THE FIRST (failed) GREEN ERA:

It was during the early 1980's that the success of my software company allowed me to build a new home-office using the latest state-of-the-art construction and energy saving design known in 1983. I decided to move my headquarters from warm Dallas to frigid Minneapolis - where a winter day could be 10 to 20 degrees below zero – *burr*. Summer temperatures can reach 100 degrees in Minneapolis, so the annual temperature spread can be 120 degrees or more. Heating is the largest concern, as the difference between a cold winter day and a warm comfortable home can require heating outside temperature by 90 degrees, where a summer day needs only 10 or 20 degrees of cooling for comfort.

PASSIVE SOLAR 1.0

Tom Betz, who was knowledgeable in the latest in energy savings construction as well as implementing the then new theory of passive solar design into many of his homes built my house. The lot I bought was perfect for a solar home – with a steep south facing slope along an inlet of Fish Lake in Maple Grove, a new suburban city – population 4,000 at the time.

Figure 2 - a lack of curb appeal typical of the earth berm homes of the 1980's

At the time earth insulated construction (where sides of the home were either built underground or earth-bermed) were the latest trend. The southern slope allowed the majority of the structure to be underground. The other house sides lacked windows (and lacked curb appeal) to prevent heat loss.

To offset the lack of curb appeal I added a paver stone driveway and a curved glass block wall at the entrance door. Then as is somewhat the case today with many "green" homes – the architecture made the home stand out as "eco-friendly" compared to typical homes in the subdivision.

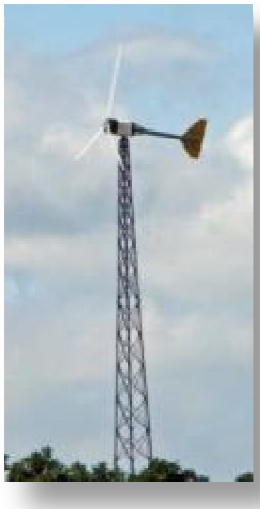
The south facing rear of the home was mostly glass – 36 dual pane windows in all. At the time the home was built there was no Energy Star rating (introduced in 1992 by the EPA) and very little information on passive solar designs. In "passive" solar the sun heats up a dark brick floor of the main living area of the home (middle floor, as seen in this more recent picture of the home). The bricks were built upon a thick concrete base which stored heat over-night.

Figure 3 - The south facing windows allow the sun to heat the dark tile floors

The exposed 6” and 10” thick walls provided great insulation (for it’s day).

Building the home far underground proved to be problematic with ground water problems - requiring a constantly running sump pump with a battery back-up system. Controlling the solar gain was at first another problem as the heat generated by the sun could not be controlled (until the special quilted window treatments with magnetic seals were installed) . Before window treatments arrived (months into the winter) we actually ran the airconditioner even when the weather was 20 degrees below zero – that is until my 6 year old son asked – *Why don’t you just open a window?*

WIND POWER 1.0



Land Innovation, Inc. was based in my home where we were operating many large and energy hungry Hewlett Packard Workstations. The electric bill was quite high. On a whim we asked a local Wind Generator salesman to look at the feasibility of a small residential system. He visited with the City of Maple Grove and came back very excited as the City had recently passed a Wind Generator ordinace allowing a 100 foot tall wind power system to be built on a small city lot with just a permit! Perhaps the first city in the country with such a ruling.

So in 1984, we had constructed the100’ tall tower with a 10 kilowatt Bergey Wind System with 23 foot diameter blades - the actual generator shown here.

The neighbors however, were not so excited about the towering generator and waged a war against theplanning commission and council that approved the ordinance. Fortunately since I was following the rules and possessed a legal building permit, as far as I was concerned it was perfectly legal and was treated fine by the neighbors.

Over time, many of those originally opposed thought of the generator as actually something cool to have as a neighborhood focal point. Directions were not necessary, as it could be seen from quite a distance. It was not unusual for letters to be delivered to us addressed with “the house with the wind generator, Maple Grove Minnesota

The 10kW Bergey Wind Generator proved an excellent choice with never a problem. Not many “green” solutions from this era have survived to this day – however the 10 kW Bergey is still considered state of the art (see www.bergey.com) . Being within the legal (Maple Grove standards) noise limits, it’s 26 foot diameter blades did produce an annoying hellicopter-like “whop-whop” in high winds. To be a good neighbor, we turned the generator out of the wind at those times, even though it would have produced the most power.

So a quarter century before this current “Green” movement we had built a “Net-Zero” home & business (it often produced more energy than it used). The point is that if we had not ran our business from the home, and had the advantages of today’s energy savings appliances, that 10kw system would have made us a hefy profit over these years – or could have supplied power for 3 or 4 of today’s “green” homes!

REPEAL OF THE WIND ORDINANCE

Maple Grove may have been the first US City to enact a Wind Generator ordinace, but they were also the nations first city to repeal a Wind Generator ordinance! After a few years for the neighbor’s war against Maple Grove, the City made a financial offer that I could not turn down and they bought the generator. Today, the same generator is still outputting power on a site near Delano, Minnesota south of Highway 12.

It’s ironic that Maple Groves focal point of their new town center is a massive wind generator as seen here!

UNSUSTAINABLE GREEN

In 1983 this home cost about $121,00., Twelve years later it was appraised at $186,000. During this same dozen years homes escallated in price at a rapid pace – especially lake front homes.

Using an inflation calculator, $121,000 in 1983 should have been worth $196,000 n 1995.

In those same years the housing market recovered and home appreciation should have resulted in the nearly 4,000 sq.ft. home being worth at a minimum of $350,000 (had it been a conventionaly built home)– nearly twice the appraisal price.

My “green” home had taken a tremendous loss in value – it seemed no one was interested in the architectural oddity that at one time would be considered state of the art for trendy design. Even today, when I mention to Green-Groupies who are into the latest trends they think it’s really cool to cover a home with dirtl… well it’s not cool to create a house that the market will stay away from.

GREEN VERSION 2.0

A quarter of a century after my first Green experience I found myself building Green again – this time as a requirement of a land purchase I made from the City of St. Louis Park mid-2008. As part of the purchase I had to agree to build to MNGreenStar certification, a sort of LEED for Minnesota climates.

