U.S. Department of Housing and Urban Development
Office of Policy Development and Research

Charlotte,
North Carolina
Greensboro,
North Carolina

The Affordable Housing Demonstration

Two Case Studies

The Joint Venture for Affordable Housing

THE SECRETARY OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410

One of my highest priorities when I came to HUD in 1981 was to find a way to make housing again affordable for most of our citizens. As part of this effort, in January 1982 I announced the formation of the Joint Venture for Affordable Housing as a public-private partnership to find ways to overcome the cost impact of outdated and unnecessary building and land use regulations.

Over the past five years, we at HUD have worked with builders and local government officials in more than 30 communities all across the nation to demonstrate that regulatory reform does reduce housing costs. In project after project, builders have reported cost savings of 20 percent and more through the effective use of innovative site planning, site development and building construction practices.

The final step for each project has been the development of a case study documenting the steps taken by the builders, the help received from local officials, and the resulting cost reductions. Each project is different, and each case study has its own story to tell.

The Affordable Housing Demonstration program has done its job; the case studies in this volume report on some of the last projects to be completed. As the Department now moves to make the Joint Venture concept an operating program, the information in these case studies will help each of you to bring about the necessary changes in your community to reach our goal of affordable housing for everyone.

Very sincerely yours,

Samuel R. Pierce, Jr.

The Affordable Housing Demonstration
Two Case Studies

Charlotte, North Carolina
Greensboro, North Carolina

Prepared for:
U.S. Department of
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Innovative Technology and
Special Projects Division

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The Joint Venture for Affordable Housing

Housing costs have risen dramatically in recent years, so that many people have been unable to buy a home. Part of this cost increase was due to the high rate of interest on home mortgages, which reached almost 20 percent in some areas of the country before dropping under 14 percent in 1983.

A large part of the increase, however, was due to other factors -- rising costs of materials and labor, a reduction in the amount of land available for housing which has drastically increased lot prices, and changes in market patterns leading to larger homes on larger lots. Studies by the President's Commission on Housing and by a special U.S. Department of Housing and Urban Development (HUD) Task Force on Housing Costs confirmed the findings of earlier studies showing that ways exist to cut the cost of housing. These studies also show, however, that out-of-date regulations and building practices frequently prevent these ideas from being applied. In fact, the studies pointed out that many builders and local officials do not even know about many of the ways that exist to reduce housing costs.

The Joint Venture for Affordable Housing was initiated by HUD Secretary Samuel R. Pierce, Jr., to correct this situation. Since affordable housing is a problem which involves all levels of government as well as the rest of the housing industry, finding an answer requires the participation of all of these elements.

Through conferences, workshops, demonstrations, publications, and similar activities, ways to cut construction costs through more effective and efficient planning, site development, and building procedures are being brought to the attention of builders and local government officials all over the country.

The Affordable Housing Demonstrations

Home Builders learn from other builders; successful ideas are copied and used in new ways by other builders in many different areas of the country. The affordable housing demonstrations have been developed to illustrate ideas for reducing housing costs in real projects and to provide information on the cost savings that resulted.

The central theme of the demonstration program is that a builder and those local officials responsible for regulatory approval can, together, identify ways to reduce the cost of housing and to modify or interpret local building codes and site development regulations so that these methods can be used. In the demonstration program, no Federal funds are provided either to the builder or to the community to support the demonstration projects.

HUD and the National Association of Home Builders Research Foundation do provide technical assistance through various publications documenting previous research studies and through suggestions to the project designers, but it is the builders's responsibility to develop a list of possible cost-cutting ideas and it is the responsibility of local officials to accept those which are reasonable for that community.

Participating builders and communities have been selected for the demonstration program in several ways. Before the Joint Venture was announced in January 1982, HUD approached a number of communities which had already demonstrated, in other activities, a willingness to modify regulations and to take other steps to encourage local development. As these communities agreed to participate in the program, NAHB worked through its local associations to identify builders in the communities with reputations for quality and records of innovation. Following announcement of the first twelve communities and builders selected to participate in the demonstration program, many other communities and other builders expressed interest in joining the program. In each case, HUD required a formal commitment by the highest elected official that the local government would support the program.

Once a project was accepted, HUD and the NAHB Research Foundation assisted the builder to identify cost-cutting ideas and to develop a workable, attractive site plan. The cost-cutting measures used in the various demonstrations vary widely.

In some projects, street widths, street design standards, and utility system requirements were changed to reduce costs. In other projects, unit densities have been increased to reduce the impact of land cost on the final price, while good site planning and design have made this increased density acceptable to the communities. New housing materials and construction methods were used in many projects. In addition to these changes in materials and methods, many projects benefited from improvements in local administrative procedures which reduced the time and effort needed to obtain building and land use approvals.

The Case Study Approach

Each project undertaken as an Affordable Housing Demonstration as part of the Joint Venture for Affordable Housing is being described in a case study report. The case studies are intended to be learning tools to help home builders, local officials, and others concerned about affordable housing to recognize and seize opportunities to reduce housing costs through regulatory reform and the use of innovative planning and construction techniques.

Information on the changes and their impact on costs is

collected by the NAHB Research Foundation. Each case study describes the community, outlines the builder's experience, and discusses the specific project characteristics and history.

Where possible, the cost savings resulting from the use of various procedural, planning, development, and construction change are calculated and reported in detail.

The following material provides this information on the Affordable Housing Demonstration projects in Charlotte and Greensboro, North Carolina.

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Case Study 1

Charlotte, North Carolina

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Summary

The Charlotte, North Carolina, Affordable Housing Demonstration project is "Lynton Place," developed and built by the John Crosland Company. Charlotte has the lowest housing density of almost all cities its size at 1.9 dwelling units per acre. Lynton Place density is 3.6 units per acre.

Lynton Place includes 59 acres of land, of which only 41.5 acres were buildable. A total of 149 single-family detached units were built, ranging in size from 950 to 1500 square feet and priced from $58,000 to $65,000. The homes have traditional exterior styling and spacious, open interiors. Vaulted ceilings and partly masonry veneer exteriors are featured in most units.

For the more dense development to be accepted by the neighbors and the city, Crosland added an 81-foot wide park as a buffer surrounding the homes. The park contains a bike path, hiking trails, and natural vegetation. A clubhouse and two swimming pools are provided for residents.

Crosland obtained R20-MF Innovative Development (ID) zoning which resembles Planned Unit Development (PUD) zoning, allowing zero-lot-line siting, smaller lots, and other features not allowed by standard subdivision zoning. For the demonstration, the city allowed additional variances to reduce housing costs. These include expedited processing time, increased manhole spacing, surface stormwater drainage, no curbs and gutters, narrower street paving, and no sidewalks.

Cost savings in Lynton Place due to relaxed governmental regulations and builder/developer variations to typical practice in the Charlotte area totaled $8,747 per unit.

