

STRUCTURAL CALCULATIONS

FOR

**ALTMAN MIDDLE LOT SHORING
SE 64TH STREET
MERCER ISLAND, WA**

**SITE SPECIFIC
LATERAL AND VERTICAL
ANALYSIS AND DESIGN
(DO NOT REUSE)**

**FOR
BENJAMIN ALTMAN**

PROJECT #2022-0034.0

**BY
MC SQUARED, INC.**

JACOB A GUSTAFSON, EIT

REVIEWED BY

JESSE M CHASE, PE, SE



STRUCTURAL NOTES

General Notes:

These structural notes supplement the drawings. Any discrepancy found among the drawings, these notes, and the site conditions shall be reported to the Engineer, who shall correct such discrepancy in writing. Any work done by the Contractor after discovery of such discrepancy shall be done at the Contractor's risk. **The Contractor shall verify and coordinate the dimensions among all drawings prior to proceeding with any work or fabrication.** The Contractor is responsible for all bracing and shoring during construction.

All construction shall conform to the applicable portions of the latest edition of the International Building Code except where noted.

Design Criteria:

- | | | | |
|----|-----------|---|--|
| 1. | Live Load | = | 2' Soil Surcharge @ Driveway Above |
| 2. | Soil | = | Loads per PanGEO report No. 19-062, Dated Mar. 28, 2022 |
| | | = | 35 to 55 PCF Active Pressure, based on slope of backfill |
| | | = | 400 PCF, Passive Pressure |

Steel:

1. All steel piles shall be ASTM A992, $F_y=50$ Ksi, except as noted.
2. Welding shall be by AWS certified welders with E70 electrodes in accordance with AWS D1.1-75.
3. All steel members and parts shall be shop painted with two coats of red oxide primer after fabrication.
4. Anchor rods shall have $F_y= 55$ Ksi. Anchorages shall provide full load transfer to soldier piling by the use of A36 bevel plates.

Carpentry:

1. Lagging shall be ground contact pressure treated #2 Hem-Fir material.

Soldier Pile Installation Sequence

1. Drill holes for soldier pile.
2. Place soldier piles in hole properly aligned and spaced.
3. Excavate and chip out concrete adjacent to steel soldier pile to allow for placement of timber lagging.
4. Place timber lagging and attach to steel piles.
5. Continue with excavation, chipping, and lagging placement.

CAUTION

CONTRACTOR TO FIELD VERIFY ALL CONDITIONS AND ALL ELEVATIONS.

Search Information

Address: 9617 SE 64th St, Mercer Island, WA 98040, USA

Coordinates: 47.5461642, -122.2129746

Elevation: 194 ft

Timestamp: 2022-04-12T21:45:59.071Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D



Basic Parameters

| Name | Value | Description |
|----------|--------|---|
| S_S | 1.451 | MCE_R ground motion (period=0.2s) |
| S_1 | 0.503 | MCE_R ground motion (period=1.0s) |
| S_{MS} | 1.451 | Site-modified spectral acceleration value |
| S_{M1} | * null | Site-modified spectral acceleration value |
| S_{DS} | 0.967 | Numeric seismic design value at 0.2s SA |
| S_{D1} | * null | Numeric seismic design value at 1.0s SA |

* See Section 11.4.8

Additional Information

| Name | Value | Description |
|-----------|--------|--|
| SDC | * null | Seismic design category |
| F_a | 1 | Site amplification factor at 0.2s |
| F_v | * null | Site amplification factor at 1.0s |
| CR_S | 0.902 | Coefficient of risk (0.2s) |
| CR_1 | 0.899 | Coefficient of risk (1.0s) |
| PGA | 0.621 | MCE_G peak ground acceleration |
| F_{PGA} | 1.1 | Site amplification factor at PGA |
| PGA_M | 0.683 | Site modified peak ground acceleration |

| | | |
|----------------|-------|--|
| T _L | 6 | Long-period transition period (s) |
| SsRT | 1.451 | Probabilistic risk-targeted ground motion (0.2s) |
| SsUH | 1.609 | Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years) |
| SsD | 4.283 | Factored deterministic acceleration value (0.2s) |
| S1RT | 0.503 | Probabilistic risk-targeted ground motion (1.0s) |
| S1UH | 0.559 | Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years) |
| S1D | 1.644 | Factored deterministic acceleration value (1.0s) |
| PGAd | 1.424 | Factored deterministic acceleration value (PGA) |

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

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PERMANENT SOLDIER PILE WALL @ MIDDLE LOT

$$H_{\max} = 8'-0" \rightarrow \text{SEE HECFA STATION}$$

$$\Delta_{\max} = \frac{H}{120}$$

$$P_A = 35 \text{ PCF @ } \beta = 0^\circ$$

$$P_A = 55 \text{ PCF @ } \beta \approx 45^\circ \rightarrow (\text{CONTINUOUS})$$

$$P_p = 400 \text{ PCF}$$

SURCHARGING: 250 PCF FOR TRAFFIC - PER PANGED
MIN EMBED = 10'-0" - PER PANGED

SESMIC: SITE CLASS "D"

$$K_h = \frac{S_{DS}}{5} = \frac{0.967}{5} = \underline{\underline{0.193}}$$

SOIL: ASSUME RETAINED SOIL: SANDY SILT

ASSUME PASSIVE SOIL: HARD SILTY CLAY

LAGGING LOAD TO BE GREATER OF (P_{AKD} & 200 PSF)
- PER PANGED

WALL PARAMETERS

$S = 4'-0''$

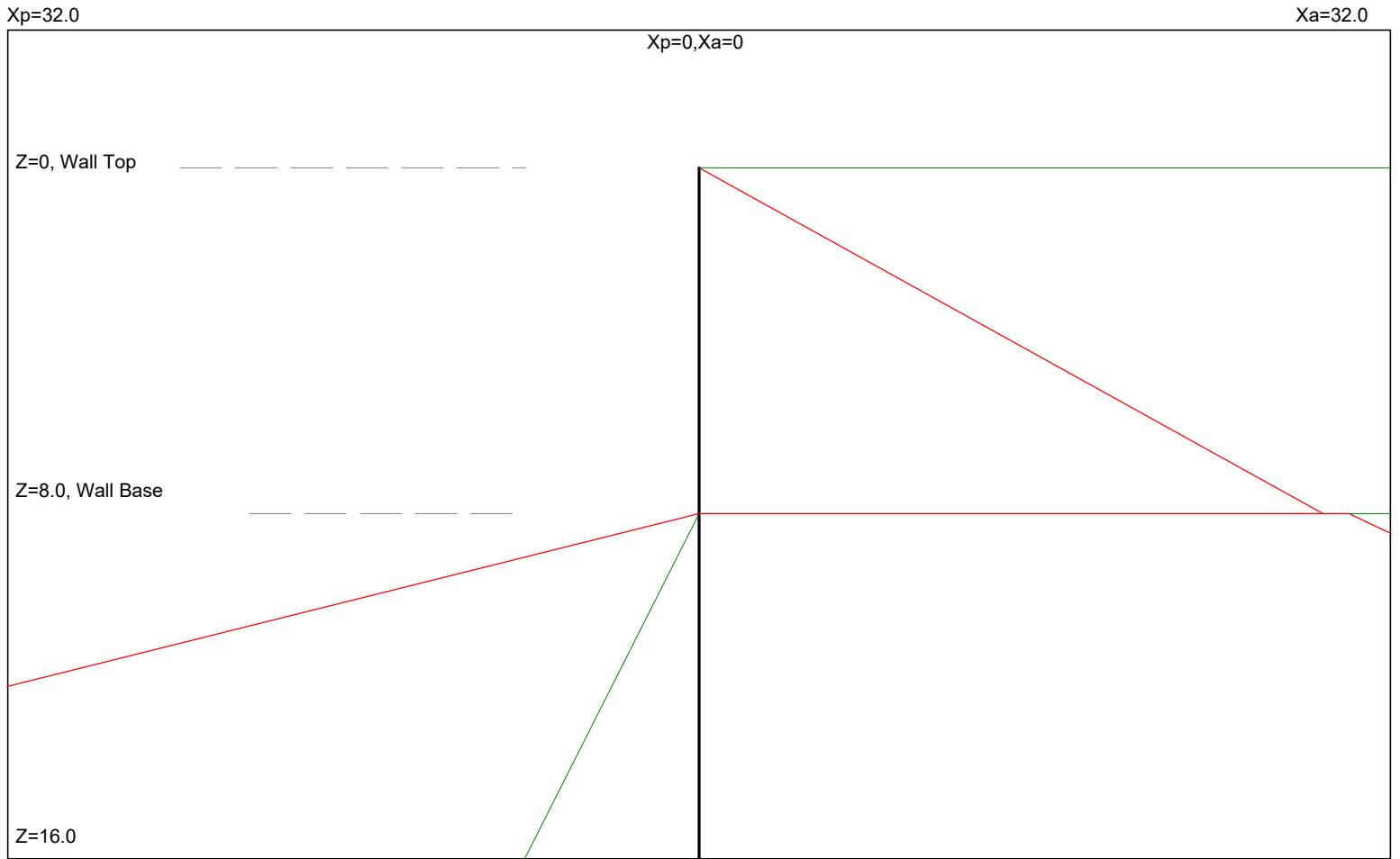
$K_h = 0.193$

$\Delta_{max} = H/120$ (STATIC CONDITIONS)

| STATION | LOCATION | DESIGN HEIGHT | P_A (PLF) | TOE SLOPE | SURCHARGE | REF |
|---------|----------|---------------|-------------|-----------|-----------|----------|
| 0+20 | UPPER | N/A | — | — | — | SEE CALC |
| | LOWER | 8'-0" | 35 | 1:1 | 250 PSF | |
| 0+40 | UPPER | N/A | — | — | — | SEE CALC |
| | LOWER | 6'-6" | 35 | 1:1 | 250 PSF | |
| 0+60 | UPPER | 3'-0" | 55 | 0° | 0 | SEE CALC |
| | LOWER | 5'-0" | 35 | 1:1 | 250 PSF | |
| 0+80 | UPPER | 4'-0" | 55 | 0° | 0 | SEE CALC |
| | LOWER | 4'-0" | 35 | 1:1 | 250 PSF | |
| 1+00 | UPPER | 5'-6" | 55 | 0° | 0 | SEE CALC |
| | LOWER | 1'-6" | 35 | 1:1 | 250 PSF | |
| 1+20 | UPPER | 1'-6" | 55 | 0° | 0 | SEE 0+60 |
| | LOWER | 4'-6" | 35 | 1:1 | 250 PSF | |

MAX LOAD TO LAGGING $\Rightarrow 8' \times 35 = 280 \text{ PSF @ LOWER}$
 $\Rightarrow 5.5' \times 55 = 302.5 \text{ PSF @ UPPER}$

MIDDLE LOT WALL PRESSURES LOWER WALLS



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UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 4/15/2022

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SOIL LOADING middle.ep8

* INPUT DATA *

Wall Height=8.0 Total Soil Types= 2

| Soil No. | Weight | Saturate | Phi | Cohesion | Nspt | Type | Description |
|----------|--------|----------|------|----------|------|------|--------------|
| 1 | 114.0 | 126.0 | 32.0 | 0.0 | 4 | 3 | Sandy Silt |
| 2 | 128.0 | 141.0 | 31.0 | 0.0 | 14 | 1 | Hard Silty C |

Ground Surface at Active Side:

| Line | Z1 | Xa1 | Z2 | Xa2 | Soil No. | Description |
|------|-----|-----|-----|-------|----------|--------------|
| 1 | 0.0 | 0.0 | 0.0 | 800.0 | 1 | Sandy Silt |
| 2 | 8.0 | 0.0 | 8.0 | 800.0 | 2 | Hard Silty C |

Ground Surface at Passive Side:

| Line | Z1 | Xp1 | Z2 | Xp2 | Soil No. | Description |
|------|-----|-----|-------|-------|----------|--------------|
| 1 | 8.0 | 0.0 | 800.0 | 800.0 | 2 | Hard Silty C |

Wall Friction Options: 1.* No wall friction

Wall Batter Angle = 0

Apparent Pressure Conversion: 1.* Default (Terzaghi and Peck)*

Water Density = 62.4

Water Pressure: 1.* No seepage at wall tip

* OUTPUT RESULTS *

Eae (Total Force above Base)= 1.12 per one linear foot (or meter) width along wall height

Ea (Total Static Force above Base)= 1.12

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

| Z1 | Pa1 | Z2 | Pa2 | Slope | Ka or Ko |
|------|------|------|------|--------|----------|
| 0.00 | 0.00 | 8.00 | 0.28 | 0.0350 | 0.3073 |

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

| Z1 | Pa1 | Z2 | Pa2 | Slope | Ka or Ko |
|------|------|-------|------|--------|----------|
| 8.00 | 0.29 | 16.00 | 0.62 | 0.0410 | 0.3200 |

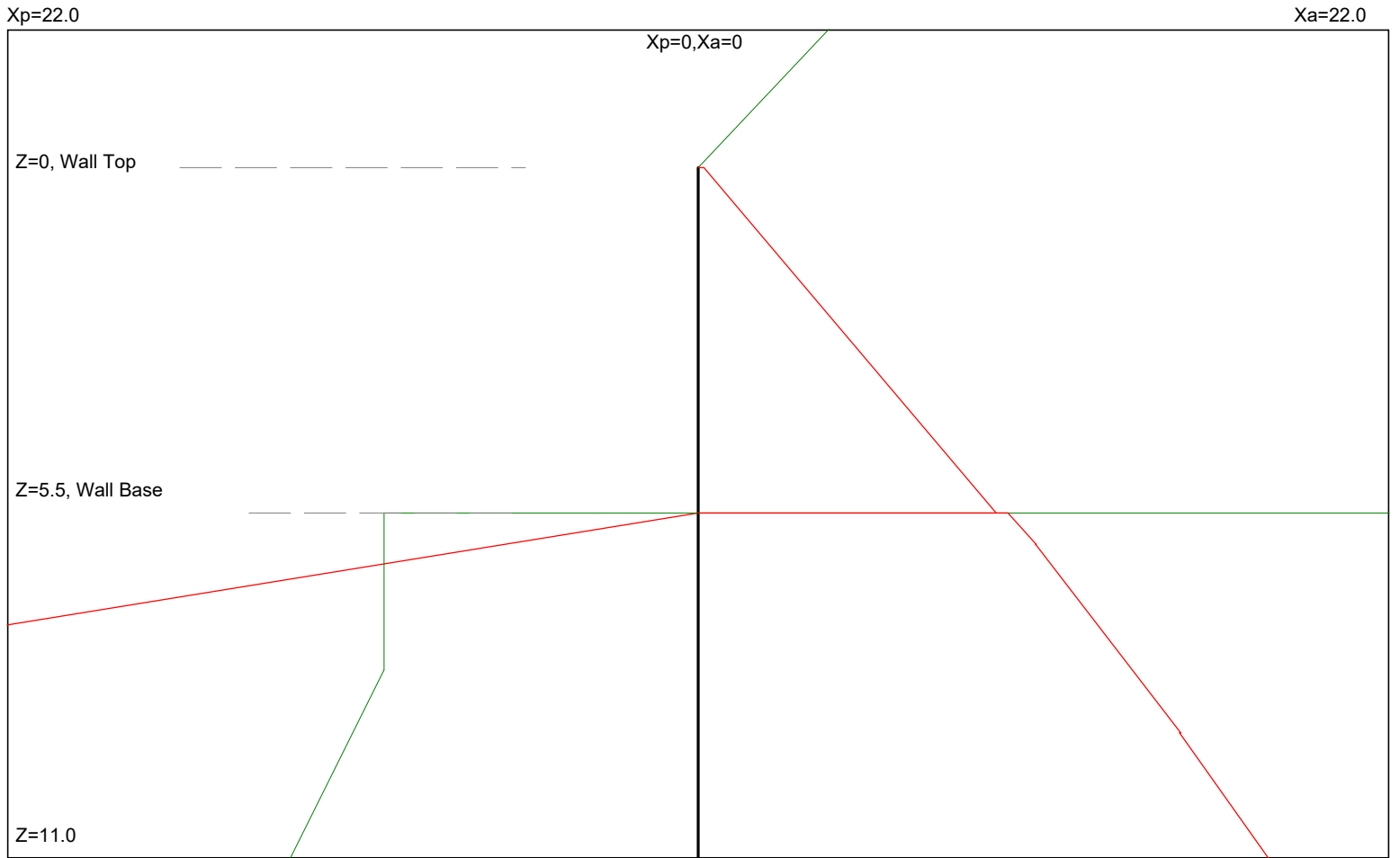
Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

| Z1 | Pp1 | Z2 | Pp2 | Slope | Kp |
|------|------|-------|------|-------|--------|
| 8.00 | 0.00 | 16.00 | 0.62 | 0.078 | 0.6069 |

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 4/15/2022 File Name: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SOIL LOADING

MIDDLE LOT WALL PRESSURES UPPER WALLS



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 UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 4/15/2022 File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\UPPER SOIL LOADING.ep8

* INPUT DATA *

Wall Height=5.5 Total Soil Types= 2

| Soil No. | Weight | Saturate | Phi | Cohesion | Nspt | Type | Description |
|----------|--------|----------|------|----------|------|------|--------------|
| 1 | 114.0 | 126.0 | 32.0 | 0.0 | 4 | 3 | Sandy Silt |
| 2 | 128.0 | 141.0 | 31.0 | 0.0 | 14 | 1 | Hard Silty C |

Ground Surface at Active Side:

| Line | Z1 | Xa1 | Z2 | Xa2 | Soil No. | Description |
|------|------|------|------|-------|----------|--------------|
| 1 | 0.0 | 0.0 | -5.3 | 10.0 | 1 | Sandy Silt |
| 2 | -5.3 | 10.0 | -5.3 | 800.0 | 1 | Sandy Silt |
| 3 | 5.5 | 0.0 | 5.5 | 800.0 | 2 | Hard Silty C |

Ground Surface at Passive Side:

| Line | Z1 | Xp1 | Z2 | Xp2 | Soil No. | Description |
|------|-----|------|-------|-------|----------|--------------|
| 1 | 5.5 | 0.0 | 5.5 | 10.0 | 2 | Hard Silty C |
| 2 | 5.5 | 10.0 | 8.0 | 10.0 | 2 | Hard Silty C |
| 3 | 8.0 | 10.0 | 800.0 | 800.0 | 2 | Hard Silty C |

Wall Friction Options: 1.* No wall friction

Wall Batter Angle = 0

Apparent Pressure Conversion: 1.* Default (Terzaghi and Peck)*

Water Density = 62.4

Water Pressure: 1.* No seepage at wall tip

*** OUTPUT RESULTS ***

Eae (Total Force above Base)= 0.85 per one linear foot (or meter) width along wall height

Ea (Total Static Force above Base)= 0.85

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

| Z1 | Pa1 | Z2 | Pa2 | Slope | Ka or Ko |
|------|------|------|------|--------|----------|
| 0.00 | 0.01 | 5.50 | 0.31 | 0.0549 | 0.4816 |

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

| Z1 | Pa1 | Z2 | Pa2 | Slope | Ka or Ko |
|------|------|-------|------|--------|----------|
| 5.50 | 0.32 | 6.00 | 0.35 | 0.0583 | 0.4554 |
| 6.00 | 0.35 | 9.00 | 0.50 | 0.0499 | 0.3902 |
| 9.00 | 0.50 | 11.00 | 0.59 | 0.0460 | 0.3590 |

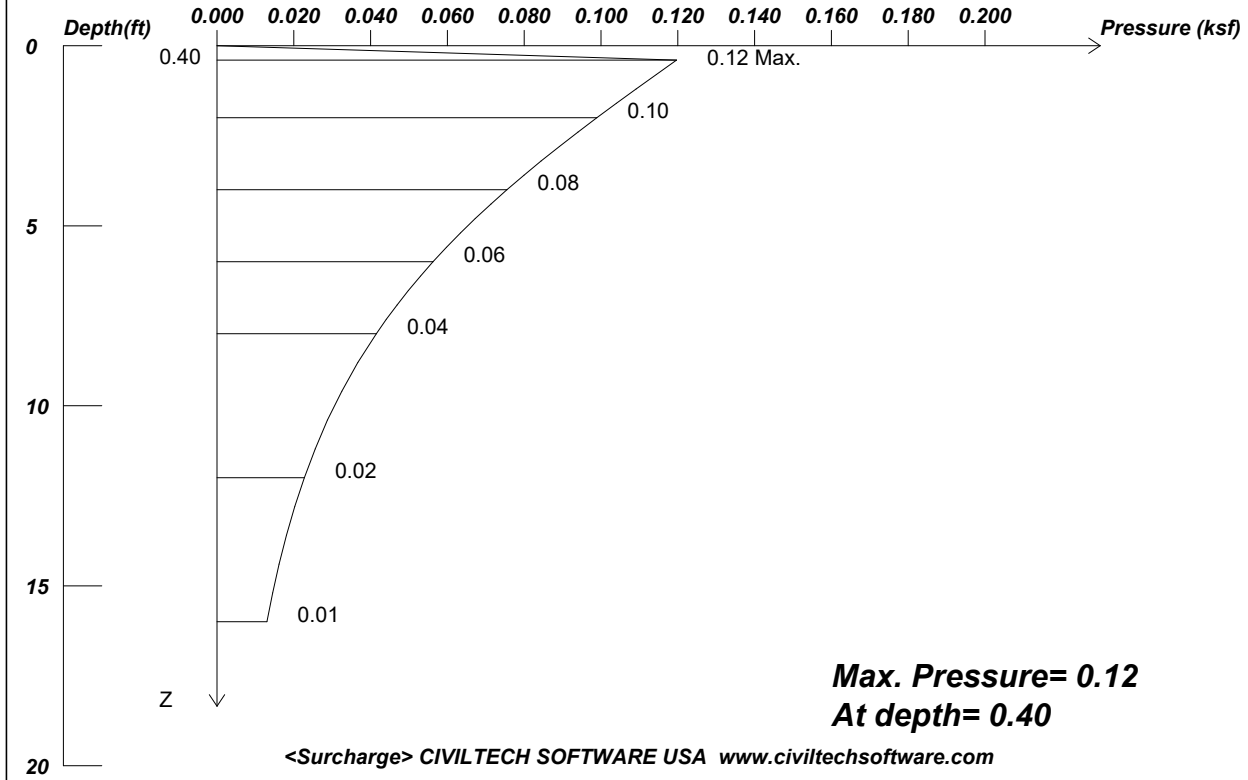
Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

| Z1 | Pp1 | Z2 | Pp2 | Slope | Kp |
|------|------|-------|------|--------|---------|
| 5.50 | 0.00 | 8.50 | 1.20 | 0.400 | 3.1247 |
| 8.50 | 1.43 | 11.00 | 0.79 | -0.254 | -1.9860 |

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 4/15/2022 File Name: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\UPPER SOIL L

VEHICLE SURCHARGE



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Date: 5/2/2022 File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Docu

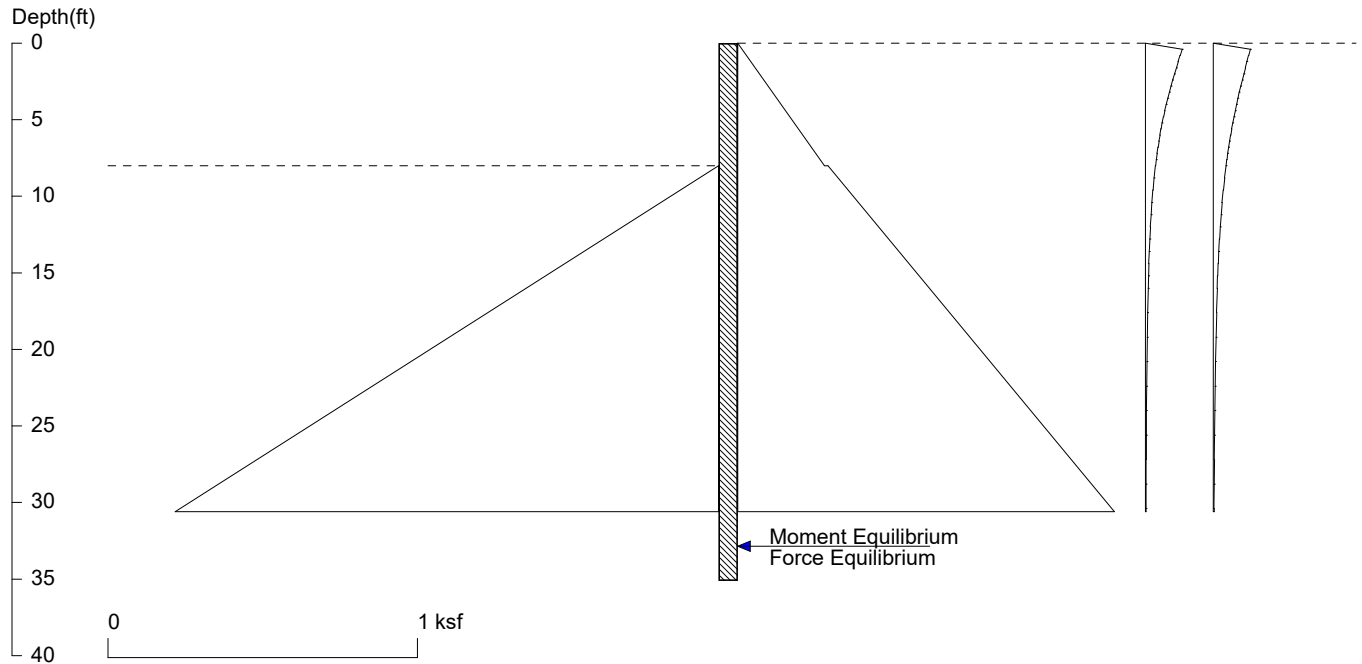
Wall Height, H= 8 Load Depth at Surface, D= 0
 Load Factor of Surcharge Loading = 1
 Flexible Wall Condition -- Movement or deflection are allowed.
 Max. Pressure = 0.120 at depth = 0.40

| X | Width | Strip Load |
|----|-------|------------|
| .0 | 12.0 | .25 |

UNITS: LENGTH/DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip/Qarea/PRESSURE: ksf

MIDDLE LOT WALLS

0+20



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Date: 5/2/2022

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SHORING m

Wall Height=8.0

Pile Diameter=0.8

Pile Spacing=4.0

Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=27.11 Min. Pile Length=35.11

MOMENT IN PILE: Max. Moment=116.39 per Pile Spacing=4.0 at Depth=20.49

PILE SELECTION:

Request Min. Section Modulus = 42.3 in³/pile=693.55 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66

W10X100 has Section Modulus = 112.0 in³/pile=1835.34 cm³/pile. It is greater than Min. Requirements!

