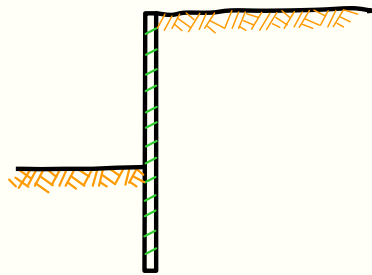




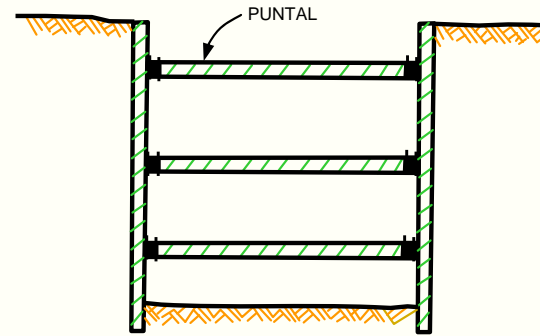
UNIVERSIDAD NACIONAL DE INGENIERÍA
FACULTAD DE INGENIERÍA CIVIL
SECCIÓN DE POST GRADO

“DISEÑO Y CONSTRUCCION DE CALZADURAS”

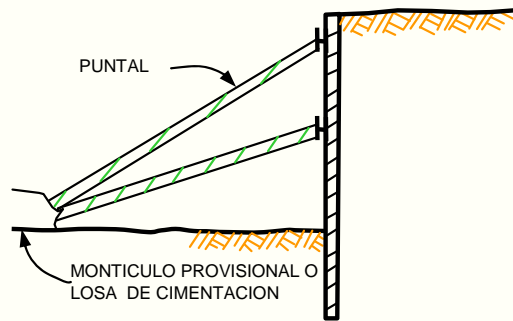
Dr. Jorge E. Alva Hurtado



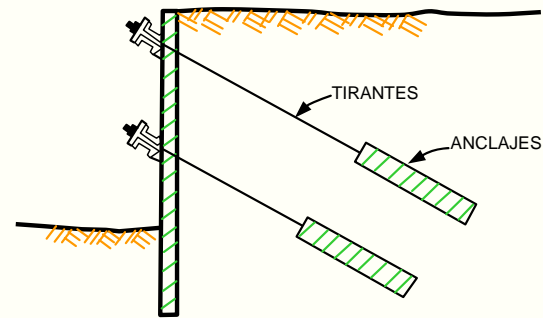
A. MURO EN VOLADIZO



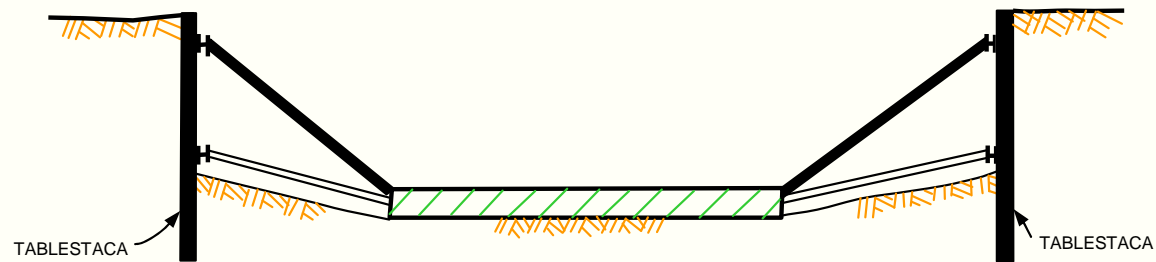
B. MURO ENTIBADO



C. SISTEMA DE PUNTALES

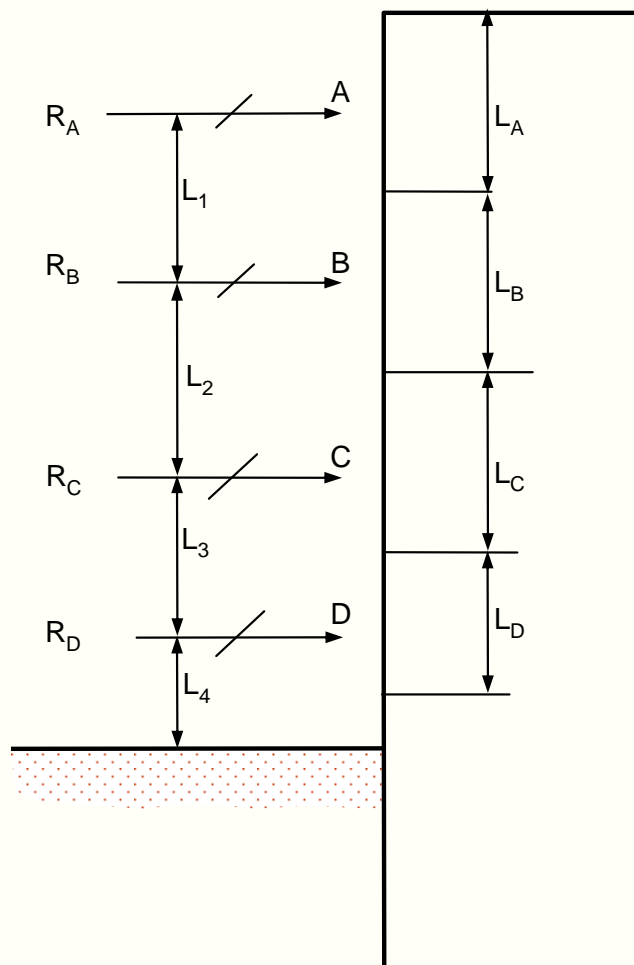


D. MURO CON ANCLAJE

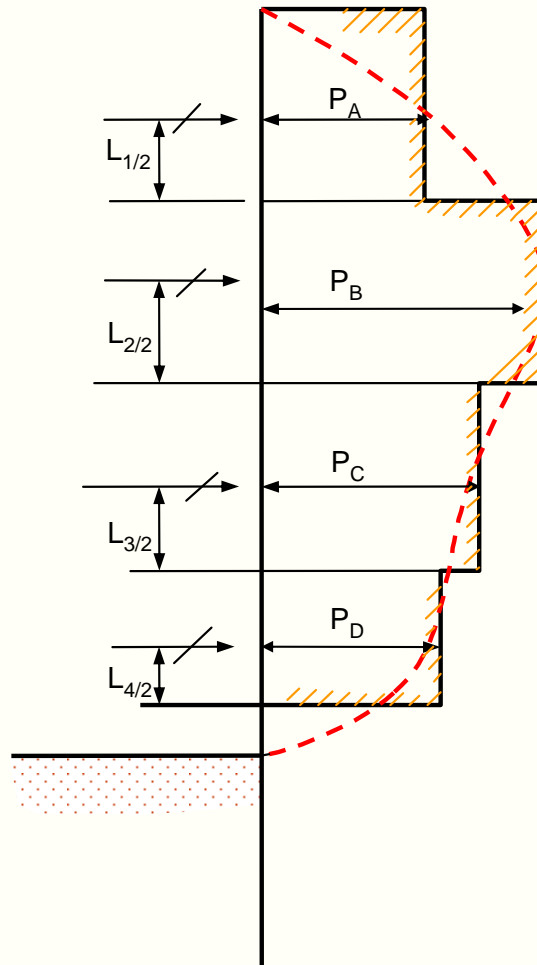


E. BERMA DE SOPORTE

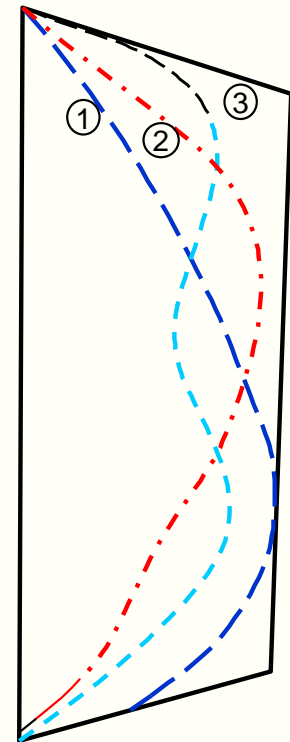
SISTEMAS DE SOPORTE LATERAL DE EXCAVACIONES



