WSDOT W42G
HS 20-44

GIRDER SPACING

N(1/2" Ø STRANDS)

SIMPLE SPAN (ft.)

DESIGN CRITERIA

2. Dead Load: Girder + Deck + 50 psf + WSDOT standard diaphragms.
3. Live Load: AASHTO Truck, Lane or Alternate Military Loading as applicable, including impact.
4. Loading Combinations: AASHTO Group I.
5. Live Load Distribution: Two or more traffic lanes, S/5.5.
6. Concrete: Girder $f_c = 7000$ psi, $w_c = 156$ pcf.
   Deck $f_c = 5000$ psi, $w_c = 155$ pcf.
   $w_c = 160$ pcf used in weight calculations (including reinforcement).
7. Deck Thickness: 7.5", unshored, including .5" wearing surface.
8. Prestressing: $f_{pi} = 202.5$ ksi (0.75 $f_{pu}$), $f_{pe} = 154.5$ ksi.
9. Allowable Stresses:
   @ Service - Tension (Girder) = $3 \sqrt{f_c} = 251$ psi
   Compression (Girder) = 0.4 ($f_{pi}$) = 2800 psi
   Compression (Deck) = 0.4 ($f_c$) = 2000 psi
   @ Release - Tension = $7.5 \sqrt{f_{ci}}$
   Compression = 0.6 ($f_{ci}$)
10. Allowing $6 \sqrt{f_c}$ tension stress at service will generally increase the allowable span length.
11. Designs above the dashed line in the chart require $f_{ci}$ in excess of 6000 psi or post-tensioning.
12. Girders are assumed to be shipped between one month and one year after casting.
13. A sharp up-turn of a curve in the chart generally indicates the transition from a tension controlled design to a compression controlled design.

NOTE: These charts are intended to be used as aids to preliminary sizing and must be interpreted on the basis of sound engineering judgement.
**MEMBER SECTION PROPERTIES:**

- Member depth (in): 42.00
- Member area (in²): 374
- Member moment of inertia (in⁴): 76,437
- Bottom distance to C.G. (in): 18.89
- Top distance to C.G. (in): 23.11
- Bottom section modulus (in³): 4045
- Top section modulus (in³): 3307
- Weight per foot (k/lf): 0.42

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