









Double Tee Bridge Typical Details





- Typical 46" wide x 23" high DT section
 - > 12-0.5" prestressing strands
 - > Two 8 x 4 D8 x D4 wire mesh
 - Four # 4 bars longitudinal bars (deck)











Transportation Learning Network - 12-17-2015





Previous Studies

Zhu, Ma, and French
> U-bar joint







Previous Studies

Zhu, Ma, and French
Headed-bar joint









"Proposed" Joint Detail

- 4" grouted keyway
 - ➤ 4" overlap D8 x D4 welded wire mesh
 - Transverse Reinf: 0.32" diameter bars at 4" c/c (0.24 in²/ft)
 - Lacer Bars: 2-0.25" diameter bars
 - ➤ 4500 psi non-shrink grout
- Optional Restraint: 3/4" bolt (tie) and concrete strut

































South Dakota State University Experimental Results: "Conventional"

- Stiffness Degradation
 - Degradation under 42 kips is more than 3 times that under 21 kips





Relative Deflection and Rotation





- Flexural Strength
 - > The combined girders attained 62% of theoretical strength
 - Separation of the two girders at the joint





(b) "Conventional" specimen at failure







Experimental Results: "Proposed"

• Stiffness Degradation

➤ Negligible







Experimental Results: "Proposed"

- Flexural Strength
 - Attained flexural failure without girder separation or joint cracking





(b) "Proposed" specimen at failure





- Reactions at supports were measured at 21 kips
- FEM analysis was conducted to verify experimental results (good agreement)
- Proposed joint provided more even load distribution





