STATIC EQUIVALENT LOADING: 952 STYLE BACKSTOP

CEILING SUSPENDED, BACKWARD FOLD, REAR BRACED

INTRODUCTION

The following pages show the estimated reaction forces of a backstop- up to the point of structure that is custom designed for each individual project. Custom-designed structure may add overall weight to the assembly, but normally distributes these reaction forces to the building attachment points.

Final reaction magnitude and locations cannot be determined until the backstop is engineered, but this document is meant to serve as a worst-case guide for your project. The reaction forces are based on the weight of the backstop (including the heaviest backboard, height adjuster, etc) and a 0.7 Seismic Factor.

CLICK ON YOUR ATTACHMENT HEIGHT BELOW:

21' Attachment Height	25' Attachment Height	29' Attachment Height
22' Attachment Height	26' Attachment Height	30' Attachment Height
23' Attachment Height	27' Attachment Height	31' Attachment Height
24' Attachment Height	28' Attachment Height	32' Attachment Height

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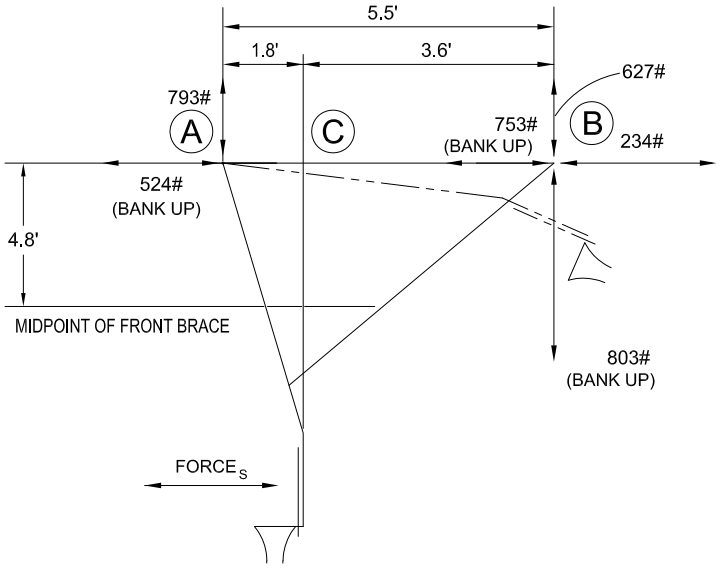
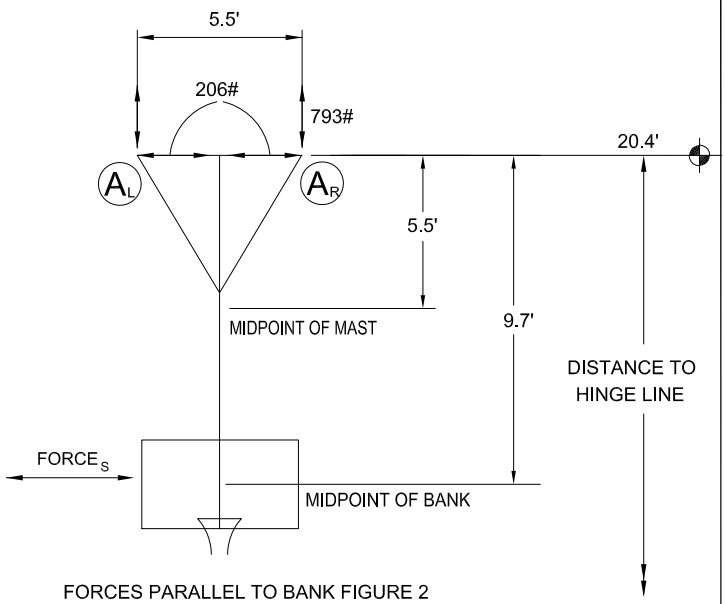


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 588 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 538 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 50 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	264 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	1788 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	28 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	95 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	260 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	996 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 2879 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 793 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 206 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 627 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 234 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 753 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: -82 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 524 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 803 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 753 lbs = HOIST CABLE TENSION