Top Deflection = 0.85(in) based on E (ksi)=29000.00 and I (in⁴)/pile=623.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|-------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 8.000 | 0.280 | 0.035027 |
| * | Below | Base | | |
| 8.000 | 0.292 | 80.00 | 3.241 | 0.040964 |
| * | Sur- | charg | | |
| 0.000 | 0.000 | 0.400 | 0.119 | 0.296601 |
| 0.400 | 0.119 | 0.800 | 0.112 | -0.01579 |
| 0.800 | 0.112 | 1.200 | 0.106 | -0.01559 |
| 1.200 | 0.106 | 1.600 | 0.100 | -0.01530 |
| 1.600 | 0.100 | 2.000 | 0.094 | -0.01492 |
| 2.000 | 0.094 | 2.400 | 0.088 | -0.01447 |
| 2.400 | 0.088 | 2.800 | 0.083 | -0.01396 |
| 2.800 | 0.083 | 3.200 | 0.077 | -0.01339 |
| 3.200 | 0.077 | 3.600 | 0.072 | -0.01278 |
| 3.600 | 0.072 | 4.000 | 0.067 | -0.01215 |
| 4.000 | 0.067 | 4.400 | 0.063 | -0.01150 |
| 4.400 | 0.063 | 4.800 | 0.058 | -0.01084 |
| 4.800 | 0.058 | 5.200 | 0.054 | -0.01018 |

| | | | | |
|-------|-------|-------|-------|----------|
| 5.200 | 0.054 | 5.600 | 0.050 | -0.00954 |
| 5.600 | 0.050 | 6.000 | 0.047 | -0.00891 |
| 6.000 | 0.047 | 6.400 | 0.044 | -0.00830 |
| 6.400 | 0.044 | 6.800 | 0.040 | -0.00772 |
| 6.800 | 0.040 | 7.200 | 0.038 | -0.00717 |
| 7.200 | 0.038 | 7.600 | 0.035 | -0.00664 |
| 7.600 | 0.035 | 8.000 | 0.032 | -0.00615 |
| 8.000 | 0.032 | 8.800 | 0.028 | -0.00547 |
| 8.800 | 0.028 | 9.600 | 0.024 | -0.00467 |
| 9.600 | 0.024 | 10.40 | 0.021 | -0.00398 |
| 10.40 | 0.021 | 11.20 | 0.018 | -0.00339 |
| 11.20 | 0.018 | 12.00 | 0.016 | -0.00289 |
| 12.00 | 0.016 | 12.80 | 0.014 | -0.00247 |
| 12.80 | 0.014 | 13.60 | 0.012 | -0.00211 |
| 13.60 | 0.012 | 14.40 | 0.011 | -0.00181 |
| 14.40 | 0.011 | 15.20 | 0.010 | -0.00156 |
| 15.20 | 0.010 | 16.00 | 0.009 | -0.00135 |
| 16.00 | 0.009 | 17.60 | 0.007 | -0.00109 |
| 17.60 | 0.007 | 19.20 | 0.006 | -0.00083 |
| 19.20 | 0.006 | 20.80 | 0.005 | -0.00063 |
| 20.80 | 0.005 | 22.40 | 0.004 | -0.00049 |
| 22.40 | 0.004 | 24.00 | 0.003 | -0.00039 |
| 24.00 | 0.003 | 25.60 | 0.003 | -0.00031 |
| 25.60 | 0.003 | 27.20 | 0.002 | -0.00025 |
| 27.20 | 0.002 | 28.80 | 0.002 | -0.00020 |
| 28.80 | 0.002 | 30.40 | 0.002 | -0.00016 |
| 30.40 | 0.002 | 32.00 | 0.000 | -0.00104 |
| * | Sur- | charg | | |
| 0.000 | 0.000 | 0.400 | 0.120 | 0.299247 |
| 0.400 | 0.120 | 0.800 | 0.114 | -0.01319 |
| 0.800 | 0.114 | 1.200 | 0.109 | -0.01307 |
| 1.200 | 0.109 | 1.600 | 0.104 | -0.01290 |
| 1.600 | 0.104 | 2.000 | 0.099 | -0.01268 |
| 2.000 | 0.099 | 2.400 | 0.094 | -0.01241 |
| 2.400 | 0.094 | 2.800 | 0.089 | -0.01209 |
| 2.800 | 0.089 | 3.200 | 0.084 | -0.01174 |
| 3.200 | 0.084 | 3.600 | 0.080 | -0.01136 |
| 3.600 | 0.080 | 4.000 | 0.076 | -0.01095 |
| 4.000 | 0.076 | 4.400 | 0.071 | -0.01052 |
| 4.400 | 0.071 | 4.800 | 0.067 | -0.01008 |
| 4.800 | 0.067 | 5.200 | 0.063 | -0.00962 |
| 5.200 | 0.063 | 5.600 | 0.060 | -0.00917 |
| 5.600 | 0.060 | 6.000 | 0.056 | -0.00871 |
| 6.000 | 0.056 | 6.400 | 0.053 | -0.00826 |
| 6.400 | 0.053 | 6.800 | 0.050 | -0.00781 |
| 6.800 | 0.050 | 7.200 | 0.047 | -0.00738 |
| 7.200 | 0.047 | 7.600 | 0.044 | -0.00696 |
| 7.600 | 0.044 | 8.000 | 0.041 | -0.00655 |
| 8.000 | 0.041 | 8.800 | 0.037 | -0.00597 |
| 8.800 | 0.037 | 9.600 | 0.032 | -0.00526 |
| 9.600 | 0.032 | 10.40 | 0.029 | -0.00462 |
| 10.40 | 0.029 | 11.20 | 0.026 | -0.00405 |
| 11.20 | 0.026 | 12.00 | 0.023 | -0.00354 |
| 12.00 | 0.023 | 12.80 | 0.020 | -0.00310 |
| 12.80 | 0.020 | 13.60 | 0.018 | -0.00271 |
| 13.60 | 0.018 | 14.40 | 0.016 | -0.00238 |
| 14.40 | 0.016 | 15.20 | 0.014 | -0.00208 |
| 15.20 | 0.014 | 16.00 | 0.013 | -0.00183 |
| 16.00 | 0.013 | 17.60 | 0.011 | -0.00151 |

| | | | | |
|-------|-------|-------|-------|----------|
| 17.60 | 0.011 | 19.20 | 0.009 | -0.00118 |
| 19.20 | 0.009 | 20.80 | 0.007 | -0.00093 |
| 20.80 | 0.007 | 22.40 | 0.006 | -0.00074 |
| 22.40 | 0.006 | 24.00 | 0.005 | -0.00059 |
| 24.00 | 0.005 | 25.60 | 0.004 | -0.00047 |
| 25.60 | 0.004 | 27.20 | 0.004 | -0.00039 |
| 27.20 | 0.004 | 28.80 | 0.003 | -0.00032 |
| 28.80 | 0.003 | 30.40 | 0.003 | -0.00026 |
| 30.40 | 0.003 | 32.00 | 0.000 | -0.00171 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 8.0 | 0.00 | 80.0 | 5.59 | 0.078 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 8.00 | 0.83 |

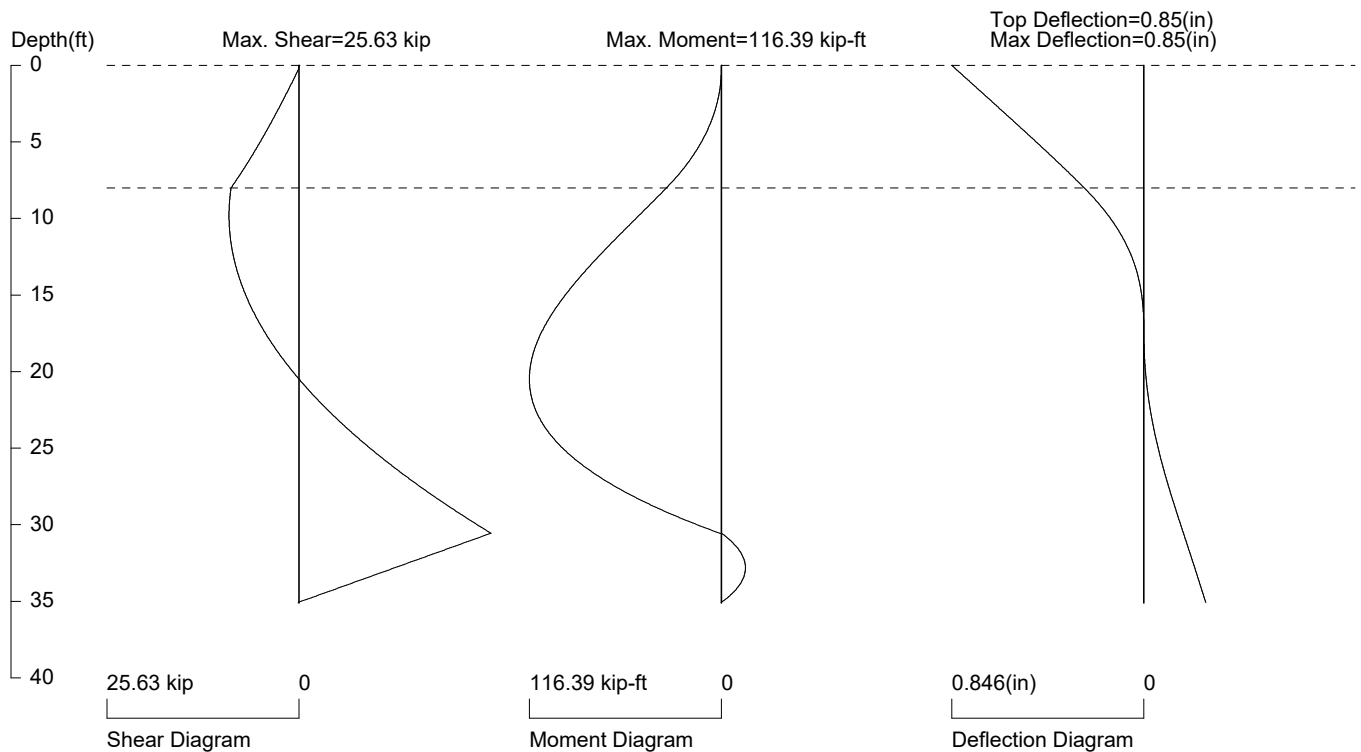
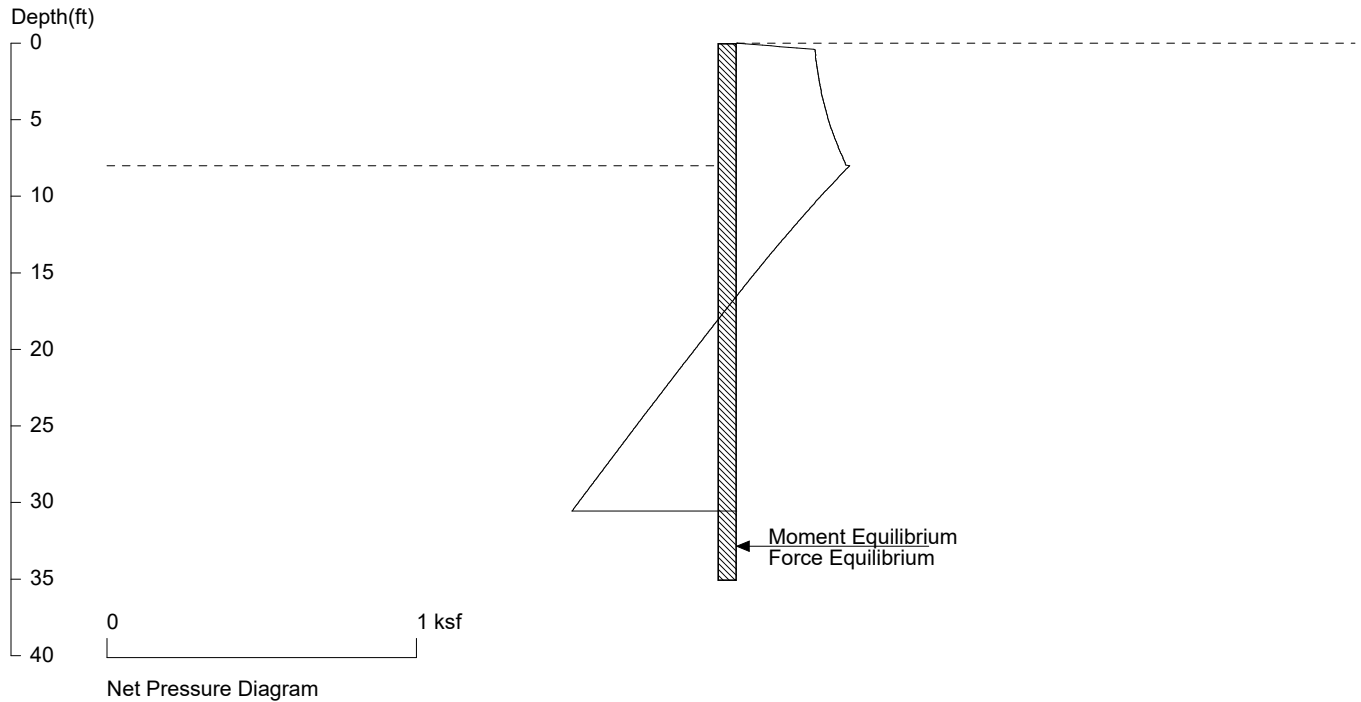
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 8.00 | 2.49 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

MIDDLE LOT WALLS

0+20



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

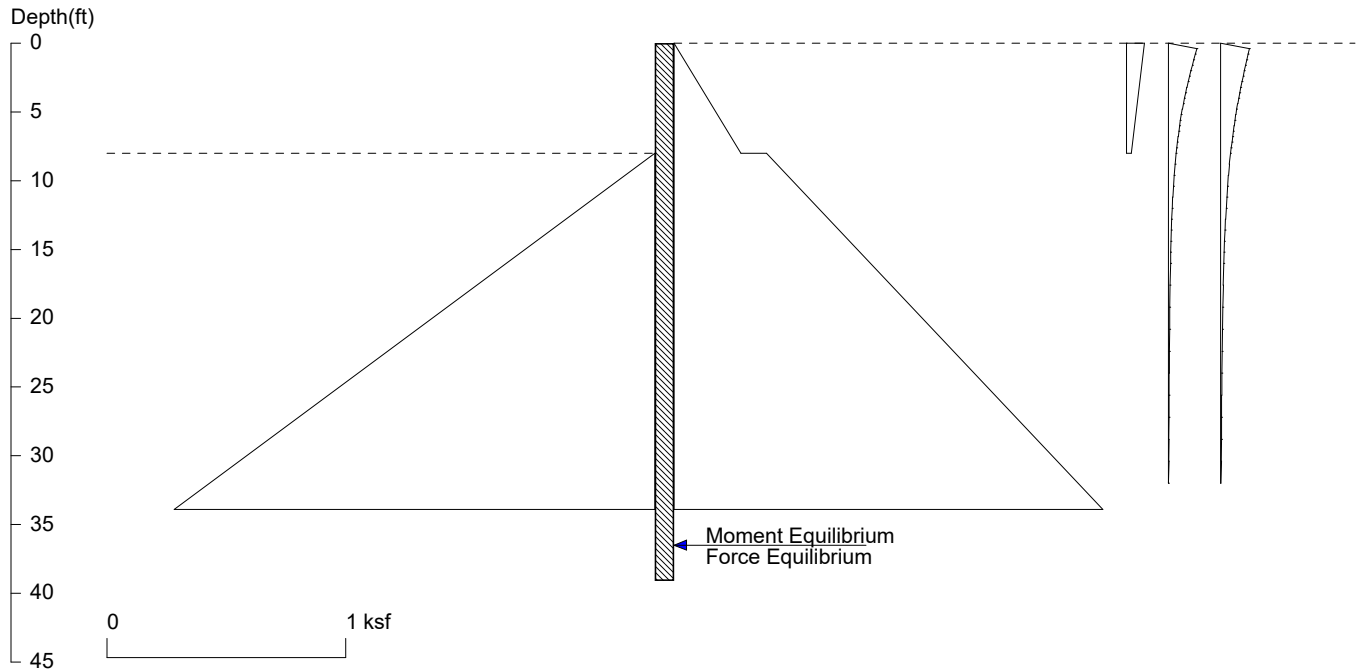
Based on pile spacing: 4.0 foot or meter

User Input Pile, W10x100: E (ksi)=29000.0, I (in⁴)/pile=623.0

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SHORING middle 8'.sh8

MIDDLE LOT WALLS

0+20 EQ



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Date: 5/2/2022

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SHORING m

Wall Height=8.0 Pile Diameter=0.8 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=31.09 Min. Pile Length=39.09

MOMENT IN PILE: Max. Moment=155.58 per Pile Spacing=4.0 at Depth=22.51

PILE SELECTION:

Request Min. Section Modulus = 56.6 in³/pile=927.09 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66

W10X100 has Section Modulus = 112.0 in³/pile=1835.34 cm³/pile. It is greater than Min. Requirements!

Top Deflection = 1.28(in) based on E (ksi)=29000.00 and I (in⁴)/pile=623.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|-------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 8.000 | 0.280 | 0.035027 |
| * | Below | Base | | |
| 8.000 | 0.387 | 80.00 | 4.300 | 0.054347 |
| * | Earth | Queck | | |
| 0.000 | 0.075 | 8.000 | 0.019 | -0.00701 |
| * | Sur- | charg | | |
| 0.000 | 0.000 | 0.400 | 0.119 | 0.296601 |
| 0.400 | 0.119 | 0.800 | 0.112 | -0.01579 |
| 0.800 | 0.112 | 1.200 | 0.106 | -0.01559 |
| 1.200 | 0.106 | 1.600 | 0.100 | -0.01530 |
| 1.600 | 0.100 | 2.000 | 0.094 | -0.01492 |
| 2.000 | 0.094 | 2.400 | 0.088 | -0.01447 |
| 2.400 | 0.088 | 2.800 | 0.083 | -0.01396 |
| 2.800 | 0.083 | 3.200 | 0.077 | -0.01339 |
| 3.200 | 0.077 | 3.600 | 0.072 | -0.01278 |
| 3.600 | 0.072 | 4.000 | 0.067 | -0.01215 |
| 4.000 | 0.067 | 4.400 | 0.063 | -0.01150 |

| | | | | |
|--------|-------|--------|-------|-----------|
| 4.400 | 0.063 | 4.800 | 0.058 | -0.01084 |
| 4.800 | 0.058 | 5.200 | 0.054 | -0.01018 |
| 5.200 | 0.054 | 5.600 | 0.050 | -0.00954 |
| 5.600 | 0.050 | 6.000 | 0.047 | -0.00891 |
| 6.000 | 0.047 | 6.400 | 0.044 | -0.00830 |
| 6.400 | 0.044 | 6.800 | 0.040 | -0.00772 |
| 6.800 | 0.040 | 7.200 | 0.038 | -0.00717 |
| 7.200 | 0.038 | 7.600 | 0.035 | -0.00664 |
| 7.600 | 0.035 | 8.000 | 0.032 | -0.00615 |
| 8.000 | 0.032 | 8.800 | 0.028 | -0.00547 |
| 8.800 | 0.028 | 9.600 | 0.024 | -0.00467 |
| 9.600 | 0.024 | 10.40 | 0.021 | -0.00398 |
| 10.40 | 0.021 | 11.20 | 0.018 | -0.00339 |
| 11.20 | 0.018 | 12.00 | 0.016 | -0.00289 |
| 12.00 | 0.016 | 12.80 | 0.014 | -0.00247 |
| 12.80 | 0.014 | 13.60 | 0.012 | -0.00211 |
| 13.60 | 0.012 | 14.40 | 0.011 | -0.00181 |
| 14.40 | 0.011 | 15.20 | 0.010 | -0.00156 |
| 15.20 | 0.010 | 16.00 | 0.009 | -0.00135 |
| 16.00 | 0.009 | 17.60 | 0.007 | -0.00109 |
| 17.60 | 0.007 | 19.20 | 0.006 | -0.00083 |
| 19.20 | 0.006 | 20.80 | 0.005 | -0.00063 |
| 20.80 | 0.005 | 22.40 | 0.004 | -0.00049 |
| 22.40 | 0.004 | 24.00 | 0.003 | -0.00039 |
| 24.00 | 0.003 | 25.60 | 0.003 | -0.00031 |
| 25.60 | 0.003 | 27.20 | 0.002 | -0.00025 |
| 27.20 | 0.002 | 28.80 | 0.002 | -0.00020 |
| 28.80 | 0.002 | 30.40 | 0.002 | -0.00016 |
| 30.40 | 0.002 | 32.00 | 0.000 | -0.00104 |
| * | Sur- | charge | | |
| 0.000 | 0.000 | 0.400 | 0.120 | 0.299247 |
| 0.400 | 0.120 | 0.800 | 0.114 | -0.013194 |
| 0.800 | 0.114 | 1.200 | 0.109 | -0.013078 |
| 1.200 | 0.109 | 1.600 | 0.104 | -0.012907 |
| 1.600 | 0.104 | 2.000 | 0.099 | -0.012684 |
| 2.000 | 0.099 | 2.400 | 0.094 | -0.012413 |
| 2.400 | 0.094 | 2.800 | 0.089 | -0.012099 |
| 2.800 | 0.089 | 3.200 | 0.084 | -0.011747 |
| 3.200 | 0.084 | 3.600 | 0.080 | -0.011364 |
| 3.600 | 0.080 | 4.000 | 0.076 | -0.010955 |
| 4.000 | 0.076 | 4.400 | 0.071 | -0.010525 |
| 4.400 | 0.071 | 4.800 | 0.067 | -0.010082 |
| 4.800 | 0.067 | 5.200 | 0.063 | -0.009629 |
| 5.200 | 0.063 | 5.600 | 0.060 | -0.009172 |
| 5.600 | 0.060 | 6.000 | 0.056 | -0.008715 |
| 6.000 | 0.056 | 6.400 | 0.053 | -0.008263 |
| 6.400 | 0.053 | 6.800 | 0.050 | -0.007818 |
| 6.800 | 0.050 | 7.200 | 0.047 | -0.007384 |
| 7.200 | 0.047 | 7.600 | 0.044 | -0.006962 |
| 7.600 | 0.044 | 8.000 | 0.041 | -0.006555 |
| 8.000 | 0.041 | 8.800 | 0.037 | -0.005977 |
| 8.800 | 0.037 | 9.600 | 0.032 | -0.005264 |
| 9.600 | 0.032 | 10.400 | 0.029 | -0.004622 |
| 10.400 | 0.029 | 11.200 | 0.026 | -0.004051 |
| 11.200 | 0.026 | 12.000 | 0.023 | -0.003547 |
| 12.000 | 0.023 | 12.800 | 0.020 | -0.003104 |
| 12.800 | 0.020 | 13.600 | 0.018 | -0.002718 |
| 13.600 | 0.018 | 14.400 | 0.016 | -0.002381 |
| 14.400 | 0.016 | 15.200 | 0.014 | -0.002088 |

| | | | | |
|--------|-------|--------|-------|-----------|
| 15.200 | 0.014 | 16.000 | 0.013 | -0.001834 |
| 16.000 | 0.013 | 17.600 | 0.011 | -0.001518 |
| 17.600 | 0.011 | 19.200 | 0.009 | -0.001184 |
| 19.200 | 0.009 | 20.800 | 0.007 | -0.000932 |
| 20.800 | 0.007 | 22.400 | 0.006 | -0.000740 |
| 22.400 | 0.006 | 24.000 | 0.005 | -0.000592 |
| 24.000 | 0.005 | 25.600 | 0.004 | -0.000478 |
| 25.600 | 0.004 | 27.200 | 0.004 | -0.000390 |
| 27.200 | 0.004 | 28.800 | 0.003 | -0.000320 |
| 28.800 | 0.003 | 30.400 | 0.003 | -0.000265 |
| 30.400 | 0.003 | 32.000 | 0.000 | -0.001713 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 8.0 | 0.00 | 80.0 | 5.59 | 0.078 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 8.00 | 0.83 |

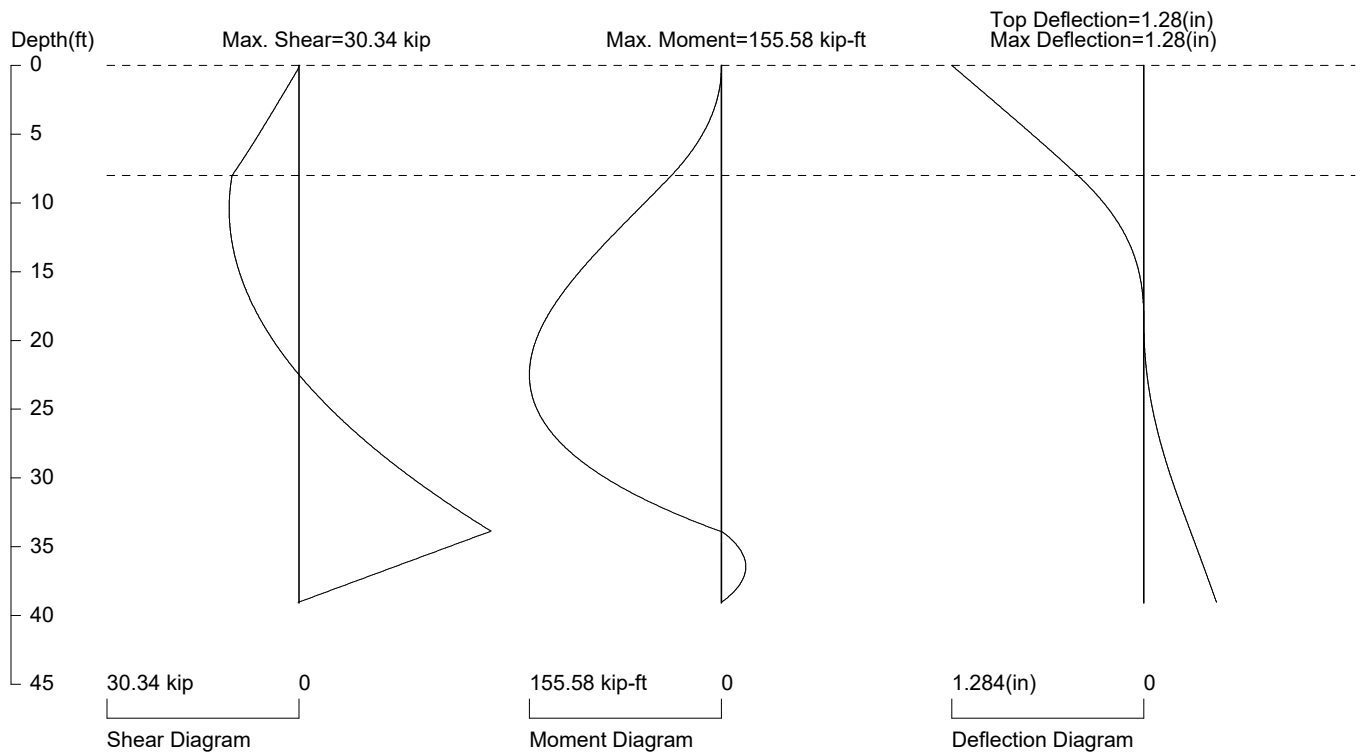
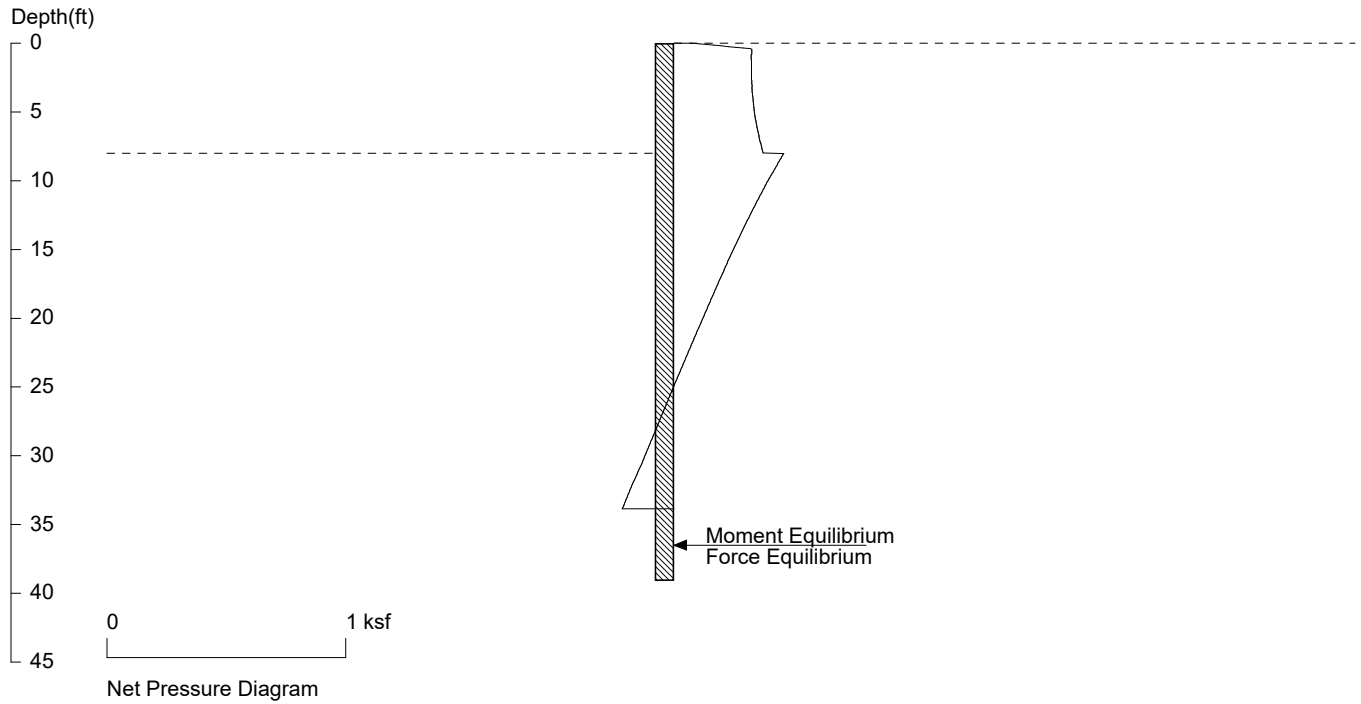
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 8.00 | 2.49 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

MIDDLE LOT WALLS

0+20 EQ



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

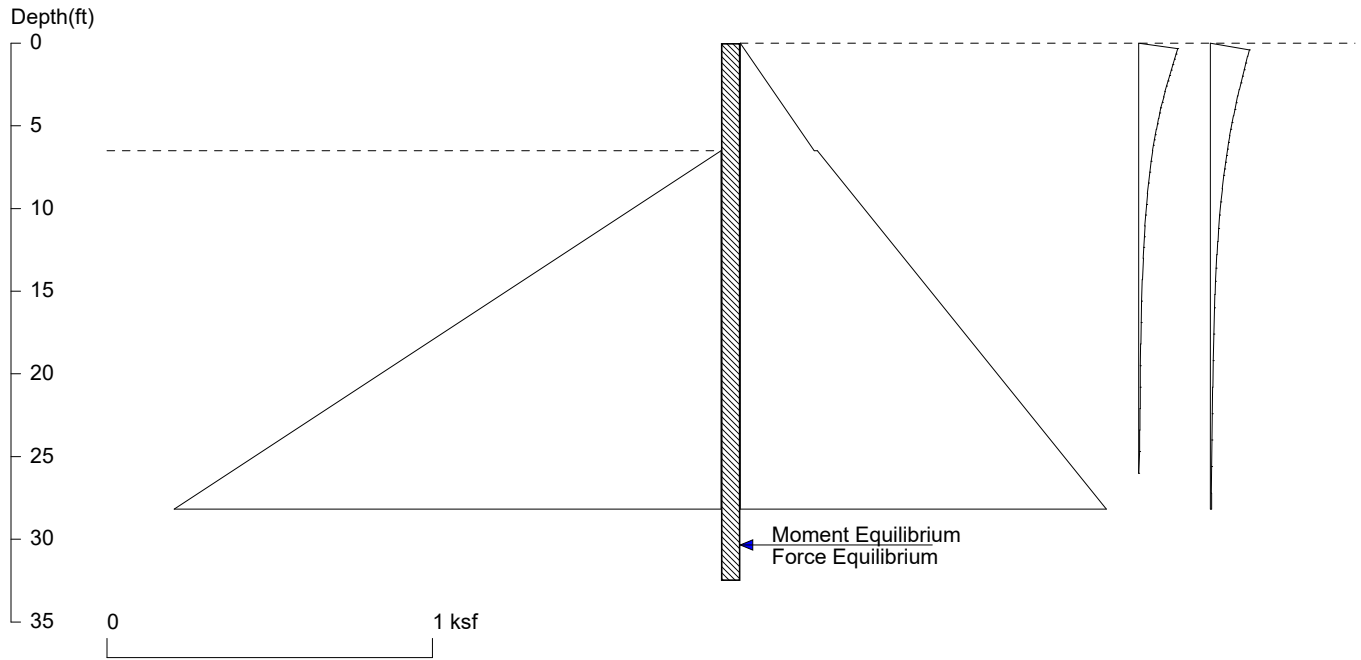
Based on pile spacing: 4.0 foot or meter

User Input Pile, W10X100: E (ksi)=29000.0, I (in⁴)/pile=623.0

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SHORING middle 8'-EQ.sh8

MIDDLE LOT WALLS

0+40



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Date: 5/2/2022

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SHORING m

Wall Height=6.5 Pile Diameter=0.7 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=26.01 Min. Pile Length=32.51

MOMENT IN PILE: Max. Moment=83.18 per Pile Spacing=4.0 at Depth=18.53

PILE SELECTION:

Request Min. Section Modulus = 30.2 in³/pile=495.65 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66

W10X77 has Section Modulus = 85.9 in³/pile=1407.64 cm³/pile. It is greater than Min. Requirements!

