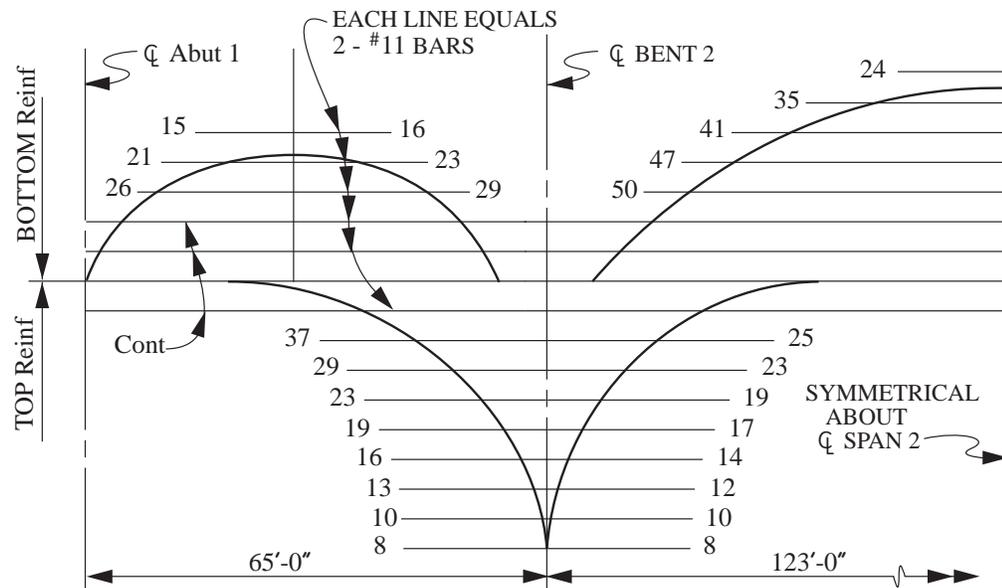


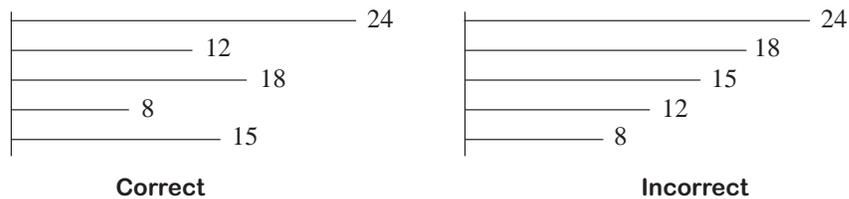
10-20 GIRDER REINFORCEMENT

Box Girder Reinforcement

The designer will ordinarily furnish moment diagrams with the number, size, and lengths of main reinforcement.



The main reinforcement should be placed so that the ends are staggered rather than being progressively shorter.



Bars should be symmetrical about the centerline of bay and the shorter bars should generally be placed nearer the centerline of bay.

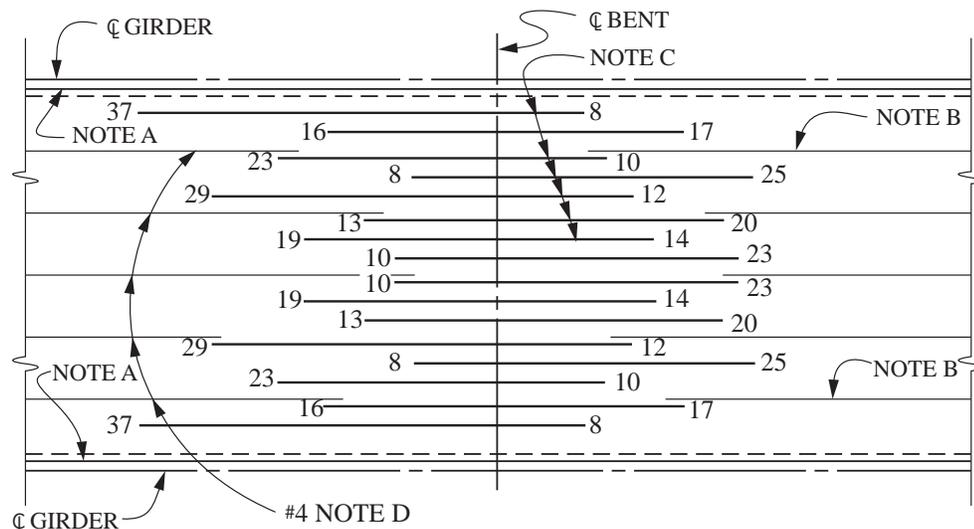
For convenience in these instructions, only an interior girder will be considered. Reinforcement of an exterior girder is similar.

