

Analysis of Land Development

By PERCY E. WAGNER

THE MARKET VALUE of improved lots in a new development is established by public acceptance. The development and the neighborhoods created will appeal to people in a particular income bracket according to the type of houses, amenities and land improvements offered. Development costs will vary according to specifications, material and labor prices, but final price and value of the improved lot is established in the market place and the test of sales becomes basic in the valuation procedure.

This presentation is prepared to acquaint real estate appraisers, developers and Realtors, with the physical and financial problems which confront a developer of raw land into a saleable subdivision of improved lots. The variance of location, material and labor costs, land condition, and the local code requirements makes this presentation subject to variables and should not be construed as applicable to every location in the United States. The basic procedure, however, is applicable and may be followed.

Our purpose is to establish a price at which improved land can be produced from an established acreage cost, improvement specifications and financing. A corollary to this purpose is to show that excess costs which accompany a development will have a bearing on final lot and front foot cost. The excess cost in this subdivision analysis may not occur in other developments. This treatise develops costs per lot and per front foot with and without consideration of excess costs. Another consideration illustrated is that regardless of the size, shape and number of lots in a given number of acres, a unit cost per front foot and lot is established.

Extension of utilities to open lands, streets adjoining unimproved land, corners and cul du sacs are plus and minus factors which govern a final cost per front foot or lot. Variations in cost per lot caused by variation

in size, shape or location will not be reflected precisely in the market place. Judgment alone can establish pricing. The pricing of corner lots and lots in cul du sacs with narrow frontage and great depth illustrate the problem and the necessity for market experience.

The purchase price of the farm land used in this analysis is \$3,000 per acre. The land was purchased under contract and a deed delivered upon payment of the down payment. Release clauses provided for release of acres (lots) upon payment of specific sums over a period of four years. This analysis assumes payment of the land purchase contract according to its terms.

Water, storm and sanitary sewers adequate to serve the subdivision are within 110 feet of the northern boundary of the property.

The topography of the land is slightly rolling, with several knolls which required leveling. The land drains from north to south and east to west with a fall in excess of ten feet in each direction. This is adequate for drainage, but lift stations are necessary for sewage disposal. Storm and sanitary sewers were installed throughout the subdivision. The sewer and water company is owned by the land developers under the supervision of the state. The water supply and sewerage disposal facilities are adequate to meet the requirements of the estimated future population.