From www.mngreenstar.org you will find:

Minnesota GreenStar seeks to transform the Minnesota residential building industry into one where healthy and sustainable building practices are understood, economically advantageous and socially desirable. It not only provides standards for designing and building better homes, but it promotes a socio-economic environment that makes such methods attainable to everyone.

Mike Hillesheim (in the center) owner of Creek Hill Custom Homes built this new home and was his first entry into the new realm of Green construction and certification.

Ironically when I had asked Mike if he could build a MNGreenstar home, he had just finished the training and was planning on building a MNGreenstar home!!

Why Creek Hill? After I had the awful experience with my first "Green" investment, I was in the market for a conventionally built home.

I found an 80' wide lot in a new Maple Grove subdivision that backed onto a large wetland - perfect for a walkout. The lot was owned by Mike. At the time Mike had several models for sale from which to choose from. A home caught my attention, not because of curb appeal, but because of the floor plan. After a few minutes speaking to Mike I sketched changes that I wanted and Mike quoted me a price that I was pleased with.

Four months later I moved into the new home (shown to the right) that Mike had built for me to the actual day and dollar he originally quoted! I was extremely satisfied. The large windows were NORTH facing – as I did not care any longer about energy savings after losing hundreds of thousands on my last "green" home investment.

Figure 10 - After alterations we came up with this house

I figured losing a few hundred dollars a year in energy but gaining thousands in home equity was a much better trade-off.

What I discovered that in the decade that passed after I built my first solar home was that the new homes were quite energy efficient! By the time I had moved into this home, Energy Star appliances and great insulation were the norm. When it was freezing outside, the windows remained warm inside!

While the prior home was very large but felt small, this home had 1,800 above ground finished sq.ft. yet felt huge.

This home was also the only in the subdivision where the garage was setback further from the curb line than the living area of the house. A model to show homes did not need to have the garage jutting forward as the main architectural element.

Figure 11 - We used every trick to increase perception of space

Set on a rectangular lot but at an angle 12 degrees from the street it offered increased front and side viewsheds without looking at the side of the home next to it.

Recently I visited the couple that bought the home from me and they have never had a problem – 12 years. Naturally when I was going to build this new home, Creek Hill Custom homes was the choice.

2008: HISTORY REPEATS ITSELF

Things are different with this Green movement than the last, yet some things remain the same.

The similar situaton is the housing market downturn coincides with an increase in energy consumption awareness, and the extra costs associated with solutions that may or may not be viable. There are no new solutions or technologies that simultaneously reduce both housing construction costs and energy consumption for new home construction, at least none that we have easily found.

The higher an EnergyStar rating on an item the more expensive it becomes. The choice today still remains to pay more now, for the promise of reduced costs later. The prospect of any increase in housing costs in **today's** market may be questionable with new home sales so slow.

PAYBACK???

Since an up-front increase in costs can reduce the number of perspective home buyers, builders in the lower to middle income market are not likely to embrace Green. An argument can be made that spending an extra $20,000 to $60,000 on a more efficient HVAC system such as Geothermal can pay for itself in reduced energy costs over time – but what is that time period and what was it compared to?

It's time to play devils advocate. Consider that the average home sells every 6 years, so the buyer is not likely to recover the initial investment in a higher efficient option leaving all the cost benefit to the next home owner. Another counter-point is that there is likely to be a significant long term mortgage on the home, so the interest in $20,000 might eventually add up to $60,000 if the home buyer actually stays in the home over the decades they are making payments. As such the payback of 5 years becomes 15 years after interest – 10 years becomes a 30 year payback – just in time to replace the aged system!

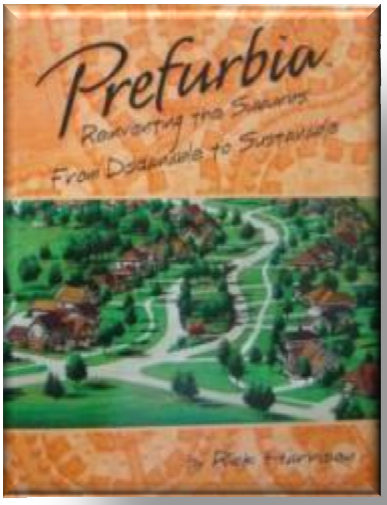
This is why we chose to use low cost proven passive solutions on our new home. We are however, using Geothermal on some of our new land developments because a single underground collection system can be shared by many homes, thus spreading the costs making geothermal a viable economic solution in a new development or existing retrofit shared by many.

Continuing on this Geothermal vs. conventional heating subject we got our first gas bill on the home for the January 2009 winter heating period. January 2009 had record lows, without a warming period at all. Because of a mix-up in delivery, the windows installed were not the correct ones to allow solar gain to heat up the floors (something we hope to correct before next winter), so this month we were essentially a typical highly insulated green home but with excessive window area. To heat our finished 3,600 square feet including a separate heater for the garage, gas range top and gas fireplace which we used often in the worst possible month with no solar gain our gas bill was only $200, and that's at a nice and toasty 72 degrees! If we spent an extra $40,000 on geothermal instead of a conventional and affordable 95% efficient furnace with a three phase heat exchanger the payback would be at least half a century – without factoring interest! Once the correct window are installed the payback comparison would be in terms of centuries. So when you hear about "payback" figures is it compared to an old home, to a new home, or to a green home with more conventional alternatives? The 30% tax credit still does not help!

WITHOUT ECONOMICS IT'S NOT SUSTAINABLE

During the land purchase I was repeatedly told my certified home should not cost extra! When I asked how my "Certified" home could cost no more – I was told it shouldn't .. at least compared to LEED requirements. In the real world, housing costs cannot be compared from one voluntary program to another voluntary program – it must be compared to "no program at all", thus the promise of economic advantage is meaningless. The home buyer has a choice – buy conventional or buy green.

Again in my particular case I would have built with most of the efficiency items required, so the costs issue is not a primary concern in this particular situation. However, for these programs to benefit the average home buyer we need better direction and we need orginizations that could leverage product discounts because of their ratings – this has not (yet) happened.



Our new home is built on many of the principals described in our book: Prefurbia, as well as conform to the goals within the MNGreenStar. In Prefurbia, all of the new methods for land development must make economic sense compared to the status quo. Simply put – any new solution must be equal or less to construct than the current conventional method – only then can it be guaranteed to make economic sense, and only then sustainable.

