



February 11, 2015

Sutro Tower, Inc.  
1 La Avanzada Street  
San Francisco, CA 94131-1124

Attention: Mr. Eric Dausman

Re: **Field Evaluation of Existing  
977-Foot Self-Support Tower  
San Francisco, California  
TCI Project Number 14.082.001**

Dear Mr. Dausman,

We are pleased to submit our report on the field observation of the above referenced self-support tower.

**Authorization / Purpose:**

Tower Consultants Incorporated was retained by Sutro Tower Company to conduct a field observation of the 977-foot self-support tower. The inspection work has been performed in accordance with the requirements of the ANSI/TIA-222-G standard.

The purpose of the field observation was to visually evaluate the condition and structural integrity of the tower. A routine inspection was performed of leg A, the north face trusses, the strands and the bases and stack A above the 6<sup>th</sup> level.

The tower is located in San Francisco, California. J. Altmyer, P.E. & Y. Kabatski performed the site observations between May 2014 and November 2014.

**Field Observations:**

The inspection consisted of a tower climb and visual examination of the tower members, connections, antennas, feed lines and mounting hardware. Only those members that could be seen with binoculars and the naked eye were inspected. There are some areas on the faces and legs that were covered by skin and could not be inspected.

The structural elements of the tower appear to be in fair condition but with completion of the recommended actions below, we anticipate the elements will be improved to a good condition. The structural beams at levels 2 and 3 were recently cleaned and painted. There are areas of the tower where rust has formed on the tower member surfaces. Minor to medium rust was seen on gusset plates between levels 1 and 4. We recommend that these areas be scraped

# Tower Consultants, Inc.

and painted during the next maintenance project. Many diagonal connections to leg members have drain holes that are plugged causing standing water that will lead to rusted steel. These connections should be power washed by Sutro personnel and the drain holes unplugged and inspected next year to evaluate their condition. There are many corroded fasteners throughout the tower height. A criteria has been developed for replacing nuts or bolts. Approximately 1,000 bolts were replaced in 2014 and many others were cleaned and painted. Inspection and evaluation of the nuts and bolts should be continued in 2015. If the nuts or bolts meet the acceptance criteria specified by Simpson Gumpertz & Heger Inc. they should be painted and then evaluated in the future for additional corrosion. If the nuts or bolts do not meet the acceptance criteria then they should be replaced.

The tower skin showed no distress. The strands and guy wires are in good condition and are properly tensioned.

The tower bases are in good condition. The exposed surfaces of the concrete foundation at the tower base are in good condition. The tower base is properly grounded.

The climbing facilities and platforms were secure and appear to be in good condition with the exception of the rusted catwalk hardware and the missing handrail cable on level six which has been referred to the Sutro Tower crew for replacement.

The elevator cable keepers show major rust. Some of the elevator cable keepers and guides have been replaced and the rest of them should be cleaned and painted during the next maintenance project.

The elevator system is maintained by the state licensed Bleyle Elevator Company.

The tower lighting system appears to be in good condition with some minor exceptions. All of the lighting levels are operational and synchronized. The following items were noted:

- The lighting conduits, junction boxes and conduit hardware are typically rusted throughout the tower height.
- One of the junction box covers has a loose bolt.

This maintenance work has been referred to Sutro personnel.

The antennas, transmission lines and associated mounting hardware appear to be in good condition with the exception of some rusted cable support U-bolts.

For detailed information see the attached inspection data sheets and photo logs.

Should you have any questions or wish to discuss any aspect of this report, please do not hesitate to contact the undersigned.

Sincerely,

Jeff Altmeyer, P.E.  
Tower Engineer  
Tower Consultants Incorporated

# Inspection Summary – Year 2015

## Description of Inspection:

- Routine inspection of Leg A
- Routine inspection of horizontal levels on North face
- Routine inspection of strands on North face
- Routine inspection of strand anchors on Leg A
- Routine inspection of base – all legs

## Special or In-Depth Inspections:

## Summary of Results:

Rusted fasteners, rusted members and some rusted gussets. There are leg gussets that have drain holes that are plugged which retains water. A handrail cable is missing on level 6 and there is rusted catwalk hardware. Rusted conduit and conduit hardware and junction boxes. A junction box has a loose bolt. There is major rust on the elevator cable keepers. Some cable support U-bolts are rusted.

**Summary of Recommendations:** See report text

## Checklist:

- Has a severe event occurred since the previous inspection ?    Yes  No
- Have action items and recommendations from previous inspections been addressed in the scope of work ?    Yes  No
- Has the inspection log for future years been revised to account for scope of work and findings of this inspection ?    Yes  No

Signature: Jeff Atmyer

Date: 11/9/15

"A"

Inspection Data Sheet: Antenna Mount Stack "C" (Level 6 to base of antenna)

Observ. No.	Location/Identification			Photo No.	Observation Comments
	Column	Elevation	Item <sup>1</sup>		
					NO DISTRESS NOTED FOR THE ANTENNA MOUNT STACK "A" BECAUSE IT WAS RECENTLY CLEANED AND PAINTED
Sutro Tower				Signature:	Page: <u>1</u> of <u>1</u>
San Francisco, CA				File:	Date: <u>1/9/15</u>

