

HONOR, PLAY, RESTORE: AN EXPLORATION OF A GOLF LANDSCAPE DESIGNED
AS A THERAPEUTIC ENVIRONMENT TO HONOR U.S. COMBAT VETERANS AND
SERVICE MEMBERS

by

BRENDAN MANNIX-SLOBIG

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture/Regional and Community Planning
College of Architecture, Planning and Design

KANSAS STATE UNIVERSITY
Manhattan, Kansas

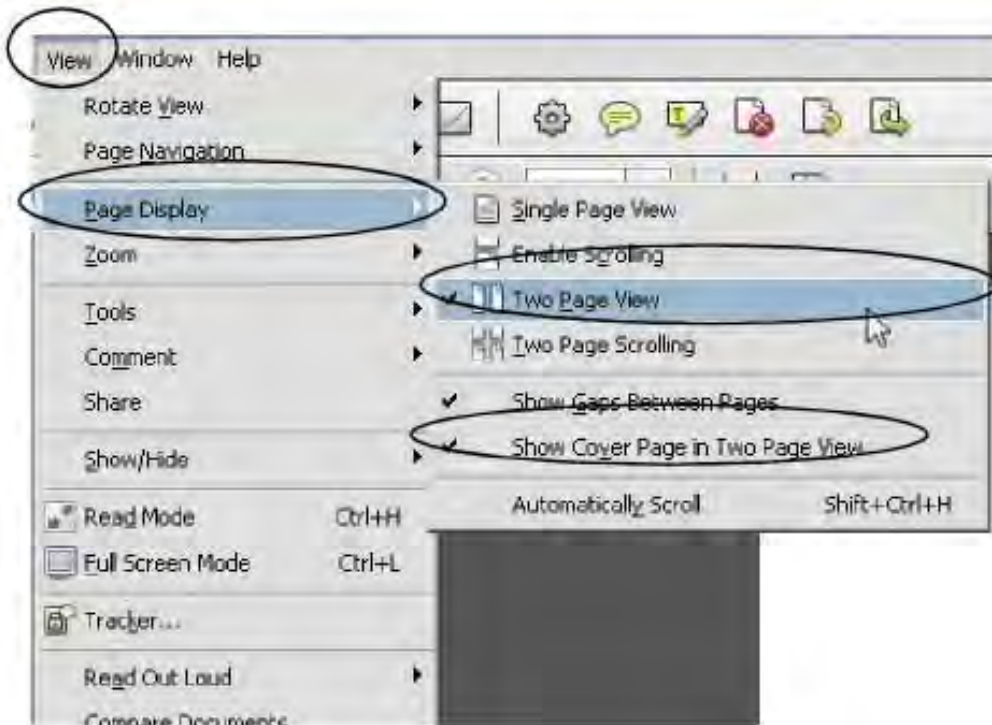
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Approved by:

Major Professor
Howard Hahn

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Honor, Play, Restore: an exploration of a golf landscape designed as a therapeutic environment to honor U.S. combat veterans and service members

A report submitted in partial fulfillment of the requirements for the degree:
Master of Landscape Architecture

Department of Landscape Architecture, Regional & Community Planning
College of Architecture, Planning & Design
Kansas State University

Master's Project Committee:
Howard Hahn, Assistant Professor, Department of LARCP
William "Chip" Winslow, Professor, Department of LARCP
Dr. Briana Nelson Goff, Professor, School of Family Studies and Human Services

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**LANDSCAPE ARCHITECTURE
/ REGIONAL & COMMUNITY PLANNING**
THE COLLEGE of
ARCHITECTURE, PLANNING & DESIGN // K-STATE

Abstract

Golf landscapes have been cast as selfish land use, only for the recreation of those who are fortunate enough to play (Kiss, 1998). Recently, golf has been used by precedent programs like the Salute Military Golf Association (SMGA) and American Lake Veterans Golf Course (ALVGC) for its perceived therapeutic value, specifically for those who are suffering from post-traumatic stress disorder (PTSD).

The following study presents an academic exploration of the potential therapeutic benefits a therapeutic golf landscape can provide U.S. combat veterans and service members suffering from PTSD. Ownership at a golf course in House Springs, Missouri is inspired to renovate their facilities to incorporate a playing experience of honor and healing for combat veterans. The golf course at Deer Creek USA is used as a model landscape for the purpose of this study.

An analysis of the existing literature on the subjects of golf course design, therapeutic landscapes and memorial landscapes provided the foundation for the study. Precedent studies were used to extract specific design principles from each subject which was next interpreted and presented into two design frameworks. The design frameworks informed a series of design consideration for both memorial landscapes and therapeutic landscapes. A detailed analysis of the existing conditions at Deer Creek USA revealed that the golf course needed an intensive renovation in order to meet the report's goals and objectives. The final Renovation Master Plan is one of many potential applications of the design guidelines to illustrate a vision for Deer Creek USA as a therapeutic landscape for U.S. combat veterans and service members.

The following report reveals an innovative approach to the renovation of a golf course specifically designed to foster a complementary form of therapy for PTSD. If built, Deer Creek USA would be a place where U.S. combat veterans and service members suffering from PTSD can go to feel honored while benefiting from the potentially therapeutic sport of golf in a landscape optimized for stress reduction.

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my first day in the landscape architecture program here at Kansas State and told him that I wanted to be a golf course architect. Chip laughed, citing the shrinking market for golf course design construction. This project was my first academic opportunity to pursue my dream, Chip, thank you, we finally did it.

I commend Dr. Goff and her courage and enthusiasm to work in an unfamiliar environment and contribute her invaluable

perspective. Thank you Dr. Goff, I hope this learning experience was as valuable for you as it continues to be for me.

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Finally, I would like to thank my family whose continued love and support has made this all worth it.



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(Author, 2013)

INTRODUCTION

1







Background

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(Author, 2013)



Deer Creek USA Golf and Event Center (Deer Creek) is an existing 18-hole golf course located 30 miles southwest of downtown Saint Louis, in House Springs, Missouri. Recently, ownership of the facilities changed and Andrea Politte assumed responsibilities for managing the neglected golf course. Ms. Politte, an inspired patriot, sees potential for Deer Creek to function as more than just a golf course. In an initial meeting with me, Politte shared her vision of transforming Deer Creek into a memorial landscape, designed to honor and heal U.S. combat veterans and service members who golf on it.

The following Master’s Project and Report (MP+R) documents a qualitative study of golf landscapes and their potential therapeutic value for U.S. combat veterans and service members suffering from post-traumatic stress disorder (PTSD). This

project investigates three realms of design theory within the practice of landscape architecture: golf course design/renovation, therapeutic landscapes, and memorial landscapes, ultimately merging them into one holistic landscape experience. By extracting design principles from each landscape type, it was possible to develop goals and objectives for designing the intended experiential landscape. The goals and objectives were next applied to the existing Deer Creek golf course as an evaluation of existing conditions.

After an analysis of the current golfing layout at Deer Creek, and a literature review of therapeutic and memorial landscapes, it was possible to inform a renovation master plan. The proposed master plan illustrates a new therapeutic and memorial golf landscape to honor U.S. combat veterans.

“*Our Mission: A Non Profit Golf and Event Center created to Honor and Thank our men and women in uniform who serve and protect. This includes Military, Veterans, Fire & Rescue, Police, Emergency Responder Personnel and Gold Star Families. For their Service and sacrifices we offer them Free Deer Creek USA Golf Memberships (“About Deer Creek USA,” 2014).*”

“*Our Vision: To create a unique golf experience reflecting our mission while playing throughout the course. Each tee box will be designed and designated to honor each service branch (“About Deer Creek USA,” 2014).*”

Figure 1.3 | Deer Creek Hole 17 from the tee
(Author, 2013)

Intent

Goals and Objectives

The intent of this project is to define a set of design guidelines for a golf landscape that incorporates therapeutic and memorial experiences. Ultimately, these design guidelines are applied to a golf course renovation. Before the design guidelines could be applied, there needed to be an evaluation of existing site conditions. A typical evaluation of a golf course focuses on factors

of playability and condition of the landscape, not therapeutic value. The following investigation provides an innovative approach to the evaluation of a golf course. This project specifically frames the therapeutic benefits on behalf of those who currently serve or have served in the United States Armed Forces, and who are suffering from PTSD.

Personal Interest

My pursuit of a master's degree in landscape architecture began with an interest in golf course design. For as long as I can remember, it has always been a dream of mine to become a golf course architect, and this project is the closest I have ever come to my dream. As a golfer myself, I have encountered many people from the non-golfing public who are critical

of the game, be it from the environmental awareness perspective, or the "boring" sport perspective. I look forward to sharing my findings of this project, and framing the golf experience as more than hitting a white ball into a hole. I look forward to leveraging my interests in golf course design and construction to explore this topical area.

Inquiry

Primary Dilemma

Golf courses have been cast as a selfish land use, only for the recreational use of those who can afford to play. Golf courses are perceived as single dimensional landscapes. There are many benefits that a golf landscape provides to society, many of which can be overlooked. If properly designed and maintained, a golf course can serve to reserve open space from sprawling

development. Golf courses provide necessary habitat for local biota, and increase the biodiversity of a region. Golf courses also provide a social value beyond their physical benefits. Golf courses are places for public gathering and social interaction between members of a common community.

Research Questions

- Currently, is Deer Creek a suitable environment for establishing a therapeutic landscape for U.S. combat veterans who are suffering from PTSD?
- What design guidelines could be applied to a golf landscape serving two additional experiential purposes: to honor U.S. combat veterans, and incorporate design principles that respect PTSD treatment strategies?
- How can these design guidelines be applied to the existing golf course at Deer Creek near Saint Louis, Missouri?
- What makes the new renovation of Deer Creek facilities a therapeutic environment for U.S. combat veterans?

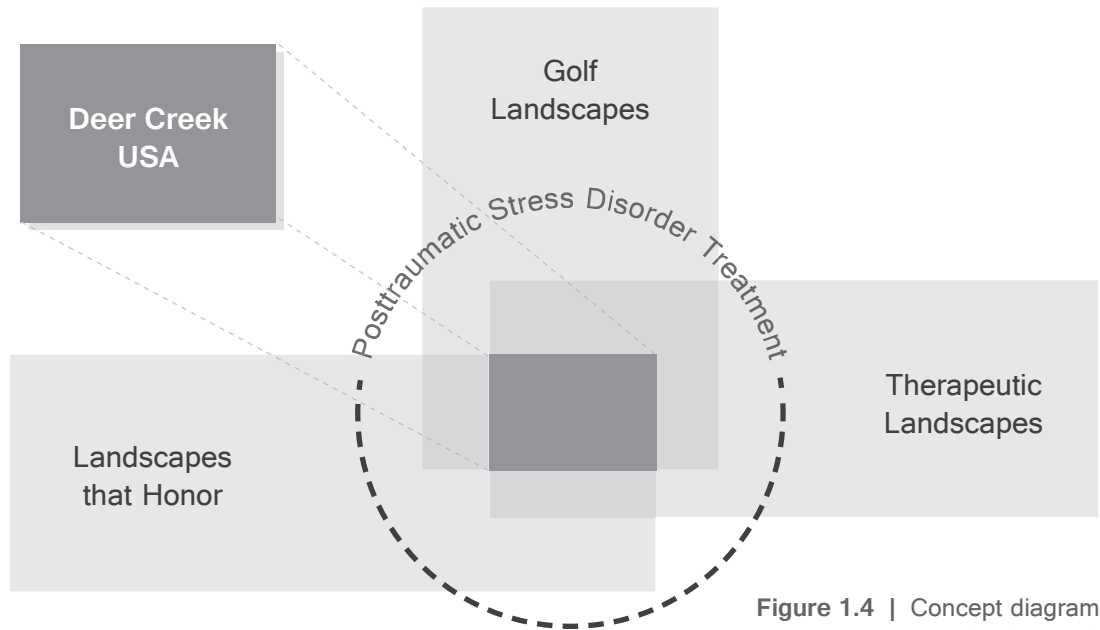


Figure 1.4 | Concept diagram
(Author, 2014)

T h e s i s

A golf course renovation master plan that incorporates design principles from both therapeutic landscapes for post-traumatic stress disorder and memorial landscapes to honor those who have served will be a suitable outdoor environment for complementary therapy for U.S. combat veterans and service members. A golf landscape specifically designed for U.S. combat veterans and service members will provide additional benefits to the golfing experience targeted to that specific audience.

This unique approach to a golf landscape will provide golf course design professionals an opportunity

to consider additional dimensions within the environments they design. Therapeutic professionals with patients who are suffering from PTSD can now view golf landscapes as environments that complement traditional therapy. As the United States continues to engage in war conflicts overseas, there is an increasing demand for research related to therapy treatment programs for post-traumatic stress disorder (Rosenthal, Grosswald, Ross, & Rosenthal, 2011). This study intends to set conditions for research in the fields of not only golf course design, but therapeutic and memorial landscapes for post-traumatic stress disorder.

Project Limitations and Boundaries

There were two types of limitations and boundaries encountered throughout the project. The first were physical and tangible boundaries which had its greatest impact during the application phase of the project. The other types of limitations and boundaries were theoretical and affected the synthesis and interpretation phases.

The application phase of the project focused on an existing golf course near Saint Louis, Missouri; therefore, there are geographic project boundaries that influenced the design outcome. The design intervention is proposed as a golf course redesign strategy. Consequently, all design intentions had to fit the existing golf landscape. Although I did not provide a cost breakdown of the final design, I was aware of budgeting concerns and future maintenance restrictions.

The interpretive boundaries are not as clearly identifiable. The thesis suggests that it is possible to successfully balance three experiential landscape qualities within a golf landscape. The original golf course, however, was not optimized for its potential therapeutic value nor was it designed to honor U.S. combat veterans and service members.

Among the theoretical limitations, this study uses the Fourth Edition of the *Diagnostic Statistical of Mental Disorders* (DSM-IV-TR) which was published in 2000 by the American Psychiatric Association (APA) (American Psychiatric Association, 2000). In May 2013, the APA published the DSM-5, which is the first major edition of the DSM in twenty years. Because a majority of the sources included in the following investigation used the DSM-IV-TR, this project will not use the DSM-5.

Finally, the redesigned Deer Creek renovation master plan has not been built and tested. Therefore, the efficacy of the report is confined to theory. Without being able to test before and after the implementation, there is no sure way to validate that the concepts in the research successfully translated into a real world experience. Because of this, the project time line includes future research and strategic considerations beyond the scope of the current report.

Relevance

Why should a landscape architect read this?

Landscape architects are trained to analyze the outdoor environment and identify strategies to improve the landscape, economically, socially and environmentally. As golf courses continue to receive criticism from the non-golf public and environmentalists, it is important to take a critical look at the performance of such landscapes. This project addresses several facets within the scope of landscape architecture and provides a solution to designing a golf landscape with multiple dimensions. A golf landscape that has cultural and therapeutic value makes it immediately relevant to landscape architecture.

Why should a golf course architect value the following proposal?

For several years the golf industry has experienced a decline in popularity. Non-participants might describe the game of golf as a boring waste of time. Comedian Bill Cosby once described his distaste for golf during a stand-up routine in 1972 when he joked, “Golf is dumb because you put

the ball down, you take a ball out of your pocket. You put it down, and you hit it – whack! And then, you walk after it... now think about that?” (Cosby, 1972). Those who play golf are likely to attribute their experience to landscape aesthetics, beautiful weather, or the camaraderie of playing with friends, before they mention their scoring performance.

A golf course architect can learn from this report to gain a better understanding how the game of golf, and the landscape upon which it is played, can have significant therapeutic benefits to the well-being of the players. Although this report frames the therapeutic benefits of a golf landscape on behalf of U.S. combat veterans suffering from PTSD, there is still a valid interpretation for how therapeutic qualities of landscape can be realized within the specific context of a golf landscape.

Finally, the golf course design industry has seen a reduction in the construction of new golf courses. Modifying or remodeling existing courses that no longer meet standards of profitability, ecology or functionally is a current trend in the industry. The application

phase of this project evaluates the conditions of the existing golf landscape at Deer Creek, and provides a solution that incorporates therapeutic and memorial design elements – while enhancing the playability of the golf course.

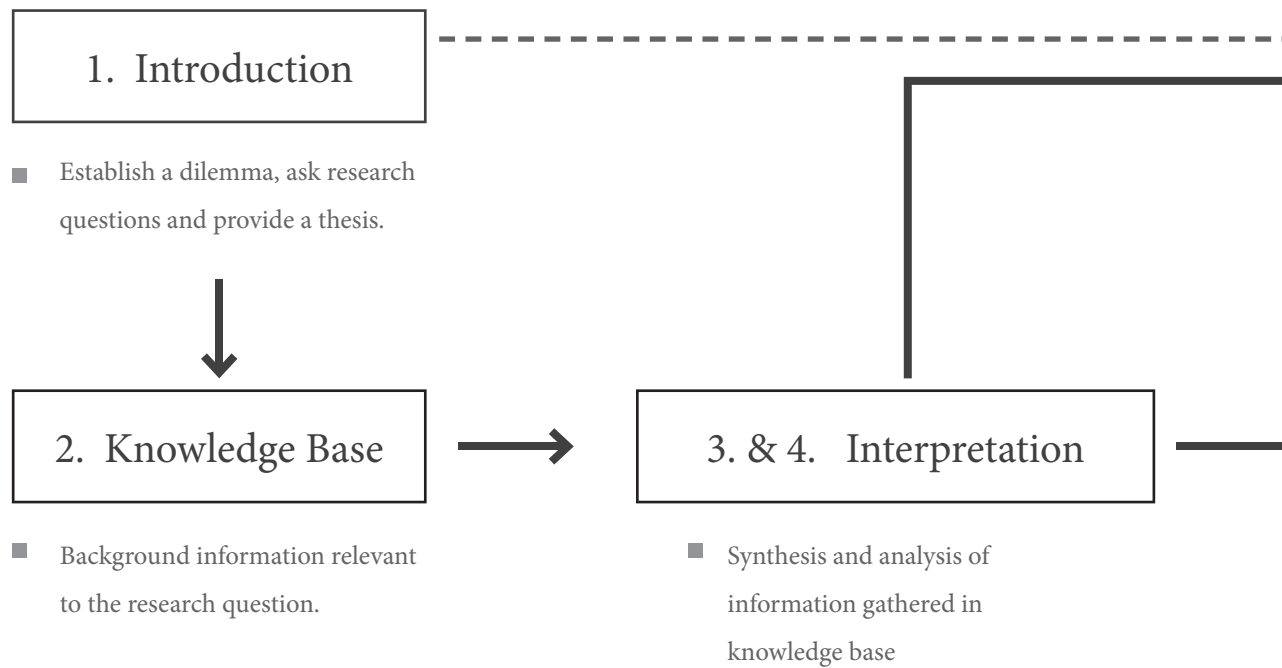
Why should an occupational therapist value the following proposal?

As diagnostic rates of post-traumatic stress disorder in U.S. combat veterans and service members continue to rise, it is important to provide additional avenues for therapy (Lapierre, Schwegler, & LaBauve, 2007). Therapeutic recreation for post-traumatic stress disorder has recently been recognized as a valid, complementary form of therapy. There are existing programs which value recreational components in their therapy, such as Higher Ground Recreation Therapists, based in Boise, Idaho (Higher Ground, 2013). Some pilot programs have already incorporated golf into their therapy schedule; however, the efficacy of such programs has yet to be studied and validated in an academic setting. This project provides

a platform by which golf landscapes can be optimized for potential therapeutic value for U.S. combat veterans and service members diagnosed with PTSD.

Why should a U.S. combat veteran or service member value the project?

An unfortunate side effect of returning home after an overseas tour of duty in war is the social disconnect between the American veteran and the general public (Lapierre, Schwegler, & LaBauve, 2007). Unfortunately, there is a perceived stigma associated with traditional therapy programs amongst U.S. combat veterans and service members. Research suggests that veterans are more likely to enroll in innovative therapy programs rather than traditional therapy programs (Rosenthal et al., 2011). The following report considers the troubles that an American veteran has when trying to reintegrate into civilian life, and proposes golf as a viable path to recovery. A therapeutic golf course that is designed in honor of veterans provides a welcoming environment for social interaction.



Process

1. Introduction:

The Introduction established the project dilemma and the realms of landscape architecture under investigation. The intent of the MP+R was explained and the driving thesis and limitations are established. The introduction also described the project's relevance to the professional industries relevant to the study. Finally, the chapter concludes with a brief explanation of the process by which the study used to reach a conclusion and answer the proposed research questions.

2. Knowledge Base:

The first phase in the process was to gather all information relevant to the proposed research project. This step established the fundamental understanding of the existing research in the fields related to the project. The knowledge base was mainly informed by a review of literature and precedent studies of built works. Information from the knowledge base involved little analysis; the focus was on gathering and synthesizing existing research in order to provide a platform for the subsequent stages in the process.

3. & 4. Interpretation:

After establishing the knowledge base, the information was interpreted so that it could be applied as a series of design recommendations for a golf landscape. The interpretation phase was critical to the project's success. The primary goal was to analyze the information from the knowledge base in order to identify opportunities for design interventions in a suitable golf landscape. This phase ultimately prescribed a set of conditions and recommendations that could be applied to a golf landscape.

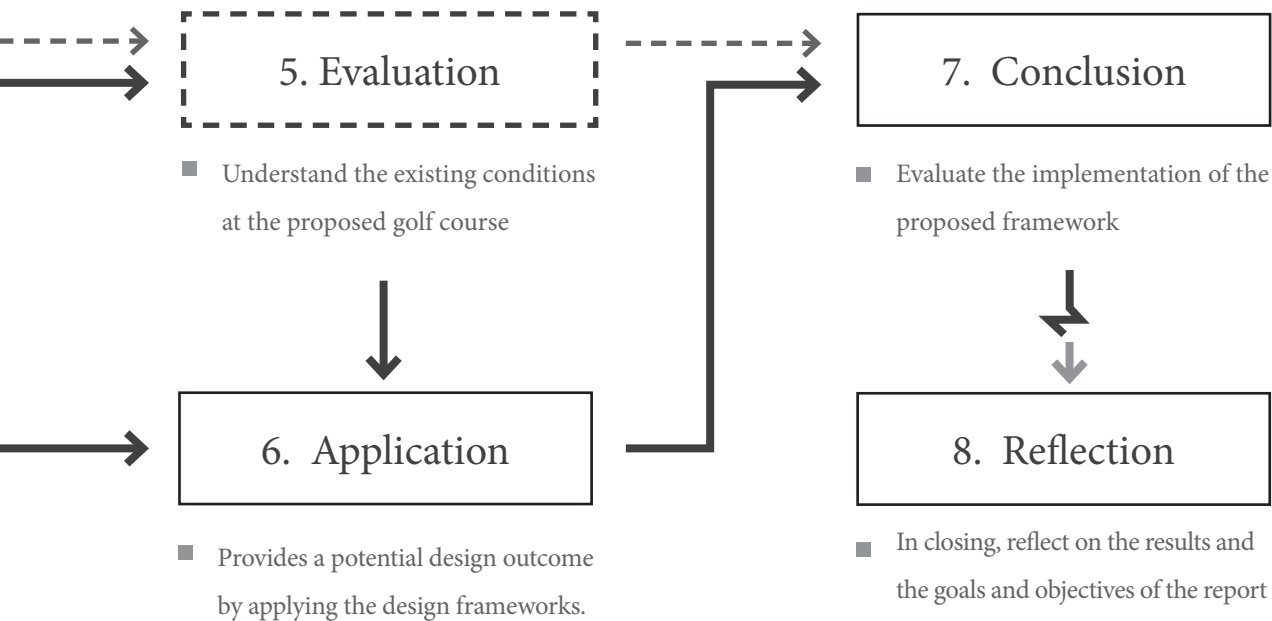


Figure 1.5 | Process diagram
(Author, 2014)

5. Evaluation:

Before the design guidelines could be applied, the performance of the existing golf landscape at Deer Creek needed to be evaluated. After taking inventory of the existing golf course, Deer Creek could be evaluated in terms of playability, potential therapeutic value, and potential memorial experience.

6. Application:

After evaluating of the existing landscape performance, it was possible to prescribe a renovation design to address current deficiencies in the landscape. This phase of the process applied the design guidelines from the *Interpretation* phase in the form of a renovation master plan with corresponding drawings to reinforce the complete design.

7. Conclusion:

The final phase of the project and report addresses the renovation master plan's potential performance, by factors of playability, functionality and therapeutic outcomes, the same factors used on the current golf landscape at Deer Creek in the *Evaluation* phase. This chapter concludes with project summary and wrap up. Future research questions and opportunities are provided to continue the research in the field of golf landscape's potential therapeutic value for U.S. combat veterans.

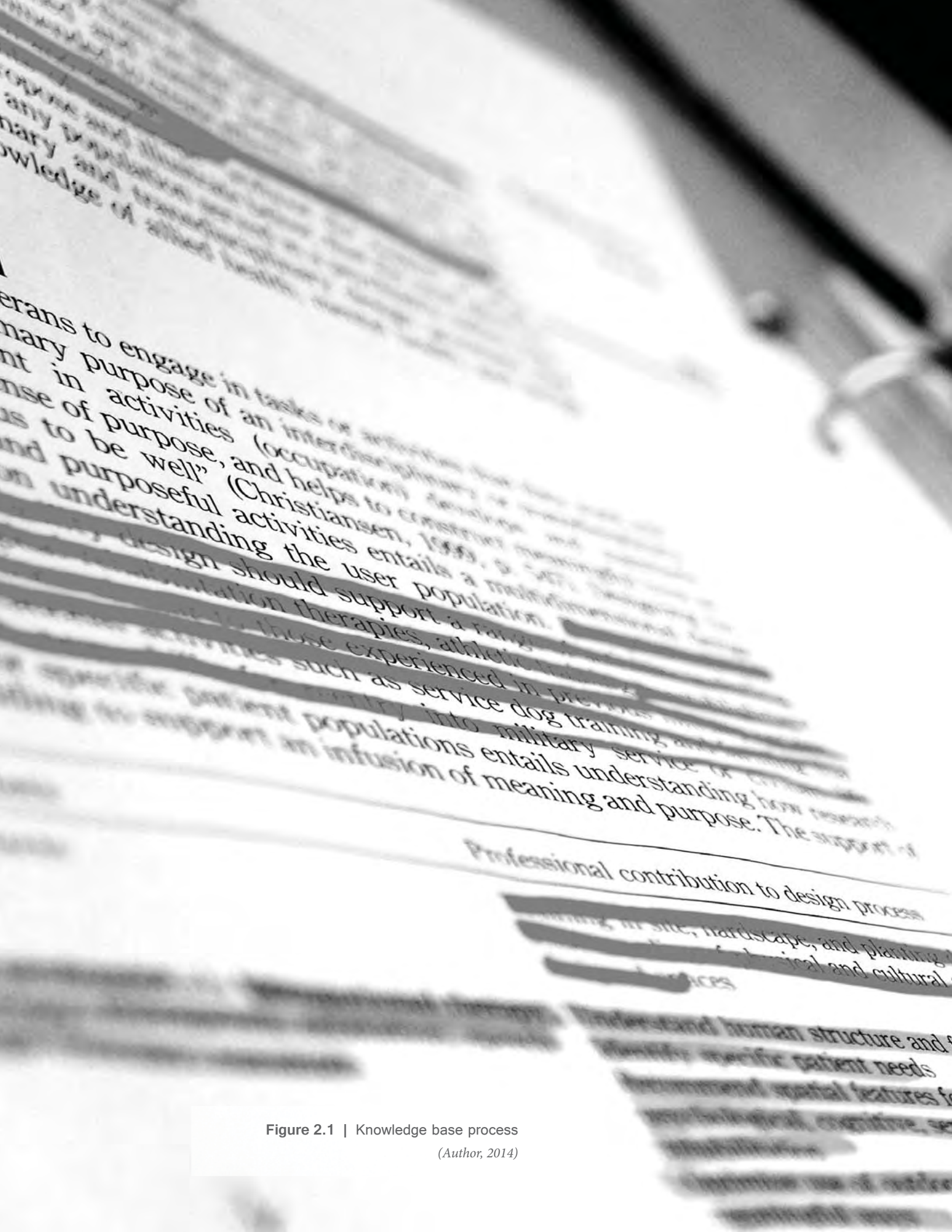


Figure 2.1 | Knowledge base process
(Author, 2014)

KNOWLEDGE BASE

2

The first phase in the process was to gather and understand all information relevant to the proposed research project. The knowledge base was informed by a review of literature and precedent studies of built works. Information from the knowledge base involved little analysis; the focus was on gathering and synthesizing existing research in order to provide a platform for the following stages in the process.

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Golf Landscapes

Golf as Therapy for PTSD
Hole
 No. 3 at American Lake
 Veterans Golf Course Dedicated to Medal of Honor Award Recipients. (2010). Friends of American Lake Veterans Golf Course. American Lake Veterans Golf Course Home Page. (2013). American Lake Veterans Golf Course. SMGA. (2013, January 18). The Salute Military Golf Association. SMGA

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Bonder, J. (2009). OnDimitropoulos, H. Memory, Trauma, Public(2009). The Character Space, Monuments,of Contemporary and Memorials.M e m o r i a l s
 Hunt, J. D. H. (2001). "Come into the garden Maud": Garden Art as a Privileged Mode of Commemoration and Identity.
 Wasserman, J. (2002). Memory Embedded.

The War Memorial as a Therapeutic Environment for veterans with PTSD
 Watkins, N., Cole, F., & Weidemann, S. (2010). The War Memorial as Healing Environment: The Psychological Effect of the Vietnam Veterans Memorial on Vietnam War Combat Veterans' Posttraumatic Stress Disorder Symptoms.



Therapeutic Landscapes for PTSD

Marcus, C. Wagenfeld, A., C., & Sachs, Roy-Fisher, C., & N. A. (2013). Mitchell, C. (2013). Therapeutic Collaborative design: Landscapes: outdoor environments An Evidence- for veterans with PTSD. Based Approach Parkins, M. (2011). Soft to Designing Touch For A Silent Voice: Healing Gardens Therapeutic Gardens and Restorative for Veterans with Post Outdoor Spaces Traumatic Stress Disorder. University of Oregon.

Therapeutic Landscapes

Kellert, S. R. (2013). Birthright: people and nature in the modern world. New Haven; London: Yale University Press. Design Recommendations
Marcus, C. C. (1999). Healing Gardens: Therapeutic Benefits and Design Recommendations. Psychological Perspective.
Kaplan, R., & Kaplan, S. (1989). The Experience of Nature: A Design Recommendations. Psychological Perspective.

Literature Review

The following literature review studies three practices within landscape architecture, while also addressing the field of PTSD in U.S. combat veterans and service members. The three realms of landscape architecture reviewed are: Golf Landscapes, Therapeutic Landscapes, and Memorial Landscapes. The literature review evaluates and summarizes

fundamental concepts and definitions within each field of study. This was the first method in the process and established a knowledge base for the remainder of the investigation. A final conclusion of the literature review reveals the conceptual overlap between all of the significant sources.

Figure 2.2 | Conceptual literature map
(Mannix-Slobig, 2014)

Golf Landscapes

History of the Sport

The origins of the game of golf are somewhat unclear; however, it is generally accepted that the modern day game traces its roots back to Scotland and the old links style courses (Figure 2.3) (Dodson, 2005). The game was founded on barren land between productive agriculture fields and the sea. This wind-blown, sparsely vegetated land was of little use to the people of Scotland, until the birth of golf.

Golf courses originally resided lightly on the landscape, but the modern game of golf has greatly evolved from a sport played in nature to a game played in a highly structured environment (Figure 2.4). The transformation of the golf landscape is the root of recent economic, environmental and social concerns that threaten the game today (Dodson, 2005).

Golf landscapes are increasingly becoming targets for environmentalists and the non-golfing public, who challenge the landscape's environmental impact (Dodson, 2005). The environmental

concerns surrounding the current practice in golf course development can be justified; nevertheless there are also unsubstantiated claims which cast golf landscapes in a bad light. On top of the environmental issues, there is a lack of public sympathy. Golf courses have been pegged as singular landscapes solely for the recreational pursuit of the wealthy (Kiss, 1998).

Demographics of Golf

In 2012, 9.6% of Americans or 29 million people played golf, making it one of the most popular individual sports in America, according to a study by the National Golf Foundation and the U.S. Census Bureau (National Golf Foundation, 2012). The act of playing golf is minimally demanding, physically speaking. This lends golf to a wide market, a sport for all ages. The age breakdown of golfers in 2012 was (Figure 2.5):

- Under 30: 5% (145,000)
- 30-39: 12% (600,000)
- 40-49: 22% (4,840,000)
- 50-59: 24% (6,960,000)



Figure 2.3 | St. Andrews landscape
(Webb, 2014)



Figure 2.4 | Augusta National Golf Club
(Winslow, 2008)

- 60-69: 18% (5,220,000)
- 70+: 19% (5,510,000)

Although these numbers may look promising, these statistics only reinforce the phenomenon of the passing of golf’s golden age. A majority of the participants are age 50 or older. Participation in golf is down since 1985 in nearly every category (National Golf Foundation, 2012).

Many mistakenly perceive golf courses as white man’s territory or a playground for those who can afford the luxury to play.

Golf landscapes, however, provide much more than just 200 acres of recreational land for the rich (Kiss, 1998). Golf courses inevitably exert an impact on the environment; however, these impacts are usually assumed to be negative (Salgot & Tapias, 2006). If properly designed, managed and maintained, golf landscapes can provide several ecological benefits to the natural environment. Some of these benefits include: a sanctuary for wildlife, a high degree of plant and animal biodiversity, and improved air and water

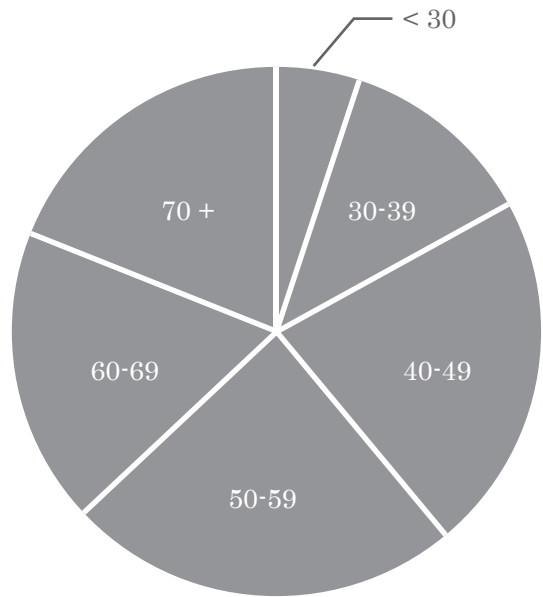


Figure 2.5 | Average age in years of golfers in 2012
(Author, 2014)

quality (Figure 2.6)(Dodson, 2005).

As stated by James Snow, the National Director of the Green Section of the United States Golf Course Association (USGCA), “No issue will have a greater effect on the way golf courses are built and maintained than people’s concern about the environment” (Williams, 1994, p.40). In the golf industry, trends in literature suggests that golf courses can be an environmentally friendly landscape. These trends are responding to overwhelming public scrutiny on the high ecological stresses that an

improperly designed and managed golf facility places on natural resources.

Golf Course Renovation

When golf courses are not meeting their goals as businesses, a central question must be asked by decision makers of the facility in question: Do we need to renovate the golf course in order to meet our long term goals? There are several factors that need to be considered before embarking on the desired design improvement project. The first of these factors is to determine to what degree



Figure 2.6 | Bird boxes
(Winslow, 2014)

does the design of the golf course need to be altered? In golf course architecture, there are three ways to describe a design improvement plan for a golf course: restoration, renovation, and redesign or remodel.

R e s t o r a t i o n

A golf course restoration describes any golf course renovation where the intended result is to restore the current golf course to the original layout or original design. These projects use historical data and imagery to inform design alterations, thus returning the golf course to its original condition (Jeffrey D. Brauer, 2006b).

R e n o v a t i o n

Golf course renovations that rebuild in place address deficiencies in the golf club's facilities one piece at a time. This type of renovation is currently the most common. If a golf course has a functional routing plan, rebuilding in place can be used to solve design problems where they occur on the course (Jeffrey D. Brauer, 2006).

R e m o d e l o r R e d e s i g n

Lastly, a golf course remodel or redesign is a type of renovation that involves substantial rerouting of golf holes. Major rerouting might be necessary because of land loss, a desire to add length to meet playability standards, address a long standing safety issue, or eliminate completely an unpopular hole (Jeffrey D. Brauer, 2006a). Of the three types of golf course improvement projects, a complete rerouting is typically the most expensive, however, costs can be justified if they vastly improve the golf course. One characteristic each renovation type shares, is the common goal to address a deficiency in either the economic, maintenance, design or aesthetic performance of the existing golf course (Jeffrey D. Brauer, 2006b).

W h y R e n o v a t e ?

There are four evaluation factors that need to be considered before deciding to renovate a golf course. It is recommended that all golf courses, like all businesses, maintain a long range business plan, which will include renovation projects in order to remain

competitive in the marketplace. The four factors to be evaluated for deficiencies are: economic, maintenance, design and aesthetic problems.

Economic Problems

Golf course facilities are businesses that market a service and a product. When a golf course is unable to raise the necessary funds to meet clients' expectations and attract new clients, a renovation may be in order. Golfers will play where they perceive the best value. As golf courses in the region update and renovate their facilities, it is important to maintain facilities that stay ahead in the marketplace. Many golf courses are meeting market demographics and renovating their golf course to accommodate women's, junior, and senior tees. This especially is to be considered when designing a golf course for U.S. combat veterans and service members, including those who have sustained wounds making them physically handicapped. Such a major change in the operational philosophy will necessitate a series of design changes to make sure that the golf course reaches its goals (Jeffrey D. Brauer, 2006b).

Maintenance problems

The next most important deficiency to be addressed through a golf course renovation is maintenance. A problem in the maintenance program will result in a golf course superintendent fixing the golf course before improving it. There are several maintenance factors that can be addressed in a golf course renovation, which include: (Jeffrey D. Brauer, 2006b, p. 12)

- Deteriorating greens
- Desire for adhering to USGA standards
- Need for larger tee surfaces
- Need to eliminate difficult to maintain bunkers
- Need for new irrigation system
- Drainage problems
- Flooding problems
- Cart path problems

Design problems

Although less frequent, there are scenarios where the administrators of a golf course want to renovate their landscape to improve the golfing experience. These renovations are rare because the decision to

renovate is not to repair a dysfunctional golf course, but to improve an already working golf course. Typical golf course renovations for playability factors include: (Jeffrey D. Brauer, 2006b, p.12)

- Desire to update design of course
- Desire to make the course more difficult/ less difficult
- Desire to host regional or national tournaments
- Rebunkering to accommodate longer tee shots
- Need to revise individual unfair holes
- Restore course for sake of historical accuracy

often originally trained as landscape architects, are equipped to recognize aesthetic problems within the landscape. Such concerns are created through an original landscape design with an inadequate budget, improper planning, misguided tree plantings, and poorly executed in-house improvement projects. Golf clubs will often try to fix the problem themselves before realizing that professional consultation from a golf course architect is ultimately more cost effective (Jeffrey D. Brauer, 2006b, p.13).

A e s t h e t i c p r o b l e m s

Aesthetics are the fourth reason to renovate golf courses and associated facilities. Commonly, golf courses that are well-built in terms of playability and maintenance, are in need of an aesthetic treatment (Jeffrey D. Brauer, 2006b, p.12). Alexander MacKenzie once wrote in 1920 that, “Beauty means a great deal on a golf course” (Mackenzie, 1920, p.36). Aesthetics are still considered a quintessential aspect of a golf course, although it can be overlooked and poorly executed. Golf course architects,

Golf Landscapes Precedent Study

Introduction

A review of precedent golf courses revealed ways that golf course architects in the past have incorporated narratives and themes into their design. There have also been previous attempts to incorporate a cultural value to a golf landscape. The golf course is a linear landscape, which gives the designer an opportunity to consider ordered sequences in the use of space. The first two precedent golf courses were built on Indian Reserves and were designed by Paul Albanese. Albanese incorporated tribal cultural values into the golf courses by relating the design to the history of the tribe.

The other golf courses that were investigated had specific golf landscape elements inspired by golf course themes. Typically, sand bunkers are used to inscribe the golf course with designs and forms that immediately reflect the theme of the golf course.

Golf courses that were studied in the following precedent study are:

- Sweetgrass Golf Club, Michigan
- Santee Souix Tribe Golf Course, Nebraska
- Colbert Hills, Kansas
- Harborside International Golf Center, Illinois

Sweetgrass Golf Club

Location: Harris, Michigan
 Architect: Paul Albanese
 Year Built: 2008

Sweetgrass Golf Club is located within the Hannahville Indian Community, which is a branch of the Potawatomi Nation. The design of the golf course is inspired by the area’s Native American heritage. Throughout the golf course there are subtle cues to Potawatomi legends.

Albanese uses several elements within the design to allude to the golf course’s theme. A common golf element used to reflect the theme of the golf course is the sand bunker, for example, the par-5 sixth

hole has a waste bunker in the shape of a white deer (Figure 2.9), which is considered a sacred animal in the Potawatomi Nation. The par-3 third hole has a sand trap inspired by a wolf, the name of the golf hole.

The signature hole at Sweetgrass is the “Turtle,” a par-3 with an island green. The putting green is surrounded by water and resembles a turtle (Figure 2.7). The inspired forms reinforce a consistent theme at Sweetgrass Golf Club.

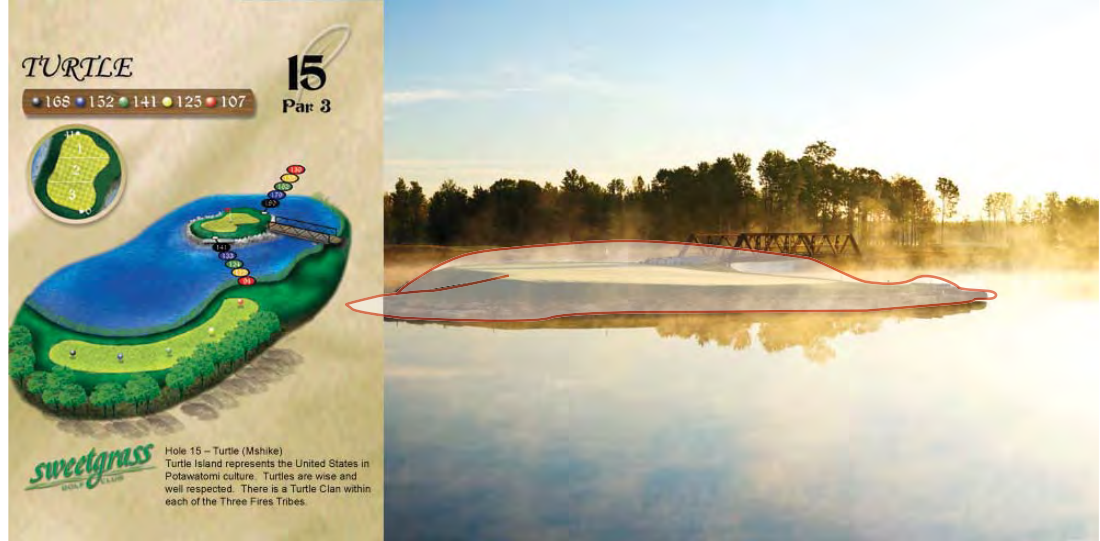


Figure 2.7 | Sweetgrass Hole 15: “Turtle”
 (Sweetgrass, 2009)



Figure 2.8 | Aerial image of Sweetgrass Hole 3: “Wolf”
(Google Earth, 2013)



Figure 2.9 | Aerial image of Sweetgrass Hole 6: “Sacred White Deer”
(Google Earth, 2013)

Santee Sioux Golf Club

Location: Niobrara, Nebraska
 Architect: Paul Albanese & Lutzke
 Year Built: In-Construction

Santee Sioux Golf Club is currently under construction in Niobrara, Nebraska on the Santee Sioux Tribe Reservation. This golf course, like its predecessor, Sweetgrass, is inspired by the heritage and history of the local Native American tribe. Each golf hole is inspired by a traditional folk story within the Santee Sioux Tribal history (Figure 2.10-12).

The proposed design for the golf course employs a cohesive theme of designing bunkers in subtle forms to reflect the theme. Some of the forms, however, would not be recognizable from the ground perspective of golfers. Albanese recognizes this fact and claims that the inspiration alone is enough to capture the imagination and golfer’s attention (Paul Albanese, n.d.).

