CUY-10-1613

PHYSICAL CONDITION REPORT
ROUTINE FRACTURE CRITIAL INSPECTION
HOPE MEMORIAL/LORAIN CARNEGIE BRIDGE
OVER THE CUYAHOGA RIVER
SFN: 1801503

Inspection Date:
July 16-20, 2018

Submitted to:

Ohio Department of Transportation
District 12
5500 Transportation Boulevard
Garfield Heights, OH 44125
United States of America

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1/31/2019

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INFRASTRUCTURE ENGINEERS
a CONSOR company

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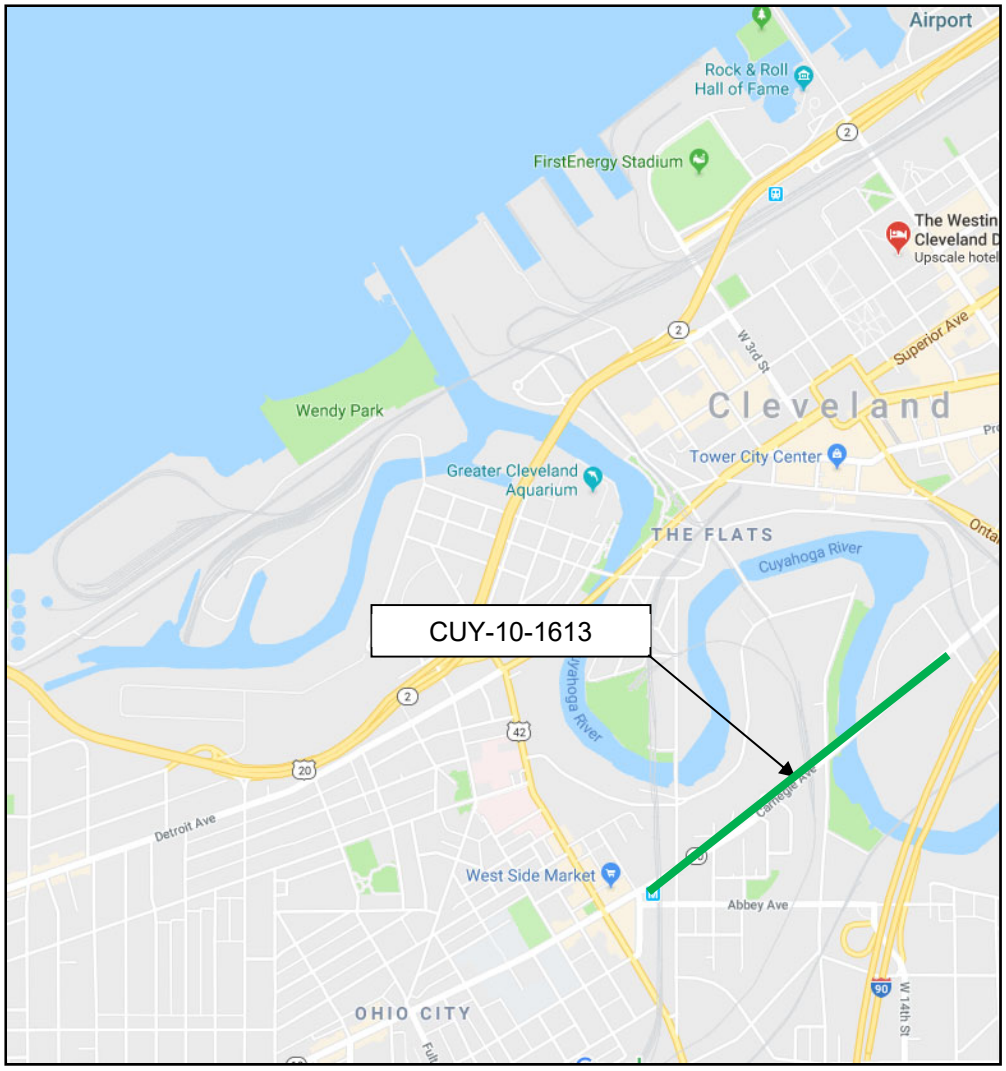
LOCATION MAP



Structure: CUY-10-1613
Hope Memorial/Lorain Carnegie over Cuyahoga River
Cleveland, Ohio

GENERAL DESCRIPTION

The Hope Memorial/Lorain Carnegie Bridge (CUY-10-1613, SFN 1801503) was built in 1932 and carries four lanes of traffic and two sidewalks over the Cuyahoga River Valley, local streets, parking lots and RTA railroad tracks. The structure is approximately 3,515 feet long and carries State Route 10 and pedestrian traffic over the Cuyahoga River Valley. The 13 main spans of the bridge are composed of four lines of cantilever Pratt deck trusses supported by cast-in-place concrete piers on spread footings. W & LE Span at the East Abutment is a single span 131-foot long Pratt deck truss span containing three truss lines.

The calculated quantities from the 2014 Element Level Inspection were used when populating the 2018 Bridge Inspection Field Report. The span units are numbered per the original shop drawings, beginning at Unit 13 at the West Abutment and decrementing to Unit 1 at the East Pylon. The easternmost span from the East Pylon to the East Abutment over RTA line is denoted as W & LE Span. Gusset plates are numbered increasing from West to East locally to each span unit.

Main spans: Thirteen (13) spans of four (4) lines of cantilever Pratt deck style trusses totaling 2,916'-1". Truss spans vary from 161'-2" to 299'-0".
West Approach: Five (5) multi beam spans sitting on concrete piers and steel bents. Total length of approach spans totaling 157'-8".
East Approach: Concrete cellular construction approximately 307'-0" L with three (3) 131'-0" L Pratt deck truss spans.

Plan views of the Hope Memorial/Lorain Carnegie Bridge with the units and sections identified are shown in Drawings A-1 and A-2.

East end view looking West

West end view looking East

South elevation

North elevation

INSPECTION PROCEDURE

Infrastructure Engineers, LLC. conducted an in-depth fracture critical inspection on the structural elements using a combination of equipment and industrial rope access techniques. The inspection was performed by a crew of four (4) members recording inspection notes and verifying all previously reported and new areas of deterioration or structural distress.

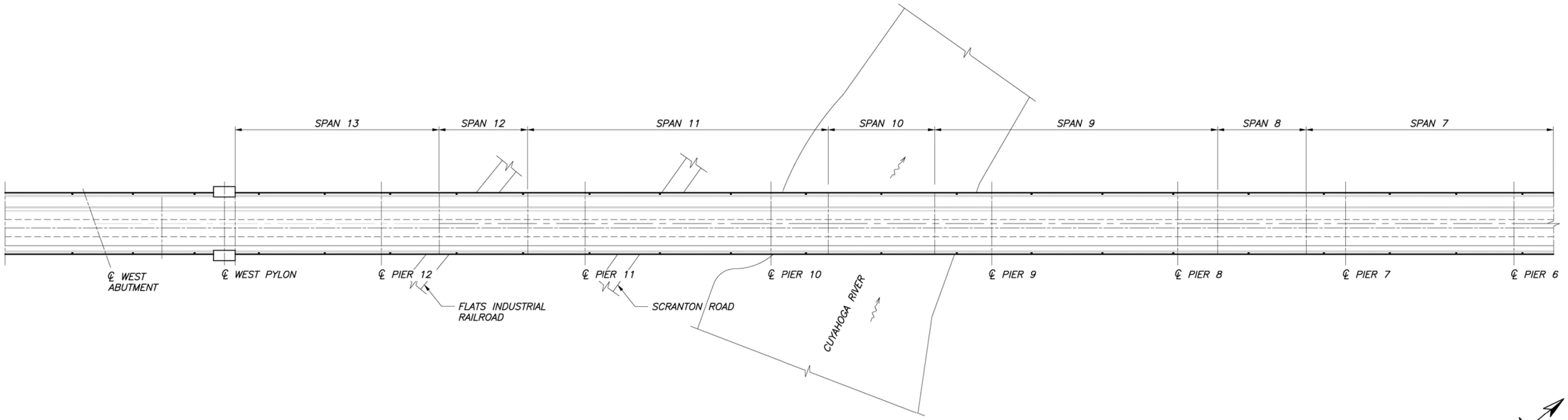
Condition and Element Rating Guidelines

The table below contains the bridge inspection rating matrix established by the Federal Highway Administration (FHWA), using a 0-Failure through 9-Excellent scale, and used by the Ohio Department of Transportation (ODOT). In this report, component conditions will generally be discussed based on the ODOT rating guidelines for individual components, 1-Good through 4-Critical.

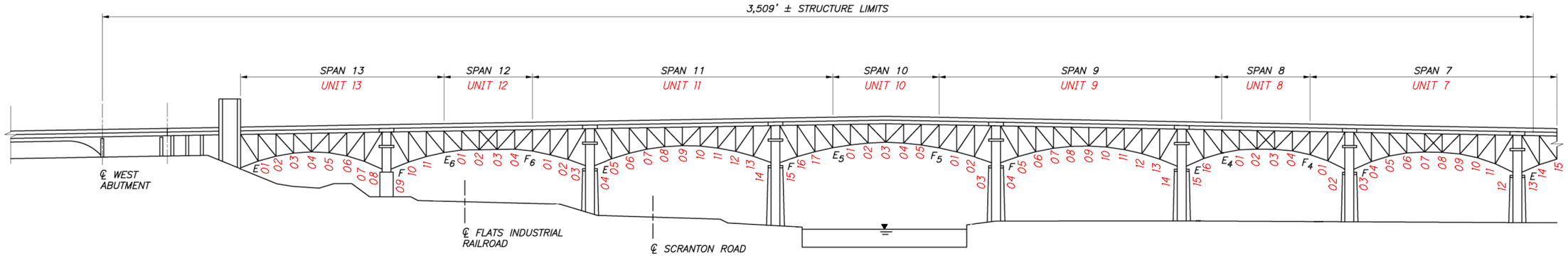
The General Appraisal, the Deck, Superstructure, Substructure, Channel and Approach Summaries, and the Protective Coating System rating will follow the NBIS/ODOT 0 through 9 rating guidelines.

Individual Items (ODOT)	Summary Items (NBIS)	Condition	Defect
1 GOOD	9	Excellent	Excellent condition.
	8	Very Good	No problems noted.
	7	Good	Some minor problems
2 FAIR	6	Satisfactory	Structural elements show some minor deterioration.
	5	Fair	All primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.
3 POOR	4	Poor	Advanced section loss, deterioration, spalling, or scour.
	3	Serious	Loss of section, deterioration, spalling or scour has seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
4 CRITICAL	2	Critical	Advanced deterioration of primary structural elements, Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure report. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
	1	"Imminent Failure"	Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may be put it back in light service.
	0	Failed	Out of service – beyond corrective action.

Manual of Bridge inspection, Ohio Department of Transportation (ODOT), 2014
Bridge Inspector's Reference Manual, Federal Highway Administration (FHWA), 2015
Manual for Condition Evaluation of Bridges, 2nd Edition, AASHTO, 2010 (rev 2011)
National Bridge Inspection Standards, U.S. Department of Transportation, 2004
Inspection of Fracture Critical Bridge Members, U.S. Department of Transportation, 1986



PLAN



SOUTH ELEVATION

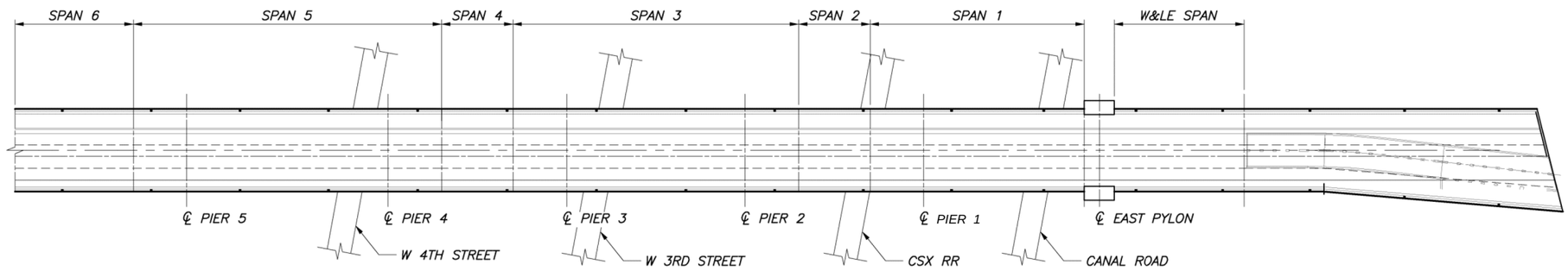
LEGEND

F = FIXED BEARING/HINGE
E = EXPANSION BEARING/HINGE

NOTE

SPANS AND PIERS ARE NUMBERED EAST TO WEST IN ORDER TO REMAIN CONSISTENT WITH ORIGINAL CONSTRUCTION AND REHABILITATION DRAWINGS.

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION PAGE A - 1



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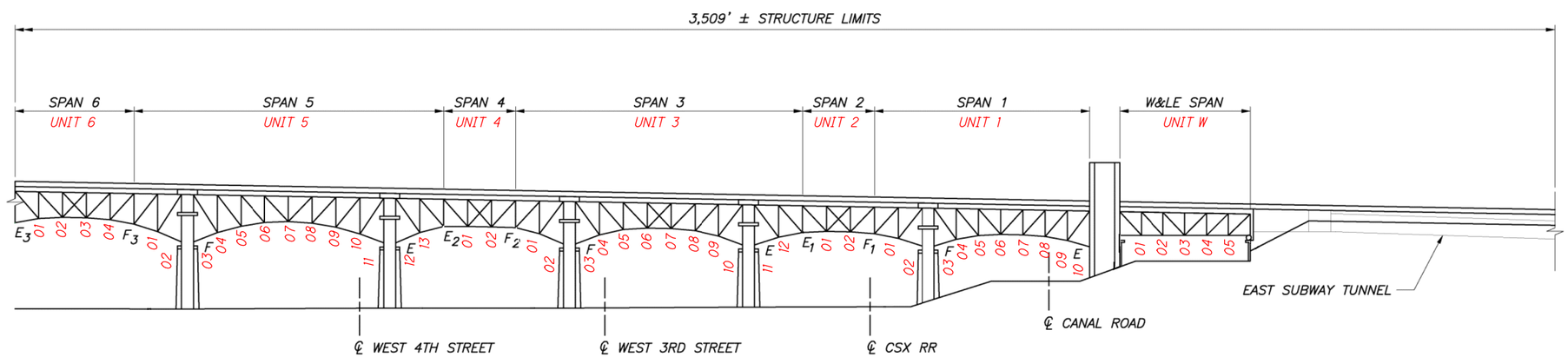

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Inspection Findings:

Item N58 – Deck (6, Satisfactory Condition)

The deck is in overall ***satisfactory*** condition, a rating of a 6 on the NBIS condition rating guidelines.

The deck findings and summary of deck conditions for individual deck items are as follows:

Item 7.1 – Floor (1, Fair Condition)
The deck floor is in overall ***Fair*** condition. The underside of the deck has random spalling with exposed rebar, areas of delaminations, and cracking with efflorescence noted throughout (Photos 1 and 2). Heavier concrete deterioration is noted near the joints and scuppers. Many of the previous spalls appear to have been coated with rust inhibitor but areas still exhibit active corrosion. Netting and/or wood form boards are in place over the roadways and parking lots to prevent loose concrete from falling into traffic. The underside of the East approach tunnel deck has large spalled areas in all bays with several consecutive transverse bars exposed and broken.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
263,774 SF	240,800 SF	12,000 SF	12,000 SF		1.64

Item 7.2 – Edge of Floor (7, Good Condition)
The edge of floor is in overall ***Good*** condition. The edge of the deck has a few isolated spalls throughout with minor cracking adjacent to expansion joints and floorbeam extensions.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
6,415 LF	6,094 LF	321 LF			1.07

Item 8– Wearing Surface (7, Good Condition)
The concrete wearing surface is in ***Good*** condition. There are no significant defects noted (Photo 3).

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
178,959 SF	178,959 SF				1.00

The lower deck wearing surface is not considered in this quantity. Random areas of delaminated concrete with a few areas of spalling were noted throughout (Photo 4). Since the lower deck is not open to the public and does not present a public safety concern, it is not considered with the rating.

Item 9 – Curb/Sidewalk (6, Satisfactory Condition)
The concrete curb and sidewalk are in ***Satisfactory*** condition. The North walk has been previously repaired at the expansion joints. Both walks have minimal areas of delamination or light cracking with moisture. The South

walk shows more deterioration and has vegetation growing in many of the cracked areas adjacent to the curb.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
7,018 LF	6,948 LF	70 LF			1.01

Item 11 – Railing (5, Fair Condition)
The concrete median and railings are in ***Fair*** condition. The lower 2/3 of the concrete railing exhibits cracking, a few random small delaminations and corrosion staining throughout (Photo 6). The bikeway railing is in good condition with a few minor deteriorated areas throughout.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
7,018 LF	1,404 LF	5,614 LF			1.86

Item 12 – Drainage (7, Good Condition)
The deck drainage is in ***Good*** condition. There is minor debris in the deck scuppers and some isolated surface corrosion below the deck in the drainage downspouts.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
28 EA	27 EA		1 EA		1.50

Item 13 – Expansion Joints (6, Satisfactory Condition)
The expansion joints are in ***Satisfactory*** condition. The majority of the joint armor is in good condition and level with the wearing surface, but there is evidence of leakage through the joint membranes (Photo 7). Minor debris accumulation was also noted throughout the joints but does not appear to be affecting the serviceability.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
1,494 LF	1,419 LF	75 LF			1.07

Deck deficiencies and specific locations are noted in the following table:

Deck Deficiencies and Locations				
Main Unit	**Secondary Unit**	**Span**	**Note**	**Photo**
Sidewalk	South Side	1	18' L x up to 1/4" W longitudinal crack with associated minor edge spalling in the sidewalk	5
Expansion Joint	Upper Deck Joint	3	The south end of the joint at Panel Point 13 is damaged/de-bonded with hanging material.	8
Bridge Railing	North Rail	8	Surface spalling along the top of the railing, just east of joint.	
Sidewalk	North Sidewalk	9	Hairline transverse cracking.	

Item N59 – Superstructure (4, Poor Condition)

The superstructure is overall ***Poor*** condition, or 4 on the NBIS condition rating guidelines (Photos 9 and 10).

The superstructure findings and summary of conditions for individual items are as follows:

Item 14 – Alignment of Members (7, Good Condition)
The alignment of the primary superstructure members is ***Good***.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
17 EA	17 EA				1.00

Item 15.1 Beams/Girders (7, Good Condition)
The beams that are part of the West approach superstructure are in overall ***Good***. No significant defects were noted (Photo 11).

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
1,207 LF	1,207 LF				1.00

Item 16 – Diaphragms or Cross Frames (7, Good Condition)
The cross frames that are part of the West approach superstructure are in ***Good*** condition. No significant defects were noted.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
55 EA	55 EA				1.00

Item 17 – Stringers (5, Fair Condition)
The stringers are in ***Fair*** condition. There are isolated areas of corrosion at the floorbeam connections. Some of these locations have minor web loss in areas and isolated through holes.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
36,709 LF	33,038 LF	3,671			1.14

Item 18 – Floorbeams (6, Satisfactory Condition)
The floorbeams are in overall ***Satisfactory*** condition. There is minor section loss and surface corrosion along the floorbeams below the deck joint locations.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
11,218 LF	10,318 LF	900 LF			1.12

Item 19 – Truss Vertical (6, Satisfactory Condition)
The truss verticals are in ***Satisfactory*** condition. The verticals are generally in good condition, with the verticals below the deck joint locations having moderate painted over pitting and reactivating corrosion throughout the full height (Photo 13).

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
529 EA	472 EA	28 EA	29 EA		1.73

Item 20 – Truss Diagonals (6, Satisfactory Condition)
The truss diagonals are in ***Satisfactory*** condition. The diagonals are generally in good condition. Areas of active pack rust along the exterior angles of the North Exterior Truss and South Exterior Truss diagonal members (Photo 14). Exterior diagonals, adjacent to abandoned utility supports, have remnants of brackets welded to the web plates. Elsewhere, several diagonals have lower stay plates with deep section losses or corrosion holes.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
506 EA	451 EA	25 EA	30 EA		1.76

Item 21 – Truss Upper Chord (7, Good Condition)
The truss upper chords are in overall ***Good*** condition. Junction box drains drip onto the upper chord members and are causing light corrosion to several exterior upper chord members. Below the expansion joints there is dirt and construction debris present inside some upper chord connections with the verticals.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
522 EA	512 EA	10 EA			1.03

Item 22 – Truss Lower Chord (4, Poor Condition)
The truss lower chords are in ***Poor*** condition. Various degrees of sections loss and pack rust are located between the flange angles and the web plates (Photo 15). Portions of the flange angles and webs of the exterior lower chords have pockets of deep pitting or perforations. The greatest section loss generally is located in Spans 11 and 13. In these spans, twelve (12) lower chord members have between 5% and 22% net section loss as previously reported by the 2014 inspection report (Photo 16). The lower chord in Spans 12 and 13 have members that are also cracked in the flange angles (Photo 17 and 18).

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
522 EA	343 EA	52 EA	126 EA	1 EA	2.53

Item 23 – Truss Gusset Plates (4, Poor Condition)
The truss gusset plates are in ***Poor*** condition. The truss gusset plates below the deck joints exhibit the most distress. Section loss is most prevalent at these locations. A previously documented laminar tear in the South gusset at Span 7 lower chord Panel Point 7 of the South Interior Truss shows no growth (Photo 19). Advanced section loss commonly occurs just above the lower chord and along the edges and ends of the diagonal connections (Photo 20). Also, minor bows are noted along the free edges of the gusset plates due to pack rust. The upper chord gusset plates are in good condition with little corrosion observed. Areas of heavy corrosion occur below the deck expansion joints. The gussets at the upper chord floorbeam connections below the junction box drains are also pitted.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
1,656 EA	1,840 EA	199 EA	260 EA	1 EA	2.17

Item 24 – Lateral Bracing (6, Satisfactory Condition)
The lateral bracing is in ***Satisfactory*** condition. Many of the lateral bracing gusset plates have minor section loss and pack rust causing their corners to peel away from the lateral bracing members. This was most prevalent below the deck joints. The members themselves are in Good condition.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
240 EA	228 EA	12 EA			1.07

Item 25 – Sway Bracing (7, Good Condition)
The sway bracing is in ***Good*** condition. Minor pack rust and corrosion is noted at the connections to the verticals below the deck joints.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
202 EA	200 EA	2 EA			1.01

Item 26 – Bearing Devices (5, Fair Condition)
The bearings are in ***Fair*** condition. Moderate surface corrosion with areas of section loss is noted around the pins (Photo 21). There is debris and water accumulation in some of the truss bearings.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
164 EA		164 EA			2.00

The bearings for the lower deck are not considered in this quantity. The majority of these bearings are out of alignment and have notable section loss. The bearings appear to be frozen at some location causing some of the bearings to be in contraction and some to be in expansion at the same panel point. A few of the bearings are extended past their limits. All lower deck bearings at expansion joints should be reset or repaired. Since the lower deck is not open to the public and does not present a public safety concern, these bearing were not considered with the rating.