DIMENSIONS SHOWN ARE BETWEEN COLUMN SPLICES

LEVEL 6.40  
LEVEL 6.38  
LEVEL 6.36  
LEVEL 6.34  
LEVEL 6.32  
LEVEL 6.30  
LEVEL 6.28  
LEVEL 6.26  
LEVEL 6.24  
LEVEL 6.22  
LEVEL 6.20  
LEVEL 6.18  
LEVEL 6.16  
LEVEL 6.14  
LEVEL 6.12  
LEVEL 6.10  
LEVEL 6.8  
LEVEL 6.6  
LEVEL 6.4  
LEVEL 6.2  
LEVEL 6.1  
LEVEL 6.0

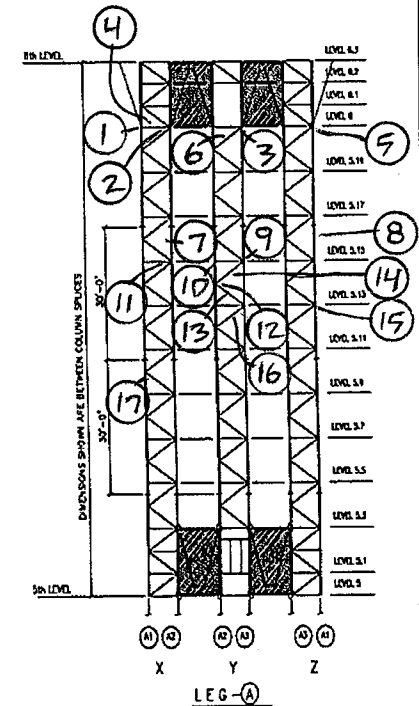
(C1) X (C2) Y (C3) Z (C1)

ANTENNA MOUNT STACK "C"

<sup>1</sup> Item designation: L=leg member, D=diagonal, H=horizontal, C=connection, O=others

## Inspection Data Sheet: Leg A (Level 5 to Level 6)

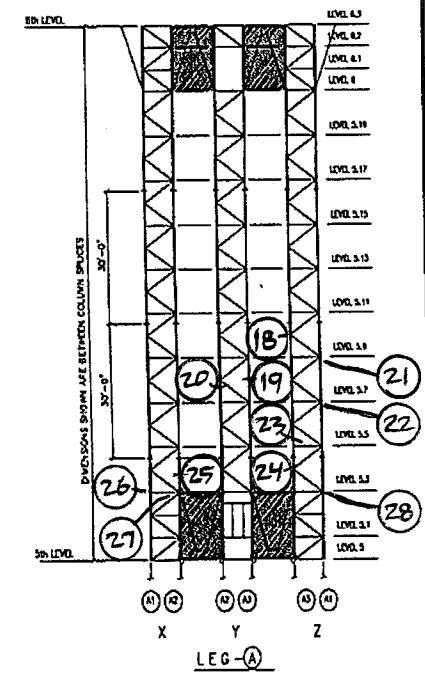
Observ. No.	Location / Identification			Photo No.	Observation Comments
	Column	Elevation	Item <sup>1</sup>		
1	A1	6	C	1	RF(3), LEG BOLTS
2	A2	6	C	2	RF(2), LEG BOLTS
3	A3	6	C	3	RF(3), LEG BOLTS
4	X-FACE	6	O	4	JUNCTION BOX HAS ONE LOOSE BOLT
5	A1	6	C	5	MAIN GUSSET PLATE IS RUSTED
6	Y-FACE	6	C	6	RF(2), DIAGONAL BOLTS
7	X-FACE	5.16	C	7	MINOR RUST ON LEG SPLICE BOLTS
8	ALL FACES	5-6	O	8	DRAINAGE HOLES NEED TO BE CLEANED
9	ALL FACES	5.15	C	9	MINOR RUST ON DIAG. & HORIZ. CONN. BOLTS
10	CENTER	5.15	O	10	MAJOR RUST ON ELEVATOR CABLE KEEPERS
11	X-FACE	5.15	C	11	RF(1), HORIZONTAL BOLT
12	Y-FACE	5.14	C	12	RF(1), DIAGONAL BOLT
13	Y-FACE	5.14	O	13	(2) 1 5/8" CABLE SUPPORT U-BOLTS ARE RUSTED
14	Y-FACE	5.14	C	14	RF(1), DIAGONAL BOLT
15	Z-FACE	5.13	C	15	RF(2), HORIZONTAL BOLTS
16	Y-FACE	5.13	C	16	RF(1), DIAGONAL BOLT
17	A1	5.10	C	17	RF(1), LEG BOLT
<b>Sutro Tower</b>				Signature: _____	Page: <u>1</u> of <u>2</u>
<b>San Francisco, CA</b>				File: _____	Date: <u>1/9/15</u>



<sup>1</sup> Item designation: L=leg member, D=diagonal, H=horizontal, C=connection, O=others

## Inspection Data Sheet: Leg A (Level 5 to Level 6)

Observ. No.	Location / Identification			Photo No.	Observation Comments
	Column	Elevation	Item <sup>1</sup>		
18	Z-FACE	5.10	O	18	RUSTED JUNCTION BOX
19	A3	5.8	C	19	RF(10), LEG BOLTS
20	Y-FACE	5.8	C	20	RF(1), DIAGONAL BOLT
21	Z-FACE	5.9	C	21	RF(2), DIAGONAL BOLT
22	Z-FACE	5.7	C	22	RF(3), DIAGONAL BOLT
23	Z-FACE	5.5	C	23	RF(2), DIAGONAL BOLT
24	Z-FACE	5.4	C	24	RF(6), LEG BOLTS
25	A2	5.4	C	25	RF(2), LEG BOLTS
26	A1	5.3	C	26	RF(5), LEG BOLTS
27	A2	5.3	C	27	RF(3), LEG BOLTS
28	A1	5.3	C	28	GUSSET PLATE IS RUSTED
<b>Sutro Tower</b>				Signature:	Page: <u>2</u> of <u>2</u>
<b>San Francisco, CA</b>				File:	Date: <u>11/9/15</u>