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21' Attachment Height

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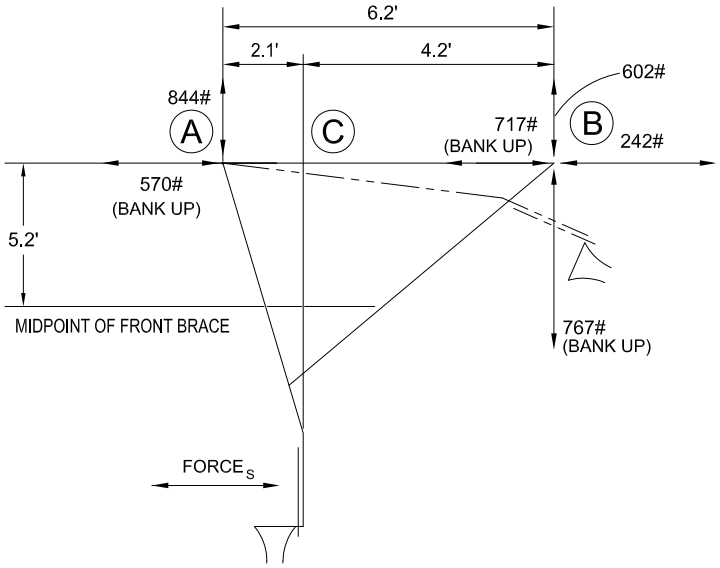
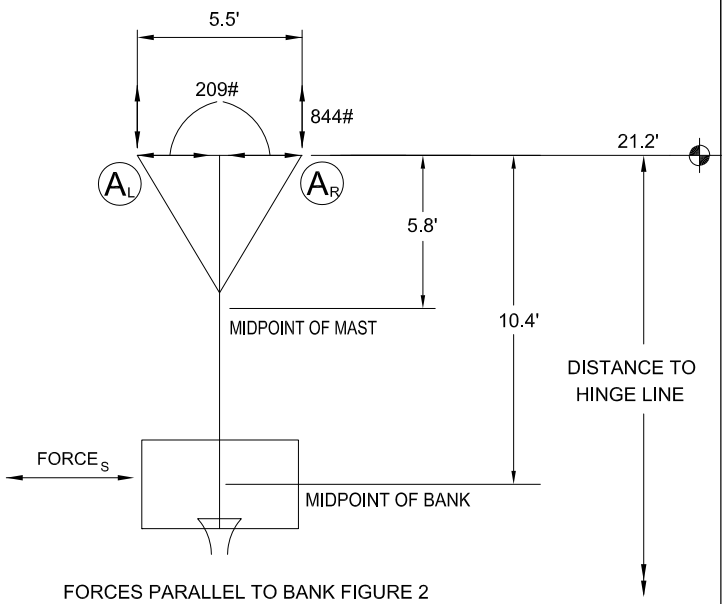


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 598 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 548 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 50 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	264 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	1928 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	28 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	102 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	270 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	1103 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 3133 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 844 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 209 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 602 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 242 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 717 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: -59 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 570 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 767 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 717 lbs = HOIST CABLE TENSION

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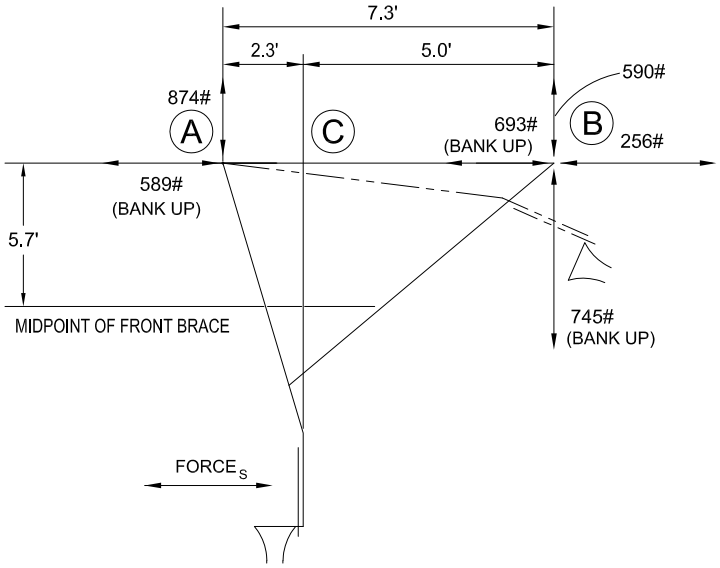
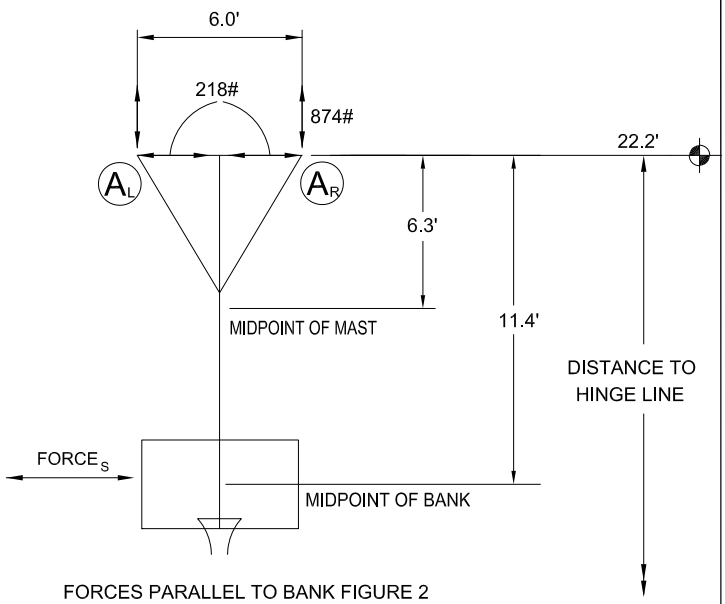


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 623 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK +PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

WEIGHT LOAD AT POINT "A" = 570 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 53 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	264 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	2113 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	33 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	132 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	290 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	1287 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 3531 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 874 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 218 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 590 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 256 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 693 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: -35 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 589 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 745 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 693 lbs = HOIST CABLE TENSION

