

SECTION VII

Development of Sites and Location of Buildings and Structures

A. Height Regulation:

1. The height of any building or structure shall not exceed forty (40) feet, as measured in accord with the Hanson Building Code.
2. Limitations of height shall not apply to spires, domes, steeples, radio towers, chimneys, broadcasting and television antennae, bulkheads, cooling towers, ventilators and other appurtenances usually carried above the roof, or to farm buildings, churches, municipal or institutional buildings, provided that, if the use requires a permit, one has been granted.
3. Heights permitted in paragraphs 1 and 2 above shall not exceed the limits permitted in Chapter 756 of the General Laws of 1960 and any more restrictive amendments thereto.

B. Area, Frontage, Yard and Floor Area Requirements:

No building shall be erected unless in conformity with the requirements on the Table of Dimensional Requirements: (10/2004)

Except that:

1. Eaves, sills, steps, cornices, belt cornices, fences, walls or uncovered patios and similar features may project into the specified yards, and provided that:
2. On a corner lot, in order to provide visibility unobstructed at intersections, no sign, fence, wall, tree, hedge or other vegetation, and no building or other structure more than three (3) feet above the established street grades, measured from a plane through the curb grades on height of the crown of the street, shall be erected, placed, or maintained within the area formed by the intersecting street lines and a straight line joining said street lines at points which are twenty-five (25) feet distant from the point of intersection, measured along said street lines.
3. Further, no yard, lot area, or other open space required for a building by this bylaw, shall, during the existence of such building, be occupied by or counted as open space for another such building. No lot area shall be so reduced or diminished so that the yards or other open space shall be smaller than prescribed by this bylaw.
4. The minimum required frontage may be reduced to forty (40) feet in a residential district according to the provisions of this section. Back lots with less than the required frontage, commonly known as "hammerhead" or "pork chop" lots, shall be subject to the following requirements:

- a. All setbacks shall be at least fifty (50) feet.
 - b. Each hammerhead lot must be serviced by its own separate driveway located in the access portion of the lot.
 - c. The width of the lot between the street line and the proposed building setback line shall be no less than forty (40) feet, which area shall be known as the access portion of the lot.
 - d. No access portion of another hammerhead lot shall be allowed to abut within that distance equal to the frontage requirement of the zoning district of the lots.
 - e. One (1) building for residential use shall be permitted and buildings shall comply with maximum percent coverage requirements.
 - f. The area of the lot exclusive of the access portion shall be twice that otherwise required in the applicable zoning district.
 - g. No more than ten (10) percent of the total number of lots in a definitive subdivision plan may be hammerhead lots, (rounded to the nearest lot). In the case of a definitive subdivision plan of less than ten lots, one (1) hammerhead lot shall be permitted (10/1998)
5. The Planning Board shall determine adequate access for that portion of a lot used as qualifying lot frontage and that frontage shall be the actual access for that lot for vehicles, water service and other normal uses of lot frontage.(05/2002)
6. A structure containing more than one dwelling unit shall have a minimum floor area of six hundred (600) square feet for each such unit. (10/1986)

7. LOT ACCESS

Driveways that are in excess of 150 feet in length that provide the principal means of vehicular access from a street to a one or two family residential structure shall be subject to the following regulations:

The driveway shall have a minimum width of 12 feet with a 2-foot clear zone on each side of the driveway. (16 feet overall)

The driveway shall have an unobstructed vertical clearance of 13 feet, 6 inches.

Driveways in excess of 250 feet in length shall be provided with an approved area for turning around fire apparatus.

Driveways, including bridges and other supporting structure of driveways, must be designed and maintained to support the imposed loads of fire apparatus and shall be provided with an all-weather driving surface.

The grade of the driveway may not exceed 10% at any point. (05/2017)

C. Accessory Building:

A detached accessory building may be erected in the rear or side yard area at least ten (10) feet from the principal building in conformance with the yard requirements of the district in which it is located. An accessory building attached to its principal building shall be subject to the front, side and rear yard requirements applicable to the principal building. (10/2015)

D. Off-Street Parking and Loading Areas:

1. Requirements for off-street parking and loading areas shall be as specified below for specific uses. These requirements shall be met in the case of all new construction, including expansions, additions, or changes of use. Where applicable, such parking areas shall be noted on a required Site Plan under Section VII.F of this By-Law. Where stipulated, "net floor area" shall mean usable floor space, exclusive of enclosed or inaccessible floor areas. In applying for a building or occupancy permit, the applicant must demonstrate that the following minimums will be met for the new demand without counting existing parking:

- a. Dwellings:** Two (2) spaces per dwelling unit, garage space inclusive.
- b. Motels, hotels, lodging houses:** One (1) space per guest unit plus one (1) additional space per eight (8) guest units or fraction thereof, plus one (1) space for each employee on the largest shift.
- c. Retail stores, offices, municipal offices, banks:** One (1) space per one hundred fifty (150) square feet of net floor area.
- d. Motor vehicle service station or repair or body shop:** Three (3) spaces for each service bay plus one (1) space per employee on the largest shift.
- e. Industrial or wholesale:** A minimum of five (5) spaces, plus one (1) space for each 2,000 sq. ft. net floor area for the first 20,000 sq. ft., plus one (1) space for each additional 10,000 sq. ft. on net floor area, plus one (1) space per employee on the largest shift.
- f. Places of assembly, restaurants:** One (1) space per three (3) seats, or one (1) space per twelve (12) square feet of seating area, whichever is greater.
- g. Hospitals:** One (1) space per bed.

