



Smolen Engineering, Ltd.
1876 State Route 46 North
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March 23, 2009

Todd Gadbury, P.E., P.S.
2381 Clermont Center Drive
Batavia, Ohio 45103

PID #: 83661
Project: Stonelick-Williams Corner Covered Bridge Rehabilitation

Re: Design Alternatives

Dear Mr. Gadbury,

Enclosed you will find a summary of five different design alternatives that we developed for the above referenced project. Opinions of probable construction cost for these design alternatives range from about \$717,000 to \$1,113,000. The design alternative labeled "Option 4," includes increasing the load capacity of the existing bridge to 12 tons by placing new floor beams at the panel points of the trusses. This will eliminate live load bending stresses in the lower chord, thus allowing the lower chord to act almost exclusively in tension. Option 5 is more expensive; however, it results in an HS20-44 loading. Please review the enclosed summary and contact me or David Shields if you have any questions regarding these results.

Sincerely,

A handwritten signature in blue ink that reads "John Smolen".

John Smolen, P.E., P.S.
Principal Engineer
Smolen Engineering, Ltd.

Enclosure

CLERMONT COUNTY STONELICK-WILLIAMS CORNER COVERED BRIDGE



Presentation of Design Alternatives for the Rehabilitation of the Stonelick-Williams Corner Covered Bridge March 2009

Smolen Engineering, Ltd.
1876 State Route 46 North
Jefferson, Ohio 44047

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Design Alternatives for the Rehabilitation of the Stonelick-Williams Corner Covered Bridge

Summary:

In all of the options below, the following work will be performed:

1. Improvement of approach roadway
2. Repair of the southeast wingwall
3. Repointing of mortar joints
4. Installation of timed traffic signals
5. Replacement of existing bridge lighting
6. Installation of hold-down bars at each corner of the bridge
7. Replacement of siding
8. Replacement of metal roofing
9. Replacement of iron rods and assemblies
10. Replacement of lower cross bracing
11. Installation of lateral sway bracing
12. Extension of roof overhang

The following are descriptions of the details of each individual option:

Option 1:

\$717,282.50

Option 1 increases load capacity of the existing covered bridge through minimal timber replacement. The most limiting portion of the truss is the lower chord. The second-most limiting portion is the upper chord. This option replaces the lower chord in its entirety, thus increasing its capacity to that of the upper chord: a single H8 truck. The floor system is replaced using a similar system to the existing. Some diagonals and small portions of the upper chord that are damaged or deteriorated will also be replaced.

Pros:

Least expensive option
Requires no permanent construction in the waterway
Requires minimal work on trusses

Cons:

Does not bring the load capacity to requested single H12 truck capacity
Requires work in the waterway for shoring

Option 2:

\$836,676.50

Option 2 increases load capacity of the existing covered bridge to a single H12 truck loading. Utilizing a floor system similar to the existing floor system presents a problem with bending in the lower chord, which

requires the replacement of the lower chord in its entirety. If the upper chord is not replaced, it requires the installation of spike-laminations on the top surface to bring its capacity up to a 12 ton truck.

Pros:

Generates desired load capacity of a single H12 truck
Requires no permanent construction in the waterway

Cons:

Relatively expensive
Requires work in the waterway for shoring
Requires removal of rafters, which may cause the replacement of more rafters than would otherwise be necessary
Spike-lamination of upper chords will be time intensive
Requires replacement of entire lower chord
Requires increase in lower chord depth

Option 3:

\$859,914.00

Option 3 increases load capacity of the existing covered bridge to a single H12 truck loading mainly through the installation of a single concrete pier toward the north end of the bridge. Utilizing a floor system similar to the existing would necessitate full replacement of the lower chord due to the additional stresses induced by bending. This solution will not require the installation spike-laminations on the upper chord because the stresses in the upper chord will be greatly reduced with the shortened span. To increase the effectiveness of this option, installing larger beams at the panel points of the trusses would likely eliminate the need for full replacement of the lower chord.

Pros:

Generates desired load capacity of a single H12 truck

Cons:

Relatively expensive
Requires work in the waterway for shoring
Requires permanent construction in the waterway
Requires replacement of entire lower chord
Requires increase in lower chord depth

Option 4:

\$783,150.50

Option 4 increases load capacity of the existing covered bridge to a single H12 truck loading primarily through eliminating the bending stresses in the lower chord. Replacement of the existing floor system with a system that utilizes larger beams installed only at the panel points of the truss will allow for replacement of fewer lower chord elements. This solution will require the installation of spike-laminations on the top surface of the upper chord and post-tensioning of the lower chord to bring its capacity up to a 12 ton truck.

Pros:

Most cost effective upgrade
Requires no permanent construction in the waterway
Generates desired load capacity of a single H12 truck
Eliminates bending stresses in the lower chord

Cons:

Requires work in the waterway for shoring
Requires removal of rafters, which may cause the replacement of more rafters than would otherwise be necessary
Spike-lamination of upper chords will be time intensive

Option 5:

\$1,112,551.00

Option 5 increases load capacity of the existing covered bridge to HS20-44 loading by essentially building a tied-arch bridge to carry the existing structure and traffic using the bridge. The economy of this solution is lost on lighter loading, and is therefore only truly effective for higher loading situations. This solution will allow for minimal replacement of existing timbers because the majority of the live and dead load will be borne by the arches and will reduce the likelihood of work being performed in the waterway. This approach was successfully used to preserve the Helmick Mill covered bridge in Morgan County, Ohio.

