

ROBINSON & COLE LLP

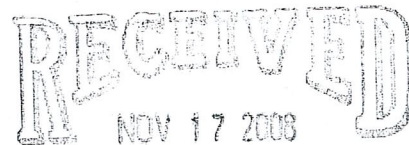
KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

ORIGINAL

November 14, 2008

Michael Perrone
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051



Re: **Cellco Partnership d/b/a Verizon Wireless
Exempt Modification Approvals**

CONNECTICUT
SITING COUNCIL

Dear Mr. Perrone:

Enclosed you will find structural reports confirming that the Verizon Wireless antenna installation was completed in accordance with the requirements of the Structural Analysis submitted as a part of the referenced exempt modification filing. The attached reports relate specifically to the following Siting Council filings.

1. EM-VER-129-071015
Somers – Pioneer Heights Road, Somers, CT
2. EM-VER-045-080428
East Lyme – 93 Roxbury Road, East Lyme, CT

If you have any questions regarding any of these materials, please do not hesitate to contact me or Rachel Mayo.

Sincerely,

Kenneth C. Baldwin



Law Offices

BOSTON

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

SARASOTA

www.rc.com

Enclosures

Copy to:

Sandy M. Carter
Brian Ragozzine
Mark Gauger

HART1-1498877-1



October 29, 2008

Marco A. Morales
Crown Castle USA
1200 MacArthur Blvd. Suite 200
Mahwah, NJ 07430
(201) 236-9032

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
jmathis@verticalstructures.com

Subject: Post Rework Audit/Inspection

Crown Castle Designation

Crown Castle BU Number: 806384
Crown Castle Site Name: NLN 136

Engineering Firm Designation

Vertical Structures Project Number: 2008-004-088

Site Data

93 Roxbury Road, East Lyme, CT, New London County
Latitude 41°-20'-8.35", Longitude -72°-13'-18.28"
150' Rohn SSV Self-Supporting Tower

Dear Mr. Morales:

Vertical Structures is pleased to present this report on the results of the post rework audit/inspection performed on the aforementioned tower. This report has been prepared in accordance with the terms of Crown Castle Purchase Order Number 289147. The purpose of the post rework audit/inspection is to verify that all required modifications have been performed in accordance with the document in Table 1.

Table 1 – Rework Documents

Document	Remarks	Reference	Source
Rework Drawings	Vertical Structures Inc. Job No. 2008-004-030 (Revised For Material)	N/A	Appendix A

Required modifications have been completed in accordance with the document in Table 1.

Vertical Structures appreciates the opportunity of providing our continuing professional services to you and Crown Castle USA. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

John Mathis, P.E.
Director/Engineering



APPENDIX A



July 24, 2008

Dan Fabiano
Crown Castle USA
1200 MacArthur Blvd
Mahwah, NJ 07430
(704) 321-3816

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
bgreenwell@verticalstructures.com

Subject: Revised Rework Construction Drawings

Carrier Designation

**Verizon Wireless Change-Out
Carrier Site Number: TBD
Carrier Site Name: East Lyme, CT**

Crown Castle Designation

**Crown Castle BU Number: 806384
Crown Castle Site Name: NLN 136
Crown Castle JDE Job Number: 101947**

Engineering Firm Designation

Vertical Structures Project Number: 2008-004-030

Site Data

**93 Roxbury Road, East Lyme, CT, New London County
Latitude 41°-20'-8.35", Longitude -72°-13'-18.28"
150' Rohn SSV Self-Supporting Tower**

Dear Mr. Fabiano,

Vertical Structures is pleased to submit these revised rework construction drawings for modifying the aforementioned tower. The drawings have been revised for material in accordance with the terms of Crown Castle Purchase Order Number 806384.

Vertical Structures appreciates the opportunity of providing our continuing professional services to you and Crown Castle International. If you have any questions or need further assistance on this or any other projects please give us a call.

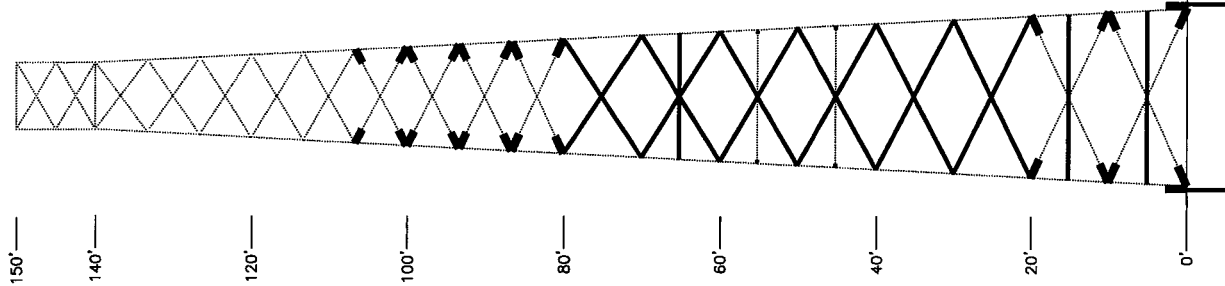
Respectfully submitted,

Ben Greenwell
Project Engineer

TABLE OF CONTENTS	
SHEET NO.	DESCRIPTION
SHEET 1	MASTER DRAWING INCLUDING NOTES
SHEET 2	TOWER MODIFICATIONS (20' - 0')
SHEET 3	TOWER MODIFICATIONS (40' - 20')
SHEET 4	TOWER MODIFICATIONS (60' - 40')
SHEET 5	TOWER MODIFICATIONS (80' - 60')
SHEET 6	TOWER MODIFICATIONS (100' - 80')
SHEET 7	TOWER MODIFICATIONS (107' - 100')
TF2008004030-F1	ANCHOR BOLT INSTALLATION (0')

STRUCTURAL MODIFICATIONS:

THIS DRAWING DEPICTS THE REWORK REQUIRED TO REMEDY THE DEFICIENCIES FOUND IN THE NLN 136, CT TOWER PER THE REPORT PUBLISHED BY VERTICAL STRUCTURES ON 2-13-08, JOB# 2008-004-025. (REWORK PER FINAL MODIFIED RISA, JOB# 2008-004-030.)



— 107' - 100'; INSTALL DIAGONAL END BOLT REINFORCEMENT PER SHEET 7.

— 100' - 80'; INSTALL DIAGONAL END BOLT REINFORCEMENT PER SHEET 4.

— 80' - 60'; INSTALL ADDITIONAL DIAGONALS PER SHEET 5.

— 70' - 60'; INSTALL MID-BAY HORIZONTALS PER SHEET 5.

— 60' - 40'; INSTALL ADDITIONAL DIAGONALS PER SHEET 4.
REPLACE MID-BAY HORIZONTAL LUGS PER SHEET 4.

— 40' - 20'; INSTALL ADDITIONAL DIAGONALS PER SHEET 3.

— 20' - 0'; INSTALL MID-BAY HORIZONTALS AND DIAGONAL END BOLT REINFORCEMENT PER SHEET 2.

— 0'; INSTALL ADDITIONAL ANCHOR BOLTS PER TF2008004030-F1.

TECHNICAL SPECIFICATION NOTES:

- CONTRACTOR: CALL VERTICAL STRUCTURES AT (859) 624-8360 TO MAKE SURE YOU HAVE THE LATEST REVISION OF THIS DRAWING. CONTACT THE ENGINEER CONCERNING ANY CHANGES OR MODIFICATIONS THAT MAY BE REQUIRED DUE TO THE EXISTING CONDITIONS.
- ALL BOLTS 1/2" OR LESS TO BE INSTALLED WITH H OR 2H NUTS. ALL BOLTS GREATER THAN 1/2" TO BE INSTALLED WITH 2H NUTS. LOCKING MECHANISM FOR BOLTS TO BE PALNUTS OR LOCKWASHERS. ALL U-BOLTS TO BE INSTALLED WITH 2H NUTS AND LOCKWASHERS. ANY HARDWARE REMOVED FROM THE EXISTING TOWER MUST BE REPLACED WITH NEW HARDWARE OF EQUAL SIZE AND QUALITY UNLESS NOTED OTHERWISE.
- AFTER FIELD MODIFICATIONS OF ANY STEEL MEMBERS, COAT EXPOSED STEEL SURFACES WITH TWO COATS OF SHERWIN WILLIAMS PART #143-0255 ZINC CLAD COATING, CONTAINING 97% ZINC DUST TO RESTORE THE GALVANIZED PROTECTION ON THE MEMBERS. IF REQUIRED, PAINT ALL AREAS AFFECTED OR NEW STEEL WITH MATCHING TOWER PAINT.
- FINISHING SPECIFICATIONS - ALL MATERIAL TO BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
A. FABRICATED MATERIAL - ASTM A153.
B. HARDWARE - ASTM A153.
C. GUY WIRE - ASTM A475.
- ELEVATIONS SHOWN ARE NOMINAL AND NOT EXACT.

CONTRACT ADMINISTRATION NOTES:

- PER CROWN POLICY, ALL MODIFICATIONS DEPICTED ON THESE DRAWINGS MUST BE INSPECTED BY VERTICAL STRUCTURES, INC. TO EXECUTE THIS SERVICE. VERTICAL STRUCTURES WILL REQUIRE A WRITTEN PURCHASE ORDER AND ONE CALENDAR WEEK PRIOR NOTICE OF AN INSPECTION. THE CONTRACTOR SHALL ALSO GIVE VERIFICATION 24 HOURS IN ADVANCE OF A SCHEDULED REQUEST FOR INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSURE THAT THESE REQUIREMENTS ARE MET.
- INSPECTIONS OF ABOVE GRADE MODIFICATIONS SHALL BE PERFORMED AT THE CONCLUSION OF THE WORK. BELOW GRADE OR HIDDEN INSTALLATIONS SUCH AS REBAR OR ANCHORS SHALL BE INSPECTED PRIOR TO THE PLACEMENT OF CONCRETE.
- VERTICAL STRUCTURES WILL PROVIDE AN ENGINEERING REVIEW OF PART FABRICATION DETAIL DRAWINGS PRIOR TO MATERIAL FABRICATION AT THE DISCRETION OF CROWN CASTLE PROJECT MANAGEMENT. VERTICAL STRUCTURES WILL REQUIRE A PURCHASE ORDER AND A COMPLETE DRAWING PACKAGE TO PERFORM THIS WORK. VERTICAL STRUCTURES WILL SUBMIT A REPORT TO THE CONTRACTOR WITHIN TWO BUSINESS DAYS AFTER RECEIPT OF THE DRAWINGS AND PURCHASE ORDER.

A MINIMUM OF 108- 9/16"Ø & 264- 11/16"Ø FIELD DRILLED HOLES ARE REQUIRED FOR THESE MODIFICATIONS. HOLES MUST HAVE TWO COATS OF ZINC RICH PAINT PER NOTE 8 BEFORE ASSEMBLY.

B	REVISED FOR MAT: 2008-067-001	7-9-08	JAC
A	ORIGINAL RELEASE	2-26-08	SPL
REV	DESCRIPTION	DATE	BY
VERTICAL STRUCTURES, INC. P.O. Box 1496 Richmond, KY 40476 Phone: (859) 624-8360 Fax: (859) 624-8369 Email: engineering@verticalstructures.com			

FOR

CROWN CASTLE

2008 MODIFICATIONS
TOWER REWORK FOR A
150' ROHN SSV S.S. TOWER
SITE: NLN 136, CT

CROWN CASTLE
BU# 806384

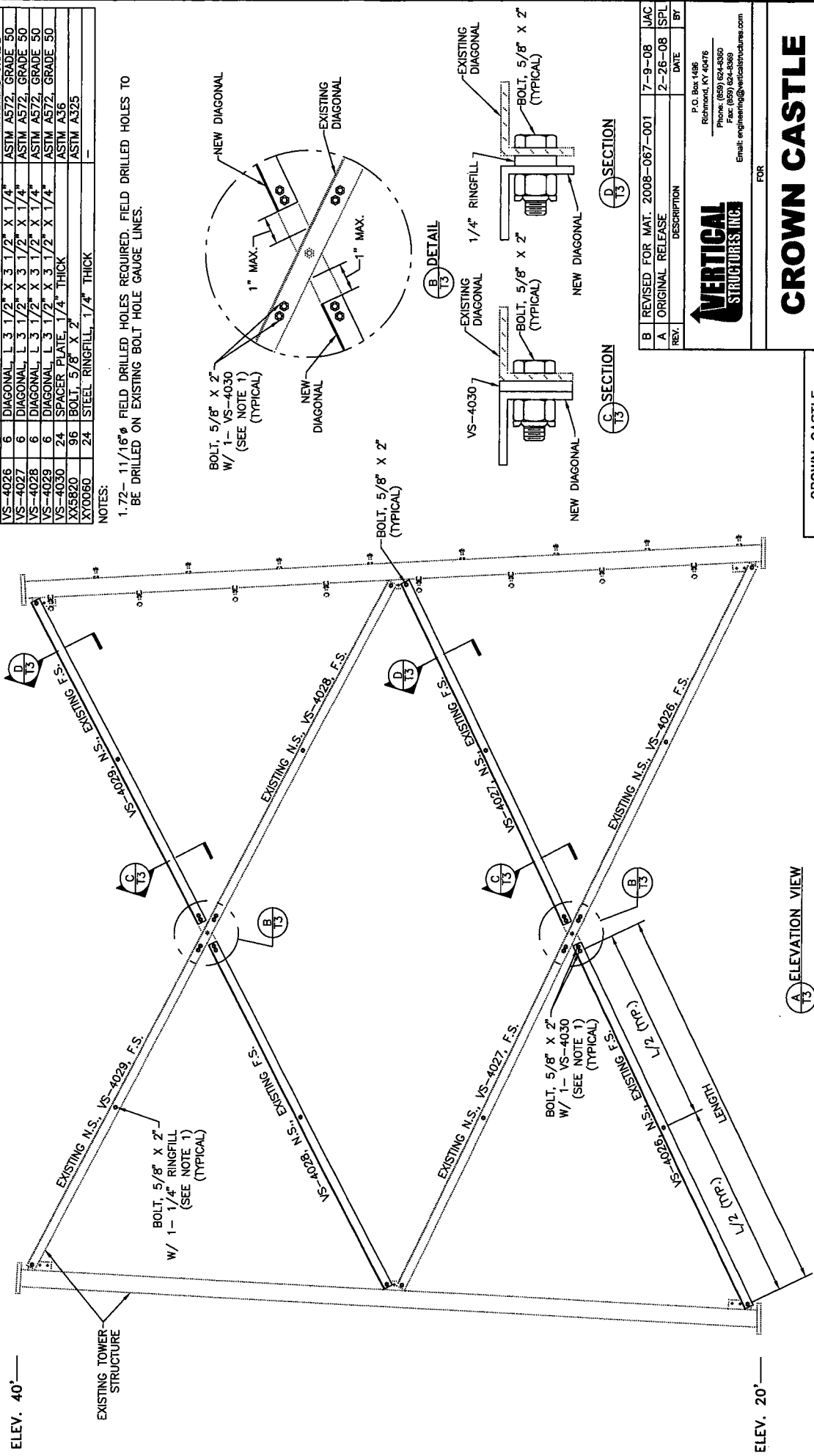
DRAFTSPERSON: S. LEMMONS	DATE 2-26-08
CHECK'D BY:	DATE
ENGR:	DATE

SHEET 1 OF 7 B TA2008004030-T1 SCALE: NONE

BILL OF MATERIALS			
MARK NO.	QTY.	DESCRIPTION	MATERIAL GRADE
VS-4026	6	DIAGONAL L 3 1/2" X 3 1/2" X 1/4"	ASTM A572, GRADE 50
VS-4027	6	DIAGONAL L 3 1/2" X 3 1/2" X 1/4"	ASTM A572, GRADE 50
VS-4028	6	DIAGONAL L 3 1/2" X 3 1/2" X 1/4"	ASTM A572, GRADE 50
VS-4029	6	DIAGONAL L 3 1/2" X 3 1/2" X 1/4"	ASTM A572, GRADE 50
VS-4030	24	SPACER PLATE, 1/4" THICK	ASTM A36
XX5820	96	BOLT, 5/8" X 2"	ASTM A325
XY0060	24	STEEL RINGFILL, 1/4" THICK	-

NOTES:

1.72- 11/16" FIELD DRILLED HOLES REQUIRED, FIELD DRILLED HOLES TO BE DRILLED ON EXISTING BOLT HOLE GAUGE LINES.



A ELEVATION VIEW

B DETAIL

C SECTION

D SECTION

B	REVISED FOR MAT. 2008-067-001	7-9-08	JAC
A	ORIGINAL RELEASE	2-26-08	SPL
REV.	DESCRIPTION	DATE	BY



P.O. Box 1486
Richmond, KY 40476
Phone: (603) 624-8850
Fax: (603) 624-8869
Email: engineering@verticalstructures.com

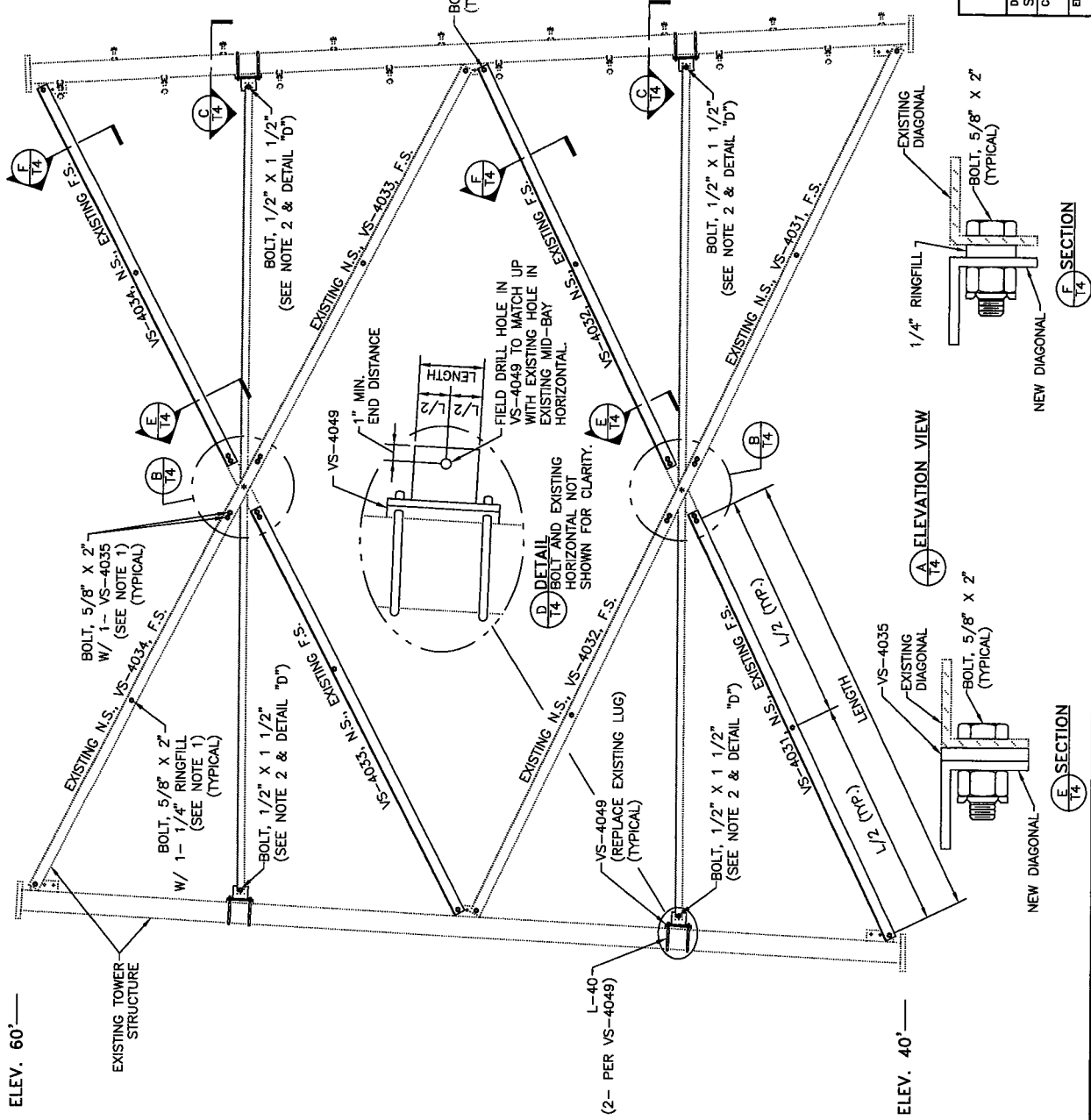
FOR

CROWN CASTLE

CROWN CASTLE BU# 806384		2008 MODIFICATIONS TOWER REWORK FOR A 150' ROHN SSV S.S. TOWER SITE: NLN 136, CT	
DRAWN BY: S. LEMMONS	DATE 2-26-08	DATE	DATE
CHK'D BY:	DATE	DATE	DATE
ENGR:	DATE	DATE	DATE
SHEET 3 OF 7	B	TA2008004030-T3	SCALE: NONE

BILL OF MATERIALS		
MARK NO.	QTY.	DESCRIPTION
VS-4031	6	DIAGONAL, L 3" X 3" X 1/4"
VS-4032	6	DIAGONAL, L 3" X 3" X 1/4"
VS-4033	6	DIAGONAL, L 3" X 3" X 1/4"
VS-4034	6	DIAGONAL, L 3" X 3" X 1/4"
VS-4035	24	SPACER PLATE, 1/4" THICK
VS-4049	6	LEG CLAMP FOR A 1/2" O.D. PIPE
L-40	12	U-BOLT, 1/2" FOR A 1/2" O.D. PIPE
XF1214	12	BOLT, 1/2" X 1 1/2"
XX5820	96	BOLT, 5/8" X 2"
XT0060	24	STEEL RINGFILL, 1/4" THICK

NOTES:
 1. 72- 11/16" FIELD DRILLED HOLES REQUIRED. FIELD DRILLED HOLES TO BE DRILLED ON EXISTING BOLT HOLE GAUGE LINES.
 2. 12- 9/16" FIELD DRILLED HOLES REQUIRED.



B	REVISED FOR MAT.	2008-067-001	7-9-08	JAC
A	ORIGINAL RELEASE		2-26-08	SPL
REV.	DESCRIPTION		DATE	BY

VERTICAL STRUCTURES INC.
 P.O. Box 1498
 Richmond, KY 40476
 Phone: (859) 624-8360
 Fax: (859) 624-8369
 Email: engineering@verticalstructures.com

FOR

CROWN CASTLE

2008 MODIFICATIONS
 TOWER REWORK FOR A
 150' ROHN SSV S.S. TOWER
 SITE: NLN 136, CT

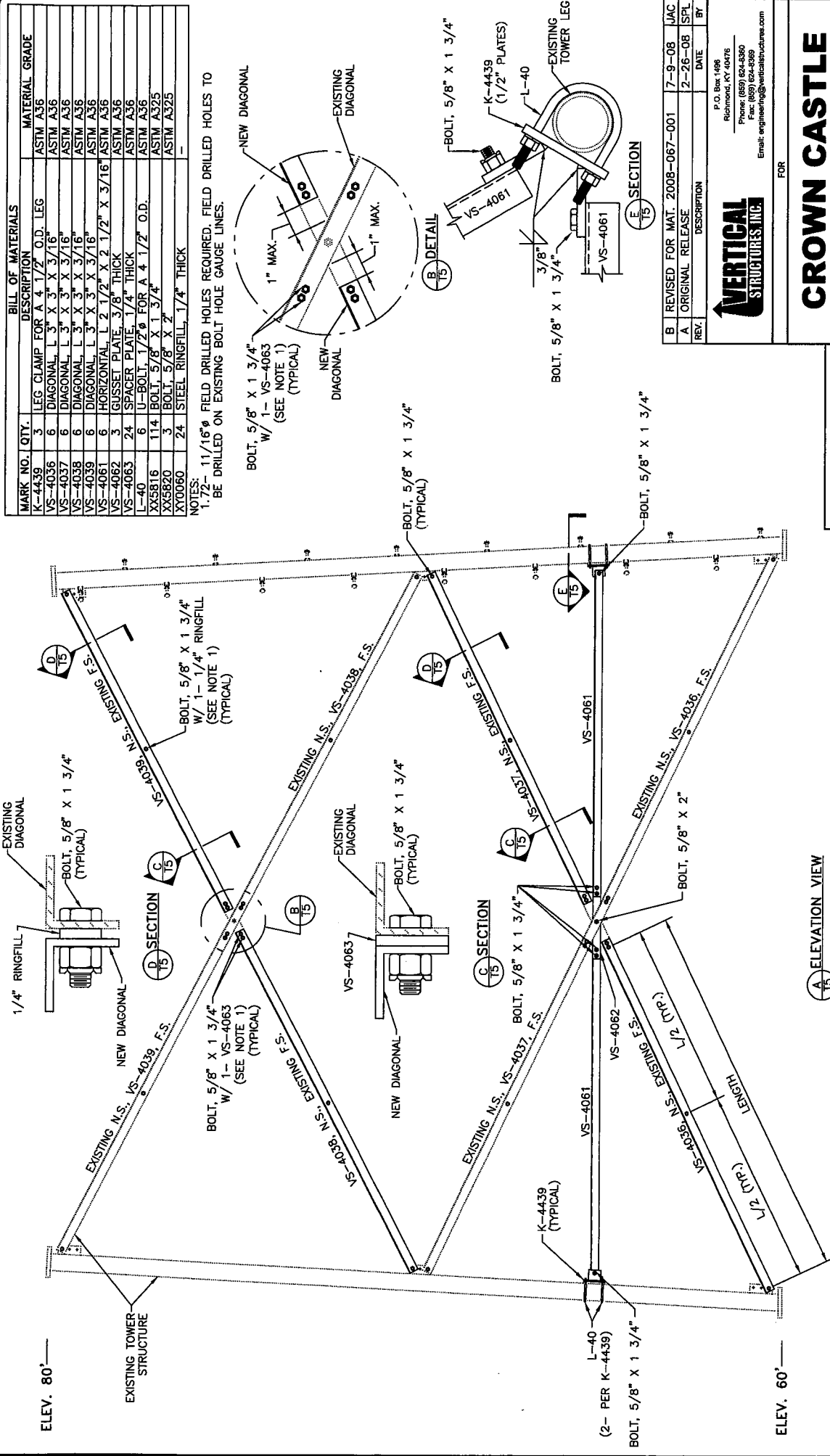
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CROWN CASTLE
 BU# 806384

DRAWN BY:	DATE
S. LEMMONS	2-26-08
CHK'D BY:	DATE
ENGR:	DATE

BILL OF MATERIALS			MATERIAL GRADE
MARK NO.	QTY.	DESCRIPTION	
K-4439	3	LEG CLAMP FOR A 1 1/2" O.D. LEG	ASTM A36
VS-4036	6	DIAGONAL L 3" X 3" X 3/16"	ASTM A36
VS-4037	6	DIAGONAL L 3" X 3" X 3/16"	ASTM A36
VS-4038	6	DIAGONAL L 3" X 3" X 3/16"	ASTM A36
VS-4039	6	DIAGONAL L 3" X 3" X 3/16"	ASTM A36
VS-4061	6	HORIZONTAL L 2 1/2" X 2 1/2" X 3/16"	ASTM A36
VS-4062	3	GUSSET PLATE, 3/8" THICK	ASTM A36
VS-4063	24	SPACER PLATE, 1/4" THICK	ASTM A36
L-40	6	U-BOLT 1/2" FOR A & 1/2" O.D.	ASTM A36
VS-4061	114	BOLT, 5/8" X 1 3/4"	ASTM A325
VS-4062	3	BOLT, 5/8" X 2"	ASTM A325
VS-4063	24	STEEL RINGFILL, 1/4" THICK	-

NOTES:
 1. 72- 11/16" FIELD DRILLED HOLES REQUIRED. FIELD DRILLED HOLES TO BE DRILLED ON EXISTING BOLT HOLE GAUGE LINES.



CROWN CASTLE BU# 806384		2008 MODIFICATIONS TOWER REWORK FOR A 150' ROHN SSV S.S. TOWER SITE: NLN 136, CT	
DRAFTSPERSON: S. LEMMONS	DATE 2-26-08	DATE 2-26-08	DATE 2-26-08
CHK'D BY:	DATE	DATE	DATE
ENGR:	DATE	DATE	DATE
SHEET 5 OF 7	B	TA2008004030-T5	SCALE: NONE



P.O. Box 1496
 Richmond, KY 40476
 Phone: (859) 624-3360
 Fax: (859) 624-3369
 Email: engineering@verticalstructures.com

FOR

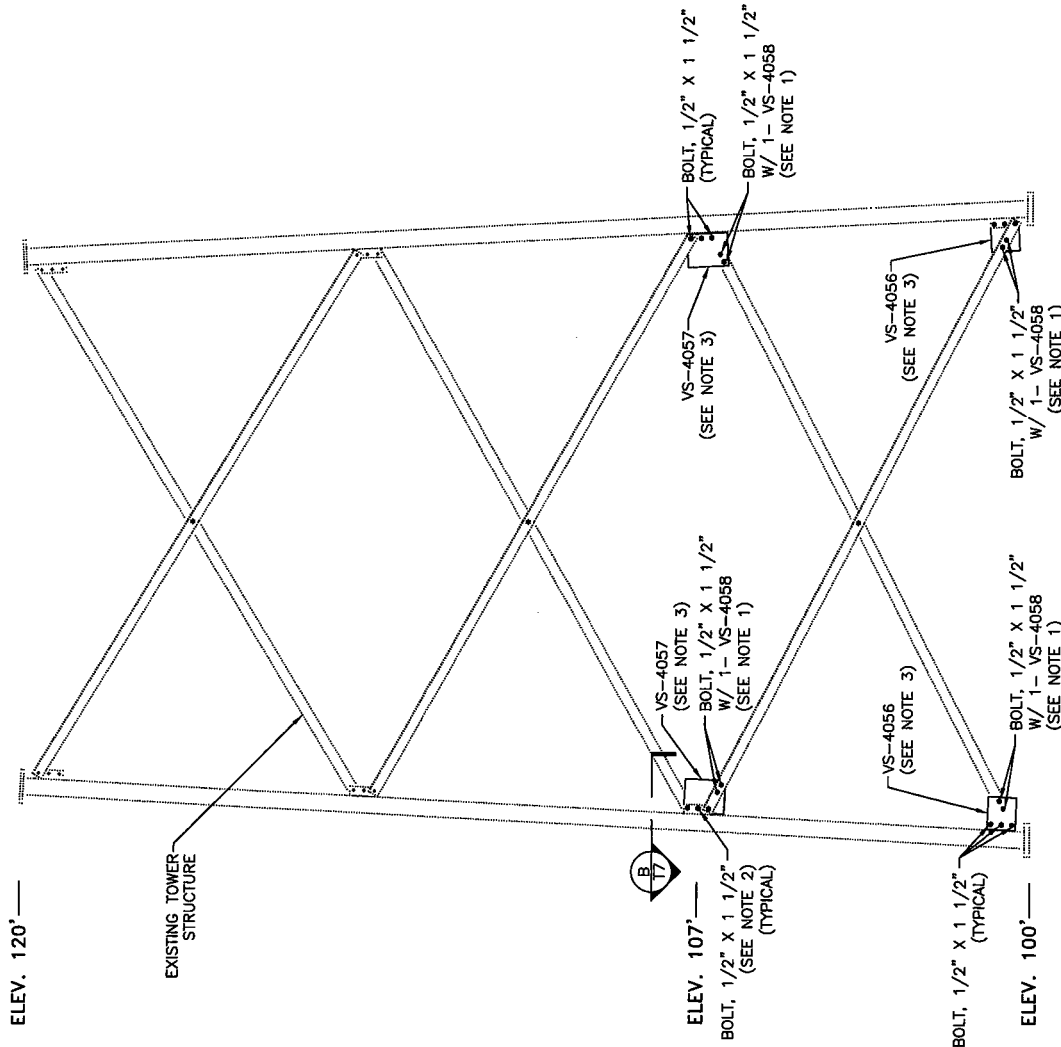
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B	REVISED FOR MAT. 2008-067-001	7-9-08	JAC
A	ORIGINAL RELEASE	2-26-08	SPL
REV.	DESCRIPTION	DATE	BY

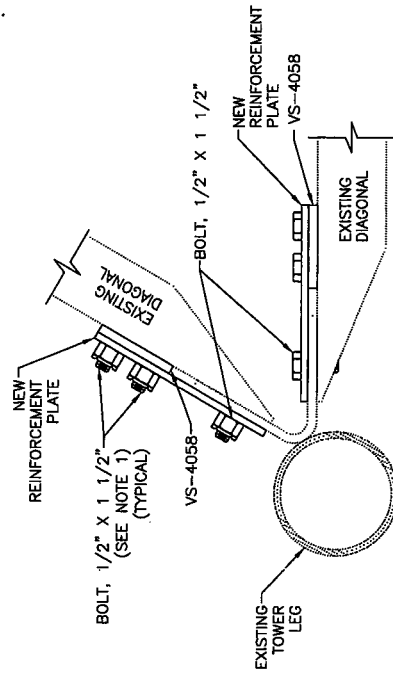
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MARK NO.	QTY.	DESCRIPTION
VS-4056	6	END CONNECTION PLATE 1/4" THICK
VS-4057	6	END CONNECTION PLATE 1/4" THICK
VS-4058	12	SPACER PLATE 3/16" THICK
XF1214	60	BOLT, 1/2" X 1 1/2"
		MATERIAL GRADE
		ASTM A36
		ASTM A36
		ASTM A36
		SAE GRADE 5

NOTES:

- 24- 9/16" Ø FIELD DRILLED HOLES REQUIRED.
- EXISTING DIAGONAL MAY NEED TO BE COPED TO ALLOW MIDDLE BOLT INSTALLATION.
- TOP OF END CONNECTION PLATE REINFORCEMENT IS MARKED WITH A "T".



ELEVATION VIEW



SECTION

B	REVISED FOR MAT. 2008-067-001	7-9-08	JAC
A	ORIGINAL RELEASE	2-26-08	SPL
REV.	DESCRIPTION	DATE	BY

VERTICAL STRUCTURES INC.
P.O. Box 1496
Richmond, KY 40476
Phone: (859) 624-8860
Fax: (859) 624-8869
Email: engineering@verticalstructures.com

FOR

CROWN CASTLE

2008 MODIFICATIONS
TOWER REWORK FOR A
150' ROHN SSV S.S. TOWER
SITE: NLN 136, CT

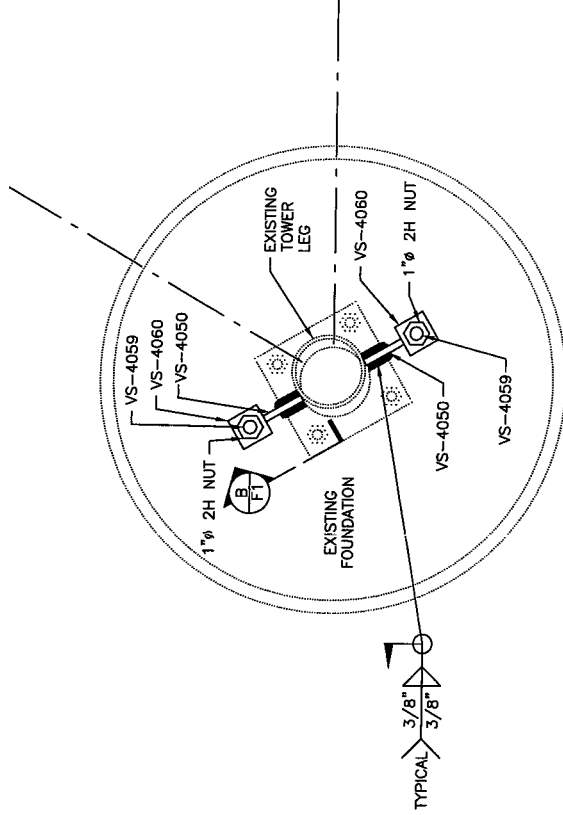
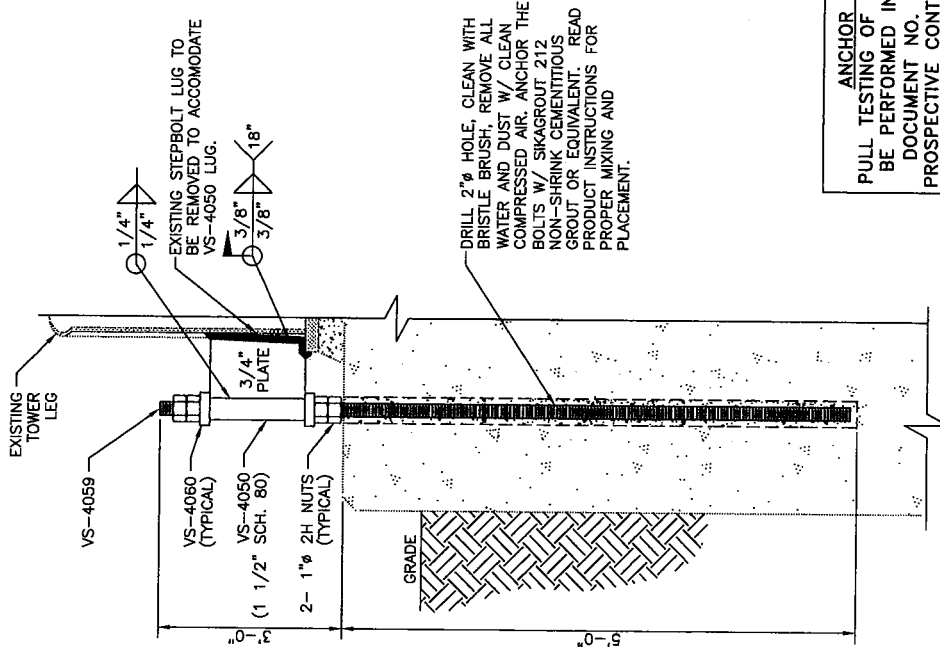
CROWN CASTLE
BU# 806384

DRAFTSPERSON:	DATE
S. LEMMONS	2-26-08
CHK'D BY:	DATE

ENGR:	DATE
SHEET 7 OF 7	B TA2008004030-17
SCALE:	NONE

BILL OF MATERIALS			MATERIAL GRADE
MARK NO.	QTY.	DESCRIPTION	
VS-4050	6	ANCHOR BOLT LUG, WELDMENT	ASTM A572, GRADE 50
VS-4059	6	ANCHOR BOLT, 1" X 8'-0" ALL-THREAD	ASTM A193, GRADE B7
VS-4060	12	PLATE WASHER, 3/4" THICK	ASTM A36
XY1002	24	2H NUT, 1"	-
-	-	SIKAGROUT 212 NON-SHRINK CEMENTITIOUS GROUT OR EQUIVALENT (AS NEEDED)	-

NOTE: QUANTITIES ARE FOR ALL THREE (3) LEGS.



PLAN VIEW

ANCHOR ROD TESTING REQUIREMENTS
 PULL TESTING OF POST-INSTALLED ANCHOR RODS MUST BE PERFORMED IN ACCORDANCE WITH CROWN CASTLE DOCUMENT NO. ENG-PRC-10119 ISSUED 4/23/08. PROSPECTIVE CONTRACTOR MUST READ DOCUMENT PRIOR TO PRICING CONSTRUCTION FOR THIS SITE.

REQUIRED TEST LOAD: 54,000 LBS.

ANY FAILED RODS MUST BE REINSTALLED AND RETESTED. CONTRACTOR SHALL REPORT ALL TESTING RESULTS TO VERTICAL STRUCTURES.

