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TABLES  
FOR FINDING STRAINS  
IN  
RAILWAY BRIDGE TRUSSES  
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DU BOIS







TABLES

FOR

FINDING THE STRAINS

IN

RAILWAY BRIDGE TRUSSES

UNDER THE ACTION OF A

CONCENTRATED LOAD SYSTEM.

REPRINTED FROM STRAINS IN FRAMED STRUCTURES.

SECOND EDITION.

BY

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## PREFACE.

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THESE Tables are intended to aid those engaged in the calculation of trusses. The system of concentrated loads annexed, is very closely that generally laid down in the specifications of our principal railroads. The use of the tables will be found sufficiently illustrated for all those for whom they are designed. The principles upon which the calculations are based are given at length in the author's work, "*Strains in Framed Structures*," from which these Tables are reprinted.

*December 10, 1884.*



TABLE I.

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CONCENTRATED LOAD SYSTEM.

SHEAR.



TABLE I.  


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CONCENTRATED LOAD SYSTEM.  
SHEAR.  


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EXPLANATION OF TABLE.

THE load-system adopted is given in Table I. It consists of two locomotives with tenders, followed by train; the wheel-weights and distances being given in the first column. The locomotive agrees closely with the "standard consolidated engine," usually specified by the best railroad and bridge companies. It is believed that the load-system assumed is such as will give, in every case, results slightly in excess of the heaviest possible loading which can actually occur in practice.

The use of Table I. is quite simple. The length of span is  $l$ . The load always comes on *from right*. The maximum shear at any point, distant  $x$  from *the left end*, is given by one of *four* formulæ. These formulæ, and the limits between which they hold good, are given at the head of the table. For the *first eight feet* of any span we must use formula (I.). From  $x = 8$  up to a certain *limit* we must use (II.). This limit is given in the table to right, for every length of span from 27 to 300. Thus, for a span of 100 feet, this limit is  $47\frac{1}{2}$  feet *from the left end*. From this limit, up to  $x = l - 8$ , we must use formula (III.). At the limit, both (II.) and (III.) give the same result. For the *last eight feet* of span we use formula (IV.).

Thus, for instance, for a span of 200 feet, we must use (I.) from  $x = 0$  up to  $x = 8$ . From  $x = 8$  up to  $x = 89\frac{1}{2}$  we must use (II.). From  $x = 89\frac{1}{2}$  up to  $x = 192$  we must use (III.). From  $x = 192$  up to  $x = 200$  we must use (IV.).

The table gives the values of  $P$  and  $A$  for the corresponding value of  $l - x$ , or  $l - x - 8$ .

*Thus, suppose we wish the maximum shear for a span of 200 feet, at 7, 80, 100, and 195 feet from end, load coming on always from right.*

For  $x = 7$  we use formula (I.). We have, then,  $l = 200$ ,  $l - x = 193$ . From table, we see that for any value of  $l - x$  between 190 and 195 we have  $P = 527000$ , and  $A = 41730000$ . Hence, for  $x = 7$ ,

$$\text{Shear} = \frac{527000}{200}193 - \frac{41730000}{200} = 299905 \text{ lbs.}$$

In like manner, for  $x = 80$ , we have  $l - x = 120$ ,  $l - x + 8 = 128$ ; and, since the limit is  $89\frac{1}{2}$ , we must use formula (II.). We have from table, for  $l - x = 120$ ,  $P = 383000$ , and  $A = 19410000$ ; and, hence,

$$\text{Shear} = \frac{15000}{200}128 + \frac{383000}{200}120 - \frac{19410000}{200} - 15000 = 127350 \text{ lbs.}$$

Observe that the table gives these values of  $P$  and  $A$  for any value of  $l - x$  *between 115 and 120, including 120*. For any value of  $l - x$  between 120 and 125, *including 120*, we have, also,  $P = 395000$ ,  $A = 20850000$ ; and these values in formula (II.) would give the same result. Thus,

$$\text{Shear} = \frac{15000}{200}128 + \frac{395000}{200}120 - \frac{20850000}{200} - 15000 = 127350 \text{ lbs.}$$

For  $x = 100$ , we have  $l - x = 100$ ,  $l - x - 8 = 92$ ; and, since the limit is  $89\frac{1}{2}$ , we must use formula (III.). We have from table, for  $l - x - 8 = 92$ ,  $P = 335000$ ,  $A = 14370000$ ; and, hence,

$$\text{Shear} = \frac{15000}{200}100 + \frac{335000}{200}92 - \frac{14370000}{200} = 89750 \text{ lbs.}$$

For  $x = 195$ , since this falls within the last 8 feet, we must use formula (IV.). We have, then,  $l - x = 5$ ; and

$$\text{Shear} = \frac{15000}{200}5 = 375 \text{ lbs.}$$

Whenever formulæ (I.) or (II.) apply, the second wheel is at the point: when (III.) or (IV.) apply, the first wheel is at the point.



TABLE I.

CONCENTRATED LOAD SYSTEM.

SHEAR.

$l$  = length of span.

$x$  = distance from left end, in feet, of any point at which the maximum shear is required.

Values of  $P$  and  $A$  to be taken from table for corresponding  $l-x$ , or  $l-x-8$ .

(I.)  $\left. \begin{array}{l} \text{From } x = 0 \text{ to } x = 8, \\ \text{second wheel at point,} \end{array} \right\} \text{Shear} = \frac{P}{l}(l-x) - \frac{A}{l}$   
 $\left. \begin{array}{l} \text{From } x = 8 \text{ to limit,} \\ \text{second wheel at point,} \end{array} \right\} \text{Shear} = \frac{\phi_1}{l}(l-x+8) + \frac{P}{l}(l-x) - \frac{A}{l} - 15000. \quad \text{(II.)}$

Limit to be found from table on right,  $\phi_1 = 15000$ .

(III.)  $\left. \begin{array}{l} \text{From } x = \text{limit to } x = l-8, \\ \text{first wheel at point,} \end{array} \right\} \text{Shear} = \frac{\phi_1}{l}(l-x) + \frac{P}{l}(l-x-8) - \frac{A}{l}$   
 $\left. \begin{array}{l} \text{From } x = l-8 \text{ to } x = l, \\ \text{first wheel at point,} \end{array} \right\} \text{Shear} = \frac{\phi_1}{l}(l-x). \quad \text{(IV.)}$

| WEIGHTS, LBS. | Distances. | $l-x$<br>or<br>$l-x-8$ . | $P$    | $A$     | WEIGHTS, LBS. | Distances. | $l-x$<br>or<br>$l-x-8$ . | $P$    | $A$      | Span.       | Limit | Span. | Limit. |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|---------------|------------|--------------------------|--------|---------|---------------|------------|--------------------------|--------|----------|-------------|-------|-------|--------|--------|---|-----|--------|----------|-------------|------|----|--------|---------|----|-----|--------|----------|---------|------|----|--------|---------|----|-----|--------|----------|-------------|------|----|--------|---------|---|-----|--------|----------|---------|------|----|--------|---------|---|-----|--------|----------|-------------|------|----|--------|---------|---|-----|--------|----------|---------|------|----|--------|
|               |            |                          |        |         |               |            |                          |        |          | feet        | $x$ . | feet. | $x$ .  |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 8                        | 25000  | 0       | Car.          | ft.        | 91                       | 335000 | 14370000 | 27          | 18.6  | 61    | 38.5   |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          | Tender.     | ft.   | 5     | 50000  | 125000 | 4 | 95  | 347000 | 15510000 | 28          | 19   | 62 | 39     |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          | Locomotive. | ft.  | 5  | 75000  | 375000  | 5  | 100 | 359000 | 16710000 | 29      | 19.4 | 63 | 39     |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          |             |      |    |        |         |    |     |        |          | Tender. | ft.  | 10 | 100000 | 750000  | 10 | 110 | 371000 | 18030000 | 30          | 19.9 | 64 | 39     |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          | Locomotive. | ft.  | 15 | 150000 | 1080000 | 5 | 115 | 383000 | 19410000 | 31      | 20.6 | 65 | 39     |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Tender.       | ft.        | 22                       | 225000 | 375000  | Car.          | ft.        | 120                      | 395000 | 20850000 | 32          | 21.3  | 66    | 39     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          | Locomotive. | ft.   | 27    | 270000 | 408000 | 5 | 125 | 407000 | 22350000 | 33          | 22   | 67 | 39     |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          | Tender.     | ft.  | 32 | 320000 | 448000  | 10 | 135 | 419000 | 23970000 | 34      | 22.7 | 68 | 40     |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 37                       | 370000 | 525000  | Car.          | ft.        | 140                      | 431000 | 25650000 | 35          | 23.4  | 69    | 40     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          | Tender.     | ft.   | 46    | 460000 | 602000 | 5 | 145 | 443000 | 27390000 | 36          | 24.1 | 70 | 41     |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          | Locomotive. | ft.  | 54 | 540000 | 756000  | 10 | 150 | 455000 | 29190000 | 37      | 24.8 | 71 | 41     |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          |             |      |    |        |         |    |     |        |          | Tender. | ft.  | 59 | 590000 | 855000  | 5  | 160 | 467000 | 31110000 | 38          | 25.5 | 72 | 42     |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 64                       | 640000 | 863500  | Car.          | ft.        | 165                      | 479000 | 33090000 | 39          | 26.2  | 73    | 42     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          | Tender.     | ft.   | 69    | 690000 | 936000 | 5 | 170 | 491000 | 35130000 | 40          | 26.8 | 74 | 42     |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          | Locomotive. | ft.  | 76 | 760000 | 1050000 | 10 | 175 | 503000 | 37230000 | 41      | 27.2 | 75 | 42     |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          |             |      |    |        |         |    |     |        |          | Tender. | ft.  | 81 | 810000 | 1171500 | 5  | 185 | 515000 | 39450000 | 42          | 27.6 | 76 | 43     |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          | Locomotive. | ft.  | 86 | 860000 | 1300500 | 5 | 190 | 527000 | 41730000 | 43      | 28   | 77 | 43     |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          | Tender. | ft.  | 91 | 910000 | 1300500 | 5 | 195 | 527000 | 41730000 | 44          | 28.7 | 78 | 44     |         |   |     |        |          |         |      |    |        |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          | Locomotive. | ft.  | 91 | 910000 | 1300500 | 5 | 195 | 527000 | 41730000 | 45      | 29.4 | 79 | 44     |
|               |            |                          |        |         |               |            |                          |        |          |             |       |       |        |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          | Tender. | ft.  | 91 | 910000 |
| Locomotive.   | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 47          | 30.8  | 81    | 45     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Tender.       | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 48          | 31.5  | 82    | 45     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 49          | 32.2  | 83    | 45     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Tender.       | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 50          | 32.9  | 84    | 46     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 51          | 33.6  | 85    | 46     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Tender.       | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 52          | 34.3  | 86    | 47     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 53          | 35    | 87    | 47     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Tender.       | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 54          | 35.4  | 88    | 48     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 55          | 35.8  | 89    | 48     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Tender.       | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 56          | 36.2  | 90    | 48     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 57          | 36.6  | 91    | 48     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Tender.       | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 58          | 37    | 92    | 48     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Locomotive.   | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 59          | 37.4  | 93    | 48     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |
| Tender.       | ft.        | 91                       | 910000 | 1300500 | Car.          | ft.        | 195                      | 527000 | 41730000 | 60          | 37.8  | 94    | 47     |        |   |     |        |          |             |      |    |        |         |    |     |        |          |         |      |    |        |         |    |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |         |   |     |        |          |             |      |    |        |         |   |     |        |          |         |      |    |        |

TABLE I.

CONCENTRATED LOAD SYSTEM.

SHEAR.

$l$  = length of span.

$x$  = distance from left end, in feet, of any point at which the maximum shear is required.

Values of  $P$  and  $A$  to be taken from table for corresponding  $l-x$ , or  $l-x-8$ .

(I.) From  $x = 0$  to  $x = 8$ ,  $\left\{ \begin{array}{l} \text{second wheel at point,} \\ \text{Shear} = \frac{P}{l}(l-x) - \frac{A}{l}. \end{array} \right.$   
 From  $x = 8$  to limit,  $\left\{ \begin{array}{l} \text{second wheel at point,} \\ \text{Shear} = \frac{p_1}{l}(l-x+8) + \frac{P}{l}(l-x) - \frac{A}{l} - 15000. \end{array} \right.$  (II.)

Limit to be found from table on right,  $p_1 = 15000$ .

(III.) From  $x = \text{limit to } x = l-8$ ,  $\left\{ \begin{array}{l} \text{first wheel at point,} \\ \text{Shear} = \frac{p_1}{l}(l-x) + \frac{P}{l}(l-x-8) - \frac{A}{l}. \end{array} \right.$   
 From  $x = l-8$  to  $x = l$ ,  $\left\{ \begin{array}{l} \text{first wheel at point,} \\ \text{Shear} = \frac{p_1}{l}(l-x). \end{array} \right.$  (IV.)

| WEIGHTS, LBS. | Distances<br>$l-x$<br>or<br>$l-x-8$ . | $l-x$<br>or<br>$l-x-8$ . | $P$ | $A$    | Span.    |       | Span. |       | Span. |       | Span. |       | Span. |       | Span. |       |      |
|---------------|---------------------------------------|--------------------------|-----|--------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
|               |                                       |                          |     |        | feet.    | $x$ . | feet. | $x$ . | feet. | $x$ . | feet. | $x$ . | feet. | $x$ . | feet. | $x$ . |      |
| Car.          | 5                                     | $p_{35} = 12000$         | 195 | 539000 | 44070000 | 95    | 47.1  | 128   | 62.5  | 161   | 79.1  | 194   | 91.1  | 227   | 89.7  | 260   | 91.1 |
|               |                                       | $p_{36} = 12000$         | 200 | 539000 | 44070000 | 96    | 47.3  | 129   | 63.2  | 162   | 79.3  | 195   | 92.1  | 228   | 89.8  | 261   | 91.2 |
|               |                                       | $p_{37} = 12000$         | 210 | 551000 | 46470000 | 97    | 47.3  | 130   | 63.9  | 163   | 80.3  | 196   | 92.4  | 229   | 89.9  | 262   | 91.4 |
|               |                                       | $p_{38} = 12000$         | 215 | 563000 | 48990000 | 98    | 47.3  | 131   | 64.6  | 164   | 80.8  | 197   | 92.7  | 230   | 89.9  | 263   | 91.4 |
|               |                                       | $p_{39} = 12000$         | 220 | 575000 | 51570000 | 99    | 47.3  | 132   | 65.3  | 165   | 81.3  | 198   | 91.8  | 231   | 89.9  | 264   | 92.4 |
| Car.          | 5                                     | $p_{40} = 12000$         | 225 | 587000 | 54210000 | 100   | 47.3  | 133   | 66    | 166   | 81.3  | 199   | 91.7  | 232   | 90.3  | 265   | 92.4 |
|               |                                       | $p_{41} = 12000$         | 235 | 599000 | 56910000 | 101   | 47.3  | 134   | 66.4  | 167   | 81.3  | 200   | 89.3  | 233   | 90.3  | 266   | 92.4 |
|               |                                       | $p_{42} = 12000$         | 240 | 611000 | 59730000 | 102   | 47.6  | 135   | 66.8  | 168   | 81.6  | 201   | 89.7  | 234   | 90.8  | 267   | 92.7 |
|               |                                       | $p_{43} = 12000$         | 245 | 623000 | 62610000 | 103   | 48    | 136   | 67.2  | 169   | 82.2  | 202   | 88.8  | 235   | 90.7  | 268   | 92.8 |
|               |                                       | $p_{44} = 12000$         | 250 | 635000 | 65550000 | 104   | 48.4  | 137   | 67.8  | 170   | 82.7  | 203   | 88.7  | 236   | 90.8  | 269   | 93.2 |
| Car.          | 5                                     | $p_{45} = 12000$         | 255 | 647000 | 68550000 | 105   | 48.8  | 138   | 68.5  | 171   | 83.3  | 204   | 88.3  | 237   | 91.7  | 270   | 93.1 |
|               |                                       | $p_{46} = 12000$         | 260 | 659000 | 71670000 | 106   | 49.2  | 139   | 69.2  | 172   | 83.3  | 205   | 89.7  | 238   | 91.7  | 271   | 93.1 |
|               |                                       | $p_{47} = 12000$         | 265 | 671000 | 74850000 | 107   | 49.6  | 140   | 69.9  | 173   | 84.3  | 206   | 89.7  | 239   | 91.7  | 272   | 94.8 |
|               |                                       | $p_{48} = 12000$         | 270 | 683000 | 78090000 | 108   | 50    | 141   | 70.6  | 174   | 84.3  | 207   | 90.7  | 240   | 92.4  | 273   | 94.7 |
|               |                                       | $p_{49} = 12000$         | 275 | 695000 | 81390000 | 109   | 50.4  | 142   | 71.3  | 175   | 84.3  | 208   | 90.6  | 241   | 92.1  | 274   | 93.8 |
| Car.          | 5                                     | $p_{50} = 12000$         | 280 | 707000 | 84810000 | 110   | 50.9  | 143   | 72    | 176   | 84.8  | 209   | 90.7  | 242   | 91.7  | 275   | 93.7 |
|               |                                       | $p_{51} = 12000$         | 285 | 719000 | 88290000 | 111   | 51.6  | 144   | 72.7  | 177   | 85.5  | 210   | 89.7  | 243   | 92.4  | 276   | 93.8 |
|               |                                       | $p_{52} = 12000$         | 290 | 731000 | 91830000 | 112   | 52.3  | 145   | 73.4  | 178   | 85.5  | 211   | 90.7  | 244   | 92.8  | 277   | 91.7 |
|               |                                       | $p_{53} = 12000$         | 295 | 743000 | 95430000 | 113   | 53    | 146   | 74.1  | 179   | 86.3  | 212   | 90.3  | 245   | 93.7  | 280   | 90.8 |
|               |                                       | $p_{54} = 12000$         | 300 | 755000 | 99090000 | 114   | 53.7  | 147   | 74.6  | 180   | 86.6  | 213   | 91.7  | 246   | 93.7  | 281   | 90.8 |

TABLE II.

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CONCENTRATED LOAD SYSTEM.

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\* In applying II. to a *framed girder*, if the panel length is *more than 8 feet*, we must put instead of 15000 (=  $p_1$ ), that *portion* of  $p_1$  only, which, by the law of the lever, takes effect at the 1st apex on left of  $p_1$ .



TABLE II.

CONCENTRATED LOAD SYSTEM.  
MOMENTS.

EXPLANATION OF TABLE.

The following table is an attempt to give a summary of the results of the experiments conducted by the author in the study of the behavior of beams under a concentrated load. The results are given in the form of a table, and are intended to be used as a guide in the design of beams for concentrated loads. The table is based on the results of the experiments conducted by the author, and is intended to be used as a guide in the design of beams for concentrated loads.

## TABLE II.

### CONCENTRATED LOAD SYSTEM.

#### MOMENTS.

TABLE II.  


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CONCENTRATED LOAD SYSTEM.  
MOMENTS.  


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EXPLANATION OF TABLE.

FOR the maximum moment at any point of any span given in the table, simply multiply the value of the reaction  $R$  by the value of  $x$ , the distance of point from the left end, and subtract the value of  $m$ . The index of  $p$ , in the last column, shows the number of the wheel which must rest on the point, and hence the position of the load-system on the span. The load-system itself is given in Table I.

Thus, for span of 200 feet:—

At 5 feet from left end, the reaction at left end is  $R = 305175$  lbs. The moment is

$$Rx = 305175 \times 5 = 1525875.$$

The second wheel of the system must rest on the point.

At 10 feet from left, the reaction is  $R = 306850$  lbs. The moment is

$$Rx - m = 306850 \times 10 - 120000 = 2948500.$$

The second wheel of the system must rest on the point.

At 20 feet from left, the reaction is  $R = 293600$  lbs. The moment is

$$Rx - m = 293600 \times 20 - 320000 = 5552000.$$

The third wheel of the system must rest on the point.

To find the moment at a point not given by the table, find the reaction  $R$  for this point by interpolation, and then proceed as before. Thus,

At 30.7 feet from left, the reaction is  $280650 - (280650 - 278060)\frac{7}{10} = 278837$ . The moment is

$$Rx - m = 278837 \times 30.7 - 645000 = 7915296.$$

The fourth wheel of the system must rest on the point.

If, however, this point falls between two "fields," find the moment by interpolation. Thus,

At 45.4 feet from left, we have the moment at 45,  $255050 \times 45 - 1095000 = 10382250$ . The moment at 46 is  $270290 \times 46 - 1900000 = 10533340$ . At 45.4, then, we have

$$10382250 + (10533340 - 10382250)\frac{4}{10} = 10442686.$$

The fifth or sixth wheel at point, indifferently.

*In general, it will not be necessary to interpolate, but will be sufficient to take the nearest foot given in the table.*

To find the moment at any point of a span not given in the table, find the moment at the same point for the two nearest spans given, and interpolate.

Thus, span 204 feet, moment at 10 feet from left:—

The moment at 10 feet from left, for a span of 200 feet, is 2948500. The moment at 10 feet from left, for span of 210 feet, is 3063330. The moment at 10 feet from left, for 204 feet span, is, then,

$$2948500 + (3063330 - 2948500)\frac{4}{10} = 2994432.$$

The second wheel of system at point.



TABLE II.

CONCENTRATED LOAD SYSTEM.

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>10<br>feet. |          |          |                       | SPAN,<br>11<br>feet. |          |          |                       | SPAN,<br>12<br>feet. |          |          |                       | SPAN,<br>13<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 32500    |          |                       | 1                    | 34090    |          |                       | 1                    | 37500    |          |                       | 1                    | 40384    |          |                       |
| 2                    | 27500    |          |                       | 2                    | 29545    |          |                       | 2                    | 31250    |          |                       | 2                    | 34615    |          |                       |
| 3                    | 22500    | 0        | <i>f</i> <sub>2</sub> | 3                    | 25000    | 0        | <i>f</i> <sub>2</sub> | 3                    | 27083    | 0        | <i>f</i> <sub>2</sub> | 3                    | 28846    | 0        | <i>f</i> <sub>2</sub> |
| 4                    | 17500    |          |                       | 4                    | 20454    |          |                       | 4                    | 22916    |          |                       | 4                    | 25000    |          |                       |
| 5                    | 12500    |          |                       | 5                    | 25909    |          |                       | 5                    | 18750    |          |                       | 5                    | 21153    |          |                       |
|                      |          |          |                       | 6                    | 21363    |          |                       | 6                    | 37500    | 125000   | <i>f</i> <sub>3</sub> | 6                    | 40384    | 125000   | <i>f</i> <sub>3</sub> |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       | 7                    | 34615    | 125000   | <i>f</i> <sub>3</sub> |
| SPAN,<br>14<br>feet. |          |          |                       | SPAN,<br>15<br>feet. |          |          |                       | SPAN,<br>16<br>feet. |          |          |                       | SPAN,<br>17<br>feet. |          |          |                       |
| <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 42857    |          |                       | 1                    | 45000    |          |                       | 1                    | 46875    |          |                       | 1                    | 50000    |          |                       |
| 2                    | 37500    |          |                       | 2                    | 40000    |          |                       | 2                    | 42187    |          |                       | 2                    | 44117    |          |                       |
| 3                    | 32142    | 0        | <i>f</i> <sub>2</sub> | 3                    | 35000    | 0        | <i>f</i> <sub>2</sub> | 3                    | 37500    | 0        | <i>f</i> <sub>2</sub> | 3                    | 39705    | 0        | <i>f</i> <sub>2</sub> |
| 4                    | 26785    |          |                       | 4                    | 30000    |          |                       | 4                    | 32812    |          |                       | 4                    | 35294    |          |                       |
| 5                    | 23214    |          |                       | 5                    | 25000    |          |                       | 5                    | 28125    |          |                       | 5                    | 30882    |          |                       |
| 6                    | 42857    | 125000   | <i>f</i> <sub>3</sub> | 6                    | 45000    | 125000   | <i>f</i> <sub>3</sub> | 6                    | 46875    | 125000   | <i>f</i> <sub>3</sub> | 6                    | 50000    | 125000   | <i>f</i> <sub>3</sub> |
| 7                    | 37500    |          |                       | 7                    | 40000    |          |                       | 7                    | 42187    |          |                       | 7                    | 44117    |          |                       |
|                      |          |          |                       | 8                    | 35000    |          |                       | 8                    | 37500    |          |                       | 8                    | 39705    |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       | 9                    | 35294    |          |                       |

## MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>18<br>feet. |          |          |       | SPAN,<br>19<br>feet. |          |          |       | SPAN,<br>20<br>feet. |          |          |       | SPAN,<br>21<br>feet. |          |          |       |
|----------------------|----------|----------|-------|----------------------|----------|----------|-------|----------------------|----------|----------|-------|----------------------|----------|----------|-------|
| <i>x</i>             | <i>R</i> | <i>m</i> |       |
| 1                    | 52777    |          |       | 1                    | 55263    |          |       | 1                    | 57500    |          |       | 1                    | 59523    |          |       |
| 2                    | 47222    |          |       | 2                    | 50000    |          |       | 2                    | 52500    |          |       | 2                    | 54761    |          |       |
| 3                    | 41666    | 0        | $p_2$ | 3                    | 44736    | 0        | $p_2$ | 3                    | 47500    | 0        | $p_2$ | 3                    | 50000    | 0        | $p_2$ |
| 4                    | 37500    |          |       | 4                    | 39473    |          |       | 4                    | 42500    |          |       | 4                    | 45238    |          |       |
| 5                    | 33333    |          |       | 5                    | 35526    |          |       | 5                    | 37500    |          |       | 5                    | 40476    |          |       |
| 6                    | 52777    |          |       | 6                    | 55263    |          |       | 6                    | 57500    |          |       | 6                    | 59523    |          |       |
| 7                    | 47222    |          |       | 7                    | 50000    |          |       | 7                    | 52500    |          |       | 7                    | 54761    |          |       |
| 8                    | 41666    | 125000   | $p_3$ | 8                    | 44736    | 125000   | $p_3$ | 8                    | 47500    | 125000   | $p_3$ | 8                    | 50000    | 125000   | $p_3$ |
| 9                    | 37500    |          |       | 9                    | 39473    |          |       | 9                    | 42500    |          |       | 9                    | 45238    |          |       |
|                      |          |          |       | 10                   | 35526    |          |       | 10                   | 37500    |          |       | 10                   | 40476    |          |       |
|                      |          |          |       |                      |          |          |       |                      |          |          |       | 11                   | 35714    |          |       |
|                      |          |          |       |                      |          |          |       |                      |          |          |       |                      |          |          |       |
| SPAN,<br>22<br>feet. |          |          |       | SPAN,<br>23<br>feet. |          |          |       | SPAN,<br>24<br>feet. |          |          |       | SPAN,<br>25<br>feet. |          |          |       |
| <i>x</i>             | <i>R</i> | <i>m</i> |       | <i>x</i>             | <i>R</i> | <i>m</i> |       | <i>x</i>             | <i>R</i> | <i>m</i> |       | <i>x</i>             | <i>R</i> | <i>m</i> |       |
| 1                    | 61363    |          |       | 1                    | 63043    |          |       | 1                    | 65208    |          |       | 1                    | 67200    |          |       |
| 2                    | 56818    |          |       | 2                    | 58695    |          |       | 2                    | 60416    |          |       | 2                    | 62600    |          |       |
| 3                    | 52272    | 0        | $p_2$ | 3                    | 54847    | 0        | $p_2$ | 3                    | 56250    | 0        | $p_2$ | 3                    | 58000    | 0        | $p_2$ |
| 4                    | 47727    |          |       | 4                    | 50000    |          |       | 4                    | 52083    |          |       | 4                    | 54000    |          |       |
| 5                    | 43181    |          |       | 5                    | 45652    |          |       | 5                    | 47915    |          |       | 5                    | 50000    |          |       |
| 6                    | 61363    |          |       | 6                    | 63043    |          |       | 6                    | 65208    |          |       | 6                    | 67200    |          |       |
| 7                    | 56818    |          |       | 7                    | 58695    |          |       | 7                    | 60416    |          |       | 7                    | 62600    |          |       |
| 8                    | 52272    | 125000   | $p_3$ | 8                    | 54847    | 125000   | $p_3$ | 8                    | 56250    | 125000   | $p_3$ | 8                    | 58000    | 125000   | $p_3$ |
| 9                    | 47727    |          |       | 9                    | 50000    |          |       | 9                    | 52083    |          |       | 9                    | 54000    |          |       |
| 10                   | 43181    |          |       | 10                   | 45652    |          |       | 10                   | 47915    |          |       | 10                   | 50000    |          |       |
| 11                   | 38636    |          |       | 11                   | 41304    |          |       | 11                   | 43749    |          |       | 11                   | 46000    |          |       |
|                      |          |          |       | 12                   | 36956    |          |       | 12                   | 39582    |          |       | 12                   | 42000    |          |       |
|                      |          |          |       |                      |          |          |       |                      |          |          |       | 13                   | 38000    |          |       |



MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>34<br>feet. |       |        |       | SPAN,<br>35<br>feet. |       |        |       | SPAN,<br>36<br>feet. |       |        |       | SPAN,<br>37<br>feet. |       |        |       |
|----------------------|-------|--------|-------|----------------------|-------|--------|-------|----------------------|-------|--------|-------|----------------------|-------|--------|-------|
| x                    | R     | m      |       | x                    | R     | m      |       | x                    | R     | m      |       | x                    | R     | m      |       |
| 1                    | 82941 |        |       | 1                    | 84714 |        |       | 1                    | 86388 |        |       | 1                    | 87972 |        |       |
| 2                    | 78676 |        |       | 2                    | 80571 |        |       | 2                    | 82361 |        |       | 2                    | 84054 |        |       |
| 3                    | 74852 | 0      | $p_2$ | 3                    | 76428 | 0      | $p_2$ | 3                    | 78333 | 0      | $p_2$ | 3                    | 80135 | 0      | $p_2$ |
| 4                    | 71029 |        |       | 4                    | 72714 |        |       | 4                    | 74395 |        |       | 4                    | 76216 |        |       |
| 5                    | 67205 |        |       | 5                    | 69000 |        |       | 5                    | 70694 |        |       | 5                    | 72297 |        |       |
| 6                    | 63382 |        |       | 6                    | 65285 |        |       | 6                    | 67083 |        |       | 6                    | 68702 |        |       |
| 7                    | 78676 |        |       | 7                    | 80571 |        |       | 7                    | 82361 |        |       | 7                    | 84054 |        |       |
| 8                    | 74852 |        |       | 8                    | 76428 |        |       | 8                    | 78333 |        |       | 8                    | 80135 |        |       |
| 9                    | 71029 | 125000 | $p_3$ | 9                    | 72714 | 125000 | $p_3$ | 9                    | 74395 | 125000 | $p_3$ | 9                    | 76216 | 125000 | $p_3$ |
| 10                   | 67205 |        |       | 10                   | 69000 |        |       | 10                   | 70694 |        |       | 10                   | 72297 |        |       |
| 11                   | 63382 |        |       | 11                   | 65285 |        |       | 11                   | 67083 |        |       | 11                   | 68702 |        |       |
| 12                   | 59558 |        |       | 12                   | 61571 |        |       | 12                   | 63472 |        |       | 12                   | 65108 |        |       |
| 13                   | 56176 |        |       | 13                   | 57857 |        |       | 13                   | 59861 |        |       | 13                   | 61513 |        |       |
| 14                   | 67353 | 320000 | $p_3$ | 14                   | 69143 | 320000 | $p_3$ | 14                   | 70833 | 320000 | $p_3$ | 14                   | 72513 | 320000 | $p_3$ |
| 15                   | 63528 |        |       | 15                   | 65428 |        |       | 15                   | 67221 |        |       | 15                   | 68512 |        |       |
| 16                   | 59705 |        |       | 16                   | 61714 |        |       | 16                   | 63611 |        |       | 16                   | 65000 |        |       |
| 17                   | 55822 |        |       | 17                   | 58000 |        |       | 17                   | 60000 |        |       | 17                   | 61486 |        |       |
|                      |       |        |       | 18                   | 54286 |        |       | 18                   | 56388 |        |       | 18                   | 57937 |        |       |
|                      |       |        |       |                      |       |        |       |                      |       |        |       | 19                   | 54460 |        |       |
|                      |       |        |       |                      |       |        |       |                      |       |        |       |                      |       |        |       |
| SPAN,<br>38<br>feet. |       |        |       | SPAN,<br>38<br>feet. |       |        |       | SPAN,<br>39<br>feet. |       |        |       | SPAN,<br>39<br>feet. |       |        |       |
| x                    | R     | m      |       | x                    | R     | m      |       | x                    | R     | m      |       | x                    | R     | m      |       |
| 1                    | 89473 |        |       | 14                   | 74737 |        |       | 1                    | 91282 |        |       | 14                   | 76538 |        |       |
| 2                    | 85657 |        |       | 15                   | 70921 | 320000 | $p_3$ | 2                    | 87179 |        |       | 15                   | 72819 | 320000 | $p_3$ |
| 3                    | 81842 | 0      | $p_2$ | 16                   | 67105 |        |       | 3                    | 83461 | 0      | $p_2$ | 16                   | 69102 |        |       |
| 4                    | 78027 |        |       | 17                   | 63685 |        |       | 4                    | 79743 |        |       | 17                   | 65384 |        |       |
| 5                    | 74211 |        |       | 18                   | 60263 |        |       | 5                    | 76025 |        |       | 18                   | 62050 |        |       |
| 6                    | 70395 |        |       |                      |       |        |       | 6                    | 72307 |        |       |                      |       |        |       |
| 7                    | 85657 |        |       | 19                   | 74737 | 645000 | $p_4$ | 7                    | 87179 |        |       | 19                   | 76538 | 645000 | $p_4$ |
| 8                    | 81842 |        |       |                      |       |        |       | 8                    | 83461 |        |       |                      |       |        |       |
| 9                    | 78027 |        |       |                      |       |        |       | 9                    | 79743 |        |       |                      |       |        |       |
| 10                   | 74211 | 125000 | $p_3$ |                      |       |        |       | 10                   | 76025 | 125000 | $p_3$ |                      |       |        |       |
| 11                   | 70395 |        |       |                      |       |        |       | 11                   | 72307 |        |       |                      |       |        |       |
| 12                   | 66974 |        |       |                      |       |        |       | 12                   | 68589 |        |       |                      |       |        |       |
| 13                   | 63553 |        |       |                      |       |        |       | 13                   | 65256 |        |       |                      |       |        |       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>40<br>feet. |          |          |                       | SPAN,<br>41<br>feet. |          |          |                       | SPAN,<br>42<br>feet. |          |          |                       | SPAN,<br>43<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 93000    |          |                       | 1                    | 94634    |          |                       | 1                    | 96190    |          |                       | 1                    | 97674    |          |                       |
| 2                    | 89000    |          |                       | 2                    | 90731    |          |                       | 2                    | 92380    |          |                       | 2                    | 93953    |          |                       |
| 3                    | 85000    | 0        | <i>p</i> <sub>2</sub> | 3                    | 86829    | 0        | <i>p</i> <sub>2</sub> | 3                    | 88571    | 0        | <i>p</i> <sub>2</sub> | 3                    | 90232    | 0        | <i>p</i> <sub>2</sub> |
| 4                    | 81375    |          |                       | 4                    | 82926    |          |                       | 4                    | 84761    |          |                       | 4                    | 86511    |          |                       |
| 5                    | 77750    |          |                       | 5                    | 79390    |          |                       | 5                    | 80952    |          |                       | 5                    | 82790    |          |                       |
| 6                    | 74125    |          |                       | 6                    | 75853    |          |                       | 6                    | 77500    |          |                       | 6                    | 79069    |          |                       |
| 7                    | 89000    |          |                       | 7                    | 90731    |          |                       | 7                    | 92380    |          |                       | 7                    | 93953    |          |                       |
| 8                    | 85000    |          |                       | 8                    | 86829    |          |                       | 8                    | 88571    |          |                       | 8                    | 90232    |          |                       |
| 9                    | 81375    | 125000   | <i>p</i> <sub>3</sub> | 9                    | 82926    | 125000   | <i>p</i> <sub>3</sub> | 9                    | 84761    | 125000   | <i>p</i> <sub>3</sub> | 9                    | 86511    | 125000   | <i>p</i> <sub>3</sub> |
| 10                   | 77750    |          |                       | 10                   | 79390    |          |                       | 10                   | 80952    |          |                       | 10                   | 82790    |          |                       |
| 11                   | 74125    |          |                       | 11                   | 75853    |          |                       | 11                   | 77500    |          |                       | 11                   | 79069    |          |                       |
| 12                   | 70500    |          |                       | 12                   | 72317    |          |                       | 12                   | 74047    |          |                       | 12                   | 75697    |          |                       |
| 13                   | 66875    |          |                       | 13                   | 68780    |          |                       | 13                   | 70595    |          |                       | 13                   | 72325    |          |                       |
| 14                   | 78250    | 320000   | <i>p</i> <sub>3</sub> | 14                   | 79877    | 320000   | <i>p</i> <sub>3</sub> | 14                   | 81784    | 320000   | <i>p</i> <sub>3</sub> | 14                   | 83604    | 320000   | <i>p</i> <sub>3</sub> |
| 15                   | 74625    |          |                       | 15                   | 76341    |          |                       | 15                   | 77975    |          |                       | 15                   | 79883    |          |                       |
| 16                   | 71000    |          |                       | 16                   | 72804    |          |                       | 16                   | 74523    |          |                       | 16                   | 76162    |          |                       |
| 17                   | 67375    |          |                       | 17                   | 69267    |          |                       | 17                   | 71071    |          |                       | 17                   | 72790    |          |                       |
| 18                   | 81875    | 645000   | <i>p</i> <sub>4</sub> | 18                   | 65730    | 645000   | <i>p</i> <sub>4</sub> | 18                   | 67618    | 645000   | <i>p</i> <sub>4</sub> | 18                   | 69417    | 645000   | <i>p</i> <sub>4</sub> |
| 19                   | 78250    |          |                       | 19                   | 79877    |          |                       | 19                   | 81784    |          |                       | 19                   | 83604    |          |                       |
| 20                   | 74625    |          |                       | 20                   | 76341    |          |                       | 20                   | 77975    |          |                       | 20                   | 79883    |          |                       |
|                      |          |          |                       | 21                   | 72804    |          |                       | 21                   | 74523    |          |                       | 21                   | 76162    |          |                       |
|                      |          |          |                       | 22                   |          |          |                       | 22                   |          |          |                       | 22                   | 72790    |          |                       |

