Telecommunications Antennae and Support Structures

Guidelines for Planning Authorities

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AND LOCAL GOVERNMENT

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Contents

CONTEXT

1.1 Scope

These Guidelines deal with those telecommunications installations which form part of the requirements for licensed, public mobile telephony and which are considered to be development in accordance with the Planning and Developments Acts.

They deal with the antennae required for receiving and transmitting telephony signals, the support structures for these antennae, the associated "buildings" and radio equipment containers, together with other ancillary requirements such as poles and cable for the provision of electric current to the site or base station. The also deal with access roads to base stations.

Planning authorities have a duty under the Local Government Act, 1991, in the performance of their functions under any enactment, to have regard to policies and objectives of the Government or any Minister in so far as they may affect or relate to their functions. Government policy on the availability of top quality telecommunications services throughout the State should, therefore, be taken into consideration.

Operators of broadcast VHF and fixed radio link installations which support the mobile radio requirements of the emergency services, should, where applicable, take cognisance of the Guidelines.

1.2National Policy Issues

The Government's telecommunications policy aims to place Ireland in the top quartile of OECD economies as regards the availability, price and quality of telecommunications services in order to promote industrial and commercial development, to improve personal and household security and to enhance social exchange and mobility.

Following a competitive application process the Government has issued a licence to Esat Digifone to provide GSM (global systems for mobile) mobile telephone services. Eircell, a subsidiary of Telecom Eireann, already provides mobile telephone services (both analogue and digital) in Ireland. Both operators are obliged to provide GSM coverage to 90% of the population within four years. The Government has emphasised throughout that both GSM operators are treated in an even-handed fashion, so that the rules of fairness apply and are seen to apply.

National policy requires that all development should conform to the concept of environmental sustainability, meeting socio-economic objectives while conserving the natural resources upon which development ultimately depends. A National Sustainable Development Strategy is being prepared to carry consideration for the environment into all areas of Government policy. Areas legally designated for environmental conservation must be given the required protection when considering planning applications for mobile telephony infrastructure. Accordingly, fragile landscapes have to be treated sensitively, scenic views preserved, archaeological/geological sites and monuments and buildings of historical and architectural interest protected and sacred areas respected.

These considerations demand that the fullest attention is paid to the location of masts by operators and planning authorities. In addition, in order to avoid an unnecessary proliferation of masts, owners (i.e. those controlling access to support structures and masts) would be expected to facilitate co-location of antennae with other operators. Owners and operators will be expected to respond to requests for sharing in a timely, fair and reasonable manner. Accordingly, where the existing site operator/owner considers it is technically possible and where sharing would not preclude the parties from foreseeable future development on the shared facility, planning authorities should encourage co-location of antennae on existing support structures and masts.

1.3 Aim

While the provision and updating of a modern mobile telephony system is part of the national development infrastructure, planning decisions regarding the installation of

base stations and other equipment are taken at a local level. The aim of these Guidelines is to provide relevant technical information in relation to these installations and to offer general guidance on planning issues so that the environmental impact is minimised and a consistent approach is adopted by the various planning authorities in the preparation of their development plans and in the operation of development control. The guidelines are also intended to be of assistance to operators and to the general public.

2.TECHNICAL INFORMATION/DESCRIPTIONS

2.1General

Public cellular mobile telephone systems are an efficient method of providing a mobile telephone service. The user's mobile phone is connected by a two way radio channel to the nearest base station. Base stations are installed in a grid pattern enabling an efficient frequency reuse scheme to be implemented while using the limited frequency spectrum assigned for the service. The base stations are connected by means of leased lines, radio, optic fibre, coaxial cable, etc. to an exchange system which allows communications into the fixed network or onwards to other mobile phone users.

At present there are two systems in operation in Ireland – analogue and digital. The analogue system is the older of the two and is operated exclusively by Eircell Telecom Eireann. The digital system, known as GSM, is also operated by Eircell Telecom Eireann side by side with its analogue system. A second operator, ESAT Digifone will operate exclusively on the GSM system and will compete with Telecom Eireann. Both systems use frequencies around 900 Mhz and optimum coverage obtains when there is line of sight. However, under certain limited conditions, use can also be made of reflected signal.

2.2The Cell

The coverage area of one transmitter/receiver base station is commonly known as a cell. In reality cells are not uniform and the diameter of a cell can vary from 0.5km to 70km. Sites can be at the intersection of three cells or at the centre of a cell.

In urban environments the cells tend to be very small, and the radio frequencies are reused more often. The reason for this is that the capacity of the network required in urban areas is much greater than in rural areas. The antennae associated with small cells are generally mounted on low support structures or on buildings. Larger cells are generally used in rural areas where coverage rather than capacity is the critical requirement. Higher masts are usually required in rural areas. The base stations or cells are arranged in a grid pattern and a mobile user in a car will be switched from one cell to another. (See illustration in Appendix 1). The principal reasons for variation in cell configuration are:

- the nature of the terrain: mountainous or hilly terrain or built up urban "clutter" are not favourable to radio transmissions so a greater number of base stations may be required,

- numbers of actual or potential users of the system, this will apply principally in urban areas; in practice, each installation can only cater for up to forty calls simultaneously and where more are likely to occur additional base stations have to be installed,

- radio spectrum can be seen as a natural resource and a licence fee is paid for every frequency required by the mobile operator; hence the same radio frequencies are reused within the system, but these cannot be in immediately adjoining cells. As a consequence, sites are sometimes chosen to restrict signal dispersion and concentrate it into a local area thus avoiding overspill and the interference which this would cause.

2.3.1 Antennae

It has been estimated that, in order to complete their respective networks, and to meet the national coverage requirement of the licence conditions, operators will, between them, require an approximate total of 600 to 700 base stations. Not all of these arrays of antennae will require separate, ad hoc support structures as many of them may well be mounted on buildings or other tall structures in urban or suburban areas.

A number of these base stations are already in existence and a further number have been commenced under the terms of Article 9 of the Local Government (Planning and Development) Regulations, 1994.

Essential to the base stations are the antennae. Typically for a GSM system nine such antennae are required per station.

They are arranged in three groups of three, on the sides of an equilateral triangle, each group giving 120 degree coverage. In order to cater for both GSM and analogue users (Telecom Eireann only) a fourth antenna (transmitting) is required on each array. The antenna type is chosen to provide coverage of the surrounding area using a directional beam.

