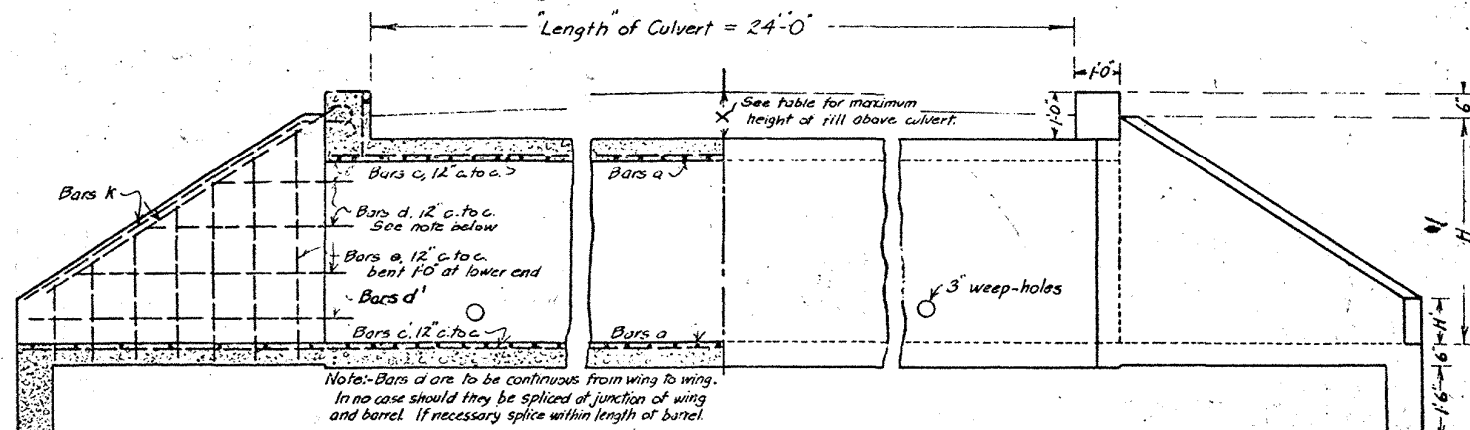
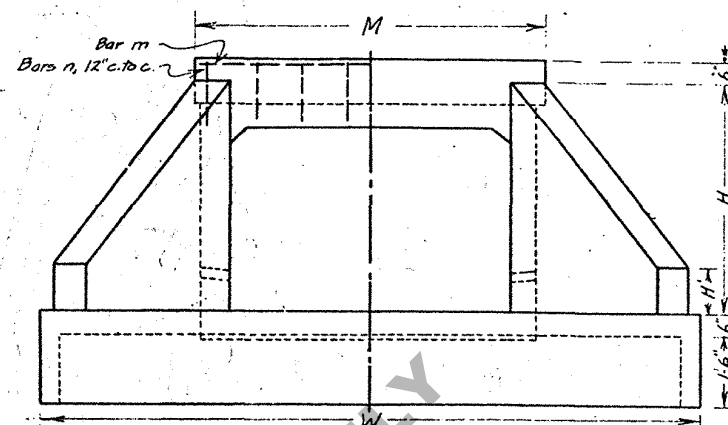


