

FIELD INSPECTION REPORT

NE STACK C, NE LEG C & SOUTH TRUSS LEVELS 2-6

SEPTEMBER 1, 2021

ERI PROJECT 38470/38471
977 FT SELF-SUPPORT TOWER
SAN FRANCISCO, CA
ASRN 1001289

Prepared For:

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EXECUTIVE SUMMARY

Mr. Velez,

This report is submitted by Electronics Research Incorporated (ERI) with regards to the field inspections conducted by ERI on Feb 11 and Sep 30-Oct 1, 2020. The contracted scope of work included on-site inspections of the NE Stack “C”, NE Leg “C”, and South Truss Levels 2-6. The subject inspections were completed in accordance with the current ANSI/TIA-222-H standard.

The purpose of the work was to complete thorough visual inspections to evaluate current condition of the structural components.

In general, all structural elements were found in good condition. Readily accessible locations throughout the structure exhibiting only signs of mild to moderate corrosion are not specifically identified in this report as they are considered part of the routine maintenance of Sutro Tower and shall be repaired and coated in accordance with STI-SOP-0001.

Appendix II in this report includes the completed inspection forms, detailed inspection findings and recommended correction action summaries, and corresponding pictures to support all pertinent observations made.

STRUCTURAL CONDITION OBSERVATIONS

In general, the structural condition observations identified do not appear to pose immediate concerns to the overall structure’s strength and stability; however, all structural condition observations noted should be further evaluated by Simpson Gumpertz & Heger Inc. serving as the structure’s engineer of record (EOR) to determine if corrective action measures are warranted.

The following page provides a summary of the structural condition observations noted (see “Inspection Summary” in Appendix II of this report for further details and associated pictures):

SOUTH TRUSS (LEVEL 6)

OBSERV. NO.	³ Location/Identification			⁴ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	¹ Chord	Horiz. Location	² Item		
41	OL	6.11-6.12	D	Minor yielding; diag ~ flange deformed 1/8" over 12" span	Contact EOR to determine if any CA is warranted

NOTES: ¹Chord Designation: OU=Outer Upper | OL=Outer Lower | IU=Inner Upper | IL=Inner Lower

²Item Designation: L=Leg Member | D=Diagonal | H=Horizontal | C=Connection | O=Other

³Reference Appendix I Of This Report For Structure Orientation/Nomenclature Used For Identifying Specific Locations On The Structure

⁴Reference Appendix II Of This Report For More Detailed Information On Observations Along With Corresponding Picture(s)

OCCUPATIONAL SAFETY RELATED OBERVATIONS

All safety related observations noted pertain strictly to occupational issues for individuals climbing and accessing the structure and do not pose any direct safety concerns to the general public. In general, the occupational safety related issues identified do not appear to pose immediate danger to trained qualified tower climbers; however, all safety related observations should be carefully reviewed and action plans established for remediation.

The following page provides a summary of the safety observations noted (see “Inspection Summary” in Appendix II of this report for further details and associated pictures):

Occupational Safety Related Observations * Sutro Tower * ERI Project 38470/38471 * Inspected Feb 11 & Sep 30-Oct 1, 2020

NORTHEAST LEG 'C'					
OBSERV. NO.	² Location/Identification			³ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	Column	Elevation	¹ Item		
8	X-Face	6.1	O	Moderate rust on safety climb top anchorage v-bolts	Replace v-bolts (x3)
15	X-Face	4.18	O	Bent climbing ladder rungs	Field-straighten bent rung (x2)
26	X-Face	2.32-3.0	O	Climbing ladder rung footing clearance obstructed by installed reinforcement (1-1/2" footing clearance)	Rework ladder attachments to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path
27	X-Face	2.25-2.26	O	Bent climbing ladder rung	Field-straighten bent rung
30	X-Face	2.11-2.13	O	Climbing ladder rung footing clearance obstructed by installed reinforcement (1-1/2" footing clearance)	Rework ladder attachments to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path
33	X-Face	1.13	O	Climbing ladder rung footing clearance obstructed by installed 8-3/16" rigid line support	Reposition support to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path

NOTES: ¹Item Designation: L=Leg Member | D=Diagonal | H=Horizontal | C=Connection | O=Other

²Reference Appendix I Of This Report For Structure Orientation/Nomenclature Used For Identifying Specific Locations On The Structure

³Reference Appendix II Of This Report For More Detailed Information On Observations Along With Corresponding Picture(s)

SOUTH TRUSS (LEVEL 6)					
OBSERV. NO.	³ Location/Identification			⁴ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	¹ Chord	Horiz. Location	² Item		
35	---	6.1	O	Damaged top rail (bent and severely rusted at corner)	Replace rail assembly
36	U	6.1-6.2	O	Mild rust on HLL shackle bolt	Surface prepare and treat IAW STI-SOP-0001
SOUTH TRUSS (LEVEL 5)					
44	U	A & B Leg	O/HLL	Mild rust on HLL eye bolt	Surface prepare and treat IAW STI-SOP-0001
SOUTH TRUSS (LEVEL 4)					
46	U	A & B Leg	O/HLL	Mild rust on HLL eye bolt	Surface prepare and treat IAW STI-SOP-0001

NOTES: ¹Chord Designation: U=Upper | M=Mid | L=Lower

²Item Designation: L=Leg Member | D=Diagonal | H=Horizontal | C=Connection | O=Other | HLL=Horizontal Lifeline

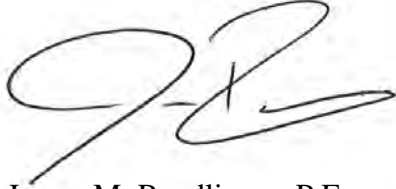
³Reference Appendix I Of This Report For Structure Orientation/Nomenclature Used For Identifying Specific Locations On The Structure

⁴Reference Appendix II Of This Report For More Detailed Information On Observations Along With Corresponding Picture(s)

SUMMARY

Please contact me if you should have any questions or require any additional details.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Ruedlinger', with a stylized flourish at the end.

