BRIDGE GEOMETRY:

- Simply supported structure
- Span = 56’-4” c/c brgs.
- Skew = 0 degrees
- 8’-4” c/c girder spa.
- 3’-6” overhang
- Constant 2% deck cross slope
- 28’-0” curb-to-curb
- 32’-0” out-to-out
**Panel Geometry:**

- 7’-8” interior panel width
- 7’-4” exterior panel width
- 8” UHPC closure pour width
FSPG BASIS OF DESIGN:

- Design is based on AASHTO LRFD Bridge Design Specification (5th Edition, 2010), without any exception
- For design purposes, Distribution Factors are based on refined methods of analysis. However, simplified D.F. are available that gives results, similar to D.F. for the I girder
- HL-93 or permit vehicle
- LL Δ ≤ L/800
- A 709 Grade 50W steel
- Section properties conservatively ignore haunch & closure pour
- Design is conservatively based on girders being simply supported while deck is being cast (unshored construction). This is done to accommodate future redecking. However, shored construction is recommended and is used in both FSPG bridges in service
- The lowest fatigue category is Category B
FSPG BASIS OF DESIGN:

- FSPG’s wide top flange provides a good platform during construction, if needed
- Wide top flange allows installation of shear studs in the field if needed to meet OSHA requirement
- FSPG, unlike regular steel tub, does not need top flange lateral bracing during unshored construction or redecking.
- The opening at the bottom of the FSPG allows for easy inspection
- FSPG can be used in conjunction with large skew
GIRDERS:

- Composite girder is compact and designed as a steel stringer
- Composite NA near top flange
- Additional 10 KSI stress in bottom flanges per AASHTO accounts for lateral loads
- Torsionally stiff: intermediate stiffeners, cross frames, & diaphragms are not required
AS-DESIGNED FSPG TYPICAL SECTION:

SECTION OF FOLDED PLATE GIRDER

Not to Scale
BEARINGS:

Bearing assemblies consist of:

- Bearing stiffeners
- Shim plates
- Sole plates
- Elastomeric bearing pads
- Anchor bolts not used
END DIAPHRAGMS:

• Backwalls are not required
• Concrete end diaphragms accommodate thermal movement and end rotation
• No approach slab needed due to GRS abutments
PICK WEIGHTS:

- 57 kip max. pick weight using normal weight concrete
- 35 kip pick weight if lightweight concrete was used
FABRICATION IS PERFORMED IN FOUR SIMPLE STEPS:

1. Bending the steel plates
2. Installation of miscellaneous hardware
3. Installation of shear studs
4. Precasting the deck & end diaphragms (on-site)
BENDING THE STEEL PLATES:
BENDING THE STEEL PLATES:

Girders are cold bent in approximately 2-3 hours
INSTALLATION OF MISCELLANEOUS HARDWARE:
Bearing stiffeners, flange separators, & sole plates installed in approx. 1-2 days
INSTALLATION OF SHEAR STUDS:
Shear studs are attached in approximately 1 day
GIRDER DELIVERY TO BOONE COUNTY, NE:
Four girders were delivered on one flat bed truck. Contractor dropped & damaged one girder.