| SPAN,<br>44<br>feet. |          |          |                       | SPAN,<br>44<br>feet. |          |          |                       | SPAN,<br>45<br>feet. |          |          |                       | SPAN,<br>45<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 99090    |          |                       | 14                   | 85340    | 320000   | <i>p</i> <sub>3</sub> | 1                    | 100444   |          |                       | 14                   | 87000    | 320000   | <i>p</i> <sub>3</sub> |
| 2                    | 95454    |          |                       | 15                   | 81704    |          |                       | 2                    | 96888    |          |                       | 15                   | 83444    |          |                       |
| 3                    | 91818    | 0        | <i>p</i> <sub>2</sub> | 16                   | 78067    |          |                       | 3                    | 93333    | 0        | <i>p</i> <sub>2</sub> | 16                   | 80000    |          |                       |
| 4                    | 88181    |          |                       | 17                   | 74431    |          |                       | 4                    | 89777    |          |                       | 17                   | 76333    |          |                       |
| 5                    | 84545    |          |                       | 18                   | 71135    |          |                       | 5                    | 86222    |          |                       | 18                   | 72777    |          |                       |
| 6                    | 80909    |          |                       |                      |          |          |                       | 6                    | 82666    |          |                       |                      |          |          |                       |
| 7                    | 95454    | 125000   | <i>p</i> <sub>3</sub> | 19                   | 85340    | 645000   | <i>p</i> <sub>4</sub> | 7                    | 79111    |          |                       | 19                   | 87000    | 645000   | <i>p</i> <sub>4</sub> |
| 8                    | 91818    |          |                       | 20                   | 81704    |          |                       | 8                    | 93333    | 125000   | <i>p</i> <sub>3</sub> | 20                   | 83444    |          |                       |
| 9                    | 88181    |          |                       | 21                   | 78067    |          |                       | 9                    | 89777    |          |                       | 21                   | 80000    |          |                       |
| 10                   | 84545    |          |                       | 22                   | 74431    |          |                       | 10                   | 86222    |          |                       | 22                   | 76333    |          |                       |
| 11                   | 80909    |          |                       |                      |          |          |                       | 11                   | 82666    |          |                       | 23                   | 72777    |          |                       |
| 12                   | 77272    |          |                       |                      |          |          |                       | 12                   | 79111    |          |                       |                      |          |          |                       |
| 13                   | 73977    |          |                       |                      |          |          |                       | 13                   | 75555    |          |                       |                      |          |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>46<br>feet. |          |          |                       | SPAN,<br>47<br>feet. |          |          |                       | SPAN,<br>48<br>feet. |          |          |                       | SPAN,<br>49<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 101739   |          |                       | 1                    | 102978   |          |                       | 1                    | 104479   |          |                       | 1                    | 105918   |          |                       |
| 2                    | 98260    |          |                       | 2                    | 99574    |          |                       | 2                    | 100834   |          |                       | 2                    | 102346   |          |                       |
| 3                    | 94782    |          |                       | 3                    | 96170    |          |                       | 3                    | 97500    |          |                       | 3                    | 98775    |          |                       |
| 4                    | 91304    | 0        | <i>p</i> <sub>2</sub> | 4                    | 92765    | 0        | <i>p</i> <sub>2</sub> | 4                    | 94166    | 0        | <i>p</i> <sub>2</sub> | 4                    | 95509    | 0        | <i>p</i> <sub>2</sub> |
| 5                    | 87826    |          |                       | 5                    | 89361    |          |                       | 5                    | 90833    |          |                       | 5                    | 92244    |          |                       |
| 6                    | 84347    |          |                       | 6                    | 85957    |          |                       | 6                    | 87500    |          |                       | 6                    | 88978    |          |                       |
| 7                    | 80869    |          |                       | 7                    | 82553    |          |                       | 7                    | 84166    |          |                       | 7                    | 85712    |          |                       |
| 8                    | 94782    |          |                       | 8                    | 96170    |          |                       | 8                    | 97500    |          |                       | 8                    | 98775    |          |                       |
| 9                    | 91304    |          |                       | 9                    | 92765    |          |                       | 9                    | 94166    |          |                       | 9                    | 95509    |          |                       |
| 10                   | 87826    | 125000   | <i>p</i> <sub>3</sub> | 10                   | 89361    | 125000   | <i>p</i> <sub>3</sub> | 10                   | 90833    | 125000   | <i>p</i> <sub>3</sub> | 10                   | 92244    | 125000   | <i>p</i> <sub>3</sub> |
| 11                   | 84347    |          |                       | 11                   | 85957    |          |                       | 11                   | 87500    |          |                       | 11                   | 88978    |          |                       |
| 12                   | 80869    |          |                       | 12                   | 82553    |          |                       | 12                   | 84166    |          |                       | 12                   | 85712    |          |                       |
| 13                   | 77391    |          |                       | 13                   | 79148    |          |                       | 13                   | 80833    |          |                       | 13                   | 82446    |          |                       |
| 14                   | 88586    |          |                       | 14                   | 90424    |          |                       | 14                   | 92187    |          |                       | 14                   | 93874    |          |                       |
| 15                   | 85107    |          |                       | 15                   | 86701    |          |                       | 15                   | 88541    |          |                       | 15                   | 90302    |          |                       |
| 16                   | 81629    | 320000   | <i>p</i> <sub>3</sub> | 16                   | 83297    | 320000   | <i>p</i> <sub>3</sub> | 16                   | 84895    | 320000   | <i>p</i> <sub>3</sub> | 16                   | 86729    | 320000   | <i>p</i> <sub>3</sub> |
| 17                   | 78151    |          |                       | 17                   | 79893    |          |                       | 17                   | 81563    |          |                       | 17                   | 83159    |          |                       |
| 18                   | 74673    |          |                       | 18                   | 76489    |          |                       | 18                   | 78229    |          |                       | 18                   | 79893    |          |                       |
| 19                   | 88586    |          |                       | 19                   | 90424    |          |                       | 19                   | 92187    |          |                       | 19                   | 93874    |          |                       |
| 20                   | 85107    |          |                       | 20                   | 86701    |          |                       | 20                   | 88541    |          |                       | 20                   | 90302    |          |                       |
| 21                   | 81629    | 645000   | <i>p</i> <sub>4</sub> | 21                   | 83297    | 645000   | <i>p</i> <sub>4</sub> | 21                   | 84895    | 645000   | <i>p</i> <sub>4</sub> | 21                   | 86729    | 645000   | <i>p</i> <sub>4</sub> |
| 22                   | 78151    |          |                       | 22                   | 79893    |          |                       | 22                   | 81563    |          |                       | 22                   | 83159    |          |                       |
| 23                   | 74673    |          |                       | 23                   | 76489    |          |                       | 23                   | 78229    |          |                       | 23                   | 79893    |          |                       |
|                      |          |          |                       | 24                   | 73085    |          |                       | 24                   | 74896    |          |                       | 24                   | 76628    |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       | 25                   | 73363    |          |                       |

| SPAN,<br>50<br>feet. |          |          |                       | SPAN,<br>50<br>feet. |          |          |                       | SPAN,<br>51<br>feet. |          |          |                       | SPAN,<br>51<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 107300   |          |                       | 14                   | 95500    |          |                       | 1                    | 108627   |          |                       | 14                   | 97057    |          |                       |
| 2                    | 103800   |          |                       | 15                   | 92000    |          |                       | 2                    | 105196   |          |                       | 15                   | 93626    |          |                       |
| 3                    | 100300   |          |                       | 16                   | 88500    |          |                       | 3                    | 101764   |          |                       | 16                   | 90195    |          |                       |
| 4                    | 96800    | 0        | <i>p</i> <sub>2</sub> | 17                   | 85000    | 320000   | <i>p</i> <sub>3</sub> | 4                    | 98333    | 0        | <i>p</i> <sub>2</sub> | 17                   | 86764    | 320000   | <i>p</i> <sub>3</sub> |
| 5                    | 93600    |          |                       | 18                   | 81500    |          |                       | 5                    | 94901    |          |                       | 18                   | 83332    |          |                       |
| 6                    | 90400    |          |                       |                      |          |          |                       | 6                    | 91764    |          |                       |                      |          |          |                       |
| 7                    | 87200    |          |                       |                      |          |          |                       | 7                    | 88627    |          |                       |                      |          |          |                       |
| 8                    | 100300   |          |                       | 19                   | 95500    |          |                       | 8                    | 101764   |          |                       | 19                   | 97057    |          |                       |
| 9                    | 96800    |          |                       | 20                   | 92000    |          |                       | 9                    | 98333    |          |                       | 20                   | 93626    |          |                       |
| 10                   | 93600    | 125000   | <i>p</i> <sub>3</sub> | 21                   | 88500    | 645000   | <i>p</i> <sub>4</sub> | 10                   | 94901    | 125000   | <i>p</i> <sub>3</sub> | 21                   | 90195    | 645000   | <i>p</i> <sub>4</sub> |
| 11                   | 90400    |          |                       | 22                   | 85000    |          |                       | 11                   | 91764    |          |                       | 22                   | 86764    |          |                       |
| 12                   | 87200    |          |                       | 23                   | 81500    |          |                       | 12                   | 88627    |          |                       | 23                   | 83332    |          |                       |
| 13                   | 84000    |          |                       | 24                   | 78300    |          |                       | 13                   | 85490    |          |                       | 24                   | 79901    |          |                       |
|                      |          |          |                       | 25                   | 75100    |          |                       |                      |          |          |                       | 25                   | 76764    |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       | 26                   | 73627    |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>52<br>feet. |          |          |                       | SPAN,<br>53<br>feet. |          |          |                       | SPAN,<br>54<br>feet. |          |          |                       | SPAN,<br>55<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 109903   |          |                       | 1                    | 111132   |          |                       | 1                    | 112314   |          |                       | 1                    | 113451   |          |                       |
| 2                    | 106538   |          |                       | 2                    | 107830   |          |                       | 2                    | 109074   |          |                       | 2                    | 110272   |          |                       |
| 3                    | 103173   |          |                       | 3                    | 104528   |          |                       | 3                    | 105833   |          |                       | 3                    | 107090   |          |                       |
| 4                    | 99807    | 0        | <i>p</i> <sub>2</sub> | 4                    | 101226   | 0        | <i>p</i> <sub>2</sub> | 4                    | 102592   | 0        | <i>p</i> <sub>2</sub> | 4                    | 103909   | 0        | <i>p</i> <sub>2</sub> |
| 5                    | 96442    |          |                       | 5                    | 97924    |          |                       | 5                    | 99351    |          |                       | 5                    | 100727   |          |                       |
| 6                    | 93076    |          |                       | 6                    | 94622    |          |                       | 6                    | 96111    |          |                       | 6                    | 97545    |          |                       |
| 7                    | 90000    |          |                       | 7                    | 91320    |          |                       | 7                    | 92870    |          |                       | 7                    | 94363    |          |                       |
| 8                    | 103173   |          |                       | 8                    | 104528   |          |                       | 8                    | 105833   |          |                       | 8                    | 107090   |          |                       |
| 9                    | 99807    |          |                       | 9                    | 101226   |          |                       | 9                    | 102592   |          |                       | 9                    | 103909   |          |                       |
| 10                   | 96442    | 125000   | <i>p</i> <sub>3</sub> | 10                   | 97924    | 125000   | <i>p</i> <sub>3</sub> | 10                   | 99351    | 125000   | <i>p</i> <sub>3</sub> | 10                   | 100727   | 125000   | <i>p</i> <sub>3</sub> |
| 11                   | 93076    |          |                       | 11                   | 94622    |          |                       | 11                   | 96111    |          |                       | 11                   | 97545    |          |                       |
| 12                   | 90000    |          |                       | 12                   | 91320    |          |                       | 12                   | 92870    |          |                       | 12                   | 94363    |          |                       |
| 13                   | 86923    |          |                       | 13                   | 88301    |          |                       | 13                   | 89629    |          |                       | 13                   | 91181    |          |                       |
| 14                   | 98557    |          |                       | 14                   | 100000   |          |                       | 14                   | 101388   |          |                       | 14                   | 102727   |          |                       |
| 15                   | 95192    |          |                       | 15                   | 96697    |          |                       | 15                   | 98147    |          |                       | 15                   | 99544    |          |                       |
| 16                   | 91826    | 320000   | <i>p</i> <sub>3</sub> | 16                   | 93395    | 320000   | <i>p</i> <sub>3</sub> | 16                   | 94906    | 320000   | <i>p</i> <sub>3</sub> | 16                   | 96362    | 320000   | <i>p</i> <sub>3</sub> |
| 17                   | 88461    |          |                       | 17                   | 90093    |          |                       | 17                   | 91665    |          |                       | 17                   | 93181    |          |                       |
| 18                   | 85095    |          |                       | 18                   | 86791    |          |                       | 18                   | 88425    |          |                       | 18                   | 90000    |          |                       |
| 19                   | 81730    |          |                       | 19                   | 83489    |          |                       | 19                   | 85184    |          |                       | 19                   | 86817    |          |                       |
| 20                   |          |          |                       | 20                   |          |          |                       | 20                   | 81943    |          |                       | 20                   | 83635    |          |                       |
| 20                   | 95192    |          |                       | 20                   | 96697    |          |                       | 20                   |          |          |                       | 20                   |          |          |                       |
| 21                   | 91826    |          |                       | 21                   | 93395    |          |                       | 21                   | 94906    |          |                       | 21                   | 96362    |          |                       |
| 22                   | 88461    | 645000   | <i>p</i> <sub>4</sub> | 22                   | 90093    | 645000   | <i>p</i> <sub>4</sub> | 22                   | 91665    | 645000   | <i>p</i> <sub>4</sub> | 22                   | 93181    | 645000   | <i>p</i> <sub>4</sub> |
| 23                   | 85095    |          |                       | 23                   | 86791    |          |                       | 23                   | 88425    |          |                       | 23                   | 90000    |          |                       |
| 24                   | 81730    |          |                       | 24                   | 83489    |          |                       | 24                   | 85184    |          |                       | 24                   | 86817    |          |                       |
| 25                   | 78364    |          |                       | 25                   | 80187    |          |                       | 25                   | 81943    |          |                       | 25                   | 83635    |          |                       |
| 26                   | 75288    |          |                       | 26                   | 76885    |          |                       | 26                   | 78702    |          |                       | 26                   | 80454    |          |                       |
|                      |          |          |                       | 27                   | 73867    |          |                       | 27                   | 75462    |          |                       | 27                   | 77272    |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       | 28                   | 74090    |          |                       |
| SPAN,<br>56<br>feet. |          |          |                       | SPAN,<br>56<br>feet. |          |          |                       | SPAN,<br>56<br>feet. |          |          |                       | SPAN,<br>56<br>feet. |          |          |                       |
| <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 115000   |          |                       | 8                    | 108303   |          |                       | 14                   | 104285   |          |                       | 21                   | 97767    |          |                       |
| 2                    | 111428   |          |                       | 9                    | 105178   |          |                       | 15                   | 100892   |          |                       | 22                   | 94642    |          |                       |
| 3                    | 108303   |          |                       | 10                   | 102053   |          |                       | 16                   | 97767    |          |                       | 23                   | 91517    |          |                       |
| 4                    | 105178   | 0        | <i>p</i> <sub>2</sub> | 11                   | 98928    | 125000   | <i>p</i> <sub>3</sub> | 17                   | 94642    | 320000   | <i>p</i> <sub>3</sub> | 24                   | 88392    | 645000   | <i>p</i> <sub>4</sub> |
| 5                    | 102053   |          |                       | 12                   | 95803    |          |                       | 18                   | 91517    |          |                       | 25                   | 85267    |          |                       |
| 6                    | 98928    |          |                       | 13                   | 92678    |          |                       | 19                   | 88392    |          |                       | 26                   | 82142    |          |                       |
| 7                    | 95803    |          |                       |                      |          |          |                       | 20                   | 85267    |          |                       | 27                   | 79017    |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       | 28                   | 75892    |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>57<br>feet. |          |          |                       | SPAN,<br>58<br>feet. |          |          |                       | SPAN,<br>59<br>feet. |          |          |                       | SPAN,<br>60<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 116491   |          |                       | 1                    | 117931   |          |                       | 1                    | 119322   |          |                       | 1                    | 120666   |          |                       |
| 2                    | 112983   |          |                       | 2                    | 114483   |          |                       | 2                    | 115932   |          |                       | 2                    | 117333   |          |                       |
| 3                    | 109475   |          |                       | 3                    | 111034   |          |                       | 3                    | 112542   |          |                       | 3                    | 114000   |          |                       |
| 4                    | 106405   | 0        | <i>p</i> <sub>2</sub> | 4                    | 107586   | 0        | <i>p</i> <sub>2</sub> | 4                    | 109152   | 0        | <i>p</i> <sub>2</sub> | 4                    | 110666   | 0        | <i>p</i> <sub>2</sub> |
| 5                    | 103335   |          |                       | 5                    | 104569   |          |                       | 5                    | 105762   |          |                       | 5                    | 107333   |          |                       |
| 6                    | 100265   |          |                       | 6                    | 101552   |          |                       | 6                    | 102796   |          |                       | 6                    | 104000   |          |                       |
| 7                    | 97195    |          |                       | 7                    | 98534    |          |                       | 7                    | 99830    |          |                       | 7                    | 101083   |          |                       |
| 8                    | 109475   |          |                       | 8                    | 111034   |          |                       | 8                    | 112542   |          |                       | 8                    | 114000   |          |                       |
| 9                    | 106405   |          |                       | 9                    | 107586   |          |                       | 9                    | 109152   |          |                       | 9                    | 110666   |          |                       |
| 10                   | 103335   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 104569   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 105762   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 107333   | 125000   | <i>p</i> <sub>3</sub> |
| 11                   | 100265   |          |                       | 11                   | 101552   |          |                       | 11                   | 102796   |          |                       | 11                   | 104000   |          |                       |
| 12                   | 97195    |          |                       | 12                   | 98534    |          |                       | 12                   | 99830    |          |                       | 12                   | 101083   |          |                       |
| 13                   | 94124    |          |                       | 13                   | 95517    |          |                       | 13                   | 96864    |          |                       | 13                   | 98166    |          |                       |
| 14                   | 105790   |          |                       | 14                   | 107241   |          |                       | 14                   | 108643   |          |                       | 14                   | 110000   |          |                       |
| 15                   | 102457   |          |                       | 15                   | 103965   |          |                       | 15                   | 105423   |          |                       | 15                   | 106833   |          |                       |
| 16                   | 99124    |          |                       | 16                   | 100689   |          |                       | 16                   | 102203   |          |                       | 16                   | 103666   |          |                       |
| 17                   | 96054    | 320000   | <i>p</i> <sub>3</sub> | 17                   | 97413    | 320000   | <i>p</i> <sub>3</sub> | 17                   | 98983    | 320000   | <i>p</i> <sub>3</sub> | 17                   | 100500   | 320000   | <i>p</i> <sub>3</sub> |
| 18                   | 92984    |          |                       | 18                   | 94396    |          |                       | 18                   | 95761    |          |                       | 18                   | 97333    |          |                       |
| 19                   | 89914    |          |                       | 19                   | 91379    |          |                       | 19                   | 92796    |          |                       | 19                   | 94166    |          |                       |
| 20                   | 86843    |          |                       | 20                   | 88361    |          |                       | 20                   | 89830    |          |                       | 20                   | 91250    |          |                       |
| 21                   | 83773    |          |                       | 21                   | 85345    |          |                       | 21                   | 86864    |          |                       | 21                   | 88333    |          |                       |
| 22                   | 96054    |          |                       | 22                   | 97413    |          |                       | 22                   | 98983    |          |                       | 22                   | 100500   |          |                       |
| 23                   | 92984    |          |                       | 23                   | 94396    |          |                       | 23                   | 95761    |          |                       | 23                   | 97333    |          |                       |
| 24                   | 89914    |          |                       | 24                   | 91379    |          |                       | 24                   | 92796    |          |                       | 24                   | 94166    |          |                       |
| 25                   | 86843    | 645000   | <i>p</i> <sub>4</sub> | 25                   | 88361    | 645000   | <i>p</i> <sub>4</sub> | 25                   | 89830    | 645000   | <i>p</i> <sub>4</sub> | 25                   | 91250    | 645000   | <i>p</i> <sub>4</sub> |
| 26                   | 83773    |          |                       | 26                   | 85345    |          |                       | 26                   | 86864    |          |                       | 26                   | 88333    |          |                       |
| 27                   | 80703    |          |                       | 27                   | 82327    |          |                       | 27                   | 83897    |          |                       | 27                   | 85416    |          |                       |
| 28                   | 77633    |          |                       | 28                   | 79309    |          |                       | 28                   | 80931    |          |                       | 28                   | 82500    |          |                       |
| 29                   | 74563    |          |                       | 29                   | 76293    |          |                       | 29                   | 77965    |          |                       | 29                   | 79583    |          |                       |
|                      |          |          |                       |                      |          |          |                       | 30                   | 74500    |          |                       | 30                   | 76666    |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>61<br>feet. |          |          |                       | SPAN,<br>62<br>feet. |          |          |                       | SPAN,<br>63<br>feet. |          |          |                       | SPAN,<br>64<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 122377   |          |                       | 1                    | 124032   |          |                       | 1                    | 125634   |          |                       | 1                    | 127187   |          |                       |
| 2                    | 118688   |          |                       | 2                    | 120403   |          |                       | 2                    | 122063   |          |                       | 2                    | 123671   |          |                       |
| 3                    | 115409   |          |                       | 3                    | 116774   |          |                       | 3                    | 118492   |          |                       | 3                    | 120156   |          |                       |
| 4                    | 112131   | 0        | <i>p</i> <sub>2</sub> | 4                    | 113548   | 0        | <i>p</i> <sub>2</sub> | 4                    | 114920   | 0        | <i>p</i> <sub>2</sub> | 4                    | 116640   | 0        | <i>p</i> <sub>2</sub> |
| 5                    | 108852   |          |                       | 5                    | 110322   |          |                       | 5                    | 111746   |          |                       | 5                    | 113125   |          |                       |
| 6                    | 105573   |          |                       | 6                    | 107096   |          |                       | 6                    | 108571   |          |                       | 6                    | 110000   |          |                       |
| 7                    | 102295   |          |                       | 7                    | 103870   |          |                       | 7                    | 105396   |          |                       | 7                    | 106875   |          |                       |
| 8                    | 115409   |          |                       | 8                    | 116774   |          |                       | 8                    | 118492   |          |                       | 8                    | 120156   |          |                       |
| 9                    | 112131   |          |                       | 9                    | 113548   |          |                       | 9                    | 114920   |          |                       | 9                    | 116640   |          |                       |
| 10                   | 108852   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 110322   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 111746   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 113125   | 125000   | <i>p</i> <sub>3</sub> |
| 11                   | 105573   |          |                       | 11                   | 107096   |          |                       | 11                   | 108571   |          |                       | 11                   | 110000   |          |                       |
| 12                   | 102295   |          |                       | 12                   | 103870   |          |                       | 12                   | 105396   |          |                       | 12                   | 106875   |          |                       |
| 13                   | 99426    |          |                       | 13                   | 100644   |          |                       | 13                   | 102222   |          |                       | 13                   | 103750   |          |                       |
| 14                   | 111311   |          |                       | 14                   | 112580   |          |                       | 14                   | 113808   |          |                       | 14                   | 115390   |          |                       |
| 15                   | 108196   |          |                       | 15                   | 109516   |          |                       | 15                   | 110792   |          |                       | 15                   | 112031   |          |                       |
| 16                   | 105081   |          |                       | 16                   | 106451   |          |                       | 16                   | 107777   |          |                       | 16                   | 109061   |          |                       |
| 17                   | 101966   | 320000   | <i>p</i> <sub>3</sub> | 17                   | 103386   | 320000   | <i>p</i> <sub>3</sub> | 17                   | 104761   | 320000   | <i>p</i> <sub>3</sub> | 17                   | 106093   | 320000   | <i>p</i> <sub>3</sub> |
| 18                   | 98851    |          |                       | 18                   | 100322   |          |                       | 18                   | 101745   |          |                       | 18                   | 103124   |          |                       |
| 19                   | 95737    |          |                       | 19                   | 97257    |          |                       | 19                   | 98729    |          |                       | 19                   | 100156   |          |                       |
| 20                   | 92622    |          |                       | 20                   | 94193    |          |                       | 20                   | 95713    |          |                       | 20                   | 97188    |          |                       |
| 21                   | 89753    |          |                       | 21                   | 91128    |          |                       | 21                   | 92698    |          |                       | 21                   | 94219    |          |                       |
| 22                   | 101966   |          |                       | 22                   | 103386   |          |                       | 22                   | 104761   |          |                       | 22                   | 106093   |          |                       |
| 23                   | 98851    |          |                       | 23                   | 100322   |          |                       | 23                   | 101745   |          |                       | 23                   | 103124   |          |                       |
| 24                   | 95737    |          |                       | 24                   | 97257    |          |                       | 24                   | 98729    |          |                       | 24                   | 100156   |          |                       |
| 25                   | 92622    |          |                       | 25                   | 94193    |          |                       | 25                   | 95713    |          |                       | 25                   | 97188    |          |                       |
| 26                   | 89753    | 645000   | <i>p</i> <sub>4</sub> | 26                   | 91128    | 645000   | <i>p</i> <sub>4</sub> | 26                   | 92698    | 645000   | <i>p</i> <sub>4</sub> | 26                   | 94219    | 645000   | <i>p</i> <sub>4</sub> |
| 27                   | 86885    |          |                       | 27                   | 88365    |          |                       | 27                   | 89682    |          |                       | 27                   | 91250    |          |                       |
| 28                   | 84016    |          |                       | 28                   | 85483    |          |                       | 28                   | 86904    |          |                       | 28                   | 88281    |          |                       |
| 29                   | 81148    |          |                       | 29                   | 82660    |          |                       | 29                   | 84126    |          |                       | 29                   | 85546    |          |                       |
| 30                   | 78279    |          |                       | 30                   | 79837    |          |                       | 30                   | 81348    |          |                       | 30                   | 82812    |          |                       |
| 31                   | 75410    |          |                       | 31                   | 77015    |          |                       | 31                   | 78570    |          |                       | 31                   | 80078    |          |                       |
|                      |          |          |                       |                      |          |          |                       | 32                   | 75792    |          |                       | 32                   | 77343    |          |                       |

## MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>65<br>feet. |          |          |                       | SPAN,<br>66<br>feet. |          |          |                       | SPAN,<br>67<br>feet. |          |          |                       | SPAN,<br>68<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 128692   |          |                       | 1                    | 130530   |          |                       | 1                    | 132313   |          |                       | 1                    | 134044   |          |                       |
| 2                    | 125231   |          |                       | 2                    | 126742   |          |                       | 2                    | 128582   |          |                       | 2                    | 130367   |          |                       |
| 3                    | 121769   |          |                       | 3                    | 123333   |          |                       | 3                    | 124850   |          |                       | 3                    | 126691   |          |                       |
| 4                    | 118308   | 0        | <i>p</i> <sub>2</sub> | 4                    | 119924   | 0        | <i>p</i> <sub>2</sub> | 4                    | 121492   | 0        | <i>p</i> <sub>2</sub> | 4                    | 123014   | 0        | <i>p</i> <sub>2</sub> |
| 5                    | 114846   |          |                       | 5                    | 116515   |          |                       | 5                    | 118134   |          |                       | 5                    | 119706   |          |                       |
| 6                    | 111385   |          |                       | 6                    | 113106   |          |                       | 6                    | 114776   |          |                       | 6                    | 116398   |          |                       |
| 7                    | 108308   |          |                       | 7                    | 109696   |          |                       | 7                    | 111417   |          |                       | 7                    | 113089   |          |                       |
| 8                    | 121769   |          |                       | 8                    | 123333   |          |                       | 8                    | 124850   |          |                       | 8                    | 126691   |          |                       |
| 9                    | 118308   |          |                       | 9                    | 119924   |          |                       | 9                    | 121492   |          |                       | 9                    | 123014   |          |                       |
| 10                   | 114846   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 116515   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 118134   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 119706   | 125000   | <i>p</i> <sub>3</sub> |
| 11                   | 111385   |          |                       | 11                   | 113106   |          |                       | 11                   | 114776   |          |                       | 11                   | 116398   |          |                       |
| 12                   | 108308   |          |                       | 12                   | 109696   |          |                       | 12                   | 111417   |          |                       | 12                   | 113089   |          |                       |
| 13                   | 105230   |          |                       | 13                   | 106666   |          |                       | 13                   | 108059   |          |                       | 13                   | 109780   |          |                       |
| 14                   | 116923   |          |                       | 14                   | 118408   |          |                       | 14                   | 119850   |          |                       | 14                   | 121250   |          |                       |
| 15                   | 113615   |          |                       | 15                   | 115151   |          |                       | 15                   | 116641   |          |                       | 15                   | 118088   |          |                       |
| 16                   | 110379   |          |                       | 16                   | 111893   |          |                       | 16                   | 113432   |          |                       | 16                   | 114927   |          |                       |
| 17                   | 107384   |          |                       | 17                   | 108635   |          |                       | 17                   | 110223   |          |                       | 17                   | 111765   |          |                       |
| 18                   | 104461   | 320000   | <i>p</i> <sub>3</sub> | 18                   | 105756   | 320000   | <i>p</i> <sub>3</sub> | 18                   | 107014   | 320000   | <i>p</i> <sub>3</sub> | 18                   | 108603   | 320000   | <i>p</i> <sub>3</sub> |
| 19                   | 101538   |          |                       | 19                   | 102878   |          |                       | 19                   | 104178   |          |                       | 19                   | 105441   |          |                       |
| 20                   | 98614    |          |                       | 20                   | 100000   |          |                       | 20                   | 101342   |          |                       | 20                   | 102647   |          |                       |
| 21                   | 95691    |          |                       | 21                   | 97119    |          |                       | 21                   | 98506    |          |                       | 21                   | 99853    |          |                       |
| 22                   | 92769    |          |                       | 22                   | 94241    |          |                       | 22                   | 95671    |          |                       | 22                   | 97055    |          |                       |
| 23                   | 104461   |          |                       | 23                   | 105756   |          |                       | 23                   | 107014   |          |                       | 23                   | 108603   |          |                       |
| 24                   | 101538   |          |                       | 24                   | 102878   |          |                       | 24                   | 104178   |          |                       | 24                   | 105441   |          |                       |
| 25                   | 98614    |          |                       | 25                   | 100000   |          |                       | 25                   | 101342   |          |                       | 25                   | 102647   |          |                       |
| 26                   | 95691    |          |                       | 26                   | 97119    |          |                       | 26                   | 98506    |          |                       | 26                   | 99853    |          |                       |
| 27                   | 92769    | 645000   | <i>p</i> <sub>4</sub> | 27                   | 94241    | 645000   | <i>p</i> <sub>4</sub> | 27                   | 95671    | 645000   | <i>p</i> <sub>4</sub> | 27                   | 97055    | 645000   | <i>p</i> <sub>4</sub> |
| 28                   | 89847    |          |                       | 28                   | 91363    |          |                       | 28                   | 92835    |          |                       | 28                   | 94220    |          |                       |
| 29                   | 86924    |          |                       | 29                   | 88484    |          |                       | 29                   | 90000    |          |                       | 29                   | 91471    |          |                       |
| 30                   | 84232    |          |                       | 30                   | 85705    |          |                       | 30                   | 87163    |          |                       | 30                   | 88656    |          |                       |
| 31                   | 81538    |          |                       | 31                   | 82954    |          |                       | 31                   | 84327    |          |                       | 31                   | 85863    |          |                       |
| 32                   | 78845    |          |                       | 32                   | 80302    |          |                       | 32                   | 81715    |          |                       | 32                   | 83068    |          |                       |
| 33                   | 89847    | 1095000  | <i>p</i> <sub>5</sub> | 33                   | 91363    | 1095000  | <i>p</i> <sub>5</sub> | 33                   | 92835    | 1095000  | <i>p</i> <sub>5</sub> | 33                   | 94220    | 1095000  | <i>p</i> <sub>5</sub> |
|                      |          |          |                       |                      |          |          |                       | 34                   | 90000    |          |                       | 34                   | 91471    |          |                       |

MOMENTS.

