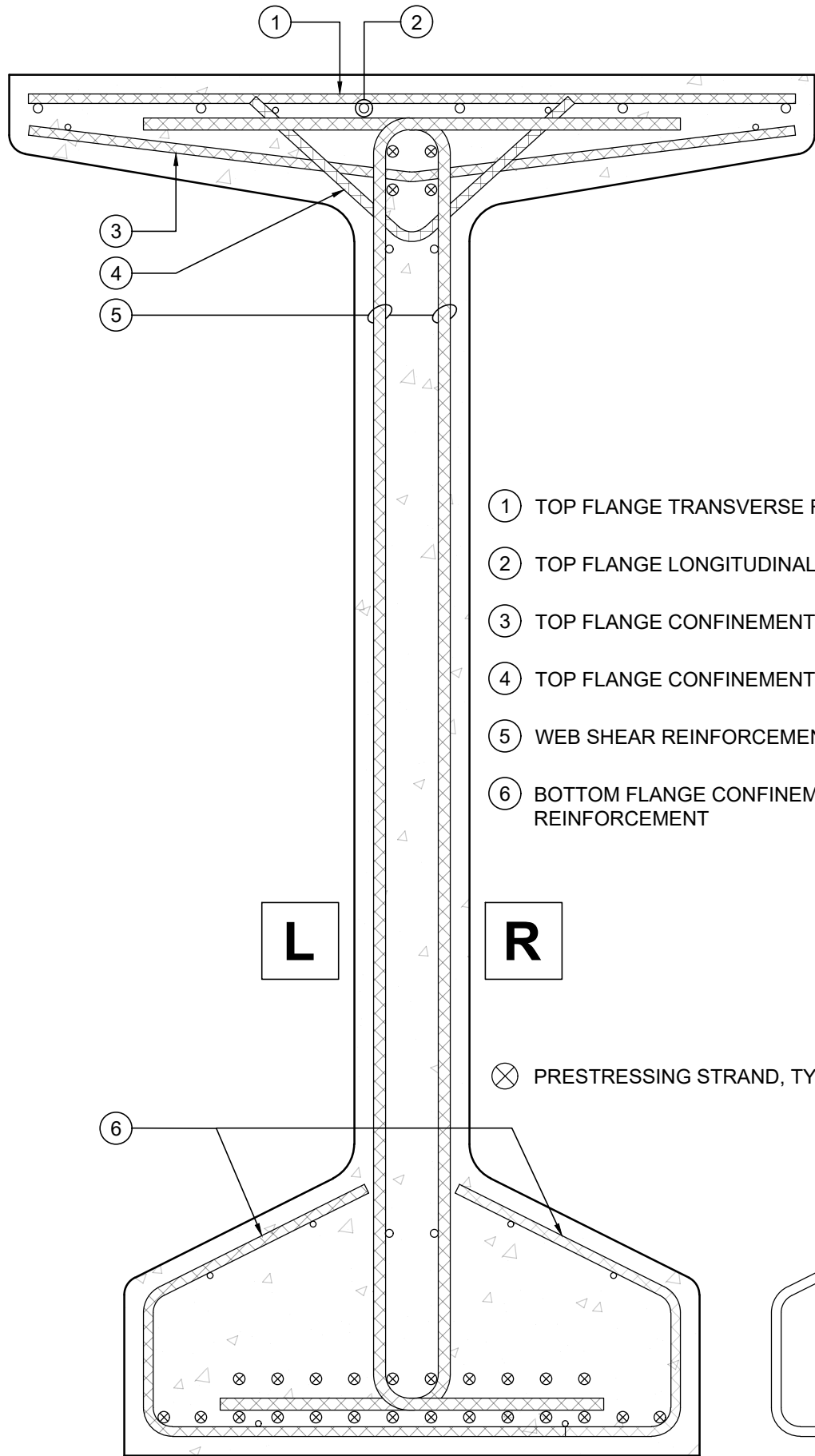
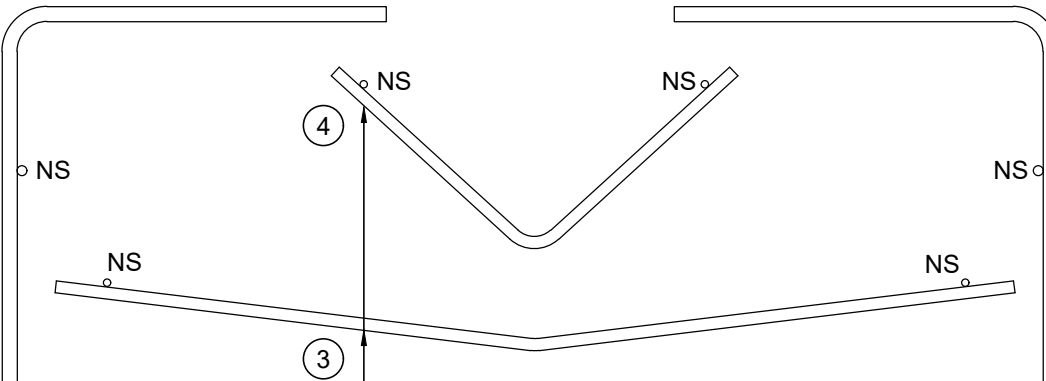




