

CHAPTER 7

LEGAL

This chapter discusses pertinent legal issues concerned with solar energy use -- solar access, building codes, and zoning regulations.





SOLAR ACCESS

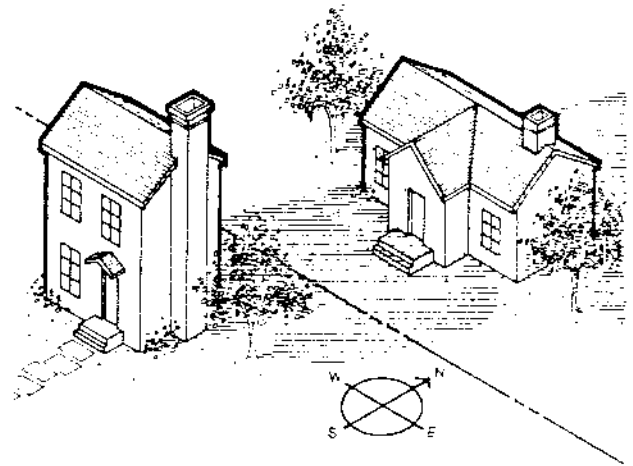
The solar access issue -- preventing the shading of the solar collecting surface -- is the primary legal concern involved in solar energy use. Solar access poses a potential problem because for hundreds of years American courts have held that, in the absence of a private agreement, a property owner has no inherent right to receive incident sunlight on his property. Thus, a property owner could plan and install a solar energy system for his home and, in the event a neighbor built or grew anything which obstructed the sunlight, the solar owner would be powerless to prevent the obstruction (FIG 7-1).

Recent cases concerning solar access have been consistent in upholding the right of the neighbor to build whatever he wants on his property against the necessity of the solar owner to receive unobstructed solar energy. E.g., in the 1980 Wisconsin case of Prah v. Maretti, Prah installed an \$18,000 active solar energy system on his home. His neighbor to the south -- Maretti -- then began construction on his home which, when completed, would shade the Prah's solar energy system and render it non-functional. Despite Prah's monetary loss, the Wisconsin court refused to enjoin construction of the Maretti home and found against the solar owner, even going so far as to rebuke the solar owner for his lack of foresight and planning.

Assuring adequate solar access requires a combination of technical processes and legal considerations:

- (1) Proper site planning and orientation (as discussed previously); and
- (2) Providing an adequate legal mechanism to assure solar access.

As noted above, courts have held that, in the absence of a private agreement (or applicable zoning regulations), a landowner has no inherent right to



7-1 SHADING CAUSED BY NEIGHBORING STRUCTURE

receive incident sunlight on his property. Obviously, the key is for the solar owner to take advantage of private agreements that can assure adequate legal access to solar energy.

Currently, the two most effective private agreements for assuring legal access to solar energy are restrictive covenants and easements. Generally speaking, restrictive covenants will be used only to provide solar access protection in new subdivisions; easements will most often be used to provide solar access protection for a solar system on a particular lot.

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RESTRICTIVE COVENANTS

When land is subdivided for new development, there are a number of activities involved in the process of turning the undeveloped land into a neighborhood. These include planning how streets will run, where homes and vegetation will be, developing a plat, obtaining necessary approval from the city or county, etc. At some time during this process, and prior to the time lots are sold to prospective homeowners, the developer will usually prepare restrictive covenants that will control activities and land uses within the subdivision. These covenants will be included as part of the deed to each lot in the subdivision.

New subdivisions offer a tremendous opportunity for providing solar access, because the entire planning process -- how streets are laid out, where houses and vegetation will be, etc. -- can be planned from the start with an eye to providing maximum solar access for every lot. At this same time the developer can utilize restrictive covenants which will provide the necessary legal protection for assuring continued solar access.

There are a number of legal requirements to ensure the enforceability of restrictive covenants:

(1) **General Scheme of Development:** The restrictive covenants must be part of a general scheme of development. This legal requirement is easily satisfied in a situation where the development has been specifically planned for solar access.

(2) **Notice to Purchaser.** All purchasers of lots within the subdivision must have notice of the restrictive covenants. This requirement is satisfied by recording the covenants in the public land records.