<sup>1</sup> Item designation: L=leg member, D=diagonal, H=horizontal, C=connection, O=others



Photo 01.JPG  
8/27/2014

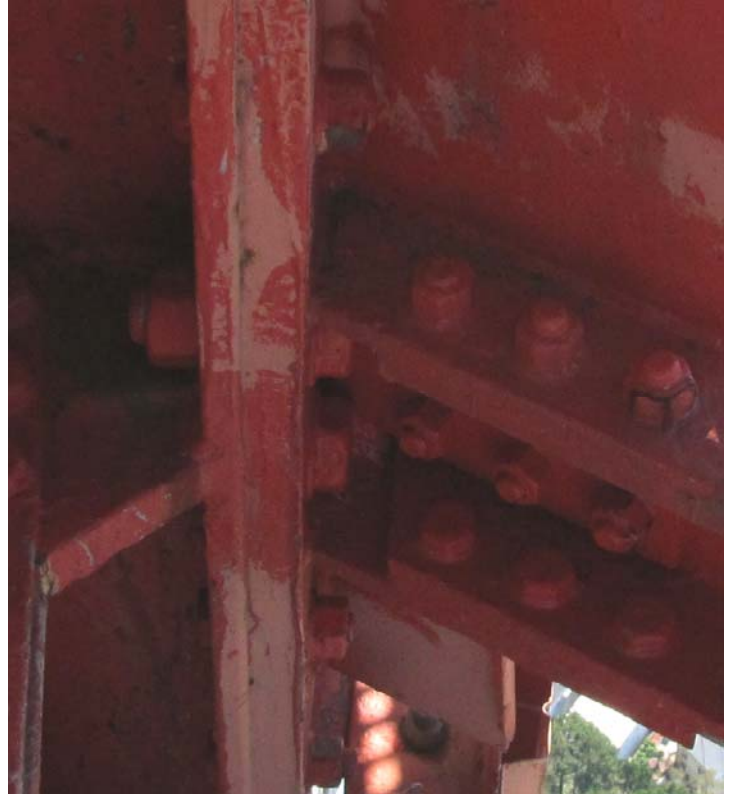


Photo 02.JPG  
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Photo 21.JPG  
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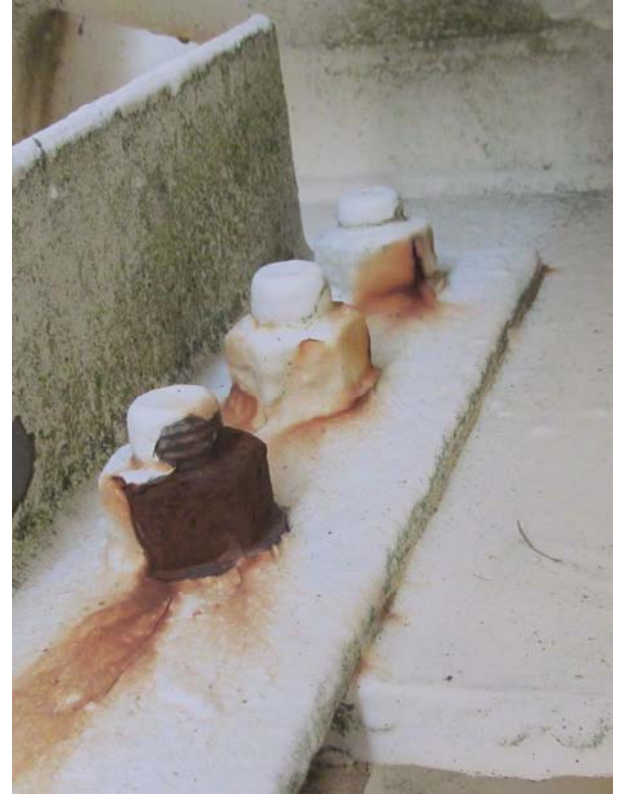


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Photo 23.JPG  
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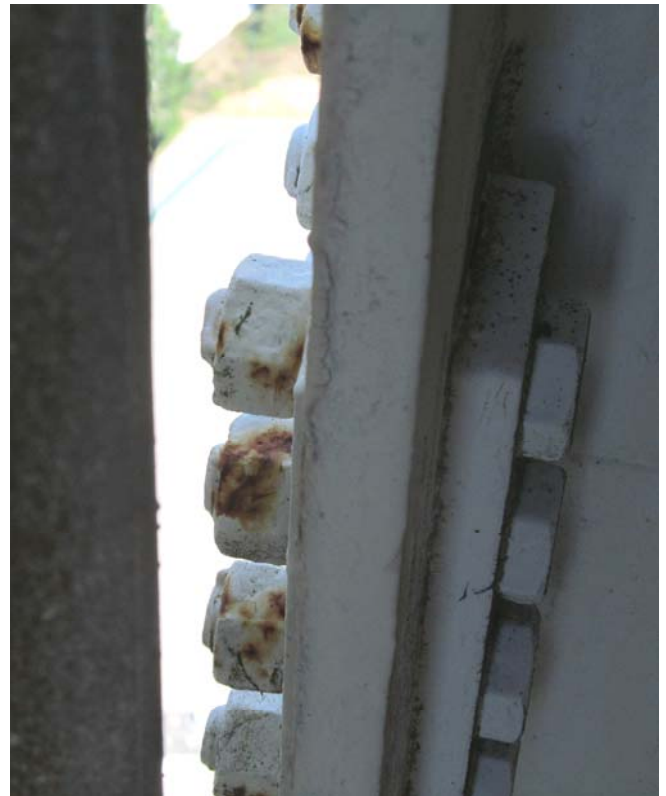