- ① TOP FLANGE TRANSVERSE REINFORCEMENT
- ② TOP FLANGE LONGITUDINAL REINFORCEMENT
- ③ TOP FLANGE CONFINEMENT REINFORCEMENT A
- ④ TOP FLANGE CONFINEMENT REINFORCEMENT B
- ⑤ WEB SHEAR REINFORCEMENT
- ⑥ BOTTOM FLANGE CONFINEMENT REINFORCEMENT

⊗ PRESTRESSING STRAND, TYP.

① ② TOP FLANGE TRANSVERSE AND LONGITUDINAL STRUCTURAL REINFORCEMENT IS PROVIDED ON A COMMON WWR MAT. LONGITUDINAL WIRES OF ADJOINING, END-FOR-END WWR MATS ARE SPLICE LAPPED PER AASHTO REQUIREMENTS.



TOP FLANGE CONFINEMENT REINFORCEMENT IS PROVIDED IN WWR MAT FORM, WITH STRUCTURAL WIRES BENT BY THE MANUFACTURER TO SUIT. STRUCTURAL WIRE PATTERN AND SHAPE IS MAINTAINED BY STRATEGICALLY POSITIONED NON-STRUCTURAL HOLDING WIRES.

⑤ WEB SHEAR REINFORCEMENT PROVIDED IN WWR MAT FORM, WITH VERTICAL STRUCTURAL WIRES AT SPACING INTERVALS PER THE CONTRACT STRUCTURAL DRAWINGS. THE "SHAPE" OF THESE STRUCTURAL WIRE PATTERNS IS MAINTAINED BY WELDED NON-STRUCTURAL HOLDING WIRES STRATEGICALLY POSITIONED NEAR THE TOP AND BOTTOM OF THE MAT. BENDING OF THE WWR MAT IS CARRIED OUT BY THE MANUFACTURER ON HYDRAULIC EQUIPMENT AT THE PLANT. WWR MATS "NEST" IN THE PRECAST BED/FORM AS ILLUSTRATED.

BOTTOM FLANGE CONFINEMENT REINFORCEMENT IN WWR MAT FORM. STRUCTURAL WIRE PATTERNS ARE MAINTAINED BY NON-STRUCTURAL HOLDING WIRES. THESE MATS NEST AND LAP AS ILLUSTRATED.

"NS" INDICATES ASTM A1064 MACHINE-WELDED NON-STRUCTURAL HOLDING WIRES CALIBRATED TO WWR MAT SHAPE AND STRUCTURAL WIRE ALIGNMENT.

