

STATIC EQUIVALENT LOADING: 950 STYLE BACKSTOP

CEILING SUSPENDED, FORWARD FOLD, FRONT 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:

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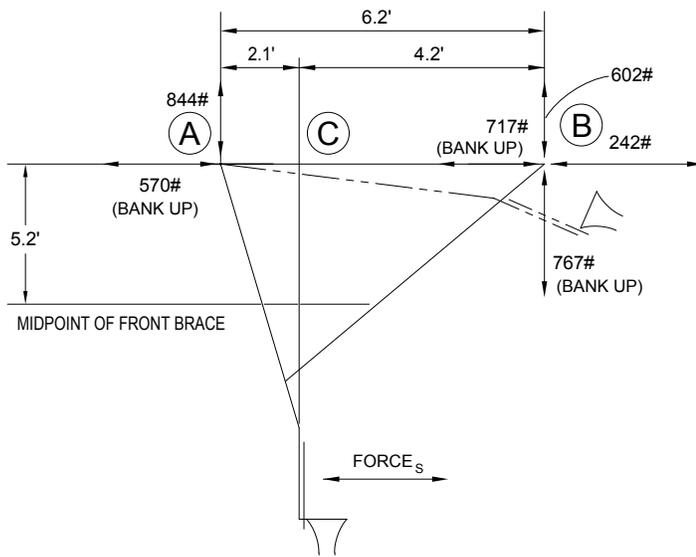
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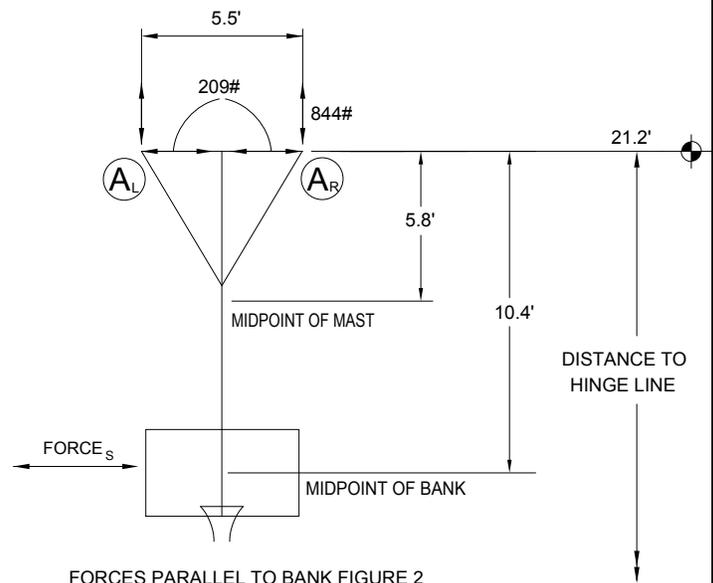
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FORCES PERPENDICULAR TO BANK FIGURE 1



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) | + 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" = | | 548 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 50 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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

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

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

BANK DOWN

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

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

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

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

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

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

BANK UP

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

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



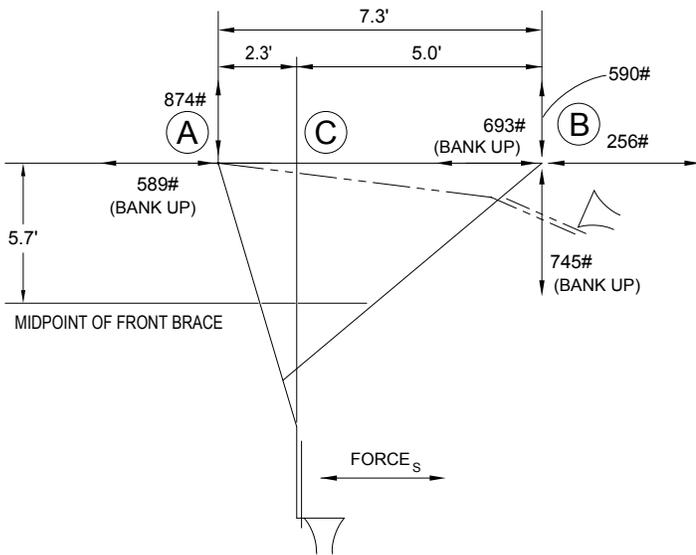
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22' Attachment Height