Top Deflection = 0.68(in) based on E (ksi)=29000.00 and I (in⁴)/pile=455.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|-------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 6.500 | 0.228 | 0.035027 |
| * | Below | Base | | |
| 6.500 | 0.237 | 65.00 | 2.634 | 0.040964 |
| * | Sur- | charg | | |
| 0.000 | 0.000 | 0.325 | 0.120 | 0.368711 |
| 0.325 | 0.120 | 0.650 | 0.115 | -0.01583 |
| 0.650 | 0.115 | 0.975 | 0.110 | -0.01570 |
| 0.975 | 0.110 | 1.300 | 0.105 | -0.01550 |
| 1.300 | 0.105 | 1.625 | 0.100 | -0.01525 |
| 1.625 | 0.100 | 1.950 | 0.095 | -0.01494 |
| 1.950 | 0.095 | 2.275 | 0.090 | -0.01458 |
| 2.275 | 0.090 | 2.600 | 0.085 | -0.01417 |
| 2.600 | 0.085 | 2.925 | 0.081 | -0.01373 |
| 2.925 | 0.081 | 3.250 | 0.077 | -0.01326 |
| 3.250 | 0.077 | 3.575 | 0.072 | -0.01276 |
| 3.575 | 0.072 | 3.900 | 0.068 | -0.01225 |
| 3.900 | 0.068 | 4.225 | 0.065 | -0.01172 |

| | | | | |
|--------|-------|--------|-------|-----------|
| 4.225 | 0.065 | 4.550 | 0.061 | -0.01119 |
| 4.550 | 0.061 | 4.875 | 0.058 | -0.01065 |
| 4.875 | 0.058 | 5.200 | 0.054 | -0.01012 |
| 5.200 | 0.054 | 5.525 | 0.051 | -0.00960 |
| 5.525 | 0.051 | 5.850 | 0.048 | -0.00908 |
| 5.850 | 0.048 | 6.175 | 0.045 | -0.00858 |
| 6.175 | 0.045 | 6.500 | 0.043 | -0.00810 |
| 6.500 | 0.043 | 7.150 | 0.038 | -0.00741 |
| 7.150 | 0.038 | 7.800 | 0.034 | -0.00655 |
| 7.800 | 0.034 | 8.450 | 0.030 | -0.00577 |
| 8.450 | 0.030 | 9.100 | 0.027 | -0.00508 |
| 9.100 | 0.027 | 9.750 | 0.024 | -0.00446 |
| 9.750 | 0.024 | 10.40 | 0.021 | -0.00392 |
| 10.40 | 0.021 | 11.05 | 0.019 | -0.00344 |
| 11.05 | 0.019 | 11.70 | 0.017 | -0.00302 |
| 11.70 | 0.017 | 12.35 | 0.015 | -0.00266 |
| 12.35 | 0.015 | 13.00 | 0.014 | -0.00234 |
| 13.00 | 0.014 | 14.30 | 0.011 | -0.00194 |
| 14.30 | 0.011 | 15.60 | 0.009 | -0.00152 |
| 15.60 | 0.009 | 16.90 | 0.008 | -0.00120 |
| 16.90 | 0.008 | 18.20 | 0.006 | -0.00095 |
| 18.20 | 0.006 | 19.50 | 0.005 | -0.00076 |
| 19.50 | 0.005 | 20.80 | 0.005 | -0.00062 |
| 20.80 | 0.005 | 22.10 | 0.004 | -0.00050 |
| 22.10 | 0.004 | 23.40 | 0.003 | -0.00041 |
| 23.40 | 0.003 | 24.70 | 0.003 | -0.00034 |
| 24.70 | 0.003 | 26.00 | 0.000 | -0.00225 |
| * | Sur- | charge | | |
| 0.000 | 0.000 | 0.400 | 0.120 | 0.299247 |
| 0.400 | 0.120 | 0.800 | 0.114 | -0.013194 |
| 0.800 | 0.114 | 1.200 | 0.109 | -0.013078 |
| 1.200 | 0.109 | 1.600 | 0.104 | -0.012907 |
| 1.600 | 0.104 | 2.000 | 0.099 | -0.012684 |
| 2.000 | 0.099 | 2.400 | 0.094 | -0.012413 |
| 2.400 | 0.094 | 2.800 | 0.089 | -0.012099 |
| 2.800 | 0.089 | 3.200 | 0.084 | -0.011747 |
| 3.200 | 0.084 | 3.600 | 0.080 | -0.011364 |
| 3.600 | 0.080 | 4.000 | 0.076 | -0.010955 |
| 4.000 | 0.076 | 4.400 | 0.071 | -0.010525 |
| 4.400 | 0.071 | 4.800 | 0.067 | -0.010082 |
| 4.800 | 0.067 | 5.200 | 0.063 | -0.009629 |
| 5.200 | 0.063 | 5.600 | 0.060 | -0.009172 |
| 5.600 | 0.060 | 6.000 | 0.056 | -0.008715 |
| 6.000 | 0.056 | 6.400 | 0.053 | -0.008263 |
| 6.400 | 0.053 | 6.800 | 0.050 | -0.007818 |
| 6.800 | 0.050 | 7.200 | 0.047 | -0.007384 |
| 7.200 | 0.047 | 7.600 | 0.044 | -0.006962 |
| 7.600 | 0.044 | 8.000 | 0.041 | -0.006555 |
| 8.000 | 0.041 | 8.800 | 0.037 | -0.005977 |
| 8.800 | 0.037 | 9.600 | 0.032 | -0.005264 |
| 9.600 | 0.032 | 10.400 | 0.029 | -0.004622 |
| 10.400 | 0.029 | 11.200 | 0.026 | -0.004051 |
| 11.200 | 0.026 | 12.000 | 0.023 | -0.003547 |
| 12.000 | 0.023 | 12.800 | 0.020 | -0.003104 |
| 12.800 | 0.020 | 13.600 | 0.018 | -0.002718 |
| 13.600 | 0.018 | 14.400 | 0.016 | -0.002381 |
| 14.400 | 0.016 | 15.200 | 0.014 | -0.002088 |
| 15.200 | 0.014 | 16.000 | 0.013 | -0.001834 |
| 16.000 | 0.013 | 17.600 | 0.011 | -0.001518 |

| | | | | |
|--------|-------|--------|-------|-----------|
| 17.600 | 0.011 | 19.200 | 0.009 | -0.001184 |
| 19.200 | 0.009 | 20.800 | 0.007 | -0.000932 |
| 20.800 | 0.007 | 22.400 | 0.006 | -0.000740 |
| 22.400 | 0.006 | 24.000 | 0.005 | -0.000592 |
| 24.000 | 0.005 | 25.600 | 0.004 | -0.000478 |
| 25.600 | 0.004 | 27.200 | 0.004 | -0.000390 |
| 27.200 | 0.004 | 28.800 | 0.003 | -0.000320 |
| 28.800 | 0.003 | 30.400 | 0.003 | -0.000265 |
| 30.400 | 0.003 | 32.000 | 0.000 | -0.001713 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 6.5 | 0.00 | 65.0 | 4.54 | 0.078 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 6.50 | 0.67 |

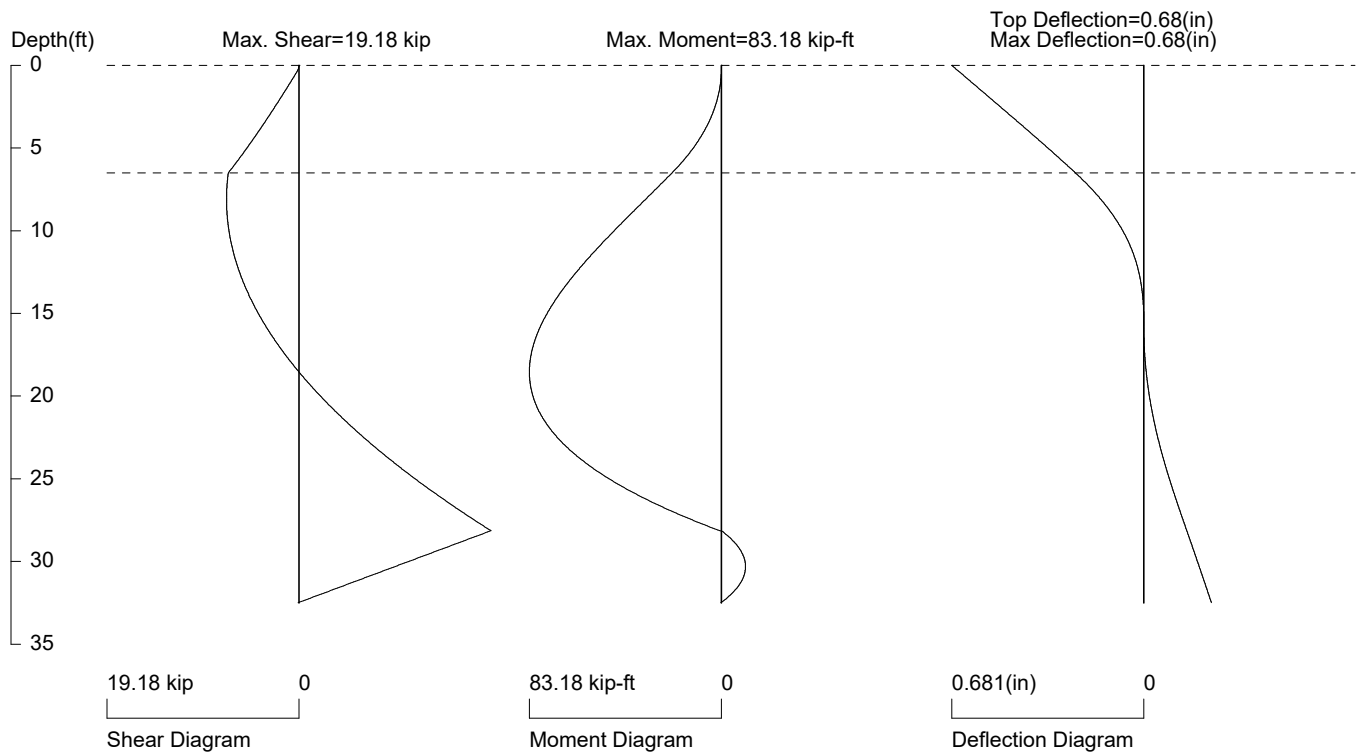
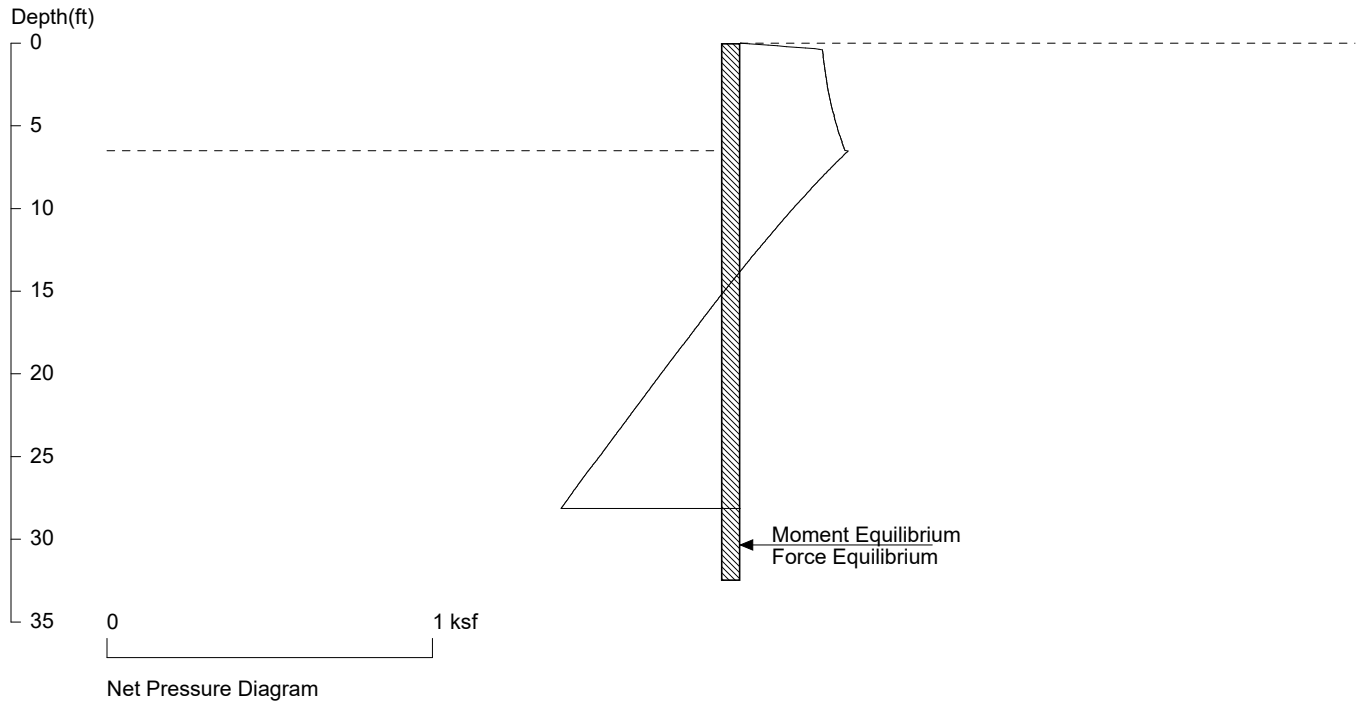
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 6.50 | 2.01 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

MIDDLE LOT WALLS

0+40



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

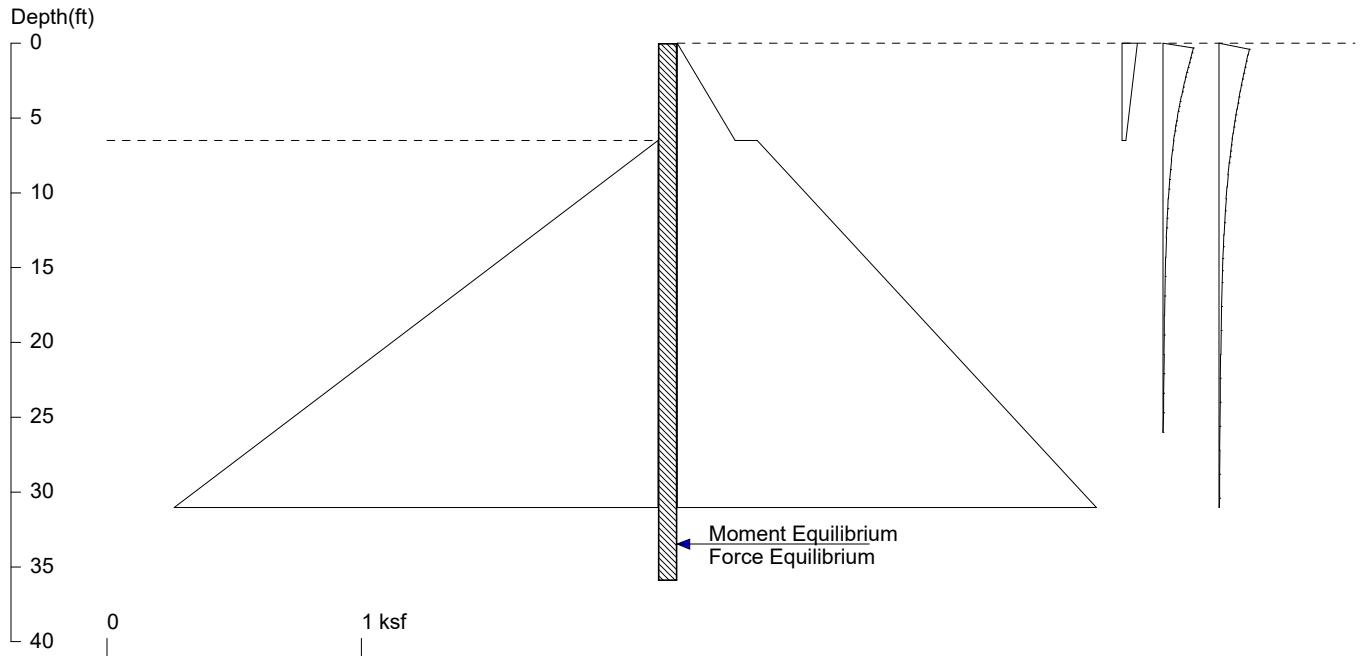
Based on pile spacing: 4.0 foot or meter

User Input Pile, W10X77: E (ksi)=29000.0, I (in⁴)/pile=455.0

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SHORING middle 6.5'.sh8

MIDDLE LOT WALLS

0+40 EQ



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Date: 5/2/2022

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SHORING m

Wall Height=6.5 Pile Diameter=0.7 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=29.43 Min. Pile Length=35.93

MOMENT IN PILE: Max. Moment=107.42 per Pile Spacing=4.0 at Depth=20.28

PILE SELECTION:

Request Min. Section Modulus = 39.1 in³/pile=640.12 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66

W10X77 has Section Modulus = 85.9 in³/pile=1407.64 cm³/pile. It is greater than Min. Requirements!

Top Deflection = 0.99(in) based on E (ksi)=29000.00 and I (in⁴)/pile=455.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|-------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 6.500 | 0.228 | 0.035027 |
| * | Below | Base | | |
| 6.500 | 0.315 | 65.00 | 3.494 | 0.054347 |
| * | Earth | Queck | | |
| 0.000 | 0.061 | 6.500 | 0.015 | -0.00701 |
| * | Sur- | charg | | |
| 0.000 | 0.000 | 0.325 | 0.120 | 0.368711 |
| 0.325 | 0.120 | 0.650 | 0.115 | -0.01583 |
| 0.650 | 0.115 | 0.975 | 0.110 | -0.01570 |
| 0.975 | 0.110 | 1.300 | 0.105 | -0.01550 |
| 1.300 | 0.105 | 1.625 | 0.100 | -0.01525 |
| 1.625 | 0.100 | 1.950 | 0.095 | -0.01494 |
| 1.950 | 0.095 | 2.275 | 0.090 | -0.01458 |
| 2.275 | 0.090 | 2.600 | 0.085 | -0.01417 |
| 2.600 | 0.085 | 2.925 | 0.081 | -0.01373 |
| 2.925 | 0.081 | 3.250 | 0.077 | -0.01326 |
| 3.250 | 0.077 | 3.575 | 0.072 | -0.01276 |

| | | | | |
|--------|-------|--------|-------|-----------|
| 3.575 | 0.072 | 3.900 | 0.068 | -0.01225 |
| 3.900 | 0.068 | 4.225 | 0.065 | -0.01172 |
| 4.225 | 0.065 | 4.550 | 0.061 | -0.01119 |
| 4.550 | 0.061 | 4.875 | 0.058 | -0.01065 |
| 4.875 | 0.058 | 5.200 | 0.054 | -0.01012 |
| 5.200 | 0.054 | 5.525 | 0.051 | -0.00960 |
| 5.525 | 0.051 | 5.850 | 0.048 | -0.00908 |
| 5.850 | 0.048 | 6.175 | 0.045 | -0.00858 |
| 6.175 | 0.045 | 6.500 | 0.043 | -0.00810 |
| 6.500 | 0.043 | 7.150 | 0.038 | -0.00741 |
| 7.150 | 0.038 | 7.800 | 0.034 | -0.00655 |
| 7.800 | 0.034 | 8.450 | 0.030 | -0.00577 |
| 8.450 | 0.030 | 9.100 | 0.027 | -0.00508 |
| 9.100 | 0.027 | 9.750 | 0.024 | -0.00446 |
| 9.750 | 0.024 | 10.40 | 0.021 | -0.00392 |
| 10.40 | 0.021 | 11.05 | 0.019 | -0.00344 |
| 11.05 | 0.019 | 11.70 | 0.017 | -0.00302 |
| 11.70 | 0.017 | 12.35 | 0.015 | -0.00266 |
| 12.35 | 0.015 | 13.00 | 0.014 | -0.00234 |
| 13.00 | 0.014 | 14.30 | 0.011 | -0.00194 |
| 14.30 | 0.011 | 15.60 | 0.009 | -0.00152 |
| 15.60 | 0.009 | 16.90 | 0.008 | -0.00120 |
| 16.90 | 0.008 | 18.20 | 0.006 | -0.00095 |
| 18.20 | 0.006 | 19.50 | 0.005 | -0.00076 |
| 19.50 | 0.005 | 20.80 | 0.005 | -0.00062 |
| 20.80 | 0.005 | 22.10 | 0.004 | -0.00050 |
| 22.10 | 0.004 | 23.40 | 0.003 | -0.00041 |
| 23.40 | 0.003 | 24.70 | 0.003 | -0.00034 |
| 24.70 | 0.003 | 26.00 | 0.000 | -0.00225 |
| * | Sur- | charge | | |
| 0.000 | 0.000 | 0.400 | 0.120 | 0.299247 |
| 0.400 | 0.120 | 0.800 | 0.114 | -0.013194 |
| 0.800 | 0.114 | 1.200 | 0.109 | -0.013078 |
| 1.200 | 0.109 | 1.600 | 0.104 | -0.012907 |
| 1.600 | 0.104 | 2.000 | 0.099 | -0.012684 |
| 2.000 | 0.099 | 2.400 | 0.094 | -0.012413 |
| 2.400 | 0.094 | 2.800 | 0.089 | -0.012099 |
| 2.800 | 0.089 | 3.200 | 0.084 | -0.011747 |
| 3.200 | 0.084 | 3.600 | 0.080 | -0.011364 |
| 3.600 | 0.080 | 4.000 | 0.076 | -0.010955 |
| 4.000 | 0.076 | 4.400 | 0.071 | -0.010525 |
| 4.400 | 0.071 | 4.800 | 0.067 | -0.010082 |
| 4.800 | 0.067 | 5.200 | 0.063 | -0.009629 |
| 5.200 | 0.063 | 5.600 | 0.060 | -0.009172 |
| 5.600 | 0.060 | 6.000 | 0.056 | -0.008715 |
| 6.000 | 0.056 | 6.400 | 0.053 | -0.008263 |
| 6.400 | 0.053 | 6.800 | 0.050 | -0.007818 |
| 6.800 | 0.050 | 7.200 | 0.047 | -0.007384 |
| 7.200 | 0.047 | 7.600 | 0.044 | -0.006962 |
| 7.600 | 0.044 | 8.000 | 0.041 | -0.006555 |
| 8.000 | 0.041 | 8.800 | 0.037 | -0.005977 |
| 8.800 | 0.037 | 9.600 | 0.032 | -0.005264 |
| 9.600 | 0.032 | 10.400 | 0.029 | -0.004622 |
| 10.400 | 0.029 | 11.200 | 0.026 | -0.004051 |
| 11.200 | 0.026 | 12.000 | 0.023 | -0.003547 |
| 12.000 | 0.023 | 12.800 | 0.020 | -0.003104 |
| 12.800 | 0.020 | 13.600 | 0.018 | -0.002718 |
| 13.600 | 0.018 | 14.400 | 0.016 | -0.002381 |
| 14.400 | 0.016 | 15.200 | 0.014 | -0.002088 |

| | | | | |
|--------|-------|--------|-------|-----------|
| 15.200 | 0.014 | 16.000 | 0.013 | -0.001834 |
| 16.000 | 0.013 | 17.600 | 0.011 | -0.001518 |
| 17.600 | 0.011 | 19.200 | 0.009 | -0.001184 |
| 19.200 | 0.009 | 20.800 | 0.007 | -0.000932 |
| 20.800 | 0.007 | 22.400 | 0.006 | -0.000740 |
| 22.400 | 0.006 | 24.000 | 0.005 | -0.000592 |
| 24.000 | 0.005 | 25.600 | 0.004 | -0.000478 |
| 25.600 | 0.004 | 27.200 | 0.004 | -0.000390 |
| 27.200 | 0.004 | 28.800 | 0.003 | -0.000320 |
| 28.800 | 0.003 | 30.400 | 0.003 | -0.000265 |
| 30.400 | 0.003 | 32.000 | 0.000 | -0.001713 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 6.5 | 0.00 | 65.0 | 4.54 | 0.078 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 6.50 | 0.67 |

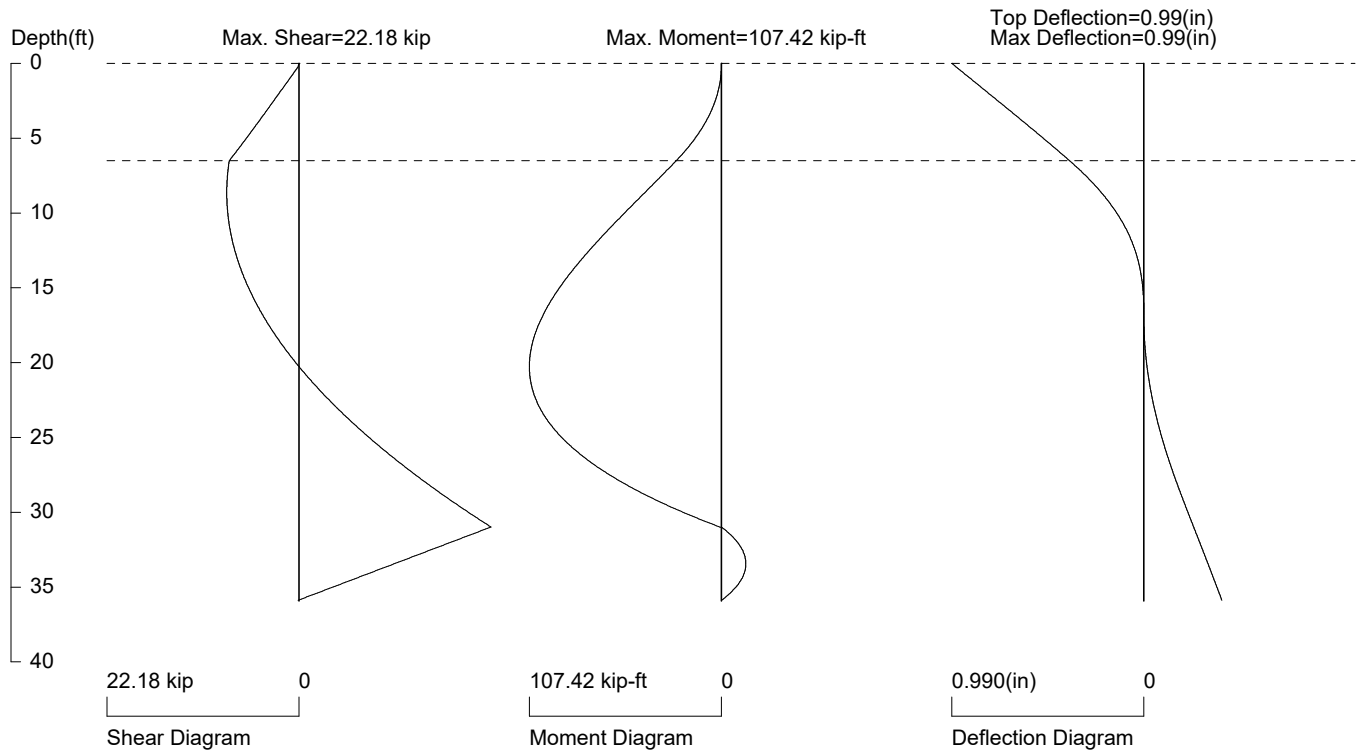
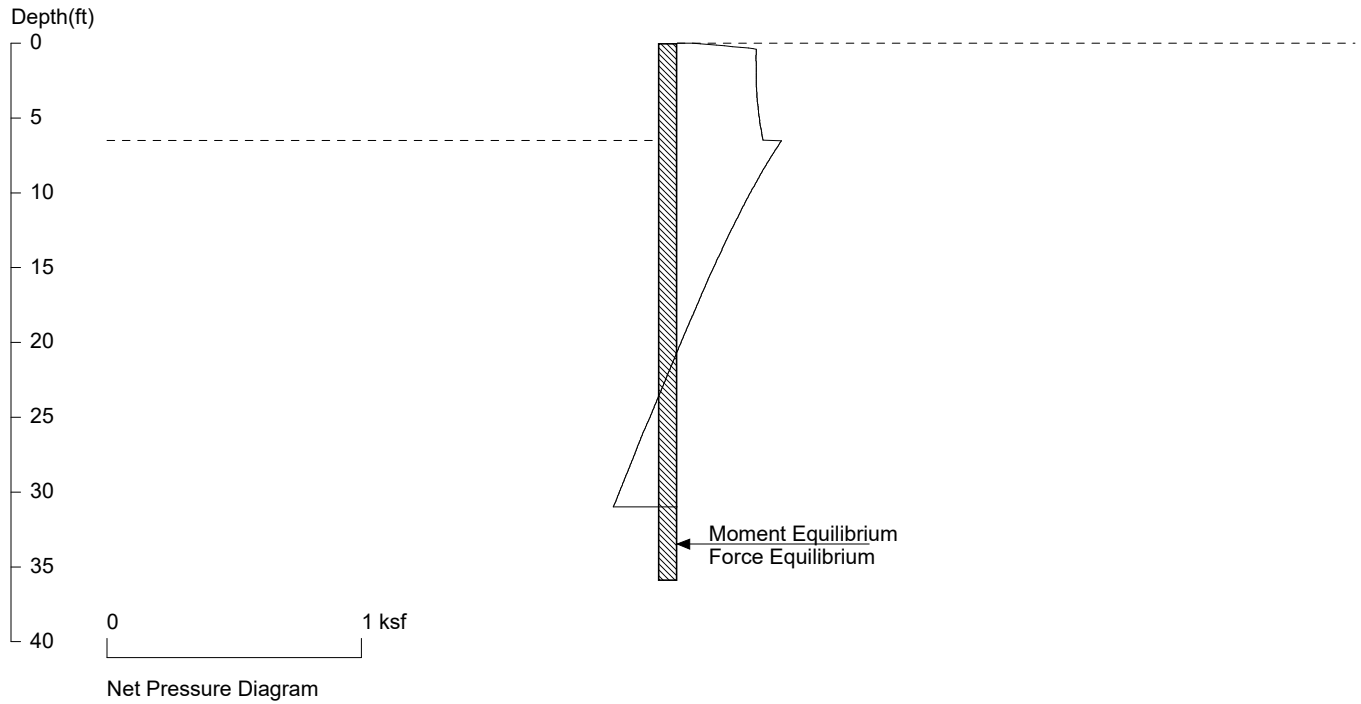
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 6.50 | 2.01 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

MIDDLE LOT WALLS

0+40 EQ



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

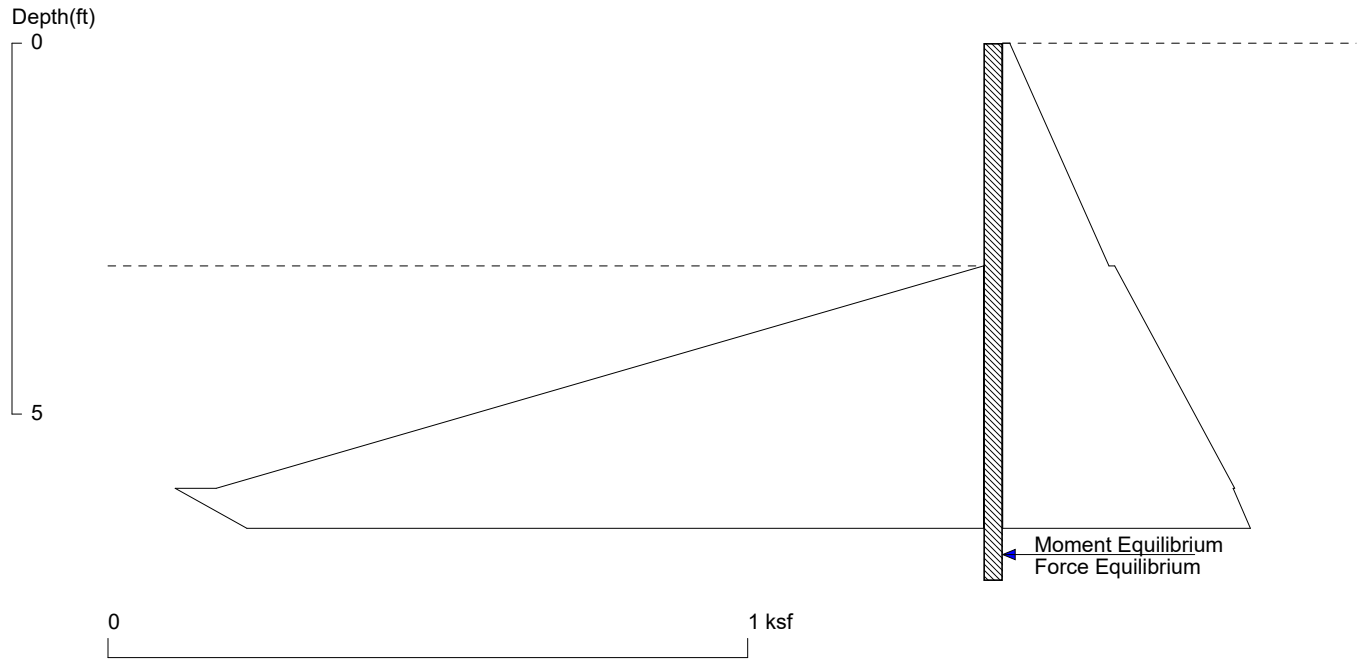
Based on pile spacing: 4.0 foot or meter

User Input Pile, w10X77: E (ksi)=29000.0, I (in⁴)/pile=455.0

File: M:\PROJECTS\Altman, Benjamin\2022-0034 - Altman Middle Soldier Pile Wall (Mercer Island)\Documents\SHORING middle 6.5'-EQ.sh8

0+60 MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis



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File: C:\PROGRAM FILES (X86)\SepWallF1.sh8

Wall Height=3.0 Pile Diameter=0.7 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=4.25 (8~10ft is recommended!!!) Min. Pile Length=7.25

MOMENT IN PILE: Max. Moment=2.49 per Pile Spacing=4.0 at Depth=4.83

PILE SELECTION:

Request Min. Section Modulus = 0.9 in³/pile=14.81 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66

W8X10 has Section Modulus = 7.8 in³/pile=127.98 cm³/pile. It is greater than Min. Requirements!