**POSSIBLE
INSTALLATION
SEQUENCE**

- ⑥ LEFT
- ⑤ LEFT
- ⑤ RIGHT
- ⑥ RIGHT
- ③
- ④
- ① ② COMMON MAT

**ANATOMY OF A HIGHWAY BRIDGE GIRDER
UTILIZING WELDED WIRE REINFORCEMENT
GIRDER END REGION**

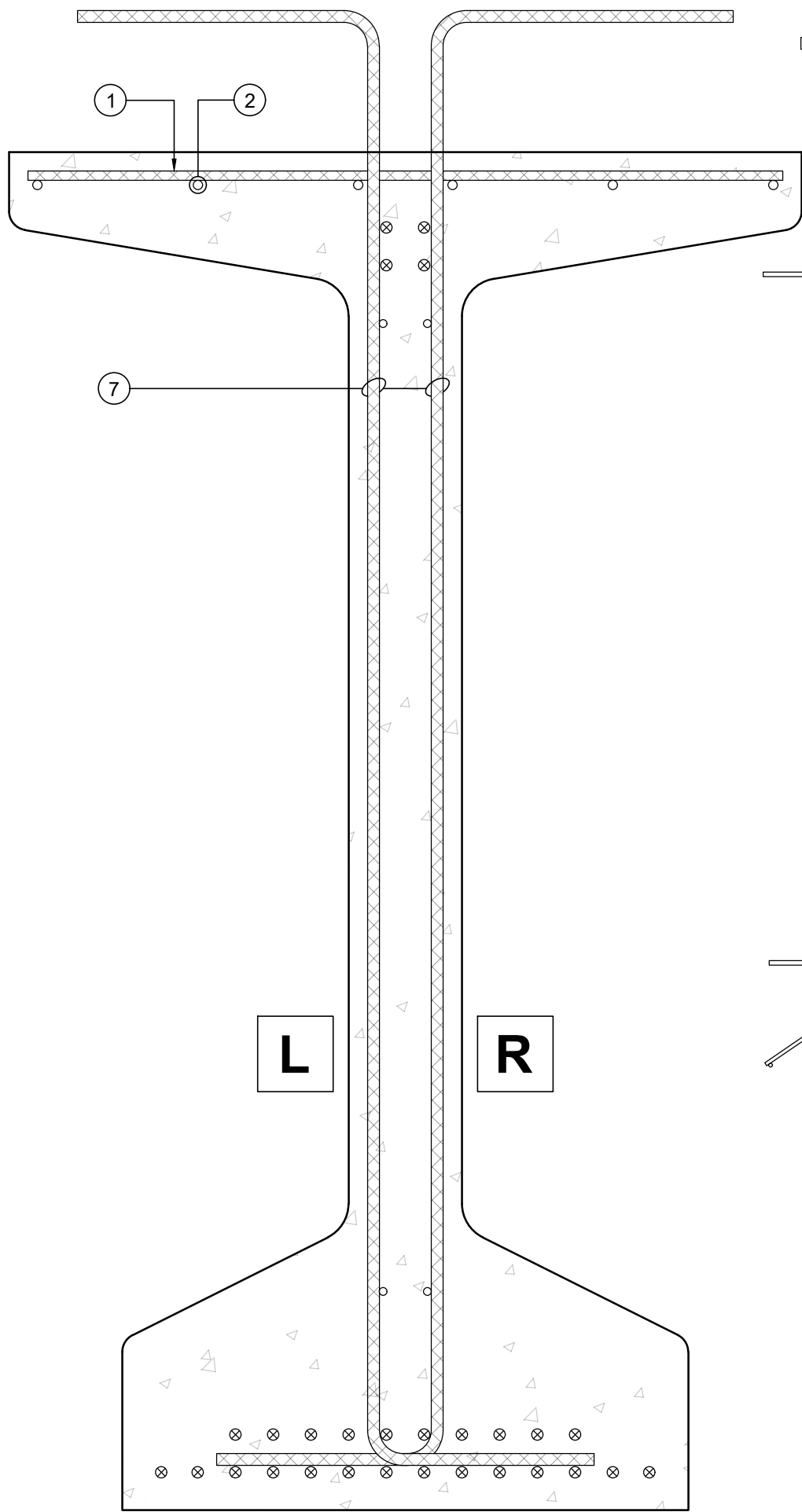
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SHEET NO.

WWR-ER



STEP #1

STEP #2

1 2

TOP FLANGE TRANSVERSE AND LONGITUDINAL STRUCTURAL REINFORCEMENT IS PROVIDED ON A COMMON WWR MAT. LONGITUDINAL WIRES OF ADJOINING, END-FOR-END WWR MATS ARE SPLICE LAPPED PER AASHTO REQUIREMENTS.

NS

NS

7

WEB SHEAR REINFORCEMENT PROVIDED IN WWR MAT FORM, WITH VERTICAL STRUCTURAL WIRES AT SPACING INTERVALS PER THE CONTRACT STRUCTURAL DRAWINGS. THE "SHAPE" OF THESE STRUCTURAL WIRE PATTERNS IS MAINTAINED BY WELDED NON-STRUCTURAL HOLDING WIRES STRATEGICALLY POSITIONED NEAR THE TOP AND BOTTOM OF THE MAT. BENDING OF THE WWR MAT IS CARRIED OUT BY THE MANUFACTURER ON HYDRAULIC EQUIPMENT AT THE PLANT. WWR MATS "NEST" IN THE PRECAST BED/FORM AS ILLUSTRATED.

"NS" INDICATES ASTM A1064 MACHINE-WELDED NON-STRUCTURAL HOLDING WIRES CALIBRATED TO WWR MAT SHAPE AND STRUCTURAL WIRE ALIGNMENT.