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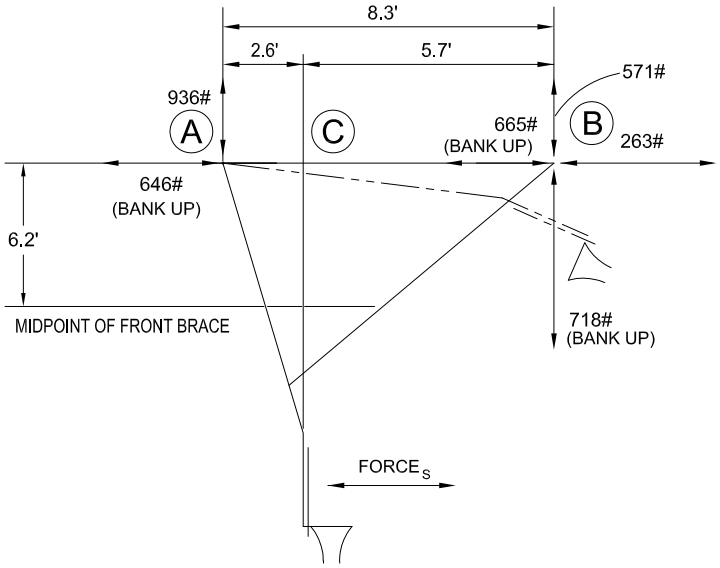
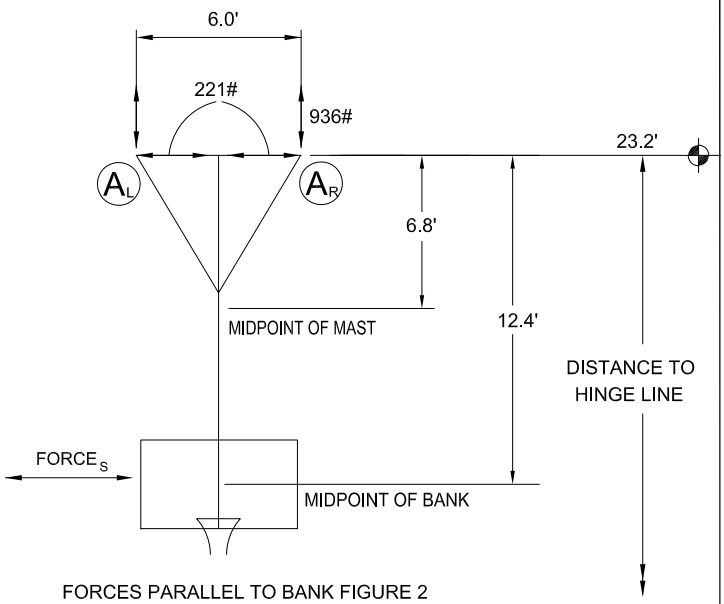


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 632 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 580 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 53 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	264 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	2297 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	33 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	144 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	299 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	1433 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 3874 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 936 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 221 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 571 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 263 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 665 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: -17 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 646 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 718 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 665 lbs = HOIST CABLE TENSION

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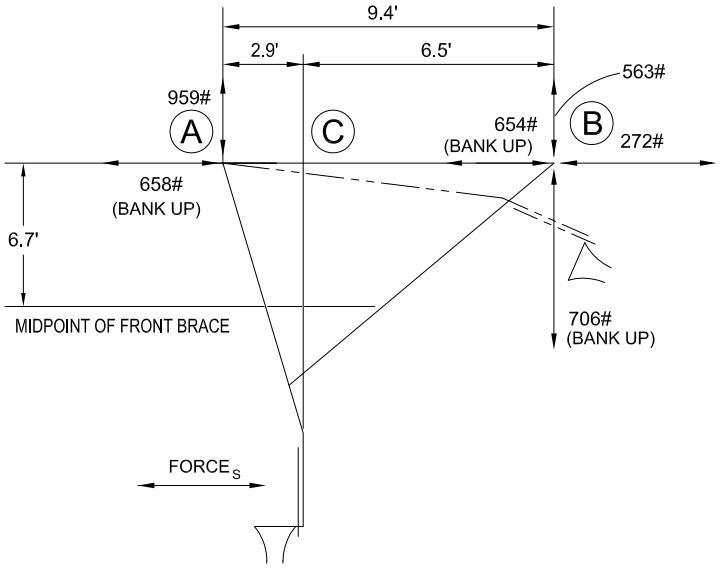
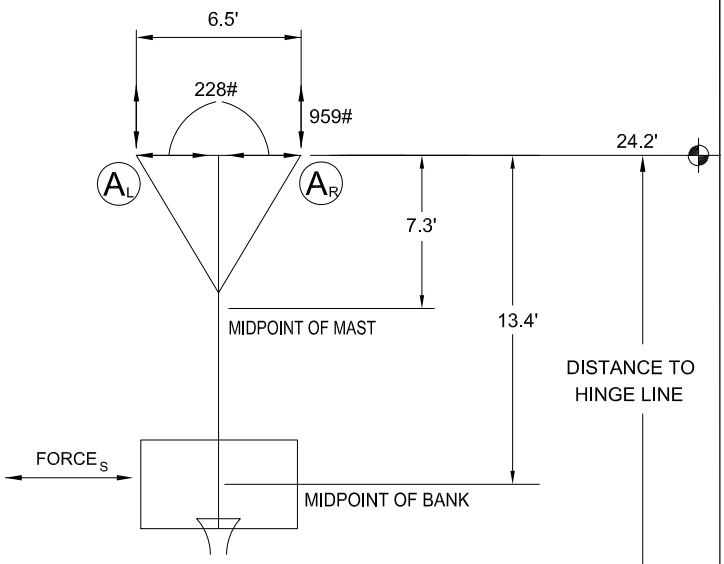


