Modernization-Modernization Design

Hattie Pavlechko
5th Year Comprehensive Project
A Golf Course Architectural Restoration-Modernization Design

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5th Year Comprehensive Project
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Abstract

Golf Course Architectural Restoration-Modernization Design
Revitalizing Classical Design Principles While Addressing Contemporary Issues

Classic golf course architecture includes designing with the land; abstracting a course from the landscape. The classical principles of historic courses such as St. Andrews of Scotland, envelope ideas of naturalistic design. Issues of orientation, views and vistas, sensitivity to topography, and the preservation of natural features, have all been vital to classic design. Many American courses of the early 1900’s held strong ties to those created overseas by naturalistic designers. Architects such as Donald Ross, Alister MacKenzie and Perry Maxwell emphasized the classical principles of golf course design in their creations. Throughout time, however, some of these early American courses have fallen to change, stylistically. Indian Hills Golf Course of Catoosa, Oklahoma was one of the first designed by Perry Maxwell, famed architect of the Midwest. Through time, the landscape has naturally evolved and has been altered. By analyzing Maxwell’s style and principles along with those of other significant golf architects, models of design may be created that reflect early architects’ visions of classic design.

A revival of the classic design principles originally found in golf course architecture is fundamental while also addressing modern ecological principles that apply in overall design such as wetland implementation and wildlife preservation. The Kampen Golf Course in West Lafayette, Indiana by architect Pete Dye, is an excellent modern course to study in its consideration of environmental principles of design. Contemporary issues of safety and length of holes must be addressed to accommodate the latest in technology in golf equipment. Sand Hills Golf Course in Mullen, Nebraska designed by Ben Crenshaw and Bill Coore considers length, tee position, and green size for today’s players while respecting the land, and retaining important historical principles. The design coincides with the natural terrain and pays great attention to the detail of main features such as bunkers. Prairie Dunes of Hutchinson, Kansas is a fine example of a course that Maxwell designed later in his career that differed from Indian Hills. Elements of his latest style may be implemented at Indian Hills in an effort to merge two diverse styles of one great architect.
In this project, I analyzed classical golf architects and their design standards to create models of their style representative for the Indian Hills site. Additionally, I created my own set of design criteria applying the historical golf principles and the naturalistic standards of Frederick Law Olmstead. While the historical principles serve as a foundation for the study, modern issues were addressed and utilized to form contemporary principles for golf design. This included an assessment of ecological and technological issues. Using all of the above information, a new set of design criteria were formulated that acknowledged the past while designing for the future of golf.
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Purpose of the Study

The purpose of this study was to analyze classical golf course design principles; standards that have shaped the game of golf since the beginning of its time, while addressing contemporary issues, to formulate a new set of design criteria appropriate for the future of golf course architecture.

The goal of the qualitative research was to determine the most important historical characteristics of the golf courses throughout time by studying various early golf architects and their principles and styles. Perry Maxwell, the most renowned Midwest golf architect of the early 1900's was analyzed along with one of his earliest courses, Indian Hills of Catoosa, Oklahoma. The site was studied for historical change and how two architects of such caliber, Alister MacKenzie and Donald Ross, would have designed on such a landscape. The formulated set of design criteria, including important foundational classical design principles in conjunction with contemporary standards were tested upon the site.

Guiding Questions

Addressing classical design principles and modern issues to form a successful restoration-modernization posed the following questions:

- How could an historical course be revived calling attention to the importance of classical design while applying contemporary principles of technology and ecology to better serve the field of golf course architecture?
• What historical, environmental and social issues should be considered in the planning and design process for three specific holes or a model of the whole?
• How could this project enlighten others of the need of such restoration-modernization designs?
• How could golf course design accommodate technological advances in golfing equipment?

Delimitations

This study explored historical landscape, environmental, and societal change; however, the focus was on only a couple specific eras. While the course is an 18 hole historic designed landscape, I proposed to study three holes in depth. The selected three holes were designed using design principles of:
• Maxwell
• Ross
• MacKenzie
• Pavlechko – a formulated set of design criteria resulting in a restoration-modernization design

Significance of the Study

The golf course designs of Perry Maxwell, Donald Ross and Alister MacKenzie are some of the best examples of golf course architecture that exist in the world. Each had various styles, but all yearned to work with the land in creating exemplar golf courses. Pioneer in Landscape Architecture, Frederick Law Olmsted also maintained that design elements should be fitting and proper in their setting. For this reason along with his relation of the landscape to the well-being of society, his naturalistic approach to design has been considered. Perry Maxwell created Indian Hills Golf Course in Catoosa, Oklahoma as one of his first works that captured his early style used throughout much of the Midwest. By
examining this style along with those of other historical architects one may make decisions as to which principles are most important. Design intent was examined along with a study of the progression of the site through time and what changes affected the design of the course. This study shall serve as a model for students of golf course architecture in appreciating classical design principles and using such standards for future golf course design. Furthermore, it has displayed the importance of formulating design today from fundamental principles of classical design while balancing these with modern-day technological/ecological/social principles.

Questions were asked such as what if the original Maxwell design was intact? What if another classical architect would have been commissioned for such a job at this particular site? Taking their particular styles into consideration, how would they have designed upon this landscape? Finally, how would I propose to design upon the given landscape using classical principles of earlier architects as a foundation, also expanding to include contemporary considerations? Societal changes through time that have revolved around golf were studied. Women have become an essential part of the game of golf and were not considered as much a part of the playing field when golf first came to America due to unwritten societal rules. Addressing the female and junior playing fields as they have grown immensely was important in formulating contemporary design criteria.

My design criteria addresses play for all; women, men, young and old. The final design was comprised of recommendations to meet today's needs and support current conditions. Golf has had a global impact and its design should hold great precedence. The game has changed greatly since its birth in Scotland. The game of golf has covered all
continents and through its travels has progressed to meet today's standards. It is for this reason that a set of criteria was chosen serving all facets of the game; remaining true to the classical ideals and opening doors to future change.