a) REACCIONES
 R_A, R_B, R_C, R_D



b) PRESIONES APARENTES
 DE TIERRA
 $P_A = \frac{R_A}{L_A} \cdot \text{etc.}$



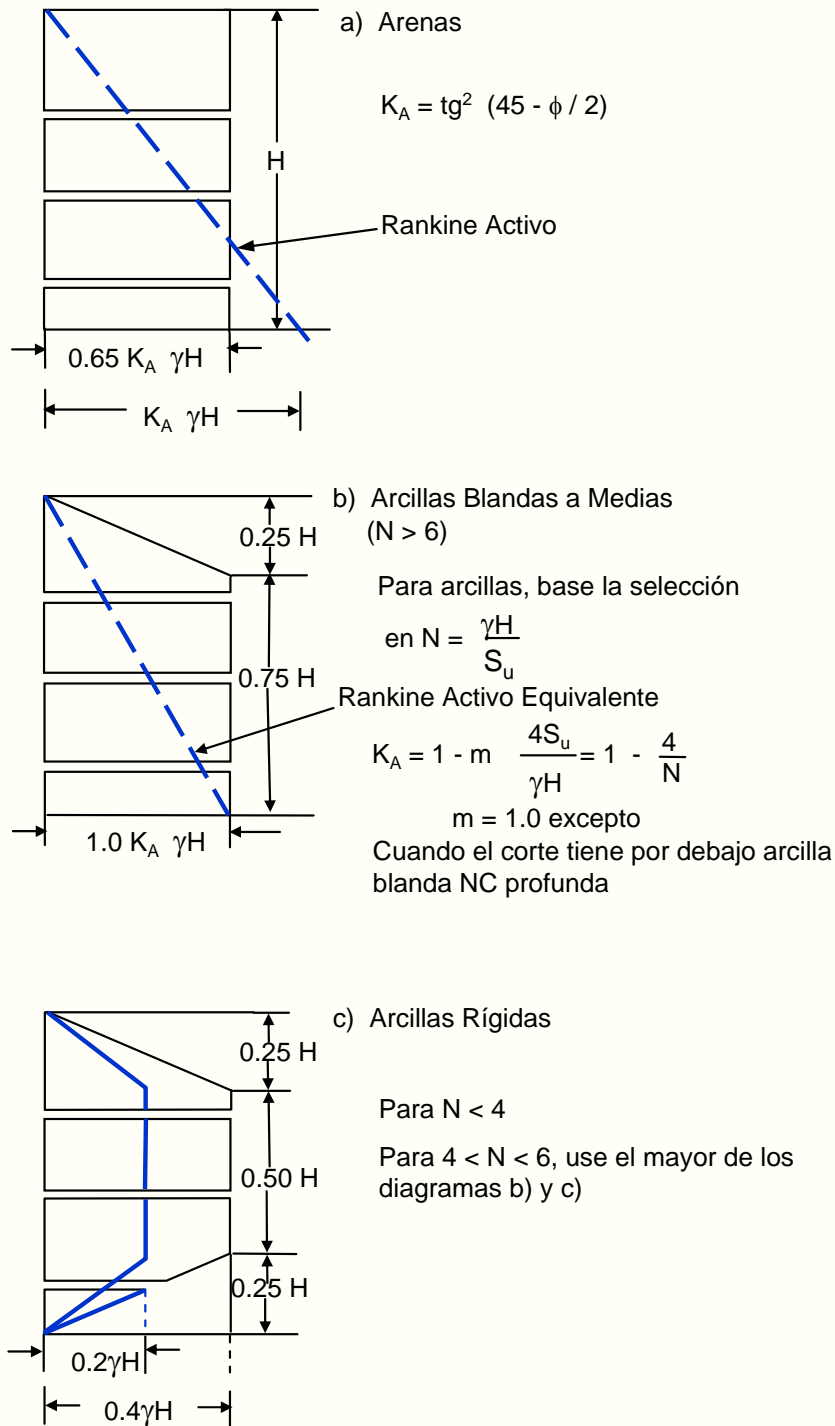
ENVOLVENTE

c) ENVOLVENTE DE
 DISEÑO DE DATOS
 EMPIRICOS

Fig. 1. METODO EMPIRICO PARA EL DESARROLLO DEL DIAGRAMA DE PRESION DE TIERRA

DISTRIBUCION DE PRESION

FUERZA TOTAL



$P_t = \text{Trapezoide}$

$P_A = \text{Rankine}$

$P_t = .65 K_A \gamma H^2$

$P_A = .50 K_A \gamma H^2$

$\frac{P_t}{P_A} = 1.30$

$m = 1.0$

$P_t = .875\gamma H^2 (1 - \frac{4}{N})$

$P_A = .50\gamma H^2 (1 - \frac{4}{N})$

$\frac{P_t}{P_A} = 1.75$

$P_t = .15\gamma H^2$ a $.30\gamma H^2$

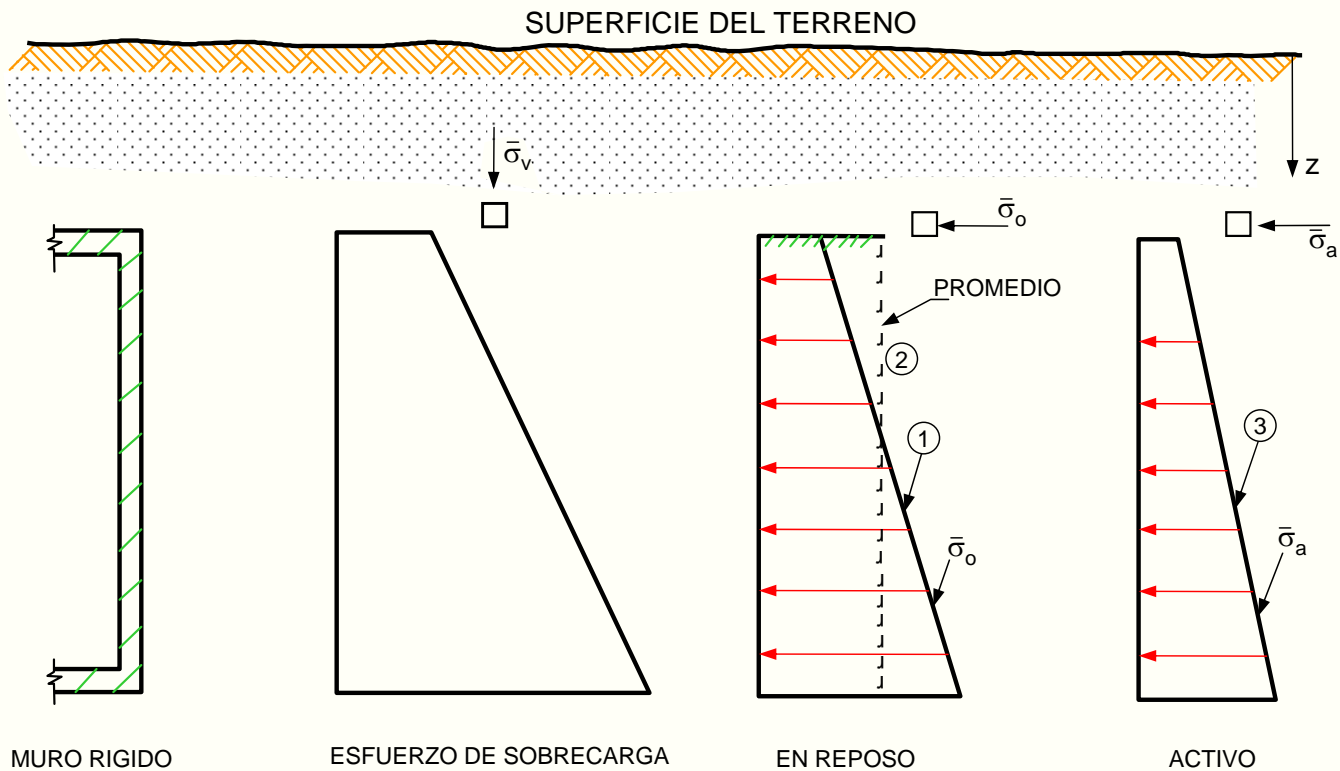
$\frac{P_A}{N} = 4, P_A = 0$

$N < 4, P_A < 0$

NOTA : Rankine Activo Equivalente = 0

Fig. 2.