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Photo 25.JPG  
8/27/2014



Photo 26.JPG  
8/27/2014



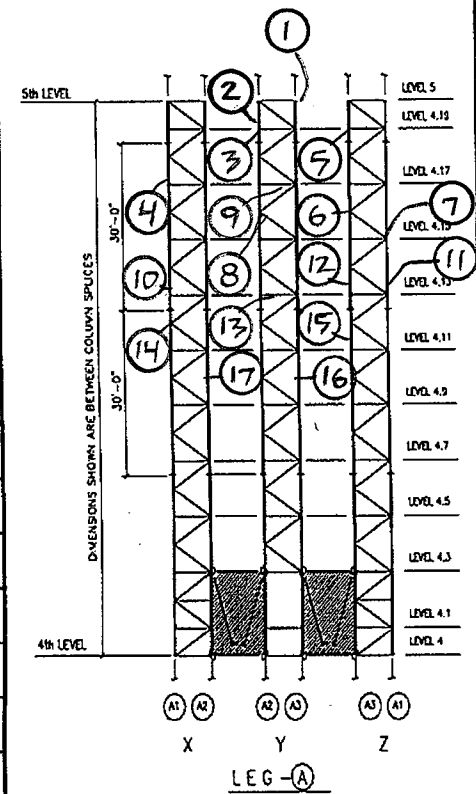
Photo 27.JPG  
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Photo 28.JPG  
8/27/2014

## Inspection Data Sheet: Leg A (Level 4 to Level 5)

Observ. No.	Location / Identification			Photo No.	Observation Comments
	Column	Elevation	Item <sup>1</sup>		
1	A3	5	C	1	MANY BOLTS FOR LEG UPGRADE ARE RUSTED
2	Y-FACE	4.19	C	2	RF(2), DIAGONAL BOLTS
3	Y-FACE	4.19	C	3	RF(2), HORIZONTAL BOLTS
4	X-FACE	4.17	C	4	RF(9), LEG BOLTS
5	Z-FACE	4.19	C	5	RF(3), DIAGONAL BOLTS
6	Z-FACE	4.16	C	6	RF(2), DIAGONAL BOLTS
7	Z-FACE	4.15	C	7	RF(1), DIAGONAL BOLTS
8	Y-FACE	4.16	C	8	RF(2), DIAGONAL BOLTS
9	Y-FACE	4.17	C	9	RF(3), DIAGONAL BOLTS
10	X-FACE	4.13	C	10	RF(2), HORIZONTAL BOLTS
11	Z-FACE	4.13	C	11	RF(1), DIAGONAL BOLT
12	Z-FACE	4.13	C	12	RF(2), HORIZONTAL BOLTS
13	Y-FACE	4.13	C	13	RF(2), SKIN SUPPORT ANGLE BOLTS
14	X-FACE	4.12	C	14	RF(1), DIAGONAL BOLT
15	Z-FACE	4.11	C	15	RF(2), HORIZONTAL BOLTS
16	A3	4.10	C	16	RF(7), LEG BOLTS
17	AZ	4.10	C	17	RF(2), LEG BOLTS
<b>Sutro Tower</b>				Signature: _____	Page: <u>1</u> of <u>2</u>
<b>San Francisco, CA</b>				File: _____	Date: <u>11/9/15</u>



<sup>1</sup> Item designation: L=leg member, D=diagonal, H=horizontal, C=connection, O=others





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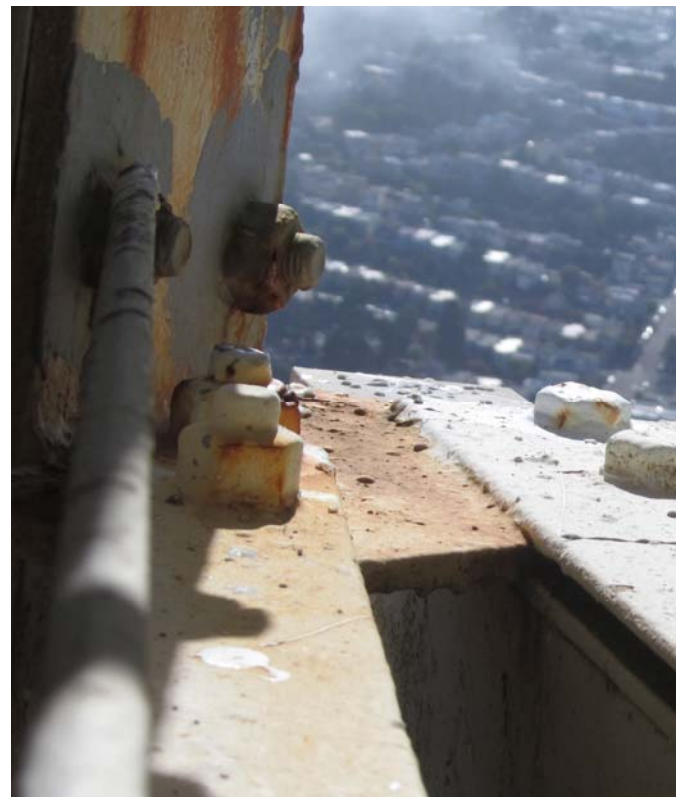