**Related Literature**

**Historical Perspective**

Frederick Law Olmsted and Historical Golf Architecture

Frederick Law Olmsted, the father of landscape architecture, was an architect whose program of social reform was the raising of the general cultural level of the entire society. He sought to improve the health of human beings through his naturalistic approach to design. Olmsted often wrote of the relation of sight to the well-being of the whole person. He manipulated the landscape to "refresh and delight the eye and through the eye, the mind and the spirit," (Beveridge 30). Perhaps one may relate Olmsted to the early golf course architects. Both early landscape and golf architects hoped to use design on the land to encourage the outdoor activity of citizens (31). Olmsted was said to promote, especially in his design of parks and other urban places, what he called "unconscious or indirect recreation," (32). His main criterion was that a design element be fitting and proper in its setting, not clashing or being incongruous. The earliest golf course architects held true to a naturalistic style of design on the land as well.
The original natural links of Scotland, especially St. Andrews form the foundation for the practice of golf course architecture today. Their impressive settings and true golf values have exerted a profound influence upon golf architecture to the present time and no doubt will do so until the end of time. In the early stages of the game of golf, its players and rules had to adapt to the existing conditions of nature as found. As architecture began to lay out courses, however, the opposite began. While throughout history designers have imitated nature, the practice of golf course architecture has demanded that the land be modified to create certain desired conditions. This is appropriate as long as the landscape maintains most of its natural characteristics and is not altered too much by human hands (Cornish 24).

The early American golf course architects could not rely on nature to craft unique links style holes such as those in Scotland. However, their courses extracted from lush landscapes to create holes unique to North America. They held the belief that their designs should be fitting for their particular location or setting. Both golf course architects and landscape architects such as Frederick Law Olmsted maintained that their main priority was to design “with” nature to captivate the true essence of a particular site. Olmsted once commented on a commissioned site in Manchester, Massachusetts. “I would not attempt to change the very pleasing character – I would take this present character and work it up.” By “working up” a site, he chose to express the “genius of the place,” (Beveridge 36). It was essential for Olmsted to recognize and enhance the natural character of the site, as this was true for the classical American golf course architects of the early 1900’s.
Olmsted once stated, "The quality of beauty in scenery lies largely in the blending in various degrees of various elements of color, texture, and form and often more largely than in anything else in the obscurity and consequent mystery, giving play to fancy, of parts of the field of vision...." (37). Many golf course architects have found importance in emphasizing these natural elements as well as others. Olmsted found three aspects of nature that led him to revere the landscape.

- Mystery – caused by deep shadows and the play of light and shadow
- Bounteouslyness – displayed in richness of foliage and lushness of growth
- Peacefulness – as evoked by gently rolling meadows with scattered shade trees or small bodies of water that reflected trees and sky (29)

These three aspects may be related to the classical principles of design created by early American golf course architects. The elements of light and shadow on a course are quite important to display a visual contrast. Trees and changes in topography may create shadows and allow for light adding visual interest. It is always important for architects to preserve natural vegetation throughout a golf course. Lush growth allows for wildlife habitats and diverse microclimates. Trees and other flora also provide challenges for players when they force accurate shot-making. They act as obstacles for players at times, therefore, maintaining many purposes for their existence. The topography is a canvas upon which golf course architects may paint a playing field. Many architects believe that a course already exists within the land, it simply requires their expertise to expose it.

The Golden Age of Golf Design

There has never been a period of time in the history of golf architecture like that of the Golden Age of Golf Design. The finest golf architects ever to have practiced designed during this era in the early 1900’s. As the original work of these
"master" architects is continually analyzed, they will be forever remembered for their vast contributions to the game of golf.

Today’s courses are rarely created to make golfers think. Many seem to serve as beautiful settings that evoke various emotions instead of making strategic play their prime concern. Although, the golf architects of the Golden Age considered beauty, color, texture and views in their courses, their main priority was to “test the mental as well as the physical component of the golfer’s game, a concept better known as strategy” (Shackelford 3). The architects of this time period were dismissing the earlier geometric designs and began focusing on the classic links of the British Isles. From these courses they were able to pull and adapt classic principles of design. These designers were not afraid to collaborate and share ideas through their designs to create masterful courses (4). They utilized principles found in overseas courses while incorporating their own personal characteristics. These architects were showing American golfers the “possibilities” of design while explaining that new, innovative ideas would surface as the art of design matured (5).

Relevant Theory

The Architects

Many golf architects have been known for different traits of design. Harry S. Colt was one of the best at routing courses using land in the most imaginative ways to create a course. He was a brilliant strategist (20). C.H. Alison was a golf architect known for not following fixed rules, but was a nonconformist in nature, adding variety to courses, creating great charm (23). Charles Blair MacDonald was an elite architect of the National School of Design a category created for his
style of design during the late 1800's. He had magnificent ideas of designing courses that had no weak holes that could be played and enjoyed by all skill levels of golfers (31). He studied overseas courses probably more than any other architect of his time, however, in applying ideas from the British Isles, he did not replicate holes but analyzed them making modifications and improvements to these "copies" (32). The Philadelphia School of Design included the styling of George Crump one of the most bold and daring golf architects of the Golden Age. He created many large and nearly overwhelming hazards such as bunkers that America had not yet seen. His variety of holes required plenty of different shots from players (65). A.W. Tillinghast was quite possibly the most eccentric of all golf architects of the Golden Age. He strove to provide eighteen separate inspirational experiences on his golf courses (77). He did, however, not want his courses to be obtrusive, simply charming. Tillinghast created some of the grandest hazards ever built with his infamous lacy edged bunkers. He was one of the golfers that were most leery of the use of water on courses. He felt it must be utilized only if appropriate. George Thomas, Philadelphia School of Design and H. Chandler Egan, Monterey School of Design were both extreme strategists while Max Behr of the MacKenzie School of Design tended to focus on discipline while exploring ways to create mystery, romance and adventure within his designs. He was keen to evaluate the psychological effects that his courses might have on players (168).

The three golf architects that were looked at in depth during this study are Perry Maxwell, Donald Ross and Alister MacKenzie. They were studied and analyzed in order to apply their styles and principles to the three specific holes of Indian Hills Golf Course. Three types of models were created for the three different holes. The models of Maxwell's principles were applied to his original design intent for Indian Hills. Maxwell is known for having two design styles, one toward the beginning of his career and one that was modified once he partnered with Alister MacKenzie. The models of
Ross and MacKenzie were portrayed by their styles of design and chosen principles as they might apply to the Indian Hills site if they would have been commissioned to do the work. The final model was comprised of a new set of design criteria that the author formulated using an assessment of classical design principles. Some of the earliest golf principles along with those of Frederick Law Olmsted were analyzed and assigned values, therefore, revealing the most significant principles. These were blended with modern principles for golf design that address contemporary issues surrounding ecology and technology.