DIAGRAMAS DE PRESION PARA ENTIBACIONES DE TERZAGHI Y PECK (1967)



$$K_o = 1 - \text{sen } \bar{\phi} \quad \left\{ \begin{array}{l} \textcircled{1} \text{ MURO VACIADO CONTRA ATAGUIA} \\ \textcircled{2} \text{ RELLENO GRANULAR COMPACTO} \end{array} \right.$$

$$K_a = \text{tg}^2 (45 - \bar{\phi} / 2) \quad \textcircled{3} \text{ RELLENO GRANULAR SUELTO}$$

Fig. 3. PRESION LATERAL EN MURO RIGIDO

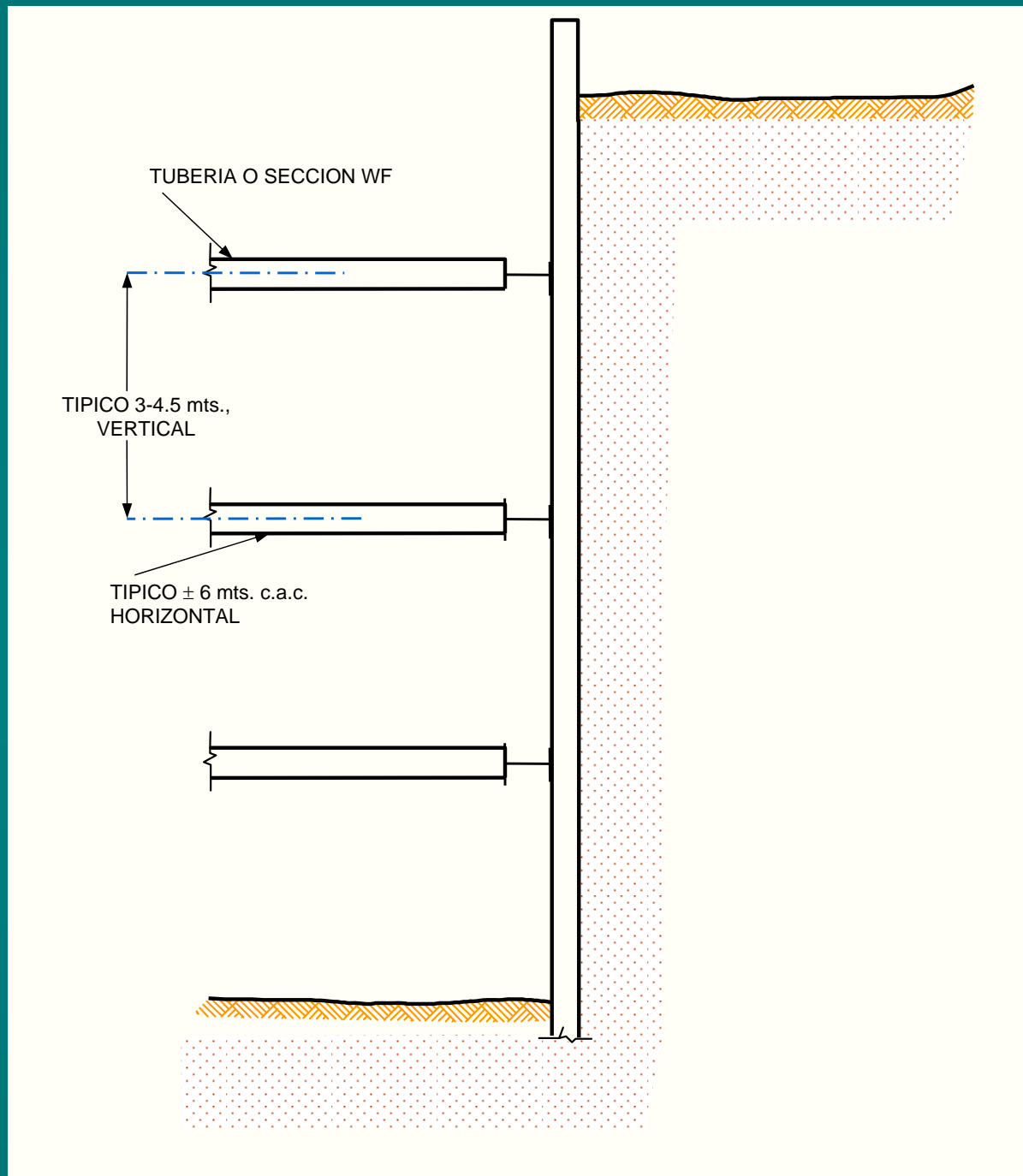


Fig. 4. CORTE SOPORTADO POR ENTIBADO

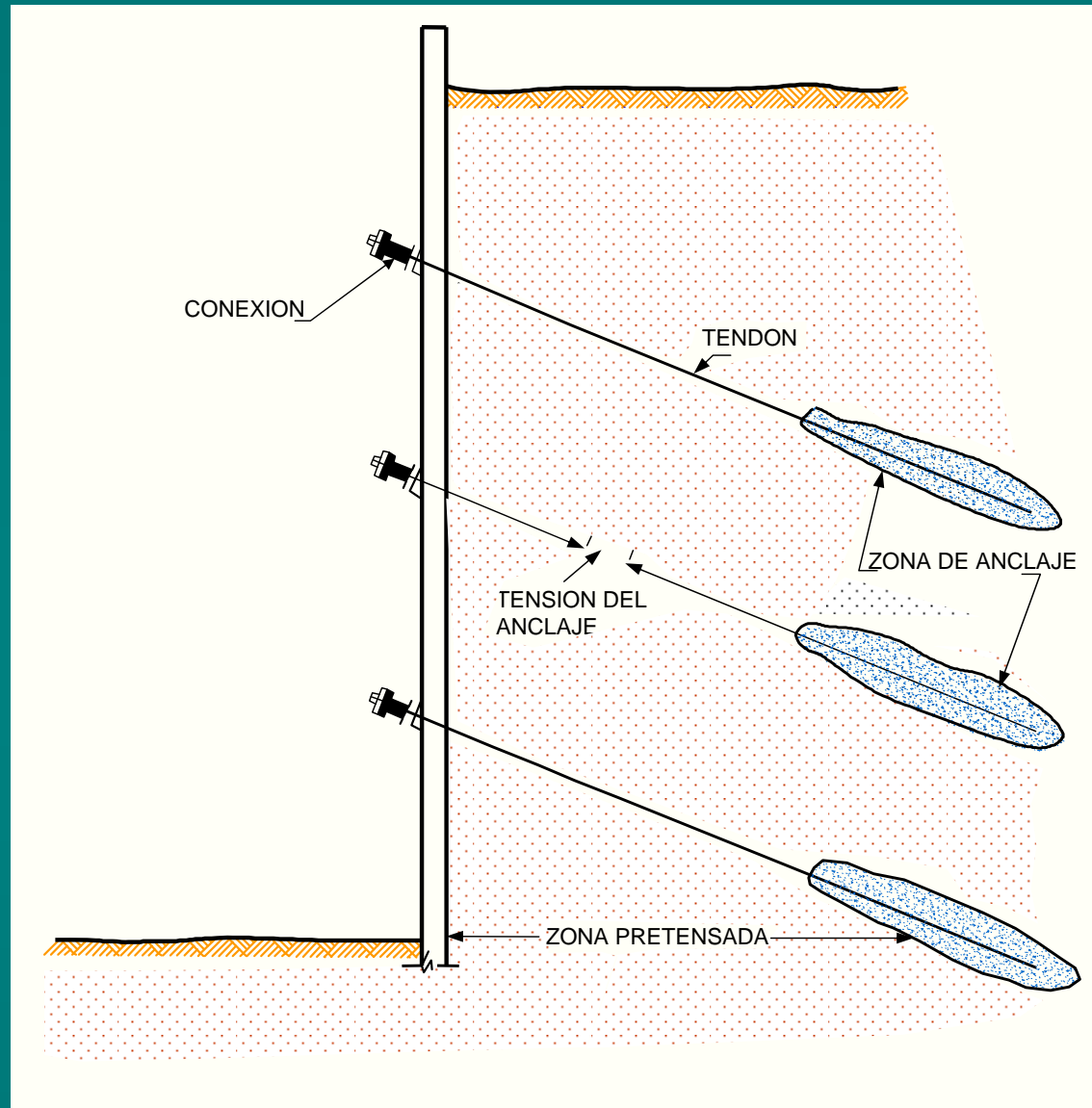


Fig. 5. CORTE SOPORTADO POR ANCLAJES