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Photo 13.JPG  
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Photo 14.JPG  
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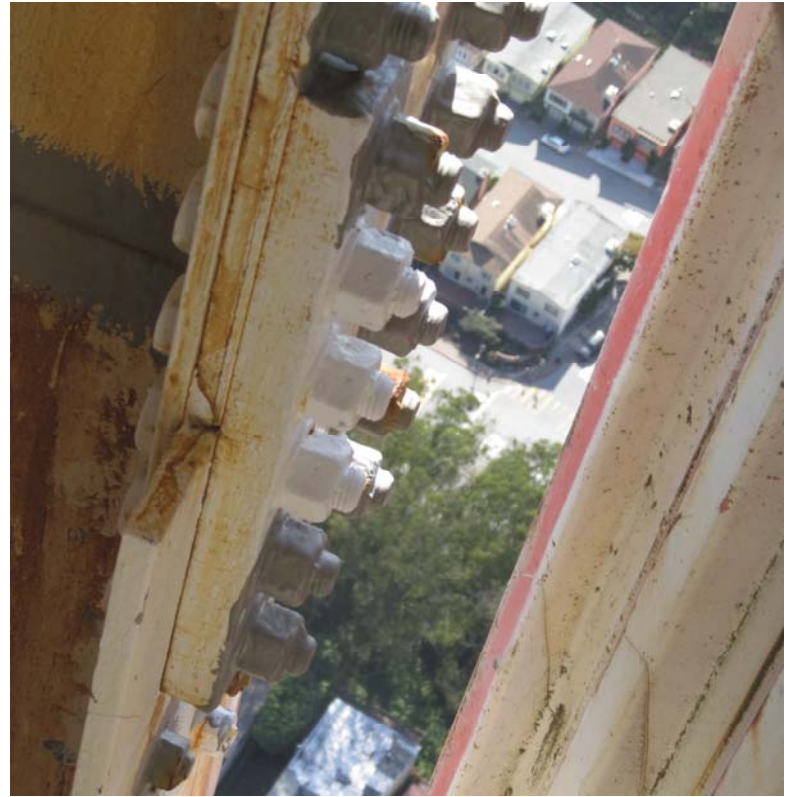


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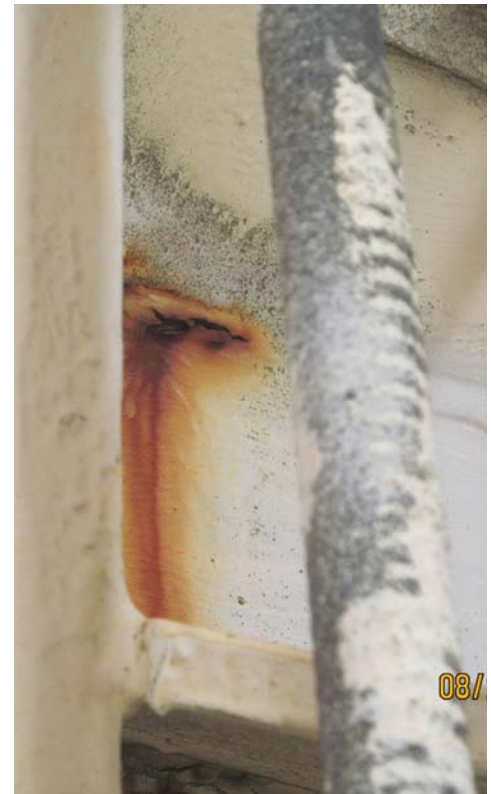


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Leg A (Level 4 to Level 5)





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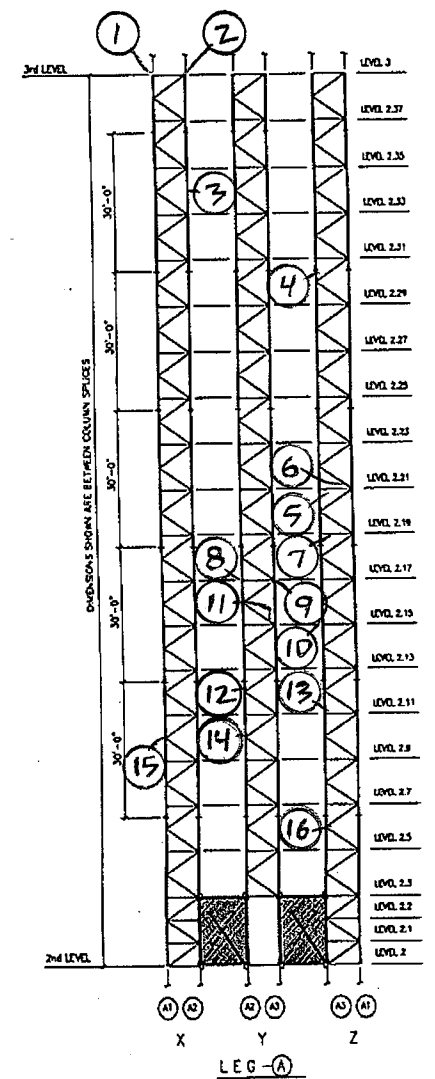


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Photo 08.JPG  
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## Inspection Data Sheet: Leg A (Level 2 to Level 3)

