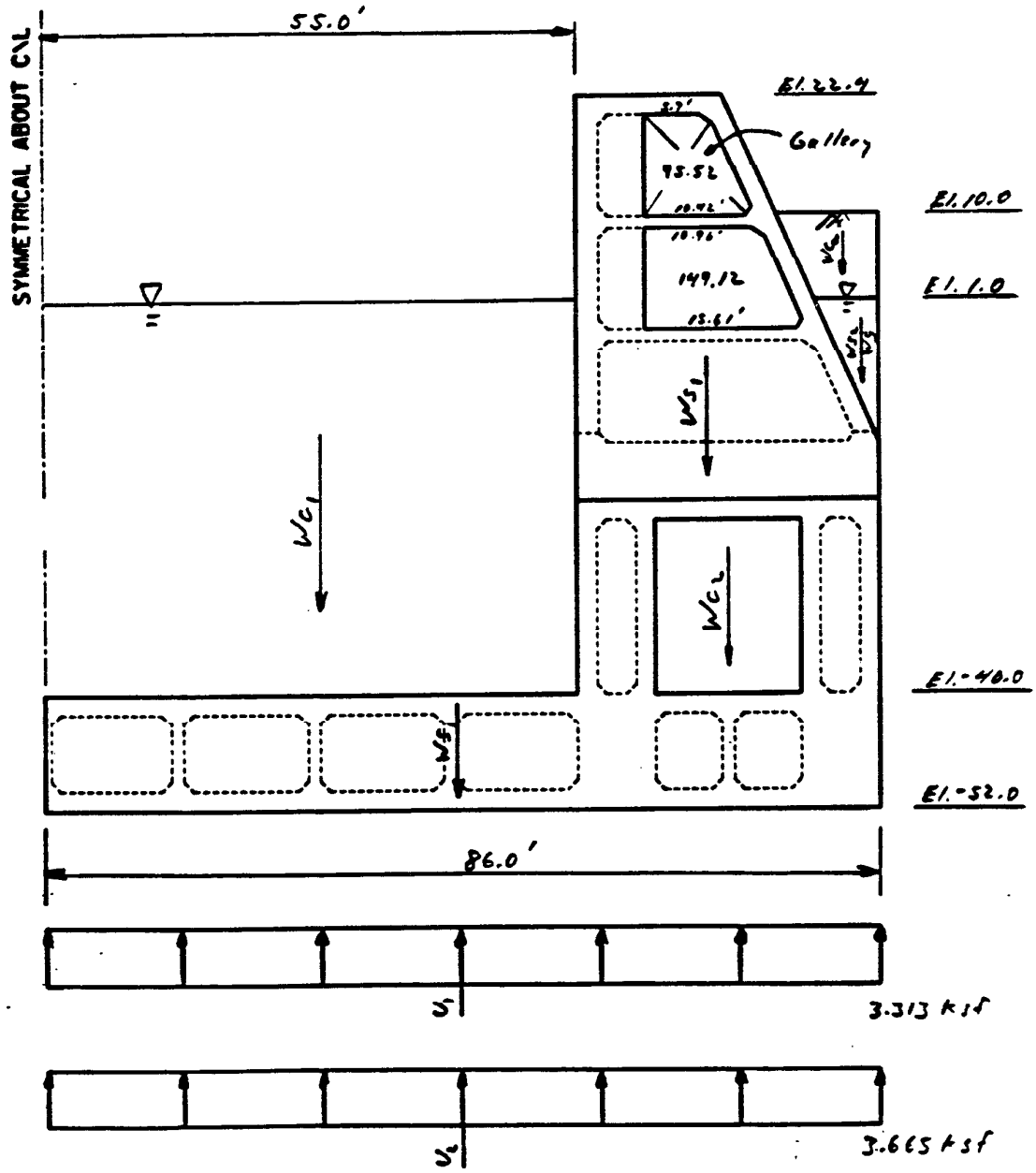
# BASE DESIGN
# LONGITUDINAL DIRECTION

LOAD CASE 1 (NORMAL OPERATION)

RS = 10.0, LS = 1.0

FLOTATION (UNBONDED)*

* Grout pad assumed not bonded to precast unit.

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FLOTATION - CASE 1 (NORMAL OPERATION)

Concrete (WS1)

Lower Precast Unit (Filled)

$A = 1659.75 - 273.75 = 1386.0$ ft.$^2$ (CMM)

$W = 1386.0(14.0)(.15) = \underline{2,910.6^k}$

Upper Cast in Place Slab and Walls

$A_v = 1017.45 - 95.52 - 149.12 = 772.81$ ft$^2$

$W_v = 772.81(14.0)(.15) = \underline{1622.9^k}$

$A_o = 149.12$ ft.$^2$

$V_o = 149.12(1.25) = 186.4$ ft.$^3$

$V_L = .5(1.0)(1.0)(2)(6.2 + 10.72 + 11.46 + 18.11) = 44.69$ ft.$^3$

$W_{oc} = (186.4 + 44.69).15 = \underline{34.7^k}$

TOTAL CONCRETE (WS1) = $\underline{\underline{4568.2^k}}$

Backfill (WS2)

Saturated Soil (El. 10.0 to 1.0)

$A = 76.68$ ft.$^2$

$W = 76.68(14.0)(.120) = \underline{128.8^k}$

Submerged Soil (El. -13.75 to 1.0)

$A = 48.15$ ft.$^2$

$W = 48.15(14.0)(.0575) = \underline{38.8^k}$

TOTAL BACKFILL (WS2) = $\underline{\underline{167.6^k}}$

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|---|---|---|---|---|
| SUBJECT | Chamber Monolith | | CHECKED BY | DATE |

Water ($W_c$)

Operator Controled

$A = 41.0(55.0) + 18.25(15.0) = 2,528.75$ ft.$^2$

$W = 2528.75(14.0)(.0625) = \underline{\underline{2,212.7^k}}$

Water ($W_g$)

Gravity Controled

$A = 48.15$ ft.$^2$

$W = 48.15(14.0)(.0625) = \underline{\underline{42.1^k}}$

Uplift-1 ($U_1$)

$U_1 = 3.313(86.0)(14.0) = \underline{\underline{3988.9^k}}$

Uplift-2 ($U_2$)