NS

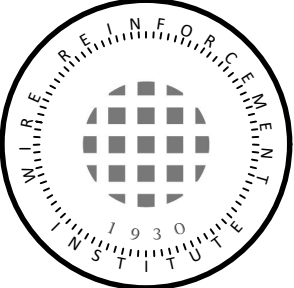
NS

STEP #3

STEP #4



wri
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**ANATOMY OF A HIGHWAY BRIDGE GIRDER
UTILIZING WELDED WIRE REINFORCEMENT
GIRDER INTERIOR REGION**

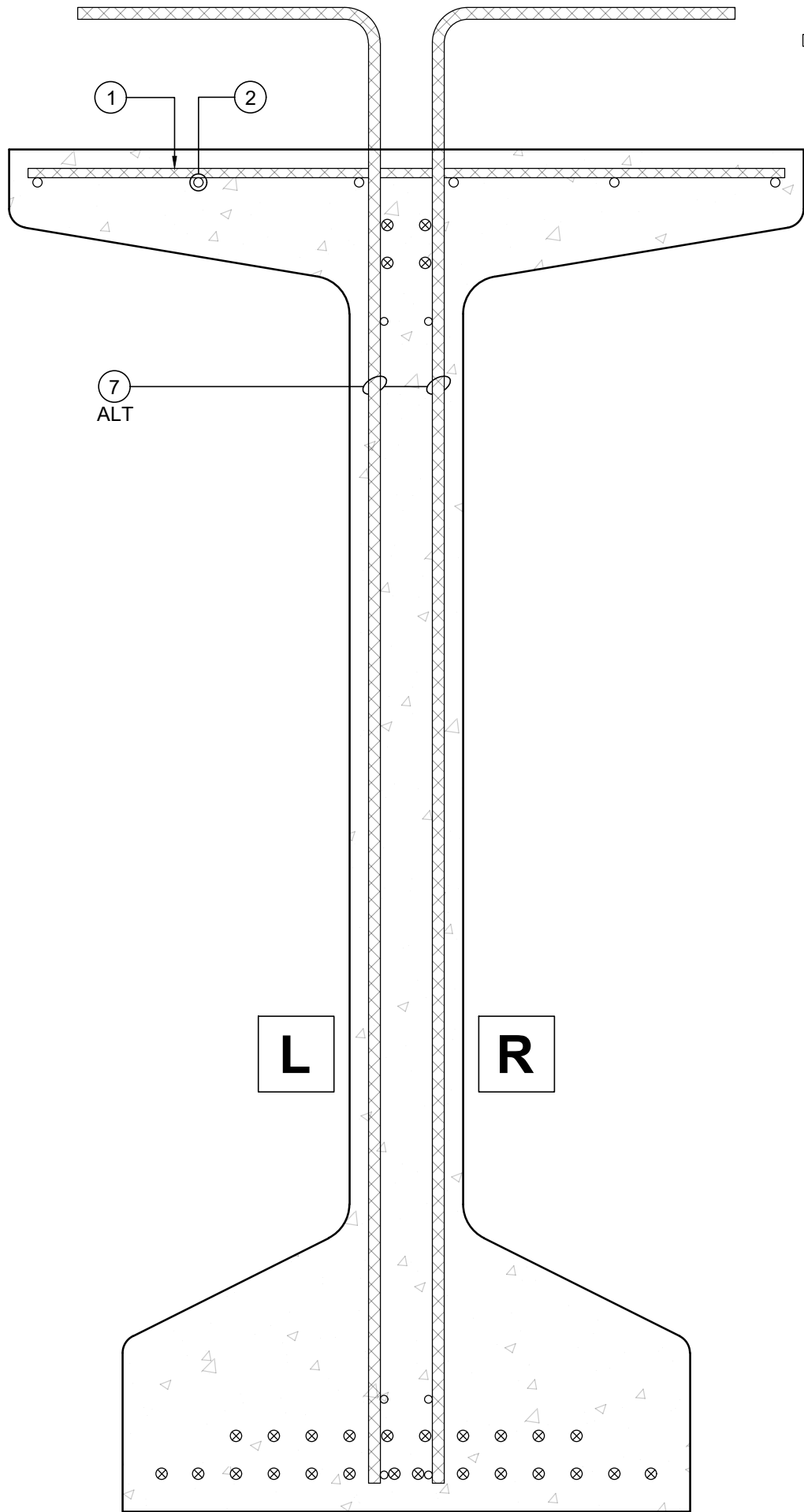
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SHEET NO.

WWR-IR



1 2

TOP FLANGE TRANSVERSE
AND LONGITUDINAL
STRUCTURAL
REINFORCEMENT IS
PROVIDED ON A COMMON
WWR MAT. LONGITUDINAL
WIRES OF ADJOINING,
END-FOR-END WWR MATS
ARE SPLICE LAPPED PER
AASHTO REQUIREMENTS.