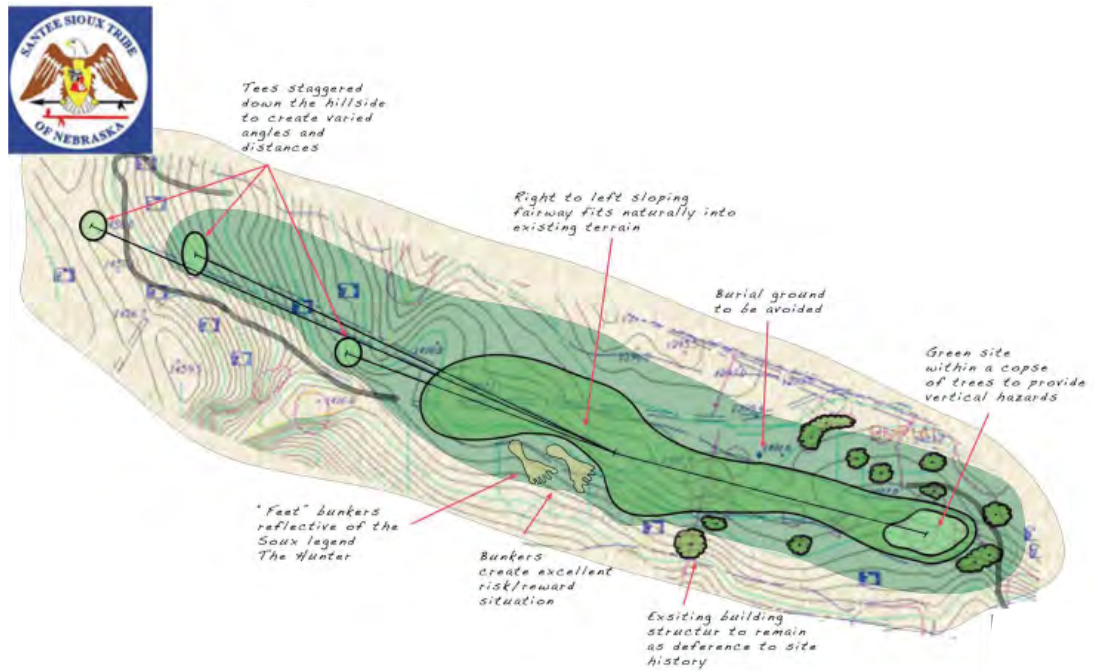


Figure 2.10 | Santee Sioux Hole 3: “Hunter’s Feet” (Albanese, 2013)

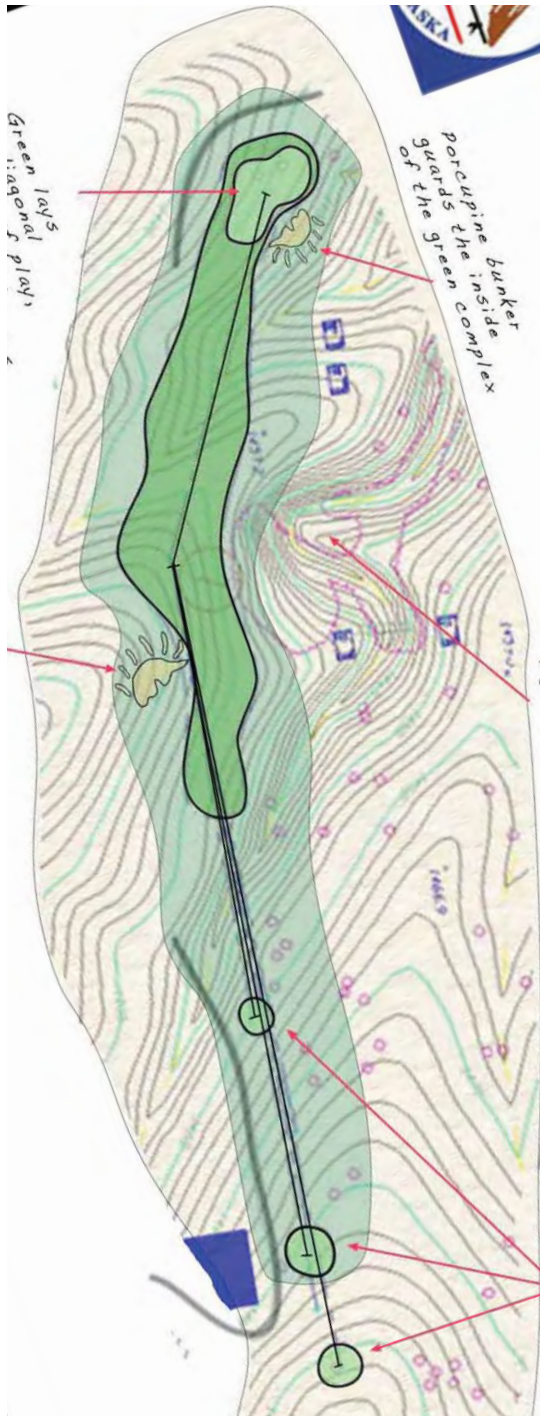


Figure 2.11 | Santee Sioux Hole 7: "Porcupine Butte"
 (Albanese, 2013)

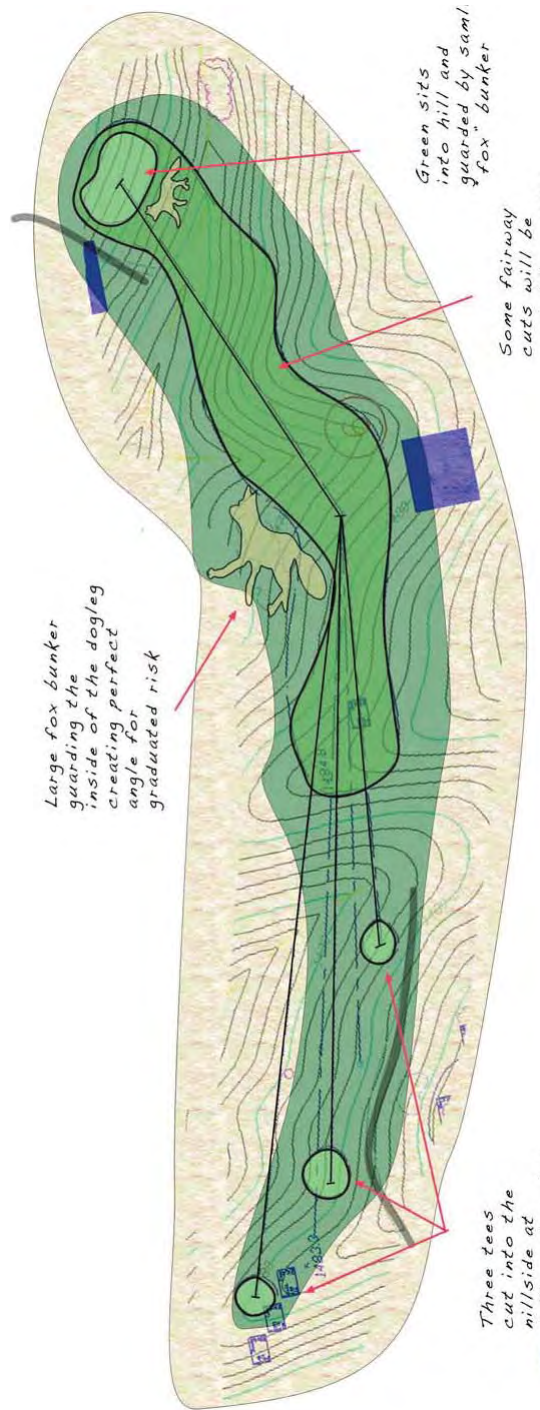


Figure 2.12 | Santee Sioux Hole 6: "The Fox"
 (Albanese, 2013)

Colbert Hills Golf Club

Location: Manhattan, Kansas
 Architect: Jeff Brauer & Jim Colbert
 Year Built: 2000

Colbert Hills in Manhattan, Kansas is the home course of the Kansas State University Men's and Women's golf teams. One of the most memorable holes on the golf course is the 5th hole, a par-3 that features a playing hazard to the right of the green. The unique bunker is called the "Cat's Paw" and from the tee box the unique design looks like a paw print in the landscape (Figure 2.13-14). Designer Jeff Brauer with the help of Jim Colbert, developed the theme further by

filling the bunker with purple sand, which is Kansas State University's school color. When playing the hole, the purple "Cat's Paw" is the first feature to catch the attention of the golfer, which reinforces the golf course's affiliation with Kansas State University. This is a valuable precedent feature because of the innovative use of colored sand and its easily perceived theme from the golfer's perspective, not just an aerial.



Figure 2.13 | The "Cat's Paw" sand bunker
 (Kansas State University, 2002)



Figure 2.14 | Colbert Hills Hole 5
(Google Earth, 2012)

Harborside International Golf Center

Location: Chicago, Illinois
 Architect: Dick Nugent
 Year Built: 1995

Harborside International Golf Center in Chicago, Illinois is a precedent of a dramatic form in the golf landscape to reinforce Harborside International's theme. The golf course's logo, the anchor, is repeated throughout the facilities at Harborside International, in the hole flags (Figure 2.18), the signage (Figure 2.15) and the landscape (Figure 2.16-17). Harborside International has two 18-hole golf courses, named Port and Starboard ("About Harborside International Golf Center," 2014). Harborside International is a useful precedent for how design can reinforce a central theme and create a strong identity at a golf course.



Figure 2.15 | Harborside International signage
 (Perry, 2008)



Figure 2.16 | Aerial image of Hole 15: "Anchor"
 (Ulivieri, 2008)



Figure 2.17 | Aerial image of Harborside International Hole 15: “Anchor”
(Google Earth, 2013)



Figure 2.18 | The pin flags at Harborside International
(Ulivieri, 2008)

Therapeutic Landscapes

Biophilia

Over the past decade, a considerable amount of research has been directed at studying the positive effects of being in nature. Biophilia is a hypothesis that suggests humans have an inherent inclination to affiliate with nature. This implies a strong inclination to interact with plants and other non-human living things (Grinde & Patil, 2009). As cities and designed environments have continued to shape the world in which people live, some question the importance of nature. Today, many people in society marvel at humankind's ability to have seemingly overcome their reliance on the natural world (Kellert, 2013). Nature to them is no

more than raw materials and an occasional outdoor experience. Do we really need nature?

Just like any other species on earth, humans have been shaped by the forces of evolution and have adapted to the outdoor environment. As far back as the Egyptian civilization, humans have reflected an inherent inclination to affiliate with nature. Ancient cave paintings and archeological ruins have illustrated how humans brought plants into their homes as far back as 2,000 years ago (Grinde & Patil, 2009). This can be interpreted as a response to the human mind's biophilic characteristic.

Figure 2.19 | Fascinating flower
(Author, 2014)



More recently, the first European hospitals included gardens; they were viewed as an essential part of the environment to support the healing process (Figure 2.20) (Grinde & Patil, 2009). There has been a substantial amount of research on the therapeutic properties of gardens in hospital settings. Robert Ulrich between 1972 and 1981 conducted a study of 46 patients at a Pennsylvania hospital recovering from a cholecystectomy (gall bladder surgery). Of the 46 postoperative patients, 23 were admitted to rooms with a view of nature, and the other 23 had a view of a brick wall. This study concluded that the patients with

a view of nature had a shorter postoperative hospital stay. In addition to a reduction in the duration of hospitalization, this subject group took fewer medications for pain management and received fewer overall negativity evaluations from the nursing staff (Marcus, 1999). While this study focused on patients in a hospital setting, Ulrich continued his research, focusing on a different demographic in a different setting. In 1981, Ulrich published his findings of a study of 18 collegiate students in, *Natural versus Urban Spaces: Some Psychophysiological Effects* (Ulrich, 1981). The subjects of the study were asked to view



Figure 2.20 | Medicinal garden in Italy
(Melchior, 2013)

60 color slides, of three different types. The first category was a nature slide dominated by water, the next, another nature slide but dominated by vegetation, and finally a third slide of an urban scene void of both nature and water. The study measured the students' heart rate, alpha amplitude and emotional states to determine the effects of each slide type. The results indicated that the two nature slides had more positive influences on the subjects' psychophysiological state. There was also a consistent pattern for the nature slides, especially those with water, to have more positive influences on students' emotional states (Ulrich, 1981).

These studies are only two of many addressing the connection between human health and well-being and the natural environment. These studies' findings have led to the relatively new sector of therapeutic design within landscape architecture.

History of Therapeutic Landscape Design

In landscape architecture, several terms are used somewhat interchangeably when referring to the realm of design focused on the therapeutic properties of nature. Such landscapes have been categorized as,

therapeutic landscapes, therapeutic gardens, healing landscapes, and healing gardens (Bergeman, 2012; Khachatourians, 2006; Marcus, 1999; Ulrich, 2002). An analysis of the existing literature on this unique sector of landscape architecture reveals certain theoretical concepts and trends that distinguish one term from another. For the purpose of this study, it is important to understand the differences between the spaces in order to appropriately reframe the golf landscape.

The most commonly used term when describing a therapeutic landscape is healing garden (Bergeman, 2012). As defined in *Healing Gardens: Therapeutic Benefits and Design Recommendations*, the term healing garden is – “a variety of garden features that have in common a consistent tendency to foster restoration from stress and have other positive influences on patients, visitors and staff or caregivers” (Marcus, 1999, p. 30).

Therapeutic gardens, however, are more closely related to horticultural therapy and are primarily designed to support the treatment of patients through horticultural activities. Therapeutic gardens have specific design programs that reflect the particular clinical program (Bergeman, 2012).

The terms healing landscapes and therapeutic landscapes are not as clearly distinguished. There are no defining characteristics or criteria distinguishing the two terms; therefore they can be used interchangeably (Bergeman, 2012). A therapeutic or healing landscape must meet the following requirements: (Marcus & Barnes, 1999, p.3)

- Aid in providing some degree of relief from both mental and physical pain
- Aid in stress reduction
- Provide an improvement in one's overall sense of well-being

Existing literature on therapeutic landscapes clearly illustrates the value of healing landscapes as a means for providing positive health outcomes (Grinde & Patil, 2009). There is however a lack of research specifically dedicated to addressing landscape design qualities and their clinical performance.

In general, it can be concluded that therapeutic landscapes lead directly to improved health outcomes (Ulrich, 2002).

There have been past attempts to compose a comprehensive set of design guidelines for such landscapes; however these design guidelines lack a degree of specificity. Generally, therapeutic landscapes will meet the following outcomes: (Ulrich, 1981)

S e n s e o f c o n t r o l a n d a c c e s s t o p r i v a c y

People who feel a sense of control experience less stress and are better able to handle stressful situations. People who feel a sense of control are healthier than people who experience a loss or lack of control (Ulrich, 1981).

S o c i a l s u p p o r t

Social support is emotional, material, and/or physical aid and caring that a person receives from one or more other individuals. Those who receive higher levels of social support are likely to be less stressed and have better health status than those who are socially isolated (Ulrich, 1981).

Physical movement and exercise

The physical and emotional benefits of exercise and movement have been well documented. Ranging from mild movement like a walking path, to more structured opportunities like games have been shown to reduce stress, including depression (Ulrich, 1981).

Access to nature and other positive distractions

Positive distractions are environmental features or situations that promote an improved emotional state in the perceiver. Nature has been found to be one of the best forms of positive distraction (Ulrich, 1981).

Although the preceding outcomes are helpful, there is no theoretical translation between the above goals and their physical manifestation within a landscape (Marcus, 1999). For example, if a designer is tasked to create a garden to alleviate stress, the literature suggests including flowers, shaded spaces for

contemplation and views to nature. These recommendations leave the designer great room for interpretation, but there is potential that the designer is out of touch with patients and their experience.

Dr. Joanne Westphal is attempting to close the perceived gap between research, design, and the evaluation of therapeutic landscapes (Bergeman, 2012). Dr. Westphal's unusual academic career, which includes a Ph.D. in soil science in 1977, a M.A. in landscape architecture in 1983, and finally a M.D. in 1995, reveals her qualifications in the field of therapeutic landscapes. Dr. Westphal recognizes a gap between designers and those for whom they are designing, ultimately resulting in a space that appeals to the designer, not for the patient who is actually suffering. She argues that the landscape treatment be specifically targeted to the patient group, just as a doctor would prescribe a medication for an illness (Bergeman, 2012).

Landscapes that Honor

Introduction

When proposing a golf course redesign with an intent to include built meaning, one must first understand how meaning in landscapes is perceived and also how memory cues can be embedded into landscapes. The following project will incorporate specific meaning into the landscape through the use of memorials. In order to appropriately incorporate memorials within a golf course, one must first gain a fundamental understanding of the many complexities within such landscapes.

The first step is to define what constitutes a memorial landscape. As defined in the Merriam-Webster Dictionary, memorials

are – “something (such as a monument or ceremony) that honors a person who has died or serves as a reminder of an event in which many people died” (“Memorial,” 2014). This definition, however, forgets the experiential dimensions of a memorial landscape.

Memorial landscapes are constructs of a culture’s collective memory. Representational works stand for the importance of some event, person(s) or circumstance (Dimitropoulos, 2009). Memorials resonate with those who share a collective memory.

Figure 2.21 | Bas-relief at the WWII Memorial
(Winslow, 2014)



H i s t o r y

One of the key elements in demarcating significant historic moments is the construction of a memorial (Dimitropoulos, 2009; Wasserman, 2002). Julian Bonder in his article, “On Memory, Trauma, Public Space, Monuments, and Memorials” (Bonder, 2009), argues that since the 1980s, collective memory has become an indication of global culture. Memory today is understood as a mode of re-presentation and belonging to the present. The multicultural construct of modern society is possible through various forms of re-presentation, “in historiography, psychoanalysis, visual and performing arts, and media – and particularly in urban studies, public art, landscape design, and architecture.” (Bonder, 2009, p.62) Of all the above forms, the built environments are further explored. How is a culture’s collective memory embedded within outdoor environments as memorial landscapes?

Memorials are ultimately built to recall the past while providing the conditions for responses in the future (Bonder, 2009). Memorials sustain a continued value to a collective cultural importance, linking the past to the present and the future

(Dimitropoulos, 2009). In Julian Bonder’s words, “the word memorial corresponds to commemoration – something that serves to preserve memory or knowledge of an individual or an event.” (Bonder, 2009, p.62) Often, the honored individuals have passed away, and the events remembered have been traumatic. Memorials act as our ethical companions, encouraging the audience to consider trauma and rethink the past (Bonder, 2009). Therefore, the expected audience is critical to the design of the memorial. Although memorials are built in the image of honor and memory, there is a risk that the design confronts, which consequently offends the audience. Those responsible in the design process must explore how contemporary memorials reveal the subject to the collective audience.

M e m o r i a l S h i f t

As described earlier, memorial landscapes are key elements to creating “place” by embedding meaning. Memorial design however has undergone a significant shift in the last 50 years. No longer are memorials identical casts of the remembered, but instead, they employ minimalism and calculated abstraction

(Dimitropoulos, 2009). This is especially true in American War Memorials. Famous battles and military leaders have long been popular subjects of commemoration. For hundreds of years, such memorials spoke of conquest and rule. They employed victorious men atop galloping horses or obelisks that extended to the heavens above (Wasserman, 2002). Gone are these figural qualities in memorials (Dimitropoulos, 2009). This trend in memorial design can be traced back to Maya Lin's Vietnam Veterans Memorial (VVM) design in Washington D.C.

In her design for the VVM, she changed the traditional vernacular of war memorials. The bold black granite walls challenged the use of pallid marble and cast bronze. The two long walls, stretching nearly 500 feet, sinking to a maximum depth of 10 feet, ultimately create a uniquely horizontal experience. This was a dramatically different approach from the traditionally vertical nature of war memorials, like the towering obelisks and the statues resting atop triumphant podiums. The VVM honors the soldiers who fought in the controversial war, not the war itself. There are over 50,000 names of soldiers engraved into the polished black granite walls listed in chronological order

of the casualty date, not their military rank or service branch, void of the traditional hierarchy. Of all the differences listed above, the most critical diversion from the traditional war memorial design is the emphasis of viewer experience. Maya Lin did not design the VVM to be looked at from a distance like an object in space, she designed it to read as an experience to engage the visitor (Wasserman, 2002). The Vietnam Veterans Memorial brought attention to the potential of commemorative space as an experience, not a shape.

Experience of a Memorial

In his article, "On Memory, Trauma, Public Space, Monuments, and Memorials" Julian Bonder writes of memorials – "as embodiments of art in the public realm, their value is not just derived from the artwork, but from their ability to direct attention to a larger good." (Bonder, 2009, p.64) Value in memorial design has shifted. Memorials are no longer cherished for their use of form, shape and image but instead their ability to make us recall, evoke, think, and perceive something beyond themselves (Bonder, 2009). The memorial is designed to facilitate a connection between the user

experience and the historical significance to a community connected by their collective memory.

Julian Bonder (2009) claims that memorial spaces can serve as public spaces for mourning. Memorials have a unique ability to act as curative mediators between people and significant events where the subject involves traumatic loss of people within a society. This quality of memorial landscapes make them different from other healing environments like, parks, churches, hospitals and private gardens. The memorial landscape provides an appropriate setting for direct reflection and response to a specific event. Inherently, such memorials present a difficult yet, interesting challenge (Bonder, 2009). Such sites of memory

exceed issues and questions of architecture and design, but ask moral, ethical and philosophical questions (Bonder, 2009).

The experience of a memorial landscape can be described by four qualities, meaning, ritual, narrative and dialogue. Each quality answers questions that define the memorial experience. Meaning asks of the memorial, *who* or *what* is this built for? Ritual asks of the memorial *how* does the visitor understand the meaning. Narrative asks of the memorial, *what* is the memorial teaching the audience? Finally, dialogue asks the memorial, *who* does the memorial speak to and resonate within? These qualities of memorial landscapes are the foundation for the remaining study of precedent landscapes.

Post-Traumatic Stress Disorder

Definition

In order to better understand the current concepts and therapies related to the treatment of post-traumatic stress disorder, it is initially critical to define trauma and traumatic stress. Trauma can be defined as any physical or emotional pain or injury – (American Psychological Association, 2013)

“an emotional response to a terrible event like an accident, rape or natural disaster. Immediately after the event, shock and denial are typical. Longer term reactions include unpredictable emotions, flashbacks, strained relationships and even physical symptoms like headaches or nausea.” (para 1)

Frequent or severe traumatic events often lead to traumatic stress, which is a reaction that occurs after experiencing highly stressful event. Post-traumatic stress disorder (PTSD) occurs after a severely traumatic event or events. Characterized by depression, anxiety, flashbacks, recurrent nightmares, and avoidance of reminders of the distressing event, PTSD can severely affect an individual's well-being. PTSD was first officially

recognized as a medical condition in 1980, when the American Psychiatric Association (APA) published their third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Wilson, 1995).

Vietnam's Impact

It was not until after the conclusion of the Vietnam War that PTSD was officially recognized as a medical condition. The war in Vietnam spanned from 1962 to 1975 and marked the first US encounter in non-conventional warfare (Wilson, 1995). The conditions of the war made it difficult to distinguish the enemy from innocent civilians. The dense jungle vegetation impeded the warrior's ability to rationalize their actions. Individuals witnessed their friends dying from unseen forces hidden in the vegetation. The troops also lacked clearly defined safe zones where they could relax without having to worry for their safety (Grossman, 2009). These factors culminated into a series of traumatic stress events that would last beyond the battlefield.

Psychologists made great strides with the publication of DSM-III in 1980. The APA has continued this trend and continues to publish successive versions of the DSM. The latest one DSM-5 was released in March of 2013 (American Psychiatric Association, 2012).

Operation Iraqi Freedom and Operation Enduring Freedom

As the United States continues to engage in military conflicts such as Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), more and more soldiers are returning with post-traumatic stress disorder. These campaigns represent the most sustained combat operations since the Vietnam War (Tanielian, 2008, p.5). PTSD is affecting 14% of those deployed, and nearly 44% of deployed individuals are suffering from mild traumatic brain injury (Rosenthal et al., 2011). These injuries impose a substantial cost to society, with estimates ranging from \$4.0 to \$6.2 billion over the two years of treatment (Rosenthal et al., 2011).

Prolonged Exposure (PE) therapy was conceived in 1982, shortly after DSM-III, to specifically treat post-traumatic stress disorder. When PTSD was first recognized in 1980, there was no empirical knowledge of how to treat PTSD; however, it was already known that variants of exposure therapy were effective in dealing with symptoms associated with anxiety disorders and phobias. In the beginning, those diagnosed with PTSD received similar or the same exposure therapy that was being used to address anxiety disorders. After applying for a grant, The Institute of Mental Health developed Prolonged Exposure therapy for trauma survivors who suffered from chronic PTSD (Foa, Hembree, & Rothbaum, 2007).

Unfortunately, most veterans suffering from PTSD are not receiving adequate treatment or pursuing help. It is estimated that only half of the soldiers experiencing PTSD symptoms are seeking professional treatment. There are several hypotheses as to why not, one cites that there is a perceived stigma associated with traditional therapy

for mental illness (Rosenthal et al., 2011). Within the military culture, PTSD has a negative connotation of admitting personal weakness (Mowatt & Bennett, 2011). In other cases, there may be a shortage of trained specialists. Veterans with limited access to adequate treatment, try to carry on without the help they need (Rosenthal et al., 2011). These reasons above suggest that there is a demand for additional or complementary therapy for U.S. combat veterans and service members. Making additional treatment non-stigmatizing and readily accessible should make veterans more inclined to seek the help they need.

R e c r e a t i o n a l T h e r a p y

Recreational therapy is a form of complementary therapy for U.S. combat veterans suffering from PTSD. There are several veteran-focused recreational therapy programs that aim to design and implement rehabilitation in outdoor environments. Recently a study by Rasul A. Mowatt and Jessie Bennett (2011) of Indiana University reviewed a therapeutic fly-fishing program on the Green River in Northeastern Utah (Figure 2.22-23). Six veteran participants engaged in fly-fishing for two days along with

a professional guide. On the last night of the program, each participant was asked to write a letter to either a family member or to an organization that donated money in order to make the trip possible. The letters were then scanned and delivered to the intended recipient. The researchers used narrative analysis to determine the effectiveness of fly fishing as therapeutic recreation for PTSD. In total, 67 program letters were collected, read and analyzed based on a three-part process: explication, explanation and exploration (Mowatt & Bennett, 2011).

After each letter was processed, the study concluded four major themes: 1) the necessity of camaraderie while undergoing treatment, 2) the ongoing presence of regret, 3) the process of reflection in reconciling memory, and 4) the benefits from outdoor recreational activity participation (Mowatt & Bennett, 2011).

These conclusions reinforce the effectiveness of fly-fishing as valid therapeutic recreation. Such conclusions provide precedence for other forms of non-traditional therapy for PTSD. This experiment also revealed the value of the writing process as a tool for recovery. The study argues that storytelling and letter writing are especially

useful forms of therapy, empowering one with a pen to confront their past within a supportive environment, like a fishing retreat. Although this study specifically focused on fly-fishing, other forms of recreation have also been recognized for a similar positive effect. Some examples include sandplay, outdoor adventure, and engagement in sports for fitness, not competition. They are important considerations when framing the golf landscape as a suitable environment for such therapy (Mowatt & Bennett, 2011).



Figure 2.22 | A Wounded Warrior fly fishing
(*Sun Valley Magazine*, 2011)



Figure 2.23 | Higher Ground fishing retreat
(*Devoor*, 2010)

Subject Overlap

Introduction

The above literature review suggests that there is a potential overlap between the pillars of research involved (Figure 2.24). Each subject of landscape architecture has been associated to PTSD. Beginning with golf landscapes, there are pilot programs that are using the perceived therapeutic sport of golf as a mode of therapy for U.S. combat

veterans and service members suffering from PTSD. Therapeutic landscapes have recently been investigated for their effectiveness for addressing the symptoms of PTSD. Finally, memorial landscapes have been studied for their potential therapeutic effect in U.S. combat veterans suffering from PTSD. Each of the above subjects, and their association to PTSD is briefly described in the following study.

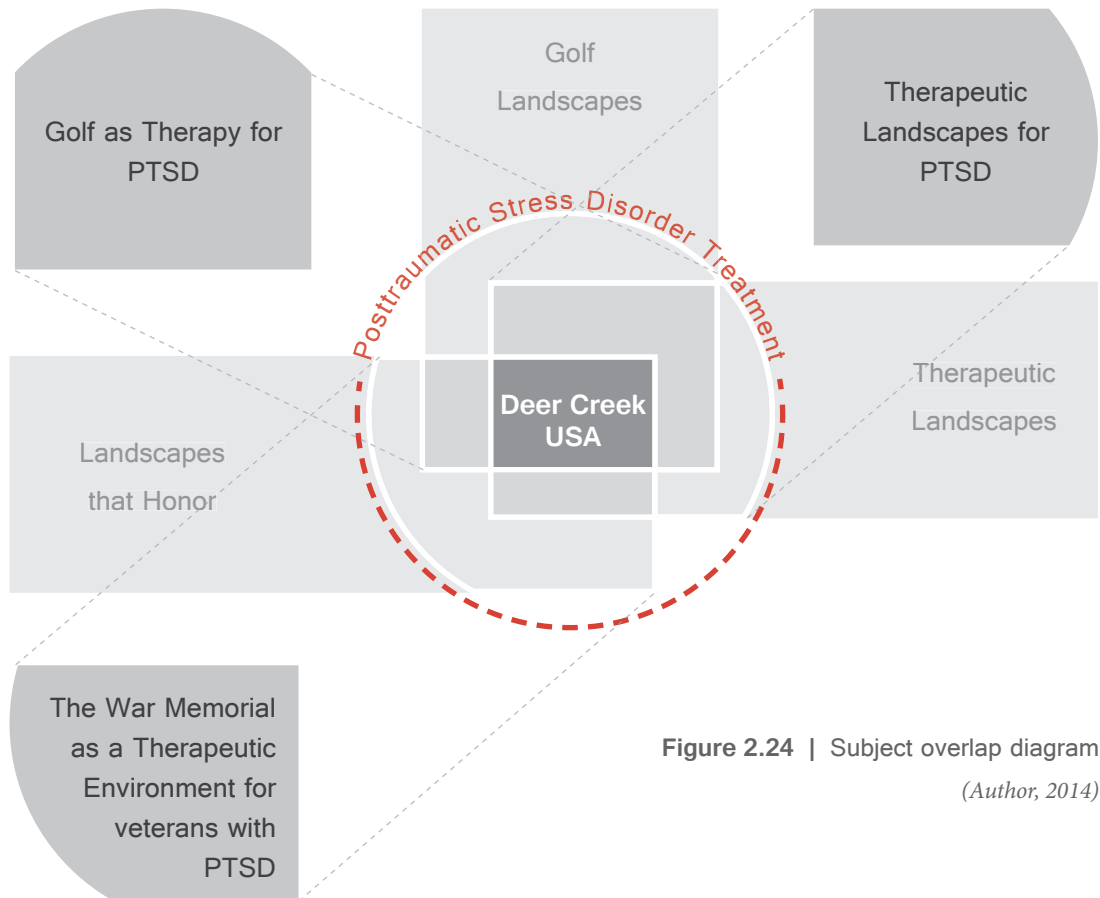


Figure 2.24 | Subject overlap diagram
(Author, 2014)

Golf as a Therapy for PTSD

Introduction

There are programs that employ golf as a therapeutic form of recreation specifically for US combat veterans and service members. These programs recognize the potential benefit that playing golf can have in a veteran. There are two existing programs which are provided below in a brief study of how these existing programs help veterans by using golf. The Salute Military Golf Association (SMGA) is a national organization based in Olney, Maryland. The second program is the American Lakes Veterans Golf Course in Tacoma, Washington. Each program bridges the gap between veterans and the perceived therapeutic value of golf.

Salute Military Golf Association (SMGA)

The SMGA was founded in 2006 by former PGA Tour Player, Jim Estes and Jamie Winslow. They founded the SMGA after they witnessed the positive effects the game of golf could have in the recovery process for

U.S. wounded warriors. The SMGA strives to create a complementary therapeutic program for post 9/11 veterans undergoing treatment at nearby Walter Reed Army Medical Center and Bethesda Naval Hospital in Maryland. The efforts of the SMGA have expanded beyond their Olney, MD location and have established programs in eight cities throughout America (“About SMGA,” 2013).

The SMGA program offers specific programs and golf clinics for wounded warriors with PTSD. Their programs are designed for injured service men and women who are recovering from their injuries and are transitioning from their life in the hospital to life back at home, or returning to active duty. Co-founder, Jim Estes, has developed an “adaptive golf program” for severely injured service members. The SMGA leverages the camaraderie between warriors and encourages family centered experiences as well. The program not only addresses the mechanics required to play golf, but also relates to topics like golf related exercise, training, nutrition and community service (“About SMGA,” 2013).

The SMGA clinic is designed to help golfers of all skill levels, regardless of age, sex or military branch. Their program recognizes the social and physical benefits that the game of golf can provide for even the most severely injured personnel. They argue that, “The social interaction and networking opportunities that exist through the game of golf are unmatched in any other sport, and provide a vehicle for integration back into the civilian community.” (“Clinic Programs,” 2013)

The SMGA’s mission is stated below: (“About SMGA,” 2013)

“The SMGA’s mission is to provide rehabilitative golf experiences and family inclusive golf opportunities for post 9/11 wounded war veterans in an effort to improve the quality of life for these American heroes. Eligible veterans include those wounded or injured in post 9/11 military operations, including those with Post-Traumatic Stress Disorder (PTSD) and/or Traumatic Brain Injury (TBI).”

The SMGA has made great strides in bridging the gap between post 9/11 wounded warriors and the psychological and physical benefits of golf to this community. The SMGA employs a staff of trained professionals, with experience in teaching “adaptive golf”

and who understand the unique challenges that face combat veterans returning home after extended deployment (“About SMGA,” 2013). The efficacy of the program is grounded in patient testimonials and first hand experience. There has yet to be an academic study that validates or ensures the effectiveness of such programs. Programs like the SMGA, however, make a significant contribution to this unique field of research.

The SMGA is a teaching clinic, where they apply the witnessed therapeutic benefits of golf and the needs of returning U.S. combat veterans and service members suffering from disabilities, PTSD, and TBI. Although their program has several partnerships with golf courses throughout America, there is no specific golf landscape associated with the SMGA. This masters project and report looks to design a landscape that optimizes the therapeutic benefits of golf with the therapeutic benefits with specific environmental conditions. It is intended that programs like the SMGA can establish a St. Louis Chapter, at Deer Creek. Their established program can use the facilities provided at Deer Creek that have been designed to optimize the therapeutic outcomes for U.S. combat veterans and service members.

American Lake Veterans Golf Course

The next program recognized in this study for melding the therapeutic benefits of golf with combat veterans is the American Lakes Veterans Golf Course in Tacoma, Washington. The American Lake Golf Course is an exclusive golf course for active duty and retired military personnel. The authorized guest list includes:

- Hospital in-patients have first priority on the course
- Persons in possession of a Veterans Universal Access Identification Card
- All VA employees and retired VA employees
- VA volunteers with proper identification
- Active duty and retired military with military ID cards

Three guests, over the age of seven, are allowed for each authorized players, and must be accompanied by their sponsor while on the golf course (“American Lake Veterans Golf Course Home Page,” 2013).

The American Lakes Golf Course (ALVGC) is a nine hole golf course, located in Tacoma, Washington and is reserved for U.S. combat veterans and service members, active and retired personnel. The golf course is operated and maintained by volunteers

who work on grounds crews, maintenance personnel, operations and management personnel. The ALVGC is dedicated to providing a therapeutic golf experience for veterans and service members. Their goal is to enrich veteran lives through a golf by promoting independence and improving psychological and physical health outcomes. Their mission statement is listed below: (“Mission Statement” ALVGC, 2013)

“The American Lake Veterans Golf Course is dedicated to providing, teaching and promoting the benefits of golf to veterans. VA Puget Sound Health Care System has a population of in-patient and outpatient veterans that have disabilities. The American Lake Veterans Golf Course is committed to providing a therapeutic environment where accommodation is welcome and all golfers can enjoy the benefits of golf, such as exercise and relaxation in a positive and accepting social environment. With these benefits it is our vision that through golf, veterans will increase their independence and improve their attitudes toward health and Thus, their lives will be enriched.”

The ALVGC was built just after the World War II when the American Lake Veterans

Hospital built a golf course for veterans returning from the war. The golf course was built to benefit the returning warriors during their recovery in the nearby hospital. The golf course, however, was not originally built to accommodate for disabled golfers. In 1995, the department of veteran affairs cut funding the golf course out of their budget (“American Lake Veterans Golf Course Home Page,” 2013).

The future of the veterans only golf course was in question. Volunteers stepped up and maintained the golf course so it was operational as long as they could. The lack of funding, however, took its toll and the golf course was neglected. In 2004, Harold Roberts, a golf course volunteer, founded the Friends of American Lake Veterans Golf Course, a non-profit organization to raise funds for the golf course. The foundation brought in the necessary funds to repair and rehabilitate the facilities at the golf course. One of the primary focuses of the golf course rehabilitation project was to make the existing golf course 100% accessible. This included larger tee boxes, handicap-accessible bunkers and greens, and the purchase of single-rider golf cars for mobility impaired veterans. Along with

the course improvements, the golf course began to offer specialized golf clinics at no charge to veterans (“American Lake Veterans Golf Course Home Page,” 2013).

The ALVGC claims they are the only golf course in the nation that is specifically designed for the rehabilitation of wounded and disabled veterans. Their facilities are designed to accommodate for the needs of this specific population, including the blind, amputees and veterans suffering from emotional trauma like PTSD and TBI. The efforts at ALVGC has gained national attention from the media, the United States Golf Association, and Jack Nicklaus. In 2009, Jack Nicklaus, was contacted by Ken Still, a former PGA Tour Pro who now volunteers at the ALVGC, to design an additional nine holes to accommodate for the increased playing traffic. Jack Nicklaus, a former PGA Tour Pro and world renowned golf course architect, designed and donated “the new nine” for the ALVGC (Bell, 2014).

The nine new holes at ALVGC designed by Nicklaus Design is currently in the funding phase and is expected to begin construction soon. The design for the new holes employs golf course design elements specifically designed for wounded warriors and handicapped veterans. Nicklaus, when

speaking of the design adjustments he would need to make to the bunker design said, “My usual sea bunkers aren’t going to work here, are they?” (Bell, 2014, para 30). Nicklaus hopes that the work at ALVGC can provide a prototype for future courses throughout the country with similar intentions (Bell, 2014).

The work at ALVGC is the closest existing design work related to the following report. The facilities at ALVGC have been designed or renovated to specifically meet the needs of U.S. combat veterans and service members suffering from physical disability and PTSD. The ALVGC facilities include a 100% ADA accessible golf course, a three hole practice area, First Swing and Blind Rehabilitation clinics, an activities shelter, and a new Rehabilitation and Learning Center (“American Lake Veterans Golf Course Home Page,” 2013). The golf course has been made accessible by expanding the tee box area and incorporating flat sand bunkers, with shallow lips. The ALVGC holes are dedicated to various military medals. Hole 3, the course’s “signature hole” was dedicated as the “Medal of Honor” hole on June 25, 2010 (“Hole No. 3 at American Lake Veterans Golf Course Dedicated to Medal of Honor Award Recipients,” 2010).

The current research project builds off the contributions made by the ALVGC.

The facilities at ALVGC provide a precedent for how a golf course can be built to accommodate disabled and wounded veteran golfers. The current research project provides design considerations that include meeting the accessibility requirements but also introduces specific design elements that optimize the therapeutic potential of the golf landscape.

The ALVGC also includes a dedication for each hole. By associating a military medal to each hole, the course embraces an additional meaning which resonates within the veteran golfers. The current research project, however, expands on the ALVGC notion of dedicating individual golf holes and instead incorporates principles from memorial landscape design to create an accrued experience designed to honor military personnel.

Finally, the golf facilities at ALVGC is exclusive for military personnel and VA employees. There are limited opportunities for guests to accompany the veterans, however, there is little opportunity to experience social interaction outside of the veteran community. Deer Creek plans to remain open to the

public, which may allow veterans more opportunities to interact and network with civilians outside of the military culture.

C o n c l u s i o n :

Both the SMGA and the ALVGC provide an example for how the potential therapeutic benefits of golf have been used to help U.S. combat veterans and service members. The SMGA is an example of a golf program and clinic designed for military personnel. The SMGA, however, is not associated with a specific therapeutic environment intended to improve health outcomes and honor military personnel. The ALVGC is the closest example to the proposed masters project and report. Their therapeutic approach to golf is associated with a specific golf landscape

designed for U.S. combat veterans and service members. Their landscape, however, does not incorporate design considerations beyond accessibility and playability for the mobility impaired veteran population.

The proposed research provides design considerations beyond accessibility and includes design recommendations for golf landscapes as therapeutic environments for combat veterans suffering from PTSD. The ALVGC also incorporates a theme that resonates within veterans of the military community by dedicating each individual golf hole to a military medal. The current project incorporates a memorial experience into the golf landscape, which is designed to honor U.S. combat veterans and service members.

Therapeutic Landscapes for PTSD

Introduction:

There have been recent attempts to close the gap in research between therapeutic landscapes and veteran rehabilitation and treatment of PTSD and TBI. Of these, *Collaborative Design: Outdoor Environments for Veterans with PTSD*, provides a collection of design guidelines specifically recommended for the treatment of veterans with PTSD (Wagenfeld, Roy-Fisher, & Mitchell, 2013). According to the American Psychiatric Association (APA), there are six criteria associated with a diagnosis of PTSD, including:

Criterion A: Stressor

The person was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, in at least one of the following capacities: direct exposure, witnessing in person, indirectly (learning through someone who was directly exposed) or repeated indirect exposure to aversive details of events (American Psychiatric Association, 2000).

Criterion B: Intrusive recollection

The traumatic event is persistently re-experienced i.e. recurrent and intrusive distressing recollections of the event, including images, thoughts or perceptions (American Psychiatric Association, 2000).

Criterion C: Avoidant/numbing

Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (American Psychiatric Association, 2000).

Criterion D: Hyper-arousal

Symptoms of increasing arousal indicated by at least two of the following: difficulty falling or staying asleep, irritability, difficulty concentrating, hyper-vigilance, and exaggerated startle response (American Psychiatric Association, 2000).

Criterion E: Duration

Duration of the disturbance symptoms in Criteria B, C, and D has lasted more than one month (American Psychiatric Association, 2000).

Criterion F: Functional significance

The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning (American Psychiatric Association, 2000).

Conclusion

A therapeutic landscape that incorporates elements to address these six criteria is the design challenge when creating environments specifically for those who are diagnosed with PTSD (Wagenfeld et al., 2013). The article provides a methodology for devising a set of design guidelines for therapeutic landscapes for U.S. combat veterans

and service members. Each criteria for diagnosing PTSD is measured by observing the presence of symptoms. Each criteria is evaluated and scored before the diagnosis can be made. The method employed in the article addresses each criteria for diagnosing PTSD individually. The symptoms associated within each criteria are then paired with a concept from therapeutic landscape design. Finally the concept associated with the treatment is physically manifested in an outdoor environment as a design guideline (Wagenfeld et al., 2013). The design guidelines recommend creating landscapes that foster a sense of control, defensible spaces, social capital, the experience of nature, and zones of challenge.

The War Memorial as a Therapeutic Environment for Veterans with PTSD

Introduction:

Recently, memorial landscapes have been studied for their therapeutic potential for U.S. combat veterans and service members suffering from post combat trauma. The Vietnam Veterans Memorial (VVM) has recently been recognized as a therapeutic environment for Vietnam veterans.

Studies have shown that the visitation of war memorials can help alleviate the effects of PTSD. The article, “The War Memorial as a Healing Environment: The Psychological Effect of the Vietnam Veterans Memorial on Vietnam War Combat Veteran’s Post-Traumatic Stress Disorder Symptoms”, discussed a study conducted on 62 male Vietnam War combat veterans diagnosed with PTSD. These men were the subject of a study that revealed distinct links between the memorial’s design features and a veteran’s experiences of the memorial (Watkins, Cole, & Weidemann, 2010). Their research revealed how Maya Lin effectively designed

a curative space by understanding how memorials facilitate the mourning process.

Successful memorial design relies on the designer’s ability to balance a conflict between creativity and abstraction. There are several design ideals in the VVM that have contributed to the memorial’s curative success. The bold black granite walls have a highly reflective finish, making it possible for the audience to see themselves projected upon the memorial. The surroundings of the VVM are a wide and open landscape. This is a desired approach to the memorial from a veteran’s perspective giving them time to “warm up” and “prepare” to go down to the VVM (Watkins, Cole, and Weidemann, 2010, p.370).

Chapter Conclusion

The above review of literature and precedents reinforces the project's thesis; a golf landscape has potential therapeutic value that can be optimized for U.S. combat veterans that are suffering from PTSD. Golf landscapes also have the potential to incorporate meaning and narrative into their designs by using forms in the design inspired by a central theme. The literature on therapeutic landscapes suggests that golf landscapes can be framed as therapeutic landscapes. The literature on memorial landscapes introduced ways that landscapes have incorporate meaning into their designs to honor U.S. combat veterans and service members. Finally, there is a growing body

of research in therapeutic recreation as an effective complementary therapy for PTSD, and the sport of golf has already been incorporated into some programs. Therefore, the knowledge base has set a foundation for the remainder of the project and report.

The above research was interpreted so that it could be incorporated into a renovation master plan for the golf landscape at Deer Creek. This chapter suggests that there is a topical overlap between the subject matter. The following chapters will address the perceived overlap and interpret the knowledge into a set of design considerations for creating therapeutic golf course that honors U.S. combat veterans.

Figure 2.25 | Knowledge base process
(Author, 2014)

effects of

function

or outdoor physical,
activity, and vocational

environments in

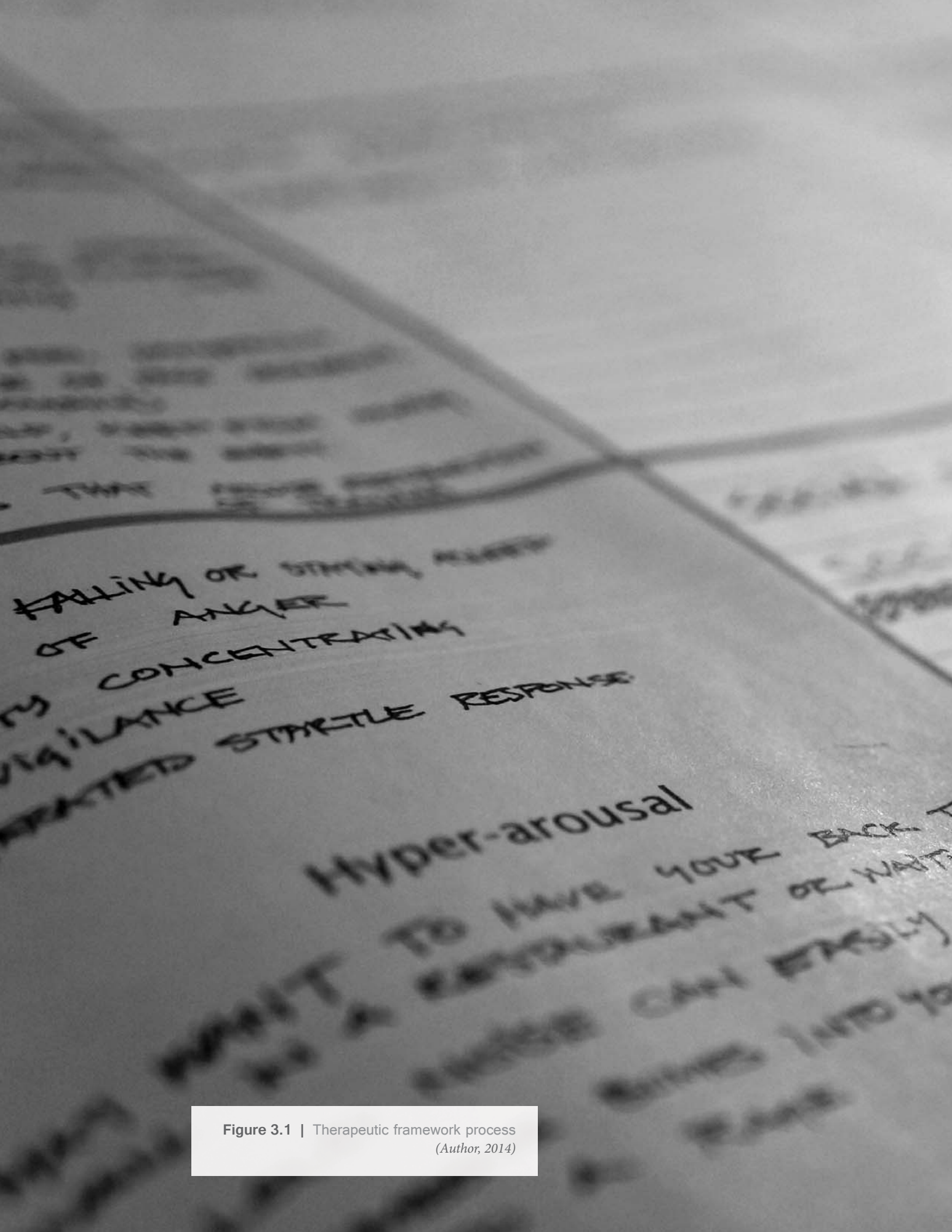


Figure 3.1 | Therapeutic framework process
(Author, 2014)

The background is a grayscale, blurred image of a document. A pen is visible at the top, and there are various handwritten notes and lines on the page. The text 'CONTROLLED' is clearly visible in a box at the bottom right. Other partially visible words include 'STARTLE' and 'ROOM'.