Pros:

Increases load limit significantly, to HS20-44
Eliminates bending stresses in the lower chord
Drastically reduces stresses in the historic truss
Retains most of the original timbers in the trusses and roof system
Eliminates the need for most work in the waterway

Cons:

Most expensive upgrade
Will require work on existing substructure
Will result in a narrower roadway on the bridge

ENGINEER'S OPINION OF PROBABLE COST

Client	Misc	SEL234
Clermont County Engineer 2381 Clermont Center Drive Batavia, Ohio 45103	Date:	3/10/2009

Project Description: Option 1: Rehabilitation of Stonelick Williams Corner Road Covered Bridge to Carry an H8-44 Loading (8-Ton Two-Axle Truck)

Ref No.	Description	Quantity	Unit	Unit Price	TOTAL
103/107	Bonds and Insurance	---	LUMP	\$ 5,000.00	\$ 5,000.00
202	Portions of Structure Removed, Over 20 Foot Span (Roofing, Siding, Lower Chord, Floor Planks, Floor Beams, Portions of Upper Chord, Specified Diagonals, Rafter and Purlins as Needed, and Steel Verticals)	---	LUMP	\$60,000.00	\$ 60,000.00
Various	Pavement Repair, Including Planing	--	LUMP	\$15,000.00	\$ 15,000.00
510	Dowel Holes with Non-Shrink Non-Metallic Grout	8	EACH	\$ 35.00	\$ 280.00
514	Field Painting Misc: Wood Stain	5500	SQ FT	\$ 2.50	\$ 13,750.00
514	Field Painting Misc: Fire Retardant	---	LUMP	\$12,000.00	\$ 12,000.00
516	Jacking and Temporary Support of Superstructure	---	LUMP	\$80,000.00	\$ 80,000.00
530	Structure, Misc.: Floor Beams	9.85	MFBM	\$ 4,500.00	\$ 44,325.00
530	Structure, Misc.: Floor Planks	9.94	MFBM	\$ 4,000.00	\$ 39,760.00
530	Structure, Misc.: Timber Curb	1.10	MFBM	\$ 4,000.00	\$ 4,400.00
530	Structure, Misc.: Girts and Siding	5500	SQ FT	\$ 8.50	\$ 46,750.00
530	Structure, Misc.: Standing Seam Metal Roof	3550	SQ FT	\$ 6.00	\$ 21,300.00
530	Structure, Misc.: Restoration of Timber Trusses	8.79	MFBM	\$12,000.00	\$ 105,480.00
530	Structure, Misc.: Restoration of Timber Trusses, as Directed By Engineer	2.20	MFBM	\$ 6,000.00	\$ 13,200.00
530	Structure, Misc.: Sway Bracing	0.68	MFBM	\$ 3,500.00	\$ 2,380.00
530	Structure, Misc.: Lateral Cross Braces	1.35	MFBM	\$ 3,000.00	\$ 4,050.00
530	Structure, Misc.: Timber Bearing Blocks	0.20	MFBM	\$ 3,000.00	\$ 600.00
530	Structure, Misc.: Replace Rafters and Purlins, as Directed By Engineer	0.50	MFBM	\$ 5,000.00	\$ 2,500.00
530	Structure, Misc.: Hold Down Bars	8	EACH	\$ 600.00	\$ 4,800.00
530	Structure, Misc.: Steel Verticals and Hardware	6000	LBS	\$ 3.00	\$ 18,000.00
530	Structure, Misc.: Extend Roof Overhang	0.40	MFBM	\$10,000.00	\$ 4,000.00
530	Structure, Misc.: Steel Plates and Hardware	15000	LBS	\$ 3.00	\$ 45,000.00
602	Masonry, Misc.: Repair Stone Wingwall	---	LUMP	\$ 3,000.00	\$ 3,000.00
602	Masonry, Misc.: Repointing Mortar Joints	---	LUMP	\$ 6,500.00	\$ 6,500.00
606	Guardrail	100	FT	\$ 70.00	\$ 7,000.00
614	Maintenance of Traffic	---	LUMP	\$ 2,500.00	\$ 2,500.00
619	Field Office	---	LUMP	\$15,000.00	\$ 15,000.00
623	Construction Layout Stakes	---	LUMP	\$ 1,500.00	\$ 1,500.00
624	Mobilization	---	LUMP	\$10,000.00	\$ 10,000.00
625	Lighting, Misc.: Bridge Lighting	---	LUMP	\$15,000.00	\$ 15,000.00
632	Signal, Misc.: Traffic Signalization at Bridge	---	LUMP	\$20,000.00	\$ 20,000.00
659	Seeding and Mulching	1500	SQ YD	\$ 2.00	\$ 3,000.00
832	SWPPP	---	LUMP	\$ 4,000.00	\$ 4,000.00
	10% Contingency				\$ 65,207.50
			TOTAL		\$ 717,282.50

ENGINEER'S OPINION OF PROBABLE COST

Client	Misc	SEL234
Clermont County Engineer 2381 Clermont Center Drive Batavia, Ohio 45103	Date:	3/10/2009

Project Description: Option 2: Rehabilitation of Stonelick Williams Corner Road Covered Bridge to Carry an H12-44 Loading (12-Ton Two-Axle Truck)