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 653 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 600 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 53 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	264 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	2482 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	33 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	155 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	320 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	1643 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 4280 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 959 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 228 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 563 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 272 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 654 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: 0 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 658 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 706 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 654 lbs = HOIST CABLE TENSION

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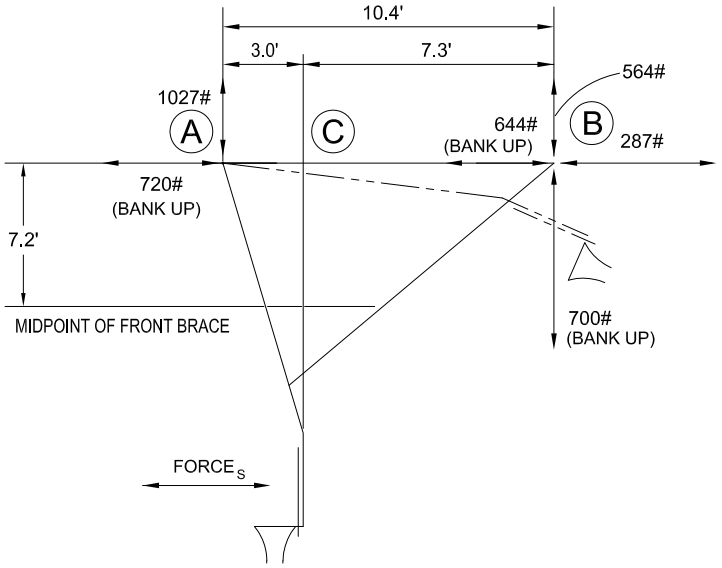
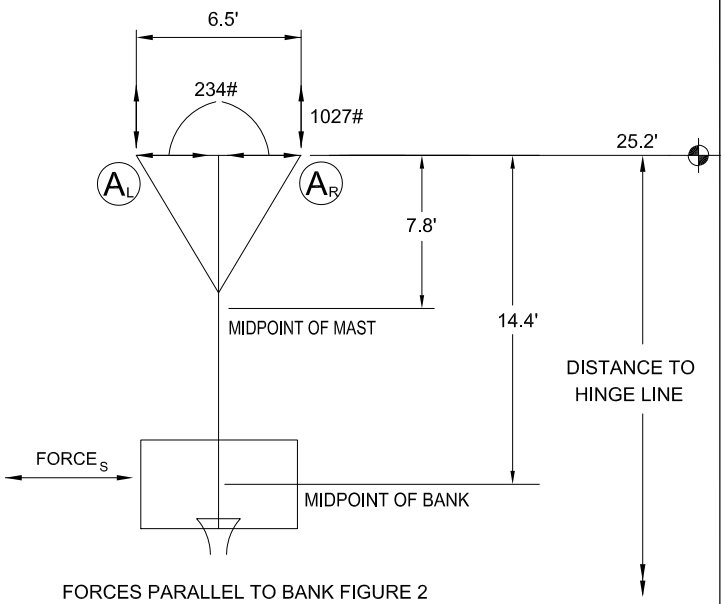


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 670 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 613 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 57 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	264 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	2667 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	41 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	207 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	329 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	1806 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 4680 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 1027 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 234 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 564 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 287 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 644 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: 13 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A FROM SEISMIC PARALLEL TO BANK: 720 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 700 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 644 lbs = HOIST CABLE TENSION