$U_2 = .5(3.594 + 3.736)(86.0)(14.0) = \underline{\underline{4,412.7}}$

FACTORS OF SAFETY

CASE 1-1

$$FS = \frac{4568.2 + 167.6 + 2212.7}{3988.9 - 42.1}$$

$FS = \underline{1.76}$

CASE 1-2

$$FS = \frac{4568.2 + 167.6 + 2212.7}{4412.7 - 42.1}$$

$FS = \underline{1.59}$ *

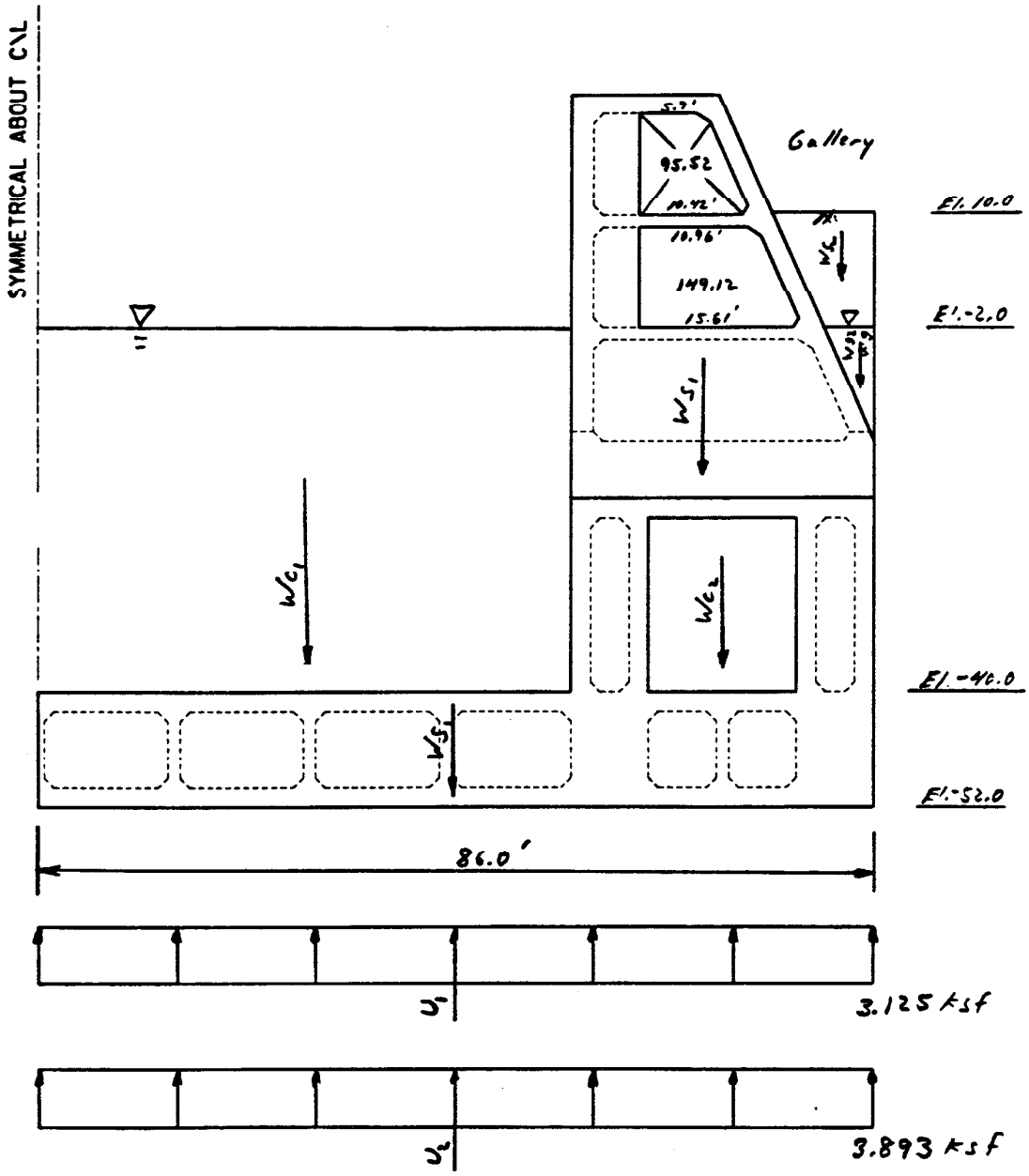
* Tension piles not required.
$FS > 1.5$

LOAD CASE 2A (MAXIMUM OPERATION)

RS = 17.6, LS = -2.0

FLOTATION (UNBONDED)*

* Grout pad assumed not bonded to precast unit.



COMPUTATION SHEET

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FLOTATION - CASE 2A (MAXIMUM OPERATION)

Concrete (WS1)

Lower Precast Unit (Filled)

$A = 1659.75 - 273.75 = 1386.0 \text{ ft.}^2$ (CAAO)

$W = 1386.0(14.0)(.15) = \underline{2,910.6^k}$

Upper Cast in Place Slab and Walls

$A_v = 1017.45 - 95.52 - 149.12 = 772.81 \text{ ft}^2$

$W_v = 772.81(14.0)(.15) = \underline{1622.9^k}$

$A_o = 149.12 \text{ ft.}^2$

$V_o = 149.12(1.25) = 186.4 \text{ ft.}^3$

$V_L = .5(1.0)(1.0)(2)(6.2 + 10.92 + 11.46 + 16.11) = 44.69 \text{ ft}^3$

$W_{cc} = (186.4 + 44.69).15 = \underline{34.7^k}$

TOTAL CONCRETE (WS1) = $\underline{\underline{4568.2^k}}$

Backfill (WS2)

Saturated Soil (El. 10.0 to -2.0)

$A = 94.28 \text{ ft.}^2$

$W = 94.28(14.0)(.120) = \underline{158.4^k}$

Submerged Soil (El. -13.75 to -2.0)

$A = 30.55 \text{ ft.}^2$

$W = 30.55(14.0)(.0575) = \underline{24.6^k}$

TOTAL BACKFILL (WS2) = $\underline{\underline{183.0^k}}$

COMPUTATION SHEET

| PROJECT IHNC Lock | PAGE 6 OF | COMPUTED BY OCB | DATE 6/96 |
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| SUBJECT Chamber Monolith | | CHECKED BY | DATE |

Water ($W_c$)

Operator Controled

$A = 38.0\,(55.0) + 16.25\,(15.0) = 2{,}363.75$ ft.$^2$

$W = 2363.75\,(14.0)(.0625) = \underline{\underline{2{,}068.3^k}}$

Water ($W_g$)

Gravity Controled

$A = 30.55$ ft.$^2$

$W = 30.55\,(14.0)(.0625) = \underline{\underline{26.7^k}}$

Uplift-1 ($U_1$)

$U_1 = 3.125\,(86.0)(14.0) = \underline{\underline{3{,}762.5^k}}$

Uplift-2 ($U_2$)