SECTION
 WORK IS TO BE DONE ON ALL THREE (3) LEGS

B	REVISED FOR MAT. 2008-067-001	7-9-08	JAC
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REV.	DESCRIPTION	DATE	BY



P.O. Box 146
 Richmond, KY 40475
 Phone: (606) 624-6380
 Fax: (606) 624-6380
 Email: engineering@verticalstructures.com

FOR

CROWN CASTLE

2008 MODIFICATIONS
 TOWER REWORK FOR A
 150' ROHN SSV S.S. TOWER
 SITE: NLN 136, CT

CROWN CASTLE
 BU# 806384

DRAFTSPERSON:
 S. LEMMONS
 DATE: 2-26-08

CHK'D BY:
 DATE: 2-26-08

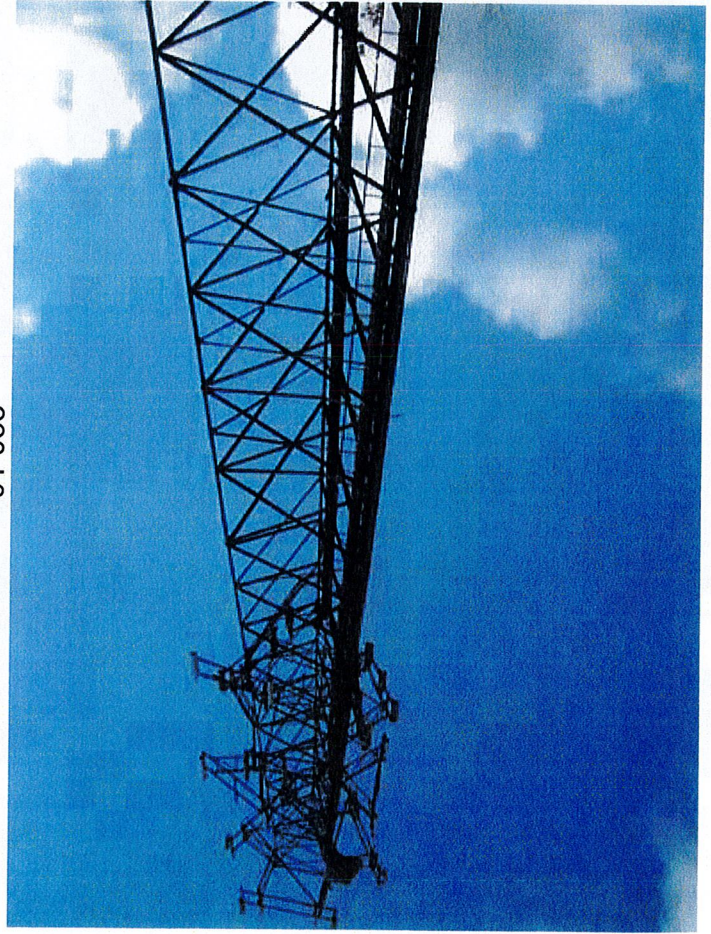
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SHEET 1 OF 1 B TF2008004030-F1 SCALE: NONE

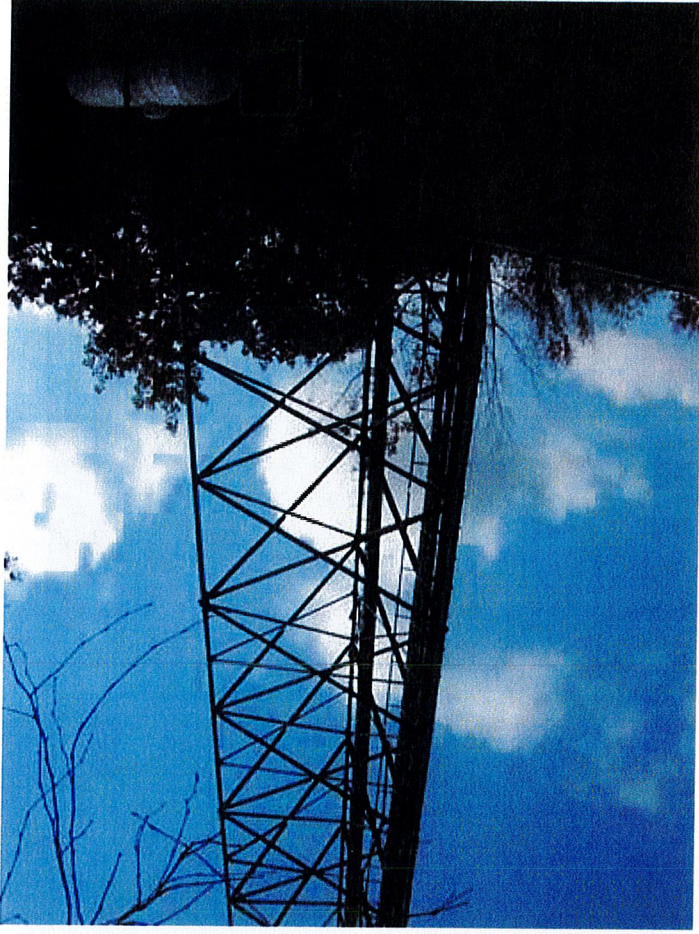
APPENDIX B



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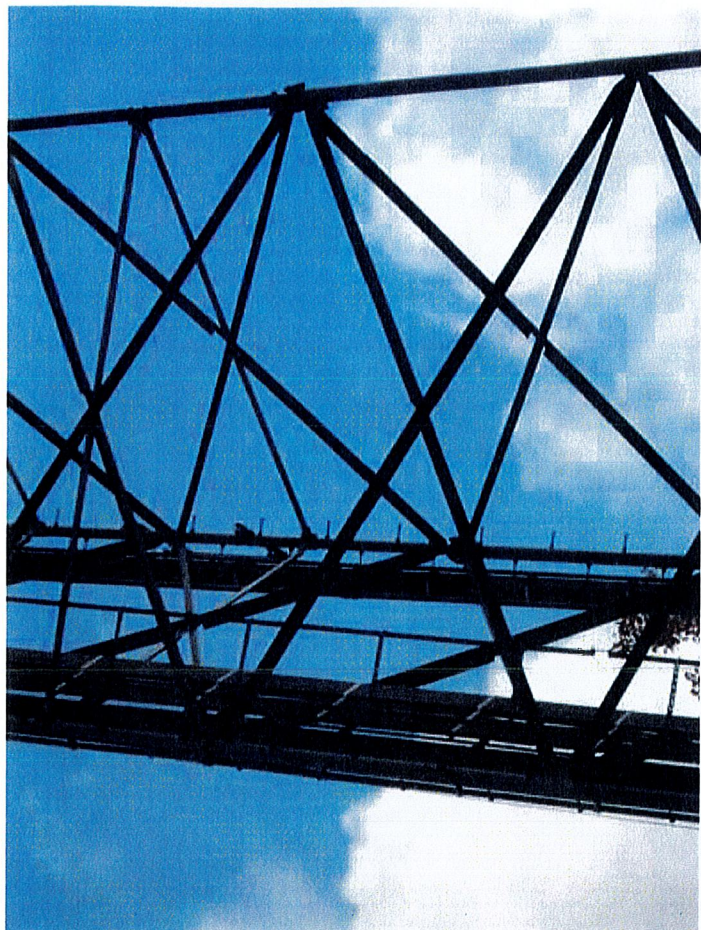
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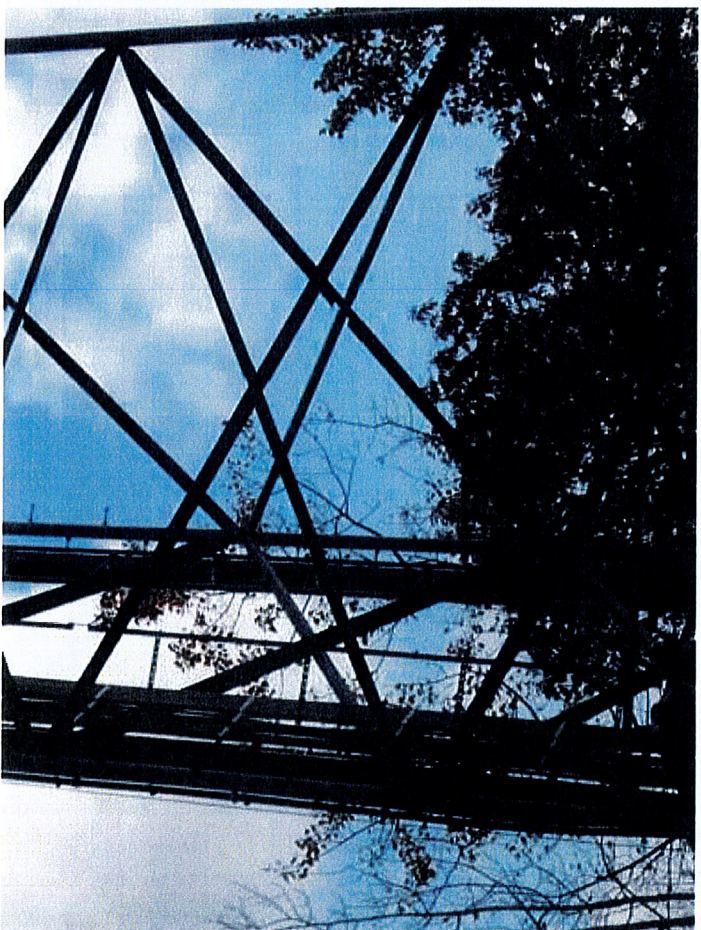
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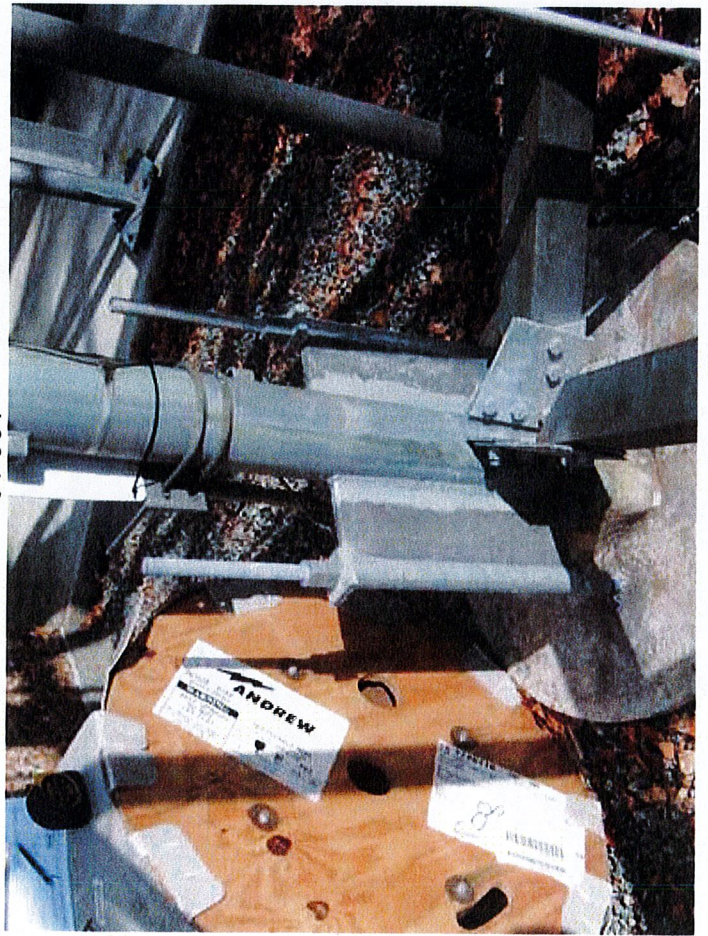
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01 062



01 063



01 064



01 065



01 066



01 067



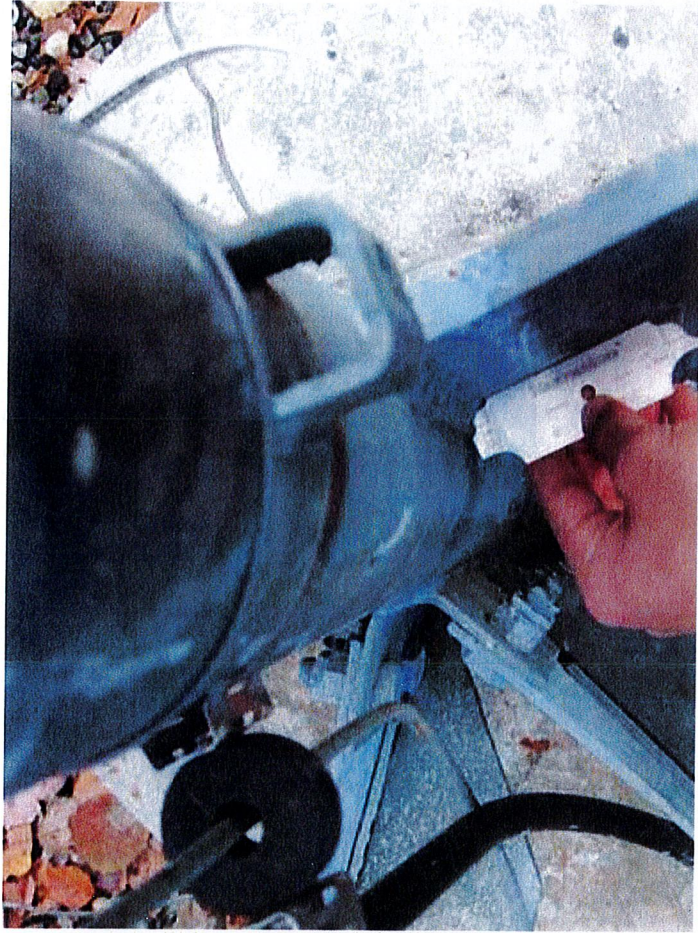
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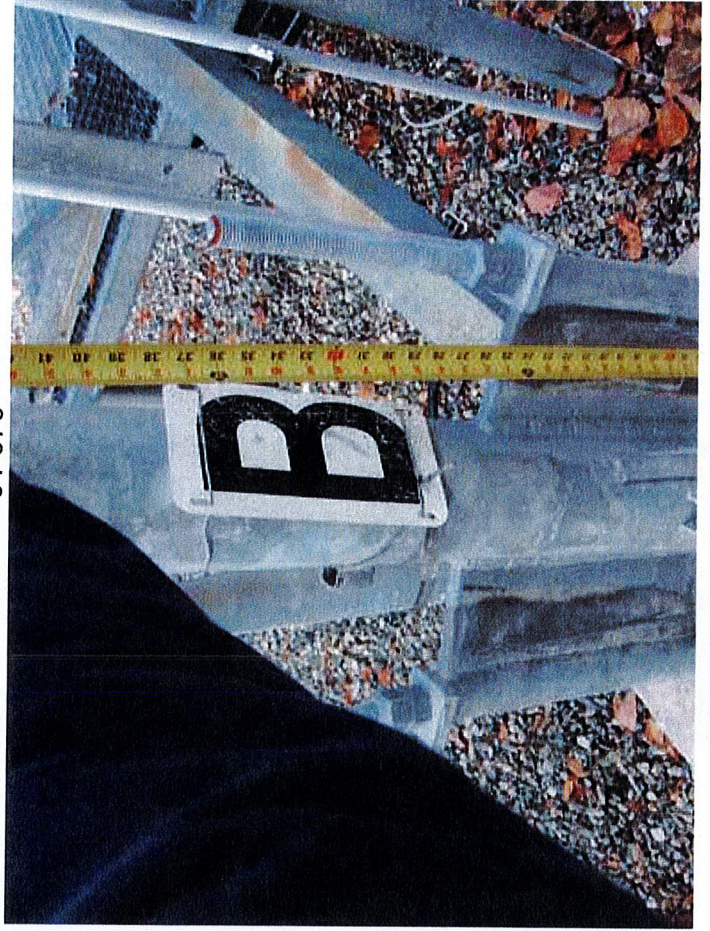
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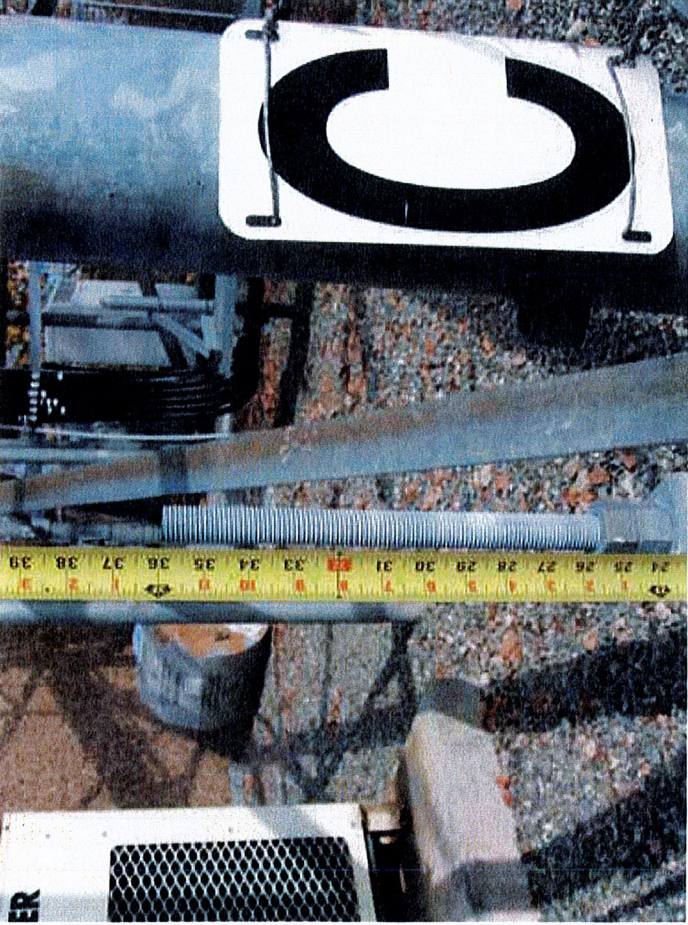
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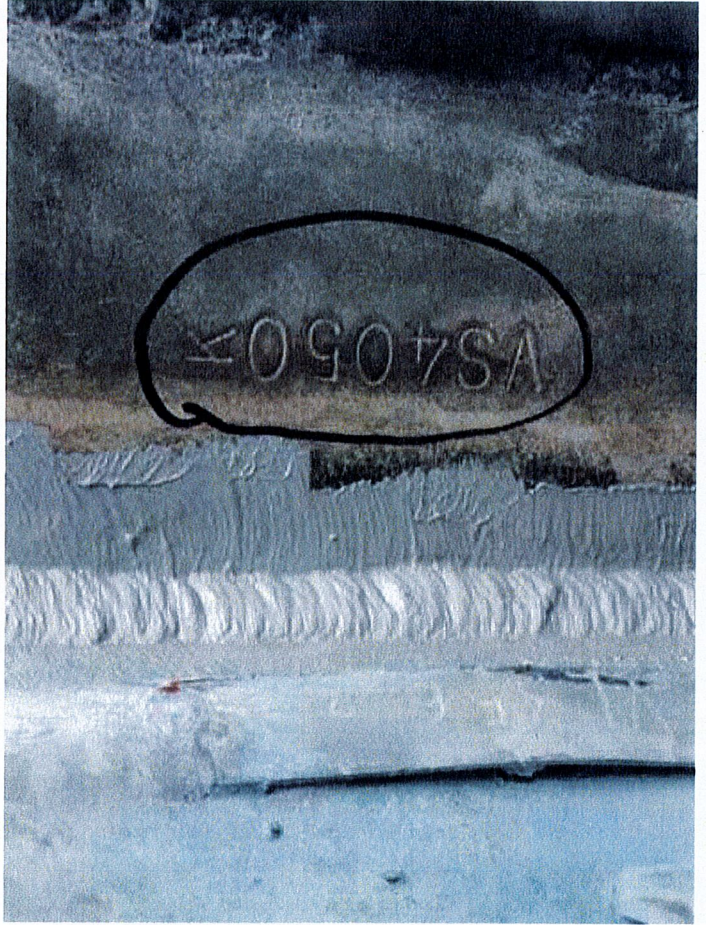
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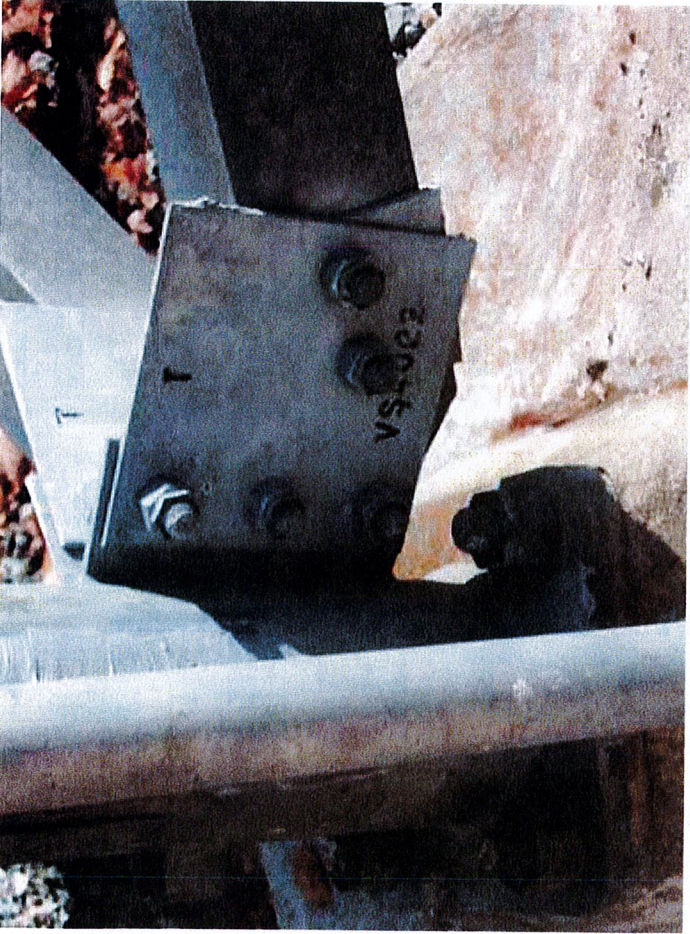
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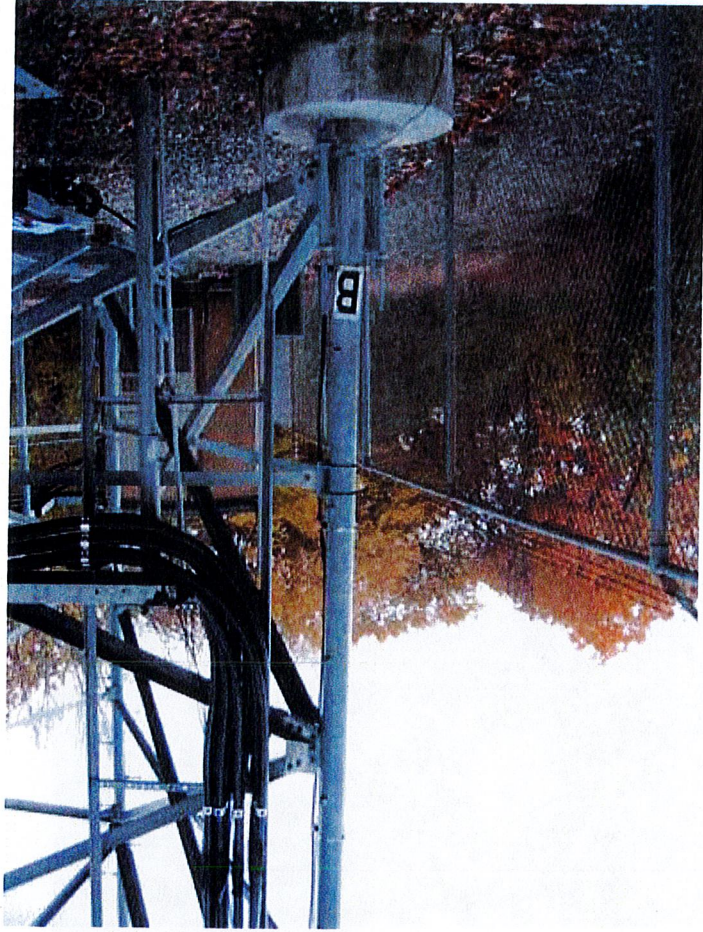
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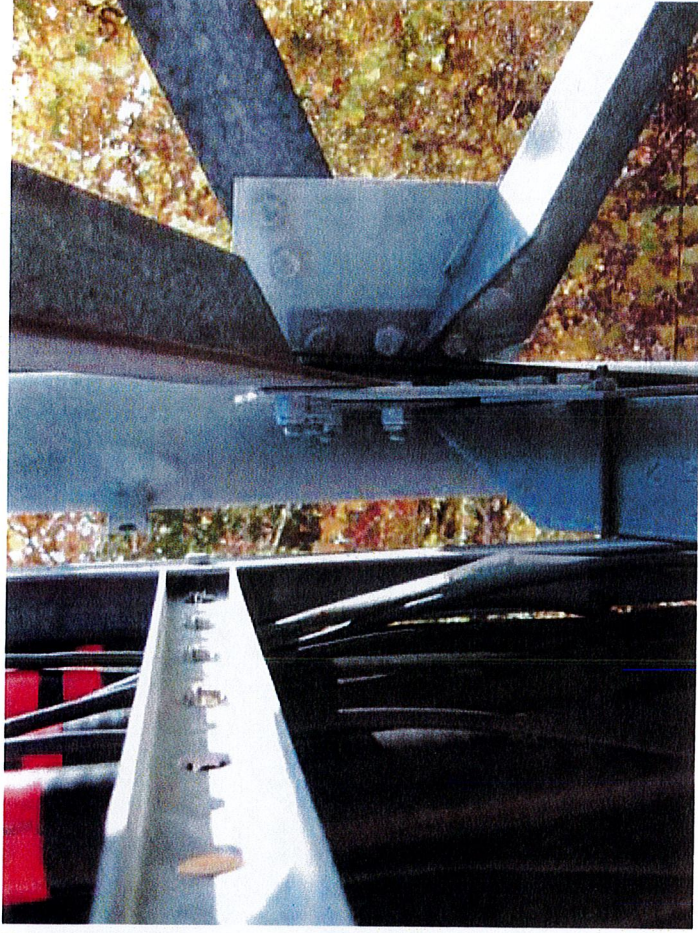
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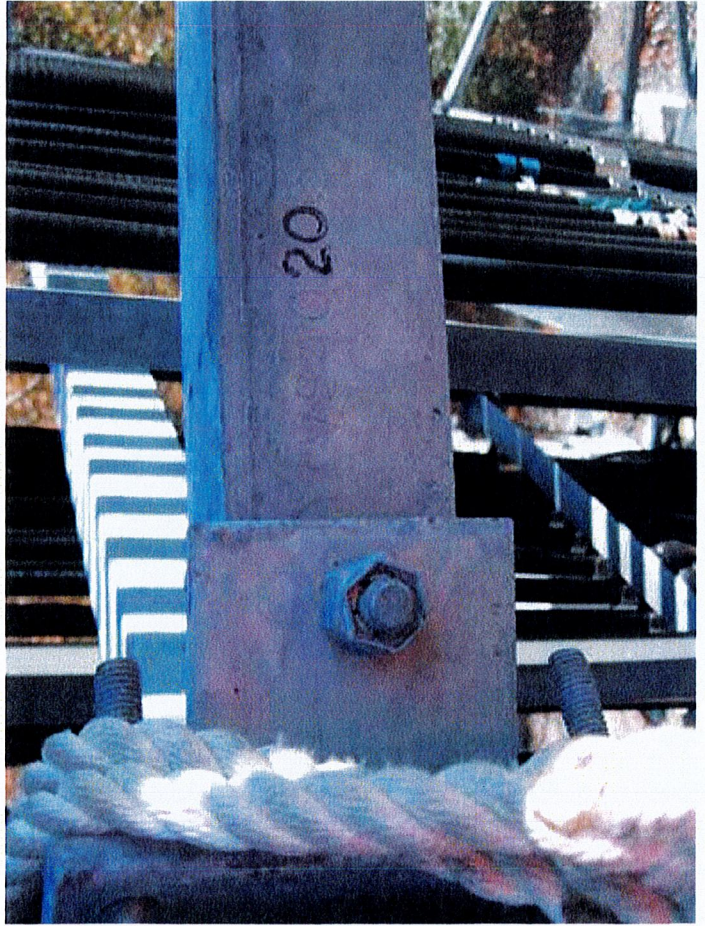
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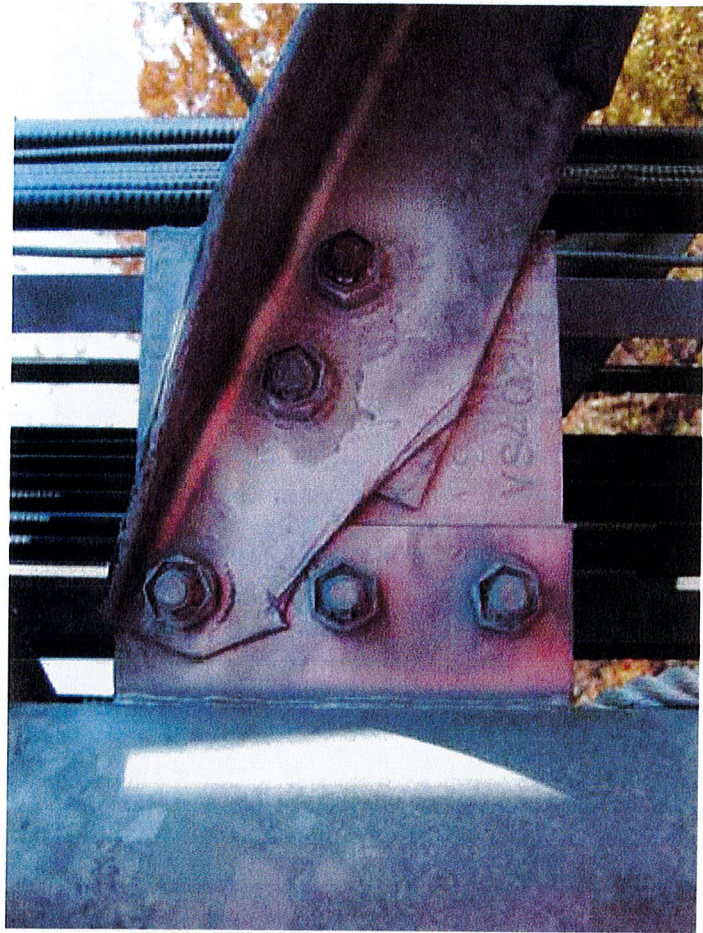
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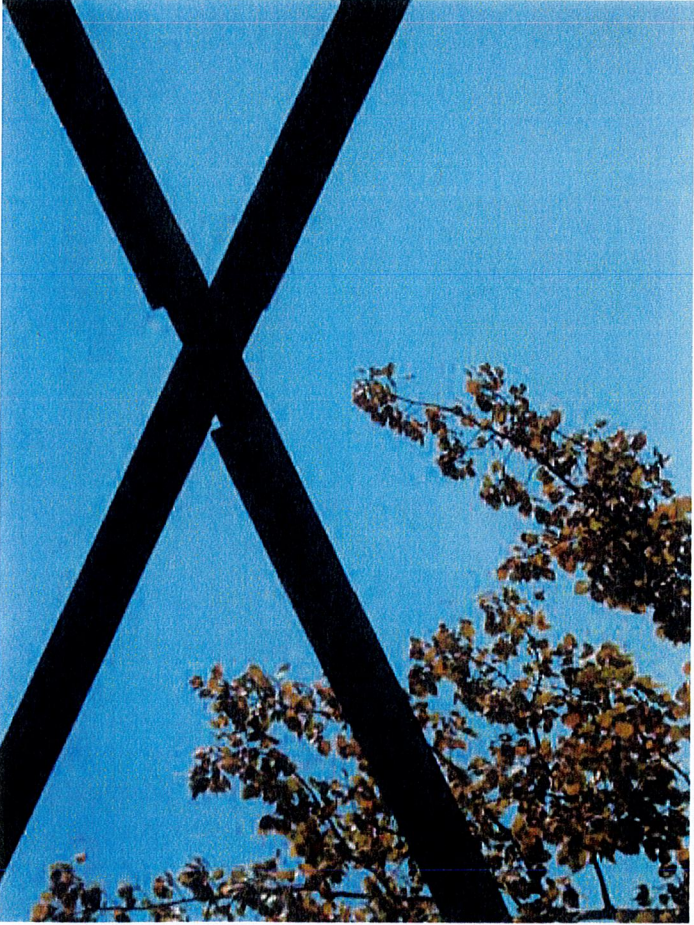
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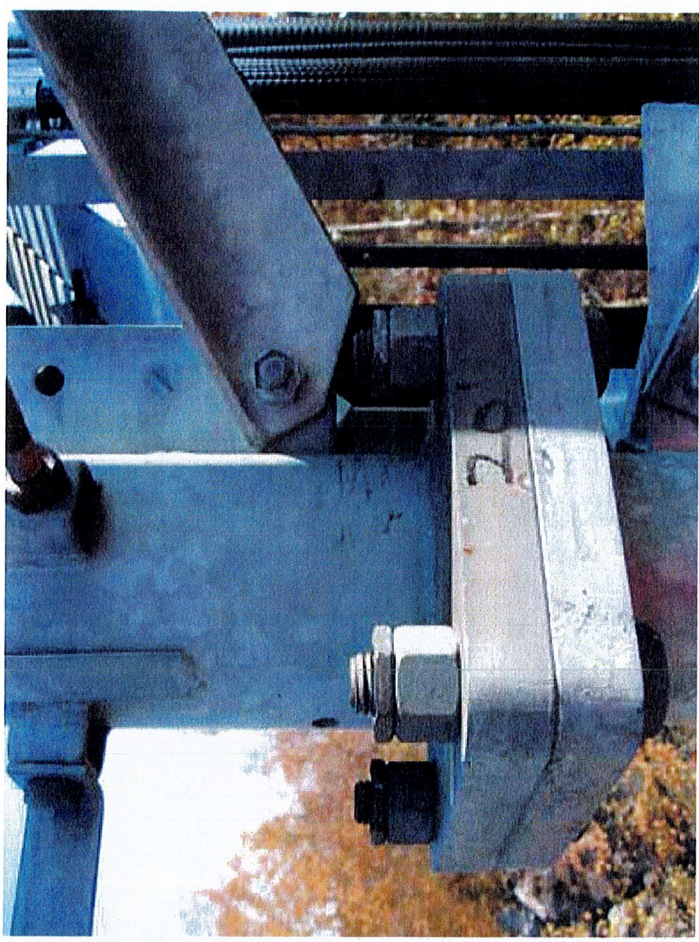
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01 102



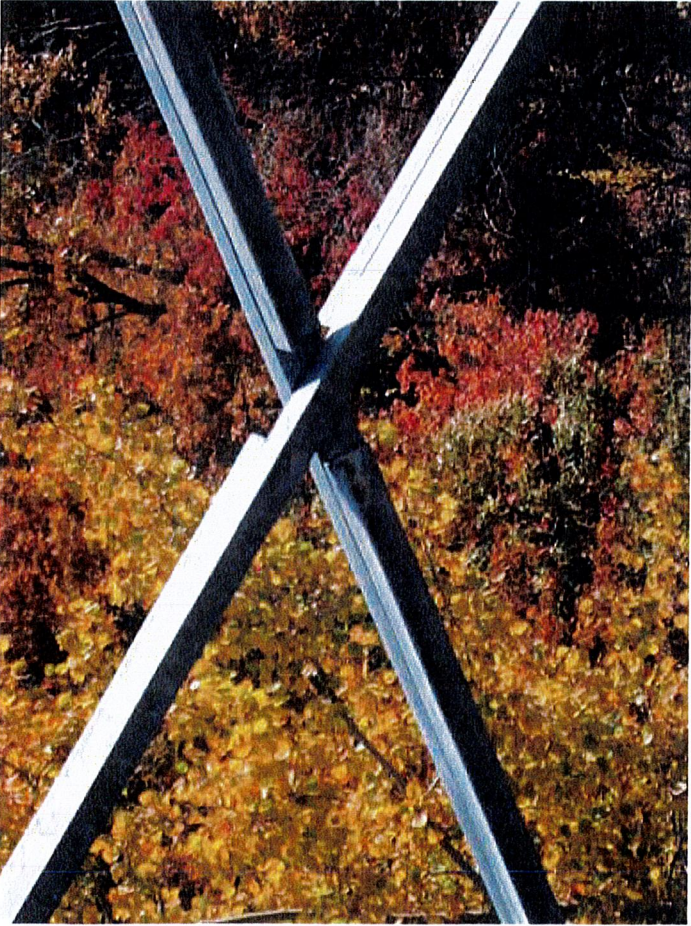
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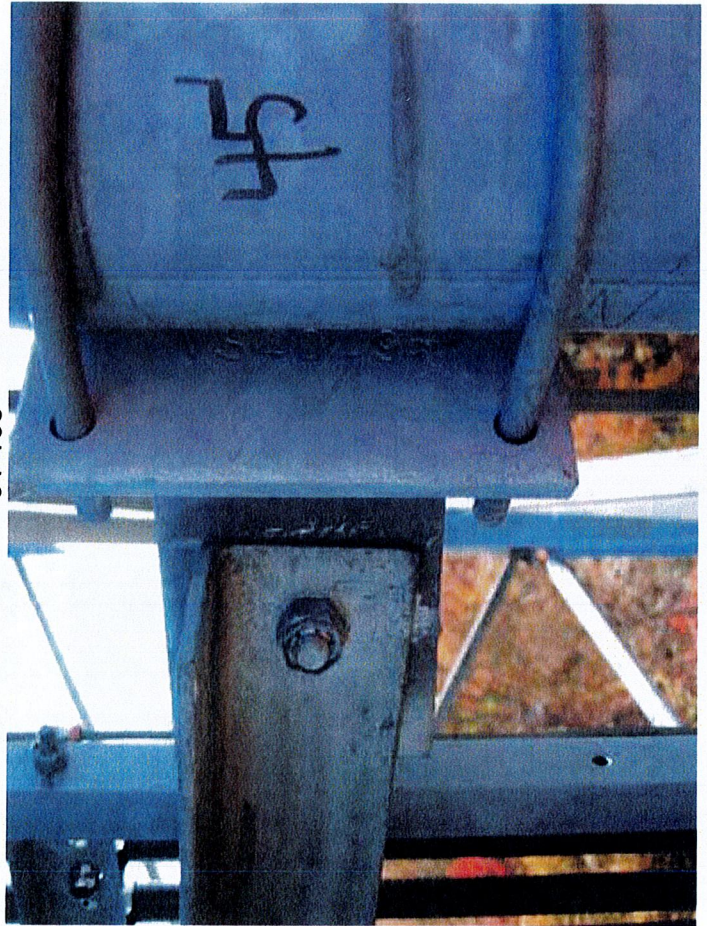
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01 103