Item 30 – Protective Coating System (5, Fair Condition)
The protective coating system (PCS) is in ***Fair*** condition. An estimated 60% of the PCS quantity is in Good condition, 20% is in Fair, and the remainder is in Poor condition. There are scattered areas of peeling and bubbling paint, especially at expansion joints where water infiltration and active corrosion is occurring. There are several areas on the superstructure with active pack rust between gusset plates, web plates, angles, and lacing, with the worst areas noted below or downstream of the deck joints.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
60,961 LF	36,577 LF	12,192 LF	12,192 LF		2.31

Item 31 – Pins, Hangers and Hinges (5, Fair Condition)
The pins, hangers, and hinges are in ***Fair*** condition. Minor to moderate section loss and pack rust were noted to the pins and the adjacent plates (Photo 22). The South Interior Truss line pin to zero-force member is dislodged at Unit 13, lower chord, Panel Point 12 (Photo 23). This is connected to a zero-force member and is not considered with the rating of the pin; however, it should be monitored, and repaired.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
192 EA		190 EA	2 EA		2.06

Item 32 – Fatigue Prone Details (7, Good Condition)
The fatigue prone details are in ***Good*** condition. No fatigue distress was noted at any of the field tack welded utility or drainage attachments.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
60,691 LF	60,961 LF				1.00

Superstructure deficiencies and specific locations are noted in the following tables:

North Exterior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
		EAST SUBWAY TUNNEL	
		W & LE SPAN	
		EAST PYLON	
L3-L4	LC	Gusset plate at L3: south gusset plate has up to 1” T sealed pack rust between the top edge and the L4U5 diagonal.	
L4-L5	LC	Gusset plate at L4: inside face of south gusset plate has up to 1/4” D painted over section loss.	
		SPAN 1	
L0-L1	LC	Top and bottom flanges have up to 3/16” D painted over section loss.	
L0-U1	DIAG	South web near L0 has up to 1/8” D painted over section loss.	
		PIER 1	
L3-L4	LC	Gusset plate at L4: south gusset plate has areas of up to 1/4” D painted over pitting.	
L4-L5	LC	Top and bottom flanges have up to 3/16” D painted over section loss.	
U4-U5	UC	Upper chord lacing bars and flanges near U4 have up to 100% painted over section loss and some reactivating corrosion.	

North Exterior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L9-L10	LC	Gusset plates at L10: both gusset plates have up to 1/4” D painted over pitting on the inside faces and reactivating laminar corrosion.	
L10-U10	VERT	50% section loss to the East flange angles and up to 100% section loss at the ends of the angles at L10.	
L10	BEARINGS	Bearing at L10 is rocked 16 degrees to the west.	
		SPAN 2	
L0-L1	LC	Up to 1” T sealed pack rust between built up lower chord members.	
L1-L2	LC	Up to 1” T sealed pack rust between built up lower chord members and up to 3/16” D painted over section loss.	
L3-U3	VERT	Gusset plates at L3 and U3: gusset plates have reactivating pack rust up to 1/2” T between them, the vertical and the diagonal. All gusset plates also have up to 1/4” D painted over pitting with reactivating corrosion.	
		SPAN 3	
L0-L1	LC	The west half of the south bottom flange has areas that have 100% section loss up to 18” L.	
L0-U0	VERT	Gusset plates at L0 and U0: gusset plates have reactivating pack rust up to 1” T between them, the vertical and the diagonal. All gusset plates also have up to 1/4” D painted over pitting with reactivating corrosion. U0 north Gusset plate, south face has up to 5/16” D painted over pitting around the pin (fjn49).	
L1-L2	LC	Gusset plates at L2: both gusset plates have up to 1/4” D painted over pitting on the inside faces.	
		PIER 3	
L5-L6	LC	Gusset plate at L6: south gusset plate has areas of up to 3/16” D painted over pitting.	
L7-L8	LC	Gusset plates at L8: both gusset plates have up to 3/16” D painted over section loss.	
		PIER 2	
L11-L12	LC	Gusset plates at L11: both gusset plates have up to 1/4” D painted over section loss. Gusset plates at L12: south gusset plate has areas of up to 3/16” D painted over section loss.	
U11-L12	DIAG	The south web at the interface with the L12 gusset plate has up to 1/4” D painted over section loss.	

North Exterior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L12-L13	LC	South bottom flange has four sections that appear to have been cut out due to excessive corrosion. There are also areas of up to 3/16” D painted over section loss in the webs and up to 1” T sealed pack rust between built up members.	
U12-L13	DIAG	The south web at the interface with the L13 Gusset plate has up to 1/4” D painted over section loss.	
L13-U13	VERT	Gusset plates at L13 and U13: gusset plates have reactivating pack rust up to 1” T between them, the vertical, the diagonal. All gusset plates also have up to 1/4” D painted over pitting with reactivating corrosion. South gusset plate at L13 has up to 1/2” D painted over section loss. L13U13 vertical has reactivating corrosion and pack rust throughout the full height of the member.	
		SPAN 4	
L0-L1	LC	The webs at L0 have up to 1/4” D painted over section loss and small corrosion holes in the south lower flange.	
L1-L2	LC	Gusset plate at L1: south gusset plate has up to 1/4” D painted over pitting.	
		SPAN 5	
L1-L2	LC	Gusset plates at L2: both gusset plates have up to 1/4” D painted over pitting on the inside faces.	
		PIER 5	
L8-L9	LC	Gusset plate at L9: south gusset plate has up to 1/16” D painted over pitting and up to 1” T sealed pack rust between it and the L9U10 diagonal.	
L10-L11	LC	Gusset plates at L11: both gusset plates have up to 1/4" D painted over pitting.	
		PIER 4	
L12-L13	LC	Both webs of the lower chord at the panel points have areas of up to 1/4” D painted over section loss. Gusset plate at L13: south gusset plate has up to 1/4” D painted over section loss.	
U13-L14	DIAG	The lower half of the diagonal has reactivating corrosion and pack rust.	
L14-U14	VERT	Gusset plates at L5 and U5: gusset plates have reactivating pack rust up to 1” T between them, the vertical, the diagonal, and the pin. All gusset plates also have up to 1/4” D painted over pitting with reactivating corrosion.	
		SPAN 6	
L0-L1	LC	There is reactivating pack rust between strengthening plates and lower chord members at the pin connection at L0.	

North Exterior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L5-U5	VERT	Gusset plates at L5 and U5: gusset plates have reactivating pack rust up to 1” T between them, the vertical, the diagonal, and the pin. All gusset plates also have up to 1/4” D painted over pitting with reactivating corrosion. The north gusset plate at U5 has 5 rivets that are not protruding all the way to the outside face.	
		SPAN 7	
L0-L1	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members. Gusset plate at L1: south gusset plate has up to 3/16” D painted over pitting and reactivating pack rust between the Gusset and diagonal.	
L0-U1	DIAG	Both webs neat L0 have up to 1/4” D painted over section loss.	
L1-L2	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members. Gusset plate at L2: both gusset plates have up to 3/16” D painted over pitting.	
PIER 7		PIER 7	
L4-L5	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
L5-L6	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
U5-L6	DIAG	Gusset plate at L6: south gusset plate has areas of up to 3/16” D painted over pitting.	
L7-L8	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
L8-L9	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members. Gusset plate at L9: south gusset plate has peeling paint and reactivating corrosion.	
L10-L11	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
L10-U11	DIAG	South web near L10 has up to 3/16” D painted over pitting. Gusset plate at L10: south gusset plate has partially sealed 3/4” T pack rust between it and the diagonal.	
L11-L12	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
		PIER 6	
L13-L14	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
L14-L15	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
L15-U15	VERT	Gusset plates at L15 and U15: gusset plates have reactivating pack rust up to 1” T between them, the vertical, the diagonal, and the pin. All gusset plates also have up to 1/4” D painted over pitting with reactivating corrosion.	
		SPAN 8	
L0-L1	LC	Lower chord pin connection and strengthening plates have up to 1/4” D painted over section loss and up to 1/1-4” T reactivating pack rust.	

North Exterior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L3-L4	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members. Gusset plate at L4: south gusset plate has up to 3/16” D painted over pitting.	
L4-L5	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
L5-U5	VERT	Gusset plates at L5 and U5: gusset plates have up to 1/4” D painted over section loss on the outside faces and reactivating corrosion on the inside faces. Both plates at U5 have up to 3/16” D painted over section loss.	
		SPAN 9	
L0-L1	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
L1-L2	LC	Gusset plate at L1: south gusset plate has areas of up to 1/4” D painted over pitting.	
L2-L3	LC	Gusset plate at L2: south gusset plate has areas of up to 3/16” D painted over pitting that is beginning to reactivate near the interface with the lower chord. There is also up to 7/8" T sealed pack rust between the gusset plate and the diagonal. Gusset plate at L3: south gusset plate has up to 1/4” D painted over pitting.	
		PIER 9	
L5-L6	LC	Gusset plates at L6: both gusset plates have areas of up to 3/16” D painted over pitting.	
L7-L8	LC	Gusset plate at L8: south gusset plate has areas of up to 1/4” D painted over pitting.	
L9-L10	LC	Inside faces of both webs at L10 has up to 1/4” D painted over section loss at the interface with the gusset plate.	
L11-L12	LC	Gusset plate at L12: south gusset plate has areas of up to 1/4” D painted over pitting.	
L13-U14	DIAG	Gusset plate at L13: south gusset plate has areas of up to 1/4” D painted over pitting. The south web near L13 has up to 3/16” D painted over pitting.	
L14-U14	VERT	Gusset plates at L14: inside faces of gusset plates have up to 1/4” D painted over pitting.	
		PIER 8	
L15-L16	LC	Gusset plate at L16: south gusset plate has areas of up to 1/4” D painted over pitting.	
L16-L17	LC	South bottom flange has a few corrosion pin holes and up to 1-1/2” T sealed pack rust. Gusset plates at L17: both gusset plates have areas of up to 1/4” D painted over pitting with some areas of corrosion reactivating.	

North Exterior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L17-U17	VERT	Gusset plates at U17: both gusset plates have up to 1” T reactivating pack rust. Reactivating corrosion throughout full height of built up members.	
		SPAN 10	
L0-L1	LC	South top flange of the lower chord has a 2” Diameter corrosion hole.	
L3-L4	LC	Gusset plate at L4: south gusset plate has areas of up to 1/4” D painted over pitting.	
L4-L5	LC	Gusset plate at L5: south gusset plate has areas of up to 3/16” D painted over pitting. Both the north and south gusset plates inside faces have six plug welds.	
L5-L6	LC	Gusset plate at L6: south gusset plate has areas of up to 3/16” D painted over pitting primarily around the pin connection.	
		SPAN 11	
L0-L1	LC	Gusset plate at L0: south gusset plate has areas of up to 1/4” D painted over section loss. Up to 1” T sealed pack rust between built up lower chord members.	20
L0-U0	VERT	Gusset plates at U0: there is up to 3/4” T reactivating pack rust between the gusset plates and vertical.	
L1-L2	LC	Gusset plate at L1: south gusset plate has areas of up to 1/4” D painted over section loss.	
L2-L3	LC	Gusset plate at L2: south gusset plate has areas of up to 1/4” D painted over section loss and up to 7/8” T pack rust between it and the L2U3 diagonal.	
L3-L4	LC	Gusset plate: the south gusset plate at L3 and the north gusset plate at L4 have areas of up to 3/16” D painted over section loss.	
		PIER 11	
U4-L5	DIAG	Gusset plate at L5: north gusset plate has 1/2” T reactivating pack rust between it and the diagonal.	
L5-L6	LC	Gusset plate at L6: south gusset plate has areas of up to 1/4” D painted over pitting and up to 5/8” T pack rust between it and the lower chord.	
U5-L6	DIAG	The south web near L6 and top flanges have up to 3/16” D painted over pitting.	
L6-L7	LC	Up to 1” T sealed pack rust between built up lower chord members.	
L7-L8	LC	Gusset plate at L8: south gusset plate has 7/8” T sealed pack rust between it and the diagonal. Up to 1” T sealed pack rust between built up lower chord members.	
L8-L9	LC	Up to 1” T reactivating pack rust between built up lower chord members.	15

North Exterior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L9-L10	LC	Up to 1-1/4” T reactivating pack rust between built up lower chord members.	
L10-L11	LC	Up to 1-1/4” T reactivating pack rust between built up lower chord members.	
L11-L12	LC	Up to 1-1/4” T reactivating pack rust between built up lower chord members.	
L11-U12	DIAG	Gusset plate at L11: south gusset plate has a plug weld in place of a rivet.	
		PIER 10	
U15-L16	DIAG	The south web near L16 and top flanges have up to 3/16” D painted over pitting.	
L17-L18	LC	Up to 1-1/4” T reactivating pack rust between built up lower chord members.	
U17-L18	DIAG	Gusset plate at L18: south gusset plate has areas of up to 1/4” D painted over pitting with some areas of reactivating corrosion. The south web near L18 has up to 3/16” D painted over pitting.	
L18-U18	VERT	Gusset plates at U18: both the north and south gusset plates have reactivating corrosion on the inside faces and up to 1/2” T reactivating pack rust between the gusset plates and vertical.	
		SPAN 12	
L0-L1	LC	There is up to 1-5/8” T pack rust between built up lower chord members and small corrosion holes in the south bottom flange.	
L1-L2	LC	Up to 1-1/4” T sealed pack rust between built up lower chord members.	
U1-L2	DIAG	Gusset plates at L2: up to 1” T pack rust between gusset plates and diagonal. South gusset plate has areas of up to 3/16” D painted over pitting.	
L2-L3	LC	Up to 1” T sealed pack rust between built up lower chord members.	
L3-L4	LC	Up to 1” T sealed pack rust between built up lower chord members.	
L4-L5	LC	Up to 1” T sealed pack rust between built up lower chord members.	
L4-U5	DIAG	Gusset plate at L4: south gusset plate has areas of up to 1/4” D painted over pitting.	
		SPAN 13	
WEST PYLON	BRG	Pack rust up to 1/4” between truss and bearing and lower chord connections.	

North Exterior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L0-L1	LC	L0 south web has two corrosion holes: 5” L x 2” H and 6” L x 2” H. L1 south web has a corrosion hole, 2-3/4” L x 1-3/4” H. Up to 1-5/8” T sealed pack rust between lower chord members. Gusset plate at L1: south gusset plate has areas of painted over pitting up to 1/4” D (original thickness 5/8”).	16
L1-L2	LC	Up to 1-5/8” T sealed pack rust between built up lower chord members. South bottom flange has two corrosion holes: 1” Diameter and 2” Diameter.	
L2-L3	LC	L3, south bottom flange has a corrosion hole, 2” Diameter. Up to 1” T sealed pack rust between built up lower chord members.	
L5-L6	LC	Gusset plate at L5: south gusset plate has areas of up to 3/16” D painted over pitting.	
L5-U6	DIAG	South web near L5 has 3/16” D painted over pitting.	
L7-L8	LC	Gusset plate at L7: south gusset plate has areas of up to 3/16” D painted over pitting.	
		PIER 12	
U9-L10	DIAG	South web at L10 has up to 1/4” D painted over pitting and up to 7/8” T pack rust at the interface with the gusset plate. Gusset plates at L10: north and south gusset plate interface with the diagonal has up to 7/8” T pack rust, and areas of up to 3/16” D painted over pitting on the south gusset plate.	
L11-L12	LC	Up to 1-1/2” T sealed pack rust between built up lower chord members.	
U11-L12	DIAG	Gusset plate at L12: south gusset plate around the pin connection has areas of painted over section loss up to 1/4” and up to 3/8” along the top edge.	
L12-U12	VERT	Up to 3/4” T reactivating pack rust between built up members. Gusset plates at U12: both gusset plates have up to 1” T reactivating pack rust between it and the vertical.	

North Interior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
		EAST SUBWAY TUNNEL	
		W & LE SPAN	
L3-U4	DIAG	1/2” T painted over pack rust between webs and angles.	
L4-U5	DIAG	1/2” T painted over pack rust between webs and angles.	
		EAST PYLON	

North Interior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
		SPAN 1	
L0-U0	VERT	Gusset plate at L0: north side has painted over section loss up to 3/16” D around pin nut.	
L1-U2	DIAG	Gusset plate at U2: 3/4” pack rust between the free corner of the north gusset and U2.	
		PIER 1	
U6-L5	DIAG	There is up to 1/4” T arrested pack rust between the north and south edges of the diagonal	
L9-L10	LC	Gusset plates at L10: both gusset plates have painted over section loss up to 3/16” D on inboard faces.	
		SPAN 2	
L0-L1	LC	Pack rust at L0 between north and south lower chord plates, north end of the pin no longer is flush with the cover plates. Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L1-U2	DIAG	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L2-U3	DIAG	Minor pack rust between north web and top angle.	
		SPAN 3	
L0-L1	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L0-U0	VERT	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
		PIER 3	
		PIER 2	
L12-L13	LC	A 10” L section has been removed at L13 along the north bottom flange. Other bolted retrofits present within vicinity.	
U12-U13	UC	Typical fretting corrosion at U13 pinned connection.	
U12-L13	DIAG	Painted over pitting, up to 3/16” D near L12 on the north web.	
L13-U13	VERT	Painted over pitting and section loss. Pack rust between pinned and riveted connections is typical. West face: additional plates have been welded between the lacing bars onto the vertical angles. Up to 5/16” D painted over section loss around pin nut on north face of north gusset plate.	
		SPAN 4	

North Interior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L0-L1	LC	Pin plates are flush with the north face of pin. South end of the pin at L0 is recessed 1” from the surface of the cover plates.	
L1-L2	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L1-U2	DIAG	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
U1-L2	DIAG	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L2-U3	DIAG	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
		SPAN 5	
L0-L1	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L0-U0	VERT	Painted over pack rust exists between the web plates and angles causing scalloping.	
		PIER 5	
L4-L5	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L5-L6	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
		PIER 4	
L13-L14	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
U13-L14	DIAG	Reactivating corrosion/pack rust at L14 gusset plate corners and lacing connections.	
L14-U14	VERT	Painted over pack rust and section loss throughout both pinned connections as well as webs and angles.	
		SPAN 6	
L1-L2	LC	Lower deck floorbeam at L2: south face of lower deck floorbeam has a 1-1/2” vertical crack in the web with a 1/2” Diameter arrester hole at the end.	
L4-L5	LC	At L5, north end of the pin no longer protrudes past the cover plates.	
		SPAN 7	
L0-L1	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	

North Interior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L0-U0	VERT	Widespread areas of painted over section loss Gusset plates at L0 and U0: gusset plates have up to 1/4” D painted over pitting.	
L2-L3	LC	Widespread areas of painted over section loss.	
		PIER 7	
L3-L4	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
U3-L4	DIAG	1/2” T pack rust between north web plate and top angle. Gusset plate at L4: north gusset free corner is bowed north 1-1/4” due to pack rust.	
L4-L5	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L5-L6	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
U5-L6	DIAG	Gusset plate at L6: north gusset plate has 1” T pack rust causing the free edge to bow.	
L6-L7	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L7-L8	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L8-L9	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L9-L10	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L10-L11	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L11-L12	LC	Gusset plate at L12: north gusset plate, north face has a 3/4” L crack in north splice plate under top flange. Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
		PIER 6	
L13-L14	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L14-L15	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
U14-L15	DIAG	Painted over pack rust and section loss up to 1/8” at L15.	

North Interior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L15-U15	VERT	Gusset plates at L15 and U15: up to 1” T pack rust exists between the gusset plates and the vertical webs at the pin. Average 1/8” D painted over pitting throughout.	
		SPAN 8	
L0-L1	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L1-L2	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L1-U1	VERT	Small areas of up to 3/16” D painted over section loss near L1, north face.	
L2-L3	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
U2-L3	DIAG	Pack rust between the north web and top angles causing slight wave in web plate.	
L3-L4	LC	Painted over section loss, up to 3/16” D along top flanges and stay plate.	
L4-L5	LC	Painted over section loss, up to 3/16” D along top flanges and stay plate. Up to 1/2” T pack rust at the pin connection at L5.	
		SPAN 9	
L0-L1	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
U0-U1	UC	Gusset plates at L0: widespread painted over section loss on both gusset plates.	
L1-L2	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
		PIER 9	
L6-L7	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L7-L8	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L8-U8	VERT	Areas of painted over section loss, up to 3/16” D on north face near L8.	
L9-L10	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L10-L11	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L11-L12	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L12-L13	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	

North Interior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L13-L14	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
		PIER 8	
L15-L16	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
U15-L16	DIAG	At L16: Reactivating pack rust at free corner of north gusset plate.	
U16-L17	DIAG	Areas of painted over section loss, up to 1/4” D near L17.	
L17-U17	VERT	Areas of painted over section loss up to 1/4” D throughout with up to 1-1/2” T pack rust between webs and interior angles. Gusset plates at U17 and L17: Numerous areas of painted over section loss on all gusset plates at panel point 17. At U17 there is up to 1-1/2” T pack rust at the pinned connection with adjacent areas of painted over section loss.	
		SPAN 10	
L0-L1	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L1-U1	VERT	Gusset plates at L1: painted over/reactivating section loss, up to 3/16” D on interior faces of both lower gusset plates.	
L4-L5	LC	Gusset plates at L5: up to 3/16” D painted over section loss on both faces of both lower gusset plates. L5; Painted over pack rust exists between the web plates and angles causing scalloping.	
L4-U4	VERT	Gusset plates at L4: up to 3/16” D painted over section loss on the interior faces of both lower gusset plates.	
L5-L6	LC	At L6, painted over pack rust exists between the web plates and angles causing scalloping.	
U5-U6	UC	Stringer at floorbeam 5 has a loose bolt at the knee brace to floorbeam.	
L5-U5	VERT	Lower deck floorbeam connection: 1-5/8” L vertical crack in web of floorbeam with arrester hole at termination. Painted over section loss at L5 adjacent to gusset plate edge.	
L5-U6	DIAG	Painted over section loss at L5 adjacent to gusset plate edge.	
		SPAN 11	
L0-L1	LC	The end 3’ L of the south bottom flange has up to 100% section loss (3” Diameter hole) — North bottom flange has been replaced and welded in. 3’ L welded repair plate on north bottom flange at L1.	
L1-L2	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
		PIER 11	

North Interior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
U4-L5	DIAG	Gusset plates at L5: 3/4” T pack rust reactivating at the free edges of the gusset plates causing minor distortion.	
U5-L6	DIAG	Gusset plate at L6: 1/8” D painted over section loss on north web at edge of the gusset plate. Reactivating pack rust between top angles and web plates.	
L10-U10	VERT	Up to 3/16” D painted over section loss near L10, north face.	
		PIER 10	
L15-L16	LC	Gusset plates at L16: Two blind holes with plug welds at inboard face of gusset plates.	
L16-L17	LC	Painted over putting up to 1\8” D on stay plate at L17, 1/2” pack rust under plate at top angles has bowed the plate upward.	
L17-L18	LC	Up to 3/16" D painted over section loss along the east end 6’.	
L18-U18	VERT	Gusset plates at U18 and L18: up to 3/16” D painted over section loss on interior faces of all gusset plates. Up to 3/4” T pack rust between the gusset plates and vertical webs at the L18 pin.	
		SPAN 12	
L0-L1	LC	Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout. Two corrosion holes, 3” L x 1” H and 1/2” Diameter in the north web plate above the bottom angle approximately 7’ east of L0.	
L1-L2	LC	6’-4” L crack in the south bottom angle of lower chord at L2. Arrester hole drilled at east end of crack. West end marked for growth monitoring.	17
L2-L3	LC	6’-4” L crack in south bottom angle of lower chord at L3. Arrester hole drilled at both ends. Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout.	
L3-L4	LC	37" L crack with arrestor hole drilled 4” west of the west end of the crack in the south lower flange angle at L4.	
L4-L5	LC	Up to 2” T pack rust between webs and gussets at L5 at pinned connection. Pin cover plates are bowed outward due to past pack rust, currently painted/caulked over.	
		SPAN 13	
		WEST PYLON	
L0-L1	LC	2-3/4” L crack due to pack rust along west end of north web at L0 riveted connection. Full length pack rust up to 2” T between lower angle and web plates.	
L1-L2	LC	Up to 2” T pack rust between lower angle and web plates near panel points.	