SUSTAINABLE GREEN

To deliver solutions that will "stick" this time we need to reduce both energy consumption and ultimately housing cost compared to conventional methods of construction. If it cost more than current options it's likely to be a benefit to only the wealthy or become a fad. The price of most "Green" homes are out of the price range of the average American family, and that's a shame.

NO DIRECTION - NO ADVICE

The other problem is that many of the orginizations that control the certification are non-profit. A non-profit's charter cannot allow them to recommend particular solutions, such as appliances or contractors.

For example when I had asked MNGreenStar for a good source of home heating and cooling they could not direct me… natural landscaping solutions? , energy efficient windows?... no! Their hands are tied - they create the criteria that we must meet to certify the home, but not give direction as to the best solutions. It's an odd feeling to be forced to meet requirements and at the same time to be left with no direct guidance for the "who to hire and what to buy" for – building green! Get intimate with Google – you'll need it. With the hundreds of items that make up a home where does one go to find the best possible solution?

Sustainable Land Development International (www.SLDI.org) is an organization whose charter is a co-op that could leverage an industry to provide efficient economical solutions and volume discounts. SLDI is

already leveraging member discounts concerning products and services. In fact we were one of the first to offer discounts on our planning services to SLDI members for work in the USA. The nation's largest builders leverage huge discounts based upon the scale of their operation. Imagine the purchasing power and influence potential if just one of these orgizations could use the volume of membership to demand discounts from vendors! What a concept – cheaper affordable Green!

HARVESTING DATA

So onto the internet to find out the latest and greatest information that would surely have been compiled this past quarter century on passive solar design methods and materials… what we found is just about the same information that was known back in 1983! If there is some study or data base of floor tile brands and colors that absorb the sun's energy better than others, it is not easily obtained.

It's quite simple actually – a dark tile gets hot under the sunlight – heats the concrete sub-floor, and maintains heat for the next day or so – for free. This is similar to sitting on a black leather seat of your car that has been sitting in the sun (ouch) compared to a white leather seat which remains cool (aah).

This picture shows the dark tile floor and the large glass area. This corner faces south and represents about 1/2 of the solar surface that will likely heat up with exposure to the sun.

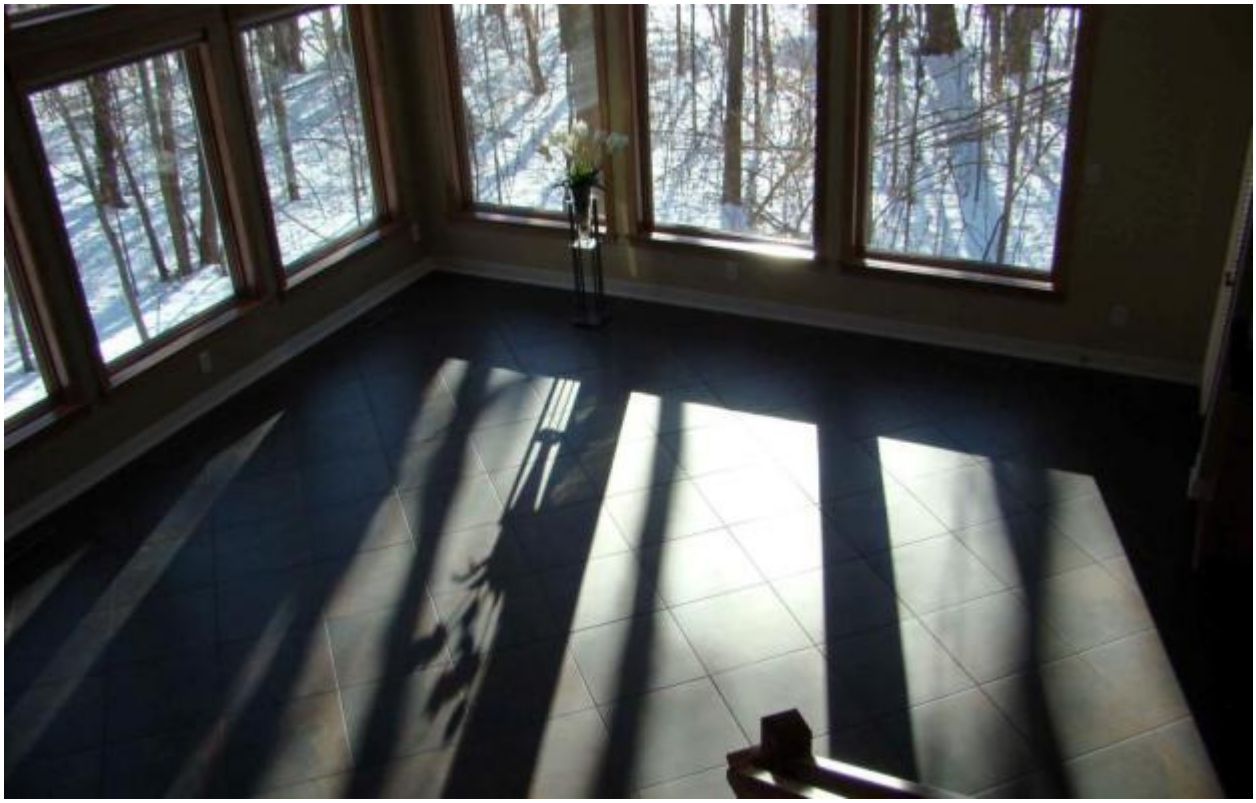


Figure 13 - The south facing windows allow the sun to heat the dark tiles (on a sunny day – cloudy day shown uses HVAC)

To maintain exposure we will have a winter furniture layout. Control of the sun comes from motorized Hunter Douglass thermal shades.

The Study: I went to Sears to purchase an *Infrared* thermometer to measure heat and started my trek to find the best tile for looks, price and heat performance to place in the home.

Shortly after we moved into the home we experineced zero gain from the solar system – What happened? The Anderson 400 series windows (or for that matter all modern argon filled "green" windows) block out 85% of the suns energy we needed to heat the floor! It turns out Mike (builder) correctly special ordered "clear glass" (uncoated) for the great room, but Anderson incorrectly delivered coated windows! This shows that even with the best intentions something can go terribly wrong.

A HOME TO GROW OLD IN:

GOING UP?

This home has an elevator. As we grow older, us Baby-Boomer's are looking into low maintenance living and climbing stairs gets more uncomfortable as we age –in some cases impossible. Today's homes with 9' ceilings and higher, along with floors getting thicker to serve as HVAC conduits add quite a bit of climbing – making stairs even more of a probllem as we age – or if a home's resident were to get a simple leg or foot injury.