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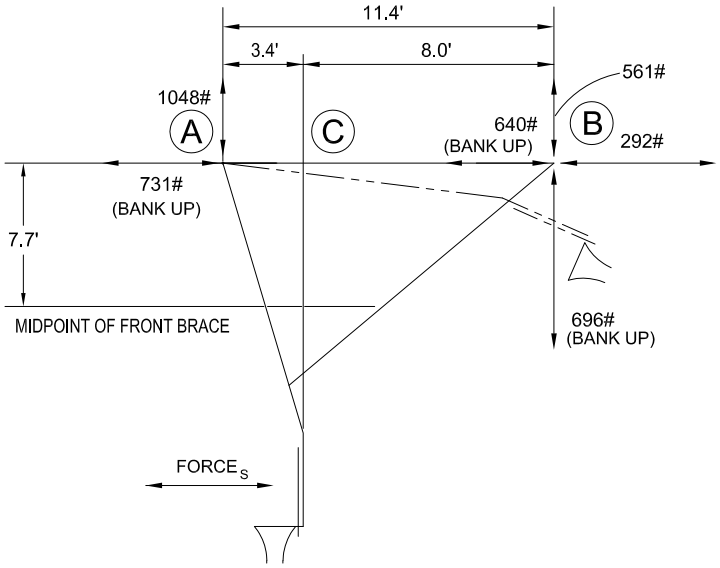
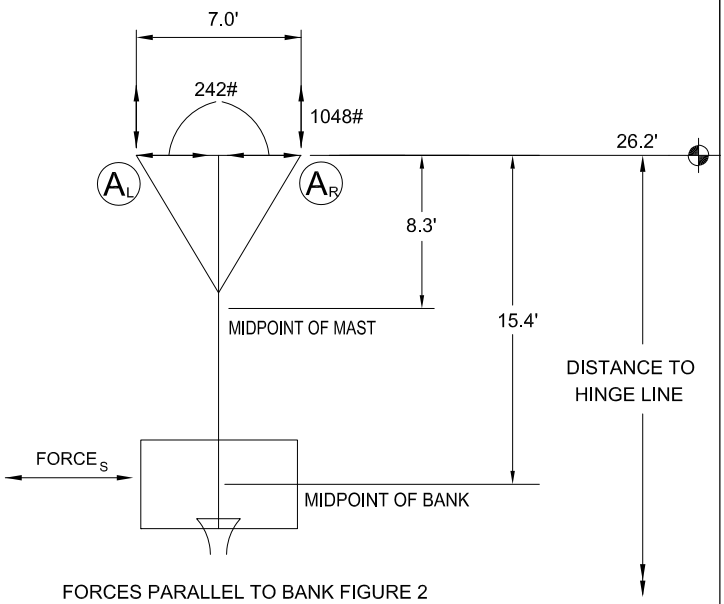


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 691 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 634 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 57 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	264 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	2852 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	41 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	221 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	350 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	2042 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 5115 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 1048 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 242 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 561 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 292 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 640 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: 25 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 731 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 696 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 640 lbs = HOIST CABLE TENSION

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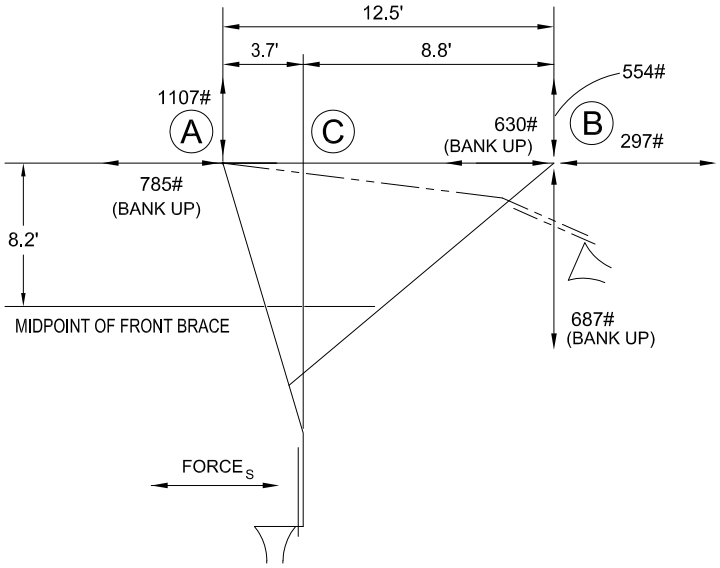
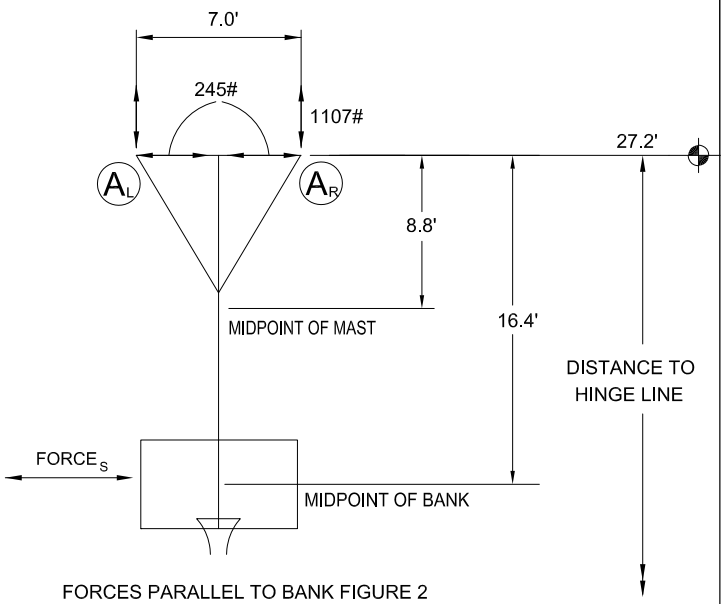


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 700 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 644 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 57 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	264 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	3037 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	41 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	236 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	359 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	2222 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 5494 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 1107 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 245 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 554 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 297 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 630 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: 35 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 785 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 687 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 630 lbs = HOIST CABLE TENSION