North Interior Truss Deficiencies			
Member	**Type**	**Note**	**Photo**
L4-L5	LC	Gusset plate at L5: north gusset plate, north face has up to 1/4” D painted over section loss along the interface with the lower chord.	
L5-L6	LC	Gusset plate at L6: north gusset plate, north face has up to 1/8” D painted over section loss along the interface with the lower chord.	
L6-U7	DIAG	Abandoned bracket (old downspout) with 6” L tack welds on north face.	
		PIER 12	
U9-L10	DIAG	Gusset plate at L10: up to 1/4” D section loss on the north face of the south gusset plate.	
L11-L12	LC	Stay plate at L11 is bowed upward due to reactivating pack rust between built up members. Painted over pack rust exists between the web plates and angles causing scalloping. Painted over section loss throughout. Gusset plates at L12: up to 3/8” D painted over section loss throughout the north face of the north gusset plate and south face of the south gusset plate.	
U11-L12	DIAG	Two 1/2” Diameter corrosion holes in bottom stay plate at L12.	
L12-U12	VERT	Widespread painted over section loss.	

		South Interior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
		EAST SUBWAY TUNNEL	
		W & LE SPAN	
		EAST PYLON	
		SPAN 1	
		PIER 1	
L7-U8	DIAG	North web has active corrosion and section loss up to 1/16" D.	
L7-L8	LC	North web and lacing have active corrosion and section loss up to 1/8" D.	
L9-L10	LC	Both sides of the web have painted over section loss up to 1/4" D	
L10-U10	VERT	Deep section loss up to 1/4" D along full height of both webs.	
		SPAN 2	
L0-L1	LC	South web plate near the built-up lower chord near L0 pin has full height painted over section loss with a corrosion hole approximately 3” h x 1/2” w. Up to 1” T sealed pack rust between built up lower chord members.	

		South Interior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L0-U0	VERT	Lacing bars have painted over section loss up to 1/4" D and several repairs. Gusset plates have heavy painted over section loss up to 1/4" D mostly around 8" pin. Gusset plates have up to 1" T pack rust. Horizontal gusset plate at top of vertical has heavy painted over section loss with corrosion holes.	
		SPAN 3	
L2-U2	VERT	North face of north gusset has painted over section loss up to 1/4" D around bearing pin.	
PIER 3		PIER 3	
		PIER 2	
U11-L12	DIAG	Gusset plate at L12: south gusset plate has pack rust up to 1-1/8" T x 20" L between the south diagonal.	
L12-L13	LC	Top batten plate at L13 has painted over section loss 1/4" D randomly throughout.	
		SPAN 4	
L1-L2	LC	South lower angle at L1 has crack 33-1/4" L.	
		SPAN 5	
		PIER 5	
U4-L5	DIAG	North web north face has reactivating laminar corrosion due to water coming from manhole in deck.	
L5-L6	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping	
L5-U5	VERT	Gusset Plate at L5: north gusset plate inside face has active corrosion up to 1/8" D.	
		PIER 4	
L12-L13	LC	South web at L13 has full height painted over section loss up to 1/4" D x 2" L.	
L14-U14	VERT	Lacing bars have painted over section loss up to 1/4" D and several repairs. Gusset plates have heavy painted over section loss up to 1/4" D mostly around 8" pin. Internal web plate at U14 has heavy painted over section loss with isolated corrosion holes.	
		SPAN 6	
L0-U0	VERT	Gusset plates at L0: Up to 1-1/4" T pack rust between both gusset plates and the vertical. The south gusset plate has a 20" diameter area of painted over section loss up to 1/2" D around the pin.	
		SPAN 7	

		South Interior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L0-L1	LC	Both web plates have pack rust up to 2" T.	
L2-L3	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping.	
		PIER 7	
L3-L4	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping.	
L4-L5	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping.	
L5-L6	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping.	
L6-L7	LC	Gusset plate at L7: South gusset plate has a 10-5/8" H laminar rolling defect open up to 1" W. The affected area of this extends 2-11/16" W and approximately 18-1/2" D.	19
L9-L10	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping	
L10-L11	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping	
L11-L12	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping	
L14-L15	LC	Up to 3/4" T reactivating pack rust throughout causing scalloping and section loss up to 1/4" D	
U14-U15	UC	Pin at U15 sits flush on north side	
		SPAN 8	
L0-U0	VERT	Gusset plates at L0: Both gusset plates have an area of painted over section loss up to 32" diameter x 1/4" D and have pack rust up to 2-1/4" T.	
L4-L5	LC	Gusset plate at L5: the north gusset plate around pin at L5 has pack rust up to 1/2" T	
L5-U5	VERT	Gusset plates at L5: Both gusset plates have pack rust up to 1-1/2" around the pin.	
		SPAN 9	
L0-L1	LC	Bottom batten plate at L0 has painted over section loss up to 1/4" D with two isolated corrosion holes up to 3/4" diameter.	
		PIER 9	
		PIER 8	
U15-L16	DIAG	Gusset plate at L16: 18" L x 3" H section of plate is bent out 1".	
		SPAN 10	
L0-L1	LC	Batten plates throughout have painted section loss up to 1/8" D.	
U0-U1	UC	Last lattice bracing at U0 has up to 50% section loss along the underside.	
		SPAN 11	
L0-U0	VERT	Gusset plates at L0: Both gusset plates have painted over section loss up to 1/8" D throughout with isolated locations up to 1/4" D.	
		PIER 11	
U4-L5	DIAG	Reactivating pack rust up to 3/4" T between angles and webs along the full length of the diagonal.	

		South Interior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L8-L9	LC	Up to 3/4" T sealed pack rust throughout the top angles.	
L9-L10	LC	Up to 3/4" T sealed pack rust throughout the top angles.	
L12-U13	DIAG	Reactivating pack rust up to 3/4" T between angles and webs along the full length of the diagonal.	
		PIER 10	
L16-L17	LC	Up to 3/4" T sealed pack rust throughout the top angles.	
L17-L18	LC	Batten plate and web flange has painted over section loss up to 1/4" at end 5' from L18. Up to 3/4" T sealed pack rust throughout the top angles.	
		SPAN 12	
L0-L1	LC	The bending of the outside channel of the lower chord due to pack rust has caused the pin at L0 to become disengaged with the south plate. South web has section loss along bottom 2" up to 1/2" D. North bottom flange angle at L0 has 44-1/2" L crack.	23
L0-U0	VERT	Gusset plates at U0: top 2' on the east side have painted over section loss with isolated areas of 100% section loss.	
L2-L3	LC	39" L crack in south lower flange near L3.	
L3-L4	LC	North lower angle at L3 has a possible crack 44" L. South lower angle at L3 has crack 43" L. South lower angle at L4 has crack 38-1/4" L.	18
L4-L5	LC	Flanges of channel at L5 are pushed outward up to 1-1/2" due to pack rust. Pin is flush on north face.	
		SPAN 13	
L0-L1	LC	Both sides of chord, lower angle has pack rust up to 2" T x 20' L between channel.	
U0-U1	UC	Bottom stay plate at U0 has knife edging and heavy section loss with areas of complete section loss.	
L0-U0	VERT	Gusset plate at L0: North gusset plate has isolated section loss up to 3/8" D x 1/2 diameter.	
L1-L2	LC	Both sides of chord, lower angle have up to 2" T pack rust x full length between channel.	
L4-L5	LC	South lower angle has up to 2" T pack rust x full length between channel.	
		PIER 12	
L10-L11	LC	Gusset plate at L10: 24" L x 2" H reactivating laminar corrosion and section loss up to 1/8" D.	

		South Interior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L11-L12	LC	Bottom plate in the north face at L11 is bent out 1.5" for 6" L due to pack rust. Gusset plate at L12: Both gusset plates have painted over section loss and active corrosion up to 1/4" D. Original thickness = 3/4" T	
L12-U12	VERT	Gusset plate at L12: Vertical web plate has multiple 1" diameter corrosion hole and both gusset plates have pack rust up to 1/2" T between vertical member at pin location	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
		EAST SUBWAY TUNNEL	
		W & LE SPAN	
		EAST PYLON	
		SPAN 1	
L0-L1	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
L1-U2	DIAG	Up to 1” T arrested pack rust between the north gusset plate and the diagonal. There is also up to 3/16” D section loss adjacent the gusset connection.	
L2-U2	VERT	The lateral bracing and horizontal strut gusset plates are in contact with the pier wall causing spalling up to 4” D.	
		PIER 1	
L4-L5	LC	Moderate section loss on the baton plate.	
U4-U5	UC	Moderate surface corrosion throughout the end 6’.	
U5-L6	DIAG	Up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
U6-L5	DIAG	Up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
		SPAN 2	
L0-L1	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length. There is active pack rust up to 1” T and section loss with laminar corrosion and surface corrosion throughout the lower chord pin connection components.	
U0-L1	DIAG	Up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
L1-U2	DIAG	Up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
U1-L2	DIAG	Up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
L2-U3	DIAG	Up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
L3-U3	VERT	Up to 1/2” T active pack rust between the north and south pin plates and the top of the vertical. Typical up to 1/8” D section loss on the north and south gusset plate faces full perimeter of the upper pins. The lower gusset plates exhibit section loss up to 1/8” D throughout with reactivated pack rust up to 1/4” T between the north and south gusset plates and vertical.	
		SPAN 3	
L0-L1	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length	
		PIER 3	
L4-L5	LC	There is active pack rust and up to 1/16” D along the gusset plate for a up to 2” H strip at the lower chord connection.	
L5-L6	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
U5-L6	DIAG	There is up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
L6-L7	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
L7-L8	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
L7-U8	DIAG	There is up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
L8-L9	LC	There is an area of active section loss in the north gusset above the lower chord connection. The area is 16” L x 6” H x up to 1/8” D with moderate surface corrosion. Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
L9-L10	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
		PIER 2	
U11-L12	DIAG	There is up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
U12-U13	UC	The pin at U13 is flat against the side of the upper chord on the north face. There is a welded angle on the end of the pin.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
U12-L13	DIAG	There is up to 1/4” T reactivated pack rust between the north and south edges of the diagonal with a 1” diameter corrosion hole on the south bottom flange at L13.	14
L13-U13	VERT	Active leakage of the joint above has caused severe surface corrosion of the vertical and gusset plates. Pack rust up to 1” was also noted on the interior strengthening plates of the vertical. There are welded strengthening plates full height on the west and east faces between each lacing bar connection. There is up to 1” T active pack rust between the north and south pin plates and the top of the vertical. There is also typical up to 3/16” D section loss on the north and south gusset plate faces full perimeter of the upper pins. Full Height x up to 1/4” reactivated pack rust was noted on all corners of the vertical. The lower gusset plates exhibit section loss up to 3/16” D throughout with reactivated pack rust and section loss typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits moderate surface corrosion with active pitting within a 12” perimeter of the pin and up to 1” pack rust between the gusset and the vertical.	
		SPAN 4	
L0-L1	LC	The north and south web strengthening plate around the pin exhibits up to 1/2” T pack rust and is flush with the end of the pin. There is up to 1/2” T pack rust typical full length of the lower chord between the built-up components.	
U0-L1	DIAG	There is up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
L2-L3	LC	The north web strengthening plate around the pin exhibits up to 1/2” T pack rust and is flush with the end of the pin.	
L2-U3	DIAG	There is up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L3-U3	VERT	There is up to 1/2” T active pack rust between the north and south pin plates and the top of the vertical. There is also typical up to 1/8” D section loss on the north and south gusset plate faces full perimeter of the upper pins. Full Height x up to 1/4” reactivated pack rust was noted on all corners of the vertical. The lower gusset plates exhibit section loss up to 1/8” D throughout with reactivated pack rust typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits minor surface corrosion with active pitting within a 12” perimeter of the pin and up to 1” pack rust between the gusset and the vertical.	
		SPAN 5	
		PIER 5	
L7-U8	DIAG	There is up to 1/4” T arrested pack rust between the north and south edges of the diagonal	
L9-U10	DIAG	There is typical 1/4” T arrested pack rust full length of all corners the top bottom baton plate also exhibits section loss up to 3/16” D with a 1” Diameter and 1/2” Diameter corrosion hole. The north gusset plate exhibits areas of up 3/16” D painted over section loss.	
U10-U11	UC	There is an abandoned welded attachment to the north face of the upper chord.	
		PIER 4	
U12-L13	DIAG	There is up to 1/4” T arrested pack rust between the north and south edges of the diagonal.	
L13-L14	LC	Moderate surface corrosion on the top baton plate at L13.	
L14-U14	VERT	There is up to 1” T active pack rust between the north and south pin plates and the top of the vertical. There is also typical up to 1/8” D section loss on the north and south gusset plate faces full perimeter of the upper pins. Full Height x up to 1/4” reactivated pack rust was noted on all corners of the vertical. The lower gusset plates exhibit section loss up to 1/8” D throughout with reactivated pack rust typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits minor surface corrosion with active pitting within a 12” perimeter of the pin and up to 1” pack rust between the gusset and vertical L0U1 span 5.	
		SPAN 6	
L0-L1	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
U1-L2	DIAG	There is typical 1/4” T arrested pack rust full length of all corners.	
U2-U3	UC	There is an abandoned welded attachment to the north face of the upper chord.	
L2-U3	DIAG	There is typical 1/4” T arrested pack rust full length of all corners.	
U2-L3	DIAG	There is typical 1/4” T arrested pack rust full length of all corners.	
L4-L5	LC	There is up to 3/4” T pack rust between the north pin strengthening plates at L5. The pack rust is deforming the plate beyond the edges of the pin.	
L5-U5	VERT	There is up to 1/4” T active pack rust between the north and south pin plates and the top of the vertical. There is also typical up to 1/8” D section loss on the north and south gusset faces full perimeter of the upper pins. The lower gusset plates exhibit section loss up to 1/8” D throughout with reactivated pack rust typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits minor surface corrosion with active pitting within a 12” perimeter of the pin and up to 1” pack rust between the gusset plate and vertical L0U1 span 6.	
		SPAN 7	
L0-L1	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
L1-L2	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
		PIER 7	
L3-L4	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
L4-L5	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
U4-U5	UC	There is an abandoned welded attachment to the north face of the upper chord.	
L5-L6	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length.	
L6-L7	LC	Typical remediated pack rust up to 1” between the internal web stiffening plates full length. Both the north and south gusset plates exhibit areas of up to 1/4” D painted over section loss at the Lower chord connection There is also a Full Height x 2” W strip of up to 1/4” T section loss on the inside face of both lower chord webs.	
L7-L8	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L8-L9	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L9-L10	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length. There is a 1/2” Diameter hole in the top lacing channel.	
L9-U10	DIAG	There is up to 3/4” T arrested pack rust on the north top edge of the diagonal.	
L10-L11	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L10-U11	DIAG	The north gusset plate has up to 1-1/2” T pack rust between the diagonal and gusset. There is also up to 1/8” D section loss to the diagonal web plate adjacent the gusset connection.	
L11-L12	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
		PIER 6	
L13-L14	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length	
L14-L15	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length There is a 1/2” Diameter corrosion hole in the top lacing channel.	
U14-L15	DIAG	The bottom baton plate exhibits areas of reactivated section loss with a 3/4” Diameter and a 2” L x 1” H hole. The lower 10’ of the diagonal exhibits moderate surface corrosion and reactivated pack rust up to 1/4” T.	
L15-U15	VERT	Up to 1” T active pack rust between the north and south pin plates and the top of the vertical. Active moderate surface corrosion is typical along the full height of the upper gusset plates, vertical, and pin connection components. There is also typical up to 3/16” D section loss on the north and south gusset faces full perimeter of the upper pins. The lower gusset plate plates exhibit section loss up to 3/16” D throughout with reactivated pack rust typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits minor surface corrosion with active pitting within a 12” perimeter of the pin and up to 1” T pack rust between the gusset plate and vertical. Moderate surface corrosion was noted throughout the wind chord and truss bracing components.	13
		SPAN 8	
L0-L1	LC	Both the north and south strengthening plates at the pin at L0 exhibit pack rust up to 1-1/2” T. The pack rust is beginning to push the north plate beyond the end of the pin. There is an up to 1/8” difference between the pin and the edge of the plate.	22

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
U1-L2	DIAG	Up to 1” T pack rust between the north gusset plate and the diagonal connection. The diagonal also exhibits up to 3/16” D section loss around the connection.	
L5-U5	VERT	Up to 1/2” T active pack rust between the north and south pin plates and the top of the vertical. Active moderate surface corrosion is typical along the full height of the upper gusset plates, vertical and pin connection components. There is also typical up to 3/16” D section loss on the north and south gusset plate faces full perimeter of the upper pins. The lower gusset plates exhibit section loss up to 3/16” D throughout with reactivated pack rust typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits minor surface corrosion with active pitting within a 12” perimeter of the pin and up to 1” T pack rust between the gusset plate and vertical.	
		SPAN 9	
L0-L1	LC	There is an abandoned welded attachment to the north face of the upper chord. The east vertical weld is partially cracked 4” L; a 1/4" increase since the previous inspection.	
L1-U2	DIAG	Full Length x up to 1/2” T arrested pack rust along the upper edges.	
L3-U4	DIAG	Full Length x up to 1/2” T arrested pack rust along the upper edges. There is also up to 3/16” D section loss adjacent the gusset plate connection on the north and south face of the diagonal.	
		PIER 9	
U4-L5	DIAG	The north gusset plates exhibit areas of up to 1/8” D SL and up to 1/2” pack rust between the gusset plate and diagonal connection.	
L6-L7	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L9-U10	DIAG	Up to 1/4” T arrested pack rust full length of diagonal on the top edges.	
L10-L11	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length. There is a 1” L x 3” W corrosion hole in the bottom flange north horizontal leg with adjacent pack rust up to 1-1/4” T.	
L11-L12	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U12-U13	UC	There is an abandoned welded attachment (various angles) to the north face of the upper chord.	
L12-U13	DIAG	Up to 1-1/4” T arrested pack rust between the north gusset plate and the diagonal with up to 3/16” D section loss in the diagonal web plate.	
L13-U14	DIAG	Up to 1-1/4” T arrested pack rust between the north gusset plate and the diagonal with up to 3/16” D section loss in the diagonal web plate.	
		PIER 8	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
U16-L17	DIAG	Up to 1/4” T arrested pack rust full length of diagonal on the top edges.	
L17-U17	VERT	Up to 1” T active pack rust between the north and south pin plates and the top of the vertical. Active moderate surface corrosion is typical along the full height of the upper gusset plates, vertical, and pin connection components. Typical up to 1/8” D section loss on the north and south gusset plate faces full perimeter of the upper pins. The lower gusset plates exhibit section loss up to 3/16” D throughout with reactivated pack rust typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits minor surface corrosion with active pitting within a 12” perimeter of the pin.	
		SPAN 10	
L0-L1	LC	4 bolts missing in the web pin strengthening angles over the pin at L0. Previous rivets replaced, no bolts due to clearance issues over pin. Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L1-L2	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length. Falcon box located on the lower chord at L2.	
U1-L2	DIAG	Active moderate surface corrosion on the north gusset plate.	
L2-L3	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L3-L4	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L3-U4	DIAG	Up to 1/2” T arrested pack rust full length of both top edges with isolated areas of up to 3/16” D painted over section loss with pin holes.	
L4-L5	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L5-L6	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L6-U6	VERT	Up to 1/2” T active pack rust between the north and south pin plates and the top of the vertical. Typical up to 3/16” D section loss on the north and south gusset plate faces full perimeter of the upper pins. The lower gusset plates exhibit section loss up to 3/16” D throughout with reactivated pack rust typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits minor surface corrosion with pitting within a 12” perimeter of the pin.	
		SPAN 11	
L0-L1	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L0-U0	VERT	Up to 1” T active pack rust between the north and south pin plates and the top of the vertical. In addition, up to 1/4” T pack rust was noted full circumference of the north and south pin nut washer. The bottom 2” of the vertical stiffener plate at L0, below the pin, exhibits typical 50% section loss with a 4” W x 3” H corrosion hole at the south corner.	
L0-U1	DIAG	Typical arrested pack rust with a 1/2” Diameter corrosion hole in the bottom baton plate at L0.	
L1-L2	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L2-L3	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
PIER 11		The elements of the pier above the bearing seats exhibit significant edge spalling up to 6” D with exposed rebar on all vertical edges.	
		PIER 11	
L4-L5	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U4-L5	DIAG	Up to 1/2” pack rust between the north and south gusset plate and the diagonal webs with painted over section loss up to 3/16” D in the diagonal web plates adjacent the gusset connections.	
L5-L6	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L5-U5	VERT	The north and south gusset plates exhibit areas of painted over section loss up to 3/16” D.	
L6-L7	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U6-L7	DIAG	Intermittent reactivated pack rust up to 1/8” T along the south top edge.	
L7-L8	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U7-L8	DIAG	The lower 8’ of the diagonal exhibit reactivated pack rust up to 1/2” T with a Full Width x up to 9” area of up to 3/16” D painted over section loss on both the north and south faces.	
L8-L9	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L9-L10	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L9-U10	DIAG	Isolated areas of up to 3/16” D section loss adjacent lacing bars.	
L10-L11	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L11-L12	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U11-U12	UC	There is an abandoned welded attachment to the north face of the upper chord.	
L12-L13	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L12-U13	DIAG	The lower 8’ exhibits reactivated pack rust up to 1/8” T along the south top edge.	
PIER 10		The elements of the pier above the bearing seats exhibit significant edge spalling up to 6” D with exposed rebar on all vertical edges.	
		PIER 10	
L15-L16	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L15-U15	VERT	Full height x up to 1/4” T arrested pack rust on all edges.	
U15-L16	DIAG	Full Length x up to 1” W arrested pack rust on the top edges with isolated areas of up to 1/8” D painted over section loss on both web plates.	
L16-L17	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U16-L17	DIAG	Full length x up to 1” W arrested pack rust on the top edges.	
L17-L18	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U17-L18	DIAG	Lower baton plate exhibits 50% section loss with a 2” L x 1/2” H corrosion hole and a 1/2” diameter corrosion hole.	
L18-U18	VERT	Up to 1” T active pack rust between the north and south pin plates and the top of the vertical. Active moderate surface corrosion is typical along the upper gusset plates and pin connection components. Typical up to 3/16” D section loss on the north and south gusset plate faces full perimeter of the upper pins. The lower gusset plates exhibit section loss up to 3/16” D throughout with reactivated pack rust typical along all edges and isolated areas of reactivated surface corrosion. The north gusset plate also exhibits minor surface corrosion with active pitting within a 12” perimeter of the pin.	
		SPAN 12	
L0-L1	LC	The north and south pin plates are bowed outward up to 1” T due to pack rust. There is no “retainer” on the end of the pin on either the north or south face. Moderate pitting is also noted throughout the end plates of the lower chord at L0. Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L1-L2	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length. 4” L x 2” H corrosion hole in the horizontal plate of the north bottom flange connection angle.	
U1-L2	DIAG	Lower baton plate has a 4” Diameter hole with a Full Height x Full Width area of up to 50% section loss typical of plate. Arrested pack rust at the connection to both gusset plates.	
L2-L3	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L3-L4	LC	23-3/4” L (3/4” growth since last inspection) longitudinal crack in top north flange angle at L3. The crack is due to pack rust up to 1” T south side of connection and 1/2” T on the north side of the connection between the top baton plate and the top flange connection angle.	
L3-U4	DIAG	Typical caulked and sealed pack rust full length of the diagonal along the north and south face edges.	
L4-L5	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L4-U5	DIAG	Typical caulked and sealed pack rust full length of the diagonal along the north and south face edges.	
L5-U5	VERT	The north and south gusset plates exhibit up to 3/16” section loss along a 6-8” perimeter of the pin. Sporadic areas throughout the rest of the gusset plates with up to 3/16” section loss typical. Pack rust up to 1/2” T is also typical between the north and south gusset plates and vertical U5L5.	
		SPAN 13	
		WEST PYLON	
L0-L1	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L0-U1	DIAG	Both the north and south gusset plates exhibit areas of painted over section loss up to 1/4” D.	
L1-L2	LC	6” L x 2” H corrosion hole in the north web above the bottom flange connection at L1. There are also five (5) corrosion holes up to 3” Diameter in the north side horizontal leg of the bottom flange along the west half. Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L2-L3	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L3-L4	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
U3-L4	DIAG	The lower baton plate has a 1.5” Diameter corrosion hole with a Full Height x 4” W area of up to 3/16” section loss.	
L4-L5	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length. The top baton plate adjacent L5 is bowed upward due to up to 1/2” of reactivated pack rust between the plate and top chord.	
U4-U5	UC	The end 4’ adjacent U5 exhibits moderate surface corrosion	
L5-L6	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U5-U6	UC	Abandoned welded attachment to the north and south faces of the upper chord web. The attachment has a rough plug weld.	
L5-U6	DIAG	Areas of up to 3/16” D painted over section loss adjacent the lower lacing bars.	
L6-U7	DIAG	Abandoned welded attachment to the south face at mid height.	
L7-L8	LC	The south gusset plate exhibit areas of painted over section loss up to 1/4” T on the north inboard face.	
L7-U8	DIAG	Areas of reactivated pack rust and painted over section loss up to 3/16” D	
PIER 12		The elements of the pier above the bearing seats exhibit significant edge spalling up to 6” D with exposed rebar on all vertical edges	
		PIER 12	
L9-L10	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length. Fill plate between the lower chord and south gusset plate exhibits section loss with corrosion holes adjacent the rivet heads.	
L9-U9	VERT	The lower 2” of the south gusset plate at the vertical connection to the lower chord exhibits reactivated section loss up to 1/8” D.	
U9-L10	DIAG	Areas of up to 3/16” D painted over section loss adjacent the lower lacing bars and baton plate. Caulked pack rust noted between the north and south gusset plate connection. Pack rust is slightly deforming the gusset plate edges.	
L10-L11	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
L11-L12	LC	Typical remediated pack rust up to 1” T between the internal web stiffening plates full length.	
U11-U12	UC	Pin at U12 is off center. It is flush with the north face of the member and protrudes approximately 3/4” beyond the south face.	