Ref No.	Description	Quantity	Unit	Unit Price	TOTAL
103/107	Bonds and Insurance	---	LUMP	\$ 4,000.00	\$ 4,000.00
202	Portions of Structure Removed, Over 20 Foot Span (Roofing, Siding, Lower Chord, Floor Planks, Floor Beams, Portions of Upper Chord, Specified Diagonals, Rafter, Purlins, and Steel Verticals)	---	LUMP	\$60,000.00	\$ 60,000.00
Various	Pavement Repair, Including Planing	--	LUMP	\$15,000.00	\$ 15,000.00
510	Dowel Holes with Non-Shrink Non-Metallic Grout	8	EACH	\$ 35.00	\$ 280.00
513	Post Tensioning of Lower Chords	--	LUMP	\$35,000.00	\$ 35,000.00
514	Field Painting, Misc.: Wood Stain	5500	SQ FT	\$ 3.00	\$ 16,500.00
514	Field Painting, Misc.: Fire Retardant	---	LUMP	\$15,000.00	\$ 15,000.00
516	Jacking and Temporary Support of Superstructure	---	LUMP	\$80,000.00	\$ 80,000.00
530	Structure, Misc.: Floor Beams	16.63	MBFM	\$ 4,500.00	\$ 74,835.00
530	Structure, Misc.: Floor Planks	9.94	MBFM	\$ 4,000.00	\$ 39,760.00
530	Structure, Misc.: Timber Curb	1.10	MFBM	\$ 4,000.00	\$ 4,400.00
530	Structure, Misc.: Girts and Siding	5500	SQ FT	\$ 8.50	\$ 46,750.00
530	Structure, Misc.: Standing Seam Metal Roof	3550	SQ FT	\$ 6.00	\$ 21,300.00
530	Structure, Misc.: Restoration of Timber Trusses	9.81	MBFM	\$12,000.00	\$ 117,720.00
530	Structure, Misc.: Restoration of Timber Trusses, as Directed By Engineer	2.45	MBFM	\$ 6,000.00	\$ 14,700.00
530	Structure, Misc.: Sway Bracing	0.68	MFBM	\$ 3,500.00	\$ 2,380.00
530	Structure, Misc.: Lateral Cross Braces	1.35	MFBM	\$ 3,000.00	\$ 4,050.00
530	Structure, Misc.: Timber Bearing Blocks	0.30	MBFM	\$ 3,000.00	\$ 900.00
530	Structure, Misc.: Replace Rafters and Purlins, as Directed By Engineer	2.00	MBFM	\$ 5,000.00	\$ 10,000.00
530	Structure, Misc.: Reinstallation of Roof System	---	LUMP	\$30,000.00	\$ 30,000.00
530	Structure, Misc.: Spiked Lamination of Upper Chord	2.02	MBFM	\$ 4,500.00	\$ 9,090.00
530	Structure, Misc.: Hold Down Bars	8	EACH	\$ 600.00	\$ 4,800.00
530	Structure, Misc.: Extend Roof Overhang	0.40	MBFM	\$ 5,000.00	\$ 2,000.00
513	Structural Steel, Misc.: Steel Verticals and Hardware	6000	LBS	\$ 3.00	\$ 18,000.00
513	Structural Steel, Misc.: Steel Plates and Hardware	15000	LBS	\$ 3.00	\$ 45,000.00
602	Masonry, Misc.: Repair Stone Wingwall	---	LUMP	\$ 3,000.00	\$ 3,000.00
602	Masonry, Misc.: Repointing Mortar Joints	---	LUMP	\$ 6,500.00	\$ 6,500.00
606	Guardrail	100	FT	\$ 70.00	\$ 7,000.00
614	Maintenance of Traffic	---	LUMP	\$ 2,500.00	\$ 2,500.00
619	Field Office	---	LUMP	\$15,000.00	\$ 15,000.00
623	Construction Layout Stakes	---	LUMP	\$ 1,500.00	\$ 1,500.00
624	Mobilization	---	LUMP	\$10,000.00	\$ 10,000.00
625	Lighting, Misc.: Bridge Lighting	---	LUMP	\$15,000.00	\$ 15,000.00
632	Signal, Misc.: Traffic Signalization at Bridge	---	LUMP	\$20,000.00	\$ 20,000.00
659	Seeding and Mulching	1500	SQ YD	\$ 2.00	\$ 3,000.00
832	SWPPP	---	LUMP	\$ 4,000.00	\$ 4,000.00
	10% Contingency				\$ 76,061.50
				TOTAL	836,676.50

ENGINEER'S OPINION OF PROBABLE COST

Client	Misc	SEL234
Clermont County Engineer 2381 Clermont Center Drive Batavia, Ohio 45103	Date:	3/10/2009

Project Description: Option 3: Rehabilitation of Stonelick Williams Corner Road Covered Bridge to Carry an 12 Ton Truck Loading with the Addition of One Pier

Ref No.	Description	Quantity	Unit	Unit Price	TOTAL
103/107	Bonds and Insurance	---	LUMP	\$ 4,000.00	\$ 4,000.00
202	Portions of Structure Removed, Over 20 Foot Span (Roofing, Siding, Lower Chord, Floor Planks, Floor Beams, Portions of Upper Chord, Specified Diagonals, Rafter and Purlins as Needed, and Steel Verticals)	---	LUMP	\$60,000.00	\$ 60,000.00
Various	Pavement Repair, Including Planing	--	LUMP	\$15,000.00	\$ 15,000.00
510	Dowel Holes with Non-Shrink Non-Metallic Grout	8	EACH	\$ 35.00	\$ 280.00
511	Class C Concrete, Pier Above Footing (Includes Steel)	30	CU YD	\$ 1,100.00	\$ 33,000.00
511	Class C Concrete, Footing (Includes Steel)	6.7	CU YD	\$ 550.00	\$ 3,685.00
511	Concrete Misc: Form Liner	620	SQ FT	\$ 20.00	\$ 12,400.00
514	Field Painting, Misc.: Wood Stain	5500	SQ FT	\$ 2.50	\$ 13,750.00
514	Field Painting, Misc.: Fire Retardant	---	LUMP	\$12,000.00	\$ 12,000.00
516	Jacking and Temporary Support of Superstructure	---	LUMP	\$80,000.00	\$ 80,000.00
530	Structure, Misc.: Floor Beams	16.63	MFBM	\$ 4,500.00	\$ 74,835.00
530	Structure, Misc.: Floor Planks	2520	SQ FT	\$ 12.50	\$ 31,500.00
530	Structure, Misc.: Timber Curb	1.10	MFBM	\$ 4,000.00	\$ 4,400.00
530	Structure, Misc.: Girts and Siding	5500	SQ FT	\$ 8.50	\$ 46,750.00
530	Structure, Misc.: Standing Seam Metal Roof	3550	SQ FT	\$ 6.00	\$ 21,300.00
530	Structure, Misc.: Restoration of Timber Trusses	9.00	MFBM	\$12,000.00	\$ 108,000.00
530	Structure, Misc.: Restoration of Timber Trusses, as Directed By Engineer	2.25	MFBM	\$ 6,000.00	\$ 13,500.00
530	Structure, Misc.: Lateral Cross Braces	1.35	MFBM	\$ 3,000.00	\$ 4,050.00
530	Structure, Misc.: Timber Bearing Blocks	0.20	MFBM	\$ 3,000.00	\$ 600.00
530	Structure, Misc.: Replace Rafters and Purlins, as Directed By Engineer	0.50	MFBM	\$ 5,000.00	\$ 2,500.00
530	Structure, Misc.: Spiked Lamination of Diagonals	0.92	MFBM	\$ 4,500.00	\$ 4,140.00
530	Structure, Misc.: Hold Down Bars	8	EACH	\$ 600.00	\$ 4,800.00
530	Structure, Misc.: Steel Verticals and Hardware	6000	LBS	\$ 3.00	\$ 18,000.00
530	Structure, Misc.: Extend Roof Overhang	0.40	MFBM	\$10,000.00	\$ 4,000.00
530	Structure, Misc.: Steel Plates and Hardware	15000	LBS	\$ 5.00	\$ 75,000.00
602	Masonry, Misc.: Repair Stone Wingwall	---	LUMP	\$ 3,000.00	\$ 3,000.00
602	Masonry, Misc.: Repointing Mortar Joints	---	LUMP	\$ 6,500.00	\$ 6,500.00
606	Guardrail	100	FT	\$ 70.00	\$ 7,000.00
614	Maintenance of Traffic	---	LUMP	\$ 2,500.00	\$ 2,500.00
619	Field Office	---	LUMP	\$15,000.00	\$ 15,000.00
623	Construction Layout Stakes	---	LUMP	\$ 1,500.00	\$ 1,500.00
624	Mobilization	---	LUMP	\$10,000.00	\$ 10,000.00
625	Lighting, Misc.: Bridge Lighting	---	LUMP	\$15,000.00	\$ 15,000.00
632	Signal, Misc.: Traffic Signalization at Bridge	---	LUMP	\$20,000.00	\$ 20,000.00
659	Seeding and Mulching	1500	SQ YD	\$ 2.00	\$ 3,000.00
832	SWPPP	---	LUMP	\$ 4,000.00	\$ 4,000.00
	10% Contingency				\$ 78,174.00
				TOTAL	\$859,914.00