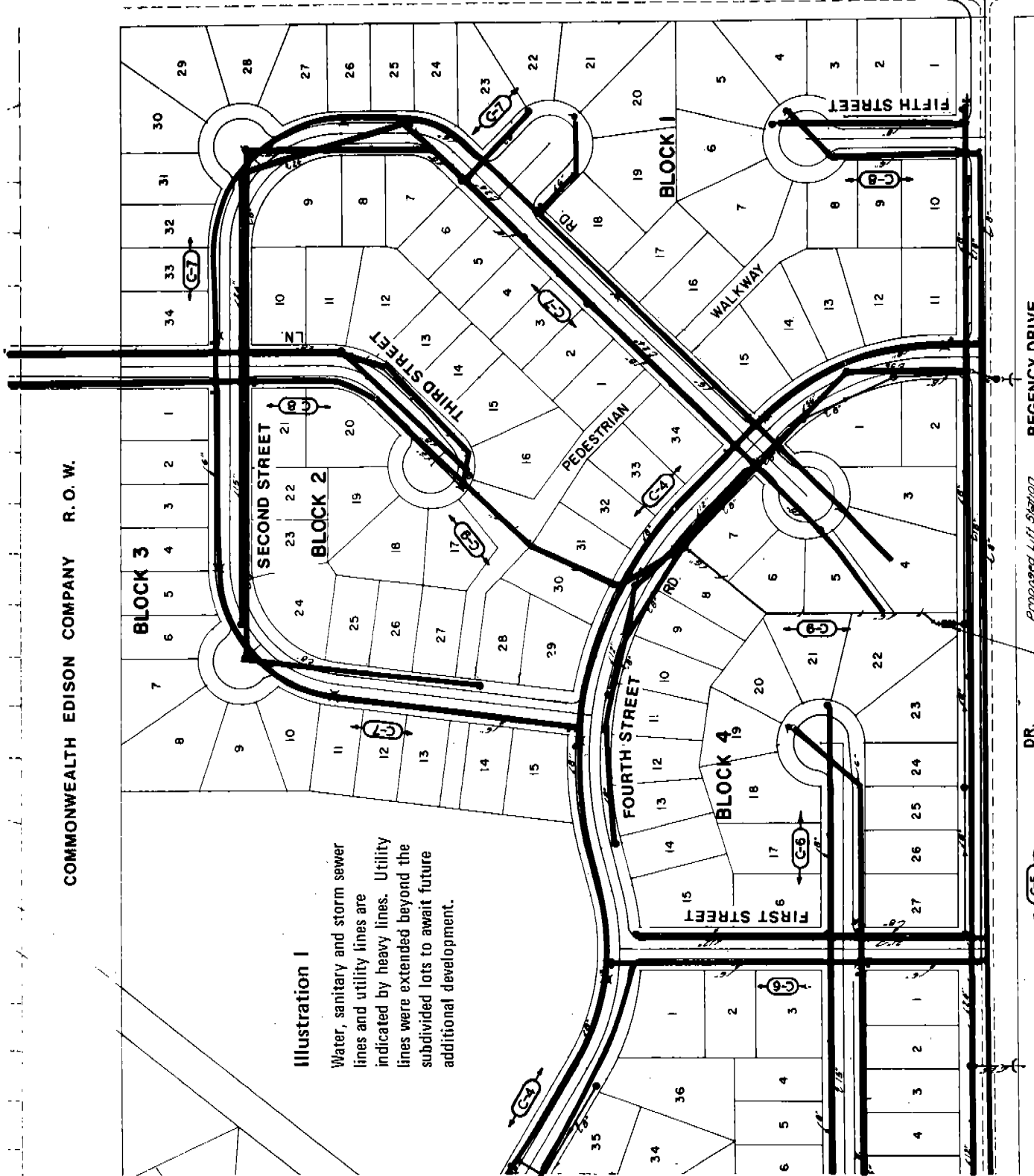
The open lands are part of the former farm and consist of a barn, house and animal sheds. It is used as a youth recreation center. The grade school is two blocks from the north boundary of the property. No school site is provided on the subdivision. The property is within the boundaries of the village and will be serviced by all village departments.

The farm land was purchased by a land developer who assumed the risk of development and resale of im-

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Illustration 1

Water, sanitary and storm sewer lines and utility lines are indicated by heavy lines. Utility lines were extended beyond the subdivided lots to await future additional development.



Farm property purchased for \$3,000 per acre was improved to provide . . .



. . . 218 homesite lots and 7.9 acres of open space. Farm buildings were retained for recreation facilities.



proved lots to builders. A residential builder purchased the entire subdivision of improved lots and erected model homes. Purchasers select the house to be built and select their homesite from a plat. All land improvements, except final blacktopping and sidewalks were installed before purchase by the builder. The builder-developer made a substantial down payment and release clauses permit taking title to properties sold to home purchasers. Development capital was supplied by the land developer. Two years were required for planning and development; no investment capital was returned during this period of development. The entire development required four years to consummate from the time of land purchase to final payment of the contract between the home developer and the land developer. Carrying charges cannot be estimated with positive accuracy as payment to contractors are staggered according to partial payment dates and completion dates. Holdbacks and village approval vary from contractor to contractor and village to village.

Estimates of interest and taxes are assumed to be normal. Six months interest is charged on contracts payable within one year. The payment for lots by the home builders was estimated on the same basis. Again, this will vary with the terms of the contract and sale of homes. The release of lots to the home builder and construction of homes will proceed according to market conditions. Variance in release clause conditions by the land developer and the home developer is prevalent. For guidance the procedure in this analysis is used.