Top Deflection = 0.18(in) based on E (ksi)=29000.00 and I (in⁴)/pile=30.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|-------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.011 | 3.000 | 0.165 | 0.051600 |
| * | Below | Base | | |
| 3.000 | 0.175 | 6.000 | 0.363 | 0.062481 |
| 6.000 | 0.360 | 9.000 | 0.511 | 0.050137 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|------|------|------|------|--------|
| 3.0 | 0.00 | 6.0 | 1.20 | 0.400 |
| 6.0 | 1.26 | 9.0 | 0.64 | -0.208 |
| 9.0 | 0.85 | 12.0 | 1.08 | 0.077 |
| 12.0 | 1.08 | 15.0 | 1.31 | 0.077 |
| 15.0 | 1.31 | 18.0 | 1.54 | 0.077 |
| 18.0 | 1.54 | 21.0 | 1.77 | 0.077 |
| 21.0 | 1.77 | 24.0 | 2.00 | 0.077 |
| 24.0 | 2.00 | 27.0 | 2.23 | 0.077 |
| 27.0 | 2.23 | 30.0 | 2.46 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 3.00 | 0.67 |

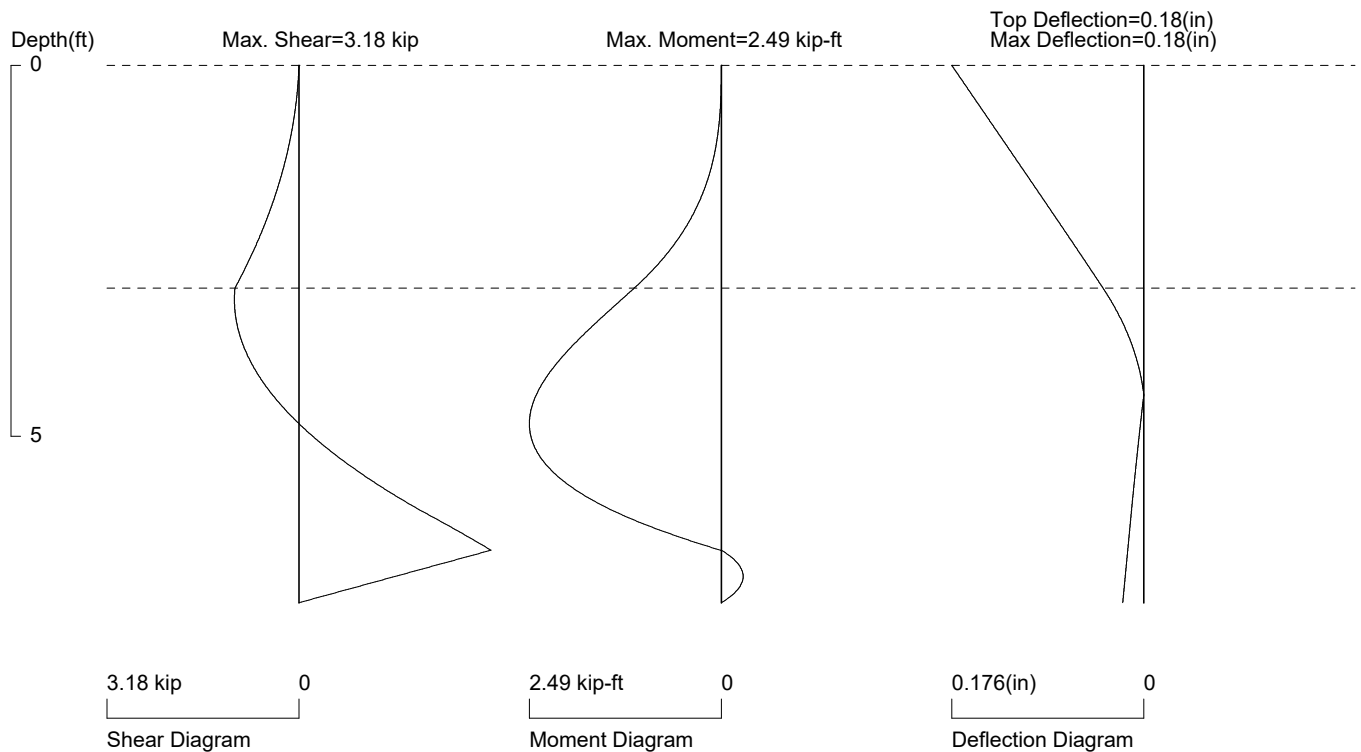
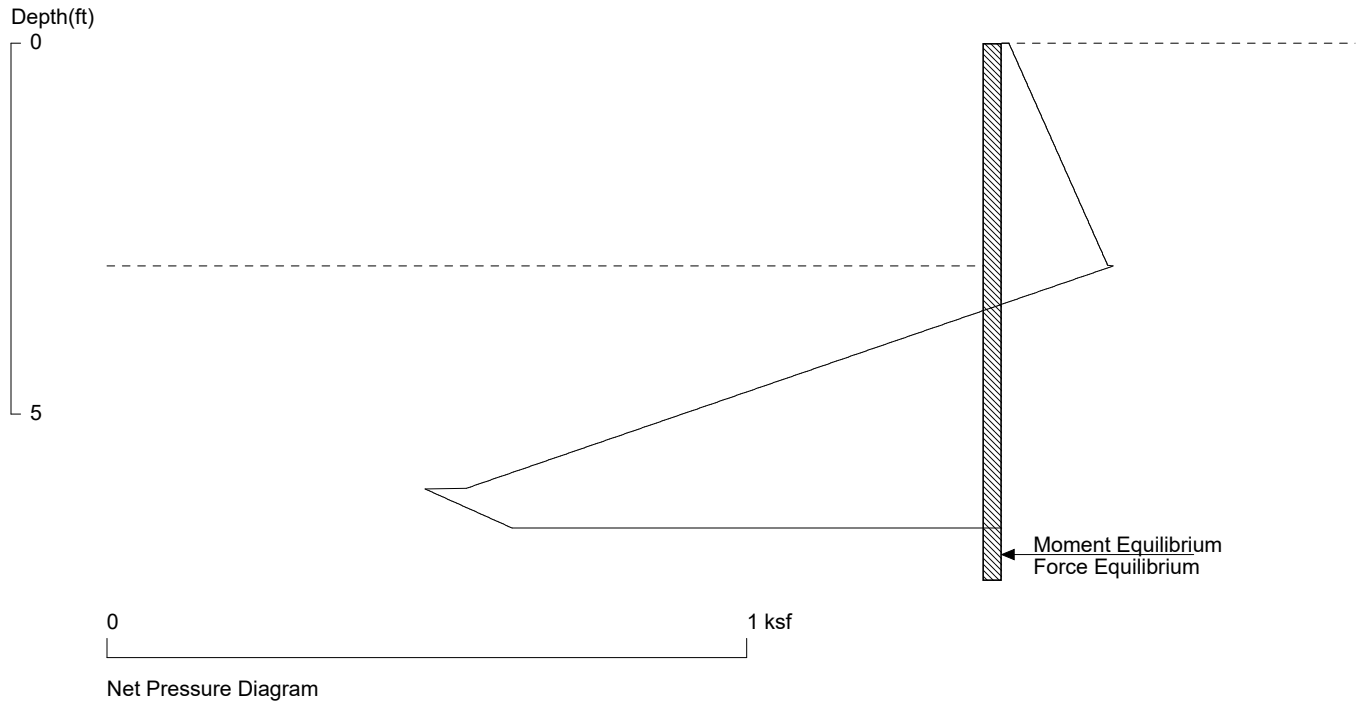
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 3.00 | 2.01 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

0+60 MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis

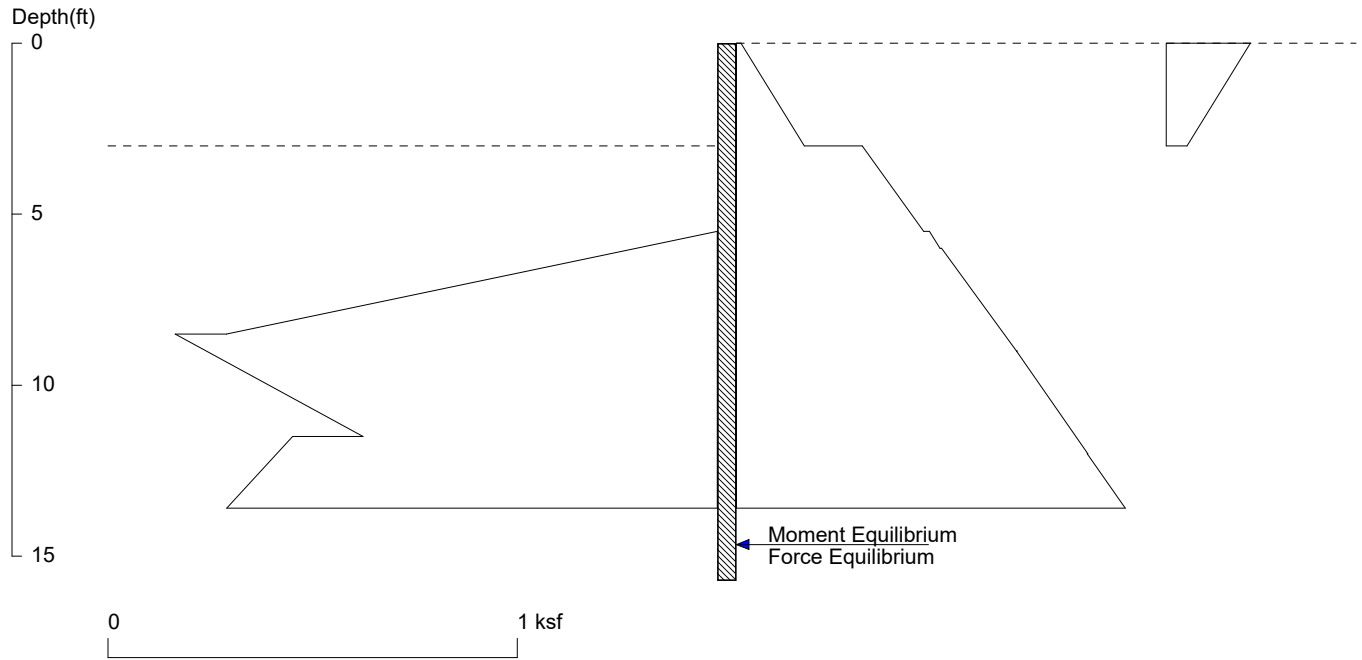


PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter
 User Input Pile, W8X10: E (ksi)=29000.0, I (in⁴)/pile=30.8
 File: C:\PROGRAM FILES (X86)\SepWallF1.sh8

0+60 EQ MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis



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File: C:\PROGRAM FILES (X86)\SepWallF1.sh8

Wall Height=3.0 Pile Diameter=0.7 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=12.72 Min. Pile Length=15.72
 MOMENT IN PILE: Max. Moment=19.01 per Pile Spacing=4.0 at Depth=8.84

PILE SELECTION:

Request Min. Section Modulus = 6.9 in³/pile=113.27 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 W8X15 has Section Modulus = 11.8 in³/pile=193.37 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 0.53(in) based on E (ksi)=29000.00 and I (in⁴)/pile=48.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|--------|-------|--------|-------|-----------|
| * | Above | Base | | |
| 0.000 | 0.011 | 3.000 | 0.165 | 0.051600 |
| * | Below | Base | | |
| 3.000 | 0.307 | 5.500 | 0.457 | 0.060198 |
| 5.500 | 0.471 | 6.000 | 0.497 | 0.051791 |
| 6.000 | 0.501 | 9.000 | 0.684 | 0.060940 |
| 9.000 | 0.684 | 12.000 | 0.858 | 0.058059 |
| 12.000 | 0.857 | 15.000 | 1.031 | 0.057928 |
| 15.000 | 1.028 | 18.000 | 1.197 | 0.056458 |
| * | Earth | Queck | | |
| 0.000 | 0.206 | 3.000 | 0.052 | -0.051615 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|------|------|------|------|--------|
| 5.5 | 0.00 | 8.5 | 1.20 | 0.400 |
| 8.5 | 1.33 | 11.5 | 0.87 | -0.153 |
| 11.5 | 1.04 | 14.5 | 1.27 | 0.077 |
| 14.5 | 1.27 | 17.5 | 1.50 | 0.077 |

| | | | | |
|------|------|------|------|-------|
| 17.5 | 1.50 | 20.5 | 1.73 | 0.077 |
| 20.5 | 1.73 | 23.5 | 1.96 | 0.077 |
| 23.5 | 1.96 | 26.5 | 2.19 | 0.077 |
| 26.5 | 2.19 | 29.5 | 2.42 | 0.077 |
| 29.5 | 2.42 | 30.0 | 2.46 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 3.00 | 0.67 |

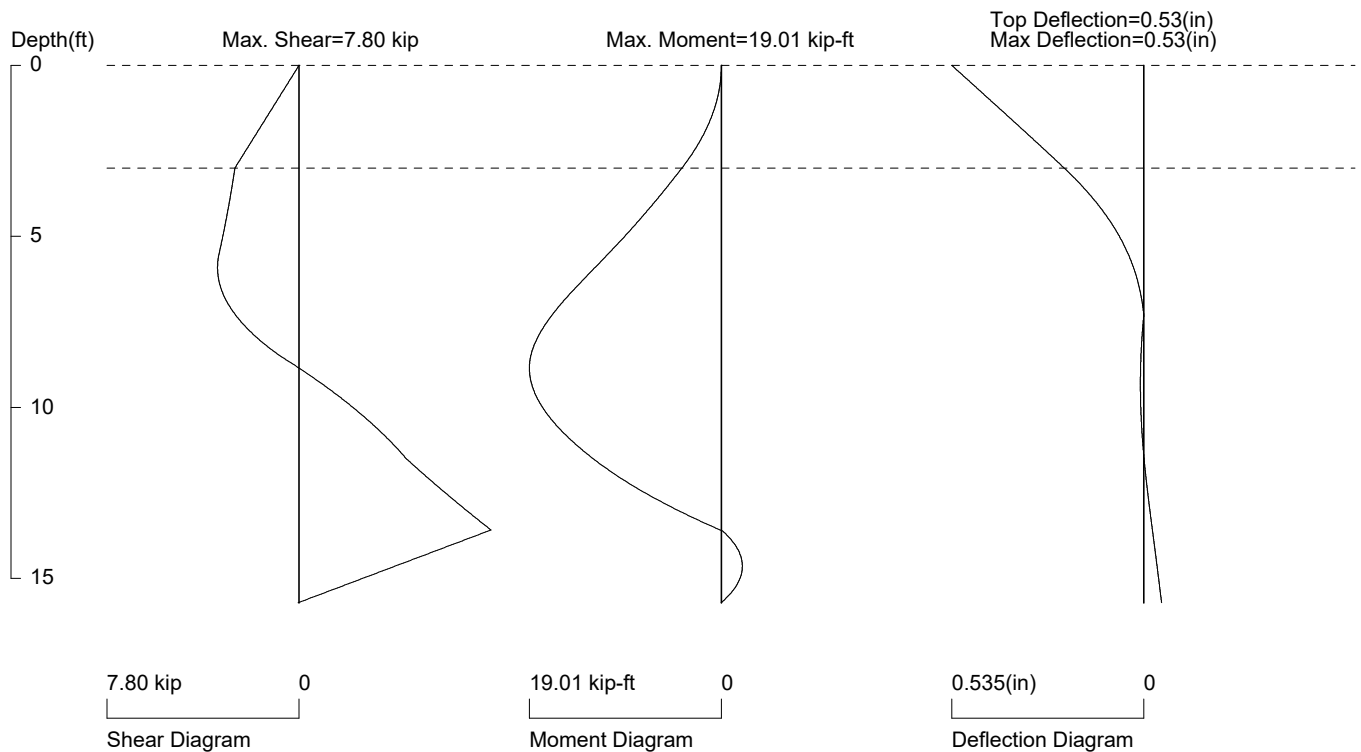
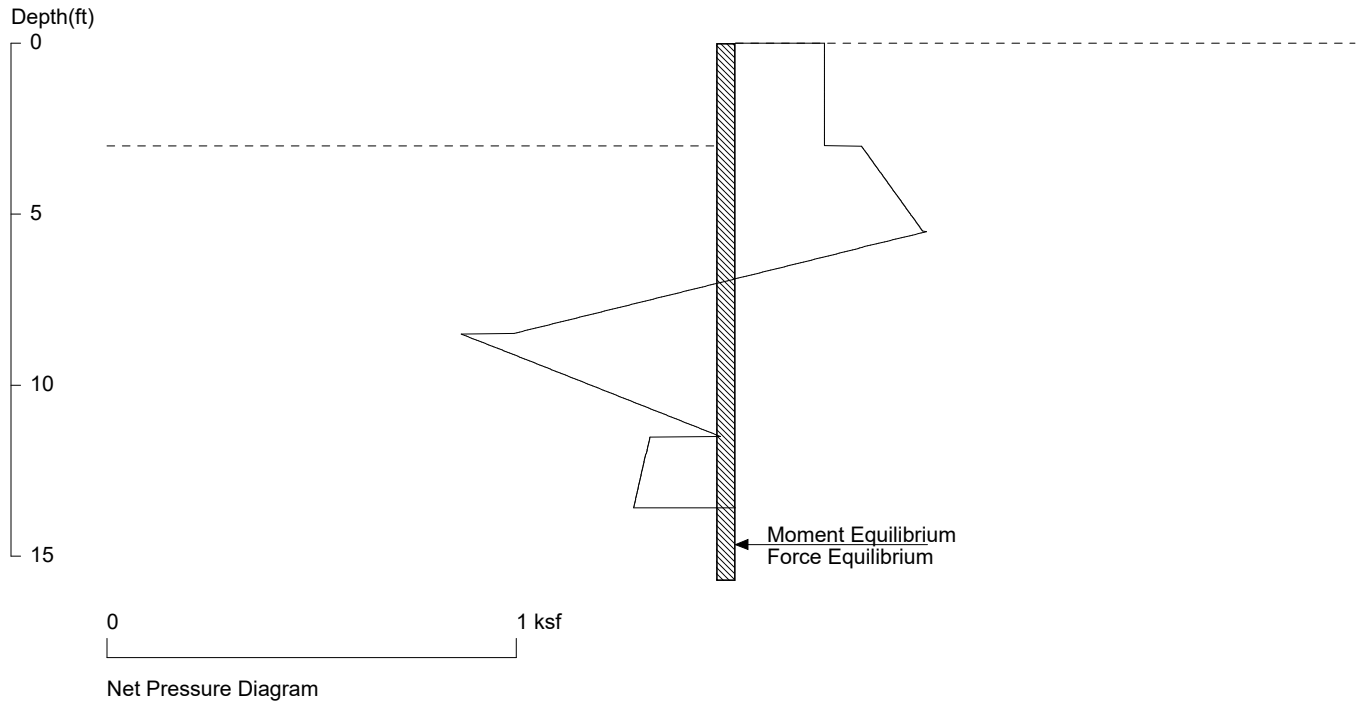
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 3.00 | 2.01 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

0+60 EQ MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis

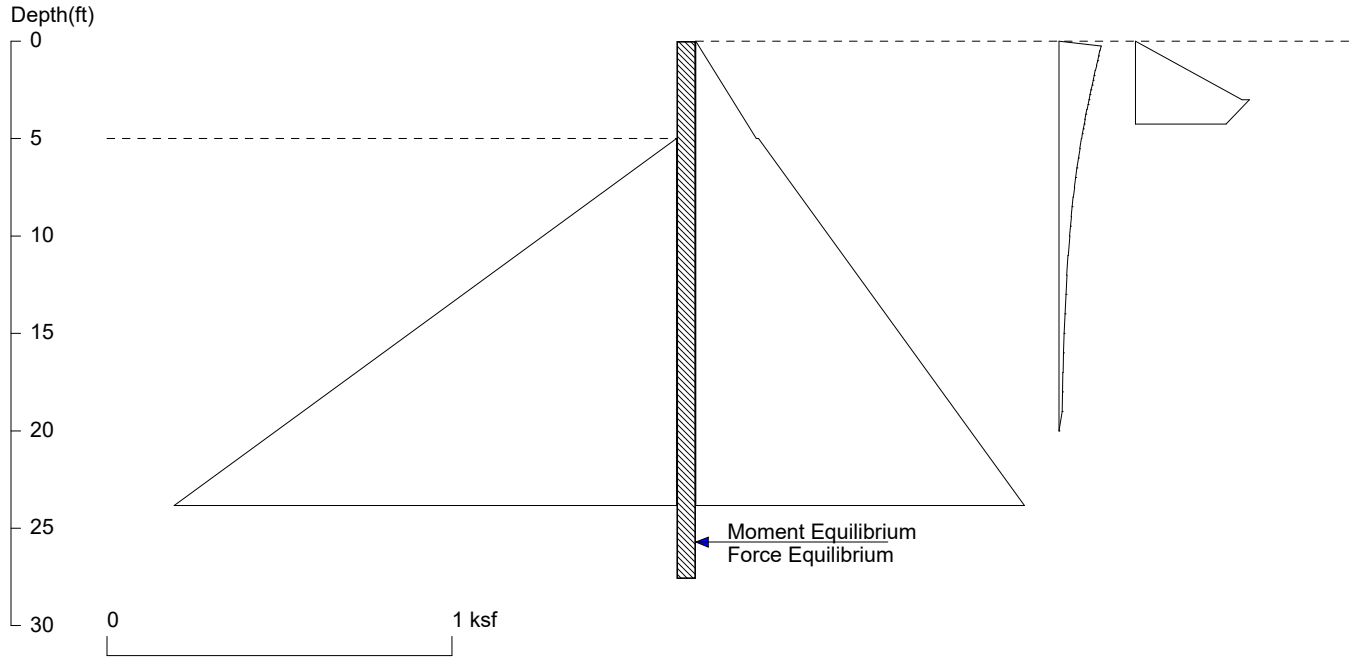


PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter
 User Input Pile, W8X15: E (ksi)=29000.0, I (in4)/pile=48.0
 File: C:\PROGRAM FILES (X86)\SepWallF1.sh8

0+60 MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1



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Wall Height=5.0 Pile Diameter=0.8 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=22.59 Min. Pile Length=27.59
 MOMENT IN PILE: Max. Moment=67.44 per Pile Spacing=4.0 at Depth=15.51

PILE SELECTION:

Request Min. Section Modulus = 24.5 in³/pile=401.84 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 W10X77 has Section Modulus = 85.9 in³/pile=1407.64 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 0.39(in) based on E (ksi)=29000.00 and I (in⁴)/pile=455.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|-------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 5.000 | 0.175 | 0.035027 |
| * | Below | Base | | |
| 5.000 | 0.182 | 50.00 | 2.026 | 0.040964 |
| * | Sur- | charg | | |
| 0.000 | 0.000 | 0.250 | 0.122 | 0.486741 |
| 0.250 | 0.122 | 0.500 | 0.118 | -0.01323 |
| 0.500 | 0.118 | 0.750 | 0.115 | -0.01319 |
| 0.750 | 0.115 | 1.000 | 0.112 | -0.01312 |
| 1.000 | 0.112 | 1.250 | 0.109 | -0.01303 |
| 1.250 | 0.109 | 1.500 | 0.105 | -0.01292 |
| 1.500 | 0.105 | 1.750 | 0.102 | -0.01278 |
| 1.750 | 0.102 | 2.000 | 0.099 | -0.01263 |
| 2.000 | 0.099 | 2.250 | 0.096 | -0.01246 |
| 2.250 | 0.096 | 2.500 | 0.093 | -0.01228 |
| 2.500 | 0.093 | 2.750 | 0.090 | -0.01207 |
| 2.750 | 0.090 | 3.000 | 0.087 | -0.01186 |
| 3.000 | 0.087 | 3.250 | 0.084 | -0.01163 |

| | | | | |
|-------|--------|--------|-------|----------|
| 3.250 | 0.084 | 3.500 | 0.081 | -0.01138 |
| 3.500 | 0.081 | 3.750 | 0.078 | -0.01113 |
| 3.750 | 0.078 | 4.000 | 0.076 | -0.01087 |
| 4.000 | 0.076 | 4.250 | 0.073 | -0.01060 |
| 4.250 | 0.073 | 4.500 | 0.070 | -0.01033 |
| 4.500 | 0.070 | 4.750 | 0.068 | -0.01005 |
| 4.750 | 0.068 | 5.000 | 0.065 | -0.00977 |
| 5.000 | 0.065 | 5.500 | 0.061 | -0.00934 |
| 5.500 | 0.061 | 6.000 | 0.056 | -0.00877 |
| 6.000 | 0.056 | 6.500 | 0.052 | -0.00820 |
| 6.500 | 0.052 | 7.000 | 0.048 | -0.00765 |
| 7.000 | 0.048 | 7.500 | 0.045 | -0.00711 |
| 7.500 | 0.045 | 8.000 | 0.041 | -0.00660 |
| 8.000 | 0.041 | 8.500 | 0.038 | -0.00611 |
| 8.500 | 0.038 | 9.000 | 0.036 | -0.00565 |
| 9.000 | 0.036 | 9.500 | 0.033 | -0.00522 |
| 9.500 | 0.033 | 10.00 | 0.031 | -0.00481 |
| 10.00 | 0.031 | 11.00 | 0.026 | -0.00425 |
| 11.00 | 0.026 | 12.00 | 0.023 | -0.00360 |
| 12.00 | 0.023 | 13.00 | 0.020 | -0.00305 |
| 13.00 | 0.020 | 14.00 | 0.017 | -0.00258 |
| 14.00 | 0.017 | 15.00 | 0.015 | -0.00219 |
| 15.00 | 0.015 | 16.00 | 0.013 | -0.00186 |
| 16.00 | 0.013 | 17.00 | 0.011 | -0.00158 |
| 17.00 | 0.011 | 18.00 | 0.010 | -0.00135 |
| 18.00 | 0.010 | 19.00 | 0.009 | -0.00116 |
| 19.00 | 0.009 | 20.00 | 0.000 | -0.00889 |
| * | Wall 1 | Impact | | |
| 0.00 | 0.00 | 3.00 | 0.31 | 0.103 |
| 3.00 | 0.33 | 4.25 | 0.26 | -0.054 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 5.0 | 0.00 | 50.0 | 3.48 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 5.00 | 0.83 |