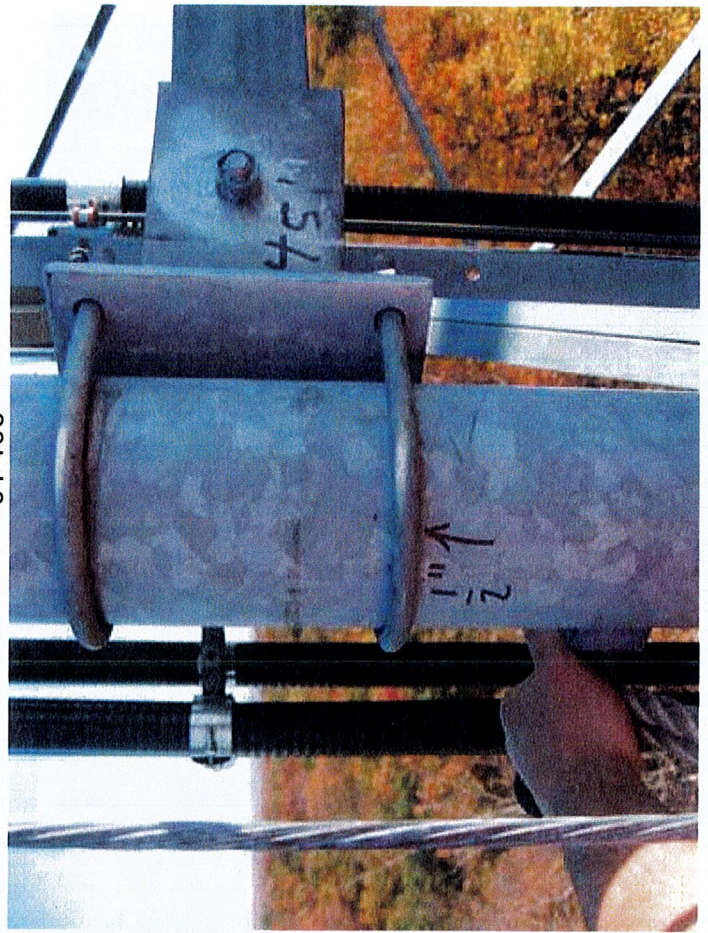
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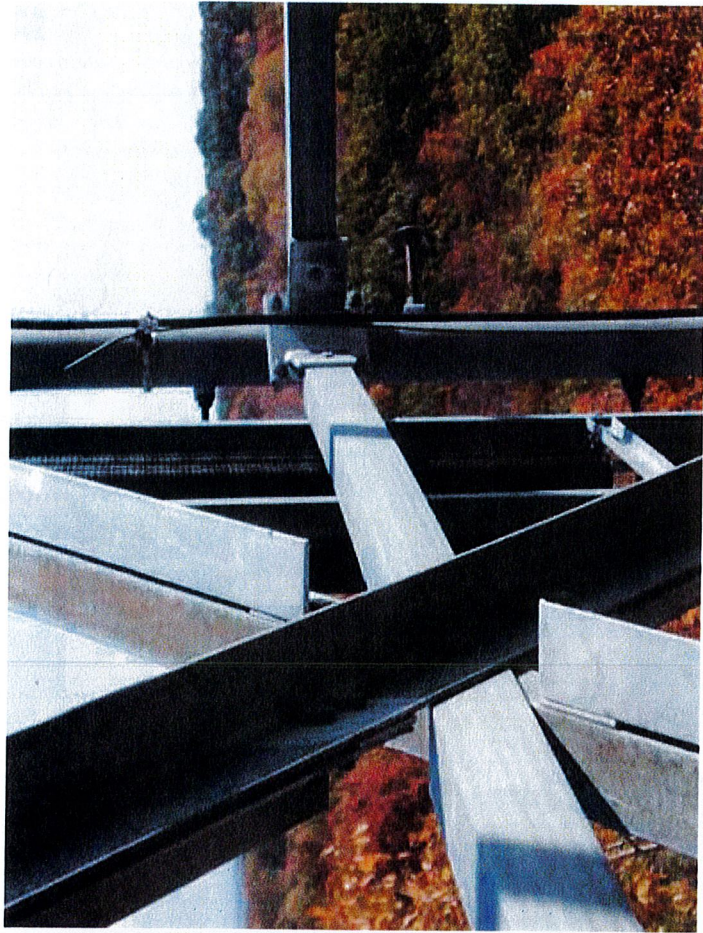
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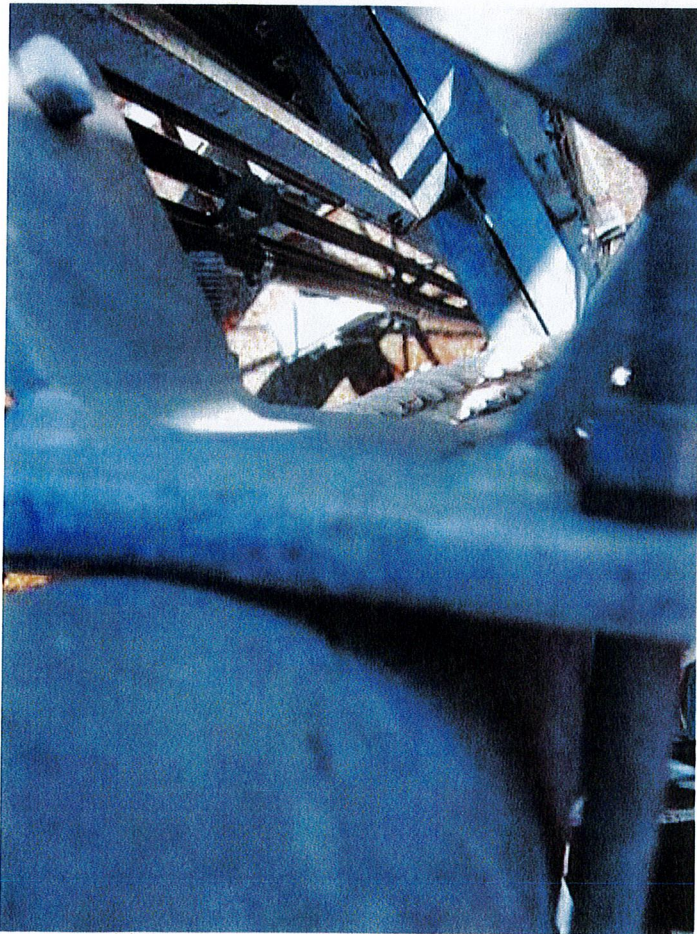
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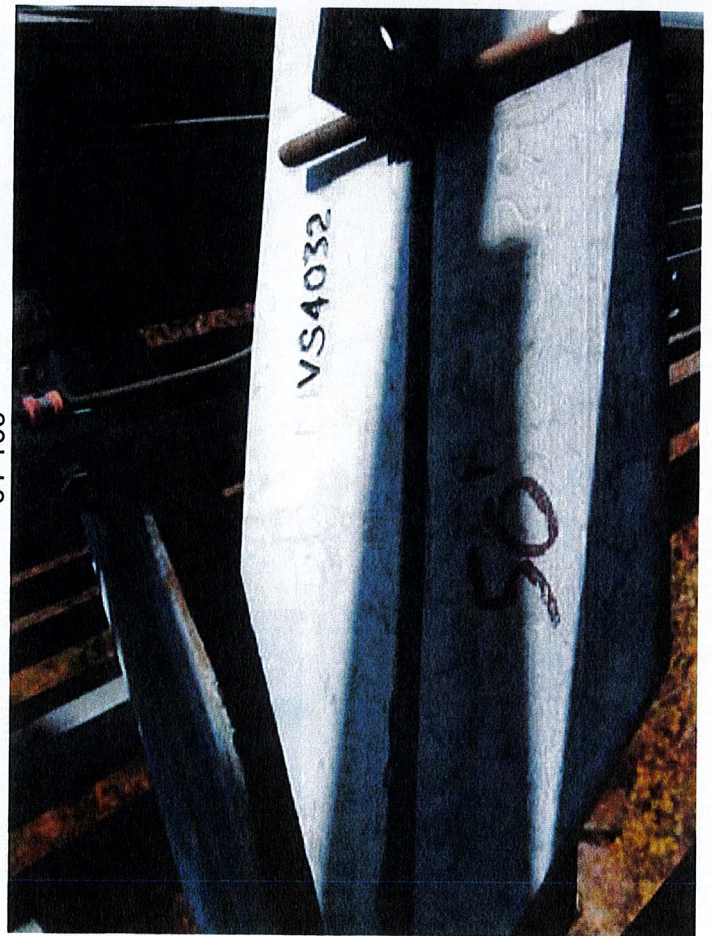
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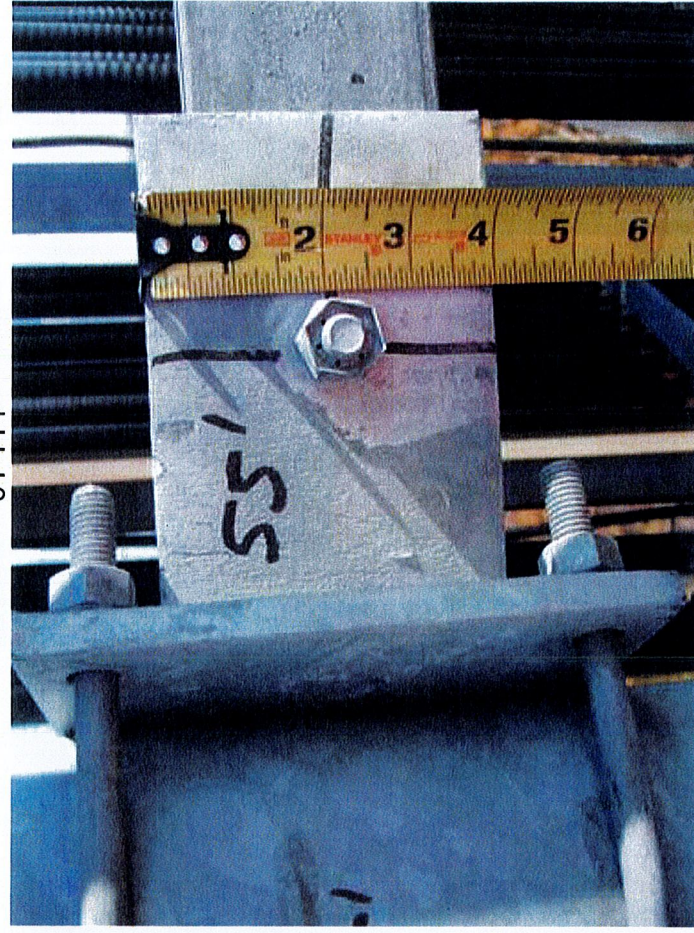
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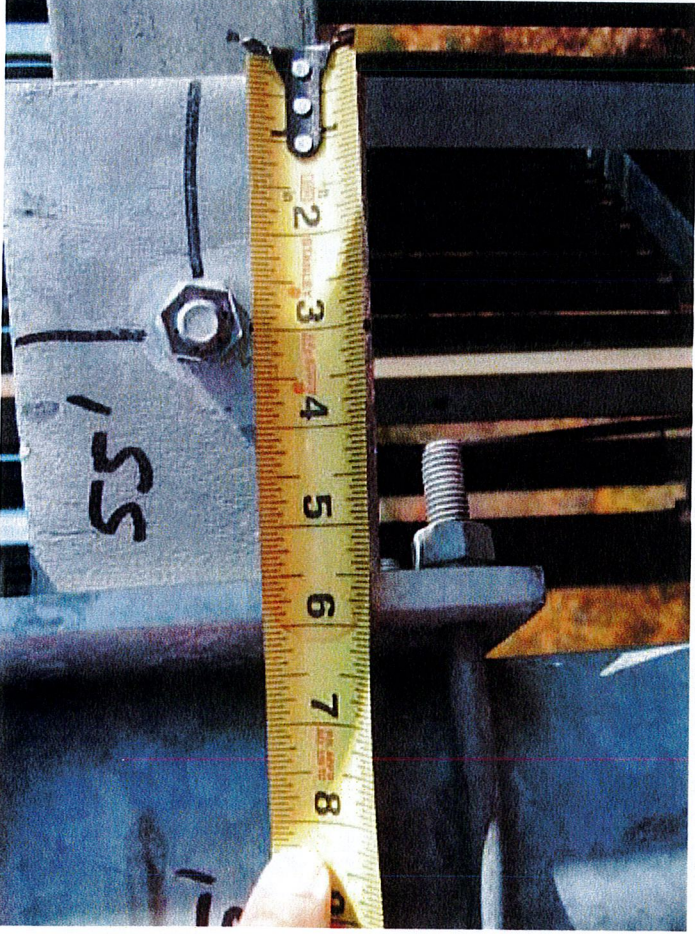
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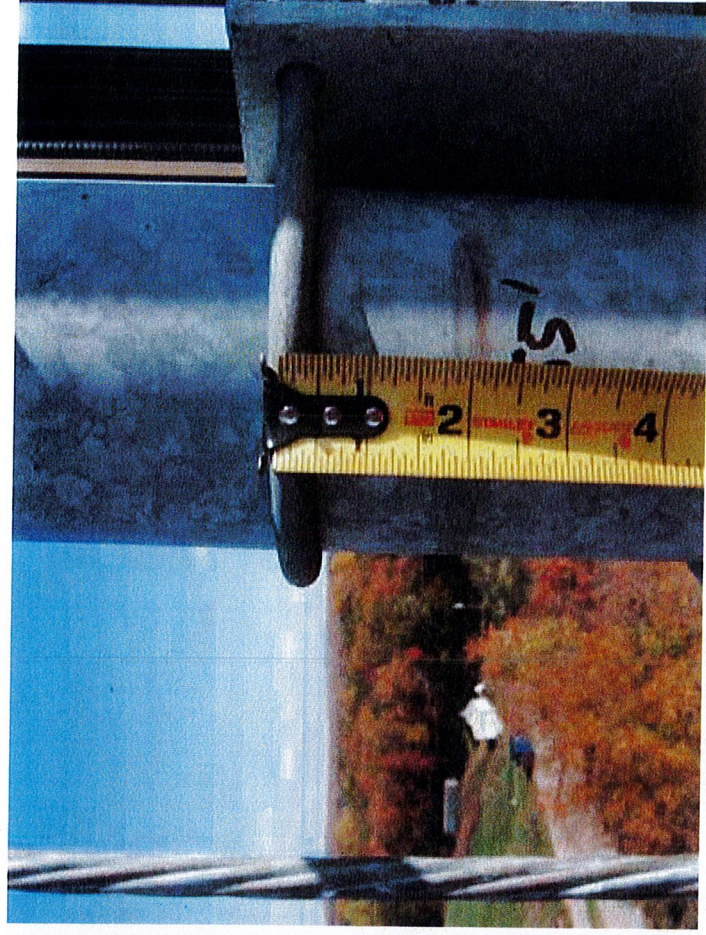
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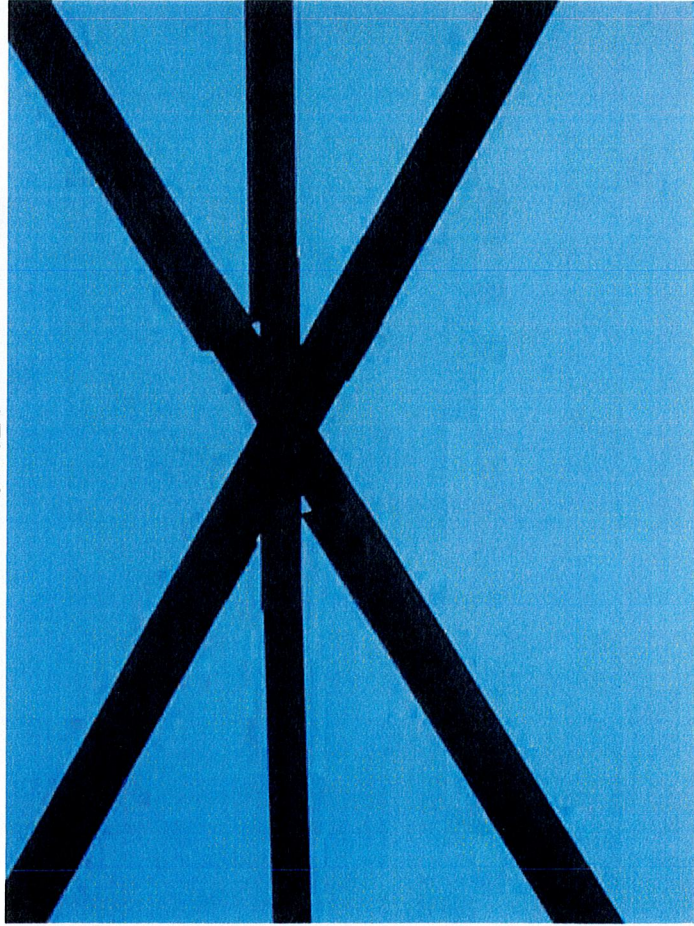
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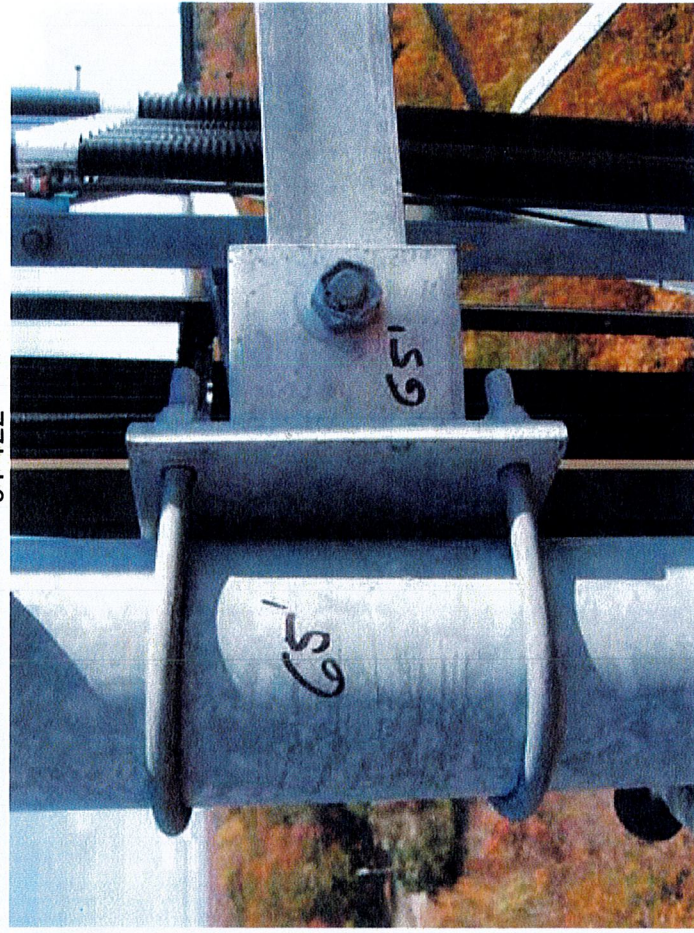
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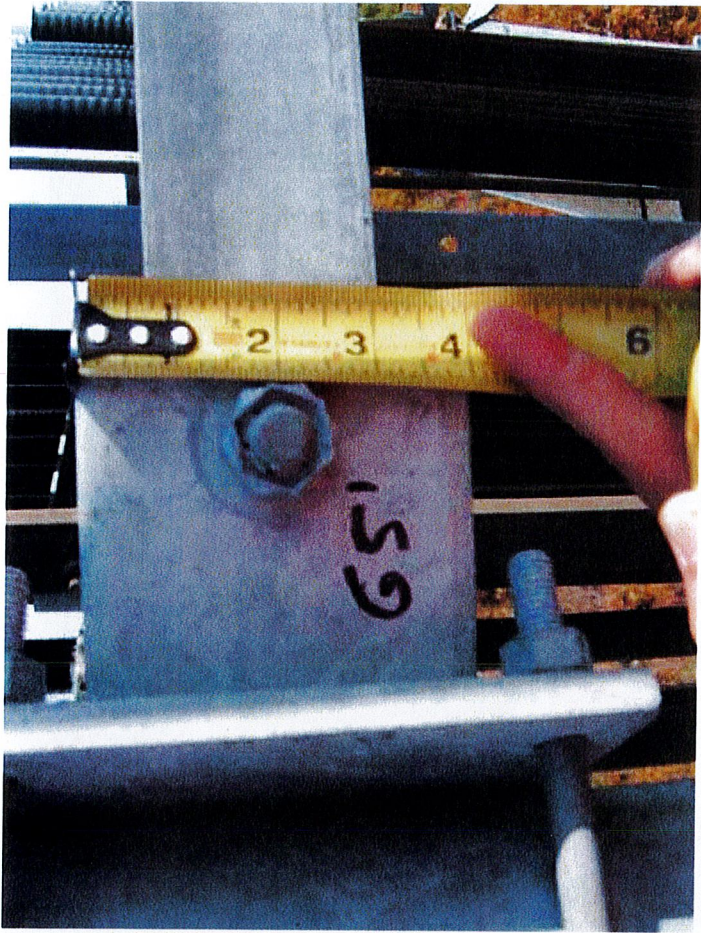
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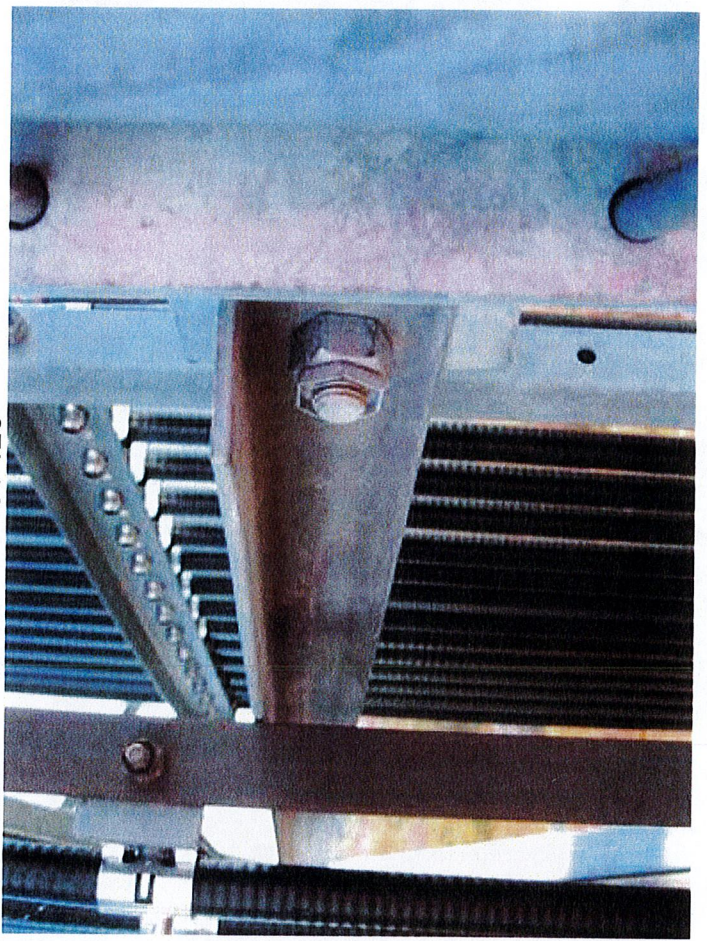
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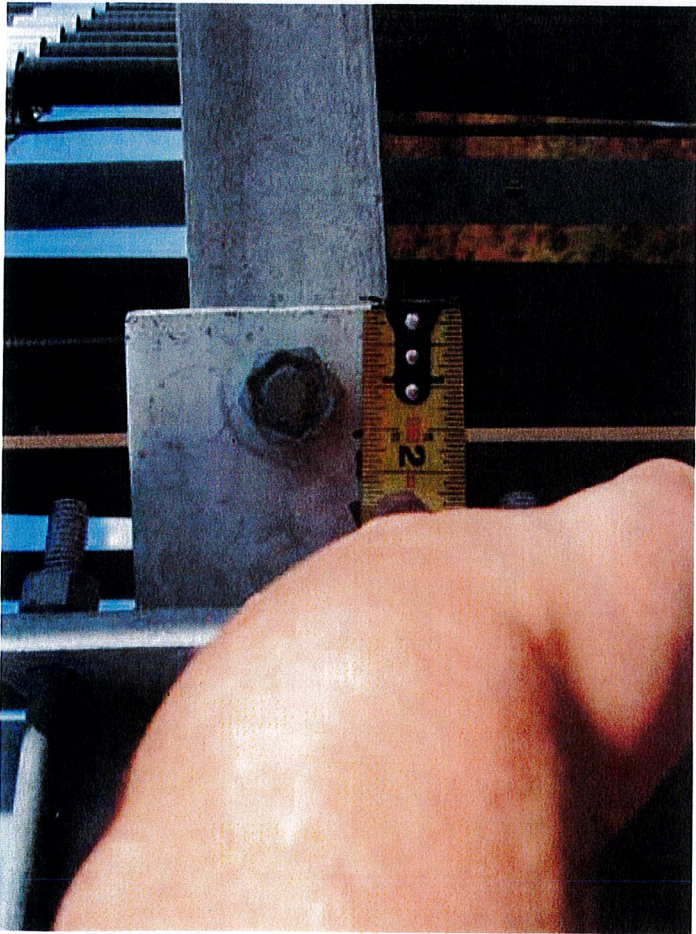
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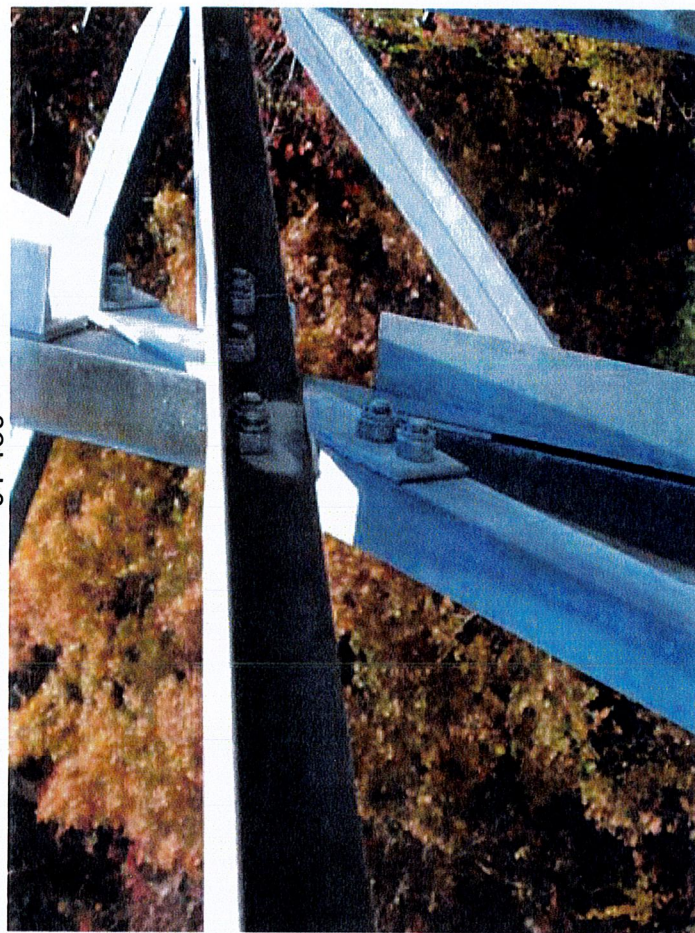
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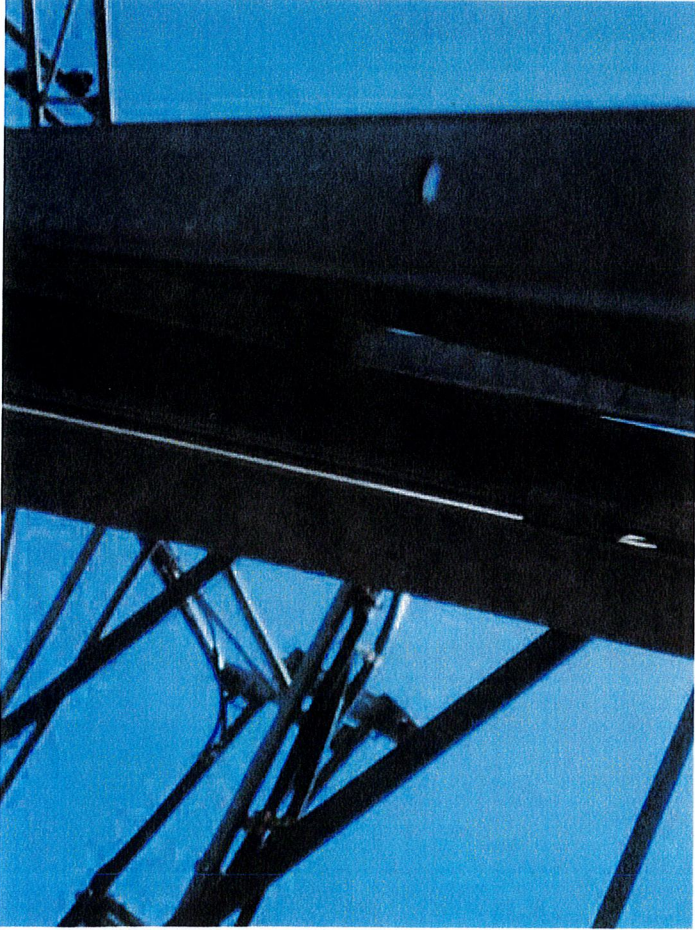
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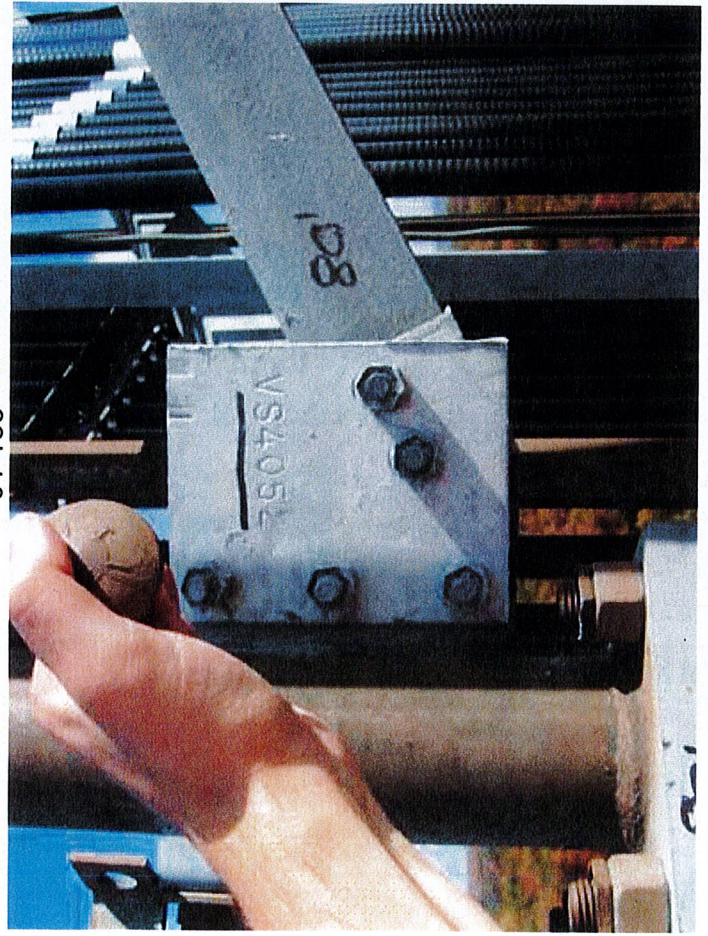
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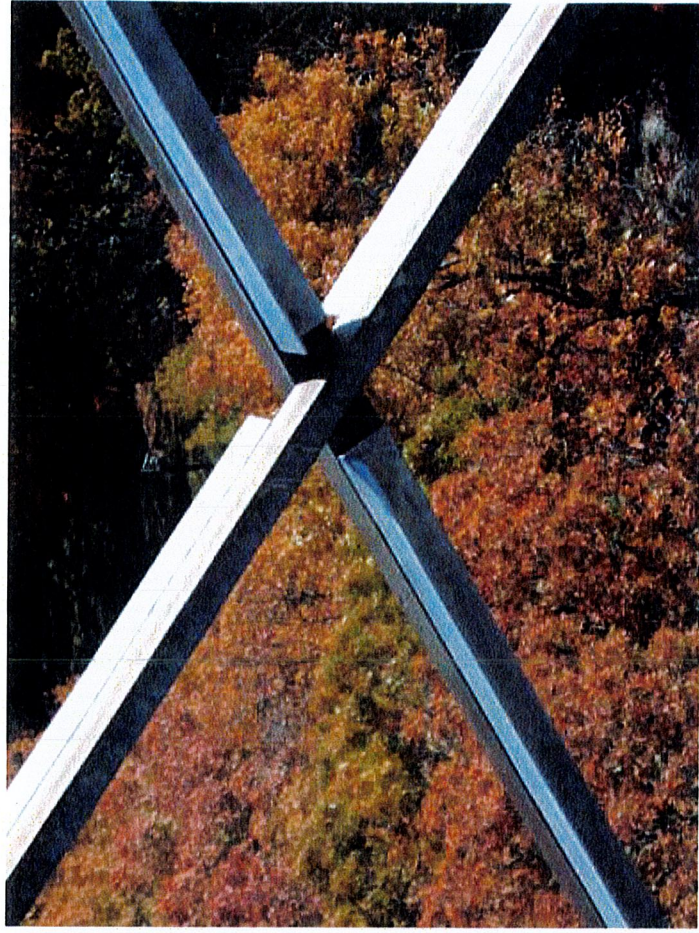
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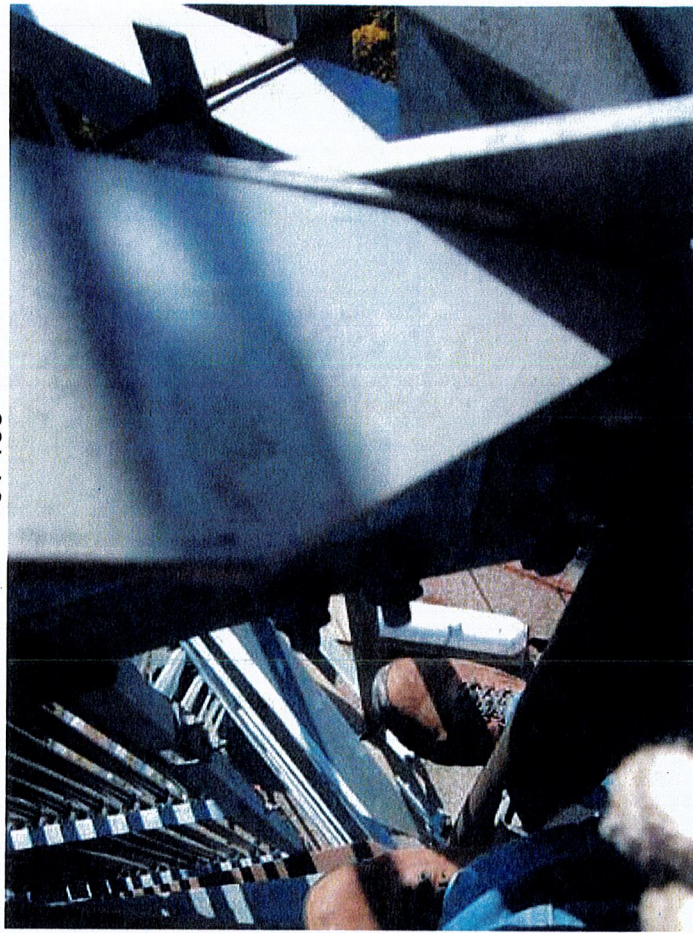
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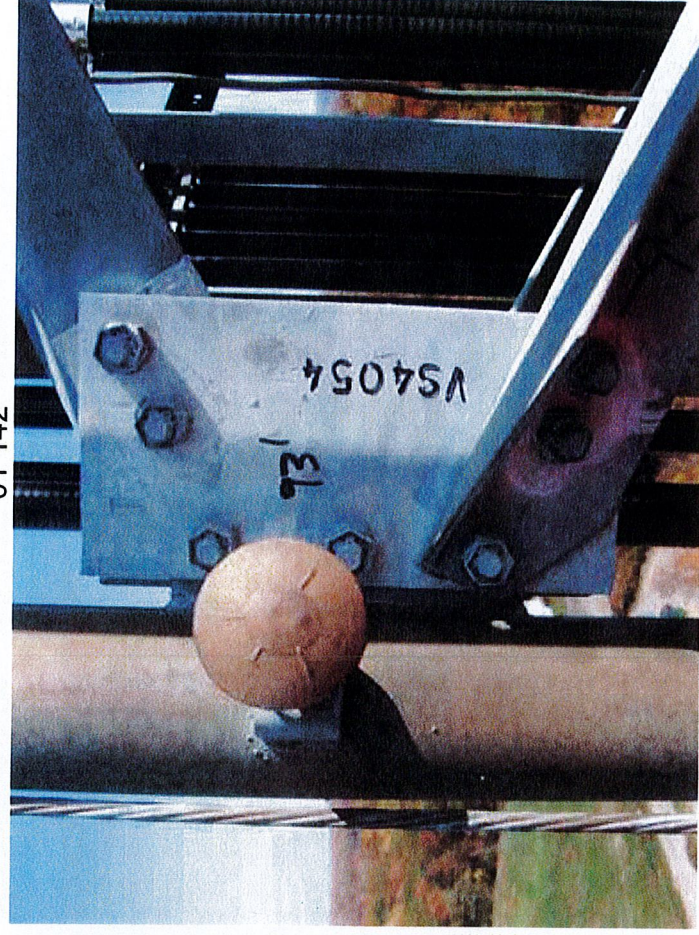
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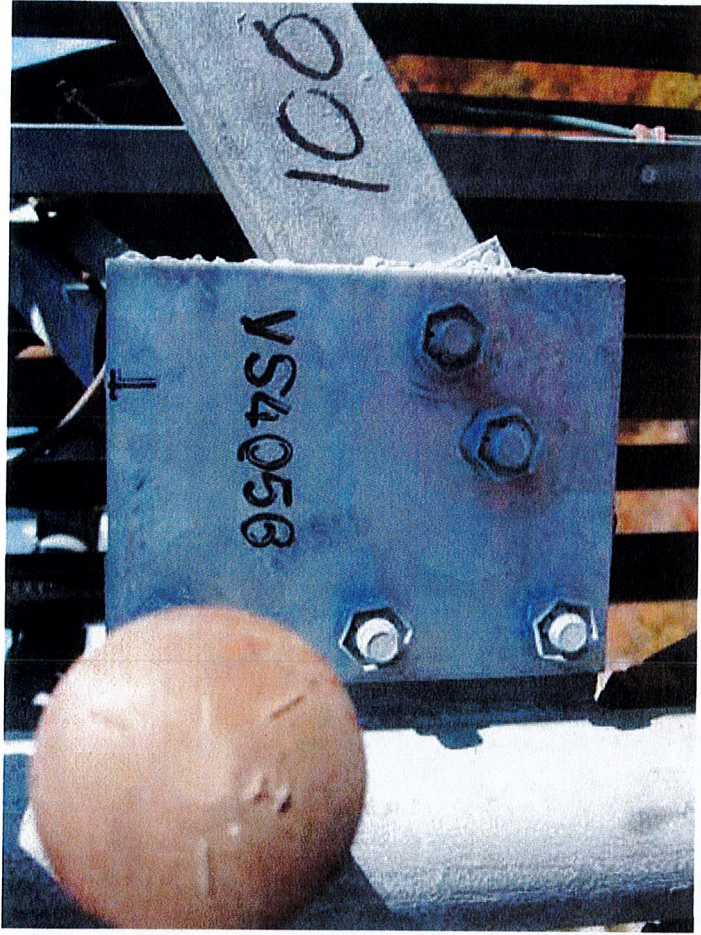
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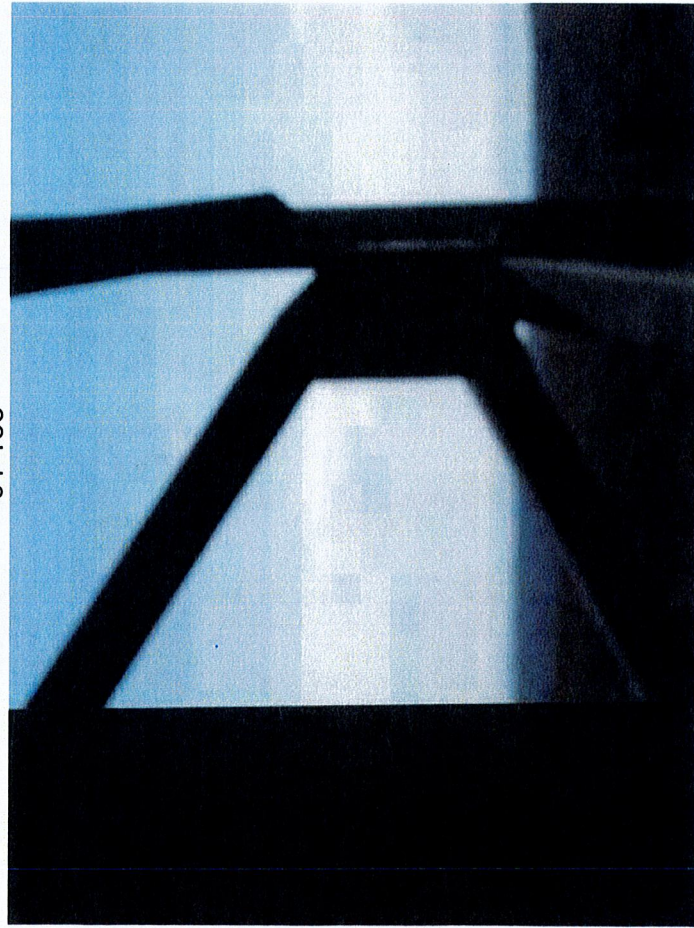
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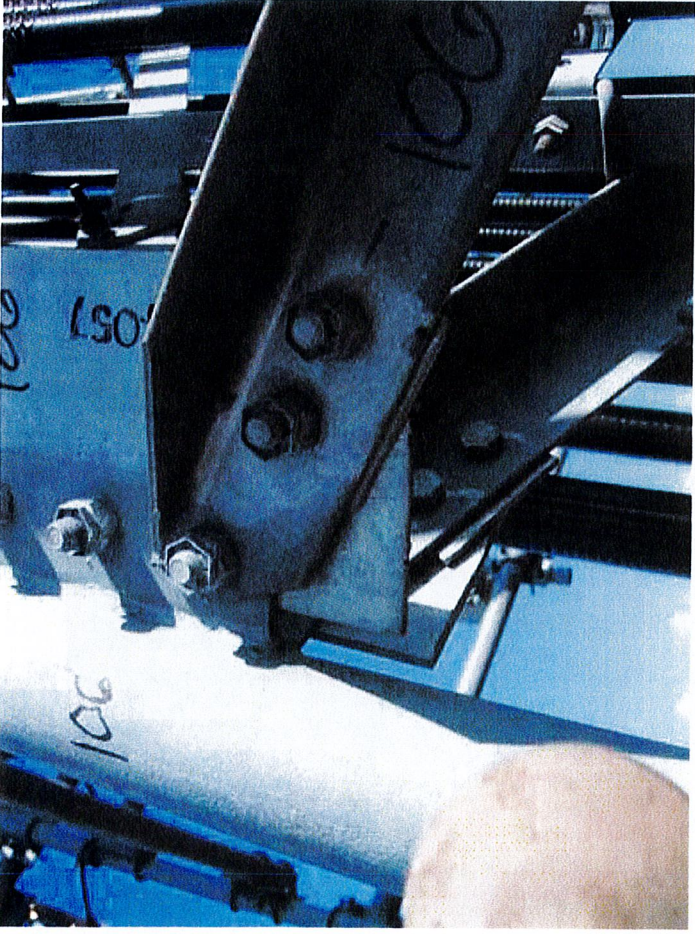
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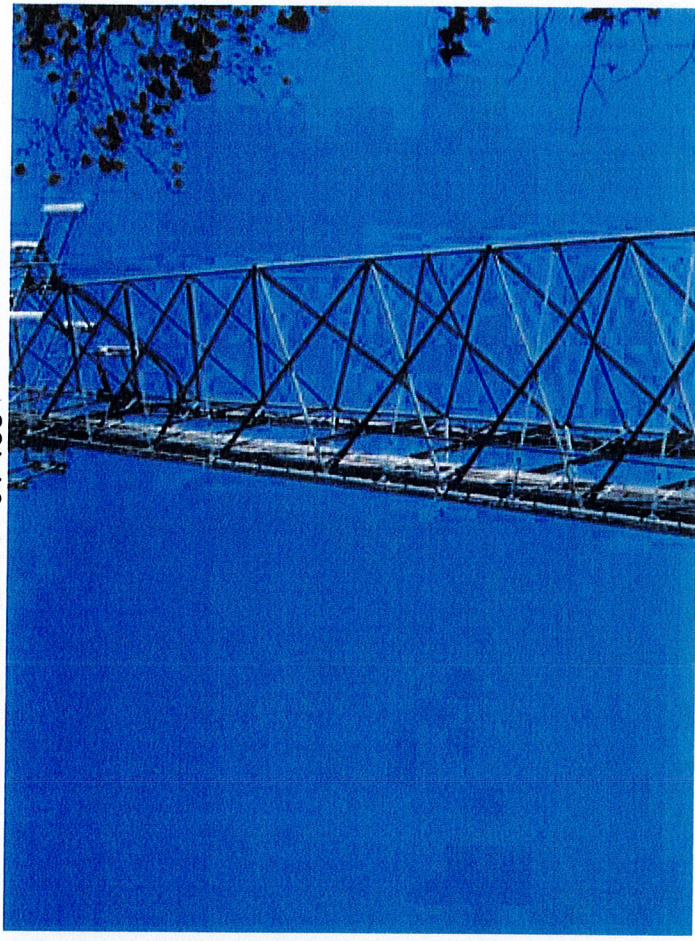
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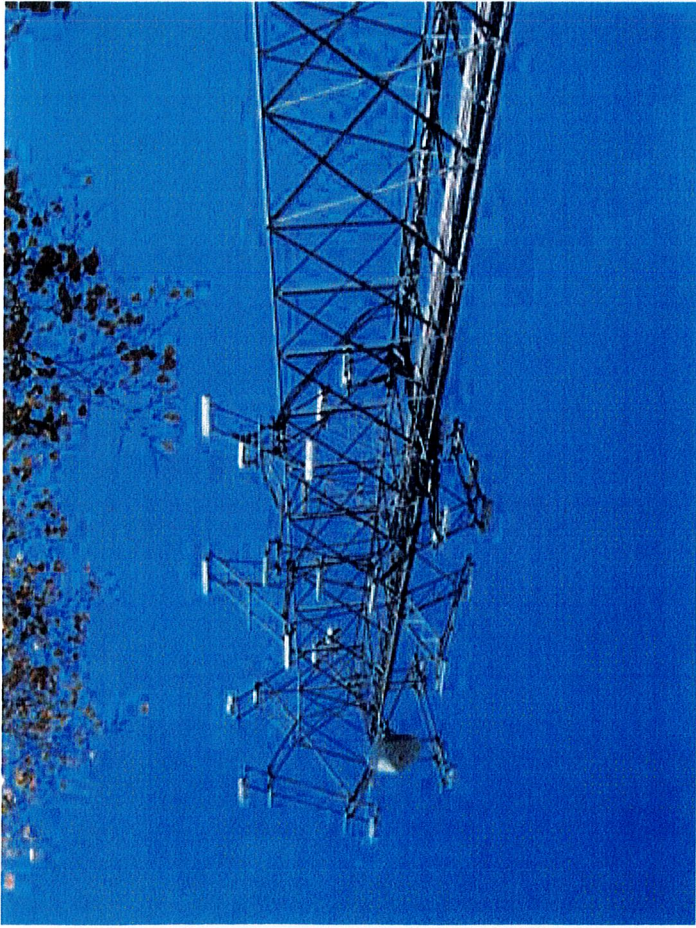
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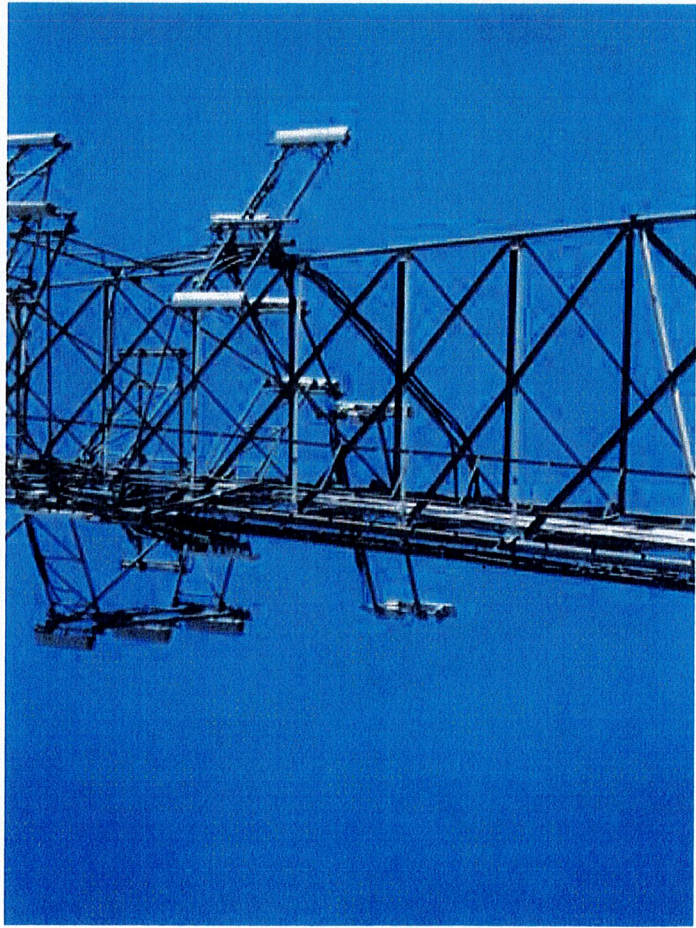
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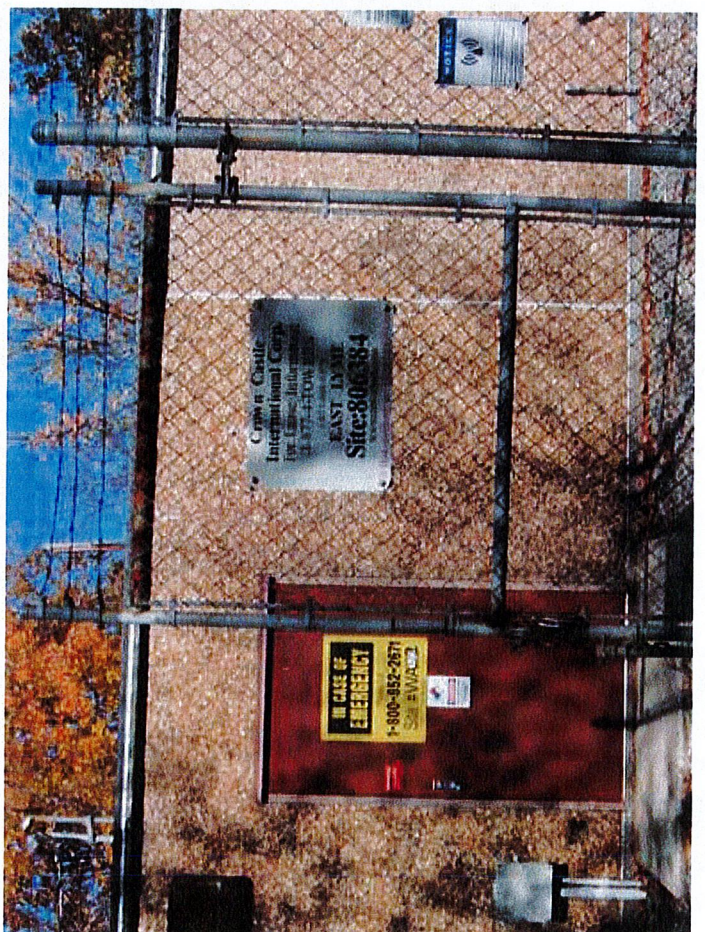
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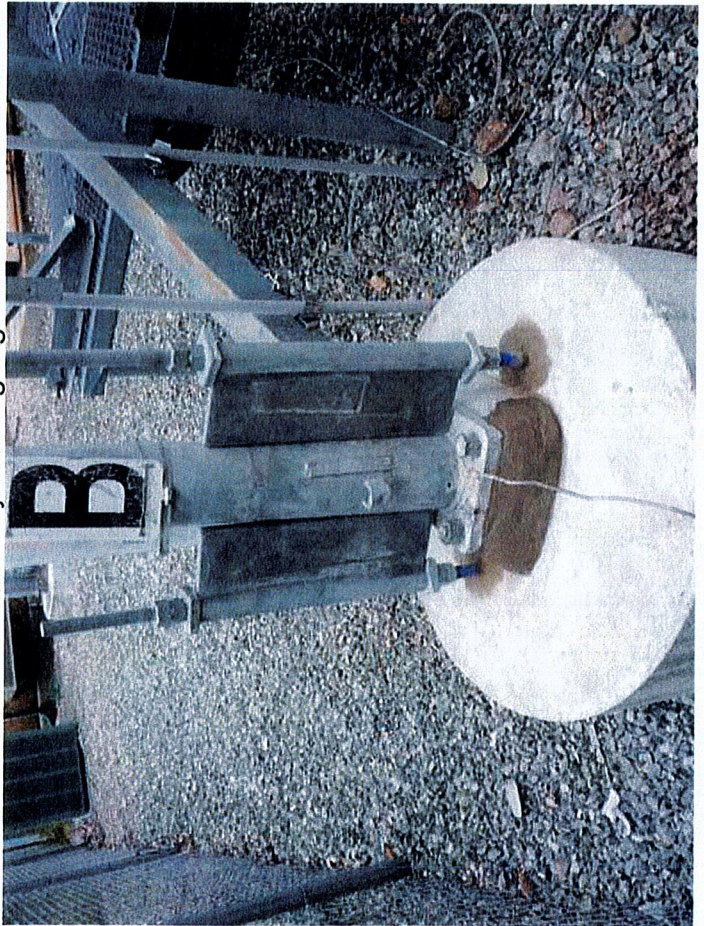
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01 174



East Lyme - Signage



East Lyme Leg B Grouted Holes

East Lyme Leg A Grouted Holes



East Lyme Leg C Grouted Holes



East Lyme Pull Test (5)



East Lyme Pull Test Leg A2 (1)



East Lyme Pull Test - Leg A1



East Lyme Pull Test Leg A1 (2)



East Lyme Pull Test Leg A2 (2)



East Lyme Pull Test Leg C (1)



East Lyme Pull Test Leg C



June 27 2007

Andrew Bazinet
Crown Castle International
349 West Commercial St., Suite 2630
East Rochester, NY 14445
(585) 899-3442

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
jmathis@verticalstructures.com

Subject: Post Rework Audit/Inspection

Crown Castle Designation

Crown Castle BU Number: 806378
Crown Castle Site Name: HRT 086

Engineering Firm Designation

Vertical Structures Project Number: 2007-004-025

Site Data

126 Pioneer Heights Road, Somers, CT, Tolland County
Latitude 41°-59'-1.48" Longitude -72°-27'-55.87"
160' Rohn SSV Self-Supporting Tower

Dear Mr. Bazinet,

Vertical Structures is pleased to present this report on the results of the post rework audit/inspection performed on the aforementioned tower. This report has been prepared in accordance with the terms of Crown Castle Purchase Order Number 232042. The purpose of the post rework audit/inspection is to verify that all required modifications have been performed in accordance with the document in Table 1.

