

## NOTE

### Two New Block Designs

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In this note the matrices  $W$ ,  $X$ ,  $Y$ , and  $Z$  are the incidence matrices of the  $(v, k, \lambda)$  configurations  $(15, 7, 3)$ ,  $(25, 9, 3)$ ,  $(45, 12, 3)$ , and  $(36, 15, 6)$ , respectively.  $W$  and  $X$  are new formulations of these configurations and  $Y$  and  $Z$  were previously not known (see [1, pp. 295, 297]).

We use the following notation:

$$I = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}, \quad L = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}, \quad M = \begin{bmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}, \quad J = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix},$$

$$e = [1, 1, 1] \quad \text{and} \quad \epsilon = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix};$$

all blank blocks contain all zeros.

The incidence matrices are

$$W = \begin{bmatrix} J & I & I & I & I \\ I & J & I & L & M \\ I & I & J & M & L \\ I & L & M & J & I \\ I & M & L & I & J \end{bmatrix},$$

$$X = \begin{bmatrix} & & & & e & e & e & & & & \\ & e & & & e & & & & & & e \\ & e & & & e & & e & & & & \\ & e & & & & & e & & e & & \\ & & & & I & I & I & J-I & J-I & J-I & \\ \epsilon & \epsilon & & \epsilon & I & I & I & I & I & I & \\ \epsilon & \epsilon & & \epsilon & I & M & L & I & M & L & \\ \epsilon & & \epsilon & & \epsilon & I & L & M & I & L & M \\ & & & & I & J-I & I & & J-I & J-I & I \\ & & & & I & J-I & J-I & I & & I & J-I \\ & & & & I & J-I & & J-I & I & & J-I \end{bmatrix},$$

