IS 3370-4 (1967): Code of practice for concrete structures for the storage of liquids, Part 4: Design tables [CED 2: Cement and Concrete]

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Indian Standard

CODE OF PRACTICE FOR CONCRETE STRUTURES FOR THE STORAGE OF LIQUIDS

PART IV DESIGN TABLES

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

CODE OF PRACTICE FOR CONCRETE STRUCTURES FOR THE STORAGE OF LIQUIDS

PART IV DESIGN TABLES

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Indian Standard

CODE OF PRACTICE FOR CONCRETE STRUCTURES FOR THE STORAGE OF LIQUIDS

PART IV DESIGN TABLES

0. FOREWORD

0.1 This Indian Standard (Part IV) was adopted by the Indian Standards Institution on 7 December 1967, after the draft finalized by the Cement and Concrete Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 The need for a code covering the design and construction of reinforced concrete and prestressed concrete structures for the storage of liquids has been long felt in this country. So far, such structures have been designed to varying standards adapted from the recommendations of the Institution of Civil Engineers and of the Portland Cement Association with the result that the resultant structures cannot be guaranteed to possess a uniform safety margin and dependability. Moreover, the design and construction methods in reinforced concrete and prestressed concrete are influenced by the prevailing construction practices, the physical properties of the materials and the climatic conditions. The need was, therefore, felt to lay down uniform requirements of structures for the storage of liquids giving due consideration to these factors. In order to fulfil this need, formulation of this Indian Standard code of practice for concrete structures for the storage of liquids (IS : 3370) was undertaken. This part deals with design tables for rectangular and cylindrical concrete structures for storage of liquids. The other parts of the code are the following:

Part I	General requirements
Part II	Reinforced concrete structures
Part III	Prestressed concrete structures

0.3 The object of the design tables covered in this part is mainly to present data for ready reference of designers and as an aid to speedy design calculations. The designer is, however, free to adopt any method of design depending upon his own discretion and judgement provided the requirements regarding Parts I to III of IS : 3370 are complied with and the structural adequacy and safety are ensured.

0.3.1 Tables relating to design of rectangular as well as cylindrical tanks have been given and by proper combination of various tables it may be possible to design different types of tanks involving many sets of conditions for rectangular and cylindrical containers built in or on ground.

0.3.2 Some of the data presented for design of rectangular tanks may be used for design of some of the earth retaining structures subject to earth pressure for which a hydrostatic type of loading may be substituted in the design calculations. The data for rectangular tanks may also be applied to design of circular reservoirs of large diameter in which the lateral stability depends on the action of counterforts built integrally with the wall.

0.4 While the common methods of design and construction have been covered in this code, design of structures of special forms or in unusual circumstances should be left to the judgement of the engineer and in such cases special systems of design and construction may be permitted on production of satisfactory evidence regarding their adequacy and safety by analysis or test or by both.

0.5 In this standard it has been assumed that the design of liquid retaining structures, whether of plain, reinforced or prestressed concrete is entrusted to a qualified engineer and that the execution of the work is carried out under the direction of an experienced supervisor.

0.6 All requirements of IS : 456-1964* and IS : 1343-1960†, in so far as they apply, shall be deemed to form part of this code except where otherwise laid down in this code.

0.7 The Sectional Committee responsible for the preparation of this standard has taken into consideration the views of engineers and technologists and has related the standard to the practices followed in the country in this field. Due weightage has also been given to the need for international coordination among the standards prevailing in different countries of the world. These considerations led the Sectional Committee to derive assistance from published materials of the following organizations:

British Standards Institution;

Institution of Civil Engineers, London; and

Portland Cement Association, Chicago, USA.

ˢles have been reproduced from 'Rectangular Concrete Tanks' and 'Circular Concrete Tanks without Prestressing' by courtesy of Portland Cement Association, USA.

0.8 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : ?-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Code of practice for plain and reinforced concrete (*second revision*).

†Code of practice for prestressed concrete.

‡Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard (Part IV) recommends design tables, which are intended as an aid for the design of reinforced or prestressed concrete structures for storage of liquid.

2. RECTANGULAR TANKS

2.1 Moment Coefficients for Individual Wall Panels — Moment coefficients for individual panels considered fixed along vertical edges but having different edge conditions at top and bottom are given in Tables 1 to 3. In arriving at these moments, the slabs have been assumed to act as thin plates under the various edge conditions indicated below:

Table 1	Top hinged, bottom hinged
Table 2	Top free, bottom hinged
Table 3	Top free, bottom fixed

2.1.1 Conditions in Table 3 are applicable to cases in which wall slab, counterfort and base slab are all built integrally.

2.1.2 Moment coefficients for uniform load on rectangular plates hinged at all four sides are given in Table 4. This table may be found useful in designing cover slabs and bottom slabs for rectangular tanks with one cell. If the cover slab is made continuous over intermediate supports, the design may be made in accordance with procedure for slabs supported on four sides (*see* Appendix C of IS : 456-1964*).

2.2 Moment Coefficients for Rectangular Tanks — The coefficients for individual panels with fixed side edges apply without modification to continuous walls provided there is no rotation about the vertical edges. In a square tank, therefore, moment coefficients may be taken direct from Tables 1 to 3. In a rectangular tank, however, an adjustment has to be made in a manner similar to the modification of fixed end moments in a frame analysed by the method of moment distribution. In this procedure the common side edge of two adjacent panels is first considered artificially restrained so that no rotation can take place about the edge. Fixed edge moments taken from Tables 1, 2 or 3 are usually dissimilar in adjacent panels and the differences, which correspond to unbalanced moments, tend to rotate the edge. When the artificial restraint is removed they will induce additional moments in the panels. The final end moments may be obtained by adding induced moments and the fixed end moments at the edge. These final end moments should be identical on either side of the common edge.

2.2.1 The application of moment distribution to the case of continuous tank walls is not as simple as that of the framed structures, because in the

*Code of practice for plain and reinforced concrete (*second revision*).

former case the moments should be distributed simultaneously all along the entire length of the side edge so that moments become equal at both sides at any point of the edge. A simplified approximation would be distribution of moments at five-points, namely, the quarter-points, the mid-point and the bottom. The end moments in the two intersecting slabs may be made identical at these five-points and moments at interior points adjusted accordingly.

2.2.1.1 The moment coefficients computed in the manner described are tabulated in Tables 5 and 6 for top and bottom edge conditions as shown for single-cell tanks with a large number of ratios of b/a and c/a, b being the larger and c the smaller of the horizontal tank dimensions.

2.2.2 When a tank is built underground, the walls should be investigated for both internal and external pressure. This may be due to earth pressure or to a combination of earth and ground water pressure. Tables 1 to 6 may be applied in the case of pressure from either side but the signs will be opposite. In the case of external pressure, the actual load distribution may not necessarily be triangular, as assumed in Tables 1 to 6. For example, in case of a tank built below ground with earth covering the roof slab, there will be a trapezoidal distribution of lateral earth pressure on the walls. In this case it gives a fairly good approximation to substitute a triangle with same area as the trapezoid representing the actual load distribution. The intensity of load is the same at mid-depth in both cases, and when the wall is supported at both top and bottom edge, the discrepancy between the the triangle and the trapezoid will have relatively little effect at and near the supported edges. Alternatively, to be more accurate, the coefficients of moments and forces for rectangular and triangular distribution of load may be added to get the final results.

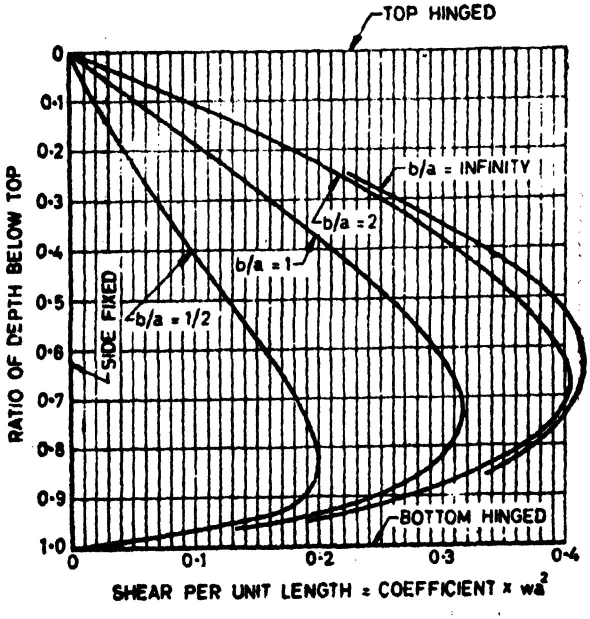
2.3 Shear Coefficients — The values of shear force along the edge of a tank wall would be required for investigation of diagonal tension and bond stresses. Along vertical edges, the shear in one wall will cause axial tension in the adjacent wall and should be combined with the bending moment for the purpose of determining the tensile reinforcement.

2.3.1 Shear coefficients for a wall panel (of width b, height a and subjected to hydrostatic pressure due to a liquid of density w) considered fixed at the two vertical edges and assumed hinged at top and bottom edges are given in Fig. 1 and Table 7.

2.3.2 Shear coefficients for the same wall panel considered fixed at the two vertical edges and assumed hinged at the bottom but free at top edge are given in Fig. 2 and Table 8.

2.3.3 It would be evident from Table 7, that the difference between the shear for $b/a = 2$ and infinity is so small that there is no necessity for computing coefficients for intermediate values. When b/a is large, a vertical strip of the slab near the mid-point of the b-dimension will behave essentially as a simply supported one-way slab. The total pressure on a strip of unit height is 0·5 wa^2 of which two-thirds, or 0·33 wa^2 is the reaction at the bottom support and one-thirds, or 0·17 wa^2, is the reaction at the top. It may be seen from Table 17 that the shear at mid-point of the bottom edge is 0·329 wa^2 for $b/a = 2·0$, the coefficient being very close to that of 1/3 for infinity. In other words, the maximum bottom shear is practically constant for all values of b/a greater than 2. This is correct only when the top edge is supported, not when it is free.

2.3.3.1 At the corner the shear at the bottom edge is negative and is numerically greater than the shear at the mid-point. The change from positive to negative shear occurs approximately at the outer tenth-points of the bottom edge. These high negative values at the corners arise from the fact that deformations in the planes of the supporting slabs are neglected in the basic equations and are, therefore, of only theoretical significance. These shears may be disregarded for checking shear and bond stresses.

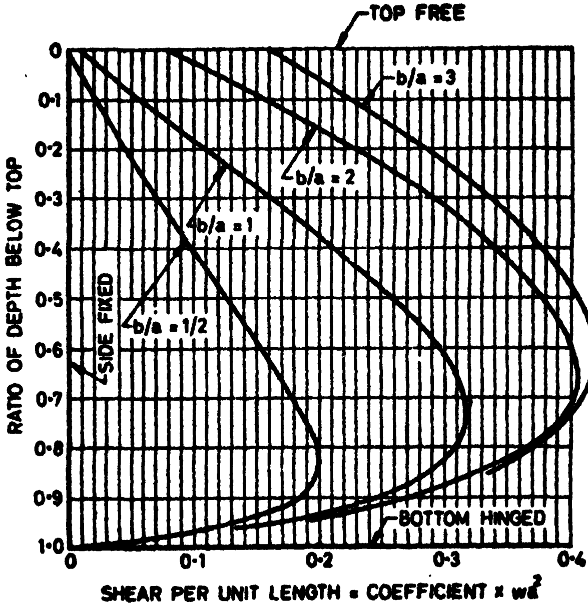


a = height of the wall

b = width of the wall

w = density of the liquid causing hydrostatic pressure

Fig. 1 Coefficients for Wall Panel, Fixed at Vertical Edges, Hinged at Top and Bottom Edges



a = height of the wall
b = width of the wall
w = density of the liquid causing hydrostatic pressure

FIG. 2 COEFFICIENTS FOR WALL PANEL, FIXED AT VERTICAL EDGES, HINGED AT BOTTOM EDGE AND FREE AT TOP EDGE

2.3.3.2 The unit shears at the fixed edge in Table 7 have been used for plotting the curves in Fig. 1. It would be seen that there is practically no change in the shear curves beyond $b/a = 2{\cdot}0$. The maximum value occurs at a depth below the top somewhere between $0{\cdot}6a$ and $0{\cdot}8a$. Fig. 1 will be found useful for determination of shear or axial tension for any ratio of b/a and at any point of a fixed side edge.

2.3.4 The total shear from top to bottom of one fixed edge in Table 7 should be equal to the area within the corresponding curve in Fig. 1. The total shears computed and tabulated for hinged top may be used in making certain adjustments so as to determine approximate values of shear for walls with free top. These are given in Table 8.

2.3.4.1 For $b/a = 1/2$ in Table 7, total shear at the top edge is so small as to be practically zero, and for $b/a = 1{\cdot}0$ the total shear, 0·005 2, is only one percent of the total hydrostatic pressure, 0·50. Therefore, it would be reasonable to assume that removing the top support will not materially change the total shears at any of the other three edges when $b/a = 1/2$ and 1.

At b/a=2·0 there is a substantial shear at the top edge when hinged, 0·053 8, so that the sum of the total shears on the other three sides is only 0·44 62. If the top support is removed, the other three sides should carry a total of 0·50. A reasonable adjustment would be to multiply each of the three remaining total shears by 0·50/0·446 2=1·12, an increase of 12 percent. This has been done in preparing Table 8 for b/a=2·0. A similar adjustment has been made for b/a=3·0 in which case the increase is 22 percent.

2.3.5 The total shears recorded in Table 8 have been used for determination of unit shears which are also recorded in Table 8. Considering the shear curves in Fig. 1 and assuming that the top is changed from hinged to free, for $b/a=\frac{1}{2}$ and 1, it would make little difference in the total shear, that is, in the area within the shear curves, whether the top is supported or not. Consequently, the curves for $b/a=\frac{1}{2}$ and 1 remain practically unchanged. For b/a=2 an adjustment has become necessary for the case with top free. A change in the support at the top has little effect upon the shear at the bottom of the fixed edge. Consequently, the curves in Fig. 1 and 2 are nearly identical at the bottom. Gradually, as the top is approached the curves for the free top deviate more and more from those for the hinged top as indicated in Fig. 2. By trial, the curve for b/a=2 has been so adjusted that the area within it equals the total shear for one fixed edge for b/a=2·0 in Table 8. A similar adjustment has been made for b/a=3·0 which is the limit for which moment coefficients are given.