The current trend to build single level homes to eliminate the stairs does have some critical drawbacks.

A two story house can take up less than half the land area of a single level home of the same square footage.

Less than ½ the area? This is because garage space is not included in the square footage of a home and living space can be built over a garage,thus a two story home can take less than

half the area of a single level home – however area is needed for the stairway (and in this case 25 square feet for the elevator).

Figure 14 – Today's homes with tall ceilings and thicker floors, and tighter regulations creates more steps than ever before.

Suppose a developer decides to build for the empty nest buyer and is convinced that the homes must be built as a single level. For this hypothetical situaton we will use 2,400 square feet (the average house built today) and $200,000 an acre for the premium raw land close into town with nearby parks and services. This single level 2,400 square foot townhome with an attached two car garage is likely to achieve a density of approximately 4 homes per acre with ample open space. That is $50,000 for each home in raw land cost. If the same unit could be built 2 story with an elevator and achieve 7 homes per acre with the same amount of common open space, the raw land costs per unit drops to $28,571.

Figure 15 - These townhomes all have elevators.

Because the 2 story units consume less land area there needs to be far less infrastructure (roads and sewers) to service the average unit. Two story could (in theory) be as much as $25,000 less cost to develop in this scenario (per unit). A two story residential elevator is about - $15,000.

So it looks like a $10,000 advantage.

But there are other advantages like higher density without sacrificing open space and less infrastructure per unit – less sprawl, and less impervious surface…

In other words, the development is more "green". With ½ the foundation and ½ of the roof structure, the construction costs should be less. The image above is "The Preserve at Islanda" a New York townhome neighborhood we designed where each home has stairs and an elevator.

A VERY LOW MAINTENANCE HOME

This home will have natural landscaping with (mostly) native materials designed for low maintenance and water use.

Since the majority of the lot the home is situated on is natural and heavily wooded, we retained experts to develop an attractive landscape theme that will look as if nature ran its course on the lot and reflect elements we would use in our land planning business. A unique aspect of the landscaping, is after it is established it will only need an initial mowing, and irrigation only during drought conditions. MNGreenstar does include guidelines for maintenance free homes and landscaping, however, NAHB Green certification required us to list the irrigation system installed as a mandatory item – we will not need an irrigation system (but will install one for drought conditions)

Most "natural" landscapes do not fit in to suburban settings very well.

Our plan is to make sure the site is a model on how to get the look acceptable for suburbia without the maintenance headache of traditional sod.

If a suburban single family home could be built with relatively affordable maintenance free materials, and the landscaping follows the same efficiency, then maintaining the single family home professionally will surely cost less per month than townhome association fees!

Figure 18 - All too often low impact landscape hides architecture as seen here in this streetscape of rain gardens

This picture is the front yard of a home in the beautiful "Fields of St Croix" neighborhood in Lino Lakes, Minnesota. This development is a low impact neighborhood with rain gardens, prairies, etc. The landscaping often overpowers the front yards hiding the attractive architectural details of the houses. Our plan is to use landscaping that can be a model for future suburban development - nothing that overpowers the yard or makes an "ecology above all" statement.

Water conservation within the home will be handled by the plumbing and appliance choices – nothing radical or fancy. Of course, snow removal on 120 feet of pervious driveway with organic landscaped strips is not easy (or cheap).

The exterior of the home has maintenance free materials – Hardie Siding, Power Coated Aluminum Raliling, Steel Roof, etc. We avoided recycled materials as some did not seem to have along service life reading on-line user comments and many were more expensive. There are some recycled materials in construction, but we avoided many of the green options that might need premature replacement or maintenance.

Another reason for the empty nesters moving from their single family home to a townhome is to avoid the maintenance required with single family ownership, but townhome maintenance is certainly not free each month.

IT'S NOT THE SIZE …

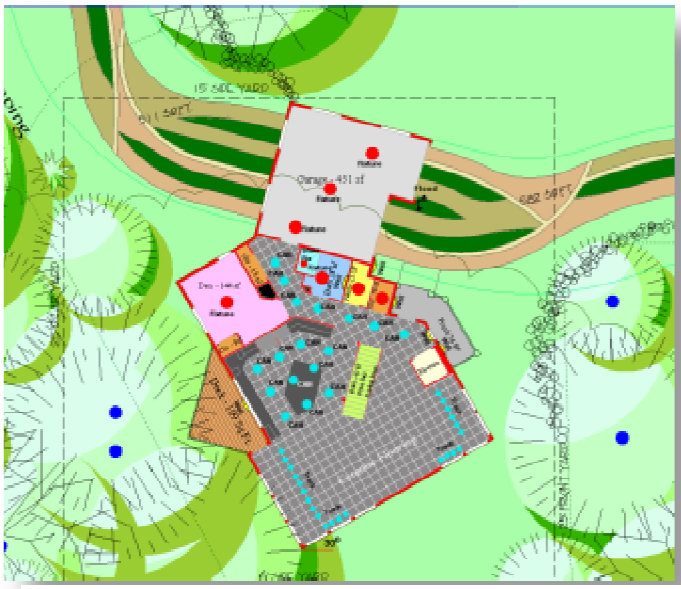


Figure 19 - The site plan of the new home

The family who just bought that new 4,000 square foot home is unlikely to take full advantage of every one of those square feet, yet will be paying each month in energy costs and taxes.

What if a 2,200 sq.ft. home could have the feel and function of that 4,000 square feet? With minor changes on the prior Maple Grove home that Mike originally built for me, I achieved just that (it was 2,500 sq,ft, but felt much bigger).

The goal of building this new home was also to demonstrate that quite a bit of space and function could be squeezed in a reasonable envelope.

To help expand the feel of space within the home all stairs have glass railing with wood capping as seen on Figure 14.