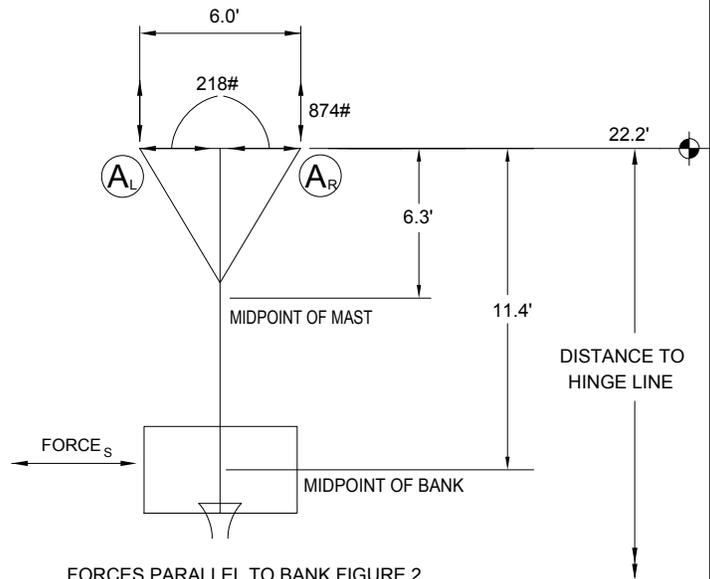
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FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

| | | | | |
|------------------------------|---|---------|---|--|
| BACKSTOP'S TOTAL WEIGHT LOAD | = | 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 | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 53 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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_{VER}^A VERTICAL REACTIONS AT POINT A: $874 \text{ lbs} = \frac{\text{WEIGHT LOAD AT POINT "A"}}{2 \text{ SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A}_L\text{-A}_R)}$
 R_{HOR}^A HORIZONTAL REACTION AT POINT A: $218 \text{ lbs} = \frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{2 \text{ SUPPORTS}}$

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

BANK DOWN

R_{VER}^B VERTICAL REACTION AT POINT B: $590 \text{ lbs} = \frac{\text{WEIGHT OF FRONT BRACE}}{2 \text{ SUPPORTS}} + \text{WEIGHT OF PULLEY} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$
 R_{HOR}^B HORIZONTAL REACTION AT POINT B: $256 \text{ lbs} = \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

R_{VER}^{A-BU} VERTICAL REACTION AT POINT A: $-35 \text{ lbs} = \frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD} - \text{HOIST CABLE TENSION}}{2 \text{ SUPPORTS}}$
 R_{HOR}^{A-BU} HORIZONTAL REACTION AT POINT A: $589 \text{ lbs} = \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM A}_L \text{ TO A}_R}$

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

BANK UP

R_{VER}^{B-BU} VERTICAL REACTION AT POINT B: $745 \text{ lbs} = \text{HOIST CABLE TENSION} + \frac{\text{WEIGHT OF FRONT BRACE}}{2 \text{ SUPPORTS}} + \text{WEIGHT OF PULLEY}$
 R_{HOR}^{B-BU} HORIZONTAL REACTION AT POINT B: $693 \text{ lbs} = \text{HOIST CABLE TENSION}$

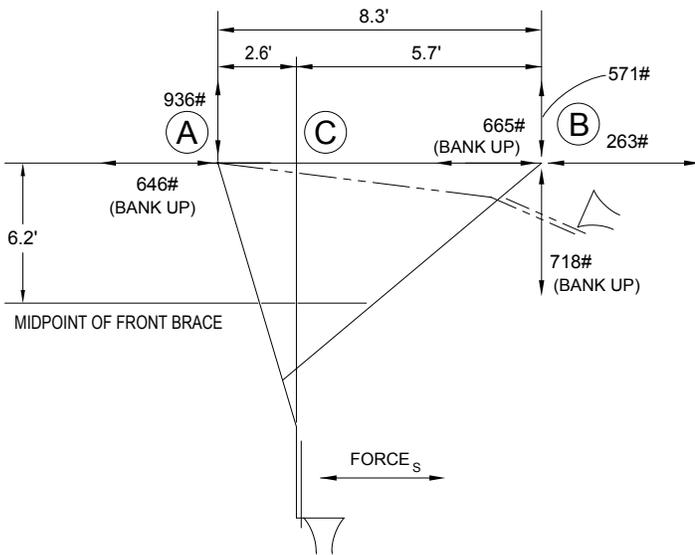


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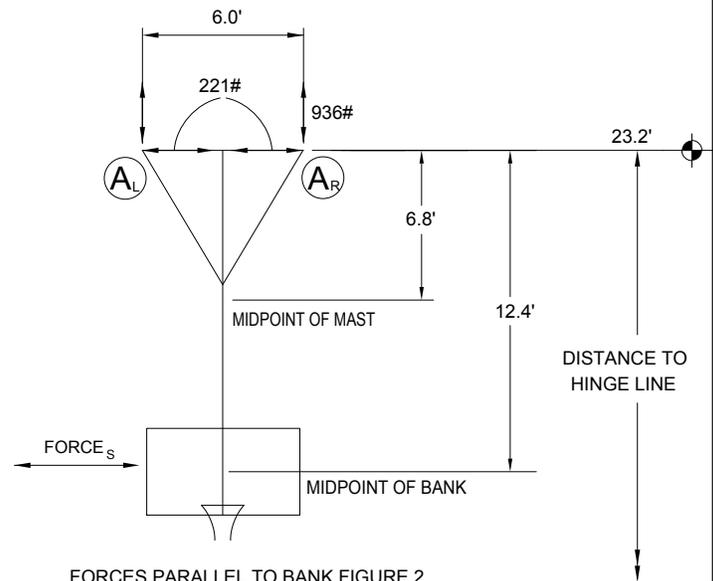
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FORCES PERPENDICULAR TO BANK FIGURE 1