$$M_x = Rx - m.$$



| SPAN, 69 feet. |          |          | SPAN, 70 feet. |          |          | SPAN, 71 feet. |          |          | SPAN, 72 feet. |          |          |
|----------------|----------|----------|----------------|----------|----------|----------------|----------|----------|----------------|----------|----------|
| <i>x</i>       | <i>R</i> | <i>m</i> |
| 1              | 135724   | 0        | 1              | 137357   | 0        | 1              | 139295   | 0        | 1              | 141180   | 0        |
| 2              | 132101   |          | 2              | 133785   |          | 2              | 135422   |          | 2              | 137361   |          |
| 3              | 128478   |          | 3              | 130214   |          | 3              | 131901   |          | 3              | 133541   |          |
| 4              | 124855   |          | 4              | 126642   |          | 4              | 128380   |          | 4              | 130070   |          |
| 5              | 121231   |          | 5              | 123071   |          | 5              | 124859   |          | 5              | 126600   |          |
| 6              | 117971   |          | 6              | 119500   |          | 6              | 121338   |          | 6              | 123129   |          |
| 7              | 114710   |          | 7              | 116285   |          | 7              | 117816   |          | 7              | 119658   |          |
| 8              | 128478   | 125000   | 8              | 130214   | 125000   | 8              | 131901   | 125000   | 8              | 133541   | 125000   |
| 9              | 124855   |          | 9              | 126642   |          | 9              | 128380   |          | 9              | 128380   |          |
| 10             | 121231   |          | 10             | 123071   |          | 10             | 124859   |          | 10             | 124859   |          |
| 11             | 117971   |          | 11             | 119500   |          | 11             | 121338   |          | 11             | 121338   |          |
| 12             | 114710   |          | 12             | 116285   |          | 12             | 117816   |          | 12             | 117816   |          |
| 13             | 111449   |          | 13             | 113071   |          | 13             | 114646   |          | 13             | 114646   |          |
| 14             | 122970   | 320000   | 14             | 124641   | 320000   | 14             | 126264   | 320000   | 14             | 127853   | 320000   |
| 15             | 119492   |          | 15             | 121212   |          | 15             | 122882   |          | 15             | 122882   |          |
| 16             | 116375   |          | 16             | 117784   |          | 16             | 119501   |          | 16             | 119501   |          |
| 17             | 113260   |          | 17             | 114712   |          | 17             | 116118   |          | 17             | 116118   |          |
| 18             | 110144   |          | 18             | 111641   |          | 18             | 113090   |          | 18             | 113090   |          |
| 19             | 107028   |          | 19             | 108570   |          | 19             | 110062   |          | 19             | 110062   |          |
| 20             | 103912   |          | 20             | 105500   |          | 20             | 107035   |          | 20             | 107035   |          |
| 21             | 101158   |          | 21             | 102427   |          | 21             | 104006   |          | 21             | 104006   |          |
| 22             | 113260   | 645000   | 22             | 114712   | 645000   | 22             | 119501   | 645000   | 22             | 121187   | 645000   |
| 23             | 110144   |          | 23             | 111641   |          | 23             | 116118   |          | 23             | 116118   |          |
| 24             | 107028   |          | 24             | 108570   |          | 24             | 113090   |          | 24             | 113090   |          |
| 25             | 103912   |          | 25             | 105500   |          | 25             | 107035   |          | 25             | 107035   |          |
| 26             | 101158   |          | 26             | 102427   |          | 26             | 104006   |          | 26             | 104006   |          |
| 27             | 98405    |          | 27             | 99713    |          | 27             | 100978   |          | 27             | 100978   |          |
| 28             | 95652    |          | 28             | 97000    |          | 28             | 98302    |          | 28             | 98302    |          |
| 29             | 92897    |          | 29             | 94284    |          | 29             | 95626    |          | 29             | 95626    |          |
| 30             | 90144    |          | 30             | 91570    |          | 30             | 92949    |          | 30             | 92949    |          |
| 31             | 87390    |          | 31             | 88857    |          | 31             | 90274    |          | 31             | 90274    |          |
| 32             | 84637    |          | 32             | 86143    |          | 32             | 87598    |          | 32             | 87598    |          |
|                |          |          | 33             | 83428    |          | 33             | 84921    |          | 33             | 84921    |          |
| 33             | 95652    | 1095000  | 34             | 94284    | 1095000  | 34             | 95626    | 1095000  | 34             | 96951    | 1095000  |
| 34             | 92897    |          | 35             | 91570    |          | 35             | 92949    |          | 35             | 92949    |          |
| 35             | 90144    |          | 36             | 89274    |          | 36             | 90274    |          | 36             | 90274    |          |
|                |          |          |                |          |          |                |          |          |                |          |          |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>73<br>feet. |          |          |                       | SPAN,<br>74<br>feet. |          |          |                       | SPAN,<br>75<br>feet. |          |          |                       | SPAN,<br>76<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 143013   |          |                       | 1                    | 144797   |          |                       | 1                    | 146533   |          |                       | 1                    | 148223   |          |                       |
| 2                    | 139246   |          |                       | 2                    | 141081   |          |                       | 2                    | 142866   |          |                       | 2                    | 144605   |          |                       |
| 3                    | 135479   |          |                       | 3                    | 137365   |          | <i>p</i> <sub>2</sub> | 3                    | 139200   |          | <i>p</i> <sub>2</sub> | 3                    | 140986   |          | <i>p</i> <sub>2</sub> |
| 4                    | 131712   | 0        | <i>p</i> <sub>2</sub> | 4                    | 133649   | 0        | <i>p</i> <sub>2</sub> | 4                    | 135533   | 0        | <i>p</i> <sub>2</sub> | 4                    | 137368   | 0        | <i>p</i> <sub>2</sub> |
| 5                    | 128287   |          |                       | 5                    | 129933   |          |                       | 5                    | 131866   |          |                       | 5                    | 133750   |          |                       |
| 6                    | 124863   |          |                       | 6                    | 126555   |          |                       | 6                    | 128200   |          |                       | 6                    | 130131   |          |                       |
| 7                    | 121438   |          |                       |                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |
| 8                    | 135479   |          |                       | 7                    | 141081   |          |                       | 7                    | 142866   |          |                       | 7                    | 144605   |          |                       |
| 9                    | 131712   |          |                       | 8                    | 137365   |          |                       | 8                    | 139200   |          |                       | 8                    | 140986   |          |                       |
| 10                   | 128287   | 125000   | <i>p</i> <sub>3</sub> | 9                    | 133649   | 125000   | <i>p</i> <sub>3</sub> | 9                    | 135533   | 125000   | <i>p</i> <sub>3</sub> | 9                    | 137368   | 125000   | <i>p</i> <sub>3</sub> |
| 11                   | 124863   |          |                       | 10                   | 129933   |          |                       | 10                   | 131866   |          |                       | 10                   | 133750   |          |                       |
| 12                   | 121438   |          |                       | 11                   | 126555   |          |                       | 11                   | 128200   |          |                       | 11                   | 130131   |          |                       |
| 13                   | 118013   |          |                       | 12                   | 123176   |          |                       | 12                   | 124866   |          |                       | 12                   | 126513   |          |                       |
|                      |          |          |                       | 13                   | 119798   |          |                       | 13                   | 121533   |          |                       | 13                   | 123223   |          |                       |
| 14                   | 129383   |          |                       | 14                   | 131216   |          |                       | 14                   | 133000   |          |                       | 14                   | 134776   |          |                       |
| 15                   | 126095   |          |                       | 15                   | 127635   |          |                       | 15                   | 129466   |          |                       | 15                   | 131249   |          |                       |
| 16                   | 122807   |          |                       | 16                   | 124391   |          |                       | 16                   | 125933   |          |                       | 16                   | 127762   |          |                       |
| 17                   | 119520   | 320000   | <i>p</i> <sub>3</sub> | 17                   | 121148   | 320000   | <i>p</i> <sub>3</sub> | 17                   | 122733   | 320000   | <i>p</i> <sub>3</sub> | 17                   | 124266   | 320000   | <i>p</i> <sub>3</sub> |
| 18                   | 116232   |          |                       | 18                   | 117904   |          |                       | 18                   | 119533   |          |                       | 18                   | 121118   |          |                       |
| 19                   | 112945   |          |                       | 19                   | 114661   |          |                       | 19                   | 116333   |          |                       | 19                   | 117959   |          |                       |
| 20                   | 110000   |          |                       | 20                   | 111418   |          |                       |                      |          |          |                       |                      |          |          |                       |
| 21                   | 122807   |          |                       | 21                   | 124391   |          |                       | 20                   | 129466   |          |                       | 20                   | 131249   |          |                       |
| 22                   | 119520   |          |                       | 22                   | 121148   |          |                       | 21                   | 125933   |          |                       | 21                   | 127762   |          |                       |
| 23                   | 116232   |          |                       | 23                   | 117904   |          |                       | 22                   | 122733   |          |                       | 22                   | 124266   |          |                       |
| 24                   | 112945   |          |                       | 24                   | 114661   |          |                       | 23                   | 119533   |          |                       | 23                   | 121118   |          |                       |
| 25                   | 110000   |          |                       | 25                   | 111418   |          |                       | 24                   | 116333   |          |                       | 24                   | 117959   |          |                       |
| 26                   | 107054   | 645000   | <i>p</i> <sub>4</sub> | 26                   | 108513   | 645000   | <i>p</i> <sub>4</sub> | 25                   | 113133   | 645000   | <i>p</i> <sub>4</sub> | 25                   | 114802   | 645000   | <i>p</i> <sub>4</sub> |
| 27                   | 104108   |          |                       | 27                   | 105607   |          |                       | 26                   | 109933   |          |                       | 26                   | 111644   |          |                       |
| 28                   | 101164   |          |                       | 28                   | 102701   |          |                       | 27                   | 107066   |          |                       | 27                   | 108486   |          |                       |
| 29                   | 98218    |          |                       | 29                   | 99797    |          |                       | 28                   | 104200   |          |                       | 28                   | 105657   |          |                       |
| 30                   | 95616    |          |                       | 30                   | 96891    |          |                       | 29                   | 101333   |          |                       | 29                   | 102828   |          |                       |
| 31                   | 93012    |          |                       | 31                   | 94323    |          |                       | 30                   | 98466    |          |                       | 30                   | 100000   |          |                       |
| 32                   | 90410    |          |                       | 32                   | 91756    |          |                       | 31                   | 95600    |          |                       | 31                   | 97170    |          |                       |
| 33                   | 87807    |          |                       | 33                   | 89188    |          |                       | 32                   | 93066    |          |                       |                      |          |          |                       |
| 34                   | 98218    | 1095000  | <i>p</i> <sub>5</sub> | 34                   | 99797    | 1095000  | <i>p</i> <sub>5</sub> | 33                   | 104200   | 1095000  | <i>p</i> <sub>5</sub> | 32                   | 108486   | 1095000  | <i>p</i> <sub>5</sub> |
| 35                   | 95616    |          |                       | 35                   | 96891    |          |                       | 34                   | 101333   |          |                       | 33                   | 105657   |          |                       |
| 36                   | 93012    |          |                       | 36                   | 94323    |          |                       | 35                   | 98466    |          |                       | 34                   | 102828   |          |                       |
| 37                   | 90410    |          |                       | 37                   | 91756    |          |                       | 36                   | 95600    |          |                       | 35                   | 100000   |          |                       |
|                      |          |          |                       |                      |          |          |                       | 37                   | 93066    |          |                       | 36                   | 97170    |          |                       |
|                      |          |          |                       |                      |          |          |                       | 38                   | 90533    |          |                       | 37                   | 94341    |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       | 38                   | 91841    |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>77<br>feet. |          |          |                       | SPAN,<br>78<br>feet. |          |          |                       | SPAN,<br>79<br>feet. |          |          |                       | SPAN,<br>80<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> | •                     | <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 149870   |          |                       | 1                    | 151666   |          |                       | 1                    | 153417   |          |                       | 1                    | 155125   |          |                       |
| 2                    | 146298   |          |                       | 2                    | 147948   |          |                       | 2                    | 149746   |          |                       | 2                    | 151500   |          |                       |
| 3                    | 142727   |          |                       | 3                    | 144423   |          |                       | 3                    | 146075   |          |                       | 3                    | 147875   |          |                       |
| 4                    | 139155   | 0        | <i>p</i> <sub>2</sub> | 4                    | 140897   | 0        | <i>p</i> <sub>2</sub> | 4                    | 142594   | 0        | <i>p</i> <sub>2</sub> | 4                    | 144250   | 0        | <i>p</i> <sub>2</sub> |
| 5                    | 135584   |          |                       | 5                    | 137371   |          |                       | 5                    | 139113   |          |                       | 5                    | 140812   |          |                       |
| 6                    | 132013   |          |                       | 6                    | 133845   |          |                       | 6                    | 135632   |          |                       | 6                    | 137375   |          |                       |
| 7                    | 128442   |          |                       | 7                    | 130319   |          |                       | 7                    | 132151   |          |                       | 7                    | 133937   |          |                       |
| 8                    | 142727   |          |                       | 8                    | 144423   |          |                       | 8                    | 146075   |          |                       | 8                    | 147875   |          |                       |
| 9                    | 139155   | 125000   | <i>p</i> <sub>3</sub> | 9                    | 140897   | 125000   | <i>p</i> <sub>3</sub> | 9                    | 142594   | 125000   | <i>p</i> <sub>3</sub> | 9                    | 144250   | 125000   | <i>p</i> <sub>3</sub> |
| 10                   | 135584   |          |                       | 10                   | 137371   |          |                       | 10                   | 139113   |          |                       | 10                   | 140812   |          |                       |
| 11                   | 132013   |          |                       | 11                   | 133845   |          |                       | 11                   | 135632   |          |                       | 11                   | 137375   |          |                       |
| 12                   | 128442   |          |                       | 12                   | 130319   |          |                       | 12                   | 132151   |          |                       | 12                   | 133937   |          |                       |
| 13                   | 124871   |          |                       | 13                   | 126793   |          |                       | 13                   | 128670   |          |                       | 13                   | 130500   |          |                       |
| 14                   | 136429   |          |                       | 14                   | 138074   |          |                       | 14                   | 140000   |          |                       | 14                   | 141874   |          |                       |
| 15                   | 132987   |          |                       | 15                   | 134677   |          |                       | 15                   | 136328   |          |                       | 15                   | 138250   |          |                       |
| 16                   | 129545   | 320000   | <i>p</i> <sub>3</sub> | 16                   | 131280   | 320000   | <i>p</i> <sub>3</sub> | 16                   | 132974   | 320000   | <i>p</i> <sub>3</sub> | 16                   | 134624   | 320000   | <i>p</i> <sub>3</sub> |
| 17                   | 126104   |          |                       | 17                   | 127882   |          |                       | 17                   | 129620   |          |                       | 17                   | 131312   |          |                       |
| 18                   | 122662   |          |                       | 18                   | 124484   |          |                       | 18                   | 126265   |          |                       | 18                   | 128000   |          |                       |
| 19                   | 119546   |          |                       | 19                   | 121088   |          |                       | 19                   | 140000   |          |                       | 19                   | 141874   |          |                       |
| 20                   | 132987   |          |                       | 20                   | 134677   |          |                       | 20                   | 136328   |          |                       | 20                   | 138250   |          |                       |
| 21                   | 129545   |          |                       | 21                   | 131280   |          |                       | 21                   | 132974   |          |                       | 21                   | 134624   |          |                       |
| 22                   | 126104   |          |                       | 22                   | 127882   |          |                       | 22                   | 129620   |          |                       | 22                   | 131312   |          |                       |
| 23                   | 122662   |          |                       | 23                   | 124484   |          |                       | 23                   | 126265   |          |                       | 23                   | 128000   |          |                       |
| 24                   | 119546   | 645000   | <i>p</i> <sub>4</sub> | 24                   | 121088   | 645000   | <i>p</i> <sub>4</sub> | 24                   | 122910   | 645000   | <i>p</i> <sub>4</sub> | 24                   | 124687   | 645000   | <i>p</i> <sub>4</sub> |
| 25                   | 116429   |          |                       | 25                   | 118010   |          |                       | 25                   | 119556   |          |                       | 25                   | 121374   |          |                       |
| 26                   | 113312   |          |                       | 26                   | 114933   |          |                       | 26                   | 116518   |          |                       | 26                   | 118062   |          |                       |
| 27                   | 110195   |          |                       | 27                   | 111857   |          |                       | 27                   | 113480   |          |                       | 27                   | 115062   |          |                       |
| 28                   | 107077   |          |                       | 28                   | 108780   |          |                       | 28                   | 110442   |          |                       | 28                   | 112062   |          |                       |
| 29                   | 104286   |          |                       | 29                   | 105702   |          |                       | 29                   | 107404   |          |                       | 29                   | 124687   |          |                       |
| 30                   | 101494   |          |                       | 30                   | 118010   |          |                       | 30                   | 119556   |          |                       | 30                   | 121374   |          |                       |
| 31                   | 113312   |          |                       | 31                   | 114933   |          |                       | 31                   | 116518   |          |                       | 31                   | 118062   |          |                       |
| 32                   | 110195   |          |                       | 32                   | 111857   |          |                       | 32                   | 113480   |          |                       | 32                   | 115062   |          |                       |
| 33                   | 107077   |          |                       | 33                   | 108780   |          |                       | 33                   | 110442   |          |                       | 33                   | 112062   |          |                       |
| 34                   | 104286   |          |                       | 34                   | 105702   |          |                       | 34                   | 107404   |          |                       | 34                   | 109062   |          |                       |
| 35                   | 101494   | 1095000  | <i>p</i> <sub>5</sub> | 35                   | 102946   | 1095000  | <i>p</i> <sub>5</sub> | 35                   | 104366   | 1095000  | <i>p</i> <sub>5</sub> | 35                   | 106062   | 1095000  | <i>p</i> <sub>5</sub> |
| 36                   | 98701    |          |                       | 36                   | 100190   |          |                       | 36                   | 101644   |          |                       | 36                   | 103062   |          |                       |
| 37                   | 95909    |          |                       | 37                   | 97433    |          |                       | 37                   | 98923    |          |                       | 37                   | 100375   |          |                       |
| 38                   | 93116    |          |                       | 38                   | 94677    |          |                       | 38                   | 96201    |          |                       | 38                   | 97687    |          |                       |
| 39                   | 90650    |          |                       | 39                   | 91923    |          |                       | 39                   | 93480    |          |                       | 39                   | 95000    |          |                       |
|                      |          |          |                       |                      |          |          |                       | 40                   | 90759    |          |                       | 40                   | 92312    |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>81<br>feet. |          |          |                       | SPAN,<br>82<br>feet. |          |          |                       | SPAN,<br>83<br>feet. |          |          |                       | SPAN,<br>84<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 156790   |          |                       | 1                    | 158414   |          |                       | 1                    | 160180   |          |                       | 1                    | 161904   |          |                       |
| 2                    | 153209   |          |                       | 2                    | 154878   |          |                       | 2                    | 156506   |          |                       | 2                    | 158273   |          |                       |
| 3                    | 149629   |          |                       | 3                    | 151341   |          |                       | 3                    | 153012   |          |                       | 3                    | 154642   |          |                       |
| 4                    | 146049   | 0        | <i>p</i> <sub>2</sub> | 4                    | 147804   | 0        | <i>p</i> <sub>2</sub> | 4                    | 149518   | 0        | <i>p</i> <sub>2</sub> | 4                    | 151190   | 0        | <i>p</i> <sub>2</sub> |
| 5                    | 142469   |          |                       | 5                    | 144268   |          |                       | 5                    | 146024   |          |                       | 5                    | 147738   |          |                       |
| 6                    | 139074   |          |                       | 6                    | 140731   |          |                       | 6                    | 142530   |          |                       | 6                    | 144285   |          |                       |
| 7                    | 135679   |          |                       | 7                    | 137378   |          |                       | 7                    | 139036   |          |                       | 7                    | 140833   |          |                       |
| 8                    | 149629   |          |                       | 8                    | 151341   |          |                       | 8                    | 153012   |          |                       | 8                    | 154642   |          |                       |
| 9                    | 146049   |          |                       | 9                    | 147804   |          |                       | 9                    | 149518   |          |                       | 9                    | 151190   |          |                       |
| 10                   | 142469   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 144268   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 146024   | 125000   | <i>p</i> <sub>3</sub> | 10                   | 147738   | 125000   | <i>p</i> <sub>3</sub> |
| 11                   | 139074   |          |                       | 11                   | 140731   |          |                       | 11                   | 142530   |          |                       | 11                   | 144285   |          |                       |
| 12                   | 135679   |          |                       | 12                   | 137378   |          |                       | 12                   | 139036   |          |                       | 12                   | 140833   |          |                       |
| 13                   | 132283   |          |                       | 13                   | 134024   |          |                       | 13                   | 135722   |          |                       | 13                   | 137380   |          |                       |
| 14                   | 143702   |          |                       | 14                   | 145487   |          |                       | 14                   | 147228   |          |                       | 14                   | 148938   |          |                       |
| 15                   | 140122   |          |                       | 15                   | 141951   |          |                       | 15                   | 143734   |          |                       | 15                   | 145475   |          |                       |
| 16                   | 136542   | 320000   | <i>p</i> <sub>3</sub> | 16                   | 138414   | 320000   | <i>p</i> <sub>3</sub> | 16                   | 140239   | 320000   | <i>p</i> <sub>3</sub> | 16                   | 142023   | 320000   | <i>p</i> <sub>3</sub> |
| 17                   | 132962   |          |                       | 17                   | 134877   |          |                       | 17                   | 136746   |          |                       | 17                   | 138570   |          |                       |
| 18                   | 129691   |          |                       | 18                   | 131314   |          |                       | 18                   | 133251   |          |                       | 18                   | 135118   |          |                       |
| 19                   | 143702   |          |                       | 19                   | 145487   |          |                       | 19                   | 147228   |          |                       | 19                   | 148938   |          |                       |
| 20                   | 140122   |          |                       | 20                   | 141951   |          |                       | 20                   | 143734   |          |                       | 20                   | 145475   |          |                       |
| 21                   | 136542   |          |                       | 21                   | 138414   |          |                       | 21                   | 140239   |          |                       | 21                   | 142023   |          |                       |
| 22                   | 132962   |          |                       | 22                   | 134877   |          |                       | 22                   | 136746   |          |                       | 22                   | 138570   |          |                       |
| 23                   | 129691   | 645000   | <i>p</i> <sub>4</sub> | 23                   | 131341   | 645000   | <i>p</i> <sub>4</sub> | 23                   | 133251   | 645000   | <i>p</i> <sub>4</sub> | 23                   | 135118   | 645000   | <i>p</i> <sub>4</sub> |
| 24                   | 126418   |          |                       | 24                   | 128109   |          |                       | 24                   | 129757   |          |                       | 24                   | 131666   |          |                       |
| 25                   | 123147   |          |                       | 25                   | 124877   |          |                       | 25                   | 126504   |          |                       | 25                   | 128214   |          |                       |
| 26                   | 119876   |          |                       | 26                   | 121645   |          |                       | 26                   | 123372   |          |                       | 26                   | 125059   |          |                       |
| 27                   | 116604   |          |                       | 27                   | 118413   |          |                       | 27                   | 136746   |          |                       | 27                   | 138570   |          |                       |
| 28                   | 113641   |          |                       | 28                   | 115182   |          |                       | 28                   | 133251   |          |                       | 28                   | 135118   |          |                       |
| 29                   | 126418   |          |                       | 29                   | 128109   |          |                       | 29                   | 129757   |          |                       | 29                   | 128214   |          |                       |
| 30                   | 123147   |          |                       | 30                   | 124877   |          |                       | 30                   | 126504   |          |                       | 30                   | 121903   |          |                       |
| 31                   | 119876   |          |                       | 31                   | 121645   |          |                       | 31                   | 120179   |          |                       | 31                   | 115594   |          |                       |
| 32                   | 116604   |          |                       | 32                   | 118413   |          |                       | 32                   | 117394   |          |                       | 32                   | 112440   |          |                       |
| 33                   | 113641   |          |                       | 33                   | 115182   |          |                       | 33                   | 108010   |          |                       | 33                   | 109582   |          |                       |
| 34                   | 110678   |          |                       | 34                   | 112255   |          |                       | 34                   | 102227   |          |                       | 34                   | 106726   |          |                       |
| 35                   | 107715   |          |                       | 35                   | 109328   |          |                       | 35                   |          |          |                       | 35                   |          |          |                       |
| 36                   | 104752   | 1095000  | <i>p</i> <sub>5</sub> | 36                   | 106401   | 1095000  | <i>p</i> <sub>5</sub> | 36                   |          | 1095000  | <i>p</i> <sub>5</sub> | 36                   |          | 1095000  | <i>p</i> <sub>5</sub> |
| 37                   | 101789   |          |                       | 37                   | 103475   |          |                       | 37                   |          |          |                       | 37                   |          |          |                       |
| 38                   | 99135    |          |                       | 38                   | 100548   |          |                       | 38                   |          |          |                       | 38                   | 125059   | 1900000  | <i>p</i> <sub>6</sub> |
| 39                   | 96481    |          |                       | 39                   | 97926    |          |                       | 39                   | 120179   | 1900000  | <i>p</i> <sub>6</sub> | 39                   | 121903   | 1900000  | <i>p</i> <sub>6</sub> |
| 40                   | 93826    |          |                       | 40                   | 95304    |          |                       | 40                   |          |          |                       | 40                   | 135118   |          |                       |
| 41                   | 91172    |          |                       | 41                   | 92682    |          |                       | 41                   | 133251   |          |                       | 41                   | 131666   |          |                       |
|                      |          |          |                       |                      |          |          |                       | 42                   | 129757   | 2550000  | <i>p</i> <sub>7</sub> | 42                   | 128214   | 2550000  | <i>p</i> <sub>7</sub> |
|                      |          |          |                       |                      |          |          |                       |                      | 126504   |          |                       |                      |          |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>85<br>feet. |          |                       | SPAN,<br>86<br>feet. |          |                       | SPAN,<br>87<br>feet. |          |                       | SPAN,<br>88<br>feet. |          |                       |
|----------------------|----------|-----------------------|----------------------|----------|-----------------------|----------------------|----------|-----------------------|----------------------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i>              |
| 1                    | 163588   |                       | 1                    | 165232   |                       | 1                    | 166839   |                       | 1                    | 168579   |                       |
| 2                    | 160000   |                       | 2                    | 161685   |                       | 2                    | 163333   |                       | 2                    | 164943   |                       |
| 3                    | 156412   |                       | 3                    | 158139   |                       | 3                    | 159827   |                       | 3                    | 161477   |                       |
| 4                    | 152824   | 0                     | 4                    | 154593   | 0                     | 4                    | 156321   | 0                     | 4                    | 158011   | 0                     |
| 5                    | 149412   | <i>p</i> <sub>2</sub> | 5                    | 151046   | <i>p</i> <sub>2</sub> | 5                    | 152816   | <i>p</i> <sub>2</sub> | 5                    | 154545   | <i>p</i> <sub>2</sub> |
| 6                    | 146000   |                       | 6                    | 147674   |                       | 6                    | 149310   |                       | 6                    | 151079   |                       |
| 7                    | 142588   |                       | 7                    | 144302   |                       | 7                    | 145977   |                       | 7                    | 147613   |                       |
| 8                    | 156412   |                       | 8                    | 158139   |                       | 8                    | 159827   |                       | 8                    | 161477   |                       |
| 9                    | 152824   |                       | 9                    | 154593   |                       | 9                    | 156321   |                       | 9                    | 158011   |                       |
| 10                   | 149412   | 125000                | 10                   | 151046   | 125000                | 10                   | 152816   | 125000                | 10                   | 154545   | 125000                |
| 11                   | 146000   | <i>p</i> <sub>3</sub> | 11                   | 147674   | <i>p</i> <sub>3</sub> | 11                   | 149310   | <i>p</i> <sub>3</sub> | 11                   | 151079   | <i>p</i> <sub>3</sub> |
| 12                   | 142588   |                       | 12                   | 144302   |                       | 12                   | 145977   |                       | 12                   | 147613   |                       |
| 13                   | 139177   |                       | 13                   | 140930   |                       | 13                   | 142643   |                       | 13                   | 144317   |                       |
| 14                   | 150587   |                       | 14                   | 152383   |                       | 14                   | 154137   |                       | 14                   | 155951   |                       |
| 15                   | 147175   |                       | 15                   | 148837   |                       | 15                   | 150632   |                       | 15                   | 152386   |                       |
| 16                   | 143763   | 320000                | 16                   | 145464   | 320000                | 16                   | 147125   | 320000                | 16                   | 148919   | 320000                |
| 17                   | 140351   | <i>p</i> <sub>3</sub> | 17                   | 142092   | <i>p</i> <sub>3</sub> | 17                   | 143792   | <i>p</i> <sub>3</sub> | 17                   | 145454   | <i>p</i> <sub>3</sub> |
| 18                   | 136939   |                       | 18                   | 138720   |                       | 18                   | 140458   |                       | 18                   | 142158   |                       |
| 19                   | 133528   |                       | 19                   | 135348   |                       | 19                   | 137125   |                       | 19                   | 138863   |                       |
| 20                   | 147175   |                       | 20                   | 148837   |                       | 20                   | 150632   |                       | 20                   | 152386   |                       |
| 21                   | 143763   |                       | 21                   | 145464   |                       | 21                   | 147125   |                       | 21                   | 148919   |                       |
| 22                   | 140351   | 645000                | 22                   | 142092   | 645000                | 22                   | 143792   | 645000                | 22                   | 145454   | 645000                |
| 23                   | 136939   | <i>p</i> <sub>4</sub> | 23                   | 138720   | <i>p</i> <sub>4</sub> | 23                   | 140458   | <i>p</i> <sub>4</sub> | 23                   | 142158   | <i>p</i> <sub>4</sub> |
| 24                   | 133528   |                       | 24                   | 135348   |                       | 24                   | 137125   |                       | 24                   | 138863   |                       |
| 25                   | 130115   |                       | 25                   | 131976   |                       | 25                   | 133793   |                       | 25                   | 135567   |                       |
| 26                   | 126704   |                       | 26                   | 128604   |                       | 26                   | 130459   |                       | 26                   | 132272   |                       |
| 27                   | 140351   |                       | 27                   | 142092   |                       | 27                   | 140458   |                       | 27                   | 142158   |                       |
| 28                   | 136939   |                       | 28                   | 138720   |                       | 28                   | 137125   |                       | 28                   | 138863   |                       |
| 29                   | 133528   | 1095000               | 29                   | 135348   | 1095000               | 29                   | 133793   | 1095000               | 29                   | 135567   | 1095000               |
| 30                   | 130115   | <i>p</i> <sub>5</sub> | 30                   | 131976   | <i>p</i> <sub>5</sub> | 30                   | 130459   | <i>p</i> <sub>5</sub> | 30                   | 132272   | <i>p</i> <sub>5</sub> |
| 31                   | 126704   |                       | 31                   | 128604   |                       | 31                   | 127126   |                       | 31                   | 128976   |                       |
| 32                   | 123586   |                       | 32                   | 125232   |                       | 32                   | 127126   |                       | 32                   | 128976   |                       |
| 33                   | 120469   |                       | 33                   | 122150   |                       | 33                   | 123792   |                       | 33                   | 125680   |                       |
| 34                   | 117351   |                       | 34                   | 119068   |                       | 34                   | 120746   |                       | 34                   | 122385   |                       |
| 35                   | 114233   |                       | 35                   | 115986   |                       | 35                   | 117701   |                       | 35                   | 119373   |                       |
| 36                   | 133528   |                       | 36                   | 135348   |                       | 36                   | 137125   |                       | 36                   | 138863   |                       |
| 37                   | 130115   | 1900000               | 37                   | 131976   | 1900000               | 37                   | 133793   | 1900000               | 37                   | 135567   | 1900000               |
| 38                   | 126704   | <i>p</i> <sub>6</sub> | 38                   | 128604   | <i>p</i> <sub>6</sub> | 38                   | 130459   | <i>p</i> <sub>6</sub> | 38                   | 132272   | <i>p</i> <sub>6</sub> |
|                      |          |                       |                      |          |                       | 39                   | 127126   |                       | 39                   | 128976   |                       |
| 39                   | 140351   |                       | 39                   | 142092   |                       | 40                   | 140458   |                       | 40                   | 142158   |                       |
| 40                   | 136939   | 2550000               | 40                   | 138720   | 2550000               | 41                   | 137125   | 2550000               | 41                   | 138863   | 2550000               |
| 41                   | 133528   | <i>p</i> <sub>7</sub> | 41                   | 135348   | <i>p</i> <sub>7</sub> | 42                   | 133793   | <i>p</i> <sub>7</sub> | 42                   | 135567   | <i>p</i> <sub>7</sub> |
| 42                   | 130115   |                       | 42                   | 131976   |                       | 43                   | 130459   |                       | 43                   | 132272   |                       |
| 43                   | 126704   |                       | 43                   | 128604   |                       | 44                   | 127126   |                       | 44                   | 128976   |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>89<br>feet. |          |          |                       | SPAN,<br>89<br>feet. |          |          |                       | SPAN,<br>90<br>feet. |          |          |                       | SPAN,<br>90<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 170280   |          |                       | 40                   | 143819   |          |                       | 1                    | 171943   |          |                       | 40                   | 145610   |          |                       |
| 2                    | 166685   |          |                       | 41                   | 140561   |          |                       | 2                    | 168388   |          |                       | 41                   | 142222   |          |                       |
| 3                    | 163089   |          |                       | 42                   | 137303   |          |                       | 3                    | 164832   |          |                       | 42                   | 139000   |          |                       |
| 4                    | 159662   |          |                       | 43                   | 134044   |          |                       | 4                    | 161277   |          |                       | 43                   | 135777   |          |                       |
| 5                    | 156235   |          | <i>p</i> <sub>2</sub> | 44                   | 130786   |          | <i>p</i> <sub>7</sub> | 5                    | 157888   |          | <i>p</i> <sub>2</sub> | 44                   | 132555   |          | <i>p</i> <sub>7</sub> |
| 6                    | 152808   |          |                       |                      |          |          |                       | 6                    | 154500   |          |                       |                      |          |          |                       |
| 7                    | 149382   |          |                       |                      |          |          |                       | 7                    | 151110   |          |                       |                      |          |          |                       |
| 8                    | 163089   |          |                       | 45                   | 143819   |          |                       | 8                    | 164832   |          |                       | 45                   | 145610   |          |                       |
| 9                    | 159662   |          |                       |                      |          |          |                       | 9                    | 161277   |          |                       |                      |          |          |                       |
| 10                   | 156235   |          |                       |                      |          |          |                       | 10                   | 157888   |          |                       |                      |          |          |                       |
| 11                   | 152808   |          | <i>p</i> <sub>3</sub> |                      |          |          |                       | 11                   | 154500   |          |                       |                      |          |          |                       |
| 12                   | 149382   |          |                       |                      |          |          |                       | 12                   | 151110   |          | <i>p</i> <sub>3</sub> |                      |          |          |                       |
| 13                   | 145955   |          |                       |                      |          |          |                       | 13                   | 147721   |          |                       |                      |          |          |                       |
| 14                   | 157527   |          |                       |                      |          |          |                       | 14                   | 159166   |          |                       |                      |          |          |                       |
| 15                   | 154100   |          |                       |                      |          |          |                       | 15                   | 155776   |          |                       |                      |          |          |                       |
| 16                   | 150673   |          |                       |                      |          |          |                       | 16                   | 152388   |          |                       |                      |          |          |                       |
| 17                   | 147246   |          | <i>p</i> <sub>3</sub> |                      |          |          |                       | 17                   | 149000   |          |                       |                      |          |          |                       |
| 18                   | 143819   |          |                       |                      |          |          |                       | 18                   | 145610   |          | <i>p</i> <sub>3</sub> |                      |          |          |                       |
| 19                   | 140561   |          |                       |                      |          |          |                       | 19                   | 142222   |          |                       |                      |          |          |                       |
| 20                   | 154100   |          |                       |                      |          |          |                       | 20                   | 155776   |          |                       |                      |          |          |                       |
| 21                   | 150673   |          |                       |                      |          |          |                       | 21                   | 152388   |          |                       |                      |          |          |                       |
| 22                   | 147246   |          |                       |                      |          |          |                       | 22                   | 149000   |          |                       |                      |          |          |                       |
| 23                   | 143819   |          |                       |                      |          |          |                       | 23                   | 145610   |          |                       |                      |          |          |                       |
| 24                   | 140561   |          | <i>p</i> <sub>4</sub> |                      |          |          |                       | 24                   | 142222   |          |                       |                      |          |          |                       |
| 25                   | 137303   |          |                       |                      |          |          |                       | 25                   | 139000   |          | <i>p</i> <sub>4</sub> |                      |          |          |                       |
| 26                   | 134044   |          |                       |                      |          |          |                       | 26                   | 135777   |          |                       |                      |          |          |                       |
| 27                   | 130786   |          |                       |                      |          |          |                       | 27                   | 132555   |          |                       |                      |          |          |                       |
| 28                   | 143819   |          |                       |                      |          |          |                       | 28                   | 145610   |          |                       |                      |          |          |                       |
| 29                   | 140561   |          |                       |                      |          |          |                       | 29                   | 142222   |          |                       |                      |          |          |                       |
| 30                   | 137303   |          |                       |                      |          |          |                       | 30                   | 139000   |          |                       |                      |          |          |                       |
| 31                   | 134044   |          |                       |                      |          |          |                       | 31                   | 135777   |          |                       |                      |          |          |                       |
| 32                   | 130786   |          | <i>p</i> <sub>5</sub> |                      |          |          |                       | 32                   | 132555   |          | <i>p</i> <sub>5</sub> |                      |          |          |                       |
| 33                   | 127527   |          |                       |                      |          |          |                       | 33                   | 129333   |          |                       |                      |          |          |                       |
| 34                   | 124269   |          |                       |                      |          |          |                       | 34                   | 126110   |          |                       |                      |          |          |                       |
| 35                   | 121010   |          |                       |                      |          |          |                       | 35                   | 122888   |          |                       |                      |          |          |                       |
| 36                   | 140561   |          |                       |                      |          |          |                       | 36                   | 142222   |          |                       |                      |          |          |                       |
| 37                   | 137303   |          |                       |                      |          |          |                       | 37                   | 139000   |          |                       |                      |          |          |                       |
| 38                   | 134044   |          | <i>p</i> <sub>6</sub> |                      |          |          |                       | 38                   | 135777   |          | <i>p</i> <sub>6</sub> |                      |          |          |                       |
| 39                   | 130786   |          |                       |                      |          |          |                       | 39                   | 132555   |          |                       |                      |          |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>91<br>feet. |          |          |                       | SPAN,<br>91<br>feet. |          |          |                       | SPAN,<br>92<br>feet. |          |          |                       | SPAN,<br>92<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 173571   |          |                       | 28                   | 147361   |          |                       | 1                    | 175163   |          |                       | 28                   | 149075   |          |                       |
| 2                    | 170054   |          |                       | 29                   | 144011   |          |                       | 2                    | 171684   |          |                       | 29                   | 145760   |          |                       |
| 3                    | 166538   |          |                       | 30                   | 140660   |          |                       | 3                    | 168206   |          |                       | 30                   | 142444   |          |                       |
| 4                    | 163021   | 0        | <i>p</i> <sub>2</sub> | 31                   | 137473   | 1095000  | <i>p</i> <sub>5</sub> | 4                    | 164728   | 0        | <i>p</i> <sub>2</sub> | 31                   | 139129   | 1095000  | <i>p</i> <sub>5</sub> |
| 5                    | 159505   |          |                       | 32                   | 134286   |          |                       | 5                    | 161250   |          |                       | 32                   | 135977   |          |                       |
| 6                    | 156153   |          |                       | 33                   | 131100   |          |                       | 6                    | 157771   |          |                       | 33                   | 132825   |          |                       |
| 7                    | 152802   |          |                       | 34                   | 127912   |          |                       | 7                    | 154456   |          |                       | 34                   | 129673   |          |                       |
|                      |          |          |                       | 35                   | 124725   |          |                       |                      |          |          |                       | 35                   | 126521   |          |                       |
| 8                    | 166538   |          |                       | 36                   | 144011   | 1900000  | <i>p</i> <sub>6</sub> | 8                    | 168206   |          |                       | 36                   | 145760   | 1900000  | <i>p</i> <sub>6</sub> |
| 9                    | 163021   | 125000   | <i>p</i> <sub>3</sub> | 37                   | 140660   |          |                       | 9                    | 164728   |          |                       | 37                   | 142444   |          |                       |
| 10                   | 159505   |          |                       | 38                   | 137473   |          |                       | 10                   | 161250   | 125000   | <i>p</i> <sub>3</sub> | 38                   | 139129   |          |                       |
| 11                   | 156153   |          |                       | 39                   | 134286   |          |                       | 11                   | 157771   |          |                       | 39                   | 135977   |          |                       |
| 12                   | 152802   |          |                       |                      |          |          |                       | 12                   | 154456   |          |                       |                      |          |          |                       |
| 13                   | 149450   |          |                       |                      |          |          |                       | 13                   | 151141   |          |                       |                      |          |          |                       |
| 14                   | 160933   |          |                       | 40                   | 147361   | 2550000  | <i>p</i> <sub>7</sub> | 14                   | 162662   |          |                       | 40                   | 149075   | 2550000  | <i>p</i> <sub>7</sub> |
| 15                   | 157417   |          |                       | 41                   | 144011   |          |                       | 15                   | 159183   |          |                       | 41                   | 145760   |          |                       |
| 16                   | 154065   |          |                       | 42                   | 140660   |          |                       | 16                   | 155705   |          |                       | 42                   | 142444   |          |                       |
| 17                   | 150713   | 320000   | <i>p</i> <sub>3</sub> | 43                   | 137473   |          |                       | 17                   | 152390   | 320000   | <i>p</i> <sub>3</sub> | 43                   | 139129   |          |                       |
| 18                   | 147361   |          |                       | 44                   | 134286   |          |                       | 18                   | 149075   |          |                       | 44                   | 135977   |          |                       |
| 19                   | 144011   |          |                       |                      |          |          |                       | 19                   | 145760   |          |                       |                      |          |          |                       |
| 20                   | 157417   |          |                       | 45                   | 147361   | 3275000  | <i>p</i> <sub>8</sub> | 20                   | 159183   |          |                       | 45                   | 149075   | 3275000  | <i>p</i> <sub>8</sub> |
| 21                   | 154065   |          |                       | 46                   | 144011   |          |                       | 21                   | 155705   |          |                       | 46                   | 145760   |          |                       |
| 22                   | 150713   |          |                       |                      |          |          |                       | 22                   | 152390   |          |                       |                      |          |          |                       |
| 23                   | 147361   | 645000   | <i>p</i> <sub>4</sub> |                      |          |          |                       | 23                   | 149075   | 645000   | <i>p</i> <sub>4</sub> |                      |          |          |                       |
| 24                   | 144011   |          |                       |                      |          |          |                       | 24                   | 145760   |          |                       |                      |          |          |                       |
| 25                   | 140660   |          |                       |                      |          |          |                       | 25                   | 142444   |          |                       |                      |          |          |                       |
| 26                   | 137473   |          |                       |                      |          |          |                       | 26                   | 139129   |          |                       |                      |          |          |                       |
| 27                   | 134286   |          |                       |                      |          |          |                       | 27                   | 135977   |          |                       |                      |          |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>93<br>feet. |          |          |                       | SPAN,<br>93<br>feet. |          |          |                       | SPAN,<br>94<br>feet. |          |          |                       | SPAN,<br>94<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 176881   |          |                       | 28                   | 150752   |          |                       | 1                    | 178563   |          |                       | 28                   | 152392   |          |                       |
| 2                    | 173279   |          |                       | 29                   | 147472   |          |                       | 2                    | 175000   |          |                       | 29                   | 149147   |          |                       |
| 3                    | 169838   |          |                       | 30                   | 144192   |          |                       | 3                    | 171436   |          |                       | 30                   | 145902   |          |                       |
| 4                    | 166397   | 0        | <i>p</i> <sub>2</sub> | 31                   | 140913   |          |                       | 4                    | 168031   | 0        | <i>p</i> <sub>2</sub> | 31                   | 142658   |          |                       |
| 5                    | 162956   |          |                       | 32                   | 137634   | 1095000  | <i>p</i> <sub>5</sub> | 5                    | 164627   |          |                       | 32                   | 139413   |          | <i>p</i> <sub>5</sub> |
| 6                    | 159516   |          |                       | 33                   | 134516   |          |                       | 6                    | 161223   |          |                       | 33                   | 136168   |          |                       |
| 7                    | 156075   |          |                       | 34                   | 131397   |          |                       | 7                    | 157819   |          |                       | 34                   | 133083   |          |                       |
|                      |          |          |                       | 35                   | 128279   |          |                       |                      |          |          |                       | 35                   | 130000   |          |                       |
|                      |          |          |                       | 36                   | 125161   |          |                       |                      |          |          |                       | 36                   | 126913   |          |                       |
| 8                    | 160838   |          |                       |                      |          |          |                       | 8                    | 171436   |          |                       |                      |          |          |                       |
| 9                    | 166397   |          |                       |                      |          |          |                       | 9                    | 168031   |          |                       |                      |          |          |                       |
| 10                   | 162957   | 125000   | <i>p</i> <sub>3</sub> | 37                   | 144192   | 1900000  | <i>p</i> <sub>6</sub> | 10                   | 164627   | 125000   | <i>p</i> <sub>3</sub> | 37                   | 145902   | 1900000  | <i>p</i> <sub>6</sub> |
| 11                   | 159516   |          |                       | 38                   | 140913   |          |                       | 11                   | 161223   |          |                       | 38                   | 142658   |          |                       |
| 12                   | 156075   |          |                       | 39                   | 137634   |          |                       | 12                   | 157819   |          |                       | 39                   | 139413   |          |                       |
| 13                   | 152795   |          |                       | 40                   | 134516   |          |                       | 13                   | 154414   |          |                       | 40                   | 136168   |          |                       |
| 14                   | 164354   |          |                       |                      |          |          |                       | 14                   | 166010   |          |                       | 41                   | 149147   |          |                       |
| 15                   | 160913   |          |                       | 41                   | 147472   | 2550000  | <i>p</i> <sub>7</sub> | 15                   | 162605   |          |                       | 42                   | 145902   | 2550000  | <i>p</i> <sub>7</sub> |
| 16                   | 157472   | 320000   | <i>p</i> <sub>3</sub> | 42                   | 144192   |          |                       | 16                   | 159201   | 320000   | <i>p</i> <sub>3</sub> | 43                   | 142658   |          |                       |
| 17                   | 154031   |          |                       | 43                   | 140913   |          |                       | 17                   | 155796   |          |                       | 44                   | 139413   |          |                       |
| 18                   | 150752   |          |                       | 44                   | 137634   |          |                       | 18                   | 152392   |          |                       |                      |          |          |                       |
| 19                   | 147472   |          |                       |                      |          |          |                       | 19                   | 149147   |          |                       |                      |          |          |                       |
|                      |          |          |                       | 45                   | 150752   | 3275000  | <i>p</i> <sub>8</sub> |                      |          |          |                       | 45                   | 152392   | 3275000  | <i>p</i> <sub>8</sub> |
| 20                   | 160913   |          |                       | 46                   | 147472   |          |                       | 20                   | 162605   |          |                       | 46                   | 149147   |          |                       |
| 21                   | 157472   |          |                       | 47                   | 144192   |          |                       | 21                   | 159201   |          |                       | 47                   | 145902   |          |                       |
| 22                   | 154031   | 645000   | <i>p</i> <sub>4</sub> |                      |          |          |                       | 22                   | 155796   | 645000   | <i>p</i> <sub>4</sub> |                      |          |          |                       |
| 23                   | 150752   |          |                       |                      |          |          |                       | 23                   | 152392   |          |                       |                      |          |          |                       |
| 24                   | 147472   |          |                       |                      |          |          |                       | 24                   | 149147   |          |                       |                      |          |          |                       |
| 25                   | 144192   |          |                       |                      |          |          |                       | 25                   | 145902   |          |                       |                      |          |          |                       |
| 26                   | 140913   |          |                       |                      |          |          |                       | 26                   | 142658   |          |                       |                      |          |          |                       |
| 27                   | 137634   |          |                       |                      |          |          |                       | 27                   | 139413   |          |                       |                      |          |          |                       |



MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>95<br>feet. |          |          |                       | SPAN,<br>95<br>feet. |          |          |                       | SPAN,<br>96<br>feet. |          |          |                       | SPAN,<br>96<br>feet. |          |          |                       |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       |
| 1                    | 180211   |          |                       | 41                   | 150788   | 0000000  |                       | 1                    | 181822   |          |                       | 41                   | 152552   | 0000000  |                       |
| 2                    | 176684   |          |                       | 42                   | 147578   |          | <i>P</i> <sub>7</sub> | 2                    | 178333   |          |                       | 42                   | 149219   |          | <i>P</i> <sub>7</sub> |
| 3                    | 173157   |          |                       | 43                   | 144367   | 2550000  |                       | 3                    | 174843   |          |                       | 43                   | 146042   |          |                       |
| 4                    | 169631   | 0        | <i>P</i> <sub>2</sub> | 44                   | 141157   |          |                       | 4                    | 171354   | 0        | <i>P</i> <sub>2</sub> | 44                   | 142865   | 2550000  |                       |
| 5                    | 166263   |          |                       |                      |          |          |                       | 5                    | 167864   |          |                       |                      |          |          |                       |
| 6                    | 162894   |          |                       |                      |          |          |                       | 6                    | 164531   |          |                       |                      |          |          |                       |
| 7                    | 159526   |          |                       |                      |          |          |                       | 7                    | 161197   |          |                       |                      |          |          |                       |
|                      |          |          |                       | 45                   | 154157   | 3275000  |                       |                      |          |          |                       | 45                   | 155885   | 3275000  |                       |
|                      |          |          |                       | 46                   | 150788   |          | <i>P</i> <sub>8</sub> |                      |          |          |                       | 46                   | 152552   |          | <i>P</i> <sub>8</sub> |
| 8                    | 173157   |          |                       | 47                   | 147578   |          |                       | 8                    | 174843   |          |                       | 47                   | 149219   |          |                       |
| 9                    | 169631   |          |                       | 48                   | 144367   |          |                       | 9                    | 171354   |          |                       | 48                   | 146042   |          |                       |
| 10                   | 166263   |          |                       |                      |          |          |                       | 10                   | 167864   | 1250000  | <i>P</i> <sub>3</sub> |                      |          |          |                       |
| 11                   | 162894   | 1250000  | <i>P</i> <sub>3</sub> |                      |          |          |                       | 11                   | 164531   |          |                       |                      |          |          |                       |
| 12                   | 159526   |          |                       |                      |          |          |                       | 12                   | 161197   |          |                       |                      |          |          |                       |
| 13                   | 156157   |          |                       |                      |          |          |                       | 13                   | 157864   |          |                       |                      |          |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |
| 14                   | 167631   |          |                       |                      |          |          |                       | 14                   | 169374   |          |                       |                      |          |          |                       |
| 15                   | 164262   |          |                       |                      |          |          |                       | 15                   | 165884   |          |                       |                      |          |          |                       |
| 16                   | 160894   |          |                       |                      |          |          |                       | 16                   | 162551   | 3200000  | <i>P</i> <sub>3</sub> |                      |          |          |                       |
| 17                   | 157525   | 3200000  | <i>P</i> <sub>3</sub> |                      |          |          |                       | 17                   | 159218   |          |                       |                      |          |          |                       |
| 18                   | 154157   |          |                       |                      |          |          |                       | 18                   | 155885   |          |                       |                      |          |          |                       |
| 19                   | 150788   |          |                       |                      |          |          |                       | 19                   | 152552   |          |                       |                      |          |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |
| 20                   | 164262   |          |                       |                      |          |          |                       | 20                   | 165884   |          |                       |                      |          |          |                       |
| 21                   | 160894   |          |                       |                      |          |          |                       | 21                   | 162551   |          |                       |                      |          |          |                       |
| 22                   | 157525   |          |                       |                      |          |          |                       | 22                   | 159218   |          |                       |                      |          |          |                       |
| 23                   | 154157   |          |                       |                      |          |          |                       | 23                   | 155885   |          |                       |                      |          |          |                       |
| 24                   | 150788   | 6450000  | <i>P</i> <sub>4</sub> |                      |          |          |                       | 24                   | 152552   | 6450000  | <i>P</i> <sub>4</sub> |                      |          |          |                       |
| 25                   | 147578   |          |                       |                      |          |          |                       | 25                   | 149219   |          |                       |                      |          |          |                       |
| 26                   | 144367   |          |                       |                      |          |          |                       | 26                   | 146042   |          |                       |                      |          |          |                       |
| 27                   | 141157   |          |                       |                      |          |          |                       | 27                   | 142865   |          |                       |                      |          |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |
| 28                   | 154157   |          |                       |                      |          |          |                       | 28                   | 155885   |          |                       |                      |          |          |                       |
| 29                   | 150788   |          |                       |                      |          |          |                       | 29                   | 152552   |          |                       |                      |          |          |                       |
| 30                   | 147578   |          |                       |                      |          |          |                       | 30                   | 149219   |          |                       |                      |          |          |                       |
| 31                   | 144367   |          |                       |                      |          |          |                       | 31                   | 146042   |          |                       |                      |          |          |                       |
| 32                   | 141157   |          |                       |                      |          |          |                       | 32                   | 142865   |          |                       |                      |          |          |                       |
| 33                   | 137948   | 10950000 | <i>P</i> <sub>5</sub> |                      |          |          |                       | 33                   | 139689   | 10950000 | <i>P</i> <sub>5</sub> |                      |          |          |                       |
| 34                   | 134738   |          |                       |                      |          |          |                       | 34                   | 136512   |          |                       |                      |          |          |                       |
| 35                   | 131686   |          |                       |                      |          |          |                       | 35                   | 133335   |          |                       |                      |          |          |                       |
| 36                   | 128634   |          |                       |                      |          |          |                       | 36                   | 130314   |          |                       |                      |          |          |                       |
|                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |                      |          |          |                       |
| 37                   | 147578   |          |                       |                      |          |          |                       | 37                   | 149219   |          |                       |                      |          |          |                       |
| 38                   | 144367   |          |                       |                      |          |          |                       | 38                   | 146042   |          |                       |                      |          |          |                       |
| 39                   | 141157   | 19000000 | <i>P</i> <sub>6</sub> |                      |          |          |                       | 39                   | 142865   | 19000000 | <i>P</i> <sub>6</sub> |                      |          |          |                       |
| 40                   | 137948   |          |                       |                      |          |          |                       | 40                   | 139689   |          |                       |                      |          |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>97<br>feet. |          |          |             | SPAN,<br>97<br>feet. |          |          |             | SPAN,<br>98<br>feet. |          |          |             | SPAN,<br>98<br>feet. |          |          |             |
|----------------------|----------|----------|-------------|----------------------|----------|----------|-------------|----------------------|----------|----------|-------------|----------------------|----------|----------|-------------|
| <i>x</i>             | <i>R</i> | <i>m</i> |             |
| 1                    | 183525   |          |             | 41                   | 150978   | 2550000  |             | 1                    | 185193   |          |             | 41                   | 155968   | 000000   |             |
| 2                    | 179948   |          |             | 42                   | 147679   |          | $\hat{p}_7$ | 2                    | 181653   |          |             | 42                   | 152703   | 2550000  | $\hat{p}_7$ |
| 3                    | 176494   |          |             | 43                   | 144535   |          |             | 3                    | 178112   |          |             | 43                   | 149438   |          |             |
| 4                    | 173041   | 0        | $\hat{p}_2$ | 44                   | 141391   |          |             | 4                    | 174693   | 0        | $\hat{p}_2$ | 44                   | 146173   |          |             |
| 5                    | 169587   |          |             |                      |          |          |             | 5                    | 171275   |          |             |                      |          |          |             |
| 6                    | 166134   |          |             | 45                   | 157576   |          |             | 6                    | 167857   |          |             | 45                   | 159234   |          |             |
| 7                    | 162835   |          |             | 46                   | 154278   |          |             | 7                    | 164438   |          |             | 46                   | 155968   |          |             |
|                      |          |          |             | 47                   | 150978   |          | $\hat{p}_8$ |                      |          |          |             | 47                   | 152703   |          | $\hat{p}_8$ |
| 8                    | 176494   |          |             | 48                   | 147679   |          |             | 8                    | 178112   |          |             | 48                   | 149438   |          |             |
| 9                    | 173041   |          |             | 49                   | 144535   | 3275000  |             | 9                    | 174693   |          |             | 49                   | 146173   | 3275000  |             |
| 10                   | 169587   | 125000   | $\hat{p}_3$ |                      |          |          |             | 10                   | 171275   | 125000   | $\hat{p}_3$ |                      |          |          |             |
| 11                   | 166134   |          |             |                      |          |          |             | 11                   | 167857   |          |             |                      |          |          |             |
| 12                   | 162835   |          |             |                      |          |          |             | 12                   | 164438   |          |             |                      |          |          |             |
| 13                   | 159536   |          |             |                      |          |          |             | 13                   | 161173   |          |             |                      |          |          |             |
|                      |          |          |             |                      |          |          |             |                      |          |          |             |                      |          |          |             |
| 14                   | 171082   |          |             |                      |          |          |             | 14                   | 172754   |          |             |                      |          |          |             |
| 15                   | 167628   |          |             |                      |          |          |             | 15                   | 169335   |          |             |                      |          |          |             |
| 16                   | 164175   | 320000   | $\hat{p}_3$ |                      |          |          |             | 16                   | 165917   | 320000   | $\hat{p}_3$ |                      |          |          |             |
| 17                   | 160875   |          |             |                      |          |          |             | 17                   | 162500   |          |             |                      |          |          |             |
| 18                   | 157576   |          |             |                      |          |          |             | 18                   | 159234   |          |             |                      |          |          |             |
| 19                   | 154278   |          |             |                      |          |          |             | 19                   | 155968   |          |             |                      |          |          |             |
|                      |          |          |             |                      |          |          |             |                      |          |          |             |                      |          |          |             |
| 20                   | 167628   |          |             |                      |          |          |             | 20                   | 169335   |          |             |                      |          |          |             |
| 21                   | 164175   |          |             |                      |          |          |             | 21                   | 165917   |          |             |                      |          |          |             |
| 22                   | 160875   |          |             |                      |          |          |             | 22                   | 162500   |          |             |                      |          |          |             |
| 23                   | 157576   | 645000   | $\hat{p}_4$ |                      |          |          |             | 23                   | 159234   | 645000   | $\hat{p}_4$ |                      |          |          |             |
| 24                   | 154278   |          |             |                      |          |          |             | 24                   | 155968   |          |             |                      |          |          |             |
| 25                   | 150978   |          |             |                      |          |          |             | 25                   | 152703   |          |             |                      |          |          |             |
| 26                   | 147679   |          |             |                      |          |          |             | 26                   | 149438   |          |             |                      |          |          |             |
| 27                   | 144535   |          |             |                      |          |          |             | 27                   | 146173   |          |             |                      |          |          |             |
|                      |          |          |             |                      |          |          |             |                      |          |          |             |                      |          |          |             |
| 28                   | 157576   |          |             |                      |          |          |             | 28                   | 159234   |          |             |                      |          |          |             |
| 29                   | 154278   |          |             |                      |          |          |             | 29                   | 155968   |          |             |                      |          |          |             |
| 30                   | 150978   |          |             |                      |          |          |             | 30                   | 152703   |          |             |                      |          |          |             |
| 31                   | 147679   | 1095000  | $\hat{p}_5$ |                      |          |          |             | 31                   | 149438   | 1095000  | $\hat{p}_5$ |                      |          |          |             |
| 32                   | 144535   |          |             |                      |          |          |             | 32                   | 146173   |          |             |                      |          |          |             |
| 33                   | 141391   |          |             |                      |          |          |             | 33                   | 143060   |          |             |                      |          |          |             |
| 34                   | 138246   |          |             |                      |          |          |             | 34                   | 139948   |          |             |                      |          |          |             |
| 35                   | 135102   |          |             |                      |          |          |             | 35                   | 136836   |          |             |                      |          |          |             |
| 36                   | 132958   |          |             |                      |          |          |             | 36                   | 133724   |          |             |                      |          |          |             |
|                      |          |          |             |                      |          |          |             |                      |          |          |             |                      |          |          |             |
| 37                   | 150978   |          |             |                      |          |          |             | 37                   | 152703   |          |             |                      |          |          |             |
| 38                   | 147679   |          |             |                      |          |          |             | 38                   | 149438   |          |             |                      |          |          |             |
| 39                   | 144535   | 1900000  | $\hat{p}_6$ |                      |          |          |             | 39                   | 146173   | 1900000  | $\hat{p}_6$ |                      |          |          |             |
| 40                   | 141391   |          |             |                      |          |          |             | 40                   | 143060   |          |             |                      |          |          |             |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>99<br>feet. |          |          |                       | SPAN,<br>99<br>feet. |          |          |                       | SPAN,<br>100<br>feet. |          |                       |                       | SPAN,<br>100<br>feet. |          |          |                       |         |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|-----------------------|----------|-----------------------|-----------------------|-----------------------|----------|----------|-----------------------|---------|
| <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>             | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i>              |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                       |         |
| 1                    | 186828   |          |                       | 41                   | 157625   | 000000   | <i>p</i> <sub>7</sub> | 1                     | 188430   |                       |                       | 41                    | 159250   |          |                       |         |
| 2                    | 183323   |          |                       | 42                   | 154393   |          |                       | 2                     | 184960   |                       |                       | 42                    | 156050   |          | <i>p</i> <sub>7</sub> |         |
| 3                    | 179818   |          |                       | 43                   | 151160   |          |                       | 3                     | 181490   |                       |                       | 43                    | 152850   | 2550000  |                       |         |
| 4                    | 176313   | 0        | <i>p</i> <sub>2</sub> | 44                   | 147928   | 2550000  |                       | 4                     | 178020   | 0                     | <i>p</i> <sub>2</sub> | 44                    | 149650   | 2550000  |                       |         |
| 5                    | 172924   |          |                       |                      |          |          |                       |                       | 5        | 174550                |                       |                       |          |          |                       |         |
| 6                    | 169545   |          |                       |                      |          |          |                       |                       | 6        | 171200                |                       |                       |          |          |                       |         |
| 7                    | 166161   |          |                       |                      |          |          |                       |                       | 7        | 167850                |                       |                       |          |          |                       |         |
| 8                    | 179818   |          |                       | 45                   | 160858   |          | <i>p</i> <sub>8</sub> | 8                     | 181490   |                       |                       | 45                    | 162600   |          | <i>p</i> <sub>8</sub> |         |
| 9                    | 176313   |          |                       | 46                   | 157625   |          |                       | 9                     | 178020   |                       |                       | 46                    | 159250   |          |                       |         |
| 10                   | 172929   |          |                       | 47                   | 154393   |          |                       | 10                    | 174550   |                       |                       | 47                    | 156050   |          |                       |         |
| 11                   | 169545   |          | <i>p</i> <sub>3</sub> | 48                   | 151160   |          |                       | 11                    | 171200   |                       | <i>p</i> <sub>3</sub> | 48                    | 152850   |          |                       |         |
| 12                   | 166161   | 125000   |                       |                      | 49       | 147928   |                       | 3275000               | 12       | 167850                |                       | 125000                |          | 49       | 149650                | 3275000 |
| 13                   | 162777   |          |                       |                      | 50       | 144696   |                       |                       | 13       | 164500                |                       |                       |          |          |                       |         |
| 14                   | 174393   |          |                       |                      |          |          |                       | 14                    | 176000   |                       |                       |                       |          |          |                       |         |
| 15                   | 171000   |          | <i>p</i> <sub>3</sub> |                      |          |          | 15                    | 172650                |          | <i>p</i> <sub>3</sub> |                       |                       |          |          |                       |         |
| 16                   | 167625   |          |                       |                      |          |          |                       | 16                    | 169300   |                       |                       |                       |          |          |                       |         |
| 17                   | 164241   |          |                       |                      |          |          |                       | 17                    | 165950   |                       |                       |                       |          |          |                       |         |
| 18                   | 160858   | 320000   |                       |                      |          |          |                       | 18                    | 162600   |                       | 320000                |                       |          |          |                       |         |
| 19                   | 157625   |          |                       |                      |          |          |                       | 19                    | 159250   |                       |                       |                       |          |          |                       |         |
| 20                   | 171009   |          |                       |                      |          |          | 20                    | 172650                |          |                       |                       |                       |          |          |                       |         |
| 21                   | 167625   |          | <i>p</i> <sub>4</sub> |                      |          |          | 21                    | 169300                |          | <i>p</i> <sub>4</sub> |                       |                       |          |          |                       |         |
| 22                   | 164241   |          |                       |                      |          |          |                       | 22                    | 165950   |                       |                       |                       |          |          |                       |         |
| 23                   | 160858   |          |                       |                      |          |          |                       | 23                    | 162600   |                       |                       |                       |          |          |                       |         |
| 24                   | 157625   |          |                       |                      |          |          |                       | 24                    | 159250   |                       |                       |                       |          |          |                       |         |
| 25                   | 154393   | 645000   |                       |                      |          |          |                       | 25                    | 156050   |                       | 645000                |                       |          |          |                       |         |
| 26                   | 151160   |          |                       |                      |          |          |                       | 26                    | 152850   |                       |                       |                       |          |          |                       |         |
| 27                   | 147928   |          |                       |                      |          |          |                       |                       |          |                       |                       |                       |          |          |                       |         |
| 28                   | 160858   |          |                       |                      |          |          | 27                    | 165950                |          |                       |                       |                       |          |          |                       |         |
| 29                   | 157625   |          | <i>p</i> <sub>5</sub> |                      |          |          | 28                    | 162600                |          | <i>p</i> <sub>5</sub> |                       |                       |          |          |                       |         |
| 30                   | 154393   |          |                       |                      |          |          |                       | 29                    | 159250   |                       |                       |                       |          |          |                       |         |
| 31                   | 151160   |          |                       |                      |          |          |                       | 30                    | 156050   |                       |                       |                       |          |          |                       |         |
| 32                   | 147928   |          |                       |                      |          |          |                       | 31                    | 152850   |                       |                       |                       |          |          |                       |         |
| 33                   | 144696   |          |                       |                      |          |          |                       | 32                    | 149650   |                       |                       |                       |          |          |                       |         |
| 34                   | 141615   |          |                       |                      |          |          |                       | 33                    | 146450   |                       |                       |                       |          |          |                       |         |
| 35                   | 138534   |          |                       |                      |          |          |                       | 34                    | 143250   |                       |                       |                       |          |          |                       |         |
| 36                   | 135454   | 1095000  |                       |                      |          |          |                       | 35                    | 140200   |                       | 1095000               |                       |          |          |                       |         |
|                      |          |          |                       |                      |          |          |                       | 36                    | 137150   |                       |                       |                       |          |          |                       |         |
| 37                   | 154393   |          |                       |                      |          |          | 37                    | 156050                |          |                       |                       |                       |          |          |                       |         |
| 38                   | 151160   |          | <i>p</i> <sub>6</sub> |                      |          |          | 38                    | 152850                |          | <i>p</i> <sub>6</sub> |                       |                       |          |          |                       |         |
| 39                   | 147928   |          |                       |                      |          |          |                       | 39                    | 149650   |                       |                       |                       |          |          |                       |         |
| 40                   | 144696   | 1900000  |                       |                      |          |          |                       | 40                    | 146450   |                       | 1900000               |                       |          |          |                       |         |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>103<br>feet. |          |          |                       | SPAN,<br>103<br>feet. |          |          |                        | SPAN,<br>105<br>feet. |          |          |                       | SPAN,<br>105<br>feet. |          |          |                        |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        |
| 1                     | 193281   |          |                       | 41                    | 164368   |          |                        | 1                     | 196438   |          |                       | 41                    | 167619   |          |                        |
| 2                     | 189796   |          |                       | 42                    | 161115   |          |                        | 2                     | 193019   |          |                       | 42                    | 164429   |          |                        |
| 3                     | 186310   |          |                       | 43                    | 157963   |          | <i>p</i> <sub>7</sub>  | 3                     | 189600   |          |                       | 43                    | 161234   |          | <i>p</i> <sub>7</sub>  |
| 4                     | 182941   | 0        | <i>p</i> <sub>2</sub> | 44                    | 154611   | 2550000  |                        | 4                     | 186180   | 0        | <i>p</i> <sub>2</sub> | 44                    | 158048   | 2550000  |                        |
| 5                     | 179572   |          |                       | 45                    | 151504   |          |                        | 5                     | 182761   |          |                       | 45                    | 154858   |          |                        |
| 6                     | 176203   |          |                       |                       |          |          |                        | 6                     | 179457   |          |                       |                       |          |          |                        |
| 7                     | 172834   |          |                       |                       |          |          |                        | 7                     | 176152   |          |                       |                       |          |          |                        |
|                       |          |          |                       | 46                    | 164368   |          |                        |                       |          |          |                       | 46                    | 167619   |          |                        |
| 8                     | 186310   |          |                       | 47                    | 161115   |          | <i>p</i> <sub>8</sub>  | 8                     | 189600   |          |                       | 47                    | 164429   |          | <i>p</i> <sub>8</sub>  |
| 9                     | 182941   |          |                       | 48                    | 157963   | 3275000  |                        | 9                     | 186180   |          |                       | 48                    | 161234   | 3275000  |                        |
| 10                    | 179572   |          |                       | 49                    | 154611   |          |                        | 10                    | 182761   |          |                       | 49                    | 158048   |          |                        |
| 11                    | 176203   | 125000   | <i>p</i> <sub>3</sub> |                       |          |          |                        | 11                    | 179457   | 125000   | <i>p</i> <sub>3</sub> |                       |          |          |                        |
| 12                    | 172834   |          |                       | 50                    | 182941   |          |                        | 12                    | 176152   |          |                       | 50                    | 170952   | 4075000  | <i>p</i> <sub>9</sub>  |
| 13                    | 169466   |          |                       | 51                    | 179572   |          |                        | 13                    | 172848   |          |                       |                       |          |          |                        |
|                       |          |          |                       | 52                    | 176203   | 4840000  | <i>p</i> <sub>10</sub> |                       |          |          |                       |                       |          |          |                        |
| 14                    | 181067   |          |                       |                       |          |          |                        | 14                    | 184400   |          |                       |                       |          |          |                        |
| 15                    | 177669   |          |                       |                       |          |          |                        | 15                    | 180953   |          |                       | 51                    | 182761   | 4840000  | <i>p</i> <sub>10</sub> |
| 16                    | 174271   |          |                       |                       |          |          |                        | 16                    | 177619   |          |                       | 52                    | 179457   |          |                        |
| 17                    | 170873   | 320000   | <i>p</i> <sub>3</sub> |                       |          |          |                        | 17                    | 173286   | 320000   | <i>p</i> <sub>3</sub> | 53                    | 176152   |          |                        |
| 18                    | 167620   |          |                       |                       |          |          |                        | 18                    | 170952   |          |                       |                       |          |          |                        |
| 19                    | 164368   |          |                       |                       |          |          |                        | 19                    | 167619   |          |                       |                       |          |          |                        |
|                       |          |          |                       |                       |          |          |                        |                       |          |          |                       |                       |          |          |                        |
| 20                    | 177669   |          |                       |                       |          |          |                        | 20                    | 180953   |          |                       |                       |          |          |                        |
| 21                    | 174271   |          |                       |                       |          |          |                        | 21                    | 177619   |          |                       |                       |          |          |                        |
| 22                    | 170873   |          |                       |                       |          |          |                        | 22                    | 173286   |          |                       |                       |          |          |                        |
| 23                    | 167620   | 645000   | <i>p</i> <sub>4</sub> |                       |          |          |                        | 23                    | 170952   | 645000   | <i>p</i> <sub>4</sub> |                       |          |          |                        |
| 24                    | 164368   |          |                       |                       |          |          |                        | 24                    | 167619   |          |                       |                       |          |          |                        |
| 25                    | 161115   |          |                       |                       |          |          |                        | 25                    | 164429   |          |                       |                       |          |          |                        |
| 26                    | 157963   |          |                       |                       |          |          |                        | 26                    | 161234   |          |                       |                       |          |          |                        |
| 27                    | 154611   |          |                       |                       |          |          |                        | 27                    | 158048   |          |                       |                       |          |          |                        |
|                       |          |          |                       |                       |          |          |                        |                       |          |          |                       |                       |          |          |                        |
| 28                    | 167620   |          |                       |                       |          |          |                        | 28                    | 170952   |          |                       |                       |          |          |                        |
| 29                    | 164368   |          |                       |                       |          |          |                        | 29                    | 167619   |          |                       |                       |          |          |                        |
| 30                    | 161115   |          |                       |                       |          |          |                        | 30                    | 164429   |          |                       |                       |          |          |                        |
| 31                    | 157963   |          |                       |                       |          |          |                        | 31                    | 161234   |          |                       |                       |          |          |                        |
| 32                    | 154611   | 1095000  | <i>p</i> <sub>5</sub> |                       |          |          |                        | 32                    | 158048   | 1095000  | <i>p</i> <sub>5</sub> |                       |          |          |                        |
| 33                    | 151504   |          |                       |                       |          |          |                        | 33                    | 154858   |          |                       |                       |          |          |                        |
| 34                    | 148398   |          |                       |                       |          |          |                        | 34                    | 151668   |          |                       |                       |          |          |                        |
| 35                    | 145290   |          |                       |                       |          |          |                        | 35                    | 148621   |          |                       |                       |          |          |                        |
| 36                    | 142183   |          |                       |                       |          |          |                        | 36                    | 145574   |          |                       |                       |          |          |                        |
|                       |          |          |                       |                       |          |          |                        |                       |          |          |                       |                       |          |          |                        |
| 37                    | 161115   |          |                       |                       |          |          |                        | 37                    | 164429   |          |                       |                       |          |          |                        |
| 38                    | 157963   |          |                       |                       |          |          |                        | 38                    | 161234   |          |                       |                       |          |          |                        |
| 39                    | 154611   | 1900000  | <i>p</i> <sub>6</sub> |                       |          |          |                        | 39                    | 158048   | 1900000  | <i>p</i> <sub>6</sub> |                       |          |          |                        |
| 40                    | 151504   |          |                       |                       |          |          |                        | 40                    | 154858   |          |                       |                       |          |          |                        |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>108<br>feet. |          |          |                       | SPAN,<br>108<br>feet. |          |          |                       | SPAN,<br>110<br>feet. |          |          |                       | SPAN,<br>110<br>feet. |          |          |                        |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                        |
| 1                     | 200953   |          |                       | 41                    | 172684   |          |                       | 1                     | 203827   |          |                       | 41                    | 176017   |          |                        |
| 2                     | 197629   |          |                       | 42                    | 169443   |          |                       | 2                     | 200563   |          |                       | 42                    | 172726   |          |                        |
| 3                     | 194395   |          |                       | 43                    | 166202   |          | <i>p</i> <sub>7</sub> | 3                     | 197300   |          |                       | 43                    | 169545   |          | <i>p</i> <sub>7</sub>  |
| 4                     | 190981   |          | <i>p</i> <sub>2</sub> | 44                    | 162962   |          |                       | 4                     | 194036   |          | <i>p</i> <sub>2</sub> | 44                    | 166362   |          |                        |
| 5                     | 187657   |          |                       | 45                    | 159861   |          | 2550000               | 5                     | 190772   |          |                       | 45                    | 163181   |          | 2550000                |
| 6                     | 184333   |          |                       |                       |          |          |                       | 6                     | 187509   |          |                       |                       |          |          |                        |
| 7                     | 181009   |          |                       |                       |          |          |                       | 7                     | 184245   |          |                       |                       |          |          |                        |
|                       |          |          |                       | 46                    | 172684   |          |                       |                       |          |          |                       | 46                    | 176017   |          |                        |
| 8                     | 194395   |          |                       | 47                    | 169443   |          |                       | 8                     | 197300   |          |                       | 47                    | 172726   |          |                        |
| 9                     | 190981   |          |                       | 48                    | 166202   |          | <i>p</i> <sub>8</sub> | 9                     | 194036   |          |                       | 48                    | 169545   |          | <i>p</i> <sub>8</sub>  |
| 10                    | 187657   |          |                       | 49                    | 162962   |          | 3275000               | 10                    | 190772   |          |                       | 49                    | 166362   |          | 3275000                |
| 11                    | 184333   |          | <i>p</i> <sub>3</sub> |                       |          |          |                       | 11                    | 187509   |          | <i>p</i> <sub>3</sub> |                       |          |          |                        |
| 12                    | 181009   |          |                       |                       |          |          |                       | 12                    | 184245   |          |                       |                       |          |          |                        |
| 13                    | 177685   |          |                       | 50                    | 175925   |          |                       | 13                    | 180981   |          |                       | 50                    | 179308   |          | <i>p</i> <sub>9</sub>  |
|                       |          |          |                       | 51                    | 172684   |          | 4075000               |                       |          |          |                       | 51                    | 176017   |          | 4075000                |
|                       |          |          |                       |                       |          |          |                       |                       |          |          |                       |                       |          |          |                        |
| 14                    | 189333   |          |                       |                       |          |          |                       | 14                    | 192581   |          |                       |                       |          |          |                        |
| 15                    | 185981   |          |                       |                       |          |          |                       | 15                    | 189181   |          |                       |                       |          |          |                        |
| 16                    | 182629   |          |                       |                       |          |          |                       | 16                    | 185890   |          |                       |                       |          |          |                        |
| 17                    | 179277   |          | <i>p</i> <sub>3</sub> | 52                    | 184333   |          |                       | 17                    | 182599   |          | <i>p</i> <sub>3</sub> | 52                    | 187509   |          |                        |
| 18                    | 175925   |          |                       | 53                    | 181009   |          |                       | 18                    | 179308   |          |                       | 53                    | 184245   |          | <i>p</i> <sub>10</sub> |
| 19                    | 172684   |          |                       | 54                    | 177685   |          | 4840000               | 19                    | 176017   |          |                       | 54                    | 180981   |          | 4840000                |
|                       |          |          |                       |                       |          |          |                       |                       |          |          |                       |                       |          |          |                        |
| 20                    | 185981   |          |                       |                       |          |          |                       | 20                    | 189181   |          |                       |                       |          |          |                        |
| 21                    | 182629   |          |                       |                       |          |          |                       | 21                    | 185890   |          |                       |                       |          |          |                        |
| 22                    | 179277   |          |                       |                       |          |          |                       | 22                    | 182599   |          |                       |                       |          |          |                        |
| 23                    | 175925   |          |                       |                       |          |          |                       | 23                    | 179308   |          |                       |                       |          |          |                        |
| 24                    | 172684   |          | <i>p</i> <sub>4</sub> |                       |          |          |                       | 24                    | 176017   |          | <i>p</i> <sub>4</sub> |                       |          |          |                        |
| 25                    | 169443   |          |                       |                       |          |          |                       | 25                    | 172726   |          |                       |                       |          |          |                        |
| 26                    | 166202   |          |                       |                       |          |          |                       | 26                    | 169545   |          |                       |                       |          |          |                        |
| 27                    | 162962   |          |                       |                       |          |          |                       | 27                    | 166362   |          |                       |                       |          |          |                        |
|                       |          |          |                       |                       |          |          |                       |                       |          |          |                       |                       |          |          |                        |
| 28                    | 175925   |          |                       |                       |          |          |                       | 28                    | 179308   |          |                       |                       |          |          |                        |
| 29                    | 172684   |          |                       |                       |          |          |                       | 29                    | 176017   |          |                       |                       |          |          |                        |
| 30                    | 169443   |          |                       |                       |          |          |                       | 30                    | 172726   |          |                       |                       |          |          |                        |
| 31                    | 166202   |          |                       |                       |          |          |                       | 31                    | 169545   |          |                       |                       |          |          |                        |
| 32                    | 162962   |          |                       |                       |          |          |                       | 32                    | 166362   |          | <i>p</i> <sub>5</sub> |                       |          |          |                        |
| 33                    | 159861   |          | <i>p</i> <sub>5</sub> |                       |          |          |                       | 33                    | 163181   |          |                       |                       |          |          |                        |
| 34                    | 156757   |          |                       |                       |          |          |                       | 34                    | 160000   |          |                       |                       |          |          |                        |
| 35                    | 153657   |          |                       |                       |          |          |                       | 35                    | 156953   |          |                       |                       |          |          |                        |
| 36                    | 150556   |          |                       |                       |          |          |                       | 36                    | 153908   |          |                       |                       |          |          |                        |
|                       |          |          |                       |                       |          |          |                       |                       |          |          |                       |                       |          |          |                        |
| 37                    | 169443   |          |                       |                       |          |          |                       | 37                    | 172726   |          |                       |                       |          |          |                        |
| 38                    | 166202   |          |                       |                       |          |          |                       | 38                    | 169545   |          |                       |                       |          |          |                        |
| 39                    | 162962   |          | <i>p</i> <sub>6</sub> |                       |          |          |                       | 39                    | 166362   |          | <i>p</i> <sub>6</sub> |                       |          |          |                        |
| 40                    | 159861   |          |                       |                       |          |          |                       | 40                    | 163181   |          |                       |                       |          |          |                        |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>113<br>feet. |          |          |                       | SPAN,<br>113<br>feet. |          |          |                        | SPAN,<br>115<br>feet. |          |          |                       | SPAN,<br>115<br>feet. |          |          |                        |    |        |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|----|--------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        |    |        |
| 1                     | 208159   | 0        | <i>p</i> <sub>2</sub> | 41                    | 180957   | 2550000  | <i>p</i> <sub>7</sub>  | 1                     | 210991   | 0        | <i>p</i> <sub>2</sub> | 37                    | 180956   | 1900000  | <i>p</i> <sub>6</sub>  |    |        |
| 2                     | 204876   |          |                       | 42                    | 177753   |          |                        | 2                     | 207765   |          |                       | 38                    | 177809   |          |                        | 39 | 174660 |
| 3                     | 201592   |          |                       | 43                    | 174550   |          |                        | 3                     | 204539   |          |                       | 40                    | 171512   |          |                        | 41 | 168364 |
| 4                     | 198415   |          |                       | 44                    | 171346   |          |                        | 4                     | 201313   |          |                       | 42                    | 180956   |          |                        | 43 | 177809 |
| 5                     | 195238   |          |                       | 45                    | 168144   |          |                        | 5                     | 198086   |          |                       | 44                    | 174660   |          |                        | 44 | 174660 |
| 6                     | 192061   |          |                       | 46                    | 180957   |          |                        | 5                     | 194965   |          |                       | 45                    | 171512   |          |                        | 45 | 171512 |
| 7                     | 188884   |          |                       | 47                    | 177753   |          |                        | 6                     | 191843   |          |                       | 46                    | 184207   |          |                        | 46 | 184207 |
| 8                     | 201592   | 125000   | <i>p</i> <sub>3</sub> | 47                    | 177753   | 3275000  | <i>p</i> <sub>8</sub>  | 8                     | 204539   | 125000   | <i>p</i> <sub>3</sub> | 47                    | 180956   | 2550000  | <i>p</i> <sub>7</sub>  |    |        |
| 9                     | 198415   |          |                       | 48                    | 174550   |          |                        | 8                     | 201313   |          |                       | 48                    | 177809   |          |                        | 47 | 180956 |
| 10                    | 195238   |          |                       | 49                    | 171346   |          |                        | 9                     | 198086   |          |                       | 48                    | 177809   |          |                        | 48 | 177809 |
| 11                    | 192061   |          |                       | 50                    | 184160   |          |                        | 10                    | 194965   |          |                       | 49                    | 174660   |          |                        | 49 | 174660 |
| 12                    | 188884   |          |                       | 51                    | 180957   |          |                        | 11                    | 191843   |          |                       | 50                    | 171512   |          |                        | 50 | 171512 |
| 13                    | 185707   |          |                       | 52                    | 177753   |          |                        | 12                    | 188721   |          |                       | 51                    | 184207   |          |                        | 51 | 184207 |
| 14                    | 197397   | 320000   | <i>p</i> <sub>3</sub> | 53                    | 174550   | 4075000  | <i>p</i> <sub>9</sub>  | 14                    | 200468   | 320000   | <i>p</i> <sub>3</sub> | 52                    | 180956   | 3275000  | <i>p</i> <sub>8</sub>  |    |        |
| 15                    | 194088   |          |                       | 54                    | 185707   |          |                        | 15                    | 197217   |          |                       | 53                    | 177809   |          |                        | 15 | 197217 |
| 16                    | 190778   |          |                       | 55                    | 208159   |          |                        | 16                    | 193964   |          |                       | 54                    | 174660   |          |                        | 16 | 193964 |
| 17                    | 187470   |          |                       | 56                    | 204876   |          |                        | 17                    | 190712   |          |                       | 55                    | 200468   |          |                        | 17 | 190712 |
| 18                    | 184160   |          |                       | 57                    | 201592   |          |                        | 18                    | 187460   |          |                       | 56                    | 180956   |          |                        | 18 | 187460 |
| 19                    | 180957   |          |                       | 58                    | 184207   |          |                        | 19                    | 184207   |          |                       | 57                    | 177809   |          |                        | 19 | 184207 |
| 20                    | 194088   | 645000   | <i>p</i> <sub>4</sub> | 55                    | 208159   | 6240000  | <i>p</i> <sub>11</sub> | 20                    | 197217   | 645000   | <i>p</i> <sub>4</sub> | 58                    | 207765   | 5650000  | <i>p</i> <sub>10</sub> |    |        |
| 21                    | 190778   |          |                       | 56                    | 204876   |          |                        | 21                    | 193964   |          |                       | 57                    | 174660   |          |                        | 21 | 193964 |
| 22                    | 187470   |          |                       | 57                    | 201592   |          |                        | 22                    | 190712   |          |                       | 58                    | 171512   |          |                        | 22 | 190712 |
| 23                    | 184160   |          |                       | 23                    | 187460   |          |                        | 23                    | 187460   |          |                       | 29                    | 184207   |          |                        | 23 | 187460 |
| 24                    | 180957   |          |                       | 24                    | 184207   |          |                        | 24                    | 184207   |          |                       | 30                    | 180956   |          |                        | 24 | 184207 |
| 25                    | 177753   |          |                       | 25                    | 180956   |          |                        | 25                    | 180956   |          |                       | 31                    | 177809   |          |                        | 25 | 180956 |
| 26                    | 174550   |          |                       | 26                    | 177809   |          |                        | 26                    | 177809   |          |                       | 32                    | 174660   |          |                        | 26 | 177809 |
| 27                    | 171346   |          |                       | 27                    | 174660   |          |                        | 27                    | 174660   |          |                       | 33                    | 171512   |          |                        | 27 | 174660 |
| 28                    | 168144   |          |                       | 28                    | 171512   |          |                        | 28                    | 171512   |          |                       | 34                    | 168364   |          |                        | 28 | 171512 |
| 29                    | 180957   | 1095000  | <i>p</i> <sub>5</sub> | 59                    | 184207   | 6240000  | <i>p</i> <sub>11</sub> | 29                    | 184207   | 1095000  | <i>p</i> <sub>5</sub> | 59                    | 184207   | 6240000  | <i>p</i> <sub>11</sub> |    |        |
| 30                    | 177753   |          |                       | 60                    | 180956   |          |                        | 30                    | 180956   |          |                       | 60                    | 180956   |          |                        | 30 | 180956 |
| 31                    | 174550   |          |                       | 61                    | 177809   |          |                        | 31                    | 177809   |          |                       | 61                    | 177809   |          |                        | 31 | 177809 |
| 32                    | 171346   |          |                       | 62                    | 174660   |          |                        | 32                    | 174660   |          |                       | 62                    | 174660   |          |                        | 32 | 174660 |
| 33                    | 168144   |          |                       | 63                    | 171512   |          |                        | 33                    | 171512   |          |                       | 63                    | 171512   |          |                        | 33 | 171512 |
| 34                    | 165046   |          |                       | 64                    | 168364   |          |                        | 34                    | 168364   |          |                       | 64                    | 168364   |          |                        | 34 | 168364 |
| 35                    | 161949   |          |                       | 65                    | 165216   |          |                        | 35                    | 165216   |          |                       | 65                    | 165216   |          |                        | 35 | 165216 |
| 36                    | 158852   |          |                       | 66                    | 162172   |          |                        | 36                    | 162172   |          |                       | 66                    | 162172   |          |                        | 36 | 162172 |
| 37                    | 177753   | 1900000  | <i>p</i> <sub>6</sub> | 67                    | 184207   | 6240000  | <i>p</i> <sub>11</sub> | 37                    | 184207   | 1900000  | <i>p</i> <sub>6</sub> | 67                    | 184207   | 6240000  | <i>p</i> <sub>11</sub> |    |        |
| 38                    | 174550   |          |                       | 68                    | 180956   |          |                        | 38                    | 180956   |          |                       | 68                    | 180956   |          |                        | 38 | 180956 |
| 39                    | 171346   |          |                       | 69                    | 177809   |          |                        | 39                    | 177809   |          |                       | 69                    | 177809   |          |                        | 39 | 177809 |
| 40                    | 168144   |          |                       | 70                    | 174660   |          |                        | 40                    | 174660   |          |                       | 70                    | 174660   |          |                        | 40 | 174660 |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>120<br>feet. |          |          |                       | SPAN,<br>120<br>feet. |          |          |                        | SPAN,<br>125<br>feet. |          |          |                       | SPAN,<br>125<br>feet. |          |          |                        |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        |
| 1                     | 218058   |          |                       | 38                    | 185883   | 190000   | <i>p</i> <sub>6</sub>  | 1                     | 225040   |          |                       | 40                    | 187424   | 190000   |                        |
| 2                     | 214866   |          |                       | 39                    | 182766   |          |                        | 2                     | 221880   |          |                       | 41                    | 184432   |          | <i>p</i> <sub>6</sub>  |
| 3                     | 211675   |          | <i>p</i> <sub>2</sub> | 40                    | 179650   |          |                        | 3                     | 218720   |          |                       | 42                    | 181440   |          |                        |
| 4                     | 208483   | 0        |                       | 41                    | 176533   |          |                        | 4                     | 215560   | 0        | <i>p</i> <sub>2</sub> | 43                    | 178448   |          |                        |
| 5                     | 205291   |          |                       |                       |          |          |                        | 5                     | 212400   |          |                       |                       |          |          |                        |
| 6                     | 202200   |          |                       |                       |          |          |                        | 6                     | 209336   |          |                       |                       |          |          |                        |
| 7                     | 199108   |          |                       | 42                    | 189000   |          |                        | 7                     | 206272   |          |                       | 44                    | 190416   |          |                        |
|                       |          |          |                       | 43                    | 185883   | 2550000  | <i>p</i> <sub>7</sub>  | 8                     | 203208   |          |                       | 45                    | 187424   | 2550000  | <i>p</i> <sub>7</sub>  |
|                       |          |          |                       | 44                    | 182766   |          |                        |                       |          |          |                       | 46                    | 184432   |          |                        |
| 8                     | 211675   |          |                       | 45                    | 179650   |          |                        | 9                     | 215024   | 120000   | <i>p</i> <sub>2</sub> | 47                    | 181440   |          |                        |
| 9                     | 208483   |          |                       | 46                    | 176533   |          |                        |                       |          |          |                       | 48                    | 178448   |          |                        |
| 10                    | 205291   | 125000   | <i>p</i> <sub>3</sub> |                       |          |          |                        |                       |          |          |                       |                       |          |          |                        |
| 11                    | 202200   |          |                       | 47                    | 189000   |          |                        | 10                    | 212400   |          |                       | 49                    | 190416   |          |                        |
| 12                    | 199108   |          |                       | 48                    | 185883   | 3275000  | <i>p</i> <sub>8</sub>  | 11                    | 209336   |          |                       | 50                    | 187424   | 3275000  | <i>p</i> <sub>8</sub>  |
| 13                    | 196016   |          |                       | 49                    | 182766   |          |                        | 12                    | 206272   | 125000   | <i>p</i> <sub>3</sub> | 51                    | 184432   |          |                        |
|                       |          |          |                       | 50                    | 179650   |          |                        | 13                    | 203208   |          |                       | 52                    | 181440   |          |                        |
|                       |          |          |                       | 51                    | 176533   |          |                        |                       |          |          |                       | 53                    | 178448   |          |                        |
| 14                    | 207800   |          |                       |                       |          |          |                        | 14                    | 215024   |          |                       | 54                    | 190416   |          |                        |
| 15                    | 204583   |          |                       | 52                    | 189000   |          |                        | 15                    | 211840   |          |                       | 55                    | 187424   | 4075000  | <i>p</i> <sub>9</sub>  |
| 16                    | 201466   |          | <i>p</i> <sub>3</sub> | 53                    | 185883   | 4075000  | <i>p</i> <sub>9</sub>  | 16                    | 208752   |          |                       | 56                    | 184432   |          |                        |
| 17                    | 198350   | 320000   |                       | 54                    | 182766   |          |                        | 17                    | 205664   |          |                       | 57                    | 181440   |          |                        |
| 18                    | 195233   |          |                       | 55                    | 179650   |          |                        | 18                    | 202576   |          |                       |                       |          |          |                        |
| 19                    | 192116   |          |                       | 56                    | 176533   |          |                        | 19                    | 199488   | 320000   | <i>p</i> <sub>3</sub> |                       |          |          |                        |
| 20                    | 189000   |          |                       |                       |          |          |                        | 20                    | 196400   |          |                       | 58                    | 205664   | 5650000  | <i>p</i> <sub>10</sub> |
|                       |          |          |                       |                       |          |          |                        | 21                    | 193408   |          |                       | 59                    | 202576   |          |                        |
|                       |          |          |                       |                       |          |          |                        |                       |          |          |                       | 60                    | 199488   |          |                        |
| 21                    | 201466   |          |                       | 57                    | 201466   | 5650000  | <i>p</i> <sub>10</sub> | 22                    | 205664   |          |                       |                       |          |          |                        |
| 22                    | 198350   |          |                       | 58                    | 198350   |          |                        | 23                    | 202576   |          |                       | 61                    | 206272   | 6240000  | <i>p</i> <sub>11</sub> |
| 23                    | 195233   |          |                       |                       |          |          |                        | 24                    | 199488   |          |                       | 62                    | 203208   |          |                        |
| 24                    | 192116   | 645000   | <i>p</i> <sub>4</sub> |                       |          |          |                        | 25                    | 196400   |          |                       |                       |          |          |                        |
| 25                    | 189000   |          |                       |                       |          |          |                        | 26                    | 193408   |          |                       |                       |          |          |                        |
| 26                    | 185883   |          |                       |                       |          |          |                        | 27                    | 190416   | 645000   | <i>p</i> <sub>4</sub> |                       |          |          |                        |
| 27                    | 182766   |          |                       |                       |          |          |                        | 28                    | 187424   |          |                       |                       |          |          |                        |
| 28                    | 179650   |          |                       | 59                    | 205291   | 6240000  | <i>p</i> <sub>11</sub> | 29                    | 184432   |          |                       | 63                    | 215024   | 7170000  | <i>p</i> <sub>11</sub> |
|                       |          |          |                       | 60                    | 202200   |          |                        | 30                    | 181440   |          |                       |                       |          |          |                        |
|                       |          |          |                       |                       |          |          |                        |                       |          |          |                       |                       |          |          |                        |
| 29                    | 192116   |          |                       |                       |          |          |                        | 31                    | 193408   |          |                       |                       |          |          |                        |
| 30                    | 189000   |          |                       |                       |          |          |                        | 32                    | 190416   |          |                       |                       |          |          |                        |
| 31                    | 185883   |          |                       |                       |          |          |                        | 33                    | 187424   |          |                       |                       |          |          |                        |
| 32                    | 182766   |          |                       |                       |          |          |                        | 34                    | 184432   |          |                       |                       |          |          |                        |
| 33                    | 179650   | 1095000  | <i>p</i> <sub>5</sub> |                       |          |          |                        | 35                    | 181440   |          |                       |                       |          |          |                        |
| 34                    | 176533   |          |                       |                       |          |          |                        | 36                    | 178448   |          |                       |                       |          |          |                        |
| 35                    | 173416   |          |                       |                       |          |          |                        | 37                    | 175456   |          |                       |                       |          |          |                        |
| 36                    | 170389   |          |                       |                       |          |          |                        | 38                    | 172404   |          |                       |                       |          |          |                        |
| 37                    | 167372   |          |                       |                       |          |          |                        | 39                    | 169472   |          |                       |                       |          |          |                        |