$U_2 = .5\,(4.048 + 3.738)(86.0)(14.0) = \underline{\underline{4{,}687.2^k}}$

FACTORS OF SAFETY

CASE 2A-1

$$FS = \frac{4568.2 + 183.0 + 2068.3}{3762.5 - 26.7}$$

$FS = \underline{\underline{1.83}}$

CASE 2A-2

$$FS = \frac{4568.2 + 183.0 + 2068.3}{4687.2 - 26.7}$$

$FS = \underline{\underline{1.46}}$ *

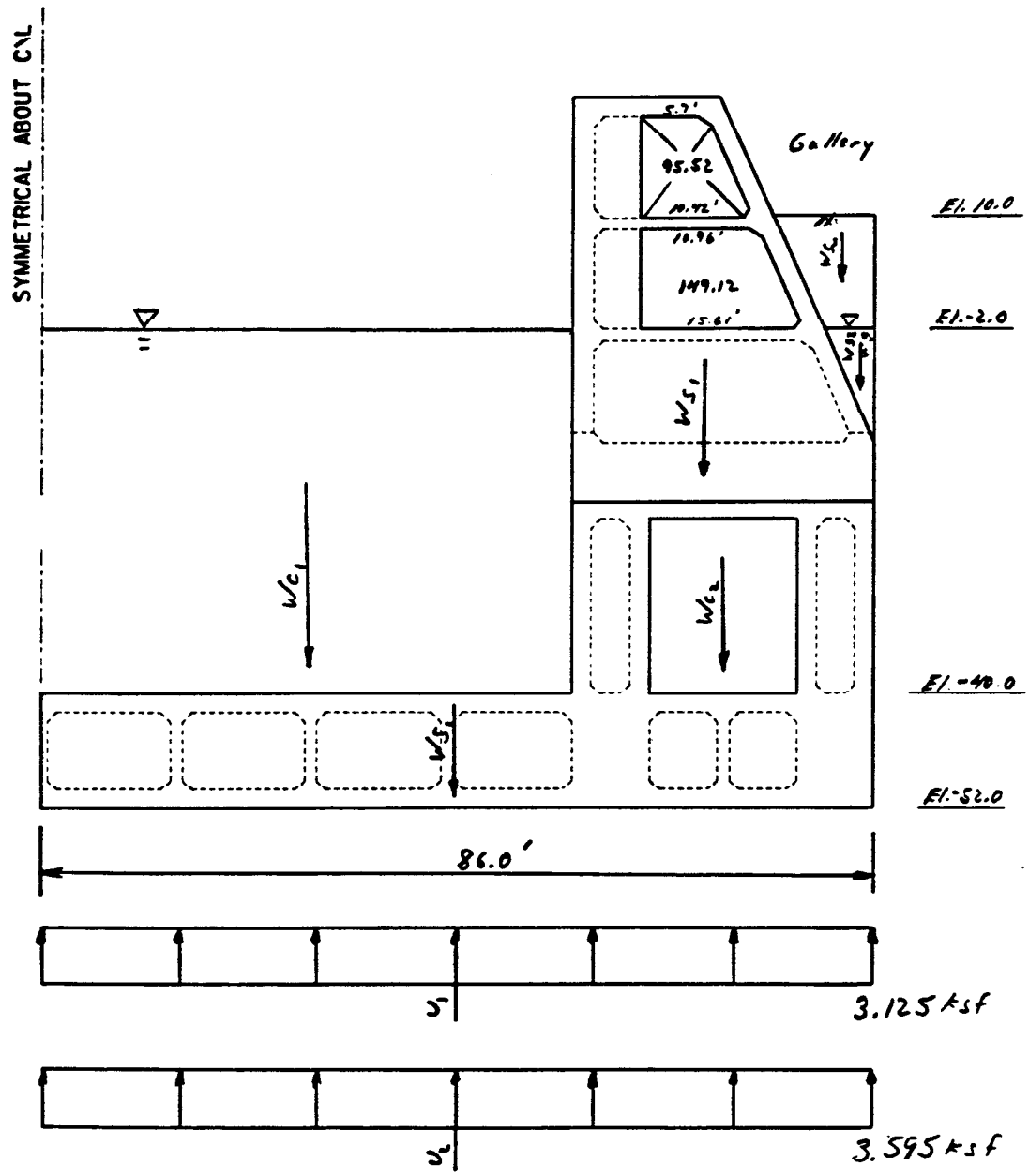
* Tension piles not required.
$FS \approx 1.5$

LOAD CASE 2B (MAXIMUM OPERATION)

RS = 10.0, LS = -2.0

FLOTATION (UNBONDED)*

* Grout pad assumed not bonded to precast unit.



COMPUTATION SHEET

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FLOTATION - CASE 2B (MAXIMUM OPERATION)

Concrete (WS1)

Lower Precast Unit (Filled)

$A = 1659.75 - 273.75 = 1386.0\ ft.^2$ (CAD)

$W = 1386.0(14.0)(.15) = \underline{2,910.6^k}$

Upper Cast in Place Slab and Walls

$A_v = 1017.45 - 95.52 - 149.12 = 772.81\ ft^2$

$W_v = 772.81(14.0)(.15) = \underline{1622.9^k}$

$A_o = 149.12\ ft.^2$

$V_o = 149.12\ (1.25) = 186.4\ ft.^3$

$V_c = .5(1.0)(1.0)(2)(6.2 + 10.92 + 11.46 + 16.11) = 44.69\ ft.^3$

$W_{oc} = (186.4 + 44.69).15 = \underline{34.7^k}$

TOTAL CONCRETE (WS1) = $\underline{\underline{4568.2^k}}$

Backfill (WS2)

Saturated Soil (El. 10.0 to -2.0)

$A = 94.28\ ft.^2$

$W = 94.28\ (14.0)(.120) = \underline{158.4^k}$

Submerged Soil (El. -13.75 to -2.0)

$A = 30.55\ ft.^2$

$W = 30.55\ (14.0)(.0575) = \underline{24.6^k}$

TOTAL BACKFILL (WS2) = $\underline{\underline{183.0^k}}$

COMPUTATION SHEET

| PROJECT JHNC Lock | PAGE 9 OF | COMPUTED BY DCB | DATE 6/96 |
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Water ($W_c$)

Operator Controled

$A = 38.0\,(55.0) + 18.25\,(15.0) = 2{,}363.75\ ft.^2$

$W = 2363.75\,(14.0)(.0625) = \underline{2{,}068.3^k}$

Water ($W_g$)

Gravity Controled

$A = 30.55\ ft.^2$

$W = 30.55\,(14.0)(.0625) = \underline{26.7^k}$

Uplift-1 ($U_1$)

$U_1 = 3.125\,(86.0)(14.0) = \underline{3{,}762.5^k}$

Uplift-2 ($U_2$)