- h. **Nursing homes:** One (1) space per each two (2) beds, plus one (1) space per employee on the largest shift.
 - i. **Bowling alleys:** Four (4) spaces per lane.
 - j. **All others:** As determined by the Board of Appeals.
2. **Design of Off-Street Parking and Loading Spaces** shall meet the requirements specified below:
- a. **Location:**
Required parking shall be either on the same premises as the activity it serves, or on a separate parcel if said parcel is located within three hundred (300) feet of the building's major entrance, and if not separated by a state-numbered highway, and if in a zoning district allowing the activity it serves.
 - b. **Backing:**
All parking areas shall be designed and located so that their use does not involve vehicles backing onto a public way. This shall not apply to residential uses.
 - c. For all required off-street parking spaces, open or enclosed, each three hundred (300) square feet of net standing and maneuvering area shall be considered one (1) space. All such parking spaces shall be designed so as to provide a twelve (12) foot clear space adjacent to each building. All required parking spaces shall be provided with unobstructed access to and from a street and shall be properly maintained in such a manner as to permit them to be used at all times. All required parking spaces shall be located on the same lot as the use with which such spaces are connected or, in the case of unenclosed spaces, within two hundred (200) feet of the lot, except that two (2) or more businesses may jointly provide the required spaces on one (1) or more of their lots. The number of spaces in any such joint facilities shall at least equal the total number required under the provisions of this Section for their individual uses.
 - d. Required off-street parking and loading spaces shall not hereafter be reduced, nor shall one be counted as or substituted for the other.
 - e. Whenever off-street parking in Business or Commercial-Industrial Districts is required in accordance with Section VII D, there shall be an area at least twenty (20) feet deep between the street line and the balance of the lot which shall be separated from the street and the balance of the lot by a curb which shall encompass an area that shall be seeded and landscaped except at an access. Such access shall be at least twenty (20) feet wide and at least one hundred twenty (120) feet center to center apart and further provided that there shall be only one (1) access if the street frontage is two hundred (200) feet or less. If the street frontage is greater, additional accesses may be allowed in the ratio of one (1) such access for

each additional two hundred (200) feet or portion thereof of frontage.

- f. Except in the case of parking spaces provided for dwellings, requirements for paving off-street parking and loading areas shall be determined by the Planning Board.
- g. Except in the case of parking spaces provided for single-family dwellings, off-street parking and loading areas used after sundown shall be illuminated with illumination so arranged so as not to shine directly on abutting properties or on streets.
- h. Entrance cuts to be made onto a traveled way shall be designed by the Planning Board after consultation with the State DPW Engineers as required, Police Chief, and Highway Surveyor.
- i. For Parking areas of fifteen (15) cars or more, the following requirements shall apply:
 - 1. Parking lots for fifteen (15) or more cars shall be screened from any residential use or district which is abutting or separated from it only by a street. Screening shall be by a four foot planting strip maintained with densely planted shrubs, or by a fence of not less than four feet in height, and shall be landscaped as required below.
 - 2. Parking lots for fifteen (15) or more cars shall contain or be bordered within five (5) feet by at least one (1) tree per ten (10) cars, trees to be of two (2) inch caliper or larger, and if within the parking area, to be planted in curbed soil plots allowing not less than forty (40) square feet of unpaved soil area per tree.
 - 3. Parking lots for fifty (50) or more cars shall be separated into areas not to contain more than twenty-five (25) spaces. Parking areas of twenty-five (25) spaces shall be separated by grass or shrub buffer areas, not less than ten (10) feet in width.

E. Permitted and Prohibited Signs (10/2017)

- 1. All permitted signs shall conform with any design guidelines set forth in the Sign Regulations as may be established by the Planning Board, and with those standards set forth in this section E herein, and with all other federal, state and local requirements.
- 2. The following signs shall be permitted without a permit: *examples of permitted signs are available in the sign regulations as adopted by the Planning Board and amended from time to time:*

- a. Construction Signs: A maximum of four signs located on construction sites which advertise the commercial enterprise engaging in work on the property. Said signs may be maintained only while a valid construction permit is active. For commercial and residential projects on sites 3 acres or larger, said signs shall not exceed aggregate 32 square feet, calculated in accordance with the Sign Regulations. For all other projects, said signs shall not exceed 16 aggregate square feet.
- b. Government Signs: Official Federal, State or local government signs and notices issued by any court, person or officer in performance of a public duty.
- c. Miscellaneous Small Signs: Signs with an aggregate area not to exceed 3 square feet and located within 5 feet of an entrance to a building
- d. No Trespassing Signs: Trespassing warnings that are posted in compliance with the requirements of Federal, State and local laws.
- e. Traffic Safety Signs: Signs warning of construction, excavation, or similar hazards if expressly approved by the Town of Hanson Zoning Enforcement Officer. Parking lot and other private traffic directional signs each not exceeding 3 feet in height and 5 square feet in area and limited to guidance of pedestrian or vehicular traffic within the premises on which they are located.
- f. Real Estate Signs: Temporary signs indicating that the property on which the sign is located is for sale, rent or lease, as provided for by law. Only one such sign is permitted to face on each street adjacent to the property. Such signs may be single or double-faced and are limited in size to 3 square feet or less on property in residential zones, and 10 square feet or less on property in commercial zones.
- g. Temporary Window Signs: Temporary signs on commercial properties, affixed to the inside of the window, or hung within 12 inches of a window promoting grand openings and special events (commercial or non-commercial), provided the sign or signs do not exceed 10 percent of each window area, or 4 square feet per window, whichever is greater.
- h. Transit Signs: Signs identifying transit stops, facilities, times and routes.
- i. Utility Signs: Signs placed by utility companies as part of the normal operation and maintenance of facilities such as public telephones and underground services.
- j. Vehicle Signs: painted signs or decals affixed to the body of any vehicle, unless parked for the primary purpose of displaying the sign.

- k. Political Signs: Political signs in all zoning districts on private property with the property owner's authorization. Said signs are not subject to size limitations, provided however, structures shall require a building permit.
 - l. Farm Stands: A farm stand may have no more than two temporary ground identification signs. Such signs shall not exceed 12 square feet in area and six feet in height from the ground; be located on the same lot as the farm stand. A farm stand may have temporary signs(s) at the nearest intersecting streets with the land owner's permission. Farm Stand signs may not be illuminated or create a hazard to traffic, and must be removed when the farm stand closes for the season.
 - m. Yard Sales: Signs for yard sales shall be limited to not more than three consecutive days.
3. The following signs shall be prohibited: *examples of permitted signs are available in the sign regulations as adopted by the Planning Board and amended from time to time:*
- a. Public safety. No sign shall not block reasonable sight lines of roads, streets, ways or sidewalks.
 - b. Municipal Property. With the exception of Government Signs, Traffic Safety Signs, Transit Signs and Utility Signs, no signs shall be placed on public property without express written approval of the Board of Selectmen.
 - c. Signs that Block Ingress or Egress. Any sign, such as a sandwich-board sign, placed or maintained so as to interfere with free ingress to or egress from any door, window, fire escape, or parking lot.
 - d. Signs in the Street Right of Way. Any sign placed in any street right of way without a valid permit or prior approval for the purpose of safety or traffic control. No sign shall be affixed to or posted in front of any guardrails located in a public right of way.
 - e. Signs on Street Trees: Any sign posted on or affixed to a street tree, fence or utility pole.
 - f. Simulated Traffic Signs. Any sign which simulates or imitates any traffic sign or signal in size, color, lettering or design, or which makes use of words, symbols or characters in such a manner as to interfere with, mislead, or confuse pedestrian or vehicular traffic.
 - g. Portable Signs, excepting temporary real estate or construction signs; and sandwich board signs that do not pose an obstruction to vehicles (10/2017)