		South Exterior Truss Deficiencies	
Member	**Type**	**Note**	**Photo**
L12-U12	VERT	Up to 1” T active pack rust between the north and south pin plates and the top of the vertical. In addition, up to 1/4” T pack rust was noted full circumference of the north and south pin nut washer. Active moderate surface corrosion is typical along the upper gusset plates and pin connection components. Typical up to 3/16” D section loss on the north and south gusset plate faces. The lower gusset plates exhibit section loss up to 3/16” D throughout with reactivated pack rust typical along all edges. The north gusset plate also exhibits moderate surface corrosion with active pitting within a 6” perimeter of the pin.	

Item N60 – Substructure (6, Satisfactory Condition)

The substructure is in overall ***Satisfactory*** condition, or 6 on the NBIS condition rating guidelines (Photos 25 through 32).

The substructure findings and summary of conditions for individual items are as follows:

Item 33 – Abutment Walls (7, Good Condition)
The abutment walls are in overall ***Good*** condition. There is minimal staining and hairline cracks in the abutment faces.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
171 LF	151 LF	20 LF			1.17

Item 36 – Pier Walls (6, Satisfactory Condition)
The Pier walls are in ***Satisfactory*** condition. Minor cracking, staining, and previously patched areas are noted throughout.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
166 LF	124 LF	42 LF			1.34

Item 37 – Pier Caps (5, Fair Condition)
The Pier caps are in ***Fair*** condition. The nonstructural portions of the pier towers were not considered in the rating but are in poor condition and pose a risk to public safety as they continue to deteriorate. Many of the pier tower roofs have been removed, but those that remain show active degradation with debris accumulating on the pier cap below. The inspection manholes in the pier caps are in poor condition. There is little remaining lip to support the lid and care should be taken when walking around or opening them.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
1,079 LF	439 LF	540 LF	100 LF		2.21

Item 38 – Pier Columns/Bents (7, Good Condition)
The pier columns are in ***Good*** condition with minor areas of staining, cracking, or delamination concentrated around previously patched areas.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
70 EA	65 EA	5 EA			1.10

Item 39 – Backwalls (5, Fair Condition)
The backwalls are in ***Fair*** condition. Cracking and spalling was noted in some of the backwalls.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
171 LF	120 LF	34 LF	17 LF		2.10

Item 40 – Wingwalls (7, Good Condition)
The wingwalls are in ***Good*** condition with scattered areas of light efflorescence staining.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
4 EA	4 EA				1.00

Item 42 – Scour (7, Good Condition)
The scour is in ***Good*** condition. The bridge had an underwater bridge inspection on July 14, 2015 by GPI. They found a change in the exposure of the footing at Pier 10 (West Pier), Column D, where the exposure of the footing has advanced since the 2010 underwater inspection. “The maximum vertical exposure was measured to be 3.7 feet. 9.5 horizontal feet of footing are exposed along the South side and 18 horizontal feet are exposed on the East face of the footer.” No change significant change was noted at other locations. Pier 9 (East Pier), Column A exhibited less exposure to the footing. Timber debris is still lodged at the Northeast corner of Pier 10.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
2 EA	2 EA				1.00

Item 43 – Slope Protection (7, Good Condition)
The concrete slope protection is in ***Good*** condition.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
1 EA	1 EA				1.00

Substructure deficiencies and specific locations are noted in the following table:

Location	Member	Note	Photo
All piers	Pier Caps	General Note - The underside of the pier caps is deteriorated with delaminations and spalling. The majority of the spalling has exposed reinforcing.	29
All piers	Access Hatches	General Note - The access manholes in the pier caps are in poor condition with the lips heavily deteriorated.	
East pylon	Backwall	The backwall has a 12' H x up to 12" W spall/delamination behind the North Exterior Truss	30
Pier 4	Pier Walls	The East and West faces of Pier 4 have large painted over spalls with exposed reinforcing along the top behind the truss lines.	31
Pier 8	Pier Columns	A rebar cage has been added to the 2' x 3' opening in the West face of the North Column. The hole has been filled with trash	

Item N61 – Channel (4, Poor Condition)

The channel is in ***Poor*** condition, or a 4 on the NBIS condition rating guidelines.

The channel findings and summary of conditions for individual items are as follows:

Item 51 – Alignment (5, Fair Condition)
The alignment is in ***Fair*** condition. Water is flowing along the Southern most three columns of Pier 10 and the Northern most column of Pier 9. The channel meanders sharply.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
200 LF		200 LF			2.00

Item 52 – Protection (4, Poor Condition)
The channel protection is in ***Poor*** condition. The West bank channel protection is in Good condition and the East bank channel protection is in Poor condition. The timber bulkhead at the east embankment near Pier 9 has failed (Photo 31).

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
200 LF	100 LF		100 LF		3.00

Item 53 – Hydraulic Opening (8, Very Good Condition)
The hydraulic opening is in ***Very Good*** condition. The hydraulic opening is sufficient.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
2 EA	2 EA				1.00

Item 54 – Navigation Lights (4, Poor Condition)
The navigation lights are in ***Poor*** condition. One of the navigation lights appears to be operating. The remainder appear to be without power or the bulbs are burned out.

Sign/Utility Items

Item 55 – Signs (7, Good Condition)
The 15 signs on the structure are in ***Good*** condition. The two speed limit signs facing West bound traffic are mounted to light poles behind the new bike path and bike path railing with limited visibility.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
15 EA	15 EA				1.00

Item 56 – Utilities (4, Poor Condition)
The utilities are in ***Poor*** condition. The gas main appears recently rehabilitated with new pedestals, rollers, and restraints along the full length of the lower deck (Photo 33). The PVC telecom conduits are damaged, and cables are exposed, especially in the East approach tunnel (Photo 34). The telecom structural supports, sheds, and corrugated roofs/walls are heavily corroded. Many steel pieces are hanging or have fallen on to the utility deck below. Only six (6) street lights were found nonoperational. The architectural lighting is not considered as part of the rating. Concrete debris has filled the upward facing lighting which shines on the West face of the Southeast pylon. Lighting at both East pylons is nonoperational as are half the lights at the West pylons.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
9,054 LF	6,036 LF	3,018 LF			1.43

Sign/Utility deficiencies and specific locations are noted in the following table:

Location	Secondary Unit	Note	Photo
All spans	Junction boxes	General Note - The junction boxes between the decks typically have larger sections of corrosion and deterioration	
All spans	Telecom conduits	General Note - The PVC telecom conduits are damaged with areas of broken and/or missing pipe sections in random areas throughout. The most severe damage is noted in the East Tunnel.	35
Span 10	Navigation Lights	General Note – One (1) channel navigation light is working	
Pier 10	Navigation electric	There is a small open electrical box along the lower deck catwalk at the North column	

Item 6 – Approaches Summary (7, Good Condition)

The approaches are in ***Good*** condition, or a 7 on the NBIS condition rating guidelines.

The approach findings and summary of conditions for individual items are as follows:

Item 1 – Approach Wearing Surface (6, Satisfactory Condition)
The approach wearing surfaces are in ***Satisfactory*** condition. The east approach pavement is in Good condition and the west approach pavement is in satisfactory condition with about 20% spalls, patches, or cracks.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
2 EA	1 EA	1 EA			1.60

Item 2 – Approach Slabs (7, Good Condition)
The approach slabs are in ***Good*** condition. The approach slabs are in Good condition with no signs of settlement or shifting. Due to surface deficiencies within the West approach, 5% of the total 2075 square feet of approach slab was rated a 2.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
2,075 SF	1,971 SF	104 SF			1.07

Item 4 – Embankment (7, Good Condition)
The approach embankments are in ***Good*** condition. Embankments are starting to show signs of erosion.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
4 EA	4 EA				1.00

Item 5 –Guardrail (6, Satisfactory Condition)
The approach guardrails are in ***Satisfactory*** condition. The concrete guardrail that extends off all four corners of the bridge exhibits minor surface spalling and staining particularly concentrated in the lower third of the interior faces.

Total Quantity	CS 1	CS 2	CS 3	CS 4	Transition Rating
4 EA		4 EA			2.00

Approach deficiencies and specific locations are noted in the following table:

Approach	Member	Note	Photo
East	Wearing Surface	Typical map cracking throughout	
East	East Tunnel Subway	East approach tunnel has large spalled areas with exposed rebar in all bays	36
West	Wearing Surface	The pavement has spalling, cracking and bituminous patching over 20% of the pavement	37
Pier 1		The embankment at Pier 1 is steep and encroaching into the gravel lot on the East side of the pier	
Span 3		There are several slope depressions throughout	
Pier 4	Catch basin	The South catch basin is completely clogged	
Pier 6	Access Hatches	There is an open manhole near the South column on the West face.	38

Security Items

There are numerous areas of easy access for non-bridge personnel to enter the lower level.

Recommendations

The General Appraisal and Operating Status for the Hope Memorial/Lorain Carnegie Bridge over the Cuyahoga River is rated 5A, Fair condition. The substructure components are the governing element for this condition rating.

The following items are recommendations by Infrastructure Engineers, LLC:

Immediate:

- Repair and clean areas of the deteriorated substructure concrete
- Replace and/or repair the concrete railings
- Repair areas of leaking and dislodge joint materials
- Secure all access points to the bridge lower level
- Spot paint areas of active corrosion along the truss spans
- Repair areas of section loss to the truss gussets and members.
- Reset the dislodged pin at the South Interior Truss, Panel Point L12.
- Repair the access manholes in the pier caps.
- Repair the East bank channel protection and bulkhead.
- Fix the areas of broken and deteriorated utility supports.
- Replace corroded junction boxes.
- Replace and/or repair the navigation lights
- Patch the spalling within the East Approach Tunnel
- Replace the missing manhole cover at Pier 6, West face.

Routine:

- Monitor areas of fatigue cracking and fatigue crack repairs during future inspections.

Photos

Deck Photos

Photo 1 - Typical upper and lower deck soffits

Photo 2 - Typical underside of deck spalling with exposed rebar and delaminations

Photo 3 – Typical wearing surface condition

Photo 4 – Typical lower deck wearing surface; Cracking and delaminations with isolated spalling

Photo 5 - South sidewalk; 18' L x up to 1/4" W longitudinal crack with associated minor edge spalling

Photo 6 – Typical bridge rail condition

Photo 7 – Typical expansion joint condition

Photo 8 – Span 3 at panel point 13, South end of the joint; damaged/de-bonded with hanging material

Superstructure Photos

Photo 9 – Typical superstructure condition

Photo 10 – Typical truss condition

Photo 11 – Typical West approach superstructure

Photo 12 – Typical paint condition at panel points

Photo 13 - South Interior Truss, Span 7, L15U15 at U15; Vertical below deck joint with active corrosion and pack rust

Photo 14 – South Exterior Truss, Span 3, U12L13; pack rust and corrosion holes

Photo 15 – North Exterior Truss, Span 11, L8L9; typical pack rust between lower chord built up members

Photo 16 – North Exterior Truss, Span 13, L0L1; corrosion holes in lower chord web

Photo 17 – North Interior Truss, Span 12, L1L2; 6'-4" L crack with an arrestor hole at the east end of crack

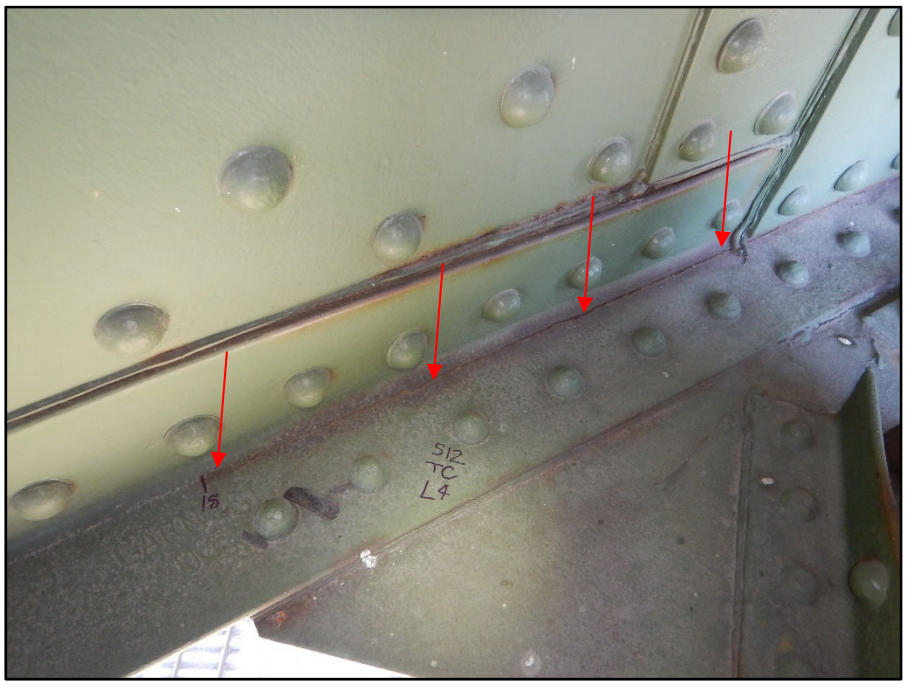


Photo 18 – South Interior truss, Span 12, L3L4; south lower angle at L4 with a 38-1/4" L crack

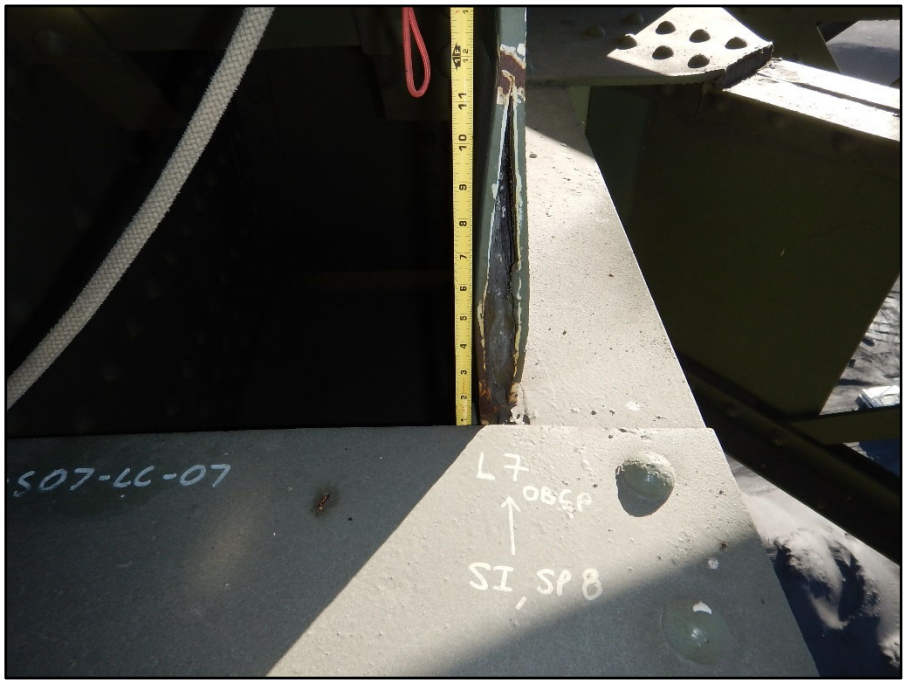


Photo 19 – South Interior truss, Span 7, L7; Laminar rolling defect opening gusset plate 1" W

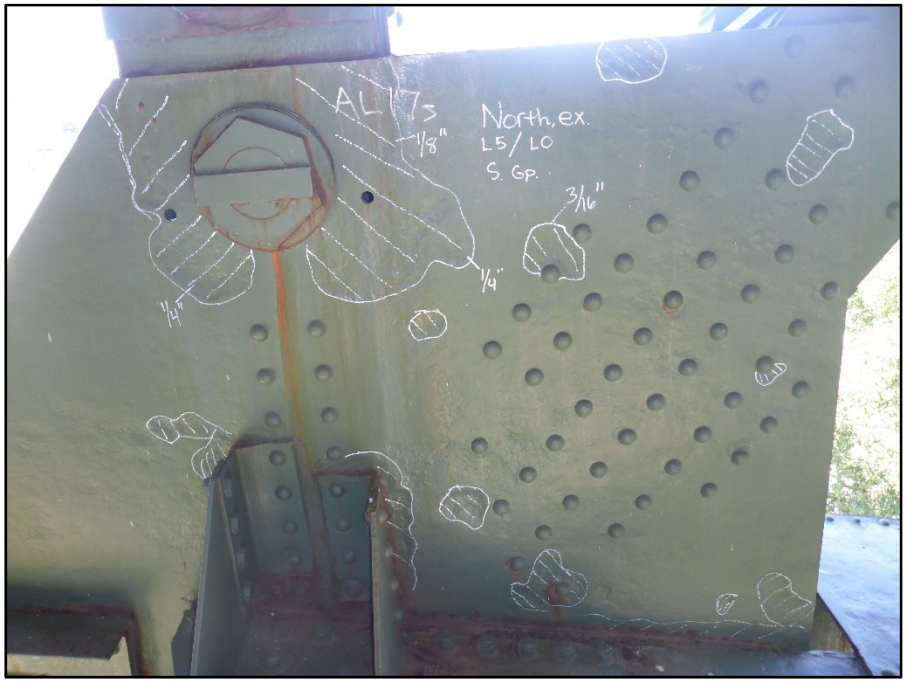


Photo 20 – North Exterior Truss, Span 11, L0 south Gusset Plate; Typical painted over pitting up to 1/4" D

Photo 21 – North Exterior Truss, Pier 6; Typical nested rocker bearing

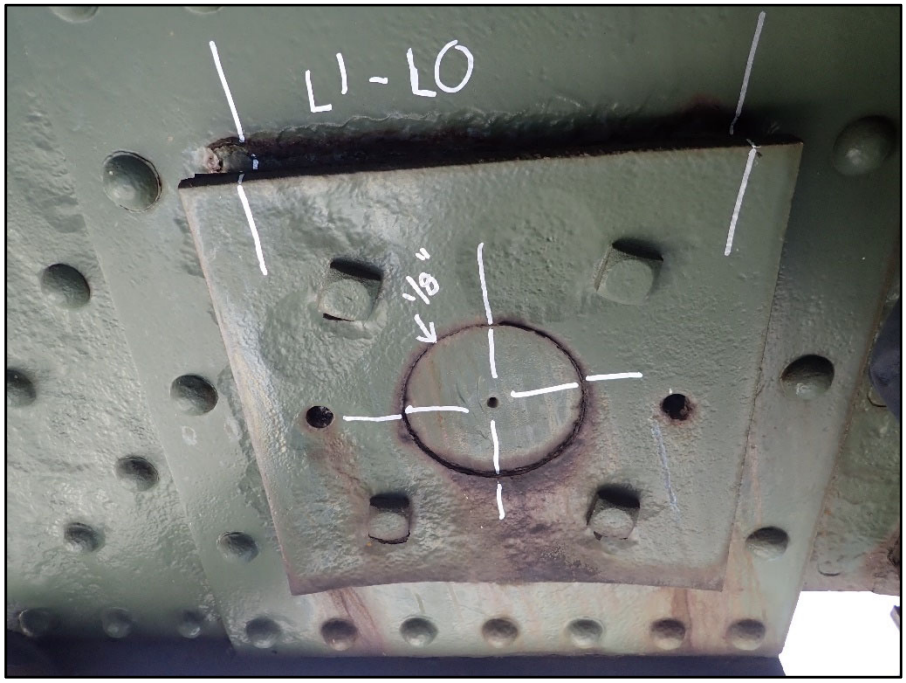


Photo 22 – South Exterior Truss, Span 8, L0; Typical corrosion and pack rust around pin and plate