2.3.5.1 Comparison of Fig. 1 and Fig. 2 would show that whereas for b/a=2·0 and 3·0 the total shear is increased 12 and 22 percent respectively when the top is free instead of hinged, the maximum shear is increased but slightly, 2 percent at the most. The reason for this is that most of the increase in shear is near the top where the shears are relatively small.

2.3.5.2 The same procedure has been applied, for adjustment of unit shear at mid-point of the bottom, but in this case the greatest change resulting from making the top free is at the mid-point where the shear is large for the hinged top condition. For example, for b/a=3·0, the unit shear at mid-point of the bottom is 0·33 wa^2 with hinged top but 0·45 wa^2 with free top. an increase of approximately one-third.

2.3.6 Although the shear coefficients given in Tables 7 and 8 are for wall panels with fixed vertical edges, the coefficients may be applied with satisfactory results to any ordinary tank wall, even if the vertical edges are not fully fixed.

3. CYLINDRICAL TANKS

3.1 Ring Tension and Moments in Walls

3.1.1 *Wall with Fixed Base and Free Top, Subjected to Triangular Load* (*Fig.* 3) — Walls built continuous with their footings are sometime designed as though the base was fixed and the top free, although strictly speaking the base is seldom fixed, but it is helpful to start with this assumption and then to go on to the design procedures for other more correct conditions. Ring tensions at various heights of walls of cylindrical tanks fixed at base, free at top, and subjected to triangular load are given in Table 9. Moments in cylindrical wall fixed at base, free at top and subjected to triangular load are given in Table 10. Coefficients for shear at base of cylindrical wall are given in Table 11.

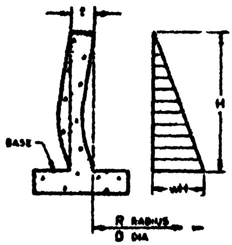


FIG. 3 WALL WITH FIXED BASE AND FREE TOP SUBJECTED TO TRIANGULAR LOAD

3.1.2 *Wall with Hinged Base and Free Top, Subjected to Triangular Load* (*Fig.* 4) — The values given in **3.1.1** are based on the assumption that the base joint is continuous and the footing is prevented from even the smallest rotation of kind shown exaggerated in Fig. 4. The rotation required to reduce the fixed base moment from some definite value to, say, zero is much smaller than rotations that may occur when normal settlement takes place in subgrade. It may be difficult to predict the behaviour of the subgrade and its effect upon the restraint at the base, but it is more reasonable to assume that the base is hinged than fixed, and the hinged-based assumption gives a safer design. Ring tensions and moments at different heights of wall of cylindrical tank are given in Tables 12 and 13 respectively. Coefficients for shear at base of cylindrical wall are given in Table 11.

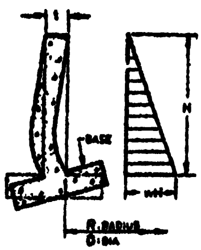


FIG. 4 WALL WITH HINGED BASE AND FREE TOP SUBJECTED TO TRIANGULAR LOAD

3.1.2.1 The actual condition of restraint at a wall footing as in Fig. 3 and 4 is between fixed and hinged, but probably closer to hinged. The comparison of ring tension and moments in cylindrical walls with the end conditions in **3.1.1** and **3.1.2** shows that assuming the base hinged gives conservative although not wasteful design, and this assumption is, therefore, generally recommended. Nominal vertical reinforcement in the inside curtain lapped with short dowels across the base joints will suffice.

This condition is considered satisfactory for open-top tanks with wall footings that are not continuous with the tank bottom, except that allowance should usually be made for a radial displacement of the footing. Such a displacement is discussed in **3.1.5**. If the wall is made continuous at top or base, or at both, the continuity should also be considered. These conditions are given in **3.1.6**.

3.1.3 *Wall with Hinged Base and Free Top, Subjected to Trapezoidal Load* (*Fig.* 5) — In tank used for storage of liquids subjected to vapour pressure and also in cases where liquid surface may rise considerably above the top of the wall, as may accidently happen in case of underground tanks, the pressure on tank walls is a combination of the triangular hydrostatic pressure plus uniformly distributed loading. This combined pressure will have a trapezoidal distribution as shown in Fig. 5, which only represents the loading condition, without considering the effect of roof which is discussed in **3.1.4**. In this case, the coefficients for ring tension may be taken from Tables 12 and 14. Coefficients for shear at the base are given in Table 11. Coefficients for moments per unit width are given in Table 13.

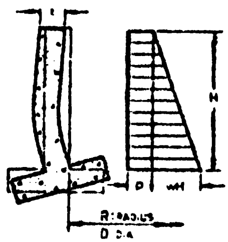


FIG. 5 WALL WITH HINGED BASE AND FREE TOP SUBJECTED TO TRAPEZOIDAL LOAD

3.1.4 *Wall with Shear Applied at Top* (*Fig.* 6) — When the top of the cylindrical wall is dowelled to the roof slab, it may not be able to move freely as assumed in **3.1.1** to **3.1.3**. When displacement is prevented, the top cannot expand and the ring tension is zero at top. If T kg is the ring tension at 0·0 H when the top is free to expand as in **3.1.3**, the value of shear V can be found from Table 15 as below:

$$T = -x \frac{VR}{H} \quad \text{or}$$

$$V = \frac{HT}{Rx}$$

where

x = the coefficient obtained from Table 15 depending upon the ratio $\frac{H^2}{Dt}$

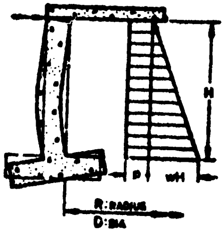


FIG. 6 WALL WITH SHEAR APPLIED AT TOP

3.1.5 *Wall with Shear Applied at Base* — Data given in Table 15 may also be approximately applied in cases where shear is at the base of the wall, as in Fig. 7, which illustrates a case in which the base of the wall is displaced radially by application of a horizontal shear V having an inward direction. When the base is hinged, the displacement will be zero and the reaction on wall will be inward in direction. When the base is sliding, there will be largest possible displacement but the reaction will be zero

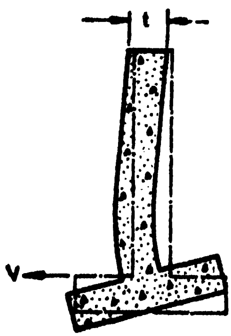


FIG. 7 WALL WITH SHEAR APPLIED AT BASE

3.1.6 *Wall with Moment Applied at Top* — When the top of the wall and the roof slab are made continuous as shown in Fig. 8, the deflection of the roof will tend to rotate the top joint and introduce a moment at the top of the wall. In such cases, data in Tables 16 and 17 will be found useful although they are prepared for moment applied at one end of the wall when the other is free. These tables may also be applied with good degree of accuracy, when the free end is hinged or fixed.

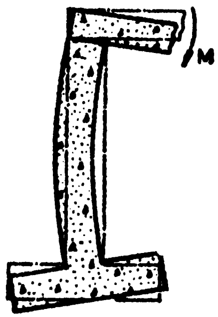


FIG. 8 WALL WITH MOMENT APPLIED AT TOP

3.1.7 Data for moments in cylindrical walls fixed at base and free at top and subjected to rectangular load are covered in Table 18, and the data for moments in cylindrical wall, fixed at base, free at top, subjected to shear applied at the top are covered in Table 19.

3.2 Moments in Circular Slabs — Data for moments in circular slabs with various edge conditions and subjected to different loadings are given in Tables 20 to 23.

TABLE 1 MOMENT COEFFICIENTS FOR INDIVIDUAL WALL PANEL, TOP AND BOTTOM HINGED, VERTICAL EDGES FIXED

(*Clauses* 2.1, 2.2 *and* 2.2.2)

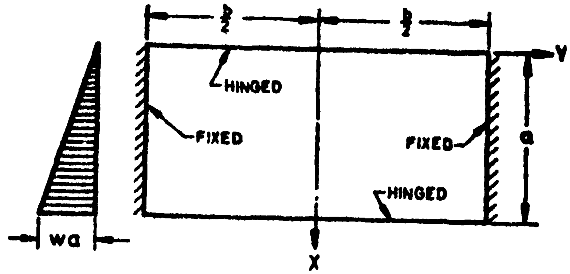
a = height of the wall

b = width of the wall

w = density of the liquid

Horizontal moment = $M_y wa^3$

Vertical moment = $M_x wa^3$



b/a	x/a	$y = 0$		$y = b/4$		$y = b/2$	
		M_x	M_y	M_x	M_y	M_x	M_y
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3·00	1/4	+0·035	+0·010	+0·026	+0·011	−0·008	−0·039
	1/2	+0·057	+0·016	+0·044	+0·017	−0·013	−0·063
	3/4	+0·051	+0·013	+0·041	+0·014	−0·011	−0·055
2·50	1/4	+0·031	+0·011	+0·021	+0·010	−0·008	−0·038
	1/2	+0·052	+0·017	+0·036	+0·017	−0·012	−0·062
	3/4	+0·047	+0·015	+0·036	+0·014	−0·011	−0·055
2·00	1/4	+0·025	+0·013	+0·015	+0·009	−0·007	−0·037
	1/2	+0·042	+0·020	+0·028	+0·015	−0·012	−0·059
	3/4	+0·041	+0·016	+0·029	+0·013	−0·011	−0·053
1·75	1/4	+0·020	+0·013	+0·012	+0·008	−0·007	−0·035
	1/2	+0·036	+0·020	+0·023	+0·013	−0·011	−0·057
	3/4	+0·036	+0·017	+0·025	+0·012	−0·010	−0·051
1·50	1/4	+0·015	+0·013	+0·008	+0·007	−0·006	−0·032
	1/2	+0·028	+0·021	+0·016	+0·011	−0·010	−0·052
	3/4	+0·030	+0·017	+0·020	+0·011	−0·010	−0·048
1·25	1/4	+0·009	+0·012	+0·005	+0·005	−0·006	−0·028
	1/2	+0·019	+0·019	+0·011	+0·009	−0·009	−0·045
	3/4	+0·023	+0·017	+0·014	+0·009	−0·009	−0·043
1·00	1/4	+0·005	+0·009	+0·002	+0·003	−0·004	−0·020
	1/2	+0·011	+0·016	+0·006	+0·006	−0·007	−0·035
	3/4	+0·016	+0·014	+0·009	+0·007	−0·007	−0·035
0·75	1/4	+0·001	+0·006	+0·000	+0·002	−0·002	−0·012
	1/2	+0·005	+0·011	+0·002	+0·003	−0·004	−0·022
	3/4	+0·009	+0·011	+0·005	+0·005	−0·005	−0·025
0·50	1/4	+0·000	+0·003	0·000	+0·001	−0·001	−0·005
	1/2	+0·001	+0·005	+0·001	+0·001	−0·002	−0·010
	3/4	+0·004	+0·007	+0·002	+0·002	−0·003	−0·014

TABLE 2 MOMENT COEFFICIENTS FOR INDIVIDUAL WALL PANEL, TOP FREE, BOTTOM HINGED, VERTICAL EDGES FIXED

(*Clauses* 2.1, 2.2 *and* 2.2.2)

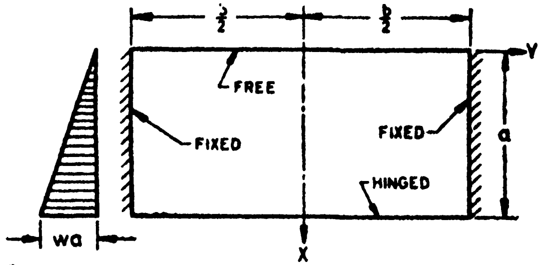
a = height of the wall

b = width of the wall

w = density of the liquid

Horizontal moment = $M_y\, wa^3$

Vertical moment = $M_x\, wa^3$



b/a	*x/a*	*y* = 0		*y* = *b*/4		*y* = *b*/2	
		M_x	M_y	M_x	M_y	M_x	M_y
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3·00	0	0	+0·070	0	+0·027	0	−0·196
	1/4	+0·028	+0·061	+0·015	+0·028	−0·034	−0·170
	1/2	+0·049	+0·049	+0·032	+0·026	−0·027	−0·137
	3/4	+0·046	+0·030	+0·034	+0·018	−0·017	−0·087
2·50	0	0	+0·061	0	+0·019	0	−0·138
	1/4	+0·024	+0·053	+0·010	+0·022	−0·026	−0·132
	1/2	+0·042	+0·044	+0·025	+0·022	−0·023	−0·115
	3/4	+0·041	+0·027	+0·030	+0·016	−0·016	−0·078
2·00	0	0	+0·045	0	+0·011	0	−0·091
	1/4	+0·016	+0·042	+0·006	+0·014	−0·019	−0·04
	1/2	+0·033	+0·036	+0·020	+0·016	−0·018	−0·089
	3/4	+0·035	+0·024	+0·025	+0·014	−0·013	−0·065
1·75	0	0	+0·036	0	+0·008	0	−0·071
	1/4	+0·013	+0·035	+0·005	+0·011	−0·015	−0·076
	1/2	+0·028	+0·032	+0·017	+0·014	−0·015	−0·076
	3/4	+0·031	+0·022	+0·021	+0·012	−0·012	−0·059
1·50	0	0	+0·027	0	+0·005	0	−0·052
	1/4	+0·009	+0·028	+0·003	+0·008	−0·012	−0·059
	1/2	+0·022	+0·027	+0·012	+0·011	−0·013	−0·063
	3/4	+0·027	+0·020	+0·017	+0·011	−0·010	−0·052
1·25	0	0	+0·017	0	+0·003	0	−0·034
	1/4	+0·005	+0·020	+0·002	+0·005	−0·008	−0·042
	1/2	+0·017	+0·023	+0·009	+0·009	−0·010	−0·049
	3/4	+0·021	+0·017	+0·013	+0·009	−0·009	−0·044
1·00	0	0	+0·010	0	+0·002	0	−0·019
	1/4	+0·002	+0·013	+0·000	+0·003	−0·005	−0·025
	1/2	+0·010	+0·017	+0·005	+0·006	−0·007	−0·036
	3/4	+0·015	+0·015	+0·009	+0·007	−0·007	−0·036
0·75	0	0	+0·005	0	+0·001	0	−0·008
	1/4	+0·001	+0·008	+0·000	+0·002	−0·003	−0·013
	1/2	+0·005	+0·011	+0·002	+0·004	−0·004	−0·022
	3/4	+0·010	+0·012	+0·006	+0·004	−0·005	−0·026
0·50	0	0	+0·002	0	+0·000	0	−0·003
	1/4	+0·000	+0·004	+0·000	+0·001	−0·001	−0·005
	1/2	+0·002	+0·006	+0·001	+0·002	−0·002	−0·010
	3/4	+0·007	+0·008	+0·002	+0·002	−0·003	−0·014

