Presentation
to
McHenry County College
Crystal Lake, IL

FM/TV Broadcast Facility
to include
1-1500 ft Self Supporting Tower

BMB COMMUNICATIONS MANAGEMENT, LLC

February 18, 2009

Introduction

- BMB Communications Management,LLC was formed in 2003 as an Oklahoma Limited Liability Company. It is owned by 3 partners, John Maguire, Jason Bradshaw and Ronald Bradshaw.
- BMB has constructed, owned, operated and managed over 30 towers in the United States.
- BMB's clients have included broadcast companies such as College Creek Media LLC, Aurora Media LLC, M&M Broadcasting LLC, Sky Media LLC, Portland Broadcasting LLC and Resurgence Media LLC.

Economic Benefits

The construction of the site alone will greatly benefit the local economy. BMB will use local vendors when possible for some of the following construction work.

- Concrete
- Electrical
- Excavation and Fencing
- Miscellaneous Civil Work

Alan D. Kirshner
Engineering experience

- 37 Years Broadcast Engineering Experience
- FCC First Class Radiotelephone Operators License held since 1973
- *Past Projects:*
  - Design and installation-former World Trade Center
  - Design and installation-Empire State Building
  - Design and installation-Stratosphere (Las Vegas, NV)
- *Licenses Held*

FCC General Class Radio Telephone License with Ship Radar Endorsement
FCC Amateur Radio Operator License
FAA Private Pilot Certificate (own plane)
New York State Private Trade School Teachers Certificate

Why McHenry County College?

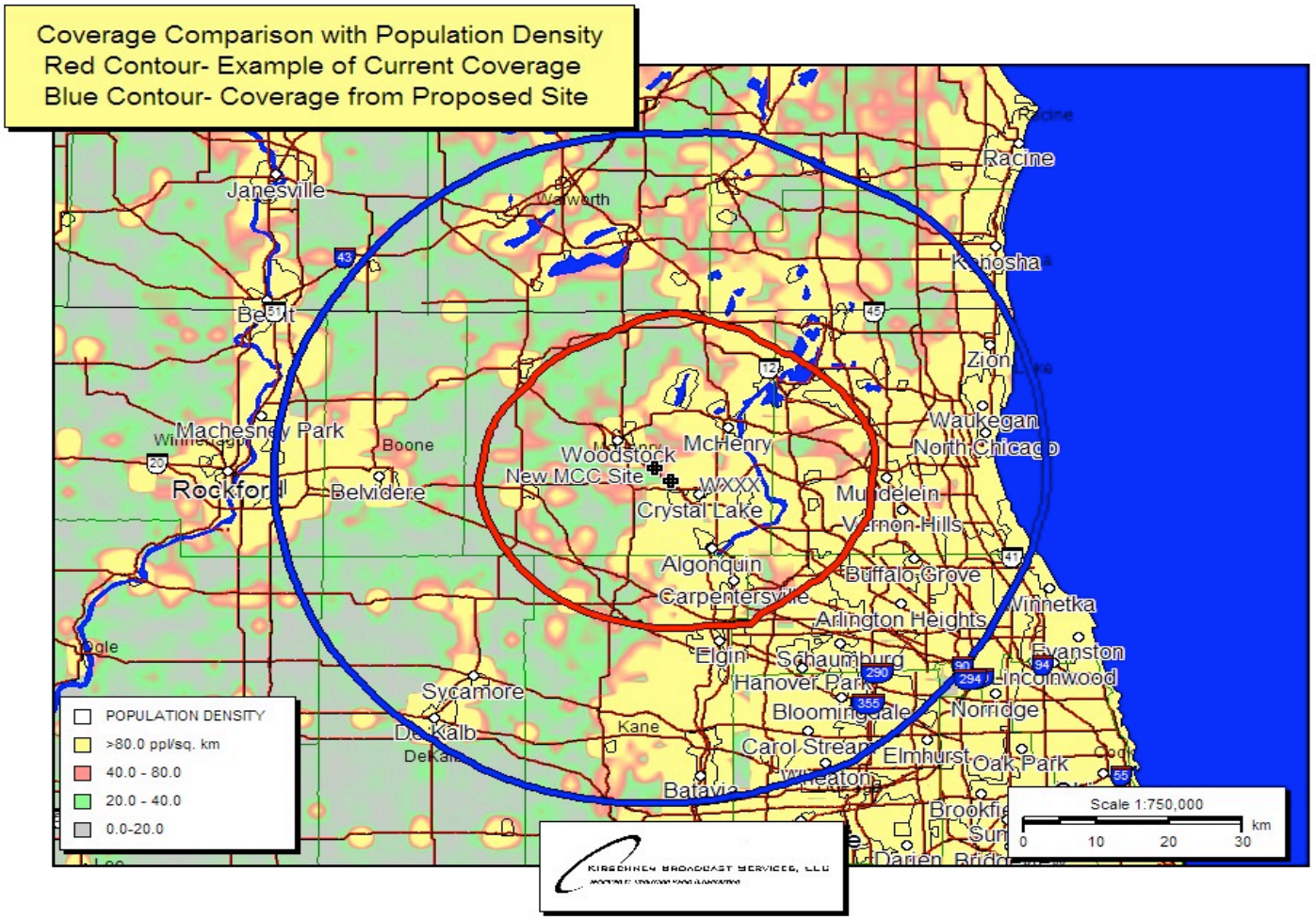
- Reasons for the location of the 1500' Tall Tower

- Meets Federal Communications Commission's Spacing Requirements for FM stations proposed to be located there.
    - The FCC has minimum spacing requirements that FM stations must meet.
- Semi-rural area has the vacant land needed for this tower.
- Signal coverage from the site chosen will enable the station to be economically feasible
    - A shorter tower would not provide the desired signal level over the needed population.
- Outside the O'Hare Airspace.

Improved Coverage

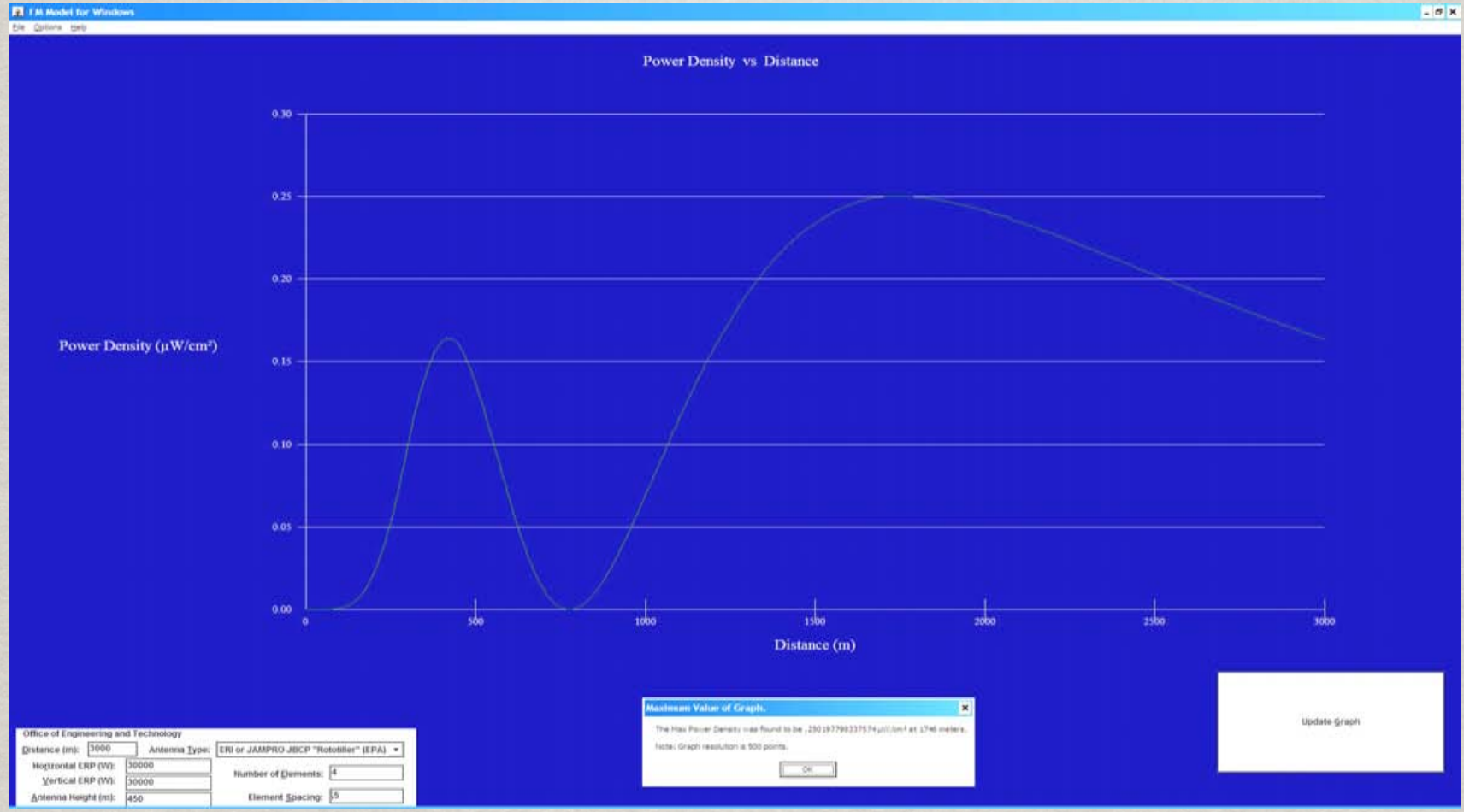
- **Improved Coverage for Stations Will Result In:**
  - Better coverage for populated areas North and West of Chicago
  - Additional choices for listeners in high growth areas
  - A chance for small business owners to have an outlet for advertising
  - Additional local communities receiving first aural services
    - Resulting in better news and public service coverage of these communities
  - Most Importantly, better **EMERGENCY SERVICES COVERAGE** of West Metro Communities that are not now being served
    - Severe Weather Alerts
      - Tornado Warnings
      - Flood Warnings
      - Lightning Storm Warnings
      - Blizzard Warnings
    - Hazardous Material Spills
    - Amber Alerts