NS

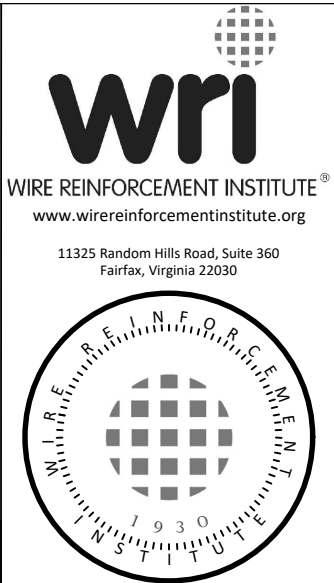
NS

7A

ALTERNATE WEB SHEAR
REINFORCEMENT PROVIDED IN WWR
MAT FORM, WITH VERTICAL
STRUCTURAL WIRES AT SPACING
INTERVALS PER THE CONTRACT
STRUCTURAL DRAWINGS. THE
"SHAPE" OF THESE STRUCTURAL
WIRE PATTERNS IS MAINTAINED BY
WELDED NON-STRUCTURAL HOLDING
WIRES STRATEGICALLY POSITIONED
NEAR THE TOP AND BOTTOM OF THE
MAT. BENDING OF THE WWR MAT IS
CARRIED OUT BY THE
MANUFACTURER ON HYDRAULIC
EQUIPMENT AT THE PLANT. BOTTOM
HOOK TERMINATIONS REPLACED
WITH WELDED STRUCTURAL
ANCHORAGE WIRES.

**AASHTO LRFD 9TH EDITION
ARTICLE 5.10.8.2.6c**

IT IS PERMITTED TO REPLACE SINGLE-LEG
STIRRUP HOOK TERMINATIONS WITH
STRUCTURAL WELDED LONGITUDINAL ASTM
A1064 WIRES. THIS SUBSTITUTION CAN
REDUCE CONGESTION AND EASE
INSTALLATION OF REINFORCEMENT.



**ANATOMY OF A HIGHWAY BRIDGE GIRDER
UTILIZING WELDED WIRE REINFORCEMENT
GIRDER INTERIOR REGION - ALTERNATE**

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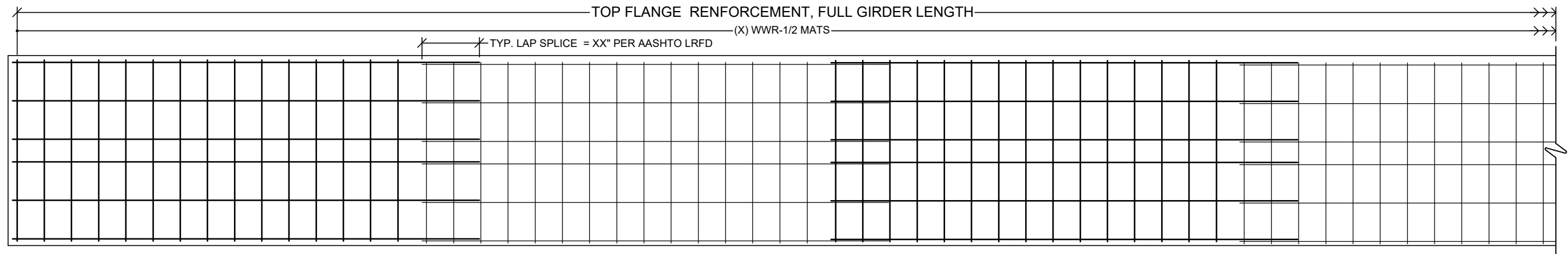
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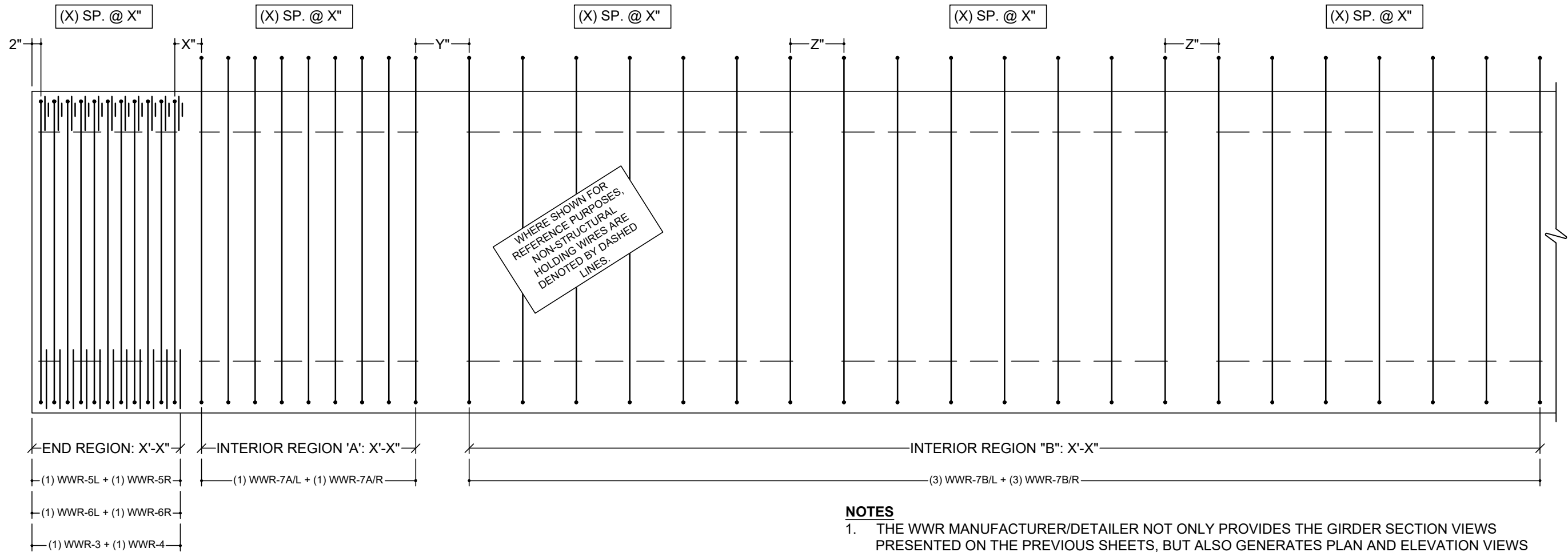
SHEET NO.