James M. Ruedlinger, P.E.
Senior VP Engineering

APPENDIX I:
STRUCTURE ORIENTATION/NOMENCLATURE
977 FT SELF-SUPPORT TOWER
SAN FRANCISCO, CA
ASRN 1001289

Figure 1. Structure Orientation & Nomenclature

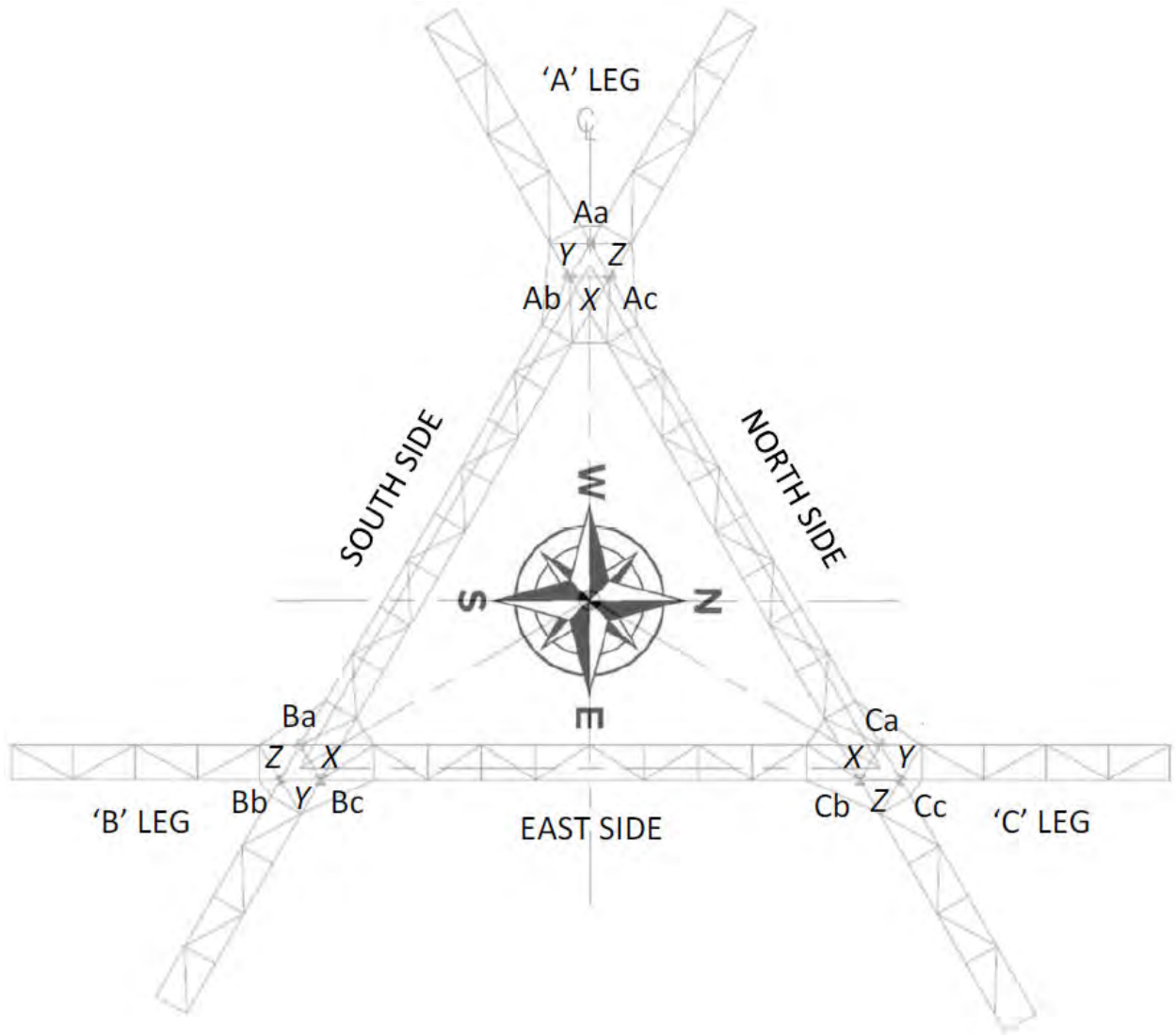


Figure 2. Portion of Structure Covered in this Report

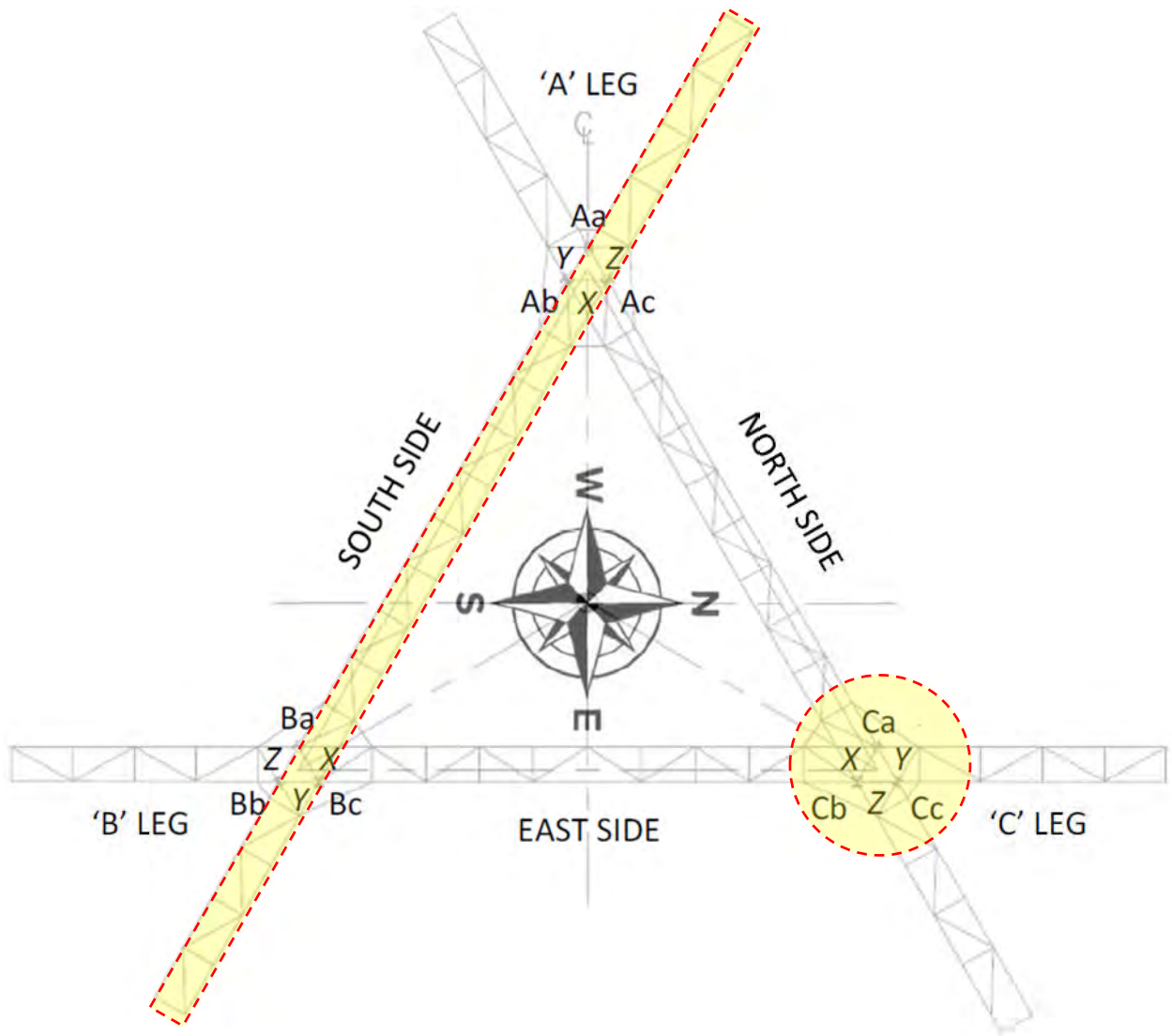


Figure 3. Stack 'C' Details