The antennae described above would be typically 2000mm to 1200mm in length x 300mm in width x 170mm in depth. Other smaller and less elaborate arrangements are possible in urban areas or in particular "end of line" locations in rural areas. (See Appendix 1A)

The outer two antennae on each array are receivers (i.e. passive) and in the case of Telecom Eireann they both may be used for the analogue and digital systems. To facilitate better reception, they are mounted at a distance of between 4000mm and 5000mm horizontally one from the other. The central antenna transmits and in the case of Telecom Eireann there may be two central antennae, one for the analogue and one for the digital system. In the case of an antennae support structure shared by Telecom Eireann and Esat Digifone and fully equipped (3 sectors), there would be a total of twenty one antennae mounted on the structure, excluding additional antennae for point to point radio links. (See Appendix 1B)

In urban areas (centre city) these antennae can generally be mounted on buildings or other structures. In rural areas, and in many suburban situations, because of the low rise nature of most of our suburban buildings and structures a supporting mast or tower is needed. As technology develops, the number and size of antennae may change, becoming more efficient and less obtrusive.

2.3.2 Masts – Support Structures

As has been pointed out in the previous paragraph, in urban areas the antennae can be mounted on tall buildings – either on roof tops or otherwise – in suburban and rural areas the arrays of antennae are mounted on free standing support structures or masts. In both rural and urban areas a supporting mast or tower is almost always necessary where microwave drum antennae are required (see final paragraph under this heading).

The height of these structures, when the requirements of the backbone network are taken into account, can range from 12m to 60m though most typically they will be between 20m and 40m. They are normally fixed to reinforced concrete raft foundations, will incorporate ladder and anti-climbing devices and suitable arrangements for bringing cables from antennae to an equipment cabinet. The height will be a function of the terrain, the cell size and coverage requirements and it should be noted that there is a trade-off between the height of any given mast and the number of masts required for network coverage. Both the antennae and the support structures can be finished in various colours. The most usual support structure will be a tripod lattice construction. Such support structures will typically measure up to 4m at the base and the antennae are mounted on platforms at the top, as described in the previous paragraph. It should be noted, however, that (for GSM systems) newer type towers measuring approximately 1.7m at the base are now becoming available. The configuration of the antennae can also be reduced to two on each side of the tower, reducing the total number of antennae to six. (See Appendix 1C) One of these antennae acts simultaneously as both receiver and transmitter. In some instances a single mast may be sufficient but where it is stayed it will require larger sites to contain staying anchorage points. (See illustrations at Appendix 1D)

For the point to point radio links connecting the base stations to the backbone network, the nature of the link transmission is such that any movement of the transmitter/receiver dishes greater than 0.5 degrees could result in loss of signal. The design of the antennae support structures must ensure the elimination of such movement. In addition, high capacity point to point radio links are required for the backbone network with large microwave drum antennae requiring more robust structures, and in general square towers. Initially all of Esat Digifone's backbone network will be constructed using point to point radio links.

2.3.3 Radio Equipment Containers

The associated radio equipment is normally housed in a cabinet, rectangular box container (approximately $85m^3$ to $100m^3$). This in turn may be in a building which also includes other items. Improved technology has already considerably reduced the size of radio equipment. The complete site would then measure, typically 25m x 25m. (See Appendix 1E)

2.3.4 Other

Sites should be surrounded by safety fencing and the masts/towers should be equipped with lockable trap-doors or other anti-climbing devices. However, in some cases, for example, where a single steel pole is used, safety fencing may not be required. Electrical power (equivalent to ordinary domestic power supply) will, depending on the location, be delivered to the site on poles. In order to avoid the additional visual intrusion of poles, ducting in the immediate vicinity of the base station should be considered. Access to the mast and equipment will be through a gate in the perimeter fence and access to the site itself will be dependent on the site location.

2.4 Summary of Technical Requirements

From the operator's point of view, each base station site will be chosen because it gives good quality coverage over maximum area and because it can be integrated with the other base stations of the network. The following considerations will have to be taken into account.

2.4.1 Topography and population density will dictate to a large extent the location of the base station. While each base station has its own locational requirements it must also fit into the national network. Base stations have been described as pieces of a jigsaw puzzle. For this reason, there may not always be great flexibility regarding a given location. Where substantial local flexibility is required it may mean moving other sites in the network or providing additional alternative base stations. However, some flexibility should almost always be available.

2.4.2 The height and structural rigidity of the supporting towers (and in some instances the dimensions of the antennae themselves) will normally be dictated by the requirements of the radio parameters, the coverage and the projected number of actual or potential customers. In some instances there is a possible trade-off between the height of a given structure and the number of structures required. Thus, as a general principle, the higher the support structures the lesser the number of base stations required in order to provide radio coverage for a given area. However, whatever the height of the structure may be, the base station will be limited by its capacity (the number of calls which can be dealt with simultaneously). Therefore an adequate number of base stations must be provided in order to meet capacity requirements.

The structural stiffness/rigidity, load bearing capacity and wind loading will be a function of engineering criteria. Special attention to rigidity will be required in the case of point to point radio links. Because of the nature of the beam and the strict line of sight requirement from one antenna to the next, very minute movement (> 0.5 of a degree) could result in loss of signal.

In some instances it may be technically possible for operators to share facilities or indeed to share with other owners of antennae support structures. Sharing will give rise to higher and stronger structures. Where masts are to be shared arrangements must be put in place for security, access onto the mast, joint inspections and maintenance regimes, prior agreements on financial and leasing arrangements.

3. Telecommunications and the Development Plan

3.1 Each planning authority's development plan should include in relation to those telecommunications installations which form part of the requirements for public mobile telephony. Where planning authorities have recently adopted a new or revised development plan, rather than wait for the next review, a variation of their existing plan should be considered.

3.2 The policy statement should include the following:

- acceptance of the importance of a high quality telecommunications service taking into account both National and regional considerations,

- in considering locational requirements, the authority should take into account certain factors such as population centres, the number and importance of road networks traversing the authority's area, plans for the development of these networks, including any future by-passes,

- an authority should also indicate any locations where, for various reasons, telecommunications installations would not be favoured or where special conditions would apply. Such locations might include, for example, lands whose high amenity value is already recognised in the development plan or sites beside schools which might give rise to local concerns,

- general indications as to the authority's requirements in relation to:

  - pre-planning discussions

  - siting and design

  - visual amenity and access roads

  - possible sharing of installations

  - health and safety aspects

4. Development Control and Telecommunications

4.1 Pre-Planning Discussions

Planning authorities should encourage and facilitate pre-planning discussions with operators. Operators should in turn keep authorities informed of their plans and should provide outline visual analysis of proposed sites at pre-planning discussions. Topics which might be usefully raised with the operator at these discussions would include the following:

- any prior consultations which the applicant may have had with the other questions/mast owners,

- the number of existing masts and the stage of development of structures commenced in accordance with Article 9 (1)(b) of the Local Government (Planning and Development) Regulations 1994. (It should be noted that Class 29(h) of the Second Schedule to the Regulations does not exempt antennae and support structures for licensed public mobile telecommunications networks).