Project Description

The Community - Charlotte, North Carolina

Charlotte, North Carolina, seat of Mecklenburg County, is the largest city in the Carolinas and 47th largest in the country. In 1980, 314,447 people lived in Charlotte and 404,270 in the county. The median household income in the city was $17,837.

At 1.9 dwelling units per acre, Charlotte has the lowest housing density of any city its size except for those cities that have large areas of unimproved land because of city/county consolidation.

Because of favorable annexation laws, Charlotte has been able to grow rapidly in area and population, and for planning purposes, the city and county increasingly are considered as one economic unit.

Charlotte, incorporated in 1768, is located in the Piedmont Region--fertile, rolling farmland stretching from New York State to Birmingham, Alabama just east of the Appalachian chain. At the intersection of major north-south and east-west interstate highways, Charlotte is second only to Chicago in trucking. The city also is served by five airlines and three railroads.

Charlotte provides the Central Piedmont Region with banking, insurance, and wholesaling services. In order of importance, Charlotte manufactures machinery, food products, textiles, printed materials, and electronics. It is the home of the University of North Carolina at Charlotte, Central Piedmont Community College, Queens College, and Johnson C. Smith University.

The Charlotte-Mecklenburg Planning Commission report of 1985, "Employment And Household Projections", states that Charlotte-Mecklenburg (C-M) is "an employment magnet in which jobs are increasing faster than population and housing, and a rising share of jobs will be filled by commuters from surrounding counties."

The climate of Charlotte is mild, with average winter temperatures ranging between lows of 33°F. and highs of 53°F. Average summer temperatures fluctuate between lows of 67°F. and highs of 88°F. An average of 43 inches of precipitation occurs each year.

The city has a council-manager form of government. Voters elect a mayor and twelve members of City Council to two-year part-time terms. The mayor votes only to break tie votes of the council. Council appoints a city manager to which department heads report. Departments include Engineering (including Sanitation), Traffic, Police, Fire, and Community Development, plus three city-county departments-- the Planning Commission, the Utility

Department, and the Building Standards Department.

The Planning Commission acts as a clearinghouse for subdivision approvals, sending plans to other departments for approvals. When approvals are received, the Commission recommends action to the City Council, and if approved by Council, records the subdivision plat.

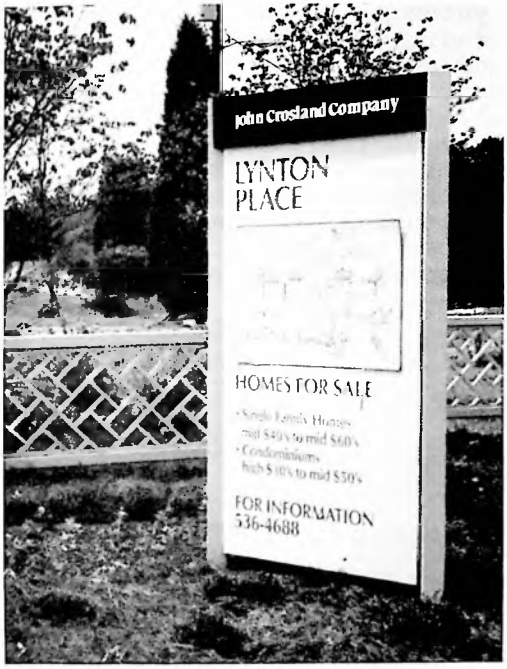
The Zoning Administrator of the Building Standards Department determines whether the subdivision plan complies with the city zoning plan.

After land-use plans are approved by the Planning Commission and Council, the Engineering Department approves plans for streets, and water and sewer systems. Building Standards Department approves construction plans and inspects site construction.

Concurrent to the planning and construction approval proccesses are approvals of the utilities plan by the City-County Utilities Department and environmental impact by the state Environmental Management Department.

The Builder - John Crosland Company

John Crosland Company, founded in 1937, has built more than 10,000 single-family detached houses and 7500 apartments. It has undergone rapid expansion in the past few years, growing from a construction volume of $20 million in 1982, $60 million in 1985, and $100 million projected for 1986. It currently holds 26% of the Charlotte market. Crosland will build 900 for-sale units in Charlotte in 1985 plus 300 units in other cities, primarily Raleigh, NC, and Charleston and Myrtle Beach, SC. In addition, it will build between 800 and 1000 for-rent units.



The company employs 300 people in six divisions: Land Acquisition, Land Development, Charlotte Metro (for-sale units), Carolinas (for-sale outside Charlotte), For Rent (apartment construction, rehabilitation and property management in four states), and J. Crosland & Associates (shopping centers and commercial development).

Crosland does its own land acquisition, land planning, marketing, sales, accounting, permanent financing and construction management, and obtains all approvals and permits for its construction subcontractors. Crosland subcontracts construction and infrastructure development, some of its land planning, engineering, and architectural design work.

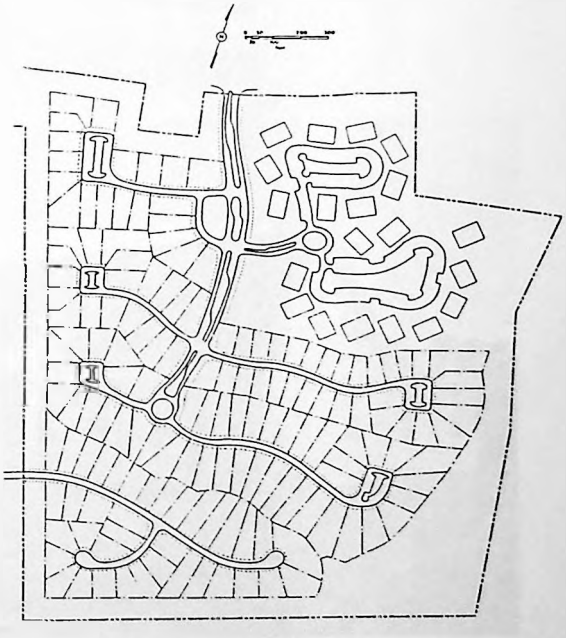
The Project - Lynton Place

Lynton Place is located on the south side of Albermarle Road, a two-lane state highway, in eastern Charlotte. The site is bordered by two established subdivisions. Lynton Place includes 59 acres of land total, of which 41.5 acres were buildable, as explained in Chapter 4.

A total of 149 single-family detached units were built, ranging in size from 950 to 1500 square feet. Prices ranged from $58,000 to $65,000. Net density is 3.6 units per acre.

In addition to the single-family homes, 160 condominium units were originally scheduled to be built. These were

Lynton Place



not included in the demonstration portion of Lynton Place although similar cost saving techniques were incorporated in condominium land development and construction. Because of slow condominium sales, Crosland is considering replatting the condo area to single-family zero-lot-line homes.

