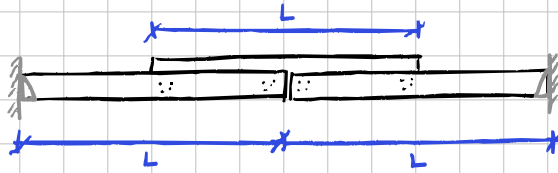


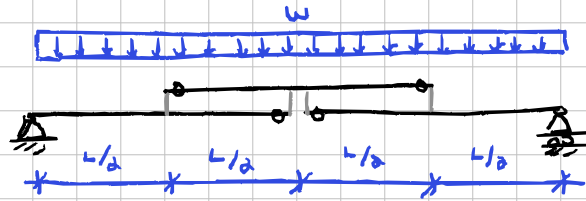
# 07A-Reciprocal frame splicing (Ideal).

Getting 3 members of length  $L$  to span  $2L$

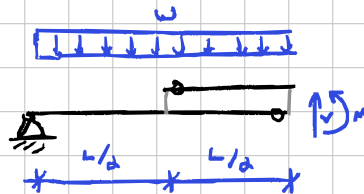
SKETCH



FBD



MID  
POINT  
CUT



|       | TOP         | BOT |
|-------|-------------|-----|
| $M =$ | $w(2L)^2/8$ | 0   |
| $V =$ | 0           | 0   |

ISOLATE



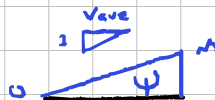
From statics:  
 $V_{ave} = M / (L/2)$

SFD



Worse case scenario  
 top beam is taking  
 100% of  $w$

BMD



$$V_{max} = V_{ave} + wL/4$$

$$V_{max} = 2M/L + wL/4$$

Summary

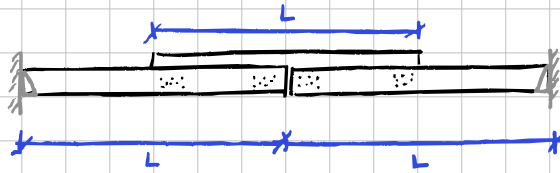
$$M_{SPLICE} = M$$

$$V_{SPLICE} = 2M/L + wL/4$$

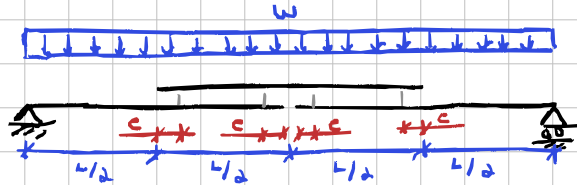
$$\Delta_{SPLICE} < \Delta \text{ (As long as connections are stiff)}$$

# 07B - Reciprocal frame splicing (with connexion widths)

SKETCH



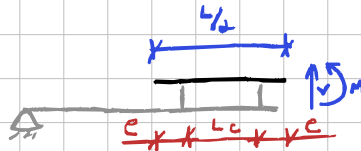
FBD



where  $e$  : Distance from end of member to connection center line.

Neglecting local member loading for now

ISOLATE



$$\text{If } L_c = L/4 - 2e$$

$$V_{ave} = M / L_c$$

SFD



Worse case scenario top beam is taking 100% of  $w$ : do these still work?  $\rightarrow$

BMD



$$V_{max} = V_{ave} + wL/4$$

$$V_{max} = M/L_c + wL/4$$

Summary

$$M_{SPLICE} = M$$

$$V_{SPLICE} = M/L_c + wL/4$$

$$\Delta_{SPLICE} < \Delta$$