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) | +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" = | | 580 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 53 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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

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

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

BANK DOWN

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

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

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

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

R_{HOR}^{A-BU} HORIZONTAL REACTION AT POINT A: $646 \text{ lbs} = \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM A}_L \text{ TO A}_R}$

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

BANK UP

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

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



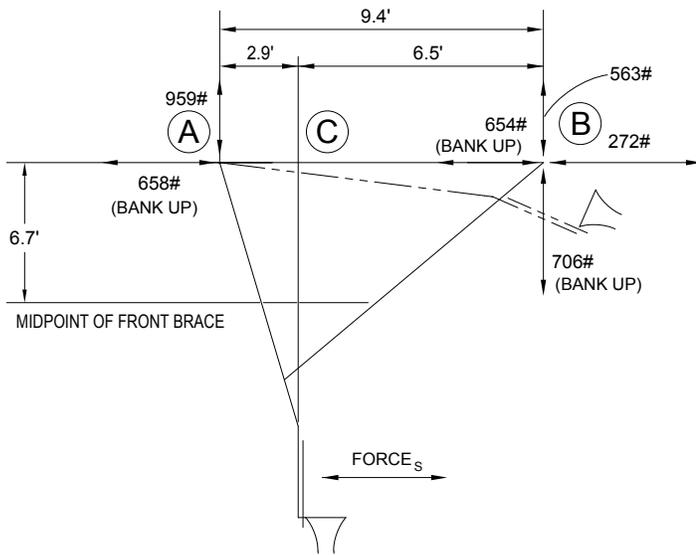
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24' Attachment Height

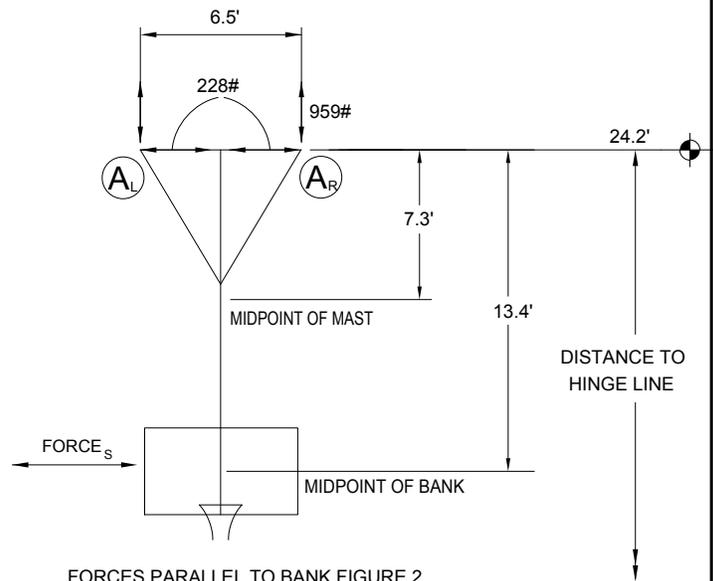
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FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

| | | | | |
|------------------------------|---|---------|---|--|
| BACKSTOP'S TOTAL WEIGHT LOAD | = | 653 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" = | | 600 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 53 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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

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

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

BANK DOWN

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

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

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

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

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

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

BANK UP

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

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



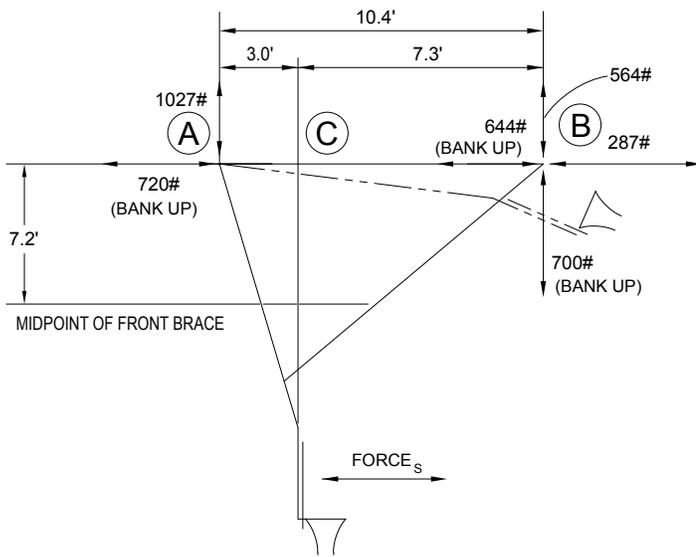
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STATIC EQUIVALENT LOADING FOR:
950 Style Backstop
25' Attachment Height