Photo 23 – South Interior Truss, Span 12, L0; dislodged pin

Photo 24 –South Exterior truss Span 12, L3; 23-3/4” L longitudinal crack in inboard top north flange angle (3/4” growth since previous inspection)

Substructure Photos

Photo 25 – East Abutment typical condition

Photo 26 – East Pylon, Eat face; Typical condition

Photo 27 – Pier typical condition

Photo 28 – West Abutment typical condition

Photo 29 – Underside of Pier 12 cap, Typical condition

Photo 30 – East pylon backwall has a 12' H x up to 12" W spall/delamination behind the North Exterior Truss

Photo 31 – West faces of Pier 4 have large painted over spalls with exposed reinforcing along the top behind the South truss line

Photo 32 – Pier 9 bulkhead has failed along the East bank

Sign / Utility Photos

Photo 33 – Typical gas line on lower deck

Photo 34 – Typical Telecom conduits

Photo 35 – Span 13, damaged area of conduit

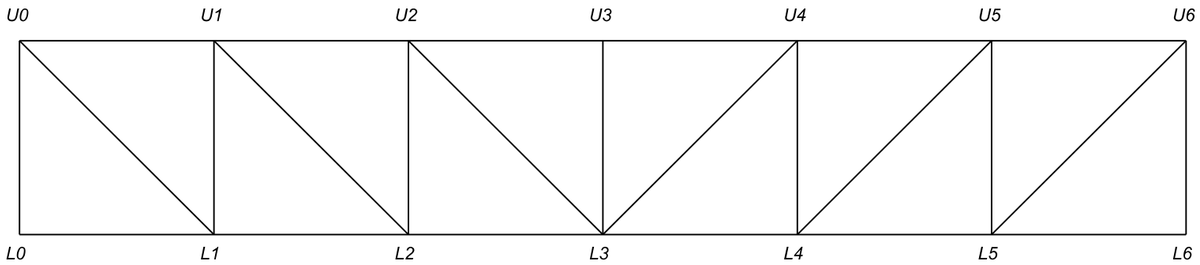
Approach Photos

Photo 36 – East approach tunnel has large spalled areas with exposed rebar in all bays

Photo 37 – West approach pavement has spalling, cracking, and bituminous patching over 20% of the pavement

Photo 38 – Embankment on West face of Pier 6 has an open manhole

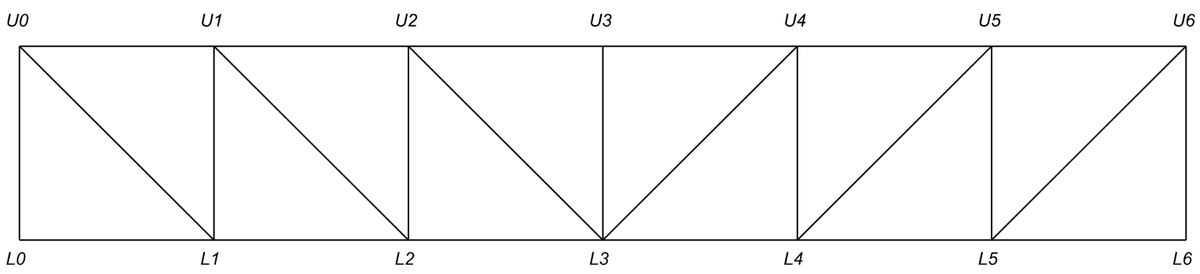
Truss Span CADD Drawings And Deficiencies



EAST PYLON

NORTH EXTERIOR TRUSS
SOUTH ELEVATION

EAST ABUTMENT

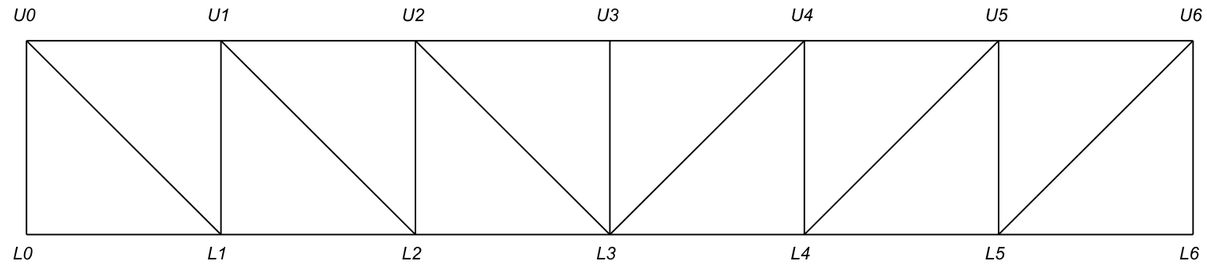


EAST PYLON

NORTH INTERIOR TRUSS
SOUTH ELEVATION

EAST ABUTMENT

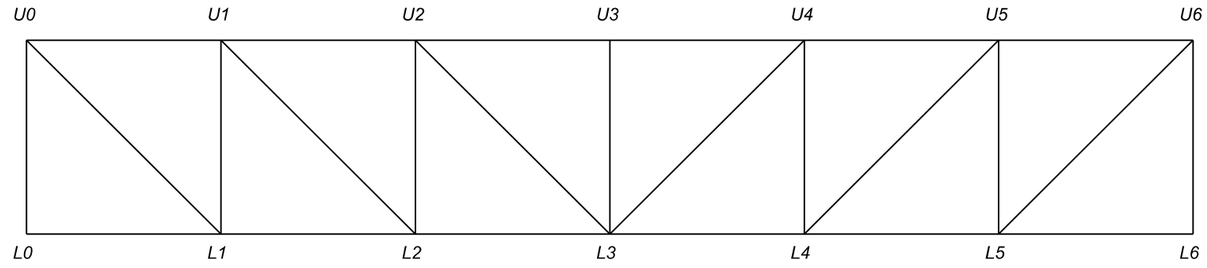
GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - W & LE SPAN PAGE A - 3



EAST PYLON

SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

EAST ABUTMENT



EAST PYLON

EAST ABUTMENT

SOUTH INTERIOR TRUSS
SOUTH ELEVATION

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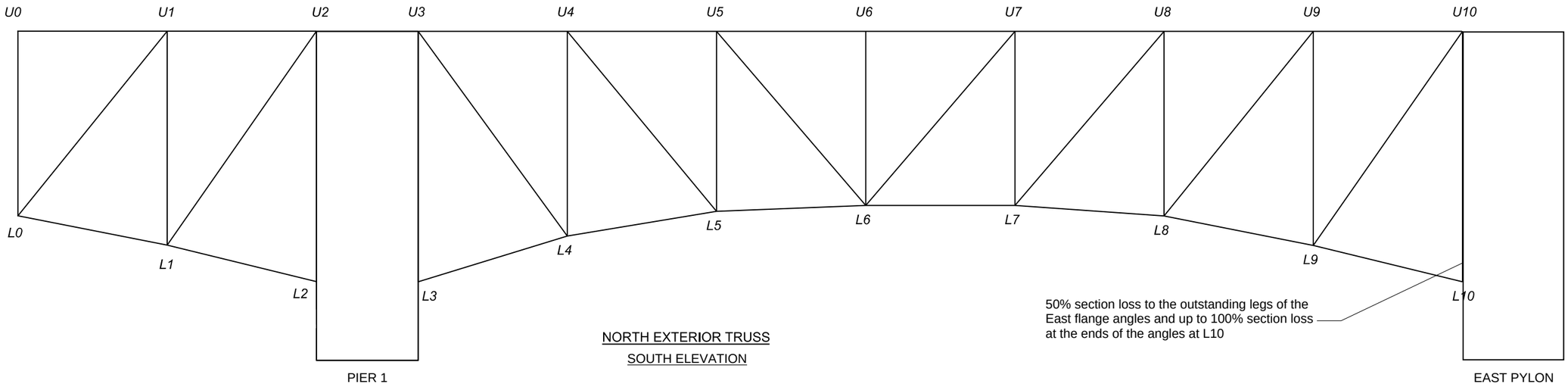
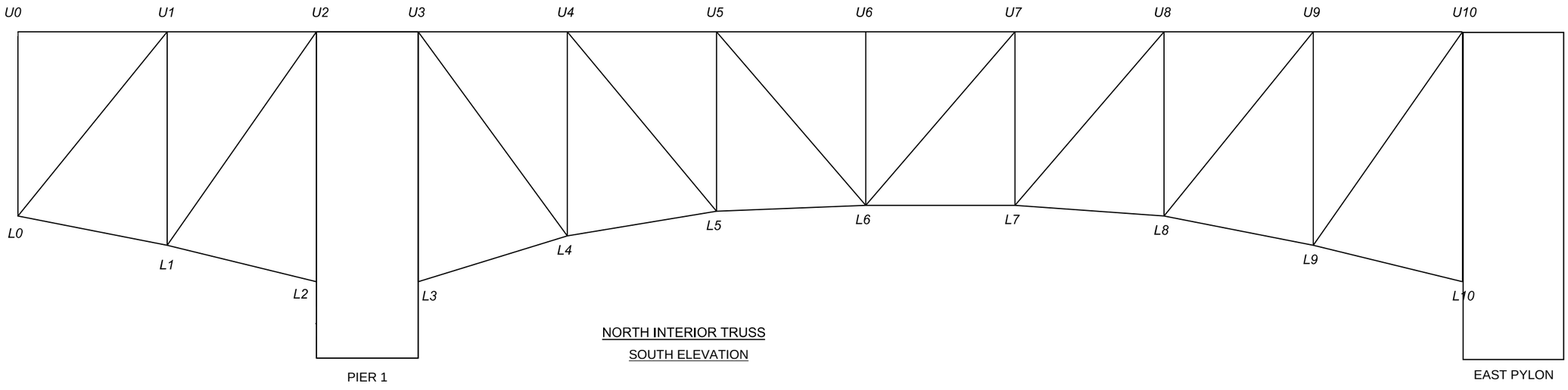


NORTH EXTERIOR TRUSS

SOUTH ELEVATION



NORTH INTERIOR TRUSS

SOUTH ELEVATION

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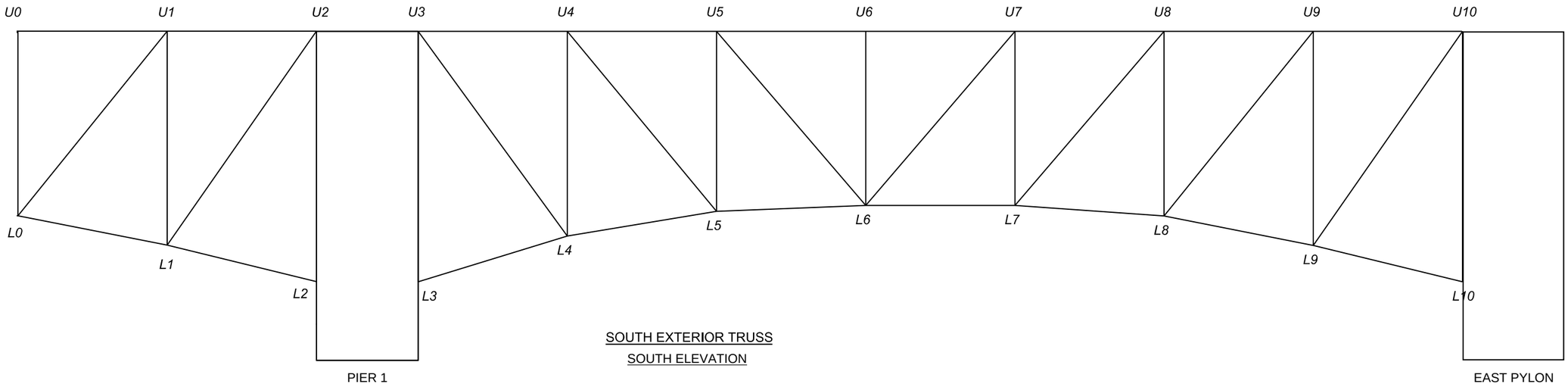
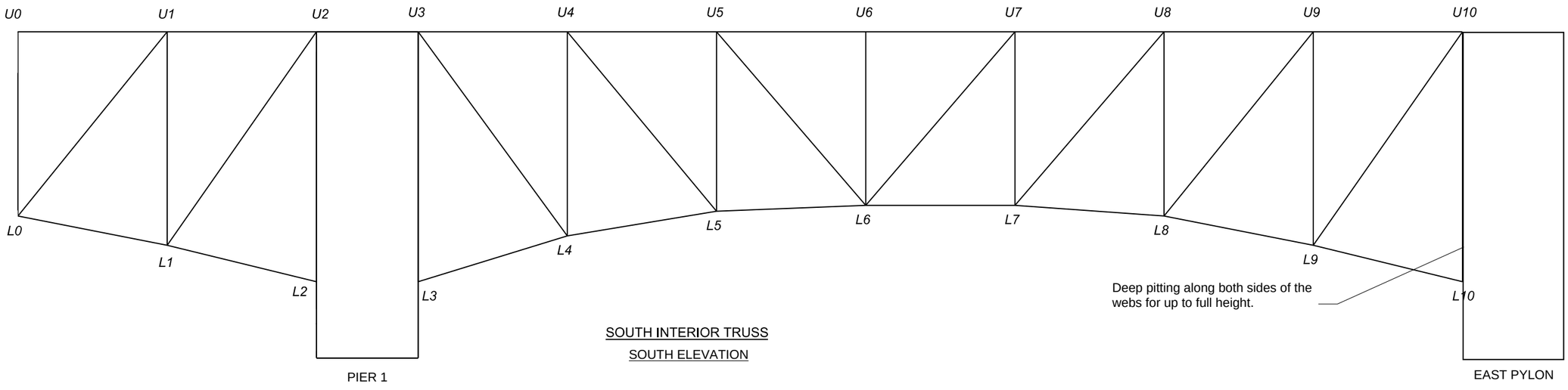
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 1 / PAGE A - 5



SOUTH EXTERIOR TRUSS

SOUTH ELEVATION



SOUTH INTERIOR TRUSS

SOUTH ELEVATION

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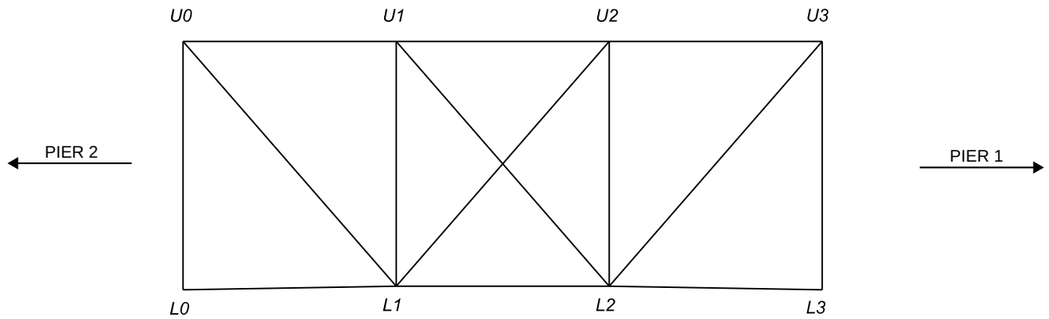
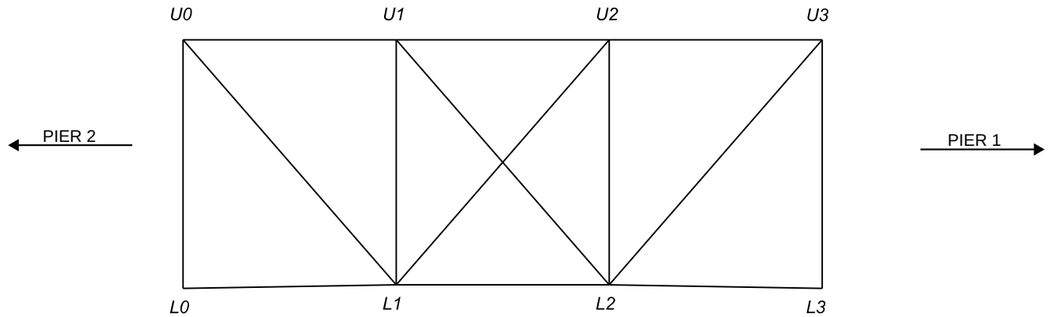


NORTH EXTERIOR TRUSS
SOUTH ELEVATION



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SOUTH ELEVATION

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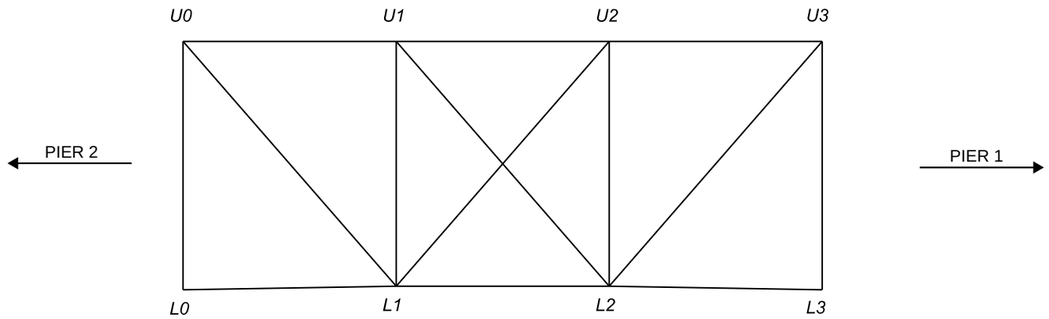
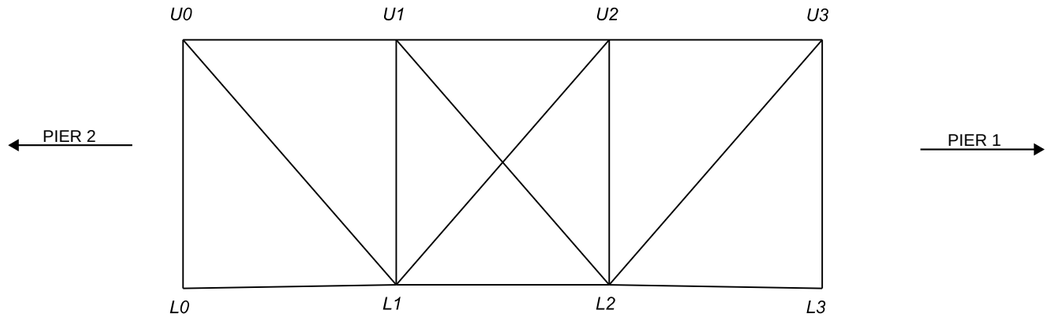
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 2	PAGE A - 7



SOUTH EXTERIOR TRUSS
SOUTH ELEVATION



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SOUTH ELEVATION

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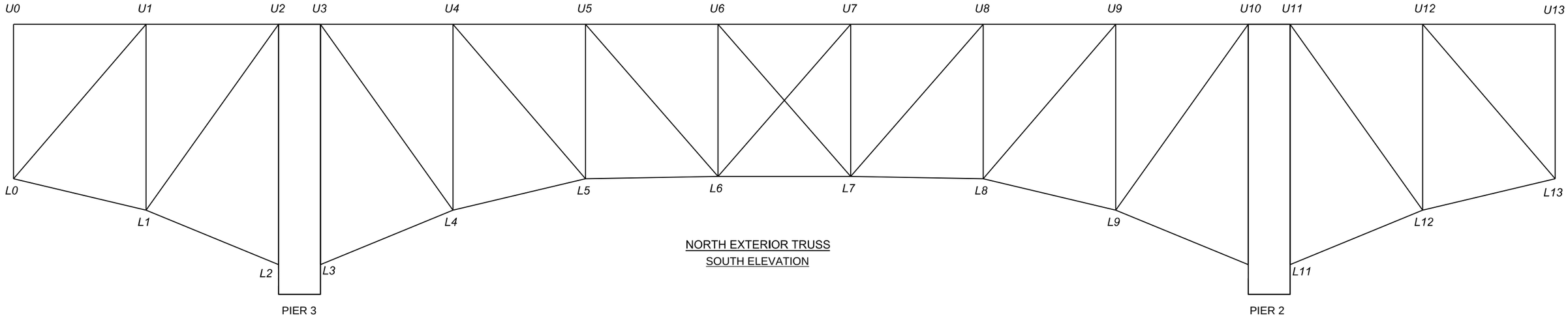
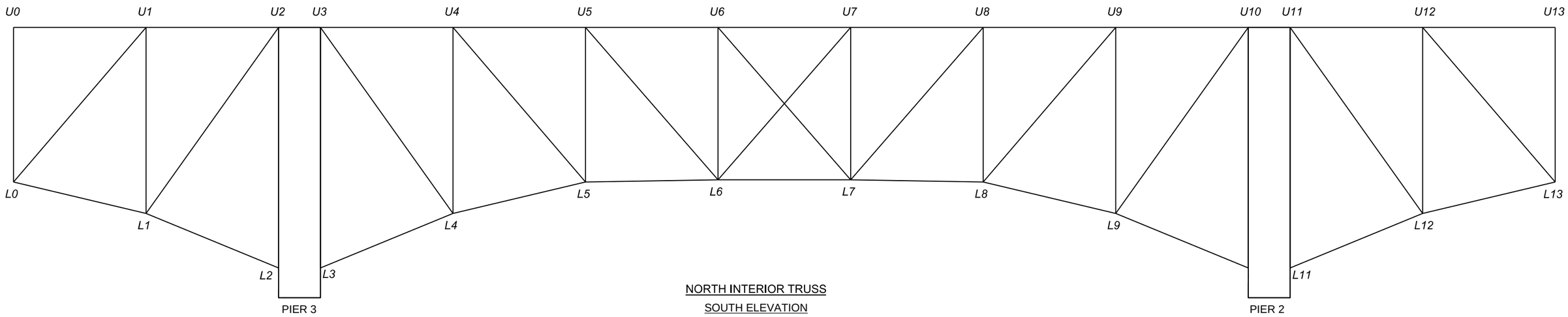