F. Signs requiring Sign Site Plan Review

1. Signs requiring site plan review shall include: (a) Signs with moving, flashing, electronic or animated images or copy; (b) Illuminated or neon Signs and (c) Reflective or Fluorescent Signs. (10/2017)

G. Site Plan Review

1. Site Plan Approval by the Zoning Board of Appeals is required in the "Business District, Commercial-Industrial District, or any Residence District, or for any nonresidential or nonagricultural construction or use, including extensions, alterations, or changes to nonconforming nonresidential or nonagricultural structures or uses, and for multi-family dwellings.
2. Applicants shall submit eight (8) copies of a site plan to the Zoning Board of appeals in accordance with the criteria specified below. The Zoning Board of Appeals shall review and approve, with such conditions as may be deemed appropriate, the site plan within ninety (90) days of its receipt, and notify the applicant of its decision. The decision of the Zoning Board of Appeals shall be upon a majority of those present and shall be in writing. No building permit shall be issued by the Building Inspector without the written approval of the site plan by the Board of Appeals, or unless ninety (90) days lapse from the date of the submittal of the site plan without action by the Board of Appeals. (10/1992)
3. Unless waived by the Board of Appeals, in writing, for unusually simple circumstances, plans subject to this section shall show the following:
 - a. existing and proposed topography at two (2) foot contour intervals; (10/2004)
 - b. water provisions, including fire protection measures;
 - c. sanitary sewerage;
 - d. storm drainage, including means of ultimate disposal and calculations to support maintenance of the requirements in the Planning Board's Subdivision Rules and Regulations;
 - e. parking and loading spaces, access, and egress provisions;
 - f. planting, landscaping, and screening;
 - g. all boundary line information pertaining to the land sufficient to permit location of same on ground, including assessors map and lot number information;
 - h. location of existing and proposed buildings, with information on gross lot coverage;

- i. sufficient information to ensure compliance with all applicable provisions of this Zoning By-Law.
- 4. Site Plan shall be submitted in 24-inch by 36-inch sheets. Plans shall be prepared by a Registered Professional Engineer and a Registered Land Surveyor. Dimensions and scales shall be adequate to determine that all requirements are met and to make a complete analysis and evaluation of the proposal. The Board of Appeals may waive the requirements of this Section VII.F.3 where no exterior change will be made to an existing building.
- 5. Site Plan approval shall be granted upon determination by the Board of Appeals that the following conditions are complied with. The Board of Appeals may impose reasonable conditions, even at the expense of the applicant, to ensure that the following conditions have been satisfied. Any new building construction or other site alteration shall provide adequate access to each structure for fire and service equipment and adequate provision for utilities and stormwater drainage consistent with the functional requirements of the Planning Board's Subdivision Rules and Regulations. New building construction or other site alteration shall be designed in the Site Plan, after considering the qualities of the specific location, the proposed land use, the design of building form, grading, egress points, and other aspects of the development, so as to:
 - a. minimize the volume of cut and fill, the number of removed trees six (6) inch caliper or larger, the length of removed stone walls, the area of wetland vegetation displaced, the extent of stormwater flow increase from the site, soil erosion, and threat of air and water pollution;
 - b. maximize pedestrian and vehicular safety both on the site and egressing from it;
 - c. minimize obstruction of scenic views from publicly accessible locations;
 - d. minimize visual intrusion by controlling the visibility of parking, storage, or other outdoor service areas viewed from the public ways or premises residentially used or zoned;
 - e. minimize glare from headlights through plantings or other screening;
 - f. minimize lighting intrusion through use of such devices as cut-off luminaires confining direct rays to the site, with fixture mounting not higher than twenty (20) feet;
 - g. minimize unreasonable departure from the character and scale of building in the vicinity, as viewed from public ways;
 - h. minimize contamination of groundwater from on-site wastewater disposal systems or operations on the premises involving the use, storage, handling, or

containment of hazardous substances.

6. The Board of Appeals may adopt and from time to time amend reasonable regulations for the administration of these Site Plan guidelines.

7. Sign Site Plan Review

- a. Application Requirements: In addition to a completed application and filing fee, an applicant must submit the following (i) A photograph showing the existing facade, on which has been indicated the proposed, and a portion of adjoining stores or building (ii) for a proposed building or new facade, an architect's elevation may be submitted in lieu of a photograph; (iii) a scale drawing of the proposed sign indicating: the type of proposed sign (wall, hanging, free standing), dimensions of the proposed sign and any designs, logos, or lettering, cross-section with dimensions showing edge detail, minimum scale 1" = 1', minimum sheet size, 8.5 x 11"; (iv) a scale drawing of the bracket with a colored scale graphic indicating dimensions, showing colors, materials and method of affixing it to the sign and to the building, minimum scale 1" = 1', minimum sheet size, 8.5 x 11".
- b. Approval. Sign Site Plan Approval shall be granted upon a determination by the Board of Appeals upon the following findings: (i) the design of signs and abutting features shall not detract from the design of proposed buildings and structures and the surrounding properties; (ii) the design of signs and abutting features shall maximize pedestrian and vehicular safety both on and off the site; (iii) the design of signs and abutting features shall minimize obstruction of scenic views from publicly accessible locations; (iv) the design of signs and abutting features shall minimize lighting intrusion;
- c. Conditions. The Board of Appeals may impose reasonable conditions, even at the expense of the applicant, to ensure that the following conditions have been satisfied.
- d. Regulations. The Board of Appeals may adopt, and may from time to time amend reasonable regulations for signs. (10/2017)

H. Travel Trailer, Motor Home, Mobile Home, or Camper:

No area in any zoning district in Town shall be occupied or used as a dwelling for living quarters by a travel trailer, motor home, mobile home, or camper for a total time in excess of ninety (90) days during any one calendar year, unless permit for same is issued by the Board of Appeals, such permit to be for a term of not more than twelve (12) months. In the event such a permit is issued, the travel trailer, motor home, mobile home, or camper shall conform to yard and area requirements as specified for a dwelling in a Residence A District and Board of Health Regulations. In the event of a disaster, such as fire, flood, hurricane, tornado or lightning or similar catastrophe, a permit may be

obtained from the Building Inspector to allow a mobile home on lot affected for a period of not more than twelve (12) months. Such Permit will be subject to Board of Health Regulations and Requirements of the Building Inspector. Extensions of six (6) months may be granted by the Board of Appeals upon written application of the original petitioner. (10/1976) (10/1979) (05/1994) (10/2002)

I. Earth Removal:

The removal of earth, including soil, loam, sand, gravel, clay, stone, quarried rock or other sub-surface product, except water, from land in the Town of Hanson is prohibited except as provided in Article XVII of the Town bylaws.