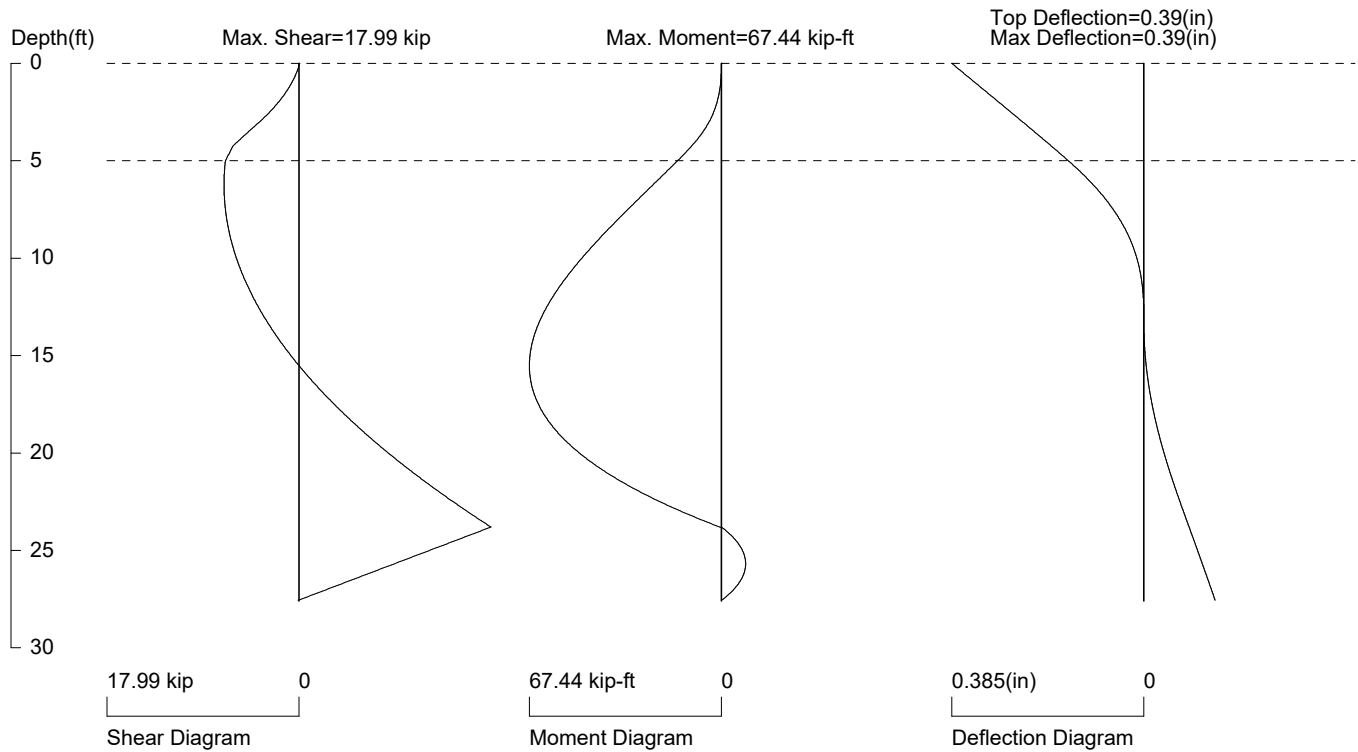
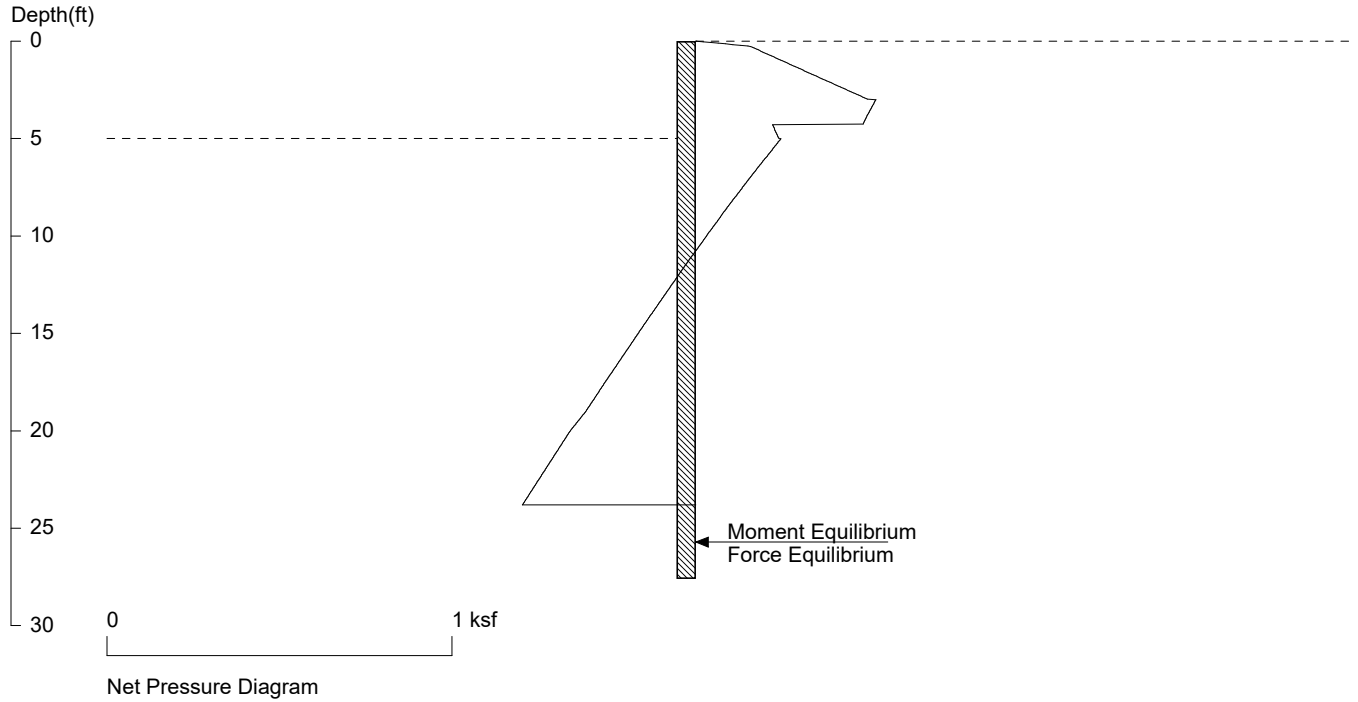
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 5.00 | 2.49 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

0+60 MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1

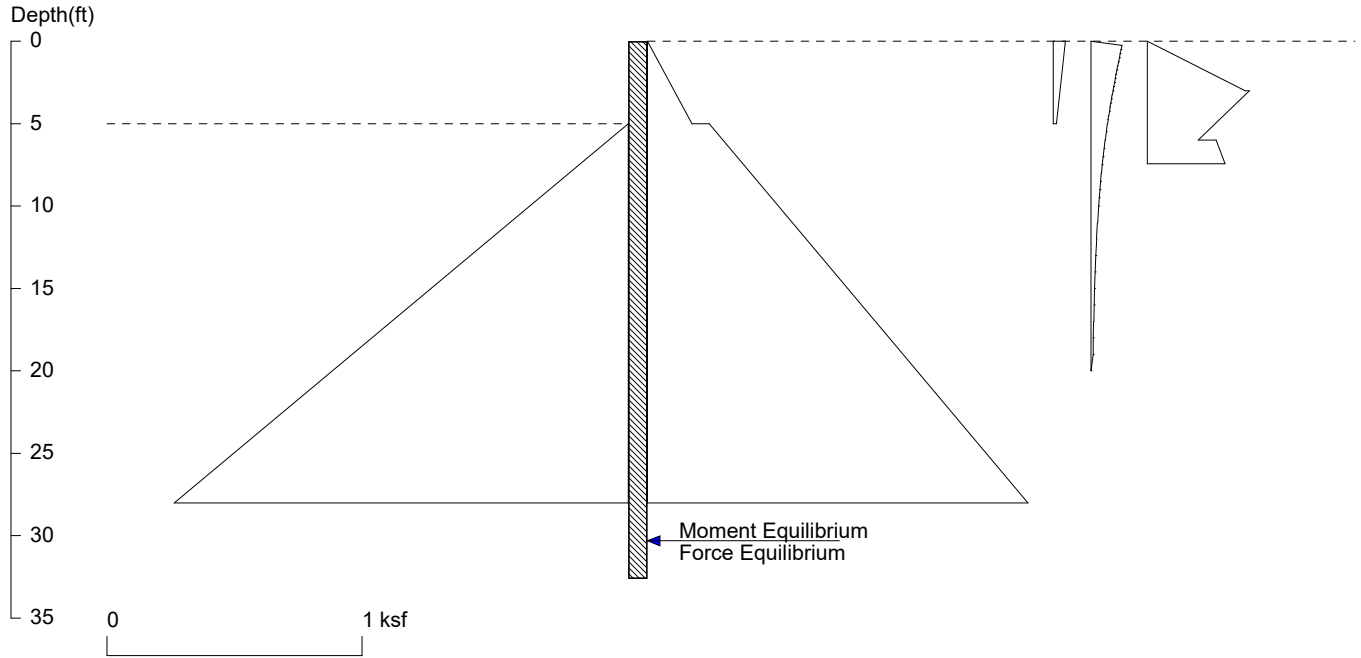


PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter
 User Input Pile, W10x77: E (ksi)=29000.0, I (in⁴)/pile=455.0
 File: C:\PROGRAM FILES (X86)\SepWallF2.sh8

0+60 EQ MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1



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 File: C:\PROGRAM FILES (X86)\SepWallF2.sh8

Wall Height=5.0 Pile Diameter=0.8 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=27.62 Min. Pile Length=32.62
 MOMENT IN PILE: Max. Moment=109.68 per Pile Spacing=4.0 at Depth=18.05

PILE SELECTION:

Request Min. Section Modulus = 39.9 in³/pile=653.57 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 W10X77 has Section Modulus = 85.9 in³/pile=1407.64 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 0.75(in) based on E (ksi)=29000.00 and I (in⁴)/pile=455.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|--------|-------|-----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 5.000 | 0.175 | 0.035027 |
| * | Below | Base | | |
| 5.000 | 0.242 | 50.000 | 2.688 | 0.054347 |
| * | Earth | Queck | | |
| 0.000 | 0.047 | 5.000 | 0.012 | -0.007017 |
| * | Sur- | charge | | |
| 0.000 | 0.000 | 0.250 | 0.122 | 0.486741 |
| 0.250 | 0.122 | 0.500 | 0.118 | -0.013236 |
| 0.500 | 0.118 | 0.750 | 0.115 | -0.013190 |
| 0.750 | 0.115 | 1.000 | 0.112 | -0.013122 |
| 1.000 | 0.112 | 1.250 | 0.109 | -0.013032 |
| 1.250 | 0.109 | 1.500 | 0.105 | -0.012921 |
| 1.500 | 0.105 | 1.750 | 0.102 | -0.012789 |
| 1.750 | 0.102 | 2.000 | 0.099 | -0.012637 |
| 2.000 | 0.099 | 2.250 | 0.096 | -0.012468 |
| 2.250 | 0.096 | 2.500 | 0.093 | -0.012281 |
| 2.500 | 0.093 | 2.750 | 0.090 | -0.012079 |

| | | | | |
|--------|--------|--------|-------|-----------|
| 2.750 | 0.090 | 3.000 | 0.087 | -0.011861 |
| 3.000 | 0.087 | 3.250 | 0.084 | -0.011631 |
| 3.250 | 0.084 | 3.500 | 0.081 | -0.011389 |
| 3.500 | 0.081 | 3.750 | 0.078 | -0.011137 |
| 3.750 | 0.078 | 4.000 | 0.076 | -0.010876 |
| 4.000 | 0.076 | 4.250 | 0.073 | -0.010608 |
| 4.250 | 0.073 | 4.500 | 0.070 | -0.010333 |
| 4.500 | 0.070 | 4.750 | 0.068 | -0.010054 |
| 4.750 | 0.068 | 5.000 | 0.065 | -0.009771 |
| 5.000 | 0.065 | 5.500 | 0.061 | -0.009344 |
| 5.500 | 0.061 | 6.000 | 0.056 | -0.008772 |
| 6.000 | 0.056 | 6.500 | 0.052 | -0.008207 |
| 6.500 | 0.052 | 7.000 | 0.048 | -0.007654 |
| 7.000 | 0.048 | 7.500 | 0.045 | -0.007119 |
| 7.500 | 0.045 | 8.000 | 0.041 | -0.006605 |
| 8.000 | 0.041 | 8.500 | 0.038 | -0.006117 |
| 8.500 | 0.038 | 9.000 | 0.036 | -0.005654 |
| 9.000 | 0.036 | 9.500 | 0.033 | -0.005220 |
| 9.500 | 0.033 | 10.000 | 0.031 | -0.004813 |
| 10.000 | 0.031 | 11.000 | 0.026 | -0.004259 |
| 11.000 | 0.026 | 12.000 | 0.023 | -0.003608 |
| 12.000 | 0.023 | 13.000 | 0.020 | -0.003054 |
| 13.000 | 0.020 | 14.000 | 0.017 | -0.002587 |
| 14.000 | 0.017 | 15.000 | 0.015 | -0.002194 |
| 15.000 | 0.015 | 16.000 | 0.013 | -0.001865 |
| 16.000 | 0.013 | 17.000 | 0.011 | -0.001589 |
| 17.000 | 0.011 | 18.000 | 0.010 | -0.001358 |
| 18.000 | 0.010 | 19.000 | 0.009 | -0.001164 |
| 19.000 | 0.009 | 20.000 | 0.000 | -0.008899 |
| * | Wall 1 | Impact | | |
| 0.00 | 0.00 | 3.00 | 0.38 | 0.128 |
| 3.00 | 0.40 | 6.00 | 0.20 | -0.067 |
| 6.00 | 0.27 | 7.43 | 0.31 | 0.024 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 5.0 | 0.00 | 50.0 | 3.48 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 5.00 | 0.83 |

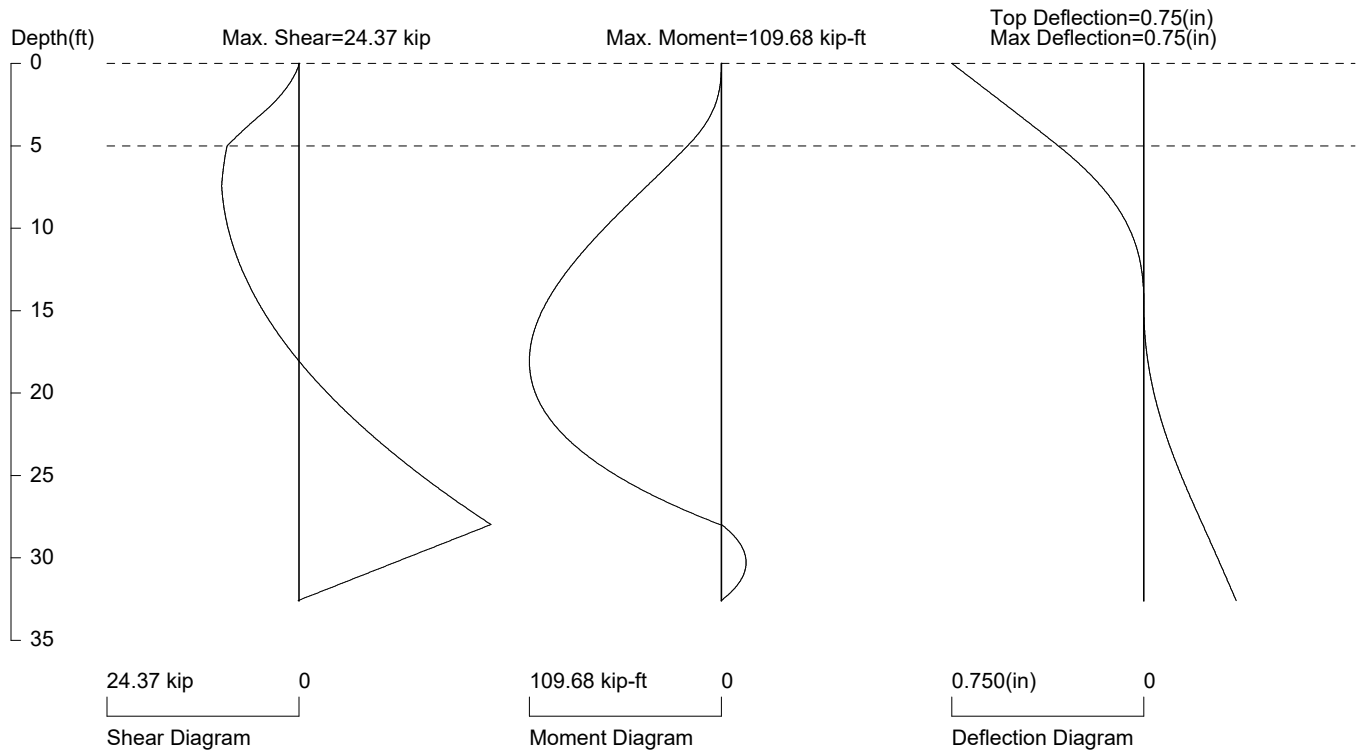
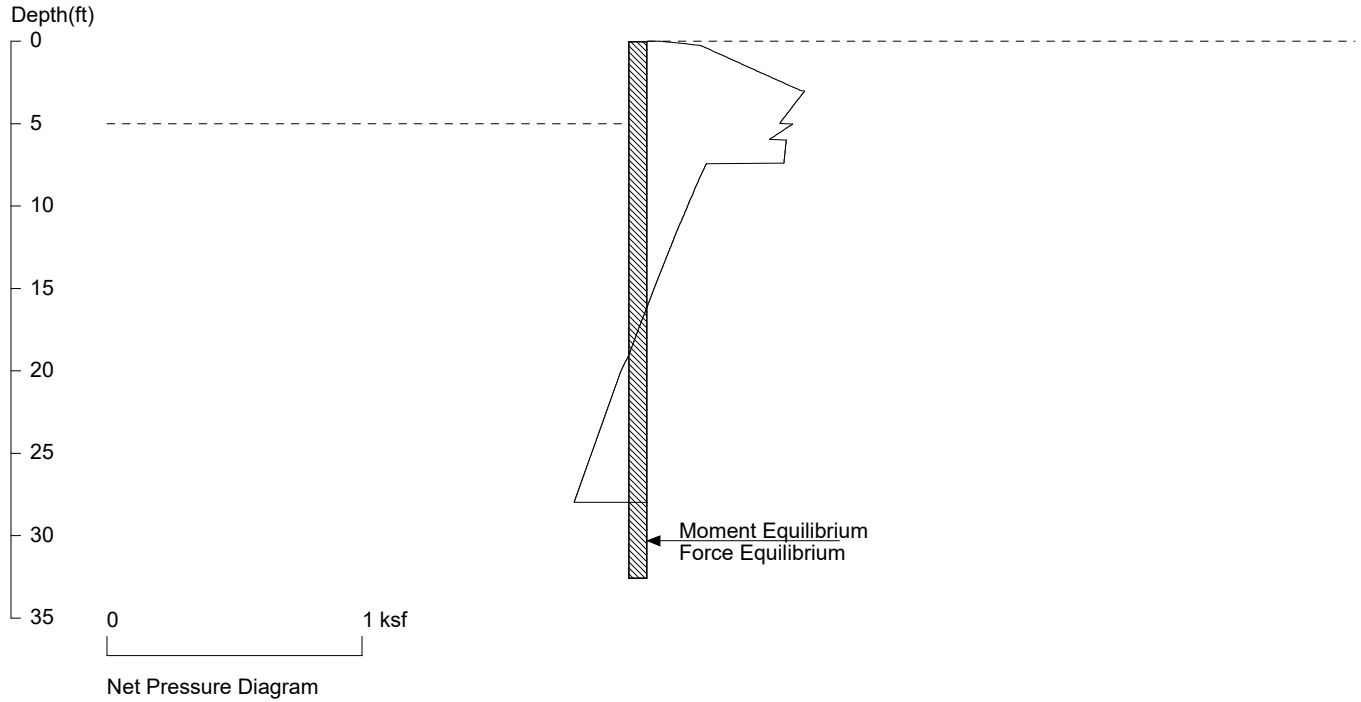
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 5.00 | 2.49 |

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

0+60 EQ MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1

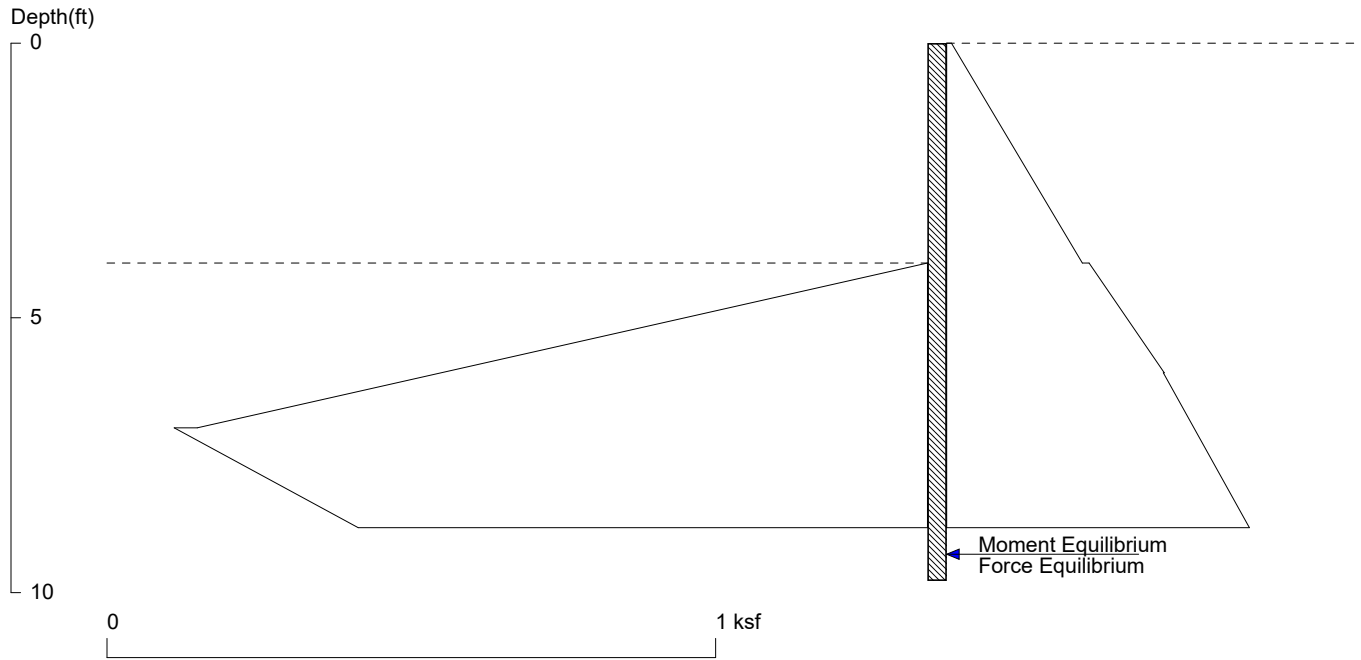


PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter
 User Input Pile, W10x77: E (ksi)=29000.0, I (in⁴)/pile=455.0
 File: C:\PROGRAM FILES (X86)\SepWallF2.sh8

0+80 MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis



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File: C:\PROGRAM FILES (X86)\SepWallF1.sh8

Wall Height=4.0 Pile Diameter=0.7 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=5.79 (8~10ft is recommended!!!) Min. Pile Length=9.79

MOMENT IN PILE: Max. Moment=5.67 per Pile Spacing=4.0 at Depth=6.41

PILE SELECTION:

Request Min. Section Modulus = 2.1 in³/pile=33.78 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66

W8X10 has Section Modulus = 7.8 in³/pile=127.98 cm³/pile. It is greater than Min. Requirements!

Top Deflection = 0.26(in) based on E (ksi)=29000.00 and I (in⁴)/pile=30.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|--------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.008 | 4.000 | 0.223 | 0.053665 |
| * | Below | Base | | |
| 4.000 | 0.234 | 6.000 | 0.358 | 0.061811 |
| 6.000 | 0.356 | 9.000 | 0.506 | 0.050071 |
| 9.000 | 0.504 | 12.000 | 0.642 | 0.045967 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|------|------|------|------|--------|
| 4.0 | 0.00 | 7.0 | 1.20 | 0.400 |
| 7.0 | 1.24 | 10.0 | 0.74 | -0.166 |
| 10.0 | 0.92 | 13.0 | 1.15 | 0.077 |
| 13.0 | 1.15 | 16.0 | 1.38 | 0.077 |
| 16.0 | 1.38 | 19.0 | 1.61 | 0.077 |
| 19.0 | 1.61 | 22.0 | 1.84 | 0.077 |
| 22.0 | 1.84 | 25.0 | 2.07 | 0.077 |
| 25.0 | 2.07 | 28.0 | 2.30 | 0.077 |
| 28.0 | 2.30 | 31.0 | 2.53 | 0.077 |

| | | | | |
|------|------|------|------|-------|
| 31.0 | 2.53 | 34.0 | 2.76 | 0.077 |
| 34.0 | 2.76 | 37.0 | 2.99 | 0.077 |
| 37.0 | 2.99 | 40.0 | 3.22 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 4.00 | 0.67 |

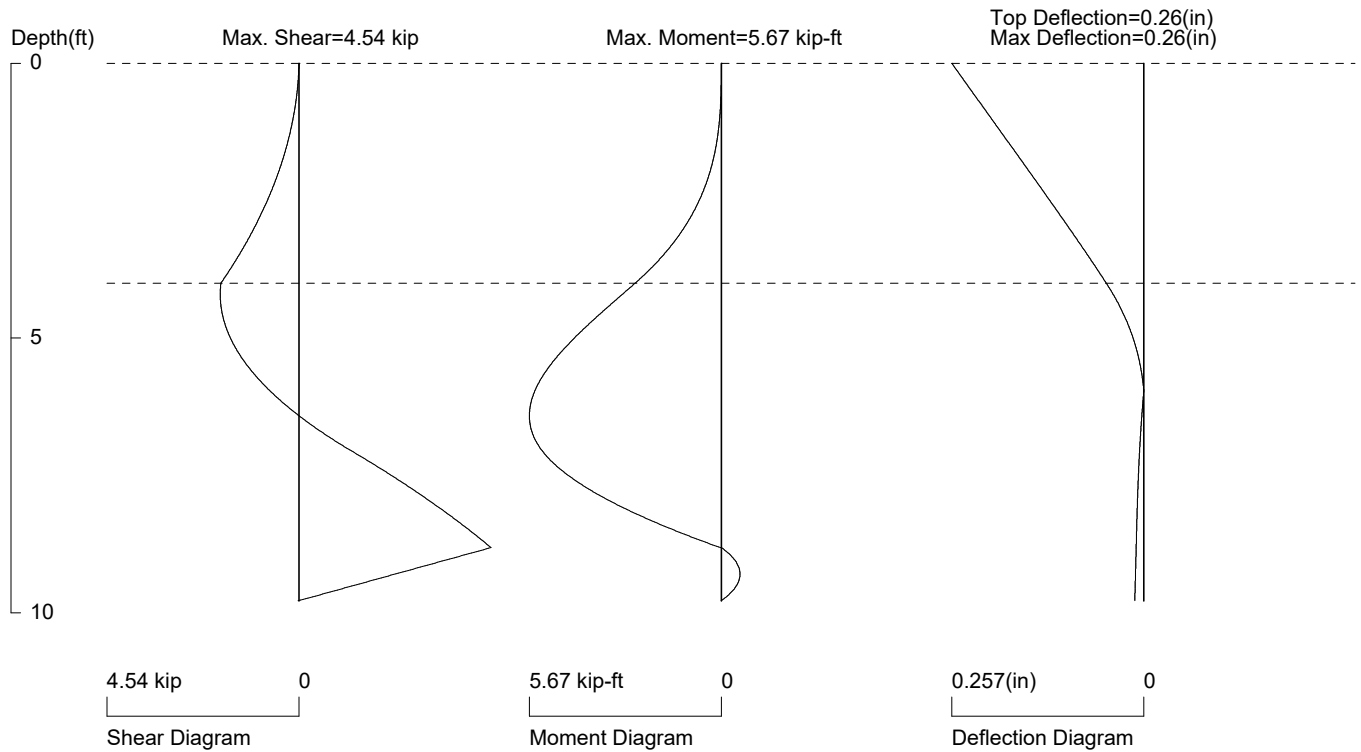
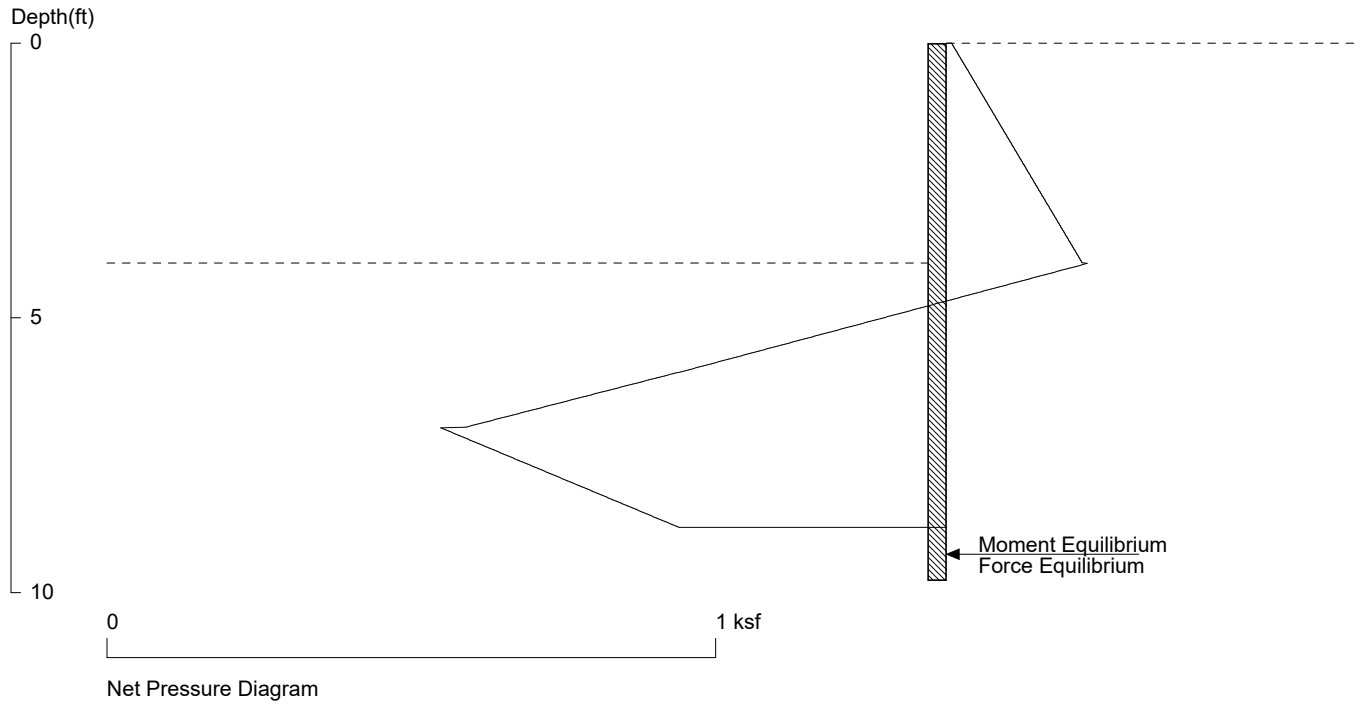
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 4.00 | 2.01 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