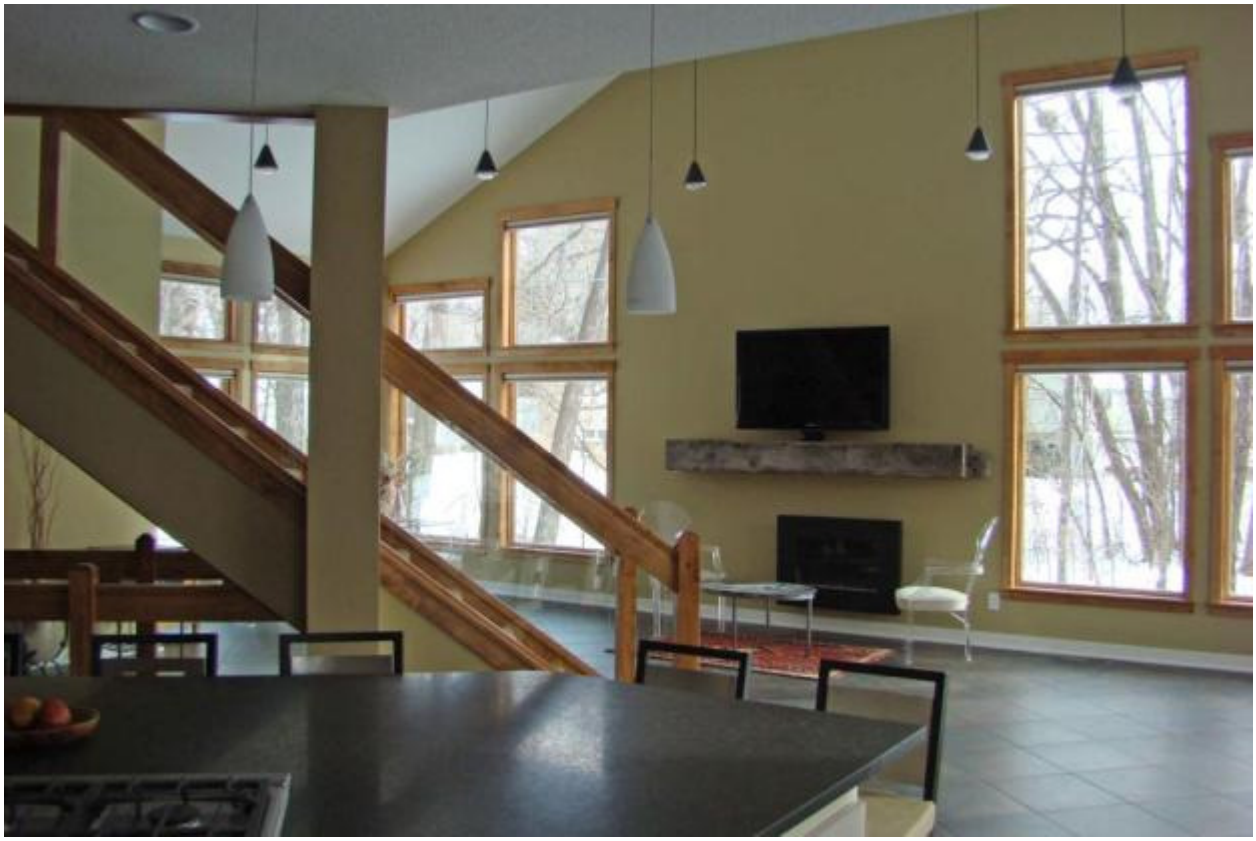
The main floor stairs are free floating - which would be difficult to achieve with the new restrictions where only a 4" gap is allowed, so we installed a short cable rail between the steps to create the flow of space through the stairway and meet the letter of the law.

The master bedroom has two large interior glass panels that overlook the great room and wooded area outside, again increasing the sense of space within the home. The interior wall windows have shades that can be lowered from the top or the botton to control privacy.

To increase space from the bedroom on the walkout level also implements a large interior glass window.

Attention was taken to minimize hallways when possible and utilize every square foot of space as functional (living space) area. For example the utility room is very small, large enough to house the HVAC equipment only.

The rooms are shaped to allow good diagonal distances across gathering areas – again to expand the illusion of space. Lighting is used to emphasize shape and space.



The main floor is the only area of increased vertical volume (9' high) over a standard 8 foot ceiling to compromise between space and energy savings on the overall home.

Because of the low cost to finish the lower walkout level, we finished the entire square footage of the home – with 2,255 sq.ft. above ground and an additional 1,340 sq.ft. below. If the home did not have a walkout level or basement it would still be a fully functional 3 bedroom home with 2 ¾ baths, an oversized 2 car garage, with panty elevator, loft, upper deck and an spacious feeling!

Recently when the home was completely framed I showed it to one of my developer friends who also was a home builder.

He asked: "What do you have here, about 4,600 – 4,800 sq.ft?" I said no, - 3,600… he then asked, "Above ground, right?" No I said, we only have 2,300 sq.ft. above ground.

If a home builder can be tricked to think we have 1/3rd more area, we can certainly make a new suburban home buyer pleased with less area. This is important because if we can build smaller homes that feel big, a smaller home size might just gain market acceptance in the suburbs – where most of the new homes will continue to be built.

Today, the average size of a new single family home is 2,400 sq.ft. By using more emphasis on space increasing techniques (both real and illusional) it may be possible to build homes 10% to 20% smaller without the buyer noticing any difference. This would have a direct positive impact on energy use from a heating and cooling perspective.

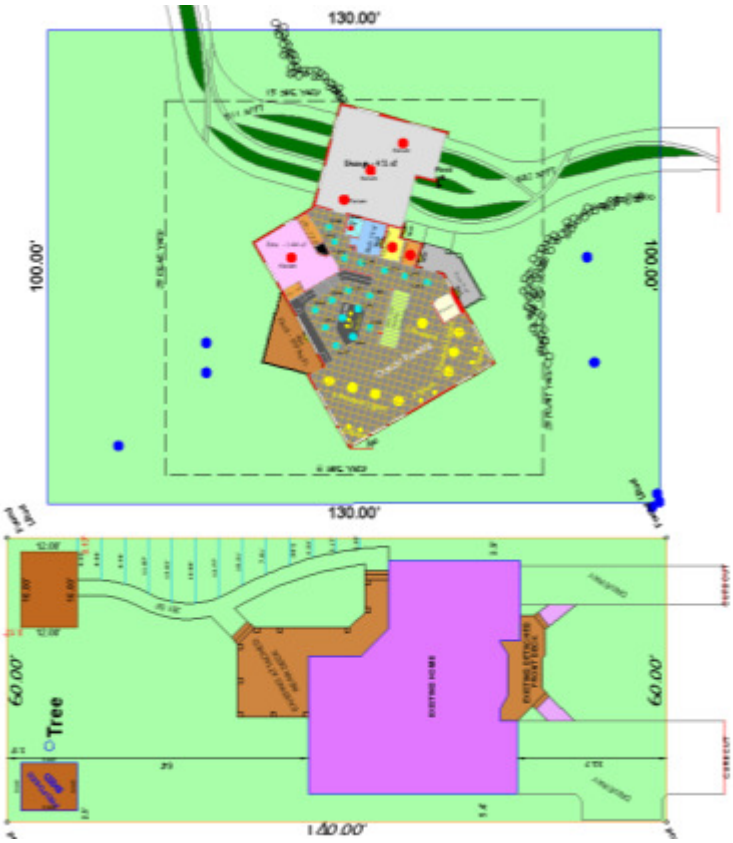
FOOTPRINT

The footprint of the home determines the percentage of the lot that is taken up by the mass of the home. For this example, we will use the foundation size, as the roof overhangs one could argue adds to the coverage area.