Lynton Place homes have traditional exterior styling and spacious, open interiors. Most living rooms in the single-family detached models have vaulted ceilings. Most homes have at least partly masonry veneer exteriors. Optional non-masonry fireplaces with wood chimneys were selected by nearly all buyers.

The main entry street is divided by a grassy strip landscaped with trees moved from other parts of the development. Most landscaping in the development was done with indigenous plantings. Streets branching from the main boulevard end in large cul-de-sacs. Cul-de-sac islands provide off-street parking. Driveways into each house provide an additional three parking spaces per home.

Surrounding the development is an 81-foot wide park with bike and hiking trails. The park was required by the Planning Commission as a buffer to increase support for the development among neighbors in the surrounding developments

and to facilitate passage of the development plan by the City Council.

A large clubhouse and two swimming pools, one for families and one for adults, are provided to property owners. Part of the clubhouse was originally used as a sales center.

The Master Homeowners Association owns the perimeter park, planting strips, detention ponds, street islands, pools, and clubhouse. The city owns all streets in the demonstration portion of the subdivision.

Lynton Place amenities

Chapter 2

Project History

John Crosland, Jr., Chairman of John Crosland Company, learned of the Affordable Housing Demonstration in the fall of 1982. He saw it as an opportunity to explore a number of ways to build more affordable homes. In March, 1983, Crosland expressed interest in participating in the program.

Paul Leonard, Crosland Executive Vice President, asked Doug Boone, head of the Land Acquisition Division, to select a suitable tract of land for the subdivision.

John Crosland, Jr. had several criteria for site selection. The tract had to be large enough to accommodate a mixture of housing types, since he wanted to demonstrate a variety of ways to reduce housing costs. Charlotte is primarily a low-density single-family area, and if Crosland Company could demonstrate that higher-density, mixed-use development could be attractive and successful, the city might allow the same land planning techniques to be used elsewhere in the area.

The tract had to be in a good market location with moderate-price housing in the adjacent neighborhoods, have amenities, and be free of soil problems. The land had to be available at a not-fully-rezoned price; one way Crosland keeps land costs low and housing more affordable is by buying land with a low-density designation and having it rezoned to higher density.

A marketing survey performed by Chuck Graham, Crosland's Director of Marketing, confirmed that a subdivision of somewhat higher density than is normal to Charlotte would best serve the local market.

The core market consisted of homes in the $60-80,000 price bracket, Crosland's primary target market. This price range appealed mainly to younger buyers; 70% of Crosland's target market had heads of households under 35 years of age, compared to 55% for Charlotte as a whole. It was becoming increasingly difficult to provide housing in this price range that would meet the potential buyers' needs.

Crosland redesigned their homes to comply with most of NAHB's Thermal Performance Guidelines, which are accepted by FHA, FNMA, and FMAC as criteria for favorable mortgage ratio consideration. Buyers could now afford to incur debt up to 32% of income instead of the normal standard of 28%.

In May, 1983, Crosland located and optioned a possible demonstration site on a two-lane state highway in southeast Charlotte bordered by established single-family detached subdivisions. Although some of the houses in the neighborhood were up to 3000 square feet and appraised for $80,000, most were between 1500 and 2000 square feet and in the $50-60,000 price range.

On June 20, 1983, Charlotte Mayor Eddie Knox, as directed by City Council action, accepted HUD's invitation to participate and HUD designated the project an Affordable Housing Demonstration site. Crosland appointed John Carpenter, Area General Manager, project director of Lynton Place.

The City

The cooperation of newly-elected Mayor Harvey Gant and City Manager Wendell White was crucial to speeding Lynton Place through the administrative process. Carol Loveless, Assistant City Manager, was specifically assigned to "fast-track" the application through the city and city-county departments.

Participation in the Affordable Housing Demonstration and support by the Mayor and City Council enabled John Crosland Company to negotiate with the city to change some restrictive regulations. Doug Boone, Crosland's Land Acquisition Manager, worked closely with Martin Crampton, Charlotte-Mecklenburg Planning Director and Bob Young of the planning staff to obtain a higher density zoning designation.

In addition, Tom Tucker, Crosland's Land Development Manager, worked with City Engineer Clark Readline, Bob Pressley of the Traffic Department, Joe Stowe of the Charlotte-Mecklenburg Utility Department, and the planning staff to obtain changes in standards and regulations which would reduce costs. Technical assistance was received from HUD, NAHB, and NAHB Research Foundation.

All land in the area of the optioned tract was originally zoned low density single-family detached. Crosland approached the city-county Planning Commission in September, 1983, with a general plan to rezone the tract R20-MF Innovative Development, which allows higher density and mixed housing types.

The Innovative Development Zoning designation obtained by Crosland allows some deviation from standard regulations, shortens processing time for the developer, and streamlines the approval process for development and construction innovations. The city-county Planning Commission staff expedites movement of applications through city-county Building Standards and other departments. When all approvals are received, the Planning Commission recommends that City Council approve the project at its regular monthly public meeting.

To win neighborhood and city acceptance of a higher-density development than normal in Charlotte, the plan specified that Crosland would encircle Lynton Place with an 81-foot wide perimeter park. This buffer reduced density of the proposed project and thus increased costs, but did allay city and neighborhood concerns. On November 21, 1983, Charlotte City Council approved the rezoning at a public meeting.

Approval and Construction

Crosland submitted final plans to the Planning Commission in January, 1984 and purchased the optioned tract in February. In August, the Planning Commission approved the final plans, and negotiations began on detailed changes to normal construction and development practices.

The state Environmental Management Department approved the grading and stormwater drainage plan in November, 1984. The Utilities Department water/sewer permit and Building Standards Department permit for construction of the first condominiums were granted in January, 1985. Construction permits for the first single-family detached units and the state highway entrance permit were both received in February, 1985. Construction of the first model home, condominium unit, and community-center/sales center began in February, 1985.

Marketing

John Crosland Company began marketing Lynton Place with its "Muddy Boots" radio, TV, and newspaper campaign. Crosland invited prospective buyers to wear their boots, visit the site sales center construction trailer, and "get the lay of the land" when Crosland was still grading the streets and just beginning to build its first model homes. The campaign advertised all of Crosland's 18 developments in and around Charlotte.

After its "Circle of Models" was complete, Crosland increased the advertising for Lynton Place. Most homes in Lynton Place were presold from the models, although several additional speculative homes were built to balance the housing mix in each neighborhood. Brochures were distributed at the model homes, and buyers were invited to drive through other Crosland developments to see "their" houses.

Lynton Place home under construction

Crosland marketed the homes to its original target group of first-time buyers, singles, and professionals in the 25-35 year old age category, and empty-nesters. A grand opening, held on July 30, 1985, drew a large crowd of prospective buyers.