$U_2 = .5(3.690 + 3.500)(86.0)(14.0) = \underline{4{,}328.4^k}$

FACTORS OF SAFETY

CASE 2B-1

$$FS = \frac{4568.2 + 183.0 + 2068.3}{3762.5 - 26.7}$$

$FS = \underline{1.83}$

CASE 2B-2

$$FS = \frac{4568.2 + 183.0 + 2068.3}{4328.4 - 26.7}$$

$FS = \underline{1.59}$ *

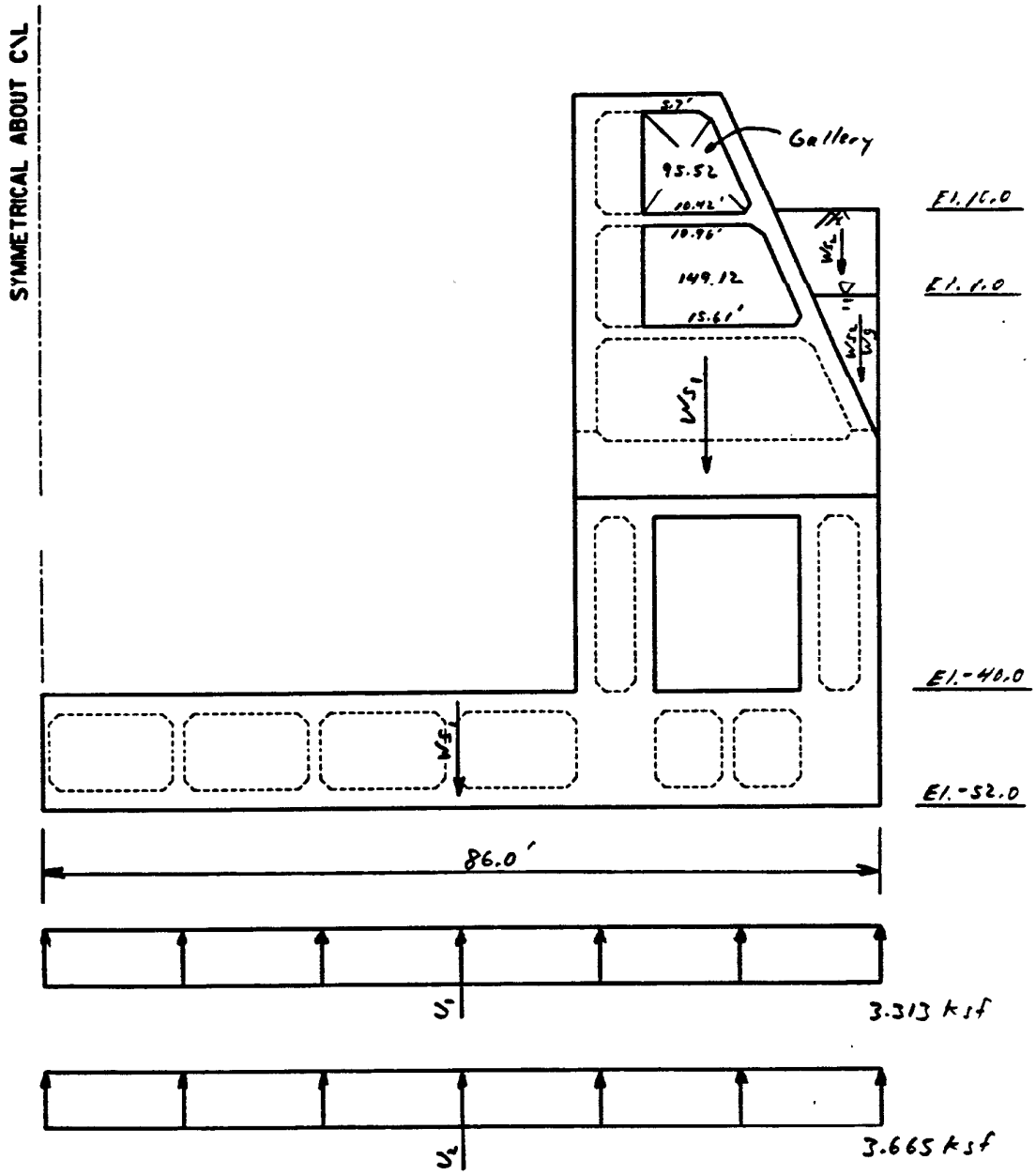
* Tension piles not required.
$FS > 1.5$

LOAD CASE 3 (MAINTENANCE DEWATERING)

RS = 10.0, LS = 1.0

FLOTATION (UNBONDED)*

* Grout pad assumed not bonded to precast unit.

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COMPUTATION SHEET

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FLOTATION - CASE 3 (MAINTENANCE DEWATERING)

Concrete ($WS_1$)

Lower Precast Unit (Filled)

$A = 1659.75 - 273.75 = 1386.0$ ft.$^2$ (CADD)

$W = 1386.0(14.0)(.15) = \underline{2,910.6^k}$

Upper Cast in Place Slab and Walls

$A_v = 1017.45 - 95.52 - 149.12 = 772.81$

$W_v = 772.81(14.0)(.15) = \underline{1622.9^k}$

$A_o = 149.12$ ft.$^2$

$V_o = 149.12(1.25) = 186.4$ ft.$^3$

$V_c = .5(1.0)(1.0)(2)(6.2 + 10.92 + 11.46 + 16.11) = 44.69$ ft.$^3$

$W_{cc} = (186.4 + 44.69).15 = \underline{34.7^k}$

TOTAL CONCRETE ($WS_1$) = $\underline{\underline{4568.2^k}}$

Backfill ($WS_2$)

Saturated Soil (El. 10.0 to 1.0)

$A = 76.68$ ft.$^2$

$W = 76.68(14.0)(.120) = \underline{128.8^k}$

Submerged Soil (El. -13.75 to 1.0)

$A = 48.15$ ft.$^2$

$W = 48.15(14.0)(.0575) = \underline{38.8^k}$

TOTAL BACKFILL ($WS_2$) = $\underline{\underline{167.6^k}}$

COMPUTATION SHEET

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| SUBJECT Chamber Monolith | | CHECKED BY | DATE |

Water ($W_c$)

Operator Controlled

$W = 0$

Water ($W_g$)

Gravity Controlled

$A = 48.15$ ft.$^2$

$W = 48.15(14.0)(.0625) = \underline{\underline{42.1^k}}$

Uplift-1 ($U_1$)

$U_1 = 3.313(86.0)(14.0) = \underline{\underline{3988.9^k}}$

Uplift-2 ($U_2$)