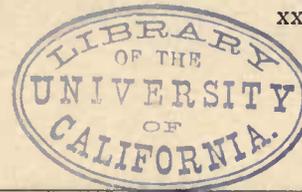
## MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>130<br>feet. |          |          |       | SPAN,<br>130<br>feet. |          |          |          | SPAN,<br>135<br>feet. |          |          |       | SPAN,<br>135<br>feet. |          |          |          |
|-----------------------|----------|----------|-------|-----------------------|----------|----------|----------|-----------------------|----------|----------|-------|-----------------------|----------|----------|----------|
| <i>x</i>              | <i>R</i> | <i>m</i> |       | <i>x</i>              | <i>R</i> | <i>m</i> |          | <i>x</i>              | <i>R</i> | <i>m</i> |       | <i>x</i>              | <i>R</i> | <i>m</i> |          |
| 1                     | 231946   |          |       | 40                    | 194783   |          |          | 1                     | 238429   |          |       | 40                    | 202042   |          |          |
| 2                     | 228815   |          |       | 41                    | 191813   |          |          | 2                     | 235414   |          |       | 41                    | 199094   |          |          |
| 3                     | 225684   |          |       | 42                    | 188844   |          | $p_6$    | 3                     | 232400   |          |       | 42                    | 196146   |          |          |
| 4                     | 222553   |          |       | 43                    | 185968   |          |          | 4                     | 229385   |          |       | 43                    | 193287   |          | $p_6$    |
| 5                     | 219422   | 0        | $p_2$ | 44                    | 183090   | 190000   |          | 5                     | 226370   | 0        | $p_2$ | 44                    | 190428   |          |          |
| 6                     | 216383   |          |       | 45                    | 194783   |          |          | 6                     | 223354   |          |       | 45                    | 187568   |          |          |
| 7                     | 213345   |          |       | 46                    | 191813   |          |          | 7                     | 220339   |          |       |                       |          |          |          |
| 8                     | 210306   |          |       | 47                    | 188844   |          | $p_7$    | 8                     | 217324   |          |       |                       |          |          |          |
| 9                     | 222152   |          |       | 48                    | 185968   |          |          | 9                     | 228498   |          |       | 46                    | 199094   |          |          |
| 10                    | 218998   |          |       | 49                    | 183090   | 2550000  |          | 10                    | 226072   |          |       | 47                    | 196146   |          |          |
| 11                    | 215936   | 120000   | $p_2$ |                       |          |          |          | 11                    | 223035   |          | $p_2$ | 48                    | 193287   |          | $p_7$    |
|                       |          |          |       |                       |          |          |          | 12                    | 219998   | 120000   |       | 49                    | 190428   |          |          |
|                       |          |          |       |                       |          |          |          | 13                    | 216961   |          |       | 50                    | 187568   |          |          |
| 12                    | 213345   |          |       | 50                    | 194783   |          |          |                       |          |          |       |                       |          |          |          |
| 13                    | 210306   | 125000   | $p_3$ | 51                    | 191813   |          |          | 14                    | 228498   |          |       | 51                    | 199094   |          |          |
|                       |          |          |       | 52                    | 188844   |          | $p_8$    | 15                    | 226072   |          |       | 52                    | 196146   |          |          |
|                       |          |          |       | 53                    | 185968   |          |          | 16                    | 223035   |          |       | 53                    | 193287   |          | $p_8$    |
|                       |          |          |       | 54                    | 183090   | 3275000  |          | 17                    | 219998   |          |       | 54                    | 190428   |          |          |
|                       |          |          |       |                       |          |          |          | 18                    | 216961   |          | $p_3$ | 55                    | 187568   |          |          |
| 14                    | 222152   |          |       | 55                    | 194783   |          |          | 19                    | 213924   |          |       |                       |          |          |          |
| 15                    | 218998   |          |       | 56                    | 191813   |          |          | 20                    | 210887   |          |       | 56                    | 199094   |          |          |
| 16                    | 215936   |          |       | 57                    | 188844   |          | $p_9$    | 21                    | 207939   |          |       | 57                    | 196146   |          |          |
| 17                    | 212875   |          |       | 58                    | 185968   | 4075000  |          |                       |          |          |       | 58                    | 193287   |          | $p_9$    |
| 18                    | 209814   |          |       |                       |          |          |          |                       |          |          |       | 59                    | 190428   |          |          |
| 19                    | 206752   |          |       |                       |          |          |          |                       |          |          |       |                       |          |          |          |
| 20                    | 203690   | 320000   | $p_3$ | 59                    | 209814   |          |          | 22                    | 219998   |          |       |                       |          |          |          |
| 21                    | 200721   |          |       | 60                    | 206752   |          |          | 23                    | 216961   |          |       | 60                    | 213924   |          |          |
|                       |          |          |       | 61                    | 203690   | 5650000  | $p_{10}$ | 24                    | 213924   |          |       | 61                    | 210887   |          |          |
|                       |          |          |       |                       |          |          |          | 25                    | 210887   |          |       | 62                    | 207939   |          | $p_{10}$ |
| 22                    | 212875   |          |       |                       |          |          |          | 26                    | 207939   |          |       | 63                    | 204991   |          |          |
| 23                    | 209814   |          |       |                       |          |          |          | 27                    | 204991   |          | $p_4$ |                       |          |          |          |
| 24                    | 206752   |          |       |                       |          |          |          | 28                    | 202042   |          |       |                       |          |          |          |
| 25                    | 203690   |          |       |                       |          |          |          | 29                    | 199094   |          |       |                       |          |          |          |
| 26                    | 200721   |          |       |                       |          |          |          | 30                    | 196146   |          |       |                       |          |          |          |
| 27                    | 197752   |          |       | 62                    | 210306   | 6240000  | $p_{11}$ |                       |          |          |       |                       |          |          |          |
| 28                    | 194783   |          |       |                       |          |          |          |                       |          |          |       |                       |          |          |          |
| 29                    | 191813   |          |       |                       |          |          |          | 31                    | 207939   |          |       | 64                    | 226072   |          |          |
| 30                    | 188844   |          |       |                       |          |          |          | 32                    | 204991   |          |       | 65                    | 223035   |          |          |
|                       |          |          |       |                       |          |          |          | 33                    | 202042   |          |       | 66                    | 219998   |          |          |
| 31                    | 200721   |          |       | 63                    | 222152   |          |          | 34                    | 199094   |          |       | 67                    | 216961   |          | $p_{11}$ |
| 32                    | 197752   |          |       | 64                    | 218998   |          | $p_{11}$ | 35                    | 196146   |          |       | 68                    | 213924   |          |          |
| 33                    | 194783   |          |       | 65                    | 215936   | 7170000  |          | 36                    | 193287   |          |       |                       |          |          |          |
| 34                    | 191813   |          |       |                       |          |          |          | 37                    | 190428   |          |       |                       |          |          |          |
| 35                    | 188844   |          |       |                       |          |          |          | 38                    | 187568   |          |       |                       |          |          |          |
| 36                    | 185968   |          |       |                       |          |          |          | 39                    | 184708   |          |       |                       |          |          |          |
| 37                    | 183090   |          |       |                       |          |          |          |                       |          |          |       |                       |          |          |          |
| 38                    | 180214   |          |       |                       |          |          |          |                       |          |          |       |                       |          |          |          |
| 39                    | 177326   |          |       |                       |          |          |          |                       |          |          |       |                       |          |          |          |

MOMENTS.

$$M_x = Rx - m.$$



| SPAN,<br>140<br>feet. |          |          |                       | SPAN,<br>140<br>feet. |          |          |                        | SPAN,<br>145<br>feet. |          |          |                       | SPAN,<br>145<br>feet. |          |          |                        |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        |
| 1                     | 244792   |          |                       | 41                    | 206285   |          |                        | 1                     | 251131   |          |                       | 41                    | 213391   |          |                        |
| 2                     | 241800   |          |                       | 42                    | 203356   |          |                        | 2                     | 248158   |          |                       | 42                    | 210481   |          |                        |
| 3                     | 238807   |          |                       | 43                    | 200514   |          | <i>p</i> <sub>6</sub>  | 3                     | 245186   |          |                       | 43                    | 207653   |          | <i>p</i> <sub>6</sub>  |
| 4                     | 235814   |          | <i>p</i> <sub>2</sub> | 44                    | 197671   |          |                        | 4                     | 242213   |          | <i>p</i> <sub>2</sub> | 44                    | 204825   |          |                        |
| 5                     | 232821   | 0        |                       | 45                    | 194827   | 1900000  |                        | 5                     | 239241   |          |                       | 45                    | 201998   | 1900000  |                        |
| 6                     | 229914   |          |                       |                       |          |          |                        | 6                     | 236351   |          |                       |                       |          |          |                        |
| 7                     | 227007   |          |                       |                       |          |          |                        | 7                     | 233461   |          |                       |                       |          |          |                        |
| 8                     | 224100   |          |                       |                       |          |          |                        | 8                     | 230571   |          |                       |                       |          |          |                        |
| 9                     | 236084   |          |                       | 46                    | 206285   |          |                        | 9                     | 242578   |          |                       | 46                    | 213391   |          |                        |
| 10                    | 233070   |          |                       | 47                    | 203356   |          |                        | 10                    | 239585   |          |                       | 47                    | 210481   |          |                        |
| 11                    | 230056   |          | <i>p</i> <sub>2</sub> | 48                    | 200514   |          | <i>p</i> <sub>7</sub>  | 11                    | 236674   |          | <i>p</i> <sub>2</sub> | 48                    | 207653   |          | <i>p</i> <sub>7</sub>  |
| 12                    | 227042   | 120000   |                       | 49                    | 197671   | 2550000  |                        | 12                    | 233764   |          |                       | 49                    | 204825   |          |                        |
| 13                    | 224028   |          |                       | 50                    | 194827   |          |                        | 13                    | 230853   | 120000   |                       | 50                    | 201998   | 2550000  |                        |
| 14                    | 236084   |          |                       | 51                    | 206285   |          |                        |                       |          |          |                       | 51                    | 213391   |          |                        |
| 15                    | 233070   |          |                       | 52                    | 203356   |          |                        | 14                    | 242578   |          |                       | 52                    | 210481   |          |                        |
| 16                    | 230056   |          |                       | 53                    | 200514   |          | <i>p</i> <sub>8</sub>  | 15                    | 239585   |          |                       | 53                    | 207653   |          | <i>p</i> <sub>8</sub>  |
| 17                    | 227042   |          | <i>p</i> <sub>3</sub> | 54                    | 197671   | 3275000  |                        | 16                    | 236674   |          |                       | 54                    | 204825   |          |                        |
| 18                    | 224028   |          |                       | 55                    | 194827   |          |                        | 17                    | 233764   |          |                       | 55                    | 201998   |          |                        |
| 19                    | 221014   | 320000   |                       |                       |          |          |                        | 18                    | 230853   |          | <i>p</i> <sub>3</sub> | 56                    | 199170   | 3275000  |                        |
| 20                    | 218000   |          |                       | 56                    | 206285   |          |                        | 19                    | 227943   |          |                       |                       |          |          |                        |
| 21                    | 215070   |          |                       | 57                    | 203356   |          | <i>p</i> <sub>9</sub>  | 20                    | 225032   |          |                       | 57                    | 210481   |          | <i>p</i> <sub>9</sub>  |
|                       |          |          |                       | 58                    | 200514   |          |                        | 21                    | 222122   |          |                       | 58                    | 207653   |          |                        |
|                       |          |          |                       | 59                    | 197671   | 4075000  |                        | 22                    | 219211   |          |                       | 59                    | 204825   |          |                        |
|                       |          |          |                       | 60                    | 194827   |          |                        |                       |          |          |                       | 60                    | 201998   |          |                        |
| 22                    | 227042   |          |                       |                       |          |          |                        |                       |          |          |                       |                       |          |          |                        |
| 23                    | 224028   |          |                       | 61                    | 218000   |          |                        | 23                    | 230853   |          |                       | 61                    | 225032   |          |                        |
| 24                    | 221014   |          |                       | 62                    | 215070   |          | <i>p</i> <sub>10</sub> | 24                    | 227943   |          |                       | 62                    | 222122   |          |                        |
| 25                    | 218000   |          |                       | 63                    | 212142   |          |                        | 25                    | 225032   |          |                       | 63                    | 219211   |          | <i>p</i> <sub>10</sub> |
| 26                    | 215070   |          | <i>p</i> <sub>4</sub> |                       |          |          |                        | 26                    | 222122   |          |                       | 64                    | 216301   |          |                        |
| 27                    | 212142   | 645000   |                       |                       |          |          |                        | 27                    | 219211   |          | <i>p</i> <sub>4</sub> | 65                    | 213391   |          |                        |
| 28                    | 209213   |          |                       |                       |          |          |                        | 28                    | 216301   |          |                       |                       |          |          |                        |
| 29                    | 206285   |          |                       | 64                    | 233070   |          |                        | 29                    | 213391   |          |                       |                       |          |          |                        |
| 30                    | 203356   |          |                       | 65                    | 230056   |          | <i>p</i> <sub>11</sub> | 30                    | 210481   |          |                       | 66                    | 233764   |          |                        |
|                       |          |          |                       | 66                    | 227042   |          |                        | 31                    | 207653   |          |                       | 67                    | 230853   |          |                        |
|                       |          |          |                       | 67                    | 224028   |          |                        |                       |          |          |                       | 68                    | 227943   |          |                        |
|                       |          |          |                       | 68                    | 221014   |          |                        |                       |          |          |                       | 69                    | 225032   |          | <i>p</i> <sub>11</sub> |
|                       |          |          |                       | 69                    | 218000   |          |                        |                       |          |          |                       | 70                    | 222122   |          |                        |
|                       |          |          |                       | 70                    | 215070   | 7170000  |                        |                       |          |          |                       | 71                    | 219211   |          |                        |
| 31                    | 215070   |          |                       |                       |          |          |                        |                       |          |          |                       | 72                    | 216301   |          |                        |
| 32                    | 212142   |          |                       |                       |          |          |                        |                       |          |          |                       | 73                    | 213391   |          |                        |
| 33                    | 209213   |          |                       |                       |          |          |                        | 32                    | 219211   |          |                       |                       |          |          |                        |
| 34                    | 206285   |          |                       |                       |          |          |                        | 33                    | 216301   |          |                       |                       |          |          |                        |
| 35                    | 203356   |          | <i>p</i> <sub>5</sub> |                       |          |          |                        | 34                    | 213391   |          |                       |                       |          |          |                        |
| 36                    | 200514   |          |                       |                       |          |          |                        | 35                    | 210481   |          |                       |                       |          |          |                        |
| 37                    | 197671   | 1095000  |                       |                       |          |          |                        | 36                    | 207653   |          | <i>p</i> <sub>5</sub> |                       |          |          |                        |
| 38                    | 194827   |          |                       |                       |          |          |                        | 37                    | 204825   |          |                       |                       |          |          |                        |
| 39                    | 191985   |          |                       |                       |          |          |                        | 38                    | 201998   |          |                       |                       |          |          |                        |
| 40                    | 189142   |          |                       |                       |          |          |                        | 39                    | 199170   |          |                       |                       |          |          |                        |
|                       |          |          |                       |                       |          |          |                        | 40                    | 196343   |          |                       |                       |          |          |                        |

## MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>150<br>feet. |          |          | SPAN,<br>150<br>feet. |          |          | SPAN,<br>155<br>feet. |                |          | SPAN,<br>155<br>feet. |          |             |    |        |         |                |
|-----------------------|----------|----------|-----------------------|----------|----------|-----------------------|----------------|----------|-----------------------|----------|-------------|----|--------|---------|----------------|
| <i>x</i>              | <i>R</i> | <i>m</i> | <i>x</i>              | <i>R</i> | <i>m</i> | <i>x</i>              | <i>R</i>       | <i>m</i> | <i>x</i>              | <i>R</i> | <i>m</i>    |    |        |         |                |
| 1                     | 257446   | 0        | $\hat{p}_2$           | 42       | 217533   | 1900000               | $\hat{p}_6$    | 1        | 263741                | 0        | $\hat{p}_2$ | 43 | 221403 | 1900000 | $\hat{p}_6$    |
| 2                     | 254493   |          |                       | 43       | 214720   |                       |                | 2        | 260806                |          |             | 44 | 218681 |         |                |
| 3                     | 251540   |          |                       | 44       | 211906   |                       |                | 3        | 257870                |          |             | 45 | 215958 |         |                |
| 4                     | 248586   |          |                       | 45       | 209093   |                       |                | 4        | 254935                |          |             | 46 | 213236 |         |                |
| 5                     | 245633   |          |                       | 46       | 206280   |                       |                | 5        | 252000                |          |             | 47 | 210515 |         |                |
| 6                     | 242760   |          |                       | 47       | 203466   |                       |                | 6        | 249141                |          |             | 48 | 207793 |         |                |
| 7                     | 239866   |          |                       | 48       | 200652   |                       |                | 7        | 246283                |          |             | 49 | 205070 |         |                |
| 8                     | 237013   |          |                       | 49       | 197838   |                       |                | 8        | 243425                |          |             | 50 | 202346 |         |                |
| 9                     | 249040   | 120000   | $\hat{p}_2$           | 50       | 209093   | 2550000               | $\hat{p}_7$    | 9        | 255470                | 120000   | $\hat{p}_2$ | 51 | 213236 | 2550000 | $\hat{p}_7$    |
| 10                    | 246066   |          |                       | 51       | 206280   |                       |                | 10       | 252515                |          |             | 52 | 210515 |         |                |
| 11                    | 243173   |          |                       | 52       | 203466   |                       |                | 11       | 249638                |          |             | 53 | 207793 |         |                |
| 12                    | 240280   |          |                       | 53       | 200652   |                       |                | 12       | 246761                |          |             | 54 | 205070 |         |                |
| 13                    | 237386   | 54       | 197838                | 13       | 243883   | 55                    | 202346         |          |                       |          |             |    |        |         |                |
| 14                    | 249040   | 320000   | $\hat{p}_3$           | 55       | 209093   | 3275000               | $\hat{p}_8$    | 14       | 255470                | 320000   | $\hat{p}_3$ | 56 | 215958 | 3275000 | $\hat{p}_8$    |
| 15                    | 246066   |          |                       | 56       | 206280   |                       |                | 15       | 252515                |          |             | 57 | 213236 |         |                |
| 16                    | 243173   |          |                       | 57       | 203466   |                       |                | 16       | 249638                |          |             | 58 | 210515 |         |                |
| 17                    | 240280   |          |                       | 58       | 200652   |                       |                | 17       | 246761                |          |             | 59 | 207793 |         |                |
| 18                    | 237386   | 59       | 197838                | 18       | 243883   | 60                    | 205070         |          |                       |          |             |    |        |         |                |
| 19                    | 234493   | 60       | 195024                | 19       | 241006   | 61                    | 202346         |          |                       |          |             |    |        |         |                |
| 20                    | 231600   | 61       | 192210                | 20       | 238128   | 62                    | 199622         |          |                       |          |             |    |        |         |                |
| 21                    | 228786   | 62       | 189396                | 21       | 235328   | 63                    | 196898         |          |                       |          |             |    |        |         |                |
| 22                    | 225973   | 63       | 186582                | 22       | 232528   | 64                    | 194174         |          |                       |          |             |    |        |         |                |
| 23                    | 237386   | 645000   | $\hat{p}_4$           | 64       | 225973   | 645000                | $\hat{p}_4$    | 23       | 243883                | 645000   | $\hat{p}_4$ | 65 | 229727 | 5650000 | $\hat{p}_{10}$ |
| 24                    | 234493   |          |                       | 65       | 223160   |                       |                | 24       | 241006                |          |             | 66 | 226926 |         |                |
| 25                    | 231600   |          |                       | 66       | 220346   |                       |                | 25       | 238128                |          |             | 67 | 224126 |         |                |
| 26                    | 228786   |          |                       | 67       | 217533   |                       |                | 26       | 235328                |          |             | 68 | 221403 |         |                |
| 27                    | 225973   |          |                       | 68       | 214720   |                       |                | 27       | 232528                |          |             | 69 | 218681 |         |                |
| 28                    | 223160   |          |                       | 69       | 211906   |                       |                | 28       | 229727                |          |             | 70 | 215958 |         |                |
| 29                    | 220346   | 70       | 209093                | 29       | 226926   | 71                    | 213236         |          |                       |          |             |    |        |         |                |
| 30                    | 217533   | 71       | 206280                | 30       | 224126   | 72                    | 210515         |          |                       |          |             |    |        |         |                |
| 31                    | 214720   | 72       | 203466                | 31       | 221403   | 73                    | 207793         |          |                       |          |             |    |        |         |                |
| 32                    | 225973   | 1095000  | $\hat{p}_5$           | 73       | 220346   | 7170000               | $\hat{p}_{11}$ | 32       | 218681                | 1095000  | $\hat{p}_5$ | 74 | 229727 | 7170000 | $\hat{p}_{11}$ |
| 33                    | 223160   |          |                       | 74       | 217533   |                       |                | 33       | 229727                |          |             | 75 | 226926 |         |                |
| 34                    | 220346   |          |                       | 75       | 214720   |                       |                | 34       | 226926                |          |             | 76 | 224126 |         |                |
| 35                    | 217533   |          |                       | 76       | 211906   |                       |                | 35       | 224126                |          |             | 77 | 221403 |         |                |
| 36                    | 214720   |          |                       | 77       | 209093   |                       |                | 36       | 221403                |          |             | 78 | 218681 |         |                |
| 37                    | 211906   |          |                       | 78       | 206280   |                       |                | 37       | 218681                |          |             | 79 | 215958 |         |                |
| 38                    | 209093   | 79       | 203466                | 38       | 215958   | 80                    | 213236         |          |                       |          |             |    |        |         |                |
| 39                    | 206280   | 80       | 200652                | 39       | 213236   | 81                    | 210515         |          |                       |          |             |    |        |         |                |
| 40                    | 203466   | 81       | 197838                | 40       | 210515   | 82                    | 207793         |          |                       |          |             |    |        |         |                |
| 41                    | 200733   | 82       | 195024                | 41       | 207793   | 83                    | 205070         |          |                       |          |             |    |        |         |                |
|                       |          | 83       | 192210                | 42       | 205070   | 84                    | 202346         |          |                       |          |             |    |        |         |                |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>160<br>feet. |          |          |                       | SPAN,<br>160<br>feet. |          |          |                        | SPAN,<br>160<br>feet. |          |          |                        | SPAN,<br>165<br>feet. |          |          |                       |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       |
| 1                     | 269725   |          |                       | 39                    | 219829   |          |                        | 75                    | 227967   |          |                        | 1                     | 275624   |          |                       |
| 2                     | 266881   |          |                       | 40                    | 217116   |          |                        | 76                    | 225254   |          |                        | 2                     | 272793   |          |                       |
| 3                     | 264037   |          |                       | 41                    | 214486   |          | <i>p</i> <sub>5</sub>  | 77                    | 222541   |          | <i>p</i> <sub>11</sub> | 3                     | 269963   |          |                       |
| 4                     | 261193   |          |                       | 42                    | 211849   |          |                        | 78                    | 219829   |          |                        | 4                     | 267133   |          |                       |
| 5                     | 258350   | 0        | <i>p</i> <sub>2</sub> |                       |          |          |                        | 79                    | 217116   |          |                        | 5                     | 264303   | 0        | <i>p</i> <sub>2</sub> |
| 6                     | 255506   |          |                       | 43                    | 227967   |          |                        |                       |          |          |                        | 6                     | 261545   |          |                       |
| 7                     | 252662   |          |                       | 44                    | 225254   |          |                        |                       |          |          |                        | 7                     | 258787   |          |                       |
| 8                     | 249818   |          |                       | 45                    | 222541   |          |                        |                       |          |          |                        | 8                     | 256030   |          |                       |
|                       |          |          |                       | 46                    | 219829   |          | <i>p</i> <sub>6</sub>  | 80                    | 227967   |          | <i>p</i> <sub>12</sub> |                       |          |          |                       |
| 9                     | 261880   |          |                       | 47                    | 217116   |          |                        |                       |          | 8245000  |                        | 9                     | 268181   |          |                       |
| 10                    | 258942   |          |                       | 48                    | 214486   |          |                        |                       |          |          |                        | 10                    | 265333   |          |                       |
| 11                    | 256079   |          | <i>p</i> <sub>2</sub> |                       |          |          |                        |                       |          |          |                        | 11                    | 262484   |          |                       |
| 12                    | 253197   | 120000   |                       | 49                    | 225254   |          |                        |                       |          |          |                        | 12                    | 259636   |          | <i>p</i> <sub>2</sub> |
| 13                    | 250354   |          |                       | 50                    | 222541   |          |                        |                       |          |          |                        | 13                    | 256787   |          |                       |
|                       |          |          |                       | 51                    | 219829   |          | <i>p</i> <sub>7</sub>  |                       |          |          |                        | 14                    | 253938   | 120000   |                       |
| 14                    | 261880   |          |                       | 52                    | 217116   |          |                        |                       |          |          |                        |                       |          |          |                       |
| 15                    | 258942   |          |                       | 53                    | 214486   |          |                        |                       |          |          |                        | 15                    | 265333   |          |                       |
| 16                    | 256079   |          |                       | 54                    | 211849   |          |                        |                       |          |          |                        | 16                    | 262484   |          |                       |
| 17                    | 253197   |          | <i>p</i> <sub>3</sub> |                       |          |          |                        |                       |          |          |                        | 17                    | 259636   |          |                       |
| 18                    | 250354   | 320000   |                       | 55                    | 222541   |          |                        |                       |          |          |                        | 18                    | 256787   |          | <i>p</i> <sub>3</sub> |
| 19                    | 247491   |          |                       | 56                    | 219829   |          |                        |                       |          |          |                        | 19                    | 253938   |          |                       |
| 20                    | 244628   |          |                       | 57                    | 217116   |          | <i>p</i> <sub>8</sub>  |                       |          |          |                        | 20                    | 251089   |          |                       |
| 21                    | 241840   |          |                       | 58                    | 214486   |          |                        |                       |          |          |                        | 21                    | 248313   |          |                       |
| 22                    | 239053   |          |                       | 59                    | 211849   |          |                        |                       |          |          |                        | 22                    | 245537   |          |                       |
| 23                    | 236255   |          |                       | 60                    | 209212   |          |                        |                       |          |          |                        | 23                    | 242761   |          |                       |
|                       |          |          |                       |                       |          |          |                        |                       |          |          |                        |                       |          |          |                       |
| 24                    | 247491   |          |                       | 61                    | 219829   |          |                        |                       |          |          |                        | 24                    | 253938   |          |                       |
| 25                    | 244628   |          |                       | 62                    | 217116   |          |                        |                       |          |          |                        | 25                    | 251089   |          |                       |
| 26                    | 241840   |          |                       | 63                    | 214486   |          | <i>p</i> <sub>9</sub>  |                       |          |          |                        | 26                    | 248313   |          |                       |
| 27                    | 239053   |          |                       | 64                    | 211849   |          |                        |                       |          |          |                        | 27                    | 245537   |          |                       |
| 28                    | 236255   |          | <i>p</i> <sub>4</sub> |                       |          |          |                        |                       |          |          |                        | 28                    | 242761   |          | <i>p</i> <sub>4</sub> |
| 29                    | 233467   |          |                       |                       |          |          |                        |                       |          |          |                        | 29                    | 239986   |          |                       |
| 30                    | 230680   | 645000   |                       | 65                    | 233467   |          |                        |                       |          |          |                        | 30                    | 237211   |          |                       |
| 31                    | 227967   |          |                       | 66                    | 230680   |          |                        |                       |          |          |                        | 31                    | 234507   |          |                       |
| 32                    | 225254   |          |                       | 67                    | 227967   |          | <i>p</i> <sub>10</sub> |                       |          |          |                        | 32                    | 231804   |          |                       |
|                       |          |          |                       | 68                    | 225254   |          |                        |                       |          |          |                        |                       |          |          |                       |
|                       |          |          |                       |                       |          |          |                        |                       |          |          |                        |                       |          |          |                       |
| 33                    | 236255   |          |                       | 69                    | 244628   |          |                        |                       |          |          |                        | 33                    | 242761   |          |                       |
| 34                    | 233467   |          | <i>p</i> <sub>5</sub> | 70                    | 241840   |          |                        |                       |          |          |                        | 34                    | 239986   |          |                       |
| 35                    | 230680   |          |                       | 71                    | 239053   |          |                        |                       |          |          |                        | 35                    | 237211   |          | <i>p</i> <sub>5</sub> |
| 36                    | 227967   |          |                       | 72                    | 236255   |          | <i>p</i> <sub>11</sub> |                       |          |          |                        | 36                    | 234507   |          |                       |
| 37                    | 225254   | 1095000  |                       | 73                    | 233467   |          |                        |                       |          |          |                        | 37                    | 231804   |          |                       |
| 38                    | 222541   |          |                       | 74                    | 230680   |          |                        |                       |          |          |                        | 38                    | 229101   |          |                       |

## MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>165<br>feet. |          |          |                        | SPAN,<br>165<br>feet. |          |          |                        | SPAN,<br>170<br>feet. |          |          |                        | SPAN,<br>170<br>feet. |                        |          |                        |         |                       |
|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|------------------------|-----------------------|------------------------|----------|------------------------|---------|-----------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i>               | <i>m</i> |                        |         |                       |
| 39                    | 226397   | 1095000  | <i>p</i> <sub>5</sub>  | 76                    | 231804   | 7170000  | <i>p</i> <sub>11</sub> | 1                     | 281535   | 0        | <i>p</i> <sub>2</sub>  | 40                    | 230235                 | 1095000  | <i>p</i> <sub>5</sub>  |         |                       |
| 40                    | 223696   |          |                        | 77                    | 229101   |          |                        | 2                     | 278717   |          |                        | 41                    | 227611                 |          |                        |         |                       |
| 41                    | 221072   |          |                        | 78                    | 226397   |          |                        | 3                     | 275900   |          |                        | 42                    | 224987                 |          |                        |         |                       |
| 42                    | 218447   |          |                        | 79                    | 223696   |          |                        | 4                     | 273082   |          |                        | 43                    | 222364                 |          |                        |         |                       |
| 43                    | 215823   |          |                        | 80                    | 221072   |          |                        | 5                     | 270264   |          |                        |                       |                        |          |                        |         |                       |
|                       |          |          |                        |                       |          |          |                        | 6                     | 267517   |          |                        |                       |                        | 44       | 238317                 | 1900000 | <i>p</i> <sub>6</sub> |
| 44                    | 231804   | 1900000  | <i>p</i> <sub>6</sub>  | 81                    | 231804   | 8245000  | <i>p</i> <sub>12</sub> | 7                     | 264770   |          |                        |                       |                        | 45       | 235624                 |         |                       |
| 45                    | 229101   |          |                        | 82                    | 229101   |          |                        | 8                     | 262023   |          |                        | 46                    | 232929                 |          |                        |         |                       |
| 46                    | 226397   |          |                        | 83                    | 226397   |          |                        | 9                     | 274188   | 47       | 230235                 |                       |                        |          |                        |         |                       |
| 47                    | 223696   |          |                        |                       |          |          |                        | 10                    | 271353   | 48       | 227611                 |                       |                        |          |                        |         |                       |
| 48                    | 221072   |          |                        |                       |          |          |                        | 11                    | 268687   |          |                        |                       |                        |          |                        |         |                       |
|                       |          |          |                        |                       |          |          |                        | 12                    | 265823   | 1200000  | <i>p</i> <sub>2</sub>  | 49                    | 238317                 | 2550000  | <i>p</i> <sub>7</sub>  |         |                       |
| 49                    | 231804   | 2550000  | <i>p</i> <sub>7</sub>  |                       |          |          |                        | 13                    | 263059   |          |                        |                       |                        |          |                        | 50      | 235624                |
| 50                    | 229101   |          |                        | 14                    | 260294   | 15       | 271353                 | 51                    | 232929   |          |                        |                       |                        |          |                        |         |                       |
| 51                    | 226397   |          |                        | 16                    | 268687   | 17       | 265823                 | 52                    | 230235   |          |                        |                       |                        |          |                        |         |                       |
| 52                    | 223696   |          |                        | 18                    | 263059   | 19       | 260294                 | 53                    | 227611   |          |                        |                       |                        |          |                        |         |                       |
| 53                    | 221072   |          |                        |                       |          | 20       | 257529                 | 54                    | 224987   |          |                        |                       |                        |          |                        |         |                       |
| 54                    | 218447   |          |                        | 21                    | 254764   |          |                        | 55                    | 235624   | 3200000  | <i>p</i> <sub>3</sub>  | 56                    | 232929                 | 3275000  | <i>p</i> <sub>8</sub>  |         |                       |
|                       |          |          |                        | 22                    | 252000   |          |                        | 57                    | 230235   |          |                        |                       |                        |          |                        |         |                       |
| 55                    | 229101   | 3275000  | <i>p</i> <sub>8</sub>  | 23                    | 249235   | 24       | 260294                 | 58                    | 227611   |          |                        |                       |                        |          |                        |         |                       |
| 56                    | 226397   |          |                        | 25                    | 257529   | 26       | 254764                 | 59                    | 224987   |          |                        |                       |                        |          |                        |         |                       |
| 57                    | 223696   |          |                        | 27                    | 252000   | 28       | 249235                 | 60                    | 222364   |          |                        |                       |                        |          |                        |         |                       |
| 58                    | 221072   |          |                        | 29                    | 246470   | 29       | 246470                 |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 59                    | 218447   |          |                        |                       |          | 30       | 243705                 |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 60                    | 215823   |          |                        | 31                    | 241010   |          |                        | 61                    | 232929   | 6450000  | <i>p</i> <sub>4</sub>  | 62                    | 230235                 | 4075000  | <i>p</i> <sub>9</sub>  |         |                       |
|                       |          |          |                        | 32                    | 238317   |          |                        | 63                    | 227611   |          |                        |                       |                        |          |                        |         |                       |
| 61                    | 226397   | 4075000  | <i>p</i> <sub>9</sub>  | 33                    | 235624   | 34       | 246470                 | 64                    | 224987   |          |                        |                       |                        |          |                        |         |                       |
| 62                    | 223696   |          |                        | 35                    | 243705   | 65       | 222364                 |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 63                    | 221072   |          |                        | 36                    | 241010   |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 64                    | 218447   |          |                        | 37                    | 238317   |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 65                    | 215823   |          |                        | 38                    | 235624   |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
|                       |          |          |                        | 39                    | 232929   |          |                        | 66                    | 243705   | 5650000  | <i>p</i> <sub>10</sub> | 67                    | 241010                 | 5650000  | <i>p</i> <sub>10</sub> |         |                       |
| 66                    | 237211   | 5650000  | <i>p</i> <sub>10</sub> |                       |          |          |                        | 68                    | 238317   |          |                        |                       |                        |          |                        |         |                       |
| 67                    | 234507   |          |                        | 69                    | 235624   | 69       | 235624                 |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 68                    | 231804   |          |                        |                       |          |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 69                    | 229101   |          |                        |                       |          |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
|                       |          |          |                        |                       |          |          |                        |                       |          | 70       | 254764                 | 7170000               | <i>p</i> <sub>11</sub> |          |                        |         |                       |
|                       |          |          |                        |                       |          |          |                        | 71                    | 252000   |          |                        |                       |                        |          |                        |         |                       |
| 70                    | 248313   | 7170000  | <i>p</i> <sub>11</sub> |                       |          |          |                        | 72                    | 249235   |          |                        |                       |                        |          |                        |         |                       |
| 71                    | 245537   |          |                        | 73                    | 246470   |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 72                    | 242761   |          |                        | 74                    | 243705   |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 73                    | 239986   |          |                        | 75                    | 241010   |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 74                    | 237211   |          |                        | 76                    | 238317   |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |
| 75                    | 234507   |          |                        |                       |          |          |                        |                       |          |          |                        |                       |                        |          |                        |         |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>170<br>feet. |          |          | SPAN,<br>175<br>feet. |          |          | SPAN,<br>175<br>feet. |          |          | SPAN,<br>175<br>feet. |          |          |
|-----------------------|----------|----------|-----------------------|----------|----------|-----------------------|----------|----------|-----------------------|----------|----------|
| <i>x</i>              | <i>R</i> | <i>m</i> |
| 77                    | 235624   | 7170000  | 1                     | 287451   | 0        | 42                    | 231508   | 1095000  | 77                    | 242114   | 7170000  |
| 78                    | 232930   |          | 2                     | 284645   |          | 43                    | 228890   |          | 78                    | 239428   |          |
| 79                    | 230235   |          | 3                     | 281840   |          | 44                    | 244800   |          | 79                    | 236742   |          |
| 80                    | 227611   |          | 4                     | 279034   |          | 45                    | 242114   |          | 80                    | 234125   |          |
|                       |          |          | 5                     | 276228   |          | 46                    | 239428   |          |                       |          |          |
| 81                    | 238317   | 8245000  | 6                     | 273491   | 120000   | 47                    | 236742   | 1900000  | 81                    | 244800   | 8245000  |
| 82                    | 235624   |          | 7                     | 270754   |          | 48                    | 234125   |          | 82                    | 242114   |          |
| 83                    | 232929   |          | 8                     | 268017   |          | 49                    | 244800   |          | 83                    | 239428   |          |
| 84                    | 230235   |          | 9                     | 280194   |          | 50                    | 242114   |          | 84                    | 236742   |          |
| 85                    | 227611   |          | 10                    | 277370   |          | 51                    | 239428   |          | 85                    | 234125   |          |
|                       |          |          | 11                    | 274616   |          | 52                    | 236742   |          | 86                    | 231508   |          |
|                       |          |          | 12                    | 271862   |          | 53                    | 234125   |          | 87                    | 228890   |          |
|                       |          |          | 13                    | 269108   |          | 54                    | 244800   |          | 88                    | 226273   |          |
|                       |          |          | 14                    | 266353   |          | 55                    | 242114   |          |                       |          |          |
|                       |          |          | 15                    | 277370   |          | 56                    | 239428   |          |                       |          |          |
|                       |          |          | 16                    | 274616   |          | 57                    | 236742   |          |                       |          |          |
|                       |          |          | 17                    | 271862   |          | 58                    | 234125   |          |                       |          |          |
|                       |          |          | 18                    | 269108   |          | 59                    | 231508   |          |                       |          |          |
|                       |          |          | 19                    | 266353   |          | 60                    | 228890   |          |                       |          |          |
|                       |          | 20       | 263600                | 61       | 239428   |                       |          |          |                       |          |          |
|                       |          | 21       | 260914                | 62       | 236742   |                       |          |          |                       |          |          |
|                       |          | 22       | 258228                | 63       | 234125   |                       |          |          |                       |          |          |
|                       |          | 23       | 255542                | 64       | 231508   |                       |          |          |                       |          |          |
|                       |          | 24       | 252857                | 65       | 228890   |                       |          |          |                       |          |          |
|                       |          | 25       | 263600                | 66       | 250171   |                       |          |          |                       |          |          |
|                       |          | 26       | 260914                | 67       | 247485   |                       |          |          |                       |          |          |
|                       |          | 27       | 258228                | 68       | 244800   |                       |          |          |                       |          |          |
|                       |          | 28       | 255542                | 69       | 242114   |                       |          |          |                       |          |          |
|                       |          | 29       | 252857                | 70       | 239428   |                       |          |          |                       |          |          |
|                       |          | 30       | 250171                | 71       | 258228   |                       |          |          |                       |          |          |
|                       |          | 31       | 247485                | 72       | 255542   |                       |          |          |                       |          |          |
|                       |          | 32       | 244800                | 73       | 252857   |                       |          |          |                       |          |          |
|                       |          | 33       | 242114                | 74       | 250171   |                       |          |          |                       |          |          |
|                       |          | 34       | 252857                | 75       | 247485   |                       |          |          |                       |          |          |
|                       |          | 35       | 250171                | 76       | 244800   |                       |          |          |                       |          |          |
|                       |          | 36       | 247485                |          |          |                       |          |          |                       |          |          |
|                       |          | 37       | 244800                |          |          |                       |          |          |                       |          |          |
|                       |          | 38       | 242114                |          |          |                       |          |          |                       |          |          |
|                       |          | 39       | 239428                |          |          |                       |          |          |                       |          |          |
|                       |          | 40       | 236742                |          |          |                       |          |          |                       |          |          |
|                       |          | 41       | 234125                |          |          |                       |          |          |                       |          |          |

## MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>180<br>feet. |        |         |       | SPAN,<br>180<br>feet. |        |     |          | SPAN,<br>180<br>feet. |        |     |        | SPAN,<br>185<br>feet. |        |        |       |
|-----------------------|--------|---------|-------|-----------------------|--------|-----|----------|-----------------------|--------|-----|--------|-----------------------|--------|--------|-------|
| $x$                   | $R$    | $m$     |       | $x$                   | $R$    | $m$ |          | $x$                   | $R$    | $m$ |        | $x$                   | $R$    | $m$    |       |
| 1                     | 293372 |         |       | 41                    | 240610 |     |          | 80                    | 240610 |     |        | 1                     | 299037 |        |       |
| 2                     | 290577 |         |       | 42                    | 238000 |     |          | 81                    | 238000 |     |        | 2                     | 296318 |        |       |
| 3                     | 287783 |         |       | 43                    | 235391 |     | $p_5$    | 82                    | 235391 |     | 717000 | 3                     | 293600 |        |       |
| 4                     | 284988 |         |       | 44                    | 232777 |     |          |                       |        |     |        | 4                     | 290881 |        |       |
| 5                     | 282194 |         | $p_2$ |                       |        |     |          |                       |        |     |        | 5                     | 288162 |        | $p_2$ |
| 6                     | 279466 | 0       |       |                       |        |     |          |                       |        |     |        | 6                     | 285443 | 0      |       |
| 7                     | 276738 |         |       | 45                    | 248444 |     |          | 83                    | 245833 |     |        | 7                     | 282724 |        |       |
| 8                     | 274010 |         |       | 46                    | 245833 |     |          | 84                    | 243221 |     |        | 8                     | 280005 |        |       |
|                       |        |         |       | 47                    | 243221 |     | $p_6$    | 85                    | 240610 |     |        |                       |        |        |       |
|                       |        |         |       | 48                    | 240610 |     |          | 86                    | 238000 |     |        |                       |        |        |       |
|                       |        |         |       | 49                    | 238000 |     |          | 87                    | 235391 |     |        |                       |        |        |       |
| 9                     | 286200 |         |       |                       |        |     |          | 88                    | 232777 |     |        | 9                     | 292204 |        |       |
| 10                    | 283388 |         |       |                       |        |     |          | 89                    | 230166 |     |        | 10                    | 289404 |        |       |
| 11                    | 280644 |         |       |                       |        |     |          | 90                    | 227621 |     |        | 11                    | 286669 |        |       |
| 12                    | 277900 |         | $p_2$ | 50                    | 248444 |     |          |                       |        |     |        | 12                    | 283934 |        | $p_2$ |
| 13                    | 275155 | 120000  |       | 51                    | 245833 |     |          |                       |        |     |        | 13                    | 281120 | 120000 |       |
| 14                    | 272410 |         |       | 52                    | 243221 |     |          |                       |        |     |        | 14                    | 278464 |        |       |
|                       |        |         |       | 53                    | 240610 |     | $p_7$    |                       |        |     |        |                       |        |        |       |
|                       |        |         |       | 54                    | 238000 |     |          |                       |        |     |        |                       |        |        |       |
|                       |        |         |       | 55                    | 235391 |     |          |                       |        |     |        |                       |        |        |       |
| 15                    | 283388 |         |       |                       |        |     |          |                       |        |     |        | 15                    | 289404 |        |       |
| 16                    | 280644 |         |       | 56                    | 245833 |     |          |                       |        |     |        | 16                    | 286669 |        |       |
| 17                    | 277900 |         |       | 57                    | 243221 |     |          |                       |        |     |        | 17                    | 283934 |        |       |
| 18                    | 275155 |         | $p_3$ | 58                    | 240610 |     |          |                       |        |     |        | 18                    | 281120 |        |       |
| 19                    | 272410 |         |       | 59                    | 238000 |     | $p_8$    |                       |        |     |        | 19                    | 278464 |        | $p_3$ |
| 20                    | 269665 |         |       | 60                    | 235391 |     |          |                       |        |     |        | 20                    | 275729 |        |       |
| 21                    | 266988 | 320000  |       |                       |        |     |          |                       |        |     |        | 21                    | 273058 |        |       |
| 22                    | 264310 |         |       |                       |        |     |          |                       |        |     |        | 22                    | 270388 |        |       |
| 23                    | 261633 |         |       |                       |        |     |          |                       |        |     |        | 23                    | 267717 |        |       |
| 24                    | 258955 |         |       |                       |        |     |          |                       |        |     |        | 24                    | 265047 |        |       |
|                       |        |         |       | 61                    | 245833 |     |          |                       |        |     |        |                       |        |        |       |
|                       |        |         |       | 62                    | 243221 |     |          |                       |        |     |        | 25                    | 275729 |        |       |
|                       |        |         |       | 63                    | 240610 |     |          |                       |        |     |        | 26                    | 273058 |        |       |
| 25                    | 269665 |         |       | 64                    | 238000 |     | $p_9$    |                       |        |     |        | 27                    | 270388 |        |       |
| 26                    | 266988 |         |       | 65                    | 235391 |     |          |                       |        |     |        | 28                    | 267717 |        |       |
| 27                    | 264310 |         |       | 66                    | 232777 |     |          |                       |        |     |        | 29                    | 265047 |        |       |
| 28                    | 261633 |         |       | 67                    | 230166 |     |          |                       |        |     |        | 30                    | 262377 |        |       |
| 29                    | 258955 |         | $p_4$ |                       |        |     |          |                       |        |     |        | 31                    | 259770 |        |       |
| 30                    | 256277 | 645000  |       |                       |        |     |          |                       |        |     |        | 32                    | 257165 |        |       |
| 31                    | 253655 |         |       |                       |        |     |          |                       |        |     |        | 33                    | 254560 |        |       |
| 32                    | 251055 |         |       | 68                    | 251055 |     |          |                       |        |     |        | 34                    | 251955 |        |       |
| 33                    | 248444 |         |       | 69                    | 248444 |     |          |                       |        |     |        |                       |        |        |       |
| 34                    | 245833 |         |       | 70                    | 245833 |     |          |                       |        |     |        |                       |        |        |       |
|                       |        |         |       | 71                    | 243221 |     | $p_{10}$ |                       |        |     |        |                       |        |        |       |
|                       |        |         |       | 72                    | 240610 |     |          |                       |        |     |        |                       |        |        |       |
| 35                    | 256277 |         |       |                       |        |     |          |                       |        |     |        | 35                    | 262377 |        |       |
| 36                    | 253655 |         |       |                       |        |     |          |                       |        |     |        | 36                    | 259770 |        |       |
| 37                    | 251055 |         | $p_5$ | 73                    | 258955 |     |          |                       |        |     |        | 37                    | 257165 |        | $p_5$ |
| 38                    | 248444 |         |       | 74                    | 256277 |     |          |                       |        |     |        | 38                    | 254560 |        |       |
| 39                    | 245833 | 1095000 |       | 75                    | 253655 |     |          |                       |        |     |        | 39                    | 251955 |        |       |
| 40                    | 243221 |         |       | 76                    | 251055 |     |          |                       |        |     |        | 40                    | 249350 |        |       |
|                       |        |         |       | 77                    | 248444 |     | $p_{11}$ |                       |        |     |        |                       |        |        |       |
|                       |        |         |       | 78                    | 245833 |     |          |                       |        |     |        |                       |        |        |       |
|                       |        |         |       | 79                    | 243221 |     |          |                       |        |     |        |                       |        |        |       |

For all values of  $x$  below  $x = 67$ , a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table.

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>185<br>feet. |          |          |                        | SPAN,<br>185<br>feet.  |                       |          |                        | SPAN,<br>190<br>feet.  |          |          |                       | SPAN,<br>190<br>feet. |          |          |                        |
|-----------------------|----------|----------|------------------------|--|-----------------------|----------|------------------------|--|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>   | <i>R</i>              | <i>m</i> |                        | <i>x</i>   | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        |
| 41                    | 246810   | 1095000  | <i>P</i> <sub>5</sub>  | 80   | 246810                | 7170000  | <i>P</i> <sub>11</sub> | 1  | 304657   | 0        | <i>P</i> <sub>2</sub> | 41                    | 252932   | 1095000  | <i>P</i> <sub>5</sub>  |
| 42                    | 244269   |          |                        | 81   | 244269                |          |                        | 2  | 301947   |          |                       | 42                    | 250396   |          |                        |
| 43                    | 241729   |          |                        | 82   | 241729                |          |                        | 3  | 299236   |          |                       | 43                    | 247859   |          |                        |
| 44                    | 239188   |          |                        | 83   | 239188                |          |                        | 4  | 296526   |          |                       | 44                    | 245322   |          |                        |
|                       |          |          |                        | 84   | 236647                |          |                        | 5  | 293815   |          |                       | 45                    | 242785   |          |                        |
| 45                    | 254560   | 1900000  | <i>P</i> <sub>6</sub>  | 85   | 246810                | 8245000  | <i>P</i> <sub>12</sub> | 6  | 291167   | 120000   | <i>P</i> <sub>2</sub> | 46                    | 258069   | 1900000  | <i>P</i> <sub>6</sub>  |
| 46                    | 251955   |          |                        | 86   | 244269                |          |                        | 7  | 288520   |          |                       | 47                    | 255469   |          |                        |
| 47                    | 249350   |          |                        | 87   | 241729                |          |                        | 8  | 285872   |          |                       | 48                    | 252932   |          |                        |
| 48                    | 246810   |          |                        | 88   | 239188                |          |                        | 9  | 283224   |          |                       | 49                    | 250396   |          |                        |
| 49                    | 244269   |          |                        | 89   | 236647                |          |                        | 10   | 280676   |          |                       | 50                    | 247859   |          |                        |
| 50                    | 241729   |          |                        | 90   | 234106                |          |                        | 11   | 278128   |          |                       |                       |          |          |                        |
| 51                    | 239188   |          |                        | 91   | 231566                |          |                        | 12   | 275580   |          |                       |                       |          |          |                        |
|                       |          |          |                        | 92   | 229024                |          |                        | 13   | 273032   |          |                       |                       |          |          |                        |
|                       |          |          |                        | 93   | 230284                |          |                        | 14   | 270484   |          |                       |                       |          |          |                        |
| 52                    | 249350   |          |                        | 2550000  | <i>P</i> <sub>7</sub> |          |                        | For all values of <i>x</i> below <i>x</i> = 57, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table. |          |          |                       | 15                    | 295418   |          |                        |
| 53                    | 246810   | 16       | 292870                 |  |                       | 52       | 255469                 |  |          |          |                       |                       |          |          |                        |
| 54                    | 244269   | 17       | 290322                 |  |                       | 53       | 252932                 |  |          |          |                       |                       |          |          |                        |
| 55                    | 241729   | 18       | 287774                 |  |                       | 54       | 250396                 |  |          |          |                       |                       |          |          |                        |
| 56                    | 239188   | 19       | 285226                 |  |                       | 55       | 247859                 |  |          |          |                       |                       |          |          |                        |
| 57                    | 236647   | 20       | 282678                 |  |                       | 56       | 245322                 |  |          |          |                       |                       |          |          |                        |
| 58                    | 246810   | 3275000  | <i>P</i> <sub>8</sub>  | For all values of <i>x</i> below <i>x</i> = 57, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table. |                       |          |                        | 21   | 281785   | 645000   | <i>P</i> <sub>4</sub> | 57                    | 242785   | 3275000  | <i>P</i> <sub>8</sub>  |
| 59                    | 244269   |          |                        |  |                       |          |                        | 22   | 279237   |          |                       | 58                    | 252932   |          |                        |
| 60                    | 241729   |          |                        |  |                       |          |                        | 23   | 276689   |          |                       | 59                    | 250396   |          |                        |
| 61                    | 239188   |          |                        |  |                       |          |                        | 24   | 274141   |          |                       | 60                    | 247859   |          |                        |
| 62                    | 236647   |          |                        |  |                       |          |                        | 25   | 271593   |          |                       | 61                    | 245322   |          |                        |
| 63                    | 246810   | 4075000  | <i>P</i> <sub>9</sub>  | For all values of <i>x</i> below <i>x</i> = 57, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table. |                       |          |                        | 26   | 268469   | 1095000  | <i>P</i> <sub>5</sub> | 62                    | 242785   | 4075000  | <i>P</i> <sub>9</sub>  |
| 64                    | 244269   |          |                        |  |                       |          |                        | 27   | 265921   |          |                       | 63                    | 240315   |          |                        |
| 65                    | 241729   |          |                        |  |                       |          |                        | 28   | 263373   |          |                       | 64                    | 250396   |          |                        |
| 66                    | 239188   |          |                        |  |                       |          |                        | 29   | 260825   |          |                       | 65                    | 247859   |          |                        |
| 67                    | 236647   |          |                        |  |                       |          |                        | 30   | 258277   |          |                       | 66                    | 245322   |          |                        |
| 68                    | 234106   |          |                        |  |                       |          |                        | 31   | 255729   |          |                       | 67                    | 242785   |          |                        |
| 69                    | 254560   | 5650000  | <i>P</i> <sub>10</sub> | For all values of <i>x</i> below <i>x</i> = 57, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table. |                       |          |                        | 32   | 265869   | 645000   | <i>P</i> <sub>4</sub> | 68                    | 240315   | 5650000  | <i>P</i> <sub>10</sub> |
| 70                    | 251955   |          |                        |  |                       |          |                        | 33   | 263321   |          |                       | 69                    | 260669   |          |                        |
| 71                    | 249350   |          |                        |  |                       |          |                        | 34   | 260773   |          |                       | 70                    | 258069   |          |                        |
| 72                    | 246810   |          |                        |  |                       |          |                        | 35   | 258225   |          |                       | 71                    | 255469   |          |                        |
| 73                    | 244269   |          |                        |  |                       |          |                        | 36   | 255677   |          |                       | 72                    | 252932   |          |                        |
| 74                    | 262377   | 7170000  | <i>P</i> <sub>11</sub> | For all values of <i>x</i> below <i>x</i> = 57, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table. |                       |          |                        | 37   | 268469   | 1095000  | <i>P</i> <sub>5</sub> | 73                    | 250396   | 7170000  | <i>P</i> <sub>11</sub> |
| 75                    | 259770   |          |                        |  |                       |          |                        | 38   | 265921   |          |                       | 74                    | 268469   |          |                        |
| 76                    | 257165   |          |                        |  |                       |          |                        | 39   | 263373   |          |                       | 75                    | 265869   |          |                        |
| 77                    | 254560   |          |                        |  |                       |          |                        | 40   | 260825   |          |                       | 76                    | 263269   |          |                        |
| 78                    | 251955   |          |                        |  |                       |          |                        |  |          |          |                       | 77                    | 260669   |          |                        |
| 79                    | 249350   |          |                        |  |                       |          |                        |  |          |          |                       | 78                    | 258069   |          |                        |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>190<br>feet. |          |          |                        | SPAN,<br>195<br>feet. |          |          |                       | SPAN,<br>195<br>feet. |                       |          |                        | SPAN,<br>195<br>feet. |                        |          |                        |         |                        |
|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|-----------------------|-----------------------|----------|------------------------|-----------------------|------------------------|----------|------------------------|---------|------------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i>              | <i>m</i> |                        | <i>x</i>              | <i>R</i>               | <i>m</i> |                        |         |                        |
| 79                    | 255469   | 7170000  | <i>P</i> <sub>11</sub> | 1                     | 310297   | 0        | <i>P</i> <sub>2</sub> | 41                    | 259056                | 1095000  | <i>P</i> <sub>5</sub>  | 79                    | 261589                 | 7170000  | <i>P</i> <sub>11</sub> |         |                        |
| 80                    | 252932   |          |                        | 2                     | 307595   |          |                       | 42                    | 256522                |          |                        | 80                    | 259056                 |          |                        |         |                        |
| 81                    | 250396   |          |                        | 3                     | 304892   |          |                       | 43                    | 253989                |          |                        | 81                    | 256522                 |          |                        |         |                        |
| 82                    | 247859   |          |                        | 4                     | 302189   |          |                       | 44                    | 251455                |          |                        | 82                    | 253989                 |          |                        |         |                        |
| 83                    | 245322   |          |                        | 5                     | 299487   |          |                       | 45                    | 248922                |          |                        | 83                    | 251455                 |          |                        |         |                        |
| 84                    | 242785   |          |                        | 6                     | 296846   |          |                       |                       |                       | 84       | 248922                 |                       |                        |          |                        |         |                        |
| 85                    | 240315   |          |                        | 7                     | 294205   |          |                       |                       |                       | 85       | 246450                 |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 8                     | 291564   |          |                       |                       |                       |          |                        |                       |                        |          |                        |         |                        |
| 86                    | 250396   | 8245000  | <i>P</i> <sub>12</sub> | 9                     | 303846   | 120000   | <i>P</i> <sub>2</sub> | 46                    | 264184                | 1900000  | <i>P</i> <sub>6</sub>  | 86                    | 256522                 |          |                        | 8245000 | <i>P</i> <sub>12</sub> |
| 87                    | 247859   |          |                        | 10                    | 301128   |          |                       | 47                    | 261589                |          |                        | 87                    | 253989                 |          |                        |         |                        |
| 88                    | 245322   |          |                        | 11                    | 298471   |          |                       | 48                    | 259056                |          |                        | 88                    | 251455                 |          |                        |         |                        |
| 89                    | 242785   |          |                        | 12                    | 295815   |          |                       | 49                    | 256522                |          |                        | 89                    | 248922                 |          |                        |         |                        |
| 90                    | 240315   |          |                        | 13                    | 293158   |          |                       | 50                    | 253989                |          |                        | 90                    | 246450                 |          |                        |         |                        |
| 91                    | 237841   |          |                        | 14                    | 290502   | 51       | 251455                | 91                    | 243978                |          |                        |                       |                        |          |                        |         |                        |
| 92                    | 235368   |          |                        | 15                    | 287845   | 52       | 261589                | 92                    | 241506                |          |                        |                       |                        |          |                        |         |                        |
| 93                    | 232894   |          |                        |                       |          | 53       | 259056                | 93                    | 239035                |          |                        |                       |                        |          |                        |         |                        |
| 94                    | 230420   |          |                        |                       |          | 54       | 256522                | 94                    | 236564                |          |                        |                       |                        |          |                        |         |                        |
| 95                    | 227946   |          |                        |                       |          | 55       | 253989                | 95                    | 234153                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        |                       |          | 56       | 251455                | 96                    | 231743                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        |                       |          | 57       | 248922                | 97                    | 229333                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        |                       |          | 16       | 298471                | 320000                | <i>P</i> <sub>3</sub> | 58       | 259056                 | 2550000               | <i>P</i> <sub>7</sub>  | 98       | 226923                 |         |                        |
|                       |          |          |                        |                       |          | 17       | 295815                |                       |                       | 59       | 256522                 |                       |                        | 3275000  | <i>P</i> <sub>8</sub>  |         |                        |
|                       |          |          |                        |                       |          | 18       | 293158                |                       |                       | 60       | 253989                 |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 19                    | 290502   | 61       | 251455                |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 20                    | 287805   | 62       | 248922                |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 21                    | 285189   | 63       | 259056                |                       |                       | 4075000  | <i>P</i> <sub>9</sub>  |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 22                    | 282532   | 64       | 256522                |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 23                    | 279876   | 65       | 253989                |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 24                    | 277219   | 66       | 251455                |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        |                       |          | 67       | 248922                |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 25                    | 287845   | 645000   | <i>P</i> <sub>4</sub> | 68                    | 246450                | 5650000  | <i>P</i> <sub>10</sub> |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 26                    | 285189   |          |                       | 69                    | 266779                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 27                    | 282532   |          |                       | 70                    | 264184                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 28                    | 279876   |          |                       | 71                    | 261589                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 29                    | 277219   |          |                       | 72                    | 259056                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 30                    | 274563   |          |                       | 73                    | 256522                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 31                    | 271969   |          |                       |                       |                       |          |                        | 7170000               | <i>P</i> <sub>11</sub> |          |                        |         |                        |
|                       |          |          |                        | 32                    | 269374   |          |                       |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 33                    | 266779   |          |                       |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 34                    | 264184   |          |                       |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        |                       |          |          |                       |                       |                       |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 35                    | 274563   | 1095000  | <i>P</i> <sub>5</sub> | 74                    | 274563                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 36                    | 271969   |          |                       | 75                    | 271964                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 37                    | 269374   |          |                       | 76                    | 269374                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 38                    | 266779   |          |                       | 77                    | 266779                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 39                    | 264184   |          |                       | 78                    | 264184                |          |                        |                       |                        |          |                        |         |                        |
|                       |          |          |                        | 40                    | 261589   |          |                       |                       |                       |          |                        |                       |                        |          |                        |         |                        |

For all values of *x* below *x* = 50, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table.