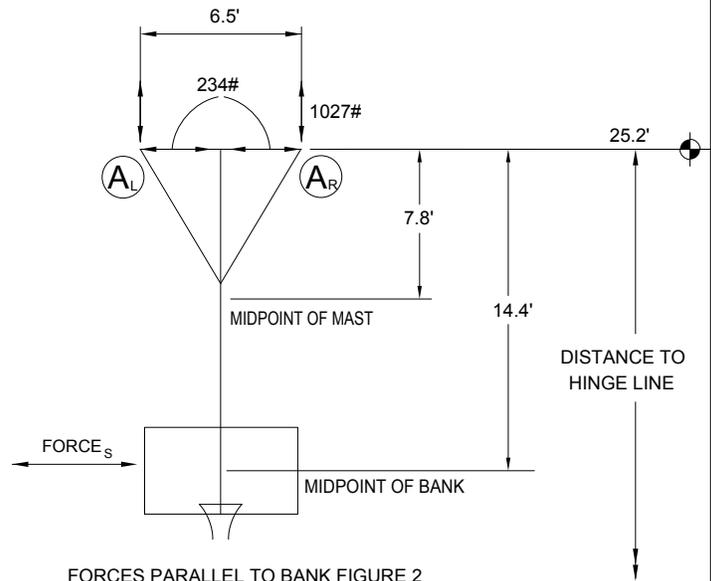
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FORCES PERPENDICULAR TO BANK FIGURE 1



FORCES PARALLEL TO BANK FIGURE 2

WEIGHT LOAD CALCULATIONS (WITH BANK DOWN)

| | | | | |
|------------------------------|---|---------|---|---|
| BACKSTOP'S TOTAL WEIGHT LOAD | = | 670 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" = | | 613 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 57 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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

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

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

BANK DOWN

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

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

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

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

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

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

BANK UP

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

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



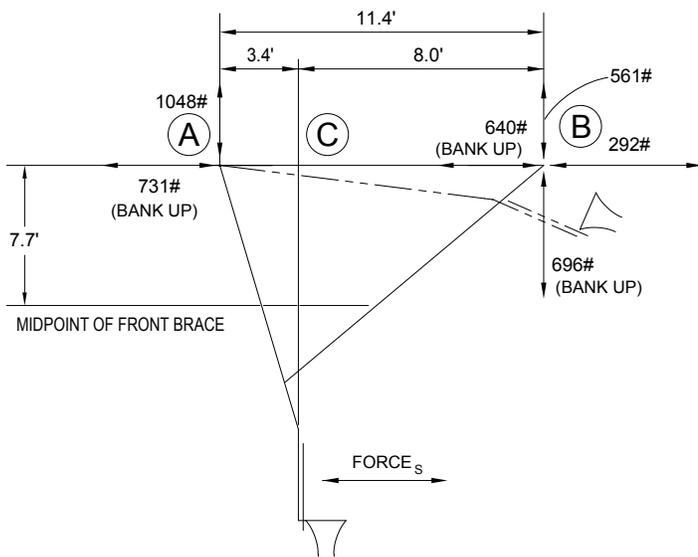
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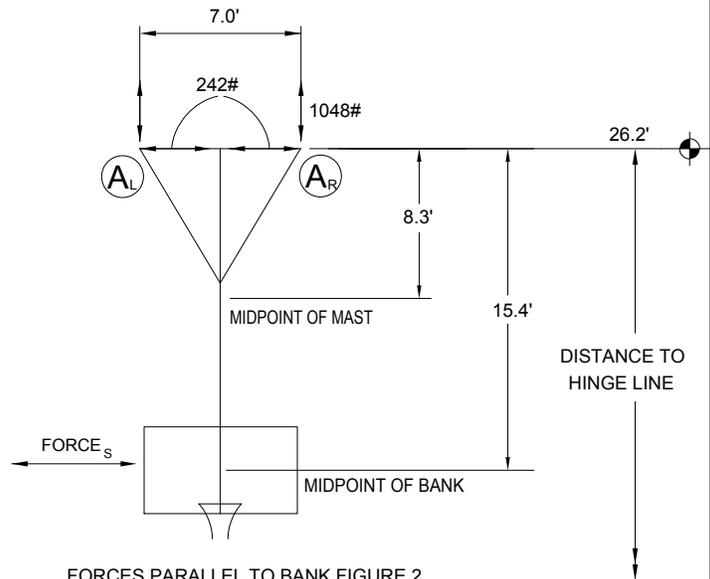
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FORCES PERPENDICULAR TO BANK FIGURE 1



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) | + 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" = | | 634 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 57 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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

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

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

BANK DOWN

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

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

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

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

R_{HOR}^{A-BU} HORIZONTAL REACTION AT POINT A: $731 \text{ lbs} = \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM A}_L\text{ TO A}_R}$