WWR-ALT

PLAN

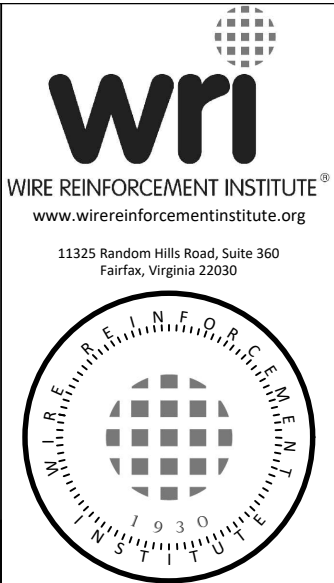


ELEVATION



NOTES

1. THE WWR MANUFACTURER/DETAILER NOT ONLY PROVIDES THE GIRDER SECTION VIEWS PRESENTED ON THE PREVIOUS SHEETS, BUT ALSO GENERATES PLAN AND ELEVATION VIEWS ALONG THE GIRDER LENGTH FOR THE PURPOSE OF SHOWING THE ARRANGEMENT AND INTERVAL OF THE VARIOUS WWR MATS USED. A GENERAL EXAMPLE OF THE PLAN AND ELEVATION VIEW IS SHOWN HERE.
2. FOR EACH UNIQUE WWR MAT, THE WWR MANUFACTURER/DETAILER'S SUBMITTAL WILL PROVIDE A MAT DRAWING ILLUSTRATING THE MAT'S GEOMETRY AND QUANTITY, INCLUDING ALL INFORMATION RELATED TO ASSOCIATED BEND GEOMETRIES AND PRESENCE OF NON-STRUCTURAL HOLDING WIRES. AN EXAMPLE OF A WWR MAT DRAWING IS SHOWN ON SHEET "WWR-MAT".



