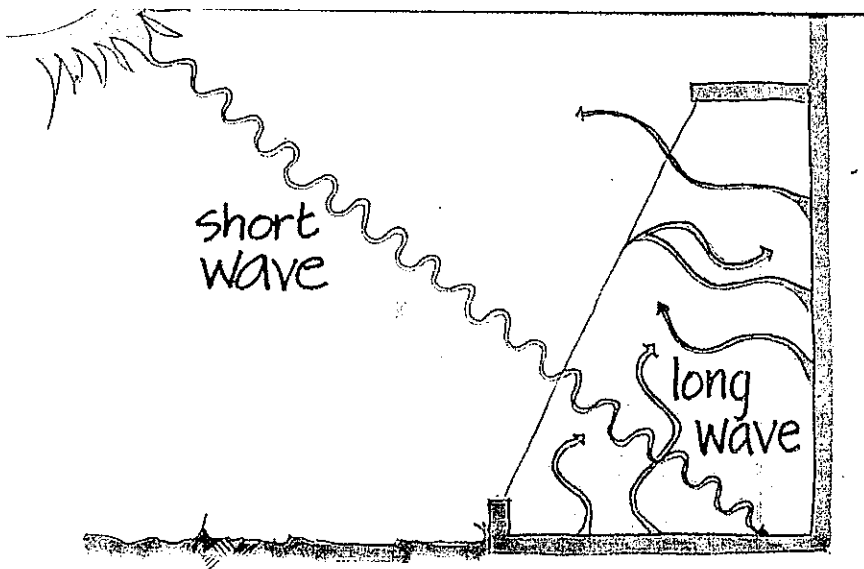


# PASSIVE SOLAR and the SUBDIVISION

A Passive Solar Home Designer/Builders Experience  
Don Roscoe BSc. BArch. April 16, 2012

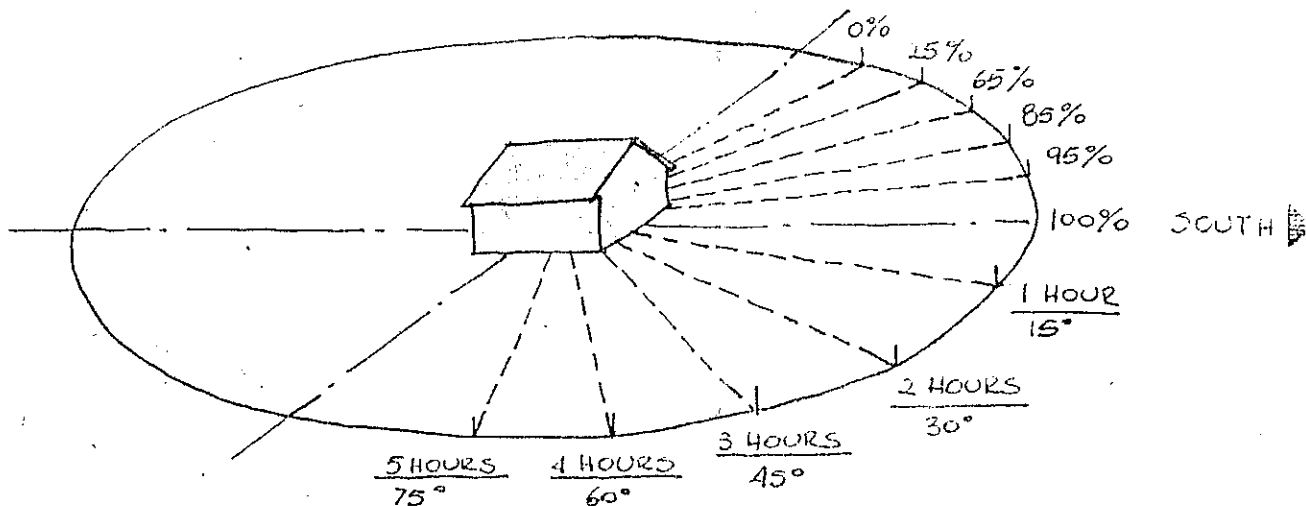
PASSIVE SOLAR BASICS Using your glazing to collect heat from the sun.