0+80 MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis

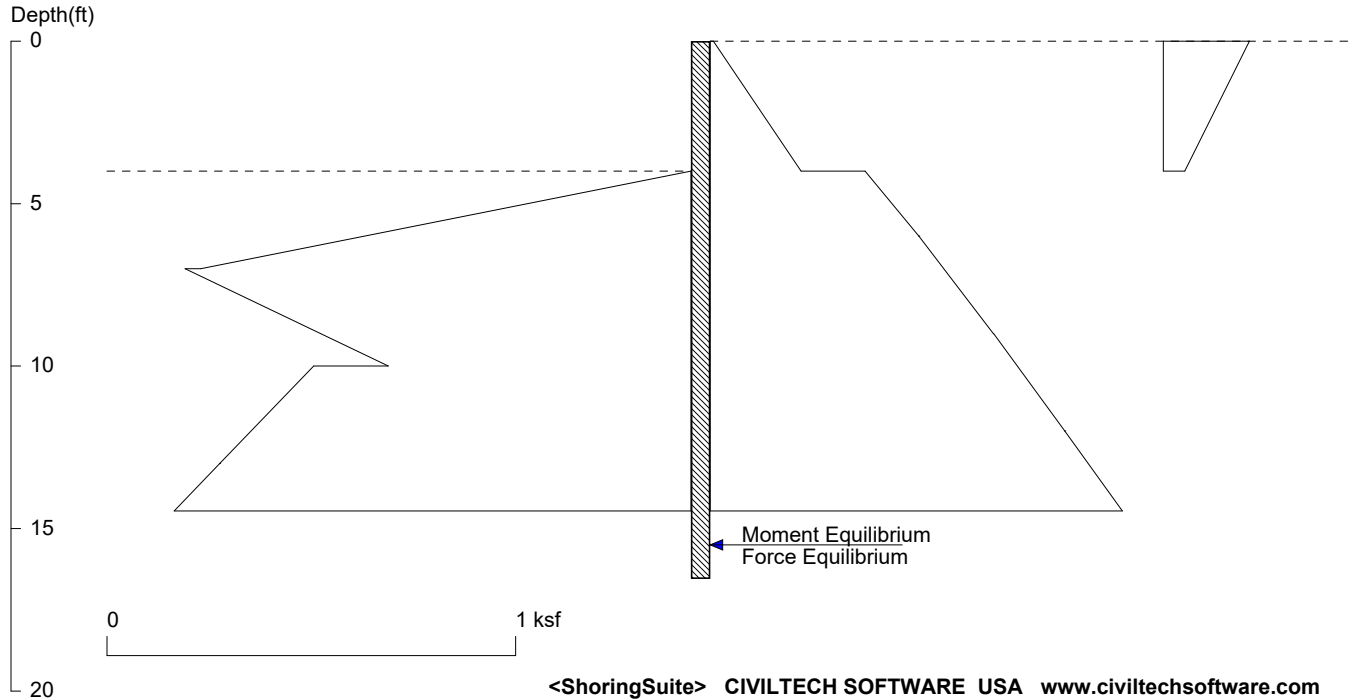


PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter
 User Input Pile, W8x10: E (ksi)=29000.0, I (in⁴)/pile=30.8
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0+80 EQ MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis



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Wall Height=4.0 Pile Diameter=0.5 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=12.55 Min. Pile Length=16.55
 MOMENT IN PILE: Max. Moment=19.13 per Pile Spacing=4.0 at Depth=8.43

PILE SELECTION:

Request Min. Section Modulus = 7.0 in³/pile=114.01 cm³/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
 W8X10 has Section Modulus = 7.8 in³/pile=127.98 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 1.01(in) based on E (ksi)=29000.00 and I (in⁴)/pile=30.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|--------|-------|--------|-------|-----------|
| * | Above | Base | | |
| 0.000 | 0.008 | 4.000 | 0.223 | 0.053665 |
| * | Below | Base | | |
| 4.000 | 0.379 | 6.000 | 0.510 | 0.065880 |
| 6.000 | 0.511 | 9.000 | 0.694 | 0.060886 |
| 9.000 | 0.694 | 12.000 | 0.868 | 0.058002 |
| 12.000 | 0.868 | 15.000 | 1.040 | 0.057368 |
| 15.000 | 1.036 | 18.000 | 1.206 | 0.056562 |
| * | Earth | Queck | | |
| 0.000 | 0.211 | 4.000 | 0.053 | -0.039517 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|------|------|------|------|--------|
| 4.0 | 0.00 | 7.0 | 1.20 | 0.400 |
| 7.0 | 1.24 | 10.0 | 0.74 | -0.166 |
| 10.0 | 0.92 | 13.0 | 1.15 | 0.077 |
| 13.0 | 1.15 | 16.0 | 1.38 | 0.077 |
| 16.0 | 1.38 | 19.0 | 1.61 | 0.077 |

| | | | | |
|------|------|------|------|-------|
| 19.0 | 1.61 | 22.0 | 1.84 | 0.077 |
| 22.0 | 1.84 | 25.0 | 2.07 | 0.077 |
| 25.0 | 2.07 | 28.0 | 2.30 | 0.077 |
| 28.0 | 2.30 | 31.0 | 2.53 | 0.077 |
| 31.0 | 2.53 | 34.0 | 2.76 | 0.077 |
| 34.0 | 2.76 | 37.0 | 2.99 | 0.077 |
| 37.0 | 2.99 | 40.0 | 3.22 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 4.00 | 0.50 |

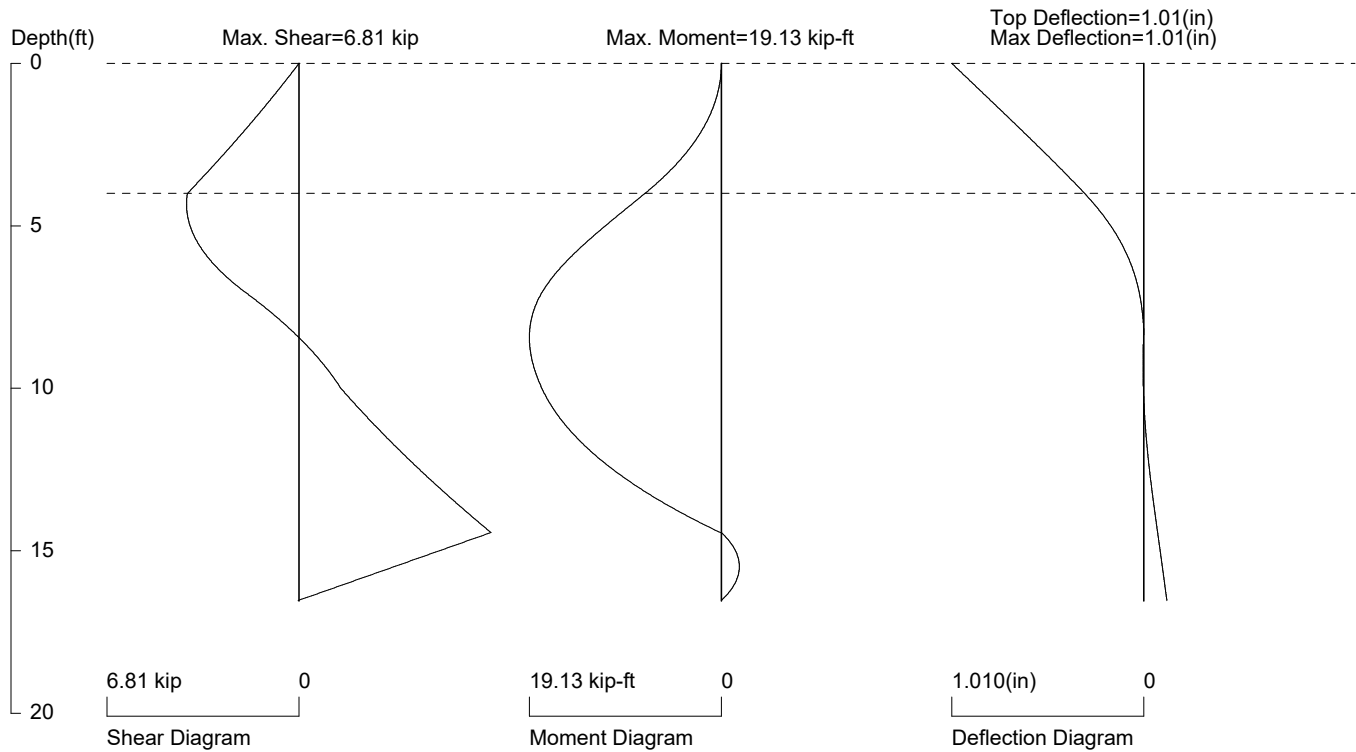
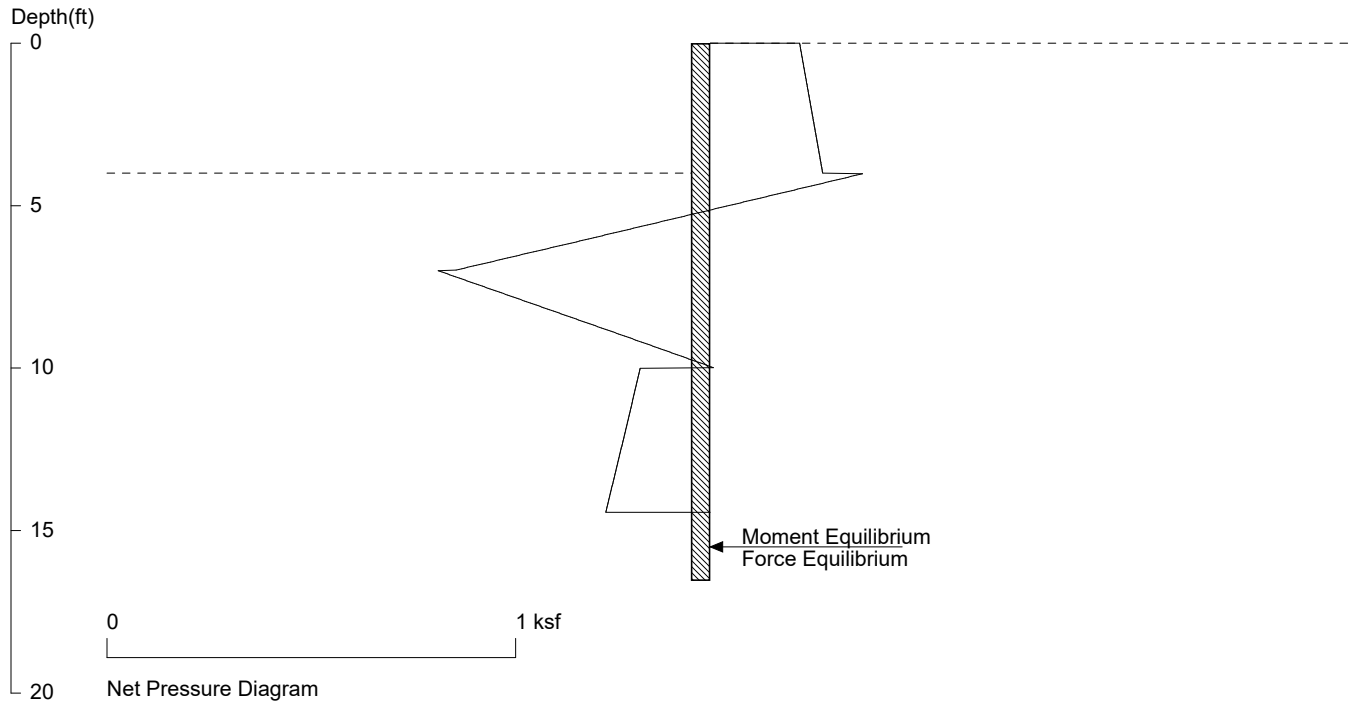
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 4.00 | 1.50 |

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

0+80 EQ MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis

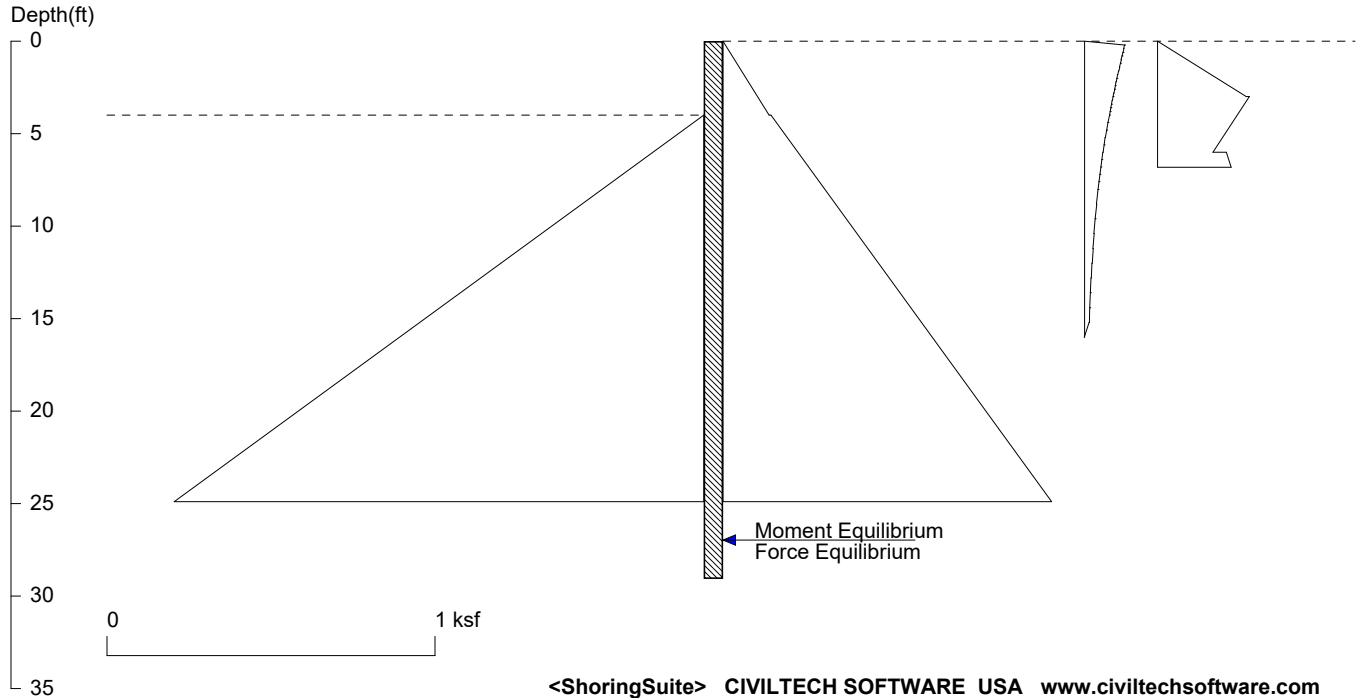


PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter
 User Input Pile, W8X10: E (ksi)=29000.0, I (in4)/pile=30.8
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0+80 MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1



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Wall Height=4.0 Pile Diameter=0.7 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=25.06 Min. Pile Length=29.06
 MOMENT IN PILE: Max. Moment=54.97 per Pile Spacing=4.0 at Depth=15.83

PILE SELECTION:

Request Min. Section Modulus = 20.0 in³/pile=327.55 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 W10X77 has Section Modulus = 85.9 in³/pile=1407.64 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 0.34(in) based on E (ksi)=29000.00 and I (in⁴)/pile=455.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|--------|-------|-----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 4.000 | 0.140 | 0.035027 |
| * | Below | Base | | |
| 4.000 | 0.146 | 40.000 | 1.621 | 0.040964 |
| * | Sur- | charge | | |
| 0.000 | 0.000 | 0.200 | 0.122 | 0.611739 |
| 0.200 | 0.122 | 0.400 | 0.120 | -0.013246 |
| 0.400 | 0.120 | 0.600 | 0.117 | -0.013216 |
| 0.600 | 0.117 | 0.800 | 0.114 | -0.013173 |
| 0.800 | 0.114 | 1.000 | 0.112 | -0.013114 |
| 1.000 | 0.112 | 1.200 | 0.109 | -0.013042 |
| 1.200 | 0.109 | 1.400 | 0.107 | -0.012956 |
| 1.400 | 0.107 | 1.600 | 0.104 | -0.012857 |
| 1.600 | 0.104 | 1.800 | 0.101 | -0.012746 |
| 1.800 | 0.101 | 2.000 | 0.099 | -0.012622 |
| 2.000 | 0.099 | 2.200 | 0.096 | -0.012486 |
| 2.200 | 0.096 | 2.400 | 0.094 | -0.012339 |
| 2.400 | 0.094 | 2.600 | 0.092 | -0.012182 |

| | | | | |
|--------|--------|--------|-------|-----------|
| 2.600 | 0.092 | 2.800 | 0.089 | -0.012015 |
| 2.800 | 0.089 | 3.000 | 0.087 | -0.011839 |
| 3.000 | 0.087 | 3.200 | 0.084 | -0.011655 |
| 3.200 | 0.084 | 3.400 | 0.082 | -0.011463 |
| 3.400 | 0.082 | 3.600 | 0.080 | -0.011265 |
| 3.600 | 0.080 | 3.800 | 0.078 | -0.011060 |
| 3.800 | 0.078 | 4.000 | 0.076 | -0.010850 |
| 4.000 | 0.076 | 4.400 | 0.071 | -0.010525 |
| 4.400 | 0.071 | 4.800 | 0.067 | -0.010082 |
| 4.800 | 0.067 | 5.200 | 0.063 | -0.009629 |
| 5.200 | 0.063 | 5.600 | 0.060 | -0.009172 |
| 5.600 | 0.060 | 6.000 | 0.056 | -0.008715 |
| 6.000 | 0.056 | 6.400 | 0.053 | -0.008263 |
| 6.400 | 0.053 | 6.800 | 0.050 | -0.007818 |
| 6.800 | 0.050 | 7.200 | 0.047 | -0.007384 |
| 7.200 | 0.047 | 7.600 | 0.044 | -0.006962 |
| 7.600 | 0.044 | 8.000 | 0.041 | -0.006555 |
| 8.000 | 0.041 | 8.800 | 0.037 | -0.005977 |
| 8.800 | 0.037 | 9.600 | 0.032 | -0.005264 |
| 9.600 | 0.032 | 10.400 | 0.029 | -0.004622 |
| 10.400 | 0.029 | 11.200 | 0.026 | -0.004051 |
| 11.200 | 0.026 | 12.000 | 0.023 | -0.003547 |
| 12.000 | 0.023 | 12.800 | 0.020 | -0.003104 |
| 12.800 | 0.020 | 13.600 | 0.018 | -0.002718 |
| 13.600 | 0.018 | 14.400 | 0.016 | -0.002381 |
| 14.400 | 0.016 | 15.200 | 0.014 | -0.002088 |
| 15.200 | 0.014 | 16.000 | 0.000 | -0.018098 |
| * | Wall 1 | Impact | | |
| 0.00 | 0.00 | 3.00 | 0.27 | 0.090 |
| 3.00 | 0.28 | 6.00 | 0.17 | -0.037 |
| 6.00 | 0.21 | 6.82 | 0.22 | 0.017 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 4.0 | 0.00 | 40.0 | 2.78 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 4.00 | 0.50 |

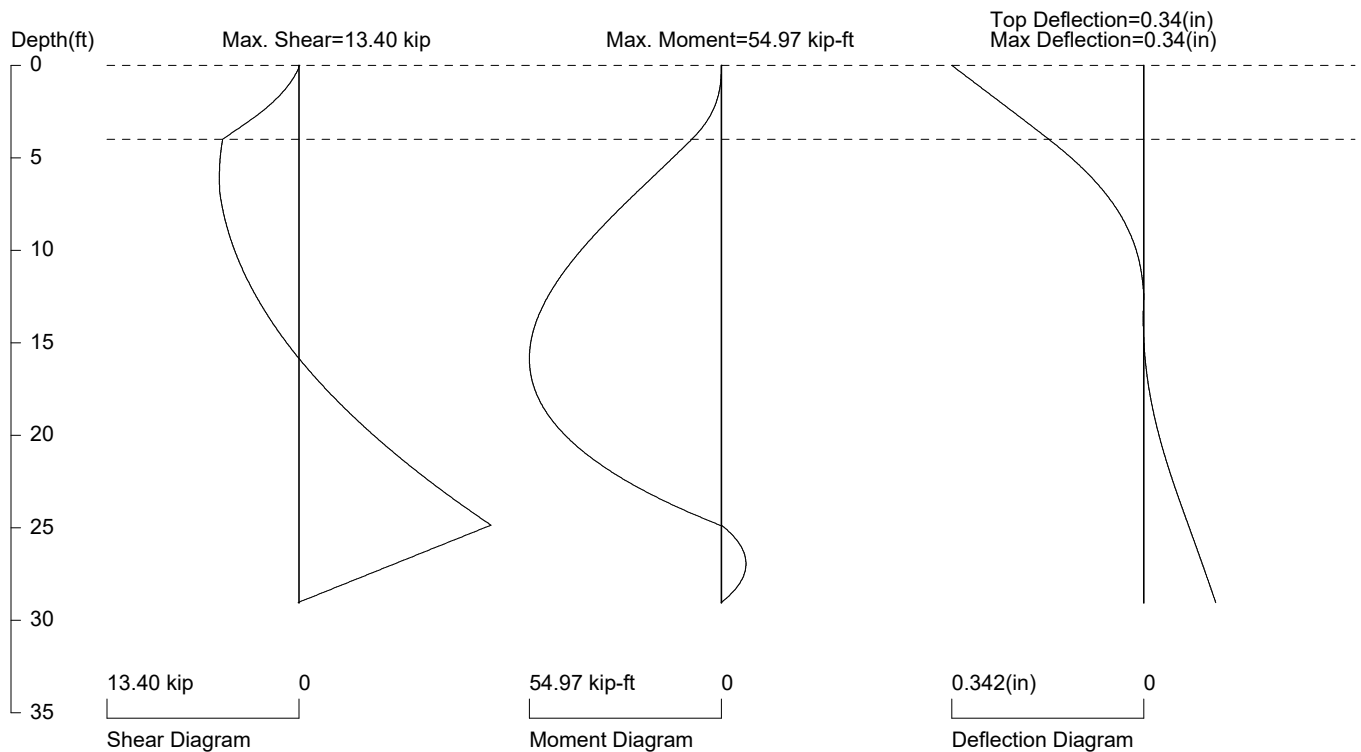
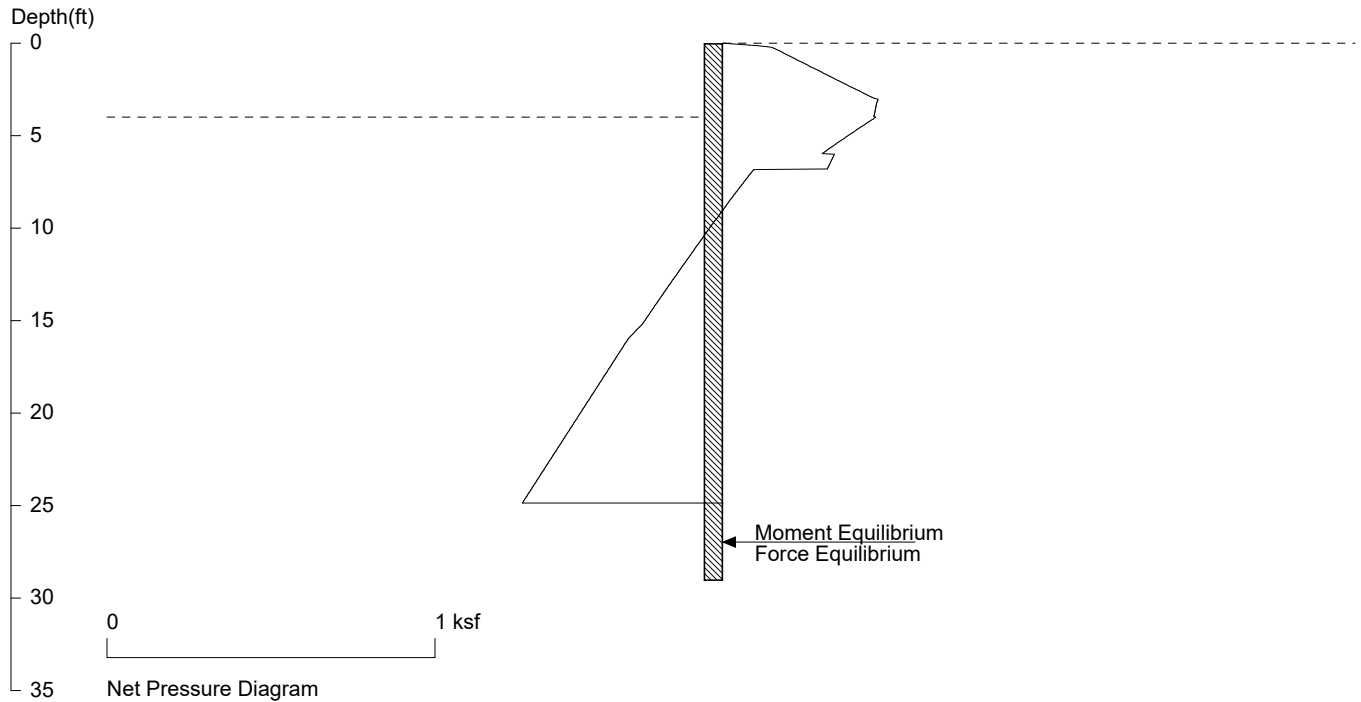
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 4.00 | 1.50 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

0+80 MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

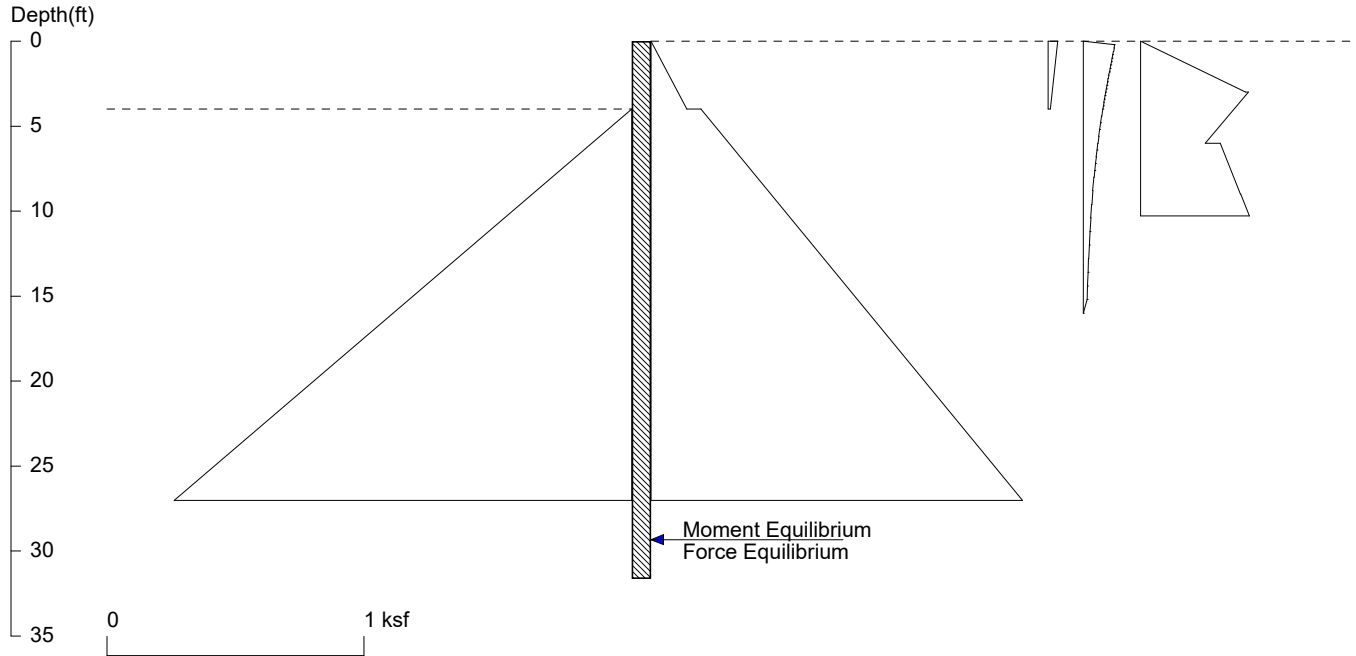
Based on pile spacing: 4.0 foot or meter

User Input Pile, W10x77: E (ksi)=29000.0, I (in⁴)/pile=455.0

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0+80 EQ MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1



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Wall Height=4.0

Pile Diameter=0.7

Pile Spacing=4.0

Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=27.63 Min. Pile Length=31.63

MOMENT IN PILE: Max. Moment=87.01 per Pile Spacing=4.0 at Depth=17.30

PILE SELECTION:

Request Min. Section Modulus = 31.6 in³/pile=518.48 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66

W10X77 has Section Modulus = 85.9 in³/pile=1407.64 cm³/pile. It is greater than Min. Requirements!