4.2 Design and Siting

The design of the antennae support structure and to a great extent of the antennae and other "dishes" will be dictated by radio and engineering parameters. There may be only limited scope in requesting changes in design. However, the applicant should be asked to explore the possibilities of using other available designs where these might be an improvement. Similarly, location will be substantially influenced by radio engineering factors. In endeavouring to achieve a balance some of the considerations which follow are relevant.

4.3 Visual Impact

The visual impact is among the more important considerations which have to be taken into account in arriving at a decision on a particular application. In most cases the applicant will only have limited flexibility as regards location, given the

- longer term plans of the operator in relation to masts within the jurisdiction of the authority,

with the general context of the proposed development. Consequently the approach of the authority will vary depending on whether the proposed development is in:

constraints arising from radio planning parameters, etc., already referred to. Visual impact will, by definition, vary

- a rural/agricultural area
- an upland/hilly, mountainous area
- a smaller settlement/village
- an industrial area/industrially zoned land
- as suburban area
- a larger town or city

Whatever the general visual context, great care will have to be taken when dealing with fragile or sensitive landscapes, with other areas designated or scheduled under planning and other legislation, for example, Special Amenity Areas, Special Protection Areas, the proposed Natural Heritage Areas and Special Areas of Conservation and National Parks. Proximity to listed buildings, archaeological sites and other monuments should be avoided.

In rural areas towers and masts can be placed in forestry plantations provided of course that the antennae are clear of obstructions. This will involve clearing of the site but in the overall will reduce visual intrusion. Softening of the visual impact can be achieved through judicious choice of colour scheme and through the planting of shrubs, trees etc as a screen or backdrop.

Some masts will remain quite noticeable in spite of the best precautions. The following considerations may need to be

taken into account:

- Along major roads or tourist routes, or viewed from traditional walking routes, masts may be visible but yet are not terminating views. In such cases it might be decided that the impact is not seriously detrimental

- Similarly along such routes, views of the mast may be intermittent and incidental, in that for most of the time viewers may not be facing the mast. In these circumstances, while the mast may be visible or noticeable, it may not intrude overly on the general view of prospect

- There will be local factors which have to be taken into account in determining the extent to which an object is noticeable or intrusive – intermediate objects (buildings or trees), topography, the scale of the object in the wider landscape, the multiplicity of other objects in the wider panorama, the position of the object with respect to the skyline, weather and lighting conditions, etc.

In upland/mountainous areas hilltops will be favoured by operators as offering the best location from the point of view of radio coverage. Masts on hilltops will by definition remain visible. Yet, if an authority were to rule out every hilltop as a possible location, the consequence would be that the operator might not be able to service the area or that a number of structures might be required to provide the same level of service. In the latter case visual intrusion might be increased rather than diminished. Where there is an existing mast every effort should be made to share it provided the shared mast is not itself unduly obtrusive. If this is the case, clustering may be more acceptable. However, for transmission reasons, clustering on hilltops may not always provide a solution.

Only as a last resort should free-standing masts be located within or in the immediate surrounds of smaller towns or villages. If such location should become necessary, sites already developed for utilities should be considered and masts and antennae should be designed and adapted for the specific location. The support structure should be kept to the minimum height consistent with effective operation.

In the vicinity of larger towns and in city suburbs operators should endeavour to locate in industrial estates or in industrially zoned land. The possibilities offered by some commercial or retail areas should be explored whether as rooftop locations or by way of locating “disguised” masts. It should also be noted that substations operated by the ESB may be suitable for the location of antennae support structures. This possibility should also be investigated. In urban and suburban areas the use of tall buildings or other existing structures is always preferable to the construction of an independent antennae support structure. In urban areas the need for increased numbers of cells to cater for customer growth will lead more and more to the subdivision of existing cells and, in some instances to the introduction of “microcell” technology. Microcells will normally have their antennae located below roof level and will serve a very specific building (shopping centre, tunnel etc.) or be used to boost a weak signal. Microcells are not an alternative to normal cells.

Only as a last resort and if the alternatives suggested in the previous paragraph are either unavailable or unsuitable should free-standing masts be located in a residential area or beside schools. If such a location should become necessary, sites already developed for utilities should be considered and masts and antennae should be designed and adapted for the specific location. The support structure should be kept to the minimum height consistent with effective operation and should be monopole (or poles) rather than a latticed tripod or square structure.

4.4 Access Roads and Poles

An access road may sometimes cause greater visual impact than the actual installation. It may further open up an otherwise undisturbed area to unwanted visitors. Consequently access roads should be permitted only where they are absolutely necessary and great care should be taken that they will not appear as a scar on a hillside. It should normally be a condition of permission that such roads are

grubbed up at the end of the construction period. In exceptional circumstances, the planning authority should consider requiring the use of a helicopter for the construction and installation of base stations. Similarly, timber poles should as far as possible follow the line of ground contours and, where underground ducting is possible, it should be maximised.

4.5 Sharing Facilities and Clustering

Sharing of installations (antennae support structures) will normally reduce the visual impact on the landscape. The potential for concluding sharing agreements is greatest in the case of new structures when foreseeable technical requirements can be included at the design stage. All applicants will be encouraged to share and will have to satisfy the authority that they have made a reasonable effort to share. Where the sharing of masts or towers occurs each operator may want separate buildings/cabinets. The matter of sharing is probably best dealt with in pre-planning discussions.

Where it is not possible to share a support structure the applicant should, where possible, be encouraged to share a site or to site adjacently so that masts and antennae may be clustered. On hill tops clustering may not offer any improvement from the point of view of visual intrusion but in urban or suburban areas use of the same structure or building by competing operators will almost always improve the situation.

Support structures used by emergency or other essential services are not suitable for sharing with public mobile telephone services.