Perry Maxwell

Maxwell has been regarded as one of the premier architects during the Depression and pre-WWII era. Being an Oklahoma native, Maxwell did most of his work in his home state, Kansas and Texas. The Midwest had lagged behind the East as far as the number of courses available to golfers prior to Maxwell. He brought Oklahoma, Kansas and Texas up to speed. He was successful in establishing himself as a designer through sculpting Oklahoma’s landscape into layouts that are still admired today. His first job was Dornick Hills in Ardmore, Oklahoma and soon was commissioned to create Twin Hills Golf and Country Club in Oklahoma City. After Twin Hills he designed the focus of this study, Indian Hills just outside of Tulsa, Oklahoma (Elliott 30). It is no coincidence that the names of his earliest courses all included the word “hills.” It was his firm belief that the land makes the course and he never approached a design unless the site had significant natural features with which he could work. His later work, Prairie Dunes, maintains this same theme, but with the natural sand dunes of Kansas as a backdrop.
With statements such as "It is my theory that nature must precede the architect, in the laying out of links," and "It is futile to attempt the transformation of wholly inadequate acres into an adequate course," it is clear that Maxwell differed drastically from those architects such as Charles "Steam Shovel" Banks, who believed in moving massive amounts of earth to build grandiose features with a course. Maxwell was not a fan of attempting to remold a featureless landscape into something of substance. "The site of a golf course should be there, not be brought there." Maxwell was therefore, passionately adamant about minimal interference with nature (30).

Maxwell has been called an "artist" by his admirers. When sketching out holes, he was painting a picture, throwing around splashes of color. "He didn’t work in oils, but in soils and grasses. He was a lover of the handiwork of God and nature," (24). Maxwell did an excellent job of addressing the science and the art of golf design. This is reflected in his green designs, inarguably the element of his courses that is admired the most. He was one of the first architects to promote the practicality of grass greens in the Midwest, and included brilliant contouring in greens on every one of his courses. "Maxwell greens, believed to be inspired by the Old Course (St. Andrews,) could best be described as large with bold swales and quirky rolls, adding interest to some of the less interesting sites Maxwell frequently worked on," (Shackelford 190).

It is considerably harder to pull apart Maxwell’s design principles than those of Ross or MacKenzie, as he did not leave a volume of written records behind such as the other two architects did. However, some of Maxwell’s most important classical design principles were:
- Minimal interference with nature
- Careful attention to color and contrast
- Use of native flora in design
- Great attention paid to green design
- Supported preservation of nature
- Only chose sites with significant natural features

Donald Ross

Ross arrived to America from Scotland at the turn of the century in 1900. He had a diverse background in golf as he studied under Old Tom Morris, one of Scotland’s most significant golf designers, and was a greenskeeper for many years. He also was a skilled player and teacher of the game. Ross designed over 400 courses in his lifetime and many still remain today as pillars of successful design. It is believed that he designed courses in forty-five to forty-eight states (Ross 2). Ross, like Maxwell, was said to have “transformed golf design into an art form and the profession into one for an artist.” He was comfortably able to merge golf holes into a landscape. Ross similar to Maxwell paid great attention to detail, although, the two may have done this in different areas. Maxwell was specific about his greens and Ross could be labeled as specific about the entire course. Many early golf architects of the Golden Age were competent at superimposing golf holes onto sites, but their results were artificial in nature. Ross was excellent at maintaining a natural feeling within a course. He was also very site-specific in his work (4).

Some of Ross’ courses have changed drastically since his death; however, every golf course is constantly in a state of evolution. With advanced technology related to the construction of courses and to play, Ross’ philosophy has been
neglected at times. The game of golf is definitely poorer for that (5). Although change is inevitable, most of Ross’ observations regarding golf still hold true today, so it is most beneficial to maintain his classic principles of design. Some of these principles are the following:

- Make each hole present a different problem
- Arrange so that every stroke must be made with full concentration and attention necessary to good golf
- Build each hole in such a manner that it wastes none of the ground at my disposal and takes advantage of every possibility I can see
- A course plan should stay true for all of time
- Sandy-loam soil conditions are best with slightly rolling terrain
- Never choose property divided by a street or railroad and design away from such elements
- Possible layouts for a golf course: fan shape, oblong shape, never a square
- Successful course consists of a few great holes and the rest can be fair
- Mold nature sufficiently to give the greatest golf possibilities
- Make each course original
- Cardinal rule: design so that one that plays a hole correctly is rewarded while another that makes a mistake is given one more stroke
- Lay out alternate routes for players
- Address play for every class of golfer
- Do not create the first couple of holes to be difficult; allow a player to warm up, also difficult holes cause congestion of play
- The first green design must depend upon the formation of the land; keep natural
- Opening hole should be approximately 400 yards
- Eliminate possibility of out of bounds on the first couple of holes
- Do not have the line of the fairway always straight from tee to green
- Do not have two or three consecutive holes going in same direction (undesirable), also forces player to contend with various wind conditions
- Do not make undulations in greens so severe that stroke becomes more chance than skill
- Putting greens should be constructed with relation to length and topography of the hole
- Ideal golfing terrain consists of knolls and dips that reach right onto green to test stance, swing and shot placement
- Force the golfer to play boldly
- Always strive to take advantage of natural conditions
- Make holes such length as property suggests/allows
- After start off holes course should increase in difficulty
- Every course should have at least one long hole
- Two-shot holes are finer tests of golf than three-shot holes
- Create adjustable tees for variety
- Course should have three or four sets of tees
- Limit water hazards to two or three on a course, cuts down on balls lost
- Include blind shots, add a bit of spice
- Putting greens should be in full view on all short holes
- Tees should be located as near to putting greens as possible without endangering players
- Long walks to tees cause dissatisfaction among players
- Quality over quantity; better to have nine great holes than 18 that are fair
- Bunkers should be placed clearly in view; no blind hazards
- Bunkers should be natural in appearance
- Use asymmetrical shapes
- Keep enjoyment of player in mind
- Trees may be spared on a course as there is a limited place for them in golf
- Make most of existing rock conditions

Alister MacKenzie

Dr. Alister MacKenzie was one of the most original and creative golf architects of his time. Some of his brilliant designs include Cypress Point, Augusta National, and Crystal Down, courses that today hold great precedence in the golfing
world. MacKenzie was born in England in 1870 and spent many of his early years in Scotland. He earned degrees in medicine, natural science, and chemistry from Cambridge and applied all of his knowledge to the design of golf courses. One of MacKenzie's design partners was Perry Maxwell, who oversaw much of the field work of MacKenzie's designs (Shackelford 137).

MacKenzie was an advocate of strategic design as it not only encouraged bold play, but also punished golfers who accepted the challenge that a certain hole presented but failed to produce the required shots. MacKenzie was one of the early golf architects that realized the appropriateness of providing an alternative route of play from tee to green every long par 4 and par 5 hole. This, therefore, permitted golfers of varying degrees of skill to play holes in a manner that suited their ability. MacKenzie believed in the element of choice for golfers. He said, "An ideal golf hole should provide an infinite variety of shots according to the various positions of the tee, the situation of the flag, the direction and strength of the wind, etc."