(3) The conditions in the covenants must be stated in the negative, (i.e.,

prohibiting a certain use or activity) rather than the affirmative (requiring a landowner to take some action). Most solar covenants will satisfy this requirement, however, some problems could arise if the proposed covenants require a landowner to trim vegetation -- an affirmative action. This is primarily a drafting problem and can perhaps best be solved by drafting the covenants to provide that a landowner could only plant vegetation according to a vegetation plan developed for the subdivision, or prohibiting the planting of species of trees or bushes that could grow over a specified height in particular areas. Here again, the process will involve combining technical aspects with legal requirements.

(4) **Enforcement.** Perhaps the most important legal requirement to ensure the enforceability of a restrictive covenant is rigid enforcement. The Architectural Control Committee, Homeowner's Association, developer and landowners within the development must be vigilant regarding breaches of the covenants, since in a situation where a covenant has been breached and action is not taken immediately, a court will usually hold that the particular covenant is no longer enforceable in the development. Thus, in the use of solar covenants, if any breach occurs -- if a structure is built outside the limits of the solar envelope or any unapproved vegetation is planted or any unauthorized shading of a solar energy system occurs -- immediate action must be taken to correct the breach.

(5) **Defining the Protected Space.** In drafting restrictive covenants to provide for solar access, it is necessary to define specifically what areas of the development are protected from shading. This satisfies a number of requirements, both legal and practical. Restrictive covenants which simply state "no solar energy system in the subdivision may be shaded," are generally unworkably vague: they do not define where solar energy systems are



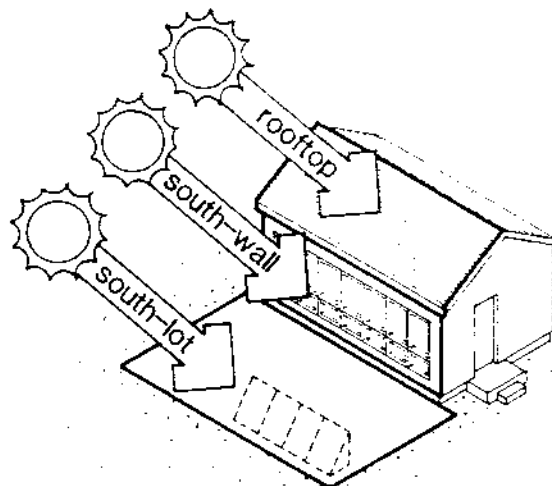
located, no guidelines are given as to what landowners can build or where they can plant so as not to shade another system, etc. Rather, it is important from the standpoint of future workability and enforceability that the development be planned so as to provide specific guidelines and that these guidelines be included in the covenants.

In defining the protected space, the first determination to be made is of the exact type of protection which will be afforded -- i.e., roof-top protection for active solar energy systems, protection to ground zero for passive systems, or a combination of the two. Generally, protection of passive systems requires a greater area of protection (FIG 7-2). Once this determination is made, there are a number of methods which will provide the necessary means of protection, such as designing bulk planes, determining height and setback restrictions specifically for solar access, the use of solar envelopes, etc.¹ To date, the most effective method of protection appears to be the use of solar envelopes.² Solar envelopes are three dimensional and define the maximum allowable space within which buildings can be built or vegetation grown so as not to shade solar collecting surfaces on surrounding parcels of land.

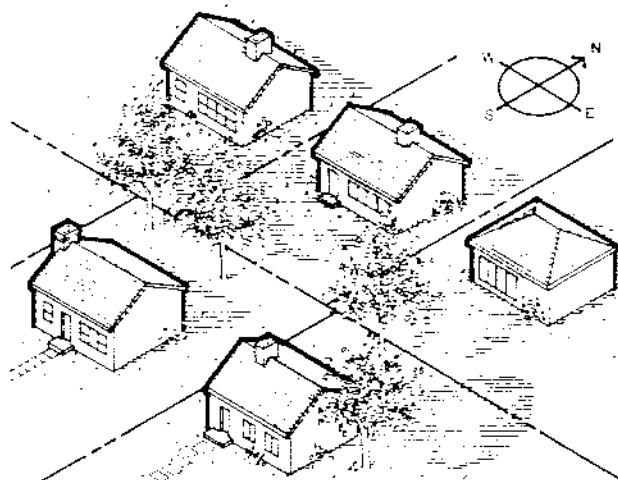
Solar envelopes offer many advantages for use in defining solar access protection:

- (1) Solar envelopes are relatively easy to design;
- (2) Solar envelopes can be used in defining restrictions for both structures and vegetation;
- (3) Solar envelopes can be an effective sales tool for the developer as potential buyers can easily understand them and their purpose.

After the solar envelopes have been designed by the solar consultants or architect (see detailed discussion



7-2 AREAS OF DIFFERING SOLAR ACCESS REQUIREMENTS



7-3 SHADING CAUSED BY VEGETATION

following), the solar covenants can be drafted. They should include a statement of the purpose and intent of the solar covenants and a precise definition of the solar envelopes. If the envelopes are being used only in conjunction with structures, separate provisions for vegetation control must be specifically enumerated in the covenants -- as growing vegetation will be a periodic source of potential problems (FIG 7-3).

In addition to provisions for solar access, restrictive covenants can also be used to implement other energy conserving strategies, e.g., requirements for insulation, double or triple glazing, etc.

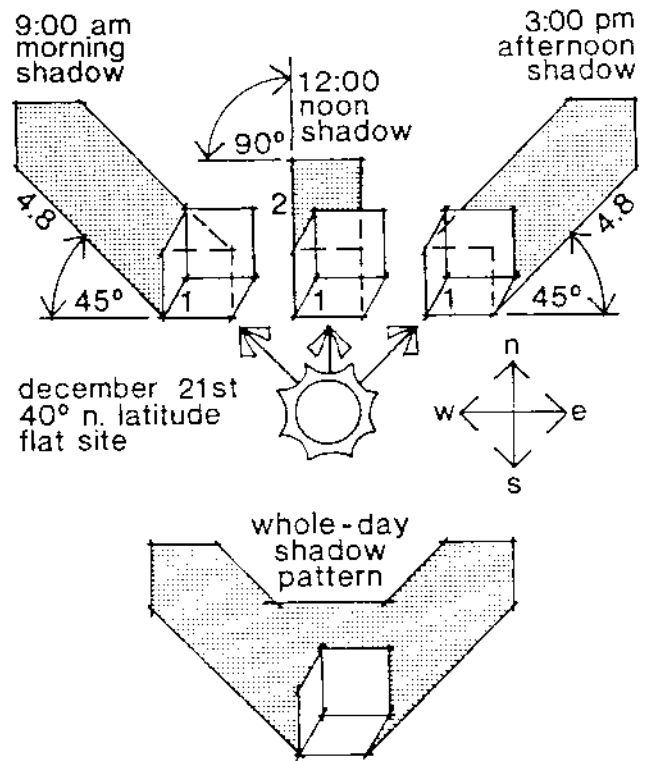
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PLANNING A SOLAR SUBDIVISION USING SOLAR ENVELOPES

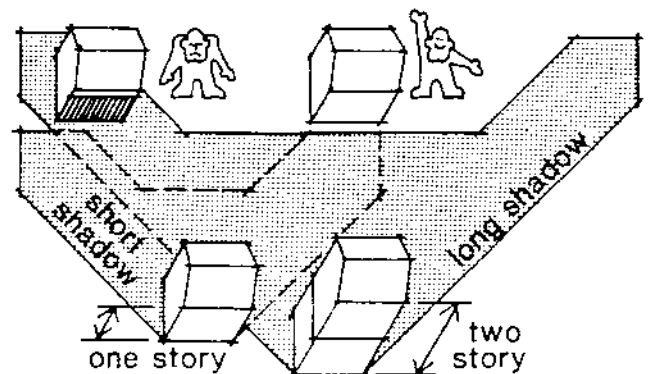
Planning a solar envelope for a lot limits the height of all structures and vegetation on that lot to prevent their casting shadows on the solar collection areas of neighboring lots. The greater the area of a lot set aside for solar collection, the more limited the heights of the solar envelopes on surrounding lots. Thus, designing a solar subdivision requires a balance between freedom to build or to plant anywhere within standard setbacks, and greater restrictions on the placement and location of plants and structures.