$U_2 = .5(3.574 + 3.736)(86.0)(14.0) = \underline{\underline{4412.7^k}}$

FACTORS OF SAFETY

CASE 3-1

$$FS = \frac{4568.2 + 167.6 + 0}{3988.9 - 42.1}$$

$FS = \underline{\underline{1.20}}$

CASE 3-2

$$FS = \frac{4568.2 + 167.6 + 0}{4412.7 - 42.1}$$

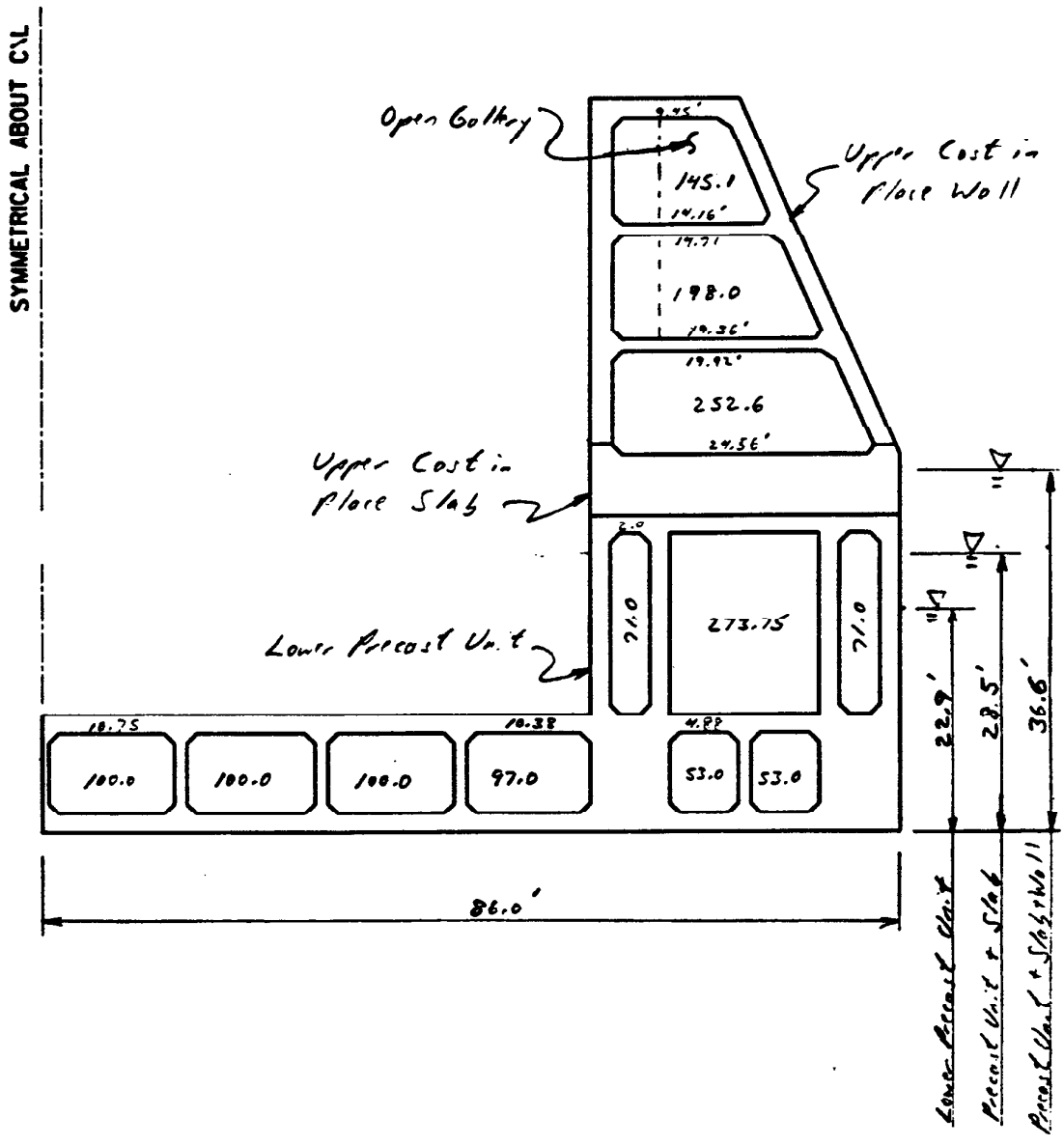
$FS = \underline{\underline{1.08}}$ *

* Use tension piles to bring to required factor of safety. $FS \geq 1.3$

LOAD CASE (TRASPORTATION / CONSTRUCTION)

CHAMBER MONOLITH - 14' STRIP

DRAFT COMPUTATIONS

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COMPUTATION SHEET

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DRAFT (Lower Precast Unit - 14' Strip)

$A_V = 1659.75 - 100.0 - 100.0 - 100.0 - 97.0 - 53.0 - 53.0 - 71.0 - 71.0 - 273.75 = 741.0$ ft.$^2$ (CADD)

$W_V = 741.0(14.0)(.15) = \underline{1556.1^k}$

$A_{D(18)} = 2(100.0) = 200.0$ ft.$^2$

$A_{D(17)} = 100.0$ ft.$^2$

$A_{D(27)} = 97.0$ ft.$^2$

$A_{D(US)} = 2(53.0) + 2(71.0) = 248.0$ ft.$^2$

$V_D = 200.0(1.5) + 100.0(1.75) + 97.0(2.25) + 248.0(1.25) = 1003.25$ ft.$^3$

$V_H = .5(1.0)(1.0)(2)(2)(64.39) = 128.78$ ft.$^3$

$W_{D+H} = 1003.25(.15) + 128.78(.15) = \underline{169.8^k}$

$W_T = 1556.1 + 169.8 = \underline{1725.9^k}$

Vol. to Displace $= 1725.9/.0625 = 27,614.4$ ft.$^3$

DRAFT $= 27,614.4 / 86.0(14.0) = \underline{\underline{22.9'}}$

DRAFT (Upper Cast in Place Slab - 14' Strip)

$A_V = 191.21$ ft.$^2$ (CADD)

$W_V = 191.21(14.0)(.15) = 401.5^k$

$W_{V_T} = 401.5(1.05) = \underline{421.6^k}$ (5% Forms and Misc. Metals)

$W_T = 1725.9 + 421.6 = \underline{2147.5^k}$

Vol. to Displace $= 2147.5/.0625 = 34,360.0$ ft.$^3$

DRAFT $= 34,360.0 / 86.0(14.0) = \underline{\underline{28.5'}}$

COMPUTATION SHEET

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DRAFT (Upper Cast in Place Walls - 14' Strip)

$A_v = 826.24 - 145.1 - 198.0 - 252.6 = 230.54 \text{ ft.}^2$

$W_v = 230.54 (14.0)(.15) = \underline{484.1^K}$

$A_0 = 198.0 + 252.6 = 450.6 \text{ ft.}^2$

$V_0 = 450.6 (1.25) = 563.25 \text{ ft.}^3$

$V_H = .5(1.0)(1.0)(2)(82.55) = 82.55 \text{ ft.}^3$

$W_{0+H} = 563.25(.15) + 82.55(.15) = \underline{96.9^K}$

$W_{v_T} = (484.1 + 96.9)\,1.05 = 610.1^K$ (5% Forms and Misc.)