Crosland emphasized the energy-efficiency of its homes, and the higher debt/ income ratios available to buyers from FHA and local lending institutions.

In addition, Crosland participated in the WATTS COUNT program in which a franchised contractor performed blower-door air infiltration tests on every house, "tightened" them as necessary with caulking and weatherstripping, and guaranteed that the home buyer's first year gas bill for both heat and domestic hot water would not exceed $0.30 per heated square foot. The contractor pays any amount over the guaranteed amount for the first year.

Changes and Their Impact on Costs

One purpose of the Affordable Housing Demonstration is to collect and evaluate sound cost data on residential development practices and construction techniques. The following discussion describes variances from the norm in administration and processing, changes in Lynton Place site planning and development, and changes in Lynton Place design and construction. Detailed cost savings are contained in Chapter 4.

Change List Approval Process

As discussed in Chapter 2, the city of Charlotte designated the Lynton Place site an R20-MF Innovative Development (ID). This zoning was invented in Charlotte and resembles Planned Unit Development (PUD) zoning in that it allows zero-lot-line construction, smaller lots, and other features not allowed in standard subdivision zoning and ordinances.

For the demonstration, the city was willing to go beyond normal ID variances and consider relaxing additional regulations and processing procedures in order to reduce housing costs. Specific issues are described later in this chapter.

Crosland submitted an initial list of requested changes to the city in March 1984 and continued submitting additional requests for the next year. Most of these requests were accepted. Some were already acceptable under the ID ordinance; others were accepted for the demonstration only based on documentation and logic presented by Crosland's Tom Tucker.

Administrative and Processing Changes

Rezoning Lynton Place to ID zoning required less than three months from application to approval. The rezoning application was submitted in September 1983, and the general plan was approved by City Council on November 21 of the same year.

Normally rezoning requires 6 to 12 months. However, Crosland's previous discussions with neighbors and willingness to compromise with them, and the city administration's positive attitude and extra effort enabled a three-month acceleration of the rezoning process. A total of $750 per unit was saved on the Lynton Place project by rezoning to R20-MFID. This savings is discussed further in Chapter 4.

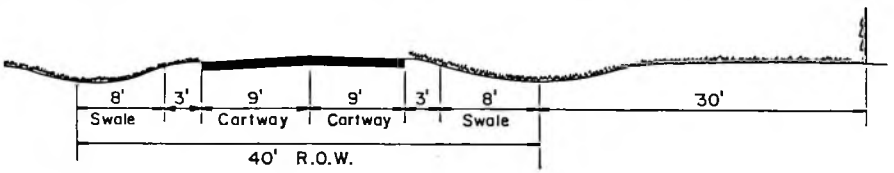
Variance discussions lasted a year, from March 1984 to March 1985, not an abnormal time span considering the large number of variances requested by Crosland.

Site Planning and Development Changes

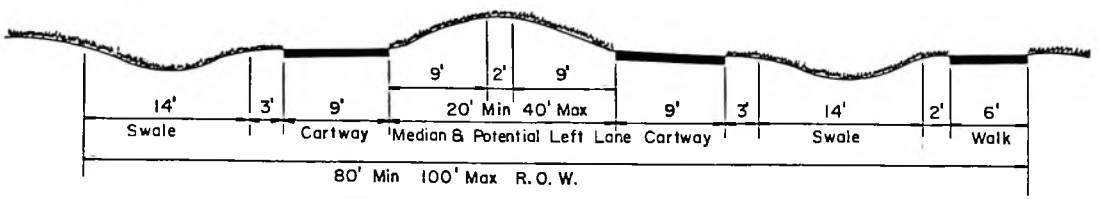
Because Charlotte allowed the ID zoning option, costs of developing land in Lynton Place were lower than normal. The ID process allowed several variances to normal city standards which were vital to reducing the cost of Lynton Place homes.

For the demonstration, the city allowed reductions in street right-of-way width from 50- to 40-feet allowing preservation of more natural tree cover and street pavement width from 22-feet to 18-feet and accepted title to the streets in the single-family detached housing area. Curbs and gutters were eliminated. Costs were reduced by $1,407 per unit.

The Planning Department allowed a reduction in single-family detached lot size from



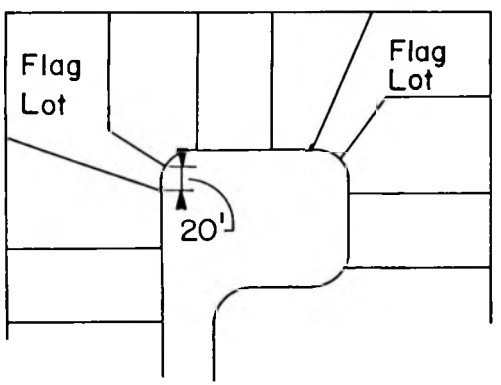
Cul-de-sac



Divided Boulevard

20,000-square feet to 6,000-square feet. Minimum frontages on public streets for single-family detached lots were lowered from 70-feet to 60-feet and from 40-feet to 20-feet on cul-de-sac lots. On single-family detached houses, set backs were reduced from 40-feet to 30-feet, and building separation from 25-feet to 14-feet.

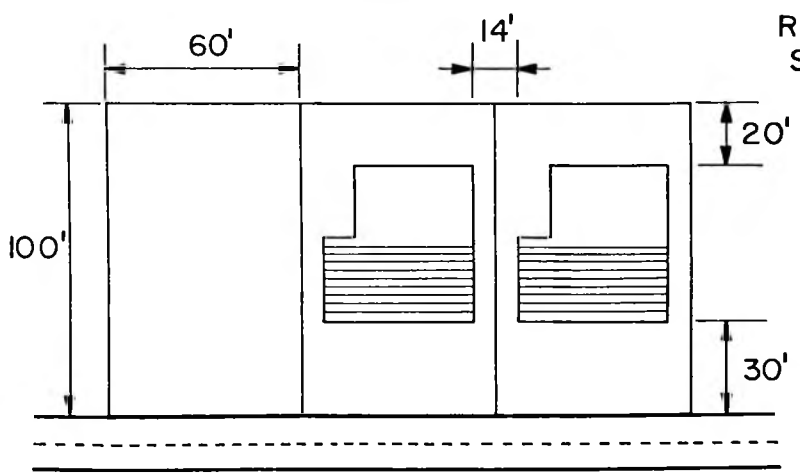
Minimum Frontage on Flag Lots



Stormwater is carried by grassy swales to a detention pond, with culverts used where necessary. Normally the city required curb and gutter using piped run-off. A total of $404 per unit was saved on storm sewer installation when compared to typical underground stormwater sewer systems.

PVC sanitary sewer pipe was permitted in lieu of vitrified clay pipe. Single crossing laterals were permitted for two units instead of one per unit. A substantial saving was gained by replacing 7 manholes with clean-outs. The overall savings on the sanitary sewer system was $755 per unit.