TABLE 3 MOMENT COEFFICIENTS FOR INDIVIDUAL WALL PANEL, TOP FREE, BOTTOM AND VERTICAL EDGES FIXED

(*Clauses* 2.1, 2.1.1, 2.2 *and* 2.2.2)

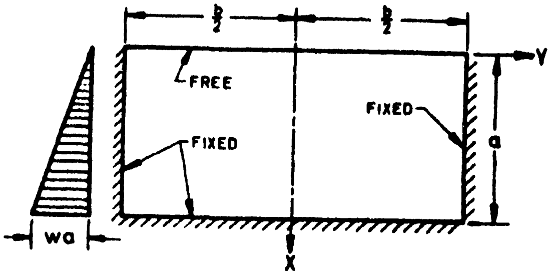
a = height of the wall

b = width of the wall

w = density of the liquid

Horizontal moment = $M_y\, wa^3$

Vertical moment = $M_x\, wa^3$



b/a	x/a	$y = 0$		$y = b/4$		$y = b/2$	
		M_x	M_y	M_x	M_y	M_x	M_y
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3·00	0	0	+0·025	0	+0·014	0	−0·082
	1/4	+0·010	+0·019	+0·007	+0·013	−0·014	−0·071
	1/2	+0·005	+0·010	+0·008	+0·010	−0·011	−0·055
	3/4	−0·033	−0·004	−0·018	−0·000	−0·006	−0·028
	1	−0·126	−0·025	−0·092	−0·018	0	0
2·50	0	0	+0·027	0	+0·013	0	−0·074
	1/4	+0·012	+0·022	+0·007	+0·013	−0·013	−0·066
	1/2	+0·011	+0·014	+0·008	+0·010	−0·011	−0·053
	3/4	−0·021	−0·001	−0·010	−0·001	−0·005	−0·027
	1	−0·108	−0·022	−0·077	−0·015	0	0
2·00	0	0	+0·027	0	+0·009	0	−0·060
	1/4	+0·013	+0·023	+0·006	+0·010	−0·012	−0·059
	1/2	+0·015	+0·016	+0·010	+0·010	−0·100	−0·049
	3/4	−0·008	+0·003	−0·002	+0·003	−0·005	−0·027
	1	−0·086	−0·017	−0·059	−0·012	0	0

(*Continued*)

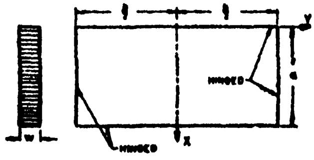
TABLE 3 MOMENT COEFFICIENTS FOR INDIVIDUAL WALL PANEL, TOP FREE, BOTTOM AND VERTICAL EDGES FIXED- *Contd*

b/a	x/a	$y = 0$		$y = b/4$		$y = b/2$	
		M_x	M_y	M_x	M_y	M_x	M_y
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1·75	0	0	+0·025	0	+0·007	0	−0·050
	1/4	+0·012	+0·022	+0·005	+0·008	−0·010	−0·052
	1/2	+0·016	+0·016	+0·010	+0·009	−0·009	−0·046
	3/4	−0·002	−0·005	+0·001	−0·004	−0·005	−0·027
	1	−0·074	−0·015	−0·050	−0·010	0	0
1·50	0	0	+0·021	0	+0·005	0	−0·040
	1/4	+0·008	+0·020	+0·004	+0·007	−0·009	−0·044
	1/2	+0·016	+0·016	+0·010	+0·008	−0·008	−0·042
	3/4	−0·003	−0·006	+0·003	−0·004	−0·005	−0·026
	1	−0·060	−0·012	−0·041	−0·008	0	0
1·25	0	0	+0·015	0	+0·003	0	−0·029
	1/4	+0·005	+0·015	+0·002	+0·005	−0·007	−0·034
	1/2	+0·014	+0·015	+0·008	+0·007	−0·007	−0·037
	3/4	+0·006	+0·007	+0·005	+0·005	−0·005	−0·024
	1	−0·047	−0·009	−0·031	−0·006	0	0
1·0	0	0	+0·009	0	+0·002	0	−0·018
	1/4	+0·002	+0·011	+0·000	+0·003	−0·005	−0·023
	1/2	+0·009	+0·013	+0·005	+0·005	−0·006	−0·029
	3/4	+0·008	−0·008	+0·005	+0·004	−0·004	−0·020
	1	−0·035	−0·007	−0·022	−0·005	0	0
0·75	0	0	+0·004	0	+0·001	0	−0·007
	1/4	+0·001	+0·008	+0·000	+0·002	−0·002	−0·011
	1/2	+0·005	+0·010	+0·002	+0·003	−0·003	−0·017
	3/4	+0·007	+0·007	+0·003	+0·003	−0·003	−0·013
	1	−0·024	−0·005	−0·015	−0·003	0	0
0·50	0	0	+0·001	0	+0·000	0	−0·002
	1/4	+0·000	+0·005	+0·000	+0·001	−0·001	−0·004
	1/2	+0·002	+0·006	+0·001	+0·001	−0·002	−0·009
	3/4	+0·004	+0·006	+0·001	+0·001	−0·001	−0·007
	1	−0·015	−0·003	−0·008	−0·002	0	0

TABLE 4 MOMENT COEFFICIENTS FOR UNIFORM LOAD ON RECTANGULAR PLATE HINGED AT FOUR EDGES

(*Clauses* 2.1.2 *and* 2.2.2)

a = height of the wall
b = width of the wall
w = density of the liquid
Horizontal moment = $M_y\, wa^2$
Vertical moment = $M_x\, wa^2$



b/a	x/a	$y = 0$		$y = b/4$	
		M_x	M_y	M_x	M_y
(1)	(2)	(3)	(4)	(5)	(6)
3·00	1/4	+0·089	+0·022	+0·077	+0·025
	1/2	+0·118	+0·029	+0·101	+0·034
2·50	1/4	+0·085	+0·024	+0·070	+0·027
	1/2	+0·112	+0·032	+0·092	+0·037
2·00	1/4	+0·076	+0·027	+0·061	+0·028
	1/2	+0·100	+0·037	+0·078	+0·038
1·75	1/4	+0·070	+0·029	+0·054	+0·029
	1/2	+0·091	+0·040	+0·070	+0·039
1·50	1/4	+0·061	+0·031	+0·047	+0·029
	1/2	+0·078	+0·043	+0·059	+0·040
1·25	1/4	+0·049	+0·033	+0·038	+0·029
	1/2	+0·063	+0·044	+0·047	+0·039
1·00	1/4	+0·036	+0·033	+0·027	+0·027
	1/2	+0·044	+0·044	+0·033	+0·036
0·75	1/4	+0·022	+0·029	+0·016	+0·023
	1/2	+0·025	+0·038	+0·018	+0·030
0·50	1/4	+0·010	+0·020	+0·007	+0·015
	1/2	+0·009	+0·025	+0·007	+0·019

TABLE 5 MOMENT COEFFICIENTS FOR TANKS WITH WALLS FREE AT TOP AND HINGED AT BOTTOM

(*Clause* 2.2.2)

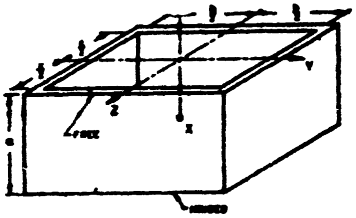
a = height of the wall

b = width of the wall

w = density of the liquid

Horizontal moment = $M_y wa^3$

Vertical moment = $M_x wa^3$



c/a	x/a	b/a=3·0									
		y=0		y=b/4		y=b/2		z=c/4		z=0	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_y
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
3·00	0	0	+0·070	0	+0·027	0	−0·196	0	+0·027	0	+0·070
	1/4	+0·028	+0·061	+0·015	+0·028	−0·034	−0·170	+0·015	+0·028	+0·028	+0·061
	1/2	+0·049	+0·049	+0·032	+0·026	−0·027	−0·137	+0·032	+0·026	+0·049	+0·049
	3/4	+0·046	+0·030	+0·034	+0·018	−0·017	−0·087	+0·034	+0·018	+0·046	+0·030
2·50	0	0	+0·073	0	+0·033	0	−0·169	0	+0·015	0	+0·057
	1/4	+0·028	+0·063	+0·016	+0·033	−0·030	−0·151	+0·009	+0·014	+0·022	+0·050
	1/2	+0·049	+0·050	+0·033	+0·029	−0·025	−0·126	+0·023	+0·017	+0·041	+0·043
	3/4	+0·046	+0·030	+0·037	+0·020	−0·017	−0·084	+0·029	+0·014	+0·040	+0·027

(*Continued*)

TABLE 5 MOMENT COEFFICIENTS FOR TANKS WITH WALLS FREE AT TOP AND HINGED AT BOTTOM — *Contd*

c/a	x/a	$b/a=3{\cdot}0$, $y=0$, M_x	$y=0$, M_y	$y=b/4$, M_x	$y=b/4$, M_y	$y=b/2$, M_x	$y=b/2$, M_y	$z=c/4$, M_x	$z=c/4$, M_z	$z=0$, M_x	$z=0$, M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2·00	0	0	+0·075	0	+0·039	0	−0·146	0	−0·005	0	+0·031
	1/4	+0·029	+0·065	+0·017	+0·036	−0·027	−0·133	+0·002	−0·002	+0·013	+0·032
	1/2	+0·050	+0·051	+0·035	+0·032	−0·023	−0·113	+0·016	+0·005	+0·030	+0·029
	3/4	+0·046	+0·031	+0·037	+0·021	−0·016	−0·078	+0·022	+0·008	+0·034	+0·020
1·75	0	0	+0·076	0	+0·041	0	−0·137	0	−0·018	0	+0·014
	1/4	+0·029	+0·065	+0·018	+0·038	−0·025	−0·125	−0·003	−0·012	+0·007	+0·018
	1/2	+0·050	+0·052	+0·036	+0·033	−0·021	−0·106	+0·011	−0·003	+0·023	+0·020
	3/4	+0·046	+0·031	+0·037	+0·021	−0·015	−0·074	+0·018	+0·004	+0·027	+0·015
1·5	0	0	+0·077	0	+0·043	0	−0·129	0	−0·033	0	−0·006
1·50	1/4	+0·035	+0·010	+0·027	+0·011	−0·007	+0·035	+0·007	+0·006	+0·014	+0·013
	1/2	+0·057	+0·015	+0·045	+0·017	−0·011	−0·057	+0·015	+0·010	+0·027	+0·020
	3/4	+0·051	+0·013	+0·042	+0·014	−0·010	−0·051	+0·019	+0·011	+0·029	+0·017
1·25	0	0	+0·078	0	+0·045	0	−0·122	0	−0·052	0	−0·031
1·25	1/4	+0·035	+0·010	+0·027	+0·011	−0·006	−0·032	+0·003	+0·003	+0·068	+0·011
	1/2	+0·057	+0·015	+0·046	+0·017	−0·011	−0·053	+0·008	+0·006	+0·017	+0·017
	3/4	+0·051	+0·013	+0·042	+0·014	−0·010	−0·048	+0·013	+0·008	+0·021	+0·016
1·00	0	0	+0·079	0	+0·047	0	−0·118	0	−0·074	0	−0·060
1·00	1/4	+0·035	+0·010	+0·027	+0·011	−0·006	−0·029	−0·001	+0·000	+0·002	+0·008
	1/2	+0·057	+0·015	+0·046	+0·017	−0·010	−0·048	+0·002	+0·002	+0·007	+0·014
	3/4	+0·051	+0·013	+0·043	+0·014	−0·009	−0·044	+0·007	+0·004	+0·013	+0·013
0·75	0	0	+0·079	0	+0·047	0	−0·120	0	−0·098	0	−0·092
0·75	1/4	+0·035	+0·010	+0·028	+0·011	−0·005	−0·025	−0·003	−0·005	−0·002	+0·001
	1/2	+0·057	+0·015	+0·046	+0·017	−0·008	−0·042	−0·003	−0·005	−0·001	+0·007
	3/4	+0·052	+0·013	+0·043	+0·014	−0·008	−0·039	+0·002	−0·002	+0·006	+0·007
0·50	0	0	+0·078	0	+0·047	0	−0·130	0	−0·126	0	−0·123
0·50	1/4	+0·036	+0·010	+0·028	+0·011	−0·004	−0·021	−0·004	−0·011	−0·005	−0·008
	1/2	+0·057	+0·015	+0·047	+0·017	−0·007	−0·035	−0·007	−0·016	−0·006	−0·010
	3/4	+0·052	+0·013	+0·043	+0·014	−0·007	−0·033	−0·004	−0·010	−0·001	−0·004

(*Continued*)

TABLE 5 MOMENT COEFFICIENTS FOR TANKS WITH WALLS FREE AT TOP AND HINGED AT BOTTOM — *Contd*

c/a	x/a	$b/a = 2·5$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2·50	0	0	+0·061	0	+0·019	0	−0·138	0	+0·019	0	+0·061
	1/4	+0·024	+0·053	+0·010	+0·022	−0·026	−0·132	+0·010	+0·022	+0·024	+0·053
	1/2	+0·042	+0·044	+0·025	+0·022	−0·023	−0·115	+0·025	+0·022	+0·042	+0·044
	3/4	+0·041	+0·027	+0·030	+0·016	−0·016	−0·078	+0·030	+0·016	+0·041	+0·027
2·00	0	0	+0·065	0	+0·026	0	−0·118	0	+0·003	0	+0·038
	1/4	+0·025	+0·055	+0·012	+0·027	−0·023	−0·113	+0·005	+0·006	+0·015	+0·037
	1/2	+0·043	+0·046	+0·028	+0·025	−0·020	−0·102	+0·018	+0·011	+0·032	+0·033
	3/4	+0·042	+0·028	+0·031	+0·018	−0·014	−0·070	+0·023	+0·011	+0·034	+0·022
1·75	0	0	+0·067	0	+0·030	0	−0·108	0	−0·006	0	+0·025
	1/4	+0·025	+0·057	+0·013	+0·030	−0·021	−0·104	+0·001	−0·002	+0·010	+0·026
	1/2	+0·044	+0·047	+0·029	+0·027	−0·019	−0·096	+0·013	+0·004	+0·025	+0·025
	3/4	+0·043	+0·028	+0·033	+0·019	−0·013	−0·066	+0·019	+0·008	+0·029	+0·019
1·50	0	0	+0·068	0	+0·033	0	−0·100	0	−0·018	0	+0·008
	1/4	+0·026	+0·058	+0·014	+0·032	−0·019	−0·097	−0·003	−0·012	+0·004	+0·013
	1/2	+0·045	+0·047	+0·030	+0·029	−0·018	−0·089	+0·008	−0·002	+0·017	+0·017
	3/4	+0·043	+0·029	+0·034	+0·019	−0·013	−0·063	+0·015	+0·004	+0·024	+0·015