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

BANK UP

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

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



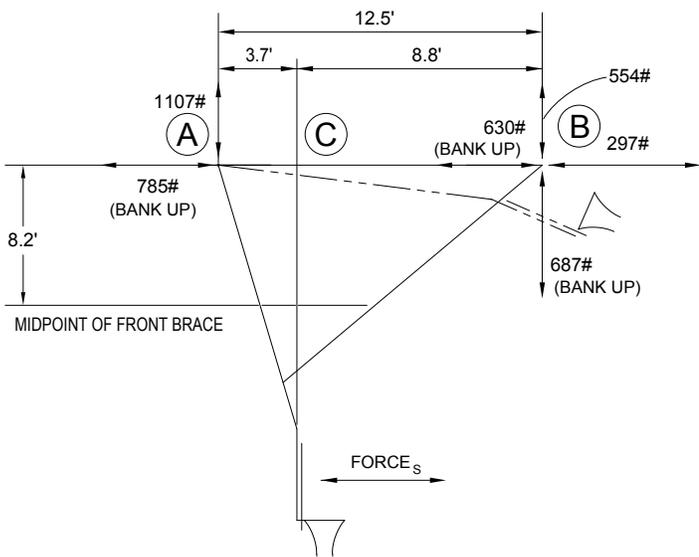
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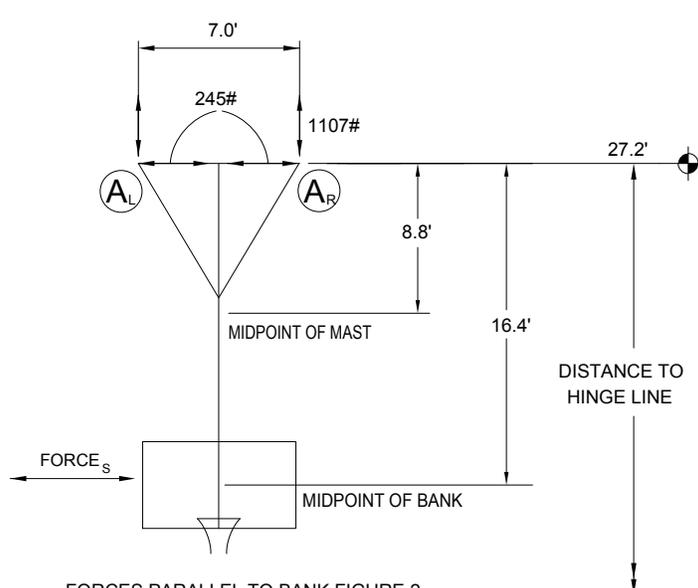
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FORCES PERPENDICULAR TO BANK FIGURE 1



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) | + 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" = | | 644 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 57 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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) | = | 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 + WFB + 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_{VER}^A VERTICAL REACTIONS AT POINT A: $1107 \text{ lbs} = \frac{\text{WEIGHT LOAD AT POINT "A"}}{2 \text{ SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A}_L\text{-A}_R)}$
 R_{HOR}^A HORIZONTAL REACTION AT POINT A: $245 \text{ lbs} = \frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{2 \text{ SUPPORTS}}$

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

BANK DOWN

R_{VER}^B VERTICAL REACTION AT POINT B: $554 \text{ lbs} = \frac{\text{WEIGHT OF FRONT BRACE}}{2 \text{ SUPPORTS}} + \text{WEIGHT OF PULLEY} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$
 R_{HOR}^B HORIZONTAL REACTION AT POINT B: $297 \text{ lbs} = \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

R_{VER}^{A-BU} VERTICAL REACTION AT POINT A: $35 \text{ lbs} = \frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD} - \text{HOIST CABLE TENSION}}{2 \text{ SUPPORTS}}$
 R_{HOR}^{A-BU} HORIZONTAL REACTION AT POINT A: $785 \text{ lbs} = \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM A}_L \text{ TO A}_R}$

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

BANK UP

R_{VER}^{B-BU} VERTICAL REACTION AT POINT B: $687 \text{ lbs} = \text{HOIST CABLE TENSION} + \frac{\text{WEIGHT OF FRONT BRACE}}{2 \text{ SUPPORTS}} + \text{WEIGHT OF PULLEY}$
 R_{HOR}^{B-BU} HORIZONTAL REACTION AT POINT B: $630 \text{ lbs} = \text{HOIST CABLE TENSION}$