4.6 Health and Safety Aspects

A statement on health and safety aspects, agreed by the Departments of Health and Transport, Energy and Communications with the Department of the Environment for inclusion as an Appendix to the Guidelines is set out in Appendix II.

As part of their planning application operators should be required to furnish a statement of compliance with the International Radiation Protection Association (IRPA) Guidelines (Health Physics, Vol. 54, No. 1 (Jan) 1988) or the equivalent European Pre-standard 50166-2 which has been conditioned by the licensing arrangements with the Department of Transport, Energy and Communications and to furnish evidence that an installation of the type applied for complies with the above guidelines. Where the applicant proposes to share an existing mast or to enter a clustering arrangement on an existing site a statement from the owner/landlord of the mast or site that the shared mast or cluster will continue to operate under the guidelines applicable to it should be presented to the planning authority.

Legislation is to be enacted by the Department of Transport, Energy and Communications later this year setting up an independent regulator for the telecommunications sector. It is envisaged that, as part of this legislation, the regulator will be specifically required to arrange for monitoring, on a nationwide basis, of emissions of non-ionising radiation from mobile telephone base station towers and MMDS masts.

Furthermore, as part of the licensing framework being developed by the Minister for Transport, Energy and Communications in relation to mobile telephony, operators are now being required to comply with the relevant international standards in relation to emissions of non-ionising radiation from telecommunications antennae.

Accordingly, planning authorities should not include monitoring arrangements as part of planning permission conditions. Operators should comply with all requests for information relating to the technical operation of base stations and should facilitate access to base stations by duly authorised members of the monitoring body.

The safety aspects of the antennae and support structures will, unless perhaps in the case of ground-mounted single poles, stayed or otherwise, involve fencing of the site, anti-climbing devices and proper ducting and insulation measures for

cables. It is unlikely that entrance and exit from the site will give rise to traffic hazards as maintenance visits should not be more than quarterly. During the construction period, depending on the location of the site, special precautions may have to be taken in relation to traffic.

The allocation of radio frequencies and the operational conditions in the licensing arrangements will normally take care of the question of radio interference. All matters relating to possible radio interference in respect of emergency or other services are dealt with by the Department of Transport, Energy and Communications.

In the vicinity of airports, the Irish Aviation Authority (or, if relevant, the Department of Defence) should be given an opportunity to comment on the application from the point of view of location, height-obstruction, painting and illumination.

Adequate clearance between structures and overhead power lines, as specified by the electricity undertaker, should be provided. It should be noted that there is a statutory obligation to notify the ESB of proposed development within 25 yards of any ESB distribution/transmission line.

The Department of Defence should be given an opportunity to comment on the application from the point of view of security where the site of the proposed mast adjoins land or property owned or administered by that Department.

4.7 Obsolete Structures

When the antennae and their support structures are no longer being used by the original operator and no new user has been identified they should be demolished, removed and the site re-instated at the operators' expense. This should be a condition of permission and the authority should consider a bonding arrangement to this effect. An owner or operator of a site may of course dispose of the site to another suitably licensed operator. In addition to whatever other notification requirements would arise from this transfer, the original owner/ operator should be required to inform the planning authority of such transfer so that the authority may be in a position to readily enforce any continuing conditions on the new operator.

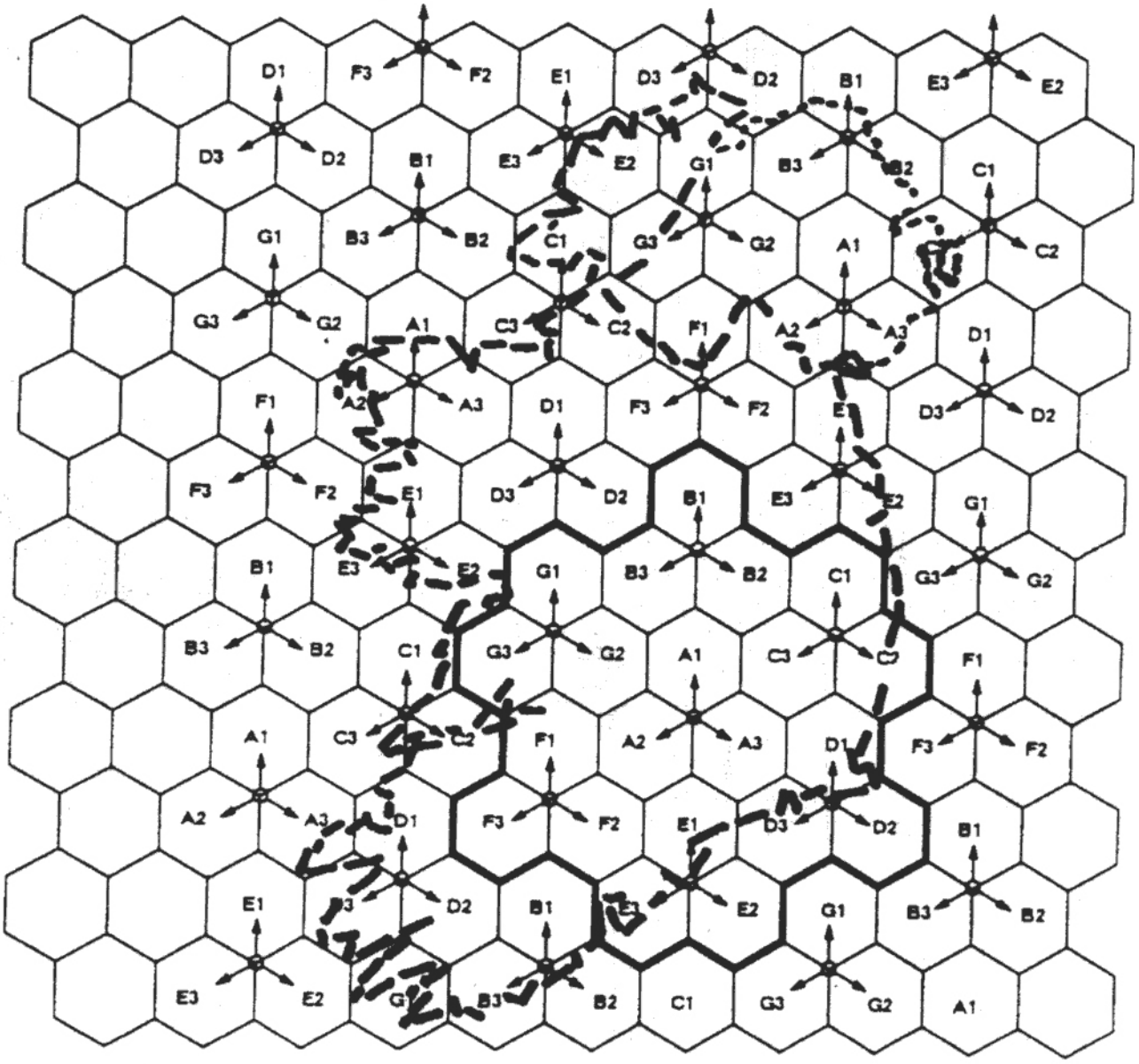
4.8 Duration of Permission – Temporary Permissions

