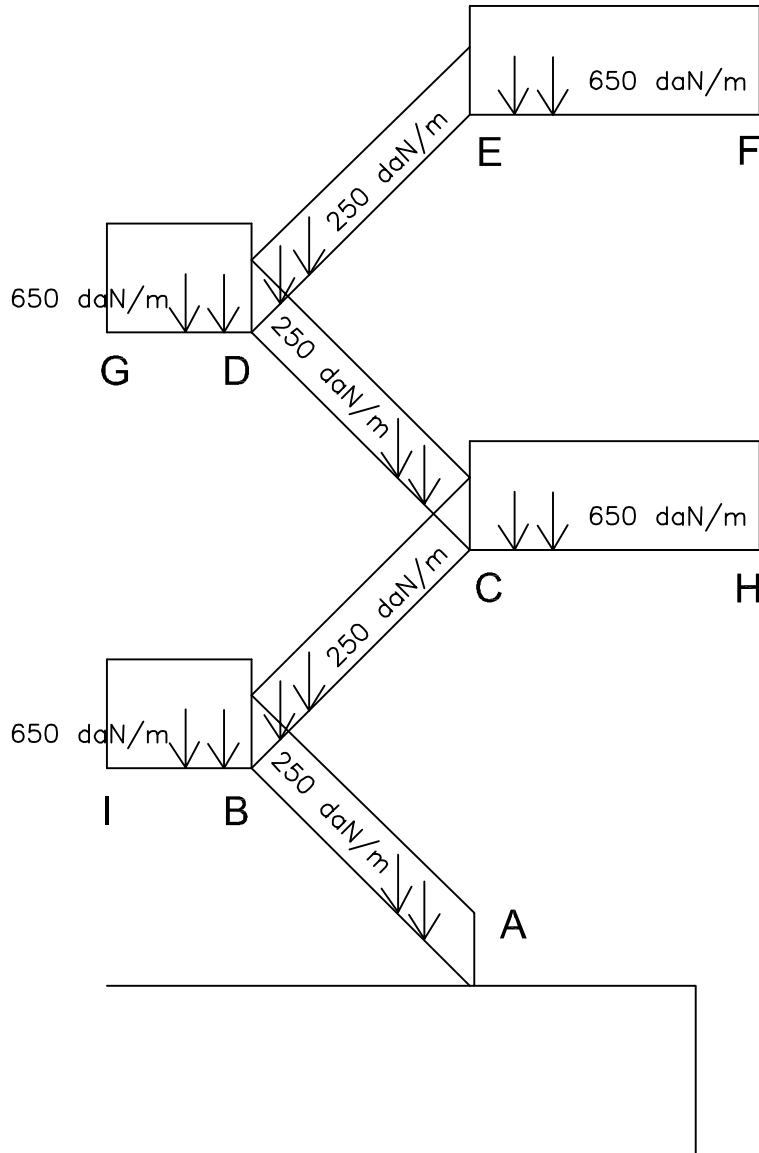
peso propio en todos los tramos:

$$p.p. = 0,20 \text{ m} \times 0,50 \text{ m} \times 2500 \text{ daN/m}^3 = 250 \text{ daN/m}$$

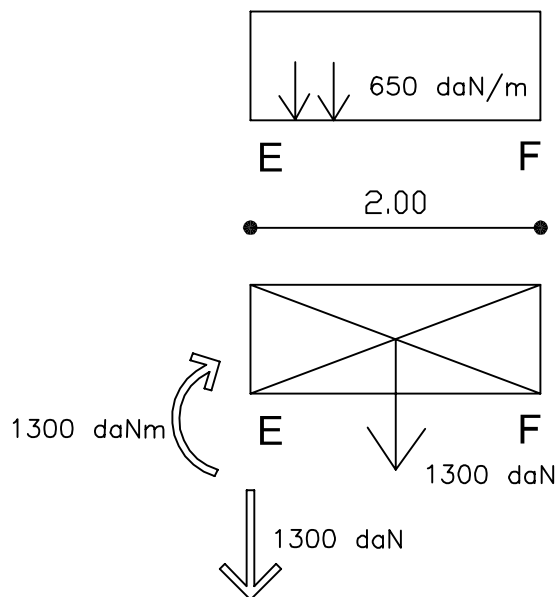
En los tramos horizontales actúa el peso propio y

y una descarga de la losa que se suman:

$$400 \text{ daN/m} + 250 \text{ daN/m} = 650 \text{ daN/m}$$



### TRAMO EF

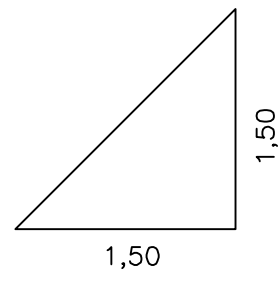
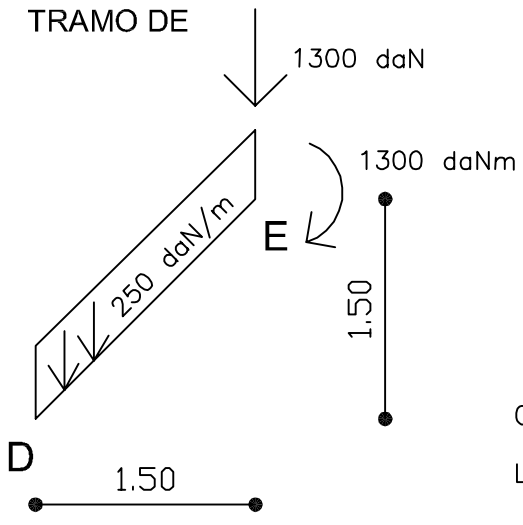