NORTH EXTERIOR TRUSS
SOUTH ELEVATION



NORTH INTERIOR TRUSS
SOUTH ELEVATION

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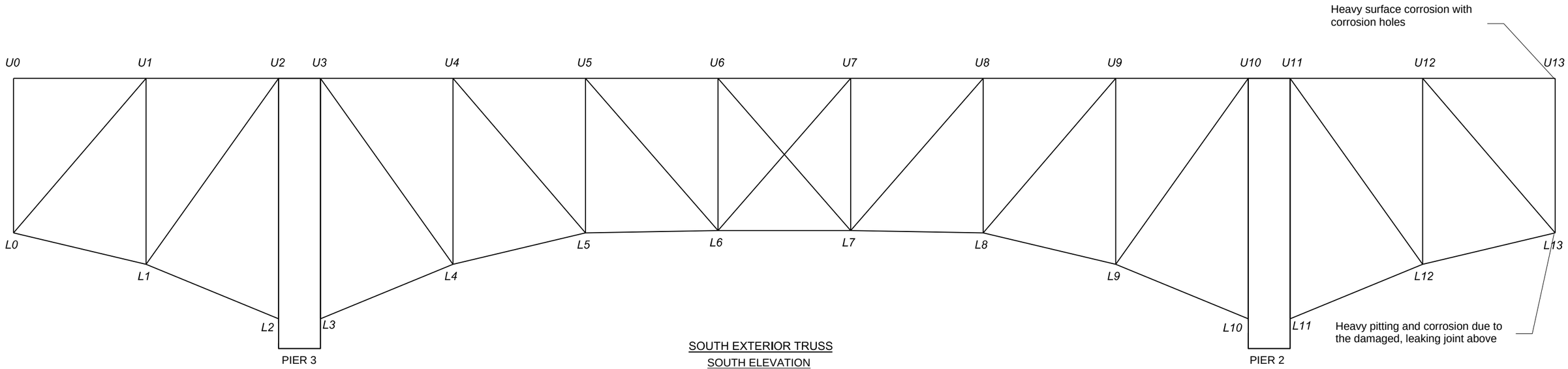
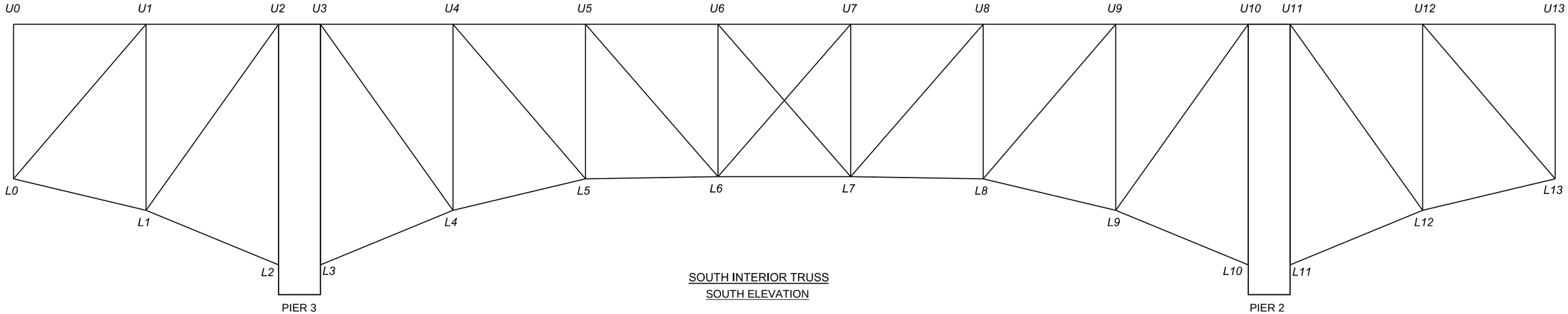
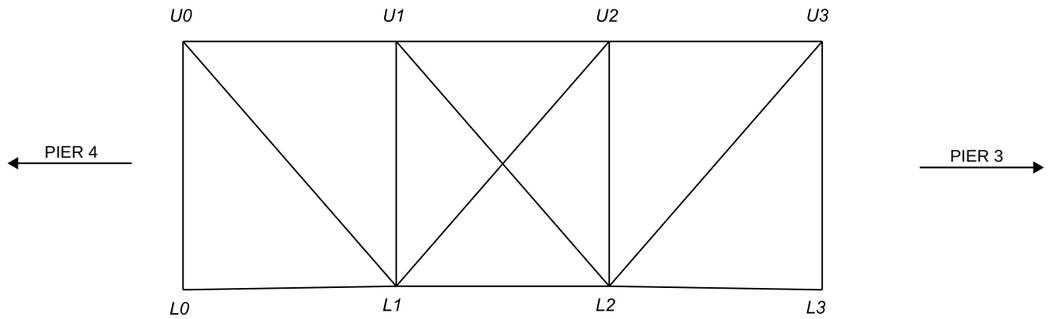


SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

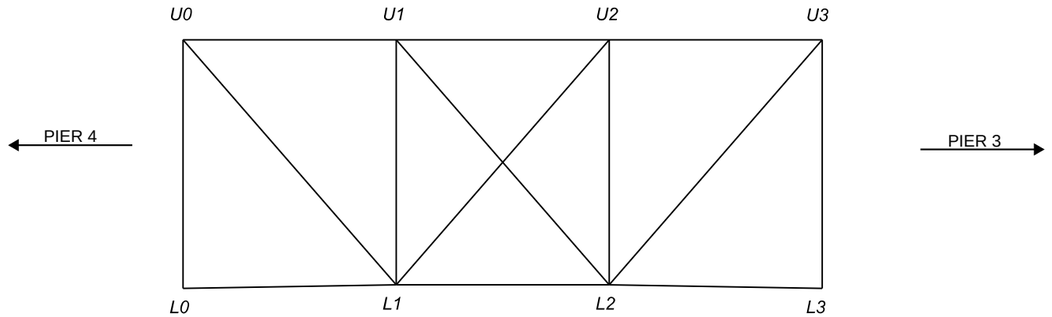


SOUTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - SPAN 3 PAGE A - 10

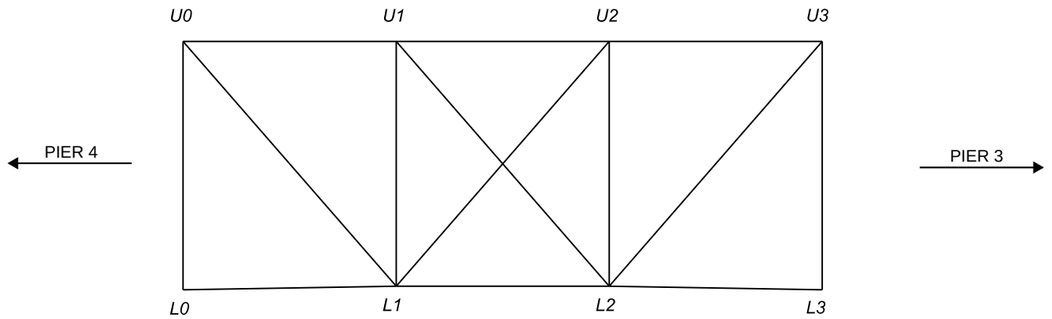


NORTH EXTERIOR TRUSS
SOUTH ELEVATION

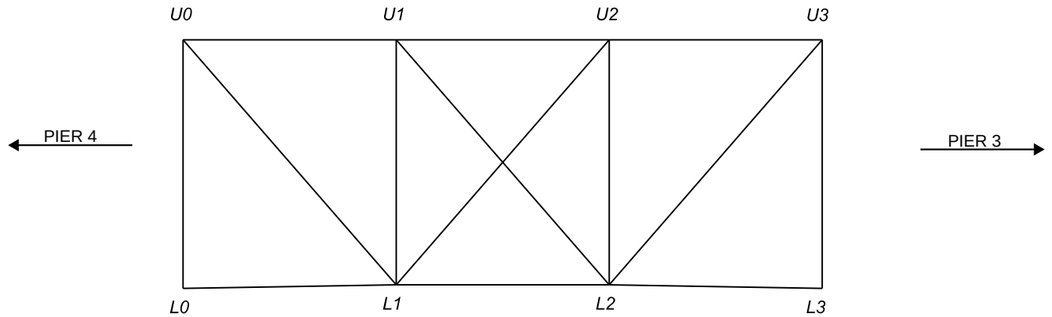


NORTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 4	PAGE A - 11

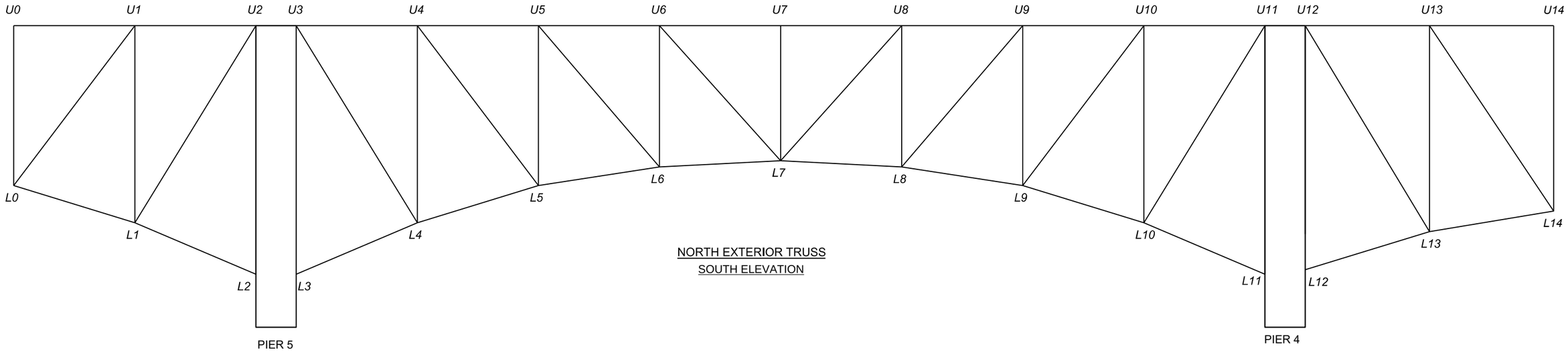


SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

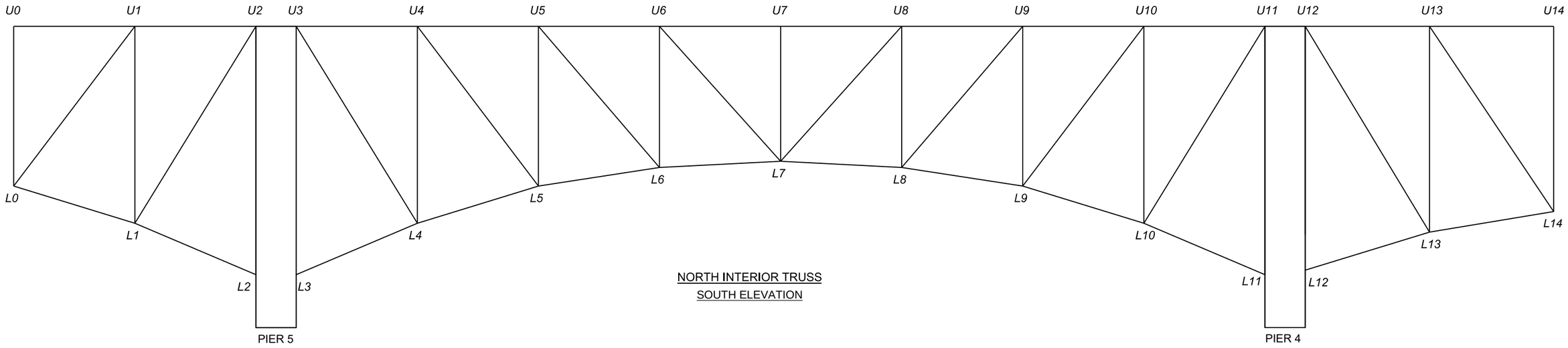


SOUTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 4	PAGE A - 12

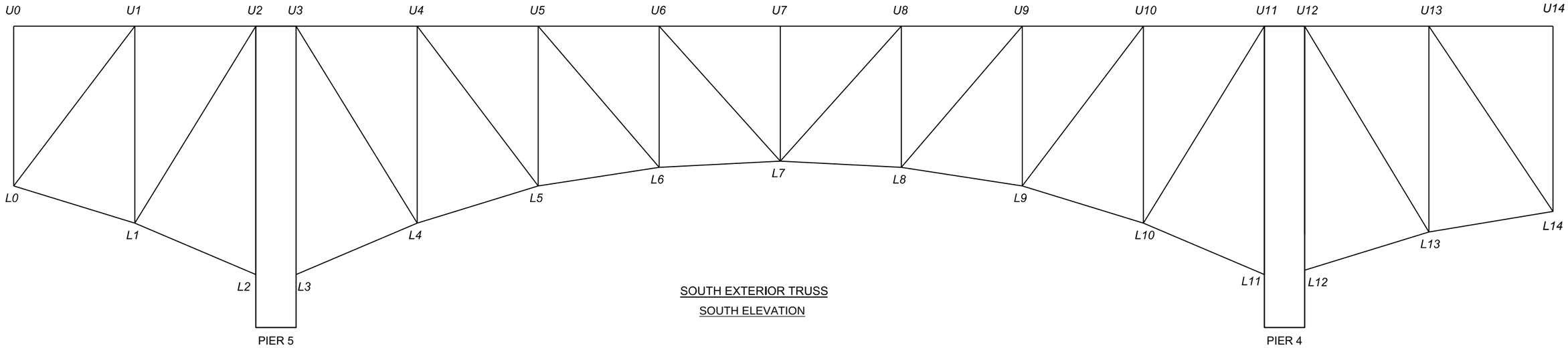


NORTH EXTERIOR TRUSS
SOUTH ELEVATION



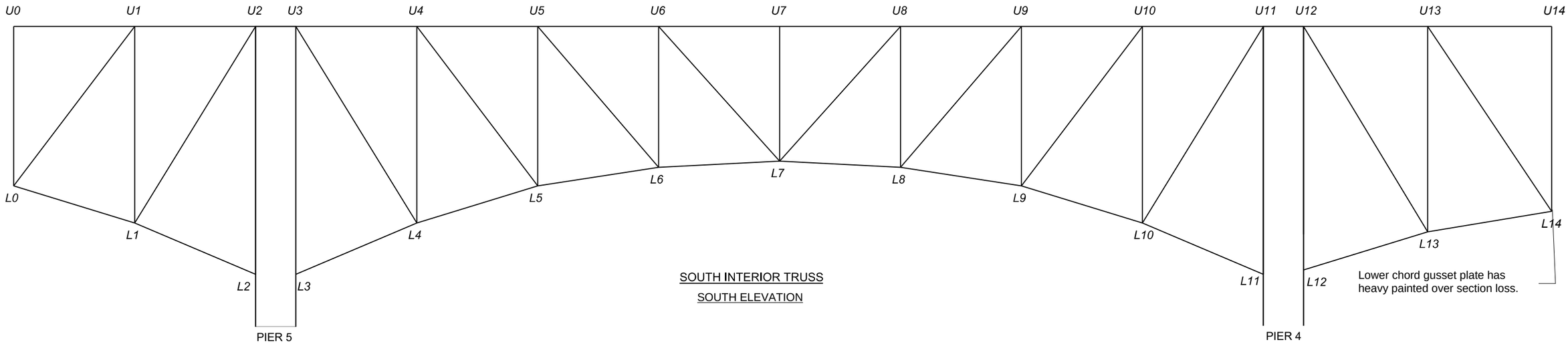
NORTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 5



SOUTH EXTERIOR TRUSS

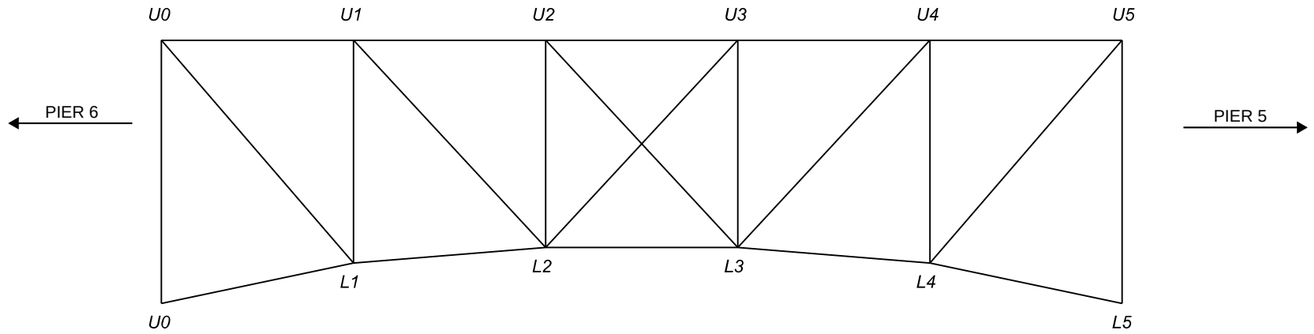
SOUTH ELEVATION



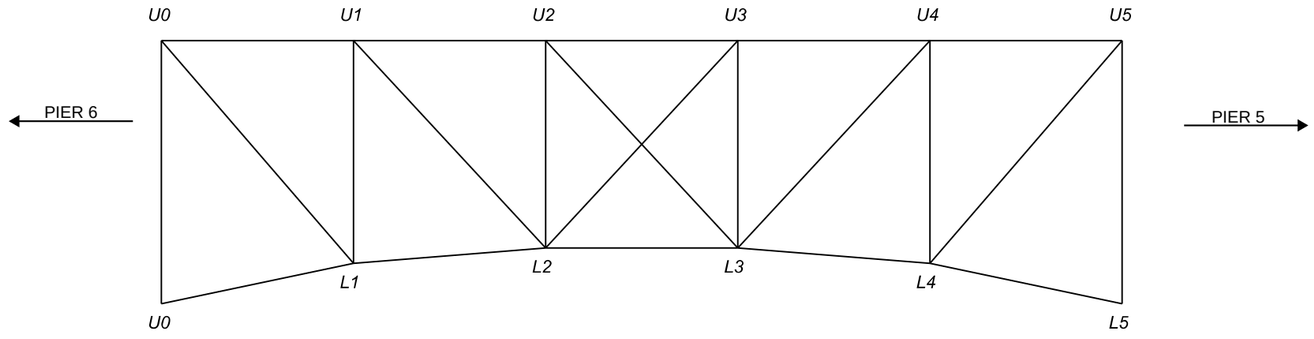
SOUTH INTERIOR TRUSS

SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 5 / PAGE A - 14

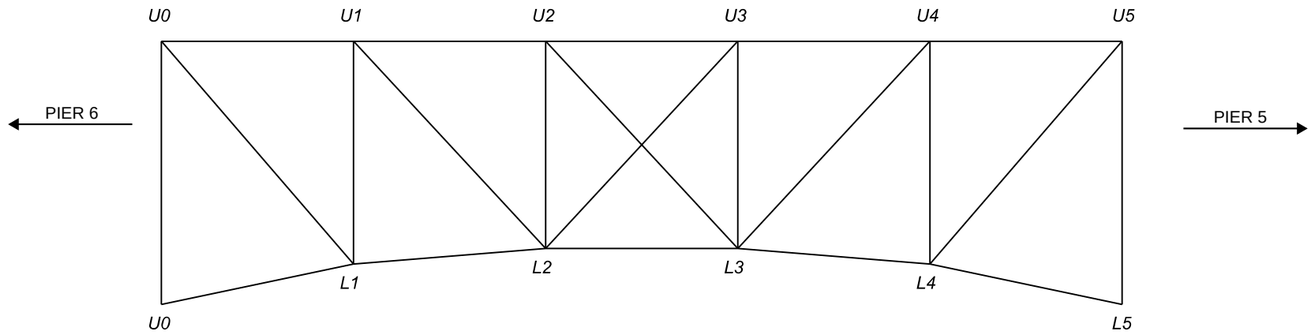


NORTH EXTERIOR TRUSS
SOUTH ELEVATION

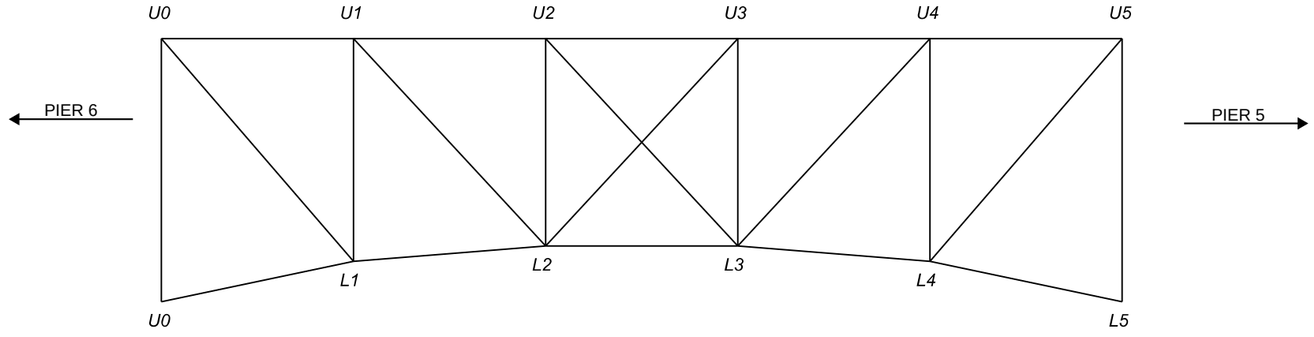


NORTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road, Suite 201, Cincinnati, OH 45242, PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 6	PAGE A - 15