Minimum Building Separation



PVC water line was permitted in lieu of ductile iron pipe. A single crossover was used for two instead of one unit. Water service costs were reduced by $554 per unit.

Sidewalks were eliminated. City standards require a sidewalk on one side of the street. Costs were reduced by $220 per unit.

Crosland saved $767 per unit in landscaping by replanting selected natural trees rather than removal and purchasing of new trees.

Building Design and Construction

Reduction in rights-of-way, street paving, and setbacks resulted in shortened water, sewer, and electrical lines to each home.

Crosland adopted the NAHB Research Foundation Optimum Value Engineered (OVE) framing system with: two-foot centers on joists, studs, and trusses; two-stud outside corners; substitution of metal drywall clips for partition backers and nailers; and elimination of headers in non-bearing walls. The company painted all unnecessary framing lumber red in a conventionally framed house and conducted tours and training seminars for its subcontractors, superintendents, and wall panel supplier.

Crosland also used polybutylene plumbing pipe instead of copper which is typical in the Charlotte area.

Total building design and construction savings was $915 per unit.

Details of Changes and Their Costs

In this chapter, costs of each change in Charlotte's standards and\or typical construction practices in the Charlotte area are discussed and compared to the method used in the demonstration project. The objective of the analysis is to show how much costs were reduced by comparing Lynton Place "as built" to existing standards and practices.

Administrative and Processing Changes

Rezoning from standard subdivision to R20-MF Innovative Development took 3 months less than normal, as explained in Chapter 3. Crosland estimates that carrying costs of the land, overhead and indirect costs, and labor and material inflation over that period saved about $250 per month per unit, or $750 per unit total.

Site Planning and Development Changes

Under Innovative Development zoning, Crosland was allowed to reduce minimum lot size from 20,000 to 6,000 and 9,000 square feet. Weighted average lot size in the demonstration portion of the site was 8,477 square feet. The 81-foot wide buffer strip and stormwater retention ponds reduced land by about 12.5 acres. A stream floodway along the southeastern edge of the site reduced the site by another 5 acres. The net result was 41.5 acres of buildable land and a net density of 3.6 units per acre with 149 units built. Had the buffer strip not been necessary, about 36 more units could have been built at the same density.

If built to conventional zoning without the buffer strip and with underground stormwater control, 90 units

Reduction in Administrative and Processing Costs

	Est. Savings per Unit
Interest on Land	$350
Overhead and Indirect	200
Labor and Material Inflation	200
TOTAL	$750

on 20,000 square foot lots would have been built at a density of 1.7 units per acre.

Throughout this chapter, the comparison subdivision contains 90 units and the demonstration contains 149 units. If a cost component is the same for both the demonstration and comparison, then the cost per unit will be much lower for the demonstration because of the greater number of units. Savings per unit always reflect any infrastructure change and increase in number of units.

Following is a summary of land development cost savings for the demonstration portion of the project.

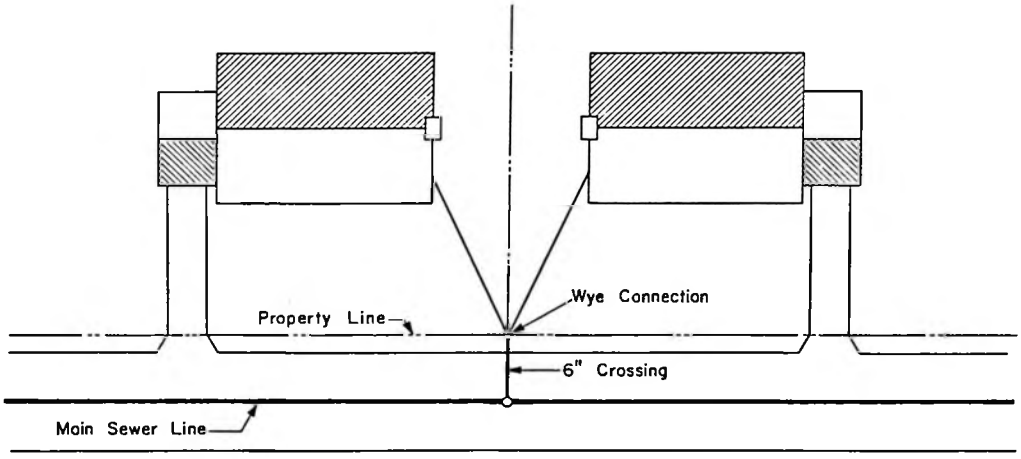
Land Development Cost Summary

	Demonstration	Comparison	Total Savings	Savings Per Unit
Raw land	$ 516,000	$ 516,000	$ 0	$2,670
Land clearing, earthwork	90,000	90,000	0	396
Sanitary sewer	122,400	141,800	19,400	755
Water service	105,270	113,400	8,130	554
Stormwater drainage	50,360	66,750	16,390	404
Streets, curbs, and gutters	87,728	179,612	91,884	1,407
Sidewalks	0	19,800	19,800	220
Landscaping	40,000	85,000	45,000	676
TOTALS	$1,011,758	$1,212,362	$200,604	
Per Unit	$ 6,790*	$ 13,471**		$7,082***

* 149 units as built
** 90 units if built to existing standards
*** Reflects both infrastructure changes and unit increase

Sanitary Sewer

Polyvinylchloride (PVC) pipe was used instead of the city standard vitrified clay pipe (VCP). PVC has since been approved for use throughout the city. Manhole spacing was increased because the city allowed lines to run outside the normal sewer right-of-way. This allowed Crosland to lengthen tangents under curved streets rather than install manholes. A total of 7 manholes were saved. The city allowed single 6-inch crossings for two units instead of one 4-inch crossing per unit, with a wye at the property line. This cut actual sewer taps in half. Costs per unit were decreased as shown below.