This is a picture of our prior 1936 Cape Cod style St. Louis Park home

Figure 20 - Prior St. Louis Park 1936 Cape Cod

The above ground square footage is roughly 1,900 sq.ft. Certainly no one woud say that this was a huge home or a McMansion, nor was it a small house either.



From an aerial view (at the same scale) emerges a different story than is seen on the ground.

The old home (below) consumed 2,130 sq.ft of building footprint on the lot, where as the new home has 1,923 sq.ft. of building footprint.

Both homes have two above ground levels and one below ground.

The old home had 2,492 total finished square feet (including finsihed accessory buildings) with two one car garages, while the new one has 3,600 square feet – plus 4 oversized garage spaces and a 600 sq.ft. great room (takes up a potential 600 square foot that could have been used on the upper level).

While not first apparent on the above plans , the new home is larger, yet is has 10% less environmental impact from a building footprint perspective.

THE BLEMISH OF DEVELOPMENT

Both suburban and urban driveways have become absurdly large (mass of paving) which not only costs more, but is terrible in terms of run-off from the huge impervious surfaces . They are really bad for the environment. The driveway also becomes a major(negative) influence on the curb appeal of a home and if over sized will be overly priced to initially construct and maintain over time. For the most part driveways are somehow overlooked when planning and constructing new subdivisions.

Figure 22 - Driveways become the main focus of the front yard - also terrible for the environment!

The example above is a Townhome development in Belle-Plaine, Minnesota where concrete defines about 90% of the front yard! Whose brilliant idea was this?... the developer, the planner, the city?

To make matters worse the typical American suburban landscape is defined as a row of garages all setback at the exact same distance as the home fronts.

The garages form a visual block to the home.The driveway being the conduit from the street to the garage is typically built as straight and simple as possible.

With the site design methods we invented in our planning busioness we introduce controlled deep setbacks and homes on angles to the street . This creates a completely different streetscape highlighting home fronts instead of garage doors. This requires aggressive meandering of the homes and some of the driveways can be lengthy. The meandering space along the street we call a “cove”.

To overcome a large increase in paving volume, attention must be placed on tapering the driveways.

To significantly reduce pavement in driveways, this home will demonstrate an entirely new concept in design – the sculpted "Art Driveway".

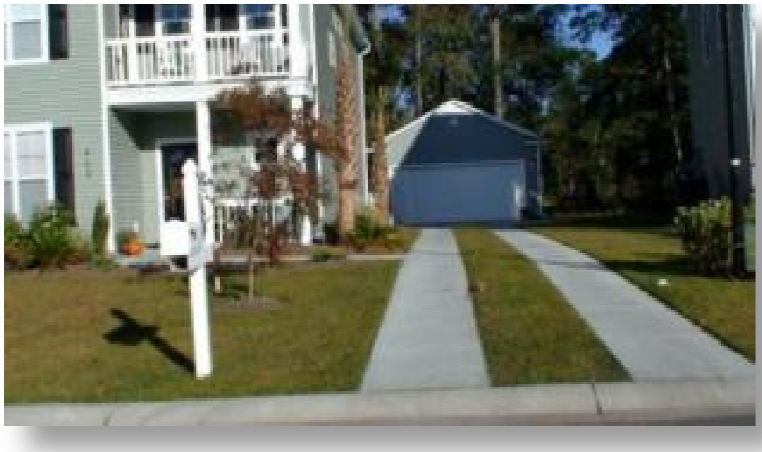
Figure 23 - A Coved front yard in Settler's Glen - Stillwater, Minnesota

SCULPTED – "ART DRIVEWAYS"

The driveways (there are two garages – an upper and a lower garage) are designed with landscaped free-form strips in areas where the tires will not tread.

The art drive consumes ½ of the paved surface compared to conventional driveways that the neighboring homes have installed.

Since there are multiple "material" options available in driveway construction. We decided on conventional paversstones for the main drivebecause they have proven to have a long service life.



This picture shows a new Centex home in the Carolina's using a method of construction common to homes in the early part of the 20th century. This type of design reduces the paved surface area (and costs) to get to the garage by 1/3rd. It simply makes sense.

We can learn some lessons from the past…

…this is a more sculpted driveway just a few miles away from the Centex example.

It is far more attractive than solid paved driveways and a major step in the right direction. It is so nice, that you first notice the driveway and the home becomes a secondary feature from a curb appeal perspective.

This driveway demonstrates design techniques that can be used in coved neighborhoods featured in Prefurbia .

Sculpting the driveway reduces both construction costs and environmental impacts while increasing the value of a home. The sculpted driveway can also be used in conventional driveway reconstruction – turning something that is typically a negative (large driveways) into a positive. The Art Driveway is something that can be retrofitted anywhere at anytime in existing neighborhoods as the driveways need repair or replacement when they age.

Thus the Art Driveway can be used as a stepping stone to driveways of the future. There are great options available which are pervious, but each have their problems – such as the interlocking VAST system which may not lend itself to a free-form design required to pull off the artistic effect (VAST are great Eco pavers but are set in a rigid grid).

A 75' long standard driveway would have been 1,400 square feet of surface area, we built this paver drive with 650 square feet of material.

We decided not to use pervious construction as it is a maintenance headache and very costly to construct.

If these driveways were pervious it would have almost no impact on the environment, but would have a massive impact on our finances.