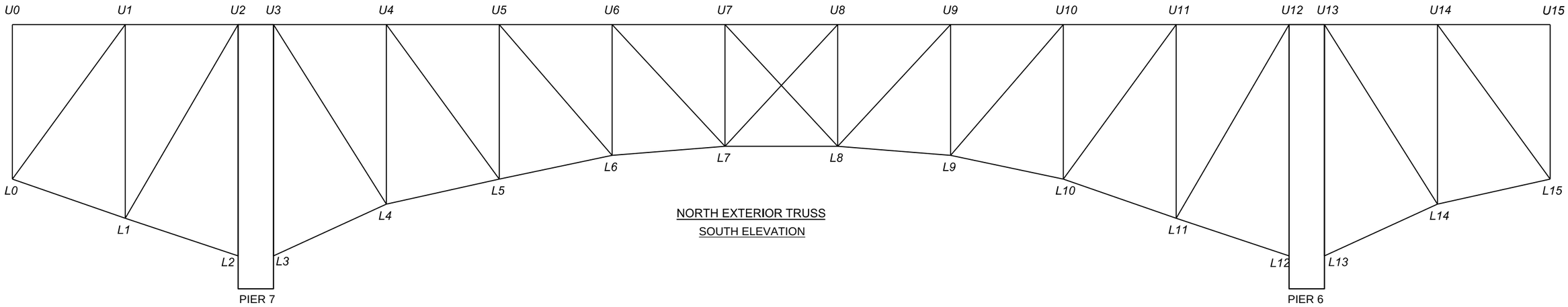


SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

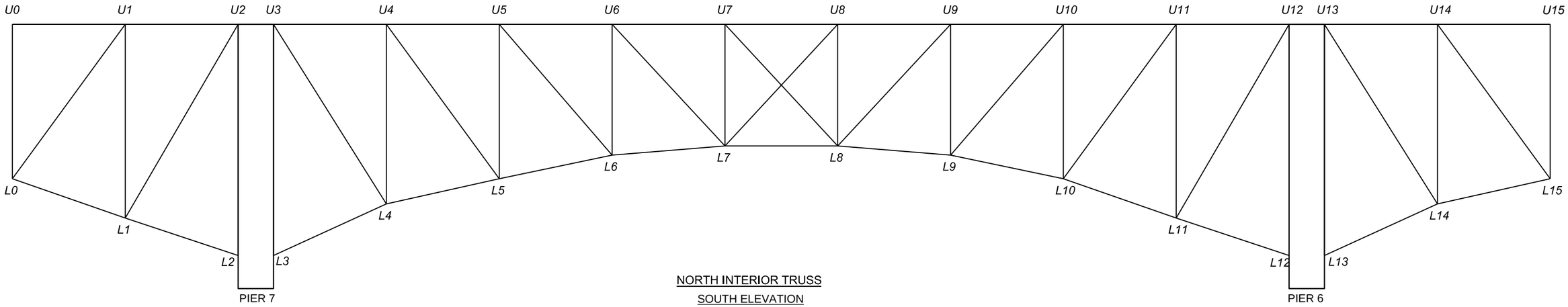


SOUTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 6	PAGE A - 16



NORTH EXTERIOR TRUSS
SOUTH ELEVATION

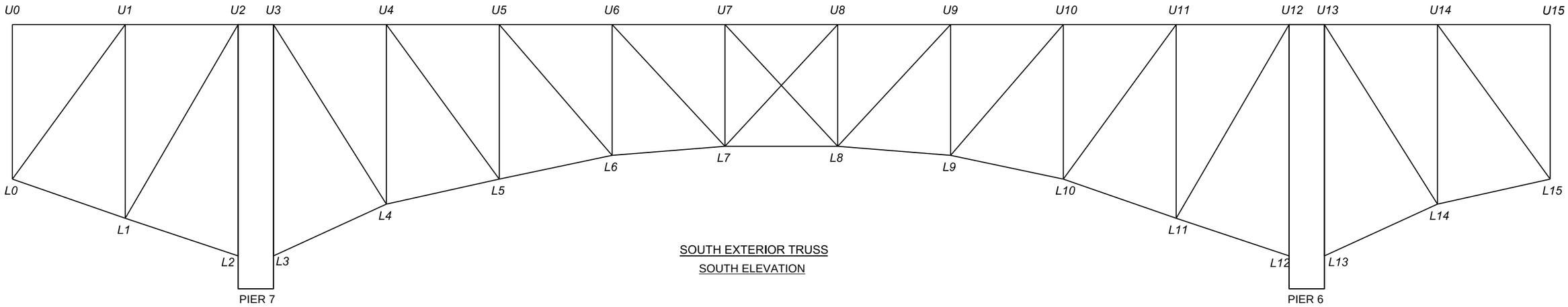


NORTH INTERIOR TRUSS
SOUTH ELEVATION

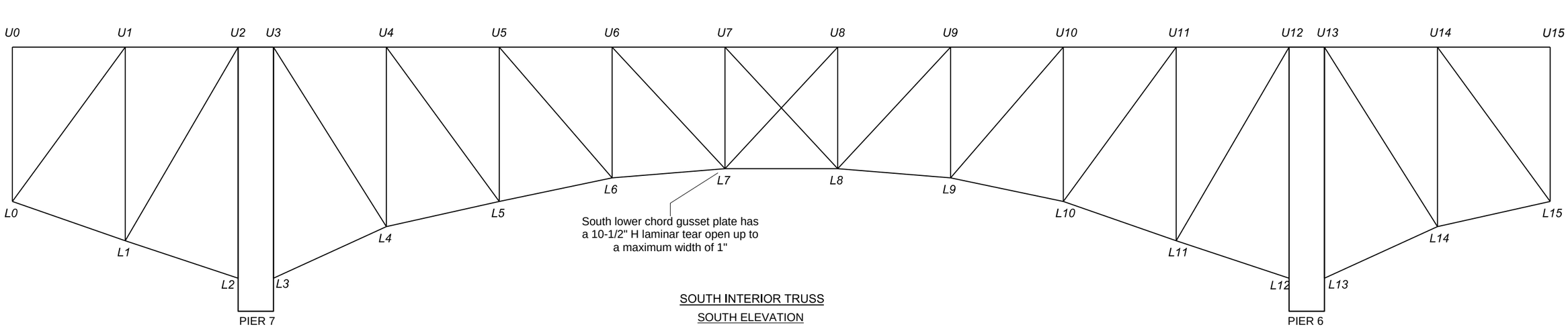
General Notes:

- Interior lower chords, for 3 panel points extending from each pier exhibit up to 2" T pack rust between the upper flange angles.

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road, Suite 201, Cincinnati, OH 45242, PH: 614-599-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 7
			PAGE A - 17



SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

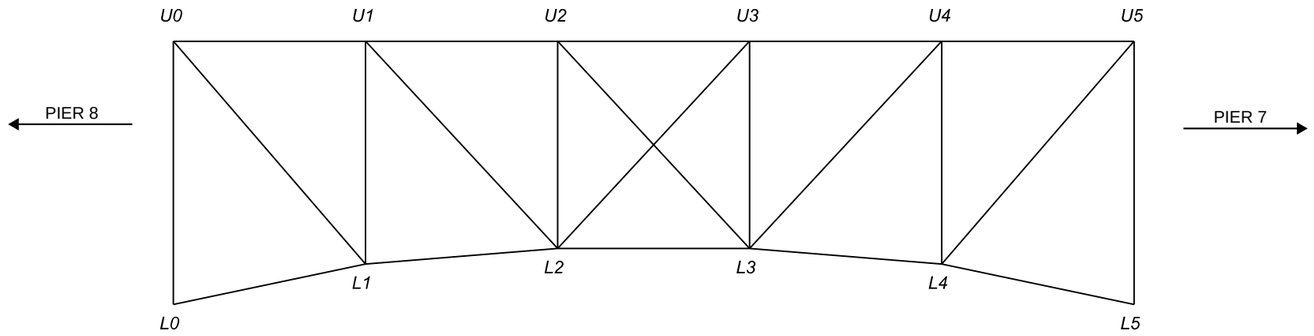


SOUTH INTERIOR TRUSS
SOUTH ELEVATION

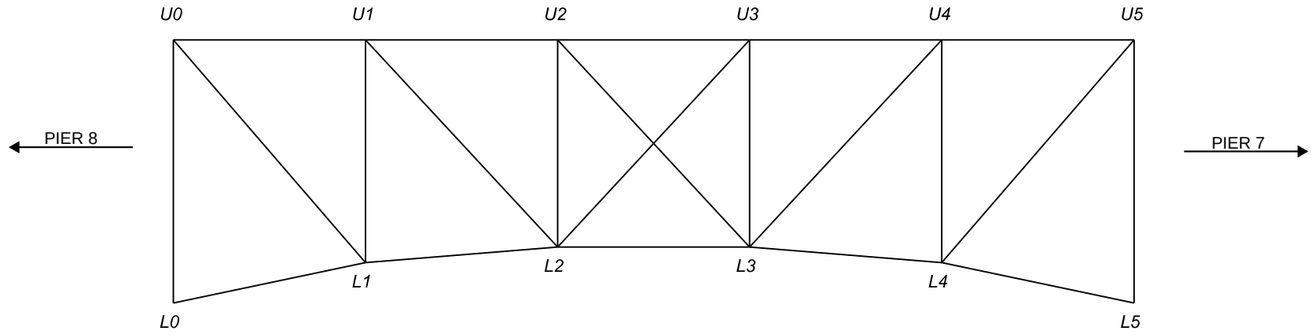
General Notes:

- Interior lower chords, for 3 panel points extending from each pier exhibit up to 2" T pack rust between the upper flange angles.

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - SPAN 7 PAGE A - 18

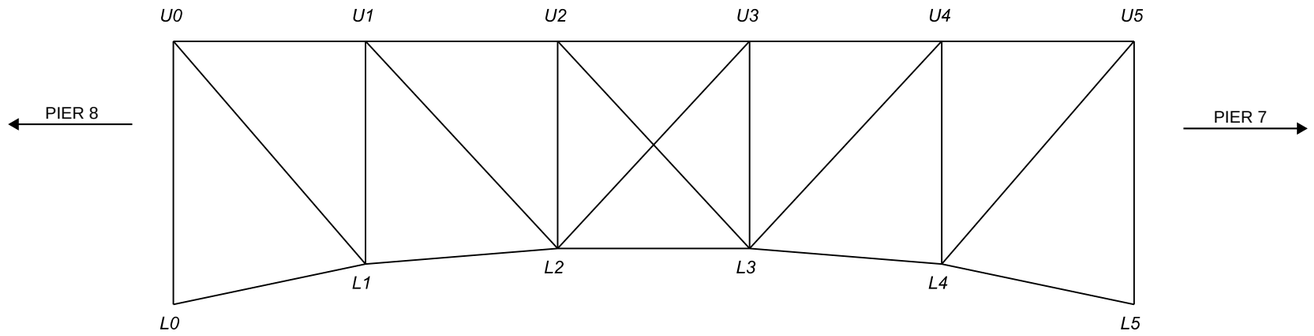


NORTH EXTERIOR TRUSS
SOUTH ELEVATION

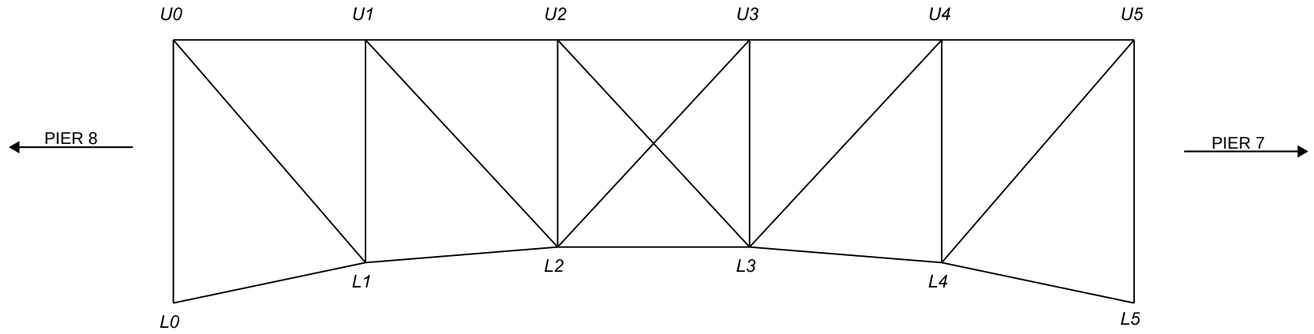


NORTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 8	PAGE A - 19

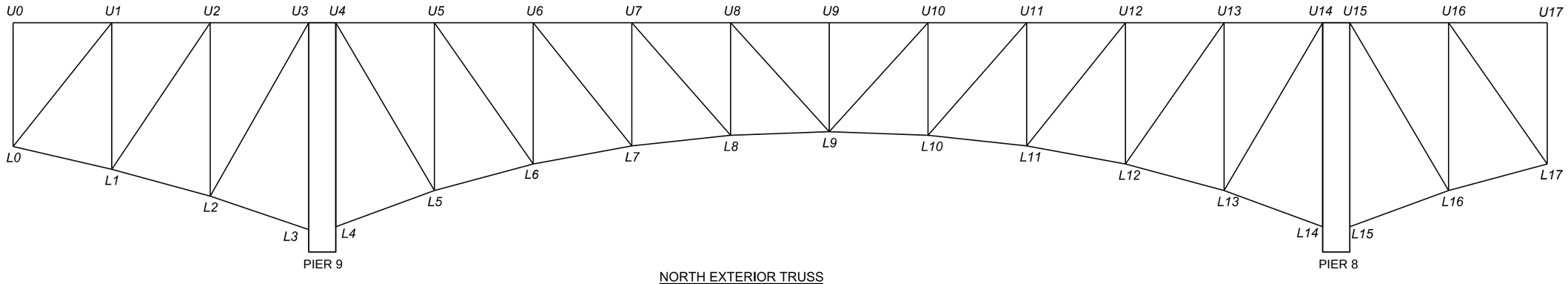


SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

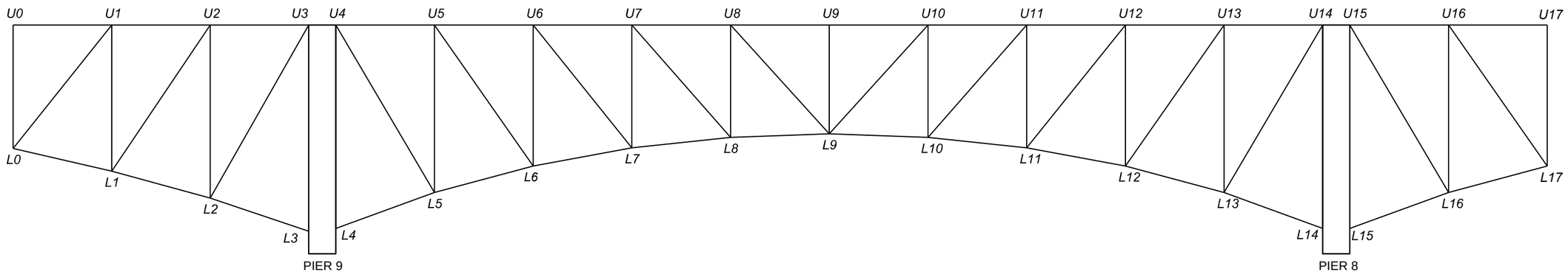


SOUTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 8	PAGE A - 20



NORTH EXTERIOR TRUSS
SOUTH ELEVATION

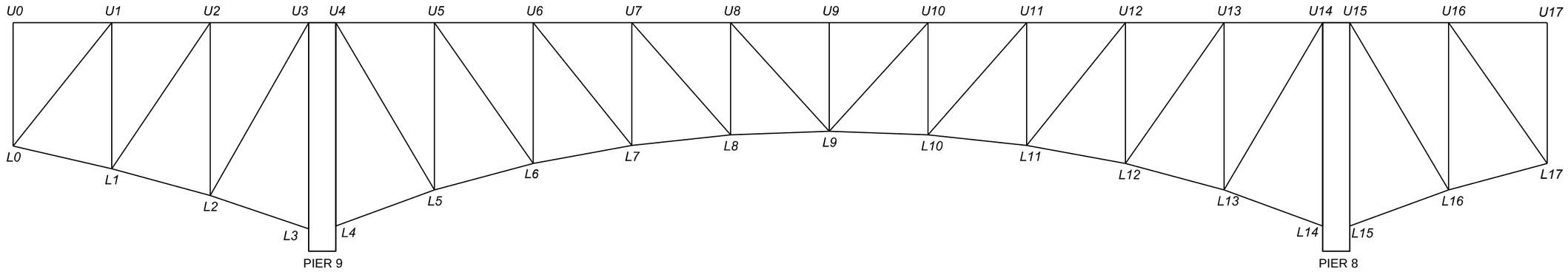


NORTH INTERIOR TRUSS
SOUTH ELEVATION

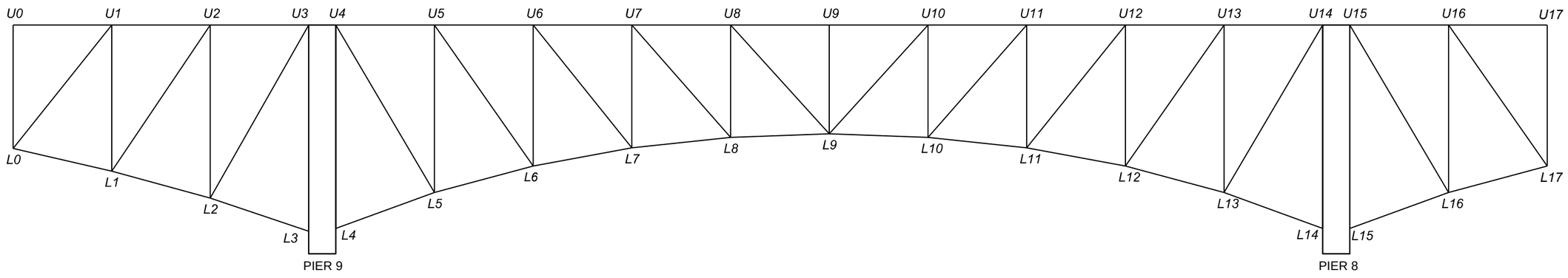
General Notes:

- Interior lower chords, for 3 panel points extending from each pier exhibit up to 2" T pack rust between the upper flange angles.

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - SPAN 9



SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

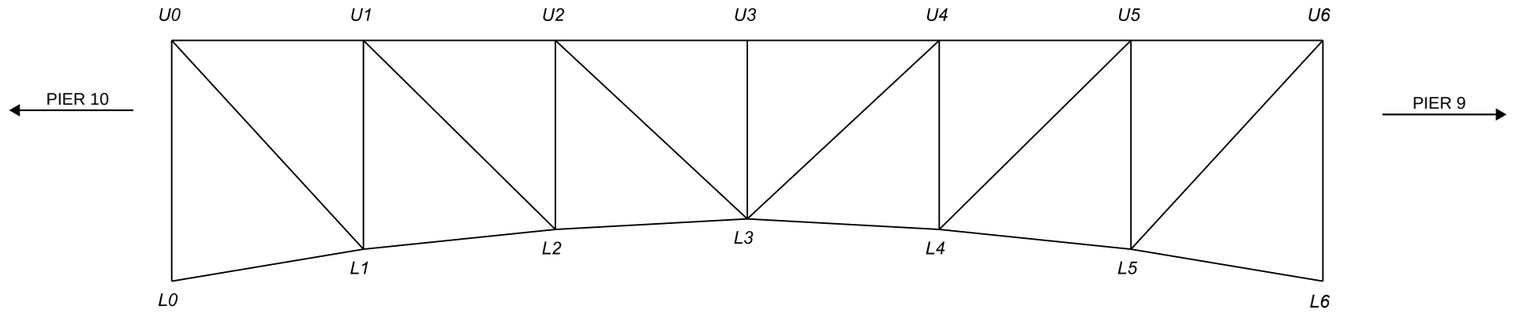


SOUTH INTERIOR TRUSS
SOUTH ELEVATION

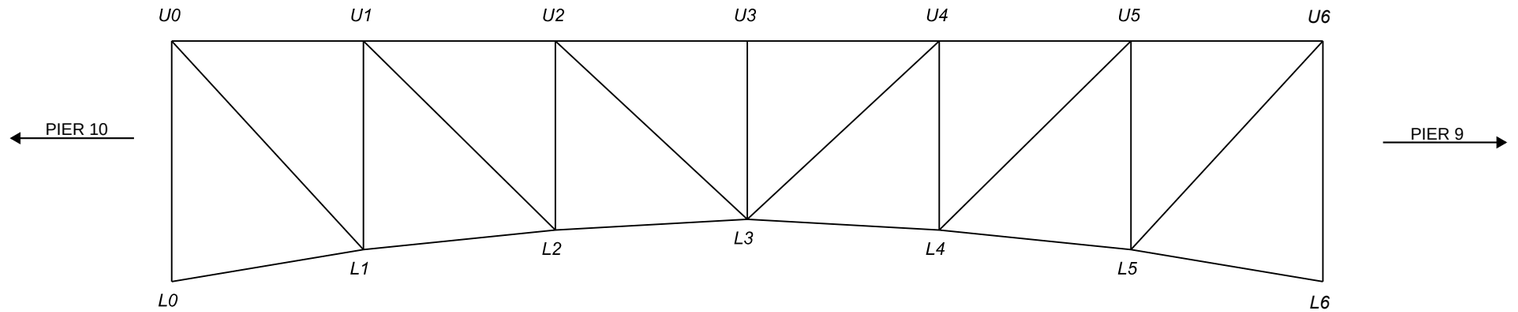
General Notes:

- Interior lower chords, for 3 panel points extending from each pier exhibit up to 2" T pack rust between the upper flange angles.