Because of the relatively high installation costs of each base station and because of the integrated nature of the network it would appear that temporary, relatively short term permissions of one or two years duration should be avoided. However for special, once-off events, where appropriate, a temporary permission of two or three months duration may be considered. Permissions should take cognisance of the duration of the licensing arrangements.

Nevertheless, it would appear that, because of rapid changes in the technology and design of the radio equipment and

antennae and because of current indications of possible changes in the design of support structures, permissions should normally be granted for five years the period to be calculated as the time during which the appliances would be operational. Retention of the base stations at the end of the five year period would then be conditional on the replacement of obsolescent technology with more modern, environment friendly designs where these have become available, where they are commercially viable and where they would allow the base station to continue to operate within the standards set out in the licensing arrangements, or in the original planning permission or within more stringent or other standards if these are considered more desirable at the time.

APPENDIX 1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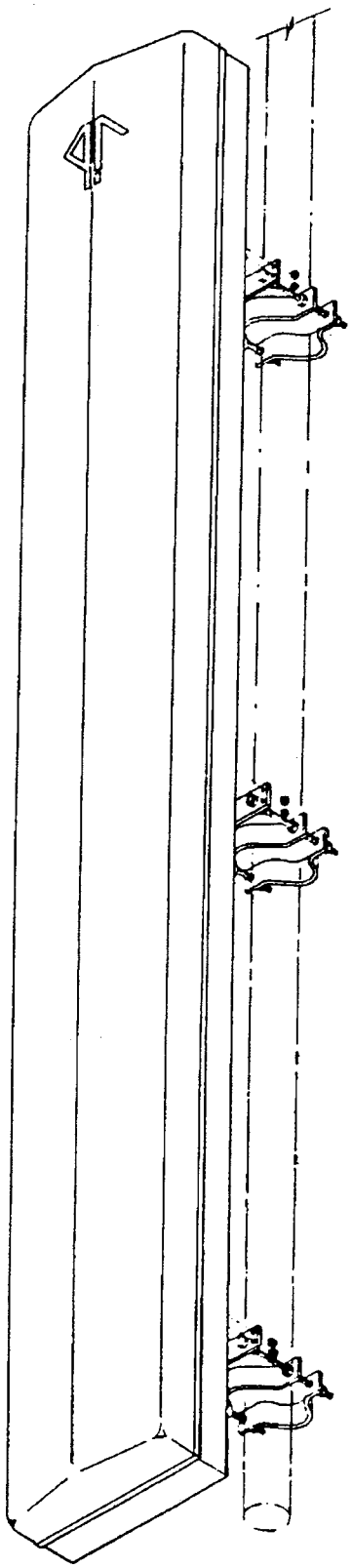
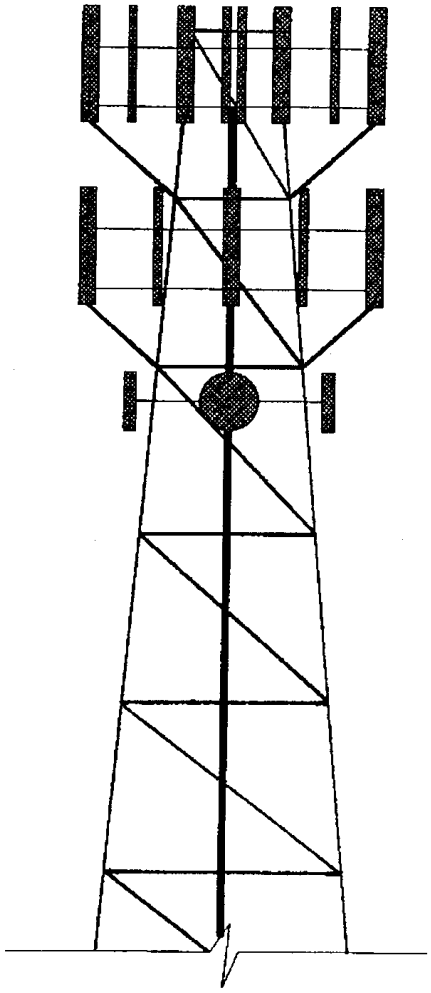
F1 A2 A3 D1 F3 F2 E1 D3 D2
F3 F2 E1 D3 D2 B1 E3 E2 G1
B1 E3 E2 G1 B3 B2 C1 G3 G2
B3 B2 C1 G3 G2 A1 C3 C2 F1
A1 C3 C2 F1 A2 A3 D1 F3 F2
A2 A3 D1 F3 F2 E1 D3 D2 B1
E1 D3 D2 B1 E3 E2 G1 B3 B2
E3 E2 G1 B3 B2 C1 G3 G2 A1

Division into cell pattern facilitates reuse of frequencies but never in adjoining cells. In reality cells are not regular in shape and they vary in size.