Coverage From Proposed Location



Radiofrequency Electromagnetic Exposure

FCC FM Model for Calculating Radio Frequency



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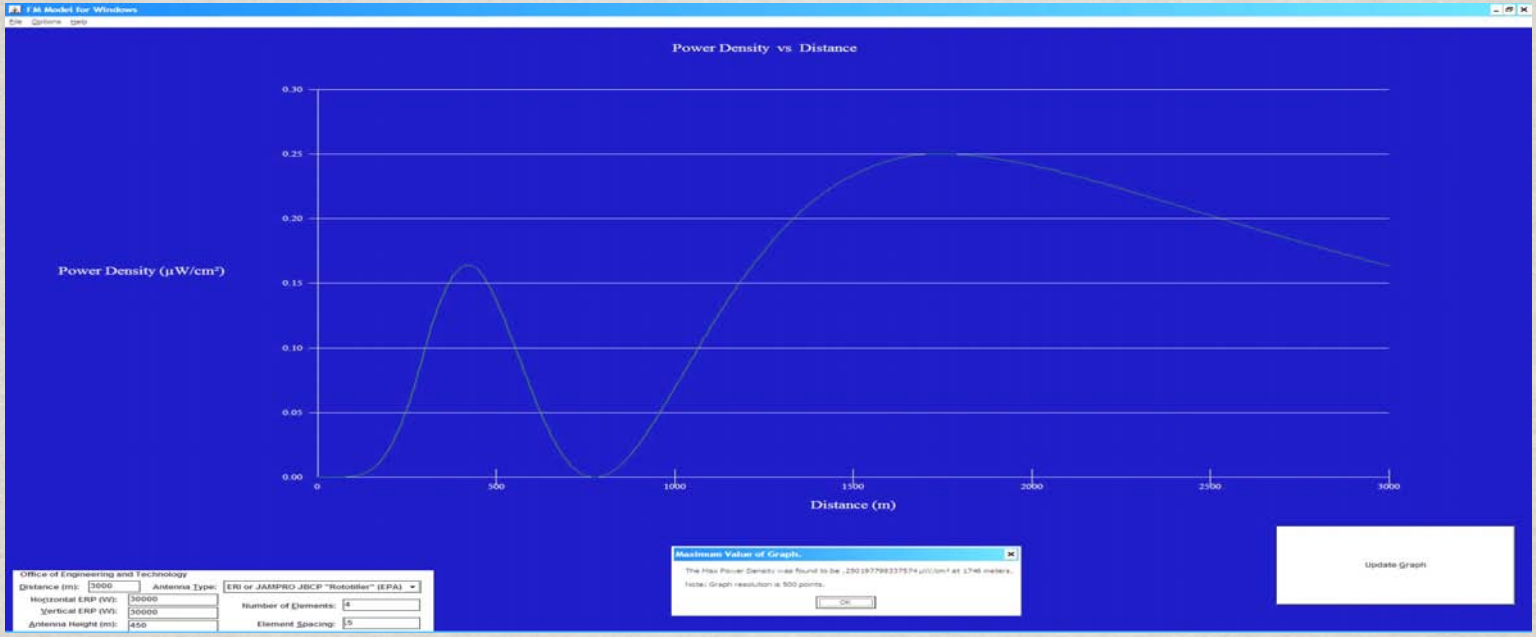
FCC FM Model for Calculating Radio Frequency Electromagnetic Exposure Levels



- The FCC Program shows that a maximum Power Density of 0.2502 μW/cm² at a distance of 1,746 meters or 5,726.9 feet from the base of the tower.
- The study was performed using an Electronics Research, Incorporated SHPX-4AC-HW antenna designed with 4 radiating bays spaced ½ wavelength apart. This antenna was chosen for, among other things, its very low downward radiation characteristics in the immediate vicinity of the tower.
- This graph shows that there will be virtually no radiation at the base of the tower and negligible radiation even at the maximum value shown.

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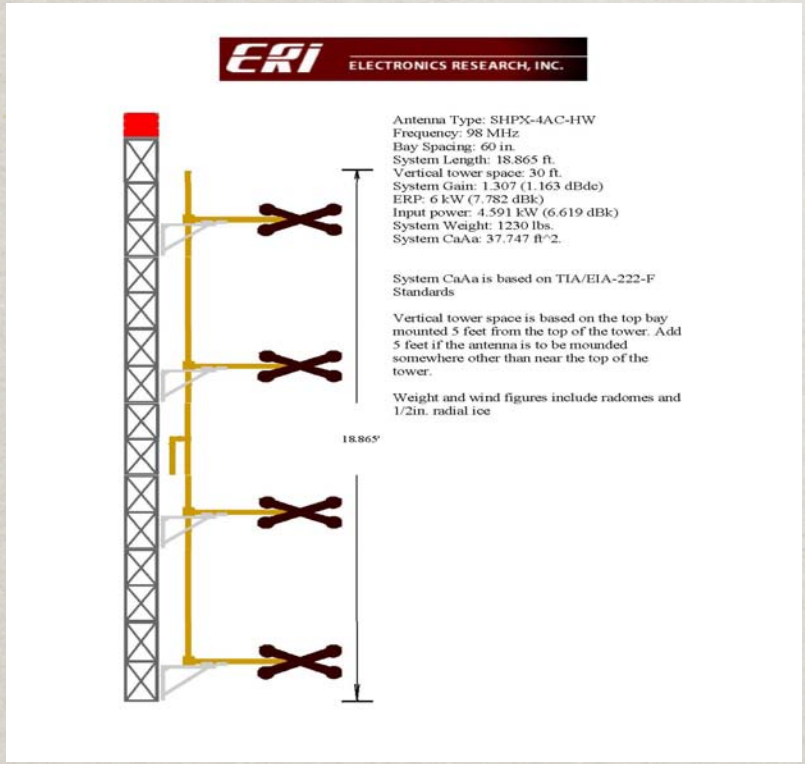
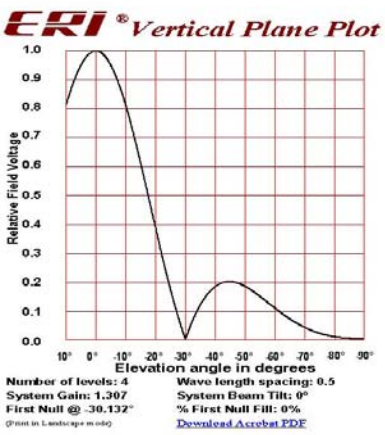
Dedicated to Improving Radio Broadcasting

Electronics Research, Inc. SHPX-4AC-HW Antenna Specifications

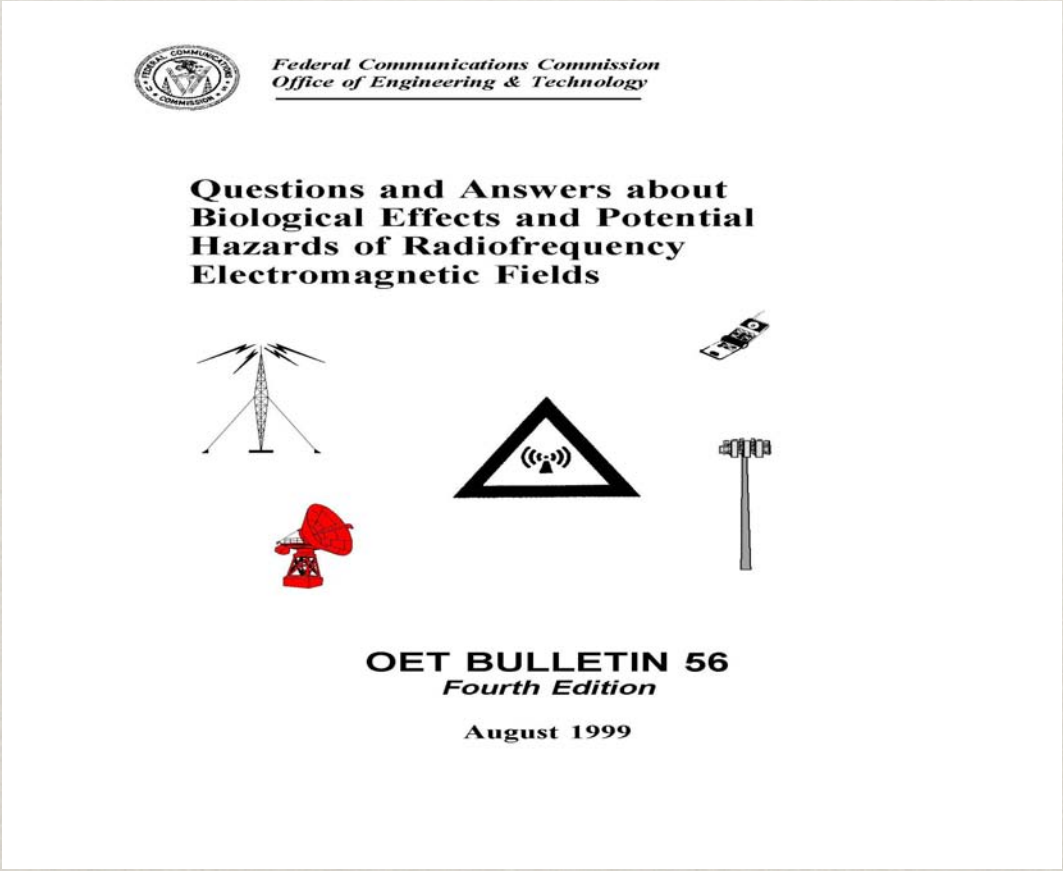
- Left picture shows the mechanical specifications of the SHPX-4AC-HW antenna proposed.
- Right picture shows the Vertical Plane Plot (downward radiation) characteristics of the SHPX-4AC-HW antenna
  - The vertical axis depicts the relative field voltage.
    - As can be seen, the relative field approaches 0 at the base of the tower.
  - The horizontal axis shows the number of degrees below the horizontal plane of the antenna.





FCC OET Bulletin 56
Questions and Answers about Biological Effects and Potential Hazards of Radiofrequency Electromagnetic Fields
August 1999

- The following slide contains information take from the FCC's OET Bulletin 56



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FCC OET Bulletin 56
Questions and Answers about Biological Effects and Potential Hazards of Radio-frequency Electromagnetic Fields