It is reasonable to believe that land development will start within one year after purchase of the land and be

completed within one year. Carrying charges on the land will be interest and taxes for two years. Payments on land development contracts would be made as work progresses and be completed within one year. The investments of the land developer in development costs should not exceed two years. Interest charges on land improvements should commence from the first draw through to completion. The return of the total investment is dependent on payments of principal and interest made under the terms of the home builders contract.

Release clauses should provide a 20 percent override and the land should be fully deeded to the home developer upon payment of 80 percent of the contract. Twenty percent of the land would be deeded free and clear to the home developer.

The initial land investment on the subject analysis was estimated at approximately \$300,000 plus the cost of improvements.

The following illustrates the allotment of acreage into sites and open areas. (See Illustration II for locations of plats and homesites.)

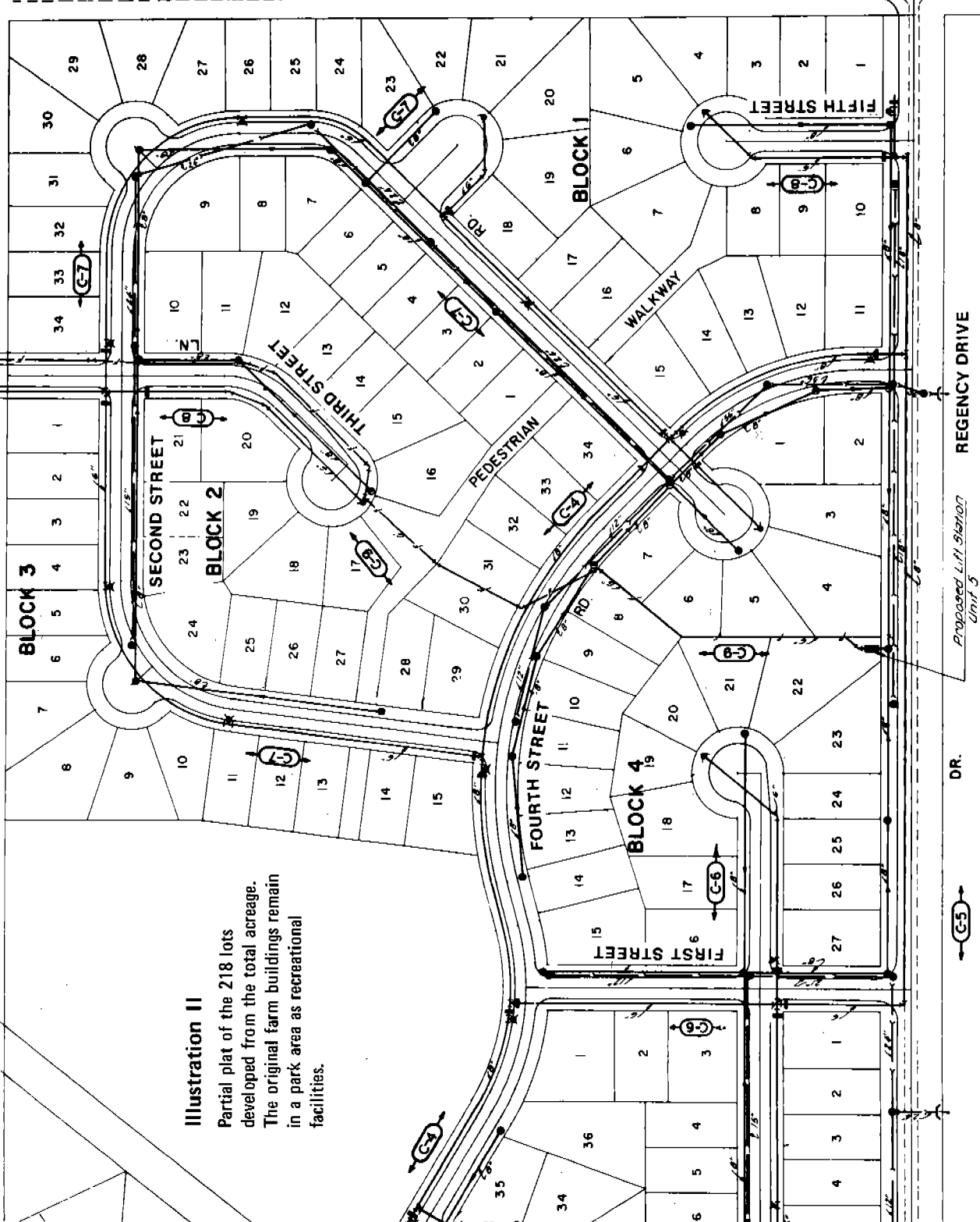
Statistical Information

Total acreage,	
including open lands and rights of way	81.765 acres
Rights of way	12.537 acres
Net acres including open space	69.228 acres
Open space	7.857 acres
Net acres for subdividing	61.373 acres
Total blocks	8 blocks
Total lots	218 lots
Lots per acre including open space (69.228)	3.15 lots
Lots per acre excluding open space (61.373)	3.55 lots
Total homesites to be fully improved	218 lots

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Illustration II

Partial plat of the 218 lots developed from the total acreage. The original farm buildings remain in a park area as recreational facilities.



Homesites now fully improved	218 lots
Total front footage	13,769 feet
Average frontage per homesite	62.89 feet
Average depth	112 feet
Lots in Block 1	21 lots
Lots in Block 2	37 lots
Lots in Block 3	25 lots
Lots in Block 4	36 lots
Lots in Block 5	17 lots
Lots in Block 6	32 lots
Lots in Block 7	28 lots
Lots in Block 8	22 lots