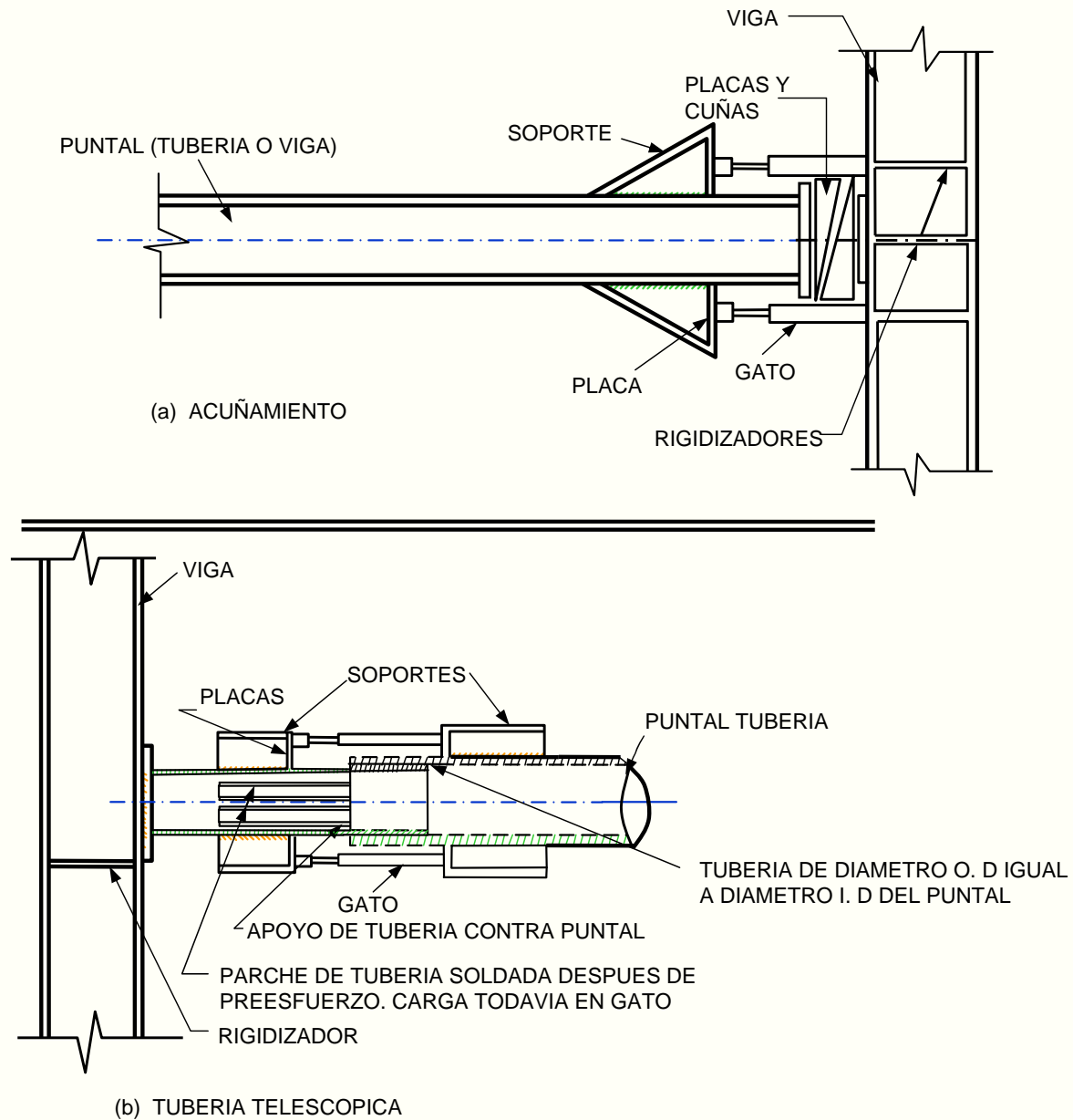


Fig. 6 . DETALLES DE PREESFUERZO

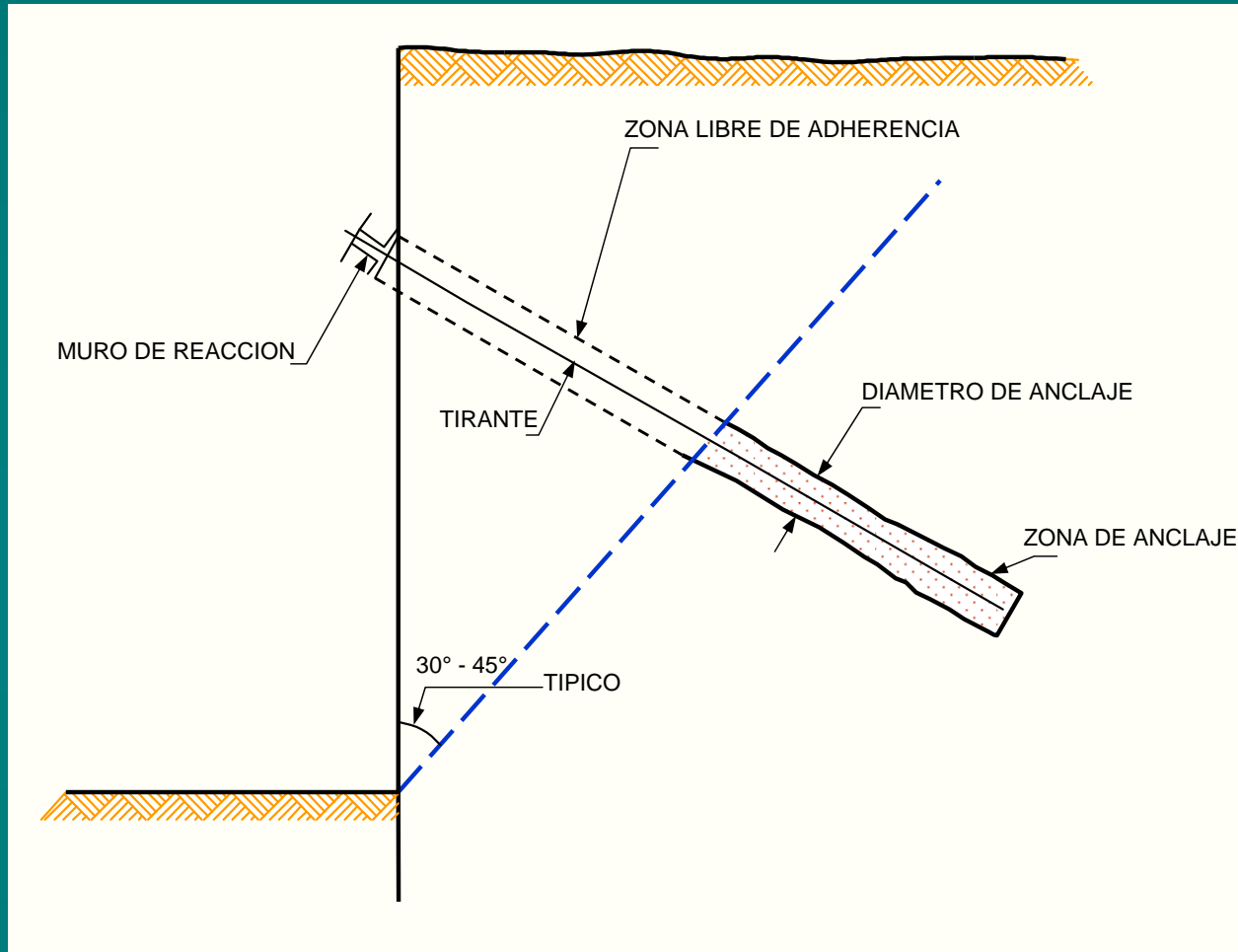


Fig. 7 . ZONA DE ANCLAJE Y ZONA LIBRE DE ADHERENCIA

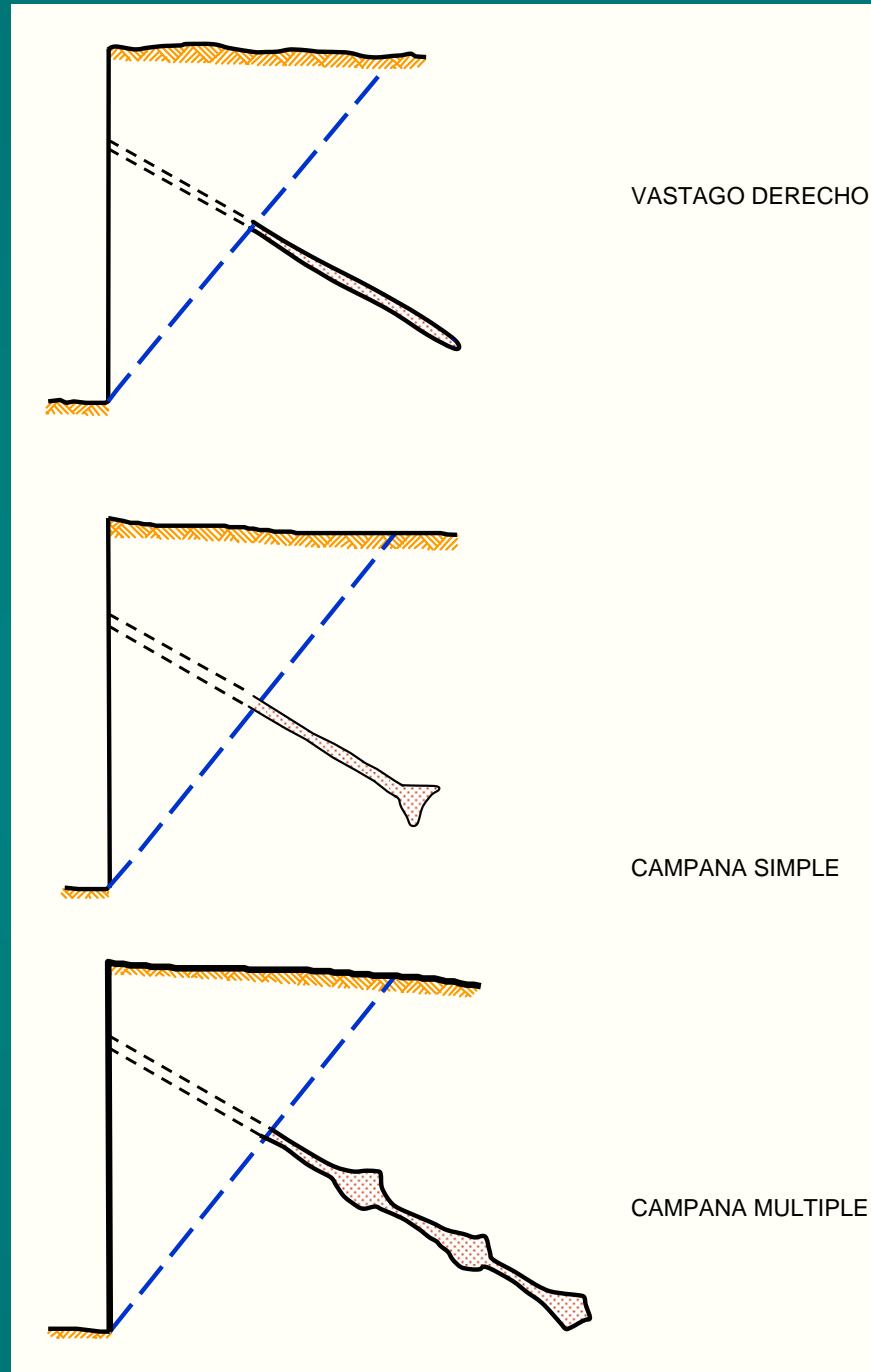
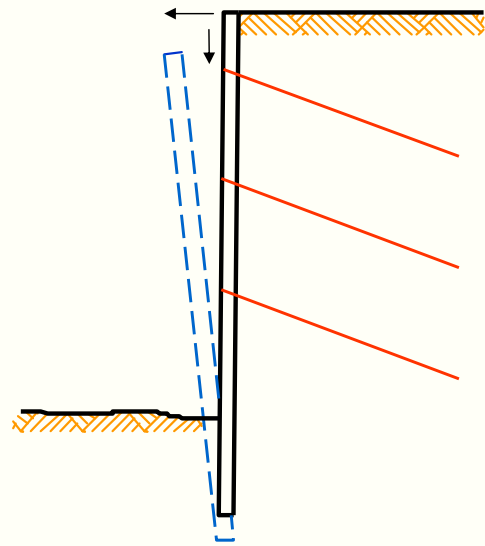
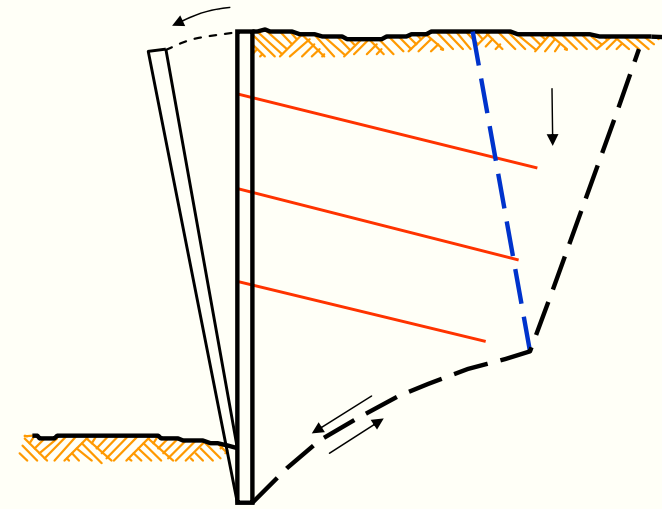