Sanitary Sewer Cost Comparison

	Demonstration	Comparison	Savings
PVC vs. VCP sewer main	$ 66,000	$ 79,200	$13,200
Manholes (15 vs. 22)	12,000	17,600	5,600
Sewer laterals	44,400	45,000	600
TOTAL	$122,400	$141,800	$19,400
Per Unit	$821*	$1,576**	$755***

* 149 units as built
** 90 units if built to existing standards
*** Reflects both infrastructure change and density increase

Water Service

Polyvinylchloride (PVC) pipe was allowed instead of ductile iron pipe (DIP) for water service for the demonstration only. The city allowed a single one-inch crossover for two units with a tee at the property line versus one 3/4-inch crossover per unit. Cost savings were as follows:

Water Service Cost Comparison

	Demonstration	Comparison	Total Savings
PVC vs DIP mains	$ 56,100	$ 69,300	$13,200
1" vs. 3/4" laterals	49,170	44,100	(5,070)
TOTAL	$105,270	$113,400	$ 8,130
Per Unit	$706*	$1,260**	$554***

* 149 units as built
** 90 units if built to existing standards
*** Reflects infrastructure change and density increase

Stormwater Drainage

Reinforced concrete pipe (RCP) is normally required in Charlotte for underground stormwater drainage. Crosland designed Lynton Place for surface drainage with grass swales and retention ponds. Driveways were depressed at the swales instead of using under driveway culvert pipe. RCP was used in strategic locations to pass under streets into retention ponds. Total costs were as follows:

Stormwater Drainage Cost Comparison

	Demonstration	Comparison	Savings
Surface vs. underground	$50,360	$66,750	$16,390
Per Unit	$338*	$742**	$404***

* 149 units as built
** 90 units if built to existing standards
*** Reflects both infrastructure changes and density increase

Streets, Curbs and Gutters

Normal residential street standards in Charlotte require 26-foot wide streets -- 22 feet of paving and 2-foot wide curb and gutter on each side. Lynton Place curbs and gutters were eliminated and paving widths reduced from 22 to 18 feet. The entry "boulevard" consisted of two 9-foot one-way lanes with a grass median strip. Normal cul-de-sacs were revised to provide off-street visitor parking. Street, curb, and gutter costs were as follows:

Streets, Curbs and Gutter Cost Comparison

	Demonstration	Comparison	Savings
18' vs. 22' paving	$87,728	$107,012	$19,284
Curb/gutter elimination	0	72,600	72,600
TOTAL	$87,728	$179,612	$91,884
Per Unit	$589*	$1,996**	$1,407***

* 149 units as built
** 90 units if built to existing standards
*** Reflects both infrastructure change and density increase

Sidewalks

Charlotte normally requires sidewalks on one side of the street. For Lynton Place, they were eliminated, saving about 3,300 feet of 4-foot wide sidewalk. Costs were as follows:

Sidewalk Cost Comparison

	Demonstration	Comparison	Savings
Elimination of sidewalk	0	$19,800	$19,800
Per Unit	0*	$220**	$220***

* 149 units as built
** 90 units if built to existing standards
*** Reflects both infrastructure change and density increase

Landscaping

Before equipment was allowed on the site, Crosland had an arborist survey, identify, and tag specimen trees. Then a company specializing in tree removal and planting removed the tagged trees and stored them for later transplanting.

Crosland estimates this procedure cost about $100 per tree versus $250 per tree had equivalent size and species been bought from a nursery and planted. Approximately 300 trees were saved.

Other landscaping costs for public areas included entrance signs and seeding.

Landscaping Cost Comparison

	Demonstration	Comparison	Savings
Tree transplanting	$30,000	$75,000	$45,000
Seeding/signs	10,000	10,000	0
TOTAL	$40,000	$85,000	$45,000
Per Unit	$268*	$944**	$676***

* 149 units as built
** 90 units if built to conventional practice
*** Reflects both innovation and density increase

Building Design and Construction Changes

Crosland was already using the Optimum Value Engineering (OVE) techniques of 24-inch on-center stud spacing, 2-stud corners, blocking instead of partition posts, and single top plates. He also devised a substitute for solid wood headers, using sections of wood/plywood I-beams which were less expensive and provided space for insulation.

Because of the 10-foot reduction in setback requirements, driveways, water service, and sanitary sewer were reduced in length. Water service property line shut-off valves were eliminated. Polybutylene hot and cold water tubing was used instead of copper. Following is a summary of construction cost savings:

Construction Cost Savings

Demonstration	Comparison	Cost Savings Per Unit
24" o.c. stud spacing, 2-stud corners, single top plate, plywood I-beam headers	16" o.c. stud spacing, 3-stud corners, double top plate, built-up wood headers	$295
25' long X 12' wide concrete driveways	35'long X 12' wide concrete driveways	150
25' long, 3/4" water line, no valve @ property line	35' long, 3/4" water line, shut-off valve @ property line	20
25' long, 4" PVC sewer lateral	35" long, 4" VCP sewer lateral	50
Polybutylene hot and cold water tubing	Copper hot and cold water pipe	100
No driveway curb cuts	Driveway curb cuts	300
	TOTAL	$915

Cost Savings Summary

Following is a summary of cost savings per unit in Lynton Place due to relaxed governmental regulations and builder/developer variations to typical practice in the Charlotte area.

Cost Saving Summary

	Cost Savings Per Unit
Administrative and processing	$ 750
Land development	7,082
Direct construction	915
TOTAL	$8,747

The Affordable Housing Demonstration
Case Study 2

Greensboro, North Carolina

Table of Contents

The Greensboro, North Carolina, Affordable Housing Demonstration project is Covington Place, located on ten heavily wooded acres in the southwest part of the city. Norcon Builders, Inc. began developing the land and building the homes in August 1985, and anticipates all units will be sold and closed by January 1987.

Covington Place includes 80 single-family detached units built at a density of 8 units to the acre. The four two and three bedroom units have from 784 square feet to 1160 square feet. Prices of the first 40 homes ranged from $49,900 to $61,900.

The units are designed by architects Mark Kaufman and Don Meeks to meet buyer demands for smaller, more affordable homes with interior amenities reflecting contemporary life styles. The units feature vaulted ceilings, atriums, window seats, fireplaces, and garages.

Covington Place is the first residential subdivision of its kind proposed within Greensboro City limits. Normal zoning for the area allowed only 3 units per acre. Commissioners, staff, and neighbors were initially wary of the higher density, but approved it and other variances to typical practice for the demonstration to reduce housing costs.

Street paving width and rights-of-way were reduced, street paving thickness was lessened, and a unique surface stormwater drainage system was implemented. These changes combined with density increases allowed an average total savings in Covington Place, compared to typical Greensboro practice, of $7,653 per unit.

Project Description

The Community - Greensboro, North Carolina

Greensboro is located in the Piedmont Triad in the north central part of North Carolina, halfway between Raleigh and Charlotte. Greensboro, Winston-Salem, and High Point form the core metropolitan area of the Triad, which includes 11 counties and more than 1.1 million people. The Triad was rated the nation's best medium-sized metropolitan area in which to live by Rand McNally's Places Rated Almanac in 1984, based on economics, climate, crime, housing, education, health care, recreation, transportation, and the arts.

The city was founded in 1808 as the Guilford County seat, and by the late 19th century was becoming a center for economic activity, with textiles a focus. Today there is a mix of manufacturing, corporate headquarters, educational institutions, transportation, government and small business. Major employers are: Cone Mills Corporation (textiles); A.T. & T. Technologies, Inc. (administrative offices); Burlington Industries, Inc. (textiles); Lorillard (tobacco); Guilford Mills (textiles); Blue Bell, Inc. (apparel); and Gilbarco (manufacturing subsidiary of Exxon Corporation).