ANATOMY OF A HIGHWAY BRIDGE GIRDER
UTILIZING WELDED WIRE REINFORCEMENT
GIRDER REINFORCEMENT LAYOUT

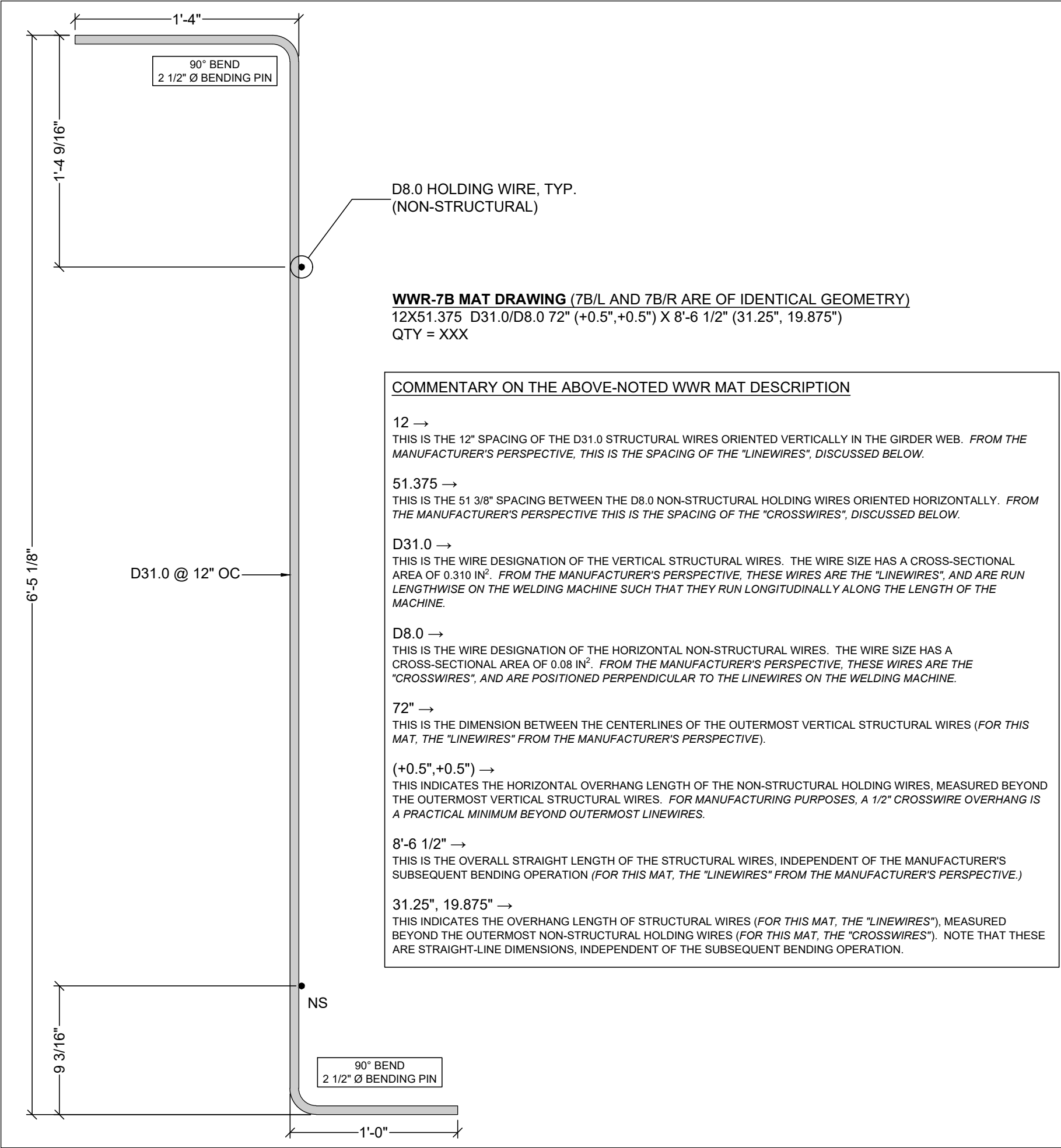
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SHEET NO.

WWR-LAY



D8.0 HOLDING WIRE, TYP.
(NON-STRUCTURAL)

WWR-7B MAT DRAWING (7B/L AND 7B/R ARE OF IDENTICAL GEOMETRY)
12X51.375 D31.0/D8.0 72" (+0.5",+0.5") X 8'-6 1/2" (31.25", 19.875")
QTY = XXX