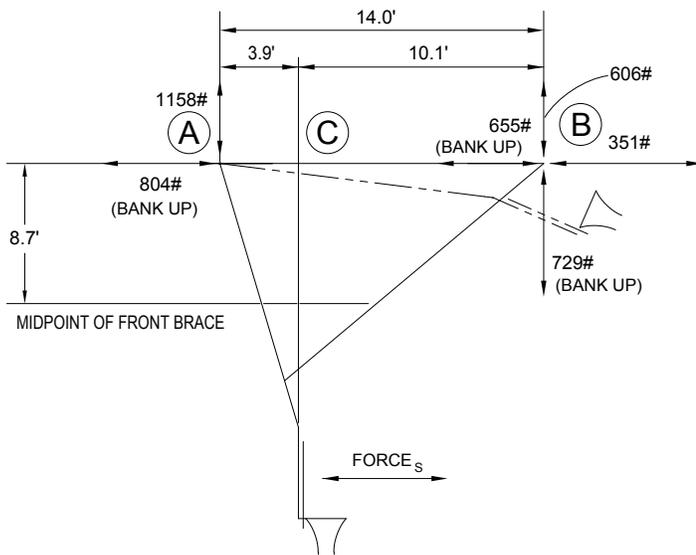


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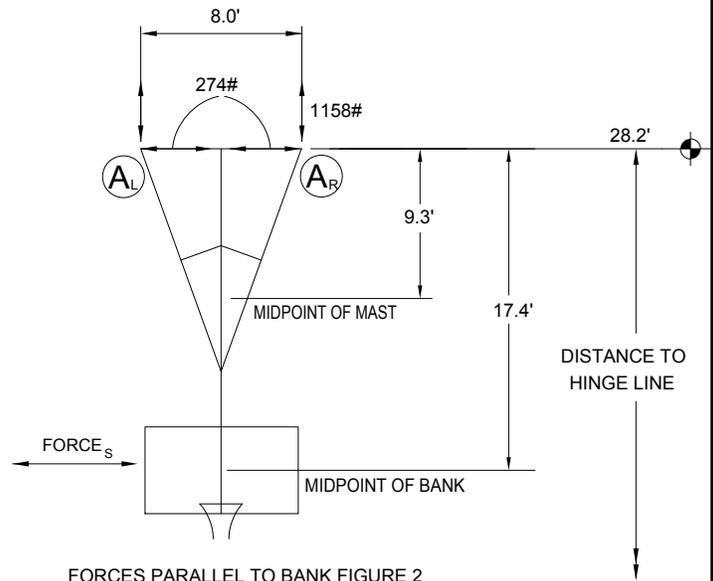
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FORCES PERPENDICULAR TO BANK FIGURE 1



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) | + 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" = | | 708 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 74 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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

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

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

BANK DOWN

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

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

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

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

R_{HOR}^{A-BU} HORIZONTAL REACTION AT POINT A: $804 \text{ lbs} = \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM A}_L \text{ TO A}_R}_R$

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

BANK UP

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

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



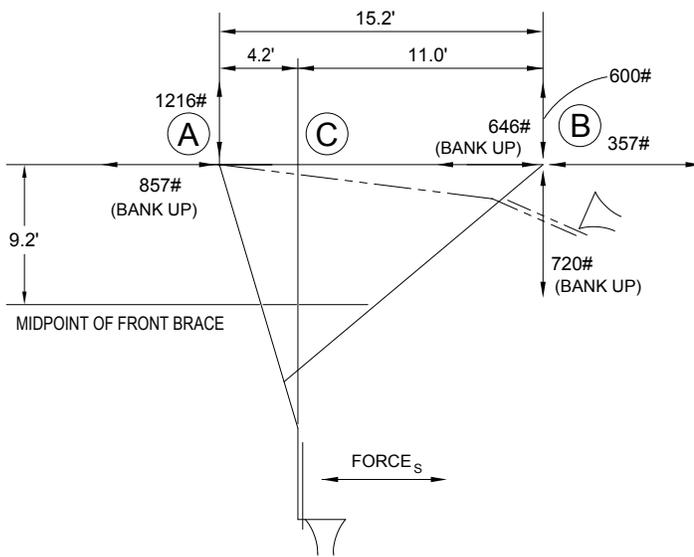
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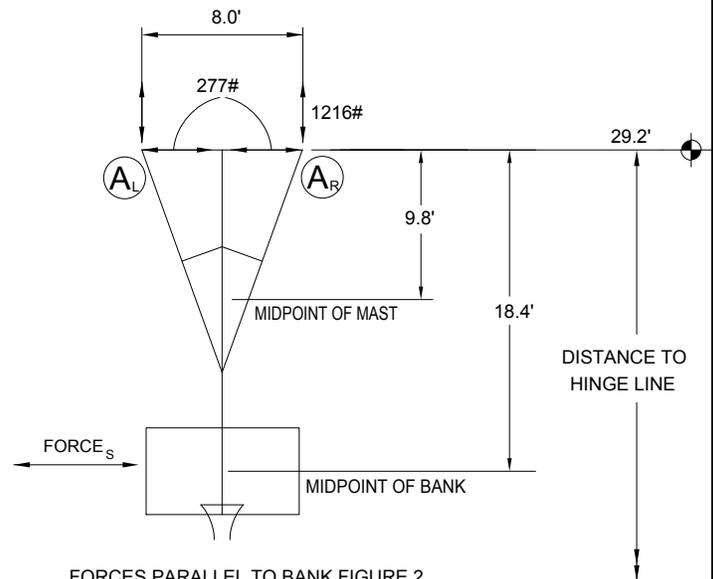
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FORCES PERPENDICULAR TO BANK FIGURE 1



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) | + 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" = | | 718 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 74 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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) | 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 + WFB + 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_{VER}^A | VERTICAL REACTIONS AT POINT A: | $1216 \text{ lbs} = \frac{\text{WEIGHT LOAD AT POINT "A"}}{2 \text{ SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A}_L\text{-A}_R)}$ |
| | R_{HOR}^A | HORIZONTAL REACTION AT POINT A: | $277 \text{ lbs} = \frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{2 \text{ SUPPORTS}}$ |