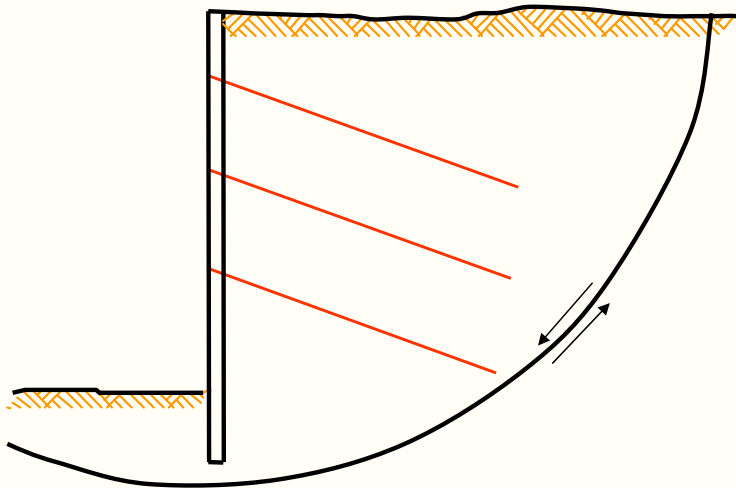
Fig. 8. TIPOS DE ANCLAJES



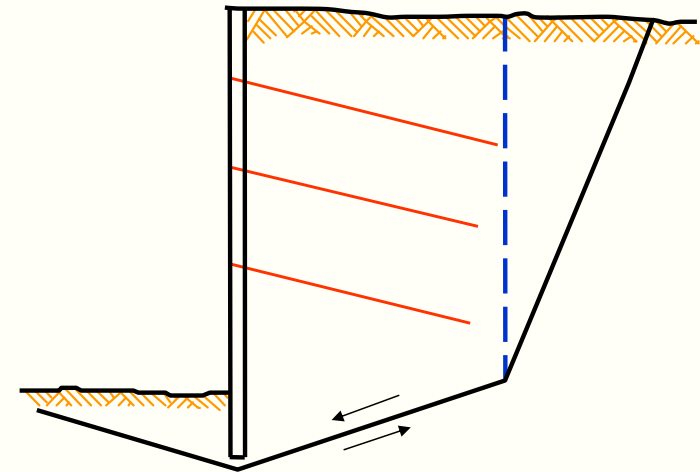
FALLA DE CAPACIDAD PORTANTE



FALLA POR VOLTEO

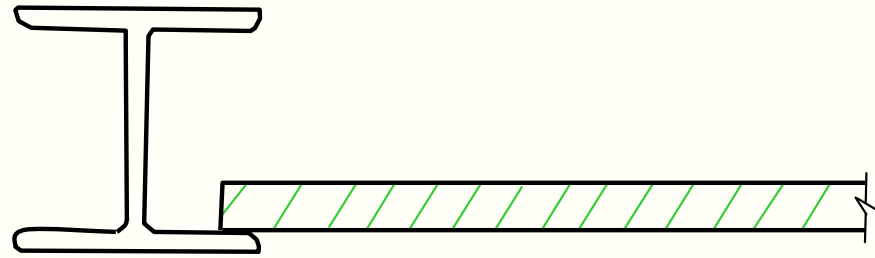


FALLA CIRCULAR DE ARCO

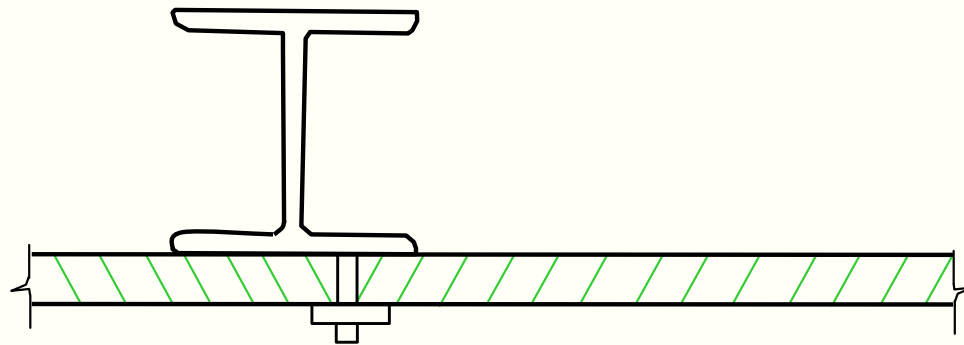


FALLA DE CUÑA DESLIZANTE

Fig. 9. INESTABILIDAD DE MUROS CON ANCLAJE



(a) TABLON EN PARTE POSTERIOR



(b) TABLON EN PARTE FRONTAL

Fig. 10. PILOTE SOLERA DE ALA ANCHA

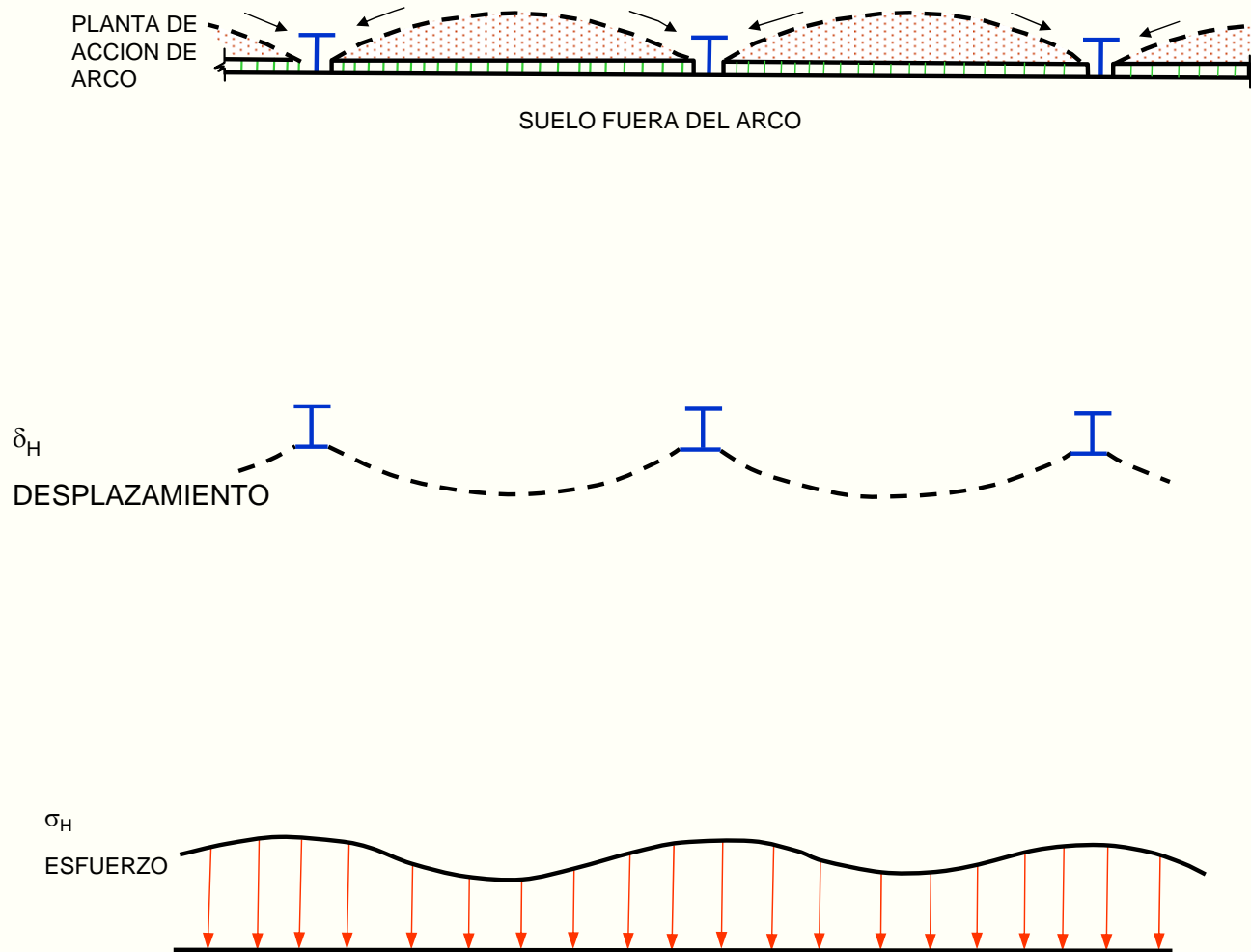


Fig. 11. ACCION DE ARCO

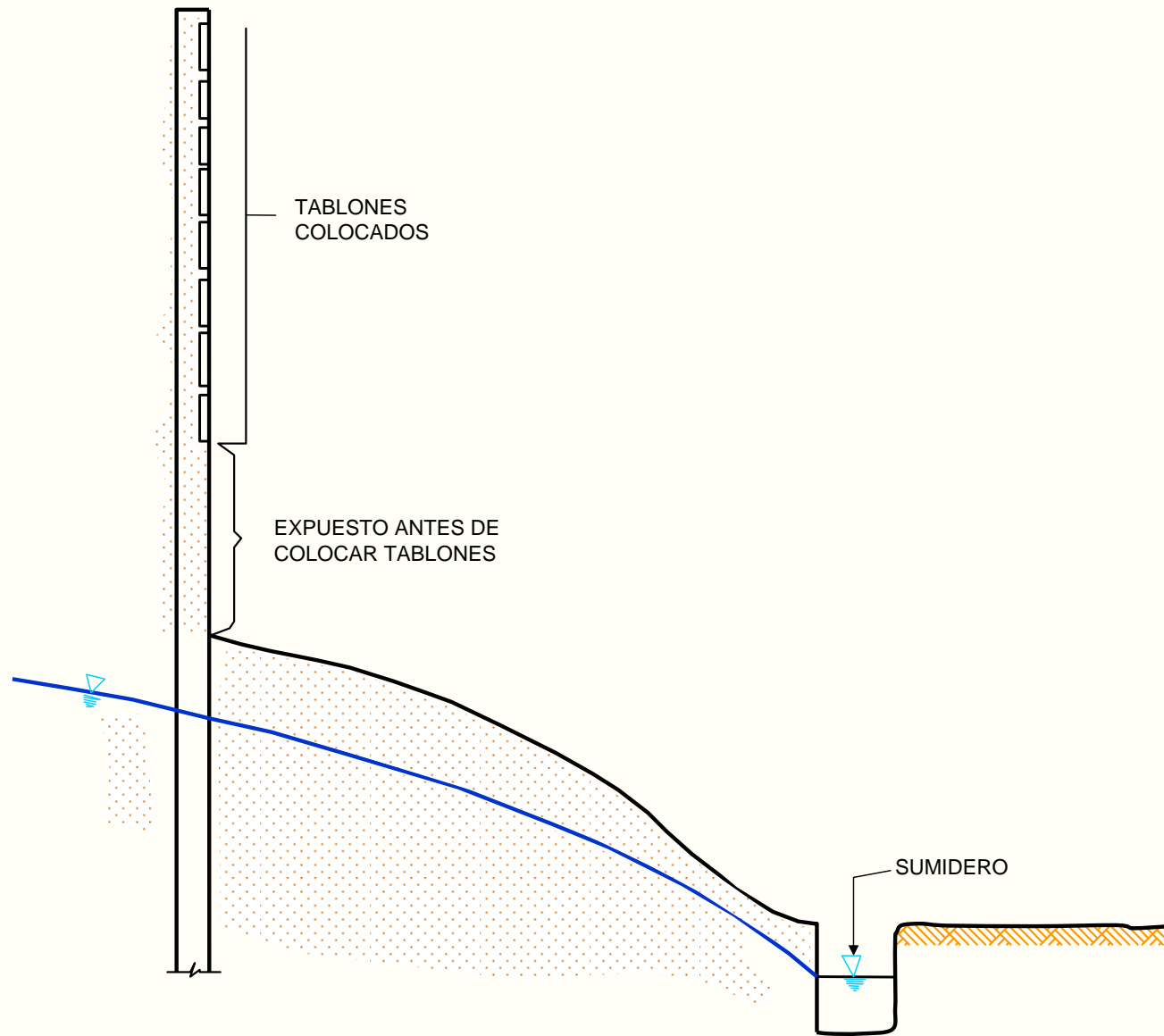


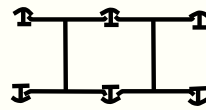
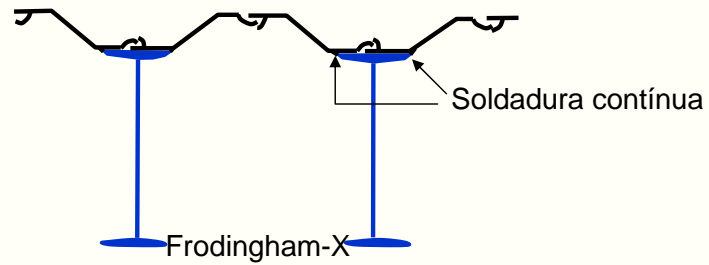
Fig. 12. BERMA CON PENDIENTE Y SUMIDERO



SECCIONES Z



Larsen
SECCION U
(a)



Peine

(c)