J. Buffer Areas:

1. The intent of a buffer area is to leave in or restore land to its natural state, to preserve or restore vegetation, to maintain or restore natural land contours, to maintain or restore visual screening. Further, the intent is to protect and preserve the value of property in the Town; to preserve and protect the beauty and amenities of the Town; to conserve natural conditions; to secure safety from congestion, traffic and blight; and to promote the general welfare, safety and convenience of the inhabitants of the Town. Said buffer areas are not intended to be used for any purpose than above except a standing sign in conformity with the Hanson Sign Bylaw and for such area at the front of a lot which may be required for access under Section VII D.2.d. Fencing shall be allowed if it is a supplement to and not a replacement of vegetative screening and is erected either at the lot line or at the innermost buffer area line but not within the buffer area.
2. When a Business or Commercial-Industrial zoned lot abuts a lot in a Residence A, Residence AA or Residence B District. A buffer area shall be incorporated as designated below. These buffer areas shall be in conformity with the requirements of a buffer area as stated in paragraph 4.

The entire buffer shall be within the lot in question, but may be entirely or partly within a Residence A, Residence AA or Residence B District if such District is included within the lot confines. Wetlands may be included within the buffer area if they are not disturbed except as may be required by an order or decision of the Hanson Conservation Commission.

- a. In the Business zone a thirty-five (35) foot buffer shall be incorporated.
- b. In the Commercial-Industrial District a fifty (50) foot buffer shall be incorporated.
3. Lots in Business or Commercial-Industrial Districts which do not abut Residence A, AA or B Districts shall have minimum buffer areas as follows:
 - a. At street frontage lines, the buffer area shall be at least twenty (20) feet in depth as further delineated in Section VII D.2.f.

- b. At side and rear lines, the buffer area shall be at least fifteen (15) feet in depth.
- 4. Within buffer areas, screening shall be retained or provided as follows:
 - a. When natural vegetative cover and natural contours have been preserved, the Special Permit Granting Authority may waive, in whole or in part, the strict enforcement of screening requirements if said natural screening substantially conforms to the intent of this bylaw to the satisfaction of said Authority.
 - b. Street plantings shall be required and consist of grass, low ground covers and/or shrubbery and a staggered row of trees within the twenty (20) foot area. Such trees may be planted or retained and if newly planted, shall have a minimum two and one-half (2 ½) inch trunk diameter (measured three (3) feet above grade) and of a size, species and spacing such as to approximately meet at maturity. Species shall be common to this area and normally reach a mature height of at least thirty (30) feet.
 - c. The full length of side and rear buffers shall be planted (or retained) with the ground level screening which is at least three (3) feet in height and which is of a species likely to reach at least five (5) feet within three (3) years. Additionally, higher screening by trees shall be provided as for street plantings except initial minimum size shall be two (2) inches in diameter measured as above.
 - d. Any shrubs planted to meet these requirements shall be at least eighty (80) percent evergreen and planted trees sixty (60) percent evergreen.
 - e. Fencing may be used in conjunction with screening but not in place of it.
 - f. All plant materials required by this bylaw including retained vegetation shall be maintained in a healthful condition and dead materials replaced at the earliest appropriate season. (10/1985)

K. Multiple Principal Structures on a Single Lot

Multiple Principal Structures on a Single Lot. Not more than one (1) principal structure may be placed upon a lot in a Business or Commercial-Industrial District unless a Special Permit is issued by the Zoning Board of Appeals pursuant to Section VIII.D, and the following conditions have been satisfied:

1. The applicant shall submit a Development Plan conforming to the requirements for a preliminary subdivision plan under the Subdivision Rules and Regulations of the Planning Board. Such plan shall indicate the proposed water provision and wastewater disposal method to be utilized on the property.
2. All ways within the property, drainage facilities, and the installation of utilities shall conform to the functional requirements of the Subdivision Rules and

Regulations of the Planning Board.

3. Major dimensions of any building shall be approximately parallel or perpendicular to one or more nearby streets, if within one hundred (100) feet of such street.
4. Structures exceeding 3500 gross sq. ft. shall incorporate in their design breaks in wall or roof lines and other architectural features to maintain the appearance of small scale business facilities.
5. Landscaping on developed portions of the lot shall be designed to ensure that buffers between properties are maintained, to provide landscaped areas between buildings on the lot, to minimize the visual effect of the bulk and height of buildings, parking areas, signs or lights, and to minimize the impact of the use of the property on land or water resources.

L. Personal Wireless Service Facilities (10/1998)

1. **Purpose and Intent.** It is the express purpose of this bylaw to minimize the visual and environmental impacts of personal wireless service facilities, consistent with the provisions of Section 253 and 704 of the Federal Telecommunications Act of 1996. The Bylaw enables the review and approval of personal wireless service facilities by the Town's Zoning Board of Appeals in keeping with existing bylaws and historic development patterns. It sets standards which are intended to preserve the safety, character, appearance, property values, natural resources and historic sites of the Town and mitigate any adverse visual effects through proper design, location and screening of structures and to encourage co-location of antennas where feasible in order to minimize the total number of sites required.
2. **Scope.** Section K shall apply to all wireless telecommunications antennas and towers and related equipment, fixtures and enclosures, including any modifications to any of the preceding, but shall not apply to fire, police, ambulance and other safety communications antennas, amateur (ham) radio or citizens band radio antennas, or to non-transmitting television antennas.
3. **District Regulations.** Applications for personal wireless service facilities will only be considered in the Commercial-Industrial zoning district. Notwithstanding the above, cell towers may be placed on any municipal property in any zone. The site location will have to be approved by 2/3 vote at Town Meeting. Installation of a cell tower on municipal land shall comply with the remaining requirements of Section VII. L (05/2018)
4. **Use Regulations.** A personal wireless service facility shall require a building permit in all cases, and may be permitted as follows:
 - a. A personal wireless service facility may locate on any existing guyed tower, lattice tower, monopole, electric utility transmission tower, or water tower,

provided that the installation of the new facility does not increase the height of the existing structure except as provided in Section 6 b) below. Such installations shall not require a Special Permit but shall require site plan approval by the Zoning Board of Appeals.