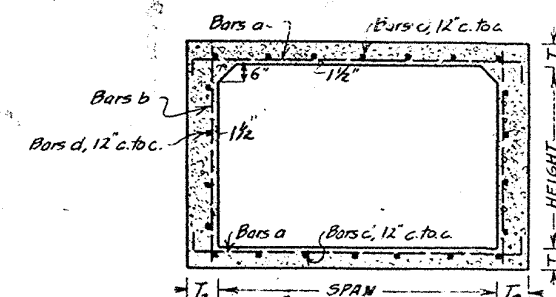


HALF LONGITUDINAL SECTION

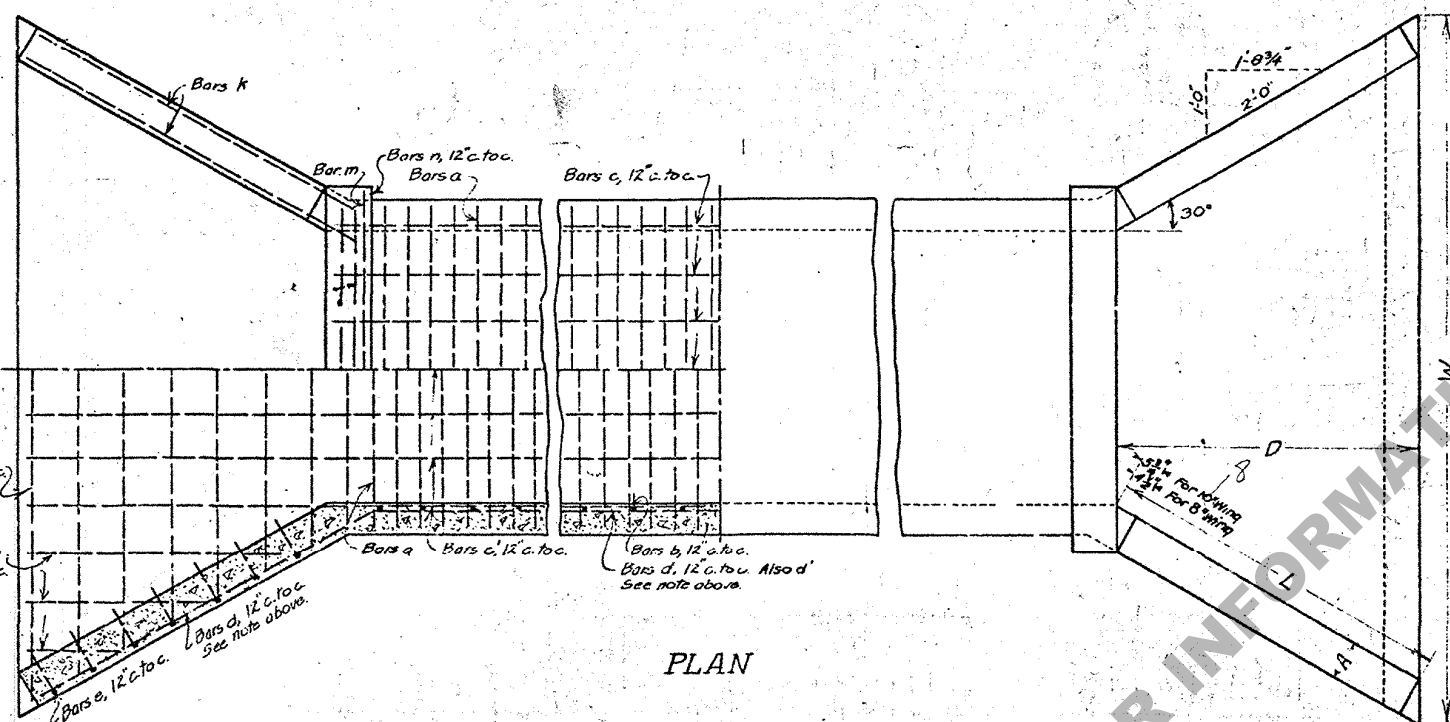
HALF SIDE ELEVATION



END VIEW



SECTION OF BARREL



PLAN

### GENERAL NOTES & DESIGN DATA.

General Specifications:- La. State Highway Dept. Spec.  
 Concrete - all class "A", 1:6 mix.

Steel - deformed bars

All exposed corners to be chamfered 3/4 in.

All exposed surfaces to be given a smooth finish.

Reinforcing bars should be wired at intersections and properly secured against displacement during depositing of concrete.

Design Loads:-

Concentrated load - 15 ton typical truck, with 30% impact allowance, distributed as specified in general specifications.

Entire weight of fill above culvert assumed as acting on culvert.

Horizontal component of earth pressure taken as 30 lbs per sq ft.

Steel in tension - 16000 lbs. Concrete in compression - 650 lbs.

Fill above slab of culvert is not to exceed the maximum height "X" as given in table.

For multiple opening use same dimensions and steel. Intermediate walls to be of same thickness as wings, reinforced same as side walls.

All dimensions relating to bars are to centers of bars.

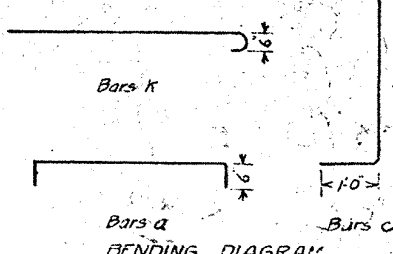
Bars at splices are to be lapped 2'-0" and separated 2'.