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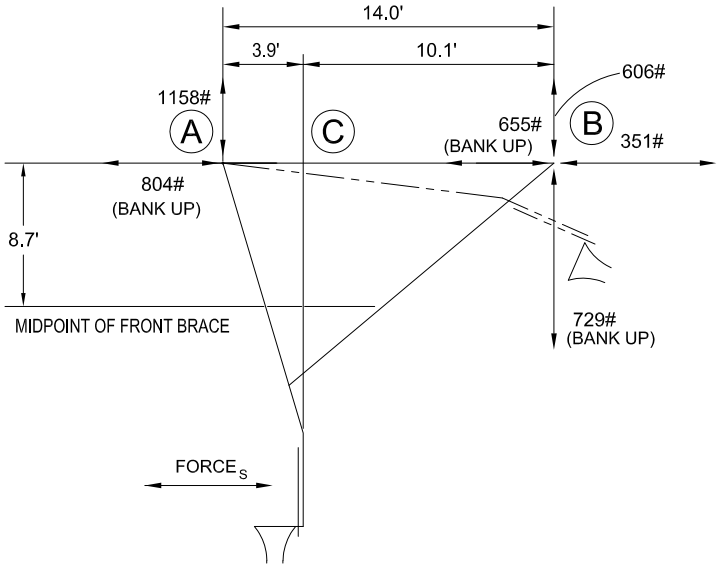
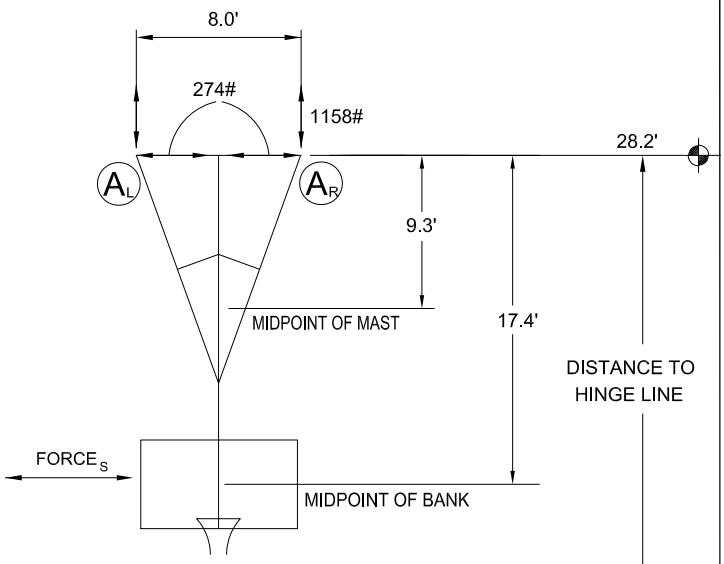


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 782 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 708 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 74 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	280 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	3417 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	76 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	464 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	390 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	2551 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 6432 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 1158 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 274 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 606 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 351 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 655 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: 64 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 804 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 729 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 655 lbs = HOIST CABLE TENSION

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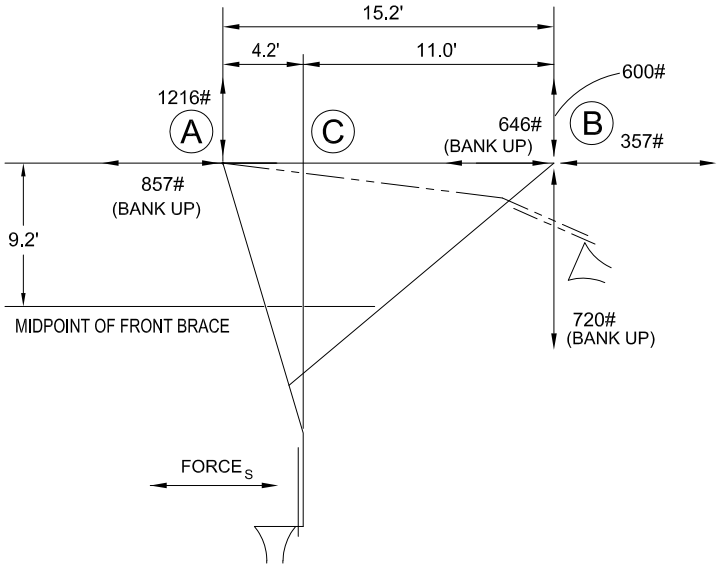
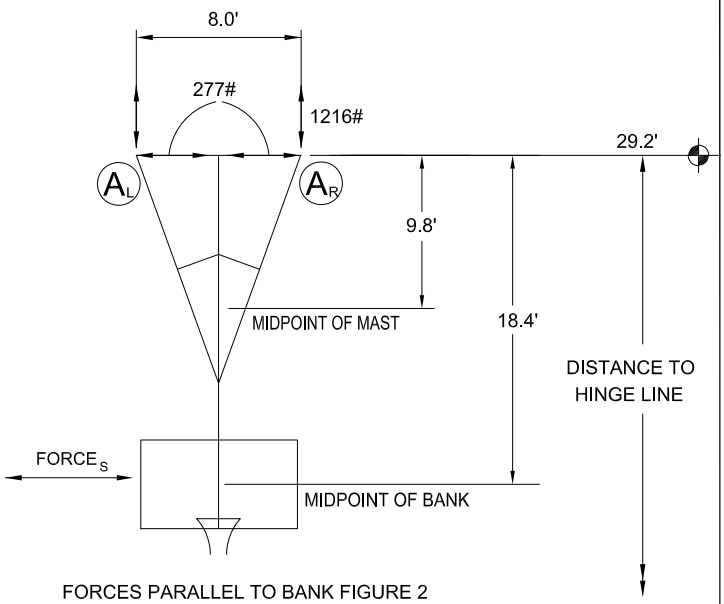