APPENDIX 1A



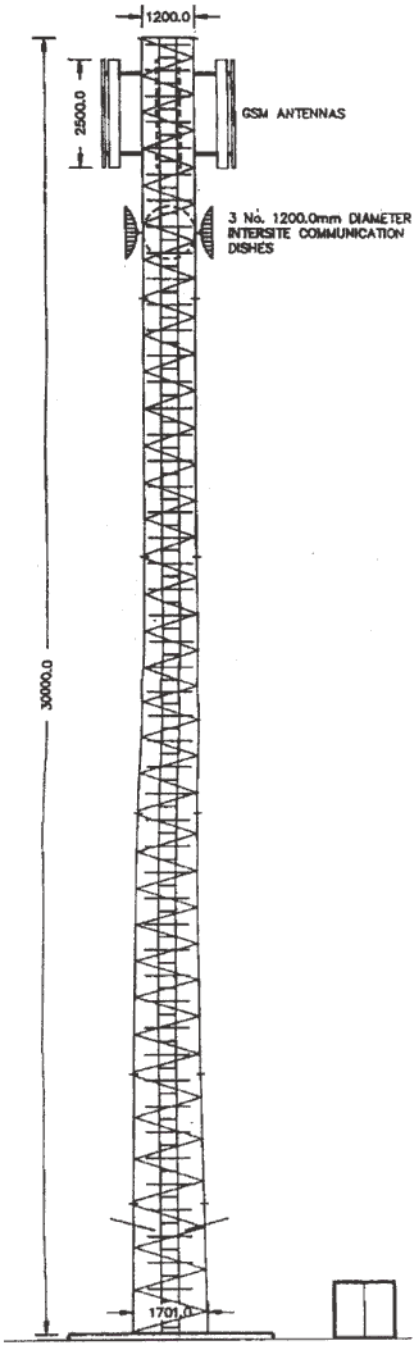
APPENDIX 1B



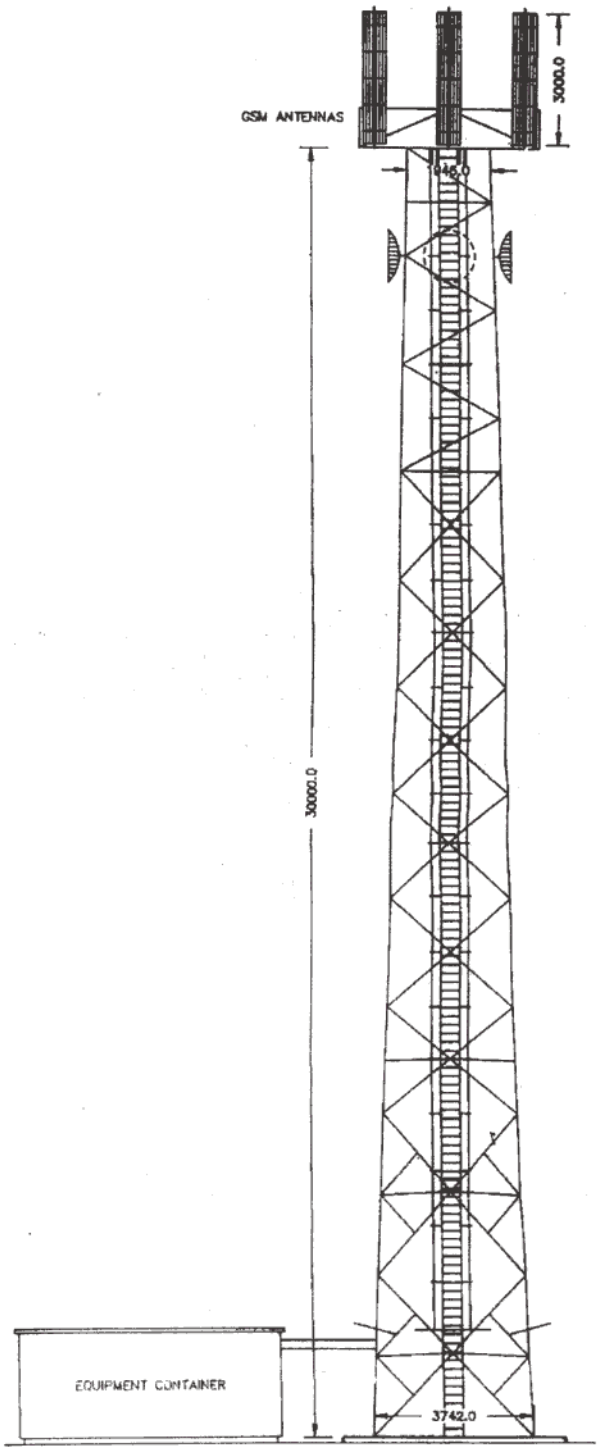
The visual impact of a shared structure should be carefully considered. In addition to the increased number of antennae the height, width and bulk of the structure and of the structural members will be increased. Cable trays to cater for at least 21 cables will be

required.