Basic guidelines used to plan for solar access are based on the following: 1) a particular latitude, 2) the direction of sun angles on December 21, and 3) the direction and degree of slope of the land. For illustration purposes (FIG 7-4), assume a piece of land located at 40° north latitude, sun angles based on December 21, and no slope to the land, i.e., a flat piece of land. At noon, a 10' high object will cast a shadow 20' in length to the north, or a 1:2 ratio. At 9:00 AM and 3:00 PM, this 10' high object will cast a shadow 48' in length at a 45 degree angle from south, or a 1:4.8 ratio (FIG 7-4). By using these ratios, shadows can be projected for any existing or proposed object in the subdivision (house, garage, tree, etc.) and a determination can be made as to whether or not proposed solar collection surfaces will be shaded.

In planning a solar subdivision with rectangular lots twice as long as they are wide, the above guidelines indicate east-west streets tend to provide better solar access than north-south streets: the east and west shadows of early morning and late afternoon affect the solar envelope design more than south shadows. Some conflicts can develop when: 1) structures are built which are taller than the north-south distance will permit (FIG 7-5), 2) there is not enough north-south distance between two



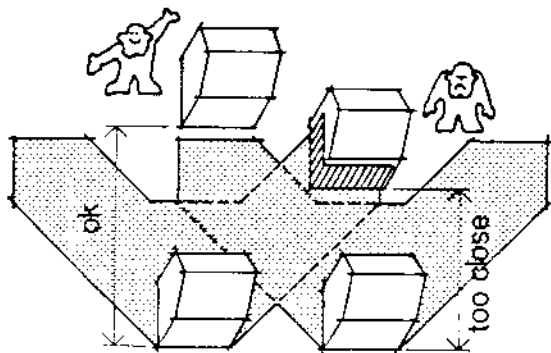
7-4 SHADOW PATTERNS: DEFINITION



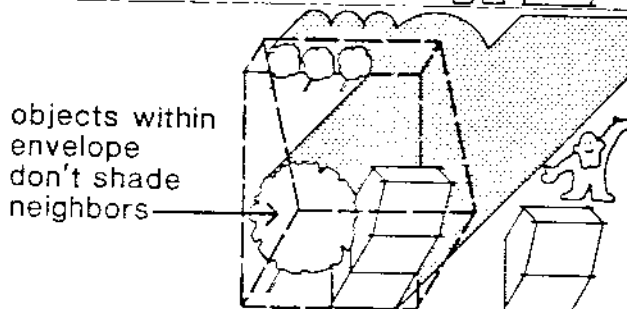
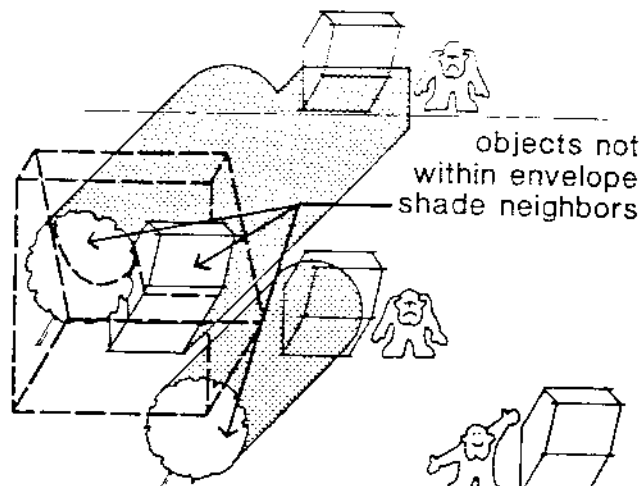
7-5 TALLER BUILDINGS CAST LONGER SHADOWS