Top Deflection = 0.53(in) based on E (ksi)=29000.00 and I (in⁴)/pile=455.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|--------|-------|-----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 4.000 | 0.140 | 0.035027 |
| * | Below | Base | | |
| 4.000 | 0.194 | 40.000 | 2.150 | 0.054347 |
| * | Earth | Queck | | |
| 0.000 | 0.037 | 4.000 | 0.009 | -0.007017 |
| * | Sur- | charge | | |
| 0.000 | 0.000 | 0.200 | 0.122 | 0.611739 |
| 0.200 | 0.122 | 0.400 | 0.120 | -0.013246 |
| 0.400 | 0.120 | 0.600 | 0.117 | -0.013216 |
| 0.600 | 0.117 | 0.800 | 0.114 | -0.013173 |
| 0.800 | 0.114 | 1.000 | 0.112 | -0.013114 |
| 1.000 | 0.112 | 1.200 | 0.109 | -0.013042 |
| 1.200 | 0.109 | 1.400 | 0.107 | -0.012956 |
| 1.400 | 0.107 | 1.600 | 0.104 | -0.012857 |
| 1.600 | 0.104 | 1.800 | 0.101 | -0.012746 |
| 1.800 | 0.101 | 2.000 | 0.099 | -0.012622 |
| 2.000 | 0.099 | 2.200 | 0.096 | -0.012486 |

| | | | | |
|--------|--------|--------|-------|-----------|
| 2.200 | 0.096 | 2.400 | 0.094 | -0.012339 |
| 2.400 | 0.094 | 2.600 | 0.092 | -0.012182 |
| 2.600 | 0.092 | 2.800 | 0.089 | -0.012015 |
| 2.800 | 0.089 | 3.000 | 0.087 | -0.011839 |
| 3.000 | 0.087 | 3.200 | 0.084 | -0.011655 |
| 3.200 | 0.084 | 3.400 | 0.082 | -0.011463 |
| 3.400 | 0.082 | 3.600 | 0.080 | -0.011265 |
| 3.600 | 0.080 | 3.800 | 0.078 | -0.011060 |
| 3.800 | 0.078 | 4.000 | 0.076 | -0.010850 |
| 4.000 | 0.076 | 4.400 | 0.071 | -0.010525 |
| 4.400 | 0.071 | 4.800 | 0.067 | -0.010082 |
| 4.800 | 0.067 | 5.200 | 0.063 | -0.009629 |
| 5.200 | 0.063 | 5.600 | 0.060 | -0.009172 |
| 5.600 | 0.060 | 6.000 | 0.056 | -0.008715 |
| 6.000 | 0.056 | 6.400 | 0.053 | -0.008263 |
| 6.400 | 0.053 | 6.800 | 0.050 | -0.007818 |
| 6.800 | 0.050 | 7.200 | 0.047 | -0.007384 |
| 7.200 | 0.047 | 7.600 | 0.044 | -0.006962 |
| 7.600 | 0.044 | 8.000 | 0.041 | -0.006555 |
| 8.000 | 0.041 | 8.800 | 0.037 | -0.005977 |
| 8.800 | 0.037 | 9.600 | 0.032 | -0.005264 |
| 9.600 | 0.032 | 10.400 | 0.029 | -0.004622 |
| 10.400 | 0.029 | 11.200 | 0.026 | -0.004051 |
| 11.200 | 0.026 | 12.000 | 0.023 | -0.003547 |
| 12.000 | 0.023 | 12.800 | 0.020 | -0.003104 |
| 12.800 | 0.020 | 13.600 | 0.018 | -0.002718 |
| 13.600 | 0.018 | 14.400 | 0.016 | -0.002381 |
| 14.400 | 0.016 | 15.200 | 0.014 | -0.002088 |
| 15.200 | 0.014 | 16.000 | 0.000 | -0.018098 |
| * | Wall 1 | Impact | | |
| 0.00 | 0.00 | 3.00 | 0.41 | 0.136 |
| 3.00 | 0.42 | 6.00 | 0.25 | -0.056 |
| 6.00 | 0.31 | 9.00 | 0.39 | 0.026 |
| 9.00 | 0.39 | 10.28 | 0.42 | 0.026 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 4.0 | 0.00 | 40.0 | 2.78 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 4.00 | 0.67 |

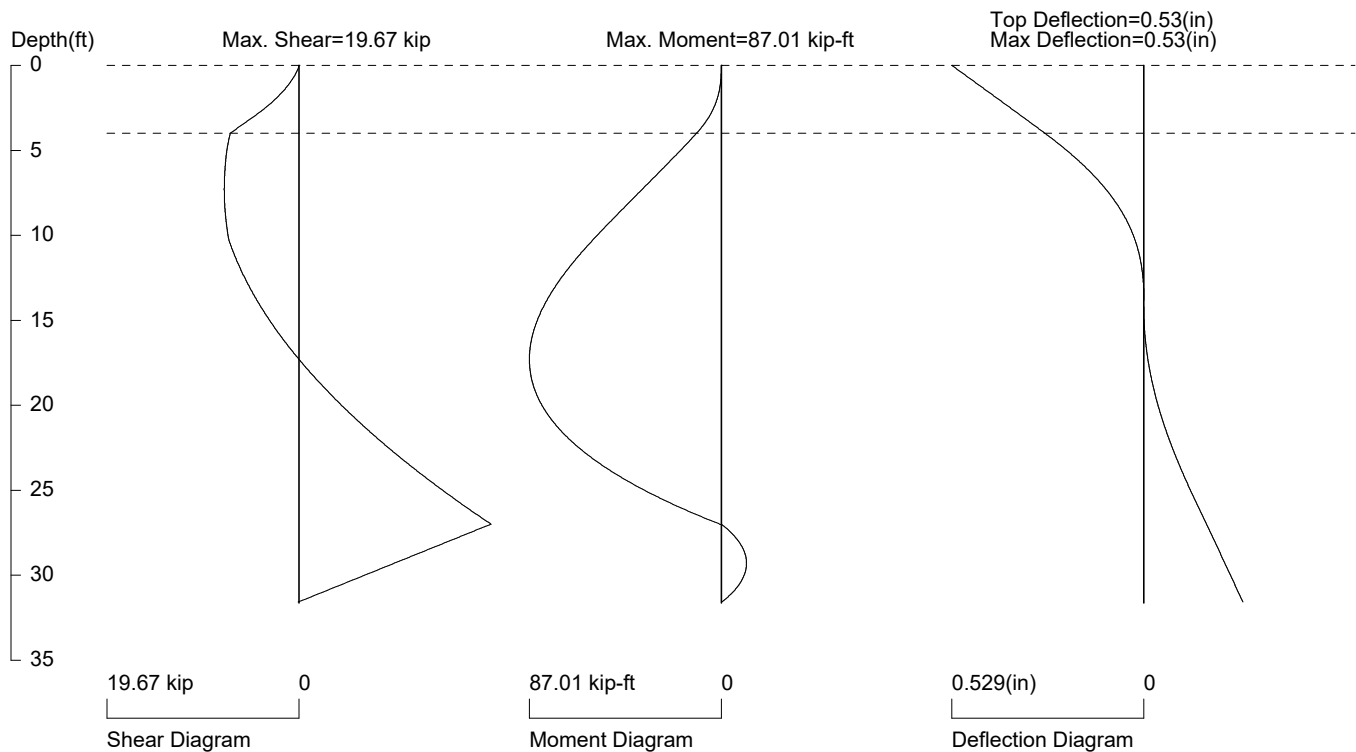
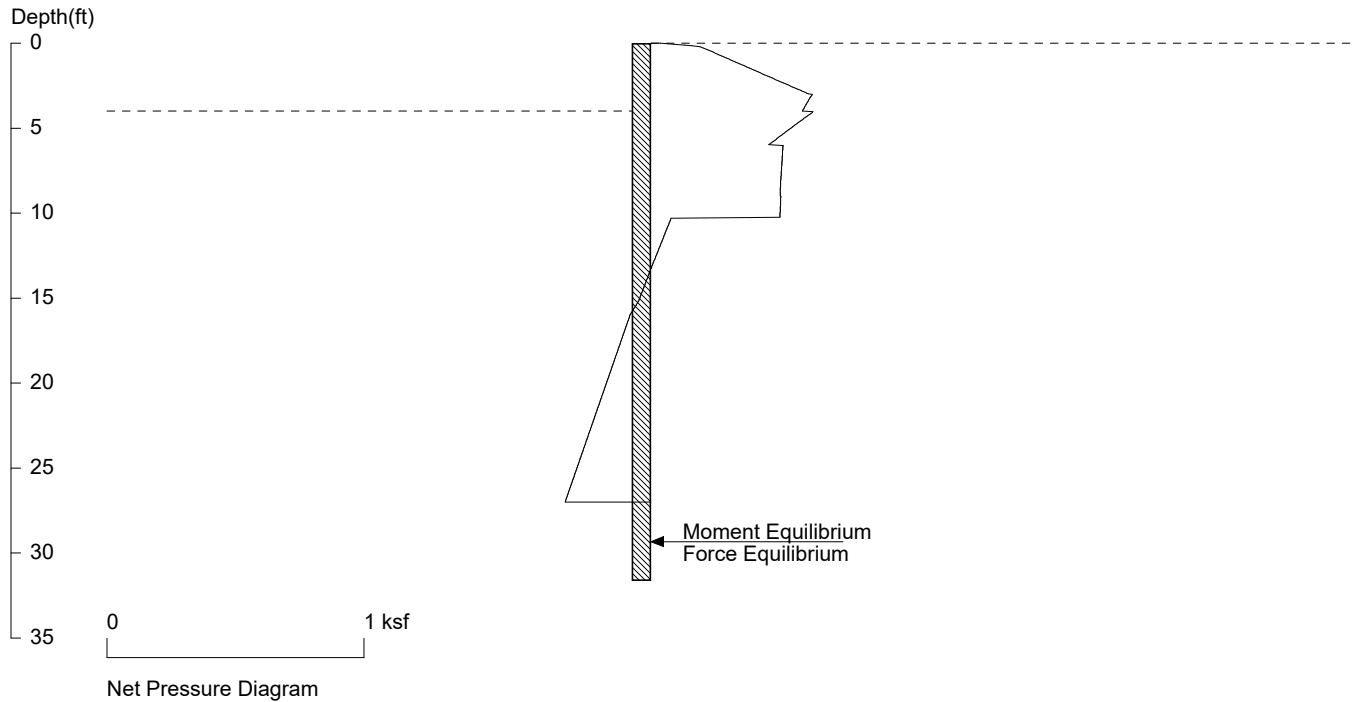
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 4.00 | 2.01 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

0+80 EQ MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

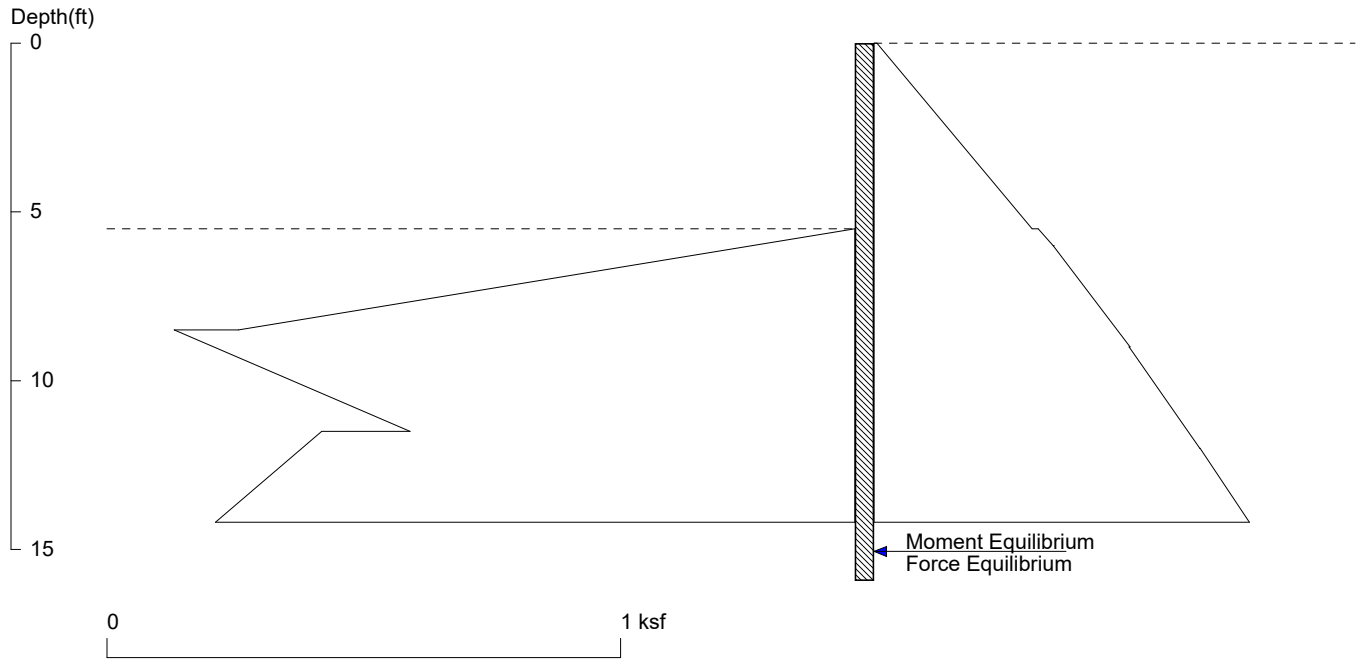
Based on pile spacing: 4.0 foot or meter

User Input Pile, W10x77: E (ksi)=29000.0, I (in⁴)/pile=455.0

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1+00 MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis



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Wall Height=5.5 Pile Diameter=0.5 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=10.43 Min. Pile Length=15.93
 MOMENT IN PILE: Max. Moment=15.50 per Pile Spacing=4.0 at Depth=9.31

PILE SELECTION:

Request Min. Section Modulus = 5.6 in³/pile=92.35 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 W8X18 has Section Modulus = 15.2 in³/pile=249.08 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 0.46(in) based on E (ksi)=29000.00 and I (in⁴)/pile=61.9

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|--------|-------|--------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.006 | 5.500 | 0.308 | 0.054905 |
| * | Below | Base | | |
| 5.500 | 0.320 | 6.000 | 0.349 | 0.058295 |
| 6.000 | 0.349 | 9.000 | 0.499 | 0.049944 |
| 9.000 | 0.497 | 12.000 | 0.635 | 0.045948 |
| 12.000 | 0.635 | 15.000 | 0.767 | 0.043847 |
| 15.000 | 0.764 | 18.000 | 0.898 | 0.044707 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|------|------|------|------|--------|
| 5.5 | 0.00 | 8.5 | 1.20 | 0.400 |
| 8.5 | 1.33 | 11.5 | 0.87 | -0.153 |
| 11.5 | 1.04 | 14.5 | 1.27 | 0.077 |
| 14.5 | 1.27 | 17.5 | 1.50 | 0.077 |
| 17.5 | 1.50 | 20.5 | 1.73 | 0.077 |
| 20.5 | 1.73 | 23.5 | 1.96 | 0.077 |
| 23.5 | 1.96 | 26.5 | 2.19 | 0.077 |

| | | | | |
|------|------|------|------|-------|
| 26.5 | 2.19 | 29.5 | 2.42 | 0.077 |
| 29.5 | 2.42 | 32.5 | 2.65 | 0.077 |
| 32.5 | 2.65 | 35.5 | 2.88 | 0.077 |
| 35.5 | 2.88 | 38.5 | 3.11 | 0.077 |
| 38.5 | 3.11 | 41.5 | 3.34 | 0.077 |
| 41.5 | 3.34 | 44.5 | 3.57 | 0.077 |
| 44.5 | 3.57 | 47.5 | 3.80 | 0.077 |
| 47.5 | 3.80 | 50.5 | 4.03 | 0.077 |
| 50.5 | 4.03 | 53.5 | 4.26 | 0.077 |
| 53.5 | 4.26 | 55.0 | 4.38 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 5.50 | 0.50 |

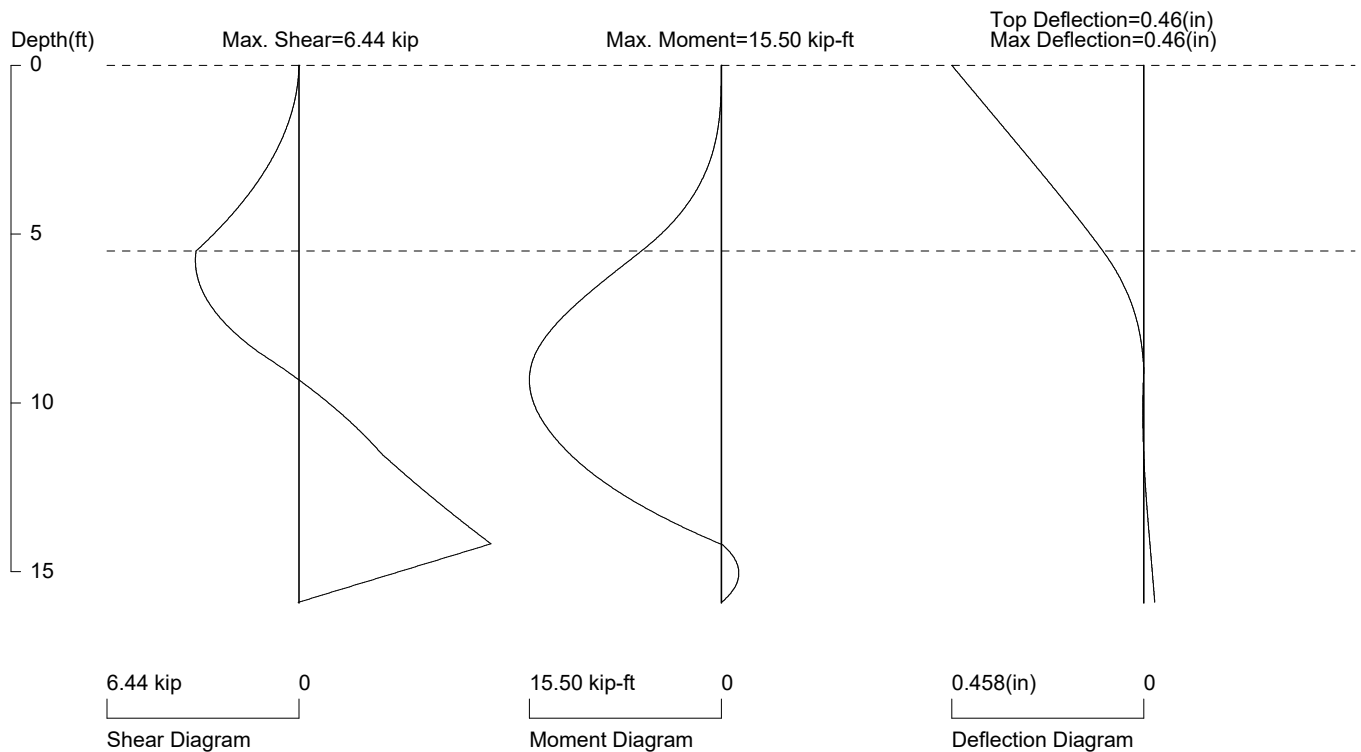
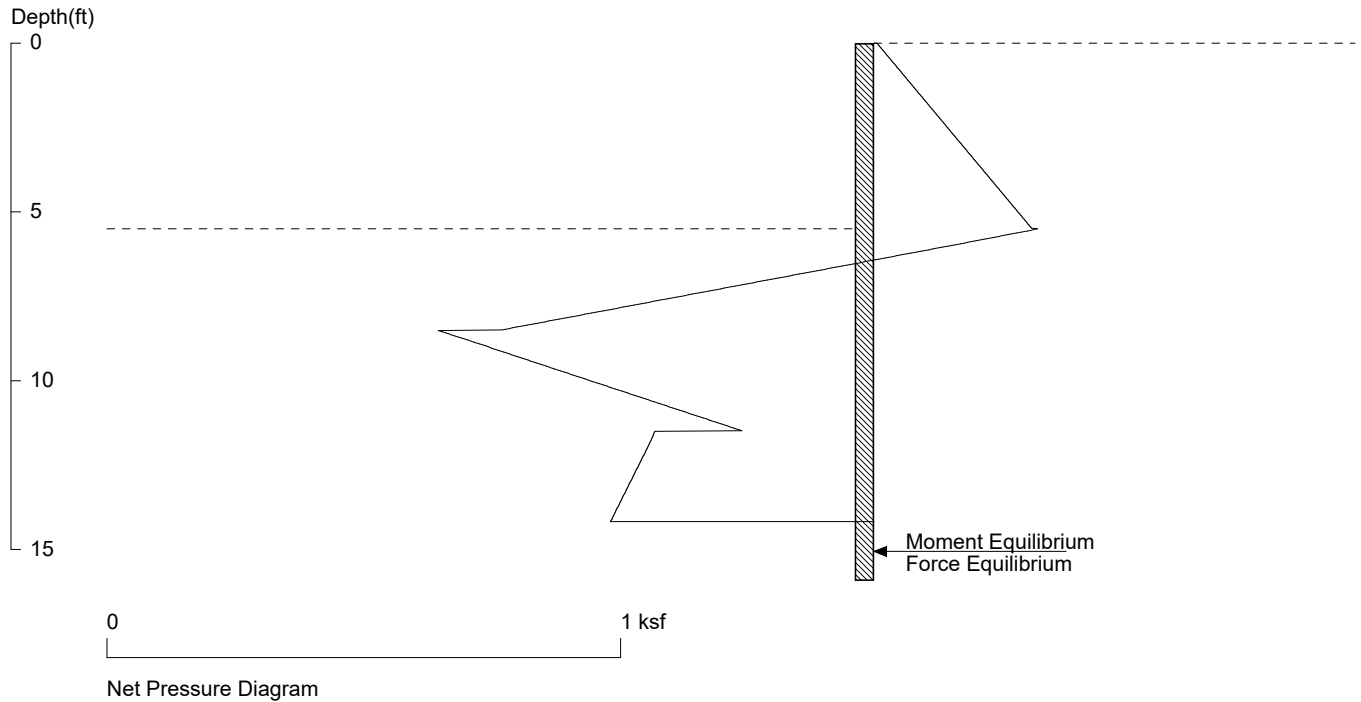
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 5.50 | 1.50 |

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

1+00 MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter

User Input Pile, W8X18: E (ksi)=29000.0, I (in4)/pile=61.9

File: C:\PROGRAM FILES (X86)\SepWallF1.sh8

| | | | | |
|------|------|------|------|-------|
| 14.5 | 1.27 | 17.5 | 1.50 | 0.077 |
| 17.5 | 1.50 | 20.5 | 1.73 | 0.077 |
| 20.5 | 1.73 | 23.5 | 1.96 | 0.077 |
| 23.5 | 1.96 | 26.5 | 2.19 | 0.077 |
| 26.5 | 2.19 | 29.5 | 2.42 | 0.077 |
| 29.5 | 2.42 | 32.5 | 2.65 | 0.077 |
| 32.5 | 2.65 | 35.5 | 2.88 | 0.077 |
| 35.5 | 2.88 | 38.5 | 3.11 | 0.077 |
| 38.5 | 3.11 | 41.5 | 3.34 | 0.077 |
| 41.5 | 3.34 | 44.5 | 3.57 | 0.077 |
| 44.5 | 3.57 | 47.5 | 3.80 | 0.077 |
| 47.5 | 3.80 | 50.5 | 4.03 | 0.077 |
| 50.5 | 4.03 | 53.5 | 4.26 | 0.077 |
| 53.5 | 4.26 | 55.0 | 4.38 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 5.50 | 0.50 |

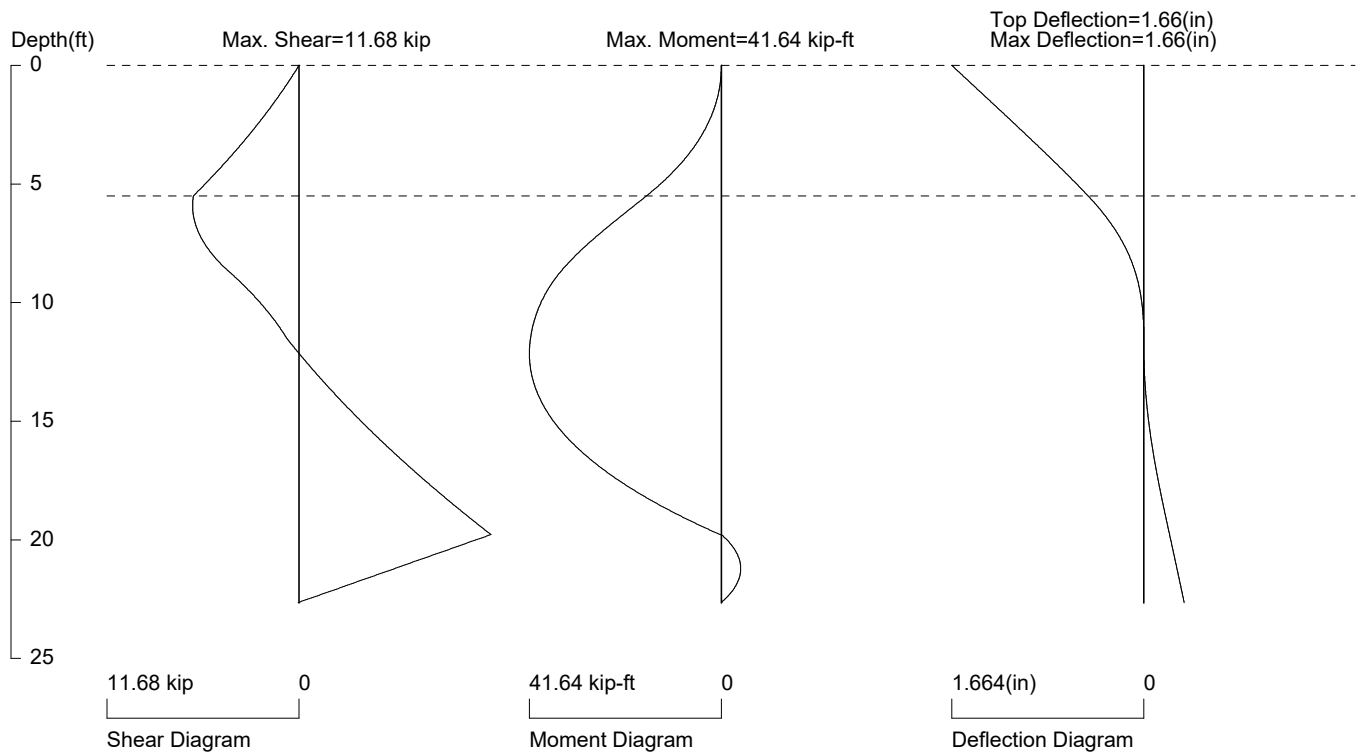
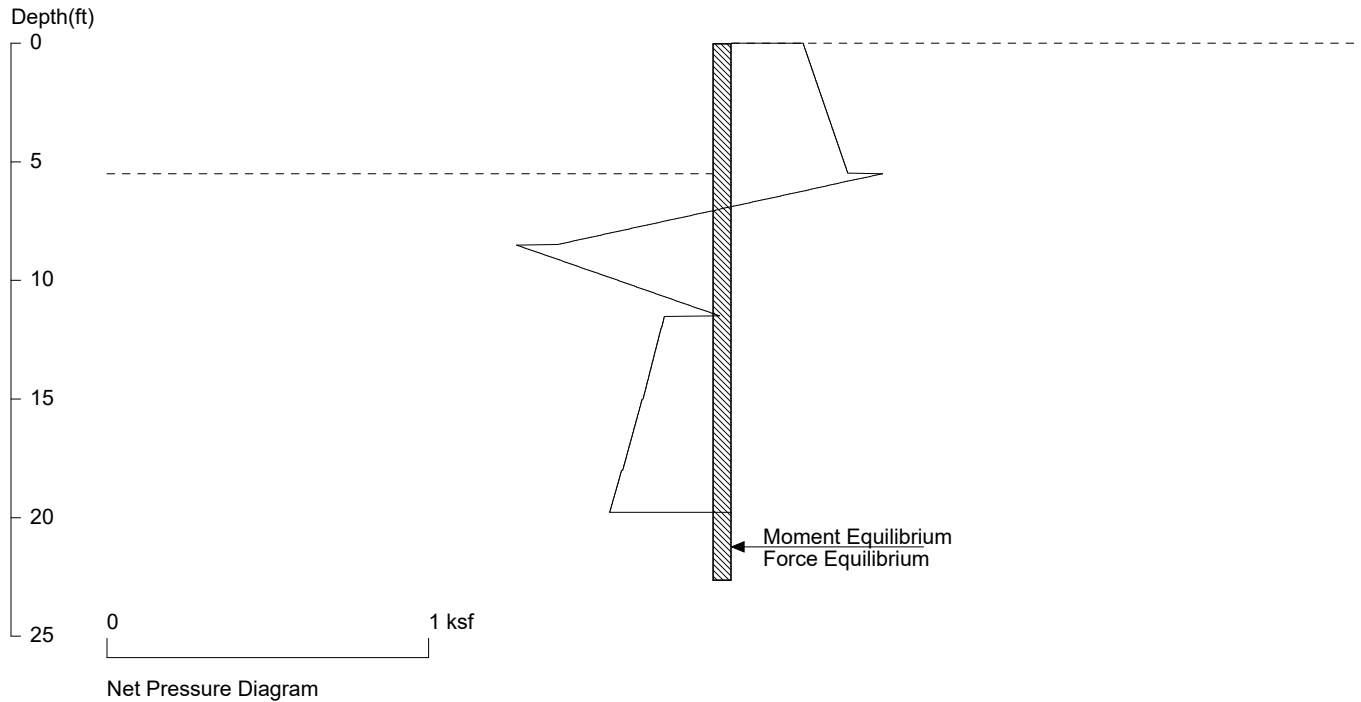
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 5.50 | 1.50 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

1+00 EQ MIDDLE LOT WALL PRESSURES UPPER

Two Wall Case, Step 1: Wall 1 Analysis



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

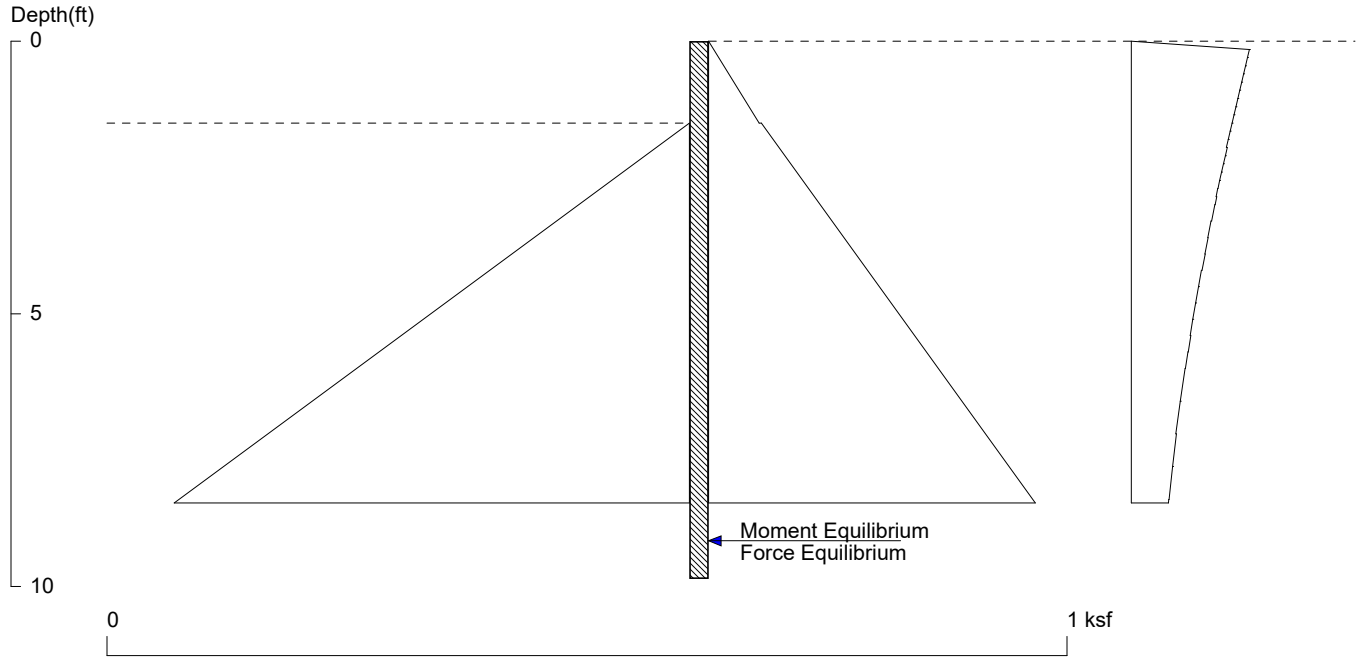
Based on pile spacing: 4.0 foot or meter