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - SPAN 9

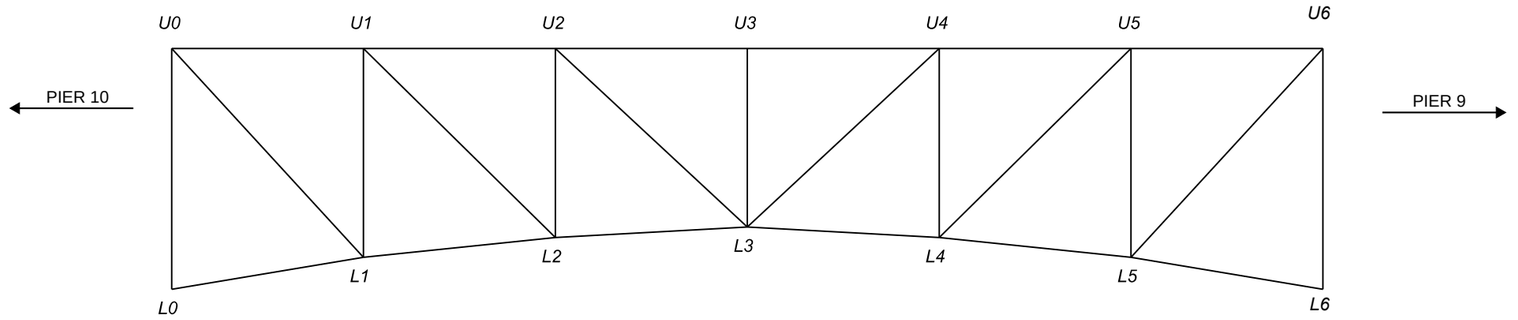


NORTH EXTERIOR TRUSS
SOUTH ELEVATION

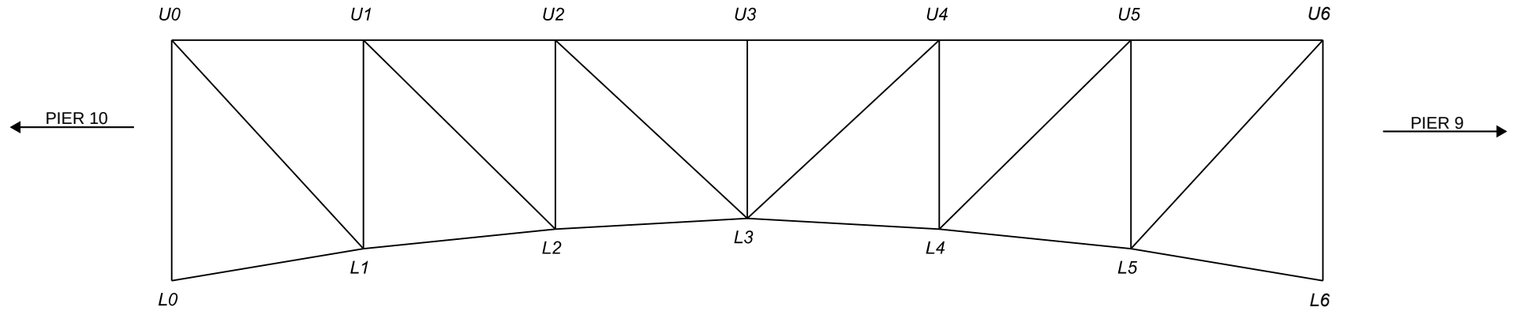


NORTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 10	PAGE A - 23

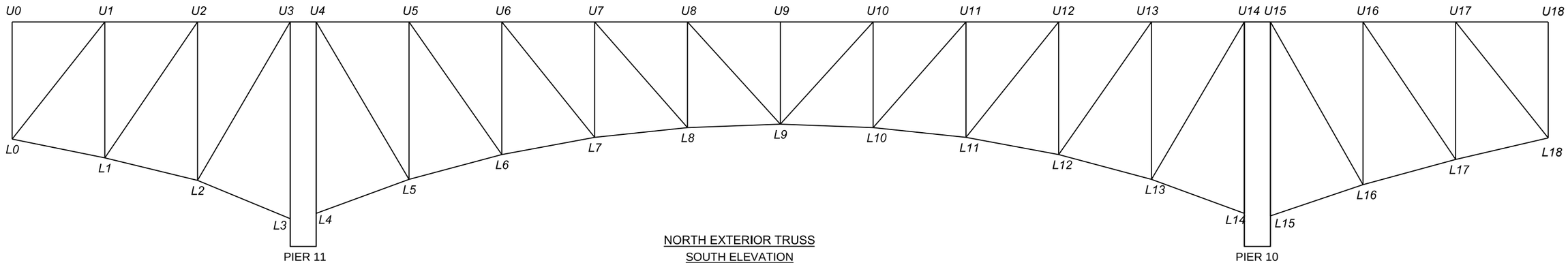


SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

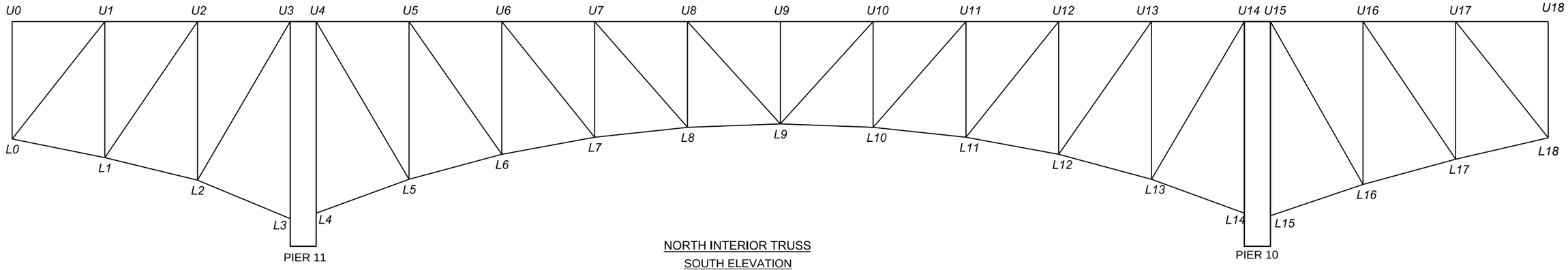


SOUTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 10	PAGE A - 24



NORTH EXTERIOR TRUSS
SOUTH ELEVATION

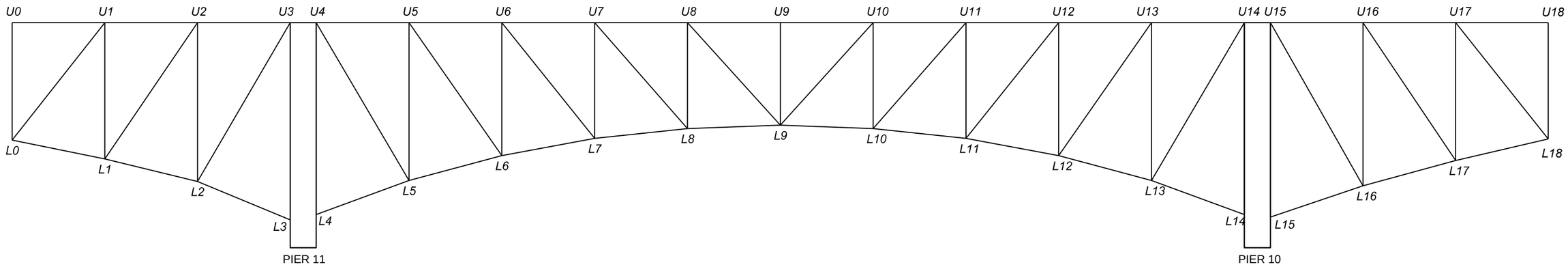


NORTH INTERIOR TRUSS
SOUTH ELEVATION

General Notes:

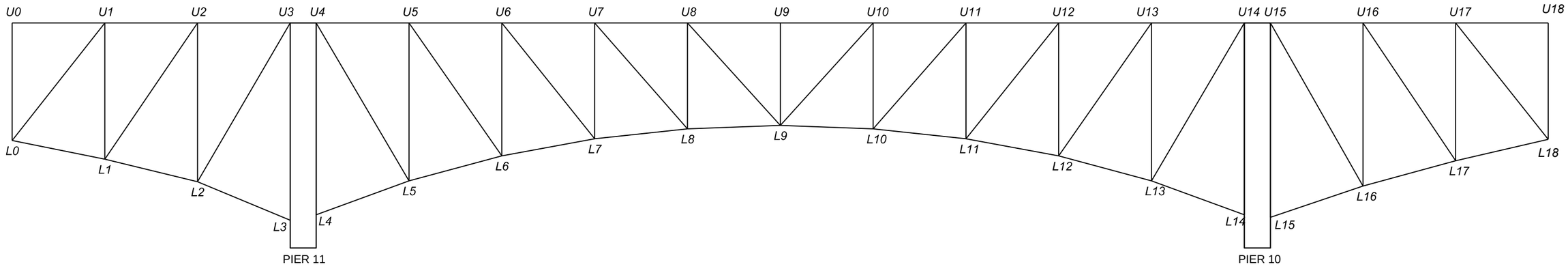
- Interior lower chords, for 3 panel points extending from each pier exhibit up to 2" T pack rust between the upper flange angles.
- Deep pitting and sections of perforations throughout the bottom of the lower chord webs and flange angles.

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - SPAN 11 PAGE A - 25



SOUTH EXTERIOR TRUSS

SOUTH ELEVATION



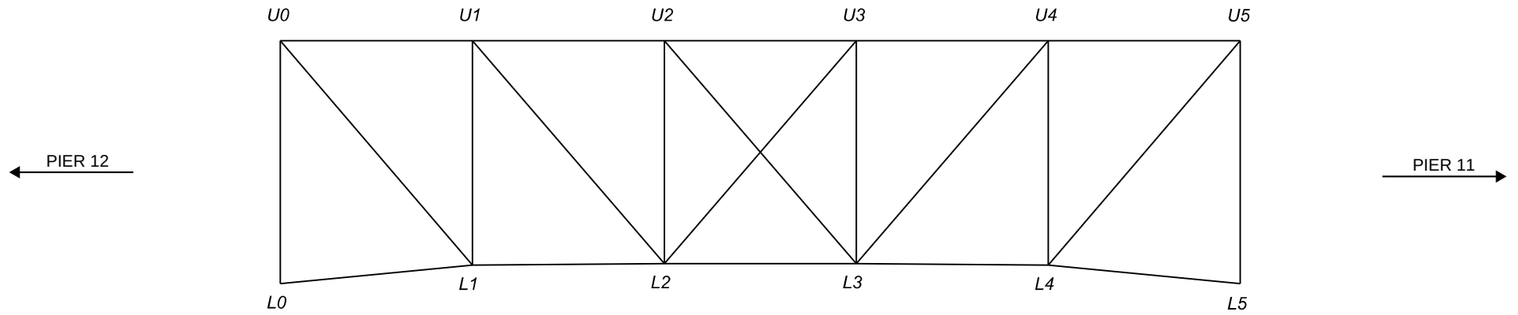
SOUTH INTERIOR TRUSS

SOUTH ELEVATION

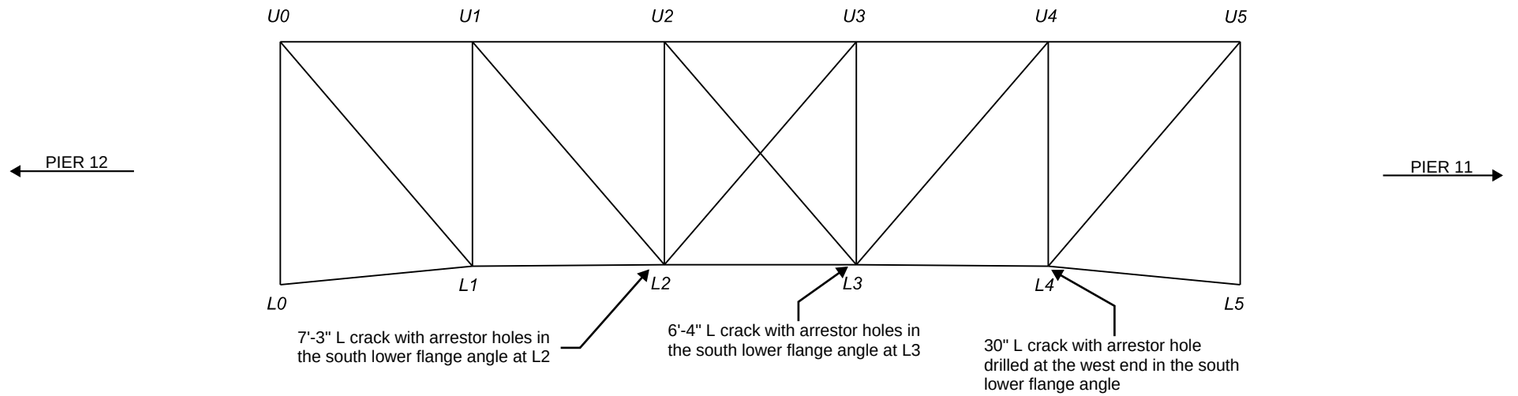
General Notes:

- Interior lower chords, for 3 panel points extending from each pier exhibit up to 2" T pack rust between the upper flange angles.

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - SPAN 11

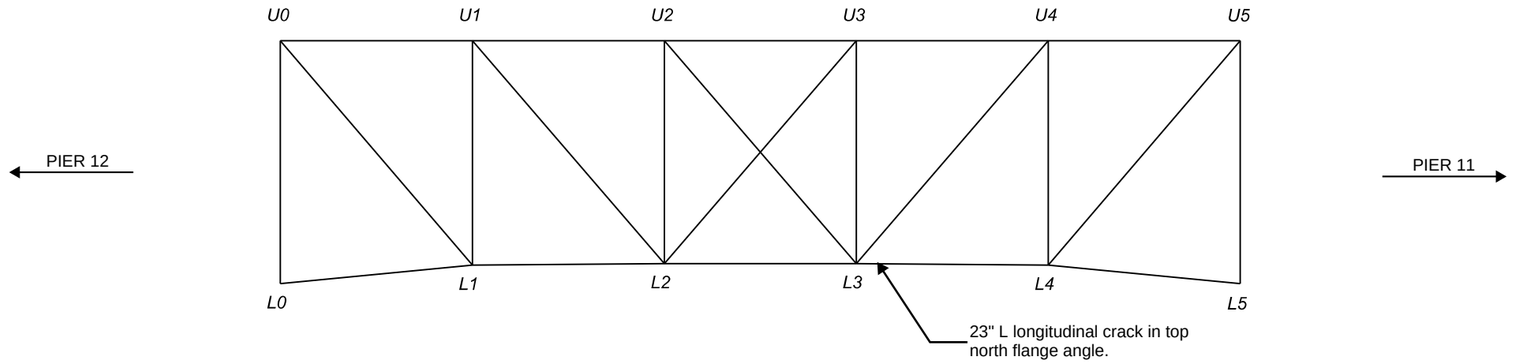


NORTH EXTERIOR TRUSS
SOUTH ELEVATION

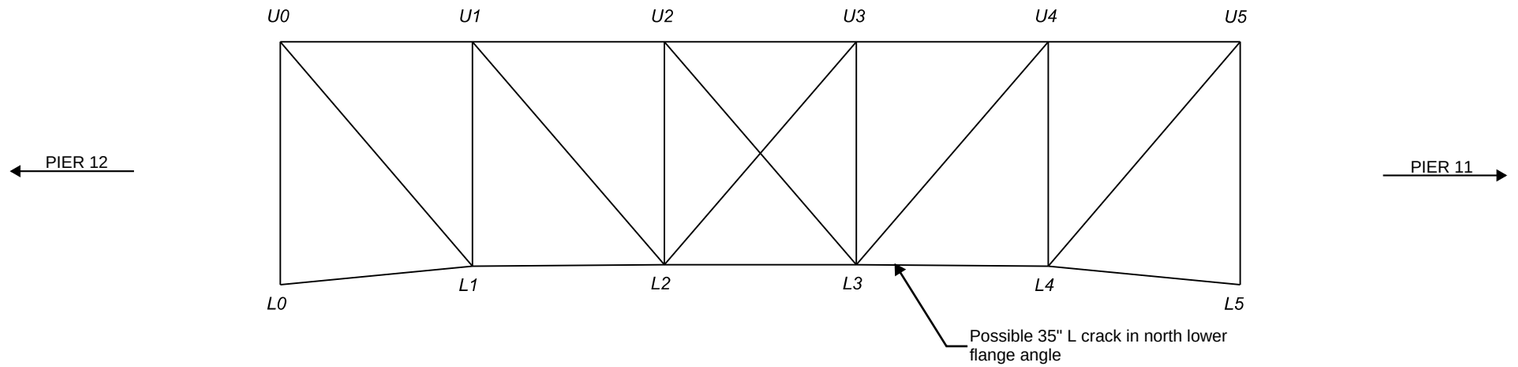


NORTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 12 / PAGE A - 27

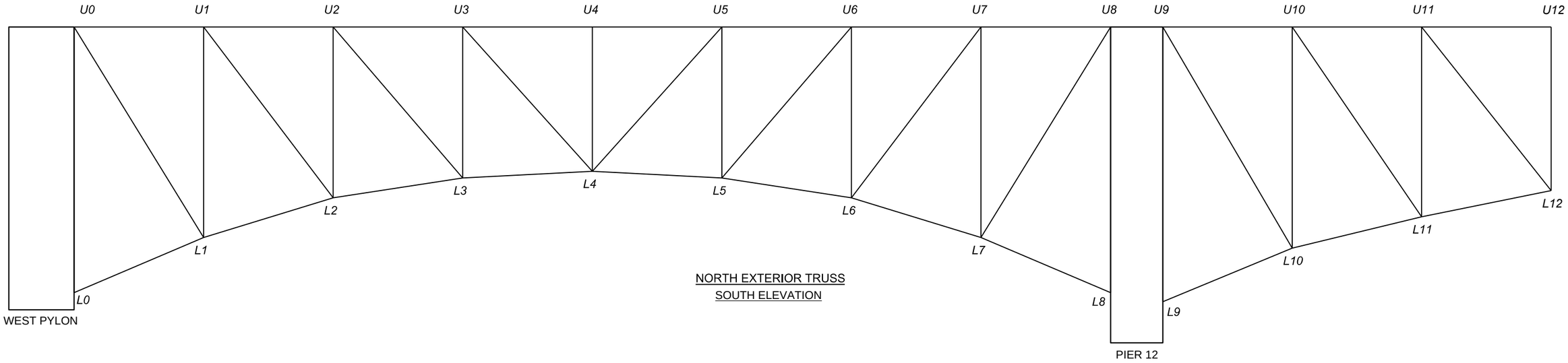


SOUTH EXTERIOR TRUSS
SOUTH ELEVATION

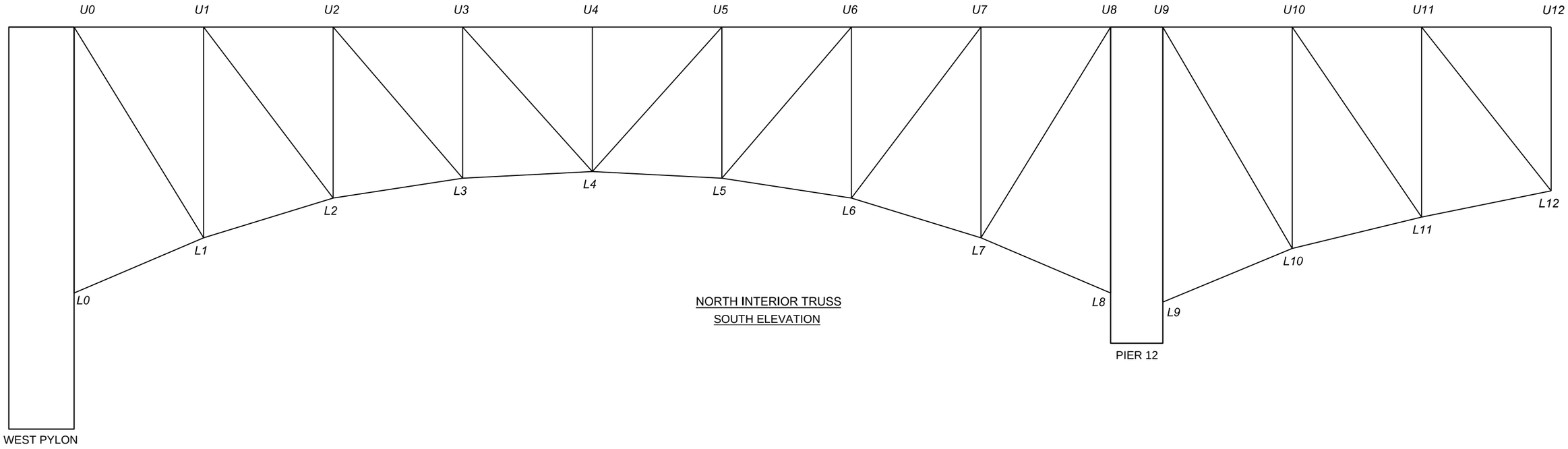


SOUTH INTERIOR TRUSS
SOUTH ELEVATION

GRAPHIC SCALE MEASURED IN FEET	DATE	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613	
NOT TO SCALE	JUL, 2018	INFRASTRUCTURE ENGINEERS, LLC.	TRUSS ELEVATION - SPAN 12	PAGE A - 28



NORTH EXTERIOR TRUSS
SOUTH ELEVATION

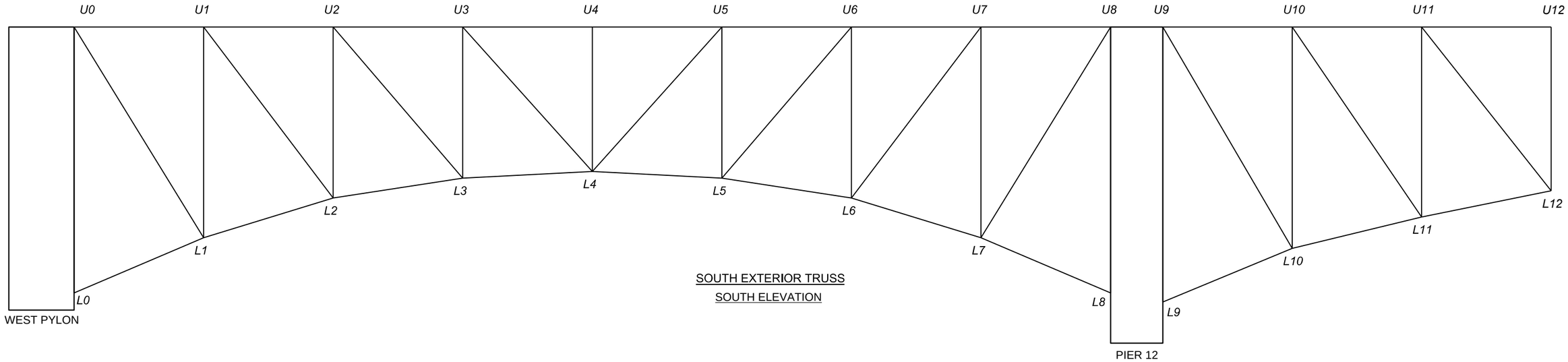


NORTH INTERIOR TRUSS
SOUTH ELEVATION

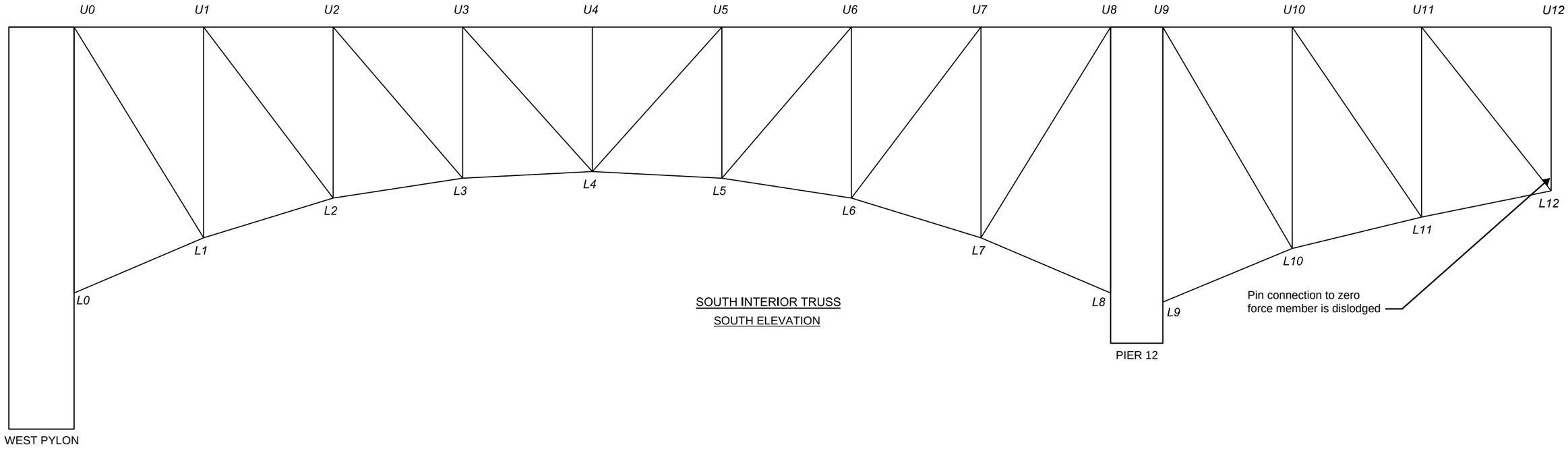
General Notes:

- Interior lower chords, for 3 panel points extending from each pier exhibit up to 2" T pack rust between the upper flange angles.

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE JUL, 2018	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, LLC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - SPAN 13 PAGE A - 29



SOUTH EXTERIOR TRUSS
SOUTH ELEVATION



SOUTH INTERIOR TRUSS
SOUTH ELEVATION

General Notes:

- Interior lower chords, for 3 panel points extending from each pier exhibit up to 2" T pack rust between the upper flange angles.

GRAPHIC SCALE MEASURED IN FEET NOT TO SCALE	DATE DEC, 2017	9902 Carver Road Suite 201 Cincinnati, OH 45242 PH: 614-699-5000 INFRASTRUCTURE ENGINEERS, INC.	HOPE MEMORIAL BRIDGE OVER CUYAHOGA RIVER BRIDGE NO. CUY-10-1613 TRUSS ELEVATION - SPAN 13