As an architect, MacKenzie felt that a golf course was a great asset to a nation. He compared the small amount of land used for a course to that used by agriculture and said that we definitely get more value out of the "former than the latter. We all eat too much," (118). MacKenzie often liked to identify what constituted a great architect. He said that it was a test of skill to convert bad inland material into a good course. It was not nearly as difficult to fashion an excellent course from seaside land. MacKenzie felt that it was not possible to construct a golf course without damaging the natural attractions of a site in some way. Prior to a push by architects to preserve natural features on a site, many magnificent elements were lost (9). MacKenzie hoped to conserve existing natural features and where they were lacking, he created
"formations in the spirit of nature herself," (37). To imitate the beauty of nature so closely as to make an architect's work indistinguishable from nature, was the prime goal for designers or greenkeepers, according to MacKenzie (35).

MacKenzie knew that his courses should be low maintenance or not be too brutally difficult on greenkeepers. He felt that undulations should remain easy to mow and if they ever surpassed this, should be altered to not be so drastic. MacKenzie enjoyed incorporating side-slope lies for golfers. He felt that flat fairways would grow monotonous. He liked to study the formation of sand dunes to consider how to construct natural-looking undulations on a course. Sand dunes are created by the wind "blowing up sand in the form of waves, which become gradually turfed over in the course of time," (27). MacKenzie strove to design courses that had diverse character for every course depending upon its setting (31). He pushed visibility as one of the most important characteristics of a course. He was comfortable with providing blind tee shots for golfers, but did not appreciate blind approach shots (32). Nor did he care for blind greens, or bunkers (93).

The greatest holes and greens, according to MacKenzie, were those that were fascinating to the golfer by reason of their shape, their situation, and the character of their modeling. He believed in laws of balance, harmony, and fine proportion as they equal beauty in nature. To a golfer, excellence in design such as this is felt more than fully realized by the player. Nevertheless, it is constantly exercising a subconscious influence upon the golfer, and they admire the beauty around them (38). MacKenzie enjoyed allowing golfers freedom of play. He disliked extremely narrow fairways bordered by long grass. He felt this destroyed harmony and continuity of the game. His theory was that fairways should gradually widen out where a long drive goes. The driver is then given more space in case of pulling or slicing.
MacKenzie was a believer of the dramatic effect a golf course could have on an individual. "A good golf course is like good music or good anything else; it is not necessarily a course which appeals the first time one plays over it, but one which grows on the player the more frequently he visits it," (42). He felt strongly about playing with the senses of humans through color and contrast. He felt that visual elements sparked a desire to play a course; that a stimulation of the mind and body was possible through color.

The green is delightfully picturesque. It is extremely visible against a background of fir trees - it stands up and looks at you. The contrast between the vivid green of the grass, the dark green of the firs, the whiteness of the sand, the purple heather, and a vivid background of rhododendrons, combined with the natural appearance and extreme boldness of the contours, gives one a picture probably unsurpassed by anything of a similar kind in nature (100).

The fewer the changes required over time to keep a course in excellent playing condition, the more intact the course's original values. This was a theory of MacKenzie. He once wrote that, "A golf course that is altered is an indication of faulty design," (121). This is true unless technology advances to the point that courses must be reevaluated to address safety issues that relate to length of holes and length between one hole and another. Today we have seen such occurrences and courses should be altered as deemed necessary. MacKenzie thought of the future of golf design and what might come after his passing. He wrote that a few elements should be avoided:

- Flat fairways
- Flat unguarded greens
- Long grass
- Mathematically placed hazards instead of those natural
MacKenzie has enumerated thirteen essential features of an ideal golf course

- The course, where possible, should be arranged in two loops of nine holes.
- There should be a large proportion of good two-shot holes, two or three drive-and-pitch holes, and at least four one-shot holes.
- There should be little walking between the greens and tees, and the course should be arranged so that in the first instance there is always a slight walk forwards from the green to the next tee; then the holes are sufficiently elastic to be lengthened in the future if necessary.
- The greens and fairways should be sufficiently undulating, but there should be no hill climbing.
- Every hole should have a different character.
- There should be a minimum of blindness for the approach shots.
- The course should have beautiful surroundings, and all the artificial features should have so natural an appearance that a stranger is unable to distinguish them from nature itself.
- There should be a sufficient number of heroic carries from the tee, but the course should be arranged so that the weaker player with the loss of a stroke or portion of a stroke shall always have an alternative route open to him.
- There should be infinite variety in the strokes required to play the various holes, interesting brassy shots, iron shots, pitch and run-up shots.
- There should be a complete absence of the annoyance and irritation caused by the necessity of searching for lost balls.
- The course should be so interesting that even the plus man is constantly stimulated to improve his game in attempting shots he has hitherto been unable to play.
- The course should be so arranged that the long handicap player, or even the absolute beginner, should be able to enjoy his round in spite of the fact that he is piling up a big score.
- The course should be equally good during winter and summer, the texture of the greens and fairways should be perfect, and the approaches should have the same consistency as the greens (introduction).

Some of the fundamental points of MacKenzie were:
- The chief object of every golf architect or green-keeper worth his salt is to imitate the beauties of nature so closely as to make his work indistinguishable from nature itself.
Most golfers have an entirely erroneous view of the real object of hazards. The majority of them simply look upon hazards as a means of punishing a bad shot, when their real object is to make the game interesting.

- Hazards should be placed with an object, and none should be made which has not some influence on the line of play to the hole.
- On many courses there are far too many bunkers: the sides of the fairway are riddled with them, and many of these courses would be equally interesting if half of the bunkers were turfed over as grassy hollows.
- On a seaside course in particular little construction work is necessary; the most important thing is to make the fullest possible use of existing features (foreword).

Precedent

Prairie Dunes

Perry Maxwell’s Prairie Dunes is buried deep in the heartland of the U.S., however, it is considered to resemble quite closely a seaside links golf course. Hutchinson, Kansas provides a magnificent location for a course in an unusual geological area in the plains. The site includes towering sand dunes taller than 60’ blended with tall prairie grasses and plum thickets. To fully understand the magnitude of such a course we must first take a look at the rich history of Prairie Dunes.