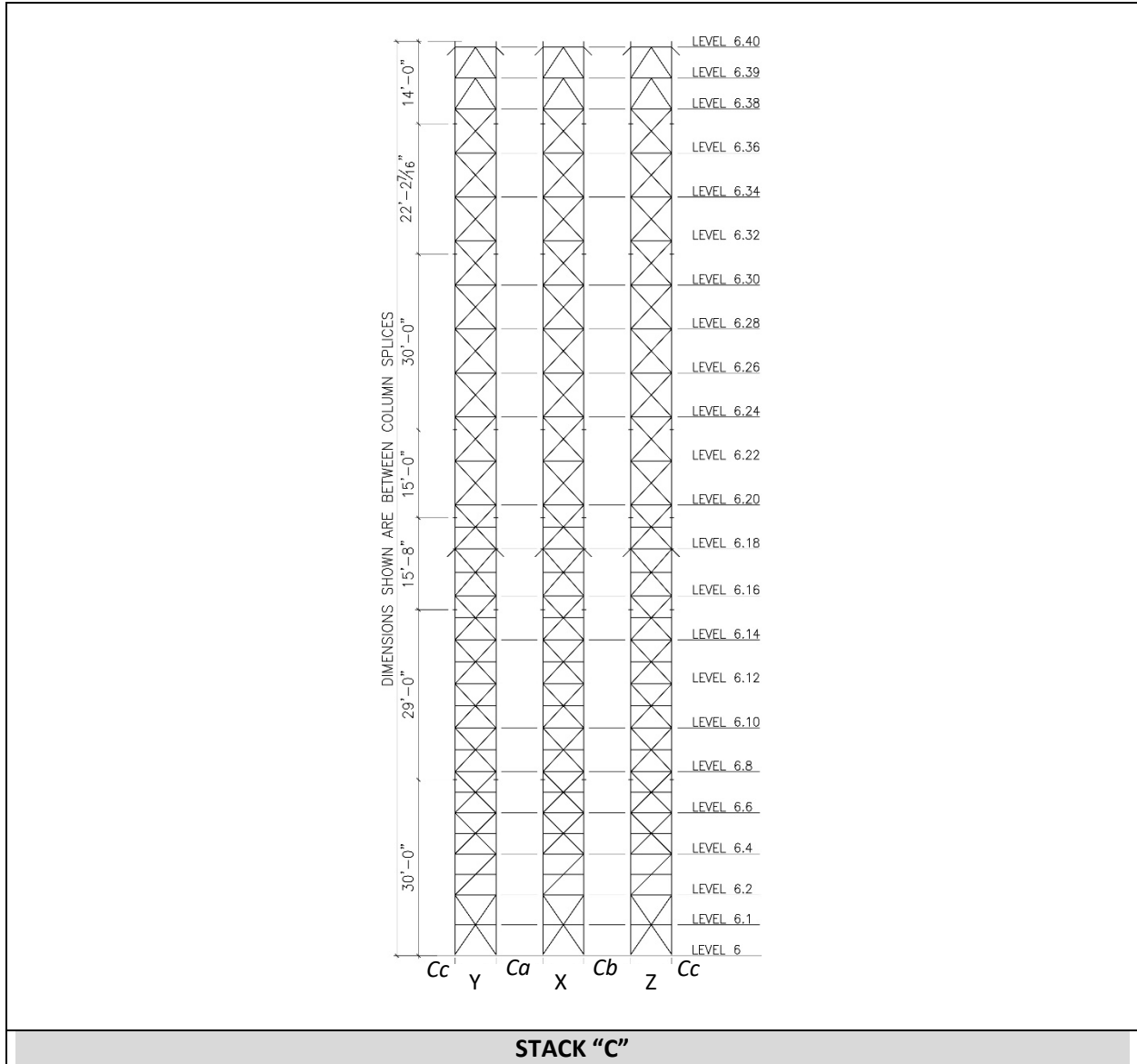


Figure 4. Leg 'C' Details

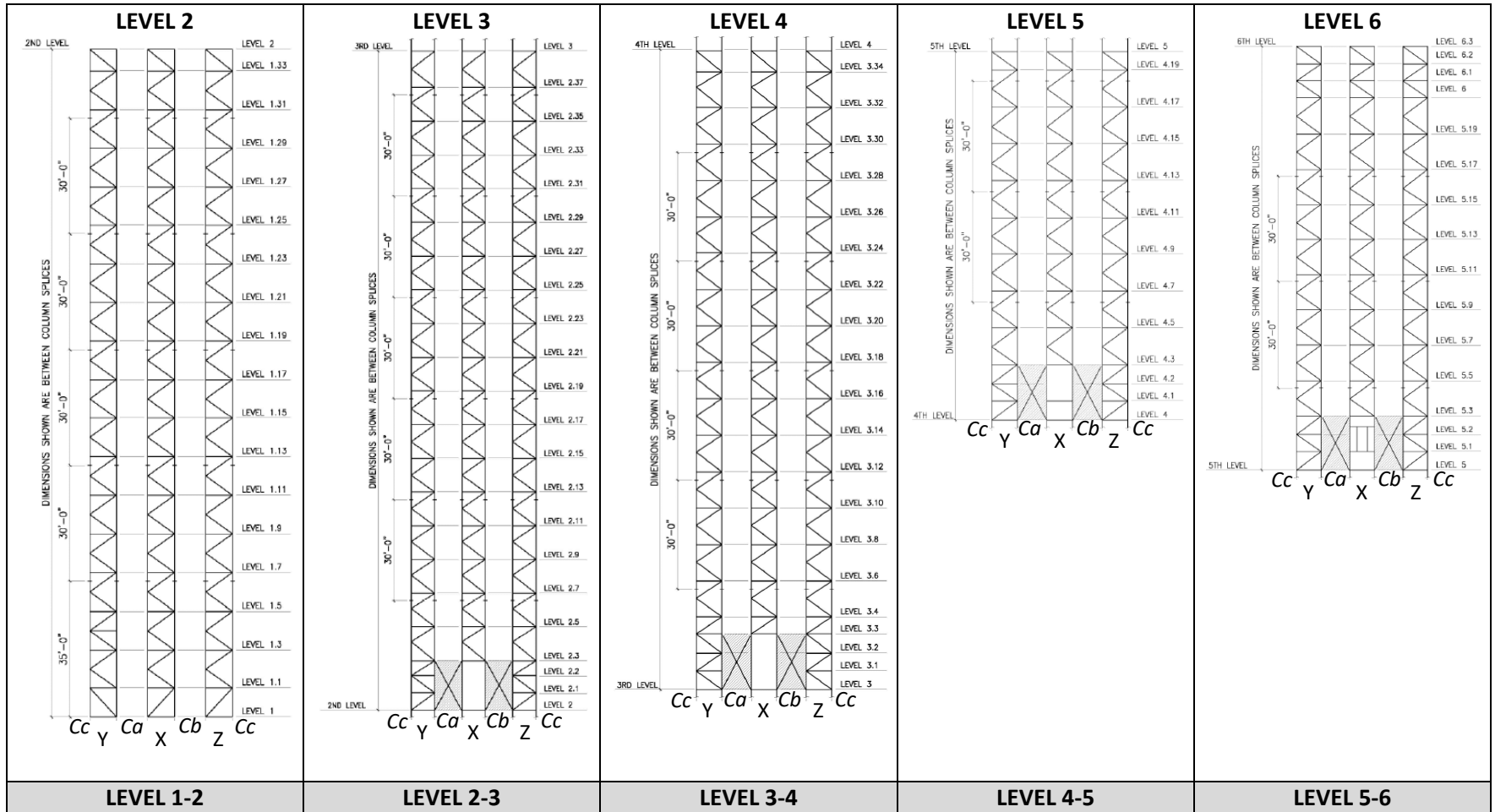
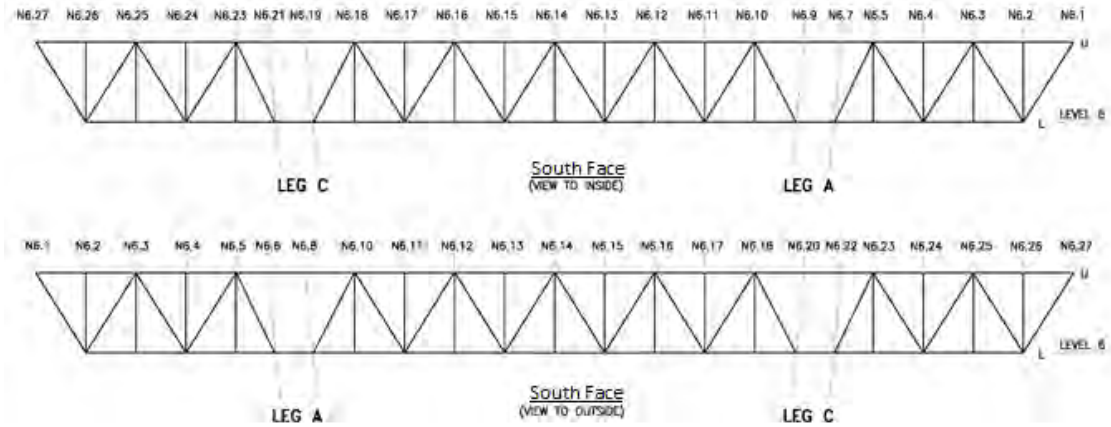


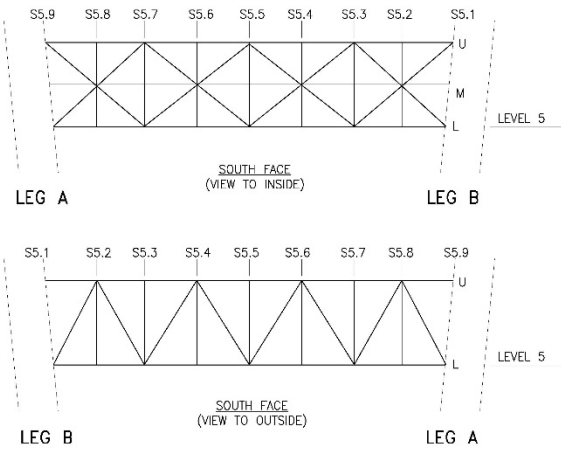
Figure 5. South Face Truss Level 6 Details



TRUSS LEVEL 6



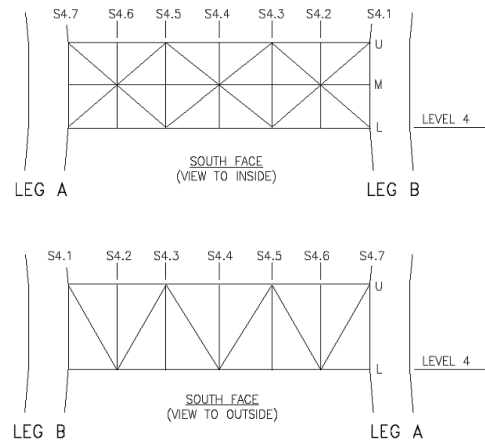
Figure 6. South Face Truss Level 5 Details