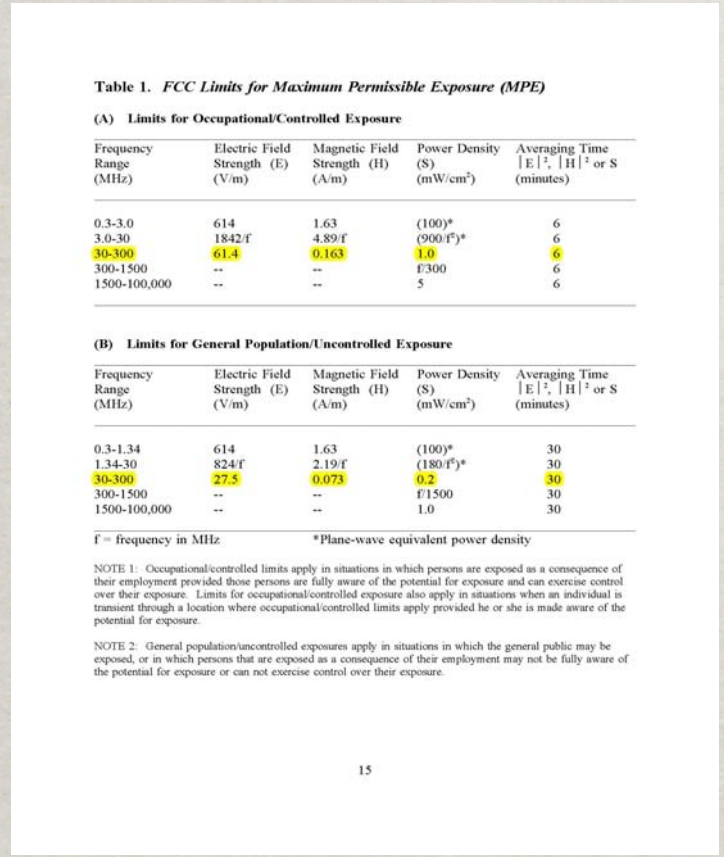


Table 1. *FCC Limits for Maximum Permissible Exposure (MPE)*

(A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

NOTE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

15

- The previous graphs calculated using the FCC's FM Model Program showed a maximum Power Density of 0.2502 μW/cm²
- The information supplied in Table 1 (A) of the FCC's OET Bulletin 56 shows the limit for Occupational/Controlled to be 1 mW/cm² (1000 μW/cm²)
  - **Therefore the maximum Power Density of this antenna will represent only 0.025% of the maximum allowed for Workers in the vicinity of the tower.**
- The information supplied in Table 1 (B) of the FCC's OET Bulletin 56 shows the limit for General Public/Uncontrolled to be 0.2 mW/cm² (200 μW/cm²)
  - **Therefore, the maximum Power Density for this antenna will represent only 0.125% of the maximum allowed for the General Public**
- To protect workers in the vicinity of the tower or antenna where the Power Density exceeds the maximum values allowed (over 100%), the FCC adds the following language to all AM, FM and TV Licenses (A copy of a typical FCC license is in the next slide)
  - The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Typical FCC License for Multi-User Antenna Site
Note Special Operating Condition 1

United States of America
FEDERAL COMMUNICATIONS COMMISSION
FM BROADCAST STATION LICENSE

Authorizing Official:

Official Mailing Address:

RADIO LICENSE HOLDING V, LLC
7201 W. LAKE MEAD BLVD
SUITE 400
LAS VEGAS NV 89128

Brian J. Butler
Supervisory Engineer
Audio Division
Media Bureau

Grant Date: February 20, 2001

Facility Id: 73228
Call Sign: WLS-FM

This license expires 3:00 a.m. local time, December 01, 2004.

License File Number: BLH-20001027ABQ

This License Covers Permit No.: BPH-20001027ABO

Subject to the provisions of the Communications Act of 1934, subsequent acts and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions set forth in this license, the licensee is hereby authorized to use and operate the radio transmitting apparatus herein described.

This license is issued on the licensee's representation that the statements contained in licensee's application are true and that the undertakings therein contained so far as they are consistent herewith, will be carried out in good faith. The licensee shall, during the term of this license, render such broadcasting service as will serve the public interest, convenience, or necessity to the full extent of the privileges herein conferred.

This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequency designated in the license beyond the term hereof, nor in any other manner than authorized herein. Neither the license nor the right granted hereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934. This license is subject to the right of use or control by the Government of the United States conferred by Section 606 of the Communications Act of 1934.

Callsign: WLS-FM License No.: BLH-20001027ABQ

Name of Licensee: RADIO LICENSE HOLDING V, LLC

Station Location: IL-CHICAGO

Frequency (MHz): 94.7

Channel: 234

Class: B

Hours of Operation: Unlimited

Transmitter: Type Accepted. See Sections 73.1660, 73.1665 and 73.1670 of the Commission's Rules.

Transmitter output power: 10.5 kW

Antenna type: Non-Directional

Description: HAR TAC-1M

Antenna Coordinates: North Latitude: 41 deg 52 min 44 sec
West Longitude: 87 deg 38 min 08 sec

	Horizontally Polarized Antenna	Vertically Polarized Antenna
Effective radiated power in the Horizontal Plane (kW):	4.4	4.4
Height of radiation center above ground (Meters):	468	468
Height of radiation center above mean sea level (Meters):	649	649
Height of radiation center above average terrain (Meters):	468	468

Antenna structure registration number: 1032960

Overall height of antenna structure above ground (including obstruction lighting if any) see the registration for this antenna structure.

Special operating conditions or restrictions:

1 The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

*** END OF AUTHORIZATION ***

KIRSCHNER BROADCAST SERVICES, LLC
Dedicated to Improving Radio Broadcasting

FAA Guidelines

AIRSPACE®

Site ID Number: West Chicago Tower

AERONAUTICAL RECOMMENDATIONS

Notice to the FAA is mandatory.

Proposed structure is located within a terminal procedure area. Recommend Form 7460-1 be filed with the Federal Aviation Administration.

TERPS® analysis has been completed for the proposed site. The maximum allowable height identified is 1439 feet AMSL. Due to the VOR missed approach on Runway 26 at 3CK:LAKE IN THE HILLS

The height of the proposed structure will exceed obstruction standards. The FAA will require an extended study to determine the aeronautical impacts. The maximum not to exceed height to avoid an extended study by the FAA is 1169 feet AMSL.

Marking and Lighting of the proposed structure is required.

IFR flight operations impact with a low altitude federal airway.

No impact to VFR Traffic Pattern Airspace.

FCC Licensed AM Broadcast Station interference identified.

Government Approvals and Permits

- The Federal Aviation Administration
- The Federal Communication Administration
- NEPA (National Environmental Policy Act)
- Local zoning
- Federal, state and local permitting

Cabin Canyon, NV

Cabin Canyon, NV: This tower was built on Bureau of Land Management Land near Mesquite, NV. It is 190' and was built for four FM broadcast stations.

Senator MT.

Senator Mt, AZ: This tower was built for two FM broadcast stations at close to a 4,000' elevation. The tower is 199' high, with a 12' X 20' transmitter building. BMB constructed over 7 miles of new mountain road to access the site.

Portland Tower

Portland, OR: **This tower is a 550 ft Self Supporting tower built on State of Oregon Forestry Land. It has a 20'x20' transmitter building and sits on a 100'x 80' compound.**

Safety and Construction

Mr. Ernie Jones, VP of Engineering - Structural Division, Electronic Research, Inc.

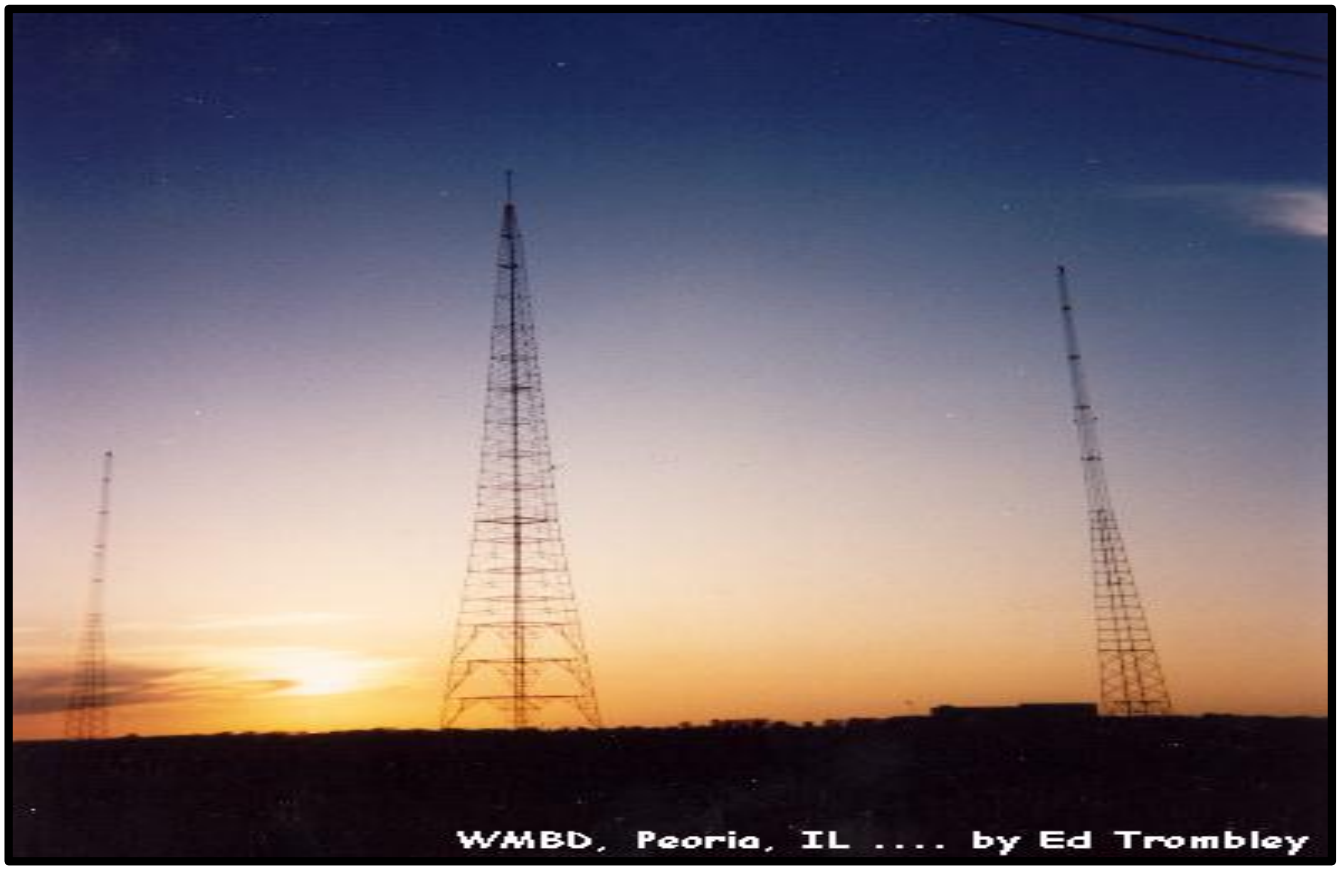
- Designs and fabricates steel structures such as the 1500 ft tower we are discussing.
- PE (Professional Engineers) Licenses held 19 states.
- 36 years of experience.