Prairie Dunes was designed by Maxwell in 1937. The first design consisted of only nine holes, but was completed by Maxwell’s son, Press two decades later in 1957. Press’ design incorporated nine more holes to successfully complete the full eighteen hole layout (Elliott 9). Maxwell built the course for the prestigious Carey family of Kansas, to rival any course of that area. Maxwell achieved this objective and much more. Prairie Dunes has hosted six USGA national
championships and was the site of the 2002 U.S. Women's Open. Some of the most famous and talented golfers have walked Prairie Dunes such as Jack Nicklaus, Arnold Palmer, and Sam Snead.

As already mentioned, Prairie Dunes is located on an unusual geological area in the plains. The salt deposits and sand dunes in Kansas were formed by the evaporation of Permian seas around 245 to 286 million years ago. The seas rose and fell in Kansas, covered the plains and dried up, leaving salt, gypsum, potash and sand. For eons the land lay untouched until Perry Maxwell and the Carey family joined to create a rich recreational environment. Salt mining became a major industry in Kansas in the early 1900's and was dominated by the Carey family. With their wealth from this industry, the Careys built many golf courses in Hutchinson, Prairie Dunes being the most special (60).

There is virtually no water on Prairie Dunes. Many golfers have searched for such an element as it is expected with the links style nature of the course. Maxwell was chosen as the designer of Prairie Dunes due to his familiarity with the Scottish links. When approaching Prairie Dunes, one must strain to see the course as it fits so well into the landscape. The seventh green and practice green are visible near the clubhouse, but the rest of the course is waiting to be seen. Even the ninth green only 40 yards from the clubhouse is hidden behind a screen of tall grasses (24).

One more element contributes to a seaside atmosphere at Prairie Dunes. Wind was fundamental in the movement of sand on the Kansas prairie that created the dunes. Some of the early Scottish courses faced the element of wind and still do today. Golfers are challenged immensely by the wind when aiming for Prairie Dunes' narrow fairways and small, undulating greens. Another feature of Prairie Dunes that affects golfers' scores is the thick rough surrounding fairways.
Trees were nonexistent when the course was first built. Today, however, the course has been invaded by many trees, mostly mature cottonwoods, therefore lessening the resemblance of Prairie Dunes to early Scottish courses (62).

Prairie Dunes is not a long course which was a typical characteristic of Maxwell’s layouts. It measures 6,598 yards. With courses today reaching well over 7,000 yards, Prairie Dunes remains short for a championship course. The average width of a fairway is 30 yards, quite narrower than the usual 40 to 60 yards on many modern courses. Many older courses that are considered moderate in length have been looked upon by critics as superior to most contemporary courses (63).

Maxwell firmly believed in the least disruption of nature as possible. The course has become a wildlife and habitat management preserve in correlation with Audobon International. Undisturbed prairie encircles the golf course and includes 100 acres. Within the course, 75 acres of prairie habitat are preserved. Maxwell maintained a natural environment to follow his theory that retaining such features resulted in low maintenance costs (64). 75% of the 240 acres of Prairie Dunes remains in its native state (65).

Seven of the nine original greens of Prairie Dunes are still intact after 66 years. Of the additional holes built by Press Maxwell, only one has been rebuilt. The greens at Prairie Dunes were considered severe at the time of their creation in 1937, even when grasses and technology were not able to create slick conditions similar to today. Now the greens prove to be more difficult than ever due to modern equipment enhancing the greens to produce slicker, faster surfaces. Maxwell’s greens have lasted through time due to the “soil that was pushed up in making the greens sandy loam similar to that used in the refurbishing of greens. Also, Maxwell’s severe rolls allow for excellent drainage,” according to Stan
George, the current golf course superintendent (63). Many of Maxwell’s greens have been altered to fit standards of today. Players have been intimidated by Maxwell’s extreme rolls and architects have modified them accordingly. However, the purist of golf architects have attempted to retain historically designed greens such as those by Maxwell (80).

Other architects such as Ben Crenshaw, designer of Sand Hills Golf Course, feel that historical courses such as Prairie Dunes may be studied and learned from for a very long time. He stated, “With this new technology everybody hits the ball so far, but [at Prairie Dunes] you have to hit it remarkably well. The rough has always been a key part of Prairie Dunes.” Crenshaw believes the theory that Maxwell held so true in his designs, “If you pick a suitable piece of ground and make your holes fit your landscape, your golf course will be different than anybody else’s.” Crenshaw actually redesigned two greens at Prairie Dunes in order to make more cupping locations. The main reason for the redesign, however, revolved around spots on the first and second holes where the ground was sinking leaving standing water (62). Crenshaw was sure to be respectful of Maxwell’s green designs by changing as little as he possibly could. Crenshaw softened the greens slightly and was successful at maintaining the original Maxwell intent (63).

**Design Issues, Trends, New Ideas**

In my opinion, golf course architecture of today should closely follow the ideas of golf design from the beginning of time. Using these early principles as a foundation, an architect may expand by addressing contemporary issues; thus, blending the earliest of traditions with modern principles. In the early years of golf architecture, naturalistic approaches to design were of utmost importance. Golf design began as the art of shaping the game of golf to best fit the land. Variety should
always remain a top priority in designing golf courses, for there is much variety in nature and golf courses should be extensions of nature. Artistic and strategic elements remain essential considerations when designing golf courses.

Natural features must be considered when designing with the land. These features shape the landscape and include trees, water, and natural undulations. By being consciously aware of the placement of such features, views and vistas may be created and modified. Other important elements of a golf course include variety in color, texture, and contrast. All of these elements appeal to the senses and contribute to an aesthetically pleasing atmosphere for golfers. These are some of the design considerations that have existed since the beginning of golf architecture and will remain for years to come. I plan on including these design characteristics in my criteria for a model design.

Design Principles

Through much research of various architects and their design standards and methodology, I chose aspects of design from which I created my own set of design criteria. The following design principles served as pieces in my overall design criteria:

- Natural features admirably used
- Natural features not used will be reduced in emphasis
- All work to follow irregular lines of nature
- Holes shall have a “twist” or interesting aspect
- Frequent changes in direction of holes
- Use of multiple tees
- Challenging holes that exude confidence in players’ abilities
Hierarchy of elements on holes (different emphasis on different elements)
- Natural, irregular bunkering
- Multiple options for players on each hole
- Simple strategic problems created by bunkering schemes and angles of green design
- Stimulating holes to improve the game of golfers
- Risk/reward holes offered to promote strong, bold play
- Hazards in view of golfers, but not necessarily all of the hazard (partial view of bunkers, flashed to show player trouble)
- Use of complex depth perception
- Design shall accommodate future growth and change
- Creation of variety of approach shots into greens
- Force players to contend with various wind conditions
- Explore different holes and green complexes such as the Redan
- Preserve the heritage of a course; respect its character and style originally intended
- Create an attractive environment utilizing 19th century principles of landscape design