(Continued)

TABLE 5 MOMENT COEFFICIENTS FOR TANKS WITH WALLS FREE AT TOP AND HINGED AT BOTTOM — *Contd*

c/a	x/a	$b/a=2\cdot5$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1·25	0	0	+0·069	0	+0·035	0	−0·092	0	−0·030	0	−0·010
	1/4	+0·026	+0·059	+0·015	+0·034	−0·018	−0·089	−0·006	−0·024	−0·002	−0·003
	1/2	+0·045	+0·048	+0·031	+0·031	−0·016	−0·082	+0·003	−0·012	+0·008	+0·007
	3/4	+0·044	+0·029	+0·034	+0·020	−0·012	−0·059	+0·011	−0·002	+0·018	+0·008
1·00	0	0	+0·070	0	+0·037	0	−0·087	0	−0·045	0	−0·032
	1/4	+0·026	+0·060	+0·015	+0·036	−0·017	−0·083	−0·010	−0·036	−0·008	−0·021
	1/2	+0·046	+0·048	+0·031	+0·032	−0·015	−0·077	−0·003	−0·021	−0·001	−0·008
	3/4	+0·044	+0·029	+0·033	+0·021	−0·011	−0·056	+0·006	−0·008	+0·011	−0·000
0·75	0	0	+0·070	0	+0·038	0	−0·082	0	−0·062	0	−0·055
	1/4	+0·025	+0·060	+0·015	+0·037	−0·016	−0·078	−0·014	−0·053	−0·014	−0·042
	1/2	+0·045	+0·047	+0·030	+0·032	−0·014	−0·071	−0·008	−0·035	−0·009	−0·025
	3/4	+0·043	+0·029	+0·033	+0·020	−0·011	−0·054	+0·002	−0·016	+0·005	−0·011
0·50	0	0	+0·069	0	+0·039	0	−0·080	0	−0·081	0	−0·080
	1/4	+0·025	+0·059	+0·014	+0·038	−0·015	−0·075	−0·019	−0·072	−0·019	−0·068
	1/2	+0·044	+0·046	+0·028	+0·032	−0·014	−0·068	−0·014	−0·056	−0·017	−0·048
	3/4	+0·042	+0·028	+0·032	+0·019	−0·010	−0·052	−0·003	−0·030	−0·002	−0·026

(*Continued*)

TABLE 5 MOMENT COEFFICIENTS FOR TANKS WITH WALLS FREE AT TOP AND HINGED AT BOTTOM — *Contd*

c/a	x/a	$b/a=2·0$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2·00	0	0	+0·045	0	+0·011	0	−0·091	0	+0·011	0	+0·045
	1/4	+0·016	+0·042	+0·006	+0·014	−0·019	−0·094	+0·006	+0·014	+0·016	+0·042
	1/2	+0·033	+0·036	+0·020	+0·016	−0·018	−0·089	+0·020	+0·016	+0·033	+0·036
	3/4	+0·036	+0·024	+0·025	+0·014	−0·013	−0·065	+0·025	+0·014	+0·036	+0·024
1·75	0	0	+0·048	0	+0·015	0	−0·081	0	−0·001	0	+0·032
	1/4	+0·017	+0·044	+0·007	+0·017	−0·017	−0·085	+0·003	+0·006	+0·012	+0·032
	1/2	+0·034	+0·038	+0·021	+0·019	−0·017	−0·083	+0·015	+0·011	+0·027	+0·029
	3/4	+0·036	+0·024	+0·025	+0·015	−0·012	−0·061	+0·020	+0·012	+0·031	+0·021
1·50	0	0	+0·050	0	+0·019	0	−0·072	0	−0·010	0	+0·018
	1/4	+0·018	+0·046	+0·008	+0·021	−0·015	−0·077	+0·000	−0·002	+0·007	+0·020
	1/2	+0·035	+0·039	+0·022	+0·021	−0·015	−0·076	+0·009	+0·004	+0·020	+0·022
	3/4	+0·036	+0·025	+0·026	+0·016	−0·012	−0·058	+0·016	+0·008	+0·025	+0·017
1·25	0	0	+0·052	0	+0·023	0	−0·064	0	−0·021	0	−0·000
	1/4	+0·009	+0·048	+0·009	+0·024	−0·014	−0·068	−0·002	−0·013	+0·001	+0·005
	1/2	+0·023	+0·041	+0·023	+0·023	−0·014	−0·069	+0·005	−0·004	+0·011	+0·012
	3/4	+0·026	+0·025	+0·026	+0·017	−0·011	−0·054	+0·011	+0·002	+0·016	+0·011

(*Continued*)

TABLE 5 MOMENT COEFFICIENTS FOR TANKS WITH WALLS FREE AT TOP AND HINGED AT BOTTOM — *Contd*

c/a	x/a	b/a=2·0									
		y=0		y=$b/4$		y=$b/2$		z=$c/4$		z=0	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1·00	0	0	+0·054	0	+0·027	0	−0·058	0	−0·037	0	−0·023
	1/4	+0·019	+0·050	+0·010	+0·027	−0·012	−0·062	−0·005	−0·025	−0·005	−0·013
	1/2	+0·037	+0·042	+0·024	+0·025	−0·013	−0·064	−0·000	−0·015	+0·001	+0·000
	3/4	+0·037	+0·026	+0·027	+0·018	−0·010	−0·051	+0·006	−0·006	+0·008	+0·004
0·75	0	0	+0·055	0	+0·030	0	−0·058	0	−0·049	0	−0·044
	1/4	+0·018	+0·051	+0·011	+0·029	−0·012	−0·062	−0·009	−0·040	−0·010	−0·031
	1/2	+0·038	+0·043	+0·025	+0·026	−0·012	−0·062	−0·005	−0·029	−0·007	−0·015
	3/4	+0·037	+0·026	+0·027	+0·018	−0·010	−0·049	+0·002	−0·015	+0·001	−0·004
0·50	0	0	+0·054	0	+0·030	0	−0·065	0	−0·064	0	−0·061
	1/4	+0·018	+0·052	+0·011	+0·029	−0·014	−0·068	−0·012	−0·056	−0·014	−0·051
	1/2	+0·038	+0·044	+0·025	+0·025	−0·013	−0·064	−0·010	−0·045	−0·012	−0·034
	3/4	+0·037	+0·026	+0·026	+0·017	−0·010	−0·050	−0·003	−0·026	−0·004	−0·018

(*Continued*)

TABLE 5 MOMENT COEFFICIENTS FOR TANKS WITH WALLS FREE AT TOP AND HINGED AT BOTTOM — *Contd*

c/a	x/a	$b/a=1\cdot5$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1·50	0	0	+0·027	0	+0·005	0	−0·052	0	+0·005	0	+0·027
	1/4	+0·009	+0·028	+0·003	+0·008	−0·012	−0·059	+0·003	+0·008	+0·009	+0·028
	1/2	+0·022	+0·027	+0·012	+0·011	−0·013	−0·063	+0·012	+0·011	+0·022	+0·027
	3/4	+0·027	+0·020	+0·017	+0·011	−0·010	−0·052	+0·017	+0·011	+0·027	+0·020
1·25	0	0	+0·031	0	+0·008	0	−0·045	0	−0·005	0	+0·011
	1/4	+0·010	+0·031	+0·005	+0·012	−0·010	−0·050	+0·001	−0·001	+0·004	+0·015
	1/2	+0·024	+0·030	+0·014	+0·014	−0·011	−0·056	+0·007	+0·006	+0·014	+0·020
	3/4	+0·027	+0·021	+0·018	+0·012	−0·010	−0·048	+0·013	+0·006	+0·018	+0·016
1·00	0	0	+0·035	0	+0·013	0	−0·038	0	−0·016	0	−0·006
	1/4	+0·011	+0·034	+0·006	+0·016	−0·008	−0·042	−0·002	−0·010	−0·001	+0·001
	1/2	+0·025	+0·032	+0·015	+0·017	−0·010	−0·049	+0·002	−0·003	+0·006	+0·010
	3/4	+0·028	+0·022	+0·019	+0·014	−0·009	−0·045	+0·008	+0·002	+0·009	+0·010
0·75	0	0	+0·038	0	+0·016	0	−0·034	0	−0·024	0	−0·019
	1/4	+0·011	+0·036	+0·007	+0·018	−0·008	−0·038	−0·005	−0·020	−0·004	−0·013
	1/2	+0·025	+0·033	+0·016	+0·019	−0·008	−0·042	−0·002	−0·014	−0·001	−0·004
	3/4	+0·028	+0·022	+0·019	+0·015	−0·008	−0·041	+0·003	−0·007	+0·002	+0·001
0·50	0	0	+0·040	0	+0·017	0	−0·036	0	−0·030	0	−0·028
	1/4	+0·010	+0·037	+0·007	+0·019	−0·008	−0·040	−0·008	−0·031	−0·007	−0·027
	1/2	+0·024	+0·034	+0·017	+0·020	−0·009	−0·044	−0·006	−0·027	−0·006	−0·020
	3/4	+0·028	+0·022	+0·018	+0·016	−0·008	−0·040	−0·002	−0·018	−0·004	−0·010

(*Continued*)

TABLE 5 MOMENT COEFFICIENTS FOR TANKS WITH WALLS FREE AT TOP AND HINGED AT BOTTOM — *Contd*

c/a	x/a	$b/a = 1·0$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1·00	0	0	+0·010	0	+0·002	0	−0·019	0	+0·002	0	+0·010
	1/4	+0·002	+0·013	+0·000	+0·003	−0·005	−0·025	+0·000	+0·003	+0·002	+0·013
	1/2	+0·010	+0·017	+0·005	+0·006	−0·007	−0·036	+0·005	+0·006	+0·010	+0·017
	3/4	+0·015	+0·015	+0·009	+0·007	−0·007	−0·036	+0·009	+0·007	+0·015	+0·015
0·75	0	0	+0·016	0	+0·007	0	−0·013	0	−0·004	0	+0·003
	1/4	+0·003	+0·017	+0·001	+0·008	−0·004	−0·020	−0·001	−0·005	−0·001	+0·003
	1/2	+0·011	+0·020	+0·006	+0·009	−0·007	−0·033	+0·002	−0·001	+0·005	+0·007
	3/4	+0·016	+0·014	+0·009	+0·009	−0·006	−0·032	+0·004	+0·002	+0·009	+0·008
0·50	0	0	+0·020	0	+0·011	0	−0·011	0	−0·007	0	−0·005
	1/4	+0·003	+0·018	+0·001	+0·010	−0·004	−0·018	−0·002	−0·012	−0·003	−0·007
	1/2	+0·012	+0·016	+0·008	+0·010	−0·006	−0·032	+0·001	−0·009	+0·002	−0·005
	3/4	+0·017	+0·013	+0·010	+0·009	−0·006	−0·031	+0·002	−0·005	+0·006	+0·001

TABLE 6 MOMENT COEFFICIENTS FOR TANKS WITH WALLS HINGED AT TOP AND BOTTOM

(*Clause* 2.2.2)

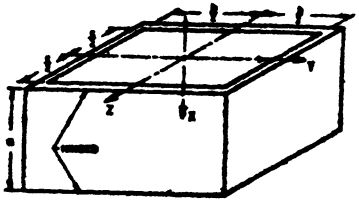
a = height of the wall

b = width of the wall

w = density of the liquid

Horizontal moment = $M_x\, wa^3$

Vertical moment = $M_y\, wa^3$



c/a	x/a	b/a = 3·0: y = 0, M_x	y = 0, M_y	y = b/4, M_x	y = b/4, M_y	y = b/2, M_x	y = b/2, M_y	z = c/4, M_x	z = c/4, M_z	z = 0, M_x	z = 0, M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
3·00	1/4	+0·035	+0·010	+0·026	+0·011	−0·008	−0·039	+0·026	+0·011	+0·035	+0·010
	1/2	+0·057	+0·016	+0·044	+0·017	−0·013	−0·063	+0·044	+0·017	+0·057	+0·016
	3/4	+0·051	+0·013	+0·041	+0·014	−0·011	−0·055	+0·041	+0·014	+0·051	+0·013
2·50	1/4	+0·035	+0·010	+0·026	+0·011	−0·008	−0·039	+0·021	+0·010	+0·031	+0·011
	1/2	+0·057	+0·016	+0·044	+0·017	−0·012	−0·062	+0·036	+0·017	+0·052	+0·017
	3/4	+0·051	+0·013	+0·041	−0·014	−0·011	−0·055	+0·036	+0·014	+0·047	+0·014
2·00	1/4	+0·035	+0·010	+0·026	+0·011	−0·008	−0·038	+0·015	+0·010	+0·025	+0·013
	1/2	+0·057	+0·016	+0·045	+0·017	−0·012	−0·062	+0·028	+0·015	+0·043	+0·020
	3/4	+0·051	+0·013	+0·042	+0·014	−0·011	−0·054	+0·029	+0·013	+0·041	+0·016

(*Continued*)