ENGINEER'S OPINION OF PROBABLE COST

Client	Misc	SEL234
Clermont County Engineer 2381 Clermont Center Drive Batavia, Ohio 45103	Date:	3/10/2009

Project Description: Option 4: Rehabilitation of Stonelick Williams Corner Road Covered Bridge to Carry an H12-44 Loading (12-Ton Two-Axle Truck). Eliminate moment in lower chord by placing beams only at panel points, thus eliminating need to replace lower chord.

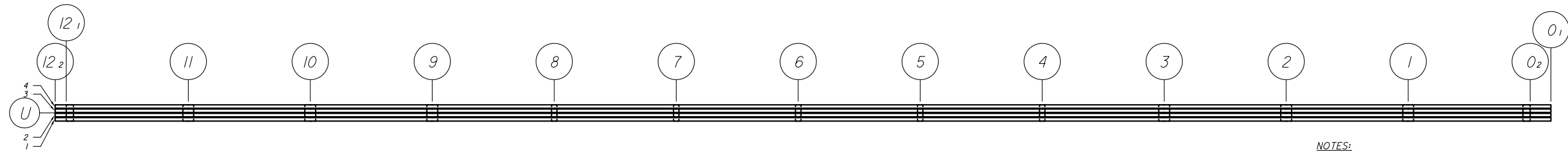
Ref No.	Description	Quantity	Unit	Unit Price	TOTAL
103/107	Bonds and Insurance	---	LUMP	\$ 4,000.00	\$ 4,000.00
202	Portions of Structure Removed, Over 20 Foot Span (Roofing, Siding, Lower Chord, Floor Planks, Floor Beams, Portions of Upper Chord, Specified Diagonals, Rafter, Purlins, and Steel Verticals)	---	LUMP	\$60,000.00	\$ 60,000.00
Various	Pavement Repair, Including Planing	--	LUMP	\$15,000.00	\$ 15,000.00
510	Dowel Holes with Non-Shrink Non-Metallic Grout	8	EACH	\$ 35.00	\$ 280.00
514	Field Painting, Misc.: Wood Stain	5500	SQ FT	\$ 3.00	\$ 16,500.00
514	Field Painting, Misc.: Fire Retardant	---	LUMP	\$15,000.00	\$ 15,000.00
516	Jacking and Temporary Support of Superstructure	---	LUMP	\$80,000.00	\$ 80,000.00
530	Structure, Misc.: Floor Beams	3.87	MFBM	\$ 4,500.00	\$ 17,415.00
530	Structure, Misc.: Floor Planks	20.16	MFBM	\$ 4,500.00	\$ 90,720.00
530	Structure, Misc.: Timber Curb	1.10	MFBM	\$ 4,000.00	\$ 4,400.00
530	Structure, Misc.: Girts and Siding	5500	SQ FT	\$ 8.50	\$ 46,750.00
530	Structure, Misc.: Standing Seam Metal Roof	3550	SQ FT	\$ 6.00	\$ 21,300.00
530	Structure, Misc.: Restoration of Timber Trusses	3.89	MFBM	\$12,000.00	\$ 46,680.00
530	Structure, Misc.: Restoration of Timber Trusses, as	0.97	MFBM	\$ 6,000.00	\$ 5,820.00
530	Structure, Misc.: Lateral Cross Braces	1.35	MFBM	\$ 3,000.00	\$ 4,050.00
530	Structure, Misc.: Timber Bearing Blocks	0.30	MFBM	\$ 3,000.00	\$ 900.00
530	Structure, Misc.: Replace Rafters and Purlins, as Directed By Engineer	2.00	MFBM	\$ 5,000.00	\$ 10,000.00
530	Structure, Misc.: Reinstallation of Roof System	---	LUMP	\$30,000.00	\$ 30,000.00
530	Structure, Misc.: Spiked Lamination of Upper Chord	2.02	MFBM	\$ 4,500.00	\$ 9,090.00
530	Structure, Misc.: Hold Down Bars	8	EACH	\$ 600.00	\$ 4,800.00
513	Structural Steel, Misc.: Steel Verticals and Hardware	6000	LBS	\$ 3.00	\$ 18,000.00
530	Structrue, Misc.: Extend Roof Overhang	0.40	MFBM	\$ 5,000.00	\$ 2,000.00
513	Structural Steel, Misc.: Steel Plates and Hardware	15000	LBS	\$ 5.00	\$ 75,000.00
602	Masonry, Misc.: Repair Stone Wingwall	---	LUMP	\$ 3,000.00	\$ 3,000.00
602	Masonry, Misc.: Repointing Mortar Joints	---	LUMP	\$ 6,500.00	\$ 6,500.00
606	Guardrail	100	FT	\$ 70.00	\$ 7,000.00
614	Maintenance of Traffic	---	LUMP	\$ 2,500.00	\$ 2,500.00
619	Field Office	---	LUMP	\$15,000.00	\$ 15,000.00
623	Construction Layout Stakes	---	LUMP	\$ 1,500.00	\$ 1,500.00
624	Mobilization	---	LUMP	\$10,000.00	\$ 10,000.00
625	Lighting, Misc.: Bridge Lighting	---	LUMP	\$15,000.00	\$ 15,000.00
632	Signal, Misc.: Traffic Signalization at Bridge	---	LUMP	\$20,000.00	\$ 20,000.00
659	Seeding and Mulching	1500	SQ YD	\$ 2.00	\$ 3,000.00
832	SWPPP	---	LUMP	\$ 4,000.00	\$ 4,000.00
	10% Contingency				\$ 71,195.50
TOTAL					783,150.50

ENGINEER'S OPINION OF PROBABLE COST

Client	Misc	SEL234
Clermont County Engineer 2381 Clermont Center Drive Batavia, Ohio 45103	Date:	3/23/2009

Project Description: Option 5: Rehabilitation of Stonelick Williams Corner Road Covered Bridge to Carry an HS20-44 Loading (40-Ton Three-Axle Truck) by installing glue laminated timber arches to carry the existing bridge.