Lots with water, sanitary sewer, storm sewer, paved streets, curbs and walks	218 lots
Lots with no improvements	None
Excess water line on Regency Drive	½ of 2,657 ft.
Excess water line on Albert Drive	½ of 1,360 ft.
Excess street and curb on Albert Drive	½ of 1,360 ft.
Excess street and curb on Regency Drive	½ of 2,657 ft.
Open land has connection rights to sewer and water.	

Majority of lots are 65 feet by 111 feet and 65 feet by 115 feet with corners and cul du sac lots of various widths and depths causing average size lot to be 63.16 feet in width.

Computations are made of 65 foot lot width to illustrate results in per foot cost. Using the 65 foot by 111 foot computation, there are 3.55 lots to the acre. Corners and cul du sac lots have additional and/or lesser width and depth than average 65 foot and 63.16 foot lot.

Interest and tax charges are arbitrary selections, but approximate market. Subdivision development from date of land acquisition proceeded on schedule. Two years' interest and taxes are computed as average time from date of purchase to completion of improvements.

Recapture of land investments and improvement cost estimated in four years. Recapture of excess improve-

Exhibit I

Total Investment of Developer

Cost Estimates and Reduction to Per Front Foot Cost*	
Sanitary sewer	\$142,348.00
Extras	389.31
Water main	120,681.90
Pipe Connections	26,742.50
Storm sewer	96,966.10
Paving	158,410.00
Curb and gutter	81,220.00
Excavating, stripping and staking	42,510.00
Performance	4,499.98
Sidewalk	91,000.00
Total	\$764,767.79

*Estimates are total costs which include the excess street improvements, sewer and water. They are bids and engineers' estimates, and bare field cost (no overhead, profit, interest, etc.).

ment cost will require development of adjacent land; time is unknown.

Total front feet (frontage of 218 lots) is 13,769 feet giving an average per front foot cost of \$55.55. The cost per foot is based on the preceding over-all cost, including excess street sewer and water with 218 improved lots absorbing all improvements, including corners and side street. Exhibit II illustrates individual front foot costs.