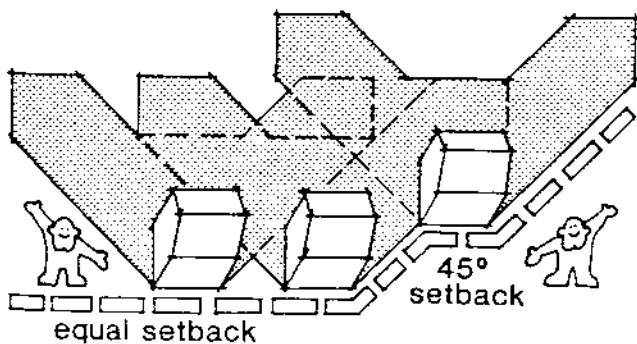
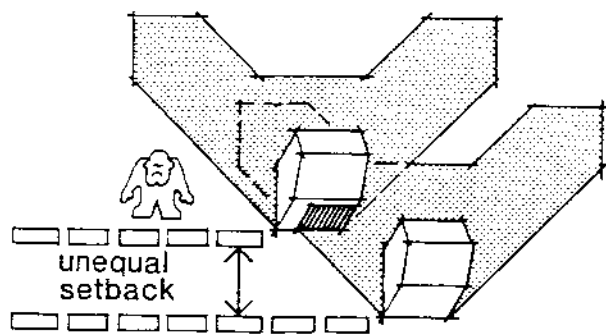
structures (FIG 7-6), or 3) little thought is given to offsetting the south facades more than 45 degrees from each other (FIG 7-7). In designing a solar envelope, an attempt is made to ensure that these conflicts do not occur and that structures and vegetation do not penetrate the envelope roof, as penetrations of the envelope roof cast shadows beyond the intended maximum shadow line (FIG 7-8).