Modern or contemporary issues must be addressed in golf design today such as ecology and technology. Some design principles for these issues are:

- Achieve sustainability with consideration of ecological, hydrological, and agronomic systems
- Restore and improve natural systems within a golf course
- Creatively tap into natural resources of the site
- Courses must accommodate a growing number of golfers, and must accommodate different groups of play such as women, seniors, and juniors
- Provide course with updated quality turf grasses
- Create comprehensive planning for a golf course's future
- Accommodate for all skill levels of golfers
- With technological advancements in golf equipment, not only lengthen courses but improve strategic content and variety as well
- Create sustainable habitats for flora, fauna
- Unused parcels of property may be used as mini-habitats
- Zonal management may create natural areas on holes; also reduces maintenance costs for such areas
- Consider native plant revegetation and habitat edge management

Description of Site and Context

Indian Hills Golf Course of Catoosa, Oklahoma is located on the outskirts of the more populated Tulsa, Oklahoma. In 1924, when Indian Hills was built, it was thought that growth would occur to the north of Tulsa. However, after WWII, Tulsa expanded south instead of north, leaving Catoosa less populated than originally imagined. Southern Hills, a more well-known Perry Maxwell course in southern Tulsa therefore thrived and is still one of his more renowned courses today.

Perry Maxwell designed Indian Hills for a local group of businessmen. However, there have been numerous changes in ownership over the years. The local owners sold the course to the Aberdeen Company in the mid 1950’s. The name of the course was immediately changed to Rolling Hills. For about twenty-five years the Aberdeen Company retained ownership until they sold it to an individual in the area named Dennis Huntley. During Mr. Huntley’s ownership of the course, a tornado swept through the course and destroyed a large number of trees on the front side of the site. The year of the tornado was 1993. When Indian Hills was designed in 1924, it was a typical Maxwell style with not many obstacles in the way of trees and growth along holes. Through the years, however, as with most courses, trees surrounding the course matured and almost seemed to take over the course in certain areas. The members of the club at that time were
amazed by the changes the course had undergone. With the tornado of 1993, the course was dramatically altered and more closely resembled the original design of Maxwell. The Club was named once more to Spunky Creek Country Club. Around this time, the development of a housing addition to the north of the site occurred which greatly increased the value of the property of the golf course. The club was once again sold due to financial considerations to an investor group in Colorado. Then in August 2001, the local Cherokee Nation purchased the golf club. Cherokee Nation Enterprises owns a casino that now sits adjacent to the golf course. The Cherokee Nation hoped to develop the course into a tourist location. A large hotel is in the process of being built along with an expansion to their casino. They are marketing the course, hotel and casino as a resort type of location. They prove to be successful with the large amount of visitors they often receive when the Tulsa area hosts popular events such as the U.S. Open. Due to the lack of space they had for the expansion of the casino, part of the original layout of the course was redesigned using land to the west of the original eighteen holes. It is important to the owners to revive the course, as it is an historical treasure of the Catoosa area and of Oklahoma.

The earliest of Maxwell’s Mid-west courses differed stylistically from those that he created in his later years. When Maxwell designed Indian Hills, it included many of his earliest traits. The course was comprised of small greens and required accurate approaches made extremely difficult with tight greenside bunkering. All in all, the course at Indian Hills is a typical course developed by Maxwell in the 1920’s.

The course as it is today features the clubhouse overlooking the first tee, which is elevated high above the fairway for a straightaway 374 yard par four. Like many of the early designs by Maxwell, this hole featured an elevated tee location
with a scenic view of some manner and allowed the golfer to see much of the course that they would battle during their round. The 2nd hole goes back the opposite direction 427 yards up a hill to a beautiful green tucked into the hillside that slopes dramatically from left to right towards a huge bunker. The 3rd hole is a par three that plays 197 yards downhill to a small green. The 4th is a 382 yard par four dogleg right and is followed by a 323 yard par four to a tiny green that is heavily contoured. The 6th hole is a big hole that doglegs to the right with a big tree at the turn. Number 7 is a 475 yard par five that plays uphill all the way, though short in yardage the hole features some opportunities for the player to score low or high with a depression in the fairway and a small green. The 8th hole is another downhill par three of 169 yards. The 9th tee box sits right behind the 8th green and is an uphill par five of 472 yards that goes back to the clubhouse and finishes the front nine much in the fashion of many other Maxwell designs with a tough final hole. There is never a walk of more than twenty yards from green to tee on the front nine. The par threes and par fives play in different directions from each other showing how Maxwell was a master of using the terrain and prevailing winds in setting up a variety of shots to the player during their round.

The back nine features the much more interesting terrain and starts with a brute of a par five of 615 yards! This was one of the first extremely long par fives that Maxwell would design over his career. The tee shot is a dogleg to the left, and then it plays straight to a small green. Then the player faces another par three of 166 yards, playing in a different direction to the other par threes. The next hole is perhaps the most photogenic on the course. It is a 373 yard par four that runs along the edge of a pond and has a creek that crosses the middle of the fairway. The hole is very similar in nature to what Maxwell would design with the 11th hole at Muskogee just a few years later. The green requires an uphill approach and leads to an elevated tee for the next hole. The significance of the hole was that it also featured the first forced carry of any
type that Maxwell had designed to that point. The strategic value of the shot was that the further to the left the player hit the ball, the closer they would be to the elevated green site. Up to this point the only carries of water that Maxwell used were creeks directly in front of tee boxes and a diagonal carry of the pond on the 2nd hole at Dornick Hills. For this hole at Indian Hills though, there was no alternative to playing over the water, the question was how much would the player try to carry.