User Input Pile, W8X18: E (ksi)=29000.0, I (in⁴)/pile=61.9

File: C:\PROGRAM FILES (X86)\SepWallF1.sh8

1+00 MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 2: Wall 2 Analysis



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Wall Height=1.5 Pile Diameter=0.8 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=8.36 Min. Pile Length=9.86
 MOMENT IN PILE: Max. Moment=3.07 per Pile Spacing=4.0 at Depth=5.51

PILE SELECTION:

Request Min. Section Modulus = 1.1 in³/pile=18.30 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 W10X77 has Section Modulus = 85.9 in³/pile=1407.64 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 0.05(in) based on E (ksi)=29000.00 and I (in⁴)/pile=455.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|-------|-------|----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 1.500 | 0.053 | 0.035027 |
| * | Below | Base | | |
| 1.500 | 0.055 | 15.00 | 0.608 | 0.040964 |
| * | Sur- | charg | | |
| 0.000 | 0.000 | 0.150 | 0.123 | 0.820072 |
| 0.150 | 0.123 | 0.300 | 0.121 | -0.01325 |
| 0.300 | 0.121 | 0.450 | 0.119 | -0.01323 |
| 0.450 | 0.119 | 0.600 | 0.117 | -0.01321 |
| 0.600 | 0.117 | 0.750 | 0.115 | -0.01317 |
| 0.750 | 0.115 | 0.900 | 0.113 | -0.01313 |
| 0.900 | 0.113 | 1.050 | 0.111 | -0.01308 |
| 1.050 | 0.111 | 1.200 | 0.109 | -0.01303 |
| 1.200 | 0.109 | 1.350 | 0.107 | -0.01296 |
| 1.350 | 0.107 | 1.500 | 0.105 | -0.01289 |
| 1.500 | 0.105 | 1.650 | 0.103 | -0.01281 |
| 1.650 | 0.103 | 1.800 | 0.101 | -0.01273 |
| 1.800 | 0.101 | 1.950 | 0.100 | -0.01263 |

| | | | | |
|-------|-------|-------|-------|----------|
| 1.950 | 0.100 | 2.100 | 0.098 | -0.01253 |
| 2.100 | 0.098 | 2.250 | 0.096 | -0.01243 |
| 2.250 | 0.096 | 2.400 | 0.094 | -0.01232 |
| 2.400 | 0.094 | 2.550 | 0.092 | -0.01220 |
| 2.550 | 0.092 | 2.700 | 0.090 | -0.01207 |
| 2.700 | 0.090 | 2.850 | 0.089 | -0.01195 |
| 2.850 | 0.089 | 3.000 | 0.087 | -0.01181 |
| 3.000 | 0.087 | 3.300 | 0.083 | -0.01160 |
| 3.300 | 0.083 | 3.600 | 0.080 | -0.01131 |
| 3.600 | 0.080 | 3.900 | 0.077 | -0.01100 |
| 3.900 | 0.077 | 4.200 | 0.073 | -0.01068 |
| 4.200 | 0.073 | 4.500 | 0.070 | -0.01036 |
| 4.500 | 0.070 | 4.800 | 0.067 | -0.01002 |
| 4.800 | 0.067 | 5.100 | 0.064 | -0.00968 |
| 5.100 | 0.064 | 5.400 | 0.062 | -0.00934 |
| 5.400 | 0.062 | 5.700 | 0.059 | -0.00900 |
| 5.700 | 0.059 | 6.000 | 0.056 | -0.00865 |
| 6.000 | 0.056 | 6.600 | 0.051 | -0.00815 |
| 6.600 | 0.051 | 7.200 | 0.047 | -0.00749 |
| 7.200 | 0.047 | 7.800 | 0.043 | -0.00686 |
| 7.800 | 0.043 | 8.400 | 0.039 | -0.00626 |
| 8.400 | 0.039 | 9.000 | 0.036 | -0.00570 |
| 9.000 | 0.036 | 9.600 | 0.032 | -0.00517 |
| 9.600 | 0.032 | 10.20 | 0.030 | -0.00469 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 1.5 | 0.00 | 15.0 | 1.04 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 1.50 | 0.83 |

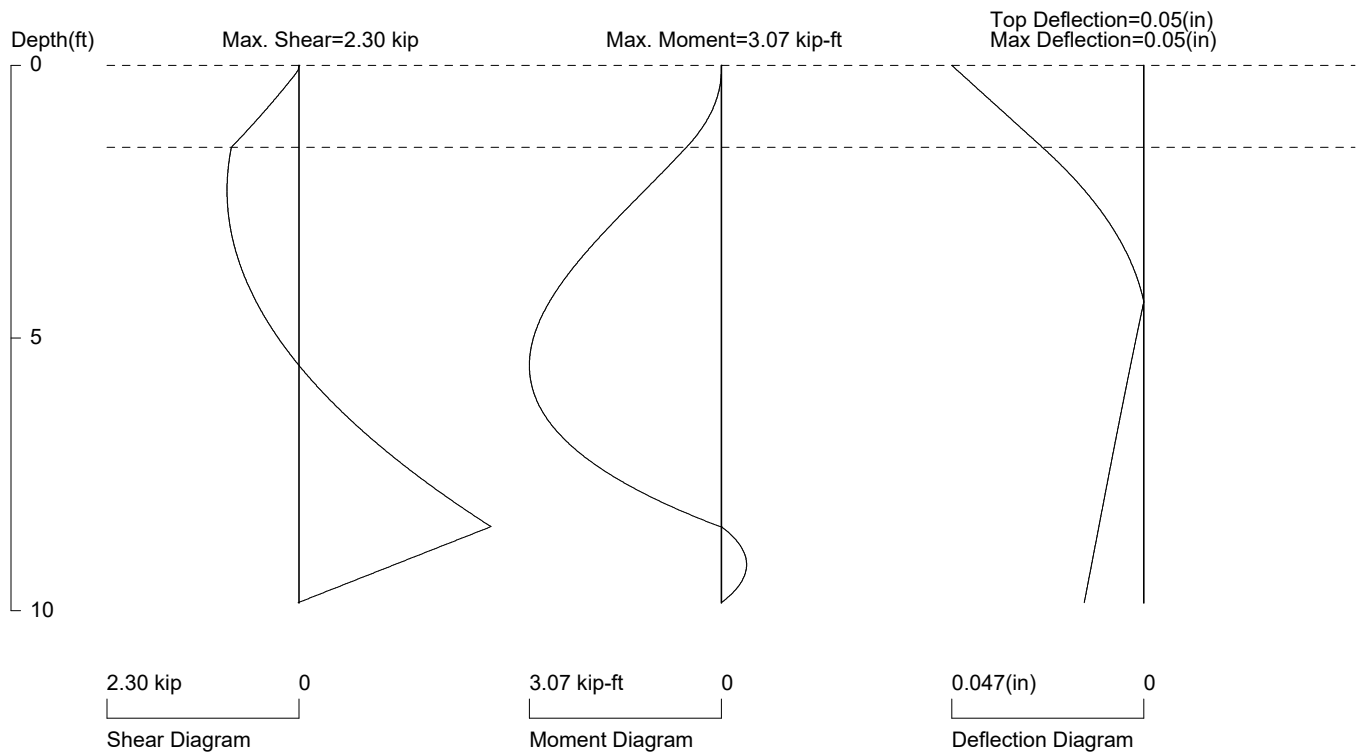
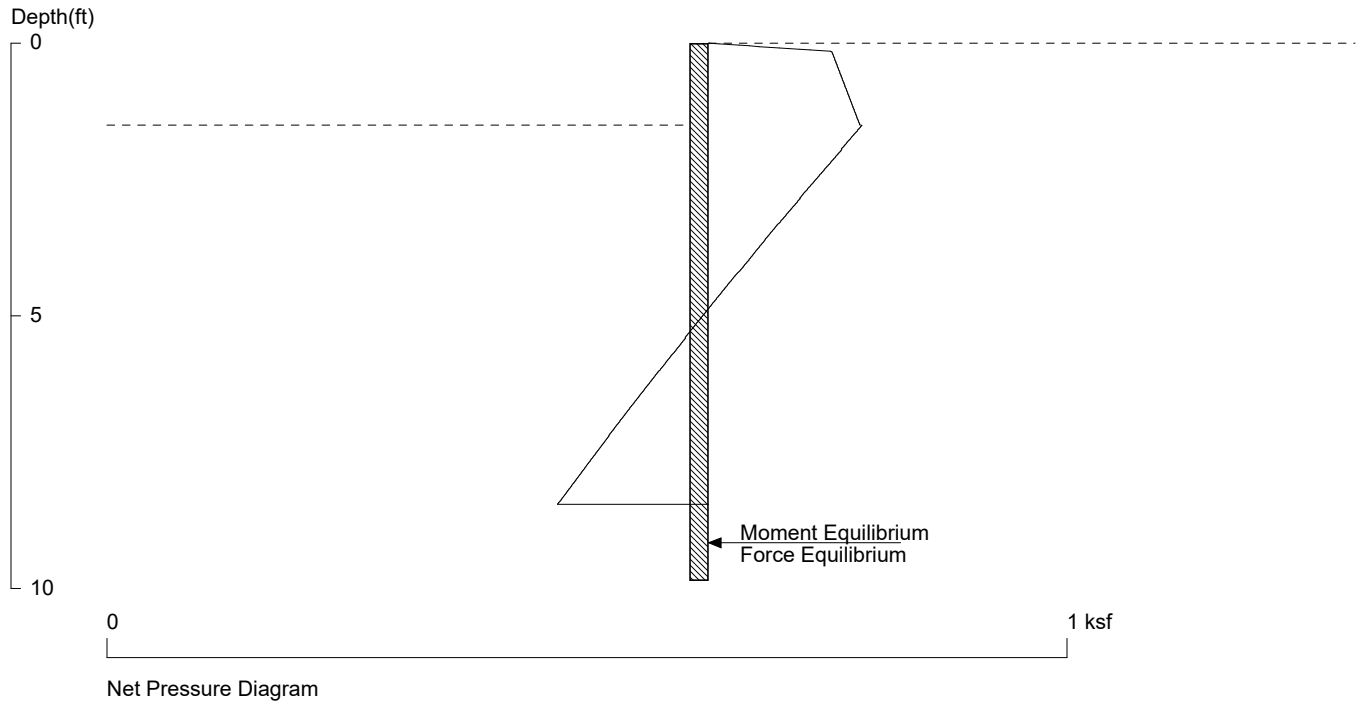
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 1.50 | 2.49 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

1+00 MIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 2: Wall 2 Analysis

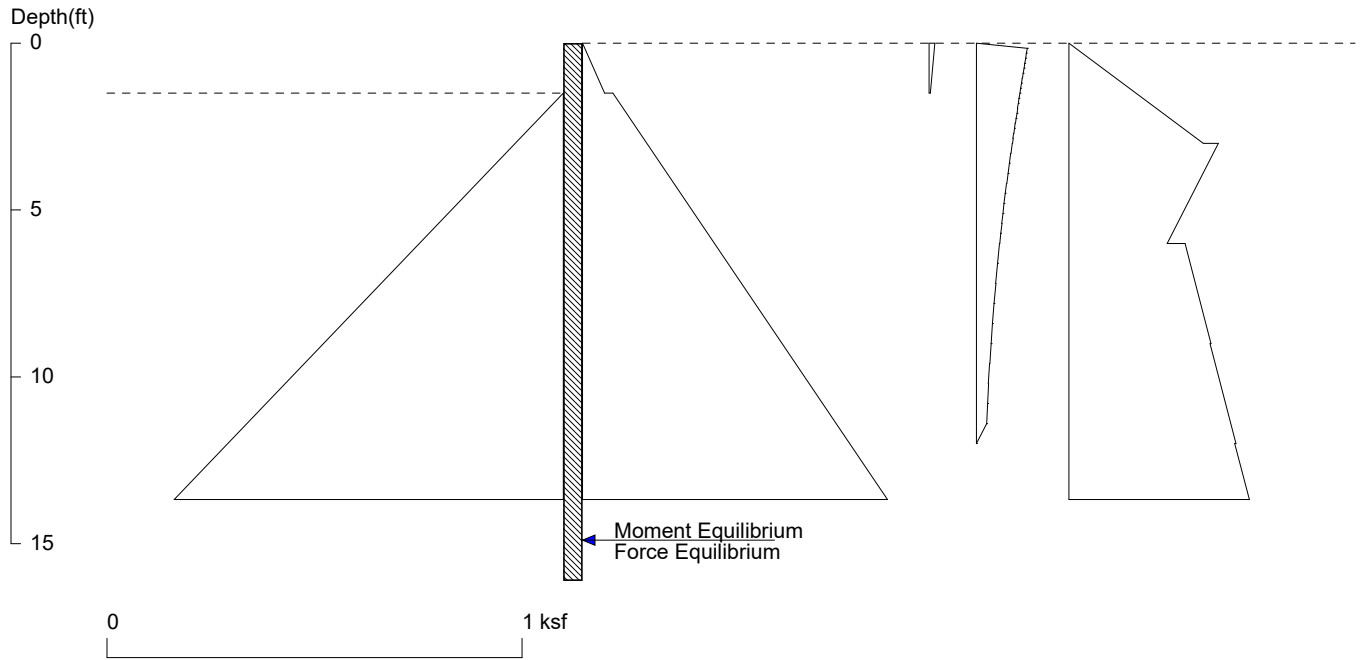


PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter
 User Input Pile, W10x77: E (ksi)=29000.0, I (in⁴)/pile=455.0
 File: C:\PROGRAM FILES (X86)\SepWallF2.sh8

1+00 EQMIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1



<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltechsoftware.com

Licensed to 4324324234 3424343 Date: 5/2/2022
 File: C:\PROGRAM FILES (X86)\SepWallF2.sh8

Wall Height=1.5 Pile Diameter=0.8 Pile Spacing=4.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=14.61 Min. Pile Length=16.11
 MOMENT IN PILE: Max. Moment=10.72 per Pile Spacing=4.0 at Depth=8.86

PILE SELECTION:

Request Min. Section Modulus = 3.9 in³/pile=63.86 cm³/pile, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 W10X77 has Section Modulus = 85.9 in³/pile=1407.64 cm³/pile. It is greater than Min. Requirements!
 Top Deflection = 0.12(in) based on E (ksi)=29000.00 and I (in⁴)/pile=455.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

| Z1 | P1 | Z2 | P2 | Slope |
|-------|-------|--------|-------|-----------|
| * | Above | Base | | |
| 0.000 | 0.000 | 1.500 | 0.053 | 0.035027 |
| * | Below | Base | | |
| 1.500 | 0.073 | 15.000 | 0.806 | 0.054347 |
| * | Earth | Queck | | |
| 0.000 | 0.014 | 1.500 | 0.004 | -0.007017 |
| * | Sur- | charge | | |
| 0.000 | 0.000 | 0.150 | 0.123 | 0.820072 |
| 0.150 | 0.123 | 0.300 | 0.121 | -0.013253 |
| 0.300 | 0.121 | 0.450 | 0.119 | -0.013237 |
| 0.450 | 0.119 | 0.600 | 0.117 | -0.013212 |
| 0.600 | 0.117 | 0.750 | 0.115 | -0.013179 |
| 0.750 | 0.115 | 0.900 | 0.113 | -0.013138 |
| 0.900 | 0.113 | 1.050 | 0.111 | -0.013089 |
| 1.050 | 0.111 | 1.200 | 0.109 | -0.013033 |
| 1.200 | 0.109 | 1.350 | 0.107 | -0.012968 |
| 1.350 | 0.107 | 1.500 | 0.105 | -0.012896 |
| 1.500 | 0.105 | 1.650 | 0.103 | -0.012817 |

| | | | | |
|--------|--------|--------|-------|-----------|
| 1.650 | 0.103 | 1.800 | 0.101 | -0.012731 |
| 1.800 | 0.101 | 1.950 | 0.100 | -0.012638 |
| 1.950 | 0.100 | 2.100 | 0.098 | -0.012538 |
| 2.100 | 0.098 | 2.250 | 0.096 | -0.012432 |
| 2.250 | 0.096 | 2.400 | 0.094 | -0.012320 |
| 2.400 | 0.094 | 2.550 | 0.092 | -0.012202 |
| 2.550 | 0.092 | 2.700 | 0.090 | -0.012079 |
| 2.700 | 0.090 | 2.850 | 0.089 | -0.011950 |
| 2.850 | 0.089 | 3.000 | 0.087 | -0.011817 |
| 3.000 | 0.087 | 3.300 | 0.083 | -0.011607 |
| 3.300 | 0.083 | 3.600 | 0.080 | -0.011314 |
| 3.600 | 0.080 | 3.900 | 0.077 | -0.011007 |
| 3.900 | 0.077 | 4.200 | 0.073 | -0.010689 |
| 4.200 | 0.073 | 4.500 | 0.070 | -0.010361 |
| 4.500 | 0.070 | 4.800 | 0.067 | -0.010026 |
| 4.800 | 0.067 | 5.100 | 0.064 | -0.009686 |
| 5.100 | 0.064 | 5.400 | 0.062 | -0.009344 |
| 5.400 | 0.062 | 5.700 | 0.059 | -0.009001 |
| 5.700 | 0.059 | 6.000 | 0.056 | -0.008659 |
| 6.000 | 0.056 | 6.600 | 0.051 | -0.008151 |
| 6.600 | 0.051 | 7.200 | 0.047 | -0.007492 |
| 7.200 | 0.047 | 7.800 | 0.043 | -0.006860 |
| 7.800 | 0.043 | 8.400 | 0.039 | -0.006261 |
| 8.400 | 0.039 | 9.000 | 0.036 | -0.005700 |
| 9.000 | 0.036 | 9.600 | 0.032 | -0.005178 |
| 9.600 | 0.032 | 10.200 | 0.030 | -0.004697 |
| 10.200 | 0.030 | 10.800 | 0.027 | -0.004256 |
| 10.800 | 0.027 | 11.400 | 0.025 | -0.003853 |
| 11.400 | 0.025 | 12.000 | 0.000 | -0.041339 |
| * | Wall 1 | Impact | | |
| 0.00 | 0.00 | 3.00 | 0.32 | 0.108 |
| 3.00 | 0.36 | 6.00 | 0.23 | -0.041 |
| 6.00 | 0.28 | 9.00 | 0.34 | 0.021 |
| 9.00 | 0.34 | 12.00 | 0.40 | 0.021 |
| 12.00 | 0.40 | 15.00 | 0.47 | 0.021 |
| 15.00 | 0.47 | 17.16 | 0.51 | 0.021 |

PASSIVE PRESSURES:

| Z1 | P1 | Z2 | P2 | Slope |
|-----|------|------|------|-------|
| 1.5 | 0.00 | 15.0 | 1.04 | 0.077 |

ACTIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 0.00 | 4.00 |
| 2 | 1.50 | 0.83 |

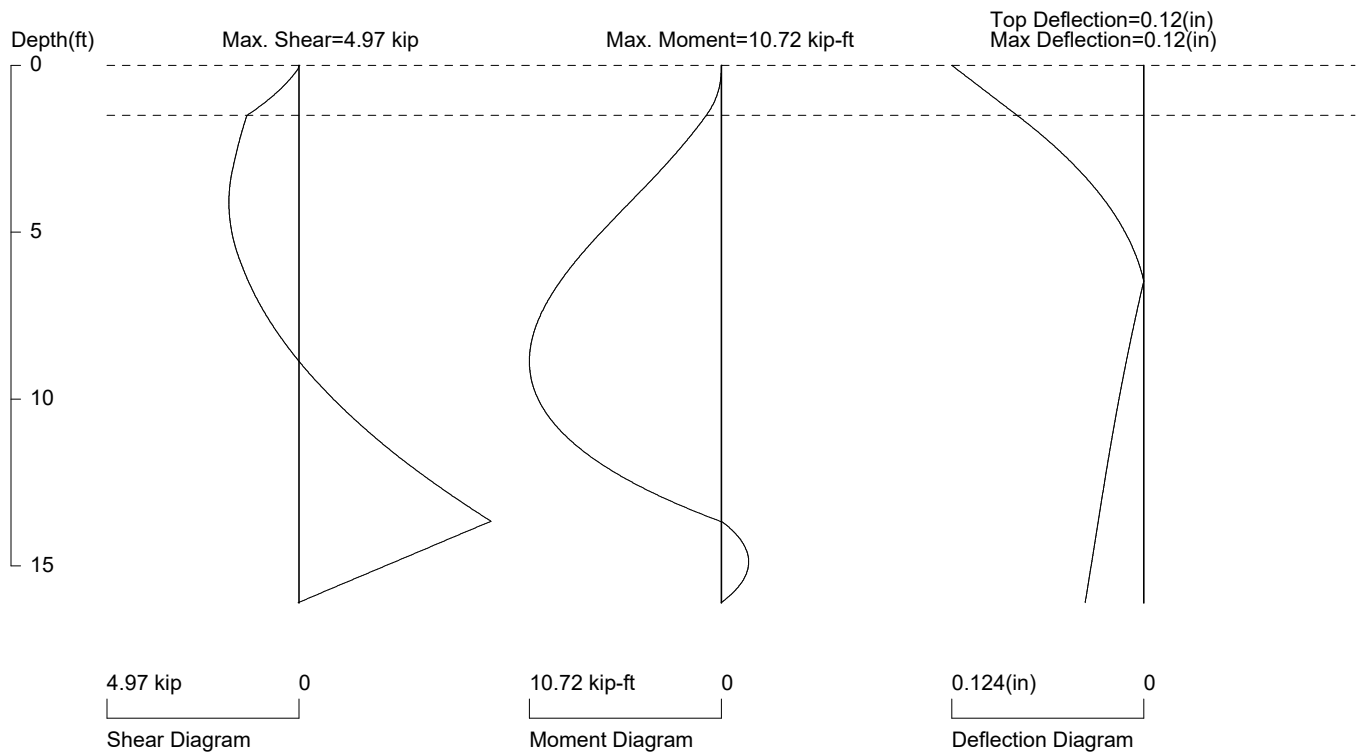
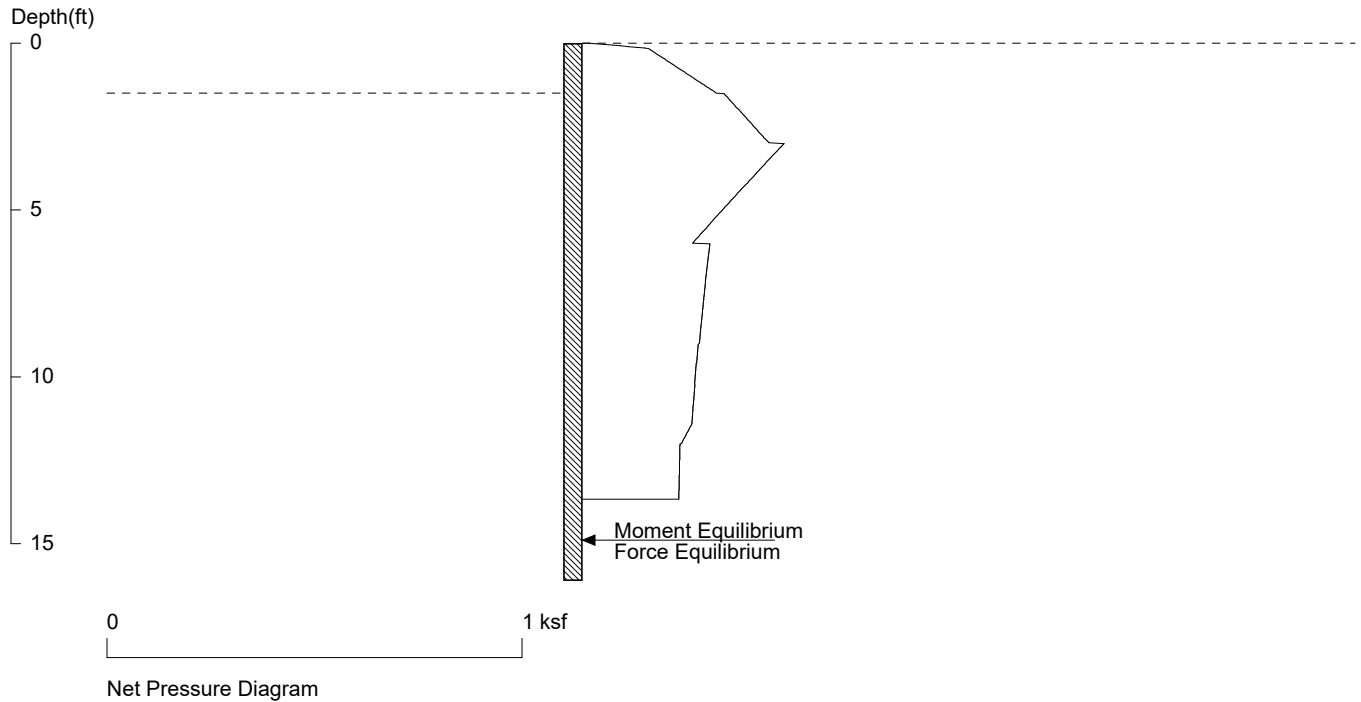
PASSIVE SPACING:

| No. | Z depth | Spacing |
|-----|---------|---------|
| 1 | 1.50 | 2.49 |

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

1+00 EQMIDDLE LOT WALL PRESSURES LOWER

Two Wall Case, Step 4: Wall 2 w/ Impact from Wall 1



PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.0 foot or meter

User Input Pile, W10x77: E (ksi)=29000.0, I (in⁴)/pile=455.0

File: C:\PROGRAM FILES (X86)\SepWallF2.sh8

Multiple Simple Beam

Lic. #: KW-06005122

MC SQUARED, INC.

Description : 34- SOLDIER PILE WALL LAGGING

Wood Beam Design : 4' LAGGING @ LOWER

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

BEAM Size : **11.250 X 3.50, Sawn, Fully Unbraced**

Using Allowable Stress Design with IBC 2018 Load Combinations, Major Axis Bending

Wood Species : Hem-Fir

Wood Grade : No.2

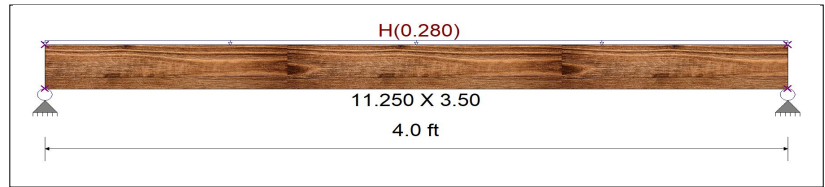
| | | | | | | | | | |
|--------------|-----------|-----------|-------------|----|-----------|---------------|-------------|---------|------------|
| Fb - Tension | 850.0 psi | Fc - Prll | 1,300.0 psi | Fv | 150.0 psi | Ebend- xx | 1,300.0 ksi | Density | 26.840 pcf |
| Fb - Compr | 850.0 psi | Fc - Perp | 405.0 psi | Ft | 525.0 psi | Eminbend - xx | 470.0 ksi | | |

Applied Loads

Unif Load: H = 0.280 k/ft, Trib= 1.0 ft

Design Summary

Max fb/Fb Ratio = **0.382** : 1
 fb : Actual : 292.57 psi at 2.000 ft in Span # 1
 Fb : Allowable : 765.00 psi
 Load Comb : +D+H
 Max fv/FvRatio = **0.170** : 1
 fv : Actual : 18.35 psi at 0.000 ft in Span # 1
 Fv : Allowable : 108.00 psi
 Load Comb : +D+H



| | | | | | | |
|-------------------|---|---|----|---|---|---|
| Max Reactions (k) | D | L | Lr | S | W | E |
| Left Support | | | | | | |
| Right Support | | | | | | |

Max Deflections

| | | | | |
|------|--------------------|------------|----------------|----------|
| H | Transient Downward | 0.031 in | Total Downward | 0.031 in |
| 0.56 | Ratio | 1546 | Ratio | 1546 |
| 0.56 | | LC: H Only | | LC: +D+H |
| | Transient Upward | 0.000 in | Total Upward | 0.000 in |
| | Ratio | 9999 | Ratio | 9999 |
| | | LC: | | LC: |

Wood Beam Design : 4' LAGGING UPPER

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

BEAM Size : **11.250 X 3.50, Sawn, Fully Unbraced**

Using Allowable Stress Design with IBC 2018 Load Combinations, Major Axis Bending

Wood Species : Hem-Fir

Wood Grade : No.2

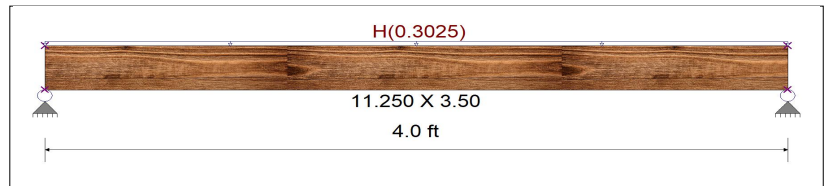
| | | | | | | | | | |
|--------------|-----------|-----------|-----------|----|-----------|---------------|-------------|---------|------------|
| Fb - Tension | 675.0 psi | Fc - Prll | 500.0 psi | Fv | 140.0 psi | Ebend- xx | 1,100.0 ksi | Density | 26.840 pcf |
| Fb - Compr | 675.0 psi | Fc - Perp | 405.0 psi | Ft | 350.0 psi | Eminbend - xx | 400.0 ksi | | |

Applied Loads

Unif Load: H = 0.3025 k/ft, Trib= 1.0 ft

Design Summary

Max fb/Fb Ratio = **0.520** : 1
 fb : Actual : 316.08 psi at 2.000 ft in Span # 1
 Fb : Allowable : 607.50 psi
 Load Comb : +D+H
 Max fv/FvRatio = **0.197** : 1
 fv : Actual : 19.82 psi at 0.000 ft in Span # 1
 Fv : Allowable : 100.80 psi
 Load Comb : +D+H



| | | | | | | |
|-------------------|---|---|----|---|---|---|
| Max Reactions (k) | D | L | Lr | S | W | E |
| Left Support | | | | | | |
| Right Support | | | | | | |

Max Deflections

| | | | | |
|------|--------------------|------------|----------------|----------|
| H | Transient Downward | 0.040 in | Total Downward | 0.040 in |
| 0.61 | Ratio | 1211 | Ratio | 1211 |
| 0.61 | | LC: H Only | | LC: +D+H |
| | Transient Upward | 0.000 in | Total Upward | 0.000 in |
| | Ratio | 9999 | Ratio | 9999 |
| | | LC: | | LC: |