Ref No.	Description	Quantity	Unit	Unit Price	TOTAL
103/107	Bonds and Insurance	---	LUMP	\$ 4,000.00	\$ 4,000.00
202	Portions of Structure Removed, Over 20 Foot Span (Roofing, Siding, Backwalls, Floor Planks, Floor Beams, Portions of Substructures, Specified Diagonals, Rafter, Purlins, and Steel Verticals)	---	LUMP	\$60,000.00	\$ 60,000.00
Various	Pavement Repair, Including Planing	--	LUMP	\$15,000.00	\$ 15,000.00
509	Reinforcing Steel	--	LUMP	\$ 5,000.00	\$ 5,000.00
510	Dowel Holes with Non-Shrink Non-Metallic Grout	8	EACH	\$ 35.00	\$ 280.00
511	Concrete for Structures Arch Seats and Backwalls	20	CU YD	\$ 800.00	\$ 16,000.00
514	Field Painting, Misc.: Wood Stain	5500	SQ FT	\$ 3.00	\$ 16,500.00
514	Field Painting, Misc.: Fire Retardant	---	LUMP	\$15,000.00	\$ 15,000.00
516	Jacking and Temporary Support of Superstructure	---	LUMP	\$40,000.00	\$ 40,000.00
517	Bridge Railings	270	FT	\$ 100.00	\$ 27,000.00
530	Structure, Misc.: Floor System	2430	SQ FT	\$ 75.00	\$ 182,250.00
530	Structure, Misc.: Girts and Siding	5500	SQ FT	\$ 8.75	\$ 48,125.00
530	Structure, Misc.: Standing Seam Metal Roof	3550	SQ FT	\$ 6.00	\$ 21,300.00
530	Structure, Misc.: Restoration of Timber Trusses	3.89	MFBM	\$12,000.00	\$ 46,680.00
530	Structure, Misc.: Restoration of Timber Trusses, as Directed By Engineer	0.97	MFBM	\$ 6,000.00	\$ 5,820.00
530	Structure, Misc.: Glue Laminated Timber Arches	13.44	MFBM	\$ 6,500.00	\$ 87,360.00
530	Structure, Misc.: Sway Bracing	0.68	MFBM	\$ 3,500.00	\$ 2,380.00
530	Structure, Misc.: Lateral Cross Braces	1.35	MFBM	\$3,000.00	\$ 4,050.00
530	Structure, Misc.: Timber Bearing Blocks	0.30	MFBM	\$ 3,000.00	\$ 900.00
530	Structure, Misc.: Replace Rafters and Purlins, as Directed By Engineer	2.00	MFBM	\$ 5,000.00	\$ 10,000.00
530	Structure, Misc.: Reinstallation of Roof System	---	LUMP	\$15,000.00	\$ 15,000.00
530	Structure, Misc.: Hold Down Bars	8	EACH	\$ 600.00	\$ 4,800.00
530	Structure, Misc.: Extend Roof Overhang	0.40	MFBM	\$ 5,000.00	\$ 2,000.00
513	Structural Steel, Misc.: Steel Verticals and Hardware	6000	LBS	\$ 3.00	\$ 18,000.00
513	Structural Steel: Steel Attachment Arch to Truss	2000	LBS	\$ 7.50	\$ 15,000.00
513	Structural Steel, Misc.: Steel Plates and Hardware	15000	LBS	\$ 5.00	\$ 75,000.00
513	Structural Steel, Misc.: Steel Assemblies for Arches	28000	LBS	\$ 5.00	\$ 140,000.00
602	Masonry, Misc.: Repair Stone Wingwall	---	LUMP	\$ 3,000.00	\$ 3,000.00
602	Masonry, Misc.: Repointing Mortar Joints	---	LUMP	\$ 6,215.00	\$ 6,215.00
606	Guardrail	100	FT	\$ 70.00	\$ 7,000.00
614	Maintenance of Traffic	---	LUMP	\$ 2,500.00	\$ 2,500.00
619	Field Office	---	LUMP	\$15,000.00	\$ 15,000.00
623	Construction Layout Stakes	---	LUMP	\$ 1,500.00	\$ 1,500.00
624	Mobilization	---	LUMP	\$10,000.00	\$ 10,000.00
625	Lighting, Misc.: Bridge Lighting	---	LUMP	\$15,000.00	\$ 15,000.00
632	Signal, Misc.: Traffic Signalization at Bridge	---	LUMP	\$20,000.00	\$ 20,000.00
659	Seeding and Mulching	1500	SQ YD	\$ 2.00	\$ 3,000.00
832	SWPPP	---	LUMP	\$ 4,000.00	\$ 4,000.00
	10% Contingency				\$ 101,141.00
			TOTAL		1,112,551.00