APPENDIX 1C

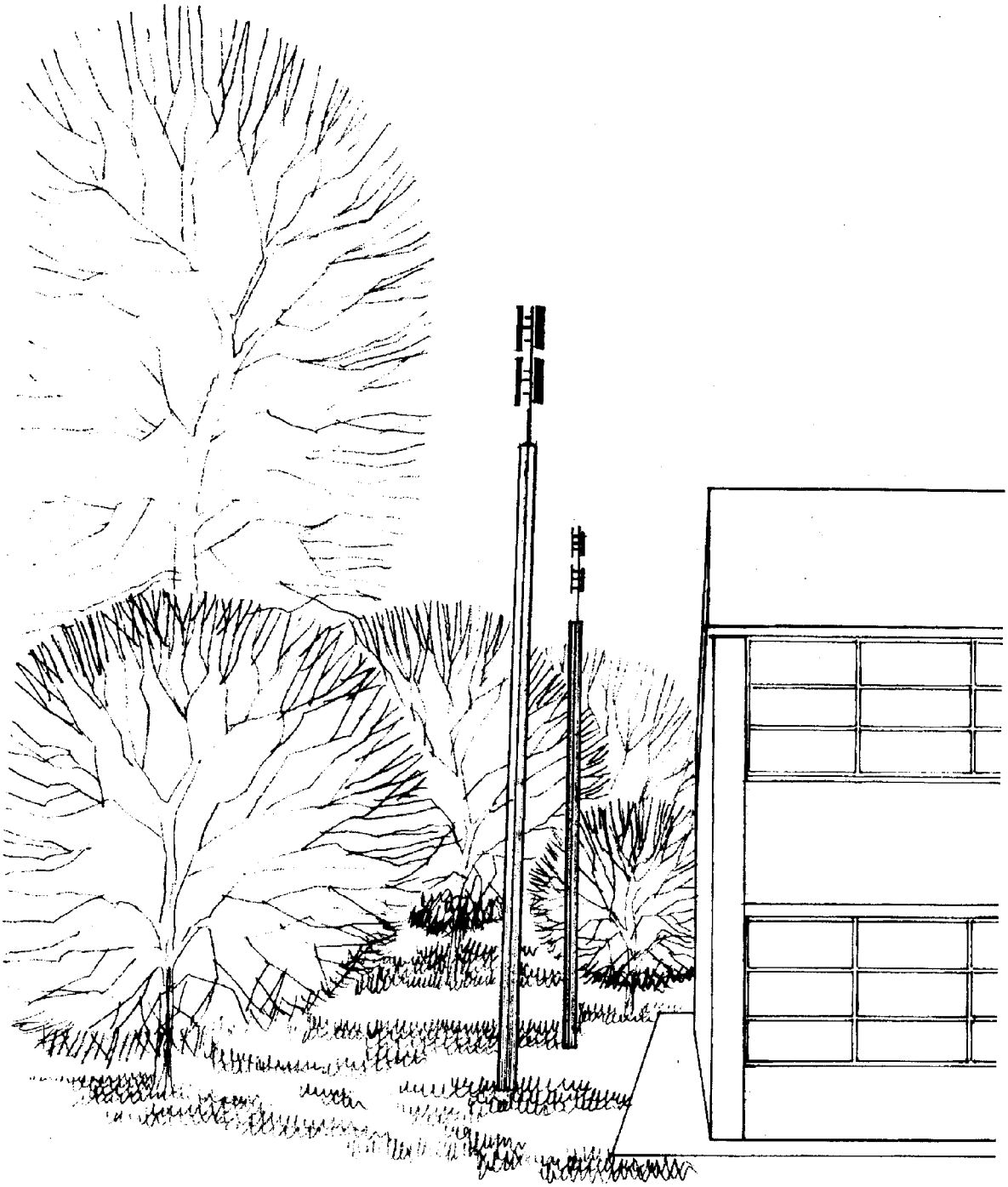


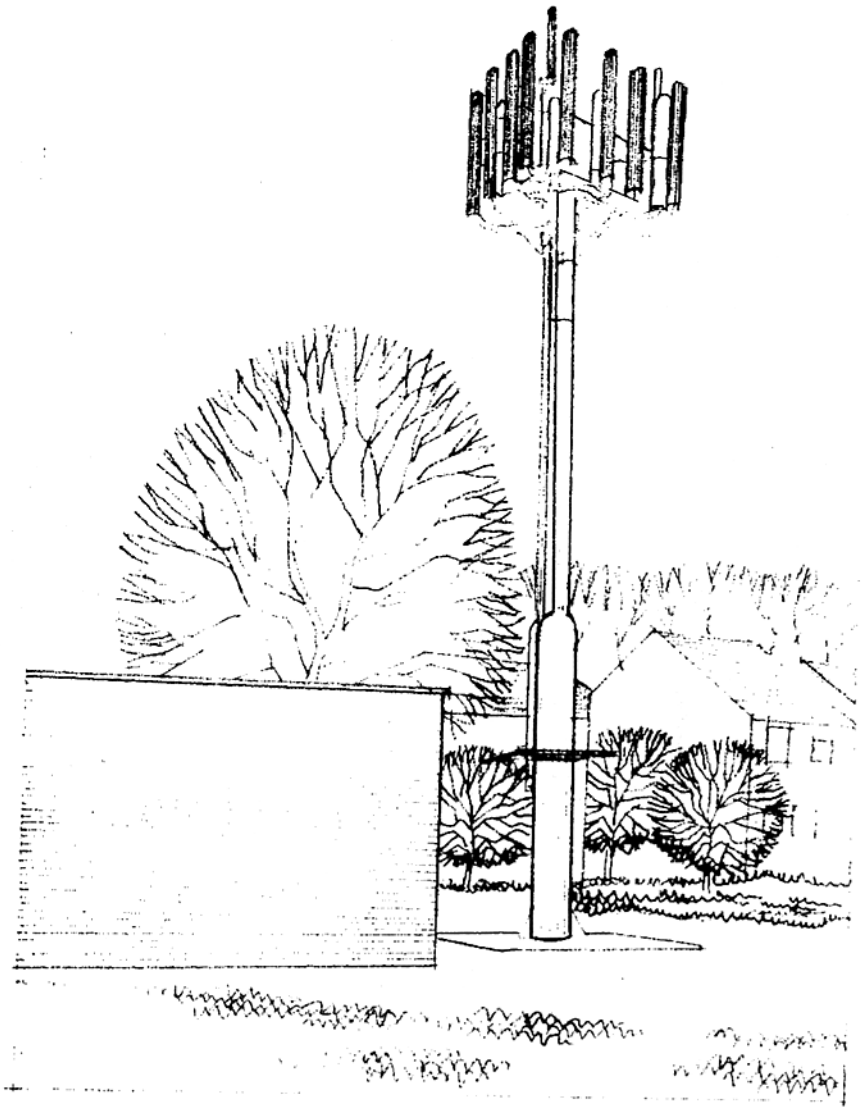
Newer type (GSM)