THERAPEUTIC LANDSCAPE INTERPRETATION

3

After establishing the knowledge base, the next step was to interpret the information so that it could be applied as a design concept in the following stage. The interpretation was critical to the project, because it determines specific design considerations for the application phase.

Therapeutic Landscape Interpretation Framework Study

Introduction

The following framework study investigates information from the preceding literature review and precedent studies and translates it into the vernacular of the golf landscape. The order of the framework study was inspired by a recent article by Amy Wagenfeld, Connie Roy-Fisher and Carolyn Mitchell (2013), “Collaborative Design: Outdoor Environments for Veterans with PTSD.” In their article, they devise a table that associates each criteria for diagnosing PTSD with a concept in therapeutic design, which is then paired with a physical manifestation within the landscape (Wagenfeld, Roy-Fisher, & Mitchell, 2013). This process was modified and adopted for the current investigation because each design feature is ultimately grounded in a diagnostic criteria for PTSD.

The following process begins with a detailed description of the PTSD criteria listed in the fourth edition of the American Psychiatric Association’s (APA) *Diagnostic and Statistical Manual of Mental Disorders - Text Revision* (DSM-

IV-TR). There are 6 criteria for evaluating PTSD: A. stressor, B. intrusive recollection, C. avoidant/numbing, D. hyper-arousal, E. duration, F. functional significance (American Psychiatric Association, 2000). Each criterion is determined after an evaluation of the symptoms. The symptoms within each category are used to associate the diagnostic criterion with a concept in therapeutic landscapes. All associated concepts are listed for each diagnostic criterion. Next, the associated concepts are physically manifested through design guidelines. These design guidelines are finally interpreted into the golf vernacular. The final interpretation is based on my personal experiences as a golfer.

This study addresses the experience of golf in two categories: The Golf Landscape, and the Sport of Golf. The Golf Landscape considers the physical environment in which the game is played. The Sport of Golf is the active part of the game, which includes the recreational experiences within a round

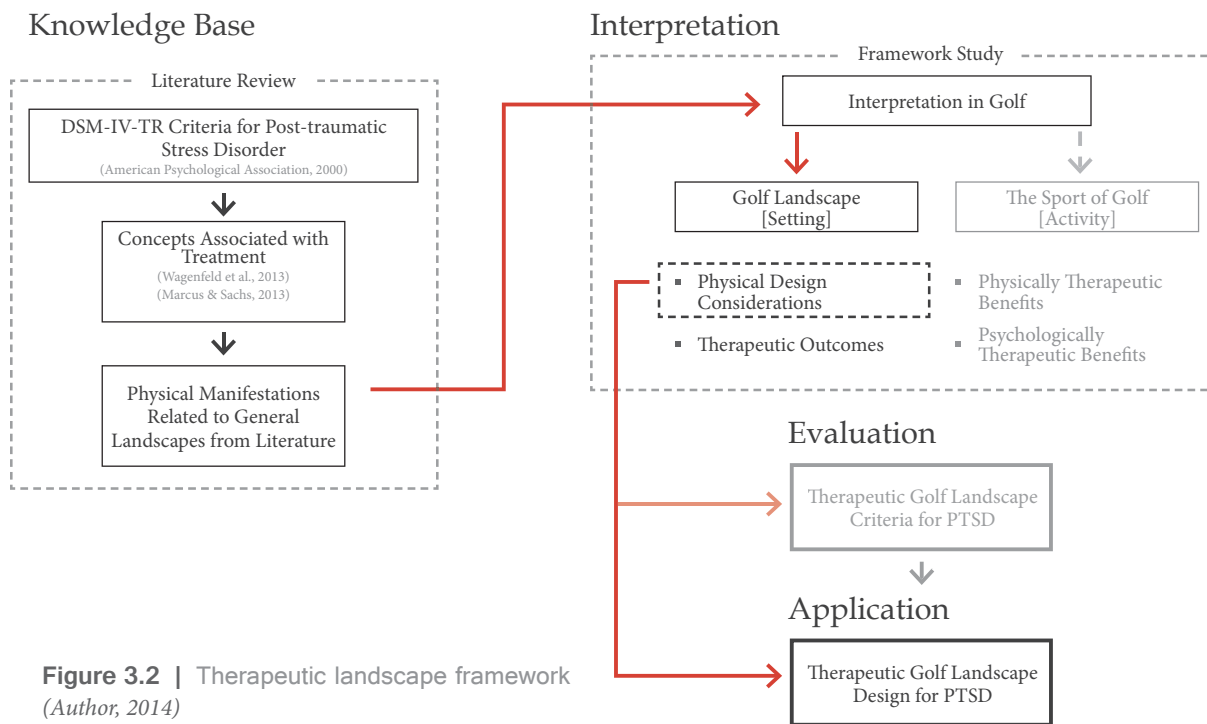


Figure 3.2 | Therapeutic landscape framework (Author, 2014)

of golf. In reality, the Golf Landscape and the Sport of Golf are not experienced individually, they occur simultaneously.

For the purpose of this study, however, therapeutic concepts were interpreted into either the *Golf Landscape*, or the *Sport of Golf*. This investigation identifies design outcomes for the Golf Landscape to inform a design program for a golf course renovation. The recreationally therapeutic aspects of the *Sport of Golf* are included to reinforce the notion that the complete golf experience can be therapeutic. On a similar note, each category in the *Sport of*

Golf has a physically and psychologically therapeutic outcome.

Diagnostic criteria for PTSD and their associated therapeutic outcomes are further defined in the following section. The final result of the study reveals design considerations to theoretically optimize a golf landscape’s therapeutic value for U.S. combat veterans and service members suffering from PTSD. Potential therapeutic outcomes are framed from a physical standpoint, relating to the recreational aspects of the sport, and also through psychological restoration in the environment.

DSM-IV-TR Criterion: A. Stressor

A. Stressor

The person has been exposed to a traumatic event in which both of the following were present:

1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.
2. The person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior.

Concepts Extracted from Literature Review

Therapeutic Concepts Associated with Treatment	Physical Translation within a Landscape
<ol style="list-style-type: none"> 1. Adaption Level 2. Need to Feel Safe 3. Sense of Control 	<ul style="list-style-type: none"> • Public spaces for social challenge • Familiarity • Balance of prospect and refuge • Reduced perceptual sensory distortion • Space to be alone • Space to be in a group or with company • Avoidance of ambiguity and abstraction • Defensible spaces • Offer choices within landscape • Plants and water to touch • Avoid spaces reminiscent of where a sniper could hide • Moveable furniture that the user can interact with • Provide zones of challenge • Offer choices of where to look, sit, ambulate

Therapeutic Interpretation in the *Golf Landscape*

A. Stressor

The first DSM-IV-TR criterion for diagnosing PTSD is identifying a stressor. A stressor is a traumatic event that seriously threatened a person's physical integrity with either serious injury or a near death experience. The traumatic event caused the person to react with feelings of helplessness, fear or horror (American Psychiatric Association, 2000). The concepts associated with the treatment of the stressor criterion are adapted from therapeutic landscapes designed for people suffering from personality disorders (Marcus & Sachs, 2013).

1. Adaption Level

Adaption level (AL) theory is the concept that after repeated exposure to a given stimuli, one becomes more comfortable with an improved sense of well-being and adaptive behavior is displayed (Labouvie-Vief, 2009). Such adaptive behaviors are controlled by the surrounding

environment, and the user's personal competence with the complexity of the space (Powell & Nahemow, 1973). By designing "zones of challenge" in the landscape, the concept of adaption level can be translated into the outdoor environment (Wagenfeld et al., 2013). When one moves from one zone, through a threshold, into the next zone, they gain adaptive behavior and increased comfort in previous zones. The complexity of these zones of challenge can increase psychologically or physically. If carefully designed and controlled, stressful situations can even have a beneficial health effect on the intended user group.

A golf landscape can be designed to include psychological and physical zones of challenge. When interpreted within a golf landscape, zones of challenge include passing through the thresholds of practice spaces as one is learning how to play golf. By beginning with a practice putting green and first learning how control the putting stroke, to learning how to complete a full swing,

there can be different environments suitable for each zone of challenge.

Zones of challenge can be applied to social challenges as well. Many returning veterans with PTSD have a difficult time reintegrating back into the civilian lifestyle (Mowatt & Bennett, 2011). The golf landscape can help by providing social spaces that encourage casual encounters between golfers. A large putting green with lobed edges can foster a range of social interactions. For a more private setting, one may choose to occupy one of the lobes, and

avoid crossing through the center of the putting green where there is a higher chance of social interaction with others (Figure 3.3).

2. Need to Feel Safe

The need to feel safe is a design consideration that is recognized in all therapeutic landscapes. The need to feel safe is especially important when designing environments for veterans with PTSD (Marcus & Sachs, 2013). Design considerations for making safe spaces include: defensible spaces,

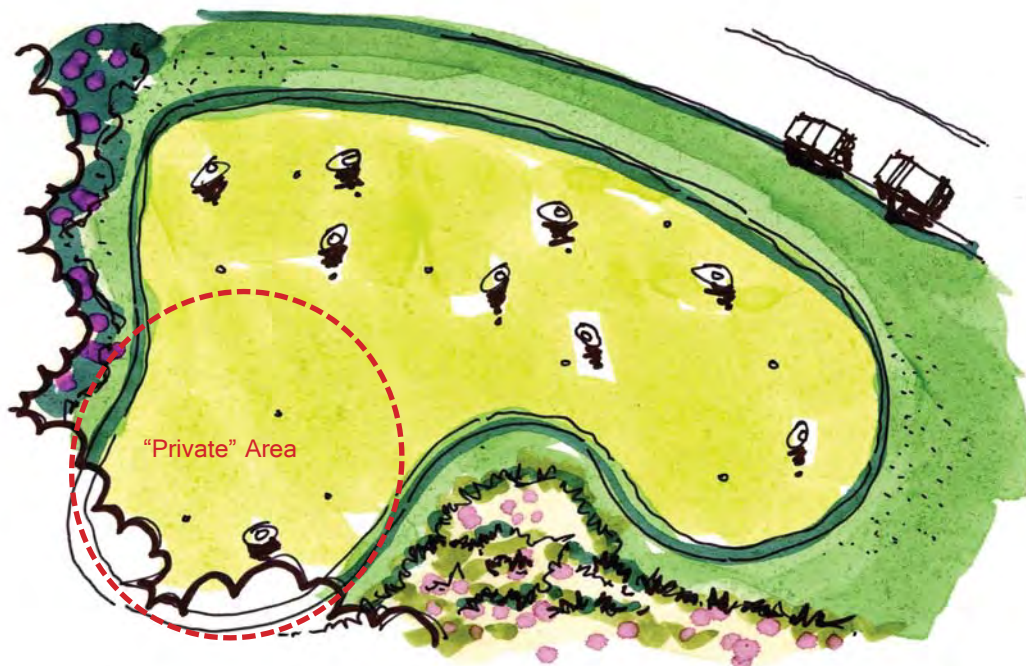


Figure 3.3 | Practice putting green
(Author, 2014)

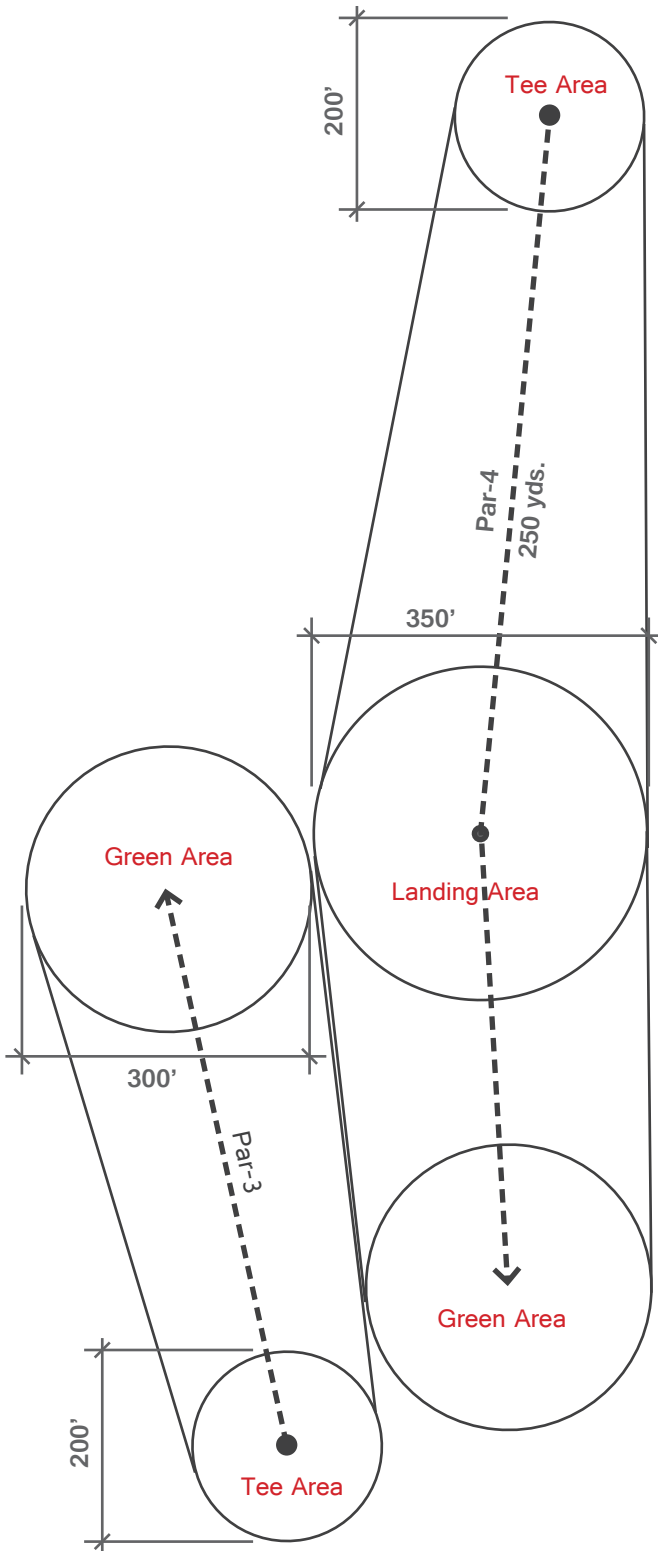


Figure 3.4 | Standard safety envelope
(Winslow, 2006)

avoiding sharp turns and blind corners, clear wayfinding, and avoiding hidden spaces (Wagenfeld et al., 2013).

There are current practices used in golf course design that are intended to ensure the safety of the participants. Poorly designed golf courses can threaten players' safety by putting them in the landing area of surrounding golf holes. A safe golf course uses the standard safety envelope analysis to reduce the risk of sudden injury on unsuspecting victims (Figure 3.4).

Golf landscapes are designed to be played in sequential order, without skipping to future holes or replaying previous holes. Clear wayfinding and signage can be interpreted in the golf landscape to reduce all confusion



Figure 3.5 | Circulation diagram
(Author, 2014)

when circulating from one hole to the next. Circulation paths should be distinct and legible. Cart paths should avoid creating intersections where golfers have to figure out which path is correct (Figure 3.5).

A golf course designed for U.S. combat veterans must consider the quality of enclosure in gathering spaces. Golf landscapes provide a variety of enclosure, from a tee box cut out of a wooded draw, to a fairway with little trees. Areas like tee boxes and putting greens should feel safe and defensible. Retaining walls or vertical plains should be implemented on the backsides of the tee boxes, to encourage a “back against the wall” sensation. Vegetative buffers and other screening materials should be incorporated to shield undesirable vistas beyond the site. Special care should be considered when using berms and earthen mounds to screen views, as it can remind some veterans of the landscape in Iraq and Afghanistan (Marcus & Sachs, 2013).

3. Sense of Control

One of the most important factors to consider when designing outdoor environments for veterans with PTSD is designing for a sense of control (Wagenfeld

et al., 2013). Veterans often experience heightened feelings of depression, anxiety and pain when they experience a loss of control and balance in their local

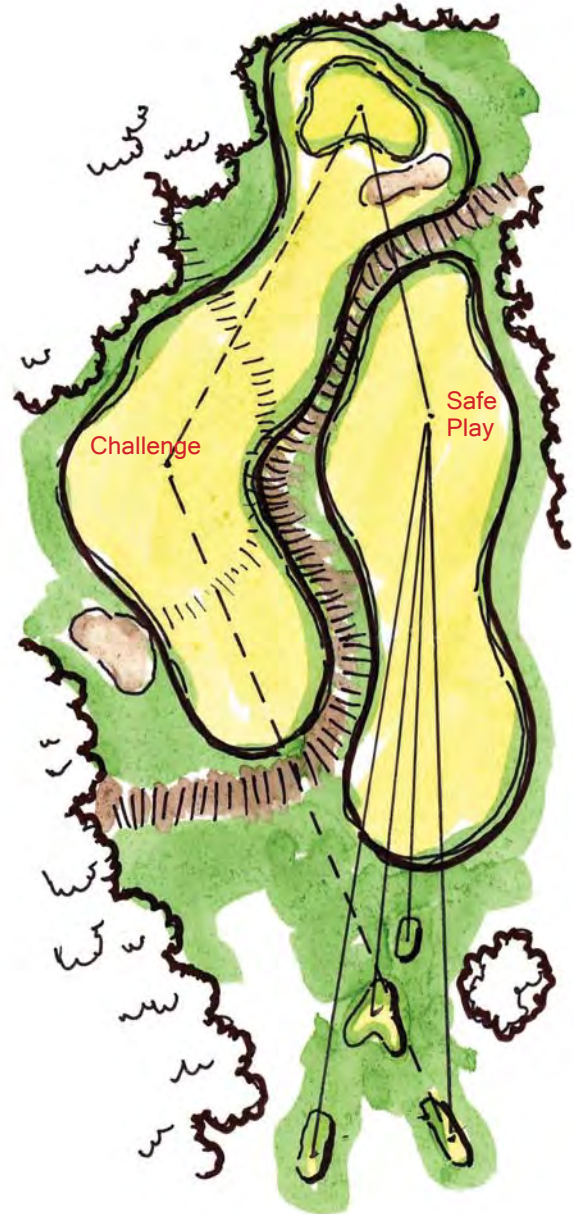


Figure 3.6 | Shot choices within the golf course
(Author, 2014)

surroundings (Wagenfeld et al., 2013). Veterans are especially sensitive to a loss of control because of their past training in the military when they lived in a strict environment, and were expected to be prepared and confident (Wagenfeld et al., 2013). An outdoor environment to provide veterans with a sense of control might include: choices, familiar forms and settings and reduced ambiguity and abstraction (Wagenfeld et al., 2013).

There is an opportunity to provide the golfer with several choices throughout

the round. The design of the golf course can dictate when, where and what shot choices are available to the golfer. The golfer has control over what tee box they chose to hit from, depending on their skill level. A golf hole can offer choices on how to advance towards the flag by playing it safe, or accepting challenge (Figure 3.6). Throughout the round of golf, the player is constantly faced with choices, all of which are under their control because only they can advance their golf ball.

Familiar forms and settings interpreted

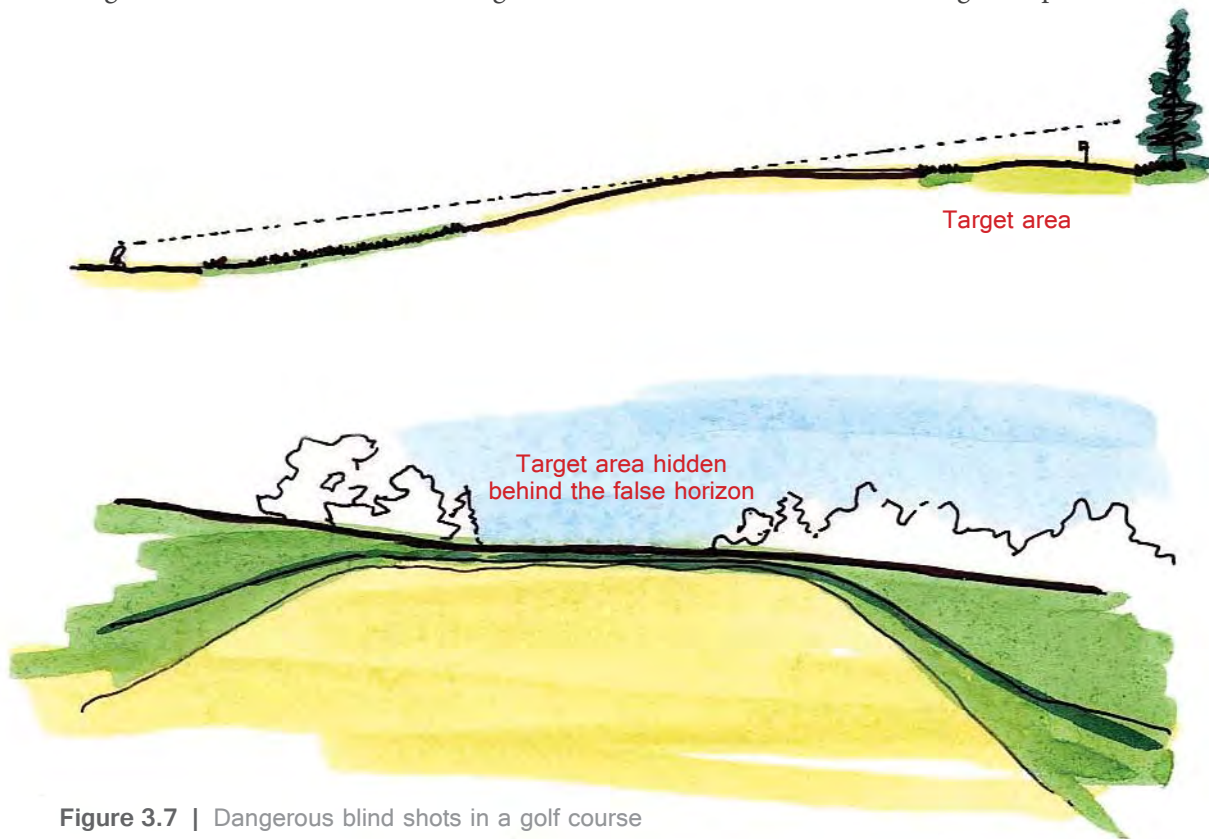


Figure 3.7 | Dangerous blind shots in a golf course
(Author, 2014)

into golf course design suggests that the golf course should not include any radical or drastically different elements or features. Ambiguous and abstract forms of art should be avoided, as they can evoke feelings of frustration in someone who does not understand the art. The golf landscape should incorporate familiar features and elements to avoid confusing veterans.

Familiar forms can also be interpreted as shapes, symbols and other elements that are familiar to the American Armed Forces. Veterans may feel a stronger sense of control if the golf landscape incorporates familiar

sayings and recognizable features.

Finally, reducing ambiguity in a golf landscape can apply to the design and appearance of golf shots. A golf landscape for U.S. combat veterans should avoid blind shots (Figure 3.7), where the golfer has seemingly no control over where the ball goes. It should be evident how each golf hole should be played. This can be accomplished with a more detailed score card that shows the golf hole in its entirety, with annotations that identify elements in the landscape to reinforce a sense of control over their local environment.

Table 3.1 | Stressor interpretation in the Golf Landscape (Source: Author)

Physical Design Considerations	Therapeutic Outcomes
<ul style="list-style-type: none"> • Keep playing area outside of landing area/safety envelope of other adjacent golf holes. • Provide a variety of tee boxes to give the golfer more choices within the landscape. • Design a large practice putting green by the clubhouse to foster social interaction • Driving range should include separated / screened booths for privacy and comfort • Provide a practice facility for those who are trying to learn how to play golf • Make signage frequent and legible; use a large font and legible colors • Avoid designing spaces that are exposed on the back; design “back against a wall” spaces • Provide the golfer options from the tee box, where they have to think left/right or short/long • Avoid blind tee shots and dangerous hole design • Stay with conventional golf course design, familiar hazards and geometries • Provide plants and water features in gathering spaces to promote interaction with nature • Use buffering to block or screen unattractive vistas within and beyond the golf course • Welcoming experiences should be clear and obvious, the visitor should know that it is a golf course 	<ul style="list-style-type: none"> • Design the golf course to feel comfortable and familiar even if they haven’t been there before • Avoid potential surprises, or hidden spaces. • Views within the site should be appealing • Views beyond the site should be void of any negative distraction or chaos • Screen views reminiscent of sniper hideouts • Circulation throughout the site should be orderly and easy to understand, thus avoiding stress and frustration • Provide choices for the golfer on what shot to make, golfers should have to think first • Enclosed spaces and contained spaces feel safe, but avoid over enclosure, which feels claustrophobic • Provide opportunities to see others on the golf course, so that the golfer does not feel alone • Seeing others on the golf course may evoke a cordial experience and social comfort • Memorial spaces on a golf course suggest emotional zones of challenge • Tee boxes and greens provide social gathering spaces and cordial experiences • Fairways offer separation spaces for personal reflection

Therapeutic Interpretation in the *Sport of Golf*

A. Stressor

The recreational aspects of playing golf can also address the first criterion in the DSM-IV-TR for PTSD. The same therapeutic concepts associated with the treatment of symptoms can be interpreted in the sport of golf.

1. Adaption Level

Throughout the round of golf, there are frequent tests of the player's ability to adapt to a variety of conditions. The turf or material that the golf ball rests on can have a great influence on the required skills to make a good play on the ball. For example, hitting a golf ball that is resting in a sand trap is a much different experience than hitting a golf ball off a tee. Golfers display adaptive behavior when making adjustments through repeated exposure to the various tests within the game. This adaptive behavior can be framed from a psychological standpoint as well.

The various tests within golf will challenge the player's patience level. A golfer learns to adapt their expectations and manage their emotions when faced with

adversity. A veteran that learns to cope with frustration on a golf course can apply that adaptive behavior to other facets of their daily lives.

2. Need to Feel Safe

The sport of golf is minimally demanding from a physical standpoint. If a golfer properly prepares their body to play golf, there is little risk of injury when participating in golf. Therefore, the sport is a comforting act with little threat to personal safety.

3. Sense of Control

Throughout a round of golf, the player is frequently tested to make choices on how they want to swing the club. This reinforces their sense of control, as they are the only player in the field that can legally affect their golf ball. Through continued practice, golfers can gain better control over their golf swing, which reinforces their sense of control over the golf ball.

There are social implications to be considered in a discussion about the therapeutic aspects of golf as well. The golfer

should have a choice on whether they want to play alone or within a group, with friends or with strangers. By giving the veteran a choice when it comes to playing partners, it might reinforce their sense of control. They may also learn adaptive behaviors as they progress through the various social zones of challenge within a golf landscape.

Table 3.2 | Stressor interpretation in the Sport of Golf (Source: Author)

Physically Therapeutic Outcomes	Psychologically Therapeutic Outcomes
<ul style="list-style-type: none"> • Golfer has to make a choice on how to swing the club depending on the desired shot result. • Able players have the option to walk or use a cart. • Golfers have a set of familiar golf shots that are tested throughout the round of golf: driving, putting, punch shots, chip shots, half-swing wedge shots, sand shots, etc... • Elevated tee shots evoke feelings of grandeur and prospect • Punch shots and lay-up shots evoke feelings of refuge • Golf holes can range in difficulty • Putting can be an ambiguous experience at first, but after repeated attempts, it becomes a familiar experience 	<ul style="list-style-type: none"> • Playing golf with others encourages a dialogue between all players in the group (maximum of four people in a group) • Choice of what club to use gives the golfer a sense of control • Choice and control whether to play with a group of people or play alone • The beginning hole of a round of golf can be nerve racking and evoke feelings of stage fright and fear, this is a mental zone of challenge. • Playing with peers can encourage you to try your best effort • A golfer is solely responsible for his or her play and score (complete control) • Golf challenges a player to control emotions and potential frustration. This is a learning experience that improves over time. • Putting greens require a mental capacity to understand the break and the speed of the desired putt • Playing golf is difficult, it has moments where the player is facing adversity, therefore there are zones of challenge throughout the round.

DSM-IV-TR Criterion: B. Intrusive Recollection

B. Intrusive Recollection

The traumatic event is persistently reexperienced in one (or more) of the following ways:

1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions.
2. Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.
3. Acting or feeling as if the traumatic event were recurring
4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

Concepts Extracted from Literature Review

Therapeutic Concepts Associated with Treatment	Physical Translation within a Landscape
<ol style="list-style-type: none"> 1. Nature 2. Positive distractions 	<ul style="list-style-type: none"> • Incorporate native plantings into the planting design • Increase wildlife habitat area • 70% Nature / Landscape space (minimum) • 30% Hardscape (maximum) • Provide water features • The environment should “feel like a garden”

Therapeutic Interpretation in the *Golf Landscape*

B. Intrusive Recollection

The second criterion in the DSM-IV-TR is intrusive recollection. Someone suffering through intrusive recollection is frequently reexperiencing the traumatic event through a psychological reaction to external stimuli that resembles an aspect of the traumatic event. When triggered, the person might react with intense psychological distress or acting as if the event were happening again (American Psychiatric Association, 2000). Therapeutic concepts that are associated with intrusive recollection include nature and other positive distractions (Marcus & Sachs, 2013; Wagenfeld et al., 2013).

1. Nature

In 2011, Michelle Parkins surveyed 38 U.S. veterans about their views of nature and therapeutic landscapes in her thesis project, *Soft Touch For A Silent Voice: Therapeutic Gardens for Veterans with Post Traumatic Stress Disorder*. Parkins' study revealed certain design

considerations for incorporating nature in an outdoor environment for veterans with PTSD (Parkins, 2011).

She polled the survey participants and asked them if there were any specific elements that would attract them to a healing landscape. Of the responses, 68 percent identified water as an important element. Other common elements included wildlife, and other nature sounds. Water in a landscape however can be perceived differently depending on the past experiences of the users (Parkins, 2011).

Dorinda Wolfe Murray suggests that veterans from the naval services have a much difference perception of water than infantry and air borne. The sound of rushing water can terrify a sailor and remind them of the sound of a breach in their ship's hull. Therefore, a therapeutic environment for combat veterans should avoid incorporating a sudden or rushing water feature. Murray recommends that a water feature within a therapeutic landscape for war veterans

should be a calm, still pool, accompanied with aquatic plants and vegetation (Marcus & Sachs, 2013, p. 209).

Water is a common element in golf landscapes and is frequently used as a hazard, and challenges golfers to avoid hitting into it. A therapeutic golf landscape for veterans with PTSD should include a water feature as not only a golf hazard, but also a therapeutic element. Therefore, the water element should be a calm still pond or lake accompanied by aquatic vegetation.

Natural settings can help to ameliorate the negatives effects of attentional fatigue (Kaplan & Kaplan, 1989). A veteran suffering from mental or attentional fatigue can lead to a decrease in productivity, anger, and

impulsive or reckless behavior (Wagenfeld et al., 2013). Golf courses can incorporate nature into their design by integrating golf holes with the surrounding landscape and maximizing native vegetation for natural habitat (Terman, 1997).

In a typical golf course, the natural habitat areas include roughs, woodlands and water features. On average, these golf elements comprise approximately 1.7 times the acreage of the maintained turf grass areas, greens tees and fairways (Beard & Green, 1994). The managed turf areas typically comprise 30% of the golf landscape, and the remaining 70% is rough and out-of-play areas (Green & Marshall, 1987). These out-of-play zones, on the margins



Figure 3.8 | Golf course section of suitable habitat
(Author, 2014)

of play, offer the most suitable habitat for plant and animal species (Figure 3.8) (Green & Marshall, 1987). A therapeutic golf course for veterans suffering from PTSD must leverage out-of-play areas to enhance biodiversity and wildlife presence.

A therapeutic golf landscape should incorporate naturalistic design principles to maximize the landscape's natural feel and aesthetics. Intensive earthwork and terrain shaping should be kept to a minimum to reduce the potential for veterans to perceive the landscape as

human engineered. This is evident when comparing a highly engineered golf course and a natural layout (Figures 3.9-10).

Wildflower plantings can also enhance the natural beauty and feel of the golf landscape. With careful planning, specific flower colors can be selected for particular effects. Wildflowers for a veteran population suffering from combat related injuries should avoid using red and orange flowers, a strategy incorporated in The Combat Stress Garden in Leatherhead, UK by Dorinda Wolfe Murray and Fi Boyle

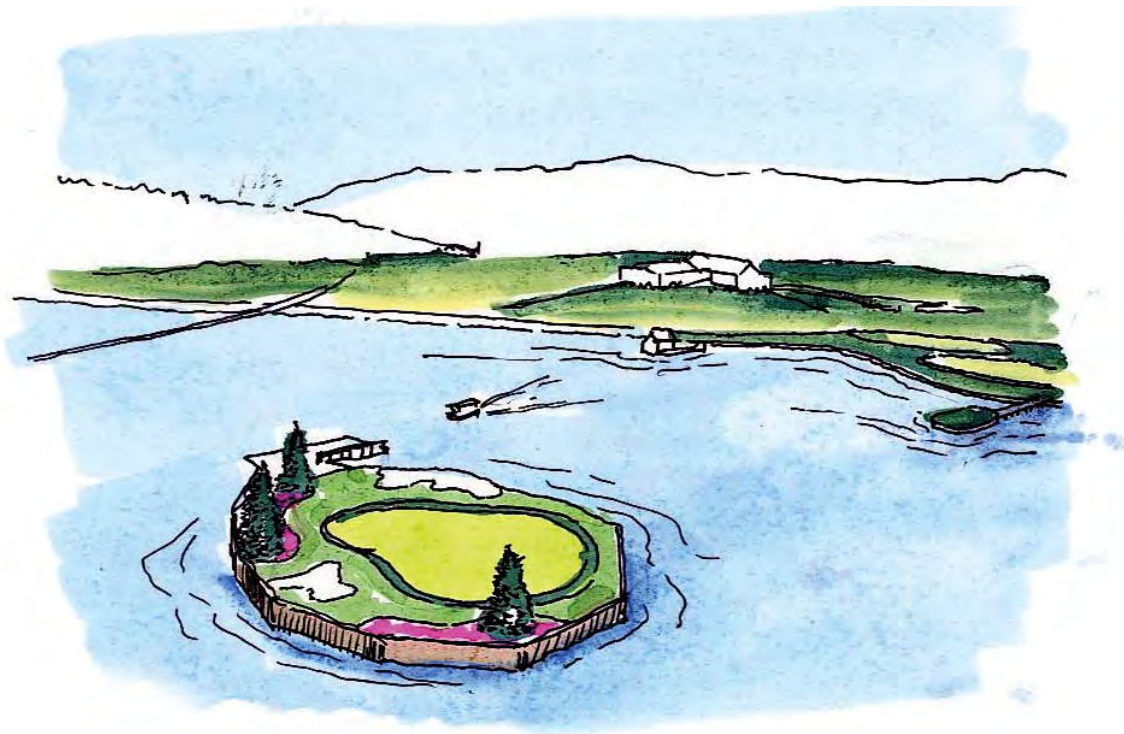


Figure 3.9 | Highly engineered golf landscape
(Author, 2014)



Figure 3.10 | Naturalistic golf course design
(Author, 2014)

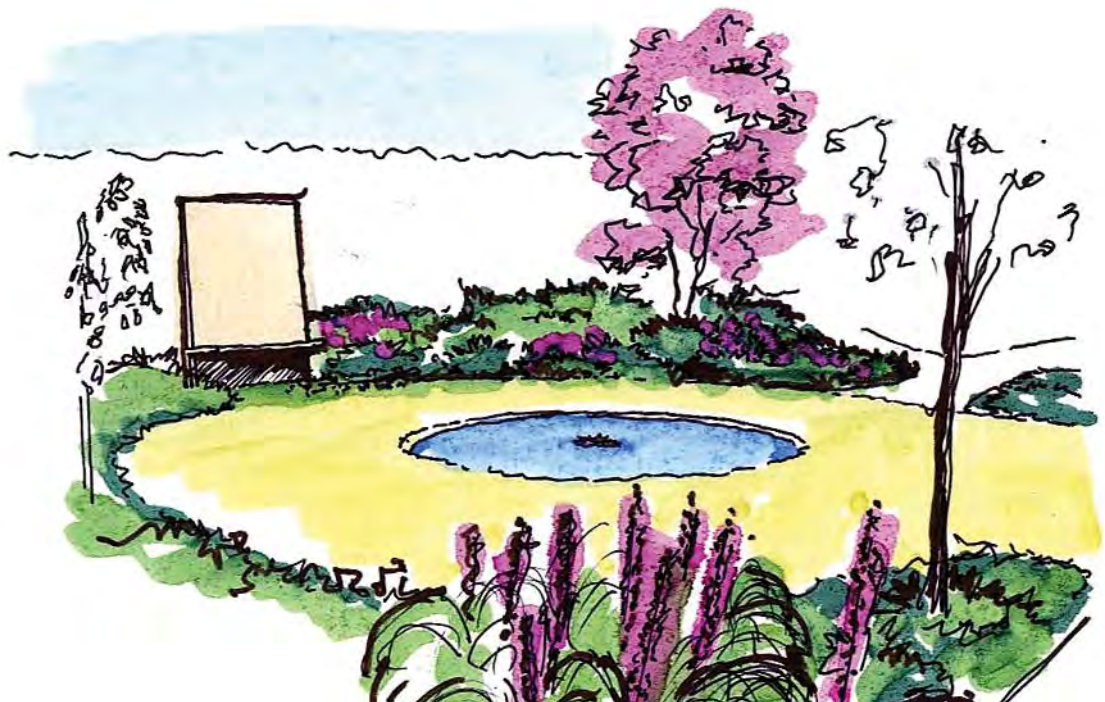


Figure 3.11 | Combat stress garden
(Author, 2014)

(Figure 3.11). Murray's experience with service personnel revealed that orange and red flowers reminded users of blood and explosions (Marcus & Sachs, 2013). A mixture of short and tall wildflowers can improve the overall aesthetic and enhance the therapeutic effect.

A golf landscape should incorporate a reflective rather than a noisy water feature. Use of a planting palette with primarily native plants and pleasing wildflowers should also increase the therapeutic value for combat veterans with PTSD. If planned and properly maintained, these therapeutic landscape elements will add ecological value to the golf landscape, and provide suitable habitat for local fauna.

2. Positive Distractions

A positive distraction is a feature in the environment that promotes an improved emotional state in the perceiver. Such distractions may block or reduce worrisome thoughts, and promote beneficial changes in physiological systems like lowered blood pressure and stress hormones. Positive distractions range from comedy or laughter between two people, to wildlife and natural processes (Marcus, 1999).

In order to promote positive distractions, landscapes should look and feel like a garden (Marcus & Sachs, 2013). There should be as many opportunities to interact with nature as possible. Interaction with nature can include sensory engagements with the physical landscape, like touching, smelling, tasting, hearing and viewing. Interaction with nature also includes connections with wildlife, like birds, butterflies and animals (Marcus & Sachs, 2013).

Golf landscapes can adopt positive distractions within their design by including a rich and diverse planting palette that increases the planted area and creates a more complex landscape experience. Using sensory plants near the tee boxes and gathering spaces on a golf



Figure 3.12 | Layered planting
(Author, 2014)

course can promote engagement with nature. A golf landscape that uses a variety of layered planting designs in the planting plan will increase the complexity of the environment (Figure 3.12).

A therapeutic golf landscape will also maximize and promote habitat areas to increase interaction with wildlife. Golf courses are complex ecosystems, which are capable of supporting diverse populations of natural wildlife (Balogh, & Green, 1992). Providing opportunities to interact with wildlife in the golf landscape may be especially significant for a veteran population. Dorina Murray of the Independent Gardening organization, states: (Marcus & Sachs, 2013)

“Veterans have an almost obsessive interest in wildlife, be they bugs, butterflies, birds, or mammals—even vermin. It is as if the fundamental fact that they have been taught how to kill has to be balanced by an overwhelming desire to preserve life, no matter how small or insignificant.” (p. 209)

Golf landscapes can be designed to maximize space for wildlife habitat while preserving playability and functionality. Out-of-play areas are the most suitable sites to provide the requirements for wildlife survival including food, cover, water, space and nesting locations



Figure 3.13 | Managed wildlife habitat areas
(Author, 2014)



Figure 3.14 | Tree snags
(Author, 2014)



Figure 3.15 | Naturalized pond edge
(Author, 2014)

(Figure 3.13)(Maffei, 1978). Introducing and managing native vegetation for wildlife in these out-of-play areas can benefit songbird, hummingbird, and butterfly populations. Nesting boxes, brush piles and dead tree snags (Figure 3.14) will also improve the quality of wildlife habitat (Miller et al., 1995; Hatt, 1992).

Pond edges and riparian zones are also critically important for quality. Naturalizing pond edges (Figure 3.15) and increasing the vegetated buffer along riparian corridors

have a dual effect of improving both habitat and water quality (Kiss, 1998).

All sensitive habitat areas and nesting sites within the golf landscape must be protected. Signage should be provided to designate protected areas and restrict potential harm caused by golfers looking for their errant golf shot. Frequent signage will also promote awareness and remind the veterans of the natural condition of the therapeutic golf landscape.

Table 3.3 | Intrusive recollection interpretation in the Golf Landscape (Source: Author)

Physical Design Considerations	Therapeutic Outcomes
<ul style="list-style-type: none"> • Rich planting palette • Use plants to restore a naturalistic design • Increase planted areas • Provide large buffers at riparian edges, to increase habitat space • Design habitats for native and desired biota (deer, birds, fish and insects) • Avoid putting golfers in danger of habitat (snakes and other potentially harmful animals) • Include water features for purpose of spectacles • Design sensory experiences (audible, visual, smell, etc...) • Use water as an accessible feature • Design enclosed space to feel like a garden • Use consistent forms and planting features to create a connected experience 	<ul style="list-style-type: none"> • Water features are a positive distraction • Wildlife evokes feelings of caring for animals • Diverse plantings restore the mind • Native plantings release stress • Swathes of native plantings can take mind away from internal struggle • The design vernacular of the golf course is much different than the war environment • Touching water can evoke feelings of cleansing • View of trees and grass can promote health and healing • Features can alleviate worries

Therapeutic Interpretation in the *Sport of Golf*

Intrusive Recollection

The sport of golf can also be framed to address symptoms associated with intrusive recollection in someone with PTSD. Although the concepts suggest incorporating nature and positive distractions, which are largely physical components of the environment, the active part of the game can be framed as a positive distraction.

During a round of golf, there are active moments and passive moments. The active moments, for the purpose of this study, are times when the player is actively swinging the club or advancing the golf ball. The time

between hitting the golf ball is considered as passive time.

The active times of golf can be viewed as a positive distraction for a veteran with PTSD who is suffering from symptoms of intrusive recollection. It is unlikely that the motions involved during a golf swing resemble or symbolize an aspect of a war veteran’s traumatic event. The sport of golf can be therapeutic for a combat veteran with PTSD because the active motion of the game is unlikely to trigger an intrusive recollection.

Table 3.4 | Intrusive recollection interpretation in the Sport of Golf (Source: Author)

Physically Therapeutic Outcomes	Psychologically Therapeutic Outcomes
<ul style="list-style-type: none"> • Hitting a golf shot is a positive distraction 	<ul style="list-style-type: none"> • Refuse to let any other distractions alter your game • Golf encourages you to stay in the present

DSM-IV-TR Criterion: C. Avoidant/Numbing

C. Avoidant/Numbing

Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma
2. Efforts to avoid activities, places, or people that arouse recollections of the trauma
3. Inability to recall an important aspect of the trauma
4. Markedly diminished interest or participation in significant activities
5. Feeling of detachment or estrangement from others
6. Restricted range of affect (e.g., unable to have loving feelings)
7. Sense of a foreshortened future

Concepts Extracted from Literature Review

Therapeutic Concepts Associated with Treatment	Physical Translation within a Landscape
<ol style="list-style-type: none"> 1. Soft Fascination 2. Complexity 3. Richness 	<ul style="list-style-type: none"> • Long range views of soft landscape • Use landscape plantings that are inviting to smell, touch, and taste • Provide spaces for ritual • Provide space for reflection • Use a high degree of plant diversity • Create a rich landscape setting • Provide spaces to engage with the landscape

Therapeutic Interpretation in the *Golf Landscape*

C. Avoidant/Numbing

The third criterion in the DSM-IV-TR for diagnosing PTSD is avoidant and numbing behavior. Avoidant and numbing symptoms occur when the person persistently avoids stimuli that are associated with the traumatic event. The person does not feel interested in participating in significant activities, especially any activity that is associated with the trauma. The person is often distant, and estranged from others (American Psychiatric Association, 2000). The concepts associated with the treatment for avoidant and numbing symptoms are adopted from Stephen and Rachel Kaplan's research on attention restoration. The Kaplan's attention restoration theory (ART) identified two types of attention: directed attention and involuntary attention (Kaplan, Kaplan, & Ryan, 1998).