Tall Tower Presentation

for

Ernest R. Jones, P.E.
VP Engineering ERI
2-18-2009

Self Supporting Towers



Typical Guyed Towers

Typical Guy Anchors

FM Panel Top Mount

Self Supporting Towers

Self Supporting Towers

Self Supporting Towers

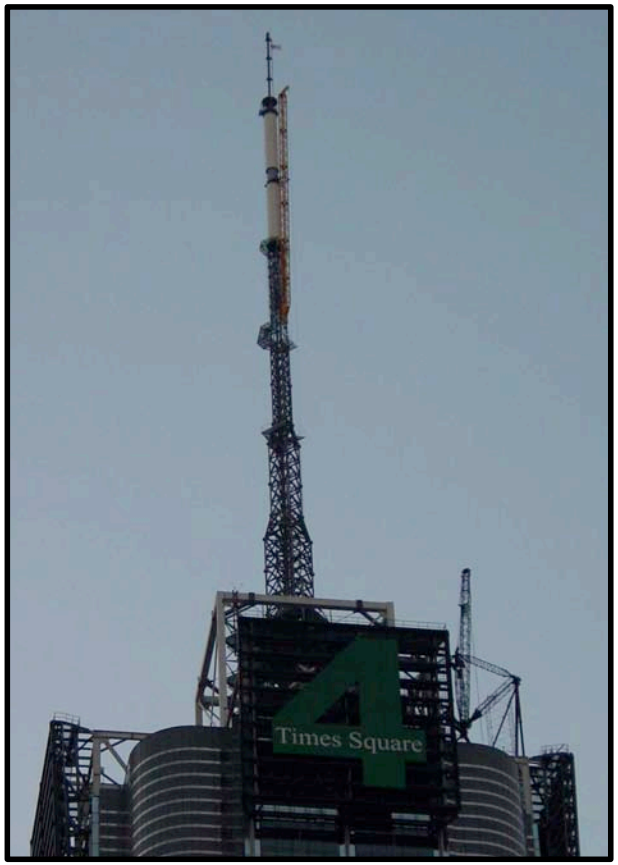
Self Supporting Towers

Built-Up Tower Leg

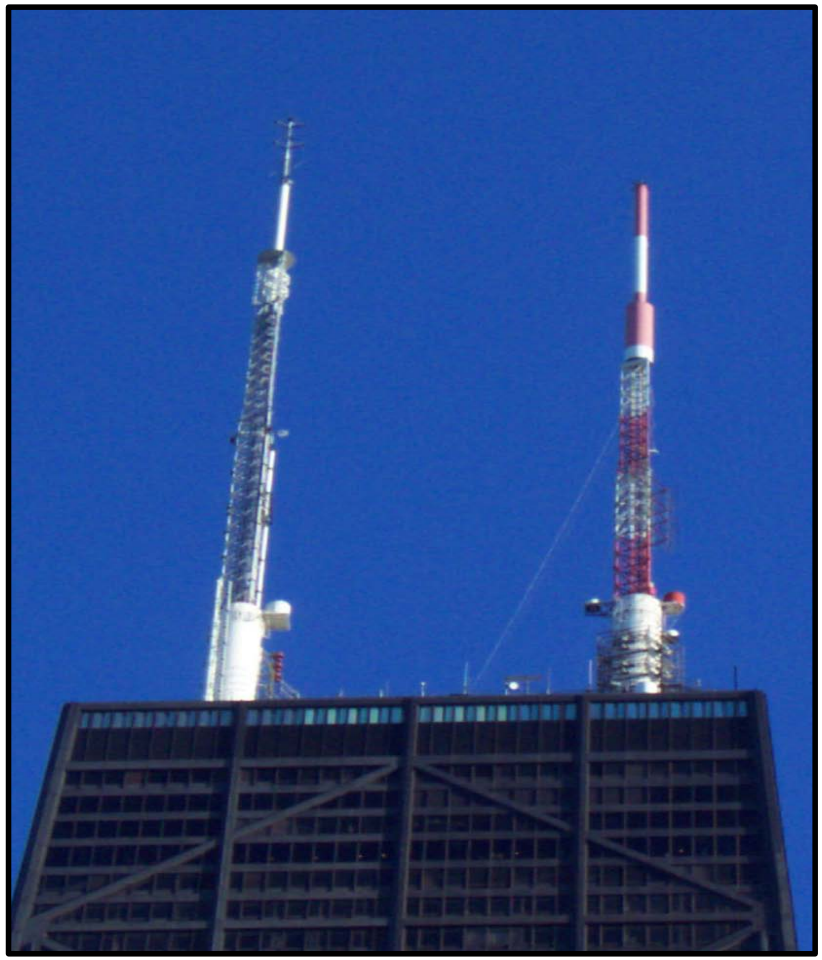
Tower on Empire State Building
New York

Tower on Top of Empire State Building

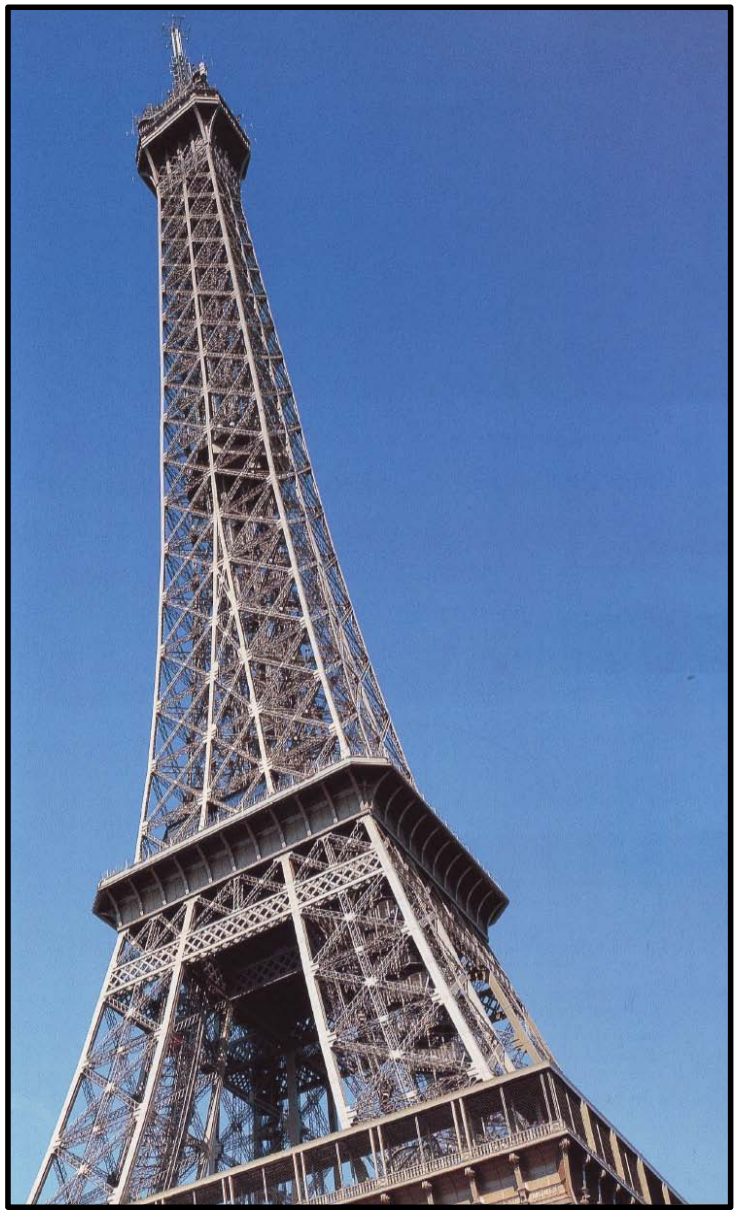
Tower on 4-Times Square Building
New York