$W_T = 2147.5 + 610.1 = \underline{2757.6^K}$

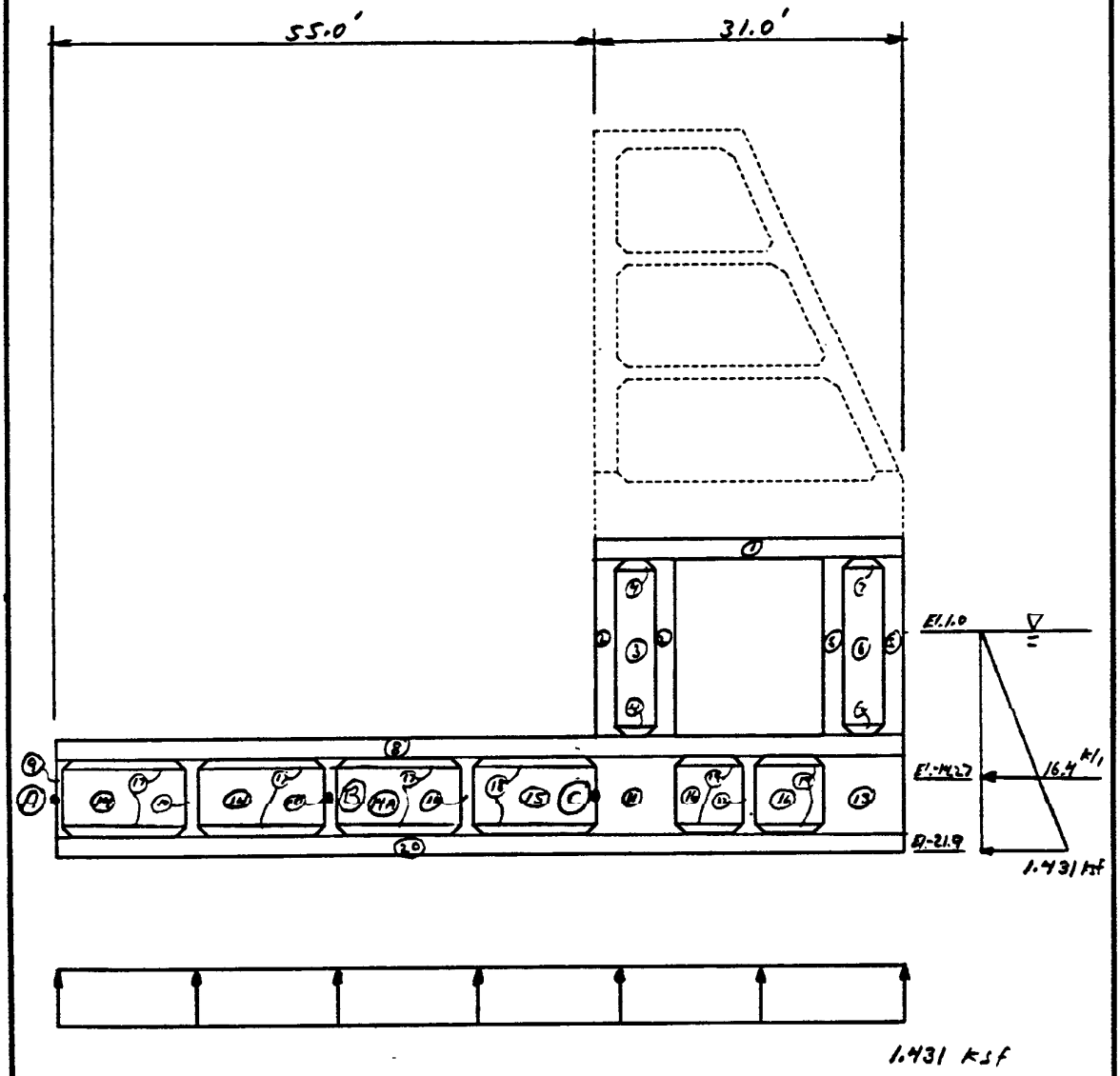
Vol. to Displace $= 2757.6 / .0625 = 44{,}121.6 \text{ ft.}^3$

DRAFT $= 44{,}121.6 / 86.0(14.0) = \underline{36.6'}$

LOCK CHAMBER - SLAB DESIGN

LOWER PRECAST UNIT - 14' STRIP

TRANSPORTATION



COMPUTATION SHEET

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LOCK CHAMBER

Slab Design - Lower Precast Unit (14' Strip)

Assume water at draft line El. 1.0.

MOMENTS AND SHEARS - (A) (Const. - Transportation)

| ITEM | $F_x$ | $F_z$ | $\bar{z}$ | $\bar{x}$ | M @ (A) |
|---|---|---|---|---|---|
| Concrete | | | | | |
| (1) 2.0(31.0)(14.0)(.15) | | 130.2 | | 70.5 | 9,179.1 |
| (2) (146.0-71.0)(14.0)(.15) | | 157.5 | | 59.0 | 9,292.5 |
| (3) 71.0(1.25)(.15) | | 13.3 | | 59.0 | 784.7 |
| (4) 1.0(3.0)(2)(.15) | | 0.9 | | 59.0 | 53.1 |
| (5) (146.0-71.0)(14.0)(.15) | | 157.5 | | 82.0 | 12,915.0 |
| (6) 71.0(1.25)(.15) | | 13.3 | | 82.0 | 1,090.6 |
| (7) 1.0(3.0)(2)(.15) | | 0.9 | | 82.0 | 73.8 |
| (8) 2.0(86.0)(14.0)(.15) | | 361.2 | | 43.0 | 15,531.6 |
| (9) 6.0(14.0)(.15) | | 12.6 | | 0.4 | 5.0 |
| (10) 12.0(3)(14.0)(.15) | | 75.6 | | 28.0 | 2,116.8 |
| (11) 64.0(14.0)(.15) | | 138.6 | | 59.0 | 8,177.4 |
| (12) 12.0(14.0)(.15) | | 25.2 | | 70.5 | 1,776.6 |
| (13) 65.0(14.0)(.15) | | 136.5 | | 81.9 | 11,179.4 |
| (14) 100.0(2)(1.5)(.15) | | 45.0 | | 14.0 | 630.0 |
| (14A) 100.0(1.75)(.15) | | 26.3 | | 35.0 | 920.5 |
| (15) 97.0(2.25)(.15) | | 32.7 | | 48.8 | 1,595.8 |
| (16) 53.0(2)(1.25)(.15) | | 19.9 | | 70.5 | 1,403.0 |
| (17) 1.0(11.75)(3)(2)(.15) | | 10.6 | | 21.0 | 222.6 |
| (18) 1.0(11.38)(2)(.15) | | 3.4 | | 48.8 | 165.9 |
| (19) 1.0(5.88)(2)(2)(.15) | | 3.5 | | 70.5 | 246.8 |
| (20) 2.0(86.0)(14.0)(.15) | | 361.2 | | 43.0 | 15,531.6 |
| | | 1725.9 | | | 92,891.8 |
| Water (H) | | | | | |
| (1) .5(1.431)(22.9)(14.0) | 229.4 | | 1.63 | | -373.9 |
| Uplift | | | | | |
| (1) 1.431(86.0)(14.0) | | -1722.9 | | 43.0 | -74,084.7 |
| TOTALS | 229.4 | — | | | 18,433.2 |

COMPUTATION SHEET

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MOMENTS AND SHEARS - (B)

| ITEM | $F_x$ | $F_z$ | $\bar{z}$ | $\bar{x}$ | M @ (B) |
|---|---|---|---|---|---|
| Concrete | | | | | |
| (1) 2.0(31.0)(14.0)(.15) | | 130.2 | | 42.5 | 5,533.5 |
| (2) (146.0 - 71.0)(14.0)(.15) | | 157.5 | | 31.0 | 4,882.5 |
| (3) 71.0(1.25)(.15) | | 13.3 | | 31.0 | 412.3 |
| (4) 1.0(3.0)(2)(.15) | | 0.9 | | 31.0 | 27.9 |
| (5) (146.0 - 71.0)(14.0)(.15) | | 157.5 | | 54.0 | 8,505.0 |
| (6) 71.0(1.25)(.15) | | 13.3 | | 54.0 | 718.2 |
| (7) 1.0(3.0)(2)(.15) | | 0.9 | | 54.0 | 48.6 |
| (8) 2.0(58.0)(14.0)(.15) | | 243.6 | | 29.0 | 7,064.4 |
| (10) 6.0(14.0)(.15) | | 12.6 | | 0.4 | 5.0 |
| (11) 12.0(14.0)(.15) | | 25.2 | | 14.0 | 352.8 |
| (11) 66.0(14.0)(.15) | | 138.6 | | 31.0 | 4,296.6 |
| (12) 12.0(14.0)(.15) | | 25.2 | | 42.5 | 1,071.0 |
| (13) 65.0(14.0)(.15) | | 136.5 | | 53.9 | 7,357.4 |
| (14A) 100.0(1.75)(.15) | | 26.3 | | 7.0 | 184.1 |
| (15) 97.0(2.25)(.15) | | 32.7 | | 20.8 | 680.2 |
| (16) 53.0(2)(1.25)(.15 | | 19.9 | | 42.5 | 845.8 |
| (17) 1.0(11.75)(2)(.15) | | 3.5 | | 7.0 | 24.5 |
| (18) 1.0(11.38)(2)(.15) | | 3.4 | | 20.8 | 70.7 |
| (19) 1.0(5.88)(2)(2)(.15) | | 3.5 | | 42.5 | 148.8 |
| (20) 2.0(58.0)(14.0)(.15) | | 243.6 | | 29.0 | 7,064.4 |
| | | 1388.2 | | | 49,293.7 |
| Water (M) | | | | | |
| (1) .5(1.431)(22.9)(14.0) | 229.4 | | 1.63 | | -373.9 |
| Uplift | | | | | |
| (1) 1.431(58.0)(14.0) | | -1162.0 | | 29.0 | -33,698.0 |
| TOTALS | | 226.2 | | | 15,221.8 |

