

EXHIBIT 1
FCC FORM 442
ITEM 4a

G: FY, No

H: FY, No

FREQUENCIES

The two additional radio frequency bands requested are 138 to 144 and 162.1 to 173 MHz. No changes are requested in the existing frequency bands from 225 to 12,200 MHz.

EXHIBIT 2
FCC FORM 442
ITEM 5c

LOCATIONS

SITE 1	RIDGE RD MAIN BLDG (Engineering range source)	N39-11-05	W076-42-23
SITE 2	RIDGE RD ENGINEERING TOWER (500 meter ground range source)	N39-10-56	W076-42-03
SITE 3	BLUEBERRY HILL TOWER (1570 meter range source)	N39-10-47*	W076-41-23

* Correction made to this location

EXHIBIT 3
FCC FORM 442
ITEM 6

ANTENNAS

The Ridge Road antenna range has an assortment of source antennas from 12dB gain horns to 31dB gain parabolic dishes. The selection of source antenna varies with frequency, distance, and size of the antenna to be tested.

EXHIBIT 4
FCC FORM 442
ITEM 10

TEST PROGRAM

The Northrop Grumman Antenna Pattern Test Range complex consists of a range control building with several 3-axis antenna positioners, a 500 meter ground range with 3 transmit sites and another positioner opposite the control building, and a 1570 meter range with a 33 meter tall transmit tower. (see map, page 2)

The antenna under evaluation is illuminated by an unmodulated rf source while positioned such that the boresight faces the source, and reference receive signal strength is taken. The antenna under evaluation is positioned at various angles of azimuth and elevation, with relative receive signal strength measurements taken as the antenna moves. This test method makes precise measurement of antenna gain patterns possible. This facility enables Northrop Grumman to evaluate new antenna design concepts, and to verify the performance of production units.

Northrop Grumman has been or is currently under contract with the FAA, US Army, Navy, and Air Force, Customs, DARPA, and various foreign military and civil aviation agencies to design, build, and/or test various advanced antennas.

The additional radio frequency bands are requested to expand the capabilities of the Northrop Grumman Antenna Pattern Test Range complex. The Antenna Design Engineering department plans to develop and test new advanced directional antenna designs in anticipation of future U.S. Government purchases.

EXHIBIT 4 PAGE 2
FCC FORM 442
ITEM 10

1"=1000'

