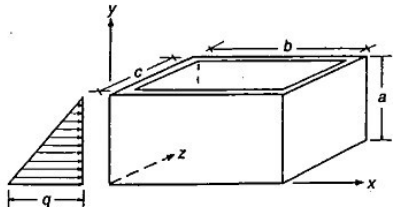
# Example 1 (Design of Rectangular Tank)

- **Note** when design of Wall for Loading Condition 3 (cover in place) (Top hinged and bottom fixed)
- Case 4 page 3-39 for the moment coefficient is smaller than previous case.

***Hinged Top***
***Fixed Base***

Moment = Coef. × $qa^2/1000$

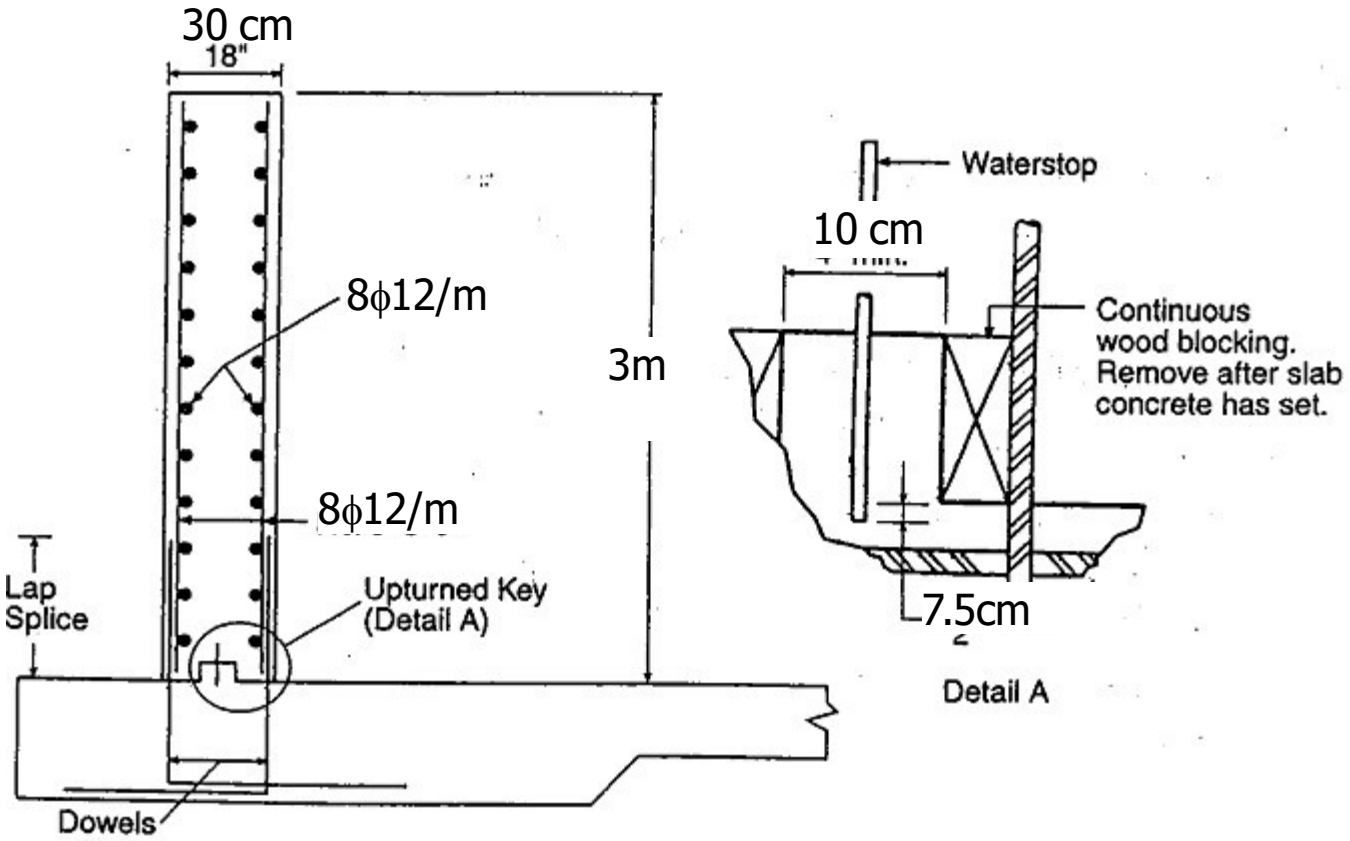



$\frac{b}{a} = 3.0, \frac{c}{a} = 2.0$

| | $M_x$ Coefficient | | | | | | $M_y$ Coefficient | | | | | | $M_{xy}$ Coefficient | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CORNER | 0.1b | 0.2b | 0.3b | 0.4b | 0.5b | CORNER | 0.1b | 0.2b | 0.3b | 0.4b | 0.5b | CORNER | 0.1b | 0.2b | 0.3b | 0.4b | 0.5b |
| | | 0.9b | 0.8b | 0.7b | 0.6b | | | 0.9b | 0.8b | 0.7b | 0.6b | | | 0.9b | 0.8b | 0.7b | 0.6b | |
| TOP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 6 | 3 | 1 | 0 |
| 0.9a | -2 | 3 | 7 | 9 | 9 | 10 | -11 | 1 | 3 | 3 | 2 | 2 | 1 | 9 | 6 | 3 | 1 | 0 |
| 0.8a | -4 | 5 | 13 | 16 | 18 | 18 | -21 | 2 | 6 | 5 | 4 | 4 | 1 | 8 | 5 | 2 | 1 | 0 |
| 0.7a | -6 | 7 | 18 | 23 | 25 | 25 | -29 | 3 | 8 | 7 | 6 | 6 | 0 | 5 | 3 | 1 | 0 | 0 |
| 0.6a | -7 | 9 | 21 | 26 | 28 | 29 | -35 | 3 | 9 | 8 | 7 | 7 | 0 | 2 | 1 | 0 | 0 | 0 |
| 0.5a | -7 | 10 | 22 | 27 | 29 | 29 | -37 | 4 | 9 | 8 | 7 | 7 | 0 | 1 | 1 | 1 | 0 | 0 |
| 0.4a | -7 | 10 | 19 | 23 | 24 | 24 | -35 | 4 | 8 | 7 | 6 | 5 | 0 | 5 | 3 | 2 | 1 | 0 |