COMPUTATION SHEET

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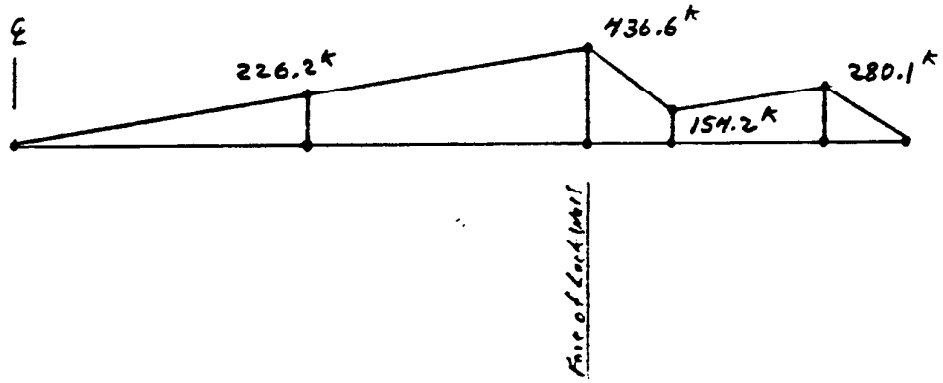
MOMENTS AND SHEARS - ©

| | $F_x$ | $F_z$ | $\bar{z}$ | $\bar{x}$ | $M_{@©}$ |
|---|---|---|---|---|---|
| Concrete | | | | | |
| ① 2.0(31.0)(14.0)(.15) | | 130.2 | | 15.5 | 2,018.1 |
| ② (146.0-71.0)(14.0)(.15) | | 157.5 | | 4.0 | 630.0 |
| ③ 71.0(1.25)(.15) | | 13.3 | | 4.0 | 186.2 |
| ④ 1.0(3.0)(2)(.15) | | 0.9 | | 4.0 | 3.6 |
| ⑤ (146.0-71.0)(14.0)(.15) | | 157.5 | | 27.0 | 4,252.5 |
| ⑥ 71.0(1.25)(.15) | | 13.3 | | 27.0 | 359.1 |
| ⑦ 1.0(3.0)(2)(.15) | | 0.9 | | 27.0 | 24.3 |
| ⑧ 2.0(31.0)(14.0)(.15) | | 130.2 | | 15.5 | 2,018.1 |
| ⑪ 66.0(14.0)(.15) | | 138.6 | | 4.0 | 554.4 |
| ⑫ 12.0(14.0)(.15) | | 25.2 | | 15.5 | 390.6 |
| ⑬ 65.0(14.0)(.15) | | 136.5 | | 26.9 | 3,671.9 |
| ⑯ 53.0(2)(1.25)(.15) | | 19.9 | | 15.5 | 308.5 |
| ⑲ 1.0(5.88)(2)(2)(.15) | | 3.5 | | 15.5 | 54.3 |
| ⑳ 2.0(31.0)(14.0)(.15) | | 130.2 | | 15.5 | 2,018.1 |
| | | 1057.7 | | | 16,489.6 |
| Water (H) | | | | | |
| ① .5(1.431)(22.9)(14.0) | 229.4 | | 1.63 | | -373.9 |
| Uplift | | | | | |
| ① 1.431(31.0)(14.0) | | -621.1 | | 15.5 | -9627.1 |
| TOTALS | | 436.6 | | | 6,488.6 |

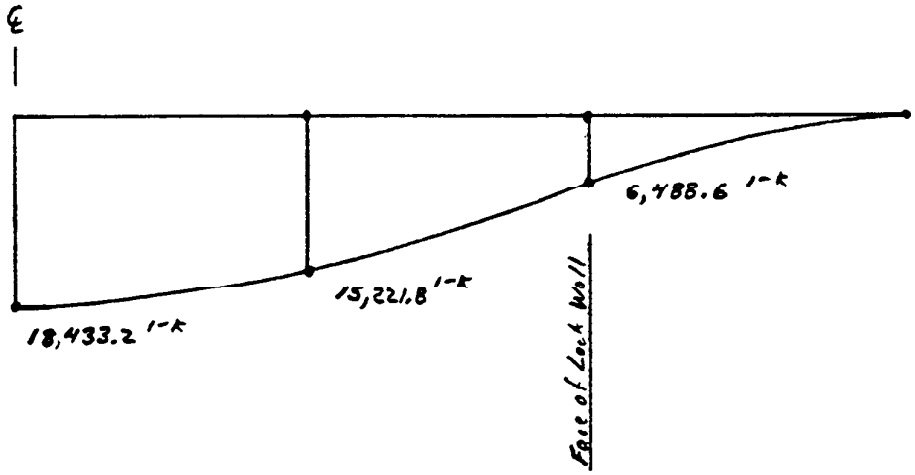
COMPUTATION SHEET

| PROJECT | IHNC Lock | PAGE 20 OF | COMPUTED BY DCE | DATE 6/96 |
|---|---|---|---|---|
| SUBJECT | Chamber Monolith | | CHECKED BY | DATE |

SHEAR DIAGRAM (14' STRIP)



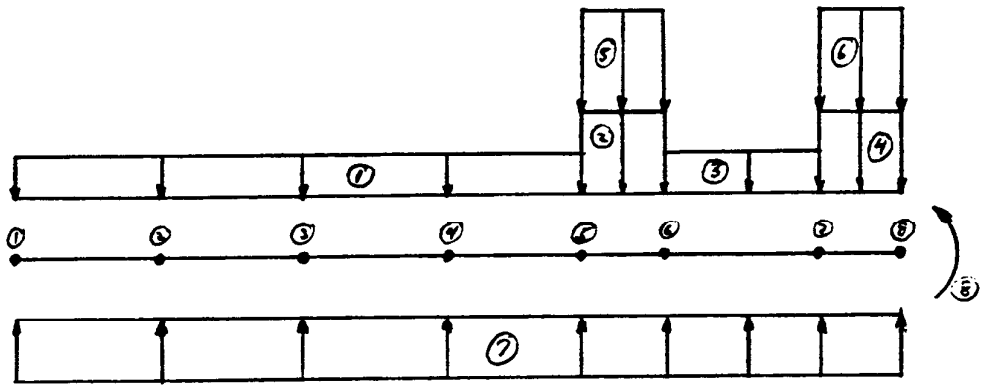

MOMENT DIAGRAM (14' STRIP)