- b. A personal wireless service facility that exceeds the height restrictions of Sections 6 (a-c) may be permitted by Special Permit in the Commercial-Industrial District provided that the proposed facility complies with the height restrictions of Section 6.d), and with all the setback and Special Permit Regulations set forth in sections 6 and 7 of this bylaw.

5. Location. Applicants seeking approval for personal wireless service facilities shall comply with the following:

- a. If feasible, personal wireless service facilities shall be located on existing structures, including but not limited to buildings, water towers, existing telecommunications facilities, utility poles and towers and related facilities, except fire towers, provided that such installation preserves the character and integrity of those structures. In particular, applicants are urged to consider use of existing telephone and electric utility structures as sites for one or more personal wireless service facilities. The applicant may have the burden of proving that there are no feasible existing structures upon which to locate.
- b. If the applicant demonstrates that it is not feasible to locate on an existing structure, personal wireless service facilities shall be designed so as to be camouflaged to the greatest extent possible, including but not limited to: use of compatible building materials and colors, screening, landscaping and placement within trees to create an effective year-round visual buffer.
- c. The applicant shall submit documentation of the legal right to install and use the proposed facility at the time of application for a building and/or Special Permit.

6. Dimensional Requirements. Personal wireless service facilities shall comply with the following requirements:

- a. **Height, General.** The height of a personal wireless service shall not exceed by more than ten (10) feet the height limits of the zoning district in which the facility is proposed to be located, unless the facility is completely camouflaged such as within a flagpole, steeple, chimney or similar structure. Personal wireless service facilities may locate on a building that is legally non-conforming with respect to height, provided that the facilities do not project above the existing building height.
- b. **Height, Existing Structures.** New antennas located on any of the following structures existing on the effective date of this bylaw shall be exempt from the height restrictions of this bylaw: Water towers, guyed towers, lattice towers, and monopoles, provided that:

1. Location on existing water towers will be subject to approval of the methods and maintenance procedures required by the Hanson Water Department.
2. There is no increase in height of the existing structure as a result of the installation of a personal wireless service facility.

c. Height, Existing Structure, (Utility).

New antennas located on any of the following existing structures shall be exempt from the height restrictions of this bylaw provided that there is no more than a twenty (20) foot increase in the height of the existing structure as a result of the installation of a personal wireless service facility: electric transmission and distribution owners, telephone poles and similar existing utility structures. This exemption shall not apply in Historic Districts, or within one hundred fifty (150) feet of the right-of-way of any scenic roadway.

d. Height, Commercial-Industrial Zoning District.

Personal wireless service facilities of up to two hundred (200) feet are permitted by Special Permit. These taller structures shall be of non-guyed design, and shall comply with all setbacks and Special Permit Regulations set forth in this bylaw. (05/2018)

e. Setbacks. All personal wireless service facilities and their equipment shelters shall comply with the building setback provisions of the zoning district in which the facility is located. In addition, the following setbacks shall be observed:

1. The minimum distance from the base of any ground-mounted personal wireless service facility to any property line, public way, habitable dwelling, shall be three (3) times the height of the facility/mount, including any antennas or other appurtenances.
2. In the event that an existing structure is proposed as a mount for a personal wireless service facility, the setback provisions of the underlying zoning district shall apply. In the case of pre-existing non-conforming structures, personal wireless service facilities and their equipment shelters shall not increase any non-conformities, except as provided in **Section 6.e) 3. below.**
3. **Flexibility.** In reviewing a Special Permit application for a personal wireless service facility, the Zoning Board of Appeals may reduce the setback by as much as one third (1/3) of the required distance, if it finds that a substantially better design will result from such a reduction. In making such a finding, the Zoning Board of Appeals shall consider both the visual and safety impacts of the proposed use.

7. Special Permit Regulations. All personal wireless service facilities shall comply

with the Performance Standards set forth in this section

8. Design Standards.

- a. Visibility/Camouflage.** Personal wireless service facilities shall be camouflaged as follows: a buffer of dense tree growth shall surround all ground-mounted equipment shelters which are not camouflaged by existing buildings or structures.
- b. Camouflage by Existing Buildings or Structures:**
 - 1. When a personal wireless service facility extends above the roof height of a building on which it is mounted, every reasonable effort shall be made to conceal the facility within or behind existing architectural features to limit its visibility from public ways. Facilities mounted on a roof shall be stepped back from the front facade in order to limit their impact on the building's silhouette.
 - 2. Personal wireless service facilities which are side mounted shall blend with the existing building's architecture and, if over five (5) square feet, shall be painted or shielded with material which is consistent with the design features and materials of the building.
- c. Color.**
 - 1. Personal wireless service facilities which are side mounted on buildings shall be painted or constructed of materials to match the color of the building material directly behind them.
 - 2. To the extent that any personal wireless service facilities extend above the height of the vegetation immediately surrounding them, they shall be painted in a light gray or light blue hue which blends with sky and clouds to the extent that such requirements do not violate applicable FAA regulations.
- d. Equipment Shelters.** Equipment shelters for personal wireless service facilities shall be designed consistent with one of the following design standards:
 - 1. Equipment shelters shall be located in underground vaults; or
 - 2. Equipment shelters shall be designed to be consistent with the architectural styles, materials and roof design typical of the district in which the facility is located.
 - 3. Equipment shelters shall be camouflaged behind an effective year-round landscape buffer and/or wooden fence, equal to the height of the

proposed building. The Zoning Board of Appeals shall determine the style of fencing and/or landscape buffer that is compatible with the area.

e. Lighting and Signs

1. Personal wireless service facilities shall be lighted only if required by the Federal Aviation Administration (FAA). Lighting of equipment structures and any other facilities on site shall be shielded from abutting properties. There shall be total cutoff of all light at the property lines of the property to be developed, and foot-candle measurements at the property line shall be 0.0 initial foot-candles when measured at grade.
2. Signs shall be limited to those needed to identify the property and the owner and warn of any danger. All such signs shall comply with the requirements of the bylaw.