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 792 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 718 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 74 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	280 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	3613 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	76 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	490 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	400 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	2752 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 6855 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 1216 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 277 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 600 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 357 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 646 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: 73 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A FROM SEISMIC PARALLEL TO BANK: 857 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 720 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 646 lbs = HOIST CABLE TENSION

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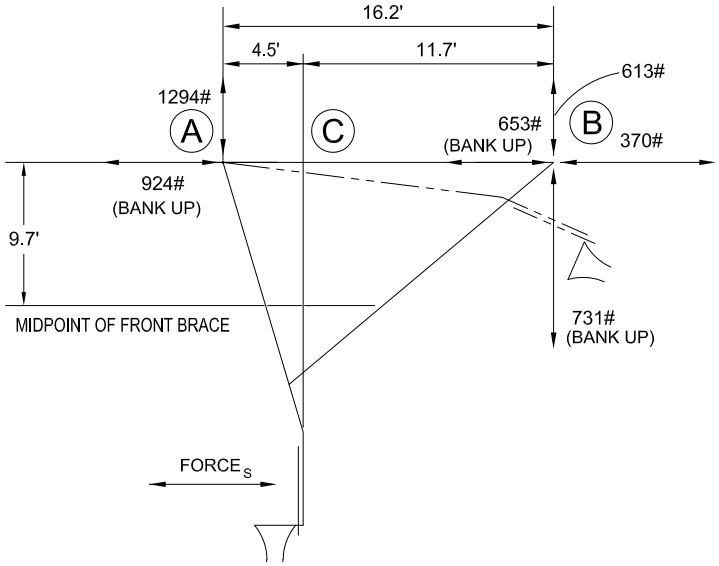
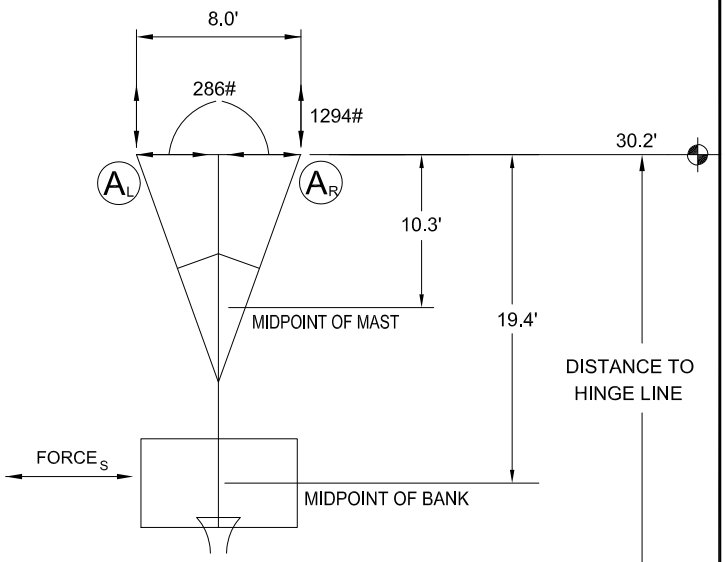


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 817 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 739 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 78 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	280 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	3809 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	84 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	571 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	417 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	3016 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 7396 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 1294 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 286 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 613 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 370 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 653 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: 82 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK 924 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 731 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 653 lbs = HOIST CABLE TENSION