1997

AA CON

ZONING

MAP

BWI INTERNATIONAL
AIRPORT

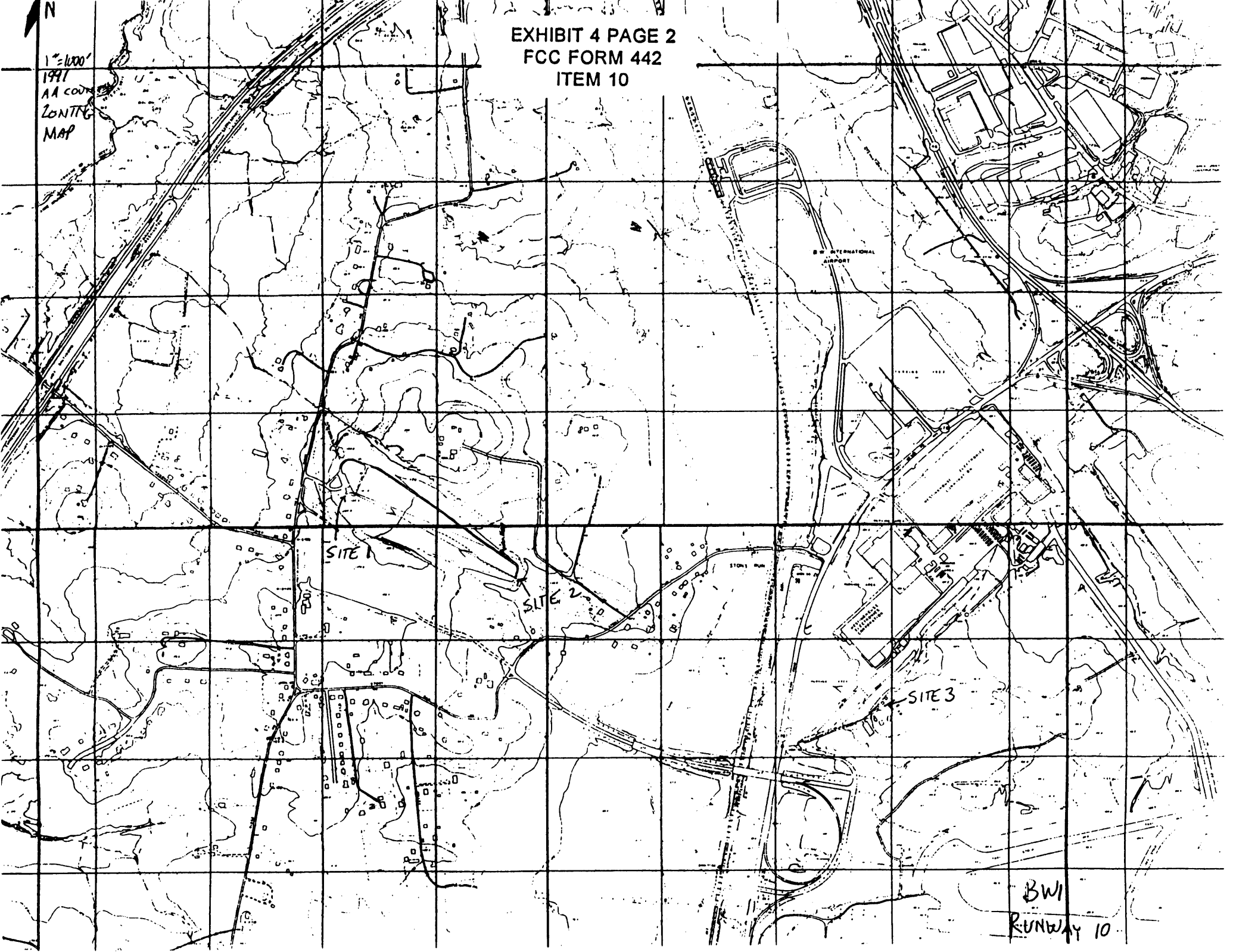
SITE 1

SITE 2

SITE 3

BWI

RUNWAY 10





BLUEBERRY HILL
TEST SITE 3

0.557 KM
1826 FT

EXHIBIT 5
FCC FORM 442
ITEM 15
page 2

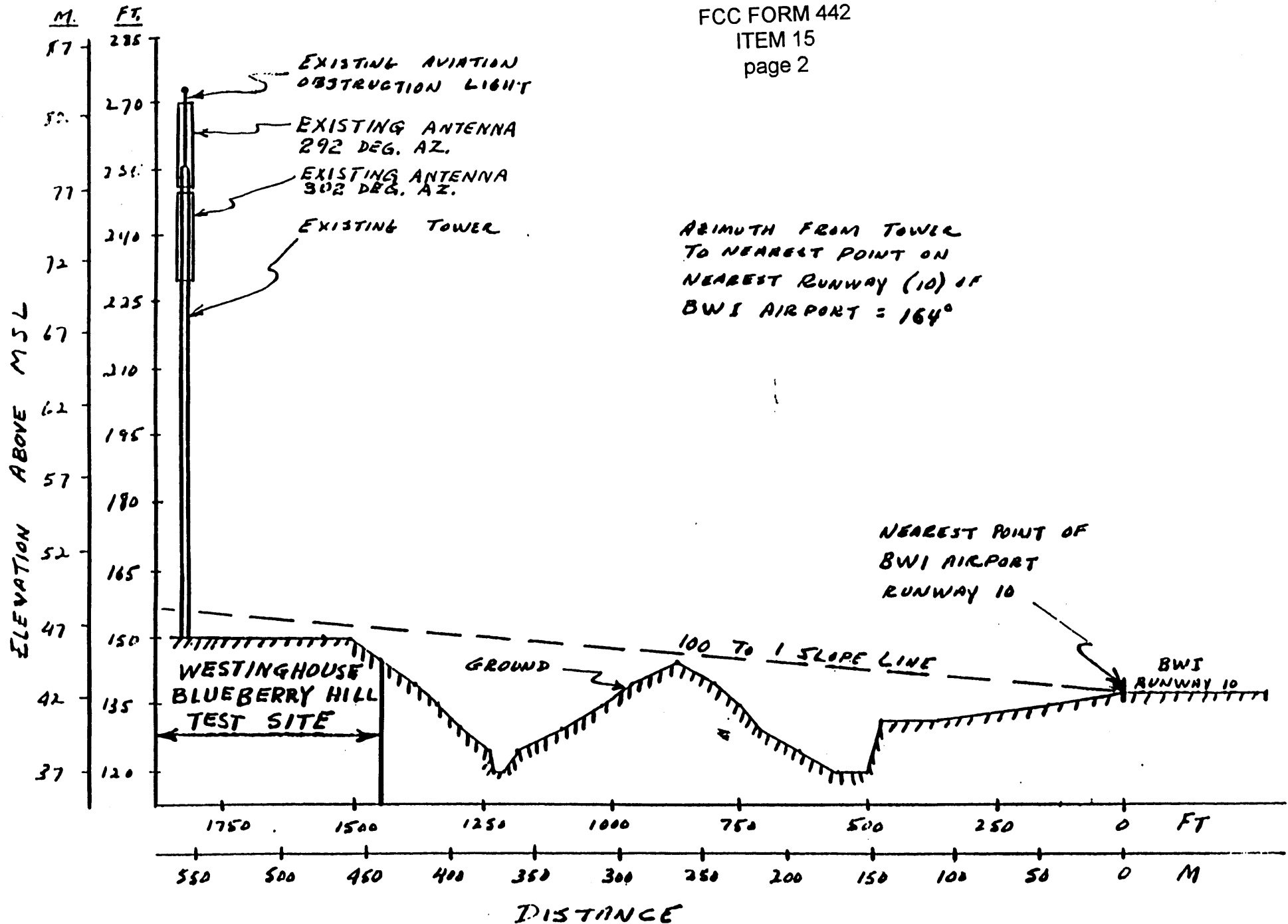