| OPENING<br>CLEAR<br>SPAN<br>FT. | CLEAR<br>HEIGHT<br>FT.-IN. | BARREL REINFORCEMENT |        |              |        |              |        |              |        |        |        | WING WALL & FLOOR REINFORCEMENT |        |        |        |        |        |        |        |        |        | All 1/2" bars |        |        |        |
|---------------------------------|----------------------------|----------------------|--------|--------------|--------|--------------|--------|--------------|--------|--------|--------|---------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|
|                                 |                            | Bars a               |        | Bars b, 1/2" |        | Bars c, 1/2" |        | Bars d, 1/2" |        | Bars e |        | Bars f                          |        | Bars g |        | Bars h |        | Bars i |        | Bars j |        | Bars k        |        | Bars l |        |
|                                 |                            | No.                  | Length | No.          | Length | No.          | Length | No.          | Length | No.    | Length | No.                             | Length | No.    | Length | No.    | Length | No.    | Length | No.    | Length | No.           | Length | No.    | Length |
| 6                               | 2-0                        | 12                   | 1/2"   | 50           | 3'-11" | 7            | 2'-5"  | 7            | 3'-2"  | 31     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 2-6                        | 12                   | 1/2"   | 50           | 3'-11" | 7            | 2'-5"  | 7            | 3'-2"  | 31     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 3-0                        | 12                   | 1/2"   | 50           | 3'-11" | 7            | 2'-5"  | 7            | 3'-2"  | 31     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 4-0                        | 12                   | 1/2"   | 50           | 3'-11" | 7            | 2'-5"  | 7            | 3'-2"  | 31     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 5-0                        | 12                   | 1/2"   | 50           | 3'-11" | 7            | 2'-5"  | 7            | 3'-2"  | 31     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
| 8                               | 2-0                        | 10                   | 3/4"   | 6            | 5'-0"  | 9            | 2'-5"  | 9            | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 2-6                        | 10                   | 3/4"   | 6            | 5'-0"  | 9            | 2'-5"  | 9            | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 3-0                        | 10                   | 3/4"   | 6            | 5'-0"  | 9            | 2'-5"  | 9            | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 4-0                        | 10                   | 3/4"   | 6            | 5'-0"  | 9            | 2'-5"  | 9            | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 5-0                        | 10                   | 3/4"   | 6            | 5'-0"  | 9            | 2'-5"  | 9            | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
| 10                              | 2-0                        | 8                    | 3/4"   | 7            | 5'-0"  | 11           | 2'-5"  | 11           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 2-6                        | 8                    | 3/4"   | 7            | 5'-0"  | 11           | 2'-5"  | 11           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 3-0                        | 8                    | 3/4"   | 7            | 5'-0"  | 11           | 2'-5"  | 11           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 4-0                        | 8                    | 3/4"   | 7            | 5'-0"  | 11           | 2'-5"  | 11           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 5-0                        | 8                    | 3/4"   | 7            | 5'-0"  | 11           | 2'-5"  | 11           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
| 12                              | 2-0                        | 10                   | 3/4"   | 6            | 5'-0"  | 13           | 2'-5"  | 13           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 2-6                        | 10                   | 3/4"   | 6            | 5'-0"  | 13           | 2'-5"  | 13           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 3-0                        | 10                   | 3/4"   | 6            | 5'-0"  | 13           | 2'-5"  | 13           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 4-0                        | 10                   | 3/4"   | 6            | 5'-0"  | 13           | 2'-5"  | 13           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |
|                                 | 5-0                        | 10                   | 3/4"   | 6            | 5'-0"  | 13           | 2'-5"  | 13           | 3'-0"  | 32     | 1'-10" | 3                               | 1'-6"  | 2      | 2'-4"  | 7      | 4'-1"  | 4      | 8'-0"  | 12     | 1'-6"  | 2             | 1'-9"  | 12     | 1'-6"  |

Note: To obtain lengths of intermediate bars use variation as an increment between short and long bars. No. of bars for each length is also given.