$$650 \text{ daN/m} \times 2,00 \text{ m} = 1300 \text{ daN}$$

Descarga en E = 1300 daN

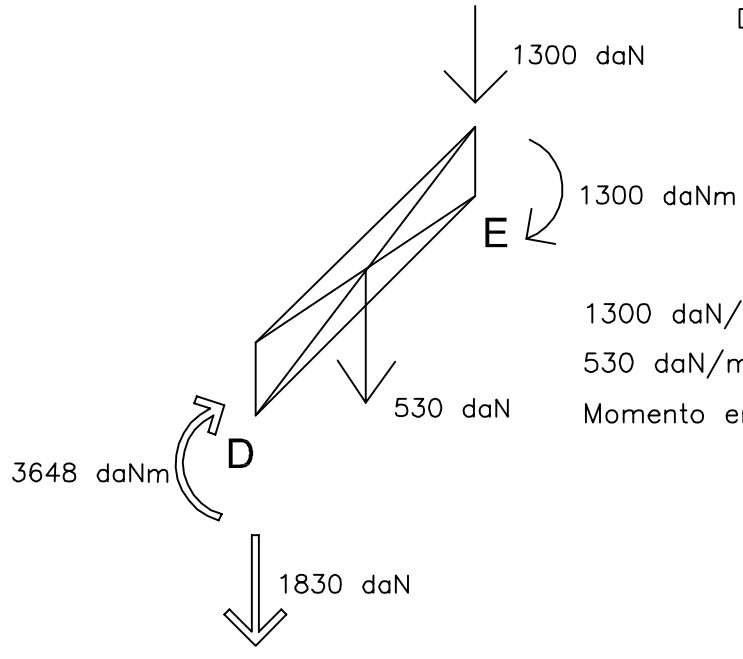
$$1300 \text{ daN/m} \times 1,00 \text{ m} = 1300 \text{ daNm}$$

Momento en E = 1300 daNm



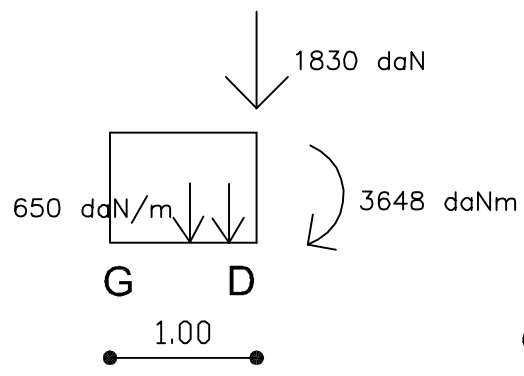
Calculamos la luz real del tramo aplicando Pitágoras  
 $L = \sqrt{1,5^2 + 1,5^2} = 2,12 \text{ m}$

$250 \text{ daN/m} \times 2,12 \text{ m} = 530 \text{ daN}$   
 Descarga en D =  $1300 \text{ daN} + 530 \text{ daN} = 1830 \text{ daN}$

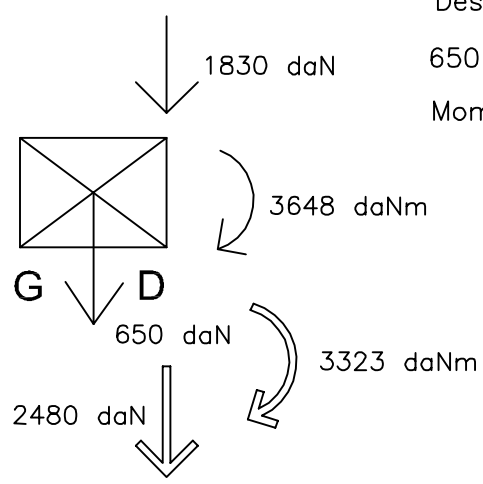


$1300 \text{ daN/m} \times 1,50 \text{ m} = 1950 \text{ daNm}$   
 $530 \text{ daN/m} \times 0,75 \text{ m} = 398 \text{ daNm}$   
 Momento en E =  $1950 \text{ daNm} + 398 \text{ daNm} + 1300 \text{ daNm} = 3648 \text{ daNm}$

TRAMO GD

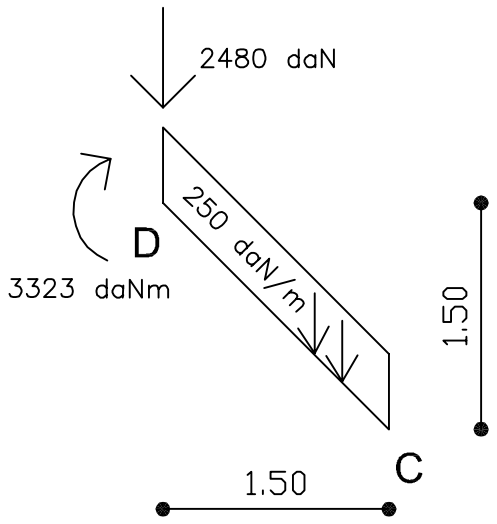


$650 \text{ daN/m} \times 1,00 \text{ m} = 650 \text{ daN}$   
 Descarga en D =  $1830 \text{ daN} + 650 \text{ daN} = 2480 \text{ daN}$



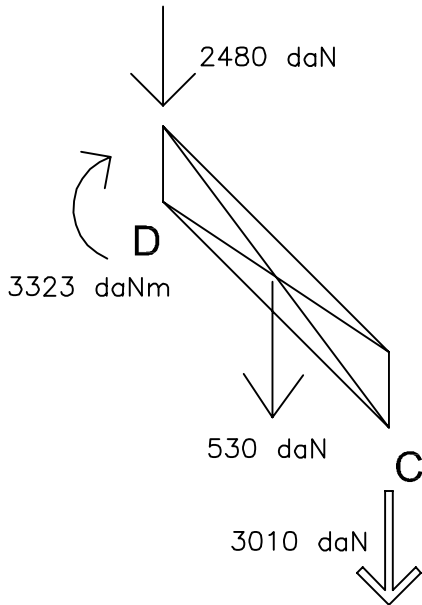
$650 \text{ daN/m} \times 0,50 \text{ m} = 325 \text{ daNm}$   
 Momento en D =  $3648 \text{ daNm} - 325 \text{ daNm} = 3323 \text{ daNm}$