For all values of *x* below *x* = 45, a uniformly distributed load of 3000 lbs. per ft. gives greater moments than this table.

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>200<br>feet. |          |          |                       | SPAN,<br>200<br>feet. |          |          |                        | SPAN,<br>200<br>feet. |          |          |                        | SPAN,<br>210<br>feet. |          |          |                       |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       |
| 1                     | 315955   |          |                       | 41                    | 265170   |          |                        | 79                    | 267700   |          |                        | 1                     | 327090   |          |                       |
| 2                     | 313260   |          |                       | 42                    | 262640   |          |                        | 80                    | 265170   |          |                        | 2                     | 324466   |          |                       |
| 3                     | 310565   |          |                       | 43                    | 260110   |          | <i>p</i> <sub>5</sub>  | 81                    | 262640   |          |                        | 3                     | 321842   |          |                       |
| 4                     | 307870   |          |                       | 44                    | 257580   |          |                        | 82                    | 260110   |          | <i>p</i> <sub>11</sub> | 4                     | 319219   |          |                       |
| 5                     | 305175   | 0        | <i>p</i> <sub>2</sub> | 45                    | 255050   | 1095000  |                        | 83                    | 257580   |          |                        | 5                     | 316595   | 0        | <i>p</i> <sub>2</sub> |
| 6                     | 302540   |          |                       |                       |          |          |                        | 84                    | 255050   |          |                        | 6                     | 313971   |          |                       |
| 7                     | 299905   |          |                       |                       |          |          |                        | 85                    | 252580   | 7170000  |                        | 7                     | 311347   |          |                       |
| 8                     | 297270   |          |                       | 46                    | 270290   |          |                        |                       |          |          |                        | 8                     | 308723   |          |                       |
|                       |          |          |                       | 47                    | 267700   |          |                        | 86                    | 262640   |          |                        |                       |          |          |                       |
| 9                     | 309560   |          |                       | 48                    | 265170   |          | <i>p</i> <sub>6</sub>  | 87                    | 260110   |          |                        | 9                     | 321028   |          |                       |
| 10                    | 306850   |          |                       | 49                    | 262640   |          |                        | 88                    | 257580   |          |                        | 10                    | 318333   |          |                       |
| 11                    | 304200   |          |                       | 50                    | 260110   | 1900000  |                        | 89                    | 255050   |          |                        | 11                    | 315694   |          |                       |
| 12                    | 301550   |          |                       | 51                    | 257580   |          |                        | 90                    | 252580   |          |                        | 12                    | 313056   |          |                       |
| 13                    | 298900   |          | <i>p</i> <sub>2</sub> |                       |          |          |                        | 91                    | 250110   |          |                        | 13                    | 310418   |          | <i>p</i> <sub>2</sub> |
| 14                    | 296250   | 120000   |                       | 52                    | 267700   |          |                        | 92                    | 247640   |          |                        | 14                    | 307780   |          |                       |
| 15                    | 293600   |          |                       | 53                    | 265170   |          |                        | 93                    | 245170   |          | <i>p</i> <sub>12</sub> | 15                    | 305142   |          |                       |
| 16                    | 291010   |          |                       | 54                    | 262640   |          |                        | 94                    | 242700   |          |                        | 16                    | 302561   |          |                       |
|                       |          |          |                       | 55                    | 260110   | 2550000  | <i>p</i> <sub>7</sub>  | 95                    | 240290   | 8245000  |                        |                       |          |          |                       |
| 17                    | 301550   |          |                       | 56                    | 257580   |          |                        | 96                    | 237880   |          |                        | 17                    | 313056   |          |                       |
| 18                    | 298900   |          |                       | 57                    | 255050   |          |                        | 97                    | 235470   |          |                        | 18                    | 310418   |          |                       |
| 19                    | 296250   |          |                       |                       |          |          |                        | 98                    | 233060   |          |                        | 19                    | 307780   |          |                       |
| 20                    | 293600   |          |                       | 58                    | 265170   |          |                        | 99                    | 230650   |          |                        | 20                    | 305142   |          |                       |
| 21                    | 291010   |          | <i>p</i> <sub>3</sub> | 59                    | 262640   |          |                        | 100                   | 228300   |          |                        | 21                    | 302561   |          | <i>p</i> <sub>3</sub> |
| 22                    | 288420   | 320000   |                       | 60                    | 260110   |          |                        |                       |          |          |                        | 22                    | 299980   |          |                       |
| 23                    | 285750   |          |                       | 61                    | 257580   |          | <i>p</i> <sub>8</sub>  |                       |          |          |                        | 23                    | 297400   |          |                       |
| 24                    | 283240   |          |                       | 62                    | 255050   |          |                        |                       |          |          |                        | 24                    | 294818   |          |                       |
| 25                    | 280650   |          |                       | 63                    | 252580   | 3275000  |                        |                       |          |          |                        | 25                    | 292237   |          |                       |
|                       |          |          |                       |                       |          |          |                        |                       |          |          |                        |                       |          |          |                       |
| 26                    | 291010   |          |                       | 64                    | 262640   |          |                        |                       |          |          |                        | 26                    | 302561   |          |                       |
| 27                    | 288420   |          |                       | 65                    | 260110   |          |                        |                       |          |          |                        | 27                    | 299980   |          |                       |
| 28                    | 285750   |          |                       | 66                    | 257580   |          |                        |                       |          |          |                        | 28                    | 297400   |          |                       |
| 29                    | 283240   |          |                       | 67                    | 255050   |          | <i>p</i> <sub>9</sub>  |                       |          |          |                        | 29                    | 294818   |          |                       |
| 30                    | 280650   |          |                       | 68                    | 252580   |          |                        |                       |          |          |                        | 30                    | 292237   |          |                       |
| 31                    | 278060   |          |                       | 69                    | 250110   | 4075000  |                        |                       |          |          |                        | 31                    | 289713   |          | <i>p</i> <sub>4</sub> |
| 32                    | 275470   | 645000   | <i>p</i> <sub>4</sub> |                       |          |          |                        |                       |          |          |                        | 32                    | 287190   |          |                       |
| 33                    | 272880   |          |                       | 70                    | 270290   |          |                        |                       |          |          |                        | 33                    | 284666   |          |                       |
| 34                    | 270290   |          |                       | 71                    | 267700   |          |                        |                       |          |          |                        | 34                    | 282142   |          |                       |
|                       |          |          |                       | 72                    | 265170   |          |                        |                       |          |          |                        | 35                    | 279618   |          |                       |
| 35                    | 280650   |          |                       | 73                    | 262640   |          | <i>p</i> <sub>10</sub> |                       |          |          |                        |                       |          |          |                       |
| 36                    | 278060   |          |                       | 74                    | 260110   | 5650000  |                        |                       |          |          |                        | 36                    | 289713   |          |                       |
| 37                    | 275470   |          |                       |                       |          |          |                        |                       |          |          |                        | 37                    | 287190   |          |                       |
| 38                    | 272880   |          |                       | 75                    | 278060   |          |                        |                       |          |          |                        | 38                    | 284666   |          | <i>p</i> <sub>5</sub> |
| 39                    | 270290   | 1095000  | <i>p</i> <sub>5</sub> | 76                    | 275470   |          |                        |                       |          |          |                        | 39                    | 282142   |          |                       |
| 40                    | 267700   |          |                       | 77                    | 272880   |          |                        |                       |          |          |                        | 40                    | 279618   |          |                       |
|                       |          |          |                       | 78                    | 270290   | 7170000  | <i>p</i> <sub>11</sub> |                       |          |          |                        |                       |          |          |                       |

For all values of *x* below *x* = 41, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table.

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>210<br>feet. |          |          |                        | SPAN,<br>210<br>feet.  |          |          |                        | SPAN,<br>220<br>feet. |          |          |                       | SPAN,<br>220<br>feet. |          |          |                        |    |        |
|-----------------------|----------|----------|------------------------|--|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|----|--------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>   | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        |    |        |
| 41                    | 277152   | 1095000  | <i>p</i> <sub>5</sub>  | 77   | 284666   | 7170000  | <i>p</i> <sub>11</sub> | 1                     | 337977   | 0        | <i>p</i> <sub>2</sub> | 41                    | 288808   | 1095000  | <i>p</i> <sub>5</sub>  |    |        |
| 42                    | 274684   |          |                        | 78   | 282142   |          |                        | 2                     | 335363   |          |                       | 42                    | 286344   |          |                        |    |        |
| 43                    | 272218   |          |                        | 79   | 279618   |          |                        | 3                     | 332750   |          |                       | 43                    | 283881   |          |                        |    |        |
| 44                    | 269751   |          |                        | 80   | 277152   |          |                        | 4                     | 330136   |          |                       | 44                    | 281418   |          |                        |    |        |
| 45                    | 267284   |          |                        | 81   | 274684   |          |                        | 5                     | 327522   |          |                       | 45                    | 278954   |          |                        |    |        |
| 46                    | 264818   |          |                        | 82   | 272218   |          |                        | 6                     | 324963   |          |                       | 46                    | 276544   |          |                        |    |        |
| 47                    | 279618   | 1900000  | <i>p</i> <sub>6</sub>  | 83   | 269751   | 8215000  | <i>p</i> <sub>12</sub> | 9                     | 332217   | 120000   | <i>p</i> <sub>2</sub> | 47                    | 291271   | 1900000  | <i>p</i> <sub>6</sub>  |    |        |
| 48                    | 277152   |          |                        | 84   | 267284   |          |                        | 10                    | 329590   |          |                       | 48                    | 288808   |          |                        |    |        |
| 49                    | 274684   |          |                        | 85   | 264818   |          |                        | 11                    | 327017   |          |                       | 49                    | 286344   |          |                        |    |        |
| 50                    | 272218   |          |                        | 86   | 262351   |          |                        | 12                    | 324445   |          |                       | 50                    | 283881   |          |                        |    |        |
| 51                    | 269751   |          |                        | 87   | 259884   |          |                        | 13                    | 321872   |          |                       | 51                    | 281418   |          |                        |    |        |
| 52                    | 267284   |          |                        | 88   | 269751   |          |                        | 14                    | 319300   |          |                       | 52                    | 278954   |          |                        |    |        |
| 53                    | 277152   | 2150000  | <i>p</i> <sub>7</sub>  | 89   | 267284   | 8215000  | <i>p</i> <sub>12</sub> | 15                    | 316726   | 320000   | <i>p</i> <sub>3</sub> | 53                    | 276544   | 2150000  | <i>p</i> <sub>7</sub>  |    |        |
| 54                    | 274684   |          |                        | 90   | 264818   |          |                        | 16                    | 327017   |          |                       | 54                    | 286344   |          |                        |    |        |
| 55                    | 272218   |          |                        | 91   | 262351   |          |                        | 17                    | 324445   |          |                       | 55                    | 283881   |          |                        |    |        |
| 56                    | 269751   |          |                        | 92   | 259884   |          |                        | 18                    | 321872   |          |                       | 56                    | 281418   |          |                        |    |        |
| 57                    | 267284   |          |                        | 93   | 257417   |          |                        | 19                    | 319300   |          |                       | 57                    | 278954   |          |                        |    |        |
| 58                    | 264818   |          |                        | 94   | 254951   |          |                        | 20                    | 316726   |          |                       | 58                    | 276544   |          |                        |    |        |
| 59                    | 274684   | 3275000  | <i>p</i> <sub>8</sub>  | 95   | 252542   | 9445000  | <i>p</i> <sub>13</sub> | 21                    | 314154   | 645000   | <i>p</i> <sub>4</sub> | 59                    | 274135   | 3275000  | <i>p</i> <sub>8</sub>  |    |        |
| 60                    | 272218   |          |                        | 96   | 250132   |          |                        | 22                    | 311581   |          |                       | 60                    | 283881   |          |                        |    |        |
| 61                    | 269751   |          |                        | 97   | 247723   |          |                        | 23                    | 309008   |          |                       | 61                    | 281418   |          |                        |    |        |
| 62                    | 267284   |          |                        | 98   | 245313   |          |                        | 24                    | 306436   |          |                       | 62                    | 278954   |          |                        |    |        |
| 63                    | 264818   |          |                        | 99   | 242904   |          |                        | 25                    | 303862   |          |                       | 63                    | 276544   |          |                        |    |        |
| 64                    | 262351   |          |                        | 100  | 240551   |          |                        | 26                    | 314154   |          |                       | 64                    | 274135   |          |                        |    |        |
| 65                    | 272218   | 4075000  | <i>p</i> <sub>9</sub>  | 101  | 250132   | 9445000  | <i>p</i> <sub>13</sub> | 27                    | 311581   | 320000   | <i>p</i> <sub>3</sub> | 65                    | 271726   | 4075000  | <i>p</i> <sub>9</sub>  |    |        |
| 66                    | 269751   |          |                        | 102  | 247723   |          |                        | 28                    | 309008   |          |                       | 66                    | 269317   |          |                        |    |        |
| 67                    | 267284   |          |                        | 103  | 245313   |          |                        | 29                    | 306436   |          |                       | 67                    | 278954   |          |                        |    |        |
| 68                    | 264818   |          |                        | 104  | 242904   |          |                        | 30                    | 303862   |          |                       | 68                    | 276544   |          |                        |    |        |
| 69                    | 262351   |          |                        | 105  | 240551   |          |                        | 31                    | 301344   |          |                       | 69                    | 274135   |          |                        |    |        |
| 70                    | 259884   |          |                        |  |          |          |                        | 32                    | 298826   |          |                       | 70                    | 271726   |          |                        |    |        |
| 71                    | 279618   | 5650000  | <i>p</i> <sub>10</sub> | For all values of <i>x</i> below <i>x</i> = 33, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table. |          |          |                        | 33                    | 296308   | 645000   | <i>p</i> <sub>4</sub> | 71                    | 269317   | 5650000  | <i>p</i> <sub>10</sub> |    |        |
| 72                    | 277152   |          |                        |  |          |          |                        | 34                    | 293790   |          |                       | 34                    | 293790   |          |                        | 72 | 288808 |
| 73                    | 274684   |          |                        |  |          |          |                        | 35                    | 291271   |          |                       | 35                    | 291271   |          |                        | 73 | 286344 |
| 74                    | 272218   |          |                        |  |          |          |                        |                       |          |          |                       | 36                    | 301344   |          |                        | 74 | 283881 |
| 75                    | 269751   |          |                        |  |          |          |                        |                       |          |          |                       | 37                    | 298826   |          |                        | 75 | 281418 |
| 76                    | 267284   |          |                        |  |          |          |                        |                       |          |          |                       | 38                    | 296308   |          |                        | 76 | 278954 |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>220<br>feet. |          |          | SPAN,<br>230<br>feet. |          |          | SPAN,<br>230<br>feet. |          |          | SPAN,<br>230<br>feet. |          |          |
|-----------------------|----------|----------|-----------------------|----------|----------|-----------------------|----------|----------|-----------------------|----------|----------|
| <i>x</i>              | <i>R</i> | <i>m</i> |
| 77                    | 296308   | 7170000  | 1                     | 348960   | 0        | 41                    | 300495   | 1095000  | 78                    | 305416   | 7170000  |
| 78                    | 293790   |          | 2                     | 346356   |          | 42                    | 298033   |          | 79                    | 302956   |          |
| 79                    | 291271   |          | 3                     | 343752   |          | 43                    | 295573   |          | 80                    | 300495   |          |
| 80                    | 288808   |          | 4                     | 341147   |          | 44                    | 293112   |          | 81                    | 298033   |          |
| 81                    | 286344   |          | 5                     | 338543   |          | 45                    | 290651   |          | 82                    | 295573   |          |
| 82                    | 283881   |          | 6                     | 335991   |          | 46                    | 288243   |          | 83                    | 293112   |          |
| 83                    | 281418   |          | 7                     | 333440   |          | 47                    | 285834   |          | 84                    | 290651   |          |
| 84                    | 278954   |          | 8                     | 330886   |          | 48                    | 300495   |          | 85                    | 288243   |          |
| 85                    | 276544   |          | 9                     | 343268   | 49       | 298033                | 86       | 285834   |                       |          |          |
| 86                    | 274135   |          | 10                    | 340651   | 50       | 295573                | 87       | 283425   |                       |          |          |
| 87                    | 271726   |          | 11                    | 338086   | 51       | 293112                | 88       | 281017   |                       |          |          |
| 88                    | 269317   |          | 12                    | 335521   | 52       | 290651                | 89       | 278608   |                       |          |          |
| 89                    | 266909   |          | 13                    | 332955   | 53       | 288243                | 90       | 288243   |                       |          |          |
| 90                    | 276544   |          | 14                    | 330390   | 54       | 298033                | 91       | 285834   |                       |          |          |
| 91                    | 274135   |          | 15                    | 327825   | 55       | 295573                | 92       | 283425   |                       |          |          |
| 92                    | 271726   | 16       | 338086                | 56       | 293112   | 93                    | 281017   |          |                       |          |          |
| 93                    | 269317   | 17       | 335521                | 57       | 290651   | 94                    | 278608   |          |                       |          |          |
| 94                    | 266909   | 18       | 332955                | 58       | 288243   | 95                    | 276251   |          |                       |          |          |
| 95                    | 264553   | 19       | 330390                | 59       | 285834   | 96                    | 273894   |          |                       |          |          |
| 96                    | 262200   | 20       | 327825                | 60       | 295573   | 97                    | 271538   |          |                       |          |          |
| 97                    | 259844   | 21       | 325312                | 61       | 293112   | 98                    | 269182   |          |                       |          |          |
| 98                    | 257490   | 22       | 322800                | 62       | 290651   | 99                    | 266826   |          |                       |          |          |
| 99                    | 255136   | 23       | 320286                | 63       | 288243   | 100                   | 264520   |          |                       |          |          |
| 100                   | 252781   | 24       | 317773                | 64       | 285834   | 101                   | 262216   |          |                       |          |          |
| 101                   | 248072   | 25       | 315260                | 65       | 283425   | 102                   | 259912   |          |                       |          |          |
| 102                   | 259844   | 26       | 325312                | 66       | 281017   | 103                   | 257608   |          |                       |          |          |
| 103                   | 257490   | 27       | 322800                | 67       | 290651   | 104                   | 255303   |          |                       |          |          |
| 104                   | 255136   | 28       | 320286                | 68       | 288243   | 105                   | 264520   |          |                       |          |          |
| 105                   | 252781   | 29       | 317773                | 69       | 285834   | 106                   | 262216   |          |                       |          |          |
| 106                   | 262200   | 30       | 315260                | 70       | 283425   | 107                   | 259912   |          |                       |          |          |
| 107                   | 259844   | 31       | 312800                | 71       | 281017   | 108                   | 257608   |          |                       |          |          |
| 108                   | 257490   | 32       | 310338                | 72       | 300495   | 109                   | 266826   |          |                       |          |          |
| 109                   | 255136   | 33       | 307877                | 73       | 298033   | 110                   | 264520   |          |                       |          |          |
| 110                   | 252781   | 34       | 305416                | 74       | 295573   | 111                   | 262216   |          |                       |          |          |
|                       |          | 35       | 302956                | 75       | 293112   | 112                   | 259912   |          |                       |          |          |
|                       |          | 36       | 300495                | 76       | 290651   | 113                   | 257608   |          |                       |          |          |
|                       |          | 37       | 310338                | 77       | 288243   | 114                   | 255303   |          |                       |          |          |
|                       |          | 38       | 307877                |          |          | 115                   | 253051   |          |                       |          |          |
|                       |          | 39       | 305416                |          |          |                       |          |          |                       |          |          |
|                       |          | 40       | 302956                |          |          |                       |          |          |                       |          |          |

For all values of *x* below *x* = 23, a uniformly distributed load of 3000 lbs. per ft. will give greater moments than this table.

Below *x* = 6, a uniform load of 3000 lbs. per ft. gives greater moments than this table.

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>240<br>feet. |          |          |                       | SPAN,<br>240<br>feet. |          |          |                       | SPAN,<br>240<br>feet. |          |          |                        | SPAN,<br>250<br>feet. |          |          |                       |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|----------|----------|-----------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       |
| 1                     | 359579   |          |                       | 41                    | 311758   |          |                       | 80                    | 311758   |          |                        | 1                     | 370260   |          |                       |
| 2                     | 357933   |          |                       | 42                    | 309350   |          |                       | 81                    | 309350   |          |                        | 2                     | 367720   |          |                       |
| 3                     | 354487   |          |                       | 43                    | 306941   |          |                       | 82                    | 306941   |          |                        | 3                     | 365180   |          |                       |
| 4                     | 351941   |          |                       | 44                    | 304532   |          |                       | 83                    | 304532   |          |                        | 4                     | 362640   |          |                       |
| 5                     | 349395   | 0        | <i>p</i> <sub>2</sub> | 45                    | 302125   | 1095000  | <i>p</i> <sub>5</sub> | 84                    | 302125   | 7170000  | <i>p</i> <sub>11</sub> | 5                     | 360100   | 0        | <i>p</i> <sub>2</sub> |
| 6                     | 346900   |          |                       | 46                    | 299766   |          |                       | 85                    | 299766   |          |                        | 6                     | 357608   |          |                       |
| 7                     | 344404   |          |                       | 47                    | 297408   |          |                       | 86                    | 297408   |          |                        | 7                     | 355166   |          |                       |
| 8                     | 341908   |          |                       | 48                    | 295050   |          |                       | 87                    | 295050   |          |                        | 8                     | 352624   |          |                       |
|                       |          |          |                       |                       |          |          |                       | 88                    | 292691   |          |                        |                       |          |          |                       |
|                       |          |          |                       |                       |          |          |                       | 89                    | 290332   |          |                        |                       |          |          |                       |
| 9                     | 354350   |          |                       | 49                    | 309350   |          |                       | 90                    | 287975   |          |                        | 9                     | 365072   |          |                       |
| 10                    | 351791   |          |                       | 50                    | 306941   |          |                       | 91                    | 285616   |          |                        | 10                    | 362520   |          |                       |
| 11                    | 349232   |          |                       | 51                    | 304532   |          |                       |                       |          |          |                        | 11                    | 360016   |          |                       |
| 12                    | 346675   | 120000   | <i>p</i> <sub>2</sub> | 52                    | 302125   | 1900000  | <i>p</i> <sub>6</sub> |                       |          |          |                        | 12                    | 357512   | 120000   | <i>p</i> <sub>2</sub> |
| 13                    | 344116   |          |                       | 53                    | 299766   |          |                       | 92                    | 295050   |          |                        | 13                    | 355008   |          |                       |
| 14                    | 341558   |          |                       | 54                    | 297408   |          |                       | 93                    | 292691   |          |                        | 14                    | 352504   |          |                       |
| 15                    | 339000   |          |                       |                       |          |          |                       | 94                    | 290332   |          |                        | 15                    | 350000   |          |                       |
|                       |          |          |                       |                       |          |          |                       | 95                    | 287975   |          |                        | 16                    | 347544   |          |                       |
|                       |          |          |                       |                       |          |          |                       | 96                    | 285616   |          |                        |                       |          |          |                       |
| 16                    | 349232   |          |                       | 55                    | 306941   |          |                       | 97                    | 283258   |          |                        | 17                    | 357512   |          |                       |
| 17                    | 346675   |          |                       | 56                    | 304532   |          |                       | 98                    | 280900   |          |                        | 18                    | 355008   |          |                       |
| 18                    | 344116   |          |                       | 57                    | 302125   |          |                       | 99                    | 278541   |          |                        | 19                    | 352504   |          |                       |
| 19                    | 341558   |          |                       | 58                    | 299766   |          |                       | 100                   | 276232   |          |                        | 20                    | 350000   |          |                       |
| 20                    | 339000   |          |                       | 59                    | 297408   |          |                       | 101                   | 273925   |          |                        | 21                    | 347544   |          |                       |
| 21                    | 336491   |          |                       | 60                    | 295050   |          |                       | 102                   | 271616   |          |                        | 22                    | 345088   |          |                       |
| 22                    | 333982   | 320000   | <i>p</i> <sub>3</sub> | 61                    | 292691   | 2550000  | <i>p</i> <sub>7</sub> | 103                   | 269308   | 8245000  | <i>p</i> <sub>12</sub> | 23                    | 342632   | 320000   | <i>p</i> <sub>3</sub> |
| 23                    | 331475   |          |                       |                       |          |          |                       |                       |          |          |                        | 24                    | 340176   |          |                       |
| 24                    | 328966   |          |                       | 62                    | 302125   |          |                       | 104                   | 278541   |          |                        | 25                    | 337720   |          |                       |
| 25                    | 326458   |          |                       | 63                    | 299766   |          |                       | 105                   | 276232   |          |                        | 26                    | 335264   |          |                       |
| 26                    | 324000   |          |                       | 64                    | 297408   |          |                       | 106                   | 273925   |          |                        |                       |          |          |                       |
|                       |          |          |                       | 65                    | 295050   |          |                       | 107                   | 271616   |          |                        |                       |          |          |                       |
|                       |          |          |                       | 66                    | 292691   |          |                       | 108                   | 269308   |          |                        |                       |          |          |                       |
|                       |          |          |                       | 67                    | 290332   |          |                       | 109                   | 267000   |          |                        | 27                    | 345088   |          |                       |
| 27                    | 333982   |          |                       |                       |          |          |                       | 110                   | 264741   |          |                        | 28                    | 342632   |          |                       |
| 28                    | 331475   |          |                       |                       |          |          |                       | 111                   | 262482   |          |                        | 29                    | 340176   |          |                       |
| 29                    | 328966   |          |                       | 68                    | 299766   |          |                       | 112                   | 260225   |          |                        | 30                    | 337720   |          |                       |
| 30                    | 326458   |          |                       | 69                    | 297408   |          |                       | 113                   | 257966   |          |                        | 31                    | 335264   |          |                       |
| 31                    | 324000   |          |                       | 70                    | 295050   |          |                       | 114                   | 255708   |          |                        | 32                    | 332808   |          |                       |
| 32                    | 321541   | 645000   | <i>p</i> <sub>4</sub> | 71                    | 292691   | 4075000  | <i>p</i> <sub>9</sub> | 115                   | 253500   | 9445000  | <i>p</i> <sub>13</sub> | 33                    | 330352   | 645000   | <i>p</i> <sub>4</sub> |
| 33                    | 319082   |          |                       | 72                    | 290332   |          |                       | 116                   | 251291   |          |                        | 34                    | 327896   |          |                       |
| 34                    | 316625   |          |                       | 73                    | 287975   |          |                       | 117                   | 249082   |          |                        | 35                    | 325440   |          |                       |
| 35                    | 314166   |          |                       |                       |          |          |                       | 118                   | 246875   |          |                        | 36                    | 323032   |          |                       |
| 36                    | 311758   |          |                       |                       |          |          |                       | 119                   | 244666   |          |                        |                       |          |          |                       |
|                       |          |          |                       |                       |          |          |                       | 120                   | 242509   |          |                        |                       |          |          |                       |
| 37                    | 321541   | 1095000  | <i>p</i> <sub>5</sub> | 74                    | 306941   |          |                       |                       |          |          |                        | 37                    | 332808   | 1095000  | <i>p</i> <sub>5</sub> |
| 38                    | 319082   |          |                       | 75                    | 304532   |          |                       |                       |          |          |                        | 38                    | 330352   |          |                       |
| 39                    | 316625   |          |                       | 76                    | 302125   |          |                       |                       |          |          |                        | 39                    | 327896   |          |                       |
| 40                    | 314166   |          |                       | 77                    | 299766   |          |                       |                       |          |          |                        | 40                    | 325440   |          |                       |
|                       |          |          |                       | 78                    | 297408   |          |                       |                       |          |          |                        |                       |          |          |                       |
|                       |          |          |                       | 79                    | 295050   |          |                       |                       |          |          |                        |                       |          |          |                       |

A uniform load of 3000 lbs. per ft. gives greater moments than this table.