TRUSS LEVEL 5



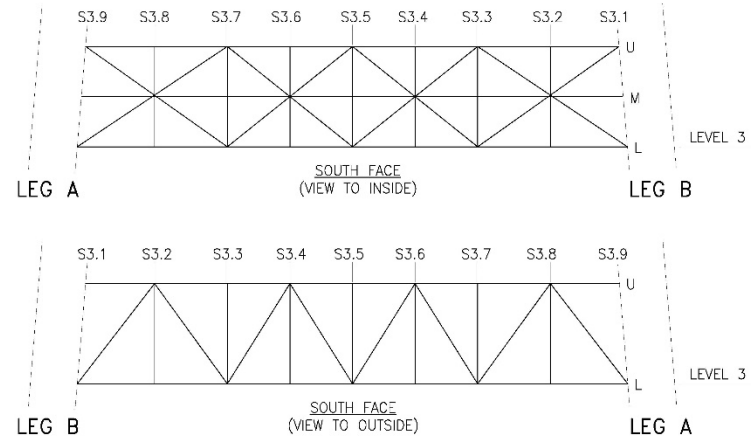
Figure 7. South Face Truss Level 4 Details



TRUSS LEVEL 4



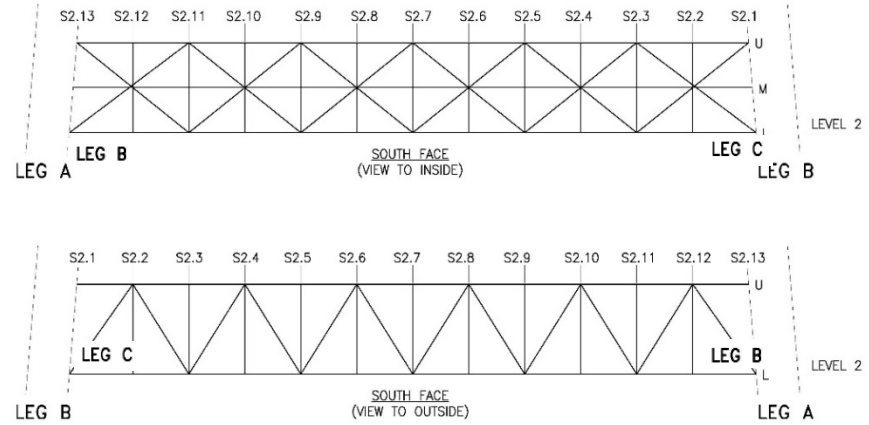
Figure 8. South Face Truss Level 3 Details



TRUSS LEVEL 3



Figure 9. South Face Truss Level 2 Details



TRUSS LEVEL 2



APPENDIX II:
INSPECTION SUMMARY & PICTURES
977 FT SELF-SUPPORT TOWER
SAN FRANCISCO, CA
ASRN 1001289

Inspection Summary * Sutro Tower * ERI Project 38470/38471 * Inspected Feb 11 & Sep 30-Oct 1, 2020

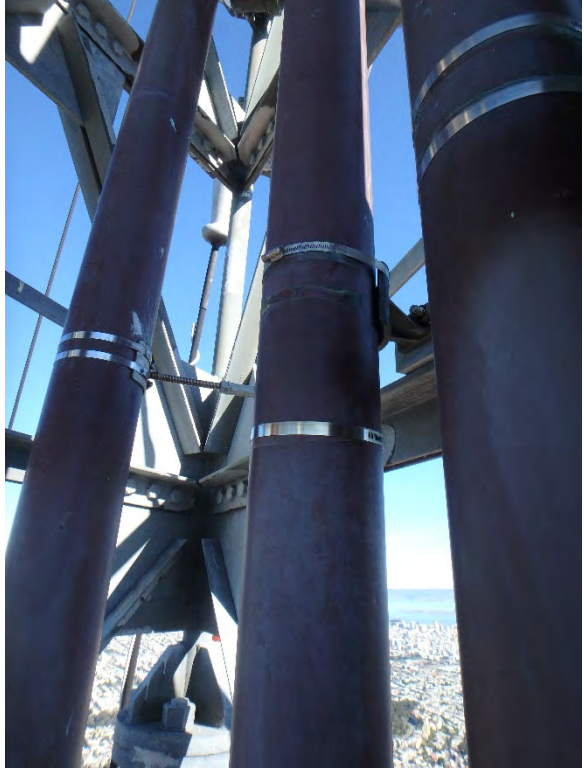

	;Denotes Occupational Safety Related Observation
	;Denotes Structural Damage Observation Requiring EOR Review
	;Denotes Missing or Damaged Hardware/Components Which Need To Be Installed, Repaired, or Replaced
	;Denotes Corrosion Observation Beyond STI-SOP-0001 Scope
	;Denotes General Maintenance Observations



NE STACK 'C'					
OBSERV. NO.	² Location/Identification			³ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	Column	Elevation	¹ Item		
1	---	6.38	O	Loose hose clamps on 6-1/8" rigid line fixed hanger	Secure loose hose clamps
2	Ca	6.32	O	Moderate rust on side-mount bracket assembly	Surface prepare and treat IAW STI-SOP-0001
3	Cb	6.32	O	Moderate rust on side-mount bracket assembly	Surface prepare and treat IAW STI-SOP-0001
4	Ca	6.26	O	Moderate rust on side-mount bracket assembly	Surface prepare and treat IAW STI-SOP-0001
5	Cb	6.26	O	Moderate rust on side-mount bracket assembly	Surface prepare and treat IAW STI-SOP-0001
NE STACK 'C' GUYING SYSTEM					
6	Guying	Truss Level 6	O	Moderate rust on all-thread cotter pins	Replace cotter pins with stainless steel pins
7	Guying	Level 1 Wires	O	Three locations including 1 on N Truss and 2 at NE Outrigger. Silicone sealant at socketed corona ends has split and separated from the cable and socket at anchor attachment ~ No damage noted to polyurethane jackets or poured resin	Remove loose silicone and debris and inject fresh pure black silicone ~ High quality pure black silicone from a local paint distributor may be used

NOTES: ¹Item Designation: L=Leg Member | D=Diagonal | H=Horizontal | C=Connection | O=Other

²Reference Appendix I Of This Report For Structure Orientation/Nomenclature Used For Identifying Specific Locations On The Structure

³Reference Appendix II Of This Report For More Detailed Information On Observations Along With Corresponding Picture(s)

OBSERVATION 1:	LOCATION:
	NE Stack C, Level 6.38
	CONCERN:
	Loose hose clamps on 6-1/8" rigid line fixed hanger
	RECOMMENDED ACTION:
Secure loose hose clamps	ADDITIONAL COMMENTS:
N/A	
OBSERVATION 2:	LOCATION:
	NE Stack C, Level 6.32
	CONCERN:
	Moderate rust on side-mount bracket assembly
	RECOMMENDED ACTION:
Surface prepare and treat IAW STI-SOP-0001	ADDITIONAL COMMENTS:
N/A	

<p>OBSERVATION 3:</p> 	<p>LOCATION: NE Stack C, Level 6.32</p> <p>CONCERN: Moderate rust on side-mount bracket assembly</p> <p>RECOMMENDED ACTION: Surface prepare and treat IAW STI-SOP-0001</p> <p>ADDITIONAL COMMENTS: N/A</p>
<p>OBSERVATION 4:</p> 	<p>LOCATION: NE Stack C, Level 6.26</p> <p>CONCERN: Moderate rust on side-mount bracket assembly</p> <p>RECOMMENDED ACTION: Surface prepare and treat IAW STI-SOP-0001</p> <p>ADDITIONAL COMMENTS: N/A</p>

<p>OBSERVATION 5:</p> 	<p>LOCATION: NE Stack C, Level 6.26</p> <p>CONCERN: Moderate rust on side-mount bracket assembly</p> <p>RECOMMENDED ACTION: Surface prepare and treat IAW STI-SOP-0001</p> <p>ADDITIONAL COMMENTS: N/A</p>
<p>OBSERVATION 6:</p> 	<p>LOCATION: NE Stack C Guying, Attachments At Level 6</p> <p>CONCERN: Moderate rust on all-thread cotter pins</p> <p>RECOMMENDED ACTION: Replace cotter pins with stainless steel pins</p> <p>ADDITIONAL COMMENTS: N/A</p>

OBSERVATION 7:



LOCATION:

NE Stack C Guying, Level 1 Wires

CONCERN:

