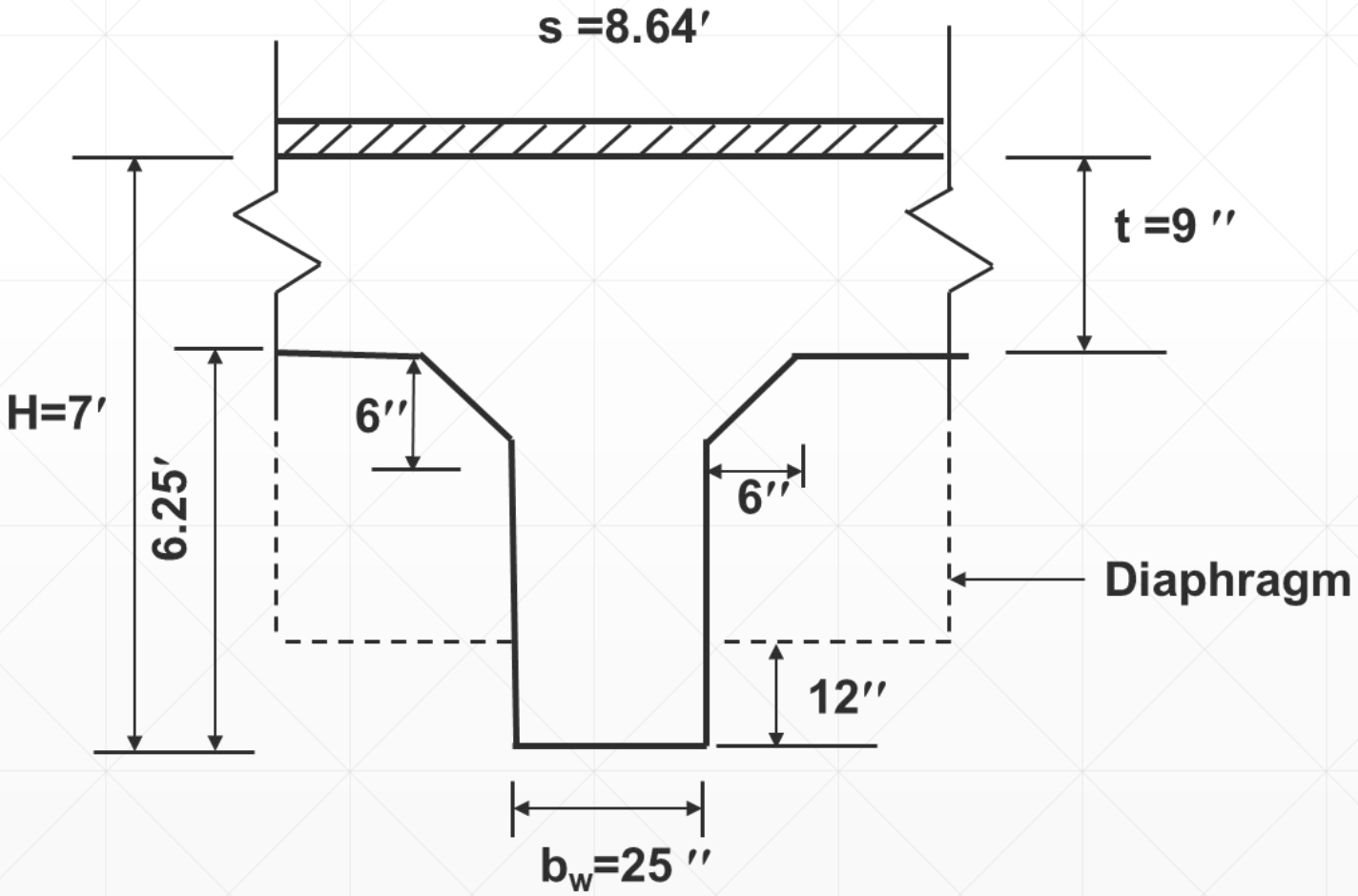
Design of Diaphragm

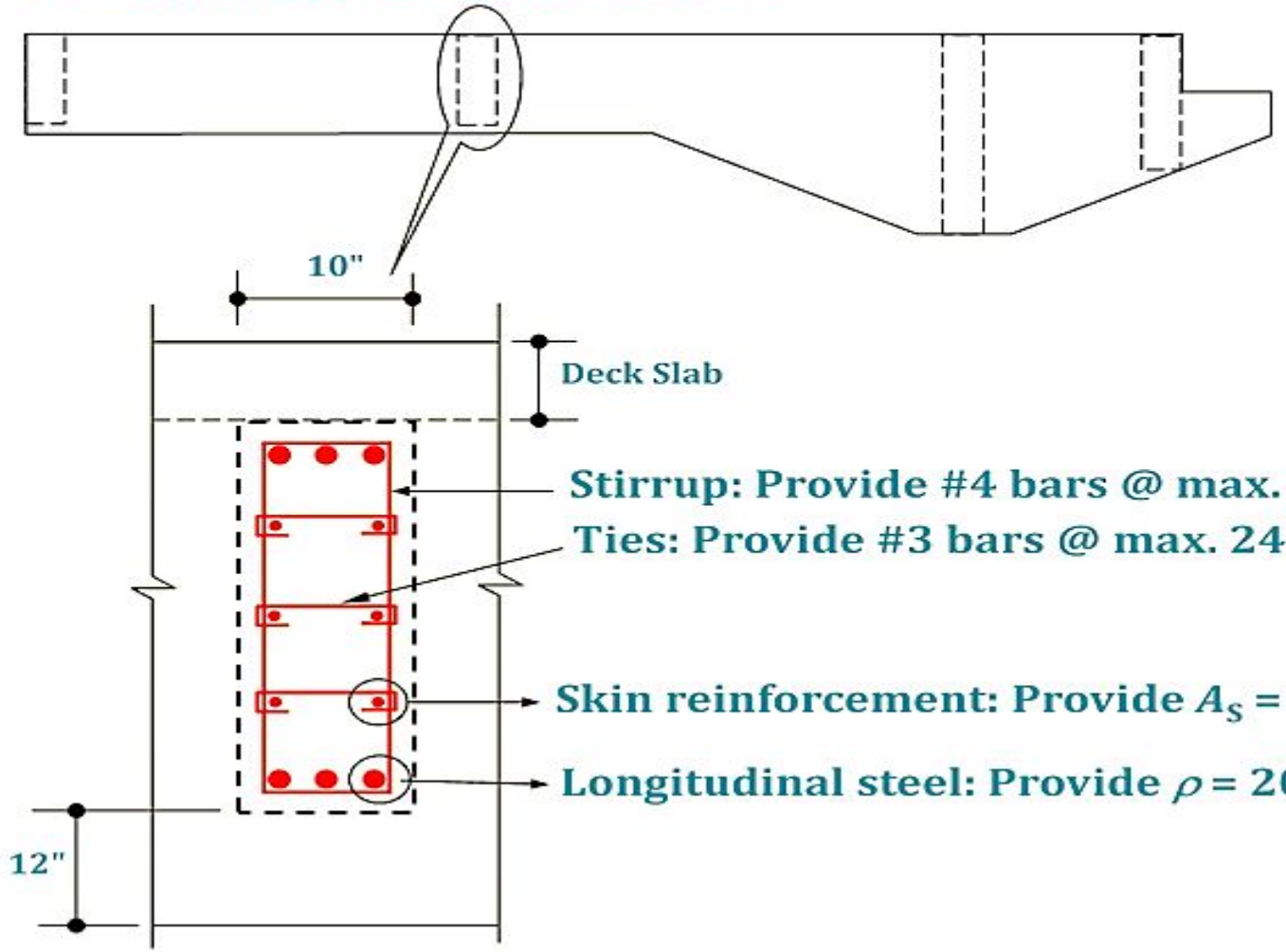
Maliha Mannan Leea

Design Example



Design of Diaphragm

NON LOAD BEARING.
FOR STABILITY OF MAIN GIRDERS.



Stirrup: Provide #4 bars @ max. 18" on centers.

Ties: Provide #3 bars @ max. 24" on centre.

Skin reinforcement: Provide $A_s = 0.002bt$

Longitudinal steel: Provide $\rho = 200/f_y$ at top and bottom.

Design of Diaphragm

For diaphragm located at abutment,

Width= 18″, depth= 7×12-12-9 = 63″

Longitudinal steel, A_{sL}=200/fy× bd

= 200/60000 × 18 ×(63-2.5)

=3.63 in^2

We will provide 3 #10 bars as longitudinal steel.

$A_{sL(provided)}$ = 3 ×1.27 =3.81in^2>3.63 in^2 (okay)

Skin reinforcement, A_{sk}= 0.002bt = $0.002 \times 18 \times 63 = 2.268\ in^2$

We shall provide 3-#8 bars as skin reinforcement,

$A_{sk(\ provided)}$= 3 ×0.79 = 2.73 in^2> 2.268 in^2 (ok)

Stirrup: #4 bar @ 15 in. c/c is provided.

Ties/link: #3 bar @ 14.5 in. c/c is provided.

For diaphragm located at pier,
Width= 18″, depth= 10.5×12-12-9 = 105″
For diaphragm located at intermediate location,
Width= 10″, depth= 7×12-12-9 = 63″

Design of Diaphragm