f. Historic Buildings and Districts

1. Any personal wireless service facilities located on or within an historic structure shall not alter the character-defining features, distinctive construction methods or original historic materials of the building.
2. Any alteration made to an historic structure to accommodate a personal wireless service facility shall be fully reversible.
3. Personal wireless service facilities within an historic district shall be concealed within or behind existing architectural features, or shall be located so that they are not visible from public roads and viewing areas within the district.

g. Scenic Landscapes and Vistas

1. Equipment shelters shall not be located within open areas that are visible from public roads or residential development. As required in Section 8.A, a buffer of dense tree growth shall surround all ground-mounted equipment shelters, which are not camouflaged by existing buildings or structures.
2. Any personal wireless service facility that is located within three hundred (300) feet of a scenic vista, scenic landscape or scenic road as designated by the Town shall not exceed the height of vegetation at the proposed location. If the facility is located farther than three hundred (300) feet from the scenic vista, scenic landscape or scenic road, the height regulations described elsewhere in this bylaw will apply.

9. Environmental Standards

- a. Personal wireless service facilities shall not be located in wetlands. Locating of wireless facilities in wetland buffer areas shall be avoided whenever possible and disturbance to wetland buffer areas shall be minimized.
- b. No hazardous waste shall be discharged on the site of any personal wireless service facility. If any hazardous materials are to be used on site, there shall be provisions for full containment of such materials. An enclosed containment area shall be provided with a sealed floor, designed to contain at least one hundred ten (110) percent of the volume of the hazardous materials stored or used on site.
- c. Storm water run-off shall be contained on-site.
- d. Ground-mounted equipment for personal wireless service facilities shall not generate noise in excess of 50 dB at the property line.
- e. Roof-mounted or side-mounted equipment for personal wireless service facilities shall not generate noise in excess of 50dB at ground level at the base of building closest to the antenna.

10. Safety Standards

- a. Radio Frequency Radiation (RFR) Standards. All equipment proposed for a personal wireless service facility shall be authorized per the FCC *Guidelines for Evaluating the Environmental Effects of Radio Frequency Radiation*.
- b. A security barrier shall surround all ground mounted personal wireless service facilities.

11. Special Permit Granting Authority. The Special Permit Granting Authority for personal wireless service facilities shall be the Zoning Board of Appeals (ZBA).

12. Application Filing Requirements. The following shall be included with an application for a Special Permit for all personal wireless service facilities.

a. General Filing Requirements

- 1. Name, address and telephone number of applicants and any co-applicants as well as any agents for the applicants or co-applicants.
- 2. Co-applicants may include the landowner of the subject property, licensed carriers and tenants for the personal wireless service facility.
- 3. A licensed carrier shall either be an applicant or a co-applicant.

4. Original signatures for the applicant and all co-applicants applying for the Special Permit. If the applicant or co-applicant will be represented by an agent, original signature authorizing the agent to represent the applicant and/or co-applicant. Photo reproductions of signatures will not be accepted.

b. Location Filing Requirements

1. Identify the subject property by including the Town as well as the name of the locality, name of the nearest roads or roads and street address, if any.
2. Tax map and parcel number of subject property.
3. Zoning district designation for the subject parcel.
4. A line map to scale showing the lot lines of the subject property and the location of all buildings, including accessory structures, on all properties shown within three hundred (300) feet of the proposed wireless service facility.
5. The proposed locations of all existing and future personal wireless service facilities in the Town on a Town-wide map for this carrier.

c. Siting filing Requirements

A one-inch-equals 40 feet vicinity plan showing the following:

1. Property lines for the subject property.
2. Property lines of all properties adjacent to the subject property within three hundred (300) feet of the property line.
3. Tree cover on the subject property and adjacent properties within three hundred (300) feet of the proposed wireless service facility, by dominant species and average height, as measured by or available from a verifiable source.
4. Outline of all existing buildings, including purpose (e.g. residential building, garages, accessory structure, etc.) on subject property and all adjacent properties within three hundred (300) feet of the proposed wireless facility.
5. Proposed location of antenna, mount and equipment shelter(s).
6. Proposed security barrier, indicating type and extent as well as point of

controlled entry.

7. Location of all roads, public and private, on the subject property and on all adjacent properties within three hundred (300) feet of the proposed wireless service facility, including driveways proposed to serve the personal wireless service facility.
8. Distances, at grade, from the proposed personal wireless service facility to each building on the vicinity plan.
9. Contours at each two feet AMSL for the subject property and adjacent properties within three hundred (300) feet of the property line.
10. All proposed changes to the existing property, including grading, vegetation removal and temporary or permanent roads and driveways.
11. Representations, dimensioned and to scale, of the proposed mount, antennas, equipment shelters, cable runs, parking areas and any other construction or development attendant to the personal wireless service facility.
12. Lines representing the sight line showing viewpoint (point from which view is taken) and visible point (point being viewed from Sight Lines subsection below).

Sight lines and photographs as described below:

1. Sight line representation. A sight line representation shall be drawn from any public road within three hundred (300) feet and the closest facade of each residential building (viewpoint) within three hundred (300) feet, to the highest point (visible point) of the personal wireless service facility. Each sight line shall be depicted in profile, drawn at one-inch equals 40 feet. The profiles shall show all intervening trees and buildings. In the event there is only one (1) residential building within three hundred (300) feet, there shall be at least two (2) sight lines from the closest habitable structures or public roads, if any.
2. Existing (before condition) photographs. Each sight line shall be illustrated by one four (4) inch by six (6) inch color photograph, of what can currently be seen from any public road within three hundred (300) feet of the proposed wireless service facility.
3. Proposed (after condition) photographs. Each of the existing condition photographs shall have the proposed personal wireless service facility superimposed on it to show what will be seen from public roads if the proposed personal wireless service facility is built.