Greensboro is home to six major colleges and universities enrolling over 24,000 students. These include: University of North Carolina at Greensboro; North Carolina Agricultural and Technical State University; Guilford College; Greensboro College; Bennett College; and Guilford Technical Institute.

The new Greensboro/High Point/Winston-Salem Regional Airport, eight miles from downtown, is a major commercial and private aviation center in the southeast.

Population of Greensboro, according to the U. S. Census Bureau, is estimated at 182,830 for 1985. This represents a 17.4 percent growth since 1980, a result of both annexation and residential development. Guilford County population for 1985 is estimated at 335,787, a 5.8 percent increase since 1980.

Average selling price of Greensboro single-family residential units was $76,457 in 1984. (Greensboro Board of Realtors, Inc.) Median household income was $15,971 in Greensboro, according to the 1980 census, compared to $14,481 for the State and $16,850 for the U.S.

Greensboro is governed by a Mayor/City Council, and administered by a City Manager. The Planning and Development Department handles residential development and housing proposals in its four divisions: planning, inspections, environmental services, and soil scientist's office. The city is a member of the Piedmont Triad Council of Governments, which developed a six county regional development plan for insuring orderly growth.

The Builder/Developer - Norcon Builders, Inc.

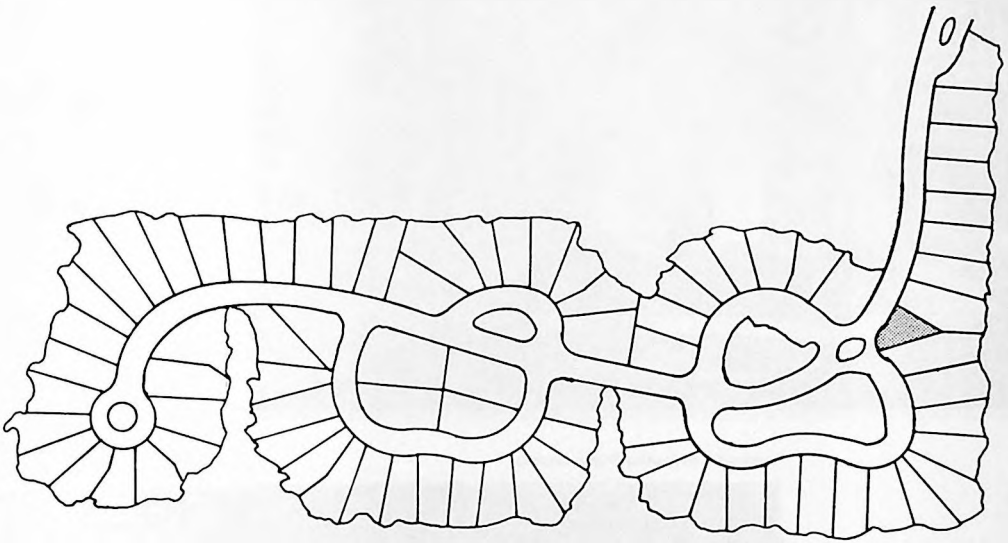
Norcon Builders, Inc. was founded in January 1973 by Norwood Stone, President. The corporation includes Norcon Builders, responsible for construction and land development, and MGT, a wholly owned subsidiary responsible for sales and real estate. Norcon is licensed in five southeastern states, with Greensboro the center of operations.

Originally, Norcon had a large commercial clientele and built high-rise apartments and condominiums. Recently the company has focused on residential construction. James Hedgecock, Vice President, estimates Norcon will complete 60 to 70 single-family units in 1986, and 50 units of Farmers Home Administration apartments for middle income residents.

Norcon maintains a small site crew, and installs its own foundations and slabs. About eighty-five percent of the company's work is subcontracted.

The Project - Covington Place

Covington Place, the Greensboro affordable housing demonstration, consists of 80 single-family detached homes on a 10-acre site in the southwest part of town near I-85. The four two and three bedroom models include from 784 square feet to 1160 square feet. Prices in Phases I and II, the first 40 homes, ranged from $49,900 to $61,900, and in Phase III and IV from $54,900 to $66,900.



Covington Place

Greensboro, North Carolina

In a private wooded setting, the Covington Place homes are picturesque, reminiscent of a quaint New England village with curving streets and sidewalks, Victorian street lighting, and picket fences. The open floor plans are

Typical Covington Place homes

suited to contemporary lifestyles. The energy-efficient homes include fireplaces, garages, storage areas, appliances, and landscaping. Vaulted ceilings, studies, atriums, window seats, and plant and

window shelves add appeal to the models.

The homes are not on the lot-line, but are placed at least 2 feet inside the line on one side. By holding to this 2-foot distance, the planner provided a minimum of 10 feet between units at the closest point while giving the maximum space possible to each home.

The fan configuration leaves space for large oak and pine trees in each of the three home groupings, and a wide treed green space of varying widths around the perimeter of the site.

Attractive wooded view of Covington Place

The Covington Place homes were designed by Mark Kaufman/Don Meeks, a Houston based architectural/planning firm which has received numerous awards for designing high-impact, affordable, smaller homes which meet buyer demands yet keep down builder costs. The designs featured in Covington Place were included in Professional Builder magazine's "Best Model Homes of 1984".

"Normal construction for an economical home could have built rectangular boxes

Typical Covington Place interiors

cheaper, but they wouldn't have sold," commented James Hedgecock, Norcon Vice President and Supervisor of Covington Place. " We built quality and added amenities not common in homes at this price."

Norcon planned specific models for each site, and controls the exterior color choice. A homeowners association will carry-on the project's architectural control when all homes are sold.

Project History

At the January 1985 Annual Convention of the National Association of Home Builders (NAHB) in Houston, Texas, Norwood Stone, Norcon Builders, Inc. President, learned about the HUD-sponsored Joint Venture for Affordable Housing. HUD representative Conrad Arnolts explained the basic requirements for participation in the program -- an innovative site plan, well-designed homes planned for entry-level buyers, and city support.

Norcon owned 10 acres of land within the Greensboro city limits which Stone decided would be an appropriate affordable housing demonstration site. He purchased house designs from the Kaufman/Meeks firm and approached the Greensboro Mayor and City Council for support for the project.

Mayor John W. Forbes wrote to HUD on March 28, 1985, documenting his willingness to support the goals of the affordable housing program. The City Council adopted a resolution of support and cooperation for the program. The Council, Mayor, and city staff pledged to work with Norcon Builders, Inc. and to consider variances to regulations which increase housing costs without providing any additional health or safety benefits or amenities.

HUD accepted the proposed land development and house plans and designated Greensboro and Norcon official participants in the program. C. E. Mortimer, Greensboro Community Planning and Development Department Director, was appointed the city contact for the project. James Hedgecock, Norcon Vice President, was named Project Director/ Supervisor.