The 13th hole plays as a dogleg right at 358 yards to a green that you must hit through the trees and over the creek again. The location of this green was perhaps the first that Maxwell would design with a forced carry over water to attack the green directly. The 14th hole is 386 yards straight uphill and running in the opposite direction of the previous hole. This was followed by a 392 yard par four with a green perched on the opposite of another swale short of the green. The 16th is a par three of 181 yards and again plays in a different direction from the other short holes on the course. The 17th hole is a 548 yard par five that plays uphill to an elevated green. The 18th hole is a little different finisher from what Maxwell had designed to this point in his career as it was a dogleg right of 366 yards right hole that plays to another elevated green. As can be seen from the description of the course, only two holes run in the same direction consecutively, the 7th and 8th. Maxwell sought out the prevailing wind and tried to design this course to be the dominant course in the Tulsa metropolitan area. Unknown to him the growth in the city would go towards the south end of town and would leave his first effort in Oklahoma’s largest city as a little known hidden gem for many years that would suffer through financial and political hardship.
Site Analysis

The site is located amongst a great deal of topography change that occurs in Oklahoma’s eastern half. The site drains from the top at an elevation of 780 to a creek and the southern portion of the site, where the three holes to be designed are located, drains in a northeast direction back to the creek as well. The creek runs from west to east throughout the site and delivers water to two irrigation/drainage ponds at the most southeast portion of the site. Two roadways border Indian Hills to the south, (highway I-44) and to the east, (East 193rd St.). A residential area resides to the northeast of the site and commercial development is located to the east along 193rd St. Although I-44 runs close to the site, the noise is not a huge factor due to the amount of vegetation presented as a buffer and the fact that the road exists below the site level. Existing structures within the site include clubhouse/pro-shop buildings and a maintenance barn.

Indian Hills Golf Course has seen three tornadoes throughout its years of existence. The most damaging occurred in 1993. It eliminated vegetation and left debris within the site. To the west of the site are heavy woodlands. The site is within the Cross Timbers Region of Oklahoma with its forests made up of Post Oaks, Red Cedars, Blackjack Oaks, and Sumac. Also there is a mosaic of savannah and glade areas or open prairie native grasses. The site has many interesting natural features. Rock outcroppings expose themselves throughout the site and many natural waterfalls occur, especially throughout the woodland area west of the site. Off-site ponds filter water through the site and these waterfalls. The soil is clay loam. These types of elements create a scenic, enjoyable environment for golfers and those that appreciate the art of golf course architecture.
Significance of 3 holes chosen
The three holes that have been chosen exist within the southern portion of the site. Holes #13, #14, and #16 all include elements of water, topography and various vegetation. #13 and #14 are both par 4's and #16 is a par 3. Many possibilities exist for these selected holes and may be experienced through design by the standards of Maxwell's later style, MacKenzie, Ross, and myself.
DESIGN PROCESS

To begin the design process, goals and a program were formulated.

GOALS
1. To address three classical architects and apply their design principles and styles to the site of Indian Hills Golf Course.
2. To create a set of design criteria that incorporates historical design as a foundation, while addressing modern-day issues.
3. To complete a study that may serve as a basis of future design for students of golf course architecture.

PROGRAM
1. Describe Maxwell’s evolution of design through written and graphical representation to display how he would have designed on the site, later in his career.
2. Describe design standards used by Donald Ross and Alister MacKenzie and display them with sample models according to how they would have designed the site.
3. Provide philosophies of the architects of the “Golden Age of Design” that may serve as important pieces to my set of design criteria.
4. Design 3 holes according to
   -Maxwell
   -MacKenzie
   -Ross
   -Pavlechko
5. Provide details, sections, sketches.
6. Build 4 models of a selected hole.
The next step in the design process included creating the golf holes #13, #14, and #16 according to the design principles and styles of Maxwell, MacKenzie and Ross. Conceptual plans were developed for each hole for each architect. From these architects, holes were created using historical principles while incorporating significant principles for contemporary issues.

PERRY MAXWELL
To determine how Maxwell would have designed upon the landscape later in his career, certain design principles of his were studied.

- Maxwell's later style was still benign compared to other architects
- Emphasized significant natural features
- Used lots of color and contrast
- More use of native grasses and plants
- Designs based on template methodology
- Contoured land to great extent

Bunkers
- More artistic flair to bunkering
- Used more extensively in fairways
- Placed bunkers at corners of doglegs for strategic purposes

Greens
- Green designs became more complex
- Introduction of Maxwell's "famous rolls"
Figure 3

Prairie Dunes in Kansas is one of Maxwell’s later works when he utilized native vegetation to bring extreme color and contrast into his courses. He also began to use grasses in and around his bunkers.
Figure 4

Maxwell’s famous rolls were used not only in his greens but also in the fairway leading up to the green as seen here.
When designing holes #13, 14, and 16, it was clear that more fairway bunkering needed to be added. Maxwell initially provided sand bunkers only around green complexes but toward the end of his design career, incorporated more sand hazards from tee to green. Also, when designing the holes to fit Maxwell’s later style, it was evident that he would have designed the greens to have much more roll. Also, native grasses and vegetation would have been incorporated around sand bunkers and water hazards. Prairie Dunes in Hutchinson, Kansas is an excellent example of this type of treatment with brilliant color and contrast due to the native vegetation brought in and around the golf holes.

**DR. ALISTER MACKENZIE**
When considering the way in which MacKenzie would have treated the landscape in designing holes #13, 14, and 16, many of his design principles were taken into account.

- Flamboyant, glitzy designs
- Adventurous designs, subtle surprises
- Made great use of existing features
- Liked to draw off old European designs
- Challenged golfers with “Heroic” holes
- Designed for all levels of play
- Provided options for players
- Gentle use of small hillocks around greens
Bunkers
- Bold, fingerlike
- Naturally placed
- Large pits with sand flashed up
  shaped faces
- Each had its own character
- Inspiration from passing clouds

Greens
- Occasional odd shapes
  boomerang, horseshoe, tooth-shaped
- Guarded and softly undulating
- Skinny, long greens on water

MacKenzie would have designed holes #13, 14, and 16 quite differently than that of golf architect Perry Maxwell. MacKenzie’s bunkers were quite bold in size and placement. This would have had an impact on the three holes at Indian Hills. The finger-like shapes would have carried over as each of MacKenzie’s bunkers was one of a kind. His greens were very guarded with bunkers and by water elements. This trait was carried through the Indian Hills site as well with greens being guarded not only to the sides and front by in the back as well, such as in figure ___. MacKenzie utilized distinctly different shapes of green complexes. On holes #13 and 14, the idea of the boomerang-shaped green is present and #16 has more of a tooth-shaped green. One of the things MacKenzie would have highlighted on in his design would have been to include options of players. For this reason, an A and a B area were provided for holes #13 and 14. Here golfers could play with the idea of risk and reward.
Figure 6

Here golfers are challenged with the bunkers immediately behind the sloped green. MacKenzie often guarded his greens on all sides including the back side.

Figure 7

The “Heroic” hole was one of MacKenzie’s finest achievements. He was able to give the golfer options and if the decided upon a riskier route and executed their shot successfully, they were rewarded. This type of hole allowed the golfer to bite off as much of the hazard as they were capable of doing.
DONALD ROSS
To design according to golf architect Donald Ross, his design principles and style were closely studied as well. From his design standards principles were chosen that would be integrated into his design for Indian Hills Golf Course.