Three locations including 1 on N Truss and 2 at NE Outrigger; Silicone sealant at socketed corona ends has split and separated from the cable and socket at anchor attachment ~ No damage noted to polyurethane jackets or poured resin

RECOMMENDED ACTION:

Remove loose silicone and debris and inject fresh pure black silicone ~ High quality pure black silicone from a local paint distributor may be used

ADDITIONAL COMMENTS:

N/A

Inspection Summary * Sutro Tower * ERI Project 38470/38471 * Inspected Feb 11 & Sep 30-Oct 1, 2020

	;Denotes Occupational Safety Related Observation
	;Denotes Structural Damage Observation Requiring EOR Review
	;Denotes Missing or Damaged Hardware/Components Which Need To Be Installed, Repaired, or Replaced
	;Denotes Corrosion Observation Beyond STI-SOP-0001 Scope
	;Denotes General Maintenance Observations

NORTHEAST LEG 'C'					
OBSERV. NO.	Location/Identification			OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	Column	Elevation	Item		
8	X-Face	6.1	O	Moderate rust on safety climb top anchorage v-bolts	Replace v-bolts (x3)
9	Ca	5.16-5.17	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
10	---	5.9	O	Missing spring hanger on 6-1/8" rigid line	Install spring hanger
11	Ca	5.4-5.5	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
12	Cc	5.4-5.5	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
13	Ca	4.18-4.19	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
14	Cc	4.18	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
15	X-Face	4.18	O	Bent climbing ladder rungs	Field-straighten bent rung (x2)
16	Ca	4.12-4.13	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
17	Ca	4.6-4.7	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
18	---	3.34	O	Missing hose clamps on 8-3/16" rigid line fixed hanger	Install hose clamps (x2)
19	Ca	3.29-3.30	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
20	Ca	3.23-3.24	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
21	Y-Face	3.20	O	Missing line hanger on 7/8" line	Install hanger
22	Ca	3.17-3.18	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
23	Ca	3.11-3.12	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.

Inspection Summary * Sutro Tower * ERI Project 38470/38471 * Inspected Feb 11 & Sep 30-Oct 1, 2020

	;Denotes Occupational Safety Related Observation
	;Denotes Structural Damage Observation Requiring EOR Review
	;Denotes Missing or Damaged Hardware/Components Which Need To Be Installed, Repaired, or Replaced
	;Denotes Corrosion Observation Beyond STI-SOP-0001 Scope
	;Denotes General Maintenance Observations

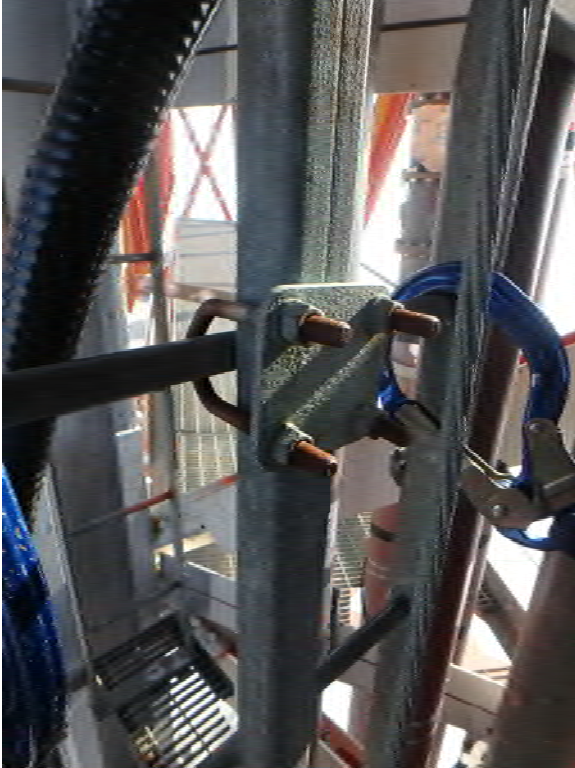
NORTHEAST LEG 'C'					
OBSERV. NO.	² Location/Identification			³ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	Column	Elevation	¹ Item		
24	Ca	3.5-3.6	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
25	Ca	2.36-2.37	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
26	X-Face	2.32-3.0	O	Climbing ladder rung footing clearance obstructed by installed reinforcement (1-1/2" footing clearance)	Rework ladder attachments to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path
27	X-Face	2.25-2.26	O	Bent climbing ladder rung	Field-straighten bent rung
28	Ca	2.24-2.25	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
29	Ca	2.18-2.19	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
30	X-Face	2.11-2.13	O	Climbing ladder rung footing clearance obstructed by installed reinforcement (1-1/2" footing clearance)	Rework ladder attachments to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path
31	---	2.9	O	Missing spring hanger on 6-1/8" rigid line	Install spring hanger
32	---	1.24-1.29	O	(2) 1-1/4" lines unsupported	Secure lines
33	X-Face	1.13	O	Climbing ladder rung footing clearance obstructed by installed 8-3/16" rigid line support	Reposition support to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path
34	Ca	1.6-1.7	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.

NOTES: ¹Item Designation: L=Leg Member | D=Diagonal | H=Horizontal | C=Connection | O=Other

²Reference Appendix I Of This Report For Structure Orientation/Nomenclature Used For Identifying Specific Locations On The Structure

³Reference Appendix II Of This Report For More Detailed Information On Observations Along With Corresponding Picture(s)

OBSERVATION 8:



LOCATION:

NE Leg C, Level 6.1, X-Face

CONCERN:



Moderate rust on safety climb top anchorage v-bolts



RECOMMENDED ACTION:



Replace v-bolts (x3)



ADDITIONAL COMMENTS:



N/A



<p>OBSERVATION 9:</p> 	<p>LOCATION: NE Leg C, Level 5.16-5.17, Ca</p> <p>CONCERN: Moderate/severe rust on column bolts</p> <p>RECOMMENDED ACTION: Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.</p> <p>ADDITIONAL COMMENTS: N/A</p>
<p>OBSERVATION 10:</p> 	<p>LOCATION: NE Leg C, Level 5.9</p> <p>CONCERN: Missing spring hanger on 6-1/8" rigid line</p> <p>RECOMMENDED ACTION: Install spring hanger</p> <p>ADDITIONAL COMMENTS: N/A</p>

OBSERVATION 11:	LOCATION:
	NE Leg C, Level 5.4-5.5, Ca
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
	ADDITIONAL COMMENTS:
	N/A
OBSERVATION 12:	LOCATION:
	NE Leg C, Level 5.4-5.5, Cc
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
	ADDITIONAL COMMENTS:
	N/A



<p>OBSERVATION 13:</p>	<p>LOCATION:</p>
	<p>NE Leg C, Level 4.18-4.19, Ca</p>
	<p>CONCERN:</p>
	<p>Moderate/severe rust on column bolts</p>
	<p>RECOMMENDED ACTION:</p> <p>Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.</p>
<p>ADDITIONAL COMMENTS:</p>	<p>N/A</p>
<p>OBSERVATION 14:</p>	<p>LOCATION:</p>
	<p>NE Leg C, Level 4.18, Cc</p>
	<p>CONCERN:</p>
	<p>Moderate/severe rust on column bolts</p>
	<p>RECOMMENDED ACTION:</p> <p>Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.</p>
<p>ADDITIONAL COMMENTS:</p>	<p>N/A</p>


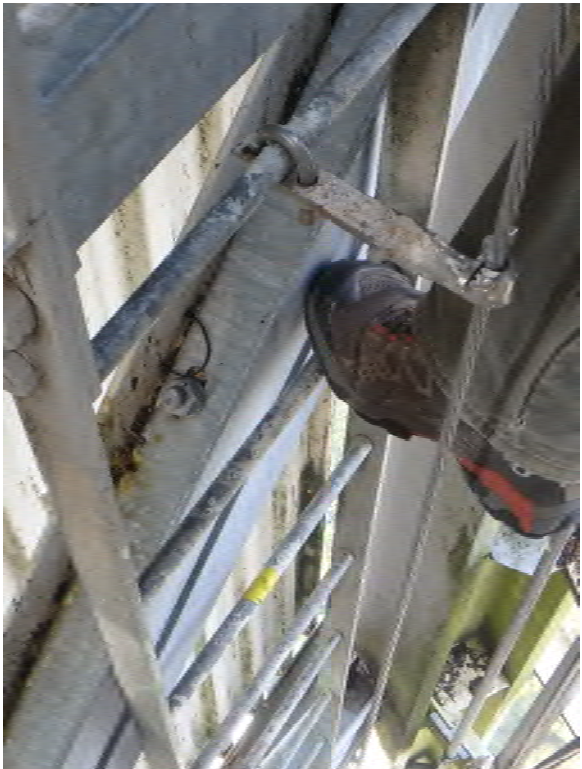
<p>OBSERVATION 15:</p> 	<p>LOCATION: NE Leg C, Level 4.18, X-Face</p> <p>CONCERN: Bent climbing ladder rungs</p> <p>RECOMMENDED ACTION: Field-straighten bent rung (x2)</p> <p>ADDITIONAL COMMENTS: N/A</p>
<p>OBSERVATION 16:</p> 	<p>LOCATION: NE Leg C, Level 4.12-4.13, Ca</p> <p>CONCERN: Moderate/severe rust on column bolts</p> <p>RECOMMENDED ACTION: Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.</p> <p>ADDITIONAL COMMENTS: N/A</p>