TABLE 6 MOMENT COEFFICIENTS FOR TANKS WITH WALLS HINGED AT TOP AND BOTTOM - *Contd*

c/a	x/a	$b/a = 3·0$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1·75	1/4	+0·035	+0·010	+0·027	+0·011	−0·007	−0·037	+0·011	+0·008	+0·020	+0·013
	1/2	+0·057	+0·015	+0·045	+0·017	−0·012	−0·060	+0·021	+0·013	+0·036	+0·020
	3/4	+0·051	+0·013	+0·042	+0·014	−0·011	−0·053	+0·024	+0·012	+0·036	+0·016
1·50	1/4	+0·035	+0·010	+0·027	+0·011	−0·007	+0·035	+0·007	+0·006	+0·014	+0·013
	1/2	+0·057	+0·015	+0·045	+0·017	−0·011	−0·057	+0·015	+0·010	+0·027	+0·020
	3/4	+0·051	+0·013	+0·042	+0·014	−0·010	−0·051	+0·019	+0·011	+0·029	+0·017
1·25	1/4	+0·035	+0·010	+0·027	+0·011	−0·006	−0·032	+0·003	+0·003	+0·008	+0·011
	1/2	+0·057	+0·015	+0·046	+0·017	−0·011	−0·053	+0·008	+0·006	+0·017	+0·017
	3/4	+0·051	+0·013	+0·042	+0·014	−0·010	−0·048	+0·013	+0·008	+0·021	+0·016
1·00	1/4	+0·035	+0·010	+0·027	+0·011	−0·006	−0·029	−0·001	+0·000	+0·002	+0·008
	1/2	+0·057	+0·015	+0·046	+0·017	−0·010	−0·048	+0·002	+0·002	+0·007	+0·014
	3/4	+0·051	+0·013	+0·043	+0·014	−0·009	−0·044	+0·007	+0·004	+0·013	+0·013
0·75	1/4	+0·035	+0·010	+0·028	+0·011	−0·005	−0·025	−0·003	−0·005	−0·002	+0·001
	1/2	+0·057	+0·015	+0·046	+0·017	−0·008	−0·042	−0·003	−0·005	−0·001	+0·007
	3/4	+0·052	+0·013	+0·043	+0·014	−0·008	−0·039	+0·002	−0·002	+0·006	+0·007
0·50	1/4	+0·036	+0·010	+0·028	+0·011	−0·004	−0·021	−0·004	−0·011	−0·005	−0·008
	1/2	+0·057	+0·015	+0·047	+0·017	−0·007	−0·035	−0·007	−0·016	−0·006	−0·010
	3/4	+0·052	+0·013	+0·043	+0·014	−0·007	−0·033	−0·004	−0·010	−0·001	−0·004

(Continued)

TABLE 6 MOMENT COEFFICIENTS FOR TANKS WITH WALLS HINGED AT TOP AND BOTTOM — *Contd*

c/a	x/a	$b/a=2.5$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2·50	1/4	+0·031	+0·011	+0·021	+0·010	−0·008	−0·038	+0·021	+0·010	+0·031	+0·011
	1/2	+0·052	+0·017	+0·036	+0·017	−0·012	−0·062	+0·036	+0·017	+0·052	+0·017
	3/4	+0·047	+0·015	+0·036	+0·014	−0·011	−0·055	+0·036	+0·014	+0·047	+0·015
2·00	1/4	+0·031	+0·011	+0·021	+0·010	−0·008	−0·038	+0·015	+0·009	+0·025	+0·012
	1/2	+0·052	+0·017	+0·036	+0·017	−0·012	−0·061	+0·028	+0·015	+0·042	+0·020
	3/4	+0·047	+0·015	+0·036	+0·014	−0·011	−0·054	+0·029	+0·013	+0·041	+0·016
1·75	1/4	+0·032	+0·011	+0·021	+0·010	−0·007	−0·037	+0·011	+0·008	+0·020	+0·012
	1/2	+0·052	+0·018	+0·037	+0·017	−0·012	−0·059	+0·022	+0·013	+0·035	+0·021
	3/4	+0·047	+0·015	+0·036	+0·014	−0·011	−0·053	+0·024	+0·012	+0·035	+0·017
1·50	1/4	+0·032	+0·011	+0·022	+0·010	−0·007	−0·035	+0·007	+0·006	+0·014	+0·013
	1/2	+0·052	+0·018	+0·037	+0·017	−0·011	−0·057	+0·015	+0·010	+0·027	+0·021
	3/4	+0·047	+0·015	+0·036	+0·014	−0·010	−0·051	+0·019	+0·010	+0·029	+0·017
1·25	1/4	+0·032	+0·011	+0·023	+0·010	−0·006	−0·032	+0·003	+0·004	+0·007	+0·012
	1/2	+0·053	+0·018	+0·038	+0·017	−0·011	−0·053	+0·008	+0·007	+0·018	+0·019
	3/4	+0·048	+0·015	+0·038	+0·014	−0·010	−0·048	+0·014	+0·008	+0·022	+0·016
1·00	1/4	+0·032	+0·011	+0·023	+0·011	−0·006	−0·028	−0·001	+0·000	+0·002	+0·008
	1/2	+0·053	+0·018	+0·038	+0·017	−0·010	−0·048	+0·002	+0·002	+0·007	+0·014
	3/4	+0·048	+0·015	+0·038	+0·015	−0·009	−0·044	+0·007	+0·004	+0·013	+0·013
0·75	1/4	+0·033	+0·011	+0·024	+0·011	−0·005	−0·024	−0·003	−0·005	−0·002	+0·002
	1/2	+0·054	+0·018	+0·039	+0·017	−0·008	−0·041	−0·003	−0·005	−0·000	+0·005
	3/4	+0·049	+0·015	+0·038	+0·015	−0·008	−0·039	+0·000	−0·002	+0·006	+0·006
0·50	1/4	+0·033	+0·012	+0·024	+0·011	−0·004	−0·021	−0·004	−0·011	−0·005	−0·008
	1/2	+0·054	+0·018	+0·040	+0·017	−0·007	−0·035	−0·007	−0·016	−0·006	−0·010
	3/4	+0·049	+0·015	+0·039	+0·015	−0·007	−0·034	−0·004	−0·010	−0·001	−0·004

(*Continued*)

TABLE 6 MOMENT COEFFICIENTS FOR TANKS WITH WALLS HINGED AT TOP AND BOTTOM — *Contd*

c/a	x/a	$b/a=2{\cdot}0$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2·00	1/4	+0·025	+0·013	+0·015	+0·009	−0·007	−0·037	+0·015	+0·009	+0·025	+0·013
	1/2	+0·042	+0·020	+0·028	+0·015	−0·012	−0·059	+0·028	+0·015	+0·042	+0·020
	3/4	+0·040	+0·016	+0·029	+0·013	−0·011	−0·053	+0·029	+0·013	+0·040	+0·016
1·75	1/4	+0·025	+0·013	+0·015	+0·009	−0·007	−0·036	+0·011	+0·008	+0·020	+0·013
	1/2	+0·042	+0·020	+0·028	+0·015	−0·012	−0·058	+0·022	+0·013	+0·035	+0·021
	3/4	+0·040	+0·016	+0·029	+0·013	−0·010	−0·052	+0·024	+0·012	+0·035	+0·017
1·50	1/4	+0·025	+0·013	+0·016	+0·009	−0·007	−0·034	+0·007	+0·006	+0·014	+0·013
	1/2	+0·043	+0·020	+0·028	+0·015	−0·011	−0·056	+0·015	+0·011	+0·027	+0·021
	3/4	+0·041	+0·016	+0·029	+0·013	−0·010	−0·050	+0·019	+0·010	+0·029	+0·017
1·25	1/4	+0·026	+0·013	+0·016	+0·010	−0·006	−0·032	+0·003	+0·003	+0·007	+0·011
	1/2	+0·043	+0·020	+0·029	+0·015	−0·010	−0·052	+0·008	+0·007	+0·018	+0·019
	3/4	+0·041	+0·016	+0·030	+0·013	−0·010	−0·048	+0·013	+0·008	+0·021	+0·016
1·00	1/4	+0·026	+0·013	+0·017	+0·010	−0·006	−0·028	−0·001	+0·000	+0·002	+0·008
	1/2	+0·044	+0·020	+0·030	+0·016	−0·009	−0·046	+0·002	+0·002	+0·007	+0·014
	3/4	+0·041	+0·016	+0·031	+0·014	−0·009	−0·044	+0·007	+0·004	+0·013	+0·013
0·75	1/4	+0·027	+0·013	+0·018	+0·010	−0·005	−0·024	−0·003	−0·004	−0·001	+0·002
	1/2	+0·045	+0·020	+0·031	+0·016	−0·008	−0·040	−0·002	−0·004	+0·000	+0·005
	3/4	+0·042	+0·016	+0·032	+0·014	−0·008	−0·041	+0·002	−0·002	+0·005	+0·008
0·50	1/4	+0·027	+0·013	+0·019	+0·010	−0·004	−0·021	−0·004	−0·010	−0·004	−0·007
	1/2	+0·046	+0·020	+0·033	+0·017	−0·007	−0·034	−0·006	−0·015	−0·006	−0·009
	3/4	+0·042	+0·016	+0·032	+0·015	−0·007	−0·037	−0·003	−0·010	−0·002	−0·003

(*Continued*)

TABLE 6 MOMENT COEFFICIENTS FOR TANKS WITH WALLS HINGED AT TOP AND BOTTOM — *Contd*

c/a	x/a	$b/a=1\cdot5$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1·50	1/4	+0·015	+0·013	+0·008	+0·007	−0·006	−0·032	+0·008	+0·007	+0·015	+0·013
	1/2	+0·028	+0·021	+0·016	+0·011	−0·010	−0·052	+0·016	+0·011	+0·028	+0·021
	3/4	+0·030	+0·017	+0·020	+0·011	−0·010	−0·048	+0·020	+0·011	+0·030	+0·017
1·25	1/4	+0·016	+0·013	+0·009	+0·008	−0·006	−0·029	+0·004	+0·004	+0·009	+0·012
	1/2	+0·029	+0·021	+0·017	+0·012	−0·010	−0·049	+0·009	+0·008	+0·018	+0·019
	3/4	+0·030	+0·017	+0·020	+0·012	−0·009	−0·045	+0·014	+0·009	+0·023	+0·016
1·00	1/4	+0·016	+0·013	+0·010	+0·009	−0·005	−0·025	+0·000	+0·001	+0·003	+0·008
	1/2	+0·030	+0·021	+0·019	+0·012	−0·009	−0·043	+0·003	+0·003	+0·008	+0·014
	3/4	+0·031	+0·017	+0·021	+0·013	−0·008	−0·041	+0·008	+0·005	+0·014	+0·014
0·75	1/4	+0·018	+0·014	+0·011	+0·010	−0·004	−0·021	−0·002	−0·003	−0·001	+0·002
	1/2	+0·032	+0·022	+0·021	+0·014	−0·007	−0·036	−0·002	−0·004	+0·001	+0·005
	3/4	+0·032	+0·018	+0·022	+0·014	−0·007	−0·036	+0·002	−0·000	+0·006	+0·008
0·50	1/4	+0·020	+0·016	+0·013	+0·012	−0·003	−0·017	−0·003	−0·009	−0·004	−0·006
	1/2	+0·035	+0·024	+0·023	+0·018	−0·006	−0·031	−0·006	−0·014	−0·005	−0·007
	3/4	+0·034	+0·020	+0·024	+0·016	−0·007	−0·033	−0·003	−0·008	−0·001	−0·001

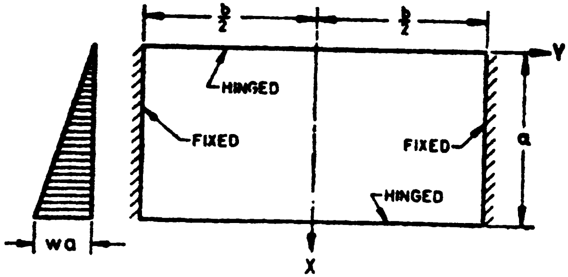
(Continued)

TABLE 6 MOMENT COEFFICIENTS FOR TANKS WITH WALLS HINGED AT TOP AND BOTTOM — *Contd*

c/a	x/a	$b/a = 1{\cdot}0$									
		$y=0$		$y=b/4$		$y=b/2$		$z=c/4$		$z=0$	
		M_x	M_y	M_x	M_y	M_x	M_y	M_x	M_z	M_x	M_z
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1·00	1/4	+0·005	+0·009	+0·002	+0·003	−0·004	−0·020	+0·002	+0·003	+0·005	+0·009
	1/2	+0·011	+0·016	+0·006	+0·006	−0·007	−0·035	+0·006	+0·006	+0·011	+0·016
	3/4	+0·016	+0·015	+0·009	+0·007	−0·007	−0·035	+0·009	+0·007	+0·016	+0·015
0·75	1/4	+0·006	+0·010	+0·003	+0·004	−0·003	−0·016	+0·000	+0·000	+0·001	+0·005
	1/2	+0·013	+0·017	+0·008	+0·008	−0·006	−0·029	+0·001	+0·001	+0·005	+0·009
	3/4	+0·017	+0·016	+0·010	+0·008	−0·006	−0·031	+0·004	+0·003	+0·008	+0·010
0·50	1/4	+0·007	+0·011	+0·005	+0·006	−0·002	−0·010	−0·002	−0·005	−0·003	−0·002
	1/2	+0·015	+0·018	+0·010	+0·010	−0·004	−0·021	−0·003	−0·007	−0·003	−0·002
	3/4	+0·018	+0·016	+0·012	+0·010	−0·005	−0·026	−0·001	−0·004	−0·000	+0·001

TABLE 7 SHEAR AT EDGES OF WALL PANEL HINGED AT TOP AND BOTTOM

(*Clauses* 2.3.1, 2.3.3, 2.3.3.2, 2.3.4, 2.3.4.1 *and* 2.3.6)



	b/a					
	½	1	2	5	10	Infinity
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Mid-point of bottom edge	$+0{\cdot}140\,7\ wa^2$	$+0{\cdot}241\,9\ wa^2$	$+0{\cdot}329\,0\ wa^2$	—	—	$+0{\cdot}333\,3\ wa^2$
Corner at bottom edge	$-0{\cdot}257\,5\ wa^2$	$-0{\cdot}439\,7\ wa^2$	$-0{\cdot}583\,3\ wa^2$	—	—	$-0{\cdot}600\,0\ wa^2$
Mid-point of fixed side edge	$+0{\cdot}128\,0\ wa^2$	$+0{\cdot}258\,2\ wa^2$	$+0{\cdot}360\,4\ wa^2$	—	—	$+0{\cdot}391\,2\ wa^2$
Lower third-point of side edge	$+0{\cdot}173\,6\ wa^2$	$+0{\cdot}311\,3\ wa^2$	$+0{\cdot}402\,3\ wa^2$	—	—	$+0{\cdot}411\,6\ wa^2$
Lower quarter-point of side edge	$+0{\cdot}191\,9\ wa^2$	$+0{\cdot}315\,3\ wa^2$	$+0{\cdot}390\,4\ wa^2$	—	—	$+0{\cdot}398\,0\ wa^2$
Total at top edge	$0{\cdot}000\,0\ wa^2b$	$0{\cdot}005\,2\ wa^2b$	$0{\cdot}053\,8\ wa^2b$	$0{\cdot}120\,3\ wa^2b$	$0{\cdot}143\,5\ wa^2b$	$0{\cdot}166\,7\ wa^2b$
Total of bottom edge	$0{\cdot}048\,0\ wa^2b$	$0{\cdot}096\,0\ wa^2b$	$0{\cdot}181\,8\ wa^2b$	$0{\cdot}271\,5\ wa^2b$	$0{\cdot}302\,3\ wa^2b$	$0{\cdot}333\,3\ wa^2b$
Total at one fixed side edge	$0{\cdot}226\,0\ wa^2b$	$0{\cdot}199\,4\ wa^2b$	$0{\cdot}132\,2\ wa^2b$	$0{\cdot}054\,1\ wa^2b$	$0{\cdot}027\,1\ wa^2b$	$0{\cdot}275\ wa^2b$*
Total at all four edges	$0{\cdot}500\,0\ wa^2b$	$0{\cdot}500\,0\ wa^2b$	$0{\cdot}500\,0\ wa^2b$	$0{\cdot}500\,0\ wa^2b$	$0{\cdot}500\,0\ wa^2b$	$0{\cdot}500\,0\ wa^2b$

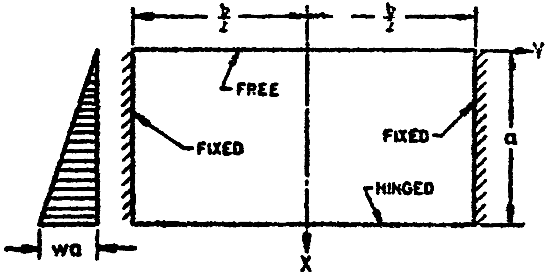
NOTE 1 — Negative sign indicates that reaction acts in direction of load.