Directed attention refers to something that a person has to pay attention to, such

as, taking a test, performing a task or walking through an active city space which requires someone to block out surrounding stimuli. Extended periods of directed attention without restoration can cause mental fatigue and even physical fatigue (Marcus & Sachs, 2013). The other kind of attention is involuntary attention which refers to attention that requires no effort (Kaplan et al., 1998). Involuntary attention that contributes to mental restoration is referred to as soft fascination in the Kaplan's research (Kaplan et al., 1998). It is important to balance prolonged periods of directed attention with involuntary attention for well-being.

Restoration in an environment is achieved through four characteristics of the setting: being away, extent, fascination, and compatibility (Kaplan et al., 1998). The most restorative environments achieve all four characteristics (Marcus & Sachs, 2013).

1. Soft Fascination

Fascination alone does not achieve a restorative experience. There can be fascinating events that do not improve someone's mental or emotional state. Therefore, there is a spectrum of fascination, from hard fascination to soft fascination. Hard fascination refers to dramatic events and stimuli, like auto racing and violent events. Soft fascination refers to stimuli that hold someone's attention in an undramatic fashion. Elements in nature are examples of soft fascination, like flora, fauna, water and natural events like sunsets (Figure 3.16) or growth and seasonal change. Elements

and events closer to the soft end of the fascination spectrum are considered to be restorative (S. Kaplan, 1995).

Soft fascination can be physically manifested in a landscape through long range views of soft landscape. This can further be interpreted into the golf landscape, and inform a layout and design that incorporates large swathes of native grasses and wildflowers. These swathes of soft landscape should be experienced from near and far, therefore, the higher elevations within the golf course should have visual access to the soft landscape.



Figure 3.16 | Fascinating sunset
(Author, 2014)

2. Complexity and Richness

Design considerations for creating restorative environments include coherence, complexity, legibility and mystery (Marcus & Sachs, 2013). Complexity refers to rich landscape settings that include many opportunities for sensory engagement. Complex environments have a high degree of plant diversity and encourage interaction with the vegetation, like touch, smell, taste and sound. Complexity in the golf landscape can be interpreted the same way.

Incorporating a high degree of plant diversity of various colors, shapes and sizes will make for a complex golf landscape (Figure 3.17). Plants that welcome sensory engagement should be located in proximity to gathering spaces, where they are most accessible by the majority of participants. Plants with volatile smells and aromas should be avoided, along with plants that are poisonous or have thorns (Figure 3.18).



Figure 3.17 | Therapeutic landscape with layered plants
(Author, 2014)



Figure 3.18 | Volatile plants
(Author, 2014)

Table 3.5 | Avoidant/numbing interpretation in the Golf Landscape (Source: Author)

Physical Design Considerations	Therapeutic Outcomes
<ul style="list-style-type: none"> • Provide vistas from high points to feel prospect • Plant large swaths of grasses and other native grasses for viewing • Close proximity of sensory plants to gathering / focus areas • Avoid using plants with thorns • Avoid using plants, shrubs and trees with volatile aromas • Provide space by the club house for reflection after a round of golf • Incorporate spaces between holes for ritual and reflection • Use plant layering to increase landscape experience • Memorial landscape setting to reflect emotive response 	<ul style="list-style-type: none"> • Feelings of excitement • Prospecting vistas from a high point evokes feelings of accomplishment • Long views of the landscape incites curiosity • Sensory plants are soothing and relaxing • Tee areas are locations for social interaction and gaining an attachment to others • Large putting greens and tee boxes to avoid feelings of claustrophobia • The golf hole design can inspire intrigue • Scent can evoke memories of the golfing experience

Therapeutic Interpretation in the *Sport of Golf*

C. Avoidant / Numbing

The sport of golf can address the symptoms of avoidant and numbing behavior in a veteran suffering from PTSD. The sport of golf includes an active component and a passive component. The active component involves the swinging of the club to advance the golf ball. The passive moments are between shots, when the golfer is traveling to their next shot.

According to the previous section, the active component requires directed attention from the golfer. The passive moments do not involve directed attention, and are opportunities for fascination and involuntary attention. The sport of golf maintains a balance between moments of directed attention and concentration, and involuntary attention. The sport of golf can reduce attentional fatigue in combat veterans.

Table 3.6 | Avoidant/Numbing interpretation in the Sport of Golf (Source: Author)

Physically Therapeutic Outcomes	Psychologically Therapeutic Outcomes
<ul style="list-style-type: none"> • Golf swing is nimble and graceful • Golf motion is unlike any war-time motion or exercise • Golf swing is complex 	<ul style="list-style-type: none"> • Maximum (traditionally) of four players in a group, a comfortable and semi-private setting • Playing partners encourage dialogue • Cordial experience • Golf is a competition with yourself and the golf course, not between you and the playing partners

DSM-IV-TR Criterion: D. Hyper-arousal

D. Hyper-arousal

Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

1. Difficulty falling or staying asleep
2. Irritability or outbursts of anger
3. Difficulty concentrating
4. Hypervigilance
5. Exaggerated startle response

Concepts Extracted from Literature Review

Therapeutic Concepts Associated with Treatment	Physical Translation within a Landscape
<ul style="list-style-type: none"> • Social Support • Social Capital 	<ul style="list-style-type: none"> • Provide picnic spaces for outdoor eating • Include a space for smoking • Design places and activities for children and family members • Avoid negative sounds like vehicle and air traffic • Provide relaxing places to sit with others • Design for places that encourage casual encounters

Therapeutic Interpretation in the *Golf Landscape*

Hyper-arousal

The fourth criteria in the DSM-IV-TR for diagnosing PTSD is hyper-arousal. Hyper-arousal symptoms include frequent instances of increased arousal and hypervigilance, which can lead to difficulties sleeping and concentrating, increased irritability, and an exaggerated startle response (American Psychiatric Association, 2000). The therapeutic concepts associated with the treatment of hyper-arousal focus on social support from others in their local environment.

Social Support

Research suggests that there is a link between the various aspects of social support and positive health impacts on a variety of illnesses in certain vulnerable populations (Wagenfeld et al., 2013). Evidence reveals the importance of social support in the recovery of severe mental illness. In cases of behavioral and psychological illness, positive

social support has shown to reduce hospitalizations, decrease symptomology, and increase self-esteem and social skills which are all important outcomes for veterans with PTSD (Lansdowne, 2011; Wagenfeld et al., 2013).

Designing spaces to promote social support is an important consideration for veterans with PTSD. Spaces that support social interaction might include picnic tables, comfortable seating areas, and areas designated for smoking or barbecue pits. These small and informal spaces can become meaningful places for veterans to socialize and support each other.

Golf landscapes are social spaces, with varying degrees of social interaction. Tee boxes and putting greens are the most social spaces because all players begin the hole together, and finish together before moving on to the next hole. These concentrated moments of social support can be designed to optimize social encounters within the golfing experience.

Tee boxes and greens can be designed to function for two holes. A shared tee box might provide an opportunity for a brief social interaction between two groups of golfers (Figure 3.19). Shared greens can have a similar effect (Figure 3.20). By allowing two groups of golfers to occupy the same space, more social interaction is afforded during a round of golf.

Throughout the golf course, views through and between other holes can reinforce a social connection to other distant

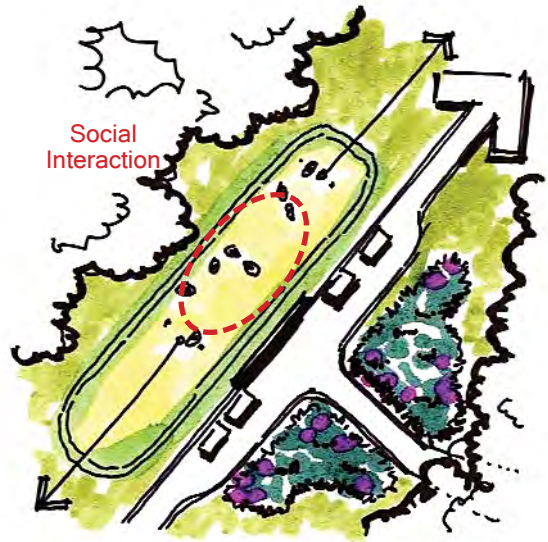


Figure 3.19 | Shared tee box
(Author, 2014)

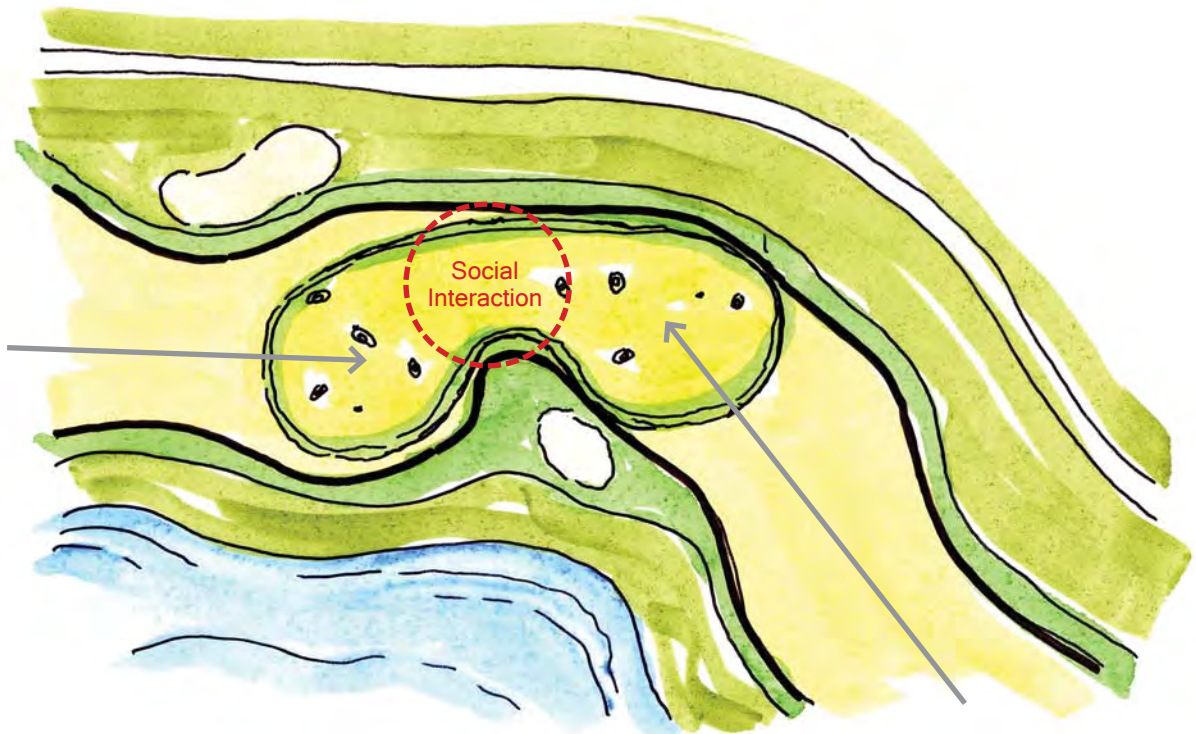


Figure 3.20 | Shared green for social interaction
(Author, 2014)

groups. Seeing others on the same golf course can reinforce feelings of comfort and sense of belonging.

Social Capital

Social capital is the capacity of a community to foster the building of social networks and connections (Wagenfeld et al., 2013). Social capital can optimize performance and well-being. Veterans with weakening social bonds are more likely to experience feelings of extreme isolation and suffer more severe PTSD (Wagenfeld et al., 2013). A golf landscape can incorporate design components to optimize social capital between its members.

Practice facilities are social spaces where individuals, with common goals and

interests, can meet and gain social capital.

Practice facilities are unlike the golf course from a social standpoint. The golf course will traditionally send out groups of a maximum of four golfers. Although the traditional foursome fosters social interaction, the practice facilities can support more than four people. Therefore, the inclusion of practice facilities is recommended to foster social capital.

Practice facilities can also be designed as spaces for isolation and privacy. A practice putting green can be interpreted as a private space and a social space within a golf landscape. A practice putting green for a therapeutic golf landscape for veterans should include a lobed design with surrounding plants to partially screen the more isolated spaces (Figure 3.21). Spatial

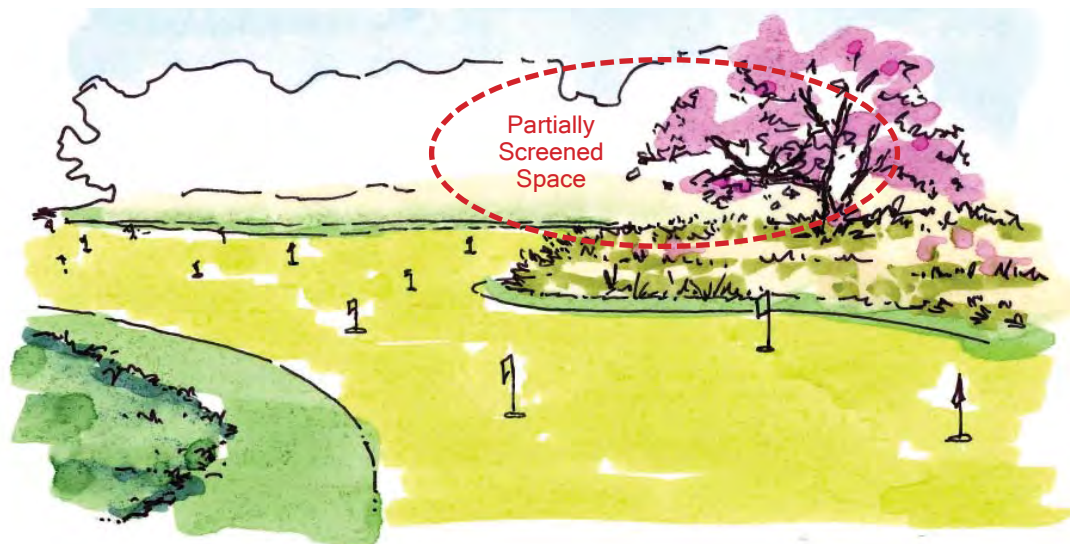


Figure 3.21 | Practice putting green
(Author, 2014)

definition should be carefully considered when designing practice facilities in the golf landscape. By partially enclosing a space, a veteran might feel more inclined to occupy the space for private reflection.

A golf landscape that is designed for veterans, especially those with PTSD, can become meaningful places because of the

physical and social connections that happen there (Wagenfeld et al., 2013). A veteran’s perception of their social and physical environment has a great influence on their sense of community. A golf landscape that incorporates design elements that resonate within the veteran community will create a place attachment for those veterans.

Table 3.7 | Hyper-arousal interpretation in the Golf Landscape (Source: Author)

Physical Design Considerations	Therapeutic Outcomes
<ul style="list-style-type: none"> • Permit smoking on golf course? • Provide scaled experiences based on ability • Design spaces to allow family, children, friends and other non-golfers to experience the place • Make it a welcoming experience from the entry drive to the clubhouse • Provide sufficient audible buffering from adjacent land and traffic throughfares • Provide outdoor eating and seating space with moveable furniture • Provide large putting greens to make for more welcoming approach shots • Wide fairways and landing areas are more welcoming tee shots • Shared greens, tee boxes and fairways can foster casual encounters and social interaction 	<ul style="list-style-type: none"> • Provide a space for mental rest after a round of golf • Golfers have a choice of which golf course they want to play • Provide familiar landscape forms to make veterans feel more welcomed • Promote peace and quietness in some areas • Provide spaces to gather with others to provide social support

Therapeutic Interpretation in the *Sport of Golf*

D. Hyper-arousal

The sport of golf can be framed to address the symptoms of hyper-arousal in a veteran suffering from PTSD. The concepts associated with treatment of hyper-arousal focus on the social aspects of the surrounding environment. The sport of golf can provide a veteran with scaled social experiences, improved concentration and patience.

Social Support

As alluded to in the previous section, the sport of golf provides a range of social opportunities for veterans. The veteran has control over their social experience based on the space they chose to occupy, and the people they chose to play or not to play with.

The sport of golf affords the players the option to play a round alone, or with others. A golf course open to the public will give veterans the opportunity to play with strangers, where they can network and gain

social capital. When playing in a group, a veteran's self esteem can improve along with their patience.

Of the several golf shots that a veteran takes on a golf course, there are bound to be a few when the veteran is pleased with the outcome. A golf shot that meets or exceeds their expectations can evoke feelings of accomplishment and pride. When playing with others, a golfer will feel acknowledged and applauded by their playing partners for hitting a good shot. These social interactions can help improve a veteran's social support and self esteem.

Throughout the round of golf, however, mistakes or mis-hits are likely to occur. Such incidents, when the shot did not meet the golfer's expectations, may evoke feelings of frustration and anger. In the long run, however, these repeated hurdles can help a veteran learn to handle frustration in an environment that is removed from their daily social lives. Repeated exposure to stimuli caused by a golf shot can

help the golfer learn adaptive behavior and to overcome their frustrations.

Playing golf can also help teach a veteran patience. When playing with others in a group, the veteran is required to wait until it is his/her turn before play resumes. If they are playing behind a group, he/she must wait until

the group ahead has cleared away from the intended landing zone before swinging. The sport of golf tests the patience of its players, and after continued tests on the golf course, a veteran may learn to take their newfound patience off the course into their daily lives.

Table 3.8 | Hyper-arousal interpretation in the Sport of Golf (Source: Author)

Physically Therapeutic Outcomes	Psychologically Therapeutic Outcomes
<ul style="list-style-type: none"> • Swinging the golf club consistently • Letting the club “do the work” • Swing requires tempo and rhythm • Everyone has their own unique swing • The active part of the game (actually swinging the club) doesn’t take up the entire time • Standing at the ball • Walking around the green • Swing requires balance • Swinging the golf club several times in a round can be physically exhausting 	<ul style="list-style-type: none"> • Getting over frustrations on the golf course can help a golfer deal with outbursts of anger • Throughout the round of golf, there are feelings of accomplishment • A round of golf demands concentration from the golfer • Playing partners provide social support • Golf encourages dialogue and playing with others • There is a sense of belonging when playing with others that are like you • There are networking opportunities and friendships that can be made on a golf course • Lowered levels of perceived loneliness • Patience is required on the golf course • There are opportunities to play team golf, where you are a member of a social construct • League play is an opportunity to gain social support • Golf challenges your reaction to poorly played shots

DSM-IV-TR Criterion: E. Duration

E. Duration

Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

Concepts Extracted from Literature Review

Therapeutic Concepts Associated with Treatment	Physical Translation within a Landscape
<ol style="list-style-type: none"> 1. Controlled / Graded Stressors 2. Physical and Emotional Security 3. Physical Movement and Exercise 	<ul style="list-style-type: none"> • Include a physical challenge course • Minimize U.V. glare and exposure • Use landscape elements and planting patterns that are familiar to the participants • Provide varied levels of physical challenge

Therapeutic Interpretation in the *Golf Landscape*

E. Duration

The fifth criterion in the DSM-IV-TR for diagnosing PTSD is duration. Duration is used to determine if the symptoms from the previous criteria have lasted longer than a month. If the symptoms from Criteria B, C, and D have lasted less than three months, it is classified as an acute case of PTSD. If the duration of symptoms last longer than three months, it is classified as chronic PTSD (American Psychiatric Association, 2000). Therapeutic concepts associated with the treatment of PTSD regarding the duration of the symptoms focuses on controlled and graded stressors, physical and emotional security, and physical movement and exercise.

1. Controlled/Graded Stressors

The therapeutic concept, controlled stressors, can manifest in a landscape as physical challenge courses. Similar to the *zones of challenge* concept, completing one

physical challenge and moving to the next challenge entails an internal and external feeling of a meaningful and purposeful endeavor (Wagenfeld et al., 2013).

Intentionally designed physical challenges can include trail systems and fitness parks designed to accommodate the needs of wounded warriors and able bodied veterans suffering from PTSD (Marcus & Sachs, 2013).

In a golf landscape, controlled stressors can be interpreted as designing spaces to accommodate for the process of learning how to play golf, and to intentionally design some golf holes to be more difficult than others.

A therapeutic golf landscape for veterans with PTSD should not only include a golf course, but practice facilities as well. The practice facilities can be graded as physical challenges and encourage veterans to progress through the *stressors*. The first *physical challenge course* is the putting green where veterans can practice their putting strokes. The next challenge course is the short game area, where veterans can

learn half swings and chip shots. The third challenge course is the driving range, where veterans challenge themselves to take full swings and test their full range of motion. The final challenge course in the golf landscape is the golf course itself. Physical challenge courses can be interpreted within the golf course as well.

A golf landscape for veterans with PTSD should include several tee boxes. Each tee box represents a different physical challenge level. Veterans that continue to play and improve their golfing abilities should feel

comfortable moving back to a more difficult tee box. Moving back a tee will make each subsequent hole longer, and could potentially bring hazards into play that previously were not in-play from the forward tees (Figure 3.22). The difficulty of the entire golf course can be increased by moving back a tee, individual holes, however, can be designed to be more challenging than others.

There are several elements in a golf course that can be designed to make the golf hole more difficult. Hazards are used in golf courses to add difficulty and interest to a

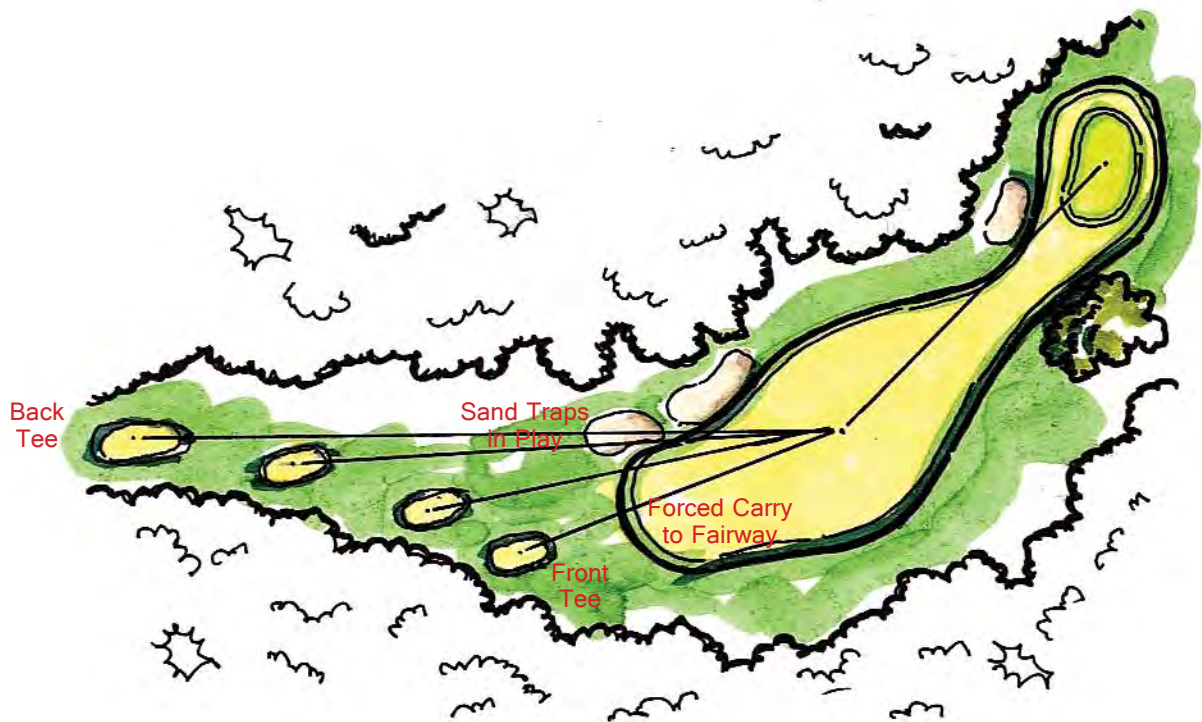


Figure 3.22 | Multiple tees to accommodate skill and confidence
(Author, 2014)



Figure 3.23 | Sand or grass bunkers
 (Author, 2014)



Figure 3.24 | Water features
 (Author, 2014)

golf hole (Hurdzan, 2005). Hazards typically include sand or grass bunkers (Figure 3.23) and water features (Figure 3.24), but any other design element that is included to penalize errant shots is considered a hazard. Spacing, size and number of hazards on a golf hole will greatly influence the difficulty of the golf hole (Figure 3.25). Fairway width can significantly affect the difficulty of a hole as well. Hitting from the fairway of a golf course is preferred over hitting from the rough because there is less resistance between the club head and the turf. The narrower the fairway, the more difficult the tee shot, which ultimately makes for a more

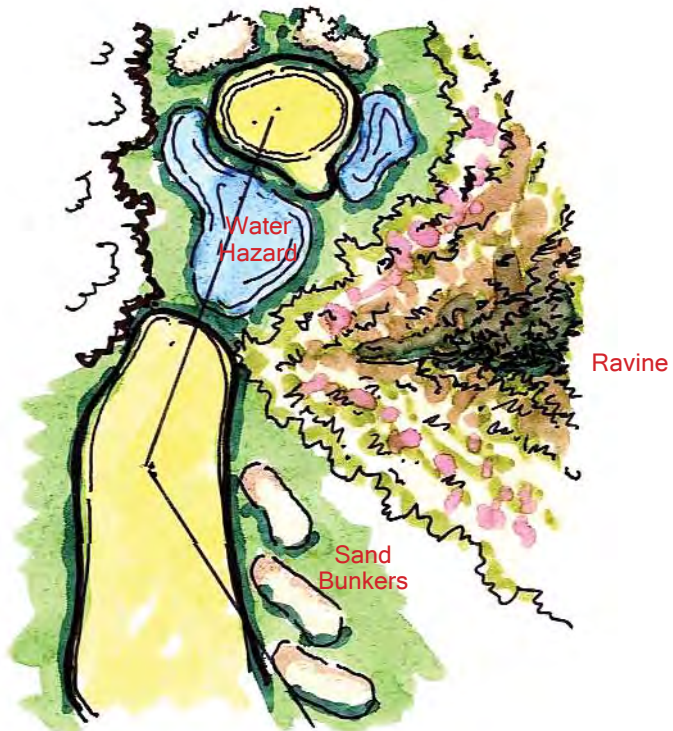


Figure 3.25 | Difficult hazards
 (Author, 2014)

difficult golf hole. Other factors to consider are elevation change and wind direction. An uphill golf hole into a stiff breeze will make for a difficult hole. Conversely, a downhill hole with a tailwind will make for an easier hole. A challenge course within the golf landscape can be interpreted as a consecutive group of difficult golf holes.

The design of the physical challenge course within a golf landscape for veterans might include a series of uphill holes, with narrow fairways and increased hazards. The veterans should be aware that they are entering the challenge course to reinforce a sense of comfort and avoid an upsetting surprise. The challenging section of the golf course, however, must remain within reasonable limits of the golfer's mental and physical abilities (Wagenfeld et al., 2013). After completing the intentional challenge course, it is intended that veterans will have enhanced their sense of competence and adaption level as well.

2. Physical and Emotional Security

Individuals who are suffering through severe injuries along with cognitive and emotional disturbance are at higher risk for accidents. Precautions within the landscape must be made to prevent themselves and others from physical harm (Marcus & Sachs, 2013). A therapeutic outdoor environment for veterans with PTSD should feel safe. Precautions and design features that ensure physical and emotional security include making the environment easily accessible and reducing sun exposure and glare.

Any outdoor space designed for combat veterans with PTSD should be fully accessible by the standards and regulations in the American Disabilities Act (ADA). In some instances, the design may need to go beyond ADA regulations to accommodate for wounded warriors and other physically handicapped individuals (Marcus & Sachs, 2013). The golf landscape can interpret accessibility standards to inform design recommendations.

Recent advances in standing power-assisted wheelchairs have made the sport of golf more accessible to those who have limited mobility due to injury or disability. Companies like SoloRider in Plano, Texas manufacture and sell a line of single-rider and adaptive golf cars for people with disabilities (“Home Page,” 2013).

SoloRider was founded in 1994 by Roger Pretekin as American Golf Car. Pretekin was determined to find a solution for mobility impaired golf enthusiasts to play golf. Their

first model was a scooter-type model that did not provide adequate stability on slopes, nor was it comfortable to ride in. Their solution was to build a single-rider golf car. The company changed its name from American Golf Car to SoloRider in 1999 to reflect the company’s focus on single-rider golf cars. In late 2004, SoloRider announced their latest single-rider golf cart model, the SoloRider 3400 series (Figure 3.26) (“Home Page,” 2013). Vehicles like the SoloRider and other mobility assisted golf cars must



Figure 3.26 | Double amputee operates a SoloRider 3400 Series
(SoloRider, 2013)

be accommodated for in the design of a therapeutic golf landscape for combat veterans.

Single-rider golf cars are built to travel on any part of the golf landscape by using turf-friendly tires, special suspension to handle uneven terrain, and lateral stability control to accommodate for steep slopes. There are, however, design guidelines to optimize a golf landscape to accommodate for single-rider golf cars including accessible bunker design, incorporating larger greens and tee boxes,

avoiding steep slopes within the playing area, and providing precautionary signage.

Accessible bunker design refers to shallow bunkers that accommodate for single-rider golf cars (Figure 3.27). Deep bunkers with steep lips are not suitable for single-rider golf cars (Figure 3.28). Accessible bunkers should be large enough to combat the negative effects of vehicular traffic and compaction. A smaller bunker may withstand more damage from frequent vehicular activity that displace the bunker sand and harm the bunker's edge

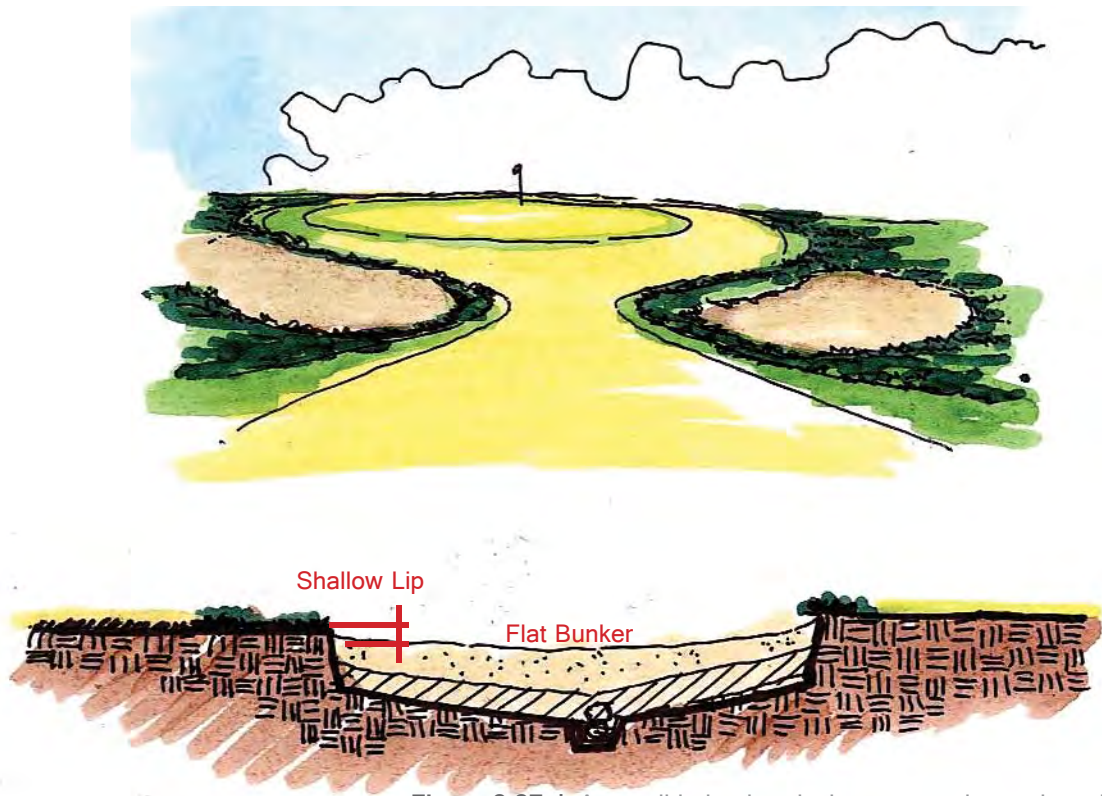


Figure 3.27 | Accessible bunker design perspective and section
(Author, 2014)



Figure 3.28 | Deep pocket bunker
(Author, 2014)

condition (Figure 3.29-30).

A golf landscape optimized for the use of single-use golf cars needs to incorporate larger green areas and tee areas. Although these vehicles are designed with turf friendly tires, repeated and concentrated traffic on turf areas can be harmful to sensitive playing surfaces. The SoloRider, with batteries, weighs 759 pounds and with a rider, the weight can exceed 850 pounds (“Home Page,” 2013).

Turf on smaller greens and tee boxes cannot

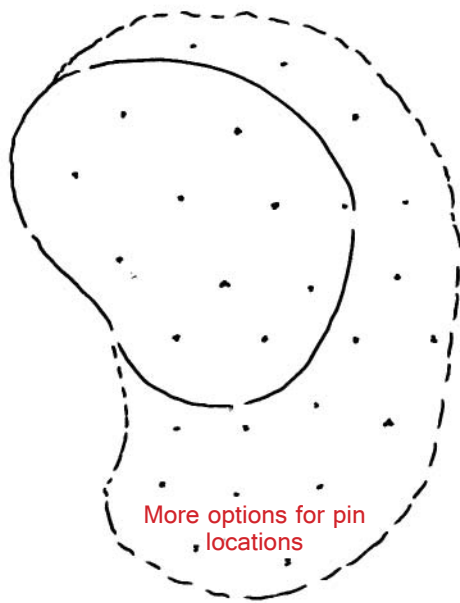


Figure 3.29 | Larger green areas
(Author, 2014)

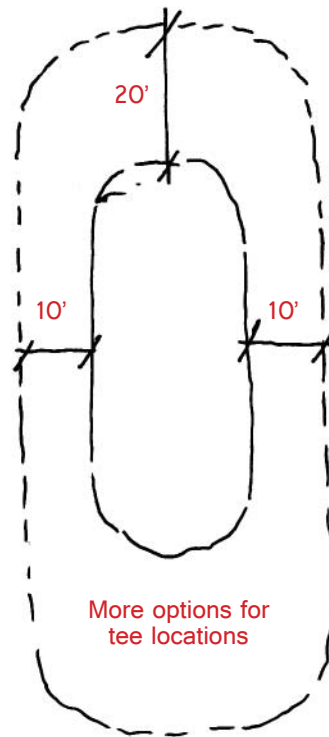


Figure 3.30 | Larger tee areas
(Author, 2014)

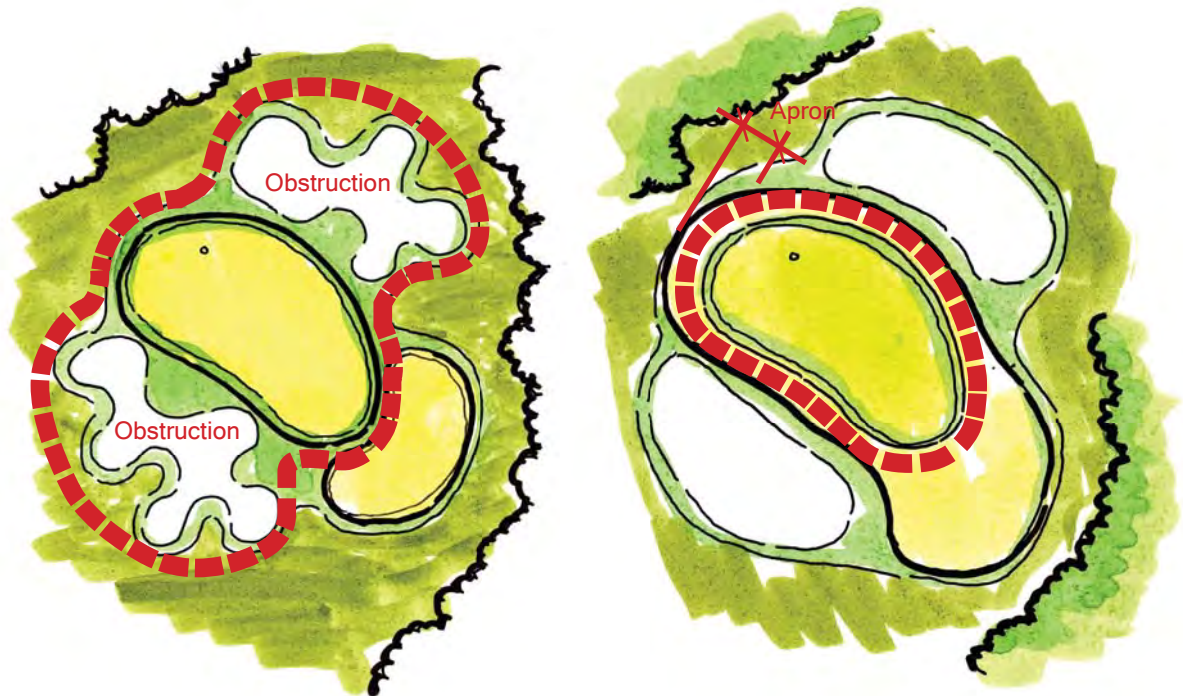


Figure 3.31 | Green area circulation diagram
(Author, 2014)

withstand the compaction caused from frequent and concentrated vehicular traffic. Therefore, the putting green and tee box turf areas should be large enough to reallocate and distribute the weight of single-rider golf cars. Putting greens and tee box areas will also need flat and large enough aprons for vehicular circulation.

The apron refers to the space immediately surrounding the defined playing surface (Figure 3.31). Aprons will need to remain free of obstruction to allow single-rider vehicles to circulate around the space before entering the sensitive playing turf. Golfers who are using single-rider golf cars should be instructed to minimize turning their vehicles on these

playing surfaces to reduce turf damage. By incorporating obstruction free aprons around green areas, single-rider golfers will have improved access and circulation around the putting greens and tee box areas.

Single-rider golf cars are designed to travel on steep slopes, but are not permitted to travel on slopes that exceed a 20% incline (“Product Specifications,” 2013). Users are also warned to avoid negotiating obstacles on inclines, nor are they approved to stop on steep inclines. Therefore, the entire golf course should be designed so that a golfer who is using a single-rider golf car can navigate throughout the golf landscape without restrictions, and without fear for their personal safety and security. The golf landscape should avoid steep slopes within the playing area of each hole. When this is not possible due to topographic limitations, clear signage should be provided to warn users of the terrain conditions.

Increasing the signage within the golf landscape to include grades and turf conditions can promote physical and emotional safety and security. A therapeutic golf landscape for veterans with PTSD should provide legible signage to inform players of the slopes and typical turf conditions. All

grades over 5% should have corresponding signage. Slope percentages illustrated in the signage should be adopted from the same increments provided in the ADA standards for purposes of familiarity:

0-5% : No signage required

5-8.33% : Should be identified as a ramp and an arrow should point to the nearest handrail.

8.33-12% : Maximum slope for stopping and operating a single-rider golf car

12-20% : Maximum slope for single-rider golf car, operators must drive in a straight line through the incline. Stopping is not permitted.

20% + : Single-rider golf cars are not permitted access

In order to prevent personal injury and harm, a handrail should be provided where slopes exceed 5% (per ADA regulations) within the playing area for a given hole. Players should also be notified if the ground surfaces of the slopes are in fair condition. If not, players should be notified and precautions should be made to restrict vehicular traffic on said slopes. If the above recommendations are met, the golf landscape will reduce risk of personal injury and harm regarding the accessibility of the environment.

Another design consideration for designing therapeutic environments for combat veterans with PTSD is to reduce sun exposure and ultraviolet glare. Combat veterans suffering from PTSD may be taking antidepressants and anxiety medications to alleviate the symptoms associated with PTSD. Many of these medications can make people more susceptible to the sun's glare and ultraviolet rays (Marcus & Sachs, 2013).

Paving and site furnishings should use materials that minimize glare and reflection. Changes in tone on the ground plane can be perceived as a change in grade,

which can make people uneasy about where to walk, and at worst, cause people to trip and fall trying to negotiate through what they perceive as holes or steps (Marcus & Sachs, 2013). The ground plane should consist of a single color, or low contrast colors that have a matte finish to avoid creating visual cliffs.

A therapeutic landscape for this specific population must offer a variety of shaded areas throughout the environment. Overhead trellises and shade structures, however, can cast striped shadows on the ground plane which might be perceived as being hazardous (Marcus & Sachs, 2013).

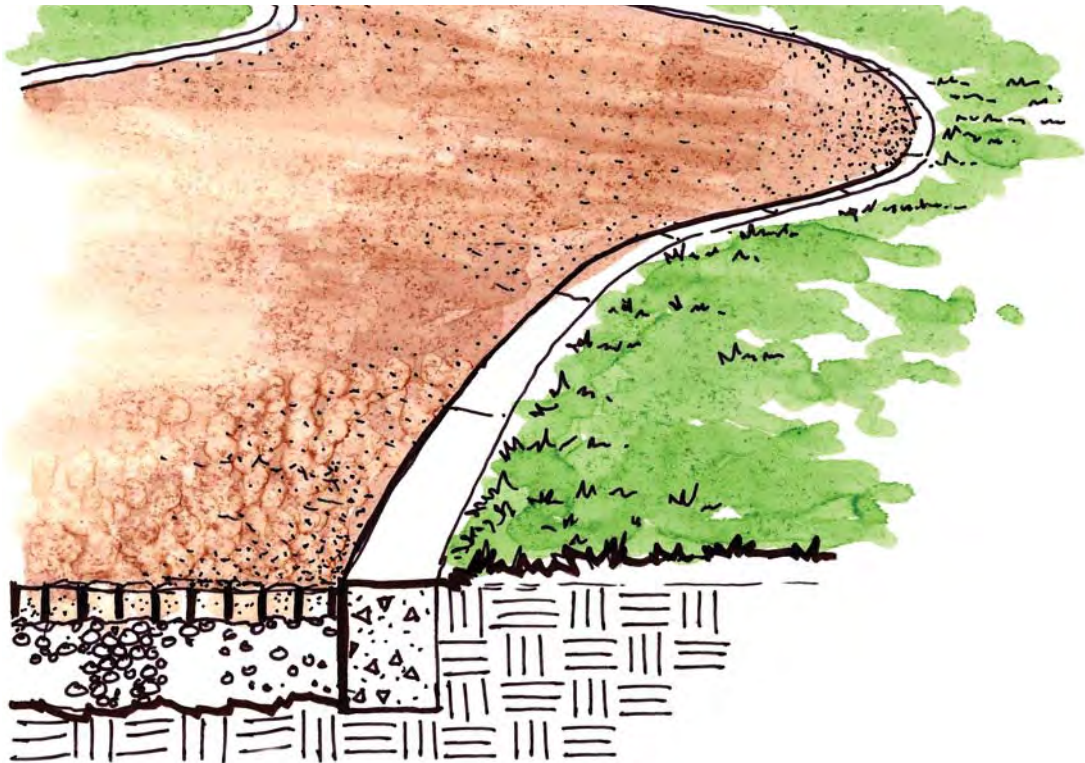


Figure 3.32 | Crushed gravel cart path
(Author, 2014)

Therefore, all shade structures incorporated in the design should cast a solid shadow.

In the golf landscape, precautions can be made to avoid ultraviolet exposure and sun glare for the participants. A therapeutic golf landscape for veterans should provide various degrees of shade for physical comfort. Large trees should accompany the gathering spaces on the golf course, including the tee boxes and putting greens. Veterans should be able to park their golf carts in the shade and walk up to the putting green or tee box areas. If possible, cart paths should be routed through the shade cast from adjacent woodlands.

Cart paths in a therapeutic golf course for veterans should be constructed with non-reflective material to reduce glare and harsh contrast with the adjacent landscape. A cart path built from non-reflective crushed stone

will provide several therapeutic benefits in a golf landscape (Figure 3.32). Crushed stone cart paths made from non-reflective stone will reduce glare as opposed to the brighter and more reflective concrete alternative. Crushed stone cart paths will also have a more natural feel than the poured concrete or asphalt alternative, and reinforce the golfer's connection to the natural environment.

Sand bunkers in a therapeutic golf landscape for combat veterans should be designed for sensory comfort without sacrificing playability. Generally, in golf course design, light colored sands are preferred for bunker use (Figure 3.33). The whiter sand creates a dramatic high contrast effect with the surrounding landscape. Sand traps that use a lighter color sand, however, reflect the most sunlight. When considering the potentially adverse effects of excessive

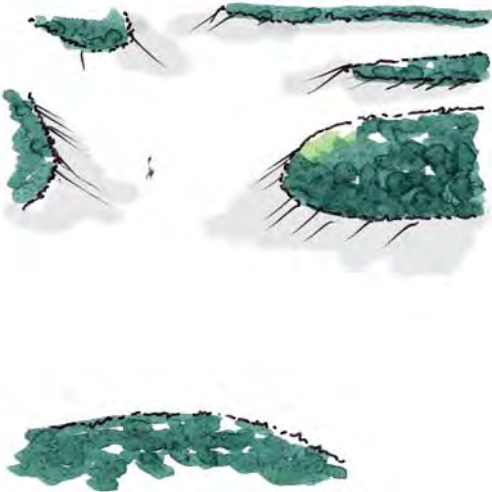


Figure 3.33 | White sand bunker
(Author, 2014)

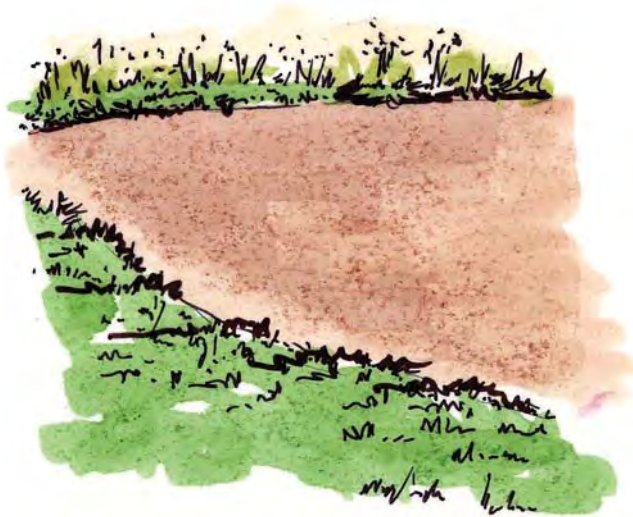


Figure 3.34 | Non-reflective bunker sand
(Author, 2014)

glare and sun reflection for someone with PTSD, the sand chosen for the bunkers should be a darker and less reflective sand. A darker sand of a local variety will reduce reflection and give the golf course a more natural appearance which will reinforce the golfer's connection to nature (Figure 3.34). The above recommendations are thought to reduce visual distress for veterans suffering from PTSD. All precautions should be taken to ensure that the golf landscape is secure, both physically and emotionally.