- \* CONSERVE Well insulated and air tight structure
- \* CAPTURE The winter sun [easy] and not the summer sun [not so easy]
- \* DISTRIBUTE HEAT Most heat gained ends up on the ceiling
- \* STORE HEAT To replace that lost later at night or on a cloudy day



Given vertical glass, Gaining the maximum winter sun and the minimum summer sun is all about **the orientation of the glazing to the sun. Facing due south + or - 15 degrees is ideal.** Facing south-west to west is a problem of overheating in the summer and fall with heat being gained at the hottest time of the day and at the hottest month of the year.

## Available solar heat



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## Subdivision Design is Complex

With many considerations and priorities

- \* Automobiles, Emergency Access, .....
- \* Grades, Slopes, Storm Runoff & Drainage, .....
- \* Water, Sewer, Communication & Electrical Services
- \* Schools, Recreation, Shopping, .....
- \* Density, Profitability, ....

The Conventional Subdivision design results in

- \* A uniform setback of homes, a **street line**
- \* Most homes oriented facing the street
- \* Thus **street orientation dictates home orientation**

## My Experiences Working with Conventional Subdivisions

With large lots, there is usually not a street line to conform to. This allows for orienting the home for the sun, slope and views.

With small lots where East-West street orientation allows facing south + or - 15 degrees, you can conform to the street line with proper orientation to the sun in either the front or the back.

On small lots where the street orientation does not allow facing south and you have to conform to a street line, you can re-configure the front or the back walls of the home to access the sun, but there is little you can do if the space between homes does not allow access to the sun..

On narrow deep lots, you can break the street line and hide the house on the back of the lot.

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## THE SOLAR SUBDIVISION EXPERIMENTS

- \* Site Planning and Landscaping Design services included in the lot cost
- \* No home to be within 15 degrees of parallel with the street, [ **no street line** ]
- \* Preserve most trees and original grades beyond ten feet of the home [ **the home is to be designed for the lot, not the lot re-designed for the home** ]

## WHAT WE LEARNED

- \* The streets go where they need to go.
- \* By not allowing the convention of orienting the home parallel to the street, it eliminates having to conform to a street line and it brings up the question of how it could be oriented. This allows it to be oriented for views, grades and for maximum winter solar gain and more important, for minimum <sup>SUMMER</sup> solar gain. By providing Site Planning Services these options can be accessed by the buyer.
- \* The above can not work if the lot boundaries themselves do not allow the home to be oriented to accommodate these considerations. In subdividing the lots, lot boundaries should consider how they affect grades or slopes, views, and **solar orientation**. In most cases, the convention of running boundary lines square back from the road restricts these options.

## CONCLUSION

Conventional practice may ignore thoughtful alternatives.

Separate street orientation from home orientation.

Where possible, shape the lots to allow the homes to access to the sun.