Table 1 – Rework Documents

Document	Remarks	Reference	Source
Rework Drawings	Vertical Structures Inc. Job No. 2006-004-066 (Revised Per Material)	N/A	Appendix A

Required modifications have been completed in accordance with the document in Table 1

Vertical Structures appreciates the opportunity of providing our continuing professional services to you and Crown Castle International. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

John Mathis, P.E.
Director/Engineering



June 27, 2007

Andrew Bazinet
Crown Castle International
349 West Commercial St., Suite 2630
East Rochester, NY 14445
(585) 899-3442

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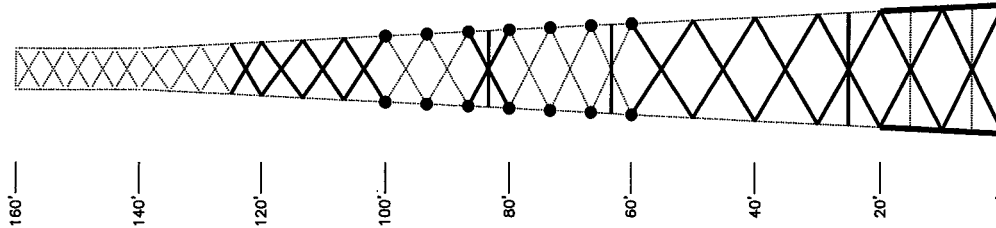
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Respectfully submitted,

John Mathis, P.E.
Director/Engineering

APPENDIX A

A MINIMUM OF 3/4" FIELD DRILLED HOLES ARE REQUIRED FOR THESE MODIFICATIONS. HOLES MUST HAVE TWO COATS OF ZINC RICH PAINT PER NOTE 8 BEFORE ASSEMBLY



— 125' - 120'; INSTALL REPLACEMENT DIAGONALS PER SHEET 8.

— 120' - 100'; INSTALL REPLACEMENT DIAGONALS PER SHEET 7.

— 100' - 80'; INSTALL END CONNECTION AND GUSSET REINFORCEMENT PER SHEET 6.

— 80' - 60'; INSTALL MID-BAY HORIZONTALS, ADDITIONAL DIAGONALS AND GUSSET REINFORCEMENT PER SHEET 5.

— 60' - 40'; INSTALL END CONNECTION AND GUSSET REINFORCEMENT PER SHEET 5.

— 40' - 20'; INSTALL MID-BAY HORIZONTALS PER SHEET 5.

— 20' - 0'; INSTALL ADDITIONAL DIAGONALS AND LEG REINFORCEMENT PER SHEET 2.

TABLE OF CONTENTS	
SHEET NO.	DESCRIPTION
SHEET 1	MASTER DRAWING INCLUDING NOTES
SHEET 2	TOWER MODIFICATIONS (20' - 0')
SHEET 3	TOWER MODIFICATIONS (40' - 20')
SHEET 4	TOWER MODIFICATIONS (60' - 40')
SHEET 5	TOWER MODIFICATIONS (80' - 60')
SHEET 6	TOWER MODIFICATIONS (100' - 80')
SHEET 7	TOWER MODIFICATIONS (120' - 100')
SHEET 8	TOWER MODIFICATIONS (125' - 120')
SHEET 9	GUSSET REINFORCEMENT DETAIL (80')

STRUCTURAL MODIFICATIONS:

THIS DRAWING DEPICTS THE REWORK REQUIRED TO REMEDY THE DEFICIENCIES FOUND IN THE HRT 086 CT TOWER PER THE REPORT PUBLISHED BY VERTICAL STRUCTURES ON 10-20-06, JOB# 2006-004-061.

- REINFORCE THE DIAGONALS BETWEEN 125' AND 100'.
- REINFORCE THE DIAGONAL GUSSETS AND END BOLT CONNECTIONS BETWEEN 100' AND 80'.
- REINFORCE THE LEGS BETWEEN 80' AND 60'.
- REINFORCE THE DIAGONALS AND GUSSETS BETWEEN 80' AND 60'.
- REINFORCE THE LEGS BETWEEN 60' AND 40'.
- REINFORCE THE DIAGONAL GUSSETS AND END BOLT CONNECTIONS BETWEEN 60' AND 40'.
- REINFORCE THE LEGS BETWEEN 40' AND 20'.
- REINFORCE THE LEGS BETWEEN 20' AND 0'.

MATERIAL SPECIFICATION NOTES:

- ALL MATERIAL AND HARDWARE CAN BE PURCHASED FROM VERTICAL STRUCTURES, INC.
- FABRICATION DETAILS FOR ANY PARTS NOT PURCHASED FROM VERTICAL STRUCTURES, INC. MUST BE APPROVED BY VERTICAL STRUCTURES, INC. BEFORE USE. REVIEW MAY INCLUDE RECEIPT OF MILL CERTIFICATIONS WHEN NECESSARY.
- NO FIELD FABRICATION OF TOWER REWORK MATERIAL IS ALLOWED. ALL STEEL TO BE SHOP FABRICATED. IT IS THE RESPONSIBILITY OF THE MATERIAL SUPPLIER TO GUARANTEE PROPER FITUP. ALL DIMENSIONS USED IN FABRICATION DETAILS MUST BE FIELD VERIFIED.

WELDING SPECIFICATION NOTES:

- SURFACES TO BE CLEARED OF GALVANIZATION BEFORE FIELD WELDING ANY MATERIAL.
 - ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CGCSA POLICY "CUTTING AND WELDING SAFETY PLAN" (000# ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT. PRIOR TO BIDDING REWORK, CONTRACTOR MUST HAVE IN THEIR POSSESSION AND HAVE READ THIS DOCUMENT. CONSULT CROWN CASTLE FOR COPIES OF THIS DOCUMENT.
- ADDITIONAL WELDING NOTE:
- WELDER TO USE E70XX RODS.

TECHNICAL SPECIFICATION NOTES:

- CONTACT THE ENGINEER CONCERNING ANY CHANGES OR MODIFICATIONS THAT MAY BE REQUIRED DUE TO THE EXISTING CONDITIONS.
- ALL BOLTS 1/2" OR LESS TO BE INSTALLED WITH H OR 2H NUTS.
- ALL BOLTS GREATER THAN 1/2" TO BE INSTALLED WITH 2H NUTS.
- LOOKING MECHANISM FOR BOLTS TO BE PALNUTS OR LOCKWASHERS.
- ALL U-BOLTS TO BE INSTALLED WITH 2H NUTS AND LOCKWASHERS.
- ANY HARDWARE REMOVED FROM THE EXISTING TOWER MUST BE REPLACED WITH NEW HARDWARE OF EQUAL SIZE AND QUALITY UNLESS NOTED OTHERWISE.
- FINISHING SPECIFICATIONS - ALL MATERIAL TO BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
 - FABRICATED MATERIAL - ASTM A153.
 - HARDWARE - ASTM A153.
 - GUY WIRE - ASTM A475.
- AFTER FIELD MODIFICATIONS OF ANY STEEL MEMBERS, COAT EXPOSED STEEL SURFACES WITH TWO COATS OF SHERWIN WILLIAMS PART #143-0255 ZINC CLAD COATING, CONTAINING 97% ZINC DUST TO RESTORE THE GALVANIZED PROTECTION ON THE MEMBERS. IF REQUIRED, PAINT ALL AREAS AFFECTED OR NEW STEEL WITH MATCHING TOWER PAINT.

CONTRACT ADMINISTRATION NOTES:

- PER CROWN POLICY, ALL MODIFICATIONS DEPICTED ON THESE DRAWINGS MUST BE INSPECTED BY VERTICAL STRUCTURES, INC. TO EXECUTE THIS SERVICE. VERTICAL STRUCTURES WILL REQUIRE A WRITTEN PURCHASE ORDER AND ONE CALENDAR WEEK PRIOR NOTICE OF AN INSPECTION. THE CONTRACTOR SHALL ALSO GIVE VERIFICATION 24 HOURS IN ADVANCE OF A SCHEDULED REQUEST FOR INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSURE THAT THESE REQUIREMENTS ARE MET.
- INSPECTIONS OF ABOVE GRADE MODIFICATIONS SHALL BE PERFORMED AT THE CONCLUSION OF THE WORK. BELOW GRADE OR HIDDEN INSTALLATIONS SUCH AS REBAR OR ANCHORS SHALL BE INSPECTED PRIOR TO THE PLACEMENT OF CONCRETE.
- VERTICAL STRUCTURES WILL PROVIDE AN ENGINEERING REVIEW OF PART FABRICATION DETAIL DRAWINGS PRIOR TO MATERIAL FABRICATION AT THE DISCRETION OF CROWN CASTLE PROJECT MANAGEMENT. VERTICAL STRUCTURES WILL REQUIRE A PURCHASE ORDER AND A COMPLETE DRAWING PACKAGE TO PERFORM THIS WORK. VERTICAL STRUCTURES WILL SUBMIT A REPORT TO THE CONTRACTOR WITHIN TWO BUSINESS DAYS AFTER RECEIPT OF THE DRAWINGS AND PURCHASE ORDER.

B	REVISED PER MAT. 2007-067-001	3-28-07	STH
A	ORIGINAL RELEASE	11-8-06	JAC
REV.	DESCRIPTION	DATE	BY



P.O. Box 1488
Redmond, NY 14676
Phone: (855) 624-6360
Fax: (855) 624-6360
Email: eng@verticalstructures.com

FOR

CROWN CASTLE

2006 MODIFICATIONS
TOWER REWORK FOR A
160' ROHN SSV TOWER
SITE: HRT 086, CT

CROWN CASTLE
BU# 806378

DATE	11-8-06
DATE	
DATE	
DATE	

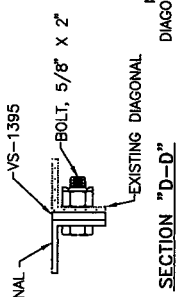
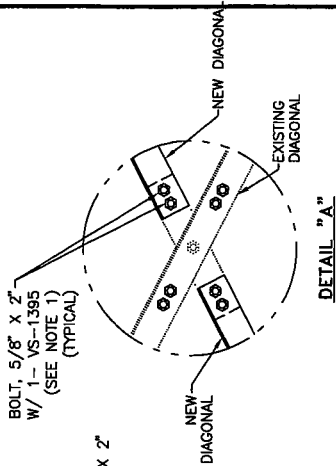
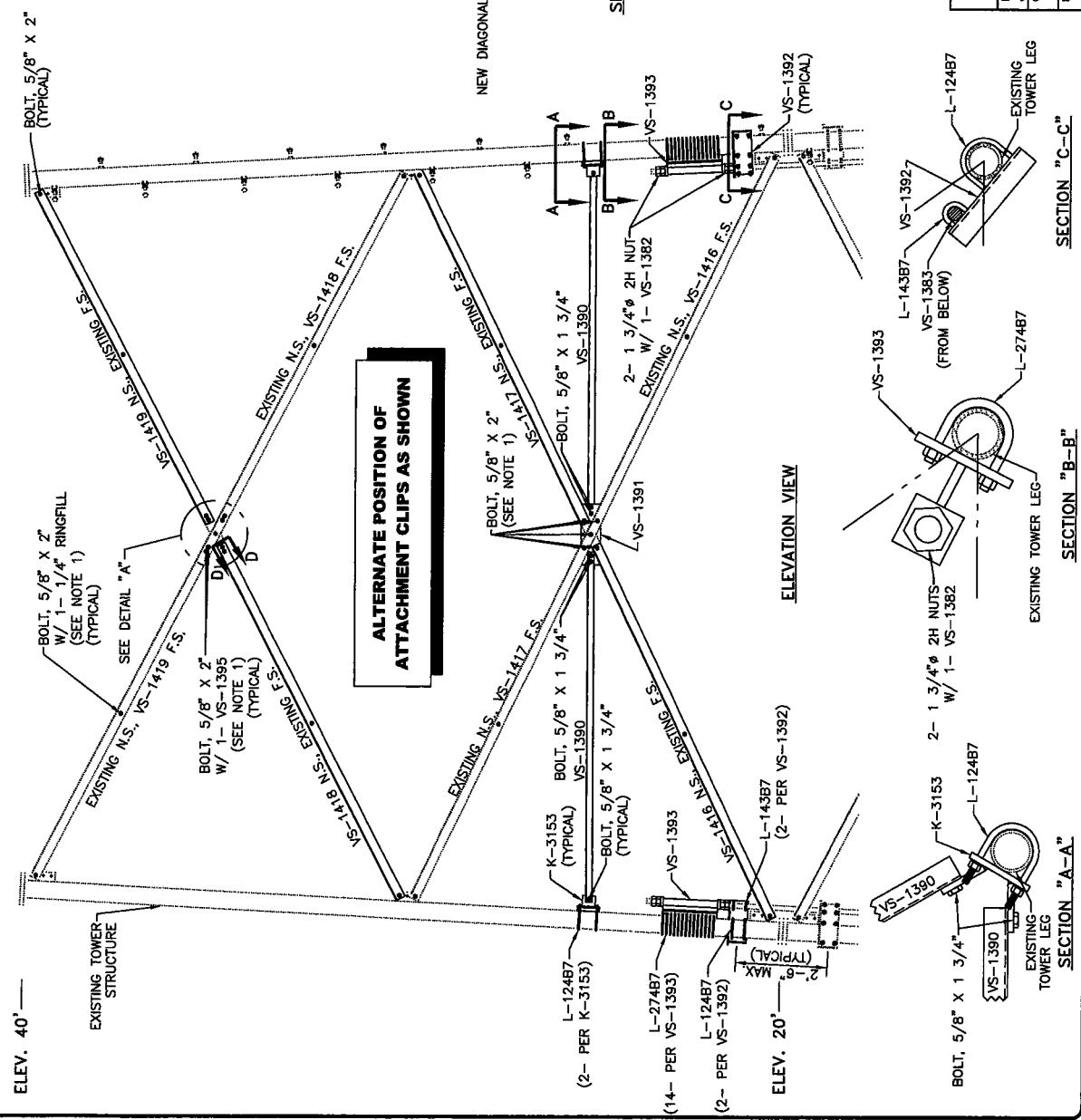
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SHEET 1 OF 9 B TA2006004066-T1 SCALE: NONE

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K-3153	3	LEG CLAMP FOR 5 9/16" O.D. PIPE	ASTM A36
VS-1392	6	BEARING PLATE, 3/4" THICK	ASTM A572 GR. 50
VS-1390	6	HORIZONTAL L 3" X 3" X 3/16"	ASTM A36
VS-1391	3	GUSSET PLATE, 3/8" THICK	ASTM A36
VS-1392	3	CLIP ANGLE, L 4" X 4" X 1/2"	ASTM A572 GR. 50
VS-1393	3	BULKHEAD WELDMENT FOR 1 3/4" S.R.	ASTM A572 GR. 50
VS-1395	12	SPACER PLATE, 1/4" THICK	ASTM A572 GR. 50
VS-1416	6	DIAGONAL, L 3" X 3" X 1/4"	ASTM A572 GR. 50
VS-1417	6	DIAGONAL, L 3" X 3" X 1/4"	ASTM A572 GR. 50
VS-1418	6	DIAGONAL, L 3" X 3" X 1/4"	ASTM A572 GR. 50
VS-1419	6	DIAGONAL, L 3" X 3" X 1/4"	ASTM A572 GR. 50
L-12487	12	U-BOLT, 1/2" FOR A 5 9/16" O.D. PIPE	ASTM A193 GR. B7
L-14387	6	U-BOLT, 1/2" FOR A 1 3/4" S.R.	ASTM A193 GR. B7
L-27487	42	U-BOLT, 5/8" FOR A 5 9/16" O.D. PIPE	ASTM A193 GR. B7
XX5816	18	BOLT, 5/8" X 1 3/4"	ASTM A325
XY0620	87	BOLT, 5/8" X 2"	ASTM A325
XY0660	24	STEEL RINGFILL, 1/4" THICK	-
XY1801	12	2H NUT, 1 3/4"	-

NOTES:

- 60- 11/16" FIELD DRILLED HOLES REQUIRED. FIELD DRILLED HOLES TO BE DRILLED ON EXISTING BOLT HOLE GAUGE LINES.



B	REVISED PER MAT. 2007-067-001	3-28-07	STH
A	ORIGINAL RELEASE	11-8-06	JAC
REV.	DESCRIPTION	DATE	BY

P.O. Box 1486
Richmond, KY 40476
Phone: (609) 624-8380
Fax: (609) 624-8389
Email: engineering@verticalstructures.com

VERTICAL STRUCTURES INC.

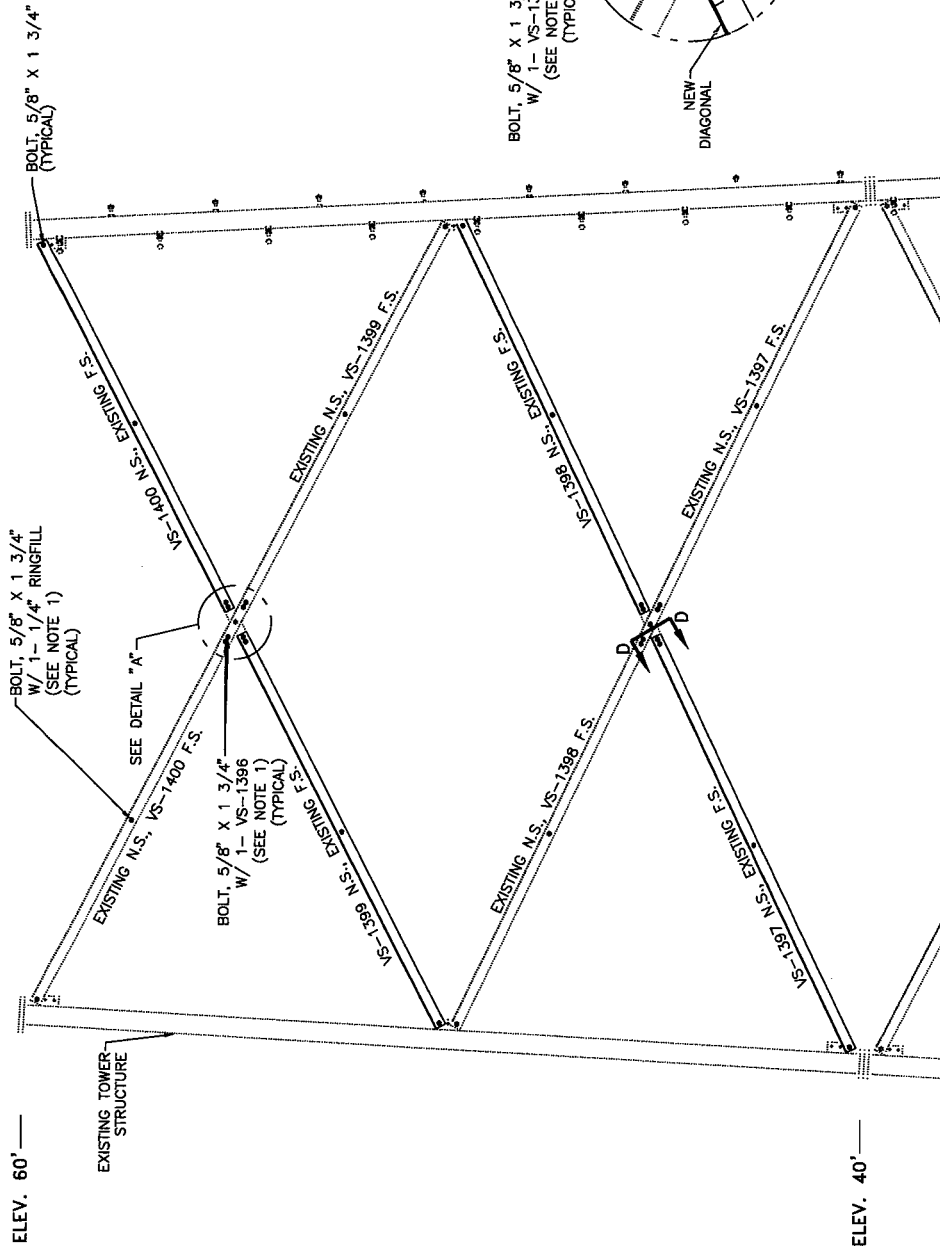
FOR			
CROWN CASTLE			
2006 MODIFICATIONS TOWER REWORK FOR A 160' ROHN SSV TOWER SITE: HRT 086, CT			
SHEET 3 OF 9		B	TA2006004066-73
SCALE:		NONE	

CROWN CASTLE BU# 806378	
DRAWN BY: J. COMBES	DATE 11-8-06
CHECK BY:	DATE
ENGR:	DATE

BILL OF MATERIALS			
MARK NO.	QTY.	DESCRIPTION	MATERIAL GRADE
VS-1396	24	SPACER PLATE, 1/4" THICK	ASTM A36
VS-1397	6	DIAGONAL, L 3" X 3" X 3/16"	ASTM A36
VS-1398	6	DIAGONAL, L 3" X 3" X 3/16"	ASTM A36
VS-1399	6	DIAGONAL, L 3" X 3" X 3/16"	ASTM A36
VS-1400	6	DIAGONAL, L 3" X 3" X 3/16"	ASTM A36
XX5816	96	BOLT, 5/8" X 1 3/4"	ASTM A325
XY0060	24	STEEL RINGFILL, 1/4" THICK	-

NOTES:

1. 72- 11/16" FIELD DRILLED HOLES REQUIRED. FIELD DRILLED HOLES TO BE DRILLED ON EXISTING BOLT HOLE GAUGE LINES.



ELEVATION VIEW

B	REVISED PER MAT. 2007-067-001	3-28-07	STH
A	ORIGINAL RELEASE	11-8-06	JAC
REV.	DESCRIPTION	DATE	BY

P.O. Box 1408
Richmond, KY 40478
Phone (606) 224-5500
Fax (606) 224-5501
Email: engineering@verticalstructures.com

FOR

CROWN CASTLE

2006 MODIFICATIONS
TOWER REWORK FOR A
160' ROHN SSV TOWER
SITE: HRT 086, CT

CROWN CASTLE BU# 806378	
DRAFTSPERSON: J. COMBS	DATE 11-8-06
CHK'D BY:	DATE
ENGR:	DATE

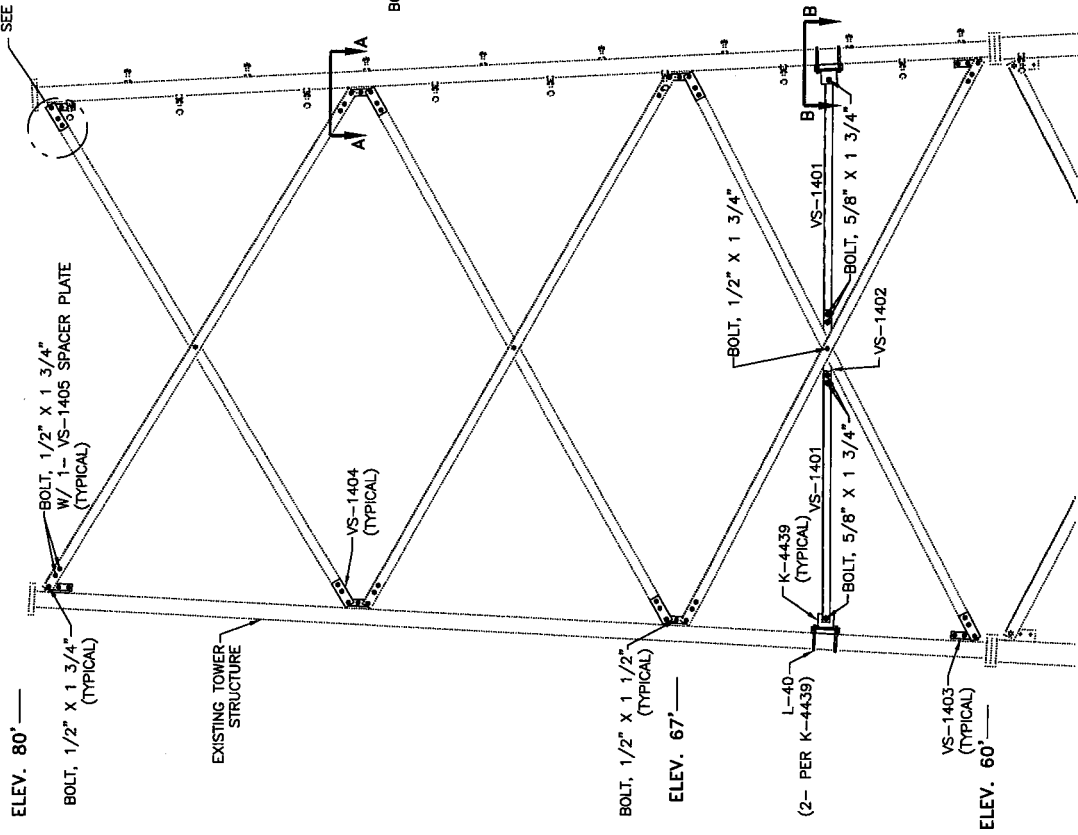
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BILL OF MATERIALS			
MARK NO.	QTY.	DESCRIPTION	MATERIAL GRADE
K-4439	3	LEG CLAMP FOR 4 1/2" O.D. PIPE	ASTM A36
VS-1401	6	HORIZONTAL, L 2" X 2" X 3/16"	ASTM A36
VS-1402	3	GUSSET PLATE, 3/8" THICK	ASTM A36
VS-1403	24	GUSSET REIN. PLATE, 3/16" THICK	ASTM A36
VS-1404	36	END CONN. REIN. PLATE, 3/16" THICK	ASTM A36
VS-1405	36	SPACER PLATE, 3/8" THICK	ASTM A36
L-40	6	U-BOLT, 1/2" FOR 4 1/2" O.D. PIPE	ASTM A36
XX1214	36	BOLT, 1/2" X 1 1/2"	ASTM A325
XX1216	111	BOLT, 1/2" X 1 3/4"	ASTM A325
XX5816	18	BOLT, 5/8" X 1 3/4"	ASTM A325

NOTES:

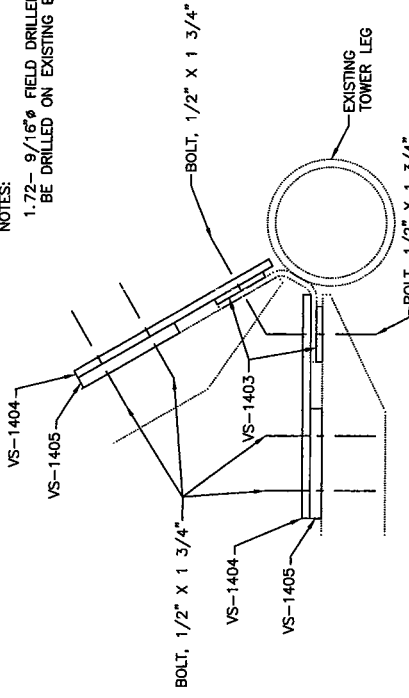
1. 72- 9/16" FIELD DRILLED HOLES REQUIRED. FIELD DRILLED HOLES TO BE DRILLED ON EXISTING BOLT HOLE GAUGE LINES.

SEE DETAIL ON SHEET 9

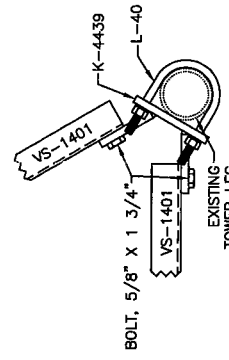


ELEVATION VIEW

SECTION "A-A"



SECTION "B-B"



REV.	DESCRIPTION	DATE	BY
B	REVISED PER MAT. 2007-067-001	3-28-07	STH
A	ORIGINAL RELEASE	11-8-06	JAC

FOR
VERTICAL STRUCTURES INC.
 P.O. Box 1498
 Richmond, KY 40476
 Phone: (609) 624-8380
 Fax: (609) 624-8389
 Email: engineering@verticalstructures.com

CROWN CASTLE

2006 MODIFICATIONS
 TOWER REWORK FOR A
 160' ROHN SSV TOWER
 SITE: HRT 086, CT

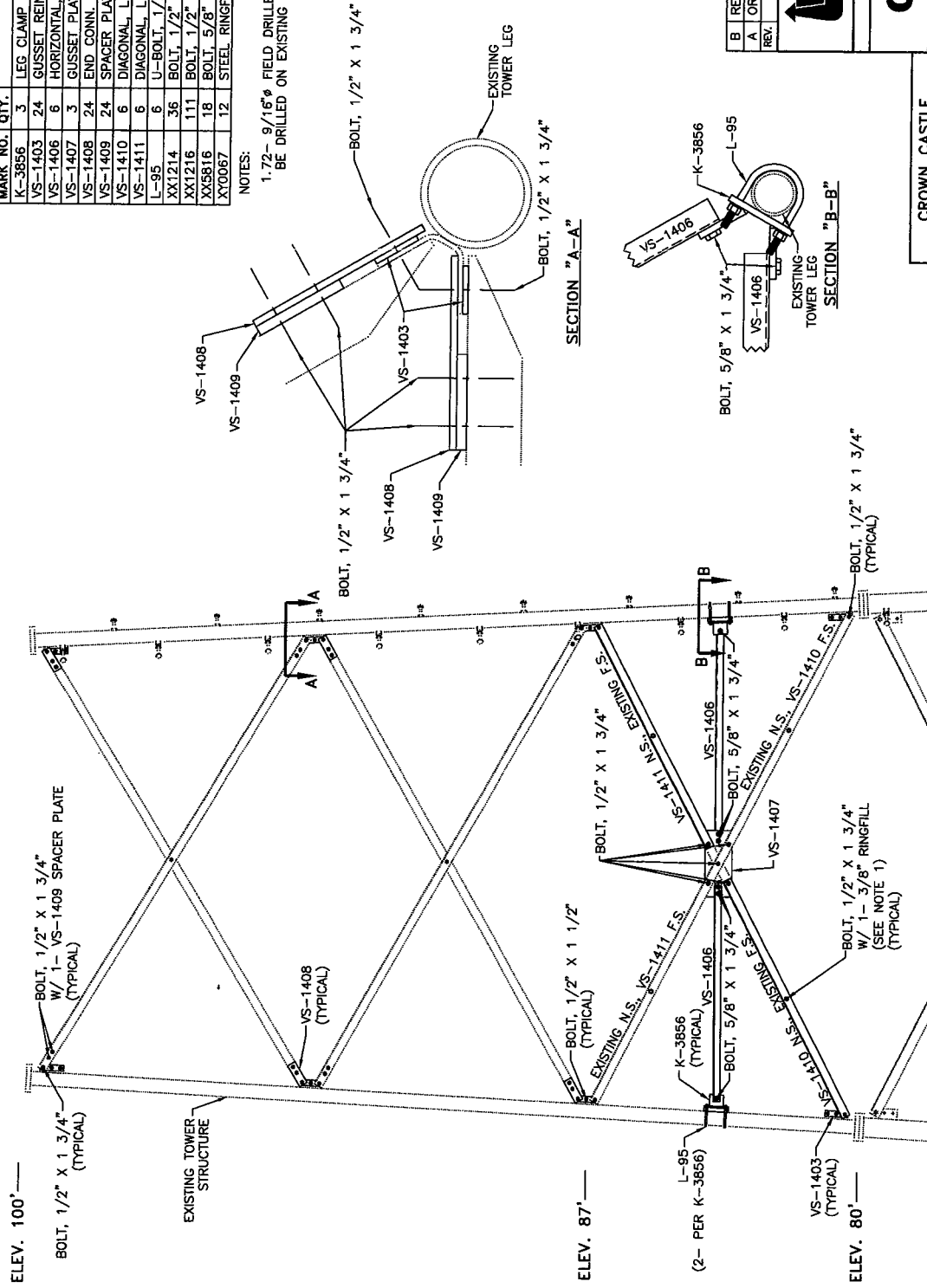
CROWN CASTLE BU# 806378	
DRAWN BY:	DATE
J. COMBS	11-8-06
CHKD BY:	DATE
ENGR:	DATE

SHEET 5 OF 9	B	TA2006004066-T5	SCALE: NONE
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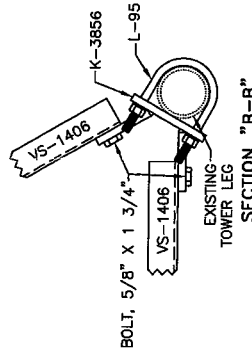
BILL OF MATERIALS			
MARK NO.	QTY.	DESCRIPTION	MATERIAL GRADE
K-3856	3	LEG CLAMP FOR 4" O.D. PIPE	ASTM A36
VS-1403	24	GUSSET REIN. PLATE, 3/16" THICK	ASTM A36
VS-1406	6	HORIZONTAL, L 2" X 2" X 3/16"	ASTM A36
VS-1407	3	GUSSET PLATE, 3/8" THICK	ASTM A36
VS-1408	24	END CONN. REIN. PLATE, 3/16" THICK	ASTM A36
VS-1409	24	SPACER PLATE, 3/8" THICK	ASTM A36
VS-1410	6	DIAGONAL, L 2 1/2" X 2 1/2" X 3/16"	ASTM A36
VS-1411	6	DIAGONAL, L 2 1/2" X 2 1/2" X 3/16"	ASTM A36
L-95	6	U-BOLT, 1/2" FOR 4" O.D. PIPE	ASTM A36
XX1214	36	BOLT, 1/2" X 1 1/2"	ASTM A325
XX1216	111	BOLT, 1/2" X 1 3/4"	ASTM A325
XX5816	18	BOLT, 5/8" X 1 3/4"	ASTM A325
XX0087	12	STEEL RINGFILL, 3/8" THICK	-

NOTES:

1. 72- 9/16" FIELD DRILLED HOLES REQUIRED. FIELD DRILLED HOLES TO BE DRILLED ON EXISTING BOLT HOLE GAUGE LINES.



ELEVATION VIEW



REV.	DESCRIPTION	DATE	BY
B	REVISED PER MAT. 2007-067-001	3-28-07	STH
A	ORIGINAL RELEASE	11-8-06	JAC

VERTICAL STRUCTURES INC.
P.O. Box 4409
Richmond, KY 40478
Phone: (502) 734-3360
Fax: (502) 734-3360
Email: engineering@verticalstructures.com

FOR

CROWN CASTLE

2006 MODIFICATIONS
TOWER REWORK FOR A
160' ROHN SSV TOWER
SITE: HRT 086, CT

CROWN CASTLE
BU# 806378

DRAWN BY	DATE
J. COMBS	11-8-06
CHK'D BY	DATE
ENGR.	DATE

SHEET 6 OF 9 B TA2006004066-T6

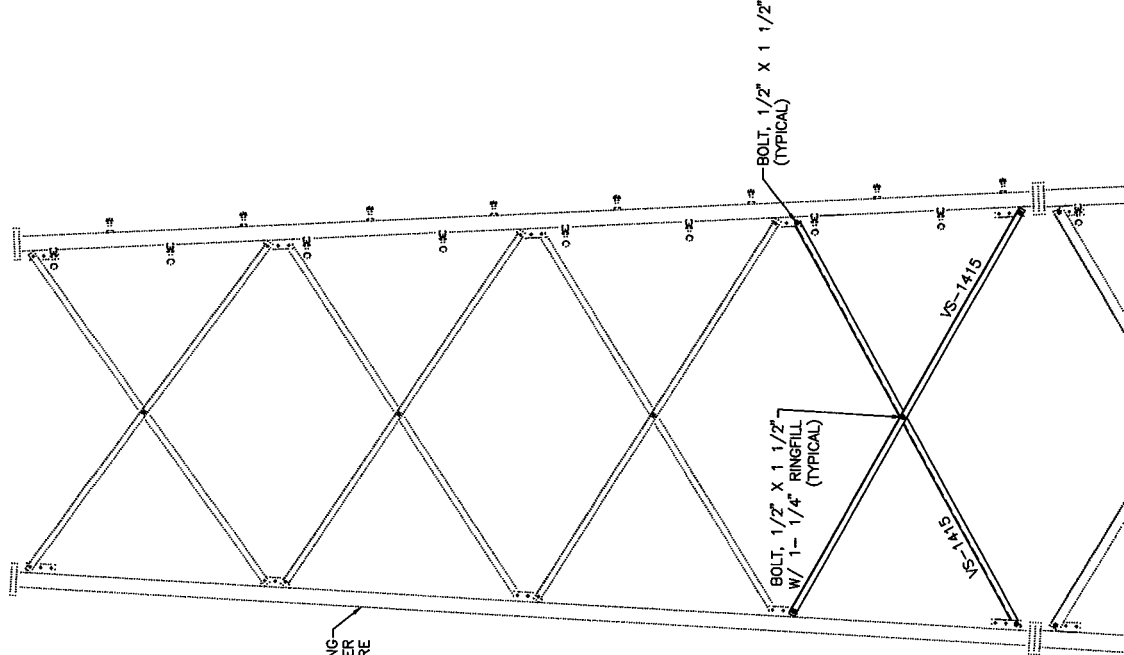
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ELEV. 140' —

EXISTING
TOWER
STRUCTURE

ELEV. 125' —

ELEV. 120' —



ELEVATION VIEW

BILL OF MATERIALS		
MARK NO.	QTY.	DESCRIPTION
VS-1415	6	DIAGONAL, L 2" X 2" X 3/16"
XX1214	15	BOLT, 1/2" X 1 1/2"
XY0066	3	STEEL RINGFILL, 1/4" THICK

		MATERIAL GRADE
		ASTM A36
		ASTM A325
		—

B	REVISED PER MAT. 2007-067-001	3-28-07	STH
A	ORIGINAL RELEASE	11-8-06	JAC
REV.	DESCRIPTION	DATE	BY

VERTICAL
STRUCTURES INC.

P.O. Box 148
Rushmore, NY 13448
Phone: (855) 824-8980
Fax: (855) 824-8981
Email: engineering@verticalstructures.com

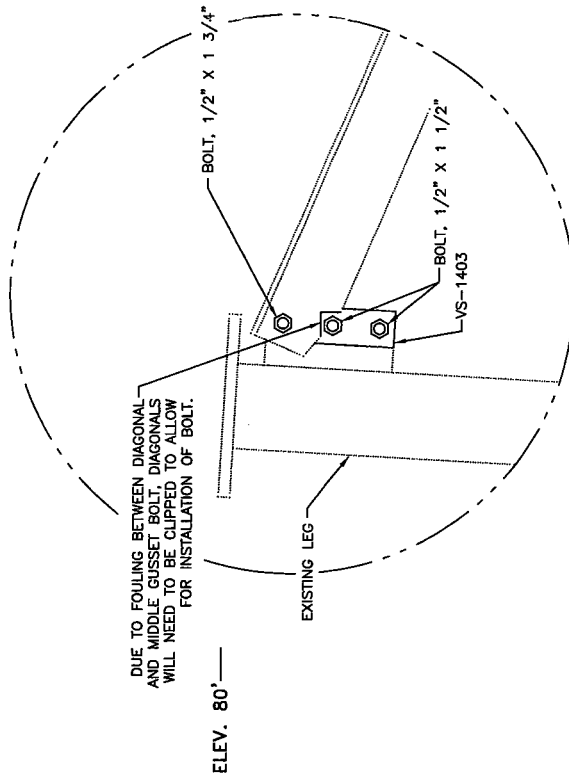
FOR

CROWN CASTLE

2006 MODIFICATIONS
TOWER REWORK FOR A
160' ROHN SSV TOWER
SITE: HRT 086, CT

SHEET B OF 9	B	TA2006004066-T8	SCALE: NONE
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CROWN CASTLE BU# 806378	
DRAFTSPERSON: J. COMBS	DATE: 11-8-06
CHK'D BY:	DATE:
ENGR:	DATE:



TOP GUSSET REINFORCEMENT
ELEV. 80'

REV.	DESCRIPTION	DATE	BY
B	REVISED PER MAT. 2007-067-001	3-28-07	STH
A	ORIGINAL RELEASE	11-8-06	JAC

VERTICAL
STRUCTURES, INC.