| 0.3a | -6 | 7 | 12 | 13 | 13 | 13 | -29 | 4 | 6 | 4 | 3 | 3 | 0 | 7 | 4 | 2 | 1 | 0 |
| 0.2a | -4 | 1 | -1 | -4 | -5 | -5 | -18 | 2 | 2 | 0 | -1 | -1 | 1 | 8 | 5 | 2 | 1 | 0 |
| 0.1a | -1 | -11 | -23 | -28 | -31 | -31 | -6 | -1 | -4 | -5 | -6 | -6 | 1 | 6 | 3 | 1 | 0 | 0 |
| BOT. | 0 | -31 | -54 | -63 | -66 | -66 | 0 | -6 | -11 | -13 | -13 | -13 | 0 | 0 | 0 | 0 | 0 | 0 |

Long Side

# Example 1 (Design of Rectangular Tank)




Walls Reinforcement Details

# Example 1 (Design of Roof Slab)

## Design of Roof Slab

It is assumed that the tank has a simply supported roof
The slab is designed using plate analysis result of case 10 chapter 2 with a/b =9/6=1.5 page 2-62

***For Positive Moment along short span***

***Coef. $M_{tx}$*** *= Coef. $M_x$ + Coef. $\lvert M_{xy} \rvert$ for +ve B.M. along short span*

| $M_{tx}$ | End | 0.1b / 0.9b | 0.2b / 0.8b | 0.3b / 0.7b | 0.4b / 0.6b | 0.5b |
|---|---|---|---|---|---|---|
| Top | 49 | 43 | 33 | 22 | 11 | 0 |
| 0.9a | 45 | 54 | 52 | 48 | 40 | 31 |
| 0.8a | 37 | 54 | 61 | 63 | 60 | 53 |
| 0.7a | 26 | 49 | 63 | 70 | 71 | 67 |
| 0.6a | 14 | 40 | 59 | 71 | 76 | 76 |
| 0.5a | 0 | 28 | 50 | 66 | 75 | 78* |
| 0.4a | 14 | 40 | 59 | 71 | 76 | 76 |
| 0.3a | 26 | 49 | 63 | 70 | 71 | 67 |
| 0.2a | 37 | 54 | 61 | 63 | 60 | 53 |
| 0.1a | 45 | 54 | 52 | 48 | 40 | 31 |
| Bottom | 49 | 43 | 33 | 22 | 11 | 0 |

*Moment coefficients governing design.