# PASSIVE SOLAR and the SUBDIVISION

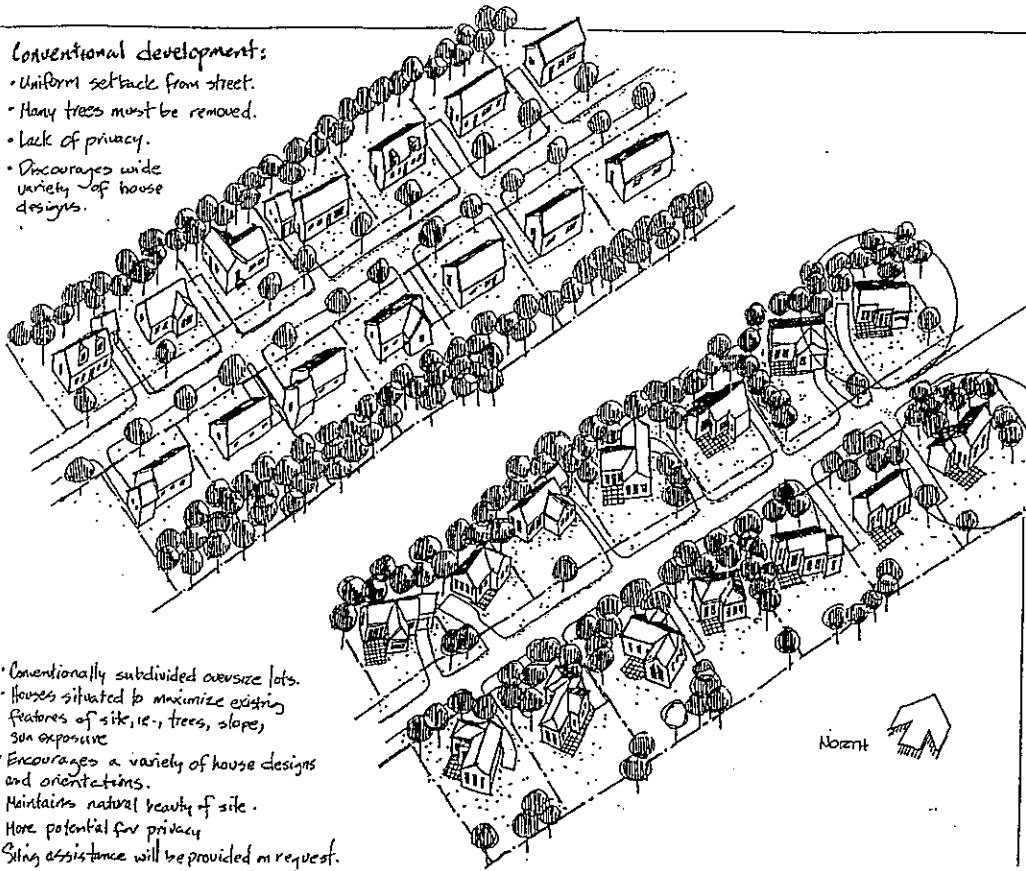
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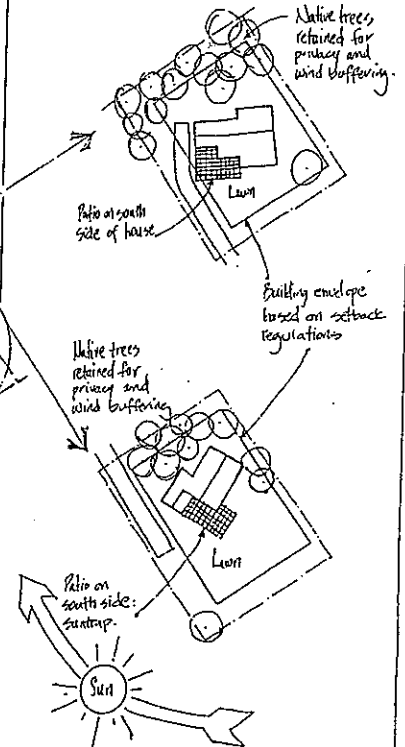
## Conventional developments:

- Uniform setback from street.
- Many trees must be removed.
- Lack of privacy.
- Discourages wide variety of house designs.