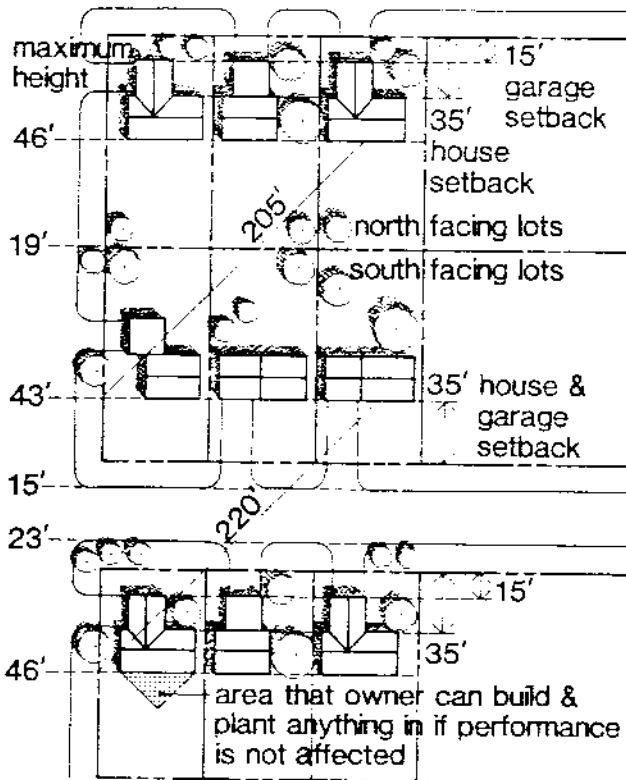
7-6 NORTH-SOUTH SEPARATION IS NEEDED



7-8 SOLAR ENVELOPES PROTECT NEIGHBOR'S ACCESS TO SUN



7-7 KEEP SETBACKS UNIFORM



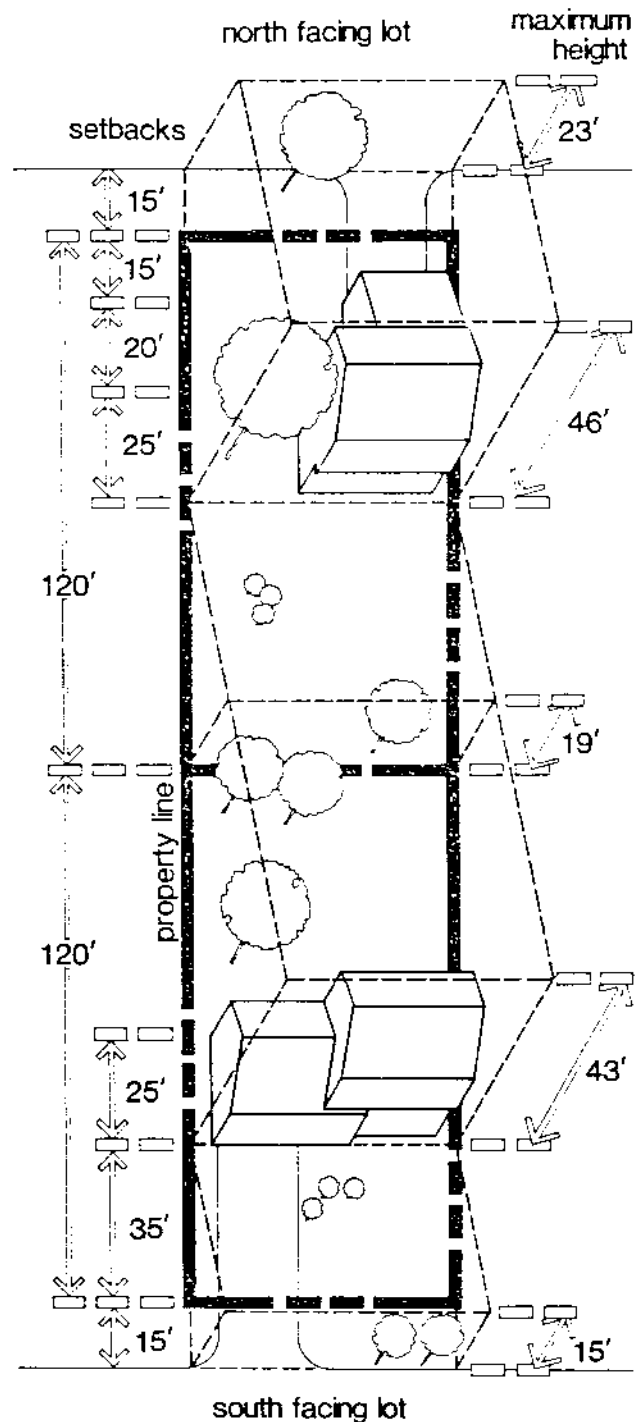
7-9 TYPICAL SOLAR SUBDIVISION

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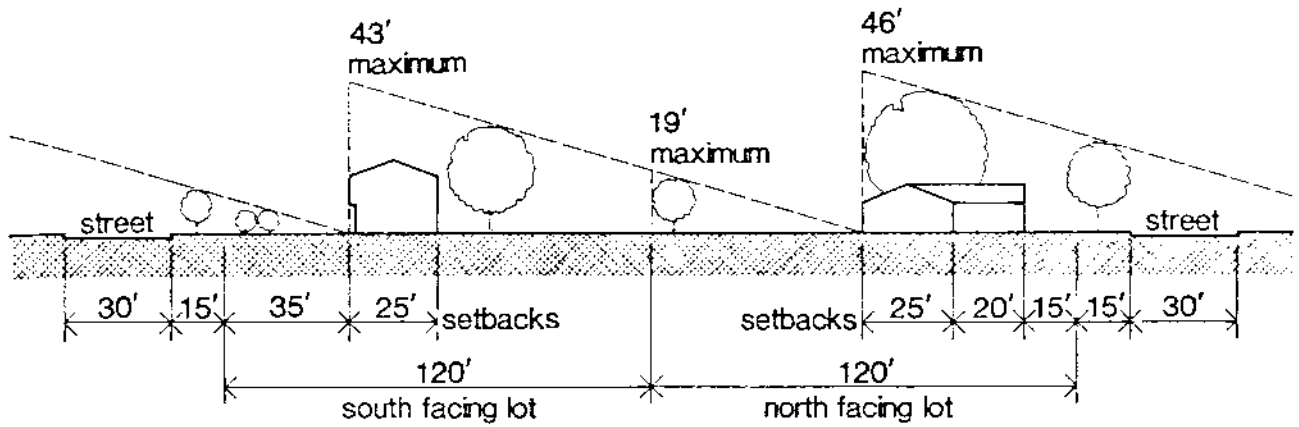
Solar envelopes can be designed for a typical single-family lot subdivision with slight modifications to the typical layout (FIG 7-9). The setback for north-facing lots can be decreased to 15' from the property line; the south-facing lots have a 35' setback; garages can be located on the north side of the house to block winter winds and provide greater south wall exposure. In the north lot of the example, a building depth of 15' has been allotted plus the 20' depth for the garage. From this south facade of a building on the north-facing lot, a line is drawn to the southwest at a 45 degree angle to the 35' front setback line of the south-facing lot. This 205 foot line is then divided by 4.8 which will give the maximum height of 43'. Any height may be determined by measuring along a 45 degree line and then dividing by 4.8.