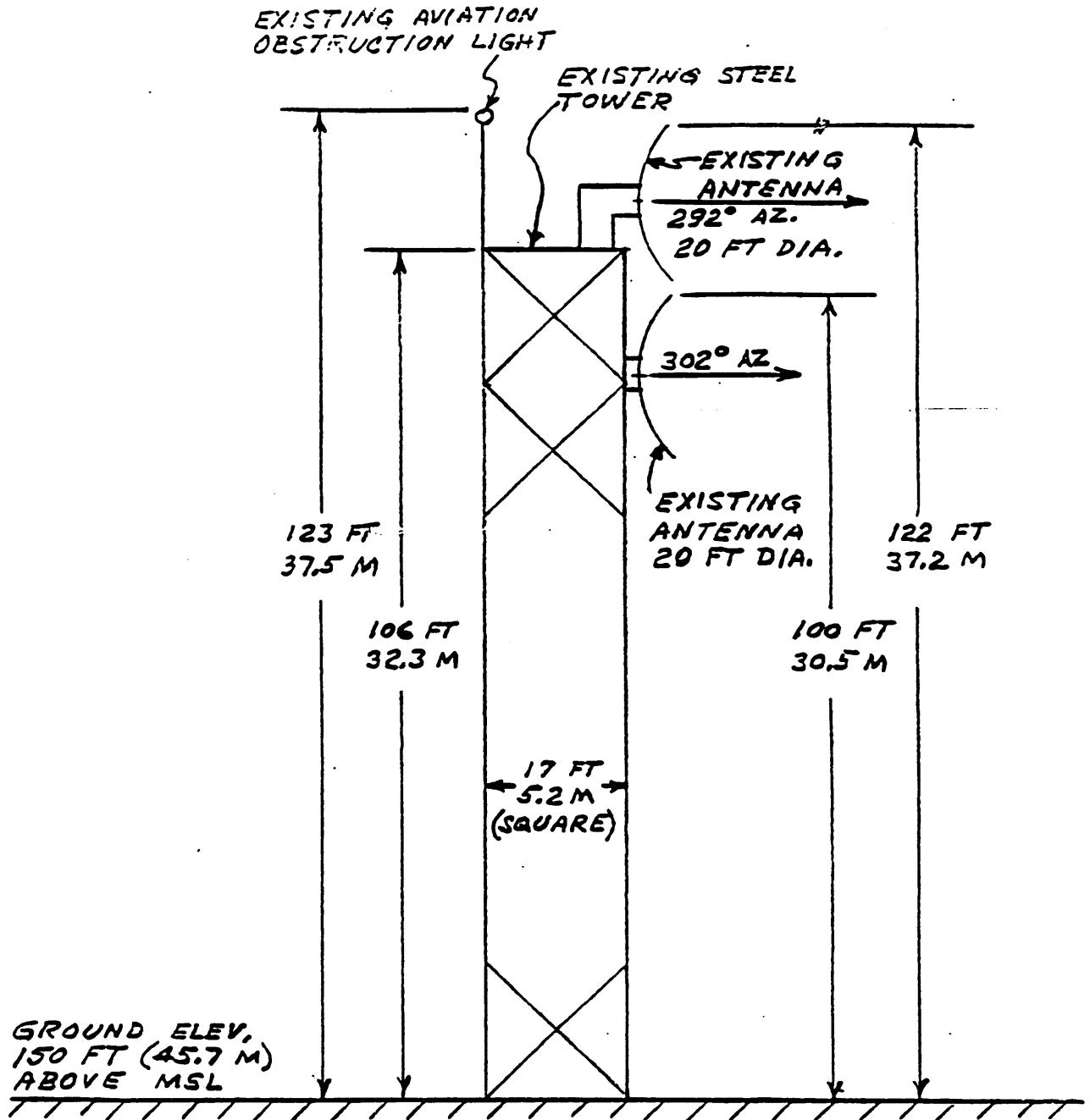


EXHIBIT 5
FCC FORM 442
ITEM 15
page 3



AZIMUTH TO NEAREST POINT ON NEAREST RUNWAY (RWY 10) OF
BWI AIRPORT IS 164°.

TOWER: N. LAT. 39° 10' 46.6137
W. LON. 76° 41' 23.1505

SCALE 20 FT = 1 IN.

VERTICAL PROFILE OF TOWER
AT BLUEBERRY HILL TEST SITE
(SITE 3)