Top Girder Reinforcement

It is considered good practice to use as few bar lengths as possible in order to simplify shop detailing, cutting, handling and placing. Also, maximum bar lengths should be kept shorter than 60' whenever possible. It is usually possible to use many bars of the same length by adding a foot or two to a couple of bars. This condition is usually obtained by combining the longest cutoff on one side of the centerline with the shortest on the opposite side. A few odd lengths are often required. The lengths for top reinforcement for this example would be as follows:

37	29	23	19	16	13	10	8	
<u>8</u>	<u>12</u>	<u>10</u>	<u>14</u>	<u>17</u>	<u>19</u>	<u>23</u>	<u>25</u>	
45'	41'	33'	33'	33'	32'	33'	33'	
							use 33'	

Thus by adding one foot to one of the bars, six identical length bars are obtained.



NOTES:

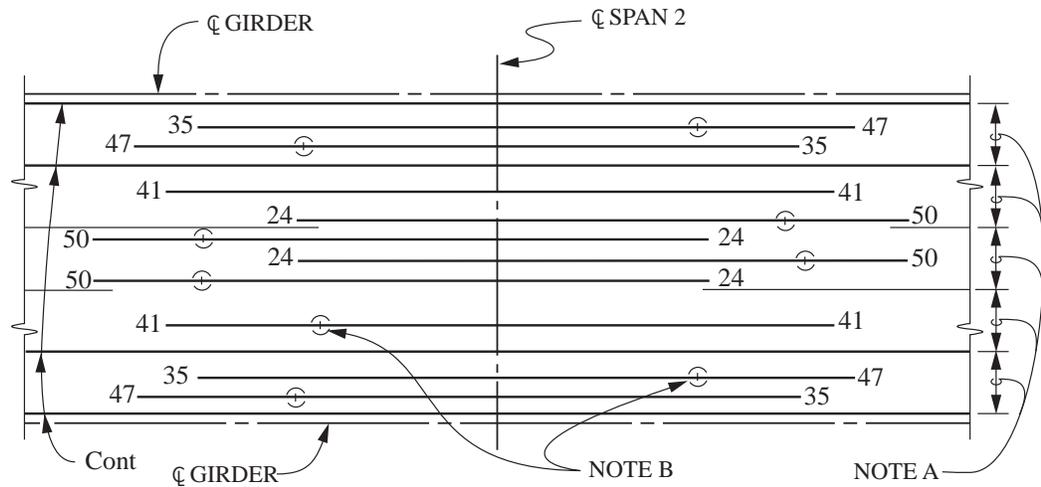
- A. Place two continuous bars in web at top of stirrup.
- B. Place bars under bend of deck reinforcement. Continuous reinforcement should also be placed at the edge of deck slab and adjacent to barrier dowels. See BRIDGE STANDARD PLAN BO-5, DETAIL 5-15.
- C. Show these bars at approximately equal space.
- D. Longitudinal bar spacing shall not exceed 18 inches. Use additional #4 bars lapped with main reinforcement where necessary.

Bottom Girder Reinforcement

The bars in the bottom reinforcement usually are long enough that the contractor must splice them to meet hauling and handling limitations. It is possible to combine lengths advantageously here also. The length for the middle span for this example would be as follows:

24	35	41	47	50	
50	47	41	35	24	
74'	82'	82'	82'	74'	Usual length limitation net length needed plus splice length
60	60	60	60	60	
14'	22'	22'	22'	14'	

Thus by combining lengths some similarity can be obtained and splices can be staggered away from maximum moment.