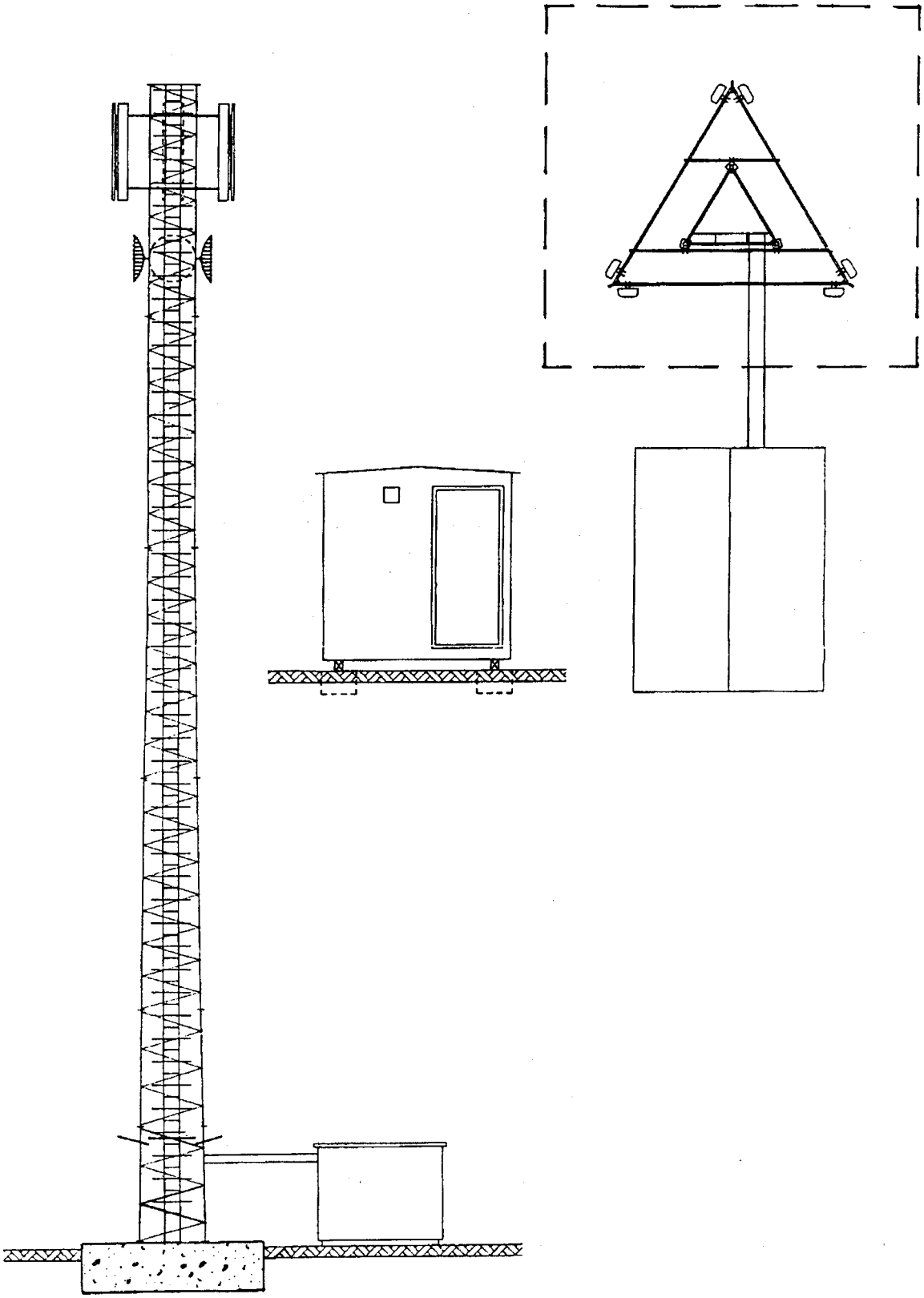
More traditional type

APPENDIX 1D





APPENDIX 1E



APPENDIX II

HEALTH AND SAFETY ASPECTS

Statement on health and safety aspects, agreed by the Department of Health and Transport, Energy and Communications with the Department of the Environment for inclusion as an Appendix to the Guidelines.

The rapid expansion of mobile telephone services in Ireland has required the construction of base station towers in urban and rural areas across the country. These base station towers are an essential feature of all modern telecommunications networks. They facilitate calls between mobile phone users and enable users of conventional telephones to place and receive calls from portable units.

Concern has been expressed that the radio signals from these base station towers may be a hazard to health. The basis for this concern is that the signals from these towers are a form of non-ionising radiation. It is claimed, that some scientific studies have shown an association between exposure to non-ionising radiation and illness. The response of authorities in Ireland has been to keep abreast of the best available information, to follow best practice and thus ensure that, in relation to exposure to non-ionising radiation, Irish telecommunications companies operate within internationally recognised safe limits.

Despite the fact that operators must conform to the internationally recognised guidelines set out by IRPA*1 (International Radiation Protection Association) some observers have expressed disquiet either because, they claim the IRPA guidelines developed in 1988 do not take into account scientific findings since then, or that the guidelines are based on thermal effects only.

The most recent position on health and safety aspects can be found in the ICNIRP*2 (International Commission on Non-Ionising Radiation Protection) Statement – Health Issues Related to the Use of Hand-held Radio Telephones and Base Transmitters, Health Physics, Vo. 70, No. 4, April 1996. A summary of the principal issues and the main conclusions is set out below:

The ICNIRP findings support the position taken by the regulatory authorities in Ireland and should provide further reassurance to those who have been concerned about the health implications of base station towers.

Taking as its basis the World Health Organisation's 1993 review of the health effects of exposure to radio-frequency radiation and all relevant research published since, ICNIRP re-examined the existing exposure guidelines (i.e. the safe exposure levels) in the frequency range utilised by mobile telephone systems (800 MHz to 2 GHz). Following a review of the technical nature of non-ionising radiation absorbed by mobile phone users and by the general public in the vicinity of base station towers, ICNIRP assessed recent published scientific literature dealing with biological effects, including athermal effects.

This latter assessment included athermal studies involving pulsed and amplitude modulated radio-frequency field and their impact on a number of biological end-points such as mutations in mouse leukaemia cells, chromosome aberrations in human lymphocytes and DNA fragmentation in rodent cells. Other work examined included the impact of radio-frequency radiation on tumour promotion, on ion fluxes across cell membraned in human blood cells, and on gene transcription rates. A number of animal exposure studies and epidemiological studies were also reviewed.

ICNIRP's conclusion concerning international standards for limiting exposure of the general public to the radio-frequency fields from base stations towers was to endorse the limits proposed in 1988 by IRPA. ICNIRP stated that there is no substantive evidence that adverse health effects, including cancer, can occur in people exposed to levels of non-ionising radiation at or below IRPA's 1988 guidelines. At the radio frequencies used in Ireland for mobile telephone networks (890

MHz to 960 MHz) the IRPA limit is 4.5 watts per square metre. In contrast the highest field strengths measured in the vicinity of base station towers in Ireland range from 0.00003 watts per square metre to 0.0035 watts per square metre, according to measurements made by Forbairt at a number of locations. These findings show that the actual exposure levels are about 1000 times lower than the IRPA levels.

The ICNIRP statement is an up to date, objective and expert contribution to the on-going debate on electromagnetic fields and their possible health effects. Irish telecommunication companies will be required by their licence to comply with the IRPA guidelines and to comply with whatever monitoring arrangements are put in place by the Department of Transport, Energy and Communications.

Further information can be obtained from the Department of Transport, Energy and Communications.

* [1] IRPA: In 1988 the International Radiation Protection Association's International Non Ionising Radiation Committee (IRPA/INIRC) published guidelines for limiting exposures to electromagnetic fields. These guidelines were developed in co-operation with the Environmental Health Organisation of the World Health Organisation (WHO) as part of the WHO Environmental Health Criteria Programme funded by the United Nations.

* [2] ICNIRP: In 1992 IRPA approved a separate character establishing the International Commission on Non-Ionising Radiation Protection (ICNIRP) which carries on the work of the now dissolved INIRC. ICNIRP is an independent scientific body, has a close relationship with IRPA and has non governmental organisation status.