TRAMO DC



$$250 \text{ daN/m} \times 2,12 \text{ m} = 530 \text{ daN}$$

$$\text{Descarga en C} = 2480 \text{ daN} + 530 \text{ daN} = 3010 \text{ daN}$$



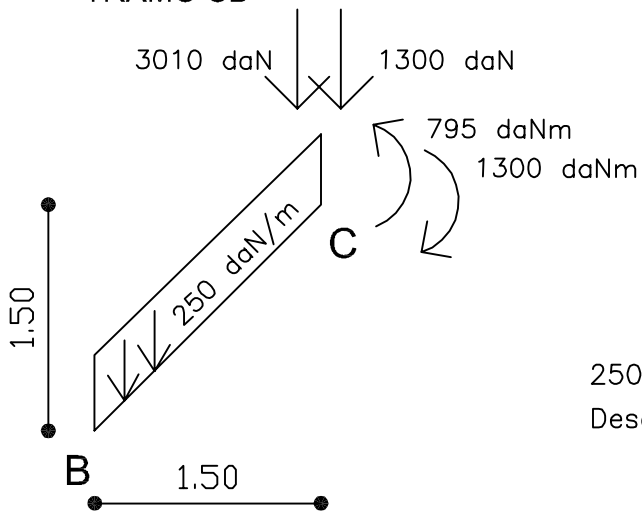
$$2480 \text{ daN/m} \times 1,50 \text{ m} = 3720 \text{ daNm}$$

$$530 \text{ daN/m} \times 0,75 \text{ m} = 398 \text{ daNm}$$

$$\text{Momento en C} = 3323 \text{ daNm} - 398 \text{ daNm} - 3720 \text{ daNm} = -795 \text{ daNm}$$