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

| | | | |
|------------------|-------------|---------------------------------|--|
| BANK DOWN | R_{VER}^B | VERTICAL REACTION AT POINT B: | $600 \text{ lbs} = \frac{\text{WEIGHT OF FRONT BRACE}}{2 \text{ SUPPORTS}} + \text{WEIGHT OF PULLEY} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$ |
| | R_{HOR}^B | HORIZONTAL REACTION AT POINT B: | $357 \text{ lbs} = \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$ |

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

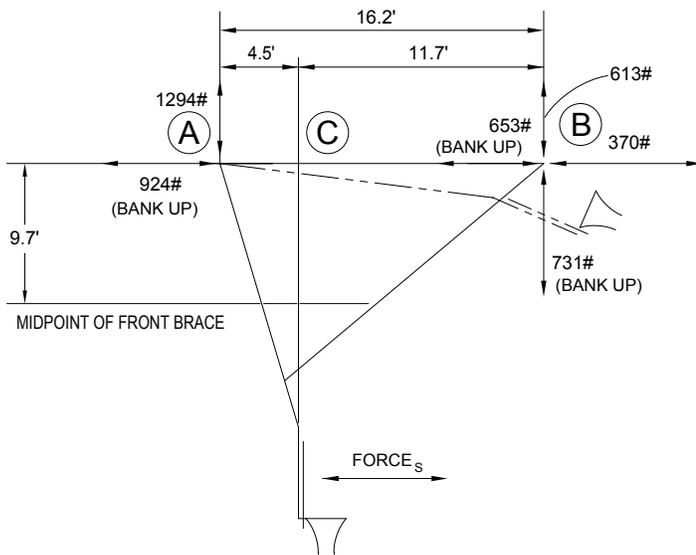
REACTIONS AT HINGE LINE AT POINT A FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

| | | | |
|----------------|------------------|---|--|
| BANK UP | R_{VER}^{A-BU} | VERTICAL REACTION AT POINT A: | $73 \text{ lbs} = \frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD} - \text{HOIST CABLE TENSION}}{2 \text{ SUPPORTS}}$ |
| | R_{HOR}^{A-BU} | HORIZONTAL REACTION AT POINT A: FROM SEISMIC PARALLEL TO BANK | $857 \text{ lbs} = \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM A}_L \text{ TO A}_R}$ |

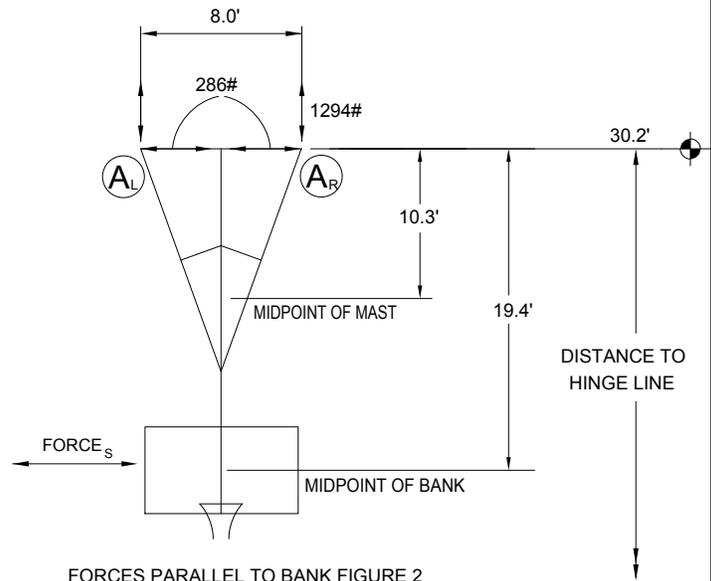
REACTIONS AT HINGE LINE AT POINT B FROM WEIGHT LOADS AND SEISMIC PARALLEL TO BANK (FIG. 2)

| | | | |
|----------------|------------------|---------------------------------|--|
| BANK UP | R_{VER}^{B-BU} | VERTICAL REACTION AT POINT B: | $720 \text{ lbs} = \text{HOIST CABLE TENSION} + \frac{\text{WEIGHT OF FRONT BRACE}}{2 \text{ SUPPORTS}} + \text{WEIGHT OF PULLEY}$ |
| | R_{HOR}^{B-BU} | HORIZONTAL REACTION AT POINT B: | $646 \text{ lbs} = \text{HOIST CABLE TENSION}$ |





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) | +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" = | | 739 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 78 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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

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

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

BANK DOWN

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

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

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

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

R_{HOR}^{A-BU} HORIZONTAL REACTION AT POINT A: $924 \text{ lbs} = \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM A}_L \text{ TO A}_R}_R$