3. Physical Movement and Exercise

The physical and emotional benefits of physical movement and exercise have been well documented. An outdoor environment for combat veterans suffering from PTSD should include spaces for physical movement and exercise for its known ability to help reduce stress and depression. Walking paths and trail systems are commonly used for physical movement and exercise in therapeutic landscapes (Marcus & Sachs, 2013).

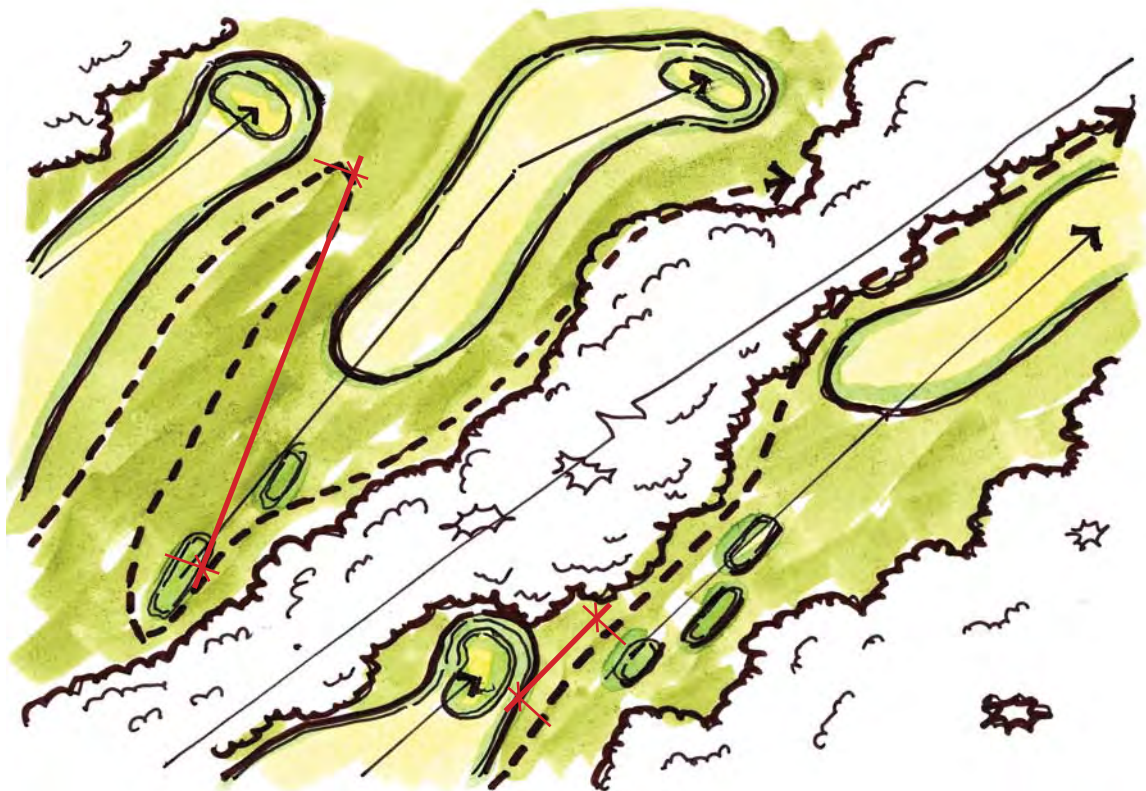


Figure 3.35 | Reduce distance between holes
(Author, 2014)

Walking circuits in an outdoor environment for PTSD will afford veterans the opportunity to enjoy being in nature, while maintaining physical movement. Incorporating walking trails of various levels and difficulty that both have interesting things to see or do will encourage veterans to use the trail regularly. In a golf landscape, the physical and emotional benefits of a walking path can be interpreted as walking the golf course instead of taking a cart.

Veterans who are physically capable of walking the golf course, should have the option to do so. The golf course should accommodate walkers by reducing the distance between putting greens and the following tee box (Figure 3.35). Doctor Woldkodoff of the Center for Health and Sport Science at the Rose Medical Center in Denver, CO conducted a study to determine the health benefits of walking the golf course. The results of his study revealed the average number of calories burned per nine holes of golf, depending if you walk and carry your golf bag (721 calories burned), walk and use a push cart (718 calories burned), or use a motorized golf cart (411 calories burned). Woldkodoff admits that his study was not perfect, referring to the small sample

size of eight golfers (men only) and the potential effect of cumbersome equipment used to measure the golfer's fitness levels (Pennington, 2010). Woldkodoff's study, however, reinforces the claim that a therapeutic golf course designed for combat veterans should make accommodations for golfers who chose to walk.

Total distance covered when walking a golf course can range from 1.5-2 miles per nine holes (Farahmand, Broman, De Faire, Vågerö, & Ahlbom, 2009). A therapeutic golf course might include mile markers along the cart path to reinforce a sense of accomplishment. It is recommended that every quarter mile, a marker appear alongside to the cart path (Figure 3.36).

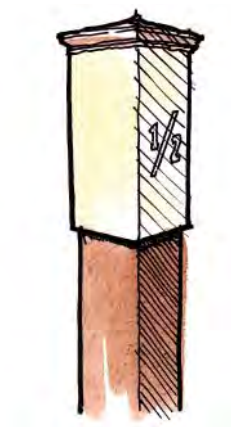


Figure 3.36 | Mile marker
(Author, 2014)

Table 3.9 | Duration interpretation in the Golf Landscape (Source: Author)

Physical Design Considerations	Therapeutic Outcomes
<ul style="list-style-type: none"> • Uphill paths and approaches to green area and tee box areas can create brief physical challenges • Provide shade at focus and gathering spaces • Avoid using reflective and glaring features; finishes should be matte • Maintain an ADA accessible golf course as much as possible • Provide handrails on steep climbs for those who are physically handicapped • Use recognizable golf features and hazards • Design uphill golf holes to challenge the golfer to think and swing harder • Group holes according to difficulty • Provide extra holes to replace easier holes • Reduce all risk of being hit by a golf cart, a car, a ball and a club 	<ul style="list-style-type: none"> • Hitting onto a narrow fairway within a confined corridor of trees feels challenging • Conquering a hole feels victorious and triumphant • Familiarity in the features of the golf course • Comfort in the landscape • Feeling secure in an enclosed space • Hole design can make the golfer feel threatened • Hazards can look harder than they are to play • Make the golf hole look harder than it actually is to make the golfer feel accomplished • Zones of challenge can encourage the golfer

Therapeutic Interpretation in the *Sport of Golf*

E. Duration

The sport of golf can be framed to address the therapeutic concepts associated with the treatment of the duration criterion. The sport of golf provides controlled stressors, physical and emotional security and movement and exercise.

1. Controlled/Graded Stressors

The sport of golf includes a variety of controlled and graded stressors. Beginning with the concepts that were discussed in the previous section, learning how to play golf is a stepwise process that can be a controlled and graded challenge for veterans. At the first stage, the veteran can learn the golf grip and posture. Next, they can learn to putt and chip, and slowly move through the progression of the swing before they are on the golf course, completing and recording a round of golf. This process of learning how to play can be therapeutic for a veteran because it challenges them to continue to progress and improve while

doing a meaningful and purposeful activity.

Veterans that have successfully completed the challenge to learn how to play, or veterans that already know how to play can find additional therapeutic challenges on the golf course. Veterans that continue to play and practice will likely see their golf scores improve. Veterans can set their own challenges by setting personal scoring goals for their total score, or for individual holes.

The sport of golf, however, can include more than therapeutic score challenges. There are social challenges as well, which can be framed as controlled stressors. At first, a veteran with PTSD learning how to play golf might not feel socially comfortable playing in a group of experienced strangers. Therefore, socially graded stressors should be incorporated into a veteran's therapeutic golfing experience. The first stage of this process, the learning process, will largely consist of time spent individually and time spent with an instructor. Lessons with an instructor should be either one-on-one

instruction, or small group sessions with veteran golfers with similar experience and skill level. The first stage is intended to be the least socially challenging.

The following challenges should steadily increase the social interactions with others in the golf environment. From learning how to play in a group with other veterans, to eventually feeling comfortable enough to play with a group of strangers, the sport offers several social challenges that could have therapeutic value for combat veterans suffering from PTSD.

2. P h y s i c a l a n d E m o t i o n a l S e c u r i t y

The therapeutic concepts associated with physical and emotional security can be interpreted into the sport of golf as preparedness. A prepared golfer will feel more physically and emotionally secure before playing a therapeutic round of golf. Precautions can be made so that all veterans and wounded warriors alike are prepared to play the sport of golf.

An unprepared veteran that attempts to play a round of golf will not benefit from the game's potential therapeutic benefits. It is important that veterans learn how to properly swing the golf club, learn the rules and practice good etiquette before playing on a golf course. If not, the golfer will feel insecure and feel outside of their element. A golf course with proper practice facilities will help veterans learn how to play without feeling the pressure of playing on a real course. A short game area will provide new golfers the opportunity to learn the rules and common etiquette of the game. This understanding will help veterans feel more comfortable and secure on the golf course. When veterans new to the game feel comfortable, they can graduate from the practice facilities and advance to the golf course.

For veterans that already know how to play the sport, practice areas can be important for golfers to physically and emotionally prepare before their round. Golfers can physically prepare by stretching and hitting golf balls into the driving range.

By physically preparing, the golfer will not only reduce the risk of personal injury, but will also improve their confidence and feel better prepared emotionally.

Finally, wounded warriors and veteran golfers who are learning to play with a physical handicap should prepare physically and emotionally before entering the real golf course. This potential audience should have the opportunity to practice in a private space for emotional security. Many veterans, especially those with physical injuries, may feel insecure learning how to play golf. Accommodations should also be made for those who are learning how to play golf in a single-rider golf cart. A practice facility like the short game area is a suitable space for veterans to learn how to operate the single-rider golf cars. With the proper instruction, veterans will feel better prepared to play golf, which will make the experience of the sport of golf more secure both physically and emotionally.

3 . P h y s i c a l M o v e m e n t a n d E x e r c i s e

Although the sport of golf is a low-intensity form of exercise, research suggests that playing golf can have a significant impact on health. A research team, led by Professor Anders Ahlbom, analyzed the mortality rate among Swedish golfers compared to the general population. Their investigation studied over 300,000 Swedish golfers and found that the mortality rate of the golfers was about 60% of those in the general population, regardless of sex, age and socioeconomic status. Their findings, which are published in the *Scandinavian Journal of Medicine & Science in Sports*, suggests that golfers have a greater life expectancy by roughly five years. Golfers with the lowest handicap, the more skilled players, had the lowest mortality of the studied population. One can assume that someone with a lower handicap plays more often and more intensely than someone with a

high handicap (Farahmand et al., 2009).

While the above research could not conclude definitively that the 40% decrease in mortality rates were linked directly to the physical activity associated with playing golf, the researchers do believe there is a valid connection. They also identified a potential correlation between playing golf and a healthy lifestyle, citing that the lifestyle choices may

be the cause of the reduced mortality rates (Farahmand et al., 2009). All in all, this study reinforces the argument for the sport of golf, a leisure-time physical activity, as a healthy physical movement and exercise. Although the study does not guarantee that golfers will live longer healthier lives, it does identify a correlation between the two, and the health benefits associated with golf likely contribute.

Table 3.10 | Duration interpretation in the Sport of Golf (Source: Author)

Physically Therapeutic Outcomes	Psychologically Therapeutic Outcomes
<ul style="list-style-type: none"> • Walking the course can be demanding • There is required stretching and preparing your body physically • Playing the game is a physical exercise • The sport is minimally demanding physically • Learn to play golf by putting first and get used to holding a club • Move on to chipping and half swings • Eventually try 3/4 and full swings to learn the golf swing • Balance is required • Walking through a variety of ground cover, from paved pathways, to sand bunkers to native grasses and woodlands • Increase grip strength • Repeating a golf swing consistently 	<ul style="list-style-type: none"> • Continued play builds confidence • Increase sense of welcome by first learning to play in practice areas • Gradually pairing veterans with larger groups of other golfers reduces social stress • Provides sense of membership and stewardship of the land when you belong to a golf club

DSM-IV-TR Criterion: F. Functional Significance

F. Functional Significance

The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Concepts Extracted from Literature Review

Therapeutic Concepts Associated with Treatment	Physical Translation within a Landscape
<ol style="list-style-type: none"> 1. Meaningful / Purposeful Activities 2. Coherence / Orderly 	<ul style="list-style-type: none"> • Farming and other horticultural activities • Dog training • Provide space for children • Maintain an orderly and organized plan to avoid confusion • Include outdoor spaces for exercise in nature

Therapeutic Interpretation in the Golf Landscape

F. Functional Significance

The sixth criterion in the DSM-IV-TR for diagnosing PTSD is functional significance. Functional significance is a symptom that occurs when the trauma significantly impairs the person's social, occupational or other important areas of functioning (American Psychiatric Association, 2000). The therapeutic concepts associated with the treatment of functional significance focus on restoring purposeful activities and order to the person's life.

1. Meaningful and Purposeful Activities

Engaging in purposeful activities helps veterans restore meaning back into their lives. Therapeutic environments for veterans recovering from PTSD should encourage veterans to engage in tasks and activities that they want and need to do (Wagenfeld et al., 2013). Designing such spaces begins with a complete understanding of the specific population intended to use the space. A

therapeutic environment for veterans with PTSD should support a range of activities and occupations including physical and psychological therapies, athletic training and task specific jobs like service dog training or farming (Wagenfeld et al., 2013).

The above criteria for making spaces support meaningful and purposeful activities can be interpreted and thus applied to a golf landscape. For veterans who already play golf, a golf landscape might already be perceived as an outdoor environment to engage in a personally meaningful activity. Veterans who already find meaning by participating in golf should find it therapeutic.

Veterans who are just learning how to play golf may find that a golf landscape can become a meaningful and significant environment. By incorporating the necessary facilities to teach a veteran how to play golf, they may experience the therapeutic benefits of the game and appreciate the golf course as a meaningful environment.

A therapeutic golf landscape built to honor combat veterans can potentially become a meaningful place for purposeful activities.

The golf landscape, however, can support therapeutic activities beyond the golfing experience. The golf landscape is built using design elements that require scheduled maintenance. Traditional golf elements include turf areas, sand bunkers and trees, which all have maintenance requirements. The turf areas, which include the putting greens, fairways and rough areas need frequent mowing to maintain playability and aesthetics. The maintenance of the golf

landscape can be an opportunity for veterans who are suffering from lack of functional significance to restore purposeful activity in their lives. Veterans can volunteer to assist in the maintenance and preservation of the meaningful landscape. The design of the golf course can simplify the maintenance routine by reducing areas of turf that need scheduled maintenance. Maintenance demands can also be minimized by simplifying and reducing the bunkers on the course. Lastly, the design of the golf landscape should reduce turf areas that cannot be reached by mowers. A properly designed therapeutic golf landscape can

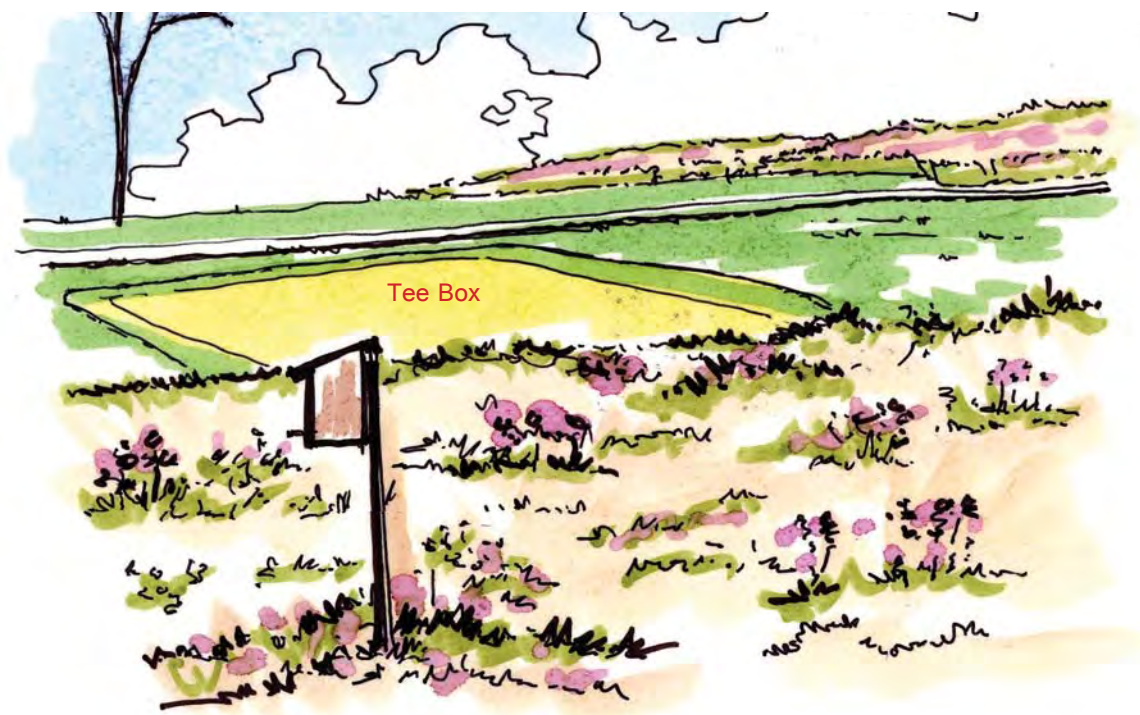


Figure 3.37 | Bird boxes near a tee box
(Author, 2014)

reduce the required maintenance, and provide opportunities for veteran involvement in the management of the facilities.

A golf landscape that includes high quality habitat areas for local wildlife will require management as well (Figure 3.37). As alluded to earlier in this study, veterans can have an obsessive interest in wildlife. A landscape that affords veterans an opportunity to contribute to the purposeful activity of caring for wildlife can be a therapeutic experience for veterans suffering from PTSD.

A therapeutic golf landscape for veterans with PTSD can also provide vocational opportunities, so that they can contribute to personally meaningful projects. Research suggests that depression symptoms can be avoided when people are given opportunities to engage in activities that restore their sense of optimism and sense of control (Hammell, 2004). Veterans can take pride in their efforts to maintain a meaningful landscape for themselves and their comrades.

Coherence and Order

Outdoor environments for veterans with PTSD must be coherent. Coherent and orderly environments requires less energy from the user to understand. Designing

landscapes for veterans that are coherent and orderly will reduce potential feelings of uncertainty thus reducing added stress (Marcus & Sachs, 2013). Spaces that can be readily understood in their entirety are more comfortable spaces for veterans with PTSD (Marcus & Sachs, 2013). A coherent and orderly golf landscape for veterans will include easily distinguishable spaces, clear wayfinding and site furnishing.

The golf landscape is made up of several spaces. The first space encountered is the entrance and driveway. When veterans arrive at the facility, they should feel welcomed and safe. The entryway at a therapeutic golf landscape must be coherent and orderly to not raise doubts or suspicions from new guests. The entry progression should begin with a clearly defined entrance, legible signage, and visual confirmation that a golfing facility is being entered. Visual confirmation includes views of identifiable golf landscape features. Therefore, visual buffers should be avoided near the entrance so that incoming guests can visually confirm their location, and confidently proceed towards the clubhouse and bag-drop area by following signage.

Required ADA parking should be provided by regulation, however, a therapeutic golf course for combat veterans, some of which are wounded warriors, should go beyond minimal requirements. Pedestrian circulation from the parking lot to the pro shop should be direct. There should be a clearly marked, safe and accessible path to the clubhouse.

In the golf landscape, distinguishable space can be interpreted into well defined practice spaces and clearly defined fairways and hole routings. A golf facility for veterans,

as alluded to earlier, should include practice areas to facilitate the learning process. The golf course, and the practice areas should be well defined. A veteran should also be aware of which practice space they are occupying and which regulations and restrictions apply to that space. This can be facilitated through coherent and legible signage. Landscape elements, like buffers and fencing, should be employed to define the edges of these spaces. These spatial dividers will also deflect errant shots, to ensure the safety of others on the property. A therapeutic golf landscape for



Figure 3.38 | Clearly defined fairways, rough, and native areas
(Author, 2014)

veterans suffering from PTSD must include a coherent progression through spaces, beginning with the entry, and must maintain distinct boundaries between spaces. Such precautions will ensure a coherent landscape for a specific population to reduce potential apprehension and suspicion.

Maintaining clear edge conditions between turf areas will reduce a golfer's confusion of where to aim next (Figure 3.38). From the tee box, veterans should have a clear view of the target landing area. This can be achieved by reducing blind shots and sharp turns, or doglegs. Blind shots can be reduced by avoiding uphill shots where the golfer cannot see their target area, or the flag pole from their location on the fairway or the tee box. The design of a therapeutic golf landscape for veterans should avoid creating holes where the golfer cannot see their intended target. Such precautions in the golf course design are intended to reinforce the golfer's sense of coherence in the environment.

Lastly, a coherent golf landscape should use clear wayfinding and consistent site furnishings. Wayfinding through the golf course should include visible and easy to understand signs, color coding and

numbers. Wayfinding provides users with clear direction in an otherwise potentially confusing physical setting. Clear wayfinding systems have proved to reduce patient stress in therapeutic landscapes, where users are able to better focus on environmental demands and worry less about becoming lost (Wagenfeld et al., 2013). Signage in a therapeutic golf landscape should occur more frequently than a standard golf landscape to reinforce the golfer's sense of orientation. Site furnishings in a golf landscape include benches, trash receptacles, water coolers and tee markers. The collection of site furnishings employed in the golf landscape should be consistent and use a consistent theme and material palette. The therapeutic experience of the golf landscape can be improved by employing consistent and coherent wayfinding and furnishings.

Table 3.11 | Functional significance interpretation in the Golf Landscape (Source: Author)

Physical Design Considerations	Therapeutic Outcomes
<ul style="list-style-type: none"> • Include landscapes that need to be maintained and taken care of including management areas • Provide wildlife habitat areas, where there is opportunity to maintain the home of wildlife • Simplify the management program of the golf course so veterans can assist in its care • Maintain distinct boundaries between spaces • Avoid crossing paths and confusion in the cart paths and circulation patterns • Use consistent signage and site furnishings • Avoid deceiving the golfer with blind shots and ambiguous hole design 	<ul style="list-style-type: none"> • Participating in golf course maintenance engenders a sense of pride and purpose • There is unlimited challenge in trying to improve • Memorable golf holes make the experience last beyond the golf course • There is a place attachment to special golf landscapes, which encourages return visits • Maintaining a golf course, provides a stewardship link to the land • Downhill shots feel accomplishing, golfers hit it further with the same swing • Greens can be shaped to funnel golf balls toward hole locations

Therapeutic Interpretation in the *Sport of Golf*

F. Functional Significance

The sport of golf can also be considered a therapeutic activity to address the functional significance symptom of PTSD. A veteran suffering through PTSD finds it difficult to participate in meaningful and purposeful activity. These symptoms can significantly impair a person's social, occupational or other areas of functioning (American Psychiatric Association, 2000). Concepts that are associated with the treatment of functional significance try to restore meaning, purpose and order to the veteran's life.

1. Meaningful and Purposeful Activities

The sport of golf, to some, may already be a meaningful activity. For combat veterans who played golf regularly before experiencing the traumatic event, a therapeutic golf landscape designed in their honor may encourage them to play again. This is especially true for wounded warriors, who may have given up on the game because they did not have the necessary equipment or a suitable golf landscape. The meaning of golf to some

may be restored with a therapeutic golf landscape built in their honor.

For those who have never played, the sport of golf can be an opportunity for them to participate in a new meaningful activity. The sport of golf may become a meaningful experience for combat veterans because of the social, psychological and physical opportunities to improve their well-being.

The sport of golf supports social interaction throughout the experience. Beginning with the clubhouse, golfers are commonly greeted and welcomed by the person behind the front desk. On the course, supportive dialogue is common between playing partners. The cordial experience of playing golf with friends, family or even strangers can be a significant step in the veteran's journey to improved health. Social skills learned on the golf course can be applied in daily civilian life, as veterans learn to reintegrate back into their community.

The sport of golf challenges players to manage their emotions. During a single round of golf, a player can experience great feelings of pride and accomplishment, or conversely, difficult

feelings of embarrassment and frustration. The sport of golf challenges players to manage their emotions, and finish their round. The psychological obstacles that present themselves during a round of golf can help a veteran learn patience.

Finally, as discussed earlier, research suggests that there is a correlation between playing golf and good health (Farahmand et al., 2009; Woldkodoff, 2009). A veteran may find the physical benefits of the game to be fulfilling.

Table 3.12 | Functional significance interpretation in the Sport of Golf (Source: Author)

Physically Therapeutic Outcomes	Psychologically Therapeutic Outcomes
<ul style="list-style-type: none"> • Practice requires an ordered approach, there is a method to learning how to swing a golf club • Practicing putting require standing tolerance 	<ul style="list-style-type: none"> • Golf encourages the practice of good etiquette • Helps golfers improve self esteem • Restores a sense of balance • Mentality to practice, improve and not give up • Self scoring sport requires honesty and integrity • League play is a scheduled event and requires team members to show up on time. • Promotes personal and team activities • Promotes accountability • Processing which club to use requires mental stimulation • Strive for excellence • Encourages personal goal setting

Chapter Conclusion

The first framework identified and suggested design considerations, that if applied to a golf course, would make the golf course a more therapeutic experience

specifically for U.S. combat veterans and service members suffering from PTSD. In summary, a therapeutic landscape for a veteran suffering from PTSD will include:

Need to Feel Safe

Avoid overlap of the safety envelope between each golf hole.

Sense of Control

Give veterans options from where they tee off from and where they can hit their tee shots. Offer them shot choices throughout the golfing experience.

Nature

Incorporate a naturalistic design style and maximize use of native vegetation. Increase the connection to nature by providing suitable habitat for local wildlife.

Complexity

Incorporate a diverse planting palette with layered planting design. Use sensory plants near gathering spaces.

Social Support

Shared tee boxes and putting greens can foster social encounter.

Controlled/Graded Stressors

Include stretch of difficult golf holes that are played consecutively. Veterans should be aware that they are entering a zone of challenge.

Physical and Emotional Security

The golf course should be accessible by ADA standards where possible. Include signage where grades exceed 5.0%. Reduce risk of accident by warning users of slopes that are too steep for single rider golf cars.

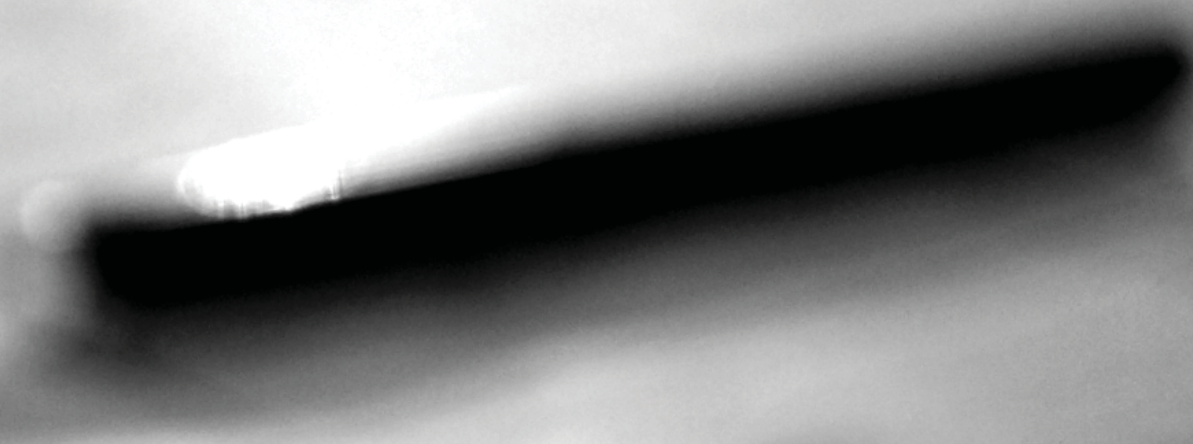
Coherence and Order

Circulation should be clear and avoid confusing intersections. Signage should be frequent, clear and legible.

Meaningful and Purposeful Activity

Provide ecologically sensitive areas, where veterans have the opportunity to care for habitat areas and wildlife.

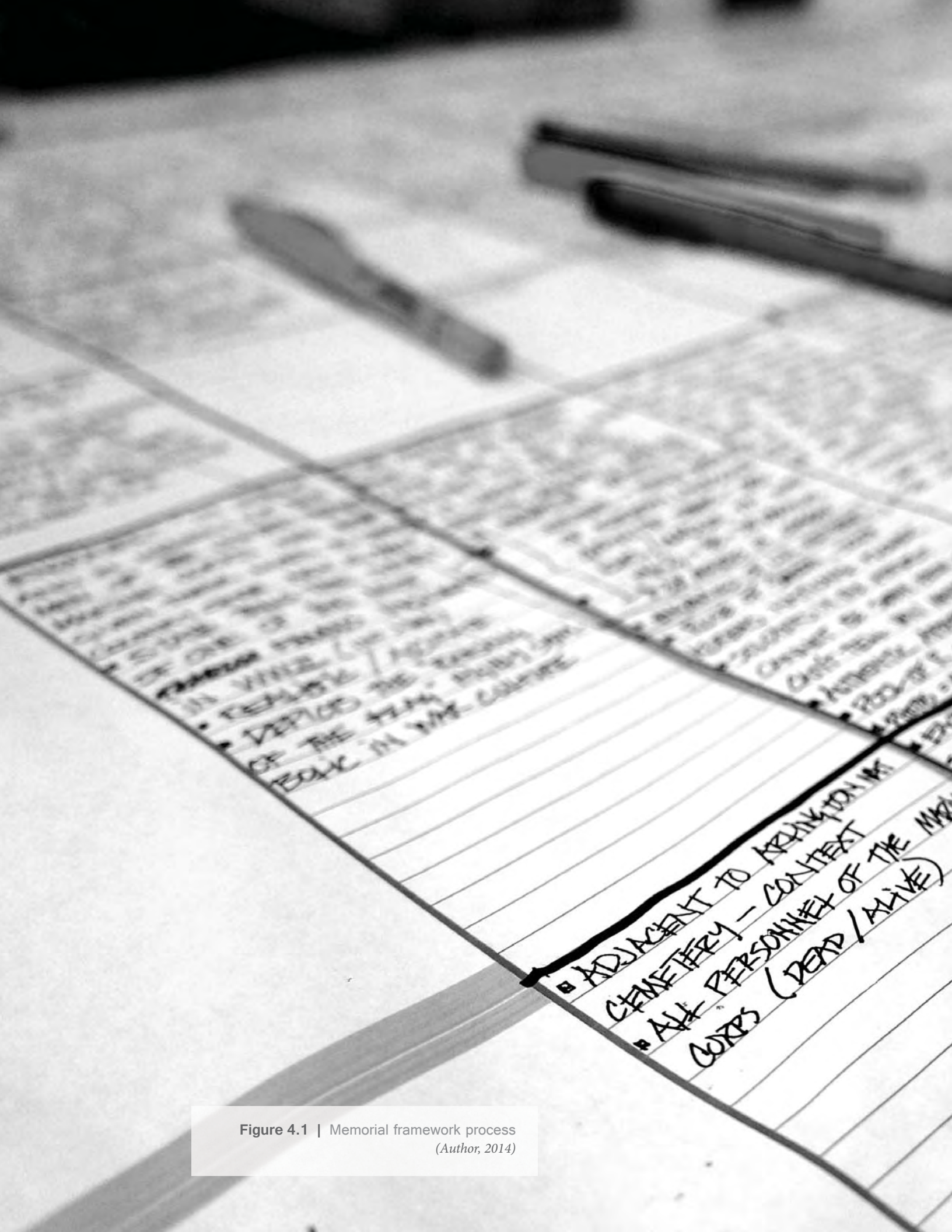
Figure 3.39 | Therapeutic framework process
(Author, 2014)



USEFUL
TO A
ROOM.
STARTLE
YOU MIGHT

CONTROLLED

WORTH



IN VIVID LIFE-LIKE
 DEPICTS THE "REAR"
 OF THE 42ND INFANTRY
 BOLD IN THE COURSE

ADJACENT TO ARKINGTON W/
 CEMETERY - CONTEXT
 ALL PERSONNEL OF THE MAR
 CORPS (DEAD / ALIVE)

Figure 4.1 | Memorial framework process
(Author, 2014)

MEMORIAL LANDSCAPE INTERPRETATION

4

After establishing the knowledge base, the next step was to interpret the information so that it could be applied as a design concept in the following stage. The interpretation was critical to the project, because it determines specific design considerations for the application phase.

... SERVICES & ...
... STATES AND ...
... 22 MEMBERS ...
... AMERICAN ...
... MORE ...
... STORIES ...
... OF MILITARY ...
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... LIKE THEY ...
... ONE ...
... ALL RANK ...
... WITH IMAGES ...
... MEMORIAL OF ...

Memorial Landscape Interpretation Framework Study

Introduction

The second design framework in the study investigated landscapes that were built in honor of American war veterans and service members. The following framework isolated each memorial landscape and extracted specific design considerations for creating landscapes that meet the experiential qualities of a memorial landscape. After a review of the literature, four experiential qualities of memorials were defined as a set of criteria to evaluate precedent memorials:

- Create meaning
- Incorporate ritual
- Narrate the meaning
- Evoke a dialogue

After studying each memorial, it was possible to identify specific design elements that fulfilled one or several of the experiential qualities of a memorial above.

The first step of the current framework was to establish qualities of a memorial landscape. This task was completed in the second chapter, in the knowledge base, where literature and precedents were reviewed to

gain a better understanding of memorial landscapes. Next, each memorial landscape was selected to be further investigated.

The investigation used photographs and aerial imagery to extract specific design elements that could be interpreted into one of the four experiential categories. The study, however, was limited because I was unable to personally access the memorials. Therefore, I was limited to photography and aerial imagery. The memorials also had web pages and other resources available through the internet.

The memorials included in the following framework include:

- Marine Corps War Memorial
- US Navy Memorial
- WWII Memorial
- Korean War Veterans Memorial
- Vietnam Veterans Memorial

Each memorial landscape was studied, and specific design moves were extracted and listed under the corresponding experiential quality. These findings are listed beneath each individual memorial column. After

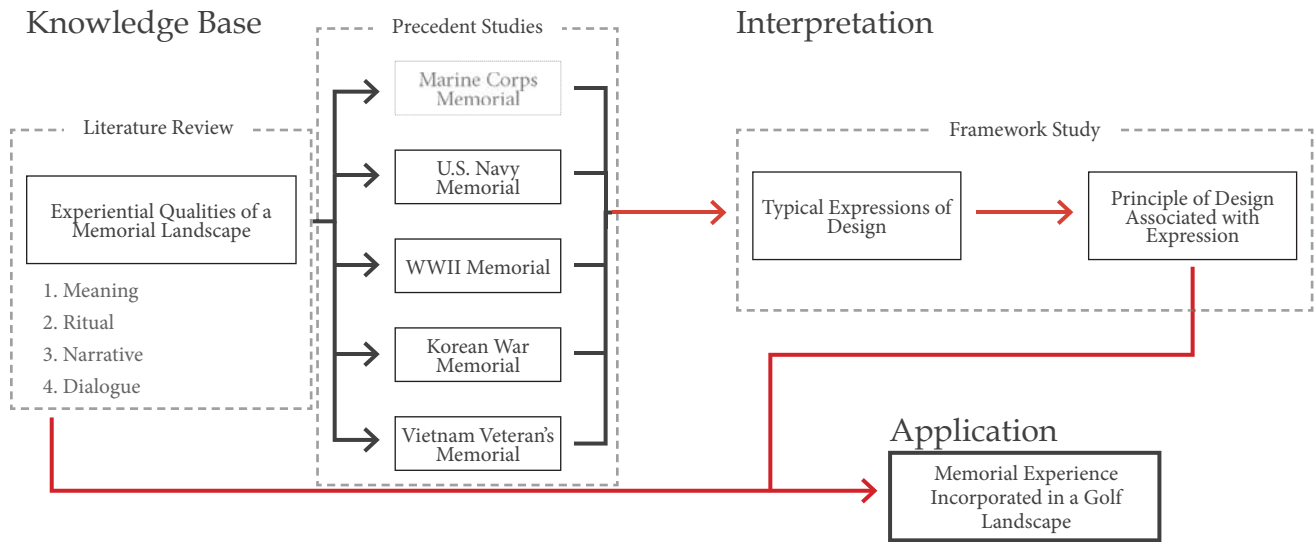


Figure 4.2 | Memorial landscapes process
(Author, 2014)

each memorial was studied, the data from the first part was synthesized and collected into a list of typical expressions. The goal was to look across each individual memorial, and build a collection of typical expressions of memorial designs. The next step was to further synthesize the data and construct a list of principles of memorial design. These principles were next interpreted into the golf landscape. The interpretation study suggested design considerations for incorporating authentic memorial experiences in a golf landscape.

The Application Chapter used the principles of memorial design and the interpreted memorial design considerations to inspire the design and layout of the Renovation Master Plan. Each experiential quality of memorial landscapes is further explored in the following chapter.

Experiential Quality of a Memorial: Meaning

Extraction from Literature Review

Meaning

The first quality of a memorial landscape experience is being in the presence of a culture's collective memory. Commemoration in a landscape requires a collective memory, and the designer strategically recalls a notable event to illustrate and share that memory with the audience (Hunt, 2001). The landscape incorporates a cultural significance and projects that meaning to those who visit. This experiential quality of memorial landscapes answers the question, "Who or what is this place built for?"

Each precedent memorial was evaluated to determine the underlying meaning. A collection of the typical design expressions in memorial design to incorporate meaning was extracted and collected. Finally, the typical design expressions could be further refined into a list of key principles of memorial design related to the meaning of the commemorative space. These principles of design could then be interpreted into a golf landscape. The final interpretation is later applied in the application phase of the report.

Precedent Memorial Landscape Study: *Meaning*

United States Marine Corps War Memorial

The United States Marine Corps War Memorial is built in *honor of all* United States Marines. On the east facing wall of the podium there is a message engraved in the granite facade that reads, "IN HONOR

AND IN MEMORY OF THE MEN OF THE UNITED STATES MARINE CORPS WHO HAVE GIVEN THEIR LIVES TO THEIR COUNTRY SINCE NOVEMBER 10, 1775." (Figure 4.3) This message establishes the subjects of the memorial which are being honored by the presence of the memorial.



Figure 4.3 | U.S. Marine Corps Memorial dedication engraving
(Rossman, 2003)

United States Navy Memorial

“The United States Navy Memorial honors the men and women of the United States Navy - past present and future.” This memorial’s meaning is established through a subtle engraving on the steps of

the memorial that reads “THE UNITED STATES NAVY MEMORIAL” (Figure 4.4)

The memorial, however, incorporates design cues to further establish meaning, including two large fountains (Figure 4.5), one which is dedicated to the United States Navy, and the other which is dedicated to the Navies of



Figure 4.4 | “United States Navy Memorial” engraved in stone
(AgnosticPreachersKid, 2009)



Figure 4.5 | The fountains at the U.S. Navy Memorial
(AgnosticPreachersKid, 2010)

the World. Two flagpoles are located on the south end of the memorial and are designed to look like ships' masts (Figure 4.6). One flag flies the American Flag, the other flies the flag of the United States Navy. Finally, the "Lone Sailor" statue can be found in the center of the memorial (Figure 4.7). "The Lone Sailor" stands as a tribute to all personnel of the United States Navy.



Figure 4.6 | Masts at the U.S. Navy Memorial
(Google Earth, 2011)



Figure 4.7 | "The Lone Sailor"
(GOTO, 2014)

World War II Memorial

The World War II (WWII) Memorial is the first national memorial dedicated to all who served at home and overseas during World War II. The memorial acknowledges the commitment and achievement of the entire nation (WWII Memorial Friends). The memorial's location is significant to the meaning of the memorial, as it is placed between the Lincoln Memorial and Washington Monument (Figure 4.8). The east entrance to the memorial is decorated with two large podiums that read, "WORLD WAR II MEMORIAL." (Figure 4.9) Also located at this entrance to the memorial is the announcement stone which establishes

the memorial's significance and meaning. It reads, "HERE IN THE PRESENCE OF WASHINGTON AND LINCOLN, ONE THE EIGHTEENTH CENTURY FATHER AND THE OTHER THE NINETEENTH CENTURY PRESERVER OF OUR NATION, WE HONOR THOSE TWENTIETH CENTURY AMERICANS WHO TOOK UP THE STRUGGLE DURING THE SECOND WORLD WAR AND MADE THE SACRIFICES TO PERPETUATE THE GIFT OUR FOREFATHERS ENTRUSTED TO US: A NATION CONCEIVED IN LIBERTY AND JUSTICE." (Figure 4.10) The focal point of the memorial plaza is the "Freedom Wall" (Figure 4.11) which displays 4048 stars



Figure 4.8 | WWII Memorial context map
(Google Earth, 2012)



Figure 4.9 | Podiums at the ceremonial entrance
(Williams, 2004)



Figure 4.10 | WWII Memorial "Announcement Stone"
(McLain, 2004)



Figure 4.11 | WWII Memorial “Freedom Wall”
(McLain, 2004)

each representing 100 American lives lost (Figure 4.12) (“Memorial Design,” 2013). The memorial plaza is sunken into the ground, which is a symbolic representation of the many sacrifices that millions of Americans made both at home and overseas.



Figure 4.12 | “Freedom Wall” gold star detail
(McLain, 2004)

Korean War Veterans Memorial

The Korean War Veterans Memorial is dedicated to the 5.8 million Americans who served in the United States Armed Forces during the Korean War. The memorial's meaning is grounded in the claim, that is engraved around the *Pool of Remembrance*, "FREEDOM IS NOT FREE." (Figure 4.14) A dedication stone can be found at the vertex of the two pathways near the *Pool of Remembrance* (Figure 4.13), the engraving reads, "OUR NATION HONORS

HER SONS AND DAUGHTERS WHO ANSWERED THE CALL TO DEFEND A COUNTRY THEY NEVER KNEW AND A PEOPLE THEY NEVER MET." (Figure 4.15) The memorial honors not only American troops, but also the 22 members of the United Nations that participated in the Korean War, 17 of which donated troops. The curb along the pathway to the north is decorated with the nations that participated in the efforts against oppression (Figure 4.16) ("Korean War Veterans Memorial," 2013).



Figure 4.13 | Aerial image of the Korean War Veterans Memorial
(Google Earth, 2012)



Figure 4.14 | "Freedom is not Free"
(Tucker, 2014)



Figure 4.15 | "Dedication Stone"
(Tucker, 2014)



Figure 4.16 | The "United Nations" curb
(Tucker, 2014)

Vietnam Veterans Memorial

There are various threads of meaning woven into the design of the Vietnam Veterans Memorial (VVM). The VVM is built in honor of all members of the United States Armed Forces who died in the Vietnam War. The memorial wall is inscribed with over 58,000 names of troops that have either been confirmed dead, or listed as missing in action or prisoners of war (Figure 4.18). One of the primary meanings of the VVM is to commemorate and honor the veterans,

not the controversial war itself. The only inscriptions on the long black granite wall are of the fallen military personnel, the dates in which the war lasted and a brief inscription dedicating the wall to the fallen warriors from the Vietnam War. The dedication text, however, is of the same variety of the text used in the names of the dead (Figure 4.19). The name of the war is not decorated on this memorial, the selfless sacrifice made by the troops is. The memorial is viewed as a wound in the landscape that is in the process of



Figure 4.17 | Aerial image of the Vietnam Veterans Memorial
(Google Earth, 2012)



Figure 4.18 | The names at the VVM
(Totya, 2014)



Figure 4.19 | VVM dedication at the vertex
(Twinblaze, 2006)

healing, yet there will always remain a scar in the landscape (Figure 4.17)(Sturken, 1991). The long horizontal experience is unique to the VVM which is unlike the traditional vertical nature of previous war memorials (Figure 4.20)(Wasserman, 2002). The sunken memorial is symbolic of the sacrifice that was made by those who participated in the Vietnam War.



Figure 4.20 | Approach to the Vietnam Veterans Memorial from the east
(Google Earth, 2013)

Table 4.1 | Typical design expression for meaning in a memorial landscape**Typical Design Expressions for *Meaning* in Memorial Landscapes**

- | | |
|---|---|
| <ul style="list-style-type: none"> • Symbolic monument of memorable event in United States history • Bronze statues accurately depicting a historical event • Dedicated memorial by the President of the United States • Tall statue atop a large podium • List of all those who were/are involved • Stainless steel statues are filled with life and movement • Larger-than-life sized statues, heroic in scale • Highly polished black granite walls to reflect visitors • Photographic imagery of events and people • Significant numbers related to the event • Reveal the numbers of those who died, wounded, missing and taken prisoner • Emotionally charged quotes: <i>sacrifice, nation, defend</i> • Honor those who made the sacrifice, not the war • Built in honor of ALL those who serve/served • <i>The Lone Sailor</i> recognizable figure to those in | <ul style="list-style-type: none"> the United States Navy • Engravings of historically significant messages in Naval history • Memorial below grade to reflect sacrifice • Reveal the price of freedom • Triumphant archways represent the conquering of the Atlantic and Pacific Oceans • Significant location between Lincoln Memorial and Washington Monument • Built in honor of those who died in service • Names of the fallen warriors puts the focus on the warriors and not the war • Depression or sinking experience into the landscape symbolizes sacrifice • Horizontal experience vs. vertical experience • Highly polished black walls to reflect the visitors faces on the names engraved in the wall. • Reflections cast the future on the past and create a bond • No hierarchy in the names of those remembered |
|---|---|

The above list is a compilation of all of the design expressions from the precedent study as related to the meaning quality of an authentic memorial experience. The typical design expressions can be further refined into a list of principles of design.