P.O. Box 1486
Richmond, KY 40476
Phone: (609) 624-8380
Fax: (609) 624-8380
Email: engineering@verticalstructures.com

FOR

CROWN CASTLE

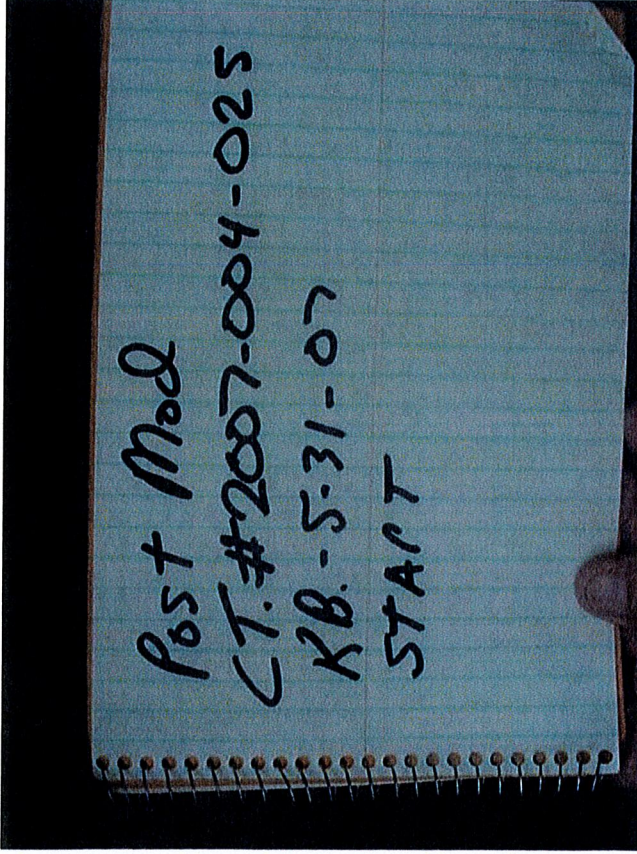
2006 MODIFICATIONS
TOWER REWORK FOR A
160' ROHN SSV TOWER
SITE: HRT 086, CT

SHEET 9 OF 9	B	TA2006004066-T9	SCALE: NONE
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CROWN CASTLE
BU# 806378

DRAWN BY:	DATE
J. COMES	11-8-06
CHECKED BY:	DATE
ENGR:	DATE

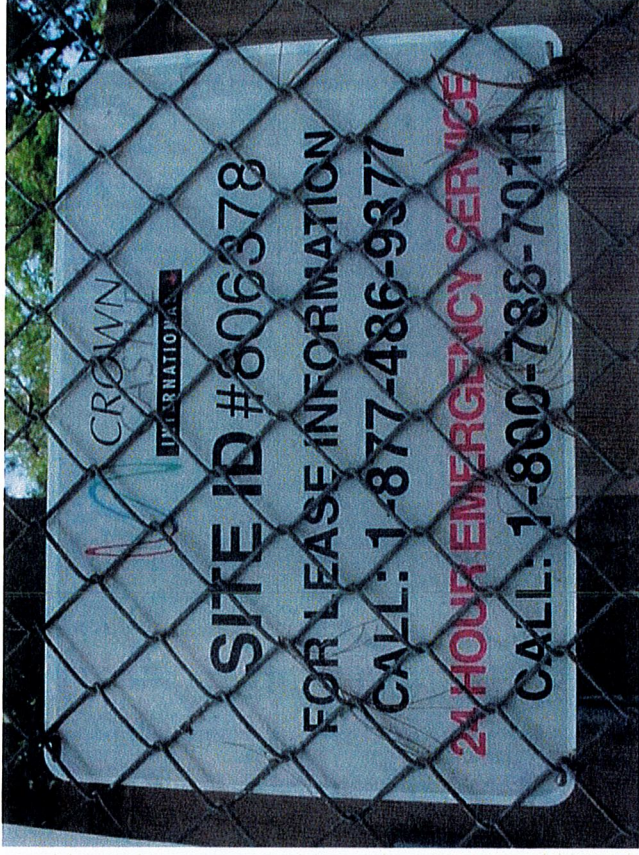
APPENDIX B



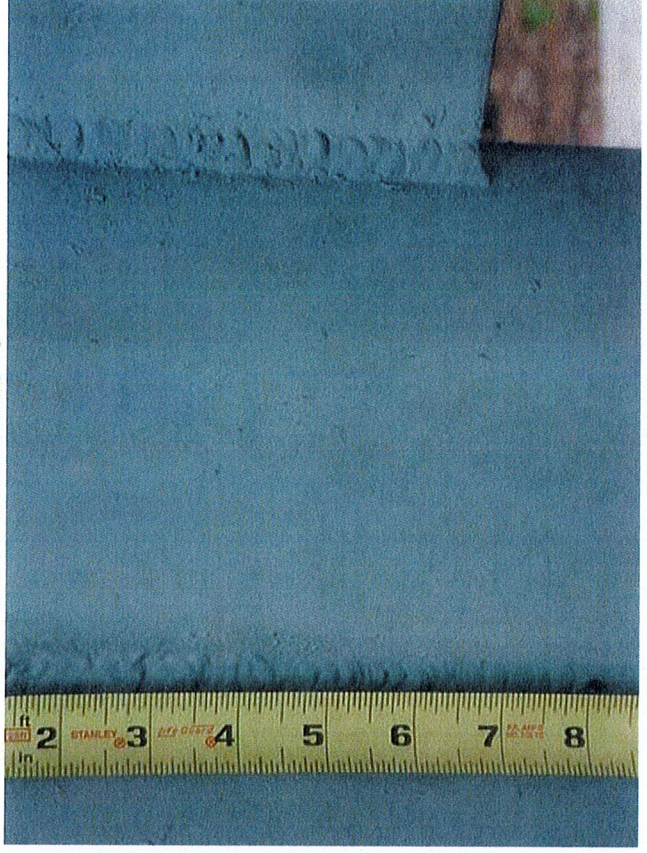
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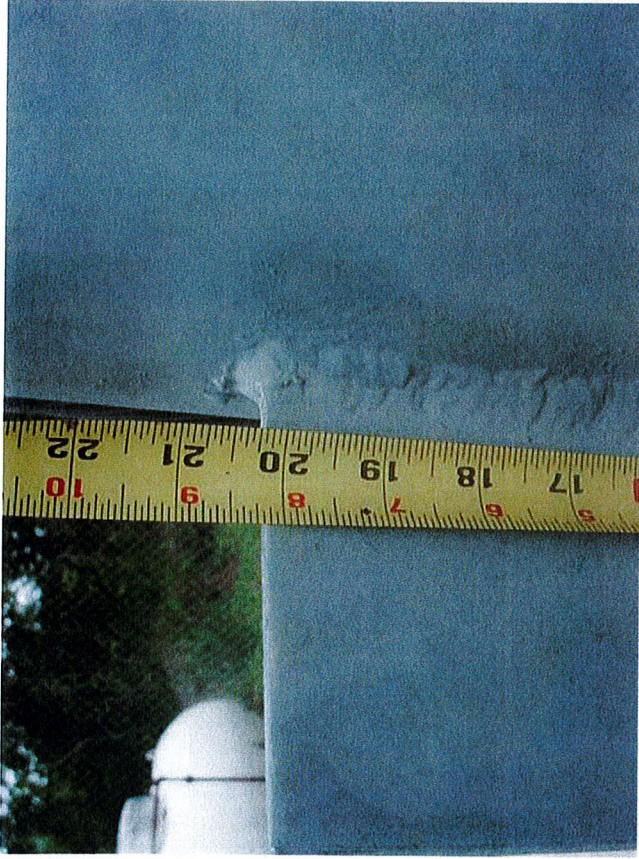
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DSC08310



DSC08312



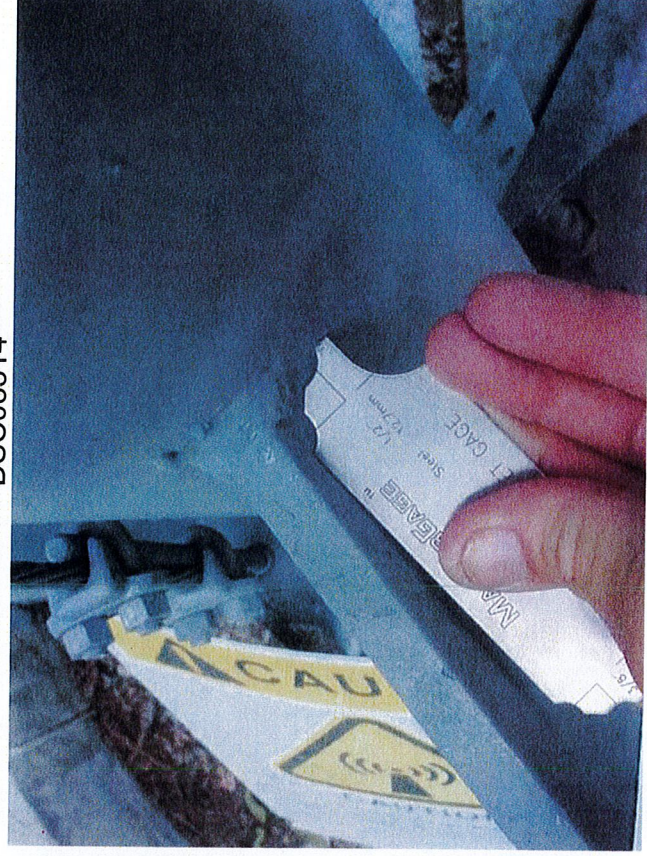
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DSC08314



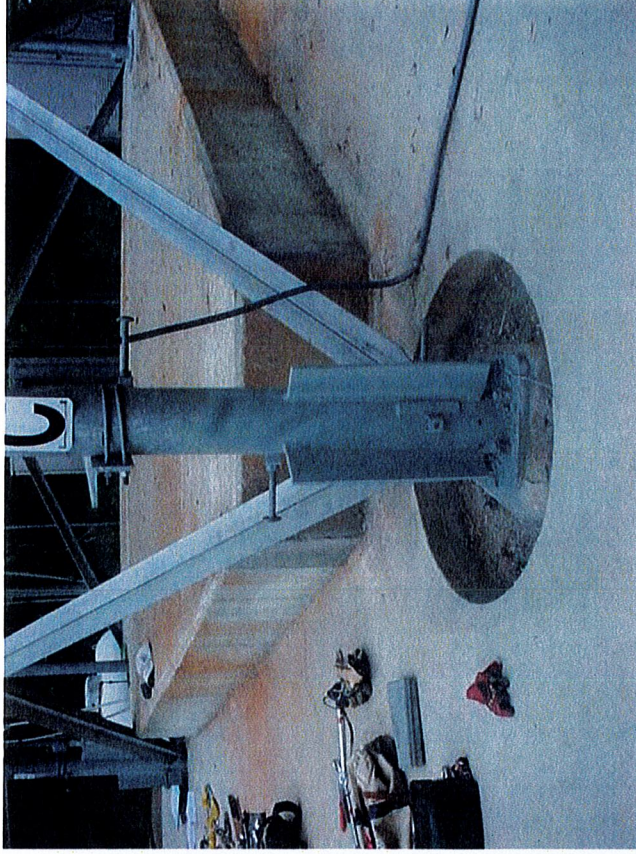
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DSC08318



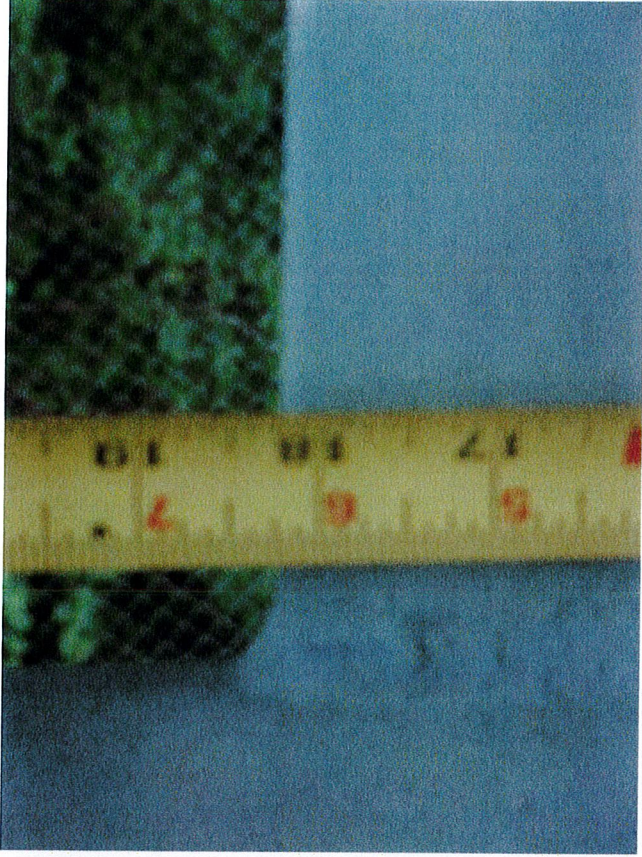
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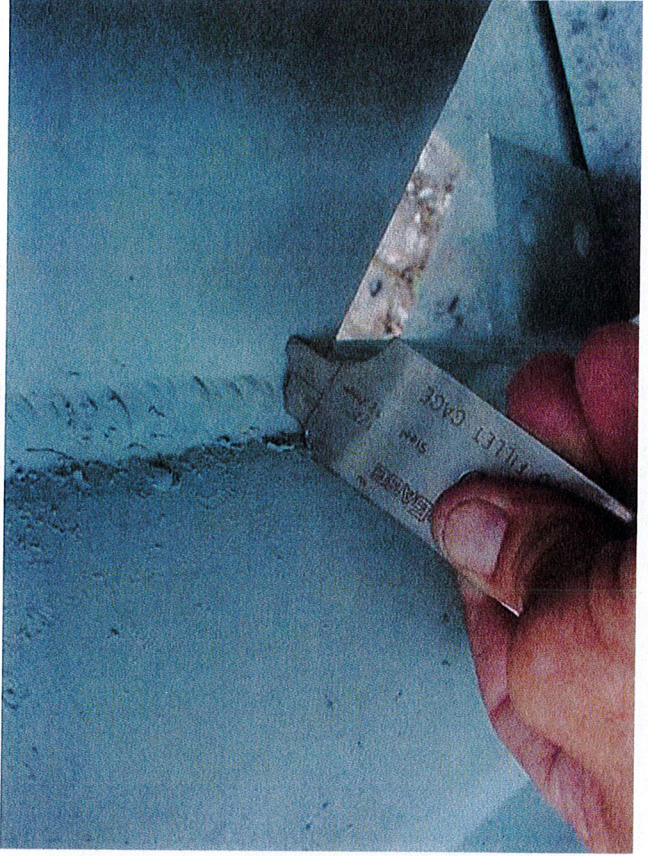
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DSC08321



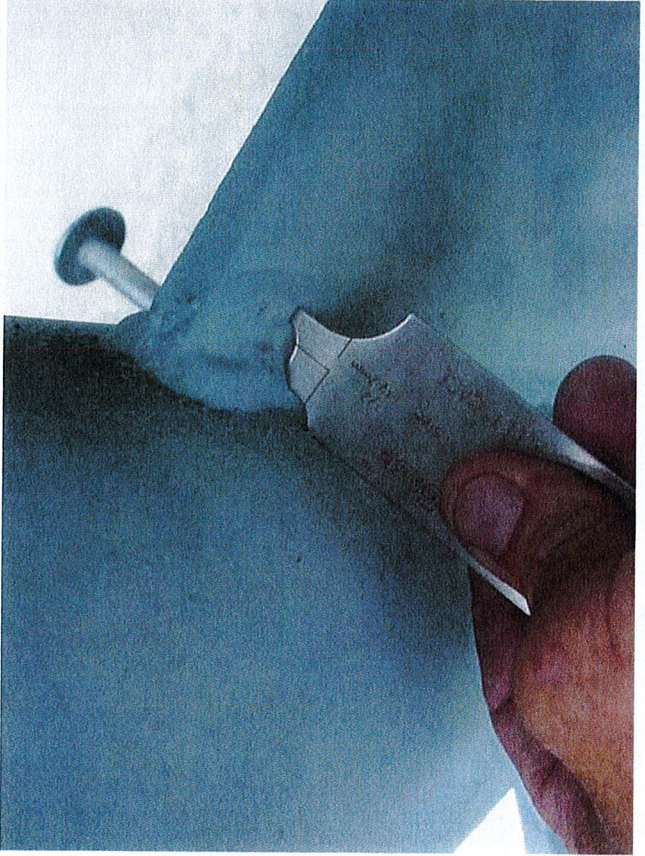
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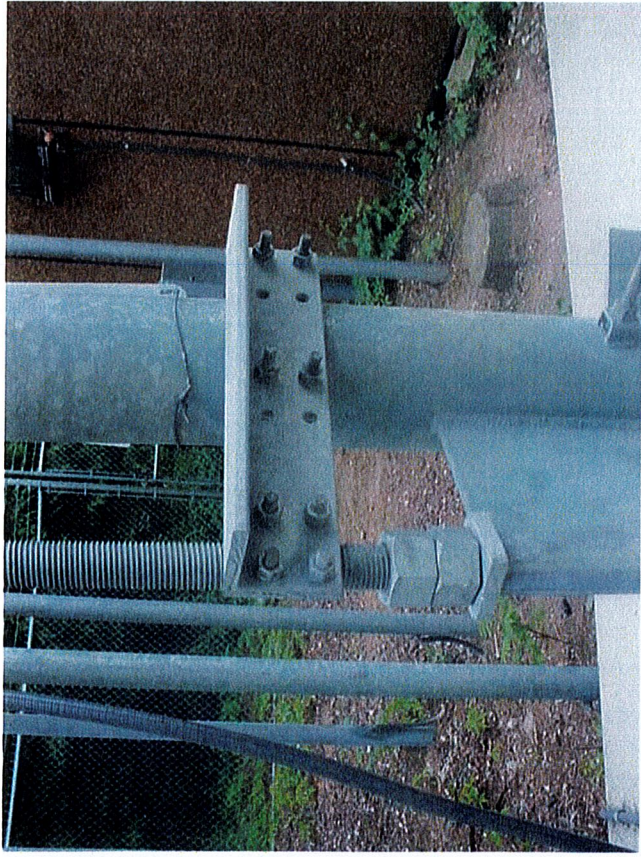
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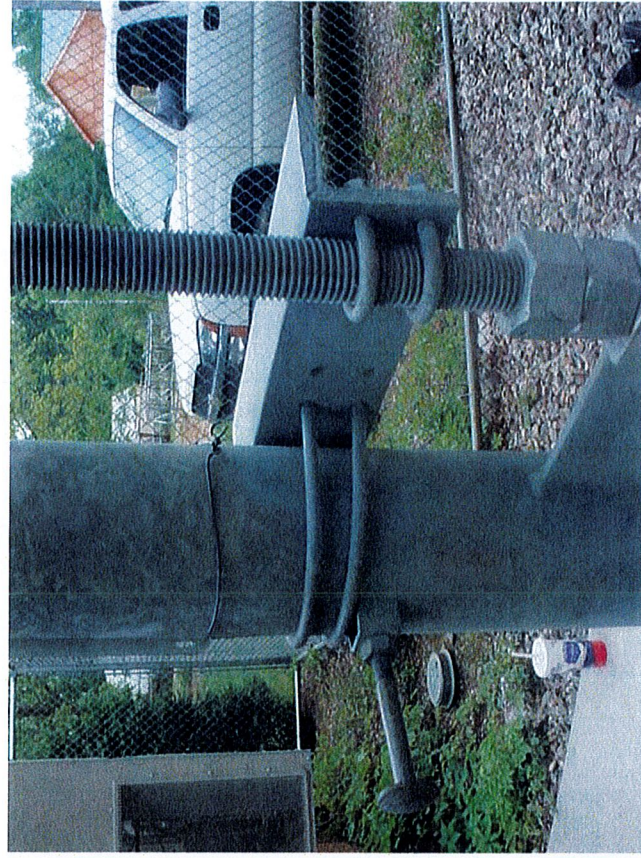
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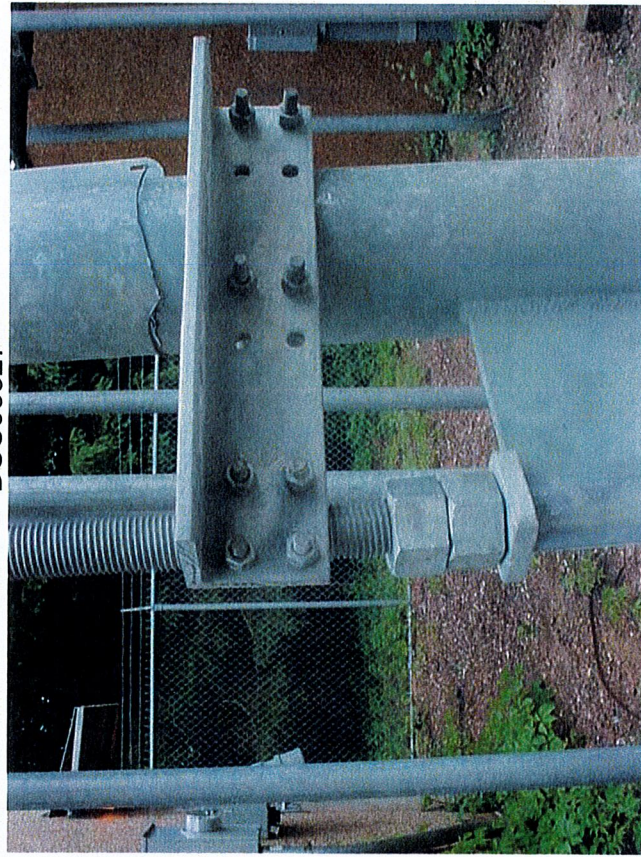
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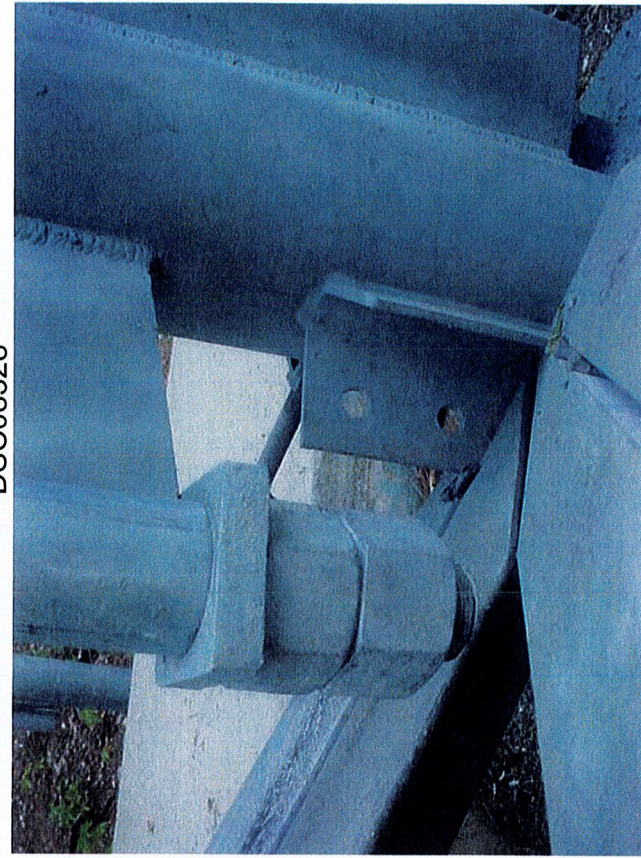
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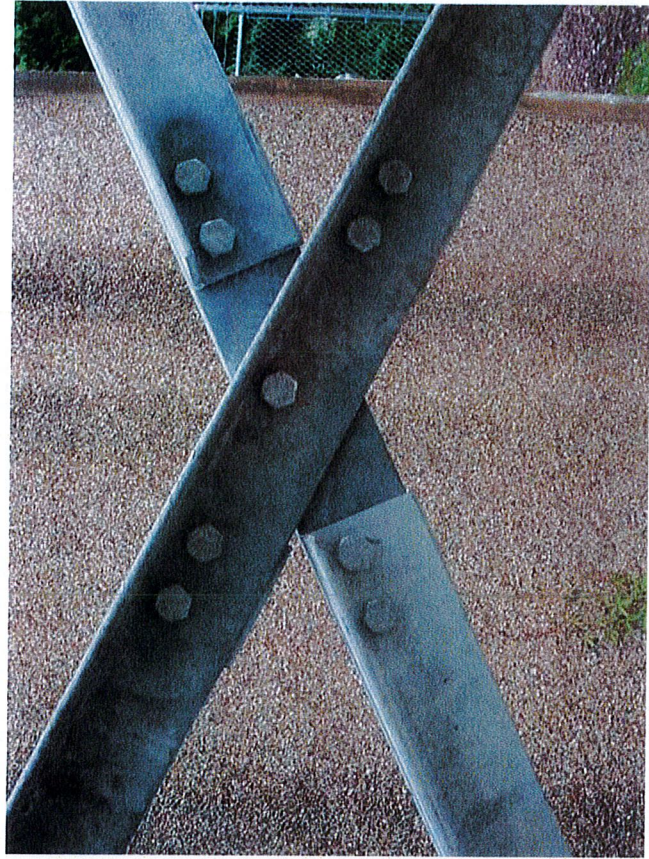
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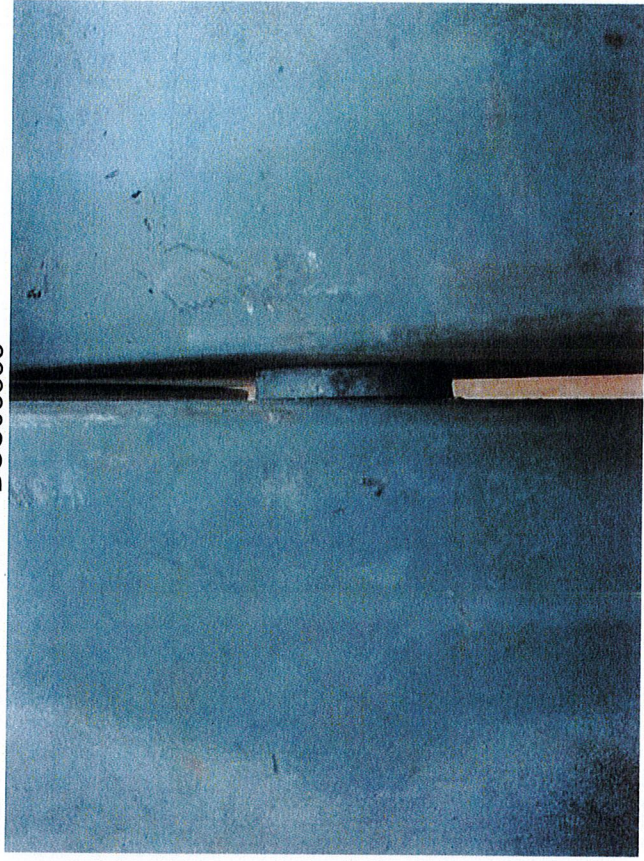
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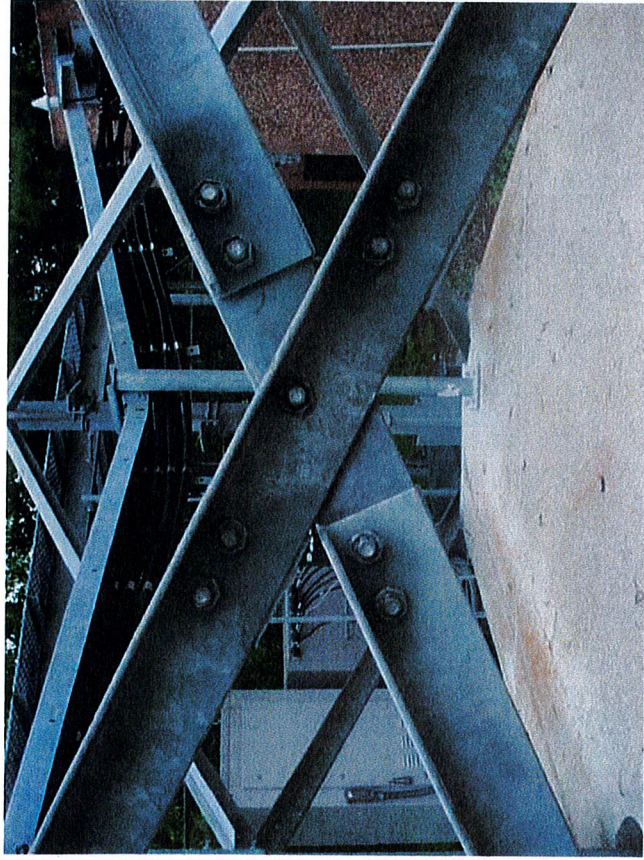
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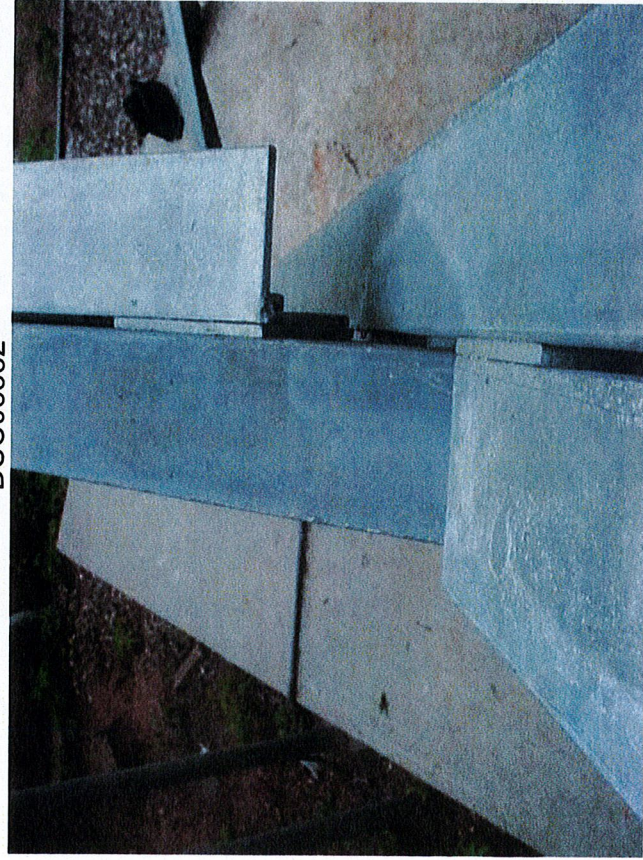
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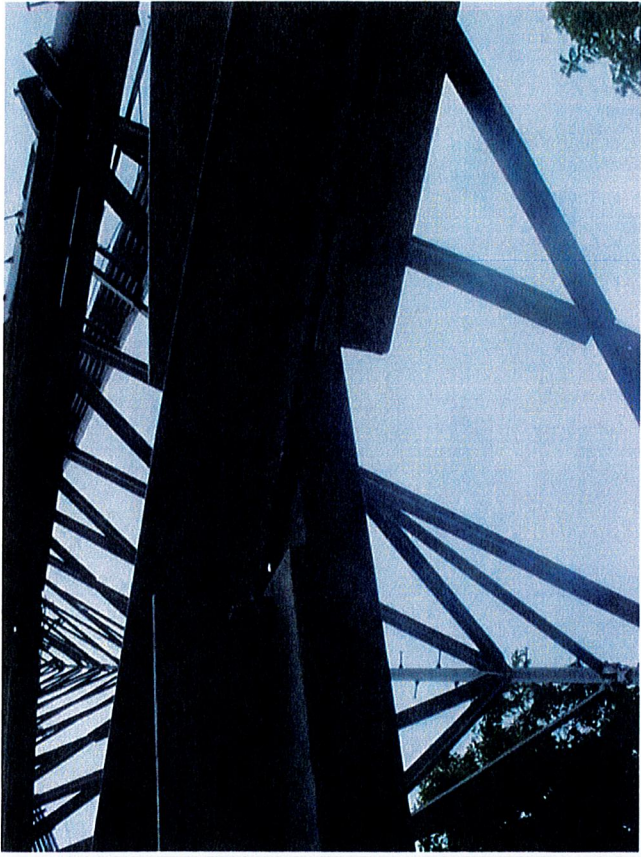
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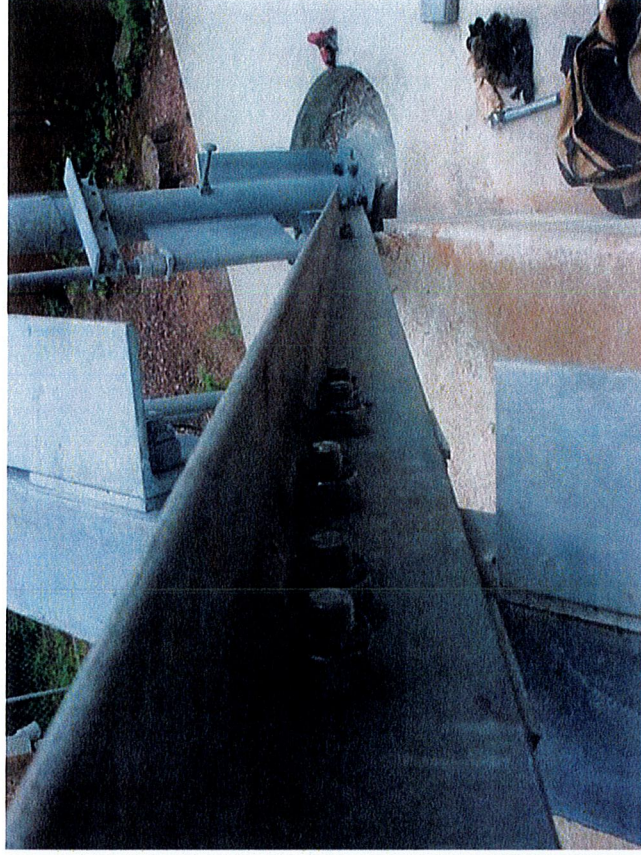
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DSC08334



DSC08336



DSC08337



DSC08338



DSC08339



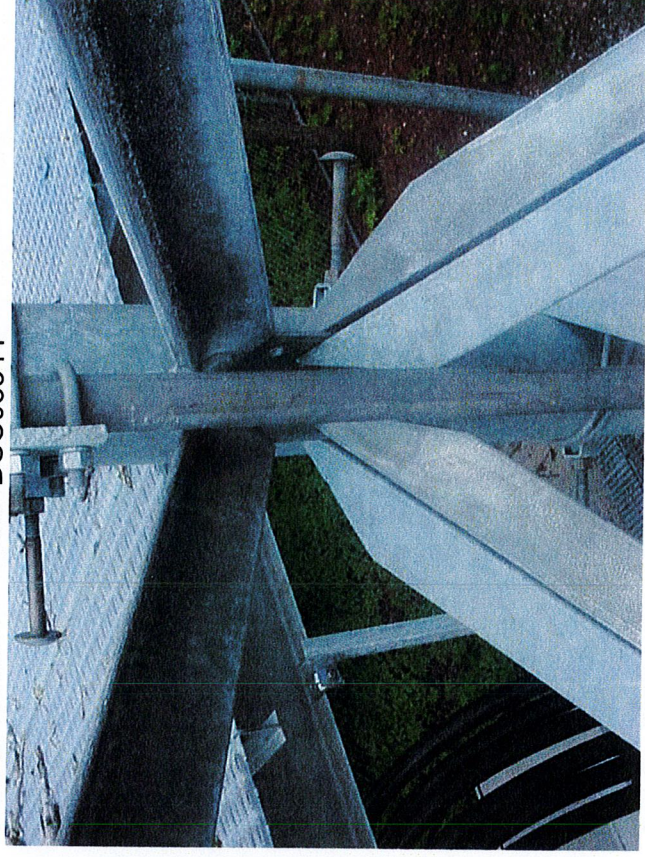
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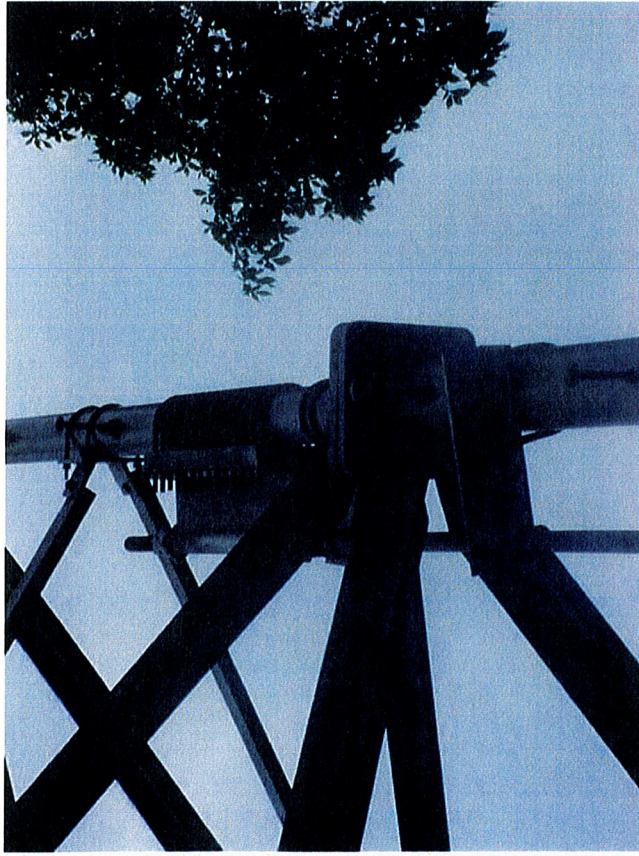
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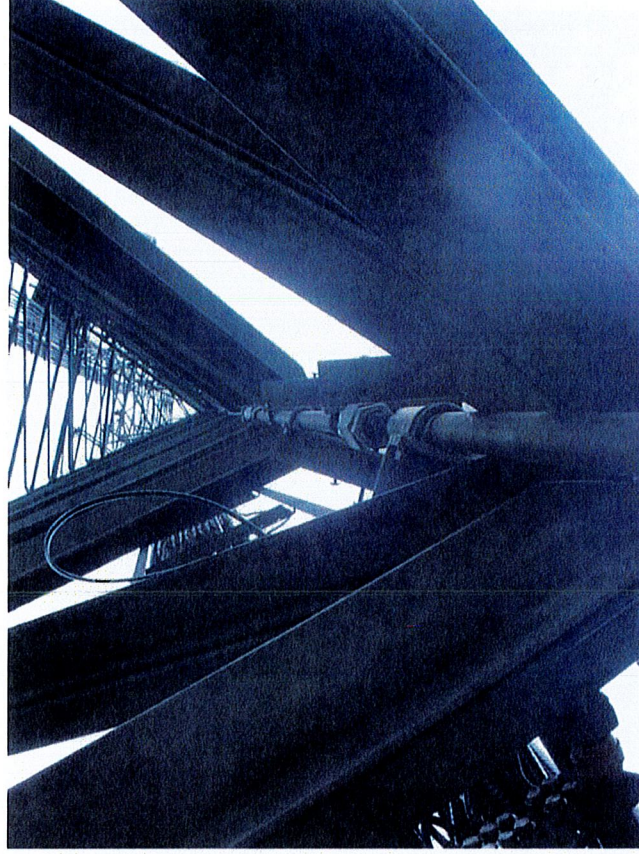
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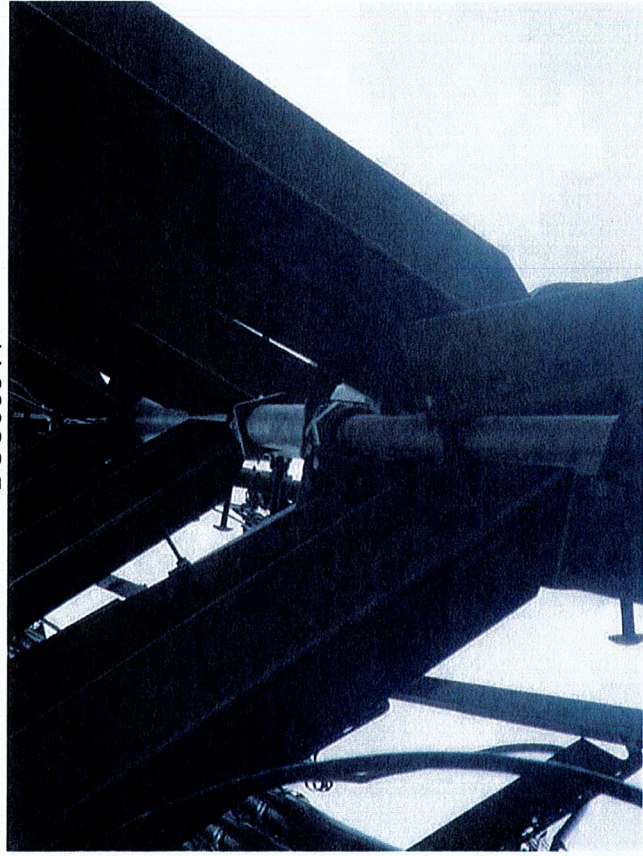
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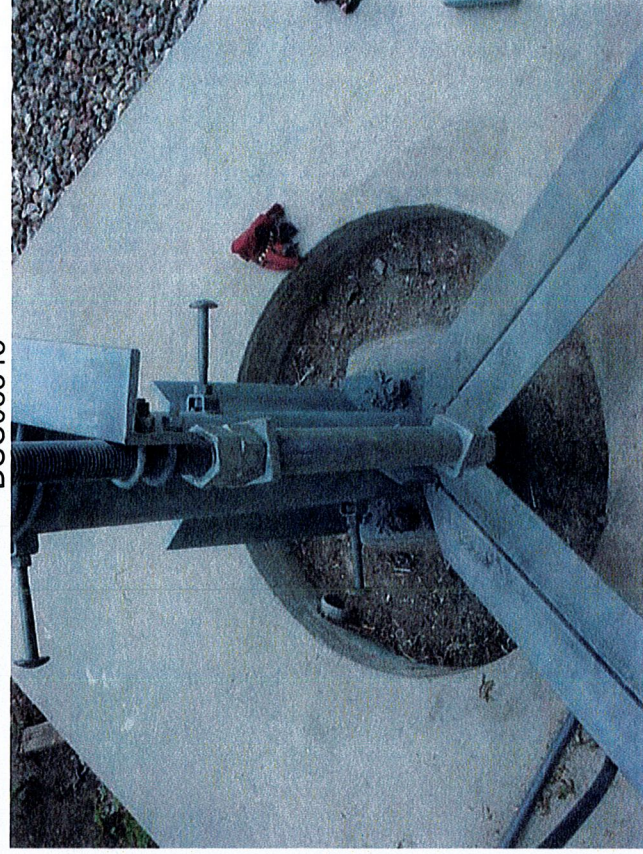
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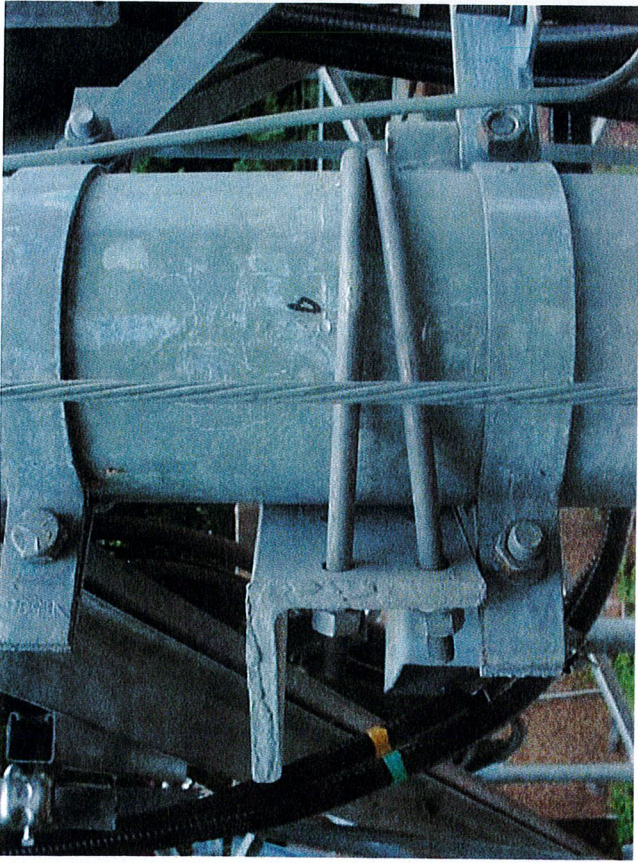
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DSC08346