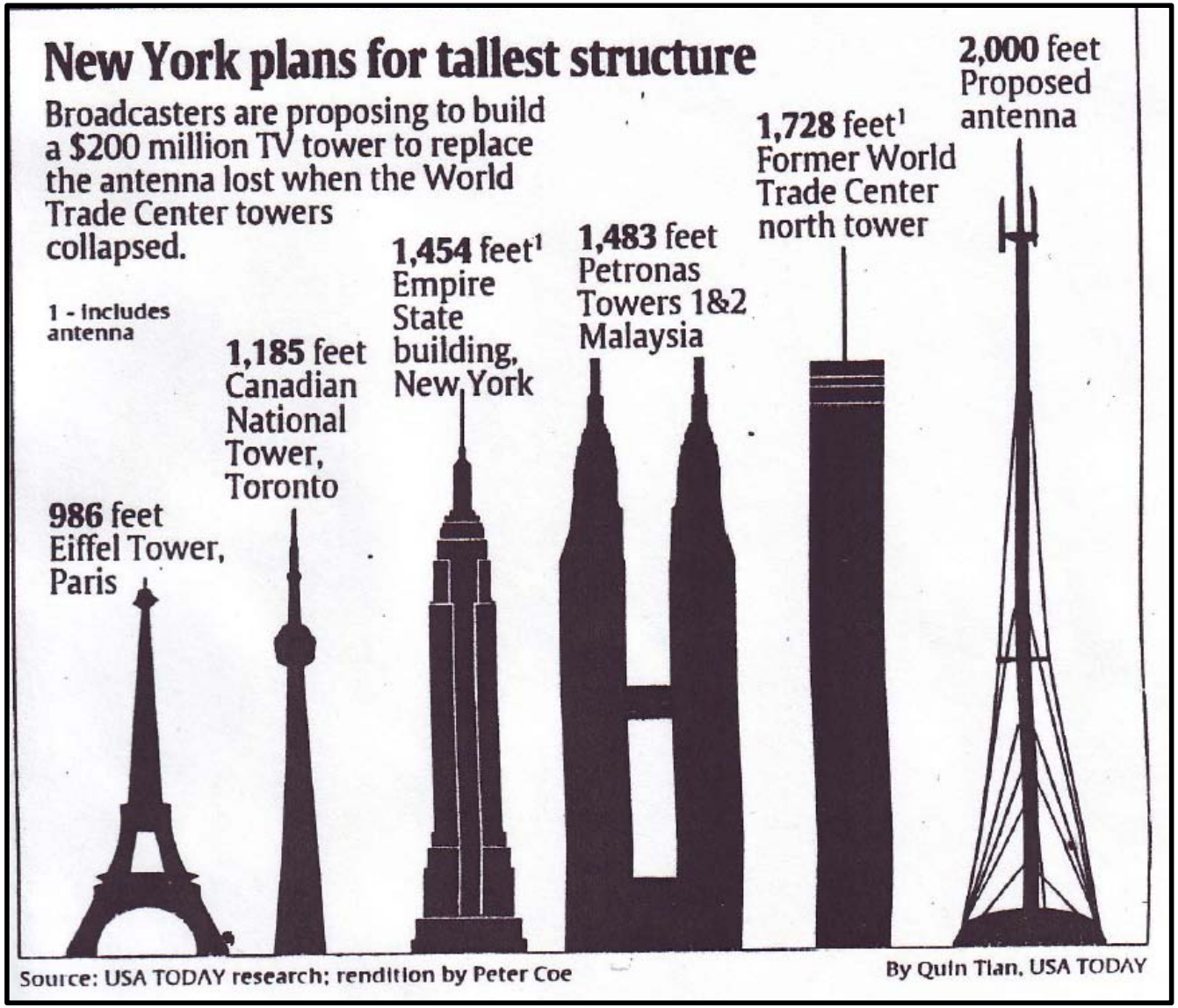
Towers on John Hancock Building Chicago

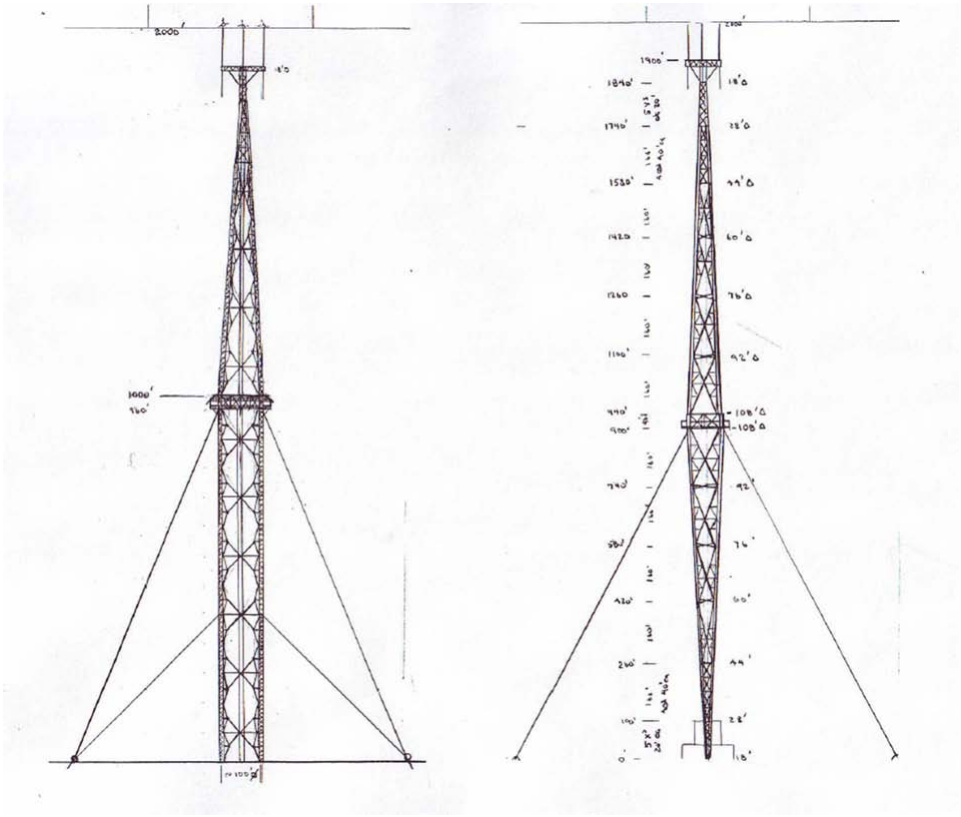


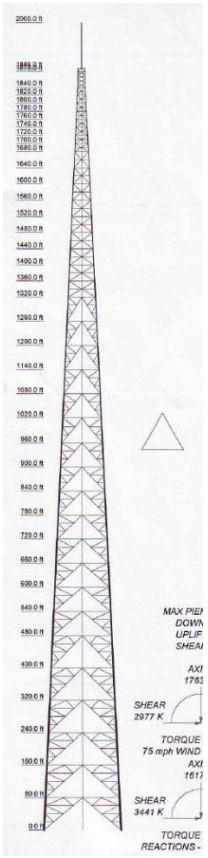
Eiffel Tower



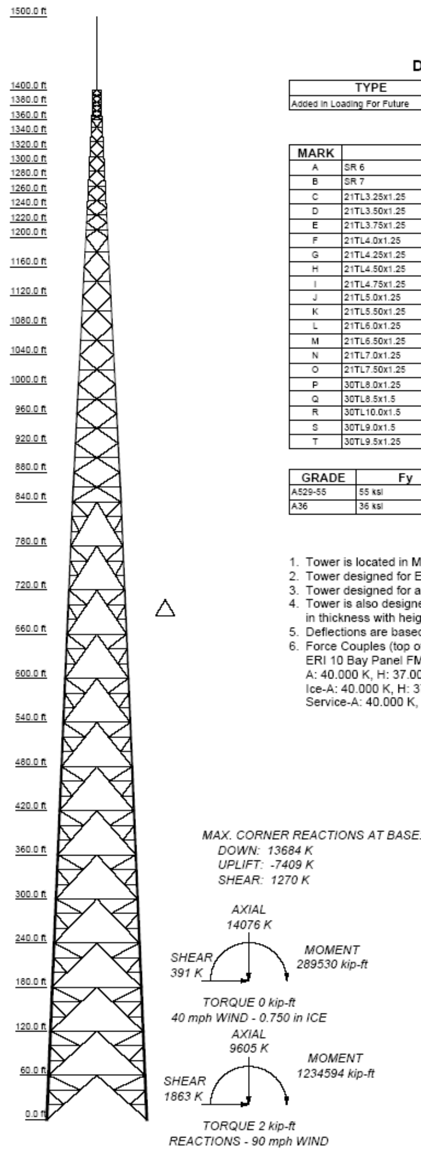
Various Tall Structures






MAX PIER
DOWN
UPLIF
SHEAR
AXI
SHEAR
2977 K
TORQUE
75 mph WIND
AXI
SHEAR
3441 K
TORQUE
REACTIONS -

Section	T33	T32	T31	T30	T29	T28	T27	T26	T25	T24	T23	T22	T21	T20	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	E1	D1	C1	B1	A1	Z	Y	X	W	V	U	R	T	S	R	Q	P	O	N		M	L	K	J	I	H	G	F	E	D	C	B	A
Leg Grade	A572-50																															F1	
Diagonals	P36x1/2	P30x1/2						P24x3/8							4L8x8x1/2x3/4								K1		J1		I1			H1		G1	
Diagonal Grade	A53-B-35		A36	A53-B-35											A36																		
Top Girts	N.A.																														L1	M1	L1
Horizontals	P30x1/2	P24x1/2						P18x.5							J1	2L5x5x3/8x3/4						2L4x4x1/4x3/4				2L3x3x1/4x3/4							
Red. Horizontals	P24x3/8	P18x.375						P16x.375							N.A.																		
Red. Diagonals	P24x3/8	P18x.375						P16x.375							N.A.																		
Red. Hips	P8x.375							P6x.28							N.A.																		
Inner Bracing	P18x.375	P14x.25								P12x.375					2L5x5x5/16				2L4x4x3/8x3/4				2L3x3x1/4x3/4				L3 1/2x3 1/2x1/4					N.A.	
Face Width (ft) 136	131	126	121	116	111	106	101	96	91	86	81	76	71	66	62	58	54	50	46	42	38	34	30	28	26	24	22	20	18	16	14	12	
# Panels @ (ft)	14 @ 60														18 @ 20									16 @ 10								10 @ 4	
Weight (K) 7914.6	758.9	656.8	624.2	585.1	554.2	524.3	495.3	411.9	386.4	363.9	340.3	317.5	291.6	274.8	194.1	158.2	142.9	129.5	118.2	115.4	105.0	93.8	67.4	35.6	26.3	24.2	21.2	19.7	18.2	15.9	15.4	15.5	12.8



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Added In Loading For Future	1400 - 0		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 6	U	30TL10.5x1.5
B	SR 7	V	30TL11.0x1.5
C	21TL3.25x1.25	W	30TL11.5x1.5
D	21TL3.50x1.25	X	30TL12.0x1.5
E	21TL3.75x1.25	Y	30TL12.5x1.5
F	21TL4.0x1.25	Z	30TL13.0x1.5
G	21TL4.25x1.25	A1	30TL13.5x1.5
H	21TL4.50x1.25	B1	30TL14.0x1.5
I	21TL4.75x1.25	C1	36TL14.5x1.75
J	21TL5.0x1.25	D1	36TL15x1.75
K	21TL5.50x1.25	E1	36TL15.5x1.75
L	21TL6.0x1.25	F1	A529-55
M	21TL6.50x1.25	G1	2L3 1/2x3 1/2x3/8x3/4
N	21TL7.0x1.25	H1	2L4x4x3/8x3/4
O	21TL7.50x1.25	I1	2L5x5x3/8x3/4
P	30TL8.0x1.25	J1	2L6x6x3/8x3/4
Q	30TL8.5x1.5	K1	4L6x6x3/8x3/4
R	30TL10.0x1.5	L1	2L3x3x3/8x3/4
S	30TL9.0x1.5	M1	N.A.
T	30TL9.5x1.25		

MATERIAL STRENGTH

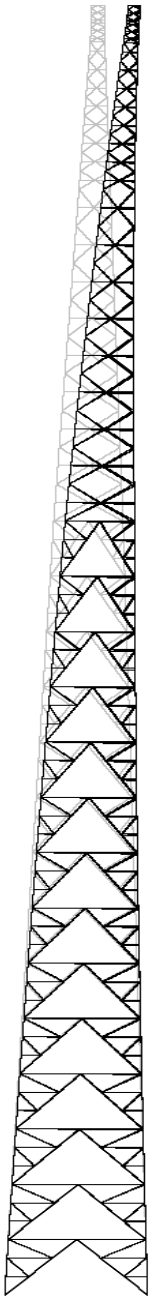
GRADE	Fy	Fu	GRADE	Fy	Fu
A529-55	55 ksi	70 ksi	A572-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A53-B-35	35 ksi	63 ksi

TOWER DESIGN NOTES

1. Tower is located in Mchenry County, Illinois.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 90 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Force Couples (top of tower)
   ERI 10 Bay Panel FM Antenna
   A: 40.000 K, H: 37.000 K, M: 1835.000 kip-ft
   Ice-A: 40.000 K, H: 37.000 K, M: 1835.000 kip-ft
   Service-A: 40.000 K, H: 16.000 K, M: 807.000 kip-ft

	Job: **Chicago 1400' SS Tower**			
	Project: *Preliminary Only - Not Fo Build*			
	Client: John McGuire & Max Brown	Drawn by:		App'd:
Phone:	Code: TIA-222-G	Date: 02/14/09		Scale: NTS
FAX:	Path: C:\ERI\ConstMax\John Maguire\Chicago SS\Tower Models\1400 SS Chicago - 1.eri			Dwg No. E-1

Project: Preliminary Only - Not Fo Build
Job: Chicago 1400' SS Tower
Client: John McGuire & Max Brown
LC:2 1.2 Dead+1.6 Wind 0 deg - No Ice
Max. Disp.144.591 in @ 1400.000 ft
Scaling 5



Tower Design with over a dozen load cases each with 12 wind directions around the structure.