OBSERVATION 17:	LOCATION:
	NE Leg C, Level 4.6-4.7, Ca
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
	ADDITIONAL COMMENTS:
	N/A
OBSERVATION 18:	LOCATION:
	NE Leg C, Level 3.34
	CONCERN:
	Missing hose clamps on 8-3/16" rigid line fixed hanger
	RECOMMENDED ACTION:
	Install hose clamps (x2)
	ADDITIONAL COMMENTS:
	N/A

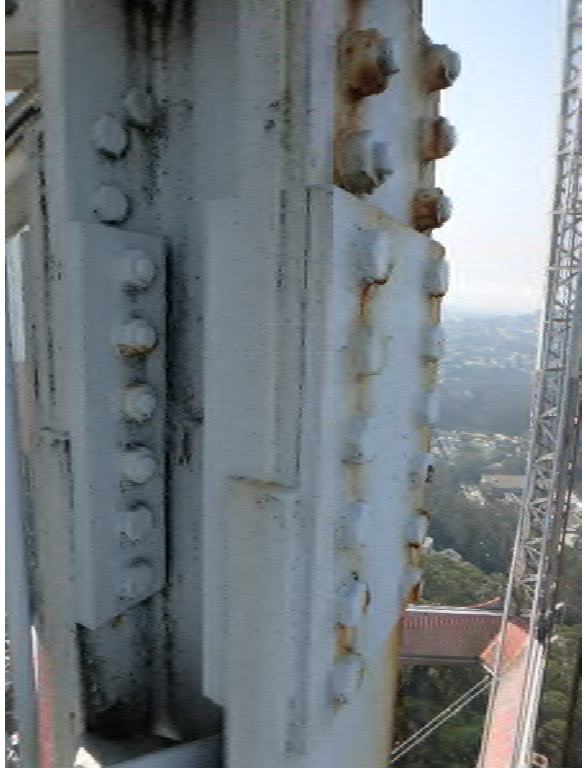

OBSERVATION 19:	LOCATION:
	NE Leg C, Level 3.29-3.30, Ca
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
	ADDITIONAL COMMENTS:
	N/A
OBSERVATION 20:	LOCATION:
	NE Leg C, Level 3.23-3.24, Ca
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
	ADDITIONAL COMMENTS:
	N/A

<p>OBSERVATION 21:</p> 	<p>LOCATION: NE Leg C, Level 3.20, Y-Face</p> <p>CONCERN: Missing line hanger on 7/8" line</p> <p>RECOMMENDED ACTION: Install hanger</p> <p>ADDITIONAL COMMENTS: N/A</p>
<p>OBSERVATION 22:</p> 	<p>LOCATION: NE Leg C, Level 3.17-3.18, Ca</p> <p>CONCERN: Moderate/severe rust on column bolts</p> <p>RECOMMENDED ACTION: Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.</p> <p>ADDITIONAL COMMENTS: N/A</p>

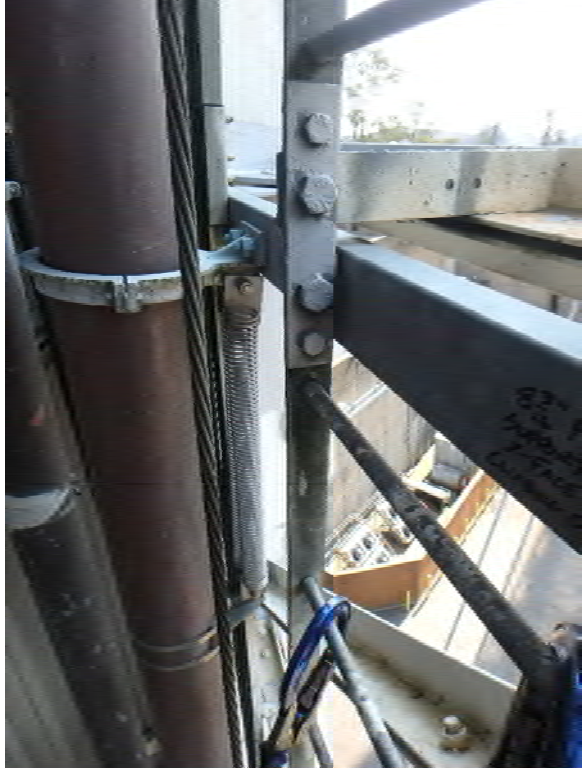

OBSERVATION 23:	LOCATION:
	NE Leg C, Level 3.11-3.12, Ca
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
ADDITIONAL COMMENTS:	N/A
OBSERVATION 24:	LOCATION:
	NE Leg C, Level 3.5-3.6, Ca
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
ADDITIONAL COMMENTS:	N/A

OBSERVATION 25:	LOCATION:
	NE Leg C, Level 2.36-2.37, Ca
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.	ADDITIONAL COMMENTS:
N/A	
OBSERVATION 26:	LOCATION:
	NE Leg C, Level 2.32-3.0, X-Face
	CONCERN:
	Climbing ladder rung footing clearance obstructed by installed reinforcement (1-1/2" footing clearance)
	RECOMMENDED ACTION:
Rework ladder attachments to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path	ADDITIONAL COMMENTS:
N/A	

OBSERVATION 27:	LOCATION: NE Leg C, Level 2.25-2.26, X-Face
	CONCERN: Bent climbing ladder rung
	RECOMMENDED ACTION: Field-straighten bent rung
	ADDITIONAL COMMENTS: N/A
OBSERVATION 28:	LOCATION: NE Leg C, Level 2.24-2.25, Ca
	CONCERN: Moderate/severe rust on column bolts
	RECOMMENDED ACTION: Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
	ADDITIONAL COMMENTS: N/A

OBSERVATION 29:	LOCATION:
	NE Leg C, Level 2.18-2.19, Ca
	CONCERN:
	Moderate/severe rust on column bolts
	RECOMMENDED ACTION:
Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.	ADDITIONAL COMMENTS:
N/A	
OBSERVATION 30:	LOCATION:
	NE Leg C, Level 2.11-2.13, X-Face
	CONCERN:
	Climbing ladder rung footing clearance obstructed by installed reinforcement (1-1/2" footing clearance)
	RECOMMENDED ACTION:
Rework ladder attachments to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path	ADDITIONAL COMMENTS:
N/A	

OBSERVATION 31:	LOCATION:
	NE Leg C, Level 2.9
	CONCERN:
	Missing spring hanger on 6-1/8" rigid line
	RECOMMENDED ACTION:
Install spring hanger	ADDITIONAL COMMENTS:
N/A	
OBSERVATION 32:	LOCATION:
	NE Leg C, Level 1.24-1.29
	CONCERN:
	(2) 1-1/4" lines unsupported
	RECOMMENDED ACTION:
Secure lines	ADDITIONAL COMMENTS:
N/A	

OBSERVATION 33:	LOCATION: NE Leg C, Level 1.13, X-Face
	CONCERN: Climbing ladder rung footing clearance obstructed by installed 8-3/16" rigid line support
	RECOMMENDED ACTION: Reposition support to provide adequate clearance, or install warning signage above and below to notify climbers of obstructed path
	ADDITIONAL COMMENTS: N/A
OBSERVATION 34:	LOCATION: NE Leg C, Level 1.6-1.7, Ca
	CONCERN: Moderate/severe rust on column bolts
	RECOMMENDED ACTION: Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
	ADDITIONAL COMMENTS: N/A

Inspection Summary * Sutro Tower * ERI Project 38470/38471 * Inspected Feb 11 & Sep 30-Oct 1, 2020