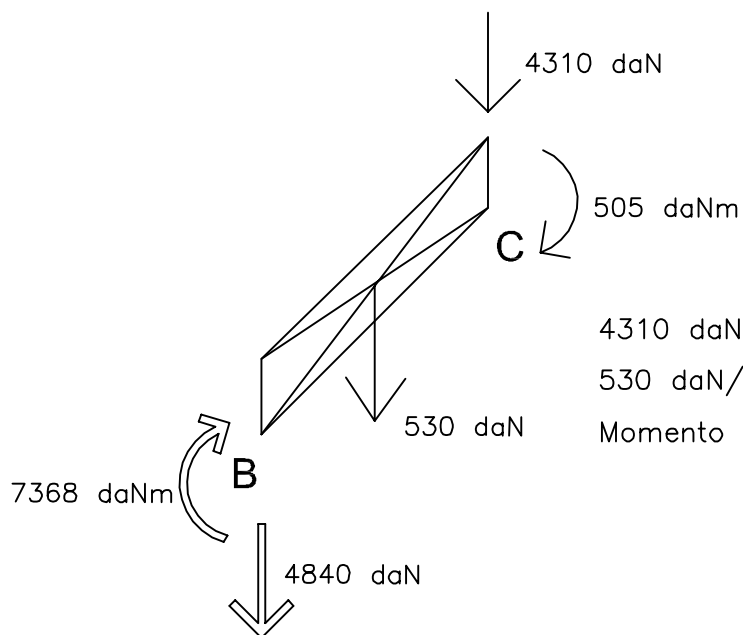
TRAMO CH IGUAL A EF

TRAMO CB



$$250 \text{ daN/m} \times 2,12 \text{ m} = 530 \text{ daN}$$

$$\text{Descarga en B} = 4310 \text{ daN} + 530 \text{ daN} = 4840 \text{ daN}$$

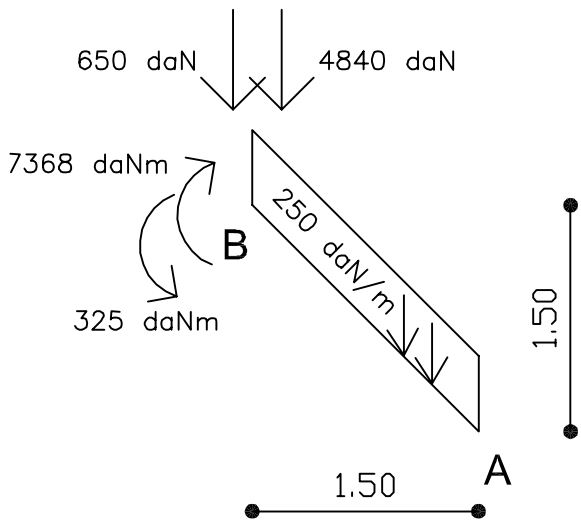


$$4310 \text{ daN/m} \times 1,50 \text{ m} = 6465 \text{ daNm}$$

$$530 \text{ daN/m} \times 0,75 \text{ m} = 398 \text{ daNm}$$

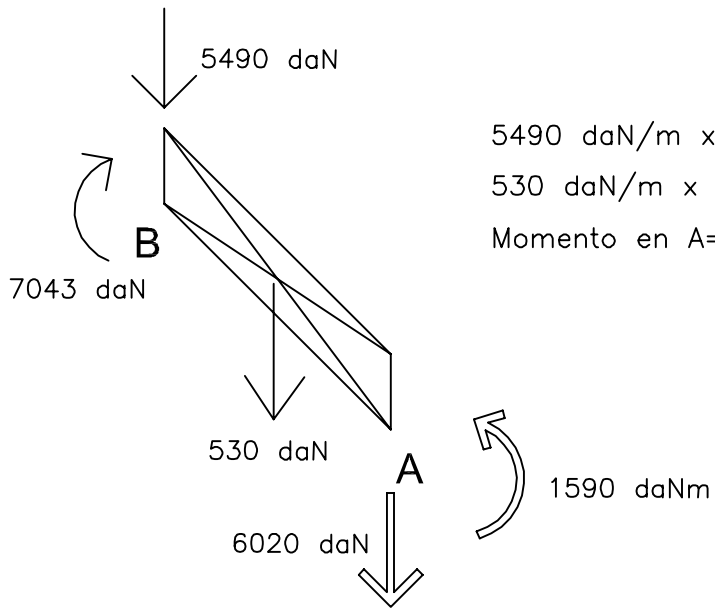
$$\text{Momento en B} = 6465 \text{ daNm} + 398 \text{ daNm} + 505 \text{ daNm} = 7368 \text{ daNm}$$

TRAMO IB IGUAL A GD  
TRAMO BA



$$250 \text{ daN/m} \times 2,12 \text{ m} = 530 \text{ daN}$$

$$\text{Descarga en A} = 5490 \text{ daN} + 530 \text{ daN} = 6020 \text{ daN}$$

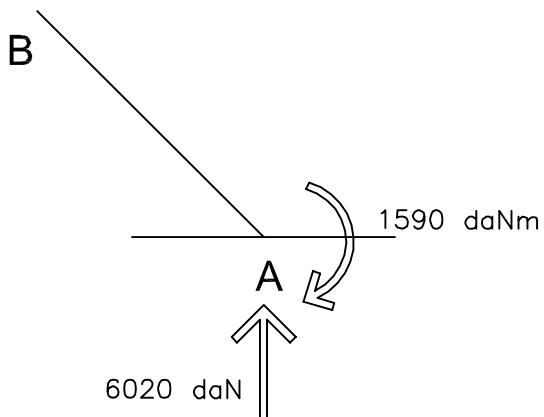


$$5490 \text{ daN/m} \times 1,50 \text{ m} = 8235 \text{ daNm}$$

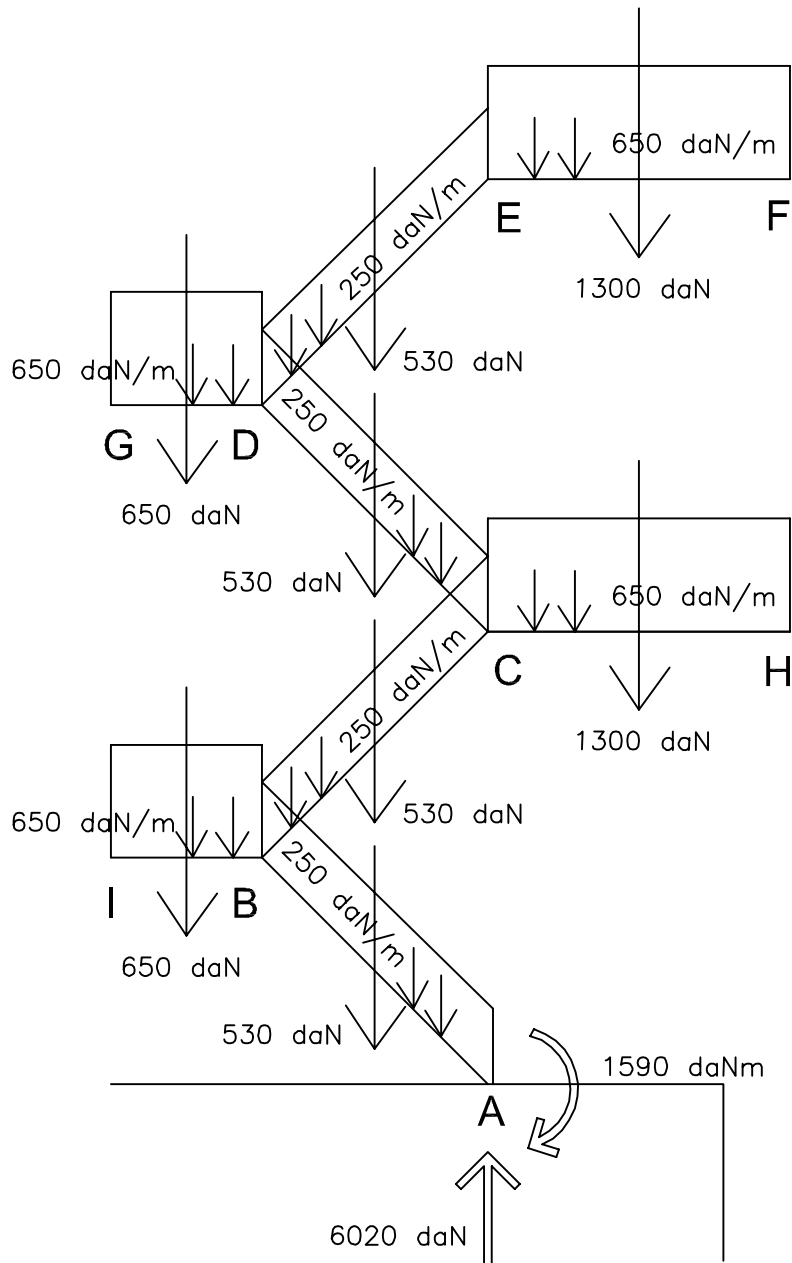
$$530 \text{ daN/m} \times 0,75 \text{ m} = 398 \text{ daNm}$$

$$\text{Momento en A} = 7043 \text{ daNm} - 398 \text{ daNm} - 8235 \text{ daNm} = -1590 \text{ daNm}$$

Las reacciones en A halladas por el método tramo por tramo son:



Confirmaremos ahora estos valores determinando las reacciones por el método analítico general:

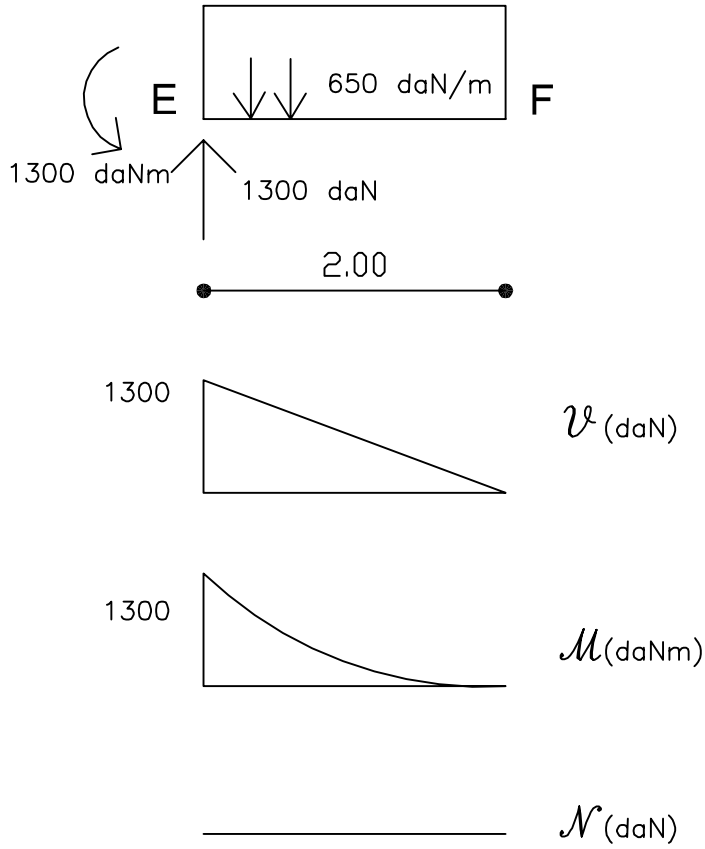


$$\sum F_H = 0$$

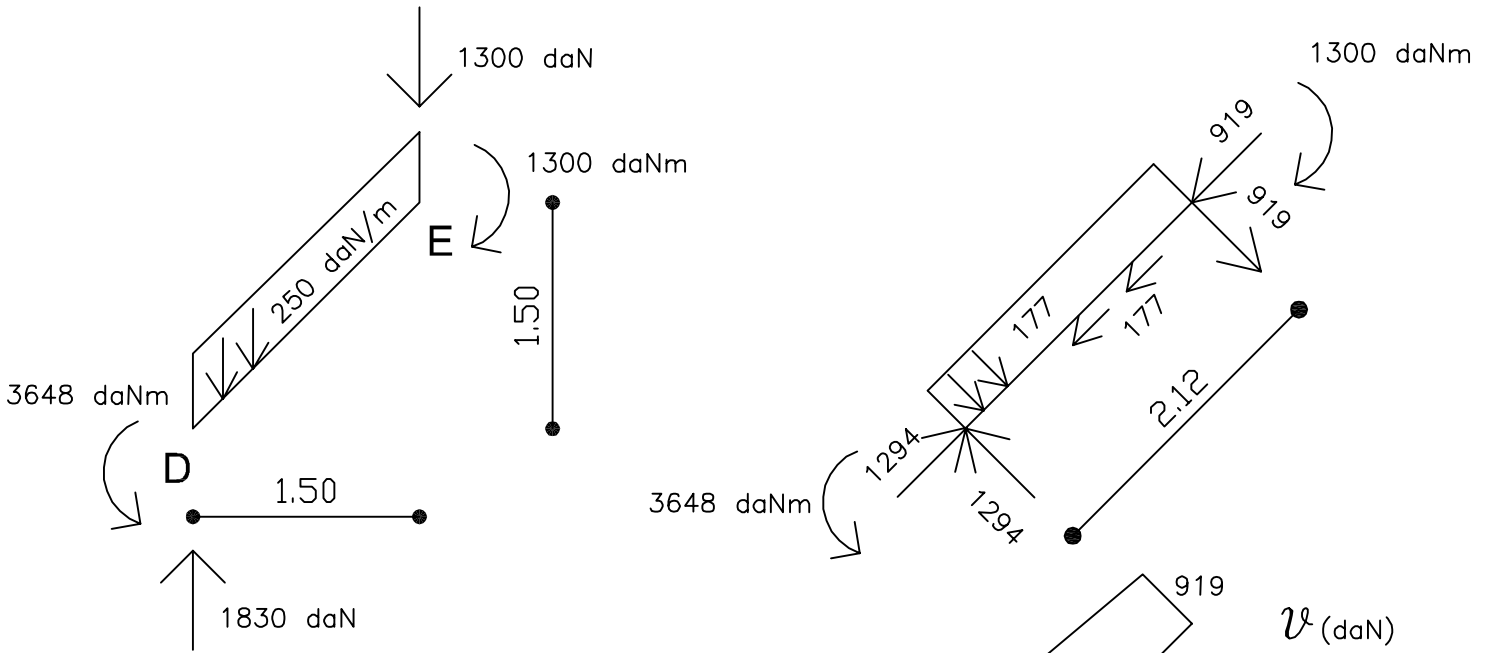
$$\sum F_v = [1300 \times 2 + 650 \times 2 + 530 \times 4] - 6020 = 0$$

$$\sum M_A = [1300 \times 1 \times 2 - 650 \times 2 \times 2 - 530 \times 0,75 \times 4] - 1590 = 0$$