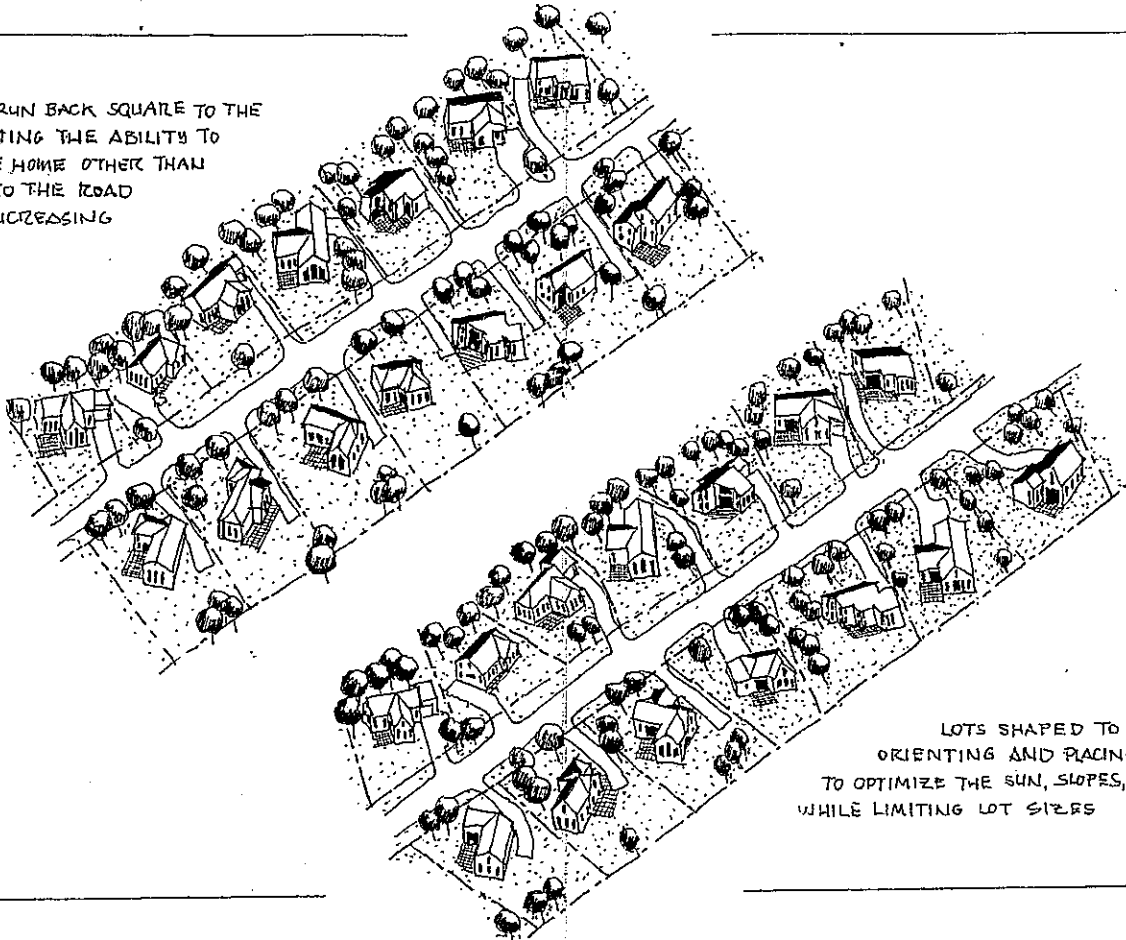
- Conventionally subdivided oversized lots.
- Houses situated to maximize existing features of site, i.e., trees, slope, sun exposure.
- Encourages a variety of house designs and orientations.
- Maintains natural beauty of site.
- More potential for privacy.
- Siting assistance will be provided on request.



## Typical Site Situations



LOT LINES RUN BACK SQUARE TO THE ROAD, LIMITING THE ABILITY TO ORIENT THE HOME OTHER THAN PARALLEL TO THE ROAD WITHOUT INCREASING LOT SIZES