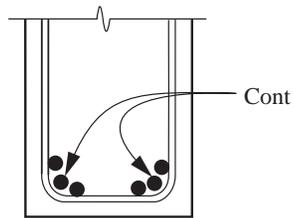
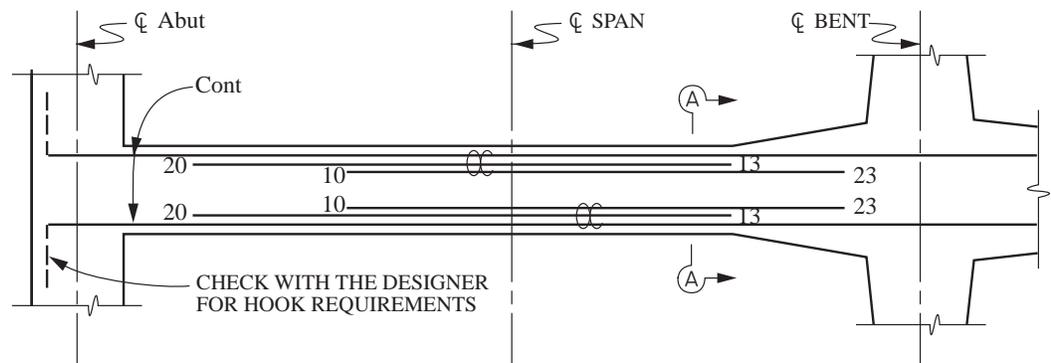


NOTES:

- A. Place continuous or other bars in the position required for maximum spacing of nominal reinforcing. This eliminates having a nominal bar paralleling and close to a main bar. Minimum longitudinal reinforcement, #6 @ 18
- B. Probable splice locations. Do not show on plans. Note staggering achieved.

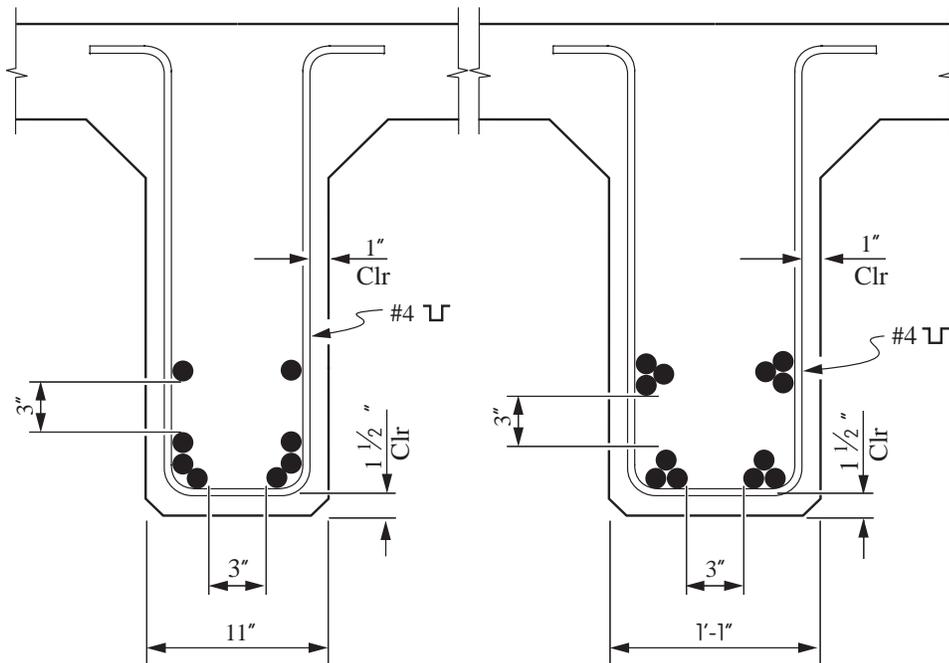
T-Beam Girder Reinforcement

1. Top Reinforcement shall be detailed similar to Box Girders.
2. Bottom Reinforcement shall be treated similar to Box Girder. Reinforcement shall be detailed by the girder as shown below.



SECTION A-A

Layout of No.11 Bars in Stem of T-Beam



No. OF BARS	* X
2	3.00"
4	3.75"
6	4.50"
8	5.75"

No. OF BARS	* X
4	2.75"
6	3.25"
8	4.50"
10	5.50"
12	6.00"

*NOTE: "X" = distance from bottom of stem to center of gravity of #11 bars.