Table 4.2 | Principles of design for meaning in a memorial landscape

Principles of Design for *Meaning* in a Memorial Landscape

- Significant location in context of surroundings
- Physical reflections of the visitors on the memorial
- Reveal the numbers of the total killed, wounded, missing, taken prisoner
- Remind audience of the sacrifices
- Nation
- Defend
- Price of freedom
- Engravings in stone have a sense of permanence
- Database revealing total numbers of people
- Honor the warriors, not the war
- Depression or below grade represents a sacrifice
- Statues
- Bring the past to the present, the present to the past
- Accurate/authentic representations of the people and events

Meaning Interpreted in a Golf Landscape

A golf experience can incorporate meaning by interpreting the above principles of memorial landscape design into the golf landscape. The following will briefly describe how some of the above principles can be interpreted into a golf landscape.

Significant location in context of surroundings

A golf landscape can incorporate meaning by recognizing significant geographic locations in relation to the golf

course. Golf holes can be geographically oriented in a direction that points to a significant landmark or location. The golf landscape can also recognize VA facilities in the region and become affiliated with their efforts. By recognizing local VA facilities, and distant yet significant locations, the golf landscape can incorporate deeper meaning for U.S. combat veterans and service members.

Engravings in stone have a sense of permanence

A golf course can incorporate stone engravings throughout the landscape to embed meaning. The engravings can include a dedication stone, as seen in the precedent landscapes, that describes the meaning of the landscape. The golf landscape already uses signage to identify the golf hole number, the par, and the yardage. The existing signage can be adapted to incorporate meaning by using stone engraved with the hole information, and a memorial dedication.

Honor the warriors, not the war

A memorial golf landscape should be built in honor of the warriors and should avoid focusing the memorial on the war itself. The meaning of the memorial should reflect the honorable sacrifice that the veterans made. Some wars in the past have been controversial and dishonorable. The selfless sacrifice made by each veteran, however, is always honorable.

Accurate/authentic representation of the people and events

A golf landscape that incorporates meaning should provide an authentic

representation of the people or the events that are being remembered. If the golf course represents a narrative experience, the dates, times and setting should be accurate to the actual event. If the golf course incorporates meaningful design elements, they should be authentic representations. Statues and other figures in the landscape should be accurate to the person or object they are representing.

Remind the audience of the sacrifices

A golf course can incorporate meaning by reminding the playing audience of the sacrifices made by US combat veterans. A golf hole can be designed to include a depression into the landscape. Just as the VVM and the WWII memorials embed meaning into their landscape by sinking the surface below grade, a golf hole can do the same. Golfers can be made aware that the depression in the landscape is designed to reflect a meaningful experience of sacrifice. Golf holes can also be designed to a specific yardage, where each yard may represent a total number of lives lost or sacrifices made, like the gold stars at the WWII Memorial.

Experiential Quality of a Memorial: Ritual

Extraction from Literature Review

Ritual

The second quality of a memorial landscape experience is participation or ritual between the audience and the memorial. Incorporating a ritual experience in a memorial supports the landscape's cultural value and meaning through visitor participation.

Professor Judith Wasserman, of The University of Georgia, argues that ritual has become an “essential component” of the contemporary memorial experience (2002, p.193). In Western cultures, memorials are increasingly becoming places as holders of ritual for community restoration (Wasserman, 2002). Ritual in memorial design is conceived in two ways.

The first, is a ritual that is intended in the original design. This includes a dictated procession through spaces, and directed views, which are all part of the original design. The second, is a ritual experience that is not originally intended. These rituals are typically developed by the participating audience, or by design interventions that occur after the

completion of the memorial. These ritual experiences are considered as impromptu ritual experiences. When such impromptu rituals are popular amongst the audience, their experience becomes just as powerful as the designed ritual. Some memorials, however, include a designed participatory ritual as a key part of the memorial's intended experience.

Jochen Gerz and Esther Shalev-Gerz's, Monument against Fascism in Hamburg, Harburg, Germany is an example of a participatory ritual orchestrated by the designer (Wasserman, 2002). Their design for the monument was a lead coated one meter square column that stood 12 meters tall. The monument invited residents and visitors to sign against fascism by engraving their name into the column. As soon as the accessible section of the obelisk was covered in signatures, the column would be lowered into the ground. This process continued for seven years before the once towering column was submerged completely into the ground in 1993. Before the column completely disappeared, over 70,000

people joined in the participatory ritual – signing their name against fascism (Gerz, 2011). The disappearance of the column allowed the community to feel empowered against fascist oppression (Wasserman, 2002).

The following precedent studies will explore ways in which American war memorials have incorporated rituals to enhance the memorial's experience. The

ritual experiences will be described as either an intentional/dictated or impromptu ritual experience. Some of the precedent memorials incorporated a strong sense of ritual experience, and some did not. Some memorials have, over time, accrued impromptu experiences, while some memorials have not. The following study describes each precedent, and how a ritual experience is included in the landscape.

Precedent Memorial Landscape Study: *Ritual*

United States Marine Corps War Memorial

The dictated ritual experience at the U.S. Marine Corps War Memorial is influenced by the traditionally vertical and outstanding size of the memorial. The memorial incorporates a bronze cast statue atop a large podium base. Visitors approach the memorial, stand in its grand presence, and admire the size and intricacies of the figures cast in bronze. The total height of

the memorial is 78', which includes the 32' figures hoisting up a 60' flag pole (Figure 4.21). The memorial is to be admired, and visitors are welcomed to circulate around the memorial, and read the various inscriptions on the podium. The memorial sits at the top of a gentle hill and is surrounded by open lawn (Figure 4.22). The vertical appearance of the memorial is exaggerated by its surrounding landscape context. The designed ritual experience at the U.S. Marine Corps

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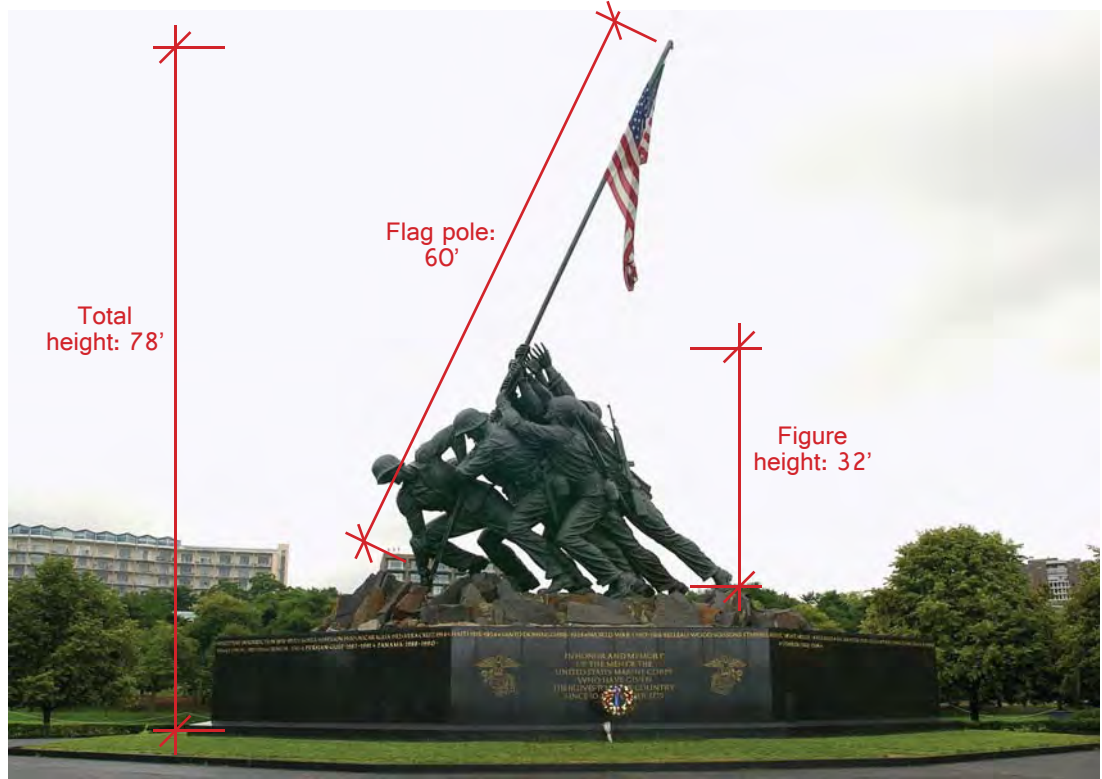


Figure 4.21 | The U.S. Marine Corps War Memorial
(Rossman, 2003)



Figure 4.22 | Aerial image of the U.S. Marine Corps War Memorial
(Google Earth, 2012)

Memorial is an example of a traditional memorial experience where a triumphant statue sits atop a podium. There is no clearly defined order or sequence to experiencing the memorial.

Through time, additional rituals have been incorporated into the experience of the U.S. Marine Corps War Memorial. On June 12, 1961 President John F. Kennedy proclaimed that the flag atop the U.S. Marine Corps War Memorial is to be flown 24 hours a day every day of the year (Fredriksen, 2011). Since 1956,

during the summer months, the memorial is the center piece of the weekly Sunset Parade (Figure 4.23). The Sunset Parade is a tribute to the United States Marines whose “Uncommon valor was a common virtue.” (“Sunset Parade,” 2014) Finally, an unintended ritual experience is the popularity of the statue. Throughout America, replicas of the memorial have been made, which spreads the influence and experience of the original memorial.



Figure 4.23 | The Sunset Parade
(Ketone 16, 2008)

United States Navy Memorial

The intended ritual experience of the U.S. Navy Memorial is similar to the U.S. Marine Corps War Memorial, in that there is no clearly defined sequence of experiences. The open layout of the memorial plaza is designed to allow visitors to explore the space (Figure 4.24). Visitors are encouraged to dictate their own experience, by walking through the plaza spaces, or using one of the many available seats to sit and reflect. The fountains to the south help to create an audible buffer from the traffic on Pennsylvania Avenue to the south (Figure

4.24). The U.S. Navy Memorial also hosts the annual Blessing of the Fleets ceremony. At each ceremony, sailors from the United States Navy Ceremonial Guard pour water samples from each of the Seven Seas and the Great Lakes into the memorial's fountains ("Blessing of the Fleets," 2014).

Of the impromptu, or unintentional ritual experiences in the U.S. Navy Memorial's original design, the memorial has become a popular spot for locals to enjoy lunch. Although they haven't included picnic tables or outdoor eating space, visitors find stairs and seating walls to sit, stop and eat.

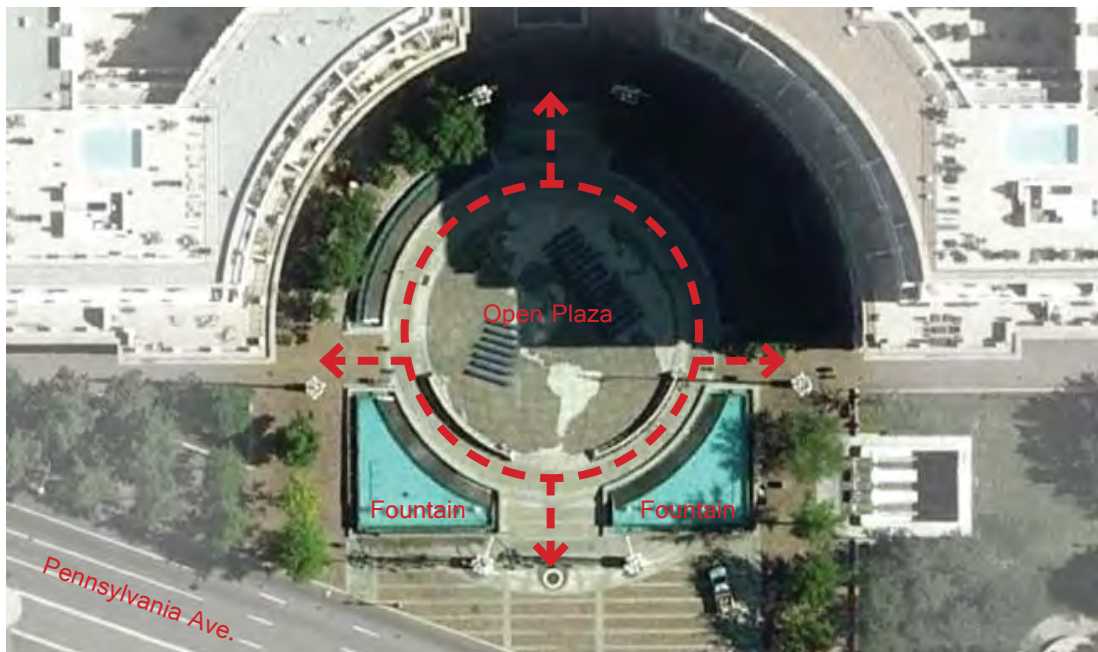


Figure 4.24 | Aerial image of the U.S. Navy Memorial (Google Earth, 2007)

World War II Memorial

The design of the World War II Memorial incorporates a ritual progression through the spaces. The primary entrance to the plaza is located on the east side of the memorial (Figure 4.25). There are two large podiums (Figure 4.9; 4.25), as previously described in the *meaning* section, that orient the visitor. The Announcement Stone is also located at this entrance, where visitors can read the meaning of the memorial before entering the plaza space below (Figure 4.10; 4.25). As visitors proceed into the memorial, they walk along one of two walls decorated with bas-reliefs that narrate the experience

of WWII. Once in the lowered space, visitors are encouraged to ambulate through the space, and read the various messages and quotes engraved into the stone facade. The open floor plan leaves room for the visitor to chose their own path. Eventually, visitors make it to the “Freedom Wall” where they experience the gravity of WWII.

The WWII Memorial, which was recently dedicated in 2004, has few established impromptu ritual experiences (“World War II Memorial: History & Culture,” 2014). One of the unintentional ritual experiences is when entering the memorial, there is a chance to over hear a

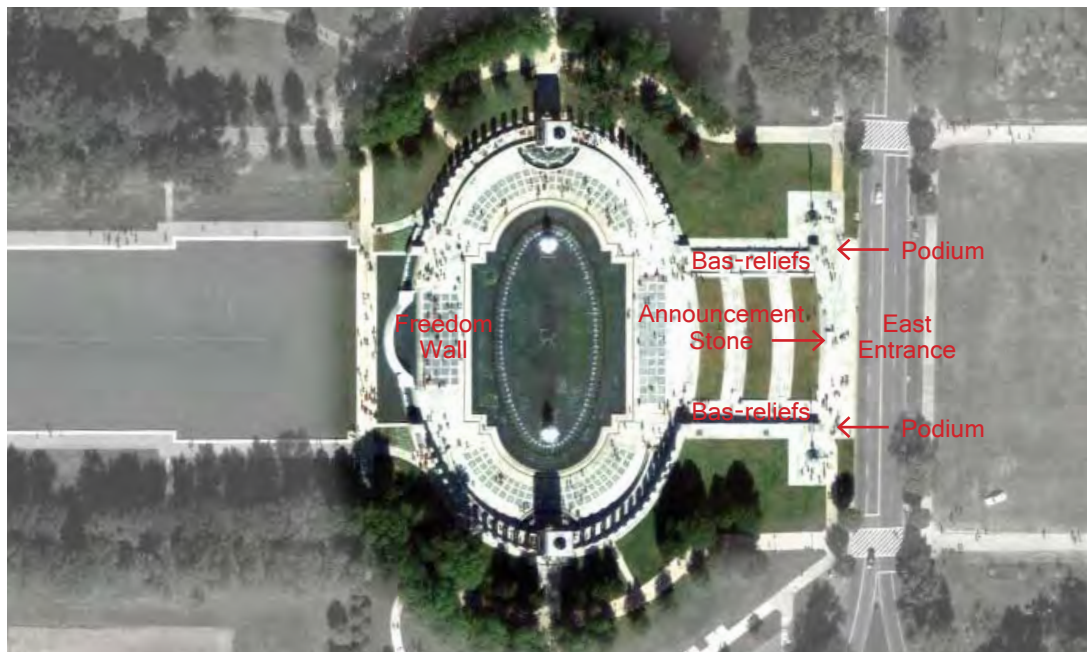


Figure 4.25 | Aerial image of the WWII Memorial
(Google Earth, 2012)

veteran or someone who experienced WWII narrating the bas-relief panels on the east entrance of the memorial.

Korean War Veterans Memorial

There are two entrances to the Korean War Memorial (Figure 4.26). Each entrance way terminates at the focal point of the memorial, the “Pool of Remembrance” (Figure 4.26). Both approaches begin with an enclosed experience walking beneath a grove of elm trees. As the visitor continues towards the “Pool of Remembrance”, the 19 patrolling

statues lead their way, climbing through the junipers below (Figure 4.27). The “Mural Wall” to the south displays over 2400 images from the Korean War (Figure 4.28). Visitors see their reflection through the wall while looking at the various photographic etchings of Korean War memories.

The Pool of Remembrance is located at the vertex of the two pathways. The wall reads, “FREEDOM IS NOT FREE”, a reminder to the audience of the meaning of the memorial. The curb of the pool honors the dead, the missing, the prisoners of war, and the wounded from the United States and

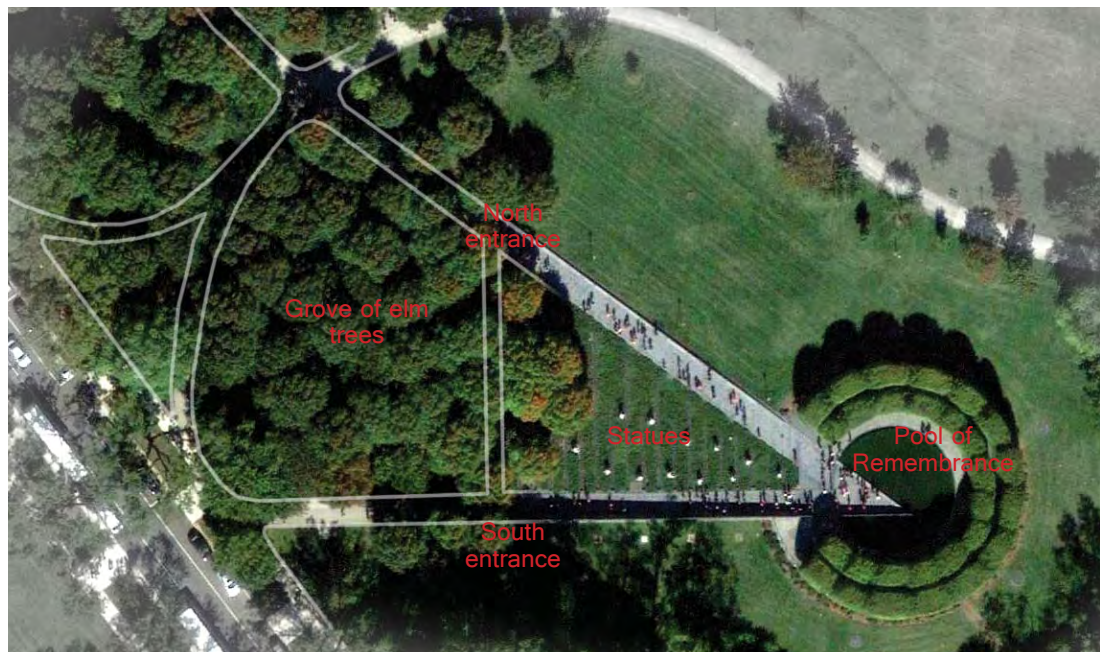


Figure 4.26 | Aerial image of the Korean War Veterans Memorial (Google Earth, 2012)



Figure 4.27 | Patrolling statues
(Winslow, 2008)



Figure 4.28 | The “Mural Wall”
(Winslow, 2008)

United Nations Forces. Linden trees provide shade for comfortable seating around the pool of remembrance (Figure 4.29).

Since the memorial’s dedication in 1995, several modifications have been incorporated into its design. A crystal optic lighting system was later added to illuminate the Mural Wall and the patrolling statues for better night time viewing. The statues’ faces come to life with a ghost-like appearance once they are illuminated.



Figure 4.29 | Contemplation space
(Tucker, 2014)

Vietnam Veterans Memorial

Maya Lin has been applauded for incorporating a designed ritual experience in the Vietnam Veterans Memorial (VVM). Her design inscribes a “memory dance.” (Wasserman, 2002, p.193) The visitor enters the memorial at grade before they descend 10 feet into the earth only to re-emerge at the other end, feeling renewed and reminded (Figure 4.30). The visitors are confined to a single pathway, that is 18 feet wide at the vertex of the two walls (Figure 4.30-31). There are no benches along the memorial walk, therefore, visitors are encouraged

to continue moving through the space, and stand before the 58,000 plus names of fallen veterans. The ritual experience of the VVM is heavily influenced by the design of the space, where visitors are limited to the single pathway, which is unlike the previous memorials. The VVM, however, also supports multiple impromptu ritual experiences as well.

When the memorial began construction in 1982, visitors started leaving mementos and other significant artifacts at the VVM. Construction of the memorial completed in 1984, and the impromptu ritual lasted.



Figure 4.30 | Entering the VVM from the east
(Winslow, 2014)



Figure 4.31 | Aerial image of the Vietnam Veterans Memorial
(Google Earth, 2012)

To this day, visitors continue to leave items at the wall, these items include flowers, letters, flags, toys, and personal items of the deceased soldier like, uniform parts, patches, and military medals (Figure 4.32). Judith Wasserman argues that this originally unintended practice is no less significant to the memorial's experience than Maya Lin's choreographed procession (2002). Non-perishable artifacts from the wall are collected and stored in the National Park Service Museum Resource Center in Landover, Maryland. To this date, over 500,000 artifacts from the VVM have been



Figure 4.32 | Mementos at the foot of "The Wall"
(Winslow, 2006)

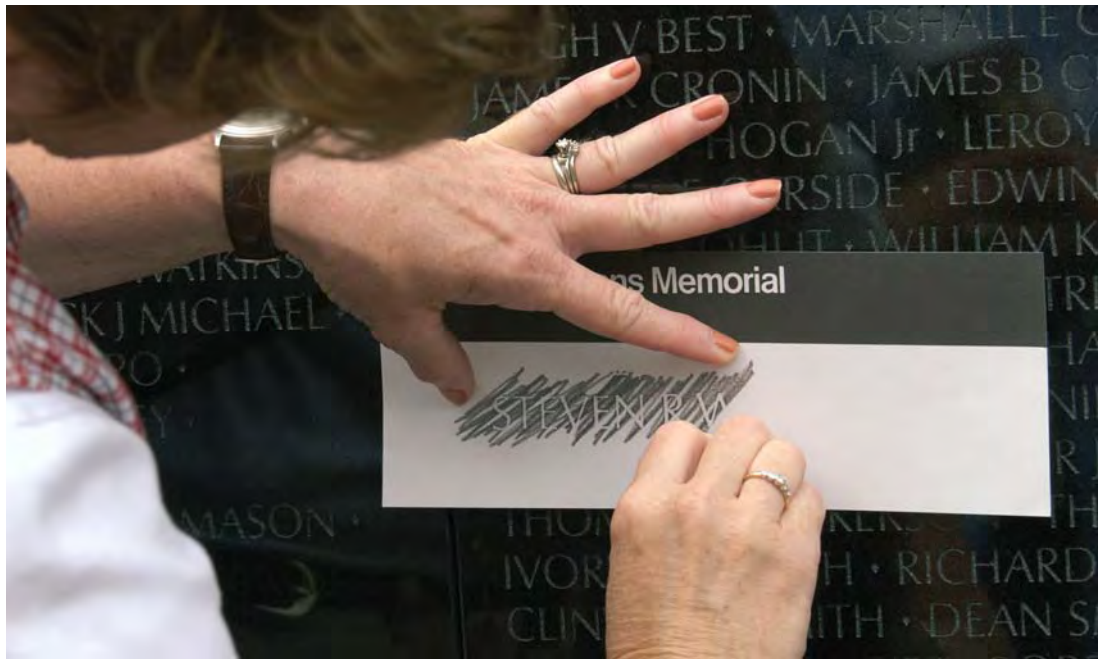


Figure 4.33 | Graphite rubbing at the VVM
(Rossman, 2003)

catalogued and stored in the storage facility.

Visitors are also welcomed to take mementos home with them. The names engraved on the wall can be transferred to paper with graphite rubbings (Figure 4.33). This practice, which was not originally designed, reinforces the lasting memorial experience because visitors can take a piece of the memorial home with them.

Table 4.3 | Typical design expression for ritual in a memorial landscape

Typical Design Expressions for *Ritual* in Memorial Landscapes

Dictated/Intentional	
<ul style="list-style-type: none"> • Largest bronze war memorial in the United States, a grand statue atop a podium at the top of a grass hill, creating a vertical and majestic experience • Pool of Remembrance is a contemplative space to sit, think and reflect • Visitors walk with the statues towards the American Flag • Visitors have 4 entrances to memorial plaza below • Ceremonial entrance to the east walks past wall of bas-reliefs that narrate the war experience 	<ul style="list-style-type: none"> • Ambulate through plaza space towards the Freedom Wall • Large pool in the center of plaza is ceremonial in scale • Surrounding lawns and shade beneath tree canopies is contemplative space • No benches force visitors to walk through the space, and stand before the names of those who sacrificed their life • Enter memorial at grade, sink 10' below grade, return to grade, renewed and refreshed • Search for the names of loved ones on the wall
Impromptu/Unintentional	
<ul style="list-style-type: none"> • Flag in the statue is to be flown 24 hours a day, 365 days of the year • Memorial is the center piece for the weekly Sunset Parade (summer) • Replicas of the memorial have been cast throughout the United States of America, spreading the memorial's influence • Parades and pageants pass by the memorial several times a year 	<ul style="list-style-type: none"> • Visitors leave behind mementos of their lost loved ones • Visitors take rubbings of the names and take a piece of the memorial home with them • Replicas of the memorial travel throughout the United States spreading the wall's influence • Healing experience for the Veterans of the Vietnam War • Non perishable items are saved and preserved

The above list is a compilation of all of the design expressions from the precedent study as related to the ritual quality of an authentic memorial experience. The typical design expressions can be further refined into a list of principles of design. The

principles of design will next be interpreted into the golf landscape, and provide design considerations for incorporating ritual experiences into a golf landscape.

Table 4.4 | Principles of design for ritual in a memorial landscape

Principles of Design for *Ritual* in a Memorial Landscape

- Incorporate contemplative and intimate spaces
- Design an intended circulation or order between spaces
- Where do people enter the memorial
- Provide a central space or a focal point of the memorial
- Design the through space and influence the movement of the visitors
- Features within the memorial inspire curiosity and exploration through the space
- Allow visitors to stop, think and read the memorial
- The memorial may be a centerpiece for pageants and parades
- Replicas and scale models spread the influence of the memorial
- Visitors leave cherished mementos with the name of the lost souls
- People like to take a piece of the memorial with them to remember their experience
- Amendments/adjustments can be made thus adding significance to the memorial
- Design amendments can be made to improve the overall experience

Ritual Experience Interpreted in a Golf Landscape

A golf experience can incorporate a ritual experience by interpreting the above principles of memorial landscape design into the golf landscape. The design can influence the intended ritual experience of the memorial. The impromptu ritual experience however, cannot be an intended experience by the original designer. Therefore, the following interpretation will include ideas for how an impromptu ritual might occur in a golf landscape.

Intentional/Dictated:
Design an intended circulation or order between spaces

A golf landscape already has an intended order or sequence to the overall experience. Golf courses are linear landscapes that are to be experienced in a predefined order. A traditional round of golf has 18 holes, which is broken into two nine hole halves. Some golf courses

are only nine holes due to size or financial limitations. In either case, each golf hole is to be played in numeric order (there are exceptions for twilight hours, when golfers are permitted to play the golf holes out of order.) A memorial golf landscape should incorporate a designed ritual experience by leveraging the linear playing order.

Provide a central space or a focal point of the memorial

A memorial golf landscape should frame the flag, or the green as the focal point of each golf hole. Each golf hole begins at a tee box and ends at the hole. Traditionally, a flag is used to mark where the hole is on the putting green. Every golfer at some point is focusing on the flag to help orient themselves within the landscape. All golfers, regardless of skill level, finish each golf hole on the putting green at the flag location. A memorial golf landscape should leverage the putting area, or nearby surrounding area, as a focal point of the hole. That way, all golfers will share in the ritual experience of the hole.

Features within the memorial inspire curiosity and exploration through the space

A ritual experience in a golf landscape should incorporate memorial elements or design cues that capture the imagination and curiosity of the golfer. The memorial cues should relate to the designed ritual order of the golf holes. A memorial cue can be interpreted into the golf landscape as a sand bunker or putting green that's shape is inspired by a significant form or message.

Unintentional/Impromptu: Visitors leave cherished mementos with the name of the lost souls

The sport of golf requires playing equipment which includes disposable items like golf balls and tees. An impromptu ritual experience at a memorial golf landscape can include traditions where veteran golfers leave behind a golf ball like a memento to the course. The golf course can collect and catalogue the golf balls like the VVM does.

Experiential Quality of a Memorial: Narration

Extraction from Literature Review

Narrative

“Memorials promise an authentic physical experience of history.” (Wasserman, 2002, p.193)

Memorial landscapes tell stories. The stories told by memorials, however, are a departure from traditional history books and historical film (Wasserman, 2002). Contemplative landscapes are not as focused on regurgitating precise dates and locations of events. What a memorial experience lacks in factual information, it gains in emotional depth (Wasserman, 2002). As memorials shift from lifeless artworks into rich holistic experiences, the narratives must shift as well. One of the great challenges in memorial design is appeasing the audience to avoid

confrontation. For a memorial to successfully tell a story, its designers must make sure that unflattering representations are forgotten and kept hidden. As Dimitropoulos writes, “for a memorial to fulfill its role it has to sacrifice specificity of narration in favor of opening up to, addressing a larger group of individuals.” (Dimitropoulos, 2009, p.55) A memorial’s ability to preserve a culture’s collective memory is limited. They are not built around objective ideals and truths. Rather, they are abstractions of a common past between creators that share a goal to make a place.

The following precedent studies will explore ways in which American war memorials have incorporated narrative into their experience.

Precedent Memorial Landscape Study: *Narration*

United States Marine Corps War Memorial

The U.S. Marine Corps War Memorial has two key design elements that contribute to the narrative experience. The dominant design element is the statue at the top of the large podium base (Figure 4.34). The statue depicts one of the most influential events in the history of the United States Marine Corps. The statue

is a realistic representation of a photograph taken by Joe Rosenthal, the “Raising of the Flag at Iwo Jima.” (Figure 4.36) The five soldiers are shown hoisting up an American flag at Mount Suribachi, representing a triumphant moment in United States history. The accurate statue tells an authentic story to the audience. The other narrative element is the banding around the base of the statue (Figure 4.35). The



Figure 4.34 | The statue atop the U.S. Marine Corps War Memorial
(*Rossmann, 2003*)



Figure 4.35 | Banding around the podium
(McLain, 2004)

banding is engraved with the names and dates of all Marine Corps major engagements since the Corps founding in 1775.



Figure 4.36 | "Raising the Flag at Iwo Jima"
(Rosenthal, 1945)

United States Navy Memorial

The U.S. Navy Memorial incorporates several narrative design cues. The primary space of the memorial is called the “Granite Sea.” The “Granite Sea” is 100’ in diameter and has a replica of the world’s oceans mapped in the paving pattern (Figure 4.37). The “Granite Sea” reinforces the narrative experience of the memorial and is an accurate representation of the waters that the U.S. Navy occupies. The next narrative element is the 26 bronze reliefs on the southern hemisphere of the “Granite Sea.”

(Figure 4.38) The reliefs illustrate significant events, key personnel and communities of various sea services (Figure 4.39). Visitors can read each relief panel and learn more about the U.S. Navy’s history.

“The Lone Sailor” stands watch over the “Granite Sea” memorial plaza (Figure 4.40). The statue is an authentic representation of a sailor in uniform. He stands seven feet tall, heroic in scale, and encourages visitors to meet him in the plaza. Visitors can look into his eyes and see what the sailor has witnessed in past experiences. The memorial has subtle cues that tells the Navy’s story.



Figure 4.37 | Aerial image of the U.S. Navy Memorial
(Google Earth, 2007)

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Figure 4.38 | U.S. Navy Memorial bronze relief panels
(AgnosticPreachersKid, 2010)



Figure 4.39 | "... In Harm's Way"
(AgnosticPreachersKid, 2010)



Figure 4.40 | "The Lone Sailor"
(GOTO, 2014)

World War II Memorial

The World War II Memorial, like the U.S. Navy Memorial, uses bronze relief statues to incorporate a narrative experience. The memorial has 24 bronze relief panels at the east entrance to the memorial plaza (Figure 4.42). The Atlantic front panels are located on the north side of the ceremonial entrance and the 12 panels on the south side of the entrance depict the Pacific front. The panels are visually unified by a consistent human scale (Figure 4.41). The panels depict America's total immersion in World War II at home and overseas. The panels are displayed



Figure 4.41 | Bas-relief panels at the east entrance
(Winslow, 2014)

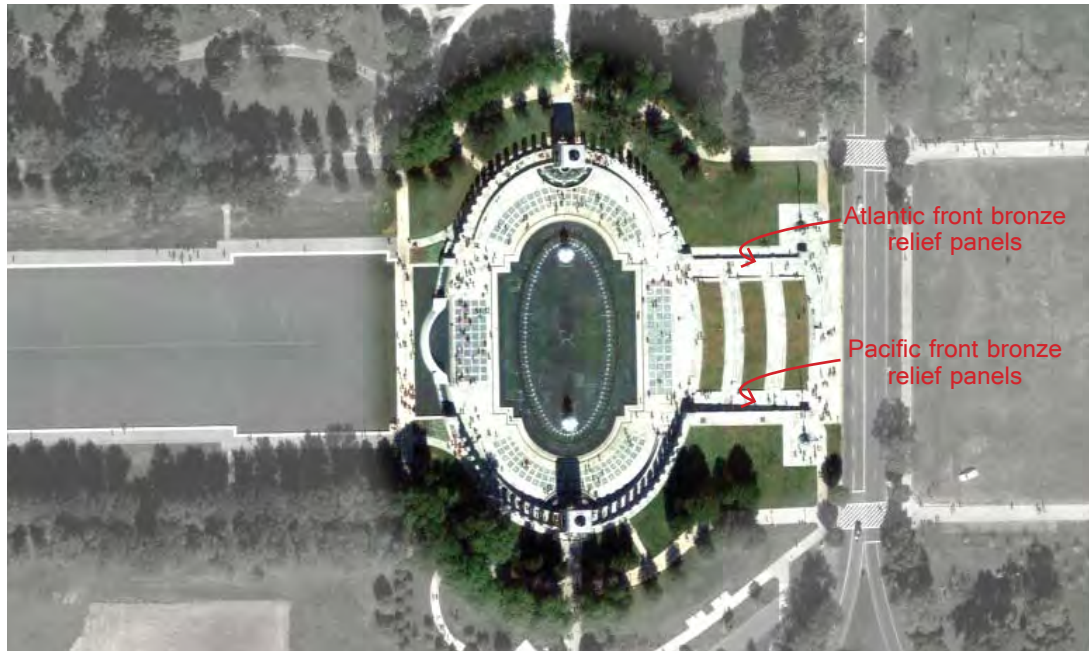


Figure 4.42 | Aerial image of the WWII Memorial
(Google Earth, 2012)

in chronological order as they descend into the memorial plaza below. A majority of the panels are inspired by historical photos and tell an authentic story from the war.

The walls of the memorial are decorated with engravings of significant quotes and messages from the World War II era (Figure 4.43). Visitors navigate through the memorial and are encouraged to stop and read the engravings on the walls. The engravings reinforce the narrative experience of the memorial. The inscriptions create a setting, a voice and ultimately establish a tone for the memorial experience.

Other narrative design elements at the WWII memorial include, laurels that decorate each of the 56 granite pillars, that represent the 48 United States and the eight United States Territories at the time (Figure 4.44). Each pillar is linked together with a bronze rope, which represents the unity of the nation during WWII, and the laurels are symbolic of a triumphant victory.

The Freedom Wall completes the narrative experience, and reveals the total number of Americans that died in WWII (Figure 4.45). Each of the 4048 gold stars on the Freedom Wall represent 100 American lives lost.

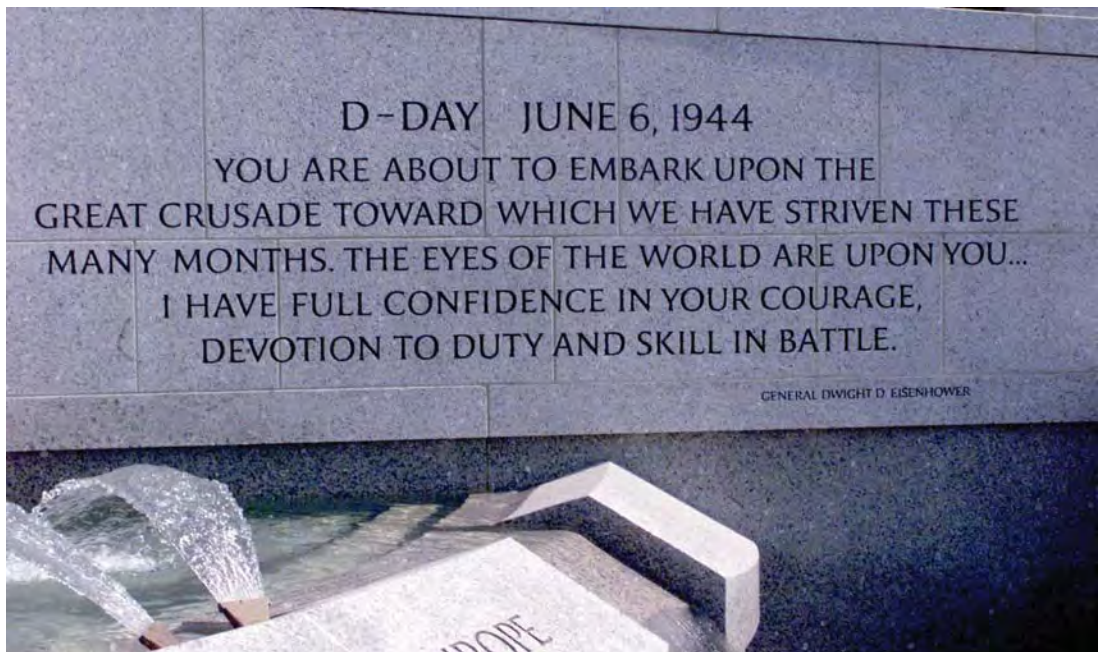


Figure 4.43 | Dwight D Eisenhower, “D-Day”
(Williams, 2004)

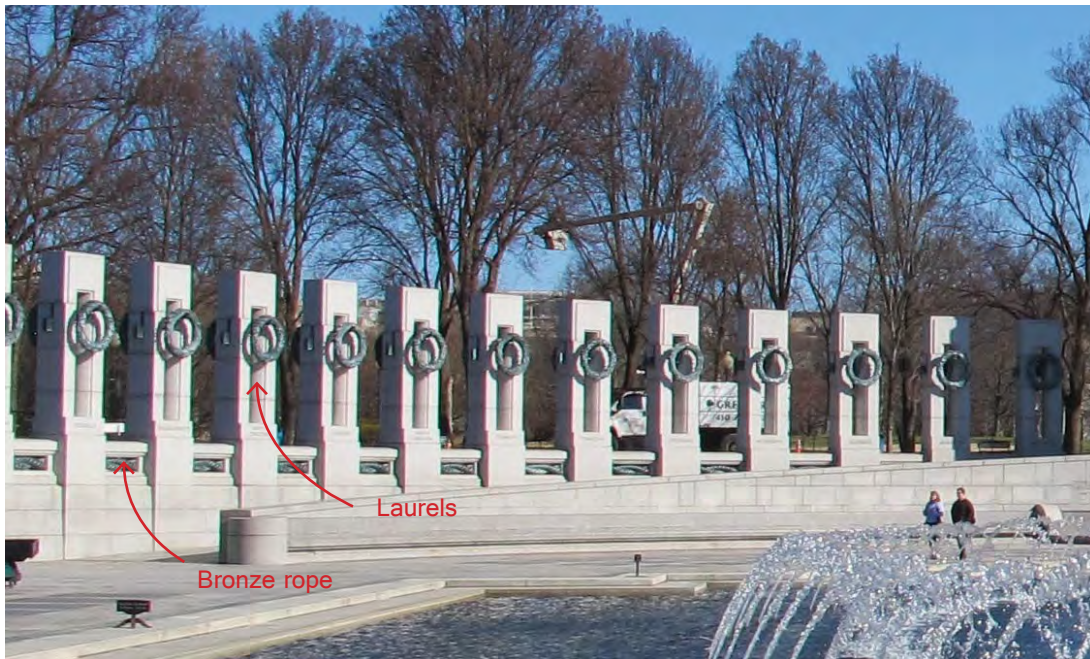


Figure 4.44 | The granite pillars at the WWII Memorial
(Winslow, 2014)

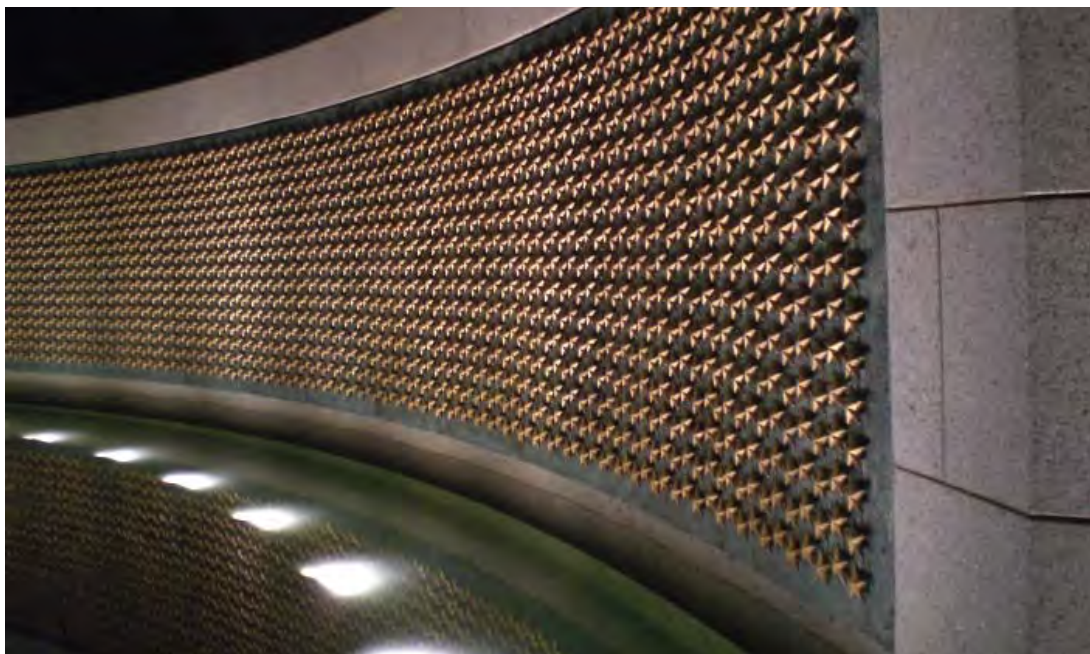


Figure 4.45 | The "Freedom Wall" at night
(Frederickson, 2006)

Korean War Veterans Memorial

The design of the Korean War Veterans Memorial includes several narrative cues to reinforce the memorial experience. The design includes a Mural Wall, a Statue Garden, and a Pool of Remembrance (Figure 4.46).

Over 2400 photographic images are engraved on the Mural Wall (Figure 4.47). The images tell the story of the three major branches of the United States Armed Forces including, the Army, the Air Force and the Navy. There is also a miscellaneous section which includes images of traffic controllers,

military police, photographers and reporters. When viewed from a far, the etched illustrations create a mountainous backdrop to the statues, an allusion to the mountainous Korean landscape (Figure 4.48).

There are 19 statues of American Armed Forces in the triangular space between the pathways (Figure 4.49). The statues are a realistic representation of what the armed forces would have been wearing at the time of the war. When the 19 statues are reflected, a total of 38 statues appear, which alludes to the 38th parallel – the boundary between North and South Korea

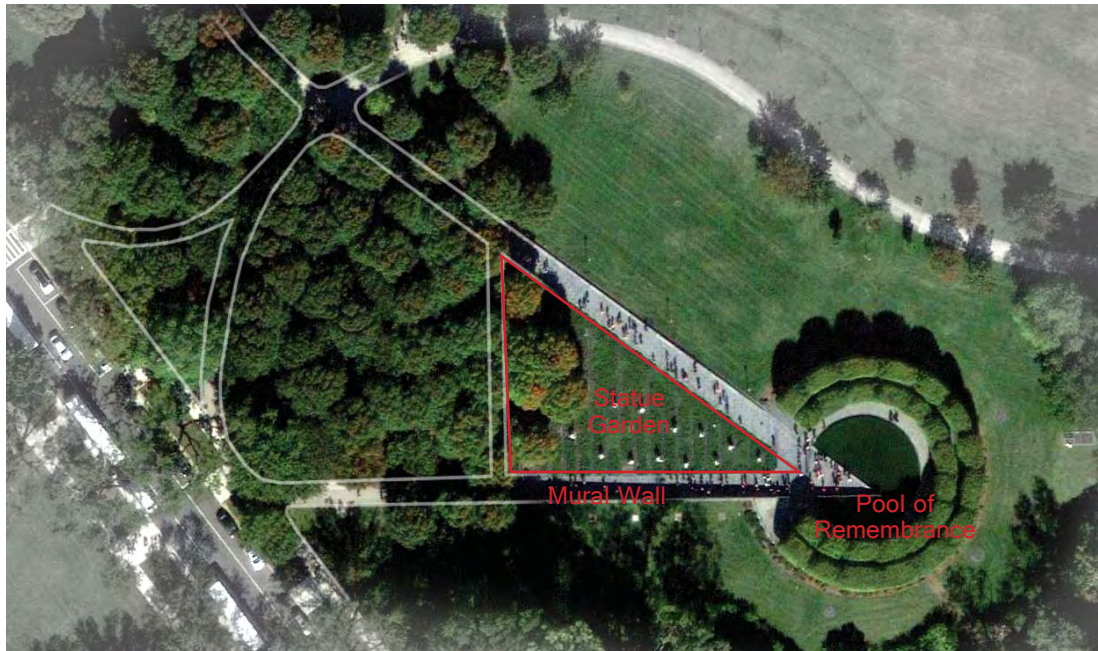


Figure 4.46 | Aerial image of Korean War Veterans Memorial
(Google Earth, 2012)



Figure 4.47 | Photographic etchings in the “Mural Wall”
(Tucker, 2014)



Figure 4.48 | Mountainous backdrop of the “Mural Wall”
(Tucker, 2014)

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Figure 4.49 | The 19 patrolling statues
(Winslow, 2008)



Figure 4.50 | The obstacles of war
(Winslow, 2014)

and the 38 months that the war lasted (“Korean War Veterans Memorial,” 2013).