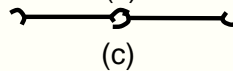


Fig. 13. SECCION DE TABLETACAS METALICAS . (a) RANGO NORMAL; (b) MODULO ALTO, (c) ALMA RECTA

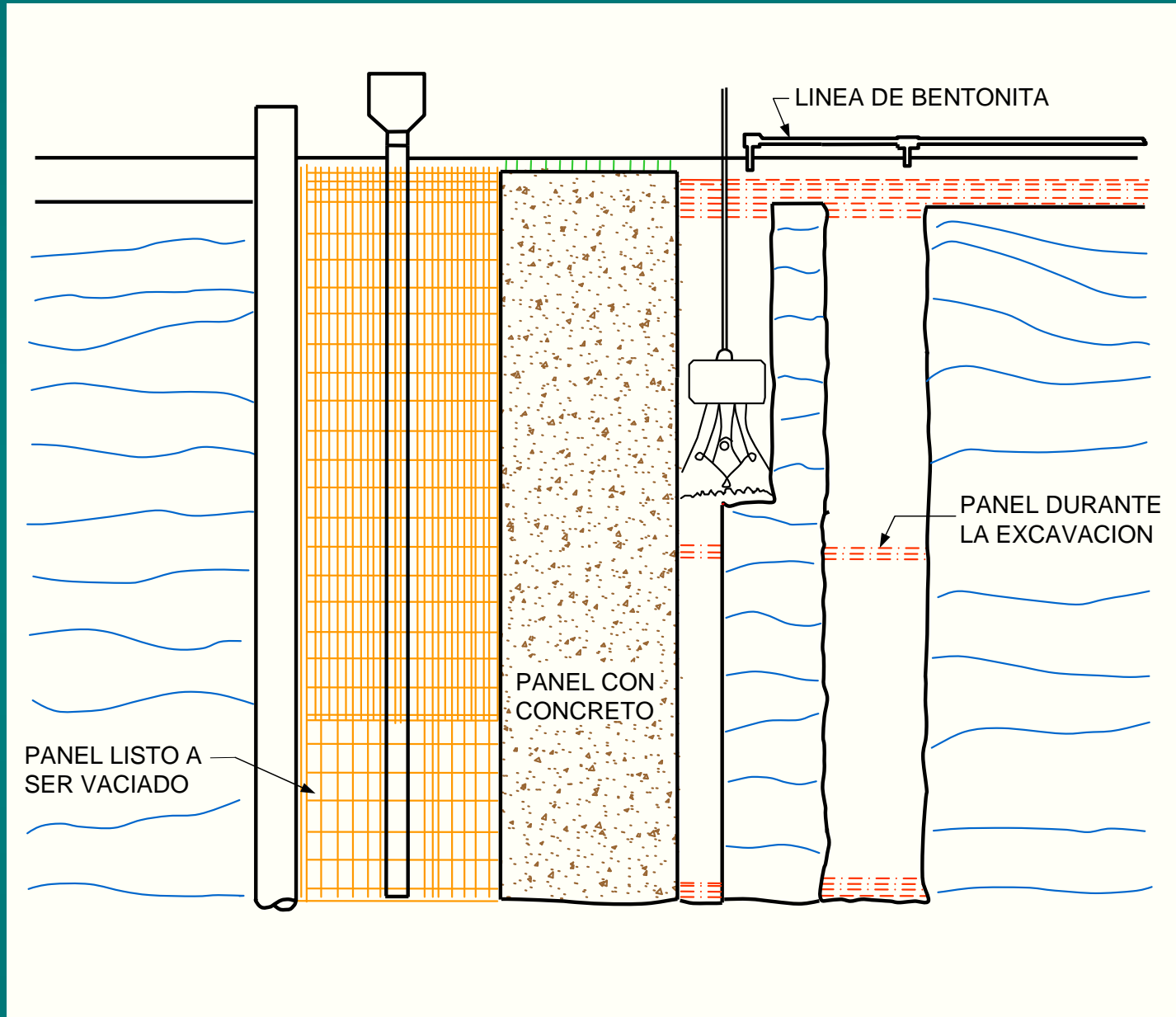
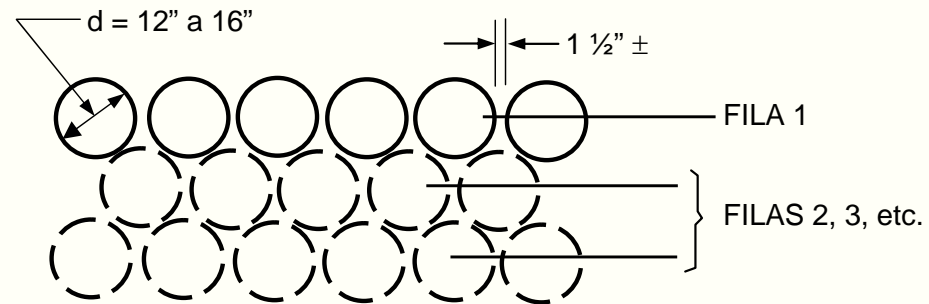


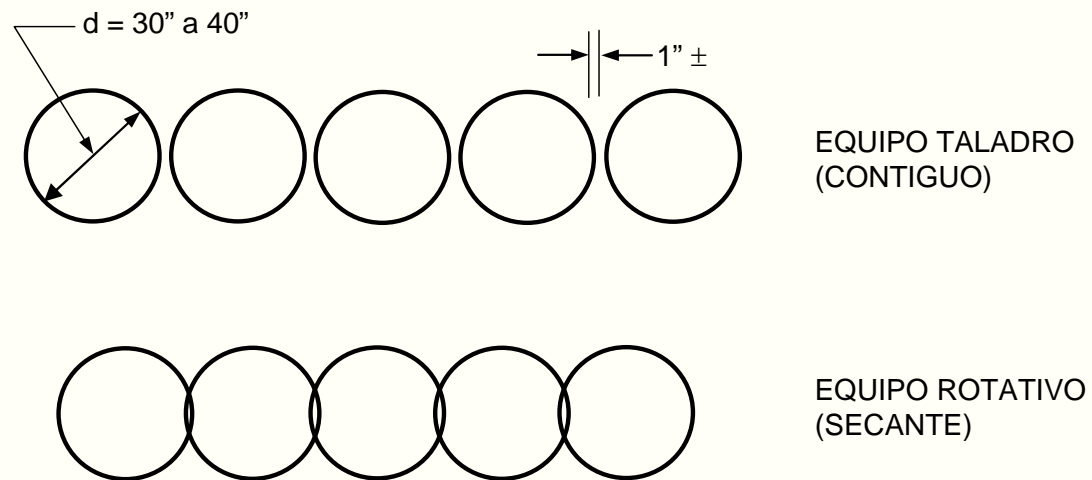
Fig. 14. CONSTRUCCION DE PANTALLA DE CONCRETO

(a) DIAMETRO PEQUEÑO (PILOTES TANGENTES)



LECHADA LLENADA CON TALADRO VASTAGO HUECO

(b) DIAMETRO GRANDE (PILOTES CONTIGUOS O SECANTES)