In April 1985, Stone and Hedgecock presented the City a "wish list" of suggested variances to regulations and typical Greensboro standards to reduce the cost of homes in the proposed Covington Place subdivision. First, rezoning was necessary for the requested density increase from the Greensboro norm of 3 units per acre to 8 units per acre. No existing Greensboro zoning fit the Norcon proposal. According to a special provision in North Carolina state law, a locality must review every proposed project fitting no existing local zoning classification.

Covington Place is the first residential subdivision of its kind proposed within the Greensboro city limits. City staff and Commission members were initially wary of such a radical departure from normal Greensboro residential development. However, they reviewed the plans, questioned specific items, negotiated variances, held public hearings, scheduled meetings of the planning and zoning commissions, and after about five months, approved the rezoning.

Because of the uniqueness of the plan for high density siting of single-family detached units, a townhouse zoning designation was accepted. Construction adhered to single-family detached and townhouse building codes.

Covington Place was designated a conditional use Planned Unit Development (PUD), allowing greater flexibility than conventional residential zoning. The PUD designation enabled Norcon to site the units for energy efficiency, maximum use of open-space, privacy, and aesthetics.

The City agreed to the variances as a one-time demonstration in Covington Place. Staff and Commissioners will monitor market acceptance by potential buyers and residents, maintenance records, resale values, safety factors, complaints, and public costs.

Construction began in August 1985 and sales started in October 1985.

The Covington Place Homeowners Association will maintain the private streets deeded to the Association, the street lights leased from the power company, and the small stormwater lift station. The city is treating the single-family detached homes subdivision as a typical Greensboro townhome development, with collective mailboxes and garbage collection.

Marketing

By November, 1986, the 20 units in Phase I were sold, closed and occupied; Phase II, all 20 units were sold, closed and occupied; Phase III, 15 units were sold and six closed; and Phase IV, six units were sold. Norcon planned to complete the entire Covington Place project by December 1986, with all units sold and closed by January 1987.

Best selling Covington Place models were the smallest and largest homes. Most buyers were first-time home buyers in white collar careers.

Changes and Their Impact on Costs

One purpose of the Affordable Housing Demonstration Program is to collect and evaluate sound cost data on residential development practices and construction techniques. The following discussion describes specific variances from the norm in administration and processing, site planning and development, and building and construction in the Greensboro demonstration project.

Administrative and Processing

As reported in Chapter 2, the Covington Place site was rezoned from the normal 3 units per acre to 8 units per acre, using a townhouse zoning designation. Next, the city designated the site a PUD. These rulings took about five months, an average length of time in Greensboro.

Land Development

Norcon selected the Covington Place site for the Affordable Housing Demonstration for several reasons. The site is convenient, about one-half mile from I-85, and not far from I-40, downtown Greensboro, and several large shopping centers. Large oak and pine trees dominate the area, creating an attractive setting. Most important, however, the raw land cost $7,500 per acre, compared to the normal $15,000 - $20,000 per acre in other areas of the city. Selecting this land allowed the builder to design and construct an amenity-filled home at an affordable price.

Site planning and land development are major areas of cost reduction for most builder/developers who plan more affordable housing without effecting life-style amenities. Norcon cut per-unit costs in Covington Place by increasing density from the normal 3 homes per acre to 8 homes per acre, reducing street widths, eliminating sidewalks, substituting easements for rights-of-way, reducing setbacks and space between units, and using 90 percent surface storm drainage instead of curbs, gutters, and underground pipes.

At 3 units to an acre, raw land costs would have been $2,500 per unit. At 8 to the acre, raw land cost $937.50 per unit. However, using the more typical land costs of $15,000-20,000 per acre, and the normal density, raw land for a lot in a typical Greensboro subdivision would have cost $5,000-$6,600 per unit.

The city permitted Norcon to reduce the normal street pavement width from 26 feet to 22 feet, curb-to-curb. The streets are deeded to and will be maintained by the Covington Place Homeowners Association. Street width reduction saved $320 per unit.

Street paving thickness was reduced from the normal Greensboro standard of 8 inches of crushed stone, 2 inches of binder, and a 1 inch topping to 6 inches of stone and 2 inches of asphalt for the demonstration. Paving thickness reduction saved $293 per unit.

Curbs and gutters were eliminated entirely in Covington Place. They are normally required on all Greensboro streets. Ninety percent of the Covington Place stormwater is absorbed by the grassy swales along the sides of the streets and filters into natural areas. One half of the site is flat, requiring minimum storm drains. A lift station costing $10,000 - $15,000 drains the low southwest corner of the site. Curb and gutter elimination and use of surface storm drainage saved $201 per unit.

Utilities are placed in the streets and in open areas behind the homes. Water and sewer lines are under the street. PVC pipes for power are under the streets only as needed for street lights. The city maintains the water and sanitary sewer service. The remaining utilities--telephone, cable TV, and power--are located in 20-foot easements around the perimeter of the site. Utilities were installed according to typical Greensboro standards, but because the cost was shared by 80 units instead of 30, $4,210 was saved on each unit.

Covington Place street scene

Costs of grading and clearing the land were shared by the 80 units allowed in Covington Place instead of the normal 30 units, saving $1,067 per unit.

Norcon chose to use concrete driveways to avoid the hassle of asphalt paving, to lessen maintenance costs, and for attractiveness. Two parking spaces per unit are required by the city. Driveways are 20-feet long and accommodate one car. The garage provides one more space. Parking pads in each area offer additional spaces.

Sidewalks were eliminated in Covington Place, but would not have been required by the city for a project so far from the center of the city.

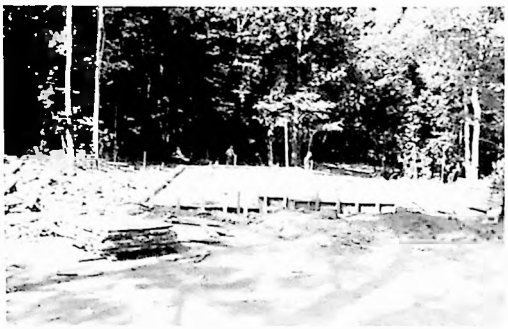
Covington Place guest parking

Construction

Norcon saved money in the land development of Covington Place, and chose to construct the homes to normal Greensboro standards.

The homes are site built, with 16 inch-on-center framing and conventional rafter framed roofs. Hedgecock reported he will recommend roof trusses if Norcon repeats these homes.

The homes are built on slabs-on-grade, standard for Greensboro. The city requires a two foundation pour operation -- first a perimeter footing pour and then the wall.



Covington Place construction

Total Savings

Raw land (density)	$1,562
Street width reduction	320
Street paving thickness	293
Storm drainage system	201
Utilities	4,210
Grading and clearing	1,067
TOTAL	$7,653

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