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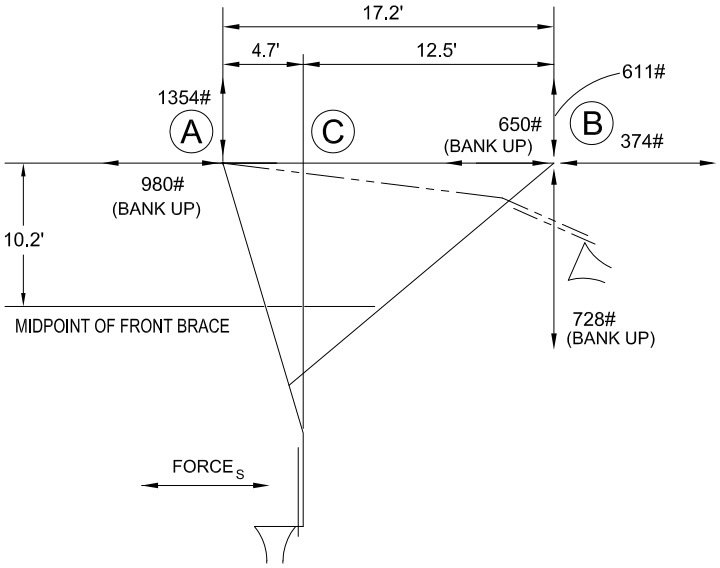
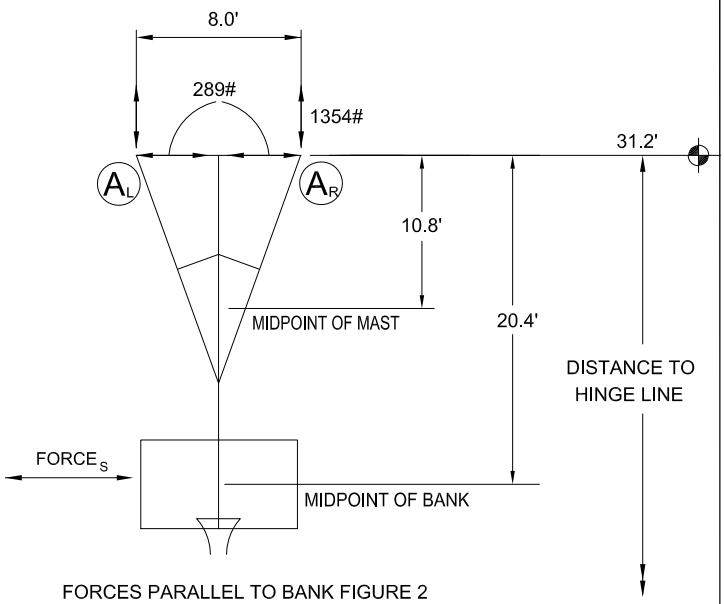


FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

BACKSTOP'S TOTAL WEIGHT LOAD = 826 lbs (WEIGHT OF FRONT BRACE + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "A" = 748 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF MAST + WEIGHT OF BANK

WEIGHT LOAD AT POINT "B" = 78 lbs $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2}\right)$ + WEIGHT OF PULLEY

+PLEASE NOTE THESE ARE ESTIMATED WEIGHT LOADS FROM THE BACKSTOP MAST HANGERS TO THE FLOOR. THESE ESTIMATES DO NOT INCLUDE ANY SUPERSTRUCTURE WEIGHTS.

SEISMIC FACTORED MOMENTS AND SUM OF MOMENTS FOR BACKSTOP ELEMENTS

SEISMIC FACTOR = 0.7 (VARIES WITH SEISMIC ZONE, RIGIDITY OF SUPPORT & ROOM USE)

WEIGHT OF BANK (WB)	280 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF BANK (DB)	=	4005 ft.lbs	SEISMIC MOMENT (MB) (FT.LBS.)
WEIGHT OF FRONT BRACE (WFB)	84 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF FRONT BRACE (DFB)	=	601 ft.lbs	SEISMIC MOMENT (MFB) (FT.LBS.)
WEIGHT OF MAST (WM)	426 lbs	X SEISMIC FACTOR X	DISTANCE TO MIDPOINT OF MAST (DM)	=	3232 ft.lbs	SEISMIC MOMENT (MM) (FT.LBS.)

WB + WRB + WM = BACKSTOP'S TOTAL WEIGHT LOAD = 7838 ft.lbs SUM OF THE MOMENTS = MB + MFB + MM

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK DOWN

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK DOWN

R^{A}_{VER} VERTICAL REACTIONS AT POINT A: 1354 lbs = $\frac{\text{WEIGHT LOAD AT POINT "A"}}{\text{2 SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS } (A_L\text{-}A)_R}$

R^{A}_{HOR} HORIZONTAL REACTION AT POINT A: 289 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{\text{2 SUPPORTS}}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PERPENDICULAR TO BANK (FIG. 1)

BANK DOWN

R^{B}_{VER} VERTICAL REACTION AT POINT B: 611 lbs = $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$

R^{B}_{HOR} HORIZONTAL REACTION AT POINT B: 374 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

HOIST CABLE TENSION AT POINT C: 650 lbs = $\frac{\text{SUM OF THE MOMENTS}}{\text{SEISMIC FACTOR X DISTANCE FROM A TO B}}$

REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{A\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT A: 88 lbs = $\frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD - HOIST CABLE TENSION}}{\text{2 SUPPORTS}}$

$R^{A\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT A FROM SEISMIC PARALLEL TO BANK: 980 lbs = $\pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM } A_L \text{ TO } A_R}$

REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

BANK UP

$R^{B\text{-}BU}_{VER}$ VERTICAL REACTION AT POINT B: 728 lbs = HOIST CABLE TENSION + $\frac{\text{WEIGHT OF FRONT BRACE}}{\text{2 SUPPORTS}}$ + WEIGHT OF PULLEY

$R^{B\text{-}BU}_{HOR}$ HORIZONTAL REACTION AT POINT B: 650 lbs = HOIST CABLE TENSION

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