Wind Criteria – 90 mph at Ground
Increasing to 118 mph above 900'

Wind With Ice – 40 mph with ¾" ice
40 mph at Ground – 52 mph at Top
1.5" ice at Ground – 2.5" ice at top

TIA-222-G


ANSI

ANSI/TIA-222-G-2005
Approved: August 2, 2005

TIA STANDARD

Structural Standard for Antenna Supporting Structures and Antennas

EFFECTIVE JANUARY 1, 2006

TIA-222-G
(Revision of TIA/EIA-222-F)

August 2005

TELECOMMUNICATIONS INDUSTRY ASSOCIATION

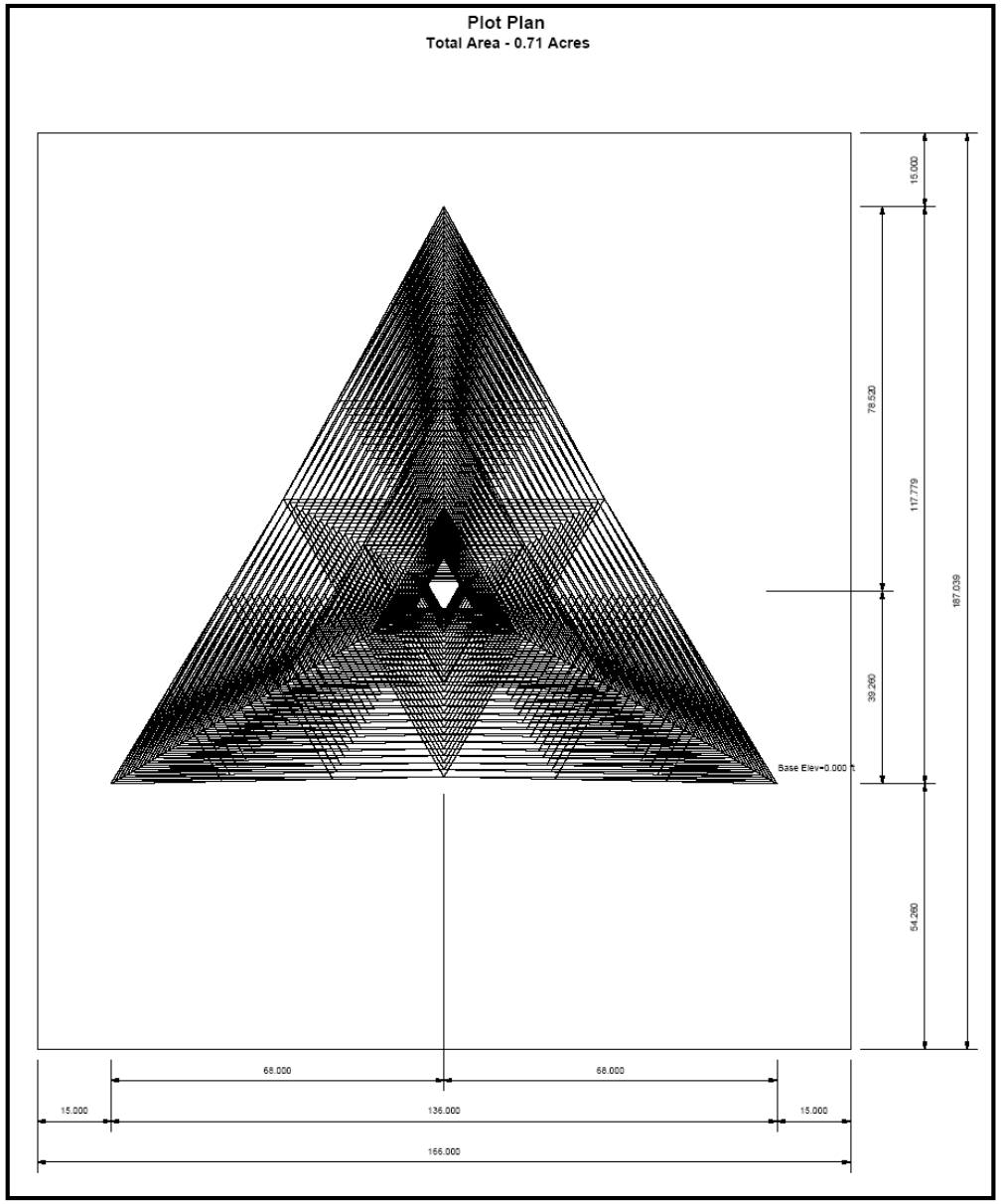
TIA

EIA
Electronic Industries Alliance

Tower Plot:

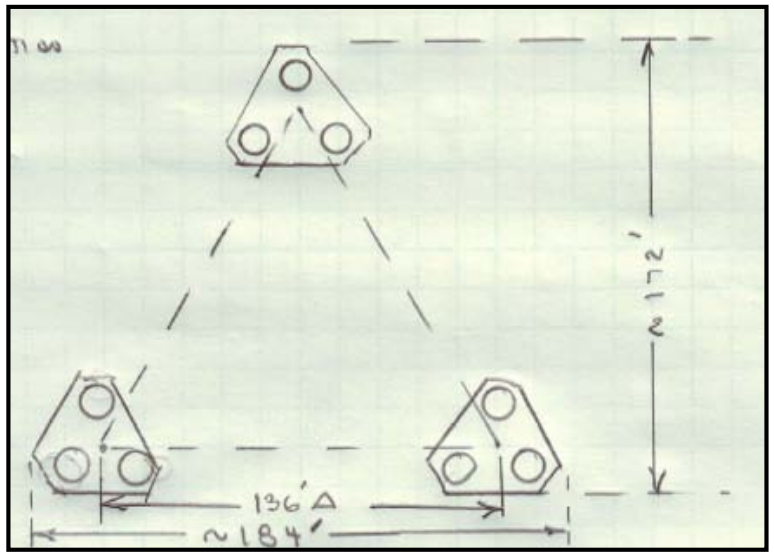
136’ Center to Center on Tower Legs

Plot Size Approximately 200’ x200’

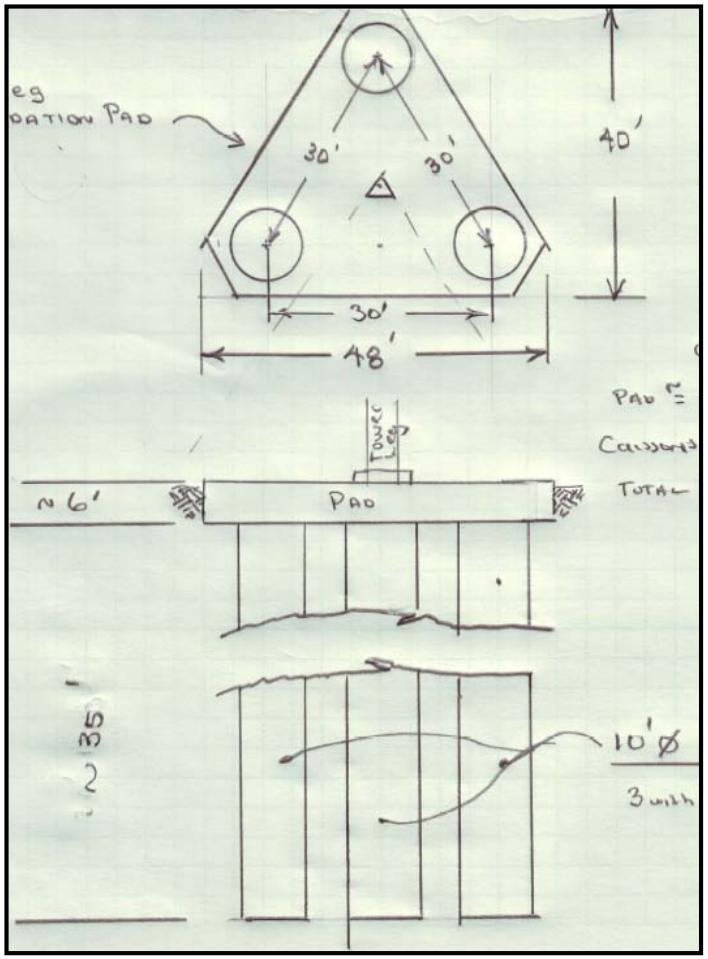


Proto-Type Tower Foundation

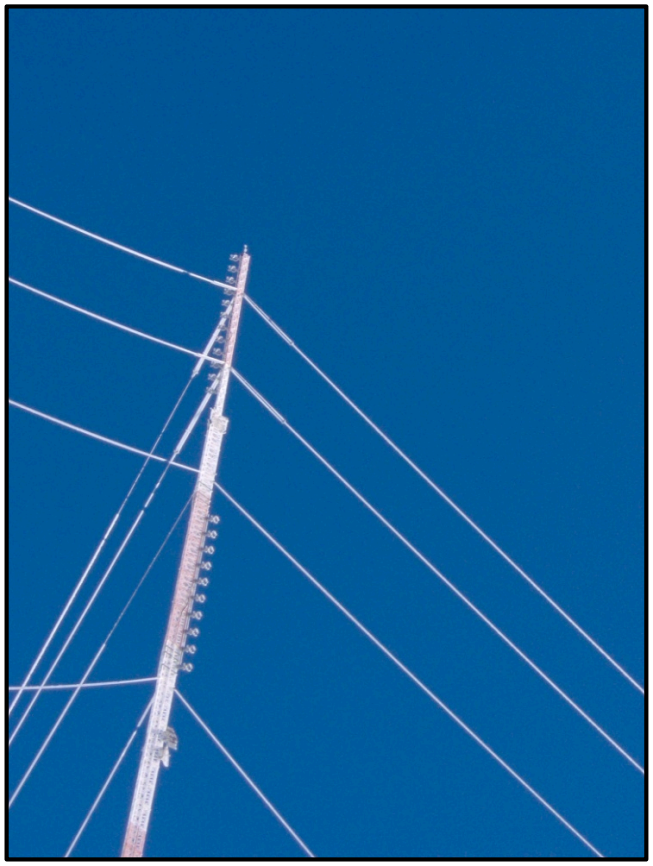
184' x 172' Outer Dimensions of Foundation



Estimated 1,600 Cu. Yds. of Concrete



Falling Ice



INTERNATIONAL STANDARD

ISO 12494

First edition
2001-08-15

Atmospheric icing of structures

Charges sur les structures dues à la glace

Table 3 — Ice classes for glaze (ICG) (density of ice = 900 kg/m^3)

Ice class (IC)	Ice thickness t mm	Masses for glaze, m, kg/m			
		Cylinder diameter, mm			
		10	30	100	300
G1	10	0,6	1,1	3,1	8,8
G2	20	1,7	2,8	6,8	18,1
G3	30	3,4	5,1	11,0	28,0
G4	40	5,7	7,9	15,8	38,5
G5	50	8,5	11,3	21,2	49,5
G6	To be used for extreme ice accretions				

Table 28 — Recommended maximum distance for falling ice

IC	Maximum distance for falling ice
R0 to R3 G0 to G1	normally not considered [a]
R4 to R6 G2 to G3	2/3 of structure height
R7 to R8 G4 to G5	Equal to structure height
R9 to R10	1½ times structure height

[a] Even in IC R2, R3 and G1, some ice on the structure can be a risk for people moving about near the structure. The area should then be closed in the rare events of risk due to falling ice.

