



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76193

Aeronautical Study No.
2014-ASO-3190-OE

Issued Date: 04/30/2014

FAA/FCC Department
American Towers, LLC
10 Presidential Way
Suite 100
Woburn, MA 01801

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Antenna Tower BENNETT NC (282301)
Location: Bennett, NC
Latitude: 35-32-45.65N NAD 83
Longitude: 79-32-03.78W
Heights: 465 feet site elevation (SE)
310 feet above ground level (AGL)
775 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part 1)
 Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

This determination expires on 10/30/2015 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (718) 553-2611. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2014-ASO-3190-OE.

Signature Control No: 209899120-216715776

(DNE)

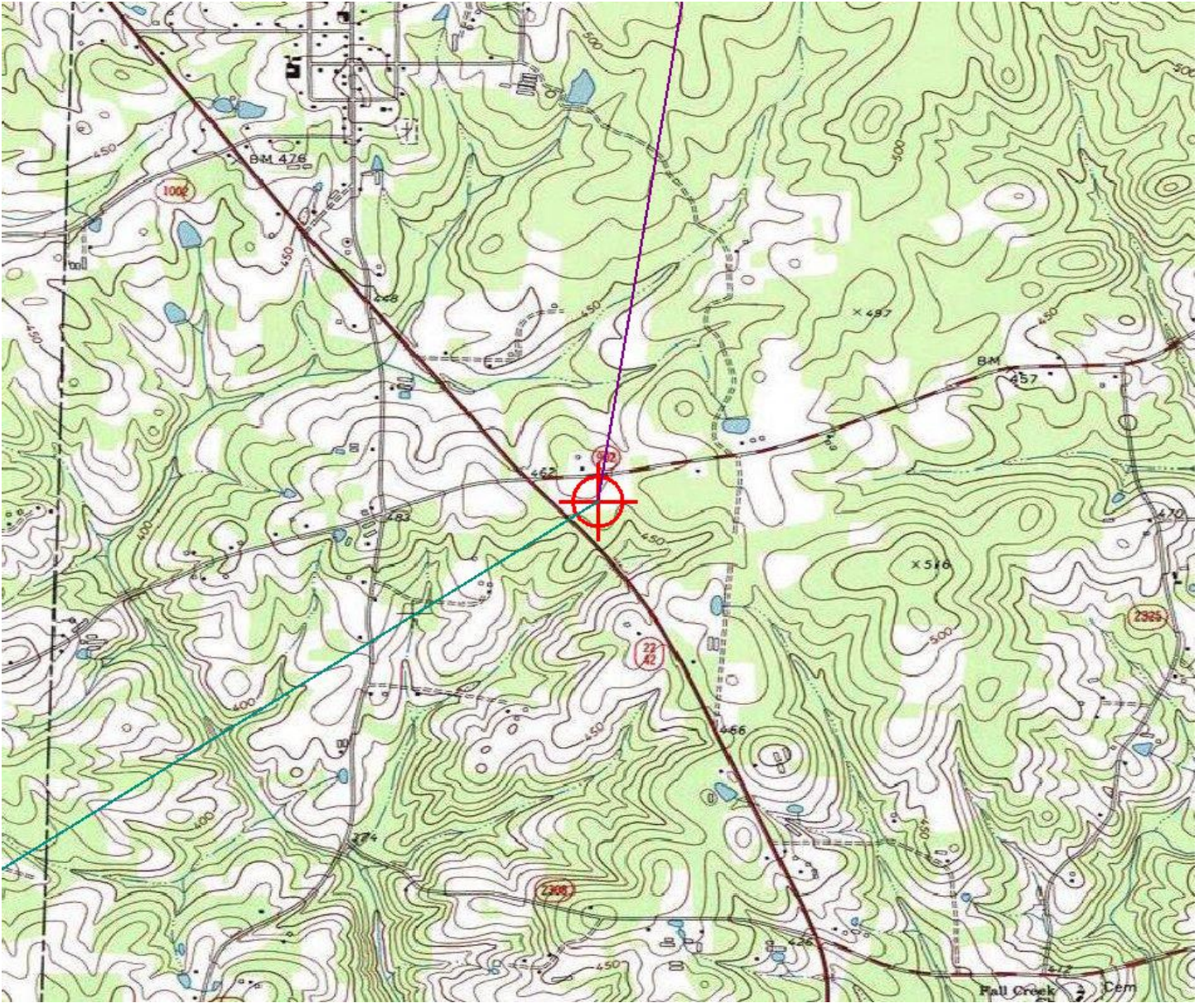
Angelique Eersteling