COMMENTARY ON THE ABOVE-NOTED WWR MAT DESCRIPTION

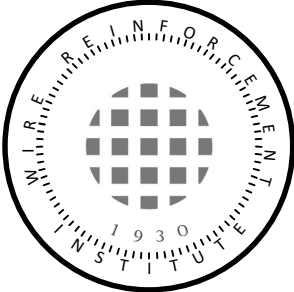
- 12 →
THIS IS THE 12" SPACING OF THE D31.0 STRUCTURAL WIRES ORIENTED VERTICALLY IN THE GIRDER WEB. *FROM THE MANUFACTURER'S PERSPECTIVE, THIS IS THE SPACING OF THE "LINEWIRES", DISCUSSED BELOW.*
- 51.375 →
THIS IS THE 51 3/8" SPACING BETWEEN THE D8.0 NON-STRUCTURAL HOLDING WIRES ORIENTED HORIZONTALLY. *FROM THE MANUFACTURER'S PERSPECTIVE THIS IS THE SPACING OF THE "CROSSWIRES", DISCUSSED BELOW.*
- D31.0 →
THIS IS THE WIRE DESIGNATION OF THE VERTICAL STRUCTURAL WIRES. THE WIRE SIZE HAS A CROSS-SECTIONAL AREA OF 0.310 IN². *FROM THE MANUFACTURER'S PERSPECTIVE, THESE WIRES ARE THE "LINEWIRES", AND ARE RUN LENGTHWISE ON THE WELDING MACHINE SUCH THAT THEY RUN LONGITUDINALLY ALONG THE LENGTH OF THE MACHINE.*
- D8.0 →
THIS IS THE WIRE DESIGNATION OF THE HORIZONTAL NON-STRUCTURAL WIRES. THE WIRE SIZE HAS A CROSS-SECTIONAL AREA OF 0.08 IN². *FROM THE MANUFACTURER'S PERSPECTIVE, THESE WIRES ARE THE "CROSSWIRES", AND ARE POSITIONED PERPENDICULAR TO THE LINEWIRES ON THE WELDING MACHINE.*
- 72" →
THIS IS THE DIMENSION BETWEEN THE CENTERLINES OF THE OUTERMOST VERTICAL STRUCTURAL WIRES (*FOR THIS MAT, THE "LINEWIRES" FROM THE MANUFACTURER'S PERSPECTIVE*).
- (+0.5",+0.5") →
THIS INDICATES THE HORIZONTAL OVERHANG LENGTH OF THE NON-STRUCTURAL HOLDING WIRES, MEASURED BEYOND THE OUTERMOST VERTICAL STRUCTURAL WIRES. *FOR MANUFACTURING PURPOSES, A 1/2" CROSSWIRE OVERHANG IS A PRACTICAL MINIMUM BEYOND OUTERMOST LINEWIRES.*
- 8'-6 1/2" →
THIS IS THE OVERALL STRAIGHT LENGTH OF THE STRUCTURAL WIRES, INDEPENDENT OF THE MANUFACTURER'S SUBSEQUENT BENDING OPERATION (*FOR THIS MAT, THE "LINEWIRES" FROM THE MANUFACTURER'S PERSPECTIVE.*)
- 31.25", 19.875" →
THIS INDICATES THE OVERHANG LENGTH OF STRUCTURAL WIRES (*FOR THIS MAT, THE "LINEWIRES"*), MEASURED BEYOND THE OUTERMOST NON-STRUCTURAL HOLDING WIRES (*FOR THIS MAT, THE "CROSSWIRES"*). NOTE THAT THESE ARE STRAIGHT-LINE DIMENSIONS, INDEPENDENT OF THE SUBSEQUENT BENDING OPERATION.

- QUICK FACTS FOR THE DESIGNER**
- WWR IS AN ACCEPTED STRUCTURAL REINFORCEMENT PER THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND IS USED INTERCHANGEABLY WITH DEFORMED REINFORCING BARS BY NUMEROUS DEPARTMENTS OF TRANSPORTATION IN THE US.
 - WWR MATS CAN BE EPOXY-COATED (ASTM A884) OR HOT-DIP GALVANIZED (A1060).
 - WWR MATS CAN BE PRODUCED WITH VARIABLE SIZE AND SPACING OF WIRES, BOTH IN THE LONGITUDINAL AND TRANSVERSE DIRECTION ON A COMMON MAT.
 - WWR MATS CAN BE PRODUCED WITH BOTH DEFORMED AND PLAIN WIRES ON A COMMON MAT.
 - USING MANUFACTURER'S NOMENCLATURE, WIRES RUN LONGITUDINALLY ON THE WELDING MACHINE ARE KNOWN AS LINEWIRES, AND WIRES RUN TRANSVERSELY ON THE WELDING MACHINE ARE KNOWN AS CROSSWIRES. NOTE THAT LINEWIRES DO NOT NECESSARILY CORRELATE TO THE LONGITUDINAL DIRECTION OF THE STRUCTURAL CONCRETE ELEMENT ITSELF. LIKEWISE, THE CROSSWIRES DO NOT NECESSARILY CORRELATE TO THE TRANSVERSE DIRECTION OF THE STRUCTURAL CONCRETE ELEMENT ITSELF.
 - NON-STRUCTURAL HOLDING WIRES (NS) ARE REQUIRED BY ASTM A1064 TO EXHIBIT A WELD SHEAR STRENGTH AT THE WELDED INTERSECTION EQUAL TO AT LEAST 800 POUNDS. STRUCTURAL WELDED WIRE INTERSECTIONS ARE REQUIRED BY ASTM A1064 TO EXHIBIT A WELD SHEAR STRENGTH EQUAL TO AT LEAST 35 KSI MULTIPLIED BY THE CROSS-SECTIONAL AREA OF THE LARGER WIRE AT THE INTERSECTION.



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**ANATOMY OF A HIGHWAY BRIDGE GIRDER
UTILIZING WELDED WIRE REINFORCEMENT
EXAMPLE MAT DRAWING**

USE AND IMPLEMENTATION OF CONTENT SHOWN HERE SHALL BE AT
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SHEET NO.

WWR-MAT