- **There is very little information about the area at a site which can be hit by shedding ice.**

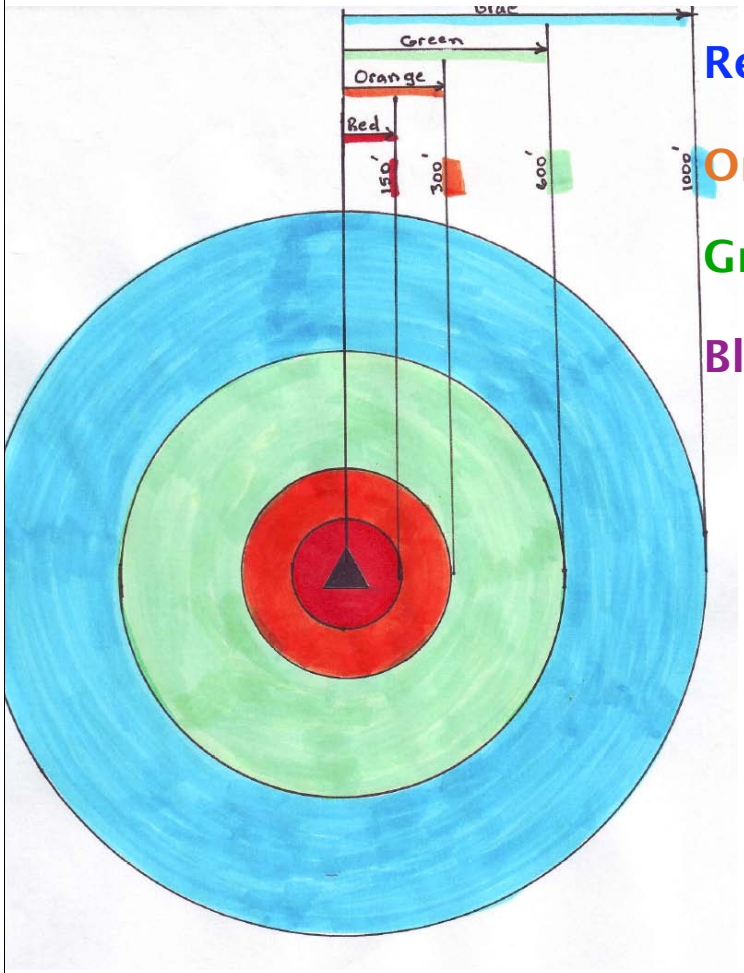
- **It depends strongly on the structure and form of the ice in question and the actual wind speeds occurring during shedding events.**

- **The actual wind direction decides the direction of falling ice. When a piece of ice is released from a structure, gravity and wind drag determine its trajectory.**

- **Exact trajectories are difficult to predict because ice pieces are of different sizes, densities and shapes.**

- **The higher the wind speeds and the smaller the ice shape dimension the longer is the distance between the structure and the impact location of ice on the ground.**

ICE ZONE AREAS



Red Zone – 150’ From Center of Tower

Orange Zone – 150’ to 300’ From Center of Tower

Green Zone – 300’ to 600’ From Center of Tower

Blue Zone – 600’ to 1000’ From Center of Tower

Red Zone – 150’ From Center of Tower

- This Zone is Potential High Impact Zone if Winds are Moderate
- Should be Marked off if Detrimental Icing Occurs
- Roofs and Walkways Should have Ice Protection
- Autos Should Not Park in this Area

Orange Zone – 150’ to 300’ From Center of Tower

This Zone Should be Considered a Moderate Impact Zone

A Warning for this Area is Recommended, Especially in the Event of High Winds or Gusty Winds. A Program Based on Site Experience of Alerting Personnel of Ice Hazards and Appropriate Protection Should be Implemented.

Green Zone – 300’ to 600’ From Center of Tower

In This Zone Expect – Large Pieces of Ice Travelling Out is Not Expected. Ice that is Lighter and in More of a Sheet Form is the Most Expected in this Area During Gusty Wind Conditions.

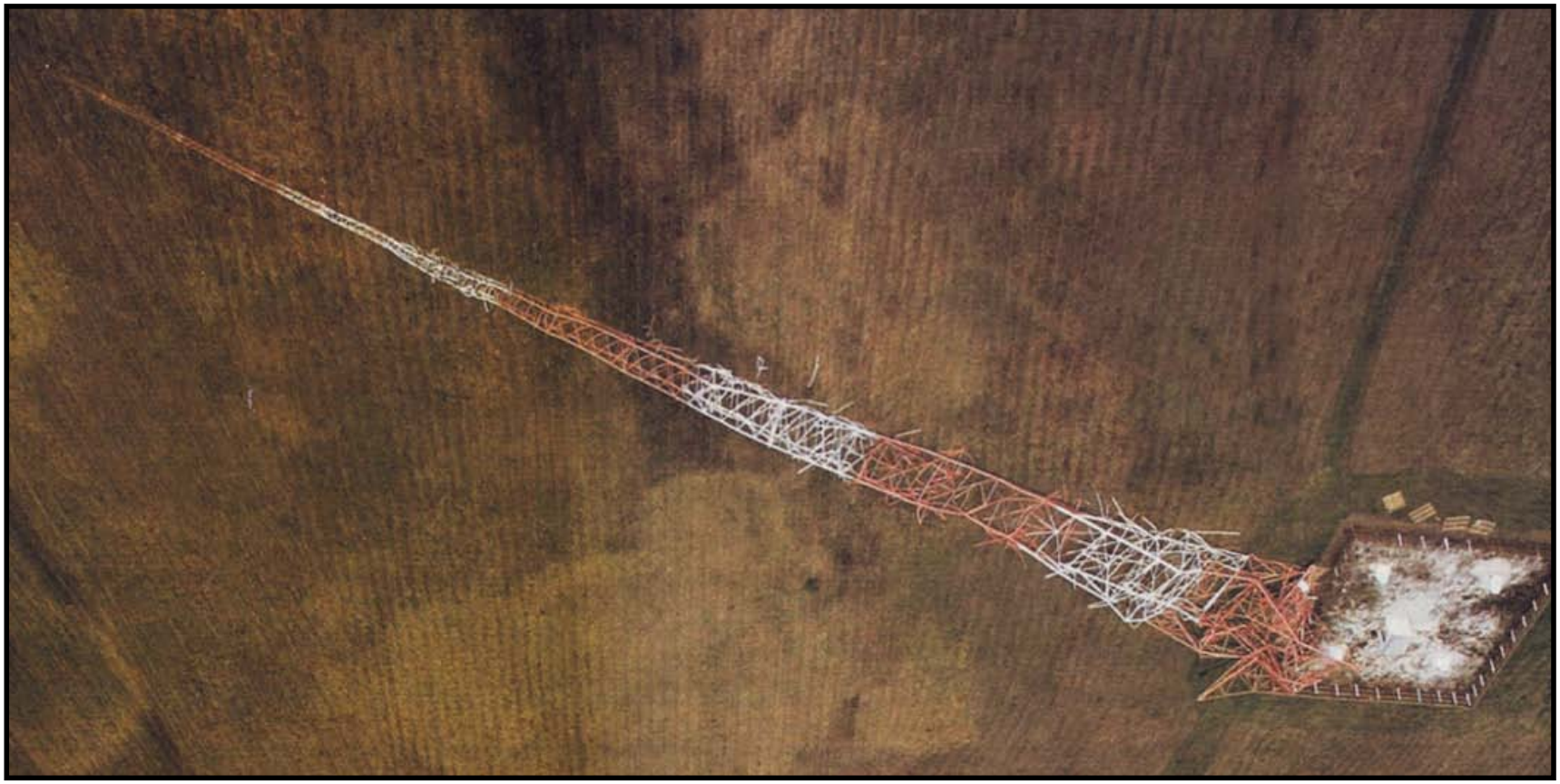
Blue Zone – 600’ to 1000’ From Center of Tower

In this Area we Expect Lighter Pieces of Ice Similar to Hail Conditions, if Winds are High and/or Gusty.

Tower Fall Radius

- **Unless a special design is implemented it is possible for a Self Supporting Tower to fall in a near layout condition!**

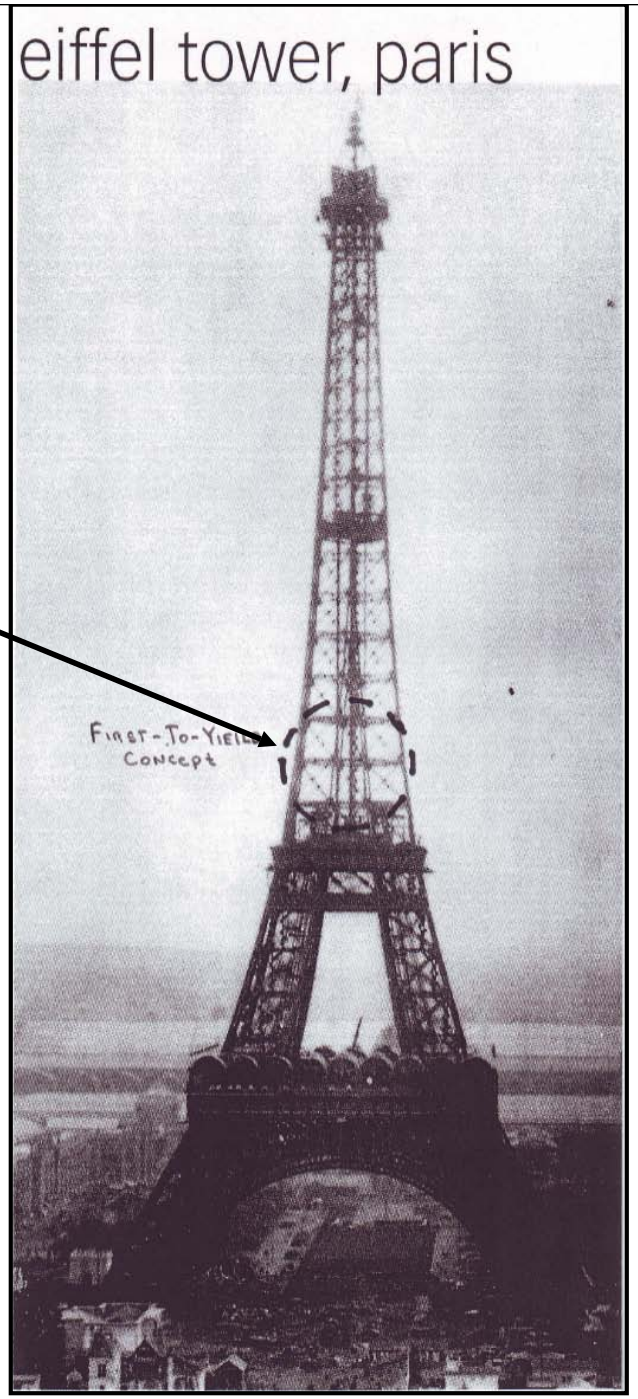
Self Supporting Tower
Catastrophic Layout Type Failure



Folding of Tower Mast

Design with
“First to Yield Section Concept”