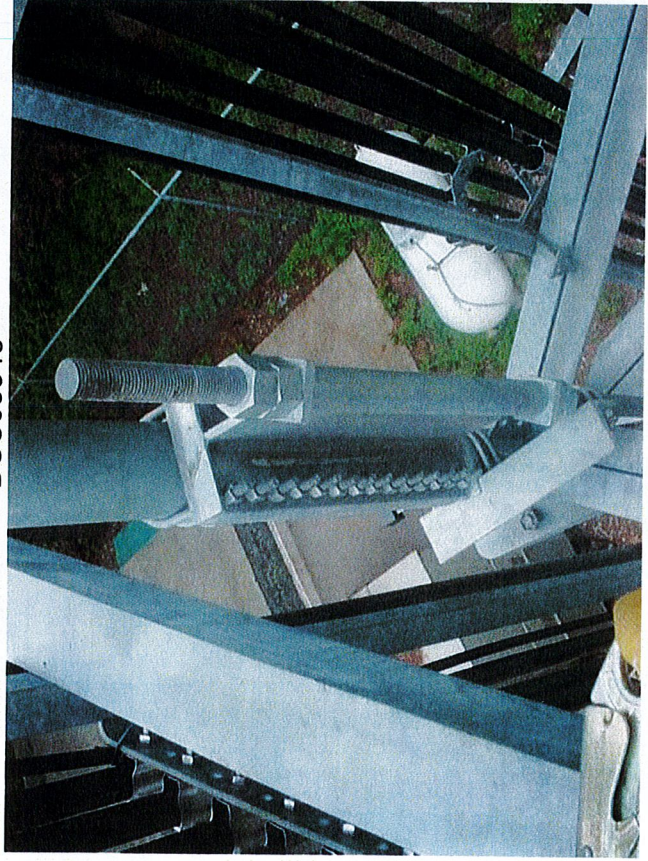
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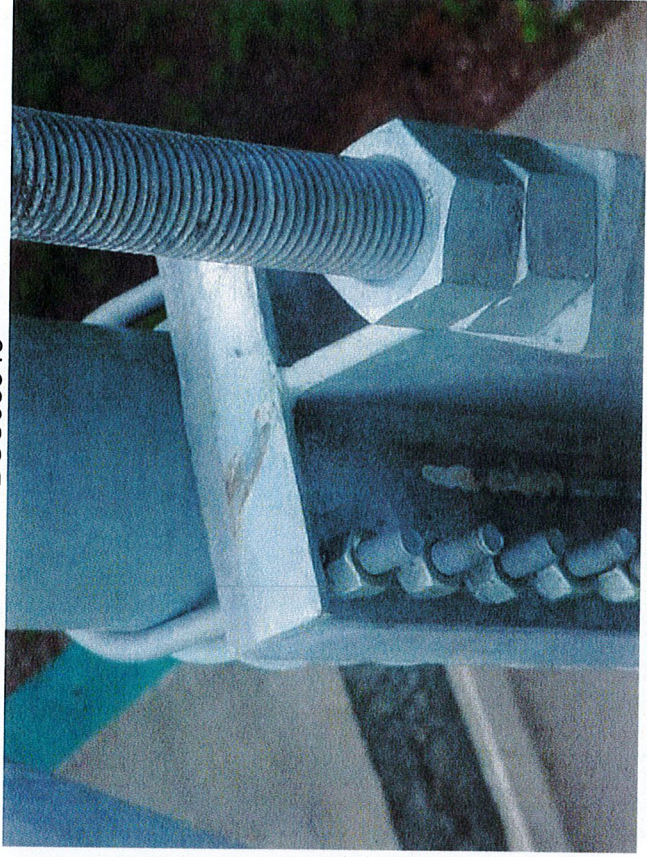
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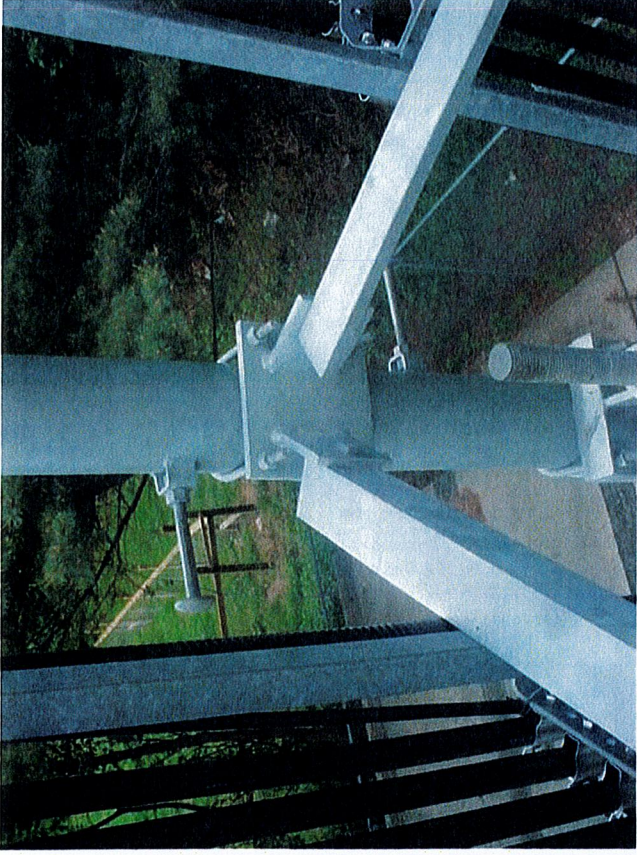
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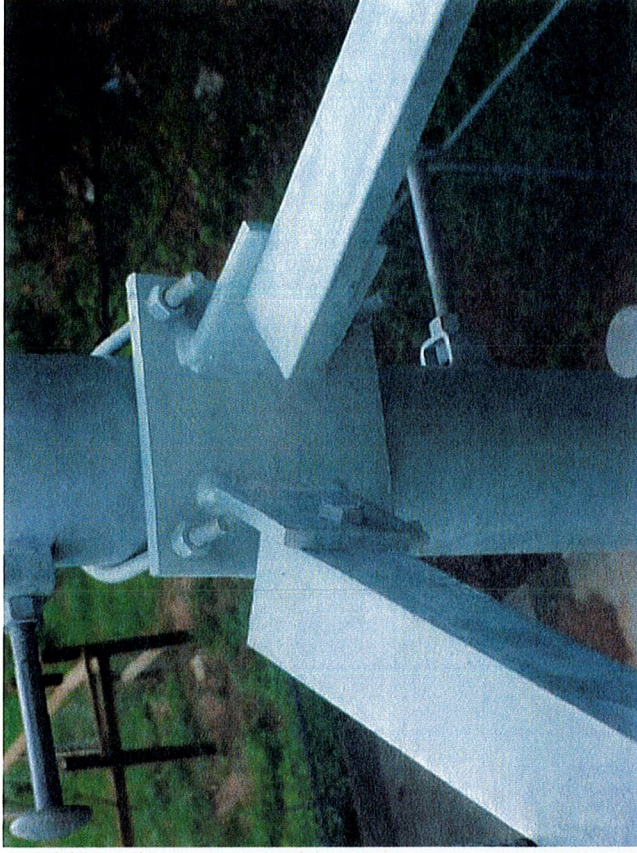
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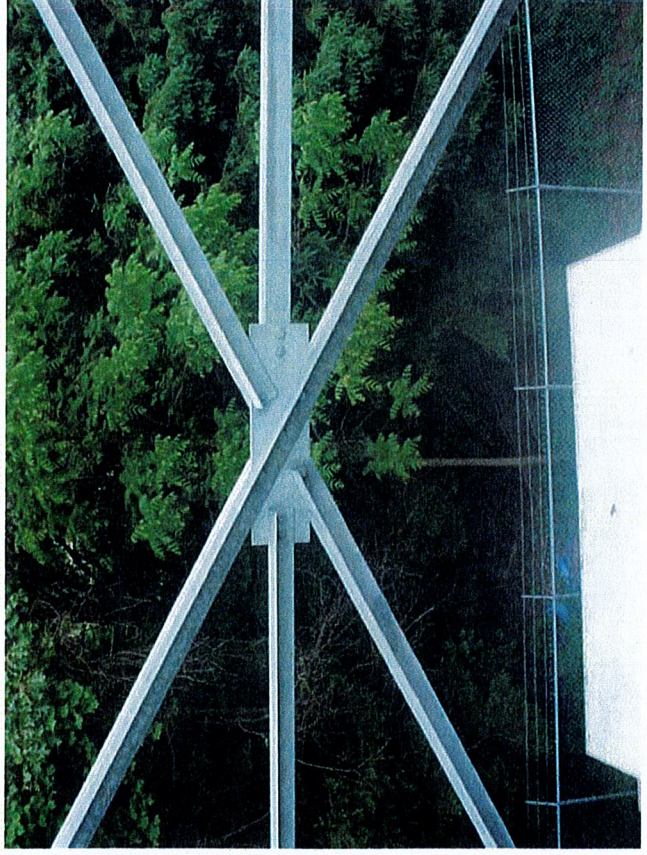
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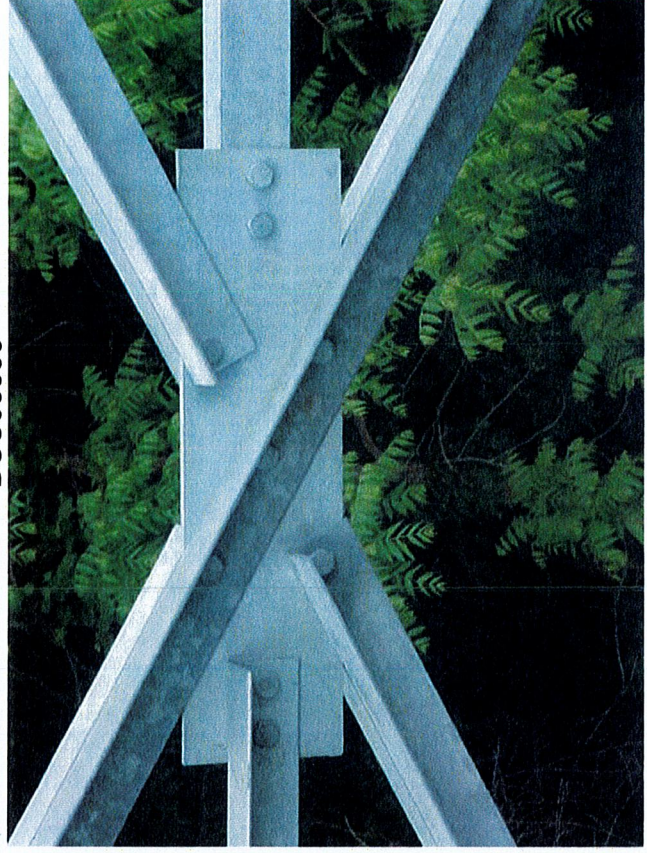
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DSC08353



DSC08354



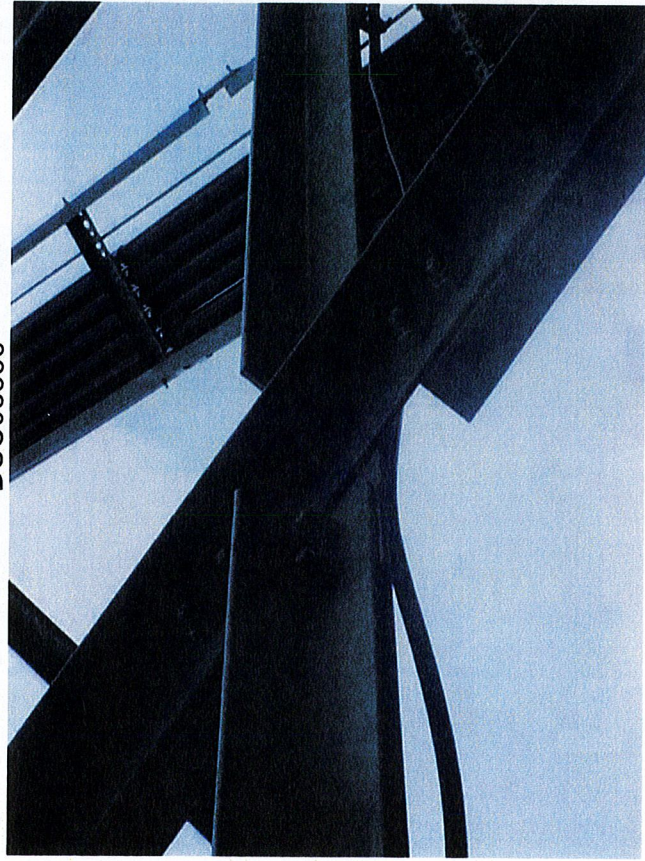
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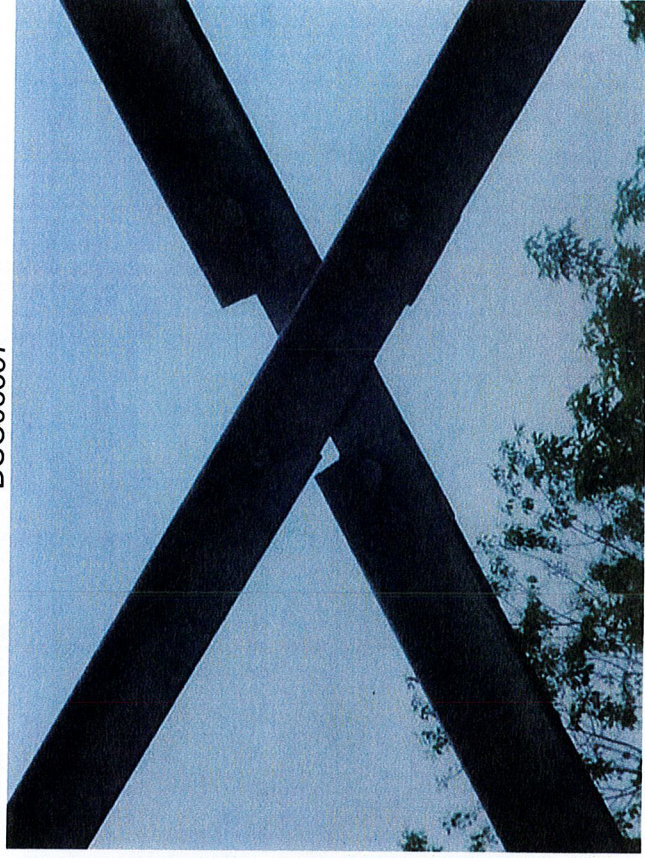
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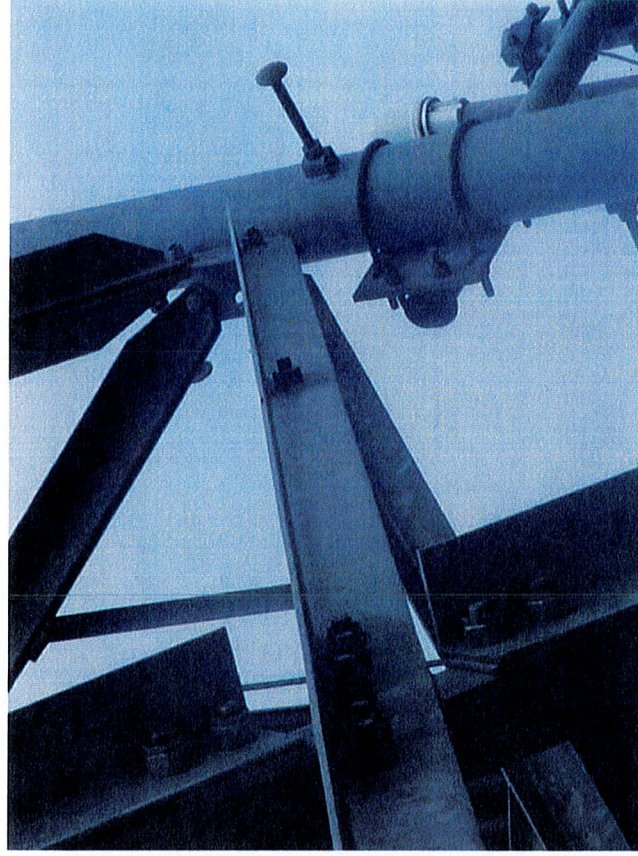
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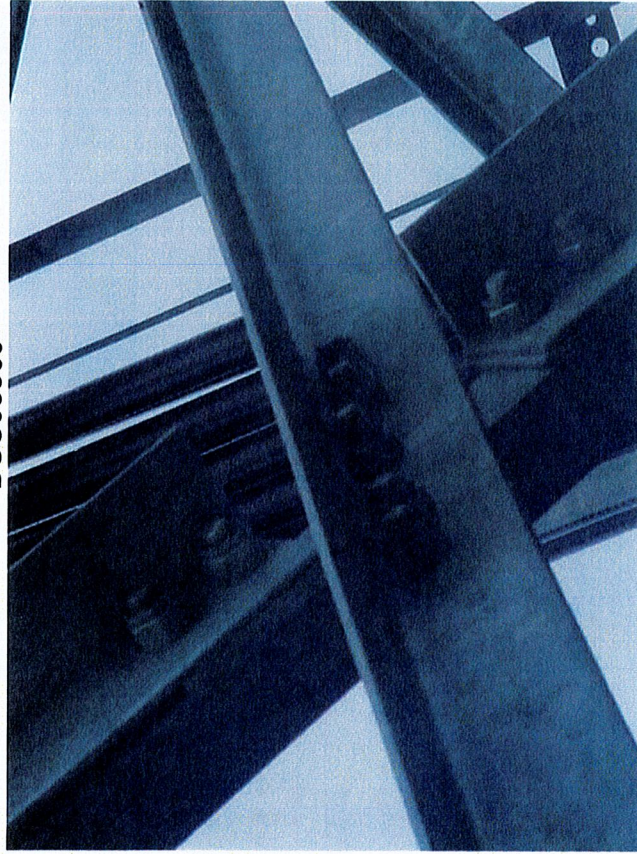
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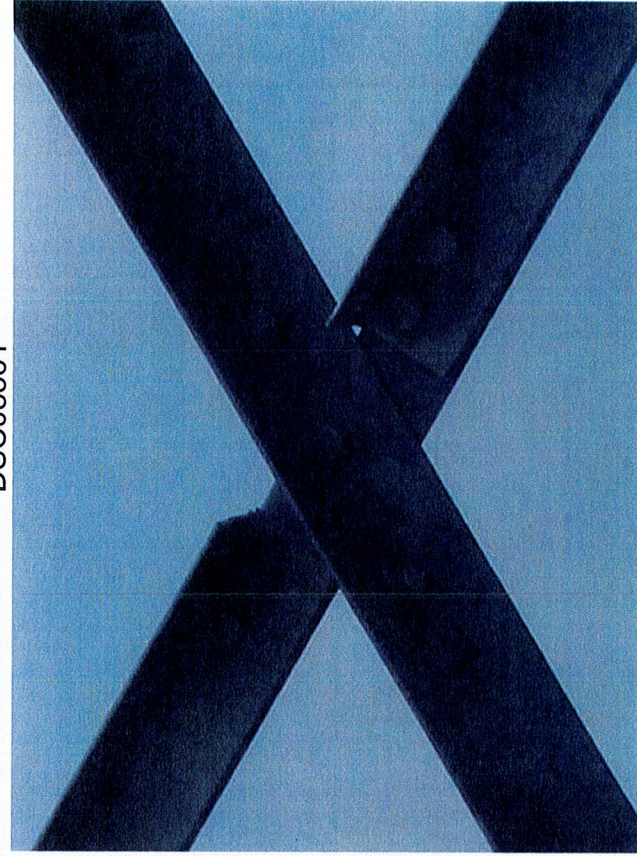
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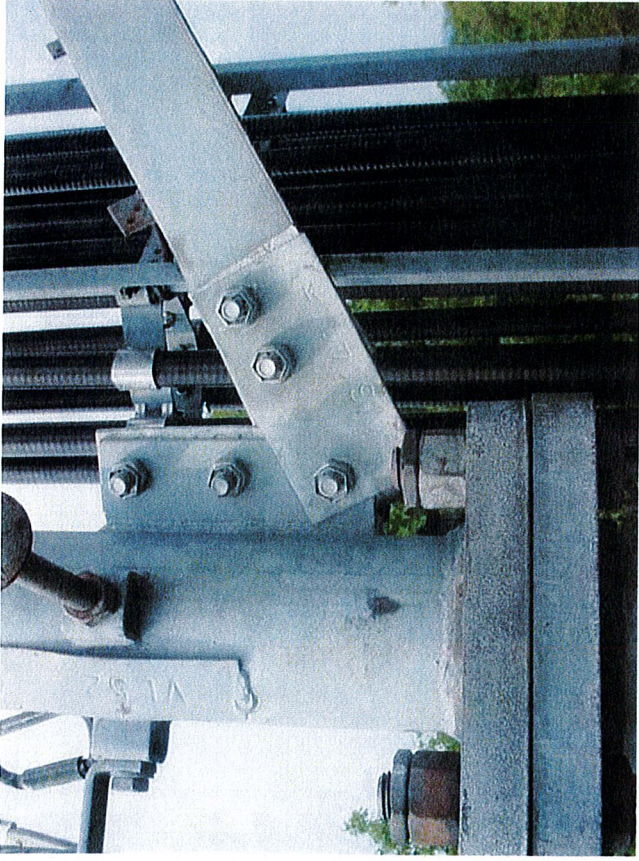
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DSC08362



DSC08363



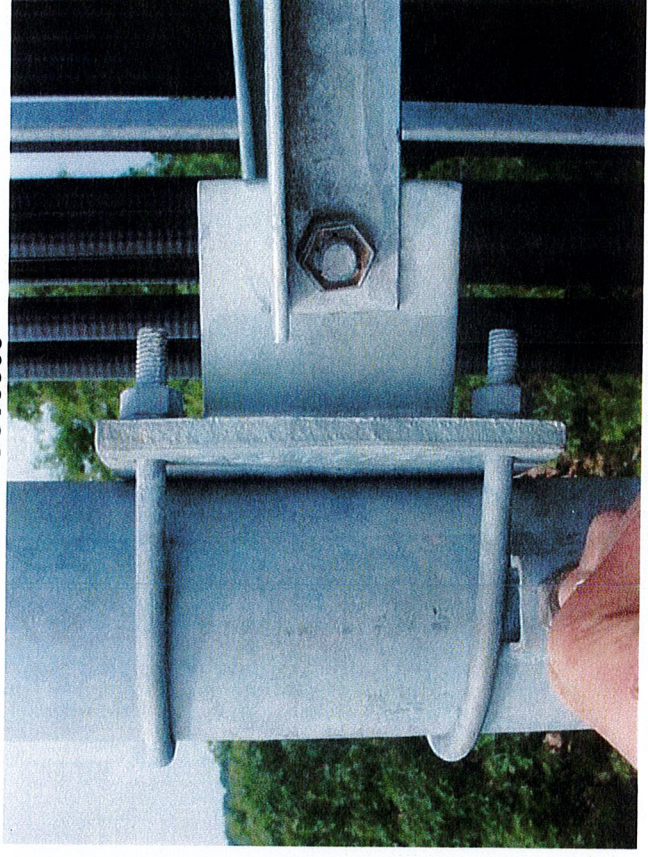
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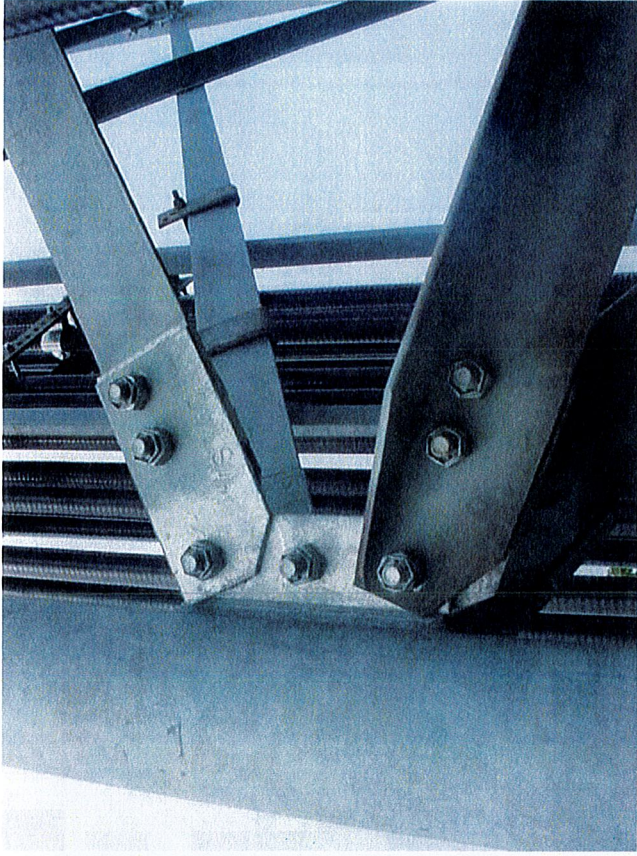
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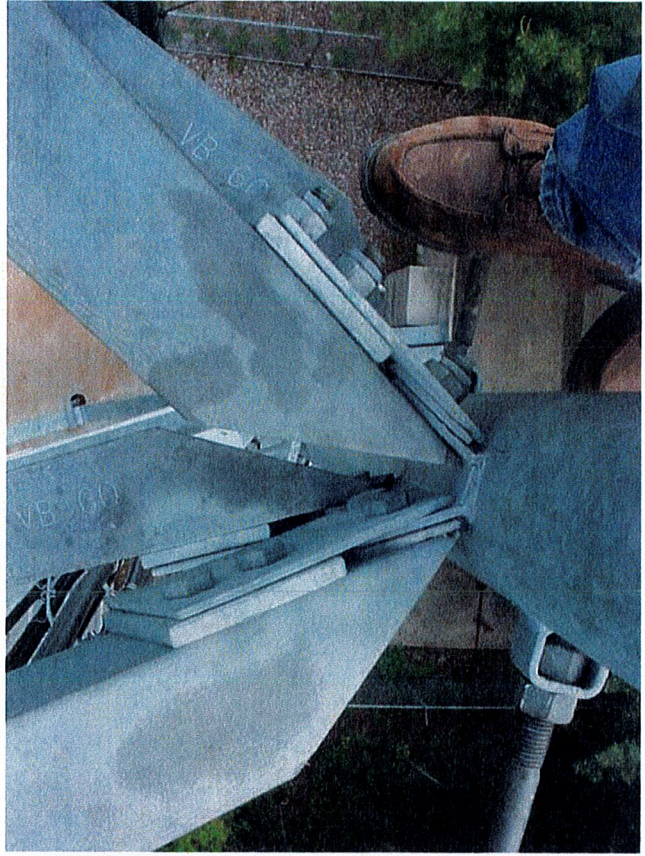
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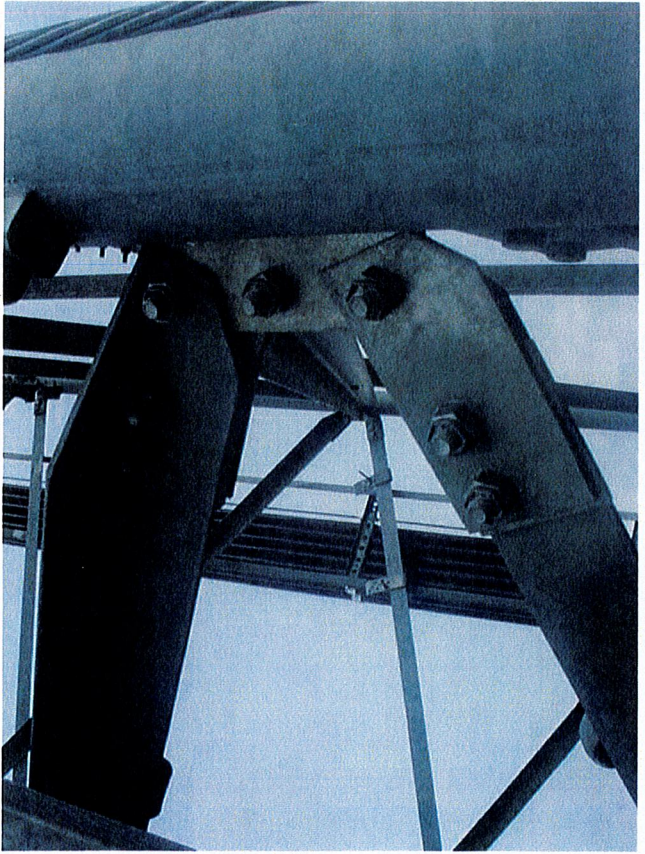
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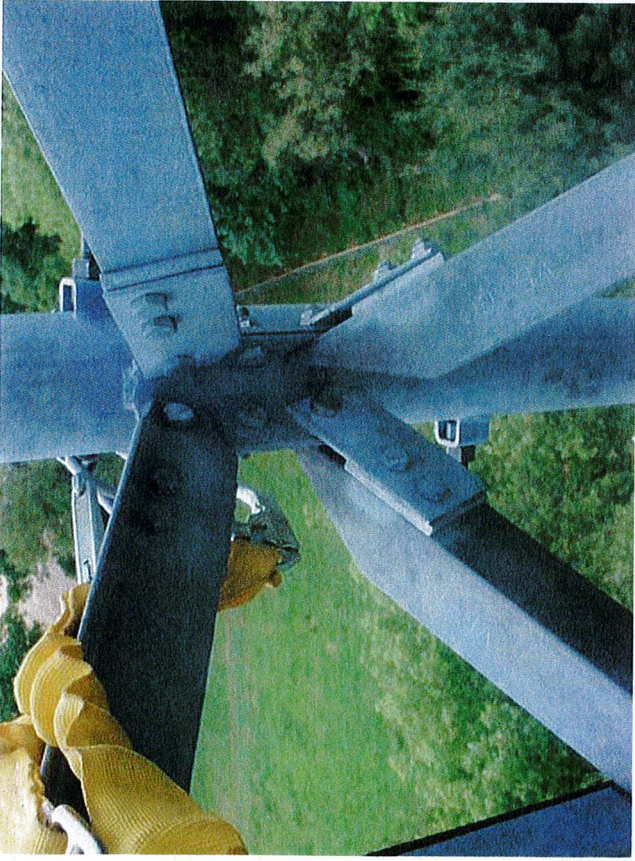
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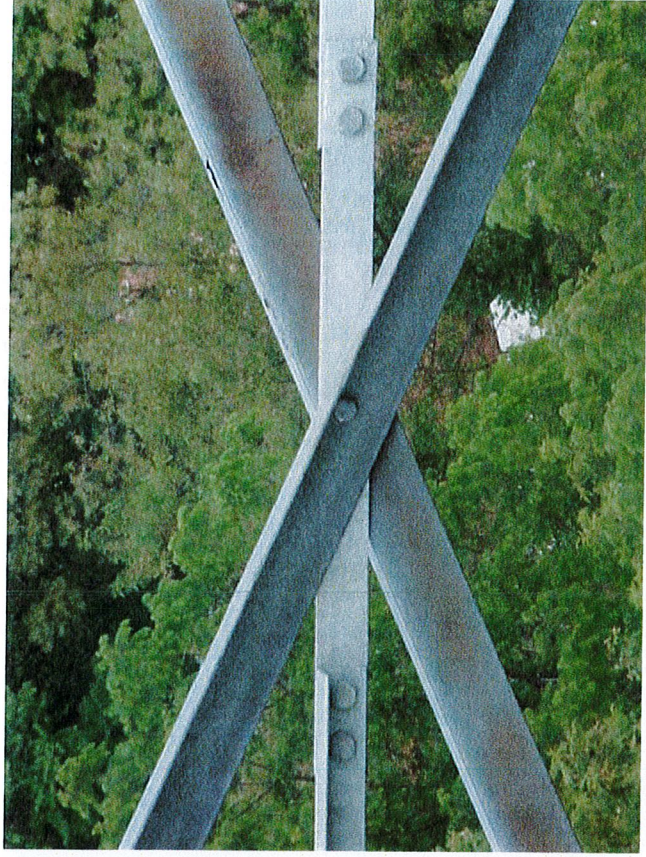
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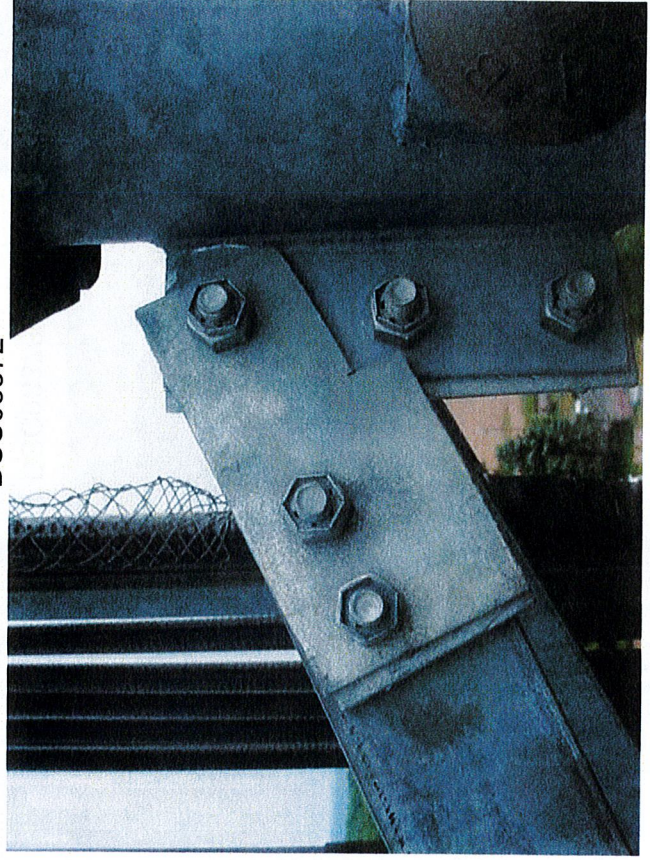
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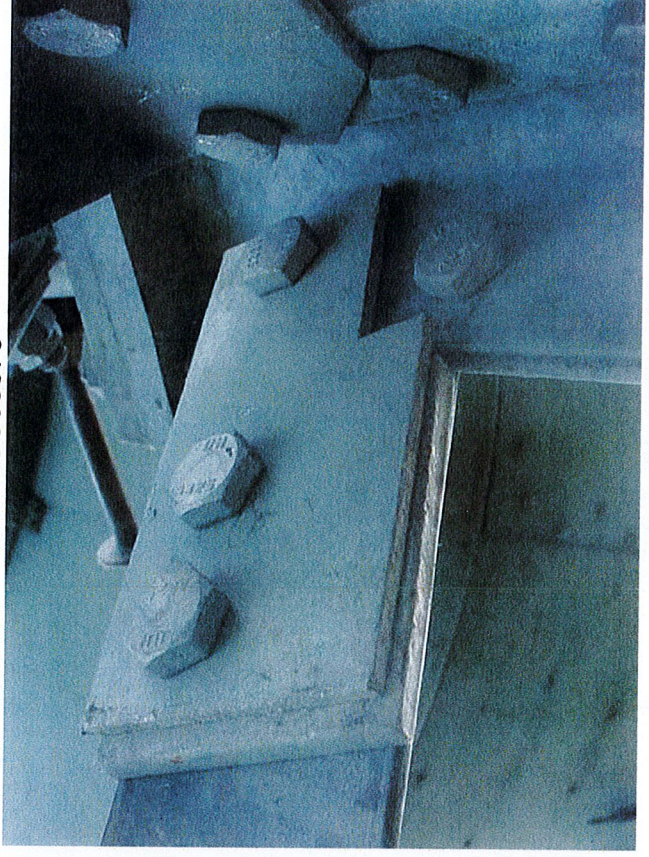
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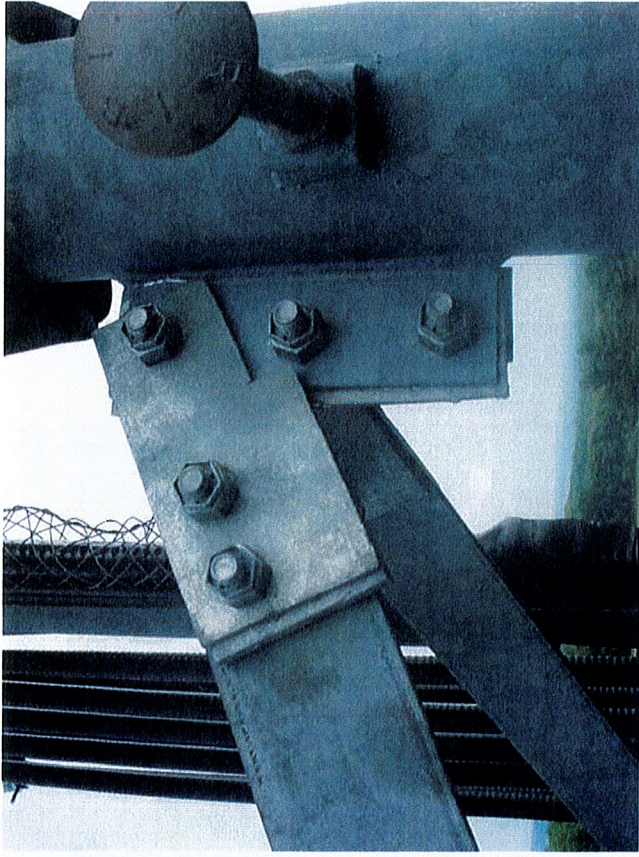
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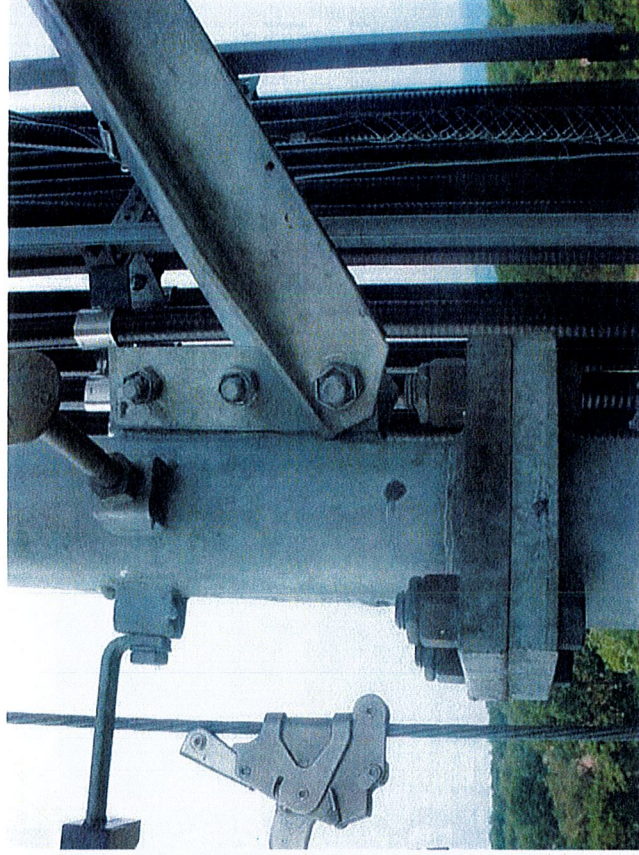
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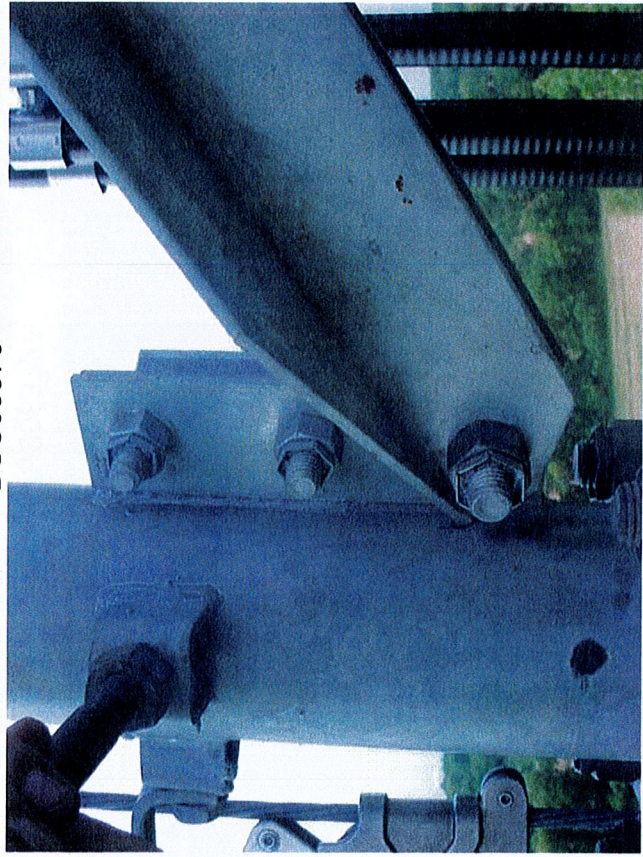
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DSC08376



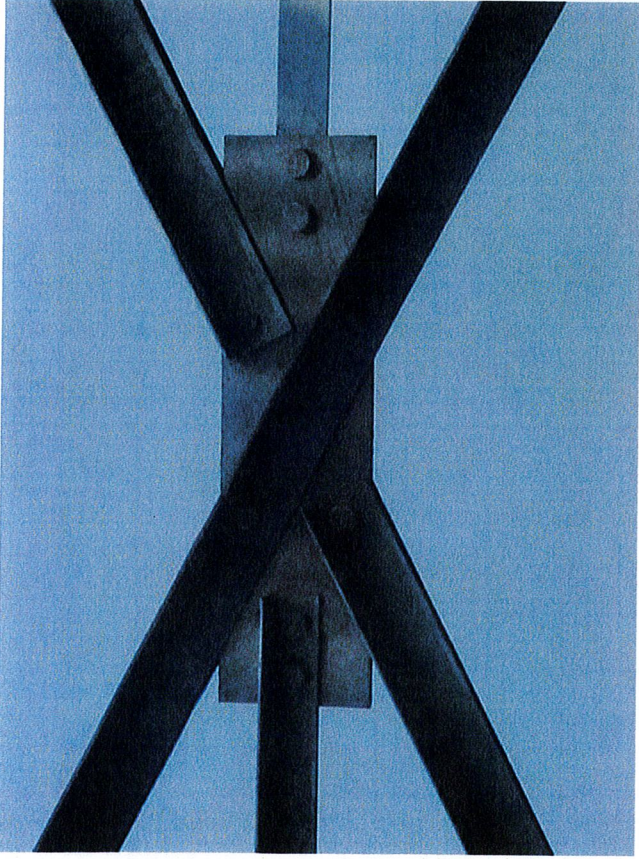
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DSC08378