LOTS SHAPED TO ALLOW ORIENTING AND PLACING THE HOME TO OPTIMIZE THE SUN, SLOPES, AND VIEWS WHILE LIMITING LOT SIZES





CAUTION  
CHILDREN  
AT  
PLAY













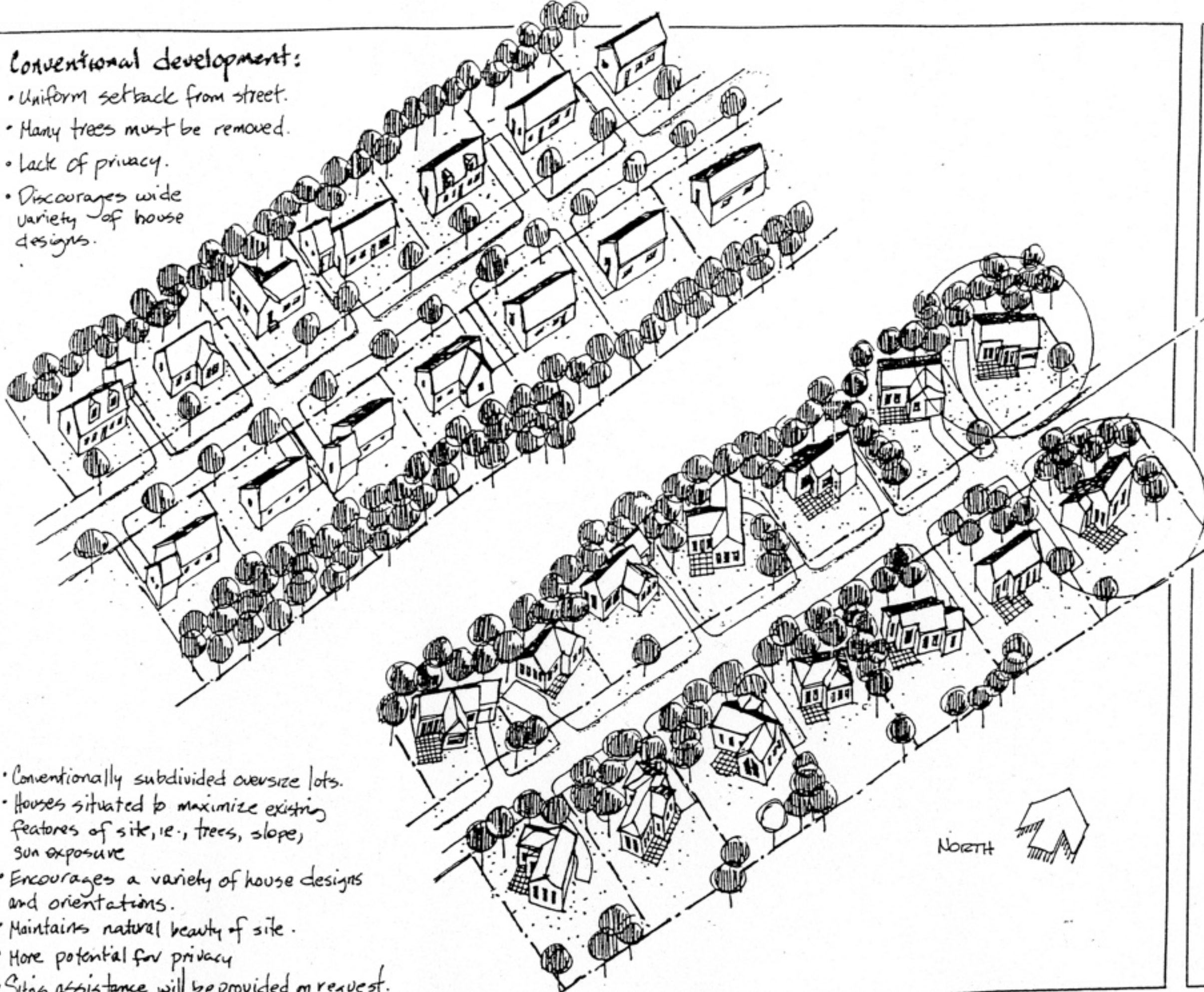






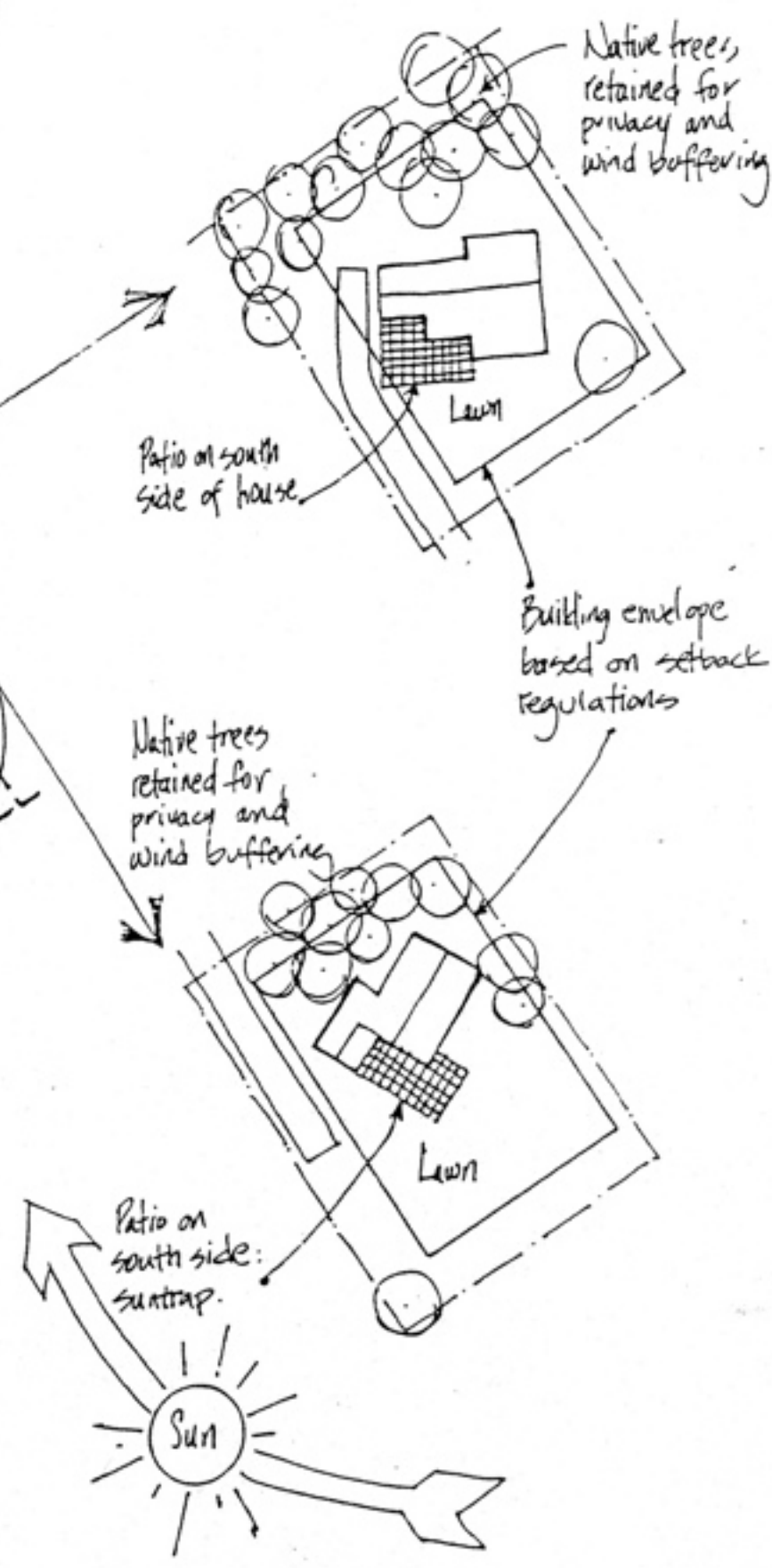