After all vertical heights have been established, an axometric drawing may be prepared to show heights for purposes of legal documentation. This drawing will normally show all important vertical and horizontal dimensions and may also include a verbal description. For illustration purposes, a north-facing and south-facing lot with buildings and trees placed within the envelope has been included (FIG 7-10 and 7-11).

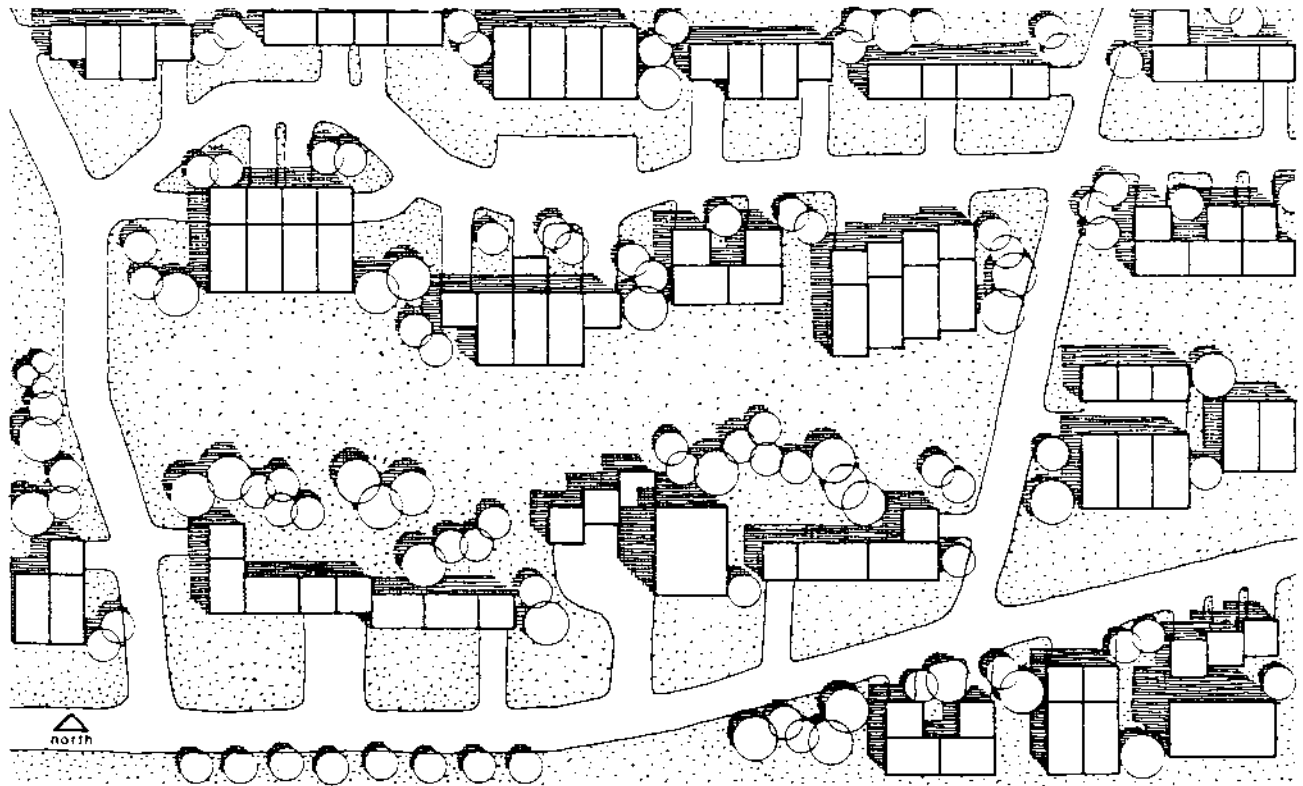
The last illustration is intended to show the improved solar access that a planned development utilizing multi-family, row house, duplex and zero lot lines can provide. This type of development increases the north-south separation between buildings and also reduces street, utility and building cost while providing open space and other amenities (FIG 7-12).