NOTE 2 — w = Density of the liquid.

*Estimated.

TABLE 8 SHEAR AT EDGES OF WALL PANEL FREE AT TOP AND HINGED AT BOTTOM*

(*Clauses* 2.3.2, 2.3.4, 2.3.4.1, 2.° 5 *and* 2.3.6)



	b/a			
	½	1	2	3
(1)	(2)	(3)	(4)	(5)
Mid-point of bottom edge	$+0{\cdot}141\ wa^2$	$+0{\cdot}242\ wa^2$	$+0{\cdot}38\ wa^2$†	$+0{\cdot}45\ wa^2$†
Corner of bottom edge	$-0{\cdot}258\ wa^2$	$-0{\cdot}440\ wa^2$	$-0{\cdot}583\ wa^2$	$-0{\cdot}590\ wa^2$
Top of fixed side edge	wa^2	$+0{\cdot}010\ wa^2$	$+0{\cdot}100\ wa^2$	$+0{\cdot}165\ wa^2$
Mid-point of fixed side edge	$+0{\cdot}128\ wa^2$	$+0{\cdot}258\ wa^2$	$+0{\cdot}375\ wa^2$	$+0{\cdot}406\ wa^2$
Lower third-point of side edge	$+0{\cdot}174\ wa^2$	$+0{\cdot}311\ wa^2$	$+0{\cdot}406\ wa^2$	$+0{\cdot}416\ wa^2$
Lower quarter-point of side edge	$+0{\cdot}192\ wa^2$	$+0{\cdot}315\ wa^2$	$+0{\cdot}390\ wa^2$	$+0{\cdot}398\ wa^2$
Total at bottom edge	$0{\cdot}048\ wa^2b$	$0{\cdot}096\ wa^2b$	$0{\cdot}204\ wa^2b$	$0{\cdot}286\ wa^2b$
Total at one fixed side edge	$0{\cdot}226\ wa^2b$	$0{\cdot}202\ wa^2b$	$0{\cdot}148\ wa^2b$	$0{\cdot}107\ wa^2b$
Total at all four edges	$0{\cdot}500\ wa^2b$	$0{\cdot}500\ wa^2b$	$0{\cdot}500\ wa^2b$	$0{\cdot}500\ wa^2b$

NOTE 1 — w = Density of the liquid.

NOTE 2 — Data are derived by modifying values computed for walls hing^d at top and bottom.

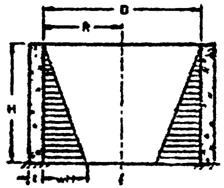
*Negative sign indicates that reaction acts in direction of load.

†This value could not be estimated accurately beyond two decimal places.

TABLE 9 TENSION IN CIRCULAR RING WALL, FIXED BASE, FREE TOP AND SUBJECT TO TRIANGULAR LOAD

(*Clause* 3.1.1)

T = Coefficient × wHR kg/m



$\frac{H^2}{Dt}$	Coefficients at Point									
	0·0H	0·1H	0·2H	0·3H	0·4H	0·5H	0·6H	0·7H	0·8H	0·9H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+0·149	+0·134	+0·120	+0·101	+0·082	+0·066	+0·049	+0·029	+0·014	+0·004
0·8	+0·263	+0·239	+0·215	+0·109	+0·160	+0·130	+0·096	+0·063	+0·034	+0·010
1·2	+0·283	+0·271	+0·254	+0·234	+0·209	+0·180	+0·142	+0·099	+0·054	+0·016
1·6	+0·265	+0·268	+0·268	+0·266	+0·250	+0·226	+0 185	+0·134	+0·075	+0·023
2·0	+0·234	+0·251	+0·273	+0·285	+0·285	+0·274	+0·232	+0·172	+0·104	+0·031
3·0	+0·134	+0·203	+0·267	+0·322	+0·357	+0·362	+0·330	+0·262	+0·157	+0·052
4·0	+0·067	+0·164	+0·256	+0·339	+0·403	+0·429	+0·409	+0·334	+0·210	+0·073
5·0	+0·025	+0·137	+0·245	+0·346	+0·428	+0·477	+0·469	+0·398	+0·259	+0·092
6·0	+0·018	+0·119	+0·234	+0·344	+0·441	+0·504	+0·514	+0·447	+0·301	+0·112
8·0	−0·001	+0·104	+0·218	+0·335	+0·443	+0·534	+0·575	+0·530	+0·381	+0·151
10·0	−0·001	+0·098	+0·208	+0·323	+0·437	+0·542	+0·608	+0·589	+0·440	+0·179
12·0	−0·005	+0·097	+0·202	+0·312	+0·429	+0·543	+0·628	+0·633	+0·494	+0·211
14·0	−0·002	+0·098	+0·200	+0·306	+0·420	+0·539	+0·639	+0·666	+0·541	+0·241
16·0	0·000	+0·099	+0·199	+0·304	+0·412	+0·531	+0·641	+0·687	+0·582	+0·265

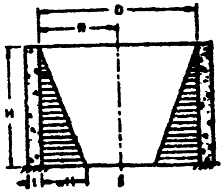
Note 1 — w = Density of the liquid.

Note 2 — Positive sign indicates tension.

TABLE 10 MOMENTS IN CYLINDRICAL WALL, FIXED BASE, FREE TOP AND SUBJECT TO TRIANGULAR LOAD

(*Clause* 3.1.1)

Moment = Coefficient × wH^3 kgm/m



$\frac{H^2}{Dt}$	Coefficients at Point									
	0·1H	0·2H	0·3H	0·4H	0·5H	0·6H	0·7H	0·8H	0·9H	1·0H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+0·0005	+0·0014	+0·0021	+0·0007	−0·0042	−0·0150	−0·0302	−0·0529	−0·0816	−0·1205
0·8	+0·0011	+0·0037	+0·0063	+0·0080	+0·0070	+0·0023	−0·0068	−0·0024	−0·0465	−0·0795
1·2	+0·0012	+0·0042	+0·0077	+0·0103	+0·0112	+0·0090	+0·0022	−0·0108	−0·0311	−0·0602
1·6	+0·0011	+0·0041	+0·0075	+0·0107	+0·0121	+0·0111	+0·0058	−0·0051	−0·0232	−0·0505
2·0	+0·0010	+0·0035	+0·0068	+0·0099	+0·0120	+0·0115	+0·0075	−0·0021	−0·0185	−0·0436
3·0	+0·0006	+0·0024	+0·0047	+0·0071	+0·0090	+0·0097	+0·0077	+0·0012	−0·0119	−0·0333
4·0	+0·0003	+0·0015	+0·0028	+0·0047	+0·0066	+0·0077	+0·0069	+0·0023	−0·0080	−0·0268
5·0	+0·0002	+0·0008	+0·0016	+0·0029	+0·0046	+0·0059	+0·0059	+0·0028	−0·0058	−0·0222
6·0	+0·0001	+0·0003	+0·0008	+0·0019	+0·0032	+0·0046	+0·0051	+0·0029	−0·0041	−0·0187
8·0	0·0000	+0·0001	+0·0002	+0·0008	+0·0016	+0·0028	+0·0038	+0·0029	−0·0022	−0·0146
10·0	0·0000	0·0000	+0·0001	+0·0004	+0·0007	+0·0019	+0·0029	+0·0028	−0·0012	−0·0122
12·0	0·0000	−0·0001	+0·0001	+0·0002	+0·0003	+0·0013	+0·0023	+0·0026	−0·0005	−0·0104
14·0	0·0000	0·0000	0·0000	0·0000	+0·0001	+0·0008	+0·0019	+0·0023	−0·0001	−0·0090
16·0	0·0000	0·0000	−0·0001	−0·0002	−0·0001	+0·0004	+0·0013	+0·0019	+0·0001	−0·0079

NOTE 1 — w = Density of the liquid.

NOTE 2 — Positive sign indicates tension on the outside.

TABLE 11 SHEAR AT BASE OF CYLINDRICAL WALL

(*Clauses* 3.1.1, 3.1.2 *and* 3.1.3)

$$v = \text{Coefficient} \times \begin{cases} wH^2 \text{ kg (triangular)} \\ pH \text{ kg (rectangular)} \\ M/H \text{ kg (moment at base)} \end{cases}$$

$\frac{H^2}{Dt}$	Triangular Load Fixed Base	Rectangular Load Fixed Base	Triangular or Rectangular Load Hinged Base	Moment at Edge
0·4	+0·436	+0·755	+0·245	−1·58
0·8	+0·374	+0·552	+0·234	−1·75
1·2	+0·339	+0·460	+0·220	−2·00
1·6	+0·317	+0·407	+0·204	−2·28
2·0	+0·299	+0·370	+0·189	−2·57
3·0	+0·262	+0·310	+0·158	−3·18
4·0	+0·236	+0·271	+0·137	−3·68
5·0	+0·213	+0·243	+0·121	−4·10
6·0	+0·197	+0·222	+0·110	−4·49
8·0	+0·174	+0·193	+0·096	−5·18
10·0	+0·158	+0·172	+0·087	−5·81
12·0	+0·145	+0·158	+0·079	−6·38
14·0	+0·135	+0·147	+0·073	−6·88
16·0	+0·127	+0·137	+0·068	−7·36

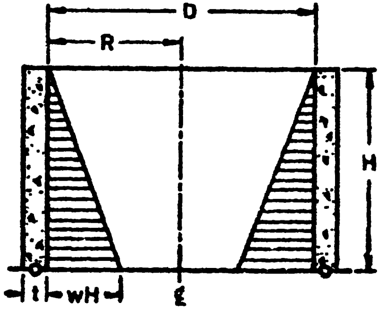
NOTE 1 — w = Density of the liquid.

NOTE 2 — Positive sign indicates shear acting inward.

TABLE 12 TENSION IN CIRCULAR RING WALL, HINGED BASE, FREE TOP AND SUBJECT TO TRIANGULAR LOAD

(*Clauses* 3.1.2 *and* 3.1.3 ,

T = Coefficient × wHR kg/m



$\frac{H^2}{Dt}$	Coefficients at Point									
	0·0H	0·1H	0·2H	0·3H	0·4H	0·5H	0·6H	0·7H	0·8H	0·9H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+0·474	+0·440	+0·395	+0·352	+0·308	+0·264	+0·215	+0·165	+0·111	+0·057
0·8	+0·423	+0·402	+0·381	+0·358	+0·330	+0·297	+0·249	+0·202	+0·145	+0·076
1·2	+0·350	+0·355	+0·361	+0·362	+0·358	+0·342	+0·309	+0·256	+0·186	+0·098
1·6	+0·271	+0·303	+0·341	+0·369	+0·385	+0·385	+0·362	+0·314	+0·233	+0·124
2·0	+0·205	+0·260	+0·321	+0·373	+0·411	+0·434	+0·419	+0·369	+0·280	+0·151
3·0	+0·074	+0·179	+0·281	+0·375	+0·449	+0·506	+0·519	+0·479	+0·375	+0·210
4·0	+0·017	+0·137	+0·253	+0·367	+0·469	+0·545	+0·579	+0·553	+0·447	+0·256
5·0	−0·008	+0·114	+0·235	+0·356	+0·469	+0·562	+0·617	+0·606	+0·503	+0·294
6·0	−0·011	+0·103	+0·223	+0·343	+0·463	+0·566	+0·639	+0·643	+0·547	+0·327
8·0	−0·015	+0·096	+0·208	+0·324	+0·443	+0·564	+0·661	+0·697	+0·621	+0·386
10·0	−0·008	+0·095	+0·200	+0·311	+0·428	+0·552	+0·666	+0·730	+0·678	+0·433
12·0	−0·002	+0·097	+0·197	+0·302	+0·417	+0·541	+0·664	+0·750	+0·720	+0·477
14·0	0·000	+0·098	+0·197	+0·299	+0·408	+0·531	+0·659	+0·761	+0·752	+0·513
16·0	+0·002	+0·100	+0·198	+0·299	+0·403	+0·521	+0·650	+0·764	+0·776	+0·536

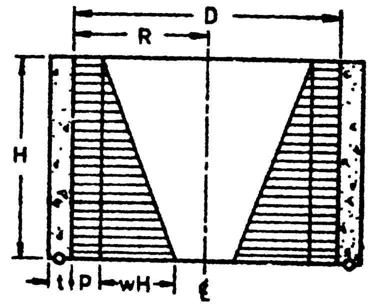
Note 1 — w = Density of the liquid.

Note 2 — Positive sign indicates tension.