COMPUTATION SHEET

| PROJECT | IHNC Lock | PAGE 21 OF | COMPUTED BY OCB | DATE 6/96 |
|---|---|---|---|---|
| SUBJECT | Chamber Monolith | | CHECKED BY | DATE |

CFRAME LOADING (14' Strip)




UNIFORM LOADING

Load 1

$2.0(55.0)(14.0)(.15) + 12.6 + 75.6 + 45.0 + 26.3 + 32.7 + 10.6 + 3.4 + 2.0(55.0)(14.0)(.15) / 55.0 = \underline{12.15^{k/'}}$

Load 2

$2.0(8.0)(14.0)(.15)(2) + 138.6 / 8.0 = \underline{25.73^{k/'}}$

Load 3

$2.0(15.0)(14.0)(.15) + 25.2 + 19.9 + 3.5 + 2.0(15.0)(14.0)(.15) / 15.0 = \underline{11.64^{k/'}}$

Load 4

$2.0(8.0)(14.0)(.15)(2) + 136.5 / 8.0 = \underline{25.46^{k/'}}$

Load 5

$.5(130.2) + 157.5 + 13.3 + 0.9 / 8.0 = \underline{29.6^{k/'}}$

Load 6

$.5(130.2) + 157.5 + 13.3 + 0.9 / 8.0 = \underline{29.6^{k/'}}$

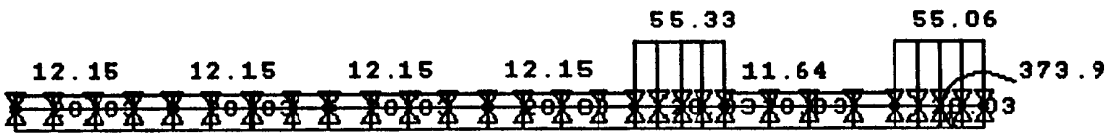
Load 7

$1722.9 / 86.0 = \underline{20.03^{k/'}}$

Load 8

$16.1(14.0)(1.57) = \underline{373.9^{'-k}}$

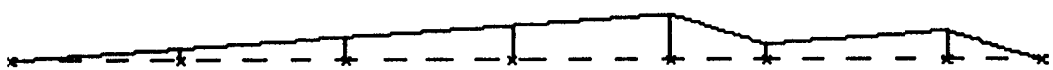
IHNC REPLACEMENT SHIP LOCK
CONCRETE FLOAT IN CHAMBER




SEP-1996 07.43.16

LOAD CASE 1 (TRANSPORTATION FLOAT IN)

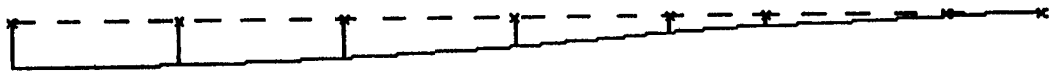
IHNC REPLACEMENT SHIP LOCK
CONCRETE FLOAT IN CHAMBER



= 436.8 KIP SHEAR SEP-1996 07.43.16

LOAD CASE 1 (TRANSPORTATION FLOAT IN)

IHNC REPLACEMENT SHIP LOCK
CONCRETE FLOAT IN CHAMBER



= .1848E+5 FT-KIP MOMENT SEP-1996 07.43.16

LOAD CASE 1 (TRANSPORTATION FLOAT IN)

```
*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
PROGRAM CFRAME
*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

 JN DATE = SEP-1996
 UN TIME = 07.43.16

IHNC REPLACEMENT SHIP LOCK
CONCRETE FLOAT IN CHAMBER
```

1 LOAD CASE 1 (TRANSPORTATION FLOAT IN)

JOINT DISPLACEMENTS

| JOINT | DX IN | DY IN | DR RAD |
|---|---|---|---|
| 1 | .0000E+00 | .0000E+00 | .0000E+00 |
| 2 | .0000E+00 | -.2550E-01 | -.2731E-03 |
| 3 | .0000E+00 | -.9968E-01 | -.5224E-03 |
| 4 | .0000E+00 | -.2166E+00 | -.7245E-03 |
| 5 | .0000E+00 | -.3548E+00 | -.8498E-03 |
| 6 | .0000E+00 | -.4455E+00 | -.8927E-03 |
| 7 | .0000E+00 | -.6201E+00 | -.9335E-03 |
| 8 | .0000E+00 | -.7131E+00 | -.9334E-03 |

MEMBER END FORCES

| MEMBER | JOINT | AXIAL KIP | SHEAR KIP | MOMENT FT-KIP | MOMENT EXTREMA FT-KIP | LOCATION FT |
|---|---|---|---|---|---|---|
| 1 | 1 | .0000E+00 | .3390E+01 | -.1848E+05 | -.1766E+05 | 14.00 |
| | 2 | .0000E+00 | -.1137E+03 | -.1766E+05 | -.1848E+05 | .00 |
| 2 | 2 | .0000E+00 | .1137E+03 | -.1766E+05 | -.1529E+05 | 14.00 |
| | 3 | .0000E+00 | -.2240E+03 | -.1529E+05 | -.1766E+05 | .00 |
| 3 | 3 | .0000E+00 | .2240E+03 | -.1529E+05 | -.1138E+05 | 14.00 |
| | 4 | .0000E+00 | -.3343E+03 | -.1138E+05 | -.1529E+05 | .00 |
| 4 | 4 | .0000E+00 | .3343E+03 | -.1138E+05 | -.6372E+04 | 13.00 |
| | 5 | .0000E+00 | -.4368E+03 | -.6372E+04 | -.1138E+05 | .00 |
| 5 | 5 | .0000E+00 | .4368E+03 | -.6372E+04 | -.4007E+04 | 8.00 |
| | 6 | .0000E+00 | -.1544E+03 | -.4007E+04 | -.6372E+04 | .00 |
| 6 | 6 | .0000E+00 | .1544E+03 | -.4007E+04 | -.7471E+03 | 15.00 |
| | 7 | .0000E+00 | -.2802E+03 | -.7471E+03 | -.4007E+04 | .00 |
| 7 | 7 | .0000E+00 | .2802E+03 | -.7471E+03 | .3739E+03 | 8.00 |
| | 8 | .0000E+00 | .0000E+00 | .3739E+03 | -.7471E+03 | .00 |

STRUCTURE REACTIONS

| JOINT | FORCE X KIP | FORCE Y KIP | MOMENT FT-KIP |
|---|---|---|---|
| 1 | .0000E+00 | .3390E+01 | .1848E+05 |
| TOTAL | .0000E+00 | .3390E+01 | |