Technician

Attachment(s)
Frequency Data
Map(s)

cc: FCC

Frequency Data for ASN 2014-ASO-3190-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
698	806	MHz	1000	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W

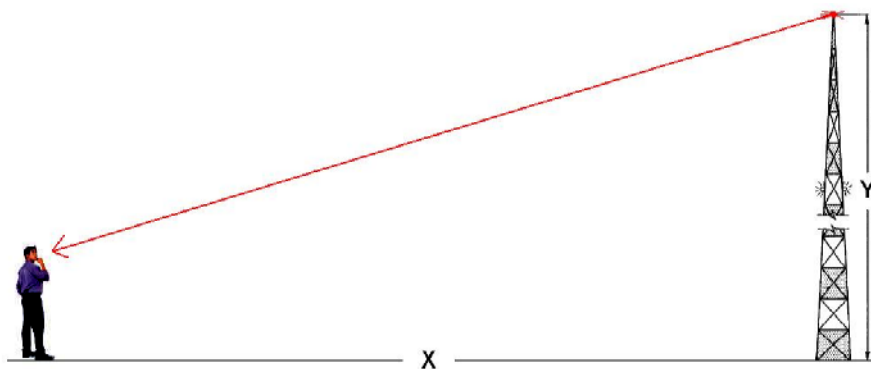




Dialight Beacons – Maximized Light Control

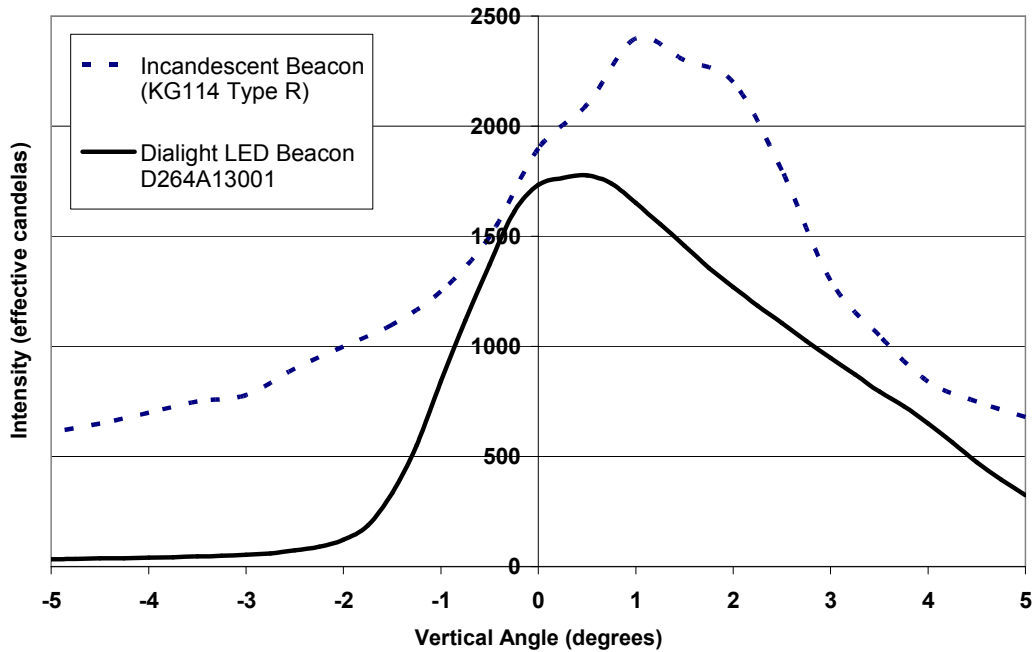
Both the FAA and Transport Canada require red and white flashing beacons for aircraft obstruction lighting to have a light intensity of 2,000 candelas +/- 25% at night at approximately the centerline of the beacon. Older optical designs, such as incandescent-based beacons, caused significant light pollution due to limitations of the lighthouse style Fresnel lenses as well as the use of large source sizes (i.e. the tungsten filament). This light pollution has led to complaints by home owners near the towers.