TABLE 13 MOMENTS IN CYLINDRICAL WALL, HINGED BASE, FREE TOP AND SUBJECT TO TRAPEZOIDAL LOAD

(*Clauses* 3.1.2 *and* 3.1.3)

Moment = Coefficient × ($wH^3 + pH^2$) kgm/m



$\frac{H^2}{Dt}$	Coefficients at Point									
	0·1*H*	0·2*H*	0·3*H*	0·4*H*	0·5*H*	0·6*H*	0·7*H*	0·8*H*	0·9*H*	1·0*H*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+0·002 0	+0·007 2	+0·015 1	+0·023 0	+0·030 1	+0·034 8	+0·035 7	+0·031 2	+0·019 7	0
0·8	+0·001 9	+0·006 4	+0·013 3	+0·020 7	+0·027 1	+0·031 9	+0·032 9	+0·029 2	+0·018 7	0
1·2	+0·001 6	+0·005 8	+0·011 1	+0·017 7	+0·023 7	+0·028 0	+0·029 6	+0·026 3	+0·017 1	0
1·6	+0·001 2	+0·004 4	+0·009 1	+0·014 5	+0·019 5	+0·023 6	+0·025 5	+0·023 2	+0·015 5	0
2·0	+0·000 9	+0·003 3	+0·007 3	+0·011 4	+0·015 8	+0·019 9	+0·021 9	+0·020 5	+0·014 5	0
3·0	+0·000 4	+0·001 8	+0·004 0	+0·006 3	+0·009 2	+0·012 7	+0·015 2	+0·015 3	+0·011 1	0
4·0	+0·000 1	+0·000 7	+0·001 6	+0·003 3	+0·005 7	+0·008 3	+0·010 9	+0·011 8	+0·009 2	0
5·0	0·000 0	+0·000 1	+0·000 6	+0·001 6	+0·003 4	+0·005 7	+0·008 0	+0·009 4	-0·007 8	0
6·0	0·000 0	+0·000 0	+0·000 2	+0·000 8	+0·001 9	+0·003 9	+0·006 2	+0·007 8	+0·006 8	0
8·0	0·000 0	+0·000 0	−0·000 2	+0·000 0	+0·000 7	+0·002 0	+0·003 8	+0·005 7	+0·005 4	0
10·0	0·000 0	0·000 0	−0·000 2	−0·000 1	+0·000 2	+0·001 1	+0·002 5	+0·004 3	+0·004 5	0
12·0	0·000 0	0·000 0	−0·000 1	−0·000 2	0·000 0	+0·000 5	+0·001 7	+0·003 2	+0·003 9	0
14·0	0·000 0	0·000 0	−0·000 1	−0·000 1	−0·000 1	0·000 0	+0·001 2	+0·002 6	+0·003 3	0
16·0	0·000 0	0·000 0	0·000 0	−0·000 1	−0·000 2	−0·000 4	+0·000 8	+0·002 2	+0·002 9	0

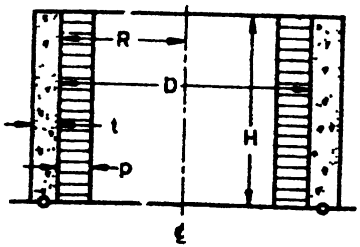
Note 1 — *w* = Density of the liquid.

Note 2 — Positive sign indicates tension on the outside.

TABLE 14 TENSION IN CIRCULAR RING, HINGED BASE, FREE TOP AND SUBJECT TO RECTANGULAR LOAD

(*Clause* 3.1.3)

t = Coefficient × p^R kg/m



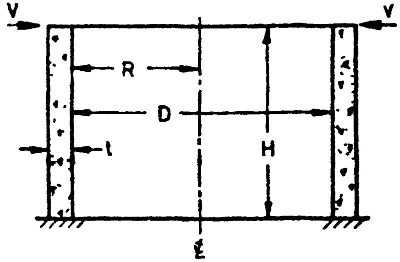
$\frac{H^2}{Dt}$	Coefficients at Point									
	0·0H	0·1H	0·2H	0·3H	0·4H	0·5H	0·6H	0·7H	0·8H	0·9H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+1·474	1·340	+1·195	+1·052	+0·908	+0·764	+0·615	+0·465	+0·311	+0·154
0·8	+1·423	+1·302	+1·181	+1·058	+0·930	+0·797	+0·649	+0·502	+0·345	+0·166
1·2	+1·350	+1·255	+1·161	+1·062	+0·958	+0·843	+0·709	+0·556	+0·386	+0·198
1·6	+1·271	+1·203	+1·141	+1·069	+0·985	+0·885	+0·756	+0·614	+0·433	+0·224
2·0	+1·205	+1·160	+1·121	+1·073	+1·011	+0·934	+0·819	+0·669	+0·480	+0·251
3·0	+1·074	+1·079	+1·081	+1·075	+1·049	+1·006	+0·919	+0·779	+0·575	+0·310
4·0	+1·017	+1·037	+1·053	+1·067	+1·069	+1·045	+0·979	+0·853	+0·647	+0·356
5·0	+0·992	+1·014	+1·035	+1·056	+1·069	+1·062	+1·017	+0·906	+0·703	+0·394
6·0	+0·989	+1·003	+1·023	+1·043	+1·063	+1·066	+1·039	+0·943	+0·747	+0·427
8·0	+0·985	+0·996	+1·008	+1·024	+1·043	+1·064	+1·061	+0·997	+0·821	+0·486
10·0	+0·992	+0·995	+1·000	+1·011	+1·028	+1·052	+1·066	+1·030	+0·878	+0·533
12·0	+0·998	+0·997	+0·997	+1·002	+1·017	+1·041	+1·064	+1·050	+0·920	+0·577
14·0	+1·000	+0·998	+0·997	+0·999	+1·008	+1·031	+1·059	+1·061	+0·952	+0·613
16·0	+1·002	+1·000	+0·998	+0·999	+1·003	+1·021	+1·050	+1·064	+0·976	+0·636

NOTE — Positive sign indicates tension.

TABLE 15 TENSION IN CIRCULAR RING, FIXED BASE, FREE TOP WITH SHEAR 'V' PER METRE APPLIED AT TOP

(*Clauses* 3.1.4 *and* 3.1.5)

t = Coefficient × VR/H kg/m



$\frac{H^2}{Dt}$	Coefficients at Point*									
	0·0H	0·1H	0·2H	0·3H	0·4H	0·5H	0·6H	0·7H	0·8H	0·9H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	−1·57	−1·32	−1·08	−0·86	−0·65	−0·47	−0·31	−0·18	−0·08	−0·02
0·8	−3·09	−2·55	−2·04	−1·57	−1·15	−0·80	−0·51	−0·28	−0·13	−0·03
1·2	−3·95	−3·17	−2·44	−1·79	−1·25	−0·81	−0·48	−0·25	−0·10	−0·02
1·6	−4·57	−3·54	−2·60	−1·80	−1·17	−0·69	−0·36	−0·16	−0·05	−0·01
2·0	−5·12	−3·83	−2·68	−1·74	−1·02	−0·52	−0·21	−0·05	+0·01	+0·01
3·0	−6·32	−4·37	−2·70	−1·43	−0·58	−0·02	+0·15	+0·19	+0·13	+0·04
4·0	−7·34	−4·73	−2·60	−1·10	−0·19	+0·26	+0·38	+0·33	+0·19	+0·06
5·0	−8·22	−4·99	−2·45	−0·79	+0·11	+0·47	+0·50	+0·37	+0·20	+0·06
6·0	−9·02	−5·17	−2·27	−0·50	+0·34	+0·59	+0·53	+0·35	+0·17	+0·01
8·0	−10·42	−5·36	−1·85	−0·02	+0·63	+0·66	+0·46	+0·24	+0·09	+0·01
10·0	−11·67	−5·43	−1·43	+0·36	+0·78	+0·62	+0·33	+0·12	+0·02	0·00
12·0	−12·75	−5·41	−1·03	+0·63	+0·83	+0·52	+0·21	+0·04	−0·02	0·00
14·0	−13·77	−5·34	−0·68	+0·80	+0·81	+0·42	+0·13	0·00	−0·03	−0·01
16·0	−14·74	−5·22	−0·33	+0·96	+0·76	+0·32	+0·05	−0·04	−0·05	−0·02

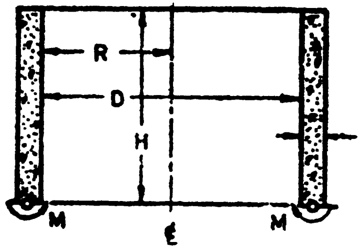
NOTE — Positive sign indicates tension.

*When this table is used for shear applied at the base, while the top is fixed, 0·0H is the bottom of the wall and 1·0H is the top. Shear acting inward is positive, outward is negative.

TABLE 16 TENSION IN CIRCULAR RING, HINGED BASE, FREE TOP WITH MOMENT PER METRE, M, APPLIED AT BASE

(*Clause* 3.1.6)

t = Coefficien. × MR/H^2 kg/m



$\frac{H^2}{Dt}$	Coefficients at Point*									
	0·0*H*	0·1*H*	0·2*H*	0·3*H*	0·4*H*	0·5*H*	0·6*H*	0·7*H*	0·8*H*	0·9*H*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+2·70	+2·50	+2·30	+2·12	+1·91	+1·69	+1·41	+ 1·13	+ 0·80	+ 0·44
0·8	+2·02	+2·06	+2·10	+2·14	+2·10	+2·02	+1·95	+ 1·75	+ 1·39	+ 0·80
1·2	+1·06	+1·42	+1·79	+2·03	+2·46	+2·65	+2·80	+ 2·60	+ 2·22	+ 1·37
1·6	+0·12	+0·79	+1·43	+2·04	+2·72	+3·25	+3·56	+ 3·59	+ 3·13	+ 2·01
2·0	−0·68	+0·22	+1·10	+2·02	+2·90	+3·69	+4·30	+ 4·54	+ 4·08	+ 2·75
3·0	−1·78	−0·71	+0·43	+1·60	+2·95	+4·29	+5·66	+ 6·58	+ 6·58	+ 4·73
4·0	−1·87	−1·00	−0·08	+1·04	+2·47	+4·31	+6·34	+ 8·19	+ 8·82	+ 6·81
5·0	−1·54	−1·03	−0·42	+0·45	+1·86	+3·93	+6·60	+ 9·41	+11·03	+ 9·02
6·0	−1·04	−0·86	−0·59	−0·05	+1·21	+3·34	+6·54	+10·28	+13·08	+11·41
8·0	−0·24	−0·53	−0·73	−0·67	−0·02	+2·05	+5·87	+11·32	+16·52	+16·06
10·0	+0·21	−0·23	−0·64	−0·94	−0·73	+0·82	+4·79	+11·63	+99.48	+20·87
12·0	+0·32	−0·05	−0·46	−0·96	−1·15	−0·18	+3·52	+11·27	+21.80	+25·73
14·0	+0·26	+0·04	−0·28	−0·76	−1·29	−0·87	+2·29	+10·55	+23·50	+30·34
16·0	+0·22	+0·07	−0·08	−0·64	−1·28	−1·30	+1·12	+ 9·67	+24·53	+34.65

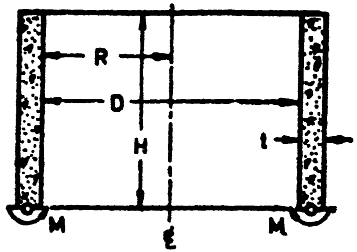
Note — Positive sign indicates tension.

*When this table is used for moment applied at the top, while the top is hinged, 0·0*H* is the bottom of the wall and 1·0*H* is the top. Moment applied at an edge is positive when it causes outward rotation at that edge.

TABLE 17 MOMENTS IN CYLINDRICAL WALL, HINGED BASE, FREE TOP, WITH MOMENT PER METRE, *M*, APPLIED AT BASE

(*Clauses* 2.3.3 *and* 3.1.6)

Moment = Coefficient × *M* kgm/m



$\frac{H^2}{Dt}$	Coefficients at Point*									
	0·1*H*	0·2*H*	0·3*H*	0·4*H*	0·5*H*	0·6*H*	0·7*H*	0·8*H*	0·9*H*	1·0*H*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+0·013	+0·051	+0·109	+0·196	+0·296	+0·414	+0·547	+0·692	+0·843	+1·000
0·8	+0·009	+0·040	+0·090	+0·164	+0·253	+0·375	+0·503	+0·659	+0·824	+1·000
1·2	+0·006	+0·027	+0·063	+0·125	+0·206	+0·316	+0·454	+0·616	+0·802	+1·000
1·6	+0·003	+0·011	+0·035	+0·078	+0·152	+0·253	+0·393	+0·570	+0·775	+1·000
2·0	−0·002	−0·002	+0·012	+0·034	+0·096	+0·193	+0·340	+0·519	+0·748	+1·000
3·0	−0·007	−0·022	−0·030	−0·029	+0·010	+0·087	+0·227	+0·426	+0·692	+1·000
4·0	−0·008	−0·026	−0·044	−0·051	−0·034	+0·023	+0·150	+0·354	+0·645	+1·000
5·0	−0·007	−0·024	−0·045	−0·061	−0·057	−0·015	+0·095	+0·296	+0·606	+1·000
6·0	−0·005	−0·018	−0·040	−0·058	−0·065	−0·037	+0·057	+0·252	+0·572	+1·000
8·0	−0·001	−0·009	−0·022	−0·044	−0·068	−0·062	+0·002	+0·178	+0·515	+1·000
10·0	0·000	−0·002	−0·009	−0·028	−0·053	−0·067	−0·031	+0·123	+0·467	+1·000
12·0	0·000	0·000	−0·003	−0·016	−0·040	−0·064	−0·049	+0·081	+0·424	+1·000
14·0	0·000	0·000	0·000	−0·008	−0·029	−0·059	−0·060	+0·048	+0·387	+1·000
16·0	0·000	0·000	+0·002	−0·003	−0·021	−0·051	−0·066	+0·025	+0·354	+1·000

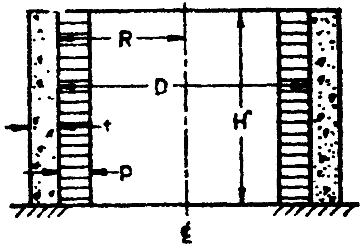
Note — Positive sign indicates tension in outside.

*When this table is used for moment applied at the top, while the top is hinged, 0·0*H* is the bottom of the wall and 1·0*H* is the top. Moment applied at an edge is positive when it causes outward rotation at that edge.