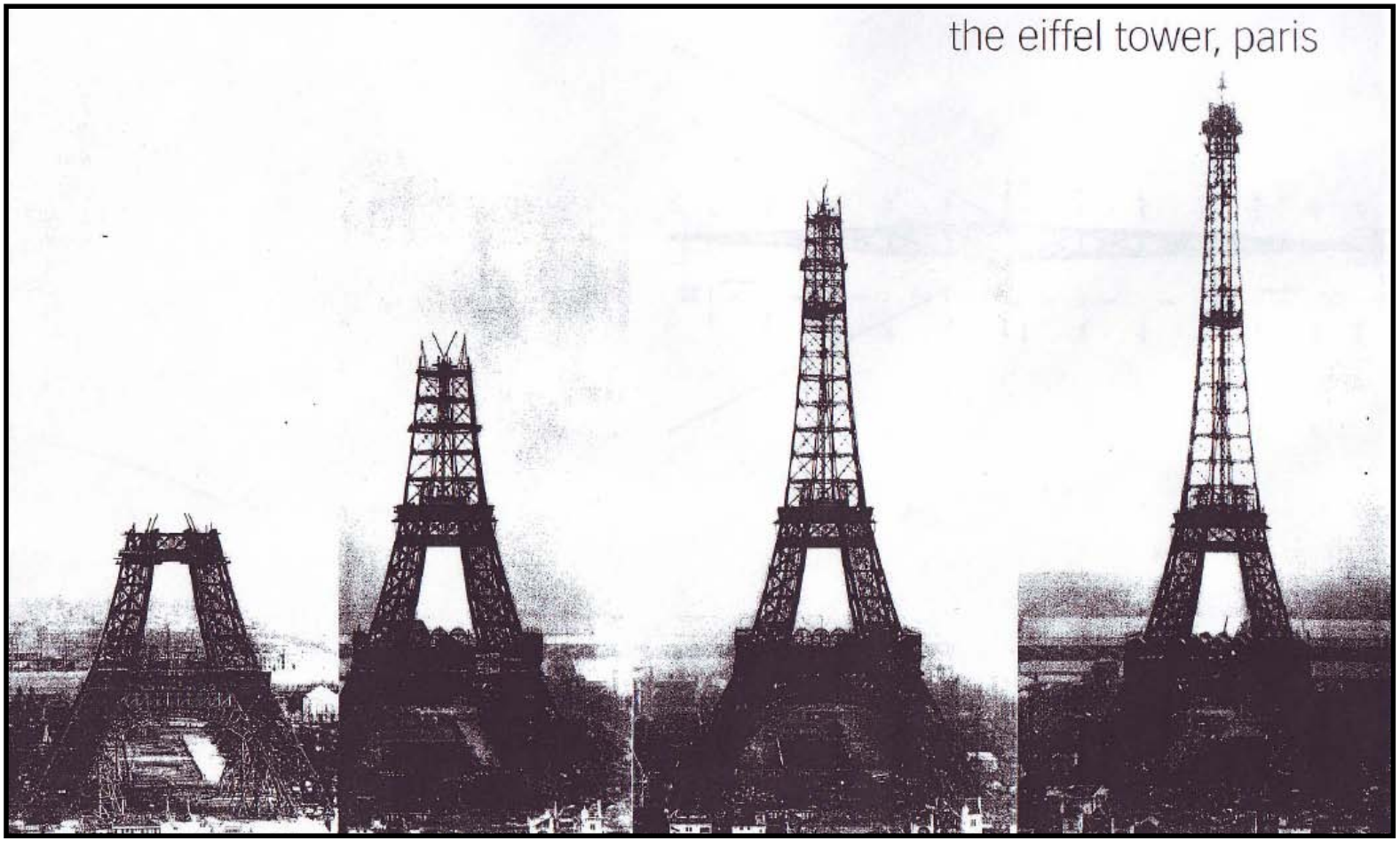
First To Yield Sections



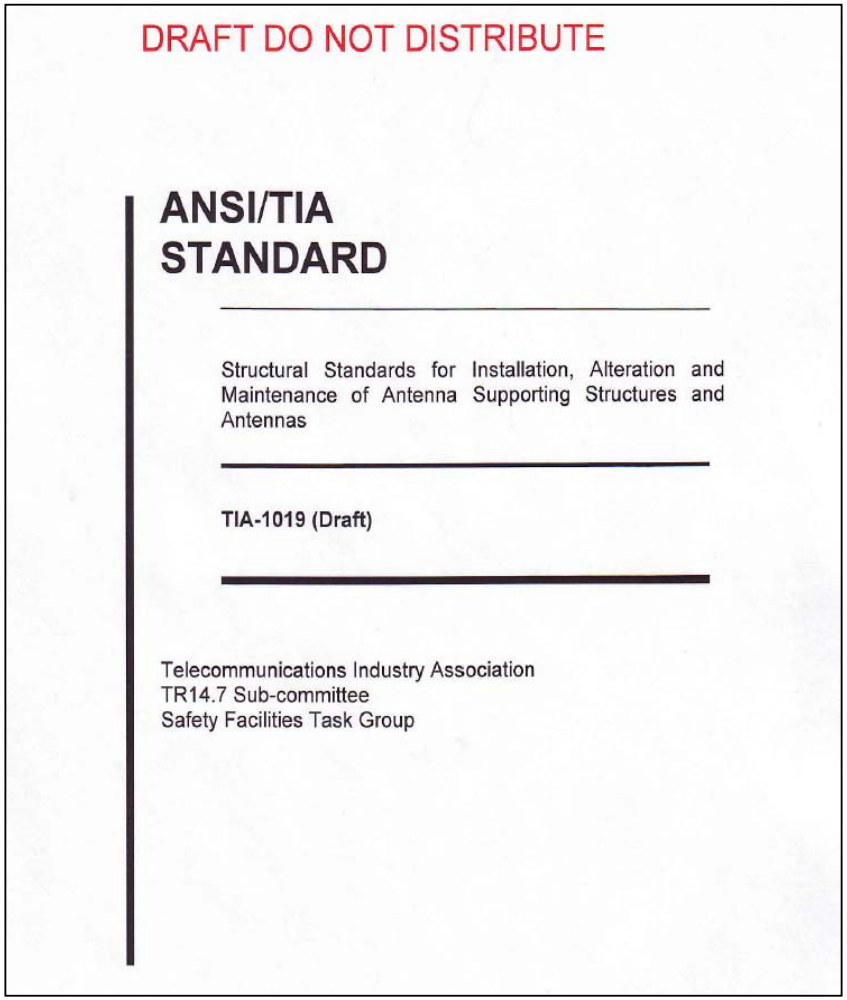
They Built the Eiffel Tower over 100 Years Ago

We Can Build this One

And We Can Build it Safely



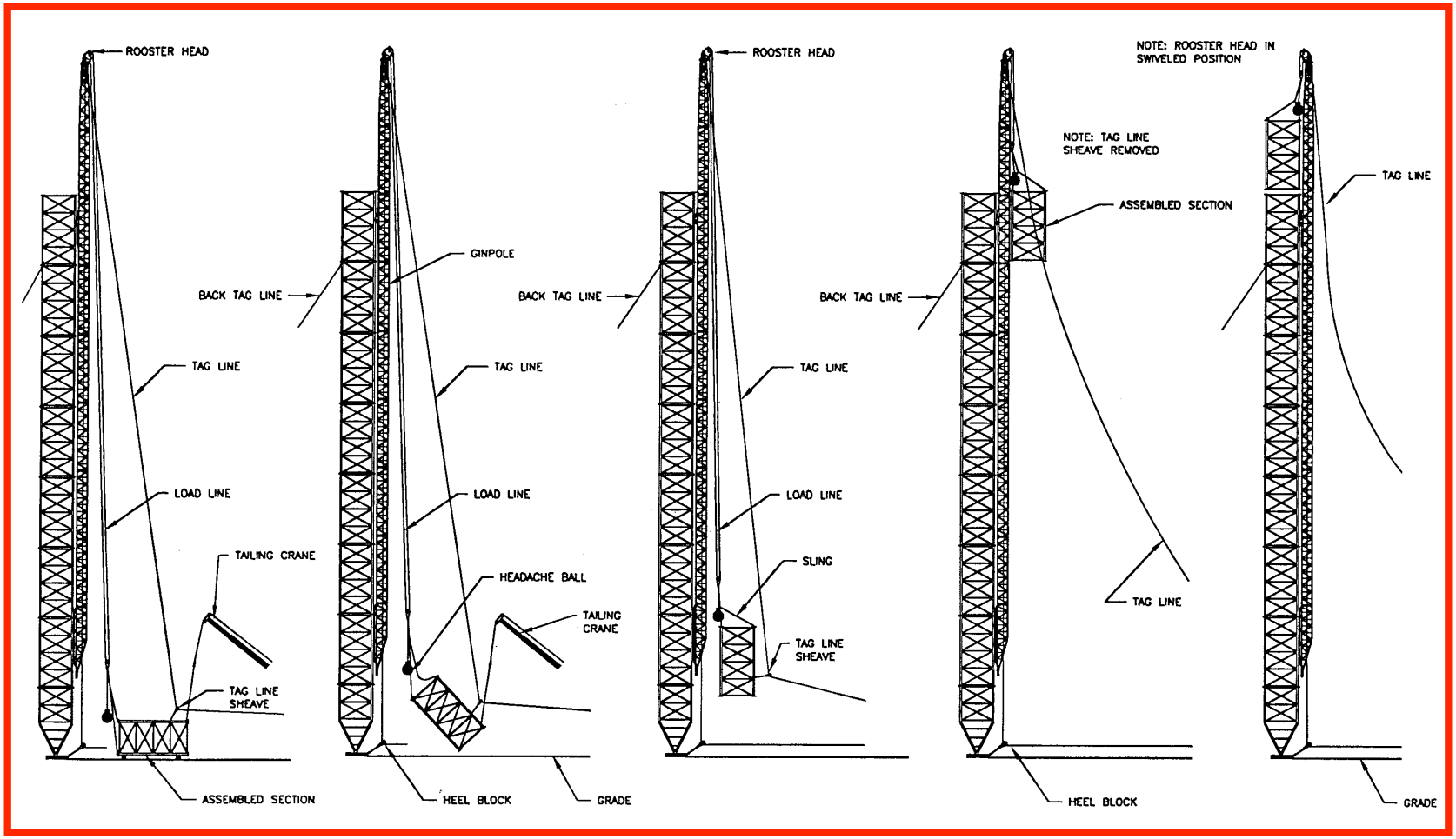
Tower Industry Construction Standard



Lower Sections Will Be Pieced Together with Ground Mounted Cranes

Gin Pole Use for Tall Structures

Ernie Jones, Chairman TIA-1019 Standard



Tilted Gin Pole Inside Tower

Gin Pole Inside Tower

Gin Pole Positioned Outside of Tower

Sequence of Turning a Lifted Load With Gin Pole

Questions?

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