Figure 26 - Actual Sculpted Driveway - Landscape Photo-shopped

ANGLING ADVANTAGES

The angle that the home sits on the lot de-emphasizes the garage doors by not directly facing any street. Instead of a large garage door, each garage space has an individual door and the main inside garage door is inset an additional 4 feet. From an aerial view both driveways are clearly visible - but from eye level at any point on the street or surrounding lots and park it would be impossible to actually see both driveways at the same time. In addition the driveway from 26th street has a slight berm to hide it.

The 30 degreeangle of the home is designed to increase premium views while at the same time decreasing undesirable views. The room functions were designed so major living areas would be placed to take advantage of the most desired views while minor living areas and non-living space (storage space, bathrooms, utility rooms, etc). are placed in areas with lesser views.

Figure 27 - Key focal points and associated viewsheds

All of these techniques can be applied to even the most basic conventional subdivision designs, yet builders never seem to tie home design into it's surroundings leaving potential market advantages on the table. The cookie-cutter placement of typical suburban homes reduces the living quality for those residing in the homes. Setting the home at a precise location on a lot, not just along the minimum setback lines allows much greater flexibility in design and is one of those things that is more of attention to detail than cost related.

If individual placement of homes would be applied to even conventional grid subdivision patterns, the shape and feel of the streetscape would take on a far more interesting and organic feel. Because this is the only house that will be built on a 5 acre area, the placement is to maximize premium views more than to create an organic pattern of homes.

REALISTIC EFFECIENCY

HomeScape Design Group from Grand Rapids, Michigan were chosen to refine my design and detail the home for that all important curb appeal. In our planning business we have used Homescape Design Group in many of our developments because their attention to reducing construction costs while maintaining a high level of curb appeal.

Care was taken to reduce materials required to build the home. The 6" studs are placed on 24 inch centers and the windows align at the studs. Every room, wall, and closet is designed to reduce cutting material.

Of course placing the garage and stairway at a 45 degree angle to the rest of the home structure does add costs, but it also reduces the monotony of plain rectangular shapes of the standard suburban home.

We also decided on a vaulted Great Room, instead of a simple rectangular space Great Room with a tall level ceiling.

This reduces home surface area and volume of air space to be heated and cooled. With the use of pendant light placement skewed across the space the illusion of openness is enhanced.

Another aspect of efficiency comes in the form of Energy Star rated appliances. We at first started to pursue only appliances that had the best ratings (the lowest energy consumption). When we researched "user comments" for various websites we found that many of these appliances reduce energy by not quite performing up to standards that the customers who bought the appliances had expected. In some cases dish washers were not cleaning, dryers were not drying, etc. So when we looked at efficiency we also researched performance - and of course pricing. Our electric costs average just over $2 a day and that's leaving a few lights (CFL's) on constantly.

Steel prices went through the roof! So the steel roof was going to be far pricier than first thought, so we looked at some of the composites. We came close to choosing a fake slate(recycled) roof, but when we investigated further, we found on the internet that many who installed these roofs experienced the colors fading after a short period of time. It seemed that the 50 years of warranty these roofs had did not address the colors fading after a few short years! This is something to check into if considering any composite or recycled material – do they warranty color fading?

LET THERE BE LIGHT - NOT!

In the move "The Graduate", a famous quote was ***One word: Plastics***. Today that one word is: ***LED***.

.The Energy Bill passed by Congress in 2007 put in place the death of the traditional incandescent bulb. Today, the fluorescent bulb is the graphic indication that many use to signify they are Green, but in fact they are anything but green.

The future is the LED, not only do they contain no mercury like the fluorescents, but they start instantly and use a fraction of the electricity and are much easier to spell than fluorescent and incandescent!

Oh, yes I forgot to mention – screw in a LED and it will probably never have to be replaced… rendering all of those "How many (?) does it take to…" jokes obsolete!

Sounds great – too bad they don't quite work. Yes, we ordered all of the lamps as LED's to have the first all LED home in the region. The bill for the bulbs came in at $2,800 at direct manufactures pricing – almost 10X that of fluorescent, but the promise of having a completely lit home with very little electrical draw was enticing. To prepare for the LED's we increased the number of fixtures around the home by 20% over typical lighting. When the LED's finally arrived we were excited to see how they would perform. We installed the 12 Flood lights that were in the kitchen and were shocked that there was not enough light to read a recipe book – and the LED's were rated at 600 lumens!

So off to the Home Depot and we bought CFL's to light the home. We will try again to convert to LED when the technology is ready.

A REAL FRONT PORCH

A full front porch is included even though the home will be setback and separated from any walk system. A porch adds warmth to the home façade that creates the image that this is a residence and provides a defined sitting area. Many porches are used in today's suburban homes, but to save costs they are often too small to place any chairs or lack the railing that defines the space as a porch.

This home has all the elements that make a porch, well, a porch. The angle of the porch directly faces the intersection of 26th and Natchez creating a welcome to those entering the neighborhood from that direction. As visitors turn the corner the porch is the main architectural feature and remains so until passing the home or turning into the driveway. It is important that this home at least demonstrate what a useable complete front porch is supposed to look like. In addition is an upper porch area over the lower porch accessable from the loft which leads to an upper patio area over the garage.

THE DECK AREAS

There are two deck areas of the home, a small one overlooking the woods and wetlands off the greatroom and a much larger one for entertaining over the garage spaces. The advantage of having the larger deck (patio) over the garage space instead of the woods is that it is likely to be above the elevation where mosquito's hover . The lower deck along the woods and wetlands we call it the "mosquito feeding deck".

Another reason for the larger patio area over the garage is that it overlooks a large park north of the home with a great view of the pond across the street. From a cost advantage this area would have otherwise typically be covered with an expensive steel roof and attic space – creating unused space. The deck seemed to be a far better way to utilize the space while keeping costs in line.

This large space will allow quite a bit of patio furniture to be used and is plumbed for a gas bar-b-que. The problem is the lugging of this furniture for storage, so we built a storage shed area along the patio area on the top floor (shown above as the double door). This shed is insulated and heated , so it could be used for non-storage purposes, or it can be used for a small den or office off of the second bedroom.

KITCHEN AS A MAIN INTERNAL FOCAL POINT

The kitchen is typically the gathering point of the home (in this country). No matter how large and varied a home's floor plan is it seems that the kitchen becomes the gathering spot for family and guests.

The kitchen opens up to an open great room and has the best combination of viewshed opportunities.