7-10 ENVELOPES FOR NORTH FACING & SOUTH FACING LOTS



7-11 SIDE VIEW OF ENVELOPES



7-12 SOLAR PLANNED URBAN DEVELOPMENT

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SOLAR EASEMENTS

In 1979, the Nebraska Unicameral approved the Nebraska Solar Access Act now codified at Neb. Rev. Stat. Sections 66-901 through 66-914 (1981 Supp.). The Act provides a first step in providing protection for solar access through the following:

(1) It authorizes the creation and recording of solar easements.

(2) It gives the power to local zoning boards to enact zoning regulations dealing with solar access.

To date, Lincoln is the only Nebraska community which has adopted solar access zoning regulations. Under these regulations, developers who provide solar access protection in new developments can increase the density in the development by 20%. The Lincoln regulations do not make solar access a requirement in the development, rather they provide an incentive to the developer who initiates solar access protection.

Thus, for the individual homeowner, the primary focus will be on solar easements. Unlike restrictive covenants, which are used to provide protection throughout an entire development, solar easements will most often be used by individual landowners to protect access for a particular system on a particular lot. Since an easement is a private land use control (unlike zoning regulations which are public land use controls) it is voluntarily negotiated between private landowners. This means that the solar owner must obtain permission from his surrounding neighbors for the solar easement. If they will not give their permission, there can be no easement.

Negotiating the easement with surrounding neighbors is entirely dependent upon the needs and demands of the landowners involved. In some instances, money may be paid for the

right to access.

After negotiations are completed, the easement will be drafted by an attorney. Under the Nebraska Solar Access Act, the easement must be in writing, signed by all landowners involved, and filed with the Register of Deeds in order to be enforceable.

The Nebraska Solar Access Act provides that the solar easement should include the following:

(1) A legal description of the real property burdened and benefitted by the easement;

(2) A description of the vertical and horizontal angles, expressed in degrees and measured from the site of the solar energy system, at which the easement extends over the burdened property, or any other description which defines the three dimensional space, or the place and times of day in which an obstruction to solar energy is prohibited or limited. (The use of a solar envelope will satisfy this requirement);

(3) Any terms or conditions under which the solar easement is granted or may be terminated;

(4) Any provisions for compensation of the owner of the benefitted property in the event of interference with the enjoyment of the solar easement, or compensation of the owner of the burdened property for maintaining the solar easement; and

(5) Any other provisions necessary or desirable to enforce the purpose of the easement.

The Act further provides that a solar easement shall run with the land, unless the easement specifically provides for termination at a later date. To "run with the land" means that the easement attaches to the land itself and will always be a condition of the land, even if the land is sold to another. This is



an important element of the easement, and it is advisable to make specific reference in the written easement that it runs with the land.

Finally, if there are any exceptions to the easement -- e.g., existing shading, utility poles, television antennae, etc. -- they should be specifically exempted in the written document to ensure enforceability of the easement.

BUILDING CODES AND ZONING REGULATIONS

As with any other new building or addition work, building a passive structure will require a building permit and approval of the planned structure. Specific requirements will vary from city to city.

In the situation of adding a solar greenhouse to an existing structure, zoning regulations may be of particular relevance. If the southern-facing wall of the existing structure is built up to the applicable setback, a variance from the setback may be required. Under Section 66-914 of the Nebraska Solar Access Act, applicable zoning boards in Nebraska are specifically given the power to grant variances in these situations.