Beacons with highly controlled beam patterns are now available with little or no light pollution. Examples of this include the Dialight D264A13001 red beacon and the D1RW-C13-006 dual red white beacon. These lights use LEDs in concert with Dialight's patented optical designs to create a well controlled beam pattern.



It is useful for individuals working with tower lighting to understand the amount of light that can be seen at various distances from a tower. The light intensity from the beacon at various distances can be related to the light intensity of a common 60-watt light bulb. This can be easily accomplished by relating the measured intensity distributions of a beacon to the measured light intensity of a 60-watt light bulb. The figure above shows a person at a distance X from a tower of height Y . These distances can be used to calculate the angle of light that may reach the observer. For example, the figure above shows the angle of light directed toward the individual at about 30 degrees below the horizon.

Dialight L864 Beacon (D264A13001) - Maximized Light Control



The graph above shows the measured light intensity distributions for both the Dialight D264A13001 LED beacon and the Honeywell KG114 Type R incandescent beacon. Zero degree represents the horizon and negative angles represent light directed below the horizon.

The light intensity of a new 60-watt 120-volt Sylvania light bulb was measured at 55 candelas. This can be compared to the intensity levels in the graph above where the values range from as low as 33 candelas to as high as 2400 candelas.





An interesting comparison can be made if various distances X from the tower of height Y are converted into angles below the horizon. The angles can be correlated with the light intensity emitted by the beacon. This light intensity can then be related to the 55 candelas emitted by the 60-watt light bulb.

The intensity relationships are shown in the two tables below for a tower height of 100 meters. For example, the incandescent beacon will emit light of 550 candelas to an observer at a distance of 1.0 km. This is equivalent to ten 60-watt incandescent light bulbs viewed on the tower 1.0 km away. In contrast the Dialight LED beacon will emit light of 25.8 candelas to an observer at a distance of 1.0 km. This is equivalent to only about half of a 60-watt incandescent light bulb viewed on the tower 1.0 km away.

Incandescent Beacon (KG114 Type R)

Distance X (kilometers)	Intensity (candelas)	60W Light Bulbs (quantity)
0.0	no data	no data
0.1	no data	no data
0.2	no data	no data
0.3	no data	no data
0.4	no data	no data
0.5	no data	no data
0.6	no data	no data
0.7	no data	no data
0.8	no data	no data
0.9	no data	no data
1.0	550.0	10.0
1.1	580.0	10.5
1.2	630.0	11.5
1.3	680.0	12.4
1.4	700.0	12.7
1.5	720.0	13.1
2.0	800.0	14.5
2.5	900.0	16.4
3.0	980.0	17.8
4.0	1120	20.4

Dialight LED Beacon D264A13001

Distance X (kilometers)	Intensity (candelas)	60W Light Bulbs (quantity)
0.0	0.0	0.0
0.1	0.5	0.0
0.2	2.9	0.1
0.3	4.1	0.1
0.4	5.0	0.1
0.5	6.6	0.1
0.6	8.8	0.2
0.7	11.2	0.2
0.8	17.2	0.3
0.9	22.2	0.4
1.0	25.8	0.5
1.1	25.8	0.5
1.2	33.0	0.6
1.3	37.7	0.7
1.4	38.2	0.7
1.5	40.7	0.7
2.0	53.7	1.0
2.5	73.9	1.3
3.0	122.5	2.2
4.0	400.0	7.3

*Beacons will show some variation in light intensity and distribution from fixture to fixture.

Dialight