Exhibit II

Costs Per Front Foot

Item	Development Cost	F. F. Developed	Cost Per Front Foot
Sanitary sewer (plus extras)	\$142,737.31	÷ 13,769	= \$10.36
Water main*	\$143,424.00	÷ 13,769	= \$10.40
Pipe connections	\$ 26,774.50	÷ 13,769	= \$ 1.94
Storm sewer	\$ 96,966.10	÷ 13,769	= \$ 7.04
Concrete curb*	\$ 81,220.00	÷ 13,769	= \$ 5.90
Concrete sidewalk	\$ 91,000.00	÷ 13,769	= \$ 5.00
	\$1.00 per sq. ft.		
Paving*	\$158,410.00	÷ 13,769	= \$11.50
Excavating and Extras	\$ 47,009.98	÷ 13,769	= \$ 3.41
Total Improvement Cost			\$55.55

*Includes 4017 excess front feet.



Gently rolling landscape contained many small knolls (right) which had to be leveled (above) before improvements could proceed.



Bids were taken on engineers' design, using 218 lots for estimates. Bids received will complete all improvements on 218 lots. Paving, curbs and water will serve additional lots. A total of 218 lots are within recorded units (See Illustration II). Additional land south of Regency Drive and west of Albert Drive has paved streets and the main water line, but is not within the recorded subdivision.

Excess paving, curbs and water cost which may be recovered in future development are:

Excess Concrete Curb	\$11,850.15
Excess Paving	23,097.50
Excess Water	20,888.40
Total	<u>\$55,836.05</u>
Excess cost per front foot	
($\$55,836.05 \div 13,769$ F. F.)	\$ 4.55
Excess cost per lot	
($\$55,836.05 \div 218$)	\$268.44
Total improvement cost per front foot	\$ 55.55
Excess Recoverable	<u>4.55</u>
Net Cost per front foot	\$ 51.00
Cost of land:	
81.765 acres @ \$3,000/acre	\$245,295.00
Open space	7.857 acres
High line right of way	12.537 acres

Land loss	20.394 acres
Net useable land	61.371 acres
Cost of useable land/acre	\$ 3,996.92
Less/acre due to unusable land	\$ 996.92
Number of homesites	218
Homesites/useable acre	3.55
Cost/lot of useable land/acre	\$ 1,125.89
Homesites/acre (81.865 acres)	2.66
Loss in homesites/acre	.89
Percentage loss	26%
Land cost/F.F., 65 ft./lot	\$ 17.31
Land cost/F.F., 63.16 ft./lot	\$ 17.81
Improvement cost/65 ft. lot	\$ 55.55
Land and Improvements; bare cost/F.F.,	
65 ft. lot	\$ 72.86
Recoverable improvement cost/F.F.	<u>4.55</u>
Net cost after recovery	\$ 68.31

The difference of \$0.50 per front foot illustrates effect of large corner lots on smaller lots when the number of lots remains the same. When front footage of the lot is changed, more lots must be obtained in order to reduce cost per front foot.

Improvement costs applicable to the average 65 foot lot illustrates mathematical difference in cost per foot.

Exhibit III

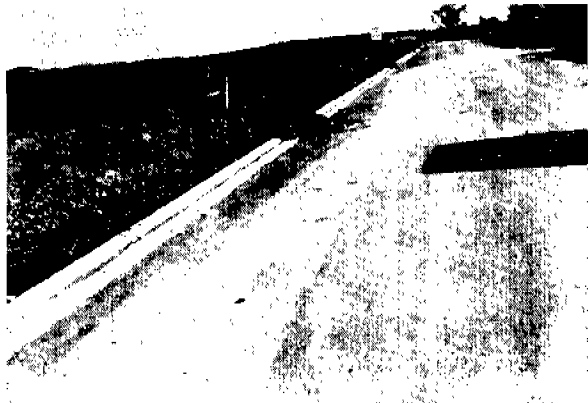
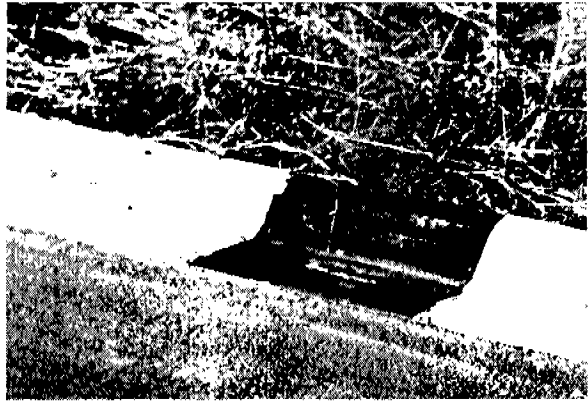
Additional Costs to Developer