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>250<br>feet. |        |         |                 | SPAN,<br>250<br>feet. |        |        |                 | SPAN,<br>250<br>feet.   |        |         |                 | SPAN,<br>260<br>feet. |        |        |                |
|-----------------------|--------|---------|-----------------|-----------------------|--------|--------|-----------------|---|--------|---------|-----------------|-----------------------|--------|--------|----------------|
| x                     | R      | m       |                 | x                     | R      | m      |                 | x   | R      | m       |                 | x                     | R      | m      |                |
| 41                    | 323032 | 1095000 | p <sub>5</sub>  | 80                    | 323032 | 717000 | p <sub>11</sub> | 121   | 262968 | 1077000 | p <sub>14</sub> | 1                     | 380857 | 0      | p <sub>2</sub> |
| 42                    | 320624 |         |                 | 81                    | 320624 |        |                 | 122   | 260752 |         |                 | 2                     | 378369 |        |                |
| 43                    | 318216 |         |                 | 82                    | 318216 |        |                 | 123   | 258536 |         |                 | 3                     | 375880 |        |                |
| 44                    | 315808 |         |                 | 83                    | 315808 |        |                 | 124   | 256320 |         |                 | 4                     | 373392 |        |                |
| 45                    | 313400 |         |                 | 84                    | 313400 |        |                 | 125   | 254152 |         |                 | 5                     | 370903 |        |                |
| 46                    | 311040 |         |                 | 85                    | 311040 |        |                 |   |        |         |                 | 6                     | 368415 |        |                |
| 47                    | 308680 |         |                 | 86                    | 308680 |        |                 |   |        |         |                 | 7                     | 365926 |        |                |
| 48                    | 306320 |         |                 | 87                    | 306320 |        |                 |   |        |         |                 | 8                     | 363438 |        |                |
| 49                    | 320624 | 1900000 | p <sub>6</sub>  | 88                    | 303960 | 824500 | p <sub>12</sub> | For all values of x below x = 120, a uniformly distributed load of 2700 lbs. per ft. will give greater moments than this table. |        |         |                 | 9                     | 375892 | 120000 | p <sub>2</sub> |
| 50                    | 318216 |         |                 | 89                    | 301600 |        |                 |   |        |         |                 | 10                    | 373345 |        |                |
| 51                    | 315808 |         |                 | 90                    | 299288 |        |                 |   |        |         |                 | 11                    | 370845 |        |                |
| 52                    | 313400 |         |                 | 91                    | 296976 |        |                 |   |        |         |                 | 12                    | 368345 |        |                |
| 53                    | 311040 |         |                 | 92                    | 294664 |        |                 |   |        |         |                 | 13                    | 365845 |        |                |
| 54                    | 308680 |         |                 | 93                    | 303960 |        |                 |   |        |         |                 | 14                    | 363345 |        |                |
|                       |        |         |                 | 94                    | 301600 |        |                 |   |        |         |                 | 15                    | 360845 |        |                |
|                       |        |         |                 | 95                    | 299288 |        |                 |   |        |         |                 | 16                    | 358391 |        |                |
| 55                    | 318216 | 2550000 | p <sub>7</sub>  | 96                    | 296976 | 320000 | p <sub>3</sub>  | 17  | 368345 | 320000  | p <sub>3</sub>  |                       |        |        |                |
| 56                    | 315808 |         |                 | 97                    | 294664 |        |                 | 18  | 365845 |         |                 |                       |        |        |                |
| 57                    | 313400 |         |                 | 98                    | 292352 |        |                 | 19  | 363345 |         |                 |                       |        |        |                |
| 58                    | 311040 |         |                 | 99                    | 290040 |        |                 | 20  | 360845 |         |                 |                       |        |        |                |
| 59                    | 308680 |         |                 | 100                   | 287776 |        |                 | 21  | 358391 |         |                 |                       |        |        |                |
| 60                    | 306320 |         |                 | 101                   | 285512 |        |                 | 22  | 355937 |         |                 |                       |        |        |                |
| 61                    | 303960 |         |                 | 102                   | 283248 |        |                 | 23  | 353484 |         |                 |                       |        |        |                |
|                       |        |         |                 | 103                   | 280984 |        |                 | 24  | 351030 |         |                 |                       |        |        |                |
| 62                    | 313400 | 3275000 | p <sub>8</sub>  | 104                   | 278720 | 944500 | p <sub>13</sub> | 25  | 348576 | 645000  | p <sub>4</sub>  |                       |        |        |                |
| 63                    | 311040 |         |                 | 105                   | 277456 |        |                 | 26  | 346169 |         |                 |                       |        |        |                |
| 64                    | 308680 |         |                 | 106                   | 274192 |        |                 | 27  | 355937 |         |                 |                       |        |        |                |
| 65                    | 306320 |         |                 | 107                   | 283248 |        |                 | 28  | 353484 |         |                 |                       |        |        |                |
| 66                    | 303960 |         |                 | 108                   | 280984 |        |                 | 29  | 351030 |         |                 |                       |        |        |                |
| 67                    | 301600 |         |                 | 109                   | 278720 |        |                 | 30  | 348576 |         |                 |                       |        |        |                |
| 68                    | 299288 |         |                 | 110                   | 277456 |        |                 | 31  | 346169 |         |                 |                       |        |        |                |
|                       |        |         |                 | 111                   | 274192 |        |                 | 32  | 343761 |         |                 |                       |        |        |                |
| 69                    | 308680 | 4075000 | p <sub>9</sub>  | 112                   | 271928 | 645000 | p <sub>4</sub>  | 33  | 341353 | 645000  | p <sub>4</sub>  |                       |        |        |                |
| 70                    | 306320 |         |                 | 113                   | 269664 |        |                 | 34  | 338945 |         |                 |                       |        |        |                |
| 71                    | 303960 |         |                 | 114                   | 267400 |        |                 | 35  | 336538 |         |                 |                       |        |        |                |
| 72                    | 301600 |         |                 | 115                   | 265184 |        |                 | 36  | 334176 |         |                 |                       |        |        |                |
| 73                    | 299288 |         |                 | 116                   | 262968 |        |                 | 37  | 331814 |         |                 |                       |        |        |                |
| 74                    | 296976 |         |                 | 117                   | 260752 |        |                 |   |        |         |                 |                       |        |        |                |
|                       |        |         |                 | 118                   | 258536 |        |                 |   |        |         |                 |                       |        |        |                |
|                       |        |         |                 | 119                   | 256320 |        |                 |   |        |         |                 |                       |        |        |                |
| 75                    | 315808 | 5050000 | p <sub>10</sub> | 120                   | 254152 |        |                 |   |        |         |                 |                       |        |        |                |
| 76                    | 313400 |         |                 |                       |        |        |                 |   |        |         |                 |                       |        |        |                |
| 77                    | 311040 |         |                 |                       |        |        |                 |   |        |         |                 |                       |        |        |                |
| 78                    | 308680 |         |                 |                       |        |        |                 |   |        |         |                 |                       |        |        |                |
| 79                    | 306320 |         |                 |                       |        |        |                 |   |        |         |                 |                       |        |        |                |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>260<br>feet. |          |          |                       | SPAN,<br>260<br>feet. |                        |   |                        | SPAN,<br>260<br>feet. |                       |                       |                        | SPAN,<br>270<br>feet. |                        |          |                       |        |                       |
|-----------------------|----------|----------|-----------------------|-----------------------|------------------------|---|------------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|------------------------|----------|-----------------------|--------|-----------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i>               | <i>m</i>  |                        | <i>x</i>              | <i>R</i>              | <i>m</i>              |                        | <i>x</i>              | <i>R</i>               | <i>m</i> |                       |        |                       |
| 38                    | 341353   | 1095000  | <i>p</i> <sub>5</sub> | 75                    | 327091                 | 5650000   | <i>p</i> <sub>10</sub> | 116                   | 274530                | 9445000               | <i>p</i> <sub>13</sub> | 1                     | 391292                 | 0        | <i>p</i> <sub>2</sub> |        |                       |
| 39                    | 338945   |          |                       | 76                    | 324730                 |   |                        | 117                   | 272353                |                       |                        | 2                     | 388807                 |          |                       |        |                       |
| 40                    | 336538   |          |                       | 77                    | 322369                 |   |                        | 118                   | 270176                |                       |                        | 3                     | 386322                 |          |                       |        |                       |
| 41                    | 334176   |          |                       | 78                    | 320007                 |   |                        | 119                   | 268000                |                       |                        | 4                     | 383837                 |          |                       |        |                       |
| 42                    | 331814   |          |                       | 79                    | 317645                 |   |                        | 120                   | 265822                |                       |                        | 5                     | 381351                 |          |                       |        |                       |
| 43                    | 329453   |          |                       | 80                    | 315284                 |   |                        | 121                   | 263646                |                       |                        | 6                     | 378911                 |          |                       |        |                       |
| 44                    | 327091   |          |                       | 81                    | 331814                 |   |                        | 122                   | 272353                |                       |                        | 7                     | 376470                 |          |                       |        |                       |
| 45                    | 324730   |          |                       | 82                    | 329453                 |   |                        | 123                   | 270176                |                       |                        | 8                     | 374029                 |          |                       |        |                       |
| 46                    | 322369   |          |                       | 83                    | 327091                 |   |                        | 124                   | 268000                |                       |                        | 10770000              | <i>p</i> <sub>14</sub> | 9        | 386532                | 120000 | <i>p</i> <sub>2</sub> |
| 47                    | 320007   |          |                       | 84                    | 324730                 |   |                        | 125                   | 265822                |                       |                        |                       |                        | 10       | 384036                |        |                       |
| 48                    | 317645   | 85       | 322369                | 126                   | 263646                 | 11  | 381584                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 49                    | 331814   | 86       | 320007                | 127                   | 261468                 | 12  | 379132                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 50                    | 329453   | 87       | 317645                | 128                   | 259291                 | 13  | 376681                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 51                    | 327091   | 88       | 315284                | 129                   | 257115                 | 14  | 374228                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 52                    | 324730   | 89       | 312922                | 130                   | 254984                 | 15  | 371777                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 53                    | 322369   | 90       | 310607                | 7170000               | <i>p</i> <sub>11</sub> | 16  | 369325                 | 120000                | <i>p</i> <sub>2</sub> |                       |                        |                       |                        |          |                       |        |                       |
| 54                    | 320007   | 91       | 308291                |                       |                        | 17  | 379132                 |                       |                       | 320000                | <i>p</i> <sub>3</sub>  |                       |                        |          |                       |        |                       |
| 55                    | 317645   | 92       | 305976                |                       |                        | 18  | 376681                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 56                    | 327091   | 93       | 315284                |                       |                        | 19  | 374228                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 57                    | 324730   | 94       | 312922                |                       |                        | 20  | 371777                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 58                    | 322369   | 95       | 310607                |                       |                        | 21  | 369325                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 59                    | 320007   | 96       | 308291                |                       |                        | 22  | 366874                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 60                    | 317645   | 97       | 305976                |                       |                        | 23  | 364421                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 61                    | 315284   | 98       | 303661                |                       |                        | 24  | 361969                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 62                    | 324730   | 99       | 301345                |                       |                        | 25  | 359518                 |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 63                    | 322369   | 100      | 299076                | 26                    | 357110                 |   |                        |                       |                       |                       |                        |                       |                        |          |                       |        |                       |
| 64                    | 320007   | 101      | 296807                | 8245000               | <i>p</i> <sub>12</sub> | For all values of <i>x</i> below <i>x</i> = 105, a uniformly distributed load of 2700 lbs. per ft. will give greater moments than this table. | 17                     | 379132                | 320000                | <i>p</i> <sub>3</sub> |                        |                       |                        |          |                       |        |                       |
| 65                    | 317645   | 102      | 294537                |                       |                        |   |                        |                       |                       |                       | 18                     | 376681                |                        |          |                       |        |                       |
| 66                    | 315284   | 103      | 292269                |                       |                        |   |                        |                       |                       |                       | 19                     | 374228                |                        |          |                       |        |                       |
| 67                    | 312922   | 104      | 290000                |                       |                        |   |                        |                       |                       |                       | 20                     | 371777                |                        |          |                       |        |                       |
| 68                    | 310607   | 105      | 287776                |                       |                        |   |                        |                       |                       |                       | 21                     | 369325                |                        |          |                       |        |                       |
| 69                    | 320007   | 106      | 285553                |                       |                        |   |                        |                       |                       |                       | 22                     | 366874                |                        |          |                       |        |                       |
| 70                    | 317645   | 107      | 283330                |                       |                        |   |                        |                       |                       |                       | 23                     | 364421                |                        |          |                       |        |                       |
| 71                    | 315284   | 108      | 292269                |                       |                        |   |                        |                       |                       |                       | 24                     | 361969                |                        |          |                       |        |                       |
| 72                    | 312922   | 109      | 290000                |                       |                        |   |                        |                       |                       |                       | 25                     | 359518                |                        |          |                       |        |                       |
| 73                    | 310607   | 110      | 287776                |                       |                        |   |                        |                       |                       |                       | 26                     | 357110                |                        |          |                       |        |                       |
| 74                    | 308291   | 111      | 285553                | 9445000               | <i>p</i> <sub>13</sub> | 27  | 366874                 | 645000                | <i>p</i> <sub>4</sub> |                       |                        |                       |                        |          |                       |        |                       |
| 75                    | 327091   | 112      | 283330                |                       |                        |   |                        |                       |                       | 28                    | 364421                 |                       |                        |          |                       |        |                       |
| 76                    | 324730   | 113      | 281107                |                       |                        |   |                        |                       |                       | 29                    | 361969                 |                       |                        |          |                       |        |                       |
| 77                    | 322369   | 114      | 278883                |                       |                        |   |                        |                       |                       | 30                    | 359518                 |                       |                        |          |                       |        |                       |
| 78                    | 320007   | 115      | 276707                |                       |                        |   |                        |                       |                       | 31                    | 357110                 |                       |                        |          |                       |        |                       |
| 79                    | 317645   | 108      | 292269                |                       |                        |   |                        |                       |                       | 32                    | 354703                 |                       |                        |          |                       |        |                       |
| 80                    | 315284   | 109      | 290000                |                       |                        |   |                        |                       |                       | 33                    | 352295                 |                       |                        |          |                       |        |                       |
| 81                    | 331814   | 110      | 287776                |                       |                        |   |                        |                       |                       | 34                    | 349888                 |                       |                        |          |                       |        |                       |
| 82                    | 329453   | 111      | 285553                |                       |                        |   |                        |                       |                       | 35                    | 347480                 |                       |                        |          |                       |        |                       |
| 83                    | 327091   | 112      | 283330                |                       |                        |   |                        |                       |                       | 36                    | 345118                 |                       |                        |          |                       |        |                       |
| 84                    | 324730   | 113      | 281107                | 37                    | 342755                 |   |                        |                       |                       |                       |                        |                       |                        |          |                       |        |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>270<br>feet. |          |          |                       | SPAN,<br>270<br>feet.  |          |          |                        | SPAN,<br>270<br>feet. |                       |          |                        | SPAN,<br>280<br>feet. |          |          |                       |
|-----------------------|----------|----------|-----------------------|--|----------|----------|------------------------|-----------------------|-----------------------|----------|------------------------|-----------------------|----------|----------|-----------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>   | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i>              | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       |
| 38                    | 352295   | 1095000  | <i>p</i> <sub>5</sub> | 77   | 333347   | 5050000  | <i>p</i> <sub>10</sub> | 118                   | 281444                | 9445000  | <i>p</i> <sub>13</sub> | 1                     | 401839   | 0        | <i>p</i> <sub>2</sub> |
| 39                    | 349888   |          |                       | 78   | 331028   |          |                        | 119                   | 279258                |          |                        | 2                     | 399357   |          |                       |
| 40                    | 347480   |          |                       | 79   | 328711   |          |                        | 120                   | 277118                |          |                        | 3                     | 396875   |          |                       |
| 41                    | 345118   |          |                       | 80   | 326392   |          |                        | 121                   | 274977                |          |                        | 4                     | 394392   |          |                       |
| 42                    | 342755   |          |                       | 81   | 324074   |          |                        | 122                   | 272836                |          |                        | 5                     | 391910   |          |                       |
| 43                    | 340391   |          |                       | 82   | 340391   |          |                        | 123                   | 270695                |          |                        | 6                     | 389471   |          |                       |
| 44                    | 338029   |          |                       | 83   | 338029   |          |                        | 124                   | 279258                |          |                        | 7                     | 387032   |          |                       |
| 45                    | 335665   |          |                       | 84   | 335665   |          |                        | 125                   | 277118                |          |                        | 8                     | 384592   |          |                       |
| 46                    | 333347   |          |                       | 85   | 333347   |          |                        | 126                   | 274977                |          |                        | 9                     | 397100   | 120000   | <i>p</i> <sub>2</sub> |
| 47                    | 331028   |          |                       | 86   | 331028   |          |                        | 127                   | 272836                |          |                        | 10                    | 394606   |          |                       |
| 48                    | 345118   | 87       | 328711                | 128  | 270695   | 11       | 392156                 |                       |                       |          |                        |                       |          |          |                       |
| 49                    | 342755   | 88       | 326392                | 129  | 268555   | 12       | 389706                 |                       |                       |          |                        |                       |          |          |                       |
| 50                    | 340391   | 89       | 324074                | 130  | 266458   | 13       | 387257                 |                       |                       |          |                        |                       |          |          |                       |
| 51                    | 338029   | 90       | 321800                | 131  | 264362   | 14       | 384806                 |                       |                       |          |                        |                       |          |          |                       |
| 52                    | 335665   | 91       | 319525                | 132  | 262266   | 15       | 382357                 |                       |                       |          |                        |                       |          |          |                       |
| 53                    | 333347   | 92       | 317251                | 133  | 260169   | 16       | 379950                 |                       |                       |          |                        |                       |          |          |                       |
| 54                    | 331028   | 93       | 314977                | 134  | 258073   | 17       | 389706                 | 320000                | <i>p</i> <sub>3</sub> |          |                        |                       |          |          |                       |
| 55                    | 328711   | 94       | 312703                | 135  | 255977   | 18       | 387257                 |                       |                       |          |                        |                       |          |          |                       |
| 56                    | 338029   | 95       | 321800                | For all values of <i>x</i> below <i>x</i> = 74, a uniformly distributed load of 2700 lbs. per ft. will give greater moments than this table. |          |          |                        |                       |                       | 19       | 384806                 |                       |          |          |                       |
| 57                    | 335665   | 96       | 319525                |  |          |          |                        |                       |                       | 20       | 382357                 |                       |          |          |                       |
| 58                    | 333347   | 97       | 317251                |  |          |          |                        |                       |                       | 21       | 379950                 |                       |          |          |                       |
| 59                    | 331028   | 98       | 314977                |  |          |          |                        |                       |                       | 22       | 377542                 |                       |          |          |                       |
| 60                    | 328711   | 99       | 312703                |  |          |          |                        |                       |                       | 23       | 375135                 |                       |          |          |                       |
| 61                    | 326392   | 100      | 310428                |  |          |          |                        |                       |                       | 24       | 372727                 |                       |          |          |                       |
| 62                    | 324074   | 101      | 308155                |  |          |          |                        |                       |                       | 25       | 370321                 |                       |          |          |                       |
| 63                    | 333347   | 102      | 305880                |  |          |          |                        |                       |                       | 26       | 367956                 |                       |          |          |                       |
| 64                    | 331028   | 103      | 303607                |  |          |          |                        | 27                    | 365593                |          |                        |                       |          |          |                       |
| 65                    | 328711   | 104      | 301332                |  |          |          |                        | 28                    | 375135                | 645000   | <i>p</i> <sub>4</sub>  |                       |          |          |                       |
| 66                    | 326392   | 105      | 299102                | 29   | 372727   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 67                    | 324074   | 106      | 296873                | 30   | 370321   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 68                    | 321800   | 107      | 305880                | 31   | 367956   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 69                    | 319525   | 108      | 303607                | 32   | 365593   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 70                    | 328711   | 109      | 301332                | 33   | 363228   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 71                    | 326392   | 110      | 299102                | 34   | 360863   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 72                    | 324074   | 111      | 296873                | 35   | 358500   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 73                    | 321800   | 112      | 294643                | 36   | 356135   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 74                    | 319525   | 113      | 292414                | 37   | 353771   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 75                    | 317251   | 114      | 290184                | 38   | 351406   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 76                    | 314977   | 115      | 288000                |  |          |          |                        |                       |                       |          |                        |                       |          |          |                       |
|                       |          | 116      | 285814                |  |          |          |                        |                       |                       |          |                        |                       |          |          |                       |
|                       |          | 117      | 283629                |  |          |          |                        |                       |                       |          |                        |                       |          |          |                       |

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>280<br>feet. |          |          |                       | SPAN,<br>280<br>feet. |          |          |                        | SPAN,<br>280<br>feet. |                       |          |                        | SPAN,<br>290<br>feet. |          |          |                       |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|-----------------------|----------|------------------------|-----------------------|----------|----------|-----------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i>              | <i>m</i> |                        | <i>x</i>              | <i>R</i> | <i>m</i> |                       |
| 39                    | 360863   | 1095000  | <i>P</i> <sub>5</sub> | 77                    | 344356   | 565000   | <i>P</i> <sub>10</sub> | 118                   | 292764                | 9445000  | <i>P</i> <sub>13</sub> | 1                     | 412113   | 0        | <i>P</i> <sub>2</sub> |
| 40                    | 358500   |          |                       | 78                    | 342035   |          |                        | 119                   | 290571                |          |                        | 2                     | 409675   |          |                       |
| 41                    | 356135   |          |                       | 79                    | 339713   |          |                        | 120                   | 288420                |          |                        | 3                     | 407237   |          |                       |
| 42                    | 353771   |          |                       | 80                    | 337392   |          |                        | 121                   | 286271                |          |                        | 4                     | 404800   |          |                       |
| 43                    | 351406   |          |                       | 81                    | 335071   |          |                        | 122                   | 284121                |          |                        | 5                     | 402362   |          |                       |
| 44                    | 348043   |          |                       | 82                    | 351406   |          |                        | 123                   | 292764                |          |                        | 6                     | 402362   |          |                       |
| 45                    | 346678   |          |                       | 83                    | 348043   |          |                        | 124                   | 290571                |          |                        | 7                     | 399965   |          |                       |
| 46                    | 344356   |          |                       | 84                    | 346678   |          |                        | 125                   | 288420                |          |                        | 8                     | 397568   |          |                       |
| 47                    | 342035   |          |                       | 85                    | 344356   |          |                        | 126                   | 286271                |          |                        | 9                     | 395172   |          |                       |
| 48                    | 339713   |          |                       | 86                    | 342035   |          |                        | 127                   | 284121                |          |                        | 10                    | 407722   | 120000   | <i>P</i> <sub>2</sub> |
| 49                    | 337393   | 87       | 339713                | 128                   | 281970   | 11       | 405274                 |                       |                       |          |                        |                       |          |          |                       |
| 50                    | 351406   | 88       | 337392                | 129                   | 279821   | 12       | 402825                 |                       |                       |          |                        |                       |          |          |                       |
| 51                    | 348043   | 89       | 335071                | 130                   | 277713   | 13       | 400377                 |                       |                       |          |                        |                       |          |          |                       |
| 52                    | 346678   | 90       | 332793                | 131                   | 275606   | 14       | 397928                 |                       |                       |          |                        |                       |          |          |                       |
| 53                    | 344356   | 91       | 330514                | 132                   | 273500   | 15       | 395480                 |                       |                       |          |                        |                       |          |          |                       |
| 54                    | 342035   | 92       | 328235                | 133                   | 271392   | 16       | 393031                 |                       |                       |          |                        |                       |          |          |                       |
| 55                    | 339713   | 93       | 325957                | 134                   | 269286   | 17       | 390624                 |                       |                       |          |                        |                       |          |          |                       |
| 56                    | 337393   | 94       | 323678                | 135                   | 267220   | 18       | 400377                 | 320000                | <i>P</i> <sub>3</sub> |          |                        |                       |          |          |                       |
| 57                    | 346678   | 95       | 332793                | 136                   | 265156   | 19       | 397928                 |                       |                       |          |                        |                       |          |          |                       |
| 58                    | 344356   | 96       | 330514                | 137                   | 263092   | 20       | 395480                 |                       |                       |          |                        |                       |          |          |                       |
| 59                    | 342035   | 97       | 328235                | 138                   | 261028   | 21       | 393031                 |                       |                       |          |                        |                       |          |          |                       |
| 60                    | 339713   | 98       | 325957                | 139                   | 258963   | 22       | 390624                 |                       |                       |          |                        |                       |          |          |                       |
| 61                    | 337392   | 99       | 323678                | 140                   | 256943   | 23       | 388217                 |                       |                       |          |                        |                       |          |          |                       |
| 62                    | 335071   | 100      | 321442                |                       |          | 24       | 385810                 |                       |                       |          |                        |                       |          |          |                       |
|                       |          | 101      | 319206                |                       |          | 25       | 383402                 |                       |                       |          |                        |                       |          |          |                       |
|                       |          | 102      | 316971                |                       |          | 26       | 380995                 |                       |                       |          |                        |                       |          |          |                       |
|                       |          | 103      | 314735                |                       |          | 27       | 378630                 |                       |                       |          |                        |                       |          |          |                       |
| 63                    | 344356   | 3275000  | <i>P</i> <sub>8</sub> | 104                   | 312500   | 8245000  | <i>P</i> <sub>12</sub> |                       |                       | 10770000 | <i>P</i> <sub>14</sub> | 28                    | 385810   | 645000   | <i>P</i> <sub>4</sub> |
| 64                    | 342035   |          |                       | 105                   | 310307   |          |                        |                       |                       |          |                        | 29                    | 383402   |          |                       |
| 65                    | 339713   |          |                       | 106                   | 308113   |          |                        |                       |                       |          |                        | 30                    | 380995   |          |                       |
| 66                    | 337392   |          |                       | 107                   | 305921   |          |                        |                       |                       |          |                        | 31                    | 378630   |          |                       |
| 67                    | 335071   |          |                       | 108                   | 303730   |          |                        |                       |                       |          |                        | 32                    | 376264   |          |                       |
| 68                    | 332793   |          |                       | 109                   | 301535   |          |                        |                       |                       |          |                        | 33                    | 373897   |          |                       |
| 69                    | 330514   |          |                       | 110                   | 310307   |          |                        |                       |                       |          |                        | 34                    | 371531   |          |                       |
|                       |          |          |                       | 111                   | 308113   |          |                        |                       |                       |          |                        | 35                    | 369165   |          |                       |
|                       |          |          |                       | 112                   | 305921   |          |                        |                       |                       |          |                        | 36                    | 366843   |          |                       |
|                       |          |          |                       | 113                   | 303730   |          |                        |                       |                       |          |                        | 37                    | 364516   |          |                       |
| 70                    | 339713   | 4075000  | <i>P</i> <sub>9</sub> | 114                   | 301535   | 9445000  | <i>P</i> <sub>13</sub> |                       |                       | 9445000  | <i>P</i> <sub>13</sub> | 38                    | 362192   |          |                       |
| 71                    | 337392   |          |                       | 115                   | 299343   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 72                    | 335071   |          |                       | 116                   | 297150   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 73                    | 332793   |          |                       | 117                   | 294957   |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 74                    | 330514   |          |                       |                       |          |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 75                    | 328235   |          |                       |                       |          |          |                        |                       |                       |          |                        |                       |          |          |                       |
| 76                    | 325957   |          |                       |                       |          |          |                        |                       |                       |          |                        |                       |          |          |                       |
|                       |          |          |                       |                       |          |          |                        |                       |                       |          |                        |                       |          |          |                       |

For all values of *x* below *x*=61, a uniformly distributed load of 2700 lbs. per ft. will give greater moments than this table.

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>290<br>feet. |          |          | SPAN,<br>290<br>feet. |          |          | SPAN,<br>290<br>feet. |          |          | SPAN,<br>300<br>feet. |          |          |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
|-----------------------|----------|----------|-----------------------|----------|----------|-----------------------|----------|----------|-----------------------|----------|----------|--------|--------|----------|----------|--------|----------|--------|--------|----------|----|--------|----------|----|--------|
| <i>x</i>              | <i>R</i> | <i>m</i> |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
| 39                    | 371531   | 1095000  | 77                    | 355260   | 5650000  | 118                   | 303814   | 9445000  | 1                     | 422463   | 0        |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
| 40                    | 369165   |          |                       | 78       |          |                       | 352977   |          |                       | 119      |          | 301655 | 2      | 420026   |          |        |          |        |        |          |    |        |          |    |        |
| 41                    | 366843   |          |                       | 79       |          |                       | 350694   |          |                       | 120      |          | 299537 | 3      | 417590   |          |        |          |        |        |          |    |        |          |    |        |
| 42                    | 364516   |          |                       | 80       |          |                       | 348411   |          |                       | 121      |          | 297420 | 4      | 415153   |          |        |          |        |        |          |    |        |          |    |        |
| 43                    | 362192   |          |                       | 81       |          |                       | 346128   |          |                       | 122      |          | 295302 | 5      | 412716   |          |        |          |        |        |          |    |        |          |    |        |
| 44                    | 359868   |          |                       | 82       |          |                       | 343793   |          |                       | 123      |          | 293185 | 6      | 410320   |          |        |          |        |        |          |    |        |          |    |        |
| 45                    | 357543   |          |                       | 83       |          |                       | 359868   |          |                       | 124      |          | 291067 | 7      | 407923   |          |        |          |        |        |          |    |        |          |    |        |
| 46                    | 355260   |          |                       | 84       |          |                       | 357543   |          |                       | 125      |          | 288950 | 8      | 405526   |          |        |          |        |        |          |    |        |          |    |        |
| 47                    | 352977   |          |                       | 85       |          |                       | 355260   |          |                       | 7170000  |          | 126    | 297420 | 10770000 | 9        | 418080 |          |        |        |          |    |        |          |    |        |
| 48                    | 350694   |          |                       | 86       |          |                       | 352977   |          |                       |          |          | 127    | 295302 |          |          | 10     | 415633   |        |        |          |    |        |          |    |        |
| 49                    | 348411   | 87       | 350694                | 128      | 293185   | 11                    | 413226   |          |                       |          |          |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
| 50                    | 346128   | 88       | 348411                | 129      | 291067   | 12                    | 410820   |          |                       |          |          |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
| 51                    | 359868   | 1900000  | 89                    | 346128   | 8245000  | 130                   | 288950   | 12800000 | 13                    |          | 408413   | 120000 |        |          |          |        |          |        |        |          |    |        |          |    |        |
|                       | 52       |          |                       | 357543   |          |                       | 90       |          |                       |          | 343793   |        | 131    |          |          | 286832 | 14       | 406000 |        |          |    |        |          |    |        |
|                       | 53       |          |                       | 355260   |          |                       | 91       |          |                       |          | 341509   |        | 132    |          |          | 284715 | 15       | 403600 |        |          |    |        |          |    |        |
|                       | 54       |          |                       | 352977   |          |                       | 92       |          |                       |          | 339226   |        | 133    |          |          | 282597 | 16       | 401233 |        |          |    |        |          |    |        |
|                       | 55       |          |                       | 350694   |          |                       | 93       |          |                       |          | 336943   |        | 134    |          |          | 280480 | 17       | 410820 |        |          |    |        |          |    |        |
|                       | 56       |          |                       | 348411   |          |                       | 94       |          |                       |          | 346128   |        | 135    |          |          | 278402 |          | 18     | 408413 |          |    |        |          |    |        |
| 57                    | 357543   | 2550000  | 95                    | 343793   | 8245000  | 136                   | 276326   | 12800000 | 19                    | 406000   | 320000   |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
|                       | 58       |          |                       | 355260   |          |                       | 96       |          |                       | 341509   |          | 137    | 274250 | 20       | 403600   |        |          |        |        |          |    |        |          |    |        |
|                       | 59       |          |                       | 352977   |          |                       | 97       |          |                       | 339226   |          | 138    | 272174 | 21       | 401233   |        |          |        |        |          |    |        |          |    |        |
|                       | 60       |          |                       | 350694   |          |                       | 98       |          |                       | 336943   |          | 139    | 284715 | 12800000 | 22       | 398866 |          |        |        |          |    |        |          |    |        |
|                       | 61       |          |                       | 348411   |          |                       | 99       |          |                       | 334660   |          |        | 140    |          |          | 282597 | 23       | 396500 |        |          |    |        |          |    |        |
|                       | 62       |          |                       | 346128   |          |                       | 100      |          |                       | 332418   |          |        | 141    |          |          | 280480 | 24       | 394133 |        |          |    |        |          |    |        |
| 63                    | 343793   | 101      | 330177                | 142      | 278402   | 25                    | 391766   |          |                       |          |          |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
| 64                    | 352977   | 3275000  | 102                   | 327935   | 8245000  | 143                   | 276326   | 12800000 | 26                    | 389400   | 645000   |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
|                       | 65       |          |                       | 350694   |          |                       | 103      |          |                       | 325693   |          |        | 144    |          |          | 274250 | 27       | 387033 |        |          |    |        |          |    |        |
|                       | 66       |          |                       | 348411   |          |                       | 104      |          |                       | 323452   |          | 145    | 272174 | 12800000 | 28       | 396500 |          |        |        |          |    |        |          |    |        |
|                       | 67       |          |                       | 346128   |          |                       | 105      |          |                       | 321251   |          |        | 139    |          |          | 284715 | 12800000 | 29     | 394133 |          |    |        |          |    |        |
|                       | 68       |          |                       | 343793   |          |                       | 106      |          |                       | 319051   |          |        |        |          |          | 140    |          |        | 282597 | 12800000 | 30 | 391766 |          |    |        |
|                       | 69       |          |                       | 341509   |          |                       | 107      |          |                       | 316851   |          |        |        |          |          |        |          |        | 141    |          |    | 280480 | 12800000 | 31 | 389400 |
| 70                    | 350694   | 4075000  | 110                   | 321251   | 9445000  | 142                   | 278402   | 12800000 | 32                    | 387033   | 645000   |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
|                       | 71       |          |                       | 348411   |          |                       | 111      |          |                       | 319051   |          |        |        |          |          |        |          |        |        |          |    | 143    |          |    | 276326 |
|                       | 72       |          |                       | 346128   |          |                       | 112      |          |                       | 316851   |          | 144    |        | 274250   | 12800000 |        |          |        |        |          |    |        |          |    | 34     |
|                       | 73       |          |                       | 343793   |          |                       | 113      |          |                       | 314651   |          |        | 145    | 272174   |          |        | 12800000 | 35     |        |          |    |        |          |    |        |
|                       | 74       |          |                       | 341509   |          |                       | 114      |          |                       | 312451   |          |        |        | 145      |          | 272174 |          |        |        | 12800000 | 36 |        |          |    |        |
|                       | 75       |          |                       | 339226   |          |                       | 115      |          |                       | 310290   |          |        |        |          |          | 145    |          |        | 272174 |          |    |        | 12800000 | 37 |        |
| 76                    | 336943   | 116      | 308131                | 145      | 272174   | 12800000              | 38       | 372953   |                       |          |          |        |        |          |          |        |          |        |        |          |    |        |          |    |        |
|                       |          | 117      | 305972                |          |          |                       |          |          |                       |          |          |        |        |          |          |        |          |        |        |          |    |        |          |    |        |

For all values of *x* below *x* = 51, a uniformly distributed load of 2700 lbs. per ft. will give greater moments than this table.

MOMENTS.

$$M_x = Rx - m.$$

| SPAN,<br>300<br>feet. |          |          |                       | SPAN,<br>300<br>feet. |          |          |                        | SPAN,<br>300<br>feet. |                        |          |                        |         |                        |
|-----------------------|----------|----------|-----------------------|-----------------------|----------|----------|------------------------|-----------------------|------------------------|----------|------------------------|---------|------------------------|
| <i>x</i>              | <i>R</i> | <i>m</i> |                       | <i>x</i>              | <i>R</i> | <i>m</i> |                        | <i>x</i>              | <i>R</i>               | <i>m</i> |                        |         |                        |
| 39                    | 382300   | 1095000  | <i>P</i> <sub>5</sub> | 78                    | 363726   | 5050000  | <i>P</i> <sub>10</sub> | 119                   | 312733                 | 9445000  | <i>P</i> <sub>13</sub> |         |                        |
| 40                    | 379933   |          |                       | 79                    | 361440   |          |                        | 120                   | 310606                 |          |                        |         |                        |
| 41                    | 377606   |          |                       | 80                    | 359153   |          |                        | 121                   | 308480                 |          |                        |         |                        |
| 42                    | 375280   |          |                       | 81                    | 356866   |          |                        | 122                   | 306353                 |          |                        |         |                        |
| 43                    | 372953   |          |                       | 82                    | 354620   |          |                        | 123                   | 304226                 |          |                        |         |                        |
| 44                    | 370626   |          |                       | 83                    | 352373   |          |                        | 124                   | 302100                 |          |                        |         |                        |
| 45                    | 368300   |          |                       | 84                    | 368300   |          |                        | 125                   | 300013                 |          |                        |         |                        |
| 46                    | 366013   |          |                       | 85                    | 366013   |          |                        | 126                   | 308480                 |          |                        |         |                        |
| 47                    | 363726   |          |                       | 86                    | 363726   |          |                        | 127                   | 306353                 |          |                        |         |                        |
| 48                    | 361440   |          |                       | 87                    | 361440   |          |                        | 128                   | 304226                 |          |                        |         |                        |
| 49                    | 359153   |          |                       | 88                    | 359153   |          |                        | 129                   | 302100                 |          |                        |         |                        |
| 50                    | 356866   | 89       | 356866                | 130                   | 300013   |          |                        |                       |                        |          |                        |         |                        |
| 51                    | 370626   | 1900000  | <i>P</i> <sub>6</sub> | 90                    | 354620   | 7170000  | <i>P</i> <sub>11</sub> | 131                   | 297926                 | 10770000 | <i>P</i> <sub>14</sub> |         |                        |
| 52                    | 368300   |          |                       | 91                    | 352373   |          |                        | 132                   | 295840                 |          |                        |         |                        |
| 53                    | 366013   |          |                       | 92                    | 350126   |          |                        | 133                   | 293753                 |          |                        |         |                        |
| 54                    | 363726   |          |                       | 93                    | 347880   |          |                        | 134                   | 291666                 |          |                        |         |                        |
| 55                    | 361440   |          |                       | 94                    | 345633   |          |                        | 135                   | 289620                 |          |                        |         |                        |
| 56                    | 359153   |          |                       | 95                    | 343426   |          |                        | 136                   | 287573                 |          |                        |         |                        |
| 57                    | 368300   |          |                       | 96                    | 341220   |          |                        | 137                   | 285526                 |          |                        |         |                        |
| 58                    | 366013   |          |                       | 97                    | 350126   |          |                        | 138                   | 283480                 |          |                        |         |                        |
| 59                    | 363726   |          |                       | 98                    | 347880   |          |                        | 139                   | 281433                 |          |                        |         |                        |
| 60                    | 361440   |          |                       | 99                    | 345633   |          |                        | 140                   | 279386                 |          |                        |         |                        |
| 61                    | 359153   |          |                       | 100                   | 343426   |          |                        | 141                   | 277340                 |          |                        |         |                        |
| 62                    | 356866   | 2550000  | <i>P</i> <sub>7</sub> | 101                   | 341220   | 8245000  | <i>P</i> <sub>12</sub> | 142                   | 289620                 | 12800000 | <i>P</i> <sub>15</sub> |         |                        |
| 63                    | 354620   |          |                       | 102                   | 339013   |          |                        | 143                   | 287573                 |          |                        |         |                        |
| 64                    | 363726   |          |                       | 103                   | 336806   |          |                        | 144                   | 285526                 |          |                        |         |                        |
| 65                    | 361440   |          |                       | 104                   | 334600   |          |                        | 145                   | 283480                 |          |                        |         |                        |
| 66                    | 359153   |          |                       | 105                   | 332393   |          |                        | 146                   | 281433                 |          |                        |         |                        |
| 67                    | 356866   |          |                       | 106                   | 330186   |          |                        | 147                   | 279386                 |          |                        |         |                        |
| 68                    | 354620   |          |                       | 107                   | 327980   |          |                        | 148                   | 277340                 |          |                        |         |                        |
| 69                    | 352373   |          |                       | 108                   | 325773   |          |                        | 149                   | 275293                 |          |                        |         |                        |
| 70                    | 350126   |          |                       | 109                   | 334600   |          |                        | 14325000              | <i>P</i> <sub>16</sub> |          |                        |         |                        |
| 71                    | 359153   |          |                       | 110                   | 332393   |          |                        |                       |                        |          |                        | 150     | 283480                 |
| 72                    | 356866   |          |                       | 111                   | 330186   |          |                        |                       |                        |          |                        | 9445000 | <i>P</i> <sub>13</sub> |
| 73                    | 354620   | 112      | 327980                |                       |          |          |                        |                       |                        |          |                        |         |                        |
| 74                    | 352373   | 113      | 325773                |                       |          |          |                        |                       |                        |          |                        |         |                        |
| 75                    | 350126   | 114      | 323566                |                       |          |          |                        |                       |                        |          |                        |         |                        |
| 76                    | 347880   | 115      | 321400                |                       |          |          |                        |                       |                        |          |                        |         |                        |
| 77                    | 345633   | 116      | 319233                |                       |          |          |                        |                       |                        |          |                        |         |                        |
|                       |          | 117      | 317066                |                       |          |          |                        |                       |                        |          |                        |         |                        |
|                       |          | 118      | 314900                |                       |          |          |                        |                       |                        |          |                        |         |                        |

For all values of *x* below *x* = 45, a uniformly distributed load of 2700 lbs. per ft. will give greater moments than this table.



## ILLUSTRATION OF THE USE OF THE TABLES.

A FEW illustrations will make clear the use of the tables.

1st, SINGLE SYSTEM OF BRACING. — Take, for instance, the Pratt truss, worked out on p. 107, Fig. 99. Here we have  $l = 90$  feet required to find the maximum strains due to live load.

For any upper flange, as  $A$ , Table II. for span 90 feet, p. xxii., gives at once the greatest moment. Thus, since the centre of moments for  $A$  is at the foot of the post  $ab$ , we must find the maximum moment at ten feet from the left end. For this point, the table gives at once,

$$\text{Maximum moment} = Rx - m = 157888 \times 10 - 125000 = 1453880;$$

dividing this by lever arm of  $A$ , which is 10 feet, we have at once,

$$A = 145388 \text{ pounds} = 72.69 \text{ tons.}$$

In like manner, for  $E$ , we have  $x = 40$ ; and hence

$$E \times 10 = Rx - m = 145610 \times 40 - 2550000 = 3274400;$$

hence

$$E = 327440 \text{ pounds} = 163.72 \text{ tons.}$$

So for any flange, upper or lower, the greatest strain due to such a rolling load as our tables assume can be at once and easily found. This rolling load is believed to be such as to give greater strains than can ever occur in practice. To the strains thus found, we must, of course, add the strains due to dead load. If we assume this at 0.5 ton per foot, or 5 tons at each upper apex, as on p. 107, we have at once for  $A$ , since the re-action at left is 20 tons,

$$A \times 10 = 20 \times 10, \text{ or } A = 20 \text{ tons};$$

$$E \times 10 = 20 \times 40 - 5(30 + 20 + 10), \text{ or } E = 50 \text{ tons.}$$

The total strains are, therefore,

$$A = 72.69 + 20 = 92.69 \text{ tons};$$

$$E = 163.72 + 50 = 213.72 \text{ tons.}$$

Comparing these with the strains found on p. 107, viz.,  $A = 100.33$ , and  $E = 223$ , tons, we see that the method given there gives us greater strains than our table. This would indicate that our "locomotive excess" of 33 tons, there adopted, is somewhat large, and that 28 tons would nearer meet the requirements of practice, and cause the values of p. 107 and those found by use of the table to agree quite closely.

For any diagonal, as  $fg$ , we can easily find the requisite shear from Table I. Thus, we have, in present case,  $l = 90$ ,  $x = 40$ ,  $l - x = 50$ ,  $l - x + 8 = 58$ . We see at once, from

Table I., p. iii., that the limit for span 90 feet is  $48\frac{1}{3}$ ; hence, for  $x = 40$ , we must use formula II. We have, then,

$$\text{Shear} = \frac{15000}{90} \cdot 58 + \frac{175000}{90} \cdot 50 - \frac{3210000}{90} - 15000 = 56222 = 28.1 \text{ tons.}$$

To this add the dead-load shear, which is 5 tons, and we have shear for  $fg$  33.1 tons. The shear found on p. 108, for 33 tons locomotive excess, is 40 tons. As before remarked, the results there given are somewhat large, and a locomotive excess of 28 tons would give a closer agreement.

The preceding, if followed carefully, will fully explain the use of our tables in all cases where we have but a single system of bracing.

2d, DOUBLE, OR MULTIPLE, SYSTEM. — For any flange, find from Table II. the greatest moment for its nearest centre of moments, and then find what uniform load will give this same moment at the same point; calculate the flange for this uniform load divided into apex loads, and acting upon each system.

If  $x$  is the distance from left end to centre of moments, and  $p$  is the uniform load per unit of length, then  $\frac{px}{2}(l-x)$  is the moment. Put this equal to the moment found from Table II., and the value of  $p$  can be found, in pounds per foot, which would give the same moment as the table, at the given point. The flange can then be calculated for this uniform load. Each flange should thus be calculated for its own equivalent uniform load.

For any brace, find the greatest shear at the foot of it from Table II.; then find the equivalent uniform moving load; divide this into apex weights, and calculate the brace for this loading.

If  $m$  is the uniform moving load per unit of length, coming on from right and extending up to a distance of  $x$  from the left end, then the shear is  $\frac{m(l-x)^2}{2l}$ .

Put this equal to the shear found from Table II., and the value of  $m$  can be found in pounds per foot, which would give the same shear as the table. The brace can then be calculated for this uniform moving load. Each brace should thus be calculated for its own equivalent uniform load.









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Ludwig