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

BANK UP

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

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



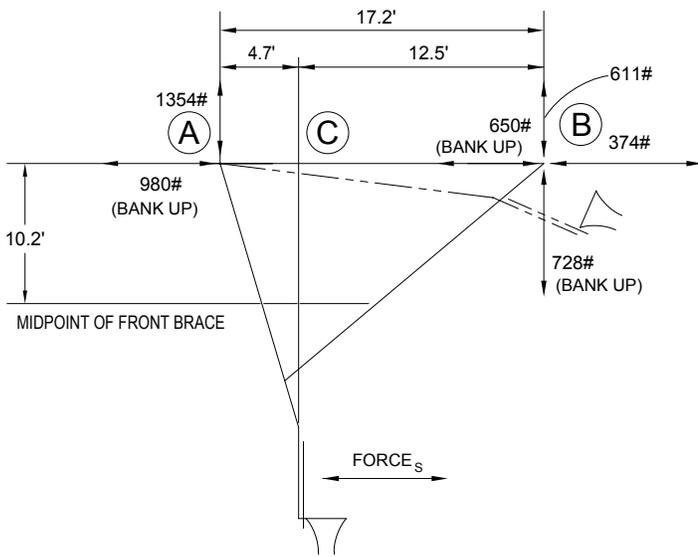
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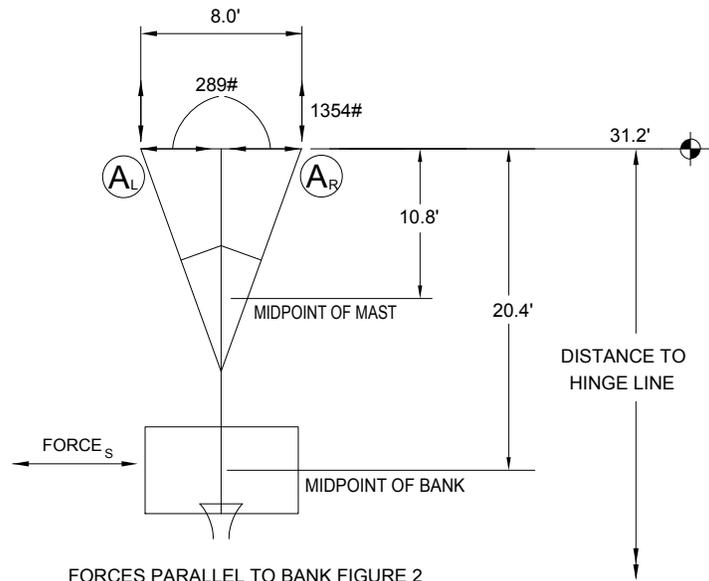
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FORCES PERPENDICULAR TO BANK FIGURE 1



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) | + 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" = | | 748 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF MAST} + \text{WEIGHT OF BANK}$ | |
| WEIGHT LOAD AT POINT "B" = | | 78 lbs | $\left(\frac{\text{WEIGHT OF FRONT BRACE}}{2} \right) + \text{WEIGHT OF PULLEY}$ | |

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) | 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_{VER}^A VERTICAL REACTIONS AT POINT A: $1354 \text{ lbs} = \frac{\text{WEIGHT LOAD AT POINT "A"}}{2 \text{ SUPPORTS}} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A}_L\text{A}_R)}$
 R_{HOR}^A HORIZONTAL REACTION AT POINT A: $289 \text{ lbs} = \frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD X SEISMIC FACTOR}}{2 \text{ SUPPORTS}}$

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

BANK DOWN

R_{VER}^B VERTICAL REACTION AT POINT B: $611 \text{ lbs} = \frac{\text{WEIGHT OF FRONT BRACE}}{2 \text{ SUPPORTS}} + \text{WEIGHT OF PULLEY} \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE BETWEEN SUPPORTS (A-B)}}$
 R_{HOR}^B HORIZONTAL REACTION AT POINT B: $374 \text{ lbs} = \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE TO MIDPOINT OF FRONT BRACE X 2}}$

POINT REACTIONS FROM WEIGHT LOADS AND SEISMIC WITH BANK UP

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

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

BANK UP

R_{VER}^{A-BU} VERTICAL REACTION AT POINT A: $88 \text{ lbs} = \frac{\text{BACKSTOP'S TOTAL WEIGHT LOAD} - \text{HOIST CABLE TENSION}}{2 \text{ SUPPORTS}}$
 R_{HOR}^{A-BU} HORIZONTAL REACTION AT POINT A: $980 \text{ lbs} = \pm \frac{\text{SUM OF THE MOMENTS}}{\text{DISTANCE FROM A}_L \text{ TO A}_R}$ FROM SEISMIC PARALLEL TO BANK

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

BANK UP

R_{VER}^{B-BU} VERTICAL REACTION AT POINT B: $728 \text{ lbs} = \text{HOIST CABLE TENSION} + \frac{\text{WEIGHT OF FRONT BRACE}}{2 \text{ SUPPORTS}} + \text{WEIGHT OF PULLEY}$
 R_{HOR}^{B-BU} HORIZONTAL REACTION AT POINT B: $650 \text{ lbs} = \text{HOIST CABLE TENSION}$



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