Total bare field cost of improvements from estimates	\$ 764,767.79
Engineering and supervision, 10% (includes fees, plats, staking, recording and inspection)	76,476.77*
Interest, six months: 8%; one year completion; six months average payout	36,649.78*
Repairs: 3% (broken curbs, walks, sewers, street repairing, contingencies)	22,920.00*
Developers' overhead and profit: 20% (includes salaries of employees, supervision and reasonable profit for risk. No sales expense)	168,248.00
	\$1,069,063.14

218 lots (per lot)	\$4,903.96
218 lots (per lot average 65 foot lot, per ft.)	75.445
Land cost per lot @ \$17.31 per front foot	1,125.00
Cost of land and improvements per lot	6,028.96
Cost of land and improvements per front foot	92.75

(Note plat for various lot sizes. Averages are used to illustrate proper lot sizes to absorb corner and side street costs.)

Developer's improvements included storm sewers (right), water and utility lines, and paved streets (lower right). A water buffalo box is shown below.



Land Developer Bare Cost

Cost of land, 81.765 acres @ \$3,000 per acre	\$ 245,295.00
Cost of Improvements, contracts only	764,767.79
Total	\$1,010,062.79
Additional Cost	304,295.35*
Total	\$1,314,358.14
Additional Carrying Charges (2 yrs. land; 1 yr. improvements)	159,161.57
Total Investments	\$1,473,519.71
Total Cost per front foot	\$ 107.01
Total Cost per lot	6,759.00
Total Cost per 65 foot lot	104.00
Total Cost per 63.16 foot lot	\$ 107.01

Cost per foot also illustrates change in cost caused by number of lots in subdivision. The corner and side street costs are absorbed by more and smaller inside lots. Efficient design of subdivision, utilities and engineering can reduce these excess costs.

Conclusions

From the foregoing analysis and statistical information on the cost to develop unimproved land to improved homesites, several conclusions may be drawn. The following are the most important:

1. An option to buy the land is desirable, due to the time required for planning and economic viability.
2. Prior to the purchase of the land, a complete utility analysis of the proposed project by competent engineers and the cost to install utilities should be obtained; the value of these estimates is worth their cost. A study of the profitability of the project is mandatory.
3. An analysis of the topography of the land may reveal the necessity for the proper installation of water mains, sewer lines, and lift stations.
4. The developer must consider the most profitable use of the project. The project may be treated as a subdivision for the sale of improved lots to builders at retail prices, or as a building development by the land

developer. Both projects have unique hazards.

5. Land development requires a keen perception of the future market for homes and homesites. A project which extends over a long period of years increases the risk of changing markets and economic conditions.

6. The profit margin used in this analysis is minimum. The hazards of land development are proportionately greater with the size of the project and the time expectancy for development. The carrying charges, interest, taxes and overhead expenses, rapidly absorb normal expected profits.

7. Prior to the purchase of land, the developer should ascertain the location of existing utilities. If water and sewer connections and storm drainage are not adjacent to the property, the excess cost to make distant connections and the time to recapture this excess expense causes extra charges which reduce profits.

8. Land development and sale of vacant improved lots have a market for use rather than for speculation. The public is well acquainted with the speculative excesses of former years and is not inclined to purchase land for profit opportunities. Lots are purchased by the public for use, and not for value enhancement or speculation.

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Mr. Wagner has written numerous articles on real estate appraisal practices for several professional journals and was co-author, with Harry Grant Atkinson, of *Management Policies of Real Estate Brokerage*, published in 1969. Messrs. Wagner and Atkinson's latest book, *Modern Real Estate Practice: An Introduction to a Career in Real Estate Brokerage*, was published by Dow Jones-Irwin, Inc. in February, 1974.