Observ. No.	Location / Identification			Photo No.	Observation Comments	
	Column	Elevation	Item <sup>1</sup>			
1	A1	3	O	1	(2) RUSTED JUNCTION BOXES	
2	A2	3	C	2	RF(2), LEG GUSSET	
3	A2	2.34	C	3	RF(1), LEG BOLT	
4	Z-FACE	2.30	C	4	RF(2), DIAGONAL BOLTS	
5	Z-FACE	2.21	O	5	RUSTED JUNCTION BOX	
6	Z-FACE	2.21	H	6	RUST ON GUSSET PLATE	
7	Z-FACE	2.19	O	7	BROKEN JUNCTION BOX CONNECTOR	
8	Y-FACE	2.17	C	8	RF(2), DIAGONAL BOLTS	
9	A3	2.17	C	9	RF(1), LEG BOLT	
10	Z-FACE	2.16	C	10	RF(1), DIAGONAL BOLT	
11	Y-FACE	2.15	C	11	RF(2), DIAGONAL BOLTS	
12	Y-FACE	2.12	C	12	RF(1), DIAGONAL BOLT	
13	Z-FACE	2.11	C	13	RF(1), HORIZONTAL BOLT	
14	A2	2.10	C	14	RF(1), LEG BOLT	
15	A1	2.10	C	15	RF(1), LEG BOLT	
16	Z-FACE	2.6	C	16	RF(1), DIAGONAL BOLT	
<b>Sutro Tower</b>					Signature: _____	Page: <u>1</u> of <u>1</u>
<b>San Francisco, CA</b>					File: _____	Date: <u>1/9/15</u>



<sup>1</sup> Item designation: L=leg member, D=diagonal, H=horizontal, C=connection, O=others



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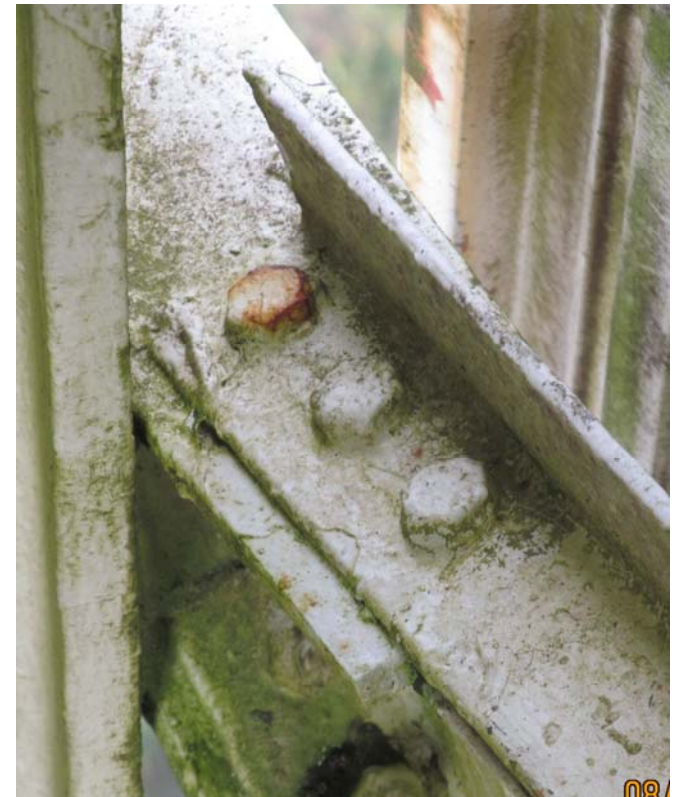


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# Inspection Data Sheet: North Truss (Level 4)

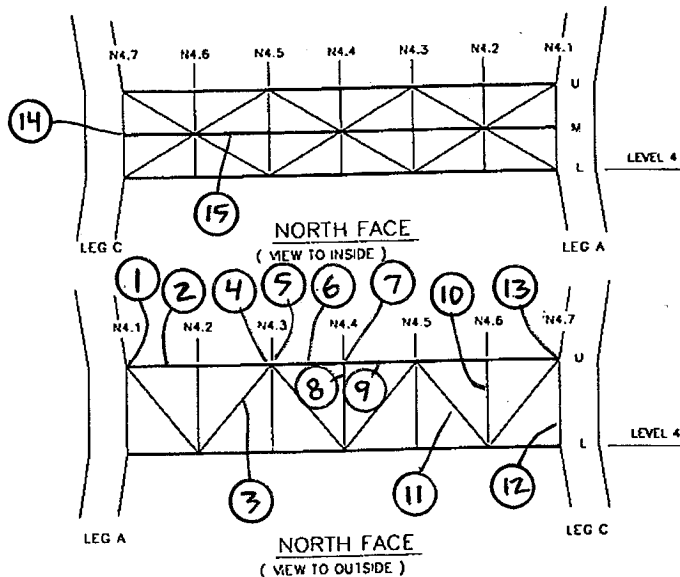
Observ. No.	Location / Identification			Photo No.	Inspection Comments
	Chord <sup>1</sup>	Horiz. Location	Item <sup>2</sup>		
1	U	4.1	C	1	RF(5)
2	U	4.15	H	2	RUST ON BEAM
3	D	4.25	D	3	RUST ON BEAM
4	U	4.3	H	4	RUST ON BEAM
5	U	4.3	C	5	RF(3)
6	U	4.35	H	6	RUST ON BEAM
7	U	4.4	C	7	RF(1)
8	V	4.4	V	8	RUST ON BEAM
9	U	4.45	H	9	RUST ON BEAM
10	V	4.6	V	10	RUST ON BEAM
11	D	4.55	D	11	RUST ON BEAM
12	V	4.7	V	12	RUST ON BEAM
13	U	4.7	C	13	RF(7)
14	M	4.7	H	14	RUST ON BEAM
15	M	4.55	H	15	RUST ON BEAM