	;Denotes Occupational Safety Related Observation
	;Denotes Structural Damage Observation Requiring EOR Review
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	;Denotes Corrosion Observation Beyond STI-SOP-0001 Scope
	;Denotes General Maintenance Observations


SOUTH TRUSS (LEVEL 6)					
OBSERV. NO.	³ Location/Identification			⁴ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	¹ Chord	Horiz. Location	² Item		
35	---	6.1	O	Damaged top rail (bent and severely rusted at corner)	Replace rail assembly
36	(HLL)	6.1-6.2	O	Mild rust on HLL shackle bolt	Surface prepare and treat IAW STI-SOP-0001
37	IU	6.4-6.5	C	Loose stitch bolt (x2); diag	Stitch bolts loosened to facilitate gusset reinforcement which was in progress during inspection; check and ensure stitch bolts are fully retightened
38	IU	6.5	C	Loose stitch bolt (x2); vertical	Stitch bolts loosened to facilitate gusset reinforcement which was in progress during inspection; check and ensure stitch bolts are fully retightened
39	IL	6.5	C	Missing stitch bolt; vertical	Install stitch bolt
40	IU	6.5-6.6	C	Loose stitch bolt (x2); diag	Stitch bolts loosened to facilitate gusset reinforcement which was in progress during inspection; check and ensure stitch bolts are fully retightened
41	OL	6.11-6.12	D	Minor yielding; diag ~ flange deformed 1/8" over 12" span	Contact EOR to determine if any CA is warranted
42	IL	6.22	C	Loose bolts (x2); diag	Retighten or replace bolts
43	OU	6.24	C	Loose bolt; wind brace	Retighten or replace bolt


NOTES: ¹Chord Designation: U=Upper | M=Mid | L=Lower

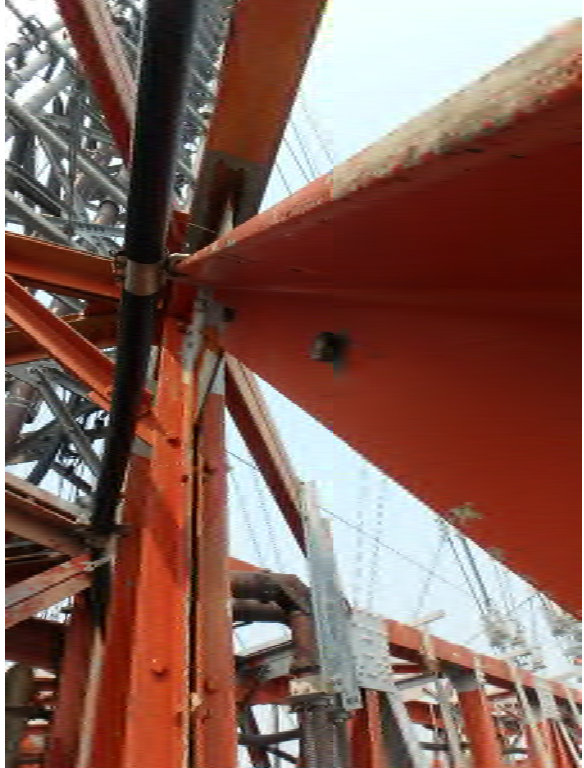

²Item Designation: L=Leg Member | D=Diagonal | H=Horizontal | C=Connection | O=Other | HLL=Horizontal Lifeline


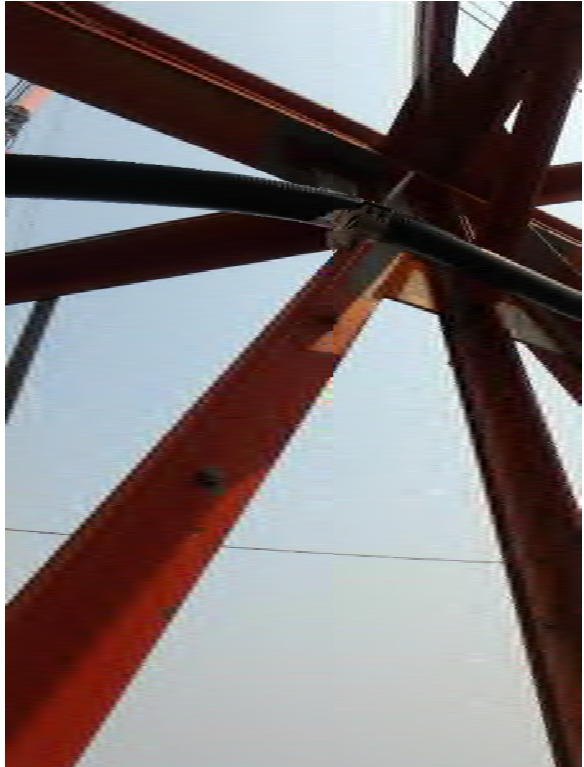
³Reference Appendix I Of This Report For Structure Orientation/Nomenclature Used For Identifying Specific Locations On The Structure

⁴Reference Appendix II Of This Report For More Detailed Information On Observations Along With Corresponding Picture(s)

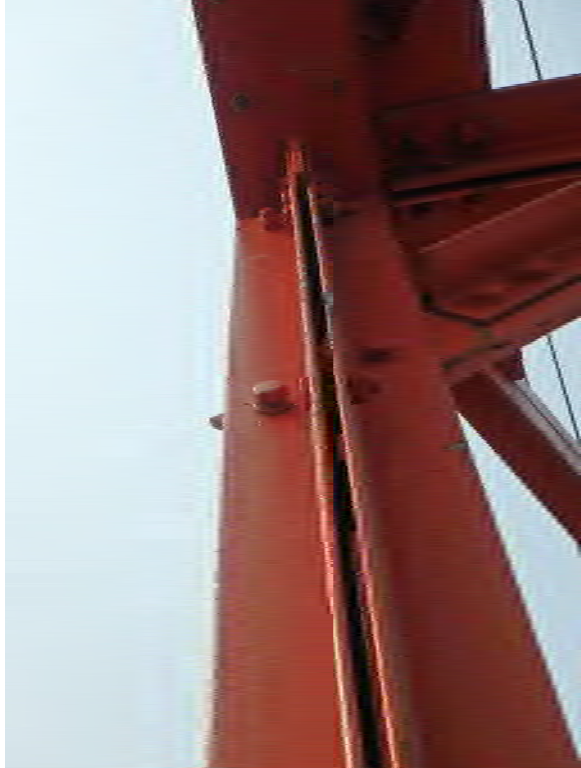
<p>OBSERVATION 35:</p> 	<p>LOCATION: South Truss Level 6, Panel 6.1</p> <p>CONCERN: Damaged top rail (bent and severely rusted at corner)</p> <p>RECOMMENDED ACTION: Replace rail assembly</p> <p>ADDITIONAL COMMENTS: N/A</p>
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<p>OBSERVATION 36:</p> 	<p>LOCATION: South Truss Level 6, Panel 6.1-6.2</p> <p>CONCERN: Mild rust on HLL shackle bolt</p> <p>RECOMMENDED ACTION: Surface prepare and treat IAW STI-SOP-0001</p> <p>ADDITIONAL COMMENTS: N/A</p>
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<p>OBSERVATION 37:</p> 	<p>LOCATION: South Truss Level 6, Panel 6.4-6.5</p> <p>CONCERN: Loose stitch bolt (x2); diag</p> <p>RECOMMENDED ACTION: Stitch bolts loosened to facilitate gusset reinforcement which was in progress during inspection; check and ensure stitch bolts are fully retightened</p> <p>ADDITIONAL COMMENTS: N/A</p>
<p>OBSERVATION 38:</p> 	<p>LOCATION: South Truss Level 6, Panel 6.5</p> <p>CONCERN: Loose stitch bolt (x2); vertical</p> <p>RECOMMENDED ACTION: Stitch bolts loosened to facilitate gusset reinforcement which was in progress during inspection; check and ensure stitch bolts are fully retightened</p> <p>ADDITIONAL COMMENTS: N/A</p>

<p>OBSERVATION 39:</p> 	<p>LOCATION: South Truss Level 6, Panel 6.5</p> <p>CONCERN: Missing stitch bolt; vertical</p> <p>RECOMMENDED ACTION: Install stitch bolt</p> <p>ADDITIONAL COMMENTS: N/A</p>
<p>OBSERVATION 40:</p> 	<p>LOCATION: South Truss Level 6, Panel 6.5-6.6</p> <p>CONCERN: Loose stitch bolt (x2); diag</p> <p>RECOMMENDED ACTION: Stitch bolts loosened to facilitate gusset reinforcement which was in progress during inspection; check and ensure stitch bolts are fully retightened</p> <p>ADDITIONAL COMMENTS: N/A</p>