TABLE 18 MOMENTS IN CYLINDRICAL WALL, FIXED BASE, FREE TOP AND SUBJECT TO RECTANGULAR LOAD

(*Clause* 3.1.7)

Moment = Coefficient × pH^3 kgm/m



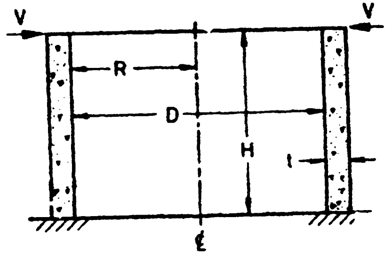
$\frac{H^2}{Dt}$	Coefficients at Point									
	0·1*H*	0·2*H*	0·3*H*	0·4*H*	0·5*H*	0·6*H*	0·7*H*	0·8*H*	0·9*H*	1·0*H*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	−0·002 3	−0·009 3	−0·022 7	−0·043 9	−0·071 0	−0·101 8	−0·145 5	−0·200 0	−0·259 3	−0·331 0
0·8	0·000 0	−0·000 6	−0·002 5	−0·008 3	−0·018 5	−0·036 2	−0·059 4	−0·091 7	−0·132 5	−0·183 5
1·2	+0·000 8	+0·002 6	+0·003 7	+0·002 9	−0·000 9	−0·008 9	−0·022 7	−0·046 8	−0·081 5	−0·117 8
1·6	+0·001 1	+0·003 6	+0·006 2	+0·007 7	+0·006 8	+0·001 1	−0·009 3	−0·026 7	−0·052 9	−0·087 6
2·0	+0·001 0	+0·003 6	+0·006 6	+0·008 8	+0·008 9	+0·005 9	−0·001 9	−0·016 7	−0·038 9	−0·071 9
3·0	+0·000 7	+0·002 6	+0·005 1	+0·007 4	+0·009 1	+0·008 3	+0·004 2	−0·005 3	−0·022 3	−0·048 3
4·0	+0·000 4	+0·001 5	+0·003 3	+0·005 2	+0·006 8	+0·007 5	+0·005 3	−0·001 3	−0·014 5	−0·036 5
5·0	+0·000 2	+0·000 8	+0·001 9	+0·003 5	+0·005 1	+0·006 1	+0·005 2	+0·000 7	−0·010 1	−0·029 3
6·0	+0·000 1	+0·000 4	+0·001 1	+0·002 2	+0·003 6	+0·004 9	+0·004 8	+0·001 7	−0·007 3	−0·024 2
8·0	0·000 0	+0·000 1	+0·000 3	+0·000 8	+0·001 8	+0·003 1	+0·003 8	+0·002 4	−0·004 0	−0·018 4
10·0	0·000 0	−0·000 1	0·000 0	+0·000 2	+0·000 9	+0·002 1	+0·003 0	+0·002 6	−0·002 2	−0·014 7
12·0	0·000 0	0·000 0	−0·000 1	0·000 0	+0·000 4	+0·001 4	+0·002 4	+0·002 2	−0·001 2	−0·012 3
14·0	0·000 0	0·000 0	0·000 0	0·000 0	+0·000 2	+0·001 0	+0·001 8	+0·002 1	−0·000 7	−0·010 5
16·0	0·000 0	0·000 0	0·000 0	−0·000 1	+0·000 1	+0·000 6	+0·001 2	+0·002 0	−0·000 5	−0·009 1

NOTE — Positive sign indicates tension on outside.

TABLE 19 MOMENTS IN CYLINDRICAL WALL, FIXED BASE, FREE TOP WITH SHEAR PER METRE, V APPLIED AT TOP

(*Clause* 3.1.7)

Moment = Coefficient × VH kgm/m



$\frac{H^2}{Dt}$	Coefficients at Point*									
	0·1H	0·2H	0·3H	0·4H	0·5H	0·6H	0·7H	0·8H	0·9H	1·0H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·4	+0·093	+0·172	+0·240	+0·300	+0·354	+0·402	+0·448	+0·492	+0·535	+0·578
0·8	+0·085	+0·145	+0·185	+0·208	+0·220	+0·224	+0·223	+0·219	+0·214	+0·208
1·2	+0·082	+0·132	+0·157	+0·164	+0·159	+0·145	+0·127	+0·106	+0·084	+0·062
1·6	+0·079	+0·122	+0·139	+0·138	+0·125	+0·105	+0·081	+0·056	+0·030	+0·004
2·0	+0·077	+0·115	+0·126	+0·119	+0·103	+0·080	+0·056	+0·031	+0·006	−0·019
3·0	+0·072	+0·100	+0·100	+0·086	+0·066	+0·044	+0·025	+0·006	−0·010	−0·024
4·0	+0·068	+0·088	+0·081	+0·063	+0·043	+0·025	+0·010	−0·110	−0·010	−0·019
5·0	+0·064	+0·078	+0·067	+0·047	+0·028	+0·013	+0·003	−0·003	−0·007	−0·011
6·0	+0·062	+0·070	+0·056	+0·036	+0·018	+0·006	0·000	−0·003	−0·005	−0·006
8·0	+0·057	+0·058	+0·041	+0·021	+0·007	0·000	−0·002	−0·003	−0·002	−0·001
10·0	+0·053	+0·049	+0·029	+0·012	+0·002	−0·002	−0·002	−0·002	−0·001	0·000
12·0	+0·049	+0·042	+0·022	+0·007	0·000	−0·002	−0·002	−0·001	0·000	0·000
14·0	+0·046	+0·036	+0·017	+0·004	−0·001	−0·002	−0·001	−0·001	0·000	0·000
16·0	+0·044	+0·031	+0·012	+0·001	−0·002	−0·002	−0·001	0·000	0·000	0·000

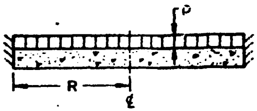
Note — Positive sign indicates tension on outside.

*When this table is used for shear applied at the base, while the top is fixed, 0·0H is the bottom of the wall and 1·0H is the top. Shear acting inward is positive, outward is negative.

TABLE 20 MOMENTS IN CIRCULAR SLAB WITHOUT CENTRE SUPPORT, FIXED EDGE, AND SUBJECT TO UNIFORM LOAD

(*Clause* 3.2)

Moment = Coefficient × pR^2 kgm/m



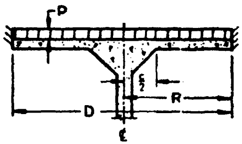
Coefficients at Point	0·00*R*	0·10*R*	0·20*R*	0·30*R*	0·40*R*	0·50*R*	0·60*R*	0·70*R*	0·80*R*	0·90*R*	1·0*R*
Radial Moments, M_r	+0·075	+0·073	+0·067	+0·057	+0·043	+0·025	+0·003	−0·023	−0·053	−0·087	−0·125
Tangential Moments, M_t	+0·075	+0·074	+0·071	+0·066	+0·059	+0·050	+0·039	+0·026	+0·011	−0·006	−0·025

NOTE — Positive sign indicates compression in surface loaded.

TABLE 21 MOMENTS IN CIRCULAR SLAB WITH CENTRE SUPPORT, FIXED EDGE, AND SUBJECT TO UNIFORM LOAD

(*Clause* 3.2)

Moment = Coefficient × pR^2 kgm/m



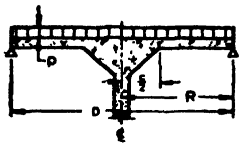
C/D	Coefficients at Point												
	0·05*R*	0·10*R*	0·15*R*	0·20*R*	0·25*R*	0·30*R*	0·40*R*	0·50*R*	0·60*R*	0·70*R*	0·80*R*	0·90*R*	1·00*R*
	Radial Moments, M_r												
0·05	−0·210 0	−0·072 9	−0·027 5	−0·002 6	+0·013 3	+0·023 8	+0·034 2	+0·034 7	+0·027 7	+0·014 2	−0·004 9	−0·029 4	−0·058 9
0·10	—	−0·143 3	−0·062 4	−0·023 9	−0·001 1	+0·013 6	+0·029 0	+0·032 6	+0·027 6	+0·015 8	−0·002 1	−0·025 5	−0·054 1
0·15	—	—	−0·108 9	−0·052 1	−0·020 0	+0·000 2	+0·022 0	+0·029 3	+0·026 9	+0·016 9	+0·000 6	−0·021 6	−0·049 0
0·20	—	—	—	−0·086 2	−0·042 9	−0·016 1	+0·013 3	+0·024 9	+0·025 4	+0·017 6	+0·002 9	−0·017 8	−0·044 1
0·25	—	—	—	—	−0·069 8	−0·035 1	+0·002 9	+0·019 4	+0·023 1	+0·017 7	+0·004 9	−0·014 3	−0·039 3
	Tangential Moments, M_t												
0·05	−0·041 7	−0·070 0	−0·054 1	−0·038 1	−0·025 1	−0·014 5	+0·000 2	+0·008 5	+0·011 8	+0·010 9	+0·006 5	−0·000 3	−0·011 8
0·10	—	−0·028 7	−0·042 1	−0·035 4	−0·025 8	−0·016 8	−0·002 7	+0·005 9	+0·009 9	+0·009 8	+0·006 1	−0·000 9	−0·010 8
0·15	—	—	−0·021 8	−0·028 4	−0·024 3	−0·017 7	−0·005 1	+0·003 1	+0·008 0	+0·008 6	+0·005 7	−0·000 6	−0·009 8
0·20	—	—	—	−0·017 2	−0·020 3	−0·017 1	−0·007 0	+0·001 3	+0·006 3	+0·007 5	+0·005 2	−0·000 3	−0·008 8
0·25	—	—	—	—	−0·014 0	−0·015 0	−0·008 3	−0·000 5	+0·004 6	+0·006 4	+0·004 8	0·000 0	−0·007 8

NOTE — Positive sign indicates compression in surface loaded.

TABLE 22 MOMENTS IN CIRCULAR SLAB WITH CENTRE SUPPORT, HINGED EDGE, AND SUBJECT TO UNIFORM LOAD

(*Clause* 3.2)

Moment = Coefficient × pR^2 kgm/m



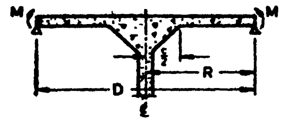
C/*D*	Coefficients at Point												
	0·05*R*	0·10*R*	0·15*R*	0·20*R*	0·25*R*	0·30*R*	0·40*R*	0·50*R*	0·60*R*	0·70*R*	0·80*R*	0·90*R*	1·00*R*
	Radial Moments, *Mr*												
0·05	−0·365 8	−0·138 8	−0·064 0	−0·022 1	+0·005	+0·025 5	+0·050 1	+0·061 4	+0·062 9	+0·056 6	+0·043 7	+0·024 7	0
0·10	—	−0·248 7	−0·118 0	−0·055 7	−0·017 6	+0·008 1	+0·039 1	+0·053 9	+0·057 8	+0·053 2	+0·041 6	+0·023 7	0
0·15	—	—	−0·186 9	−0·097 7	−0·046 7	−0·013 5	+0·025 8	+0·045 1	+0·051 8	+0·049 4	+0·039 3	+0·022 6	0
0·20	—	—	—	−0·146 5	−0·080 0	−0·038 1	+0·010 9	+0·035 2	+0·045 2	+0·045 1	+0·036 8	+0·021 5	0
0·25	—	—	—	—	−0·117 2	−0·064 5	−0·005 5	+0·024 5	+0·038 1	+0·040 4	+0·034 0	+0·020 0	0
	Tangential Moments, *Mt*												
0·05	−0·073 1	−0·127 7	−0·104 0	−0·078 6	−0·056 9	−0·039 1	−0·012 1	+0·006 1	+0·017 5	+0·023 4	+0·025 1	+0·022 8	+0·016 8
0·10	—	−0·049 8	−0·076 8	−0·068 4	−0·053 9	−0·039 4	−0·015 3	+0·002 0	+0·013 4	+0·019 7	+0·021 8	+0·019 9	+0·014 5
0·15	—	—	−0·037 4	−0·051 6	−0·047 0	−0·037 5	−0·017 5	−0·001 4	+0·009 7	+0·016 3	+0·018 6	+0·017 2	+0·012 3
0·20	—	—	—	−0·029 3	−0·036 7	−0·033 3	−0·018 4	−0·004 2	+0·006 5	+0·013 2	+0·015 8	+0·014 8	+0·010 3
0·25	—	—	—	—	−0·023 4	−0·026 3	−0·018 4	−0·006 2	+0·003 8	+0·010 3	+0·013 2	+0·012 2	+0·008 5

Note — Positive sign indicates compression in surface loaded.

TABLE 23 MOMENTS IN CIRCULAR SLAB WITH CENTRE SUPPORT, HINGED EDGE WITH MOMENT PER METRE, *M* APPLIED AT EDGE

(*Clause* 3.2)

Moment = Coefficient × *M* kgm/m



C/D	Coefficients at Point												
	0·05*R*	0·10*R*	0·15*R*	0·20*R*	0·25*R*	0·30*R*	0·40*R*	0·50*R*	0·60*R*	0·70*R*	0·80*R*	0·90*R*	1·00*R*
	Radial Moments, *Mr*												
0·05	−2·650	−1·121	−0·622	−0·333	−0·129	+0·029	+0·268	+0·450	+0·596	+0·718	+0·824	+0·917	+1·000
0·10	—	−1·950	−1·026	−0·584	−0·305	−0·103	+0·187	+0·394	+0·558	+0·692	+0·808	+0·909	+1·000
0·15	—	—	−1·594	−0·930	−0·545	−0·280	+0·078	+0·323	+0·510	+0·663	+0·790	+0·900	+1·000
0·20	—	—	—	−1·366	−0·842	−0·499	−0·057	+0·236	+0·451	+0·624	+0·768	+0·891	+1·000
0·25	—	—	—	—	−1·204	−0·765	−0·216	−0·130	+0·392	+0·577	+0·740	+0·880	+1·000
	Tangential Moments, *Mt*												
0·05	−0·530	−0·980	−0·847	−0·688	−0·544	−0·418	−0·211	−0·042	+0·095	+0·212	+0·314	+0·405	+0·486
0·10	—	−0·388	−0·641	−0·608	−0·518	−0·419	−0·233	−0·072	+0·066	+0·185	+0·290	+0·384	+0·469
0·15	—	—	−0·319	−0·472	−0·463	−0·404	−0·251	−0·100	+0·035	+0·157	+0·263	+0·363	+0·451
0·20	—	—	—	−0·272	−0·372	−0·368	−0·261	−0·123	+0·007	+0·129	+0·240	+0·340	+0·433
0·25	—	—	—	—	−0·239	−0·305	−0·259	−0·145	−0·020	+0·099	+0·214	+0·320	+0·414

Note — Positive sign indicates compression in top surface.

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