<b>Sutro Tower</b>	Signature: _____	Page: <u>1</u> of <u>2</u>
<b>San Francisco, CA</b>	File: _____	Date: <u>11/9/15</u>

<sup>1</sup> Chord member designation: U = upper, M = middle, and L = lower

<sup>2</sup> Item designation: H = horizontal, V = vertical, D = diagonal, C = connection, and O = others





# Inspection Data Sheet: North Truss (Level 4)

Observ. No.	Location / Identification			Photo No.	Inspection Comments
	Chord <sup>1</sup>	Horiz. Location	Item <sup>2</sup>		
16	M	4.45	H	16	RUST ON BEAM
17	M	4.4	H	17	RUST ON BEAM
18	M	4.35	H	18	RUST ON BEAM
19	M	4.3	H	19	RUST ON BEAM
20	M	4.2	H	20	RUST ON BEAM
21	M	4.1	21	RF(3) AND RUST ON BEAM	
<b>Sutro Tower</b>				Signature: _____	Page: <u>2</u> of <u>2</u>
<b>San Francisco, CA</b>				File: _____	Date: <u>1/9/15</u>

<sup>1</sup> Chord member designation: U = upper, M = middle, and L = lower  
<sup>2</sup> Item designation: H = horizontal, V = vertical, D = diagonal, C = connection, and O = others

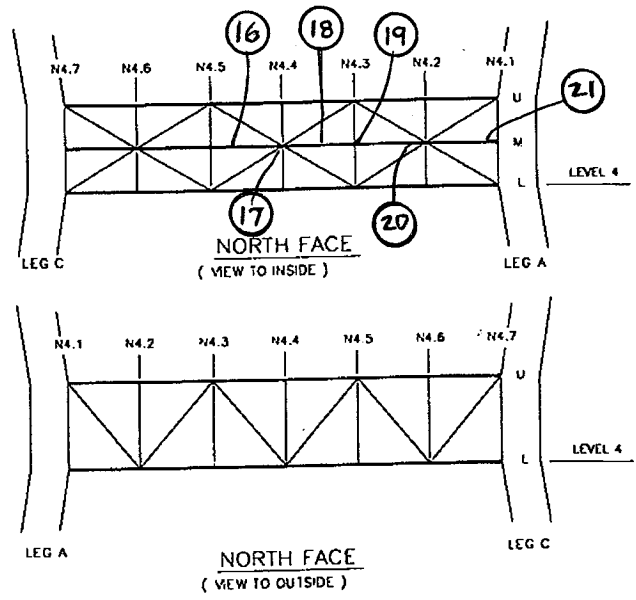




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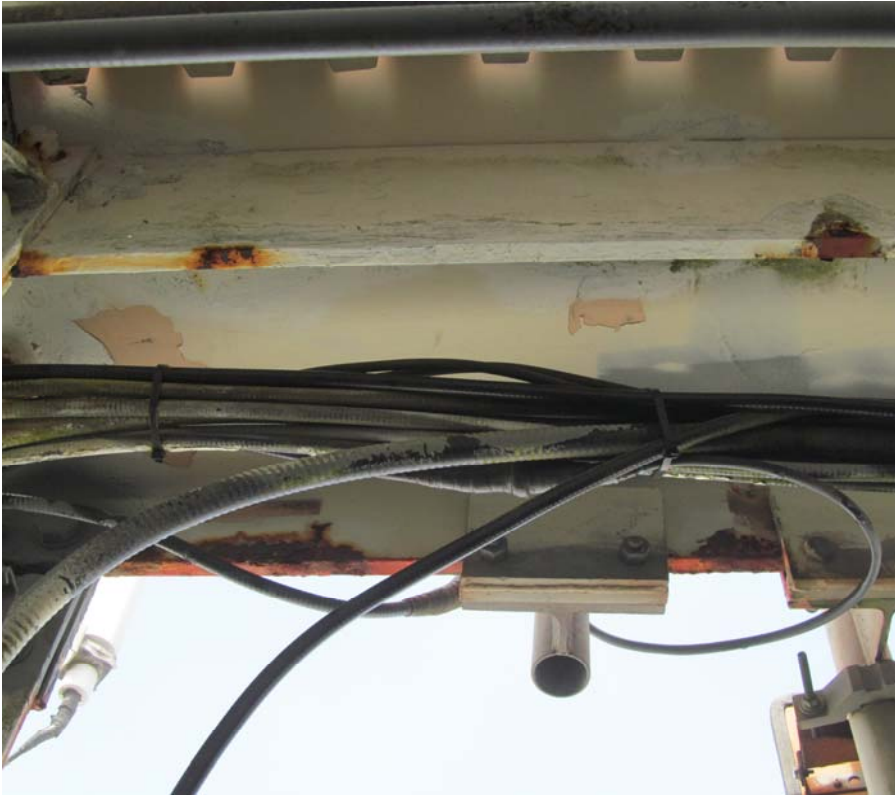


