Step-1

Suppose B is an invertible matrix, then we have $BB^{-1} = I$

We follow that the diagonal entries of the identity matrix are 1 and all other are zero.

The entry in the product matrix x_{ij} is obtained from the sum of the products of the entries of ith row of B and j^{th} column of B^{-1}

Further, the diagonal entries are formed by multiplying the ith row of B and i^{th} column of B^{-1}

The entries away from the principal diagonal are formed by multiplying the ith row of B and j^{th} column of B^{-1}

While are these entries are zero, we follow that i^{th} row of B and j^{th} column of B^{-1} are orthogonal when $1 \le i \ne j \le n$