BRITISH EMBASSY
BELGRADE

In their example. $\sum x_i = 0 = \sum z_i = \sum x_i z_i$

So $X^T X = \begin{pmatrix} n & 0 & 0 \\ 0 & \sum x_i^2 & 0 \\ 0 & 0 & \sum z_i^2 \end{pmatrix}$.

and

$X(X^T X)^{-1} X^T$

$= \begin{pmatrix} 1 & x_1 & z_1 \\ \vdots & | & | \\ 1 & x_n & z_n \end{pmatrix} \begin{pmatrix} \frac{1}{n} & & \\ & (\sum x_i^2)^{-1} & \\ & & (\sum z_i^2)^{-1} \end{pmatrix}$

$\times \begin{pmatrix} 1 & \cdots & 1 \\ x_1 & \cdots & x_n \\ z_1 & \cdots & z_n \end{pmatrix}$