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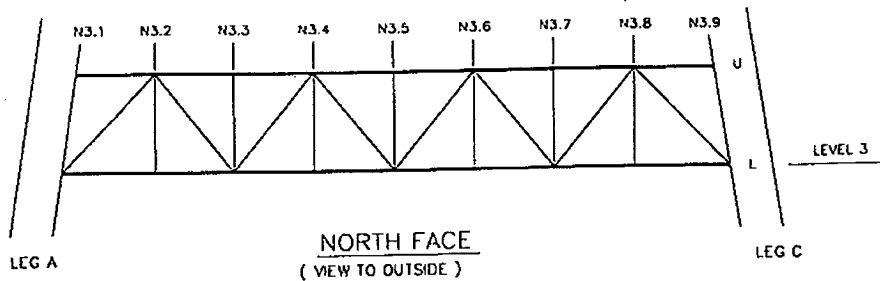
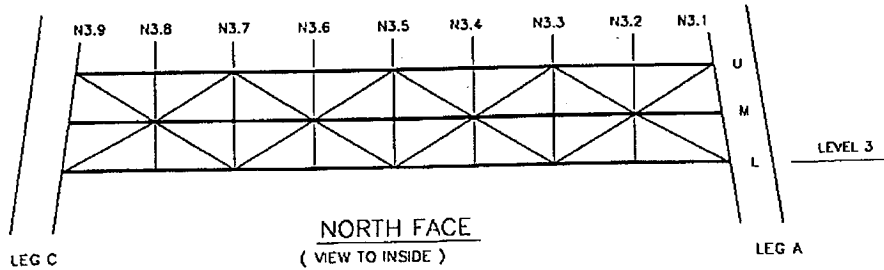


Photo 21.JPG  
9/23/2014

# Inspection Data Sheet: North Truss (Level 3)

Observ. No.	Location / Identification			Photo No.	Inspection Comments
	Chord <sup>1</sup>	Horiz. Location	Item <sup>2</sup>		
					NO DISTRESS NOTED FOR THE CHORDS BECAUSE THEY WERE RECENTLY CLEANED AND PAINTED
<b>Sutro Tower</b>		Signature:			Page: <u> 1 </u> of <u> 1 </u>
<b>San Francisco, CA</b>		File:			Date: <u> 11/9/15 </u>

<sup>1</sup> Chord member designation: U = upper, M = middle, and L = lower  
<sup>2</sup> Item designation: H = horizontal, V = vertical, D = diagonal, C = connection, and O = others

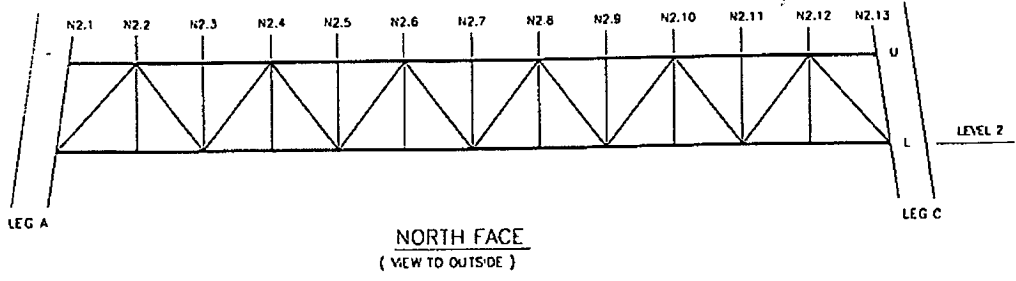
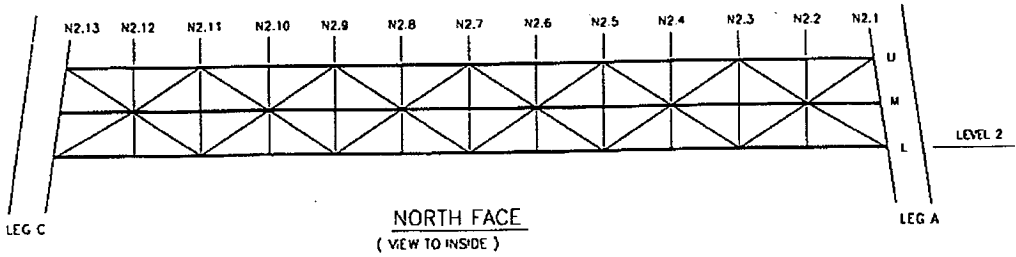




# Inspection Data Sheet: North Truss (Level 2)

Observ. No.	Location / Identification			Photo No.	Inspection Comments
	Chord <sup>1</sup>	Horiz. Location	Item <sup>2</sup>		
					NO DISTRESS NOTED FOR THE CHORDS BECAUSE THEY WERE RECENTLY CLEANED AND PAINTED
<b>Sutro Tower</b>				Signature: _____	Page: <u>1</u> of <u>1</u>
<b>San Francisco, CA</b>				File: _____	Date: <u>11/9/15</u>

<sup>1</sup> Chord member designation: U = upper, M = middle, and L = lower  
<sup>2</sup> Item designation: H = horizontal, V = vertical, D = diagonal, C = connection, and O = others



**STRANDS &**  
**Inspection Data Sheet: Miscellaneous Tower Items**

Observ. No.	Location / Identification <sup>1</sup>	Photo No.	Inspection Comments
			NO DISTRESS NOTED
<b>Sutro Tower</b>		Signature:	Page: <u> 1 </u> of <u> 1 </u>
<b>San Francisco, CA</b>		File:	Date: <b>11/9/15</b>

<sup>1</sup> Miscellaneous items for the entire tower in addition to those contained in the column leg and truss forms.