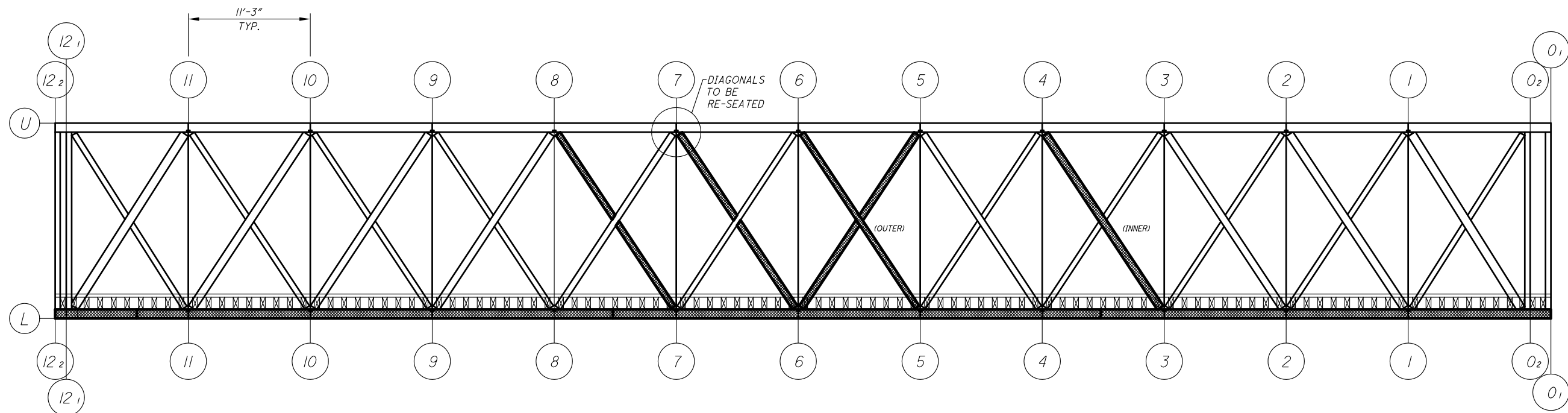
PLAN VIEW
(TOP CHORD)

NOTES:

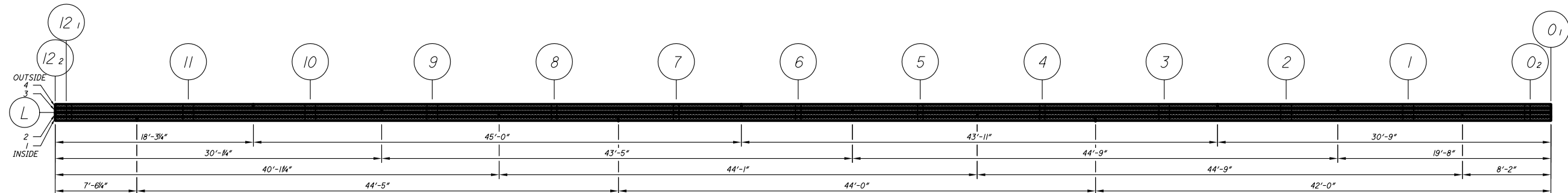
SPLICES IN UPPER CHORDS LABELED 2 & 3
ARE NOT VISIBLE



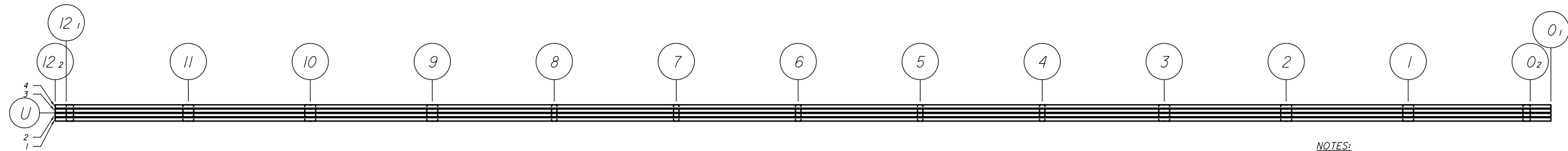
INDICATES MEMBER TO BE REPLACED



RIGHT (SOUTH) TRUSS
(INSIDE LOOKING SOUTH)
SCALE 3/32" = 1'-0"



PLAN VIEW
(LOWER CHORD)



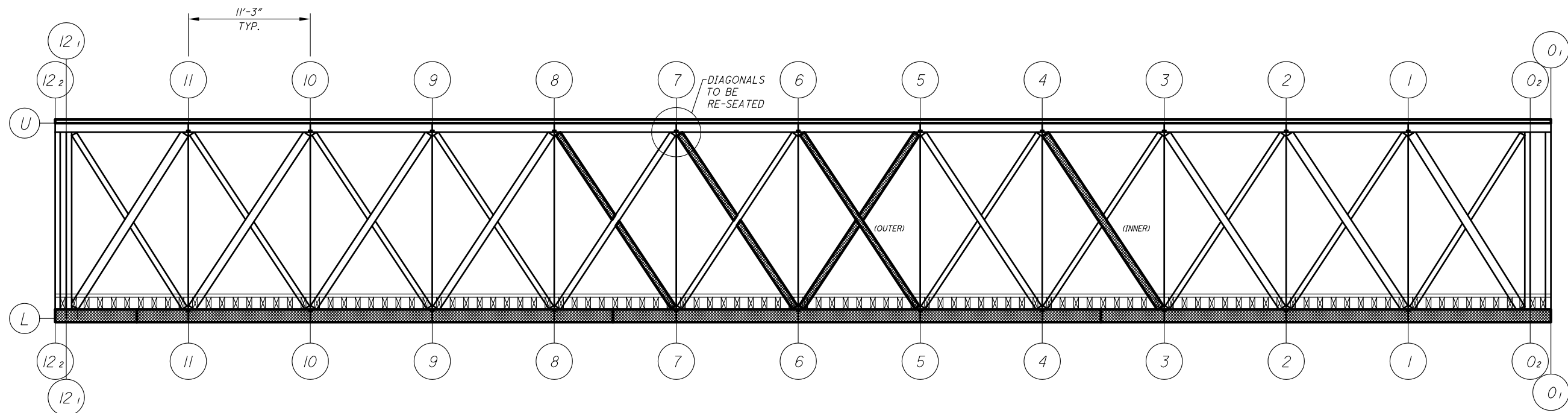
PLAN VIEW
(TOP CHORD)

NOTES:

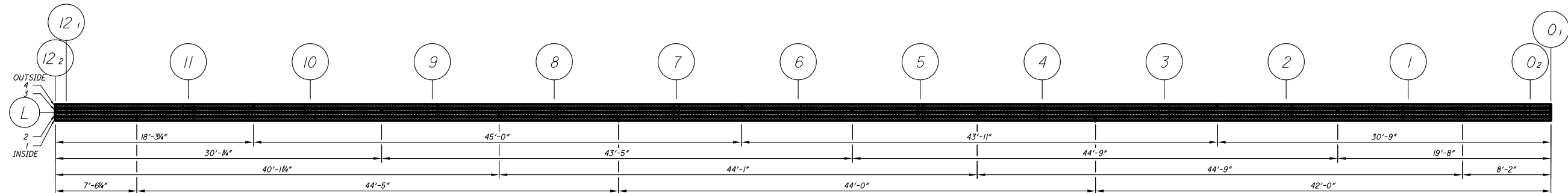
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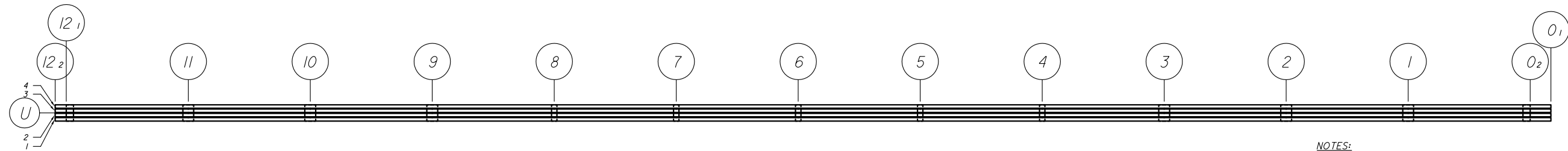
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PLAN VIEW
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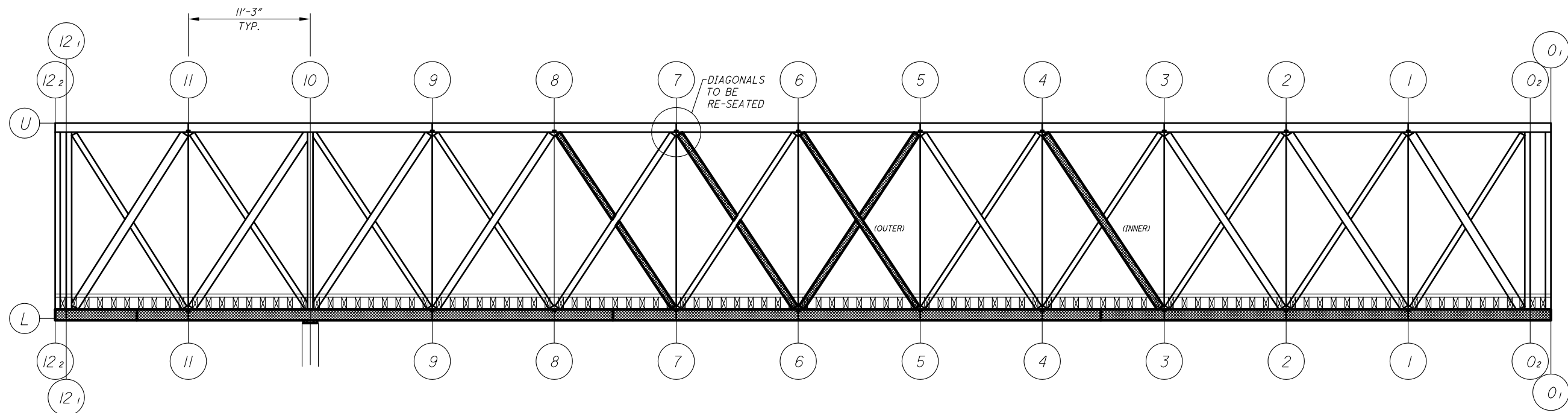
PLAN VIEW
(TOP CHORD)

NOTES:

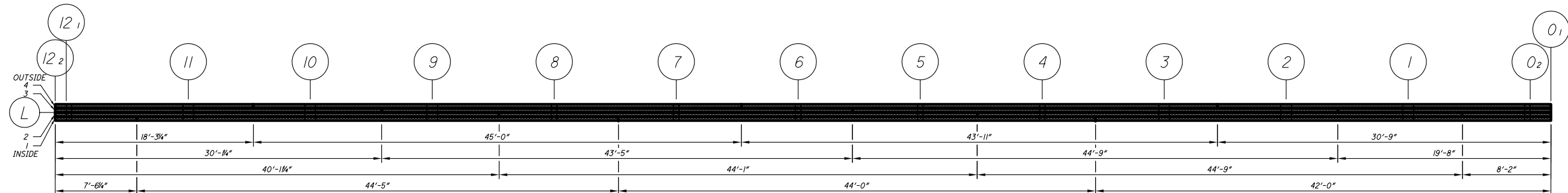
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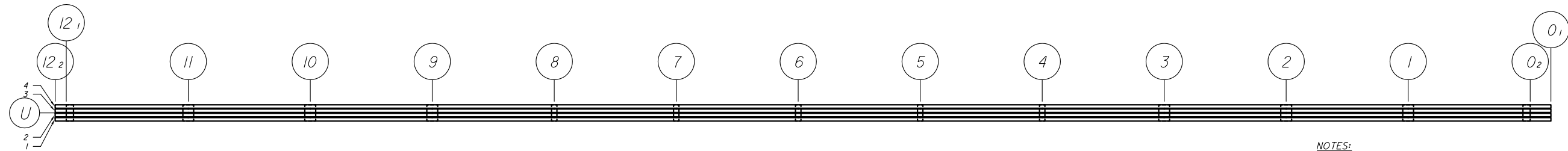
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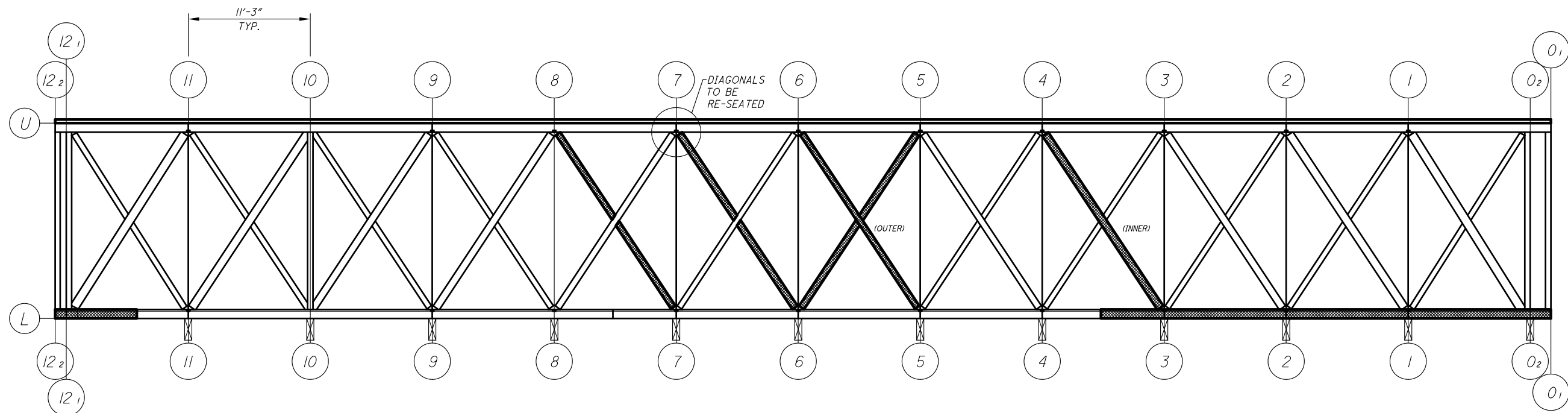
PLAN VIEW
(TOP CHORD)