### DIMENSIONS & QUANTITIES FOR 24'-0" CULVERT

| OPENING<br>CLEAR<br>SPAN<br>FT. | CLEAR<br>HEIGHT<br>FT.-IN. | AREA<br>SQ. FT. | WINGS & FLOOR |                |       |         |      |      |    |       |      |   | PER LIN. FT.<br>BARREL<br>STEEL CONC. | TOTAL<br>QUANTITIES<br>STEEL CONC. |
|---------------------------------|----------------------------|-----------------|---------------|----------------|-------|---------|------|------|----|-------|------|---|---------------------------------------|------------------------------------|
|                                 |                            |                 | T             | T <sub>2</sub> | M     | H       | H'   | L    | A  | W     | D    | X |                                       |                                    |
| 6                               | 2-0                        | 12.0            | 8             | 8              | 7-6   | 3-2     | 1-0  | 4-2  | 8  | 11-8  | 3-7  | 4 | 54                                    | 1632                               |
|                                 | 2-6                        | 15.0            | 8             | 8              | 7-6   | 3-8     | 1-2  | 4-9  | 8  | 12-3  | 4-1  | 4 | 55                                    | 1667                               |
|                                 | 3-0                        | 18.0            | 8             | 8              | 7-6   | 4-2     | 1-4  | 5-4  | 8  | 12-10 | 4-7  | 4 | 57                                    | 1815                               |
|                                 | 4-0                        | 24.0            | 8             | 8              | 7-11  | 5-2     | 1-8  | 6-7  | 10 | 14-0  | 5-8  | 4 | 61                                    | 2011                               |
|                                 | 5-0                        | 30.0            | 8             | 8              | 7-11  | 6-2     | 1-10 | 8-0  | 10 | 15-11 | 6-11 | 4 | 64                                    | 2246                               |
| 8                               | 2-0                        | 16.0            | 9 1/2         | 8              | 9-6   | 3-3 1/2 | 1-0  | 4-5  | 8  | 13-11 | 3-9  | 4 | 85                                    | 2478                               |
|                                 | 2-6                        | 20.0            | 9 1/2         | 8              | 9-6   | 3-9 1/2 | 1-2  | 5-0  | 8  | 14-6  | 4-3  | 4 | 86                                    | 2559                               |
|                                 | 3-0                        | 24.0            | 9 1/2         | 8              | 9-6   | 4-3 1/2 | 1-4  | 5-7  | 8  | 15-1  | 4-9  | 4 | 87                                    | 2688                               |
|                                 | 4-0                        | 32.0            | 9 1/2         | 8              | 9-11  | 5-3 1/2 | 1-8  | 6-10 | 10 | 16-9  | 5-10 | 4 | 92                                    | 2917                               |
|                                 | 5-0                        | 40.0            | 9 1/2         | 8              | 9-11  | 6-3 1/2 | 1-10 | 8-3  | 10 | 18-2  | 7-1  | 4 | 95                                    | 3134                               |
| 10                              | 2-0                        | 20.0            | 11            | 8              | 11-6  | 3-5     | 1-0  | 4-7  | 8  | 16-1  | 4-0  | 4 | 107                                   | 3082                               |
|                                 | 2-6                        | 25.0            | 11            | 8              | 11-6  | 3-11    | 1-2  | 5-2  | 8  | 16-8  | 4-6  | 4 | 108                                   | 3141                               |
|                                 | 3-0                        | 30.0            | 11            | 8              | 11-6  | 4-5     | 1-4  | 5-9  | 8  | 17-3  | 5-0  | 4 | 111                                   | 3216                               |
|                                 | 4-0                        | 40.0            | 11            | 10             | 11-11 | 5-5     | 1-8  | 7-0  | 10 | 18-11 | 6-0  | 4 | 116                                   | 3565                               |
|                                 | 5-0                        | 50.0            | 11            | 10             | 11-11 | 6-5     | 1-10 | 8-5  | 10 | 20-4  | 7-3  | 4 | 120                                   | 3799                               |
| 12                              | 2-0                        | 24.0            | 13 1/2        | 10             | 13-6  | 3-7 1/2 | 1-0  | 4-11 | 8  | 18-5  | 4-3  | 4 | 142                                   | 4041                               |
|                                 | 2-6                        | 30.0            | 13 1/2        | 10             | 13-6  | 4-1 1/2 | 1-2  | 5-6  | 8  | 19-0  | 4-9  | 4 | 143                                   | 4168                               |
|                                 | 3-0                        | 36.0            | 13 1/2        | 10             | 13-6  | 4-7 1/2 | 1-4  | 6-1  | 8  | 19-7  | 5-3  | 4 | 146                                   | 4276                               |
|                                 | 4-0                        | 48.0            | 13 1/2        | 10             | 13-11 | 5-7 1/2 | 1-8  | 7-4  | 10 | 21-3  | 6-4  | 4 | 149                                   | 4525                               |
|                                 | 5-0                        | 60.0            | 13 1/2        | 10             | 13-11 | 6-7 1/2 | 1-10 | 8-9  | 10 | 22-8  | 7-7  | 4 | 152                                   | 4803                               |



BENDING DIAGRAM

## CONCRETE BOX CULVERTS

FLARING WING-WALLS  
 6 FT. TO 12 FT. SPANS

LOUISIANA HIGHWAY COMMISSION

NEW ORLEANS, LA. SCALE 3/8" = 1 FT. JANUARY 1932

APPROVED: STATE HIGHWAY ENGINEER

Revised 7/10/29 Bars under Culvert Quantities (S.T.H.)