OBSERVATION 41:	LOCATION:
	South Truss Level 6, Panel 6.11-6.12
	CONCERN:
	Minor yielding; diag ~ flange deformed 1/8" over 12" span
	RECOMMENDED ACTION:
Contact EOR to determine if any CA is warranted	ADDITIONAL COMMENTS:
N/A	
OBSERVATION 42:	LOCATION:
	South Truss Level 6, Panel 6.22
	CONCERN:
	Loose bolts (x2); diag
	RECOMMENDED ACTION:
Retighten or replace bolts	ADDITIONAL COMMENTS:
N/A	

OBSERVATION 43:	LOCATION:
	South Truss Level 6, Panel 6.24
	CONCERN:
	Loose bolt; wind brace
	RECOMMENDED ACTION:
	Retighten or replace bolt
	ADDITIONAL COMMENTS:
	N/A

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	;Denotes General Maintenance Observations


SOUTH TRUSS (LEVEL 5)					
OBSERV. NO.	³ Location/Identification			⁴ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	¹ Chord	Horiz. Location	² Item		
44	(HLL)	A & B Leg	O	Mild rust on HLL eye bolt	Surface prepare and treat IAW STI-SOP-0001
45	U	5.6	O	Minor rust; antenna mount bolts	Surface prepare and treat IAW STI-SOP-0001

NOTES: ¹Chord Designation: U=Upper | M=Mid | L=Lower

²Item Designation: L=Leg Member | D=Diagonal | H=Horizontal | C=Connection | O=Other | HLL=Horizontal Lifeline

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OBSERVATION 44:	LOCATION:
	South Truss Level 5, A & B Leg
	CONCERN:
	Mild rust on HLL eye bolt
	RECOMMENDED ACTION:
	Surface prepare and treat IAW STI-SOP-0001
	ADDITIONAL COMMENTS:
	N/A
OBSERVATION 45:	LOCATION:
	South Truss Level 5, Panel 5.6
	CONCERN:
	Minor rust; antenna mount bolts
	RECOMMENDED ACTION:
	Surface prepare and treat IAW STI-SOP-0001
	ADDITIONAL COMMENTS:
	N/A

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	;Denotes General Maintenance Observations

SOUTH TRUSS (LEVEL 4)					
OBSERV. NO.	³ Location/Identification			⁴ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	¹ Chord	Horiz. Location	² Item		
46	(HLL)	A & B Leg	O	Mild rust on HLL eye bolt	Surface prepare and treat IAW STI-SOP-0001
47	U	4.2-4.3	O	Minor rust; antenna mount bolts	Surface prepare and treat IAW STI-SOP-0001
48	U	4.3-4.4	O	Minor rust; antenna mount bolts	Surface prepare and treat IAW STI-SOP-0001
49	U	4.4-4.5	O	Minor rust; antenna mount bolts	Surface prepare and treat IAW STI-SOP-0001
50	---	(Inside Truss)	O	Minor rust; rigid line chain supports & conduit	Surface prepare and treat IAW STI-SOP-0001

NOTES: ¹Chord Designation: U=Upper | M=Mid | L=Lower

²Item Designation: L=Leg Member | D=Diagonal | H=Horizontal | C=Connection | O=Other | HLL=Horizontal Lifeline

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OBSERVATION 46:



LOCATION:

South Truss Level 4, A & B Leg

CONCERN:

Minor rust; antenna mount bolts

RECOMMENDED ACTION:

Surface prepare and treat IAW STI-SOP-0001

ADDITIONAL COMMENTS:

N/A

OBSERVATION 47:



LOCATION:

South Truss Level 4, Panel 4.2-4.3

CONCERN:

Minor rust; antenna mount bolts

RECOMMENDED ACTION:

Surface prepare and treat IAW STI-SOP-0001

ADDITIONAL COMMENTS:

N/A

OBSERVATION 48:



LOCATION:

South Truss Level 4, Panel 4.3-4.4

CONCERN:

Minor rust; antenna mount bolts

RECOMMENDED ACTION:

Surface prepare and treat IAW STI-SOP-0001

ADDITIONAL COMMENTS:

N/A

OBSERVATION 49:



LOCATION:

South Truss Level 4, Panel 4.4-4.5

CONCERN:

Minor rust; antenna mount bolts

RECOMMENDED ACTION:

Surface prepare and treat IAW STI-SOP-0001

ADDITIONAL COMMENTS:

N/A

OBSERVATION 50:



LOCATION:

South Truss Level 4, Inside Truss

CONCERN:

Minor rust; rigid line chain supports & conduit

RECOMMENDED ACTION:

Surface prepare and treat IAW STI-SOP-0001

ADDITIONAL COMMENTS:

N/A

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	;Denotes General Maintenance Observations



SOUTH TRUSS (LEVEL 3)					
OBSERV. NO.	³ Location/Identification			⁴ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	¹ Chord	Horiz. Location	² Item		
51	L	3.1	C	Moderate/severe rust on column bolts	Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
52	U	3.2-3.3	O	Minor rust; antenna mount bolts	Surface prepare and treat IAW STI-SOP-0001
53	U	3.5-3.6	O	Minor rust; antenna mount bolts	Surface prepare and treat IAW STI-SOP-0001

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OBSERVATION 51:	LOCATION: South Truss Level 3, Panel 3.1
	CONCERN: Moderate/severe rust on column bolts
	RECOMMENDED ACTION: Surface prepare bolts and replace if material loss exceeds limits set in the 2014 Bolt Replacement Criteria, Tables 5 & 6. If material loss is within acceptable tolerances, repair and coat IAW STI-SOP-0001.
	ADDITIONAL COMMENTS: N/A
OBSERVATION 52:	LOCATION: South Truss Level 3, Panel 3.2-3.3
	CONCERN: Minor rust; antenna mount bolts
	RECOMMENDED ACTION: Surface prepare and treat IAW STI-SOP-0001
	ADDITIONAL COMMENTS: N/A

OBSERVATION 53:



LOCATION:

South Truss Level 3, Panel 3.5-3.6

CONCERN:

Minor rust; antenna mount bolts

RECOMMENDED ACTION:

Surface prepare and treat IAW STI-SOP-0001

ADDITIONAL COMMENTS:

N/A

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	;Denotes General Maintenance Observations

SOUTH TRUSS (LEVEL 2)					
OBSERV. NO.	³ Location/Identification			⁴ OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
	¹ Chord	Horiz. Location	² Item		
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	;Denotes General Maintenance Observations

MISCELLANEOUS				
OBSERV. NO.	¹ Location/Identification	Photo No.	² OBSERVATION COMMENTS	RECOMMENDED CORRECTIVE ACTION (CA)
54	STRANDS	---	Strand high frequency dampers throughout structure exhibit broken/degraded safeties, stiff/corroded damper cables, and/or missing components.	Replace high frequency strand dampers
55	Flex transmission lines	---	With cladding removed, flex transmission line supports should be evaluated to comply with minimum attachment intervals to prevent wind damage	Add line supports along with messenger conduits as needed to maintain adequate attachment intervals; unless otherwise noted by a specific line supplier, secure lines at maximum intervals of 3 feet to the supporting structure or messenger conduit

NOTES: ¹Reference Appendix I Of This Report For Structure Orientation/Nomenclature Used For Identifying Specific Locations On The Structure

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<p>OBSERVATION 54:</p> 	<p>LOCATION: Column Strand Bracing</p> <p>CONCERN: Strand high frequency dampers throughout structure exhibit broken/degraded safeties, stiff/corroded damper cables, and/or missing components.</p> <p>RECOMMENDED ACTION: Replace high frequency strand dampers</p> <p>ADDITIONAL COMMENTS: N/A</p>
<p>OBSERVATION 55:</p> 	<p>LOCATION: Columns</p> <p>CONCERN: With cladding removed, flex transmission line supports should be evaluated to comply with minimum attachment intervals to prevent wind damage</p> <p>RECOMMENDED ACTION: Add line supports along with messenger conduits as needed to maintain adequate attachment intervals; unless otherwise noted by a specific line supplier, secure lines at maximum intervals of 3 feet to the supporting structure or messenger conduit</p> <p>ADDITIONAL COMMENTS: N/A</p>