VACIADO CON CONCRETO

Fig. 15. PILOTES CONTINUOS EXCAVADOS

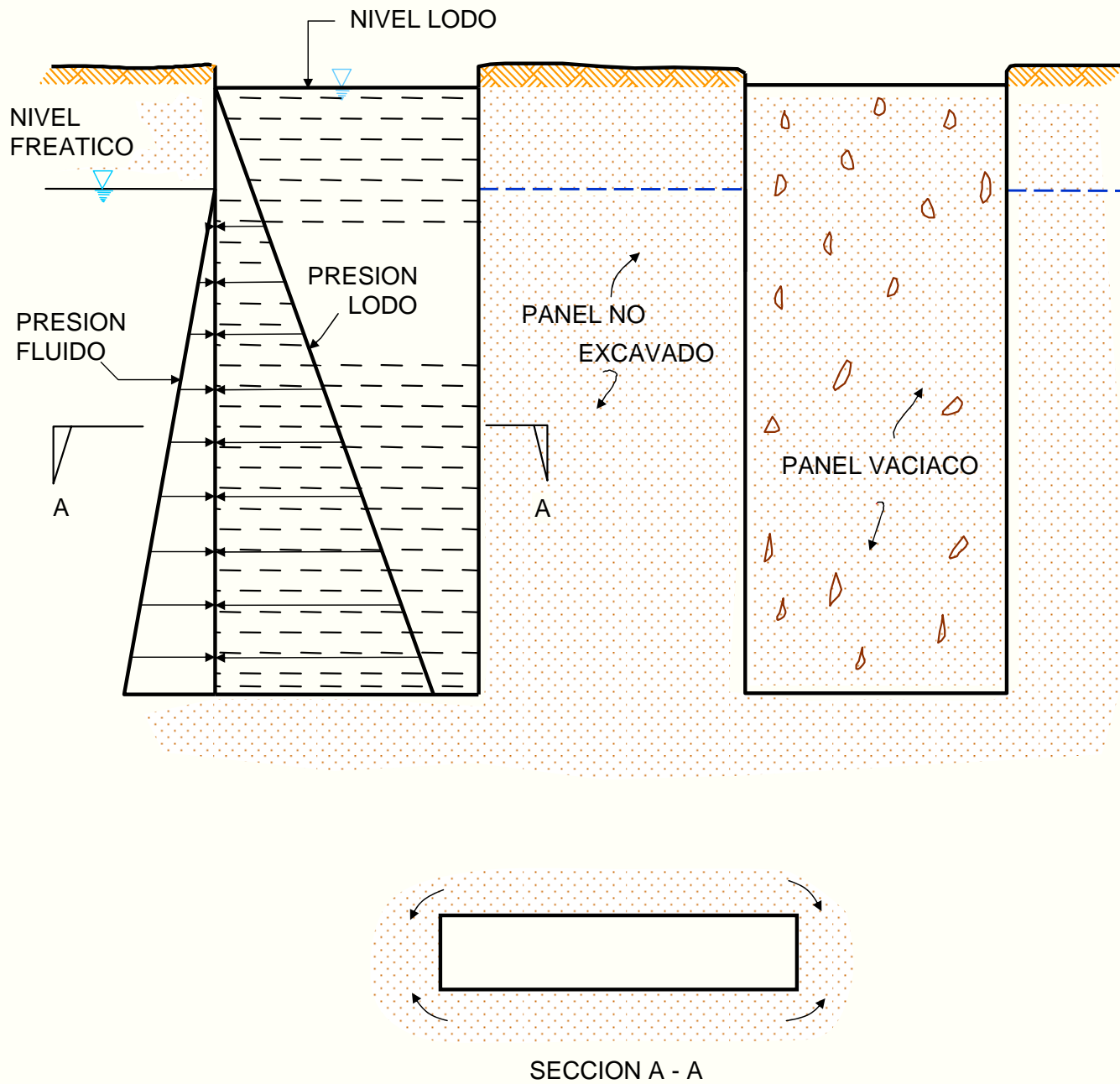


Fig. 16. FACTORES QUE AYUDAN A LA ESTABILIDAD DE LA EXCAVACION

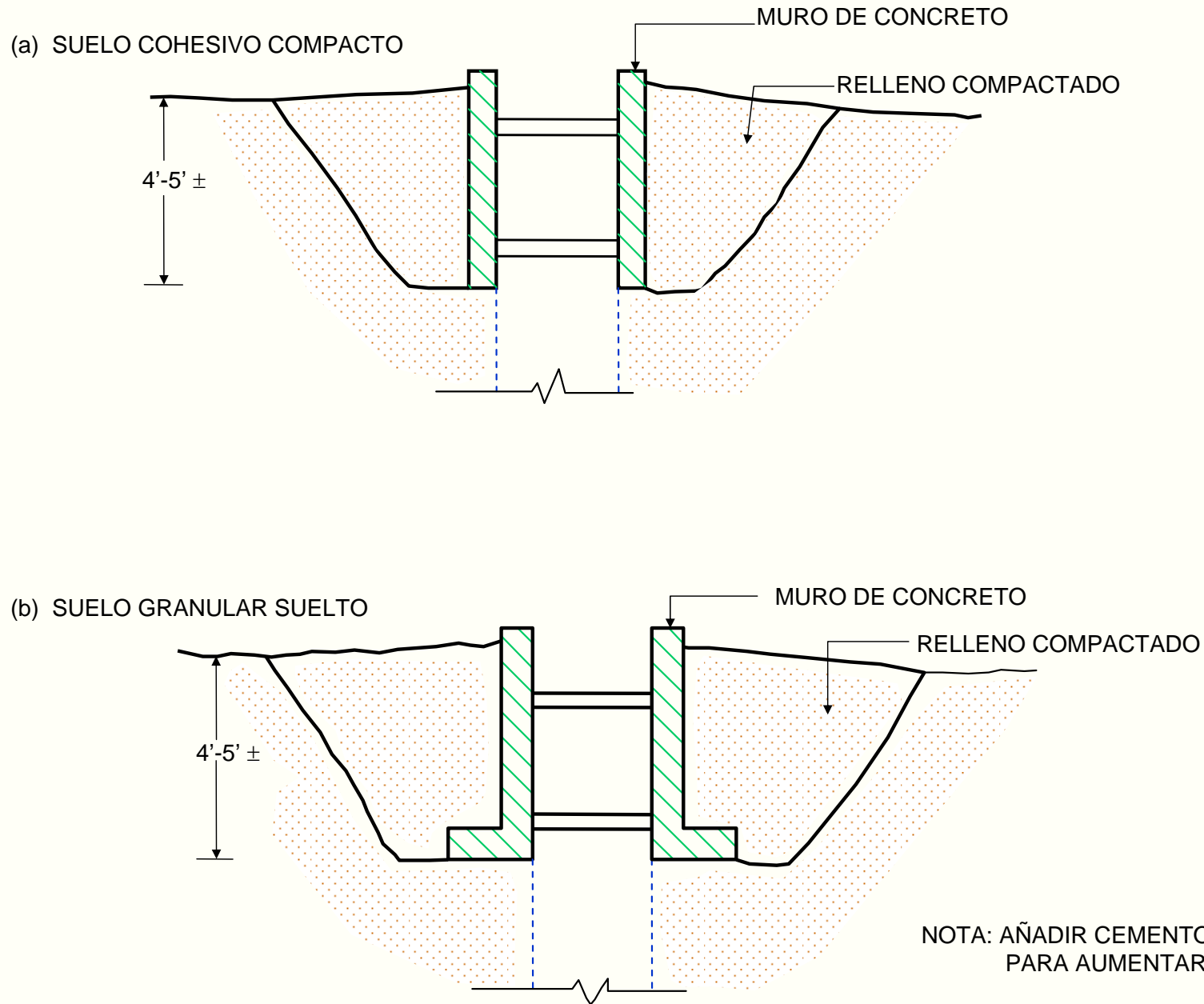
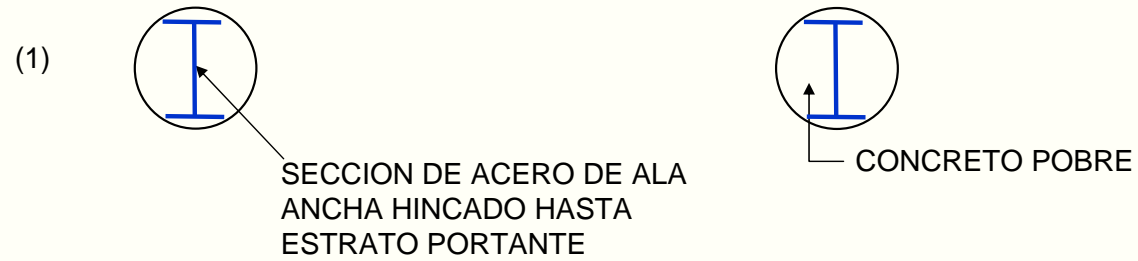


Fig. 17. MURO - GUIA

COLOCACION DE PILOTE-SOLERA EN AGUJERO PRE-EXCAVADO



EXCAVACION Y PANEL DE CONCRETO (REFUERZO CON ACERO)

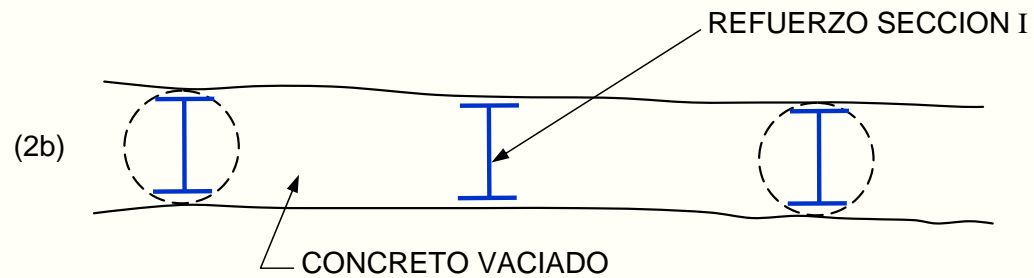
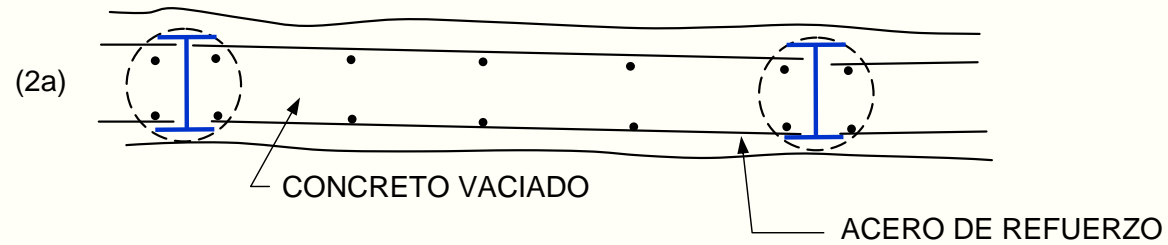


Fig. 18. PANTALLA DE CONCRETO EN DOS ETAPAS