Siting elevations, or views at-grade from the north, south, east and west

for a fifty (50) foot radius round the proposed personal wireless service facility plus from all existing public and private roads that serve the subject property. Elevations shall be at either one-quarter inch equals one (1) foot or one-eighth inch equals one (1) foot scale and show the following:

1. Antennas, mounts, and equipment shelter(s), with total elevation dimensions and AGL of the highest point.
2. **Security barrier.** If the security barrier will block views of the personal wireless service facility, the barrier drawing shall be cut away to show the view behind the barrier.
3. Any and all structures on the subject property.
4. Existing trees and shrubs at current height and proposed trees and shrubs at proposed height at time of installation, with approximate elevations dimensioned.
5. Grade changes, or cuts and fills, to be shown as original grade and new grade line, with two-foot contours above mean sea level.

d. Design Filing Requirements

1. Equipment brochures for the proposed personal wireless service facility such as manufacturer's specifications or trade journal reprints shall be provided for the antennas, mounts, equipment shelters, cables as well as runs and security barrier, if any.
2. Materials of the proposed personal wireless service facility specified by generic type and specific treatment (e.g. anodized aluminum, stained wood, painted fiberglass, etc.). These shall be provided for the antennas, mounts, equipment shelters, cables as well as cable runs, and security barrier, if any.
3. Colors of the proposed personal wireless service facility represented by a color board showing actual colors proposed. Colors shall be provided for the antennas, mounts, equipment shelters, cables as well as cable runs, and security barrier, if any,
4. Dimensions of the personal wireless service facility specified for all three directions: height, width and breadth. These shall be provided for the antennas, mounts, equipment shelters and security barrier, if any.
5. Appearance shown by at least two (2) photographic superimposed of the personal wireless service facility within the subject property. The photographic superimpose shall be provided for the antennas, mounts,

equipment shelters, cables as well as cable runs, and security barrier, if any, for the total height, width and breadth.

6. Landscape plan including existing trees and shrubs and those proposed to be added, identified by size of specimen at installation and species.
 7. Within twenty-one (21) days of filing an application for a Special Permit, the applicant shall arrange for a balloon or crane test at the proposed site to illustrate the height of the proposed facility. The date, time and location of such test shall be advertised in a newspaper of general circulation in the Town at least fourteen (14) days, but not more than twenty-one (21) days prior to the test.
 8. If lighting of the site is proposed, the applicant shall submit a manufacturer's computer generated point to point printout, indicating the horizontal foot-candle levels at grade, within the property to be developed and twenty-five (25) feet beyond the property lines. The printout shall indicate the locations and types of luminous proposed.
- e. **Noise Filing Requirements.** The applicant shall provide a statement listing the existing and maximum future projected measurements of noise from the proposed personal wireless service facilities, measured in decibels (logarithmic scale, accounting for greater sensitivity at night), for the following:
1. **Existing or ambient:** the measurements of existing noise.
 2. **Existing plus proposed personal wireless service facilities:** maximum estimate of noise from the proposed personal wireless service facility plus the existing noise environment. Such statement shall be certified and signed by an acoustical engineer, stating that noise measurements are accurate and meet the Noise Standards of the bylaw.
- f. **Radio Frequency Radiation (RFR) Filing Requirements.** The applicant shall provide a statement listing the existing and maximum future projected measurements of RFR from the proposed personal wireless service facility, for the following situations:
1. **Existing or ambient:** the measurements of existing RFR.
 2. Existing plus proposed personal wireless service facilities estimate of the maximum of RFR from the proposed personal wireless service facility plus the existing RFR environment.
 3. Certification signed by an RF engineer stating that RFR measurements are accurate and meets FCC Guidelines as specified in the Radio Frequency Radiation Standards subsection of this bylaw.

4. The applicant is required to certify that it has complied with all other requirements of the FCC and FAA.

g. Federal Environmental Filing Requirements

The National Environmental Policy Act (NEPA) applies to all applications for personal wireless service facilities. The FCC via procedures adopted as Subpart 1, Section 1.1301 et seq. (47 CFR Ch administers NEPA. 1). The FCC requires that an environmental assessment (EA) be filed with the FCC prior to beginning operations for any personal wireless service facility proposed in or involving any of the following:

1. Wilderness areas
2. Wildlife preserves
3. Endangered species habitat
4. Historical site
5. Indian religious site
6. Flood Plain
7. Wetlands
8. High intensity whit lights in residential areas
9. Excessive radio frequency radiation exposure

At the time of application filing, an EA that meets FCC requirements shall be submitted to the Town for each personal wireless service facility site that requires such an EA to be submitted to the FCC.

The applicant shall list location, type and amount (including trace elements) of any materials proposed for use within the personal wireless service facility that are considered hazardous by the federal, state or local government.

h. The Zoning Board of Appeals (ZBA) may waive one or more of the application filing requirements of this section if it finds that such information is not needed for a thorough review of a proposed personal wireless service facility.

i. Co-location.

1. Licensed carriers shall share personal wireless service facilities and sites where feasible and appropriate, thereby reducing the number of personal wireless service facilities that are stand-

alone facilities. All applicants for a Special Permit for a personal wireless service facility shall demonstrate a good faith effort to co-locate with other carriers. Such good faith effort includes:

- a. A survey of all existing structures that may be feasible sites for co-locating personal wireless service facilities;
 - b. Contact with all the other licensed carriers for commercial mobile radio services operating in the Town; and
 - c. Providing information necessary to determine if co-location is feasible under the design configuration most accommodating to co-location.
 2. In the event that co-location is found to be not feasible, a written statement of the reasons shall be submitted to the Town. The Town may retain a technical expert in the field of RF engineering to verify if co-location at the site is not feasible or is feasible given the design configuration most accommodating to co-location. The cost for such a technical expert will be at the expense of the applicant. The Town may deny a Special Permit to an applicant that has not demonstrated a good faith effort to provide for co-location.
 3. If the applicant does not intend to co-locate or to permit co-location, the Town shall request drawings and studies which show the ultimate appearance and operation of the personal wireless service facility at full build out.
 4. If the Zoning Board of Appeals (ZBA) approves co-location for a personal wireless service facility site, the Special Permit shall indicate how many facilities of what type shall be permitted on that site. Facilities specified in the Special Permit approval shall require no further zoning approval. However, the addition of any facilities not specified in the approved Special Permit shall require a new Special Permit.
 5. Estimates of RFR emissions will be required for all facilities, including proposed and future facilities.
- j. **Modifications.** A modification of a personal wireless service facility may be considered equivalent to an application for a new personal wireless service facility and require a Special Permit when the following events apply:
1. The applicant and/or co-applicant wants to alter the terms of the Special Permit by changing the personal wireless service

facility in one or more of the following ways:

- a. Change in the number of facilities permitted on the site.
 - b. Change in technology used for the personal wireless service facility.
 - c. Additional equipment shelter.
2. If the applicant and/or co-applicant would like to add any equipment or additional height not specified in the original design filing.

k. Monitoring and Maintenance

1. Within ninety (90) days of the beginning of operations, and annually thereafter, the applicant shall submit measurements of RFR from the personal wireless service facility and copies to be submitted to the Town of Hanson. Such measurements shall be signed and certified by a RF engineer, stating that RFR measurements are accurate and meet FCC Guidelines as specified in the Radio Frequency Standards section of this bylaw.
2. The applicant and co-applicants shall maintain the personal wireless service facility in good condition. Such maintenance shall include, but shall not be limited to, painting, structural integrity of the mount and security barrier and maintenance of the buffer areas and landscaping.

l. Abandonment or Discontinuation of Use

1. At such time that a licensed carrier plans to abandon or discontinue operation of a personal wireless service facility, such carrier will notify the Town by certified U.S. mail of the proposed date of abandonment or discontinuation of operations. Such notice shall be given no less than thirty (30) days prior to abandonment or discontinuation of operations. In the event that a licensed carrier fails to give such notice, the personal wireless service facility shall be considered abandoned upon such discontinuation of operations.
2. Upon abandonment or discontinuation of use, the carrier shall physically remove the personal wireless service facility within ninety (90) days from the date of abandonment or discontinuation of use. Physically remove shall include, but not be limited to:

- a. Removal of antennas, mounts and equipment shelters and security barriers from the subject property.
 - b. Proper disposal of the waste materials from the site in accordance with local and state solid waste disposal regulations.
 - c. Restoring the location of the personal wireless service facility to its natural condition, except that any landscaping and grading shall remain in the after condition.
3. If a carrier fails to remove a personal wireless service facility in accordance with this section of this bylaw, the Town shall have the authority to enter the subject property and physically remove the facility. The Zoning Board of Appeals (ZBA) shall require the applicant to post a bond at the time of construction to cover costs for removal of the personal wireless service facility in the event the Town must remove the facility.

m. Reconstruction or Replacement of Existing Towers and Monopoles.

Guyed towers, lattice towers, utility towers and monopoles in existence at the time of adoption of this bylaw may be reconstructed, altered, extended or replaced on the same site by Special Permit, provided that the Zoning Board of Appeals (ZBA) finds that such reconstruction, alteration, extension or replacement will not be substantially more detrimental to the neighborhood and/or the Town than the existing structure. In making such a determination, the ZBA shall consider whether the proposed reconstruction, alteration, extension or replacement will create public benefits such as opportunities for co-location, improvements in public safety, and/or reduction in visual and environmental impacts. No reconstruction, alteration, extension or replacement shall exceed the height of the existing facility by more than twenty (20) feet not to exceed the one hundred fifty (150) feet permitted in Section 6.(d).

- 1. The Zoning Board of Appeals will need to justify any decision not to grant a permit, in writing.
- 2. **Term of Special Permit.** A Special Permit issued for any personal wireless service facility over fifty (50) feet in height shall be valid for twenty (20) years. At the end of that time period, the personal wireless service facility shall be removed by the carrier or a new Special Permit shall be required.
- 3. No towers shall be constructed closer than 5,280 feet (one mile) to another existing tower.

DEFINITIONS

ABOVE GROUND LEVEL (AGL) - A measurement of height from the natural grade of a site to the highest point of a structure.

ANTENNA - The surface from which wireless radio signals are sent and received by a personal wireless service facility.

CAMOUFLAGED - A personal wireless service facility that is disguised, hidden, part of an existing or proposed structure or placed within an existing or proposed structure is considered "camouflaged."

CARRIER - A company that provides wireless services.

CO-LOCATION - The use of a single mount on the ground by more than one carrier (vertical co-location) and/or several mounts on an existing building or structure by more than one carrier.

CROSS-POLARIZED (OR DUAL-POLARIZED) ANTENNA - A low mount that has three (3) panels, flush mounted or attached very close to the shaft.

ELEVATION (AMSL) - The measurement of height above sea level.

ENVIRONMENTAL ASSESSMENT (EA) - An EA is the document required by the Federal Communications Commission (FCC) and the National Environmental Policy Act (NEPA) when a personal wireless service facility is placed in certain designated areas.

EQUIPMENT SHELTER - An enclosed structure, cabinet, shed, or box at the base of the mount within which are housed batteries and electrical equipment.

FALL ZONE - The area on the ground within a prescribed radius from the base of a personal wireless service facility. The fall zone is the area within which there is a potential hazard from falling debris (such as ice) or collapsing material.

FUNCTIONALLY EQUIVALENT SERVICES - Cellular, Personal Communication Services (PCS), Enhanced Special Mobile Radio, Specialized Mobile Radio and Paging.

GUYED TOWER - A monopole or lattice tower that is tied to the Ground or other surface by diagonal cables.

LATTICE TOWER - A type of mount that is self-supporting with multiple legs and cross bracing of structural steel.

LICENSED CARRIER - A company authorized by the FCC to construct and operate a commercial mobile radio services system.

MONOPOLE - The type of mount that is self-supporting with a single shaft of wood, steel or concrete and a platform (or racks) for panel antennas arrayed at the top.

MOUNT - The structure or surface upon which antennas are mounted, including the following four types of mounts:

1. **Roof Mounted** - Mounted on the roof of a building
2. **Side Mounted** - Mounted on the side of a building
3. **Ground Mounted** - Mounted on the ground
4. **Structure Mounted** - Mounted on a structure other than a building

OMNIDIRECTIONAL (WHIP) ANTENNA - A thin rod that beams and receives a signal in all directions.

PANEL ANTENNA - A flat surface antenna usually developed in multiples.

PERSONAL WIRELESS SERVICE FACILITY - Facility for the provision of personal wireless services, as defined by the Telecommunications Act.

PERSONAL WIRELESS SERVICES - The three (3) types of services regulated by this bylaw.

RADIO FREQUENCY (RF) ENGINEER - An engineer specializing in electrical or microwave engineering, especially the study of radio frequencies.

RADIO FREQUENCY RADIATION (RFR) - The emissions from personal wireless service facilities.

SECURITY BARRIER - A locked, impenetrable wall, fence or berm that completely seals an area from unauthorized entry or trespass.

SEPARATION - The distance between one carrier's array of antennas and another carrier's array of antennas. (10/1998)