- Created subtle, dignified designs
- Each hole presents a different challenge
- Risk/Reward
- Knolls and dips from fairway to green
- Ridges and rolls in the land
- Some blind shots
- 3 or 4 sets of tees per hole
- Adjustable tees for variety
- Respected natural settings
- Never overwhelmed the land
Bunkers
- Peppered throughout the fairway
- Used a great deal on each hole
- Some asymmetrical in appearance
- Some rounded and simple

Greens
- Ingeniously contoured
- Used small mounds
- Would “crown” the green
- Elevated greens that would fall off the sides
- Placed in full view

Using the above design standards of Donald Ross, holes #13, 14 and 16 were developed according to the legendary architect. Bunkers were utilized throughout the fairways and around the greens as Ross had often done. Also, the types of bunkers used were quite unique. Pot bunkers and bunkers with steep sloped grass faces were incorporated with the three holes. Ross’s use of mounding and depressions were a part of the new design creating variety. Multiple tees were included providing golfers with many options for play. His greens would have been crowned and falling off to the sides most probably on this site and for that reason all three greens were treated in this manner with variances in the direction of slope. There was a great attention to the areas around the greens for this golf architect.
Figure 9

Mounding was used quite a bit by Ross. He often included mounding/bunker combinations in his designs as seen here.

Figure 10

Ross often designed his greens to fall off to the front, side or back. Here is a dramatic example of that design concept.
PAVLECHKO
For my set of design criteria, I pulled important historical principles from Maxwell, MacKenzie, and Ross as well as some of the other golf architects I studied from the Golden Age of Design. These served as a foundation for my design criteria, while I also incorporated contemporary or modern-day principles. The contemporary principles concentrated on the areas of technology and ecology.

FOUNDATIONAL PRINCIPLES

Maxwell

-Natural features admirably used
-Attention to color, contrast, scenery/background
-Views, vistas

MacKenzie

-Each hole to have a "twist" or interesting aspect
-European influences
-Natural, irregular bunkering

Ross

-Use of multiple tees
-Risk/reward
-Alternate routes
Other
- All work will follow irregular lines of nature
- Diverse challenges for a variety of players
- Different lines of play from tee to green
- No blind, or unfair elements
- Variety of approach shots into the green
- Preservation of the heritage of the site

CONTEMPORARY PRINCIPLES

Technology
- Accommodate all skill levels of players
- Provide updated quality turf grasses
- Comprehensive planning (future growth)
- Improve strategic content vs. simply lengthening
- Force golfers to use course management
- Reduce maintenance costs
- Use of complex depth perceptions

Ecology
- Create/enhance sustainable habitats for flora/fauna
- Creatively tap into the natural resources of the site
- Unused space for mini-habitats
- Zonal management, create natural areas on holes
- Consider native plant re-vegetation and habitat edge management

DESIGN CONSIDERATIONS

- Character and scale of design features
- Force players of all levels to consider their options
- Clever strategy
- Intense variety
- Extreme naturalness

STRATEGIC ELEMENTS

Tilt of the green
Undulations throughout hole
Positions of bunkers
Chipping areas
Allow openings for certain shots

Figure 12
This hole at Prairie Dunes is an excellent example of how a golf architect can create a backdrop for a hole.
Figure 13

Sand Hills Golf Course in Mullin, Nebraska fits into the landscape perfectly. Golf architects should attempt to design courses with a natural look and feel as if it was already within the land.
For hole #13 I created multiple tee options for players. These tees will provide various lengths and angles to the green. I also provided the golfer with different options for a landing area, one route (A) being the safe play and route (B) being the risk/reward route. Route B would provide the better angle to the green and the possibility of roll with a slope, but the player must be accurate due to bunkers, trees and native grasses that line the right side. There is a bail out area right of the green where players' balls will collect in depressions. The green is two-tiered and slopes to the front with a long organic shaped bunker to the left and mounding and native grasses to the back, providing a magnificent backdrop.
Hole #14 is another par 4 with multiple tees and native grasses woven through the tee stations. This hole also utilizes the idea of different options to the green. A fairway bunker is placed approximately 235 yards from the back tees. This uphill tee shot is now a bit more difficult for the scratch golfer as they must decide how to hit over the bunker. For the average or beginner golfers they will need to decide how they will execute their second shot around the hazard. Area B provides a better angle to the green for higher pin placements while area C is a better angle for lower pin placements. A bump and run area is provided to allow players a variety of shots with a variety of clubs. A depression behind the green collects mis-hit bump and run shots. The green is sloped to the front with a couple different tiers.
Hole #16 is a par 3 that is modeled after a type of hole found overseas, called the Redan. It provokes the idea for the golfer to bite off as much of the hazard as they are able to. The water on this hole was brought out more toward the fairway with native grasses as well. Natives are also woven throughout the tee areas and behind the green to provide wonderful color and a scenic backdrop. The natives also cut down on maintenance costs and time with less grass to cut and fertilize. Area A filters the golf ball onto the green and the green slopes toward the creek with a collection area to catch balls from traveling too far. Area C penalizes the overaggressive player with mounding and native grasses. This is truly a challenging hole.

Figure 16
CONCLUSION

Through an exploration of some of the World’s earliest and best golf architects, it was possible to cipher through some of their design principles to create a set of foundational criteria. These criteria were then used as a base while new criteria representing contemporary issues were incorporated. Historical courses should serve as a foundation off of which we design for today. Looking to the past is truly vital before we can design for the future.

Collection Strategies/Resources

- Tripp Davis
- Michael Rhoads
- Jeff Jarrett, Director of Golf, Cherokee Hills Golf Club
- Don Russell, Superintendent, Cherokee Hills Golf Club
- Dennis Huntley, past owner, Indian Hills Golf Club
- Rogers County Planning offices
- Chris Clouser, Perry Maxwell historian, writer
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Interviews

Tripp Davis, golf architect, president of Tripp Davis and Associates.
I have made many site visits with Tripp to Indian Hills Golf Course and he has been instrumental in providing both
knowledge and materials for my thesis research. There is possibly no other person besides the late Perry Maxwell that
knows the site as well as Davis. He has studied the designs of early architects such as Maxwell, Ross, and Tillinghast and
uses their styles as inspirations for his own. Davis has been and will continue to be a helpful resource.

Chris Clouser, Perry Maxwell historian, writer of golf publications.
Clouser has been extremely helpful in providing me with information on Indian Hills Golf Course along with general
literature on Maxwell. He was able to supply me with an aerial photograph as well as routings and photos of the time
period before Davis' work was done to the course.
**Appendix A**

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