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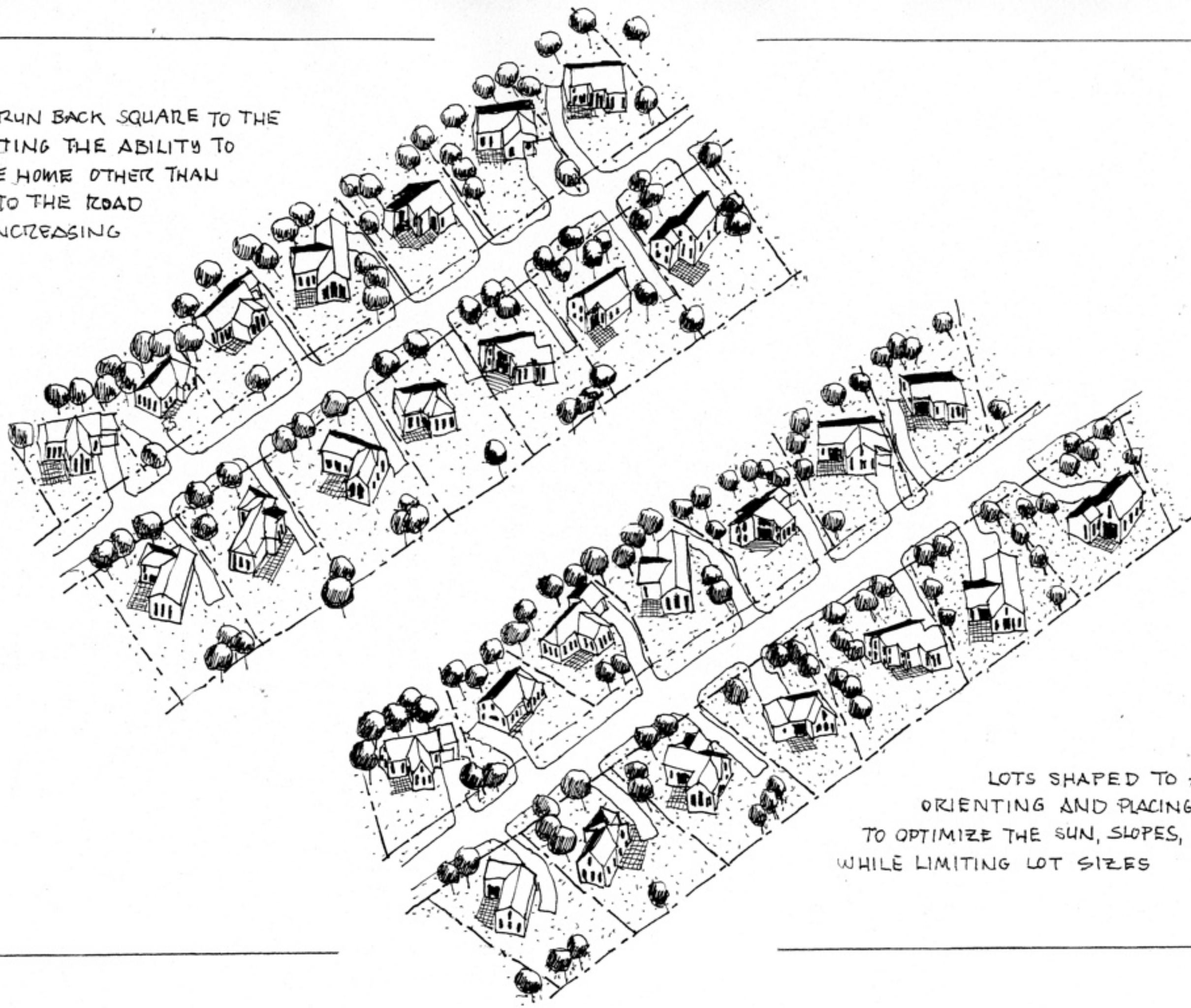


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