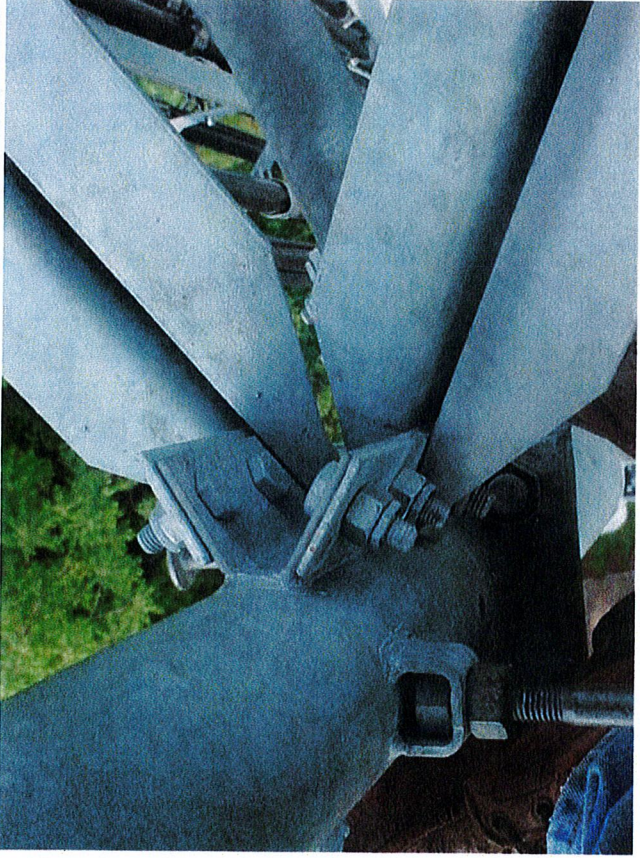
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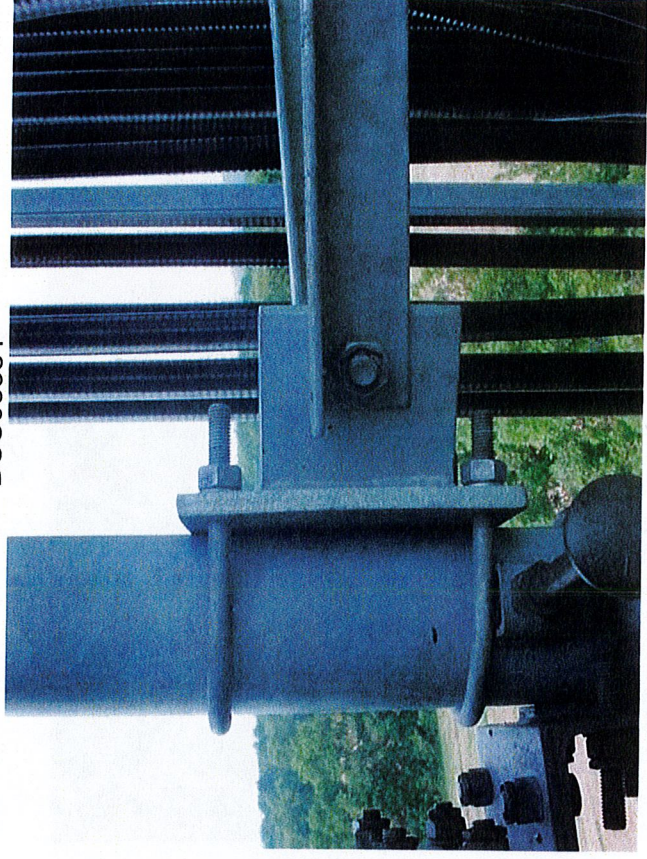
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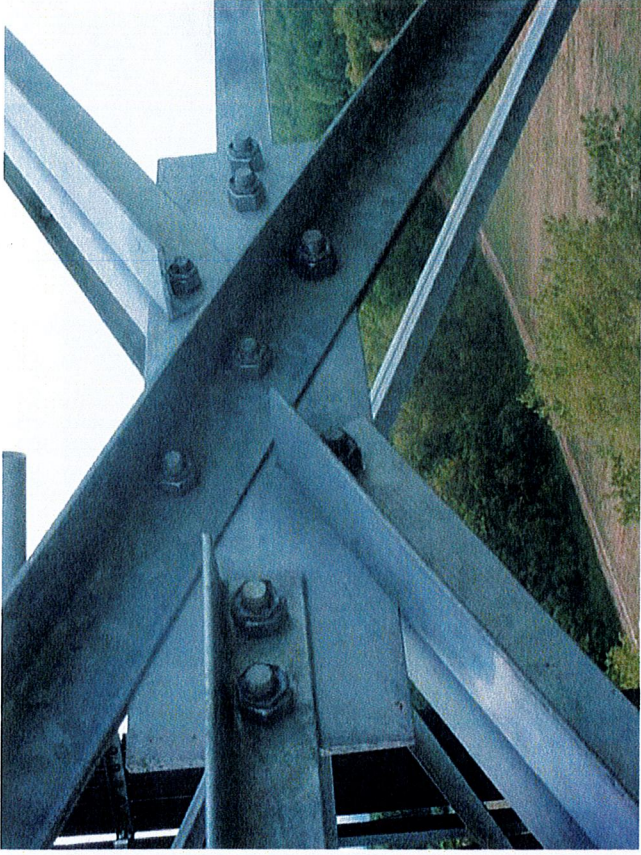
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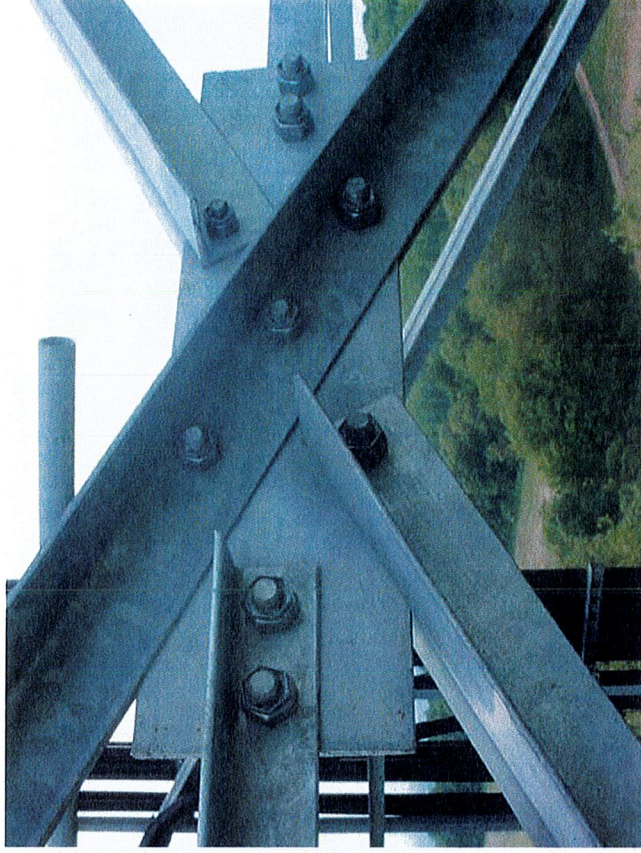
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DSC08383



DSC08384



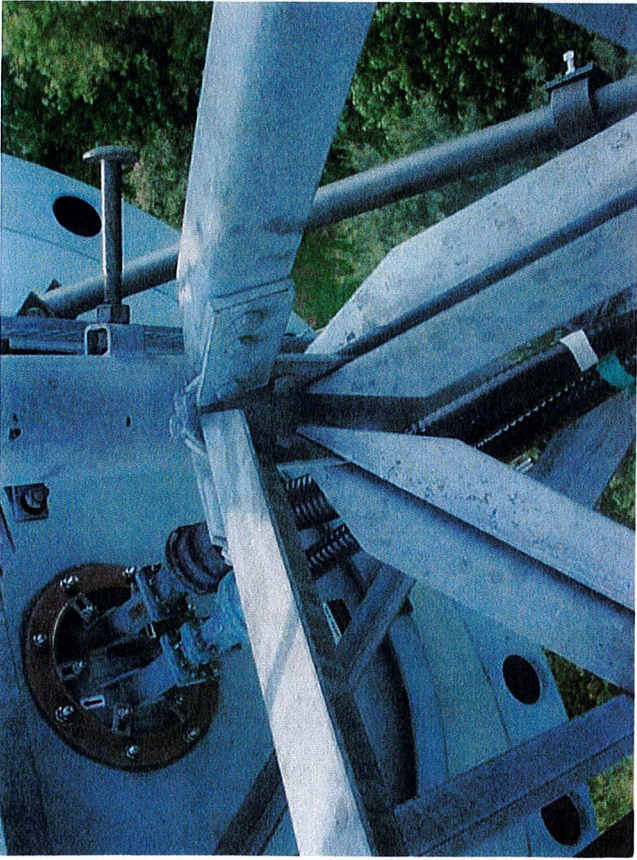
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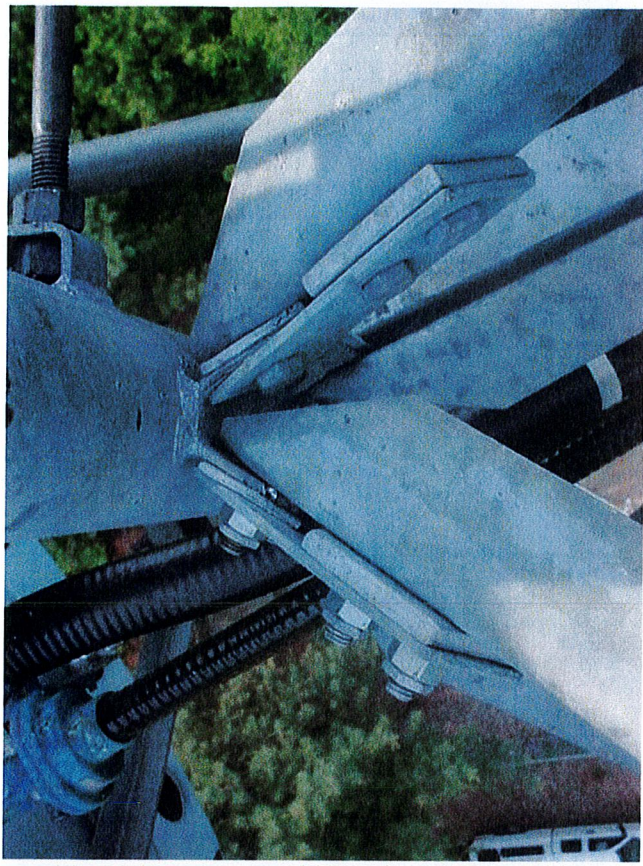
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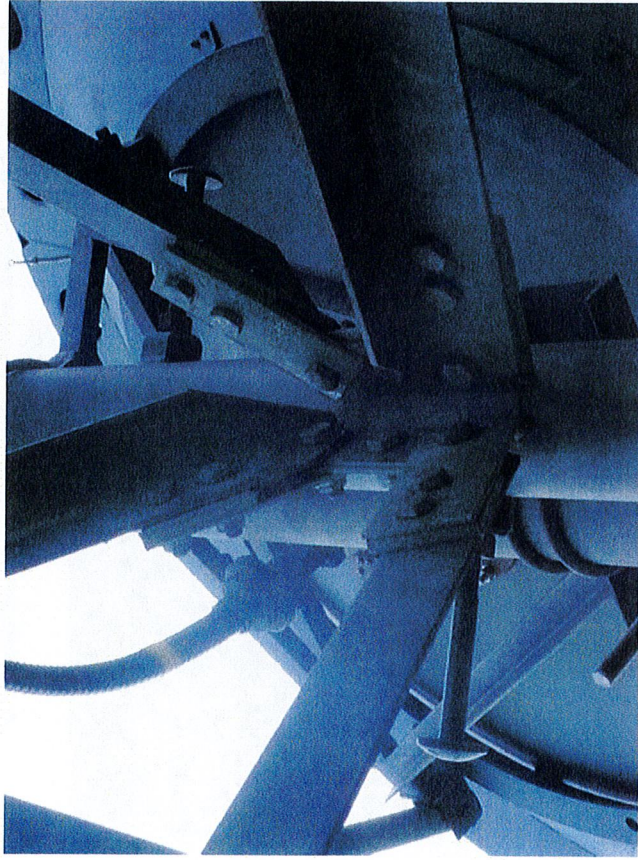
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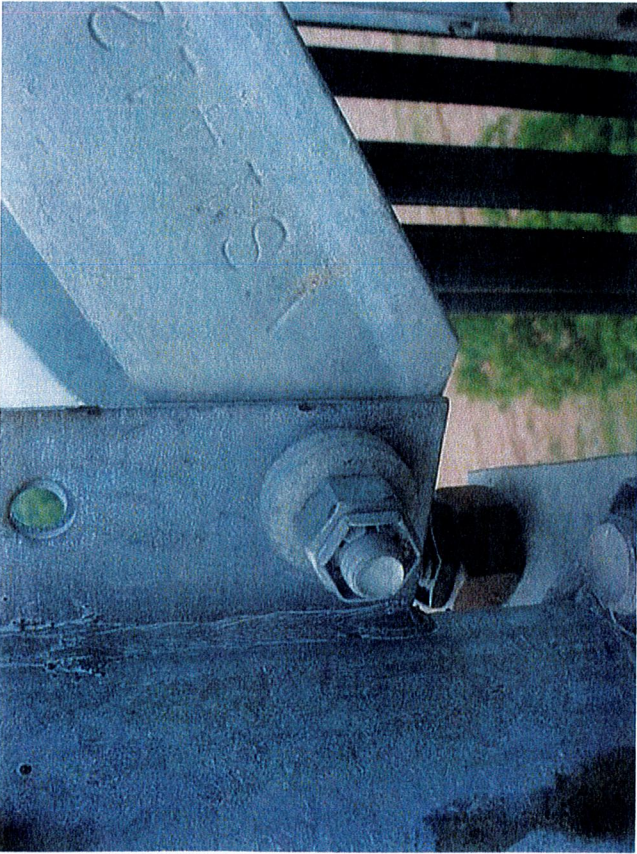
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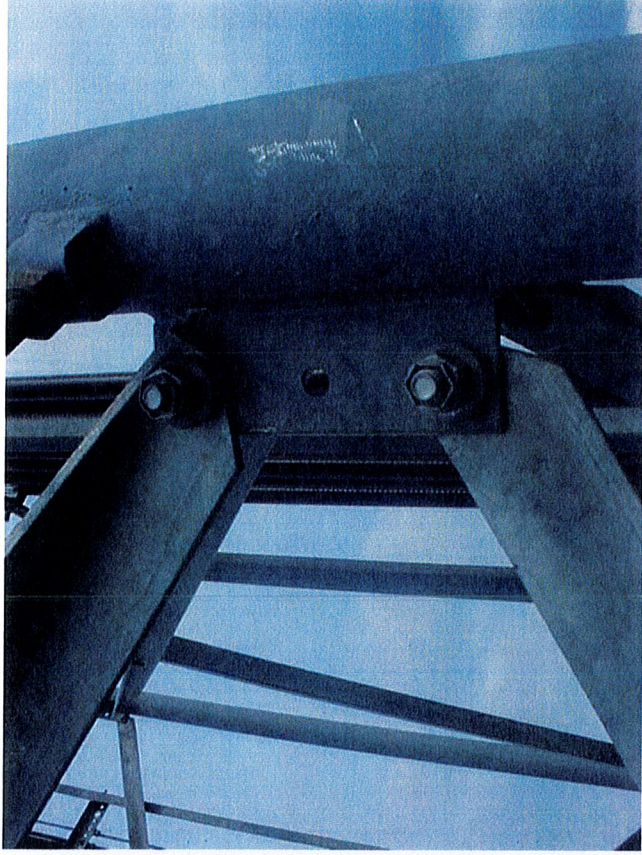
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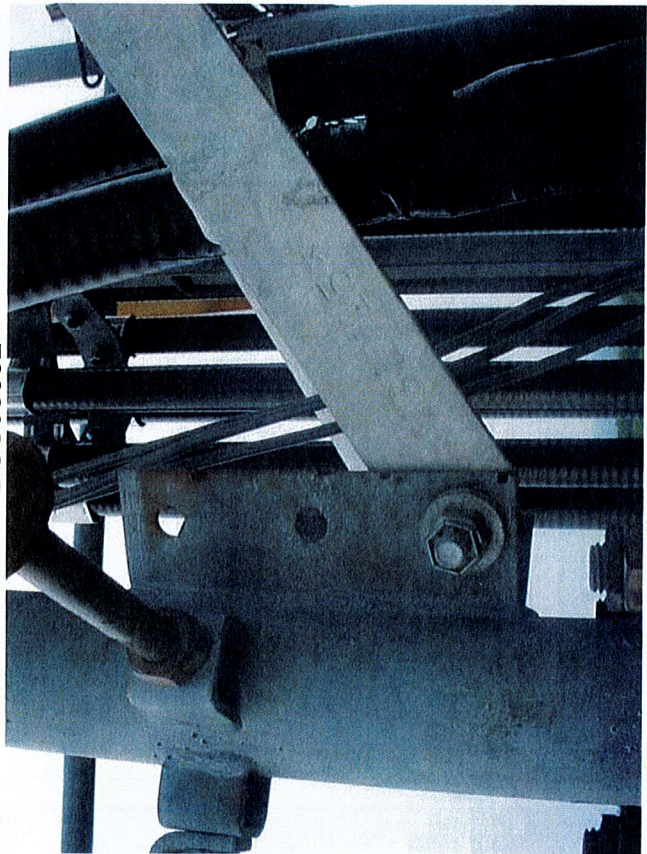
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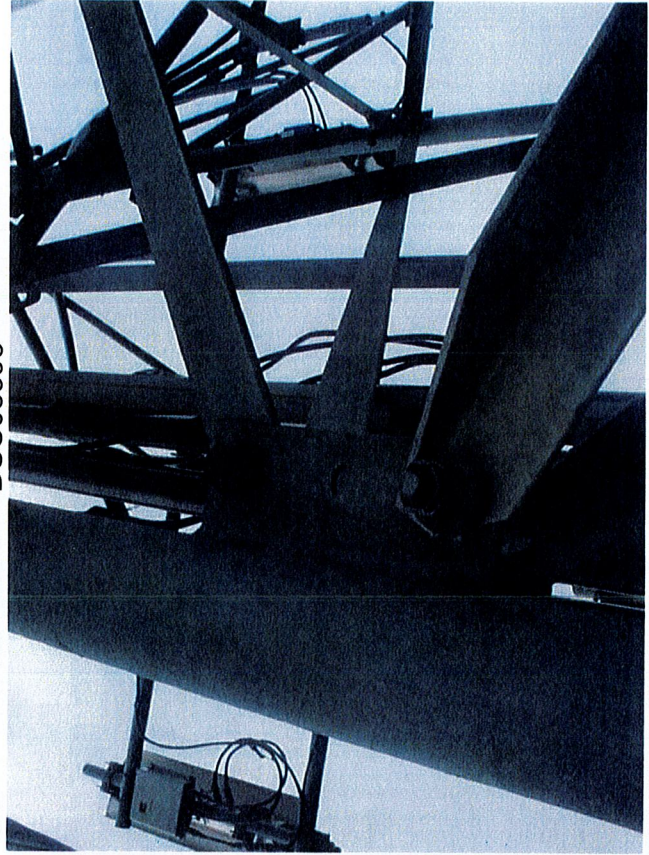
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DSC08393



DSC08394



DSC08395



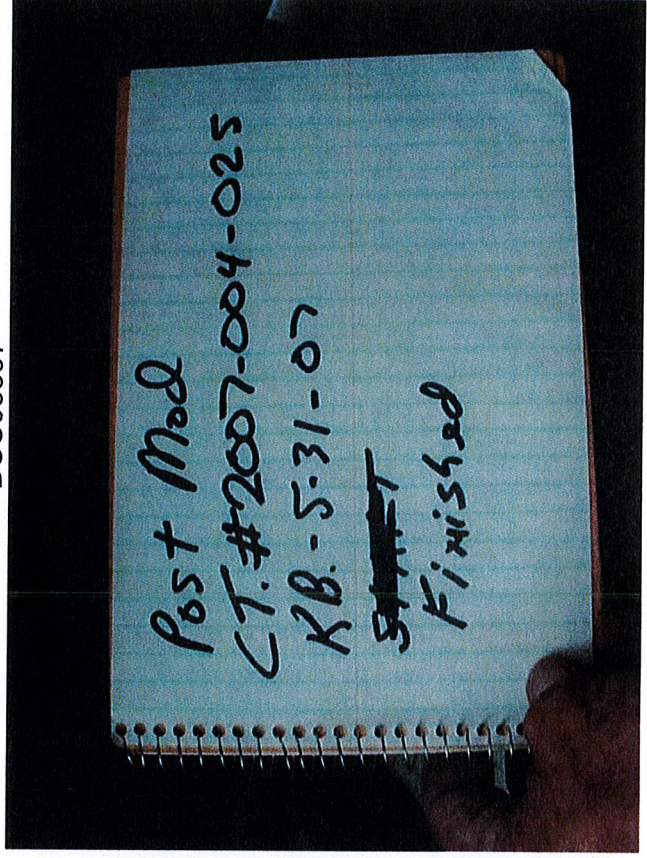
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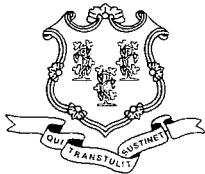
DSC08397



DSC08398



DSC08399



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso

Chairman

May 15, 2008

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-045-080428** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 93 Roxbury Road, East Lyme, Connecticut.

Dear Attorney Baldwin:

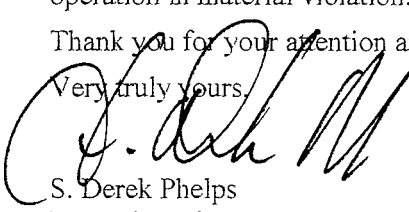
The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the condition that the modifications specified in Vertical Structures Job No. 2008-004-030 are completed prior to the antenna swap and a signed letter from a Professional Engineer is submitted to the Council to certify that the modifications have been properly completed.

The proposed modifications are to be implemented as specified here and in your notice dated April 28, 2008, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,


S. Derek Phelps
Executive Director

SDP/MP

c: Honorable Paul M. Formica, First Selectman, Town of East Lyme
Meg Parulis, Planning Director, Town of East Lyme
Crown Castle International



Affirmative Action / Equal Opportunity Employer

ROBINSON & COLE

EM-VER-045-080428

ORIGINAL

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

April 28, 2008

Via Hand Delivery

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051



Re: **Notice of Exempt Modification – Antenna Swap**
93 Roxbury Road, East Lyme, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains a wireless telecommunications facility at the above referenced location. The Council approved Cellco's shared use of this facility in Docket 116. On March 3, 2005 the Council granted Cellco's request to replace six of its existing cellular antennas with six PCS antennas. Cellco now intends to modify its installation further by replacing the six (6) ALP 9212 cellular antennas with six (6) DB846F65ZAXY cellular antennas at the 148-foot level on the 150-foot tower. The tower is owned by Crown Castle International. Attached behind Tab 1 are the specifications for the proposed replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Paul Formica, First Selectman of the Town of East Lyme. Please note that the Town of East Lyme is the owner of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in any increase in the overall height of the existing structure. Cellco's replacement antennas will be located at the 148-foot level of the 150-foot tower.



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S. Derek Phelps

April 28, 2008

Page 2

2. The proposed modifications will not involve any ground-mounted equipment and, therefore, will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for the facility is included behind Tab 2.

Also attached is a Structural Analysis Report confirming that the tower can support the proposed modifications. (See Tab 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Paul Formica, East Lyme First Selectman

Sandy M. Carter

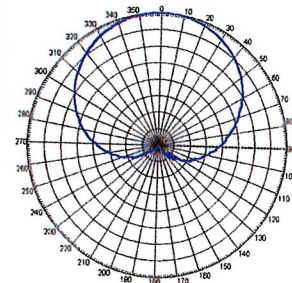
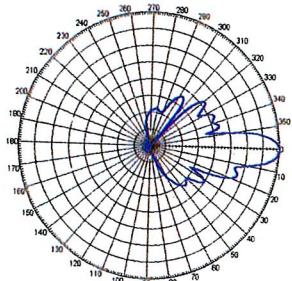
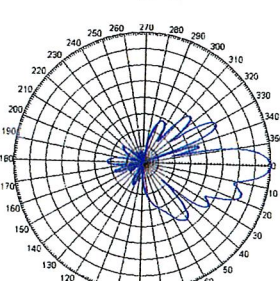
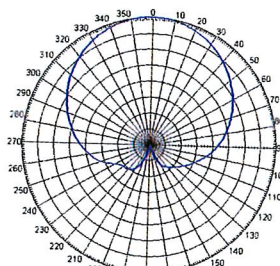
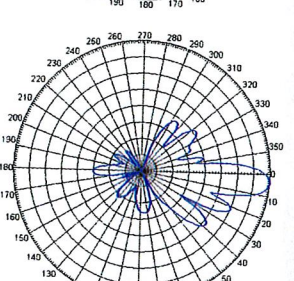
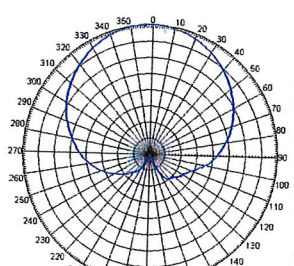


Vertically Polarized Directed Dipole® Panel Antennas

806 - 960 MHz
65° HORIZONTAL BEAMWIDTH

HORIZONTAL BEAMWIDTH		65°	65°	65°
FREQUENCY RANGE		806-960 MHz	806-896 MHz	806-896 MHz
		14.5 & 14.8 dBd / 0° Tilt	14.5 dBd / 0° Tilt	14.3 dBd / 5° Tilt
MODEL		DB846F65ZAXY	DB846H65E-SX	846H65T5E-SX
TYPE		Directed Dipole®, No Screen	Directed Dipole®	Directed Dipole®
ELECTRICAL SPECIFICATIONS				
Frequency Range (MHz)		806-896	806-896	806-896
Gain (dBd/dBi)		14.5 / 16.6	14.5 / 16.6	14.3 / 16.4
Horizontal Beamwidth (Deg.)		65	65	65
Elevation Beamwidth (Deg.)		11	11	10.5
USLS (dB)		>15	>15	>15
Null Fill (dB) – Below Peak		N/A	N/A	N/A
Beam Tilt (Deg.)		0	N/A	N/A
VSWR		<1.33:1	<1.5:1	<1.5:1
Front-To-Back Ratio (dB)		40	30	40
Isolation (dB)		N/A	N/A	N/A
Max. Input Power (Watts)		500	500	500
Polarization		Vertical	Vertical	Vertical
Connector Location		Back	Back	Back
Connector Type		7-16 DIN - Female	7-16 DIN - Female	7-16 DIN - Female
Optional Connectors		N/A	N/A	N/A
MECHANICAL SPECIFICATIONS				
Length (inch/mm)		72 / 1,829	72 / 1,829	72 / 1,829
Width (inch/mm)		10 / 254	10 / 254	10 / 254
Depth (inch/mm)		8.5 / 216	20.5 / 521	20.5 / 521
Net Weight (lbs/kg)		21 / 9.5	9 / 229	9 / 229
Max. Flat Plate Area (ft²/m²)		1.61 / 0.15	24 / 10.9	24 / 10.9
Max. Wind Load at 100 mph (lb/f/N)		87 / 386	4.95 / 0.46	4.95 / 0.46
Max. Wind Speed (mph/kmh)		125 / 201	273 / 1,214	273 / 1,214
Radome Material		ABS, UV Resistant	ABS, UV Resistant	ABS, UV Resistant
Reflector Material		Pass. Aluminum	Pass. Aluminum	Pass. Aluminum
Radiator Material		Aluminum	Aluminum	Aluminum
Hardware Material		Galvanized Steel	Brass	Brass
Color		Light Gray	Light Gray	Galvanized Steel
Std. Mounting Hardware		DB380	DB380	DB380
Optional Downtilt Kit		DB5083	DB5083	DB5083
Optional Special Mounting		DB5084-AZ	DB5084-AZ	DB5084-AZ

Specifications are subject to change. Please see our website for the latest information.

DB846F65ZAXY

Azimuth Pattern

Elevation Pattern
DB846H65E-SX

846H65T5E-SX


Scale: 10° radials, 5 dB per division

Site Name: East Lyme	General	Power	Density					
Tower Height: Verizon @ 148Ft.								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*VoiceStream/T-Mobile	8	239	103	0.0648	1930	1.0000	6.48%	
*Nextel	9	100	112.5	0.0143	851	0.5673	2.52%	
*Sprint	11	122	122.5	0.0322	1900	1.0000	3.22%	
*Town			155	0.0015		0.2000	0.75%	
Verizon	9	382	148	0.0564	880	0.5866	9.62%	
Verizon	3	218	148	0.0107	1900	1.0000	1.07%	
* Source: Siting Council								23.66%



April 11, 2008

Veronica Harris
Crown Castle USA
1200 MacArthur Blvd.
Mahwah, NJ 07430
(201) 236-9094

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
jkays@verticalstructures.com

Subject: Structural Analysis Report

Carrier Designation

Verizon Wireless Change-Out
Carrier Site Number: TBD
Carrier Site Name: East Lyme, CT

Crown Castle Designation

Crown Castle BU Number: 806384
Crown Castle Site Name: NLN 136
Crown Castle JDE Job Number: 101947

Engineering Firm Designation

Vertical Structures Project Number: 2008-004-061

Site Data

93 Roxbury Road, East Lyme, CT, New London County
Latitude 41°-20'-8.35", Longitude -72°-13'-18.28"
150' Rohn SSV Self-Supporting Tower

Dear Ms. Harris,

Vertical Structures is pleased to submit this structural analysis report to determine the structural integrity of the aforementioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 282660, and Application Number 59384, Revision 4. The purpose of the analysis is to determine the suitability of the tower for the following load case:

Load Case 1 (LC1): Proposed Equipment (Table 1) + Existing/Reserved Equipment (Table 2)

Based on our analysis we have determined the tower superstructure and foundation are sufficient for LC1, provided the modifications detailed in Vertical Structures Job No. 2008-004-030 are completed. This analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon an 85 MPH basic "fastest mile" wind speed, equivalent to a 105 MPH basic "3-second gust" wind speed per IBC Table 1609.3.1.

Vertical Structures appreciates the opportunity of providing our continuing professional services to you and Crown Castle USA. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,


Jordan Kays
Project Engineer

NLN 136 Report.doc

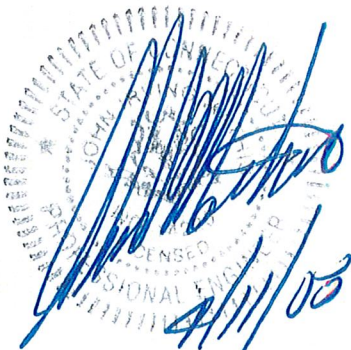


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1.) INTRODUCTION

The 150' tall self-supporting tower was designed and manufactured by Rohn in 1990 for Metro Mobile CTS. The three (3) sided tower is constructed of pipe legs with angle x-bracing and is founded on three (3) 8'-3" square by 2' thick spread footings bearing 12' below grade. The tower was reworked in 2003 to accommodate additional loading. For the purpose of this analysis, the modifications detailed in Vertical Structures Job No. 2008-004-030 are considered complete.

2.) ANALYSIS CRITERIA

The NLN 136 tower was analyzed in accordance with the current EIA-222-F publication, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures." The proposed, existing and reserved antennas, cables and mounts considered in this analysis are listed in Tables 1 and 2. Applied forces in this study were derived from an 85 MPH basic "fastest mile" wind speed with no ice and a reduced 74 MPH basic "fastest mile" wind speed with a 1/2" of radial ice accumulation. The tower was originally designed for an 85 MPH basic "fastest mile" wind speed with no ice and a reduced 74 MPH basic "fastest mile" wind speed with a 1/2" of radial ice accumulation. The original design loads are listed in Table 3. All cables are assumed to be routed in accordance with the drawing in Appendix B.

Table 1 – Proposed Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (inches)
148	6	Decibel	DB846F65ZAXY			6	1 5/8

Table 2 – Existing and Reserved Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (inches)
152	1	Celwave	1142-2B		Leg Mounted	1	7/8
148	6*	Swedcom	ALP 9212-N	Rohn	(3) 12' Sector Frames	6*	7/8
	6	Decibel	DB948F85T2E-M			6	1 5/8
	12**		52" x 9" Panel			12**	1 5/8
143	1	Andrew	PL6-59W		(1) Pipe Mount	1	EW52
122	6 + 3***	Decibel	DB980H90E-M	Rohn	(3) 12' Sector Frames	6 + 3***	1 5/8
112	12****	Swedcom	ALP 9212-N	Rohn	(3) 12' Sector Frames	12****	1 1/4
	9	Decibel	DB844H90E-XY			9	7/8
103	6 + 3***	EMS Wireless	RR90-17-02DP		(3) 12' Knockdown Frames	12 + 6***	1 5/8
	6		TMA				
90	1		10' Omni		(1) 6' Sidearm	1	7/8
50	1	Larsen	YA5900		(1) 3' Sidearm	1	3/8
	1***		GPS		(1***) 2' Sidearm	1***	1/2

*Indicates equipment to be removed.

**Indicates MLA loading. Existing and proposed loading controls and is used in this analysis.

***Indicates reserved loading.

****Indicates MLA loading. MLA loading controls and is used in this analysis.

Table 3 – Design Antenna and Cable Information

Mount Center Line Elevation (feet)	Number Of Antenna	Antenna Manufacturer	Antenna Model	Mount Manufacturer	Mount Model	Number Of Feed Lines	Feed Line Size (inches)
150	7	Celwave	PD10017		(7) 6' Sidearms		
135	6	Celwave	PD1132		(3) 6' Sidearms		
127	3		10' H.P. Dish				
120	2	Celwave	PD10017		(2) 6' Sidearms		
100	3	Celwave	PD200		(3) 6' Sidearms		

3.) ANALYSIS PROCEDURE

Table 4 – Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Change-Out Revision #4	59384	CCI iSite
Tower Drawings	Rohn Drawing No. C900865	258359	CCI iSite
Foundation Drawing	Rohn Drawing No. A900823-1	958525	CCI iSite
Geotechnical Report	Dr. Clarence Welti 'July 19, 1989' Report	258373	CCI iSite
Rework Drawings	All-Points Technology Job No. CT105761	958536	CCI iSite
Rework Drawings	Vertical Structures Job No. 2008-004-030	2215933	CCI iSite

3.1) Analysis Methods

RISA Tower (Version 5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/TIA/EIA-222-F or the local building code requirements. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and any referenced drawings.
4. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222-F.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and Vertical Structures should be allowed to review any new information to determine its effect on the structural integrity of the tower.

4.) ANALYSIS RESULTS

Table 5 – Tower Component Stresses vs. Modified Capacity (LC1)

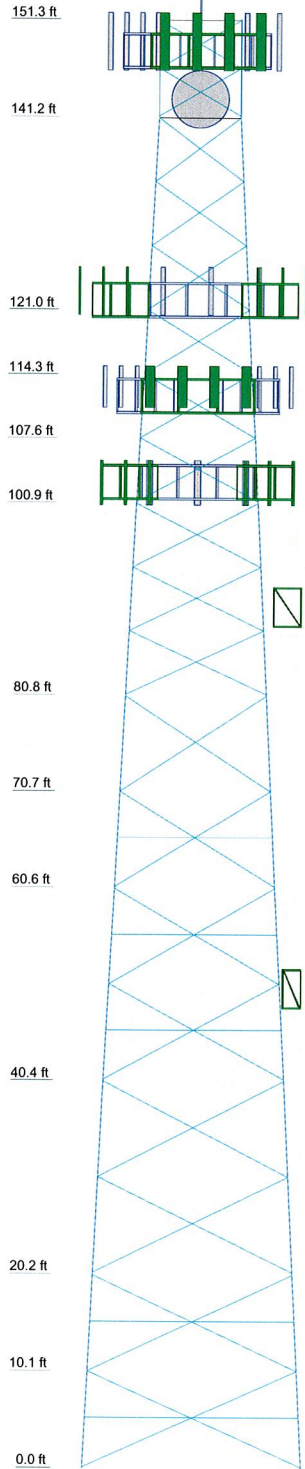
Section Capacity Table								
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
T1	151.292 - 141.167	Leg	ROHN 2.5 STD	2	-5907.10	50293.16	14.3	Pass
		Diagonal	L1 1/2x1 1/2x3/16	9	-2301.51	2917.39	78.9	Pass
		Top Girt	L2 1/2x2 1/2x3/16	6	-130.88	4167.10	3.1	Pass
T2	141.167 - 121.042	Leg	ROHN 2.5 EH	21	-23728.00	52977.02	44.8	Pass
		Diagonal	L2 1/2x2 1/2x3/16	27	-3303.82	8577.46	38.5	Pass
		Top Girt	L2 1/2x2 1/2x3/16	23	-231.18	4161.07	5.6	Pass
T3	121.042 - 114.313	Leg	ROHN 2.5 EH	45	-27036.20	52973.82	51.0	Pass
		Diagonal	L2 1/2x2 1/2x3/16	48	-4339.59	7802.10	55.6	Pass
							79.0 (b)	
T4	114.313 - 107.646	Leg	ROHN 2.5 EH	54	-36613.60	52972.08	69.1	Pass
		Diagonal	L2 1/2x2 1/2x3/16	57	-5375.42	7121.94	75.5	Pass
							98.1 (b)	
T5	107.646 - 100.917	Leg	ROHN 2.5 EH	63	-52443.30	52973.82	99.0	Pass
		Diagonal	L2 1/2x2 1/2x3/16	66	-6448.61	6524.61	98.8	Pass
T6	100.917 - 80.7708	Leg	ROHN 3 EH	72	-84908.60	83780.24	101.3	Fail X (1)
		Diagonal	L3x3x3/16	75	-7596.66	8997.64	84.4	Pass
T7	80.7708 - 70.6875	Leg	ROHN 4 EH	93	-92376.50	110049.81	83.9	Pass
		Diagonal	2L3x3x3/16x1/4	96	-8767.52	29260.28	30.0	Pass
							74.6 (b)	
T8	70.6875 - 60.6041	Leg	ROHN 4 EH	102	-117714.00	150145.11	78.4	Pass
		Diagonal	2L3x3x3/16x1/4	105	-9040.87	27030.04	33.4	Pass
							77.4 (b)	
		Secondary Horizontal	L2 1/2x2 1/2x3/16	110	-2041.37	4668.90	43.7	Pass
T9	60.6041 - 40.4166	Leg	ROHN 4 EH	114	-150007.00	150169.11	99.9	Pass
		Diagonal	2L3x3x1/4x1/4	117	-9651.95	29737.49	32.5	Pass
							83.6 (b)	
		Secondary Horizontal	L3x3x1/4	122	-2601.62	8394.69	31.0	Pass
							47.3 (b)	
T10	40.4166 - 20.2083	Leg	ROHN 5 EH	135	-182282.00	177460.95	102.7	Fail X (1)
		Diagonal	2L3 1/2x3 1/2x1/4x1/4	138	-10406.90	40231.14	25.9	Pass
							94.3 (b)	
T11	20.2083 - 10.1041	Leg	ROHN 5 EH	150	-189028.00	217673.56	86.8	Pass
		Diagonal	L4x4x1/4	153	-11352.70	12669.12	89.6	Pass
		Secondary Horizontal	L3x3x3/16	158	-3278.07	4729.99	69.3	Pass
T12	10.1041 - 0	Leg	ROHN 5 EH	162	-213162.00	217709.55	97.9	Pass
		Diagonal	L4x4x1/4	165	-11304.50	11741.28	96.3	Pass
		Secondary Horizontal	L3x3x3/16	170	-3696.58	4318.64	85.6	Pass
							98.9 (b)	
							Summary	
							Leg (T10)	102.7 Fail X (1)
							Diagonal (T5)	98.8 Pass
							Secondary Horizontal (T12)	85.6 Pass
							Top Girt (T2)	5.6 Pass
							Bolt Checks	98.9 Pass
							RATING =	102.7 Fail X (1)

Notes	Component	% Capacity	Pass/Fail
Additional Component Analysis Summary:			
2	Anchor Bolts (Tension)	65.5	Pass
2	Foundation (Compared to Allowable Loads)	84.8	Pass
Structure Rating =		102.7	Pass

- 1) Indicates an overstress of less than 5% and is considered acceptable based on the analysis procedure used.
 2) Indicates calculations supporting % capacity are included in Appendix C.