The statues appear to be moving forward, towards the American Flag and the Pool of Remembrance. The statues are climbing through patches of low growing juniper shrubs, symbols of the rough Korean landscape (Figure 4.50). The patches of juniper are separated by strips of granite that represent the obstacles and hurdles the troops had to overcome during the war.

At the Pool of Remembrance, there is a plaza that extends into the reflection pool like a peninsula, which is symbolic of

the Korean peninsula (Figure 4.51). The V-shaped plaza looks like a cut-out of the Pool of Remembrance, to remind visitors of the pain that is left after the perils of war. This experience is reinforced, as the wall above reads “FREEDOM IS NOT FREE” and the cut out represents the payment that thousands of people made for those who were suffering from oppression.

Curbs along the Pool of Remembrance are inscribed with totals of both the United States and United Nations Forces wounded, killed in action, mission in action, and prisoners of war (Figure

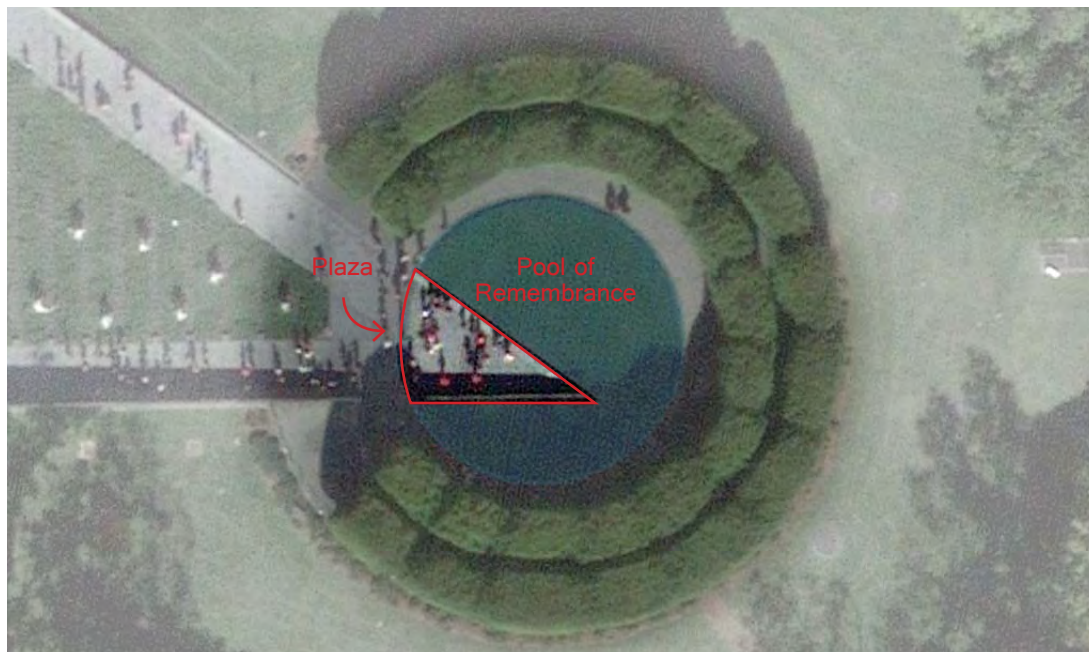


Figure 4.51 | Aerial image of the peninsula-like plaza
(Google Earth, 2012)



Figure 4.52 | The curb around the “Pool of Remembrance”
(Winslow, 2014)

4.52). The design of the Korean War Veterans Memorial reinforces the narrative experience through symbolism and accurate representation of the people and events that took place during the war.

Vietnam Veterans Memorial

The VVM narrative experience is unlike the previous memorials studied. The narrative experience is incorporated through the arrangement of the names engraved on the wall. The names are arranged in chronological order by date of casualty. The names begin at the vertex of the wall, on panel 1E (Figure 4.53). The granite panels are filled with names, in the order of their casualty and are to be read like text columns. The names of the last casualties are listed on panel 1W, which is also located at the vertex of the wall. The vertex of the two walls represents a theme of closure

or completion. The narrative experience at the VVM is evident at the vertex of the wall, where visitors read the start and end dates of the war and they see how the names begin and end in the same location. The narrative at the VVM is not graphically illustrated as it is at the previous memorials, visitors must interpret the memorial's narrative.

Names are listed chronologically by date of casualty in the pattern shown, beginning in 1959 on panel 1E.

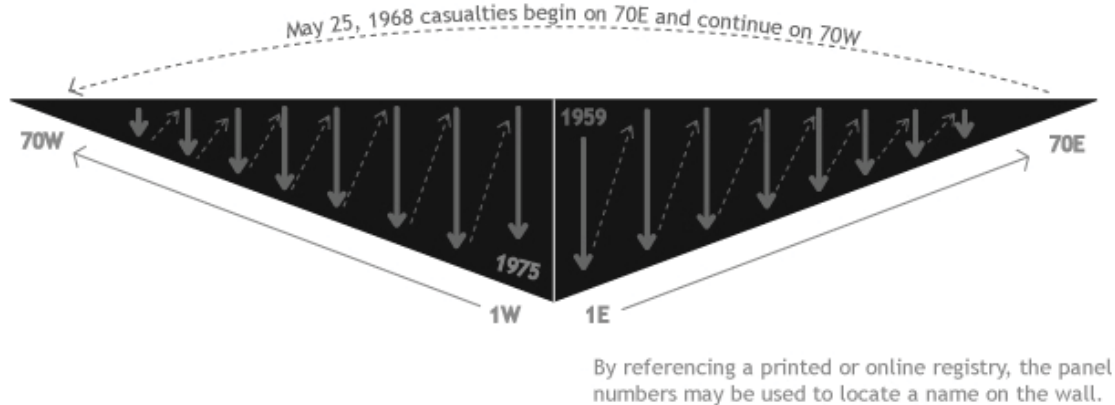


Figure 4.53 | Organization of Vietnam Veterans Memorial
(King, 2014)

Table 4.5 | Typical design expression for narration in a memorial landscape**Typical Design Expressions for *Narration* in Memorial Landscapes**

- Statue tells the story of one of the most influential incidents in WWII
- Authentic representation of the *Raising of the Flag at Iwo Jima* according to Joe Rosenthal's photograph
- Banding around podium includes all major military engagements since 1775
- Over 2,400 photographic archival images, representing all branches of the military (land, sea, air and misc.)
- 19 patrolling statues, realistic in appearance, all heroic in scale
- Plant material is symbolic of the terrain that the troops encountered in war
- Granite steps represent hurdles and obstacles encountered in war
- 19 statues reflected on the *Mural Wall* equals 38 statues, alluding to the 38th parallel and the 38 months the war lasted
- Story of the members of the United Nations that allied with the United States to fight oppression
- Authentic apparel and gear according to the time period and military branch
- Triangular plaza at the *Pool of Remembrance* extends into the water, symbolic of the Korean Peninsula
- Etchings in the *Mural Wall* from a far look like the distant mountains of the Korean landscape
- *Granite Sea* is an exact replica of the world's oceans
- 26 bronze bas-reliefs surround the southern hemisphere of the *Granite Sea* and illustrate significant events in the U.S. Navy's history
- *The Lone Sailor* represents all those who have served or who serve in the U.S. Navy
- 24 bronze bas-relief panels tell the entire story of the WWII experience, overseas and at home
- 56 granite pillars tied together by a bronze rope represents the bond between the 48 States and the 8 United States Territories
- Engravings of significant battle names and military campaigns in the paving
- Engravings of significant messages and quotes
- Laurels suspended above to represent America's triumphant victory
- Dates are engraved at the vertex of the walls to provide time context
- The wall illustrates the perils of war by revealing the names of all those who died in the War

The above list is a compilation of all of the design expressions from the precedent study as related to the narrative quality of an authentic memorial experience. The typical design expressions can be further refined into a list of principles of design. The

principles of design will next be interpreted into the golf landscape, and provide design considerations for incorporating narrative experiences into a golf landscape. Following are the principles of design for the narrative quality of memorial landscapes.

Table 4.6 | Principles of design for narration in a memorial landscape

Principles of Design for *Narration* in a Memorial Landscape

- Pride in victorious/triumphant America
- Authentic representation of people and events
- Geographic reference to the region of battle
- Photography reveals authentic truths
- Each branch of the Armed Forces has forms which evoke response
- Bas-reliefs are permanent memories
- Show actual events and moments
- Represent time
- Engrave names of those who have made the ultimate sacrifice
- Significant numbers that relate to the story
- Significant words and messages
- Location specificity in relation to context and other memorials
- Tours help teach the story
- Teach audience of the perils of war
- Transform how people think of war and United States veterans

Narration Experience Interpreted in a Golf Landscape

Principles of memorial design for incorporating a narrative experience can be interpreted in a golf landscape. The narrative experience will relate to the ritual experience of the golf landscape, which refers to the order the holes are played in. If each golf hole represents a stage in time, the narrative begins to take form, and the ritual is reinforced with a narrative.

Authentic representation of people and events

A golf landscape can incorporate design elements that reinforce the narrative experience. If the golf holes are to be played in a specific chronological order,

design cues can be incorporated into the landscape to reflect the stage in time that the hole represents. Statues and bas-reliefs are used in traditional memorial design to reinforce the narrative experience. In a golf landscape, the same traditional memorial cues can be used, by placing statues and bas-reliefs into the golf experience.

Geographic reference to the region of battle

The Korean War Veterans Memorial symbolically uses the landscaping to represent the landscape of the Korean peninsula, where the war was fought. The same idea can be incorporated into a golf

landscape. A golf landscape that tells the narrative of a specific war or battle can incorporate a landscape plan to reflect the geographic region of the battle. A golf hole that is designed to honor the veterans of the recent war conflicts in the Middle East, a desert landscape type, might incorporate sand dunes as a playing hazard, symbolic of the terrain encountered in the Middle East.

Represent time

A golf landscape that includes a memorial experience should leverage the ritual order of the playing experience to incorporate a narrative experience. Each individual golf hole can represent a stage in time of a larger plot or narrative. The story should begin with the first hole, and end with the last hole of the round. The golf holes should be inspired by a chronological order, which reinforces the ritual experience discussed earlier.

Transform how Americans think about war and US combat veterans

A golf landscape that incorporates a memorial narrative experience has an opportunity to make a lasting impression on the golfers. The narrative experience should honor the veterans and their experience. Those who are veterans of the United States Armed Forces should understand the narrative and feel that the story was accurate. Golfing participants that are not veterans should gain a better understanding of the sacrifice that veterans make to protect their freedoms as Americans. A public golf course with a narrative experience has the opportunity to tell an important story in an unconventional way.

Experiential Quality of a Memorial: Dialogue

Extraction from Literature Review

Dialogue

The fourth component to a memorial experience is dialogue. Dialogue suggests communication between two or more parties. In a memorial landscape there are multiple threads of conversation between the audience and the memorial. The memorial experience includes a dialogue not only between the memorial and the audience, but between the audience members themselves. Memorials are public landscapes built for a community of people. The premise of a memorial landscape is to share a memory through an engagement with a community of people who share an interest in the meaning (Bonder, 2009).

Memorials are not built to stand as silent sites of memory. Their meaning is not sustained solely through the symbolic representation of a past event or events (Bonder, 2009). The memorial landscape evokes a dialogue between those who participate in the landscape experience. The audience is made aware, made mindful or reminded, warned, advised and called to act

after a memorial experience (Bonder, 2009).

A memorial's design reveals the community for which the memorial is built to honor, and the community which is intended to sustain that meaning. The meaning of the memorial experience reveals the significant people to be honored. The location of the memorial and the context of the memorial reveals the community for whom the memorial is intended to speak to. The memorial landscape cannot compensate for the reality of the events being remembered. The memorial can only begin to establish a dialogical relation between the events and the audience, thus catalyzing the process of understanding. Julian Bonder describes a memorial landscape as a "roadmap" for bridging the gap between the event and the audience (2009, p.65).

The precedent memorials were reviewed for how they establish a dialogical experience between the landscape and the community. Memorials initiate conversation between the members of the audience as well, therefore,

design elements that fostered a social interaction between participants was noted.

All of the precedent memorials studied are publicly accessible landscapes located in Washington D.C., the nation's capital.

The community of participants includes all Americans. The events and people commemorated in the precedent memorials have a national significance, therefore their designs respond to a broader audience.

Precedent Memorial Landscape Study: *Dialogue*

United States Marine Corps War Memorial

The U.S. Marine Corps War Memorial is located to the north of Arlington National Cemetery (Figure 4.54). The Arlington National Cemetery is one of America's most well known national cemeteries. Over 230,000 veterans and dependents are buried in Arlington National Cemetery. The 612 acre cemetery holds the remains of veterans from every military action the United States has participated in ("U.S. Department of Veterans Affairs," 2014). The U.S. Marine Corps War

Memorial is located in a culturally significant area. The contextual setting contributes to the participating community. Visitors touring the Arlington National Cemetery are likely to visit the U.S. Marine Corps War Memorial.

Although the statue at the top the memorial represents a moment in WWII history, the memorial itself is dedicated to all past, current and future war conflicts that the U.S. Marine Corps have or will be engaged in. The veteran community of the memorial extends beyond those personnel who fought in World War II. The memorial

design incorporates significant symbols and messages that are unique to the U.S. Marine culture. Marine veterans of all wars share a dialogue with the memorial.

Those who are not in the Marine Corps participate in the memorial experience and learn to understand the memorial's significance. The audience is welcomed to circulate around the memorial and read the various inscriptions around the base of the memorial. The memorial speaks to the audience and evokes a mindful response from those who are not Marine Corps veterans.



Figure 4.54 | Arlington National Cemetery
(Google Earth, 2012)

United States Navy Memorial

The U.S. Navy Memorial is located on the north side of America's "Main Street", Pennsylvania Avenue (Figure 4.55). The memorial plaza is used as a through fare for pedestrian traffic from the north. Several design cues are included in the design of the memorial to reinforce the influence of the U.S. Navy community.

At the south entrance to the memorial, there are two large flag poles that are designed to look like the mast of a ship (Figure 4.56).

Members of the U.S. Navy community will recognize the mast-like flag poles and recognize the signal flags that hang below. International Maritime Signal Flags have been used for over 150 years for communication between ships at sea. If read individually, the signal flags flown from the U.S. Navy mast-like flag poles spell out, "U-S-N-A-V-Y-M-E-M-O-R-I-A-L." Sailors will recognize this memorial cue and know how to decipher the meaning.

The bas-relief panels that surround the southern hemisphere of the Granite Sea are a dialogical element for both the Navy

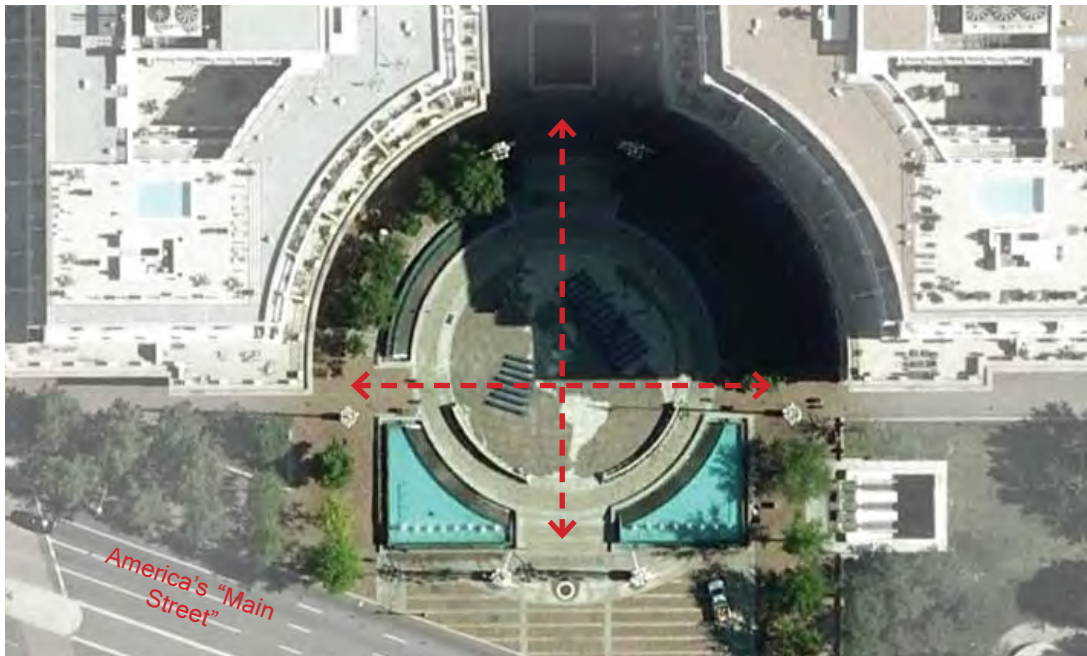


Figure 4.55 | U.S. Navy Memorial context image
(Google Earth, 2007)



Figure 4.56 | Signal flags flown from the masts
(Google Earth, 2011)

veterans and the outside community. The panels illustrate significant events in U.S. Naval history. Naval veterans, familiar with the history of the Navy can be seen narrating the panels to their friends and family. For those members of the audience who are not veterans, the panels narrate the story of the U.S. Navy. The memorial evokes a dialogic response from both the Naval veterans and the visiting public.

World War II Memorial

The design of the WWII Memorial incorporates elements that speak to all Americans. There are 56 granite pillars that surround the memorial plaza, 48 of which are dedicated to the United States and eight of which are dedicated to the United States Territories at the time (Figure 4.57). The entire American community is represented at this memorial, and visitors are encouraged to find their home state among the various pillars. The memorial starts a dialogue with

the veterans of the WWII by including hidden inscriptions and messages within the memorial. Visitors are encouraged to find the hidden Kilroys (Figure 4.58).

The cartoon drawing of Kilroy accompanied by the message, “Kilroy was here”, was a common piece of graffiti during WWII. The origin of Kilroy is unknown, but it was drawn by American troops overseas during the war as a universal sign that American troops had passed through and left their mark



*Both Alaska and Hawaii
were United States Territories
during WWII*

Figure 4.57 | The United States Territories at the WWII Memorial
(McLain, 2004)

(“U.S. National Park Service,” 2014). The meaning and message associated with Kilroy speaks directly to World War II veterans. A non-veteran that finds Kilroy may inquire of the meaning behind Kilroy, thus led to a dialogue between the audience at the memorial.

The previously discussed bas-relief panels at the ceremonial entrance to the WWII Memorial narrate the experience of the war on both the Atlantic and Pacific fronts. This feature honors the veterans of

the war, as they recall and are reminded of their own journey. The non-veteran public learns of the sacrifices made by the veterans that fought in WWII. The panels are placed near the primary entrance to the memorial plaza. When entering the memorial, there is an opportunity to pass a veteran narrating the bas-relief panels. This evokes dialogue between the members of the community at the memorial.

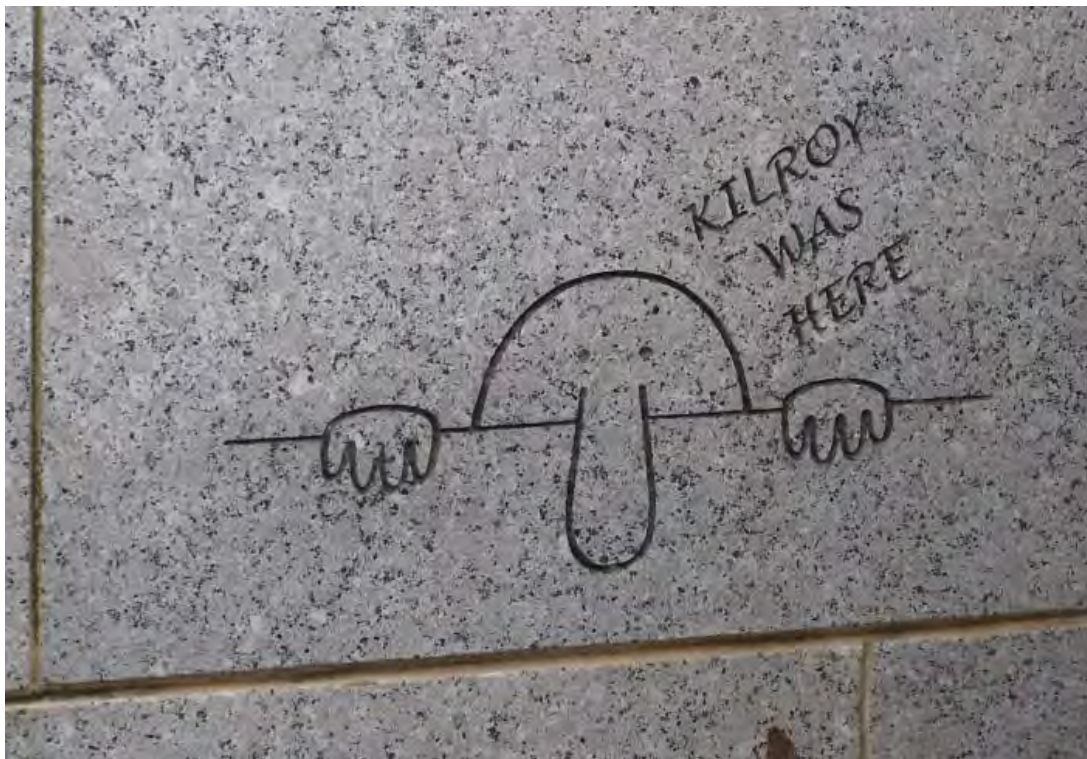


Figure 4.58 | “Kilroy was here”
(O’Leary, 2007)

Korean War Veterans Memorial

The Korean War Veterans Memorial is a memorial of faces, not of war. This dialogue begins with one of the key design features at the memorial, the Mural Wall. The Mural Wall includes photorealistic images of the faces of the men and women that fought against oppression during the Korean War (Figure 4.59). Each engraved image is based off of a photographic image from the time of the war. The images were edited, however, and the figures were stripped of their names, rank, and company insignia so that each

image honored not an individual, but a collection of individuals. The images speak to all veterans of the Korean War.

The statues that occupy the triangular space between the pathways are accurate representations of each branch of the United States Armed Forces. Of the 19 troops, 14 represent the Army, 3 the Marines, and 1 representative each for the Navy and Air Force. The statues also represent the ethnic diversity of America with 12 Caucasians, 3 African Americans, 2 Hispanics, 1 Asian-American and 1 Native American. American visitors can associate with the memorial, and



Figure 4.59 | Faces on the “Mural Wall”
(Tucker, 2014)

find people like them that have made the ultimate sacrifice in the name of freedom.

The memorial speaks to the non-veteran audience through the narrative experience of the memorial. The symbolism behind the narrative speaks to the visitor and reveals the hardships of the Korean War. At the north entrance, the curb is decorated with the names of the members of the United Nations that participated in the Korean War. Of the 22 nations inscribed on the curb, 17 provided troops and 5 provided medical support (Figure 4.60). The memorial begins a dialogue with the citizens of the countries represented

on the United Nations curb. The memorial speaks to an audience beyond the domestic boundaries and recognizes the sacrifices made in countries thousands of miles removed.

The memorial includes two pathways that terminate at a circular plaza around a reflection pool. The narrow pathways, roughly 15' wide, foster social interaction between the visiting audience. Dialogue between the audience members is encouraged by the user's proximity to one another. This intimate setting reinforces the communal dialogic experience of the Korean War Veterans Memorial.



Figure 4.60 | "ETHIOPIA" engraved in the "United Nations" curb
(Tucker, 2014)

Vietnam Veterans Memorial

The Vietnam Veterans Memorial is a memorial of names. The academy black granite walls decorated with the names of over 58,000 Americans who died in the Vietnam War. All of the names on the wall are the same font and size (Figure 4.61). The names are stripped of their rank and military branch so that there is no established hierarchy between names on the wall, each life lost is equally important. The only differentiating mark between the names is a preceding symbol that designates that veteran's status. A diamond is inscribed

before the names of the confirmed dead.

A cross precedes veterans who are listed as missing in action or taken prisoner of war. If the veteran returns alive, a circle is inscribed over the cross as a symbol of life.

The polished black granite wall reflects the figures of the visiting audience onto the names of the fallen service members (Figure 4.62). The wall speaks to the person witnessing their reflection and reminds them of the sacrifices made to protect freedom. In return, the audience recognizes the sacrifice, and honors the collection of names before them, not a single individual.

The cross before Danny Ledford's name means he is missing and has not returned

A diamond precedes the names of the service members who are confirmed dead

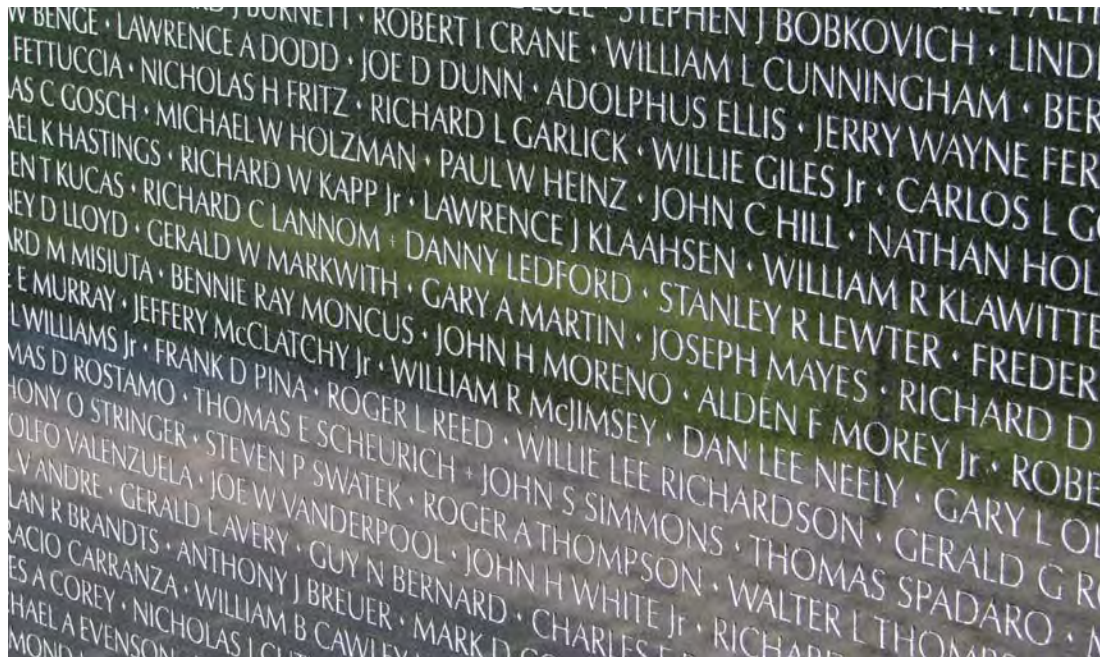


Figure 4.61 | The names on the VVM
(Totya, 2014)

A connection between the audience and the memorial is established through the dialogue between the two.

The dialogue is different for those whose lives were directly affected by the events that occurred during the Vietnam War. These people have a personal connection to the wall. Members from this community can find the name of a loved one on the wall and touch the name inscribed on the wall. The dialogue that occurs between the memorial and the audience in this instance transcends the memorial landscape. The dialogue

experience in this scenario is similar to a dialogue that occurs at a cemetery.

The confined circulation along the wall fosters social interaction between the members of the visiting audience. There are no benches where someone can stop and claim a personal space. The people at the wall become part of a common community, and their individual contemplative experiences can overlap. Story telling is common between the audience. The memorial evokes a dialogue between visitors, thus reinforcing the memorial's overall dialogic experience.



A view of the Washington Memorial on the wall's highly reflective granite facade

Figure 4.62 | Reflections on the VVM
(Winslow, 2006)

Table 4.7 | Typical design expression for dialogue in a memorial landscape

Typical Design Expressions for *Dialogue* in Memorial Landscapes

<ul style="list-style-type: none"> • Located next to the Arlington National Cemetery • Dedicated to all the members of the United States Marine Corps • Each branch of the Armed Services is included in the statues and wall • 22 members of the United Nations are included, expanding the audience to an international community • American flag flown above • Intimate spaces foster social interaction between the visiting audience • Statues show the diversity of the United States Armed Forces: race, rank and branch • All identification was removed from the photographs on the Mural Wall so that the images represent a community, not an individual • Memorial of faces, not war • Adjacent to “America’s Main Street” • Engravings of quotes significant to the U.S. Navy bond those who are within the Naval community to the memorial grounds 	<ul style="list-style-type: none"> • 4.4 million visit the WWII memorial annually • 56 pillars represent the 48 States and 8 Territories of the United States • “Kilroy was here” is a hidden message that is understood by the community of WWII veterans • The meaning of the memorial speaks to all Americans • Bas-reliefs tell the stories of the troops overseas and those who were at home • Publicly accessible space • All names are stripped of their rank, each life is equally important • Intimate memorial, no benches to sit, constantly exposed to surrounding conversation • Feel a connection to other members at the wall, some who are observing some who are searching for a name • Those who close to a veteran of the Vietnam War feel welcomed and encouraged to participate in the memorial rituals
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The above list is a compilation of all of the design expressions from the precedent study as related to the dialogic quality of an authentic memorial experience. The typical design expressions can be further refined into a list of principles of design. The

principles of design will next be interpreted into the golf landscape, and provide design considerations for incorporating dialogue experiences into a golf landscape. Below are the principles of design for the dialogic quality of memorial landscapes.

Table 4.8 | Principles of design for dialogue in a memorial landscape

Principles of Design for *Dialogue* in a Memorial Landscape

- Honor veterans from all states, nations, races, ranks
- Incorporate a national significance
- Commemorate those who have passed
- Honor and thank the troops and service members that are alive
- Recognize the sacrifices made at home and overseas
- Publicly accessible landscape
- Events, parades and spectacles increase the community experience
- American Flag is the national symbol for freedom
- Location context to the community of visiting audience
- Intimate spaces foster social interaction and dialogue between the visitors
- Consider the users and their relationships to the memorial and the subject

Dialogue Experience Interpreted in a Golf Landscape

Principles of memorial design for incorporating a dialogue experience can be interpreted in a golf landscape. The experience of a golf landscape already incorporates a degree of dialogue between playing partners. Elements in the landscape can evoke a greater sense of dialogue between the playing partners, and influence the subjects of the conversation.

Honor veterans from all states, nations, races, and ranks

A golf course that incorporates a dialogue experience should incorporate design concept that honors all veterans from all states, nations, races, and ranks. By doing so, the memorial can speak to all members of the

United States Armed Forces. The dialogue experience is enhanced when the veterans feel included in the meaning of the memorial.

Publicly accessible landscape

A golf landscape built in honor of all US combat veterans and service members should be open to the public. A private golf course would restrict the potential dialogue between the golfing participants. Welcoming veterans and non-veterans to play together enhances the dialogue experience of the memorial landscape. Veterans can contribute to the meaning and narrative, and the public can respond by honoring the combat veteran.

Chapter Conclusion

The second framework identified and suggested design considerations, that if applied to a golf landscape, would merge the golfing experience with a memorial

experience. A memorial golf landscape built in honor of U.S. combat veterans and service members should include:

Meaning

Honor all US combat veterans and service members regardless of their age, race, rank, or military branch. The memorial golf landscape should not be exclusive to a specific war, event or person. It should provide universal meaning.

Narration

Tell the story of each U.S. combat veteran and service member. The design should leverage the linear progression of holes in a golf landscape to narrate the meaning of the memorial to the playing audience. Golf holes should incorporate memorial cues that remind the veteran of their experience, and teach the public of their heroic sacrifice.

Ritual

Golf landscapes are to be played in numeric order. The design of a memorial golf landscape should incorporate design elements that respond the golf hole numbers in the ritual order of the experience.

Dialogue

A memorial golf landscape should remain open to the public and welcome members of both the veteran and non-veteran communities. That way, there is an opportunity for a dialogue to occur between playing partners. Veterans can feel honored and respected while non-veterans can learn about the experience of being a veteran.

Figure 4.63 | Memorial framework process
(Author, 2014)

... SERVICES & ...
STATES ...
22 MEMBERS ...
AMERICAN ...



ABOVE
• MORE INTIMATE SOME ...
• STATES SHOW A ...
OF MILITARY ...
• RACE • RANK • ...
• THE ...
LIKE THEY ARE ...
ONE ANOTHER
• ALL RANK ...
WAY IMAGES, ...
MEMORIAL OF ...



Figure 5.1 | Evaluation process
(Author, 2014)

EVALUATION

5

The following chapter introduces the facilities and business history of Deer Creek USA and describes the evaluation process of the existing conditions. Conclusions from the evaluation chapter will be used to inform the application chapter, where the final design proposal is illustrated.







Site Introduction

Deer Creek U.S.A. Golf and Event Center is an existing 18-hole golf course in House Springs, Missouri. In the past half century, the ownership and purpose of the land beneath Deer Creek USA has changed several times. In the late 1980s, Brooks McCarthy purchased the 122 acres of land that was once a boy scout camp to build and construct a public country club (Timothy Rueve, 2014).

Brooks McCarthy, a businessman who worked in real estate, is credited for the original design of the golf course and the construction of the 30,000 square foot clubhouse, which was completed in 1989. The course was built to have the accommodations of a country club, yet was

Figure 5.2 | The clubhouse from tee box on Hole 9
(Author, 2014)

open to the general public. McCarthy did offer memberships, where members could enjoy premium amenities, like one of the 400 men's or 400 women's private lockers. McCarthy had ambitious plans for Deer Creek, however, he was not operating a sustainable business model and membership numbers ended up suffering, eventually leading to the sale of Deer Creek.

In 2007, Tom and Kathy Kerr teamed up with a business partner and purchased Deer Creek, for investment purposes only. Being from San Diego, the Kerr family was not interested in golf, but they did see potential value in the property. Soon after, the Kerr's business partner dropped out and they became sole owners. The golf course did, however, remain open, but it was neglected and money was not reinvested into the golf facilities. The Kerr family was interested in selling the property, and there was one offer to convert the property from a golf course to an adventure park or zip line course.

Before selling the property, Andrea Politte met with the Kerrs and discussed her plan for Deer Creek, and strongly discouraged them from selling the property. From that point, Andrea Politte took over management of the facilities at Deer Creek and started to implement her plan. Her first move was to change the name from Deer Creek Golf and Country Club to Deer Creek USA Golf and Event Center. This move was a catalyst that sprung the rest of the project into motion. Now, Deer Creek USA has a mission and a new image.

Ms. Politte reopened in the spring of 2013 and personally funded the renovations necessary to make the golf course playable and the club house hospitable. Ms. Politte exhausted her savings account into Deer Creek USA in the first season, pursuing her dream to transform the facilities at Deer Creek. Ms. Politte is now the owner and president of Deer Creek USA (Timothy Rueve, 2014).

Figure 5.3 | Deer Creek USA Hole 17 tee shot
(Author, 2014)



Geographic Context

Deer Creek USA is located in House Springs, Missouri roughly 30 miles southwest of downtown Saint Louis. House Springs is located in Jefferson County which is home to approximately 220,000 Missourians (U.S. Census, 2014).

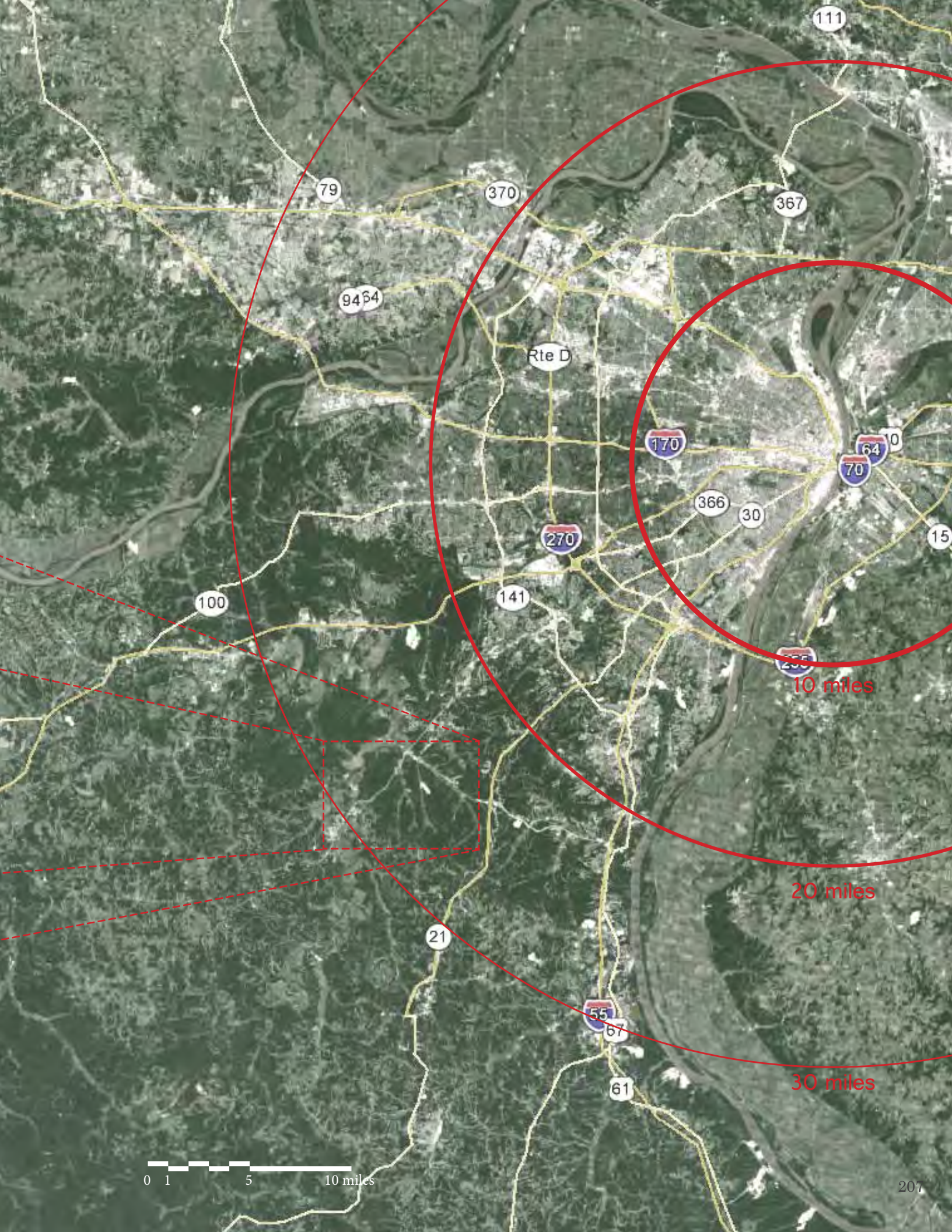
Deer Creek USA is nestled between the hills of the Eastern Ozark Border of the Ozark Highlands Ecoregion. This dramatic landscape is a network of wooded hills and lowland valleys. The golf course at Deer

Creek USA occupies a valley between two hills (Figure 5.4).

Deer Creek USA is accessed off of Dulin Creek Road, which is connected to Gravois Road or Missouri Route 30, which leads directly into the City of Saint Louis or connects into the regional expressway network at I-270 (Figure 5.5). Deer Creek USA is located in a low density housing neighborhood in a quiet region of Jefferson County, Missouri.



Figure 5.5 | Regional map
(Google Earth, 2013)



0 1 5 10 miles

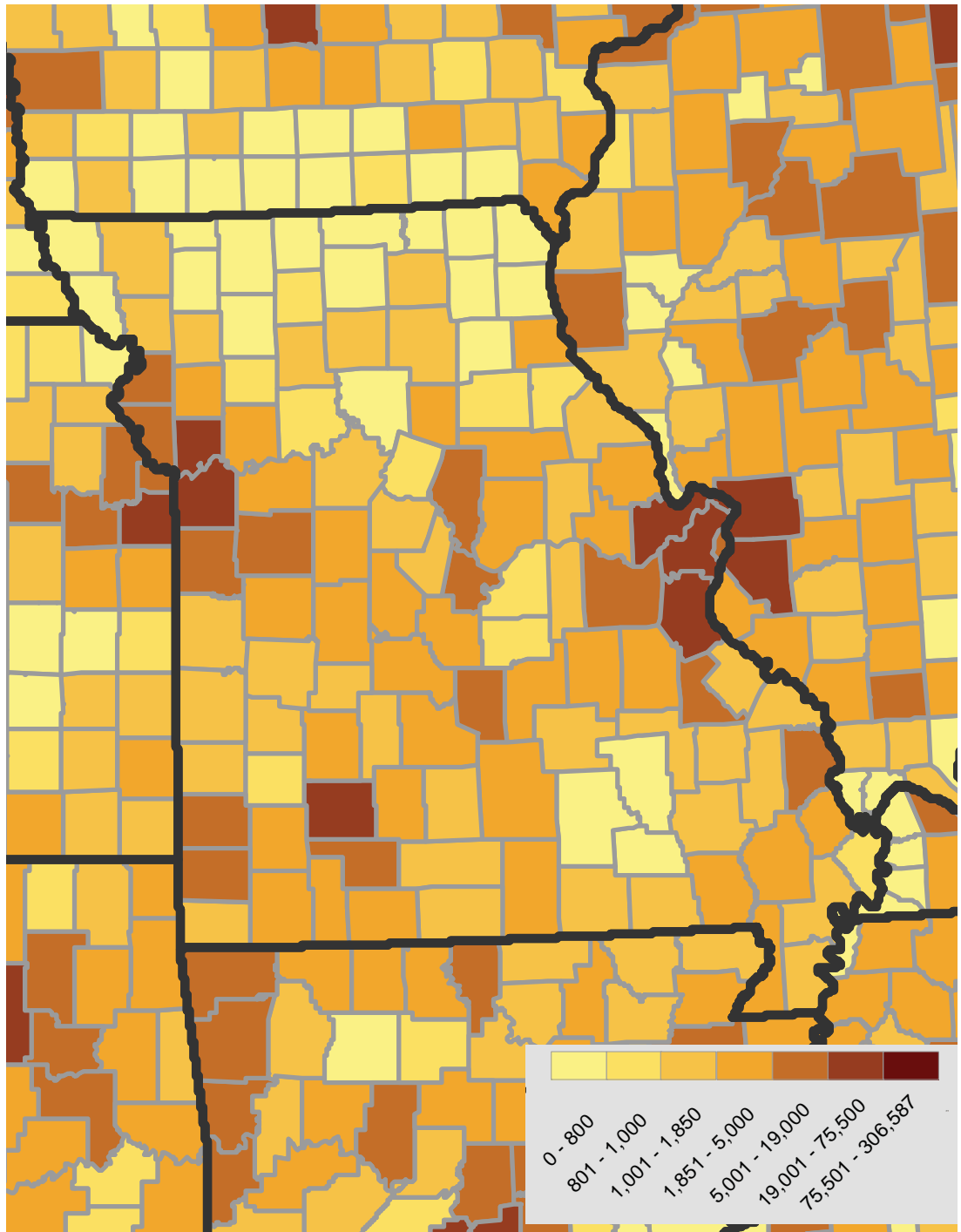


Figure 5.6 | Total veteran population by county
(NCVAS, 2013)

Veteran Context

Deer Creek USA is located within the Heartland Network of the Veterans Integrated Service Network (VISN) which includes major cities like Saint Louis and Kansas City (Figure 5.7). The St. Louis Metro region has a high concentration of veteran populations. In the Saint Louis metropolitan region, there are over 120,000 veterans, 18,000 of which are within Jefferson County (Figure 5.6) (U.S. Census, 2014). There are two major Veterans Affairs Health Care facilities in the

Saint Louis area: the John Cochran Division and the Jefferson Barracks Division. The John Cochran Division is located in midtown St. Louis, roughly 30 miles north east of Deer Creek USA, an estimated 40 minute drive. The Jefferson Barracks Division is 23 miles northeast of Deer Creek USA, an estimated 30 minute drive. The St. Louis VA already has special programs for PTSD, which Deer Creek USA could potentially complement. There is an opportunity for Deer Creek USA to provide additional support for PTSD therapy.

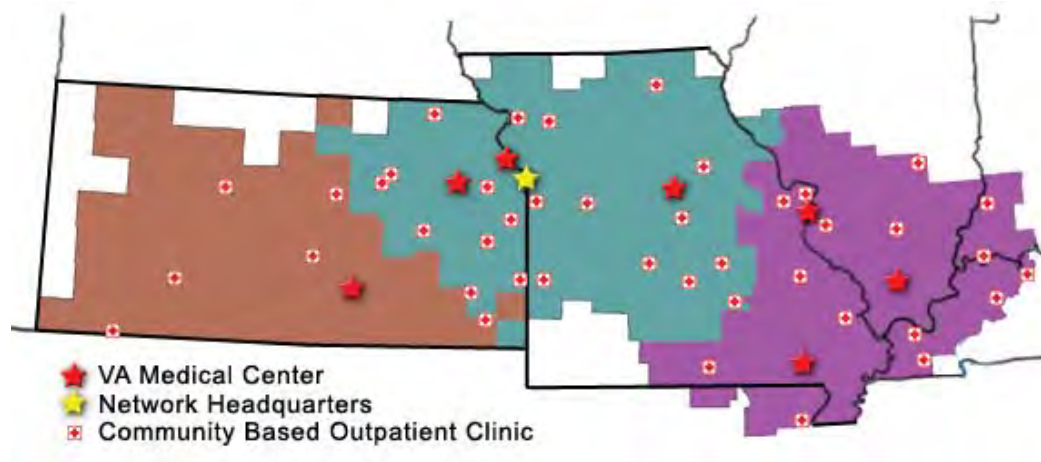


Figure 5.7 | Heartland Network of the VISN
(VA Heartland Network VISN 15, 2011)

10
PAR 4 HCP 6'
386 399
362 420



Site Inventory and Analysis

The site inventory focused on gathering all site specific information relevant to the proposed study. This first section focused on the environmental and ecological factors on the site to gain a better understanding of the land beneath the course. Next, is a playability analysis of the existing golf course at Deer Creek. This section evaluates the performance of the golf course and identifies deficiencies and problem areas. The analysis then concludes with macro analyses that identify deficiencies with the landscape that effect the entire golf course. Finally, there is a suitability analysis which determines where a golf course is most appropriate within the current boundaries.