# Example 1 (Design of Rectangular Tank)

***For Positive Moment along long span***

*Coef. $M_{ty}$ = Coef. $M_y$ +Coef. $|M_{xy}|$ for +ve B.M. along long span*

| $M_{ty}$ | End | 0.1b | 0.2b | 0.3b | 0.4b | 0.5b |
|---|---|---|---|---|---|---|
| | | 0.9b | 0.8b | 0.7b | 0.6b | |
| Top | 49 | 43 | 33 | 22 | 11 | 0 |
| 0.9a | 45 | 51* | 44 | 35 | 24 | 14 |
| 0.8a | 37 | 51* | 49 | 44 | 35 | 26 |
| 0.7a | 26 | 45 | 50 | 47 | 41 | 35 |
| 0.6a | 14 | 37 | 45 | 46 | 43 | 41 |
| 0.5a | 0 | 25 | 37 | 41 | 42 | 43 |
| 0.4a | 14 | 37 | 45 | 46 | 43 | 41 |
| 0.3a | 26 | 45 | 50 | 47 | 41 | 35 |
| 0.2a | 37 | 51* | 49 | 44 | 35 | 26 |
| 0.1a | 45 | 51* | 44 | 35 | 24 | 14 |
| Bottom | 49 | 43 | 33 | 22 | 11 | 0 |

**Moment coefficients governing design.*

# Example 1 (Design of Rectangular Tank)

***For Negative Moment along short span***

*Coef. $M_{tx}$ = Coef. $M_x$ -Coef. $|M_{xy}|$ for -ve B.M. along short span*

*if $M_{tx}>0$ then $M_{tx}=0$*

| $M_{tx}$ | End | 0.1b | 0.2b | 0.3b | 0.4b | 0.5b |
|---|---|---|---|---|---|---|
| | | 0.9b | 0.8b | 0.7b | 0.6b | |
| Top | -49* | -43 | -33 | -22 | -11 | 0 |
| 0.9a | -45 | -28 | -10 | 0 | 0 | 0 |
| 0.8a | -37 | -14 | 0 | 0 | 0 | 0 |
| 0.7a | -26 | 0 | 0 | 0 | 0 | 0 |
| 0.6a | -14 | 0 | 0 | 0 | 0 | 0 |
| 0.5a | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.4a | -14 | 0 | 0 | 0 | 0 | 0 |
| 0.3a | -26 | 0 | 0 | 0 | 0 | 0 |
| 0.2a | -37 | -14 | 0 | 0 | 0 | 0 |
| 0.1a | -45 | -28 | -10 | 0 | 0 | 0 |
| Bottom | -49* | -43 | -33 | -22 | -11 | 0 |

**Moment coefficients governing design*

# Example 1 (Design of Rectangular Tank)

***For Negative Moment along long span***

*Coef. $M_{ty}$= Coef. $M_y$ - Coef. $|M_{xy}|$  for -ve B.M. along long span*

*if $M_{tx}$>0 then $M_{tx}$=0*

| $M_{ty}$ | End | 0.1b | 0.2b | 0.3b | 0.4b | 0.5b |
|---|---|---|---|---|---|---|
| | | 0.9b | 0.8b | 0.7b | 0.6b | |
| Top | -49* | -43 | -33 | -22 | -11 | 0 |
| 0.9a | -45 | -31 | -18 | -7 | 0 | 0 |
| 0.8a | -37 | -17 | -3 | 0 | 0 | 0 |
| 0.7a | -26 | -3 | 0 | 0 | 0 | 0 |
| 0.6a | -14 | 0 | 0 | 0 | 0 | 0 |
| 0.5a | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.4a | -14 | 0 | 0 | 0 | 0 | 0 |
| 0.3a | -26 | -3 | 0 | 0 | 0 | 0 |
| 0.2a | -37 | -17 | -3 | 0 | 0 | 0 |
| 0.1a | -45 | -31 | -18 | -7 | 0 | 0 |
| Bottom | -49* | -43 | -33 | -22 | -11 | 0 |

* *Moment coefficients governing design.*