NOTES:

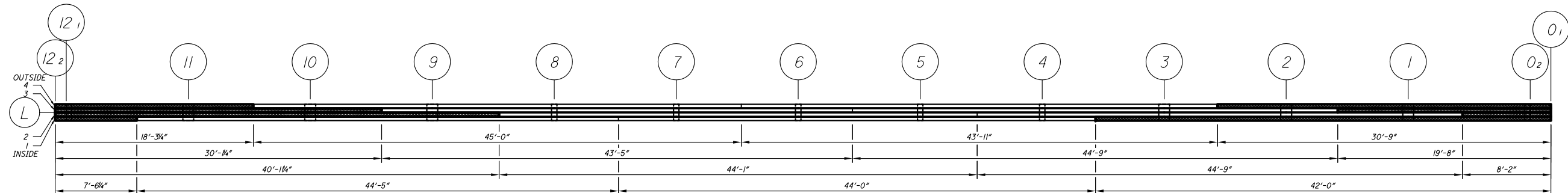
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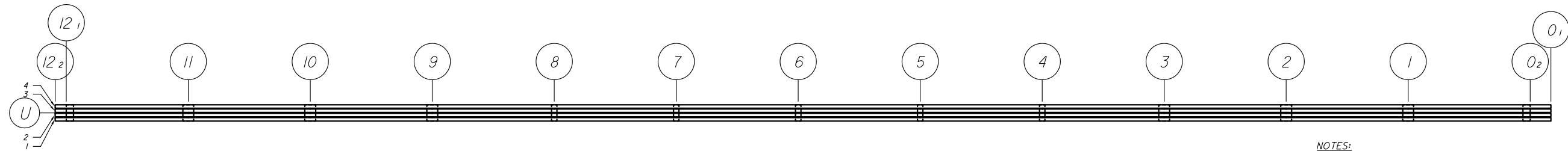
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PLAN VIEW
(LOWER CHORD)



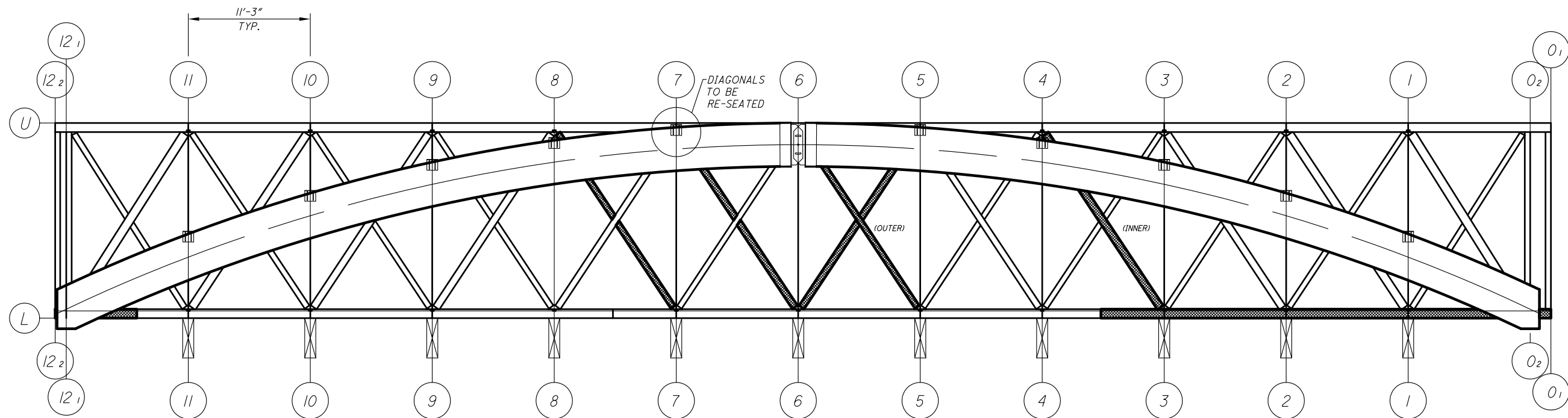
PLAN VIEW
(TOP CHORD)

NOTES:

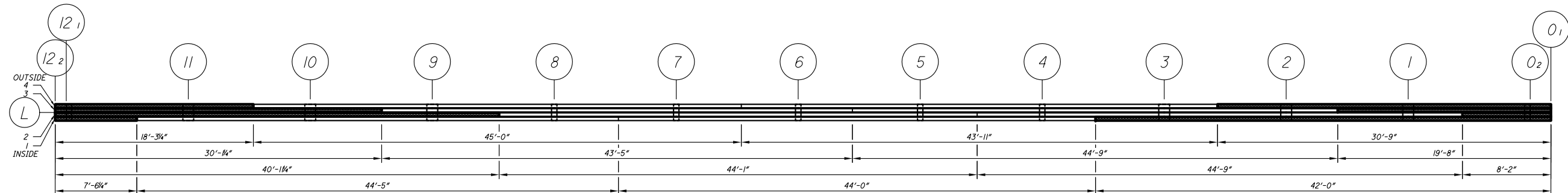
SPLICES IN UPPER CHORDS LABELED 2 & 3 ARE NOT VISIBLE



INDICATES MEMBER TO BE REPLACED



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PLAN VIEW
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