There are two types of home buyers – those that prefer individual enclosed rooms each with their own function, and those that prefer an open floor plan.

Of those that prefer individual rooms, the advantage is that if a room is not tidy, it can be closed off to guests and the kitchen can be messy without embarrasment. An open floor plan must be kept orderly to be presentable.

The homes with individual spaces cannot easily be made to appear large without being large – an open floor design can be designed to give the illusion of much more space than actually exists.

Since the kitchen is typically where people tend to gather – especially on an open floor plan, that should be the main focal point. In our book Prefurbia, one clear message is that there are many opportunities in design that production housing typical of the suburbs clearly lack – and attention to viewshed is one of those opportunities.

Since this home serves as a model for our land planning design business, and architecture should no longer be considered separate entity to the design of a development, it is a tool to demonstrate the advantages to add this level of detail for builders and developers alike.

WRAP AROUND ARCHITECTURE

Figure 34 - Typical suburbia showcases ugly plain home rears

Most homes built today have architectural detail only along the face of the house. In older urban areas where homes had more depth than width and side yards were very tight, the sides of the homes could not be easily seen, and rear's of homes were either along alleys (typically unsightly) or well hidden from view. As one drives through the suburbs the view is quite uninviting as seen in this photograph.

In the suburbs, most designers of subdivisions are concerned about creating the geometric pattern to maximize density as the main design goal ignoring how a home is exposed along streets. The suburbs have traditionally been designed with generous distances between sides of homes. This results in an increased exposure of the sides and rears of homes which are typically left plain and undetailed, which results in a less attractive and "colder" appearance than in the traditional designs of the city.

This home is placed across a very popular city park and at a very public corner, at least three sides of the home will have open exposure to traffic and the public. It was critical that every side of the home have equal architecutal detail, not just along a face. The porch defines whch face acts as the front or main entrance.

Does this cost more? Typically builders would include a large amount of brick or rock along the face of the home to provide an architectural feature that would otherwise showcase the house as a large bland box. This façade covering is not cheap.

While this home certainly is not inexpensive, it is a similar cost per square foot compared to the 1936 Cape Cod home a few blocks away that we sold while this home was under construction!

	OLD	NEW
Above ground living area:	1,900 sq.ft.	2,300 sq.ft.
Below ground finished:	400 sq.ft.	1,300 sq.ft.
Ceilings:	8' - 8' - 8'	8' – 9' – 8' + Vaulted Greatroom
Garage Spaces	2	4
Land Area	60' x 140' Urban	5 acres sitting (Lot 100 X 130)
Trim	Various styles with formica	Craftsman with Granite
Lighting	Incandescent	CFL – 100% (except appliances)
Flooring	Carpet – Wood – Pergo	Ceramic – Carpet
Heating	GAS	Solar + 95% Efficient HVAC
Access	Stairs	Stairs + Elevator
Bedrooms	4	5
Bathrooms	2 ~ full + 1 ~ ¾	3 ~ full + 1 ¾
Entertainment System	NONE	Central System with 52" HDTV
Security	Standard Security	Motion , w/5 Video Cameras
Landscaping	Sod	Natural low maintenance
Driveways	Asphalt	Paver
Insulation	4" Walls R-?– (newer windows)	6" Walls R-25 with Spray Foam
Laundry	1 - Middle Floor	2 - Lower and Upper floors
Roof	Asphalt Shingle	Steel
Price per Sq.Ft (Incl. Lot)	213 (sold price)	250 (approx)

Because of the high raw land price for this premium infill location and the expenses to make the lot buildable, it is difficult to make a direct apples-to-apples costs comparison with other green homes.

Sustainable Green

We need to deliver not just “green” homes – but sustainable housing at attainable pricing to make the largest difference. That will require certification programs that are flexible yet effective.

We desparately need many more newer and better technologies and methods than we have today. This will take the same type of research and development effort that the automotive industry maintains to be competitive.

Figure 36 - The Villages at Creekside in Sauk Rapids, Minnesota prove you can have reasonable density and space - that is the future of the suburbs!

Twenty five years ago our government spent enormous amounts of tax payer dollars on grants for programs that no longer exist. We are entering a new era where government will likely make huge funds available for energy related technologies, and now have a 30% tax credit for many green technologies.

Consumers drive the economy. Consumers talk through their purchases. When they stop buying SUV’s and start buying small cars it does not take a rocket scientist to determine why. The auto companies respond by go back to the drawing board (CAD-CAM system) and develop new new products like the Chevy Volt.

How does the Building industry respond when consumers stopped buying? How many builders have gone back to the drawing board and have redefined home construction? How many have called their suppliers and demanded more efficient materials and methods without adding any extra costs? Home energy costs will rise. Now is a wake-up call to those involved in building and development – everyone, especially those in design and engineering. We need real solutions that work this time around and we need them to be at attainable pricing.

We do not need billions of grants that will fund pie-in-the-sky widgets. This time those applying for grants should show proof of concept of ideas in working prototypes before any money is released to reimburse for the efforts.

And all of this new era will remain untouchable to the masses unless the Appraisal and Mortgage industry changes…

Appraising the Situation (not!)

This may come as a shock to you, but the home appraisal business does not factor in green at all! What good does winning Silver, Gold or Platinum mean if the building is not worth a cent more? To the consumer that's what is most important – to lenders it's critical. Even those solutions that prove to have tremendous value have no impact on the appraisal. Appraisers must look at the mass market for resale value – the *Meat & Potatoes American Family*, and they look at the Green Buyer as the limited *Tofu Vegetarian crowd*. Because the appraisals give no extra value, even for certified and/or energy rated homes – lenders see no advantage... thus only the rich can apply! Fix the appraisal and mortgage side of sustainable housing and there is hope. Think an elevator in a three floor home would add value? Not a nickel from the appraisal! You would think a home built using less than ½ of energy of a comparable new conventionally constructed home would at least have some value – nada!

These new solutions need to be sustainable which means they need to be attainable to all income levels -otherwise this green movement will fade away and be forgotten - like the past one.

WORKING WITH THE CITY:

Lastly I would like to extend a special thanks to the City of St. Louis Park and their staff, especially the Housing Coordinator, Kathy Larsen and the Zoning Coordinator, Gary Morrison. Their ability to work quickly to get the home up before the winter set in was amazing. Their "get it done" attitude is refreshing. This is a picture of the home at the end of November 2008 (landscape photoshopped):