APPENDIX A

Section	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	ROHN 5 EH	ROHN 5 EH	ROHN 5 EH	ROHN 4 EH	ROHN 4 EH	ROHN 3 EH	ROHN 3 EH	ROHN 2.5 EH	ROHN 2.5 EH	ROHN 2.5 EH	ROHN 2.5 EH	ROHN 2.5 EH
Leg Grade	L4x4x1/4	L4x4x1/4	L4x4x1/4	2L3x3x1/4x1/4	2L3x3x1/4x1/4	2L3x3x1/4x1/4	2L3x3x1/4x1/4	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x3/16
Diagonals	L4x4x1/4	L4x4x1/4	L4x4x1/4	2L3x3x1/4x1/4	2L3x3x1/4x1/4	2L3x3x1/4x1/4	2L3x3x1/4x1/4	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x3/16
Diagonal Grade	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50
Top Girts	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4
Sec. Horizontals	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4
Face Width (ft)	22.7813	21.7813	20.7813	18.7708	16.6979	15.6979	14.6979	12.6041	11.9236	11.243	10.5625	8.5625
# Panels @ (ft)	1 @ 9.99997	1 @ 9.99997	1 @ 9.99997	5 @ 10	5 @ 10	2 @ 10	2 @ 10	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	2 @ 5
Weight (lb)	18814.9	18866.2	18899.6	4217.7	3749.4	1426.4	1240.3	438.6	392.6	383.2	1164.9	465.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
1142-2B	152	(3) DB980H90E-M w/Mount Pipe	122
3' x 2 7/8" Pipe Mount (VSI)	152	Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI)	112
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI) (Verizon Wireless)	148	(4) ALP 9212-N w/Mount Pipe	112
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	148	(4) ALP 9212-N w/Mount Pipe	112
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	148	(4) ALP 9212-N w/Mount Pipe	112
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	148	Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI)	112
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	148	Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI)	112
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	148	Pirol 12' Knockdown T-Frame (1) (VSI)	103
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	148	(3) RR90-17-02DP w/Mount Pipe	103
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	148	(3) RR90-17-02DP w/Mount Pipe	103
(2) DB948F85T2E-M w/Mount Pipe (Verizon Wireless)	148	(3) RR90-17-02DP w/Mount Pipe	103
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI) (Verizon Wireless)	148	(2) Generic TMA	103
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI) (Verizon Wireless)	148	(2) Generic TMA	103
4" Std. x 5' Pipe Mount (VSI)	143	(2) Generic TMA	103
PL6-59W	143	Pirol 12' Knockdown T-Frame (1) (VSI)	103
(3) DB980H90E-M w/Mount Pipe	122	Pirol 12' Knockdown T-Frame (1) (VSI)	103
(3) DB980H90E-M w/Mount Pipe	122	Rohn 6' Side-Arm Pipe (1) (VSI)	90
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI)	122	10' x 2" Omni	90
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI)	122	3' Sidearm (1 1/4" pipe) (VSI)	50
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI)	122	2' Sidearm (1 1/2" pipe) (VSI)	50
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI)	122	Generic GPS (VSI)	50
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI)	122	YA5900	50

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD	C	L2 1/2x2 1/2x3/16
B	L1 1/2x1 1/2x3/16		

MATERIAL STRENGTH

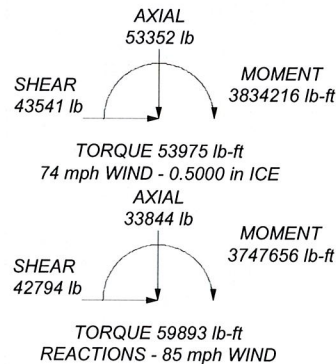
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 102.7%

MAX. CORNER REACTIONS AT BASE:

DOWN: 212108 lb
UPLIFT: -169783 lb
SHEAR: 25842 lb



Vertical Structures

309 Spangler Drive, Suite E
Richmond, KY 40475
Phone: (859) 624-8360
FAX: (859) 624-8369

Job: NLN 136, CT BU#806384 (Modified)	Project: Vertical Structures Job No. 2008-004-061
Client: Crown Castle	Drawn by: Jordan Kays App'd:
Code: TIA/EIA-222-F	Date: 04/11/08 Scale: NTS
Path: \\nas11kaya\Open Jobs\NLN 136, CT\004-061\RI8A806384 (Modified).en	Dwg No. E-1

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	Project Vertical Structures Job No. 2008-004-061	Date 13:54:49 04/11/08
	Client Crown Castle	Designed by Jordan Kays

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 151.29 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 8.56 ft at the top and 22.78 ft at the base.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in New London County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 74 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

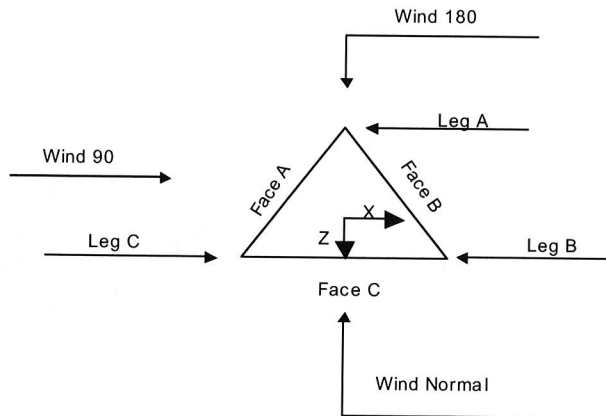
Stress ratio used in tower member design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	√ SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	√ Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

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	Client	Crown Castle	Designed by	Jordan Kays



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	151.29-141.17			8.56	1	10.13
T2	141.17-121.04			8.56	1	20.13
T3	121.04-114.31			10.56	1	6.73
T4	114.31-107.65			11.24	1	6.67
T5	107.65-100.92			11.92	1	6.73
T6	100.92-80.77			12.60	1	20.15
T7	80.77-70.69			14.70	1	10.08
T8	70.69-60.60			15.70	1	10.08
T9	60.60-40.42			16.70	1	20.19
T10	40.42-20.21			18.77	1	20.21
T11	20.21-10.10			20.78	1	10.10
T12	10.10-0.00			21.78	1	10.10

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	151.29-141.17	5.00	X Brace	No	No	0.7500	0.7500
T2	141.17-121.04	6.67	X Brace	No	No	0.7500	0.7500
T3	121.04-114.31	6.67	X Brace	No	No	0.7500	0.0000

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	Client	Crown Castle	Designed by	Jordan Kays

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T4	114.31-107.65	6.67	X Brace	No	No	0.0000	0.0000
T5	107.65-100.92	6.67	X Brace	No	No	0.0000	0.7500
T6	100.92-80.77	6.67	X Brace	No	No	0.7500	1.0000
T7	80.77-70.69	10.00	X Brace	No	No	1.0000	0.0000
T8	70.69-60.60	10.00	X Brace	No	Yes	0.0000	1.0000
T9	60.60-40.42	10.00	X Brace	No	Yes	1.0000	1.2500
T10	40.42-20.21	10.00	X Brace	No	No	1.2500	1.2500
T11	20.21-10.10	10.00	X Brace	No	Yes	1.2500	0.0000
T12	10.10-0.00	10.00	X Brace	No	Yes	0.0000	1.2500

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 151.29-141.17	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 141.17-121.04	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 121.04-114.31	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 114.31-107.65	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 107.65-100.92	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 100.92-80.77	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T7 80.77-70.69	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T8 70.69-60.60	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T9 60.60-40.42	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T10 40.42-20.21	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x1/4	A572-50 (50 ksi)
T11 20.21-10.10	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A572-50 (50 ksi)
T12 10.10-0.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
<i>ft</i>						
T1 151.29-141.17	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 141.17-121.04	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

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Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
<i>ft</i>						
T8 70.69-60.60	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 60.60-40.42	Single Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 20.21-10.10	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T12 10.10-0.00	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Gusset Area (per face)</i>	<i>Gusset Thickness</i>	<i>Gusset Grade</i>	<i>Adjust. Factor A_f</i>	<i>Adjust. Factor A_r</i>	<i>Weight Mult.</i>	<i>Double Angle Stitch Bolt Spacing Diagonals</i>	<i>Double Angle Stitch Bolt Spacing Horizontals</i>
<i>ft</i>	<i>ft²</i>	<i>in</i>					<i>in</i>	<i>in</i>
T1 151.29-141.17	0.60	0.1406	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 141.17-121.04	0.80	0.1406	A36 (36 ksi)	1	1	1	30.0000	30.0000
T3 121.04-114.31	0.27	0.1406	A36 (36 ksi)	1	1	1	30.0000	30.0000
T4 114.31-107.65	0.27	0.1406	A36 (36 ksi)	1	1	1	30.0000	30.0000
T5 107.65-100.92	1.25	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T6 100.92-80.77	2.80	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T7 80.77-70.69	0.45	0.2375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T8 70.69-60.60	0.45	0.2375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T9 60.60-40.42	0.90	0.2375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T10 40.42-20.21	0.90	0.2375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T11 20.21-10.10	1.50	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000
T12 10.10-0.00	1.50	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000

Tower Section Geometry (cont'd)

K Factors¹

<i>RISATower</i> <i>Vertical Structures</i> 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Page
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	Crown Castle	Jordan Kays

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T12 10.10-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
	in	in	in	in	in	in	in	in
T1 151.29-141.17	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 141.17-121.04	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 121.04-114.31	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T4 114.31-107.65	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 107.65-100.92	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T6 100.92-80.77	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T7 80.77-70.69	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T8 70.69-60.60	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T9 60.60-40.42	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T10 40.42-20.21	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000
T11 20.21-10.10	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000
T12 10.10-0.00	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 151.29-141.17	Flange	0.6250	4	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T2 141.17-121.04	Flange	0.6250	4	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T3 121.04-114.31	Flange	0.7500	0	0.5000	1	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
T4 114.31-107.65	Flange	0.7500	0	0.5000	1	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0

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Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T5 107.65-100.92	Flange	0.7500 A325N	4	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.92-80.77	Flange	0.8750 A325N	4	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.77-70.69	Flange	0.8750 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 70.69-60.60	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T9 60.60-40.42	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T10 40.42-20.21	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 20.21-10.10	Flange	1.0000 A325N	0	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T12 10.10-0.00	Flange	1.0000 A354-BC	4	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Feedline Ladder (Af)	A	Yes	Af (CfAe)	140.00 - 8.00	0.5000	0.4	1	1	3.0000	3.0000	12.0000	8.40
Feedline Ladder (Af)	B	Yes	Af (CfAe)	103.00 - 8.00	0.5000	0.42	1	1	3.0000	3.0000	12.0000	8.40
LDF7-50A (1-5/8 FOAM) **	B	Yes	Ar (CfAe)	103.00 - 8.00	1.0000	0.45	18	6	0.2700	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CfAe)	123.00 - 8.00	1.0000	-0.4	22	13	0.2700 1.0000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (Verizon Wireless)	B	Yes	Ar (CfAe)	143.00 - 123.00	1.0000	-0.3	13	7	0.2700 1.0000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (Verizon Wireless)	B	Yes	Ar (CfAe)	149.00 - 143.00	1.0000	-0.3	12	6	0.2700 1.0000	1.9800		0.82
LDF5-50A (7/8 FOAM)	B	Yes	Ar (CfAe)	90.00 - 8.00	1.0000	-0.32	2	2	1.1600	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	Yes	Ar (CfAe)	151.29 - 90.00	1.0000	-0.32	1	1	1.1600	1.0900		0.33
LDF6-50A (1-1/4 FOAM)	B	Yes	Ar (CfAe)	113.00 - 8.00	-1.0000	-0.35	12	6	0.0000	0.0000		0.66
LDF2-50A (3/8 FOAM)	B	Yes	Ar (CfAe)	50.00 - 8.00	1.0000	-0.35	1	1	0.0000	0.0000		0.08
LDF4-50A (1/2 FOAM)	B	Yes	Ar (CfAe)	50.00 - 8.00	-1.0000	-0.32	1	1	0.0000	0.0000		0.15
Feedline Ladder (Af)	B	Yes	Af (CfAe)	148.00 - 8.00	-0.5000	-0.35	2	1	3.0000	3.0000	12.0000	8.40

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Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight lb
T1	151.29-141.17	A	0.000	0.000	0.000	0.000	0.00
		B	8.977	1.708	0.000	0.000	196.72
		C	0.000	0.000	0.000	0.000	0.00
T2	141.17-121.04	A	0.000	4.740	0.000	0.000	159.25
		B	27.011	5.031	0.000	0.000	573.73
		C	0.000	0.000	0.000	0.000	0.00
T3	121.04-114.31	A	0.000	1.682	0.000	0.000	56.53
		B	15.045	1.682	0.000	0.000	236.66
		C	0.000	0.000	0.000	0.000	0.00
T4	114.31-107.65	A	0.000	1.667	0.000	0.000	56.00
		B	14.906	1.667	0.000	0.000	276.87
		C	0.000	0.000	0.000	0.000	0.00
T5	107.65-100.92	A	0.000	1.682	0.000	0.000	56.53
		B	17.108	2.203	0.000	0.000	338.21
		C	0.000	0.000	0.000	0.000	0.00
T6	100.92-80.77	A	0.000	5.036	0.000	0.000	169.22
		B	65.825	10.073	0.000	0.000	1337.71
		C	0.000	0.000	0.000	0.000	0.00
T7	80.77-70.69	A	0.000	2.521	0.000	0.000	84.70
		B	33.443	5.042	0.000	0.000	671.35
		C	0.000	0.000	0.000	0.000	0.00
T8	70.69-60.60	A	0.000	2.521	0.000	0.000	84.70
		B	33.443	5.042	0.000	0.000	671.35
		C	0.000	0.000	0.000	0.000	0.00
T9	60.60-40.42	A	0.000	5.047	0.000	0.000	169.57
		B	66.955	10.094	0.000	0.000	1346.29
		C	0.000	0.000	0.000	0.000	0.00
T10	40.42-20.21	A	0.000	5.052	0.000	0.000	169.75
		B	67.024	10.104	0.000	0.000	1350.12
		C	0.000	0.000	0.000	0.000	0.00
T11	20.21-10.10	A	0.000	2.526	0.000	0.000	84.88
		B	33.512	5.052	0.000	0.000	675.06
		C	0.000	0.000	0.000	0.000	0.00
T12	10.10-0.00	A	0.000	0.526	0.000	0.000	17.67
		B	6.979	1.052	0.000	0.000	140.58
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight lb
T1	151.29-141.17	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		3.709	9.775	0.000	0.000	377.38
		C		0.000	0.000	0.000	0.000	0.00
T2	141.17-121.04	A	0.500	0.000	5.793	0.000	0.000	210.46
		B		8.503	30.993	0.000	0.000	1066.67
		C		0.000	0.000	0.000	0.000	0.00
T3	121.04-114.31	A	0.500	0.000	2.056	0.000	0.000	74.70
		B		2.843	17.197	0.000	0.000	472.87
		C		0.000	0.000	0.000	0.000	0.00
T4	114.31-107.65	A	0.500	0.000	2.037	0.000	0.000	74.01
		B		3.263	17.037	0.000	0.000	512.52
		C		0.000	0.000	0.000	0.000	0.00
T5	107.65-100.92	A	0.500	0.000	2.056	0.000	0.000	74.70

<i>RISATower</i> <i>Vertical Structures</i> 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	NLN 136, CT BU#806384 (Modified)	Page 9 of 19
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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight lb
T6	100.92-80.77	B	0.500	3.921	19.786	0.000	0.000	621.89
		C		0.000	0.000	0.000	0.000	0.00
		A		0.000	6.156	0.000	0.000	223.65
T7	80.77-70.69	B	0.500	16.801	76.526	0.000	0.000	2499.17
		C		0.000	0.000	0.000	0.000	0.00
		A		0.000	3.081	0.000	0.000	111.94
T8	70.69-60.60	B	0.500	9.361	38.303	0.000	0.000	1257.99
		C		0.000	0.000	0.000	0.000	0.00
		A		0.000	3.081	0.000	0.000	111.94
T9	60.60-40.42	B	0.500	9.361	38.303	0.000	0.000	1257.99
		C		0.000	0.000	0.000	0.000	0.00
		A		0.000	6.168	0.000	0.000	224.11
T10	40.42-20.21	B	0.500	20.338	76.684	0.000	0.000	2526.64
		C		0.000	0.000	0.000	0.000	0.00
		A		0.000	6.175	0.000	0.000	224.34
T11	20.21-10.10	B	0.500	22.128	76.764	0.000	0.000	2538.17
		C		0.000	0.000	0.000	0.000	0.00
		A		0.000	3.087	0.000	0.000	112.17
T12	10.10-0.00	B	0.500	11.064	38.382	0.000	0.000	1269.08
		C		0.000	0.000	0.000	0.000	0.00
		A		0.000	0.643	0.000	0.000	23.36
		B		2.304	7.993	0.000	0.000	264.28
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation ft	Face	A_R ft ²	A_R Ice ft ²	A_F ft ²	A_F Ice ft ²
T1	151.29-141.17	A	0.000	0.000	0.000	0.000
		B	0.000	0.634	0.831	1.063
		C	0.000	0.000	0.000	0.000
T2	141.17-121.04	A	0.000	0.218	0.408	0.545
		B	0.000	1.381	2.761	3.452
		C	0.000	0.000	0.000	0.000
T3	121.04-114.31	A	0.000	0.065	0.122	0.163
		B	0.000	0.587	1.214	1.468
		C	0.000	0.000	0.000	0.000
T4	114.31-107.65	A	0.000	0.064	0.120	0.160
		B	0.000	0.591	1.195	1.477
		C	0.000	0.000	0.000	0.000
T5	107.65-100.92	A	0.000	0.063	0.119	0.158
		B	0.000	0.675	1.361	1.688
		C	0.000	0.000	0.000	0.000
T6	100.92-80.77	A	0.000	0.186	0.418	0.557
		B	0.000	2.610	6.292	7.830
		C	0.000	0.000	0.000	0.000
T7	80.77-70.69	A	0.000	0.066	0.150	0.199
		B	0.000	0.954	2.284	2.862
		C	0.000	0.000	0.000	0.000
T8	70.69-60.60	A	0.000	0.093	0.199	0.265
		B	0.000	1.335	3.038	3.807
		C	0.000	0.000	0.000	0.000
T9	60.60-40.42	A	0.000	0.183	0.412	0.549
		B	0.000	2.671	6.291	8.014
		C	0.000	0.000	0.000	0.000
T10	40.42-20.21	A	0.000	0.125	0.327	0.436

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Section	Elevation	Face	A_R	$A_{R_{Ice}}$	A_F	$A_{F_{Ice}}$
	ft		ft ²	ft ²	ft ²	ft ²
T11	20.21-10.10	B	0.000	1.849	4.990	6.471
		C	0.000	0.000	0.000	0.000
		A	0.000	0.089	0.247	0.329
		B	0.000	1.324	3.765	4.883
T12	10.10-0.00	C	0.000	0.000	0.000	0.000
		A	0.000	0.018	0.051	0.068
		B	0.000	0.274	0.780	1.011
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	$CP_{X_{Ice}}$	$CP_{Z_{Ice}}$
	ft	in	in	in	in
T1	151.29-141.17	2.6399	-9.4096	1.8228	-6.6811
T2	141.17-121.04	3.0435	-15.3780	2.2668	-12.1255
T3	121.04-114.31	3.2345	-25.7722	2.6393	-21.1034
T4	114.31-107.65	3.3111	-26.7960	2.6728	-21.7061
T5	107.65-100.92	6.4835	-22.8958	5.0245	-18.9686
T6	100.92-80.77	12.6287	-17.6994	9.7834	-15.5026
T7	80.77-70.69	14.9998	-21.3873	11.9128	-19.2728
T8	70.69-60.60	13.9639	-19.9622	10.8106	-17.6020
T9	60.60-40.42	14.4296	-20.6994	11.2399	-18.7300
T10	40.42-20.21	16.1364	-23.2360	13.1169	-22.2982
T11	20.21-10.10	13.3381	-19.2517	10.6846	-18.3125
T12	10.10-0.00	3.5809	-5.1730	2.8686	-4.9207

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	$C_A A_A$ Front ft ²	$C_A A_A$ Side ft ²	Weight lb
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI) (Verizon Wireless)	A	From Face	3.00 -0.75 0.00	-16.0000	148.00	No Ice 17.35 1/2" Ice 25.55	13.30 20.35	350.00 500.00
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI) (Verizon Wireless)	B	From Face	3.00 -0.75 0.00	-16.0000	148.00	No Ice 17.35 1/2" Ice 25.55	13.30 20.35	350.00 500.00
Rohn 6'x12' Boom Gate (1) No Mount Pipes (VSI) (Verizon Wireless)	C	From Face	3.00 -0.75 0.00	-16.0000	148.00	No Ice 17.35 1/2" Ice 25.55	13.30 20.35	350.00 500.00
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	A	From Face	4.75 -1.25 1.00	-16.0000	148.00	No Ice 7.27 1/2" Ice 7.88	7.82 9.01	46.55 111.10
(2) DB846F65ZAXY w/Mount Pipe (Verizon Wireless)	B	From Face	4.75 -1.25 1.00	-46.0000	148.00	No Ice 7.27 1/2" Ice 7.88	7.82 9.01	46.55 111.10
(2) DB846F65ZAXY	C	From Face	4.75	-16.0000	148.00	No Ice 7.27	7.82	46.55

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight lb</i>
Pirol 12' Knockdown T- Frame (1) (VSI)	A	From Leg	1.00 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	8.90 12.60	6.00 8.70	235.00 340.00
Pirol 12' Knockdown T- Frame (1) (VSI)	B	From Leg	1.00 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	8.90 12.60	6.00 8.70	235.00 340.00
Pirol 12' Knockdown T- Frame (1) (VSI)	C	From Leg	1.00 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	8.90 12.60	6.00 8.70	235.00 340.00
(3) RR90-17-02DP w/Mount Pipe	A	From Leg	1.50 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
(3) RR90-17-02DP w/Mount Pipe	B	From Leg	1.50 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
(3) RR90-17-02DP w/Mount Pipe	C	From Leg	1.50 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	43.55 81.64
(2) Generic TMA	A	From Leg	1.50 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
(2) Generic TMA	B	From Leg	1.50 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
(2) Generic TMA	C	From Leg	1.50 0.00 0.00	44.0000	103.00	No Ice 1/2" Ice	1.09 1.24	0.54 0.67	25.00 32.36
**									
Rohn 6' Side-Arm Pipe (1) (VSI)	B	From Leg	3.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice	1.70 2.35	4.60 6.38	75.00 115.00
10' x 2" Omni	B	From Leg	6.00 0.00 5.00	0.0000	90.00	No Ice 1/2" Ice	2.00 3.02	2.00 3.02	13.00 28.50
**									
3' Sidearm (1 1/4" pipe) (VSI)	B	From Leg	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	0.42 0.66	1.26 1.98	28.00 44.00
YA5900	B	From Leg	3.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	1.40 2.52	1.40 2.52	15.00 19.50
**									
4" Std. x 5' Pipe Mount (VSI)	A	From Leg	0.75 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice	0.00 0.00	2.30 2.80	60.00 85.00
**									
2' Sidearm (1 1/2" pipe) (VSI)	A	From Leg	1.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	0.38 0.58	1.14 1.74	20.00 25.00
Generic GPS (VSI)	A	From Leg	2.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice	1.40 1.70	1.40 1.70	25.00 30.00

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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
PL6-59W	A	Paraboloid w/Radome	From Leg	1.50 0.00 0.00	-30.0000		143.00	6.00	No Ice 1/2" Ice	143.00 292.13

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria
T1	151.292	Leg	A325N	0.6250	4	1027.61	13411.90	0.077 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2301.51	4123.34	0.558 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	130.88	4123.34	0.032 ✓	1.333	Bolt Shear
T2	141.167	Leg	A325N	0.6250	4	4478.17	13323.30	0.336 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3303.82	4123.34	0.801 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	246.81	4077.40	0.061 ✓	1.333	Gusset Bearing
T3	121.042	Diagonal	A325N	0.5000	1	4339.59	4123.34	1.052 ✓	1.333	Bolt Shear
T4	114.313	Diagonal	A325N	0.5000	1	5333.09	4077.40	1.308 ✓	1.333	Gusset Bearing
T5	107.646	Leg	A325N	0.7500	4	10198.80	18993.20	0.537 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3224.30	4123.34	0.782 ✓	1.333	Bolt Shear
T6	100.917	Leg	A325N	0.8750	4	17161.00	26068.10	0.658 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3798.33	4123.34	0.921 ✓	1.333	Bolt Shear
T7	80.7708	Diagonal	A325N	0.6250	1	8564.94	8609.01	0.995 ✓	1.333	Gusset Bearing
T8	70.6875	Leg	A325N	0.8750	4	23946.00	25965.80	0.922 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	8887.01	8609.01	1.032 ✓	1.333	Gusset Bearing
		Secondary Horizontal	A325N	0.6250	1	2041.37	6442.72	0.317 ✓	1.333	Bolt Shear
T9	60.6041	Leg	A325N	1.0000	4	30317.50	34119.10	0.889 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	9593.61	8609.01	1.114 ✓	1.333	Gusset Bearing
		Secondary Horizontal	A325N	0.5000	1	2601.62	4123.34	0.631 ✓	1.333	Bolt Shear
T10	40.4166	Leg	A325N	1.0000	4	36568.90	34046.90	1.074 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	10818.00	8609.01	1.257 ✓	1.333	Gusset Bearing
T11	20.2083	Diagonal	A325N	0.6250	2	5676.37	6442.72	0.881 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3278.07	6442.72	0.509 ✓	1.333	Bolt Shear
T12	10.1041	Leg	A354-BC	1.0000	4	42701.50	32397.70	1.318 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	5817.27	6442.72	0.903 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3696.58	6442.72	0.574 ✓	1.333	Bolt Shear

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria
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Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
T1	151.292 - 141.167	ROHN 2.5 STD	10.13	5.00	63.3 K=1.00	22.141	1.7040	-6604.70	37729.30	0.175
T2	141.167 - 121.042	ROHN 2.5 EH	20.16	6.68	86.7 K=1.00	17.636	2.2535	-23728.00	39742.70	0.597
T3	121.042 - 114.313	ROHN 2.5 EH	6.74	6.68	86.7 K=1.00	17.635	2.2535	-27036.20	39740.30	0.680
T4	114.313 - 107.646	ROHN 2.5 EH	6.68	6.68	86.7 K=1.00	17.634	2.2535	-36613.60	39739.00	0.921
T5	107.646 - 100.917	ROHN 2.5 EH	6.74	6.68	86.7 K=1.00	17.635	2.2535	-52443.30	39740.30	1.320
T6	100.917 - 80.7708	ROHN 3 EH	20.18	6.68	70.5 K=1.00	20.840	3.0159	-84908.60	62850.90	1.351 X
T7	80.7708 - 70.6875	H1-3 (1.35 CR) - 72 ROHN 4 EH	10.10	10.02	81.4 K=1.00	18.732	4.4074	-92376.50	82558.00	1.119
T8	70.6875 - 60.6041	ROHN 4 EH	10.10	5.16	41.9 K=1.00	25.556	4.4074	-117714.00	112637.00	1.045
T9	60.6041 - 40.4166	ROHN 4 EH	20.22	5.16	41.9 K=1.00	25.560	4.4074	-150007.00	112655.00	1.332
T10	40.4166 - 20.2083	ROHN 5 EH	20.24	10.02	65.4 K=1.00	21.782	6.1120	-182282.00	133129.00	1.369 X
T11	20.2083 - 10.1041	H1-3 (1.37 CR) - 135 ROHN 5 EH	10.12	5.12	33.4 K=1.00	26.718	6.1120	-189028.00	163296.00	1.158
T12	10.1041 - 0	ROHN 5 EH	10.12	5.12	33.4 K=1.00	26.722	6.1120	-213162.00	163323.00	1.305

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
T1	151.292 - 141.167	L1 1/2x1 1/2x3/16	9.27	4.64	189.7 K=1.00	4.150	0.5273	-2301.51	2188.59	1.052
T2	141.167 - 121.042	L2 1/2x2 1/2x3/16	11.56	5.97	144.7 K=1.00	7.134	0.9020	-3303.82	6434.70	0.513

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
T3	121.042 - 114.313	L2 1/2x2 1/2x3/16	12.14	6.26	151.7 K=1.00	6.489	0.9020	-4339.59	5853.04	0.741 ✓
T4	114.313 - 107.646	L2 1/2x2 1/2x3/16	12.73	6.55	158.8 K=1.00	5.923	0.9020	-5375.42	5342.79	1.006 ✓
T5	107.646 - 100.917	L2 1/2x2 1/2x3/16	13.32	6.84	165.9 K=1.00	5.426	0.9020	-6448.61	4894.68	1.317 ✓
T6	100.917 - 80.7708	L3x3x3/16	15.06	7.71	155.3 K=1.00	6.193	1.0900	-7596.66	6749.92	1.125 ✓
T7	80.7708 - 70.6875	2L3x3x3/16x1/4	17.36	8.97	121.1 K=1.00	10.071	2.1797	-8767.52	21950.70	0.399 ✓
T8	70.6875 - 60.6041	2L 'a' > 51.2231 in - 96 2L3x3x3/16x1/4	18.20	9.38	126.7 K=1.00	9.303	2.1797	-9040.87	20277.60	0.446 ✓
T9	60.6041 - 40.4166	2L 'a' > 53.5827 in - 105 2L3x3x1/4x1/4	19.97	10.27	138.7 K=1.00	7.760	2.8750	-9651.95	22308.70	0.433 ✓
T10	40.4166 - 20.2083	2L 'a' > 58.8413 in - 117 2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	129.2 K=1.00	8.942	3.3750	-10406.90	30180.90	0.345 ✓
T11	20.2083 - 10.1041	2L 'a' > 63.5688 in - 138 L4x4x1/4	22.61	11.57	174.6 K=1.00	4.899	1.9400	-11352.70	9504.22	1.194 ✓
T12	10.1041 - 0	L4x4x1/4	23.51	12.01	181.4 K=1.00	4.540	1.9400	-11304.50	8808.16	1.283 ✓

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
T8	70.6875 - 60.6041	L2 1/2x2 1/2x3/16	16.18	16.18	196.1 K=0.50	3.883	0.9020	-2041.37	3502.55	0.583 ✓
T9	60.6041 - 40.4166	L3x3x1/4	18.23	18.23	184.8 K=0.50	4.373	1.4400	-2601.62	6297.59	0.413 ✓
T11	20.2083 - 10.1041	L3x3x3/16	21.27	21.27	214.2 K=0.50	3.255	1.0900	-3278.07	3548.38	0.924 ✓
T12	10.1041 - 0	L3x3x3/16	22.27	22.27	224.1 K=0.50	2.972	1.0900	-3696.58	3239.79	1.141 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
T1	151.292 - 141.167	L2 1/2x2 1/2x3/16	8.56	8.56	207.6 K=1.00	3.466	0.9020	-130.88	3126.11	0.042 ✓
T2	141.167 -	KL/R > 200 (C) - 6 L2 1/2x2 1/2x3/16	8.57	8.57	207.7	3.461	0.9020	-231.18	3121.58	0.074

<i>RISA Tower</i> <i>Vertical Structures</i> 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	NLN 136, CT BU#806384 (Modified)	Page	16 of 19
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Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P
	ft		ft	ft		ksi	in ²	lb	lb	P _a
	121.042				K=1.00					✓
		KL/R > 200 (C) - 23								

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P
	ft		ft	ft		ksi	in ²	lb	lb	P _a
T1	151.292 - 141.167	ROHN 2.5 STD	10.13	5.00	63.3	30.000	1.7040	4110.42	51121.50	0.080
T2	141.167 - 121.042	ROHN 2.5 EH	20.16	6.68	86.7	30.000	2.2535	17912.70	67606.20	0.265
T3	121.042 - 114.313	ROHN 2.5 EH	6.74	6.68	86.7	30.000	2.2535	20596.00	67606.20	0.305
T4	114.313 - 107.646	ROHN 2.5 EH	6.68	6.68	86.7	30.000	2.2535	27723.60	67606.20	0.410
T5	107.646 - 100.917	ROHN 2.5 EH	6.74	6.68	86.7	30.000	2.2535	40795.20	67606.20	0.603
T6	100.917 - 80.7708	ROHN 3 EH	20.18	6.68	70.5	30.000	3.0159	68644.20	90477.90	0.759
T7	80.7708 - 70.6875	ROHN 4 EH	10.10	10.02	81.4	30.000	4.4074	74972.60	132223.00	0.567
T8	70.6875 - 60.6041	ROHN 4 EH	10.10	5.16	41.9	30.000	4.4074	95784.00	132223.00	0.724
T9	60.6041 - 40.4166	ROHN 4 EH	20.22	5.16	41.9	30.000	4.4074	121270.00	132223.00	0.917
T10	40.4166 - 20.2083	ROHN 5 EH	20.24	10.02	65.4	30.000	6.1120	146276.00	183359.00	0.798
T11	20.2083 - 10.1041	ROHN 5 EH	10.12	5.12	33.4	30.000	6.1120	151713.00	183359.00	0.827
T12	10.1041 - 0	ROHN 5 EH	10.12	5.12	33.4	30.000	6.1120	170806.00	183359.00	0.932

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P
	ft		ft	ft		ksi	in ²	lb	lb	P _a
T1	151.292 - 141.167	L1 1/2x1 1/2x3/16	9.27	4.64	121.8	29.000	0.3076	2220.49	8920.90	0.249
T2	141.167 - 121.042	L2 1/2x2 1/2x3/16	11.56	5.97	92.1	29.000	0.5886	3227.83	17069.70	0.189
T3	121.042 - 114.313	L2 1/2x2 1/2x3/16	12.14	6.26	96.5	29.000	0.5886	4186.42	17069.70	0.245

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
T4	114.313 - 107.646	L2 1/2x2 1/2x3/16	12.73	6.55	101.0	29.000	0.5886	5333.09	17069.70	0.312
T5	107.646 - 100.917	L2 1/2x2 1/2x3/16	13.32	6.84	105.5	29.000	0.5886	6395.50	17069.70	0.375
T6	100.917 - 80.7708	L3x3x3/16	15.06	7.71	98.6	29.000	0.7296	7546.74	21158.70	0.357
T7	80.7708 - 70.6875	2L3x3x3/16x1/4	17.36	8.97	114.5	29.000	1.4238	8564.94	41291.00	0.207
T8	70.6875 - 60.6041	2L 'a' > 51.2231 in - 97 2L3x3x3/16x1/4	18.20	9.38	119.8	29.000	1.4238	8887.01	41291.00	0.215
T9	60.6041 - 40.4166	2L 'a' > 53.5827 in - 106 2L3x3x1/4x1/4	19.97	10.27	132.4	32.500	1.8750	9593.61	60937.50	0.157
T10	40.4166 - 20.2083	2L 'a' > 58.8413 in - 118 2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	122.2	32.500	2.2500	10818.00	73125.00	0.148
T11	20.2083 - 10.1041	2L 'a' > 63.5688 in - 139 L4x4x1/4	22.61	11.57	111.0	32.500	1.3144	10601.30	42717.20	0.248
T12	10.1041 - 0	L4x4x1/4	23.51	12.01	115.3	32.500	1.3144	11634.50	42717.20	0.272

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
T8	70.6875 - 60.6041	L2 1/2x2 1/2x3/16	16.18	16.18	249.5	29.000	0.5710	2041.37	16559.90	0.123
T9	60.6041 - 40.4166	L3x3x1/4	18.23	18.23	235.3	29.000	0.9628	2601.62	27921.60	0.093
T11	20.2083 - 10.1041	L3x3x3/16	21.27	21.27	271.9	29.000	0.7120	3278.07	20648.90	0.159
T12	10.1041 - 0	L3x3x3/16	22.27	22.27	284.5	29.000	0.7120	3696.58	20648.90	0.179

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P P _a
T1	151.292 - 141.167	L2 1/2x2 1/2x3/16	8.56	8.56	132.1	29.000	0.5886	105.20	17069.70	0.006
T2	141.167 - 121.042	L2 1/2x2 1/2x3/16	8.57	8.57	132.2	29.000	0.5886	246.81	17069.70	0.014

<i>RISA</i>Tower Vertical Structures 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	NLN 136, CT BU#806384 (Modified)	Page	18 of 19
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Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P/P _a
	ft		ft	ft		ksi	in ²	lb	lb	

Section Capacity Table

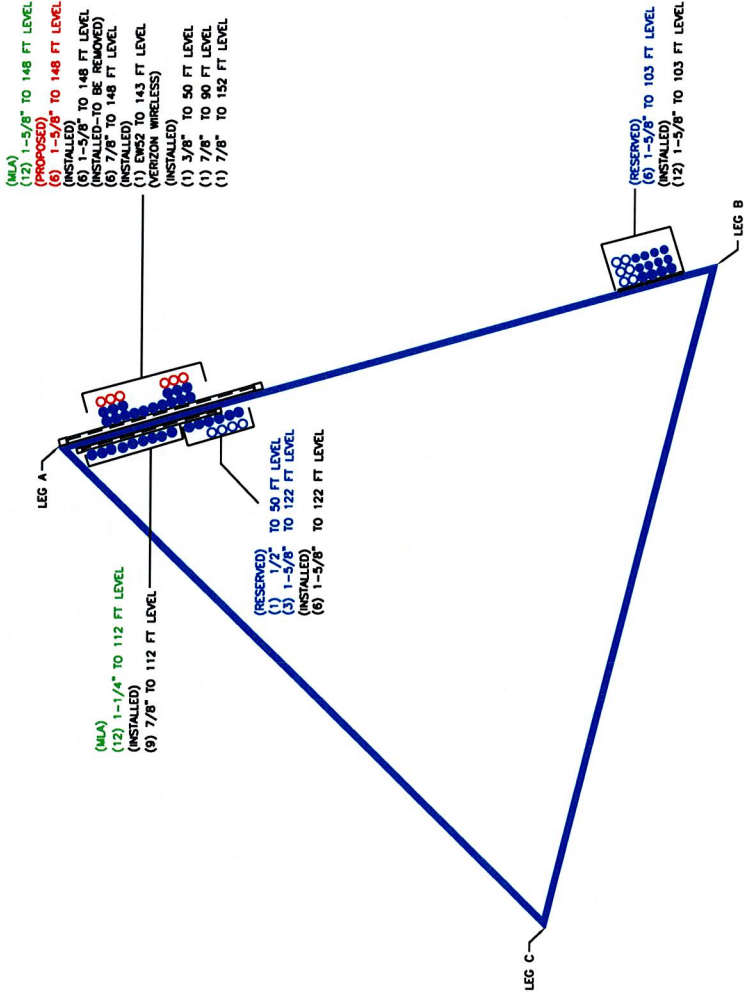
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
T1	151.292 - 141.167	Leg	ROHN 2.5 STD	2	-5907.10	50293.16	14.3	Pass
T2	141.167 - 121.042	Diagonal	L1 1/2x1 1/2x3/16	9	-2301.51	2917.39	78.9	Pass
		Top Girt	L2 1/2x2 1/2x3/16	6	-130.88	4167.10	3.1	Pass
		Leg	ROHN 2.5 EH	21	-23728.00	52977.02	44.8	Pass
T3	121.042 - 114.313	Diagonal	L2 1/2x2 1/2x3/16	27	-3303.82	8577.46	38.5	Pass
		Top Girt	L2 1/2x2 1/2x3/16	23	-231.18	4161.07	5.6	Pass
		Leg	ROHN 2.5 EH	45	-27036.20	52973.82	51.0	Pass
T4	114.313 - 107.646	Diagonal	L2 1/2x2 1/2x3/16	48	-4339.59	7802.10	55.6	Pass
		Leg	ROHN 2.5 EH	54	-36613.60	52972.08	79.0 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	57	-5375.42	7121.94	69.1	Pass
T5	107.646 - 100.917	Leg	ROHN 2.5 EH	63	-52443.30	52973.82	75.5	Pass
		Diagonal	L2 1/2x2 1/2x3/16	66	-6448.61	6524.61	98.1 (b)	Pass
		Leg	ROHN 3 EH	72	-84908.60	83780.24	99.0	Pass
T6	100.917 - 80.7708	Diagonal	L3x3x3/16	75	-7596.66	8997.64	98.8	Pass
		Leg	ROHN 4 EH	93	-92376.50	110049.81	101.3	Fail ✗
		Diagonal	2L3x3x3/16x1/4	96	-8767.52	29260.28	83.9	Pass
T7	80.7708 - 70.6875	Leg	ROHN 4 EH	102	-117714.00	150145.11	74.6 (b)	Pass
		Diagonal	2L3x3x3/16x1/4	105	-9040.87	27030.04	78.4	Pass
		Secondary Horizontal	L2 1/2x2 1/2x3/16	110	-2041.37	4668.90	33.4	Pass
T8	70.6875 - 60.6041	Leg	ROHN 4 EH	114	-150007.00	150169.11	77.4 (b)	Pass
		Diagonal	2L3x3x3/16x1/4	117	-9651.95	29737.49	43.7	Pass
		Secondary Horizontal	L3x3x1/4	122	-2601.62	8394.69	99.9	Pass
T9	60.6041 - 40.4166	Leg	ROHN 5 EH	135	-182282.00	177460.95	47.3 (b)	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x1/4	138	-10406.90	40231.14	102.7	Fail ✗
		Secondary Horizontal	L3x3x1/4	150	-189028.00	217673.56	25.9	Pass
T10	40.4166 - 20.2083	Leg	ROHN 5 EH	153	-11352.70	12669.12	94.3 (b)	Pass
		Diagonal	L4x4x1/4	158	-3278.07	4729.99	86.8	Pass
		Secondary Horizontal	L3x3x3/16	162	-213162.00	217709.55	89.6	Pass
T11	20.2083 - 10.1041	Leg	ROHN 5 EH	165	-11304.50	11741.28	69.3	Pass
		Diagonal	L4x4x1/4	170	-3696.58	4318.64	97.9	Pass
		Secondary Horizontal	L3x3x3/16				98.9 (b)	Pass
T12	10.1041 - 0	Leg	ROHN 5 EH				96.3	Pass
		Diagonal	L4x4x1/4				85.6	Pass
		Secondary Horizontal	L3x3x3/16				Summary	

<i>RISATower</i> <i>Vertical Structures</i> 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	NLN 136, CT BU#806384 (Modified)	Page	19 of 19
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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
						Leg (T10)	102.7	Fail X
						Diagonal (T5)	98.8	Pass
						Secondary Horizontal (T12)	85.6	Pass
						Top Girt (T2)	5.6	Pass
						Bolt Checks	98.9	Pass
						RATING =	102.7	Fail X

APPENDIX B

LEGEND: FEEDLINES - SOLID BLUE CIRCLE DENOTES EXISTING FEEDLINE - OPEN RED CIRCLE DENOTES PROPOSED FEEDLINE - OPEN BLUE CIRCLE DENOTES RESERVED FEEDLINE - BLUE "X" DENOTES LOCATION NOT GIVEN NOTE: ASSUME FEEDLINE ATTACHMENT HEIGHT TO TOWER STEEL AT 8'-FEET ABOVE FINISHED GRADE UNLESS OTHERWISE SPECIFIED		SCALE: N.T.S. 1
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BUSINESS UNIT: 806384 TOWER ID: C_BASELEVEL

APPENDIX C



MODIFIED ANCHOR BOLT CALCULATIONS

Customer: Crown Castle
Site Name: NLN 136, CT BU#806384
Job Number: 2008-004-061
Tower Model: 150' Rohn SSV Self-Supporting Tower
Date: 4/11/2008

Input Information:

# Bolts	4		2	
Bolt Diameter	1	in	1	in
Allowable Tension, F_u	125	ksi	125	ksi
Steel Grade	A354-BC		A193-B7	
Applied Shear	25.842	kips		
Uplift per Leg	169.783	kips		

Bolt Cross-Sectional Area, A	0.785	in ²	0.785	in ²
Applied Shear, f_v	5.48	ksi	5.48	ksi
Maximum Allowable Tensile Stress, F_t	41.25	ksi	41.25	ksi
Allowable Tension Force	129.59	kips	64.80	kips
Maximum Allowable	172.74	kips	86.37	kips

% Capacity 65.5%

The Bolt Group is sufficient for the applied Uplift Force

Maximum Allowable Tensile Stress, F_t

$$0.43F_u - 1.8f_v \leq 0.33F_u$$

This equation is for threaded parts, A449 bolts over 1 1/2" dia. (threads included in shear plane) Manual of Steel Construction ASD, 9th Edition, pg. 5-74, Table J3.3

S. S. TOWER FOOTING ANALYSIS

NLN 136, CT BU#806384
Vertical Structures Job No. 2008-004-061

VERTICAL STRUCTURES INC
RICHMOND, KENTUCKY
4/11/2008 2:09:22 PM

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=====
REACTION LOADS          P-DOWN = 212.108 KIPS
                        P-SIDE  = 14.514 KIPS
                        P-UP    = 169.783 KIPS
FOOTING DIMENSIONS      DEPTH = 12.5 FT. (OVERALL)
                        PEDESTAL WIDTH = 36 IN.
                        PAD WIDTH = 8.25 FT.
                        PAD THICK. = 24 IN.
PEDESTAL PROJECTION ABOVE GRADE
                        0.5 FT.
CONCRETE STRENGTH        3.000 K.S.I.
PASSIVE SOIL PRESSURE    0.400 K.S.F./FT. DEPTH
ANGLE OF SOIL RESISTANCE 31 DEG.
WEIGHT OF SOIL, DRY      125 LB./CU.FT.
REINFORCING STEEL        PEDESTAL 12 NUMBER 9 BARS
                        PAD, TOP 9 NUMBER 7 BARS BOTH WAYS
                        PAD, BOTTOM 9 NUMBER 7 BARS BOTH WAYS
=====
MAX. VERT. SOIL PRESSURE APPLIED = 5.055 K.S.F.
                        ALLOW. = 6.000 K.S.F.
UPLIFT RESISTANCE        SEE ATTACHED
=====
PEDESTAL STEEL PERCENTAGE 0.93%
PEDESTAL, LEEWARD        DOWN LOAD = 275.74 KIPS
                        BIAXIAL FACTOR = 1.055
                        MOMENT APPLIED = 2377.3 IN. KIPS
                        MOMENT RESISTING = 10872.6 IN. KIPS
PEDESTALS, SIDE          DOWN LOAD = 27.51 KIPS
                        BIAXIAL FACTOR = 1.012
                        MOMENT APPLIED = 2377.3 IN. KIPS
                        MOMENT RESISTING = 10423.9 IN. KIPS
PEDESTAL, WINDWARD        UP LOAD = 202.29 KIPS
                        MOMENT APPLIED = 1622.6 IN. KIPS
                        MOMENT RESISTING = 7173.6 IN. KIPS
=====
PAD PUNCHING SHEAR,      APPLIED = 0.054 K.S.I.
                        ALLOW. = 0.219 K.S.I.
PAD, UPLOAD COND.        MOMENT APPLIED = 1220.0 IN. KIPS
                        MOMENT RESISTING = 6474.0 IN. KIPS
PAD, DOWNLOAD COND.      MOMENT APPLIED = 1775.7 IN. KIPS
                        MOMENT RESISTING = 5840.0 IN. KIPS
=====
CONCRETE VOLUME REQUIRED  8.542 CU. YARDS PER FOOTING
=====
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309 Spangler Drive, Suite E
Richmond, Kentucky 40475
Phone: (859) 624-8360
Fax: (859) 624-8369

Subject

Design By

Cust:

Job No

Date:

Location:

Chk'd By

Page



CH 100' x 10'

$$W_{\text{CH}} = \text{weight of CH} = \left[\left(\frac{100}{12} \right) \left(\frac{10}{12} \right) \left(150 \right) \left(\frac{1}{16} \right) \right] \left(\frac{1}{16} \right) = 4.17 \text{ k}$$

$$\begin{aligned} \text{Assume } V_{\text{CH}} &= 0.5 \text{ k} \\ \text{Assume } S_{\text{CH}} &= 100' \end{aligned} \quad V_{\text{CH}} = \frac{1}{2} \left[\left(\frac{100}{12} \right) \left(\frac{10}{12} \right) \left(150 \right) \left(\frac{1}{16} \right) \right] \left(\frac{1}{16} \right) = 2.08 \text{ k}$$

$$W_{\text{CH}} = 4.17 \text{ k} \quad \left(\frac{2.90 \times 25.41}{2} \right) \left(\frac{1}{16} \right) = 186.77 \text{ k}$$

$$U_{\text{CH}} = 186.77 \text{ k} \quad \left(\frac{186.77}{2} \right) = 93.38 \text{ k}$$

CH 100' x 10' x 150'

$$\text{Assume } W_{\text{CH}} = \left(\frac{100}{12} \right) \left(\frac{10}{12} \right) \left(150 \right) \left(\frac{1}{16} \right) = 408.78 \text{ k}$$