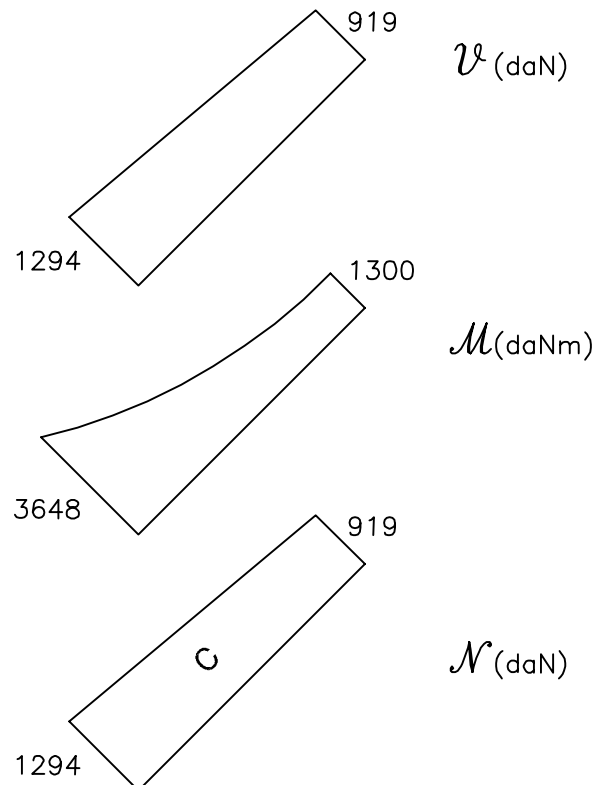
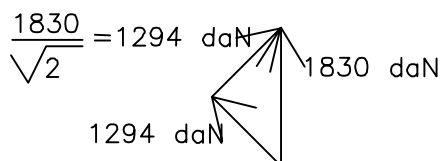
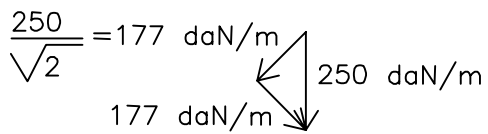
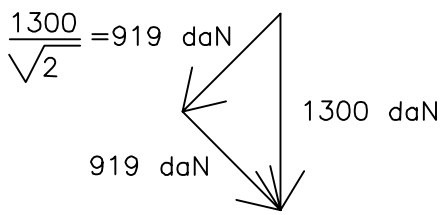
DIAGRAMAS DE SOLICITACIONES  
TRAMO EF:



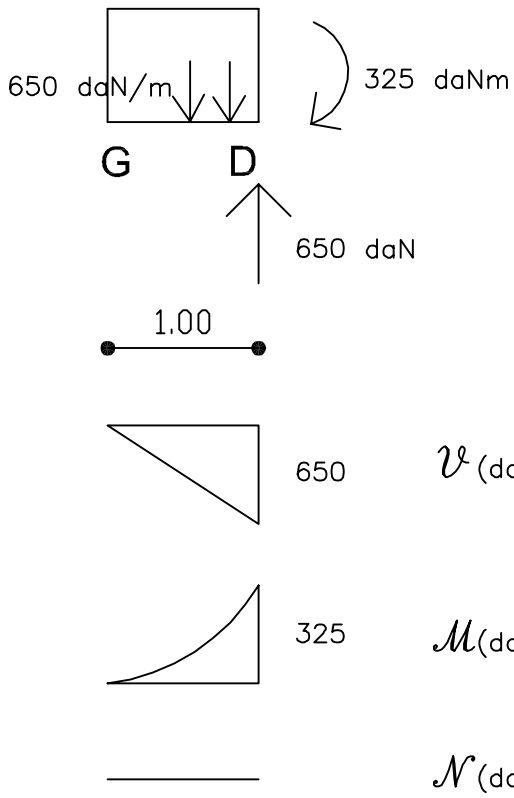
TRAMO DE:



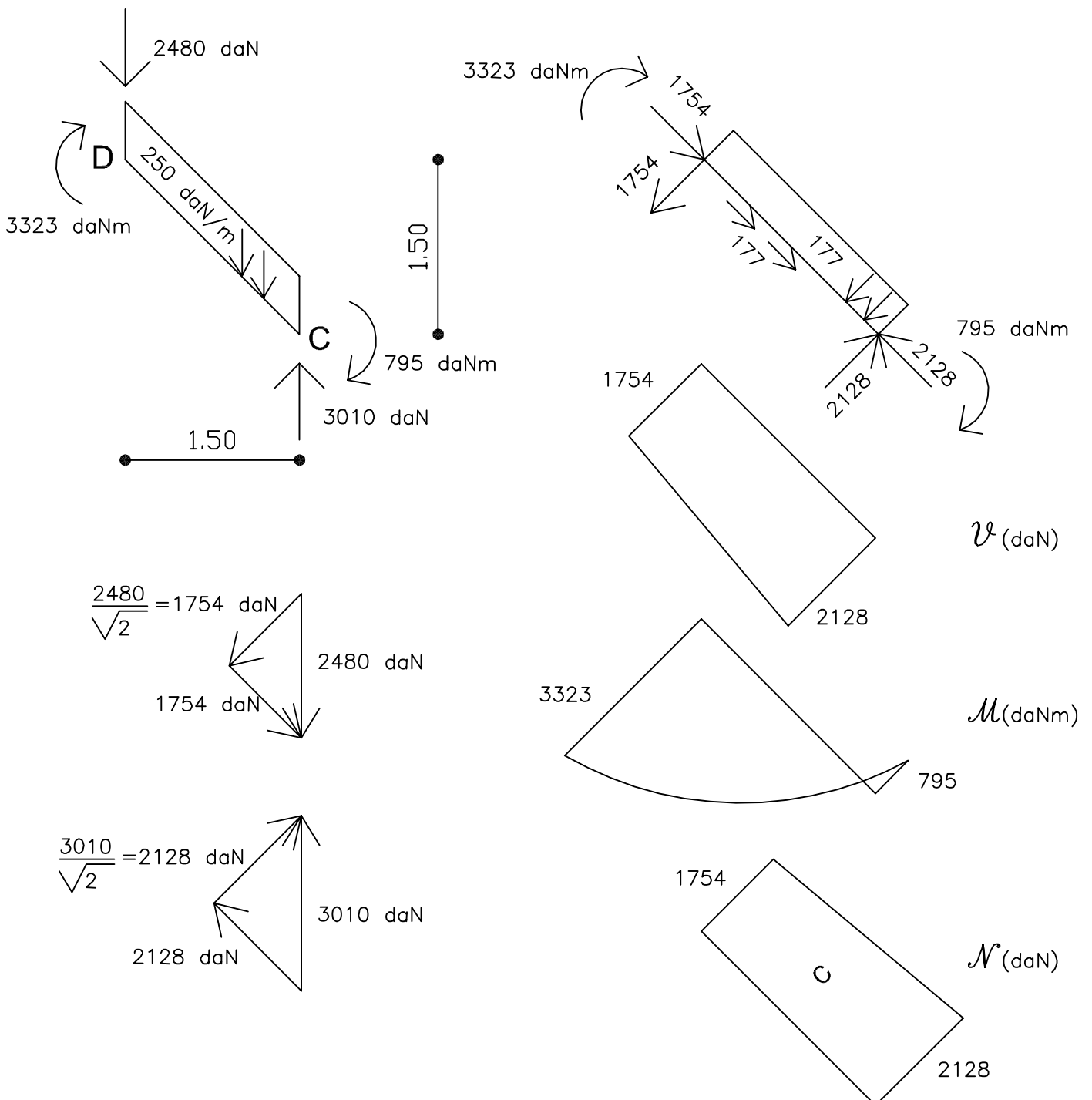
Aplicando Pitágoras:



TRAMO GD:



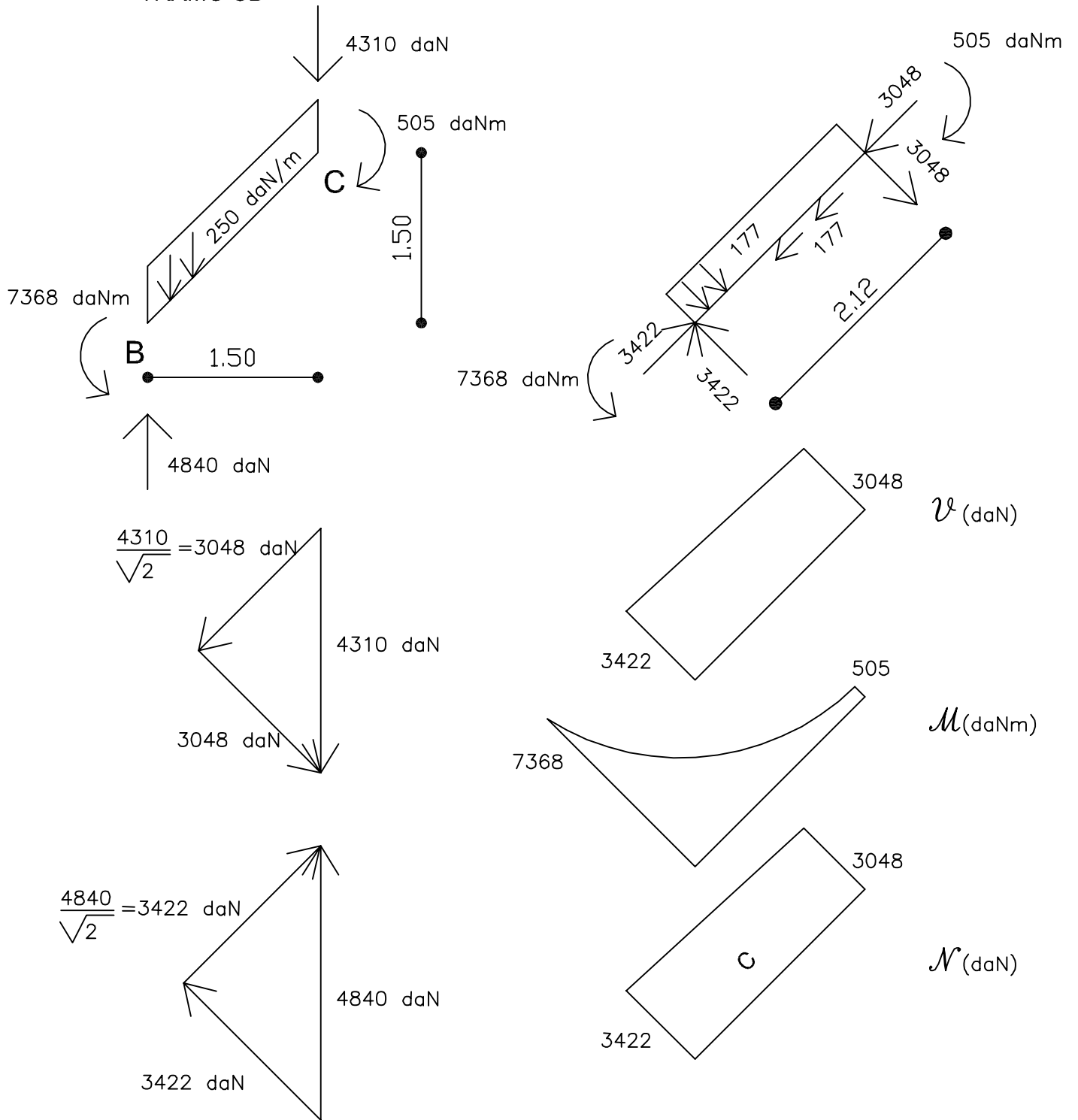
TRAMO DC





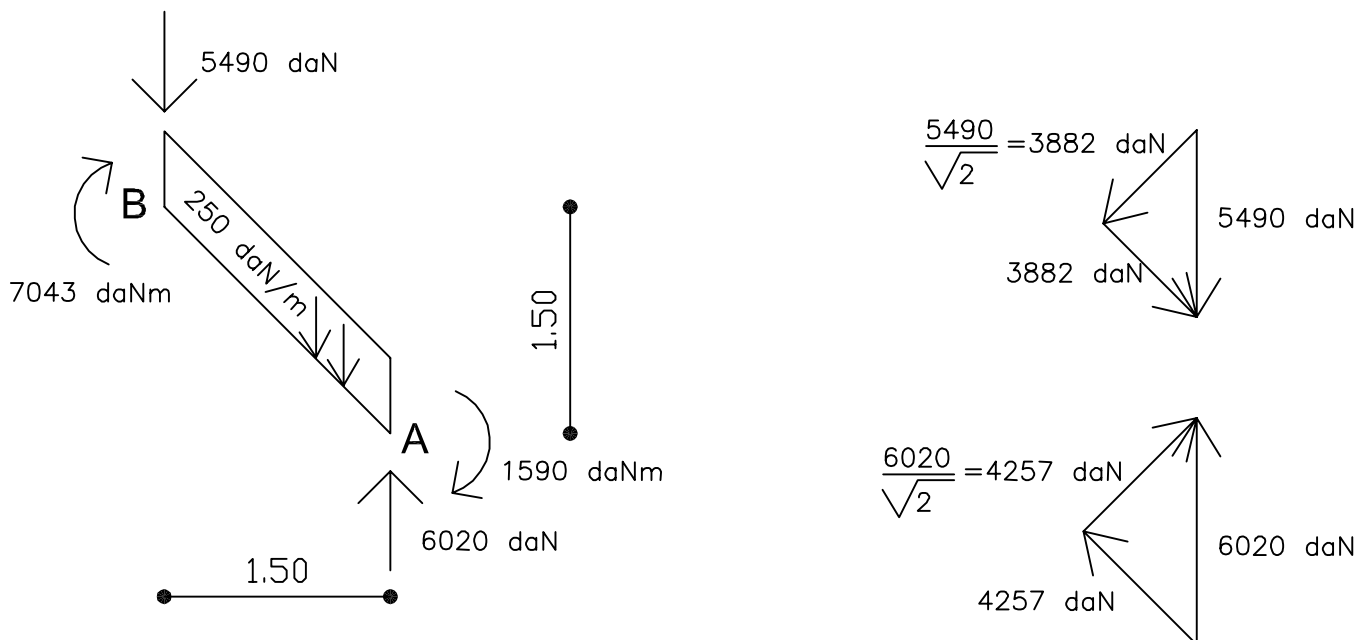
TRAMO CH IGUAL A EF

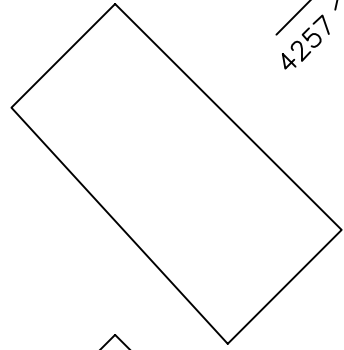
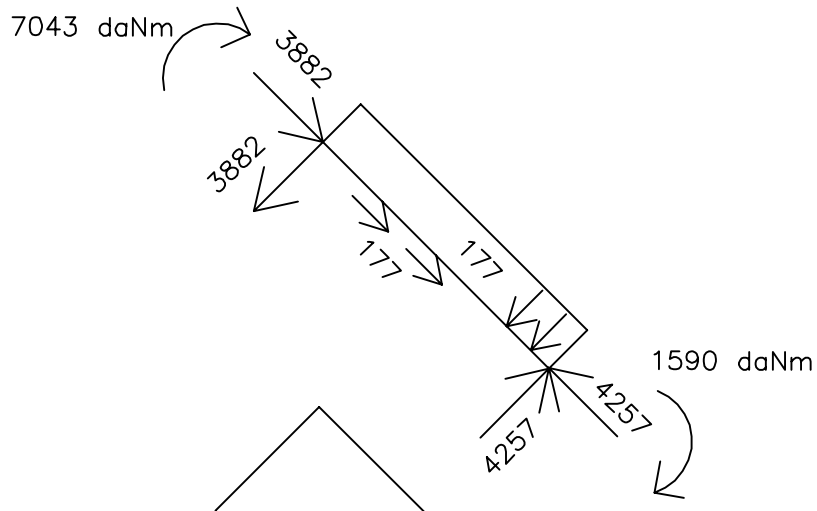
TRAMO CB



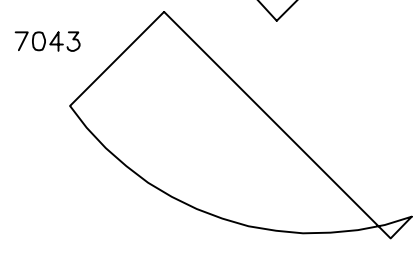
TRAMO IB IGUAL A GD

TRAMO BA

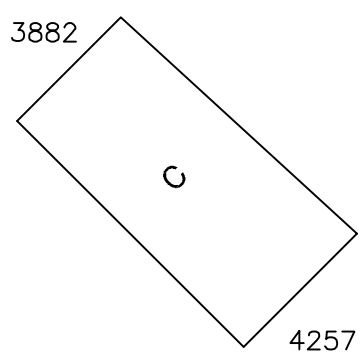




$V$  (daN)



$M$  (daNm)



$N$  (daN)

$C$