Figure 5.8 | Deer Creek USA hole signage
(Author, 2014)

Topography

Deer Creek is nestled in the valleys of the Eastern Ozark Boundary in the Ozark Highlands. Large hills surround the property and provide a sense of total enclosure. Views throughout the site are desirable vistas of the surrounding hillsides. There is roughly 400 feet of elevation change between the lowest point in the valley and the peak of the surrounding hills (Figure 5.9).

The slopes within the valley are gentle

for the most part, and the slopes on the wooded hillsides are generally steep (Figure 5.10). Slope information is especially important for the purpose of this report. The design guidelines suggest that the entire site should be accessible, and the golf course should feel natural and fit in to the surrounding landscape. A naturalistic design reduces the total impact on the environment by minimizing overall grading and earthwork.

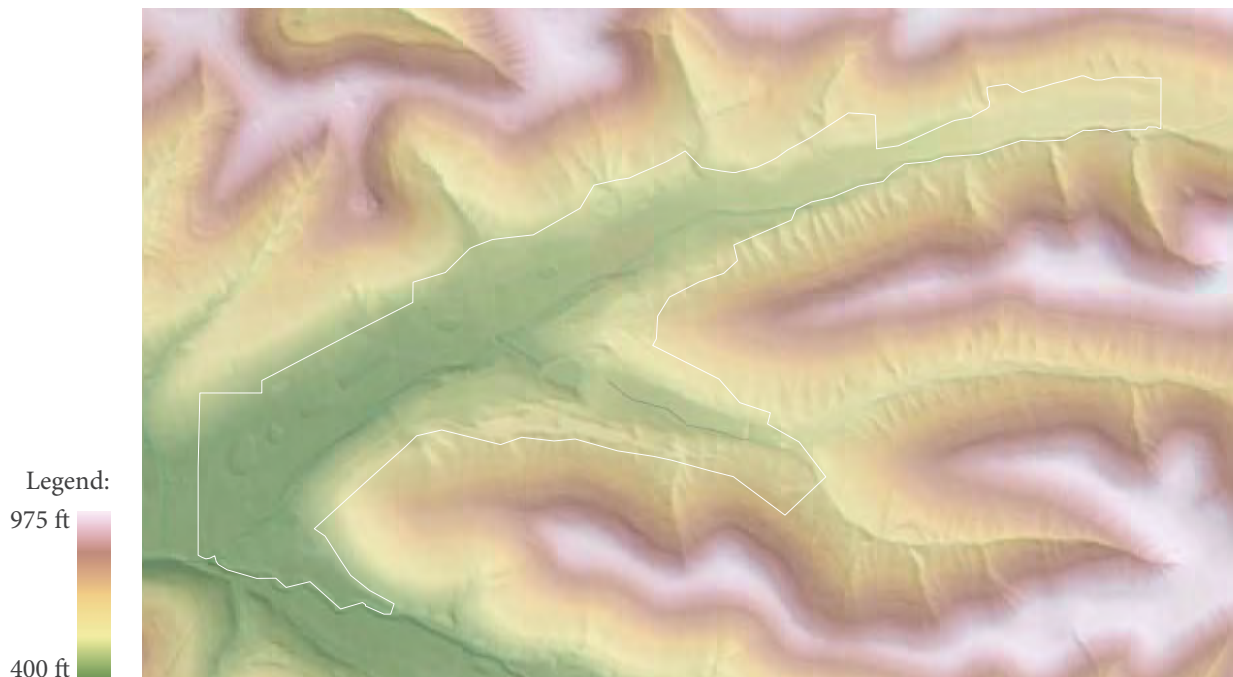
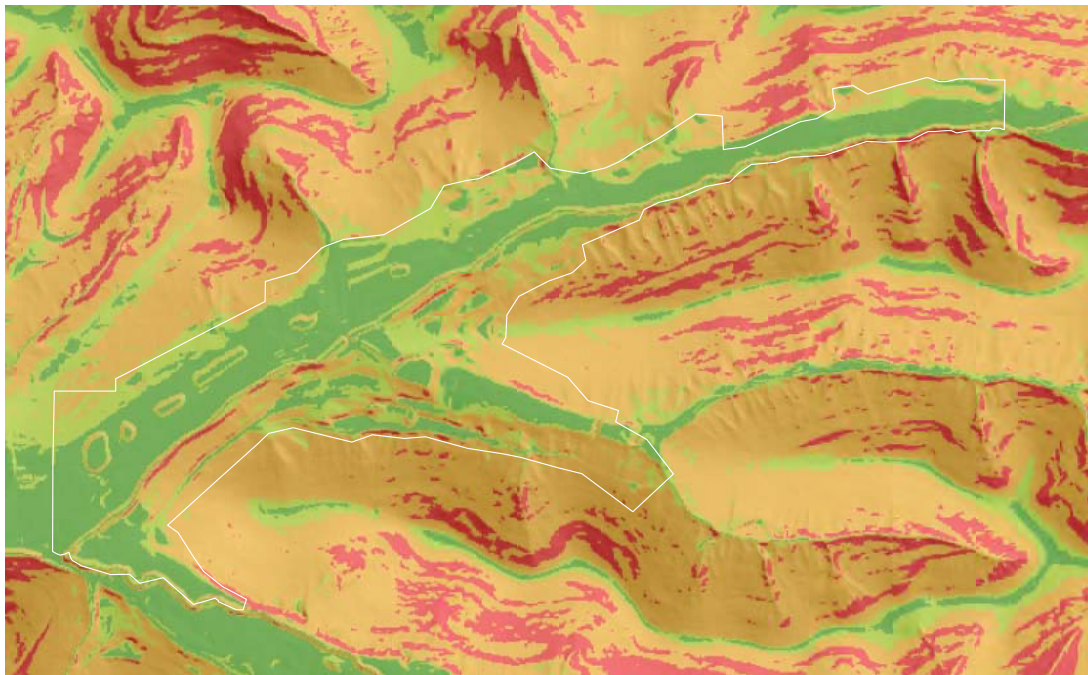
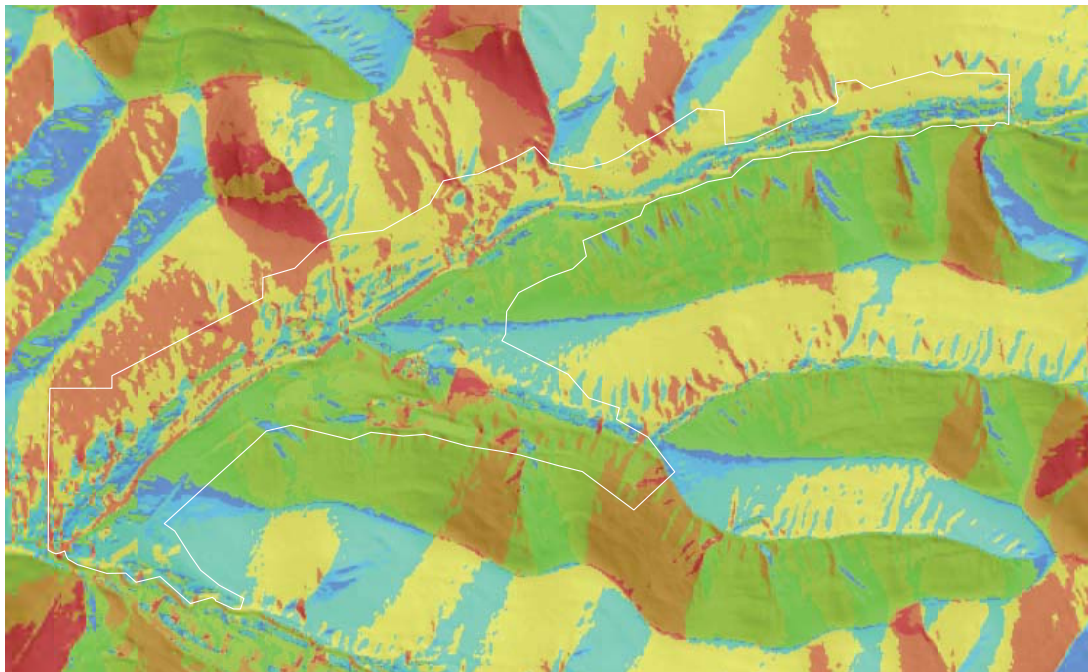


Figure 5.9 | Elevation map
(Author, 2014)



Legend:
 0-5%
 5-10%
 10-20%
 30%+

Figure 5.10 | Slopes map
 (Author, 2014)



Legend:
 North
 Northeast
 East
 Southeast
 South
 Southwest
 West
 Northwest
 North
 Flat

Figure 5.11 | Slope aspect map
 (Author, 2014)

Hydrology

The hydrologic conditions of the site are heavily influenced by the surrounding topography (Figure 5.13). Deer Creek is located within the Heads Creek Watershed, which flows into the Meramec River and eventually the Mississippi River to the east (Figure 5.12). Dulin Creek bisects the site, and is rated a 3rd order stream. This stream is the primary drainage of the site (Figure 5.13).

On the south half of the site, Dulin Creek is a second order stream (Figure

5.13), which holds standing water only during parts of the year. Dulin Creek flows to the north, and passes through a culvert. North of the culvert, Dulin Creek is classified as third order stream (Figure 5.13). Dulin Creek is a perennial stream and holds water throughout the year. There is also a one acre pond to the west of the clubhouse. The man made pond holds water year round and discharges run off into Dulin Creek.

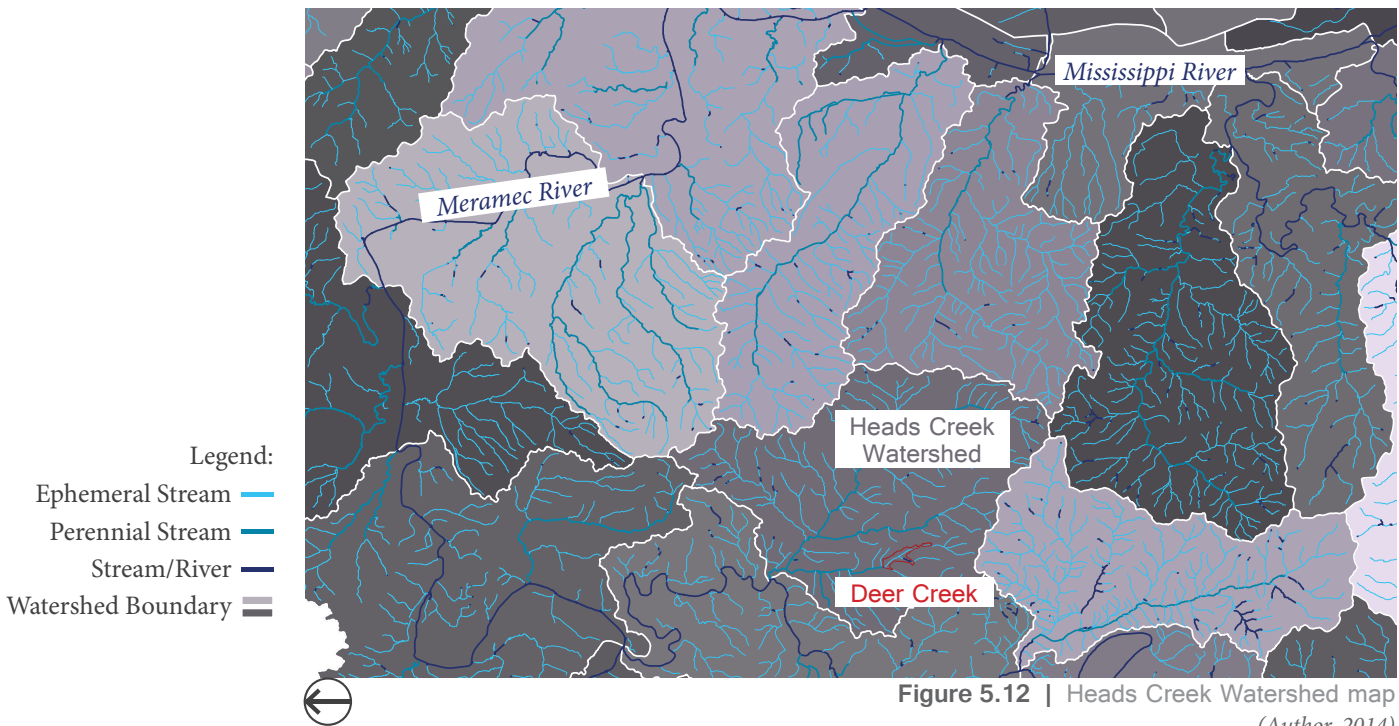
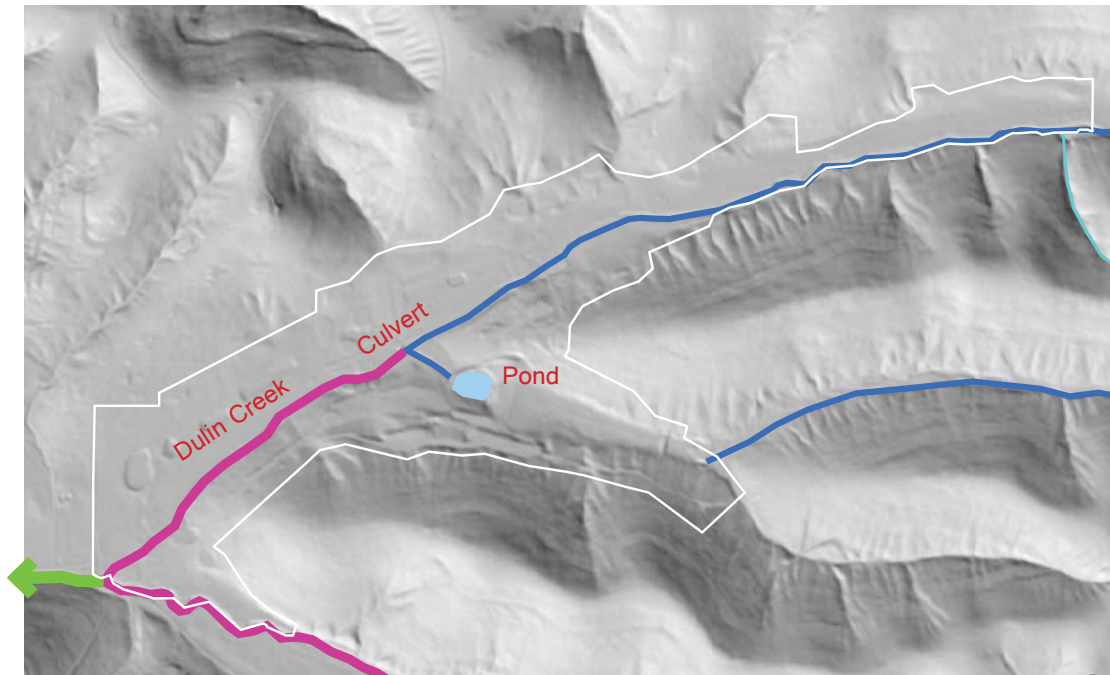


Figure 5.12 | Heads Creek Watershed map
(Author, 2014)



- Legend:
- Stream Order 1
 - Stream Order 2
 - Stream Order 3
 - Stream Order 4
 - Pond

Figure 5.13 | Stream order diagram on site
(Author, 2014)



- Legend:
- High accumulation
 - Medium accumulation
 - Low accumulation
 - No accumulation

Figure 5.14 | Flow accumulation map
(Author, 2014)

Playability Analysis

The next step of the inventory was to analyze the existing playability conditions of the golf course. The playability analysis looked at factors of the playing experience specifically for U.S. combat veterans with PTSD. The first condition was the average size of the golf elements. The golf elements that were measured were, the greens (Figure 5.17), tee boxes, fairways (Figure 5.15) and hazards (Figure 5.16). This analysis revealed that a majority of

the features were undersized and would need to be expanded in order to sustain the increased vehicular traffic caused from mobility assisting vehicles. The width of the fairways was measured to better understand the playing difficulty. Putting all other conditions aside, a narrow fairway is harder to hit than a wide fairway. A therapeutic golf course should not be designed for difficulty.

The existing fairways at Deer Creek USA are narrow which leads to more difficult tee shots



Figure 5.15 | Existing fairway at Hole 10
(Author, 2014)



The existing bunkers at Deer Creek USA have tall lips.

Figure 5.16 | Existing sand bunkers
(Author, 2014)



The existing greens at Deer Creek USA are small, which means they are smaller targets and harder to hit.

Figure 5.17 | Existing putting greens
(Author, 2014)

A.D.A. Accessibility



Slopes

A therapeutic golf landscape for U.S. combat veterans should be completely accessible under the American Disabilities Act (ADA). Therefore, the first of the large scale

analyses was an ADA conformance assessment. The above analysis reveals several problem areas within the golf course concerning the overall accessibility (Figure 5.18).



Figure 5.18 | ADA slope map in playing areas
(Author, 2014; Winslow 2006)

Legend

- 0-2%
- 2-5%
- 5-8.33%
- 8.33% +

Introduction

From the preceding macro analysis, a micro analysis is provided to further describe the accessibility concerns that exist at Deer Creek USA. A complete analysis of the literature review reveals that a therapeutic golf course for U.S. combat veterans should be fully accessible by ADA standards. The golf course for the most part is ADA accessible, and these areas are suitable for veteran golf. There are however select holes that are concerning.

Hole 3

The par-3 third hole requires the golfer to hit over a ravine (Figure 5.19). The area around the green is extremely steep and exceeds ADA standards. If the golfer does not successfully clear the ravine and land their tee shot on the flat green, they have to find their ball and hit from an inaccessible slope.



Figure 5.19 | Hole 3 accessibility map
(Author, 2014; Winslow 2006)

Legend

- 0-2%
- 2-5%
- 5-8.33%
- 8.33% +

Hole 5

The par-4 fifth hole plays along a steep hillside (Figure 5.20). Nearly the entire fairway is inaccessible by ADA standards. The green area, similar to the third hole, is surrounded by steep grades. If the golfer cannot put their second shot on the green, they may not be able to safely access their ball.

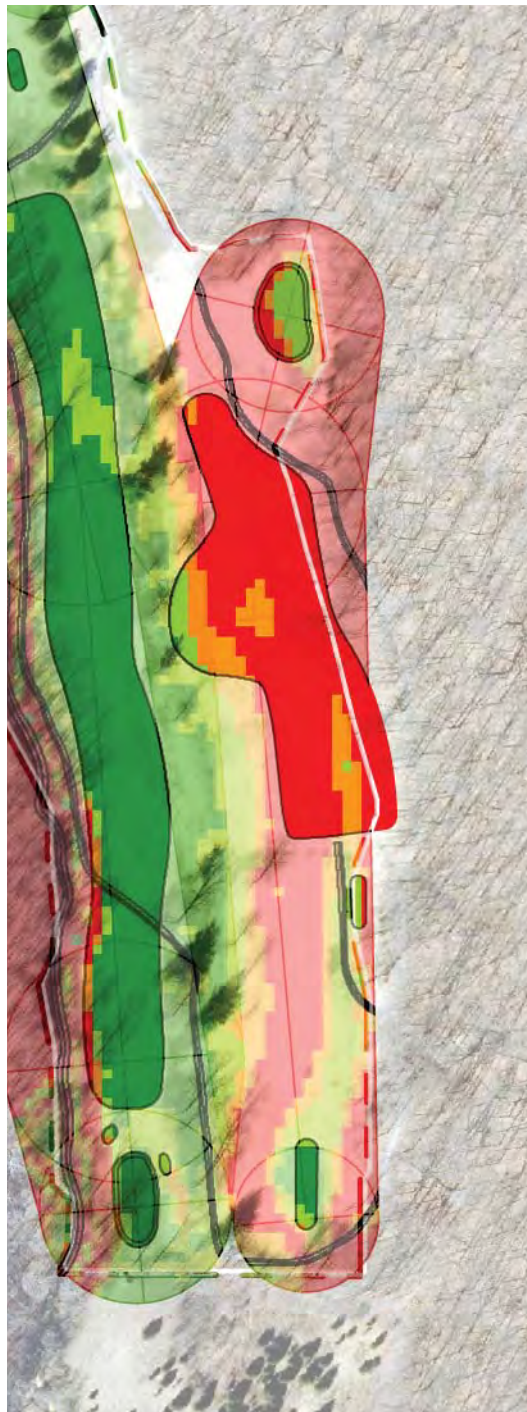


Figure 5.20 | Hole 5 accessibility map
(Author, 2014; Winslow 2006)

Legend

0-2%
2-5%
5-8.33%
8.33% +

Safety Envelope



Introduction



The next critical macro analysis was to check the safety of each hole (Figure 5.21). This analysis employed the standard safety envelope that is used for the design and construction of

new golf courses. The safety envelope of one hole should not cross or overlap with another hole. Overlapping safety envelopes illustrate unsafe course conditions, where unsuspecting golfers can be hit by golf balls.



Figure 5.21 | Existing safety envelopes
(Author, 2014; Winslow 2006)

Legend

-  Safety envelope
-  Putting greens, tee boxes, and fairways

Introduction

The standard safety envelope template is designed to protect golf holes from becoming dangerously close to other golf holes. The safety envelope is determined by first putting a 150' safety ring around the tee box, a 400' safety ring around the landing zone and a 300' safety ring around the center point of the green. The average golfer will stay within the standard safety envelope of each hole barring a very poorly hit shot.

After illustrating a safety envelope over each existing hole at Deer Creek USA, there are some critical areas that are considered to be hazardous and threatening.

Hole 1

Starting with the first hole (Figure 5.22), the entire left half of the hole is threatened by incoming tee shots from the neighboring 18th Hole. This is a significant overlap and not a safe condition for golfers on both Hole 18 and Hole 1. The next condition of concern is the overlap between the landing area surrounding Hole 1 and the tee box safety zone on Hole 2. Any golf shots approaching the green on Hole 1 that are hit too hard or go long could potentially endanger a golfer on the second tee box.



Figure 5.22 | Hole 1 safety study
(Author, 2014; Winslow 2006)

Legend:

- Not Safe
- Safe green, tee or fairway
- Safety envelope

Hole 5

Another example of a threatening condition on the current golf course is the par-4 Hole 6 (Figure 5.23). The first area of concern is around the tee box where the safety envelope for Hole 6 overlaps with the safety envelope of Hole 4. Golfers on these holes are threatened by being hit from an errant tee shot from the adjacent tee box. The next area of concern is the overlap that occurs near the green area. The green for Hole 2 is within the safety envelope of Hole 6. Errant approach shots from someone on Hole 6 may threaten golfers on the putting green on Hole 2. Lastly, the green area for Hole 6 is endanger from errant approach shots from Hole 2.

Conclusion

A golf course that has unsafe conditions for the golfers is not a suitable landscape for veterans seeking a therapeutic golf experience. Veterans suffering from PTSD, especially those who are particularly hypervigilant, may feel uneasy if threatened from neighboring golf balls. By employing the safety envelope in a redesign, the appropriate precautions will have been made to make for the safest possible golfing experience.

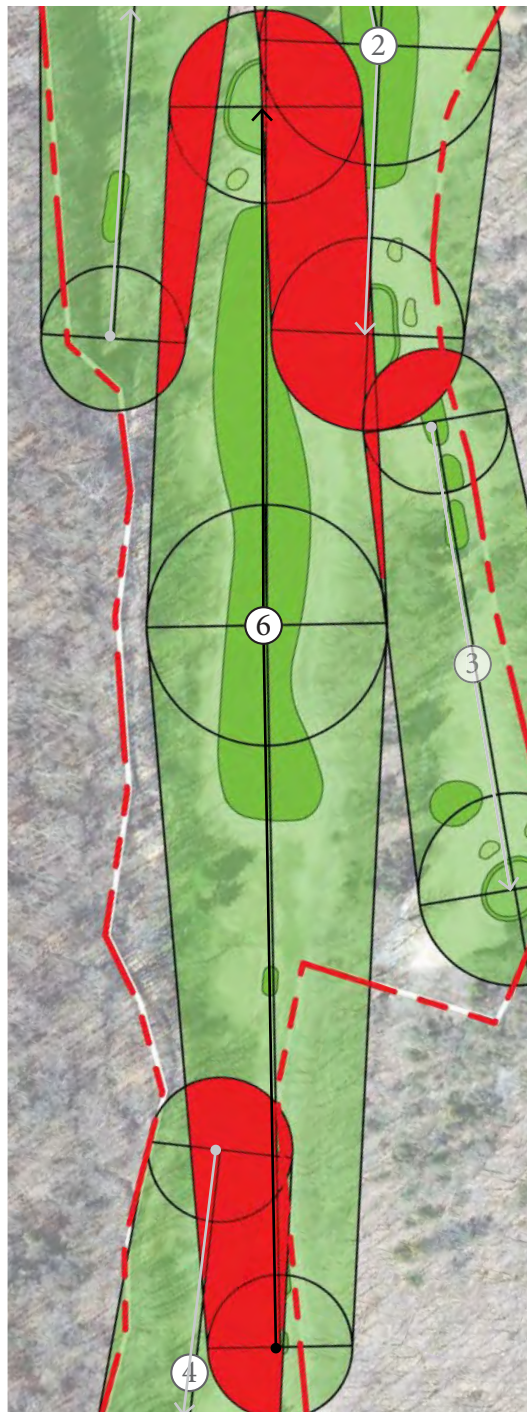


Figure 5.23 | Hole 5 safety study
(Author, 2014; Winslow 2006)

Legend:

- Not Safe
- Safe green, tee or fairway
- Safety envelope

Suitability Analysis

The final step in the evaluation of the existing conditions at Deer Creek USA was to determine where a golf course is suitable on the property. The first map identifies all elements of the existing golf course on a map (Figure 5.24). Next, the ADA accessibility information was applied, where all slopes over 8.33% were determined unsuitable (Figure 5.25). Finally, a hydrography map is overlaid

with a 100' buffer from the bank of the primary waterway, Dulin Creek (Figure 5.26) (Klein, 1994). All greens, tees, and fairways are to remain outside of the 100' buffer. After all these maps were overlaid, it was possible to determine if Deer Creek USA is a suitable layout for a therapeutic golf course designed for U.S. combat veterans suffering from PTSD.



Figure 5.24 | Existing golf course elements
(Author, 2014)

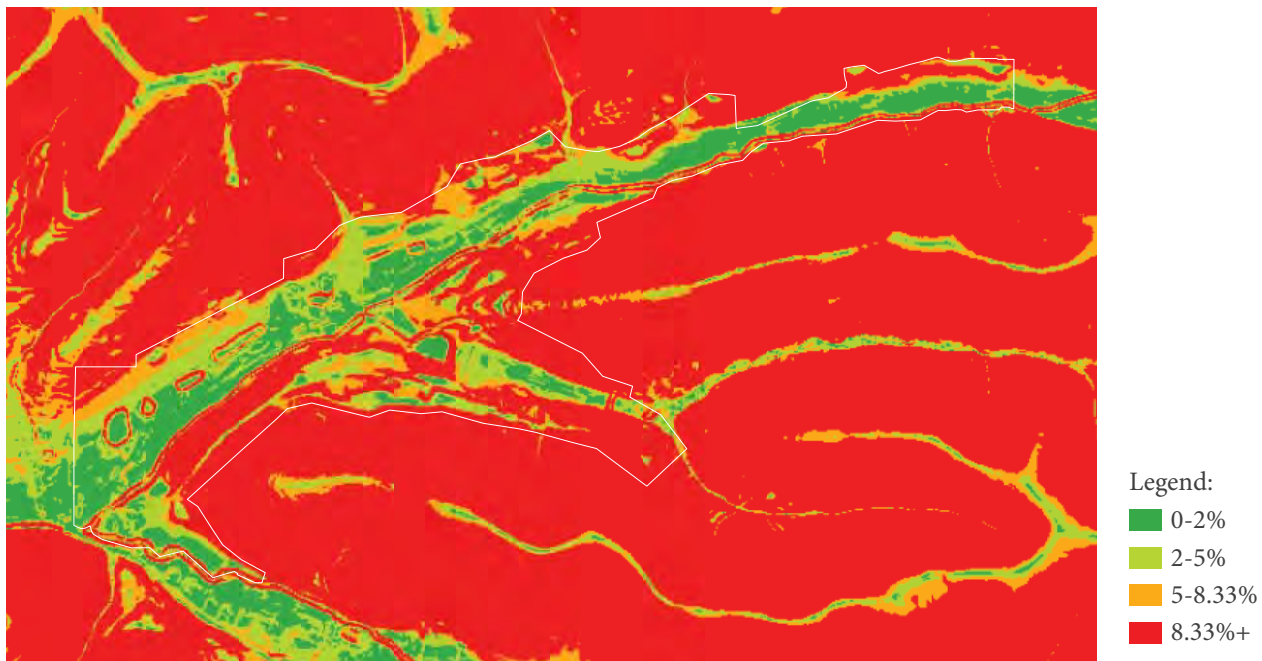
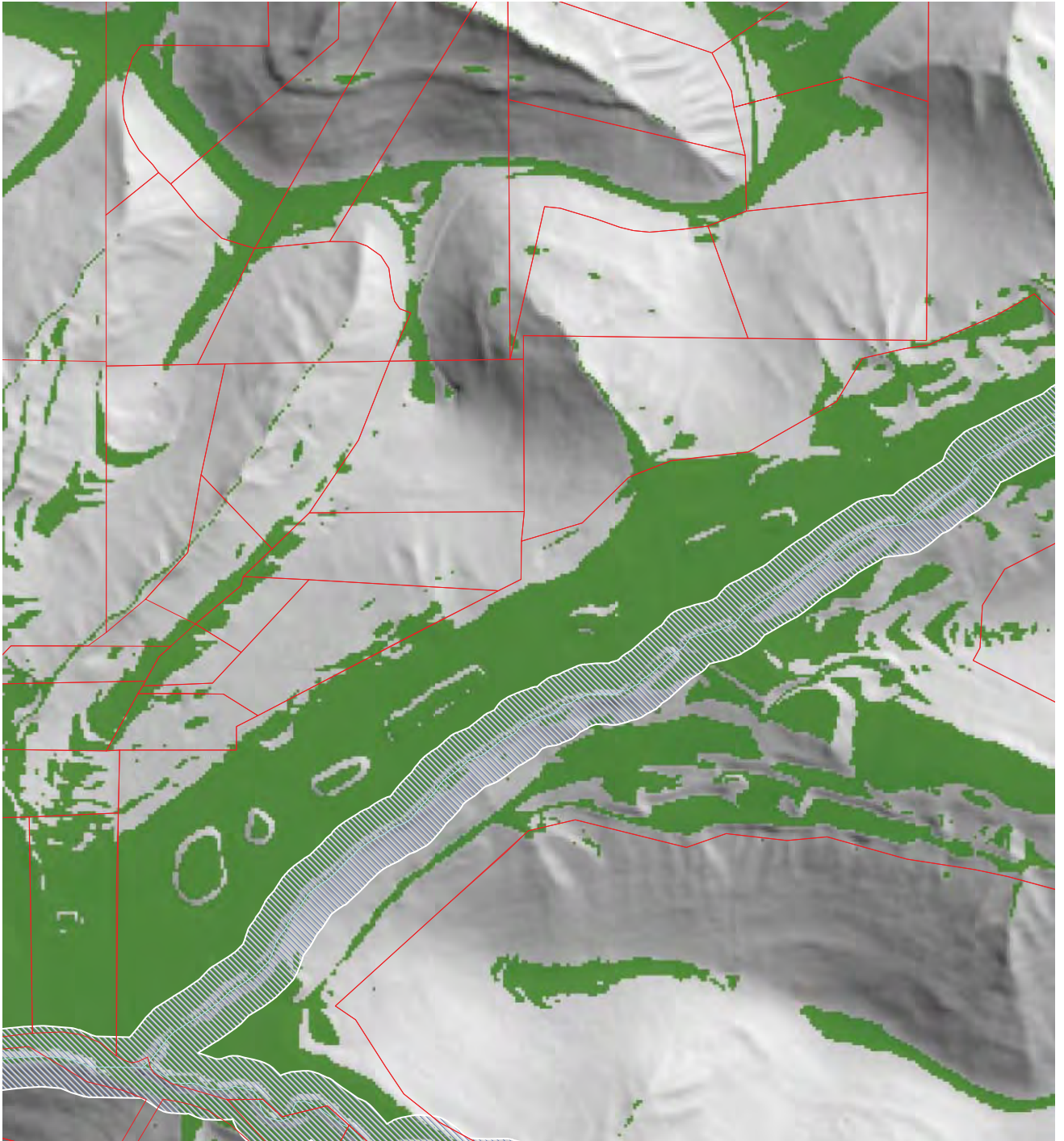


Figure 5.25 | Existing ADA accessibility
 (Author, 2014)



Figure 5.26 | Existing riparian area with buffer
 (Author, 2014)

Suitability Map



The above suitability map illustrates in green where golf elements including greens, tees and fairways for a therapeutic golf landscape for veterans with PTSD are suitable. The stripped area identifies the

extent of the 100' buffer applied to Dulin Creek, where greens, tees, and fairways are not permitted. This was used as a foundation layer for the proposed renovation master plan design application (Figure 5.27).

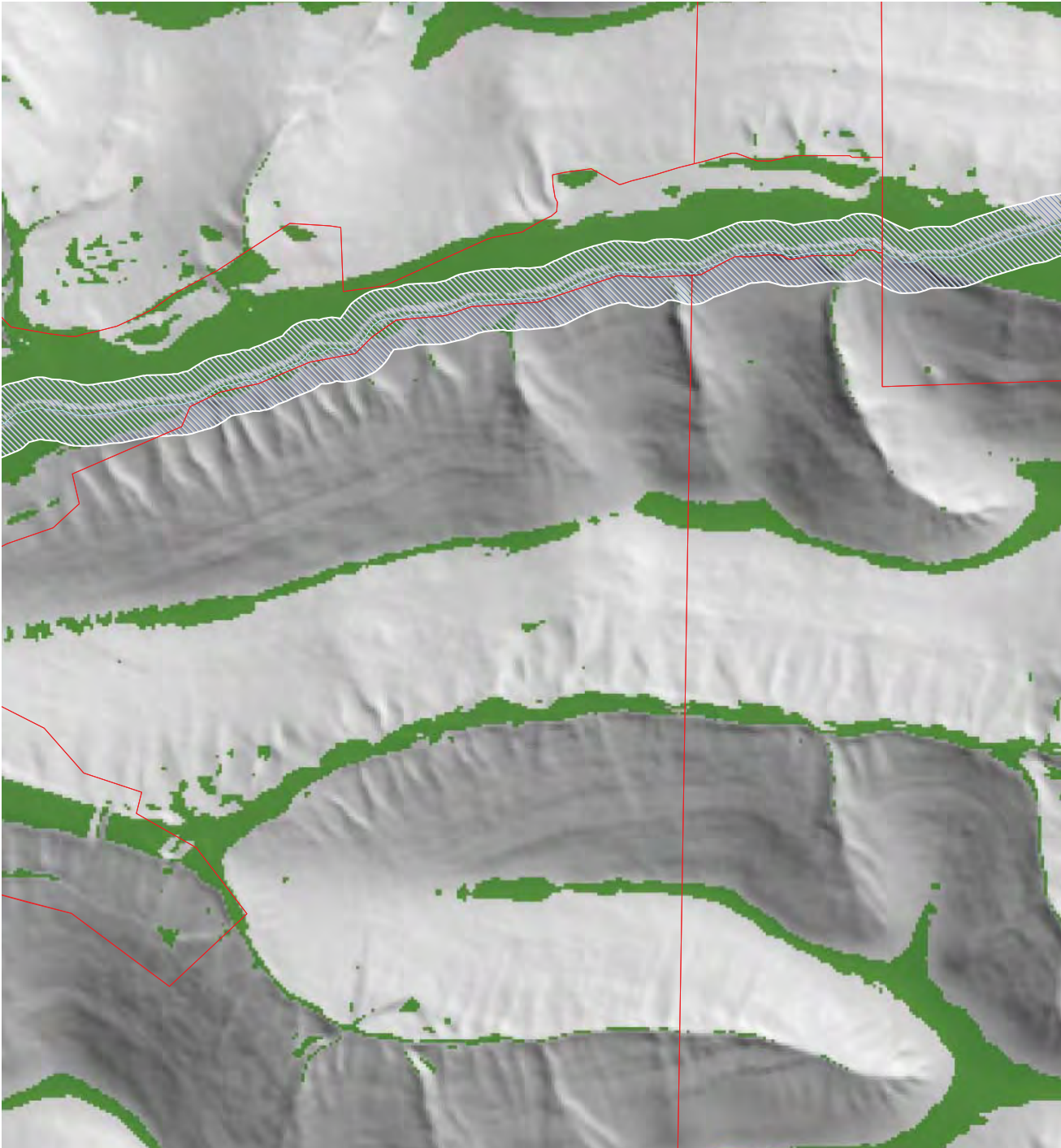


Figure 5.27 | Suitability map for Deer Creek
(Author, 2014)

- Legend:
-  Suitable
 -  Not Suitable
 -  100' Buffer

Chapter Conclusion

With a better understanding of the existing conditions of the current golf course at Deer Creek USA, it was possible to evaluate the landscape's performance based on criteria distinguished from the interpretation phase of the project. The existing golf course at Deer Creek USA is deficient in many areas concerning its therapeutic value for U.S. combat veterans and service members. Currently, there are threats a golfer's safety and well being, as the safety envelopes overlap and the site features steep slopes which are inaccessible to this unique population. There is a lack of plant diversity and complexity in the landscape. Trees are scattered throughout the golf course to function as wind screens and spatial dividers, but there is little therapeutic value to the landscape aesthetics.

The current golf course at Deer Creek USA is deficient by playability measures as well. Golf elements, including putting greens, tee boxes, fairways and sand

bunkers are all generally undersized. The proportions of such features will need to be reconsidered to accommodate increased vehicular compaction caused from mobility assisting golf carts. The fairways need to be widened to accommodate for more choices off the tee, creating a more complex round of golf. Wider fairways also create a more welcoming feeling from the tee box, and less of an intimidation factor.

Ecologically, the existing golf course encroaches on sensitive areas of land, which can potentially pollute run off water and adversely effect ecosystems down stream. The Dulin Creek riparian corridor does not have an appropriate buffer to impede contaminants or provide habitat, which is highly desirable in a therapeutic golf course for veterans.

For Deer Creek USA to meet their goal of becoming a therapeutic golf landscape for U.S. combat veterans and service members suffering from PTSD, they will need to remodel their golf facilities.

Figure 5.28 | Evaluation process
(Author, 2014)



Flow Accumulation
Legend

- STREAMS ARE A MAJOR FEATURE ON THIS AREA.
- DRAINAGE TO THE LEFT OF THIS FARMING.
- DRAINAGE ON RIGHT OF THE GREEN AREA, (UPPER HAND).

ADA Accumulation
Legend

- CIRCUMFERENTIAL DRAINAGE IS FLAT.
- LANDING AREA IS FLAT. EARL CUT THE (S)



- DRAINAGE
- ROAD
- FARM

Flow Accumulation
Legend



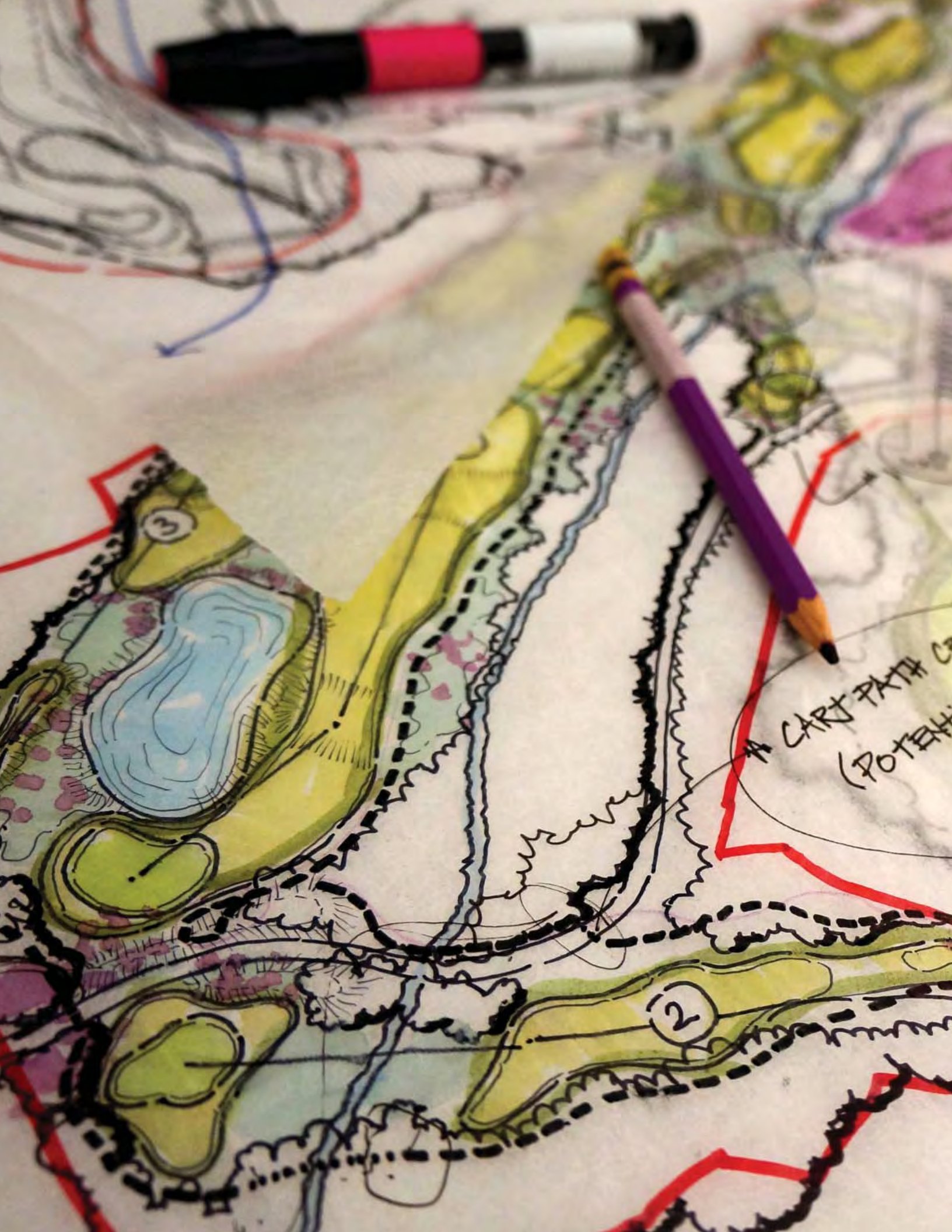
Figure 6.1 | Application process
(Author, 2014)

A black and white photograph of a desk with architectural sketches, a pen, and a pencil. The sketches are detailed line drawings of a landscape or site plan, with various lines and shapes representing terrain, paths, and structures. A pen and a pencil are resting on the sketches. The overall scene is a close-up, slightly angled view of the workspace.

APPLICATION

6

The following chapter describes the proposed conceptual design for Deer Creek USA. The Application is the final method in the report, where the collection of ideas from the Knowledge Base, Interpretation and Evaluation chapters is applied through design.



A CART PATH
(POTENTIAL)

2

1



Design Process

The design for the Renovation Master Plan has one goal, which is accomplished through three key objectives. The goal is to design a therapeutic golf landscape to honor US combat veterans and service members. This goal is achieved through meeting three objectives:

1. Create an authentic and accessible golfing experience for veterans of all skill levels
2. Optimize the therapeutic golfing experience for those suffering with PTSD
3. Create a landscape that honors US combat veterans and service members

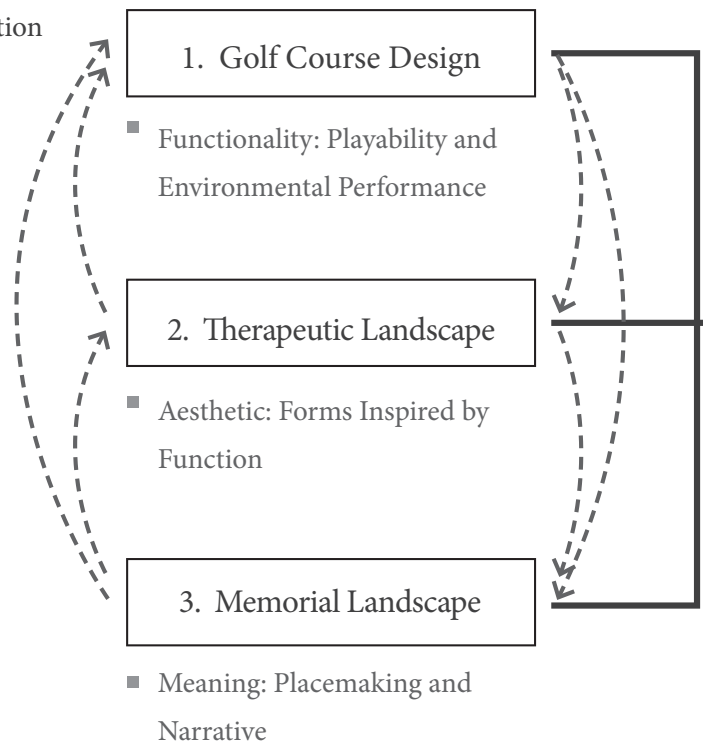
The following chapter will illustrate the process leading to the design outcome for the Renovation Master Plan at Deer Creek USA.

Figure 6.2 | Design process drawings
(Author, 2014)

Design Program

After interpreting the knowledge base, and evaluating the project site, it was possible to devise a collection of program elements that together, would fulfill the ultimate goal. The program elements to be included in the Deer Creek USA Renovation Master Plan are:

1. Golf Landscape
 - Golf course
 - Wildlife habitat
2. Club House
 - Practice facilities
 - Event space
 - Space for non-golfers
 - Outdoor eating and seating
3. Welcoming Experience
 - Entryway
 - Circulation and wayfinding



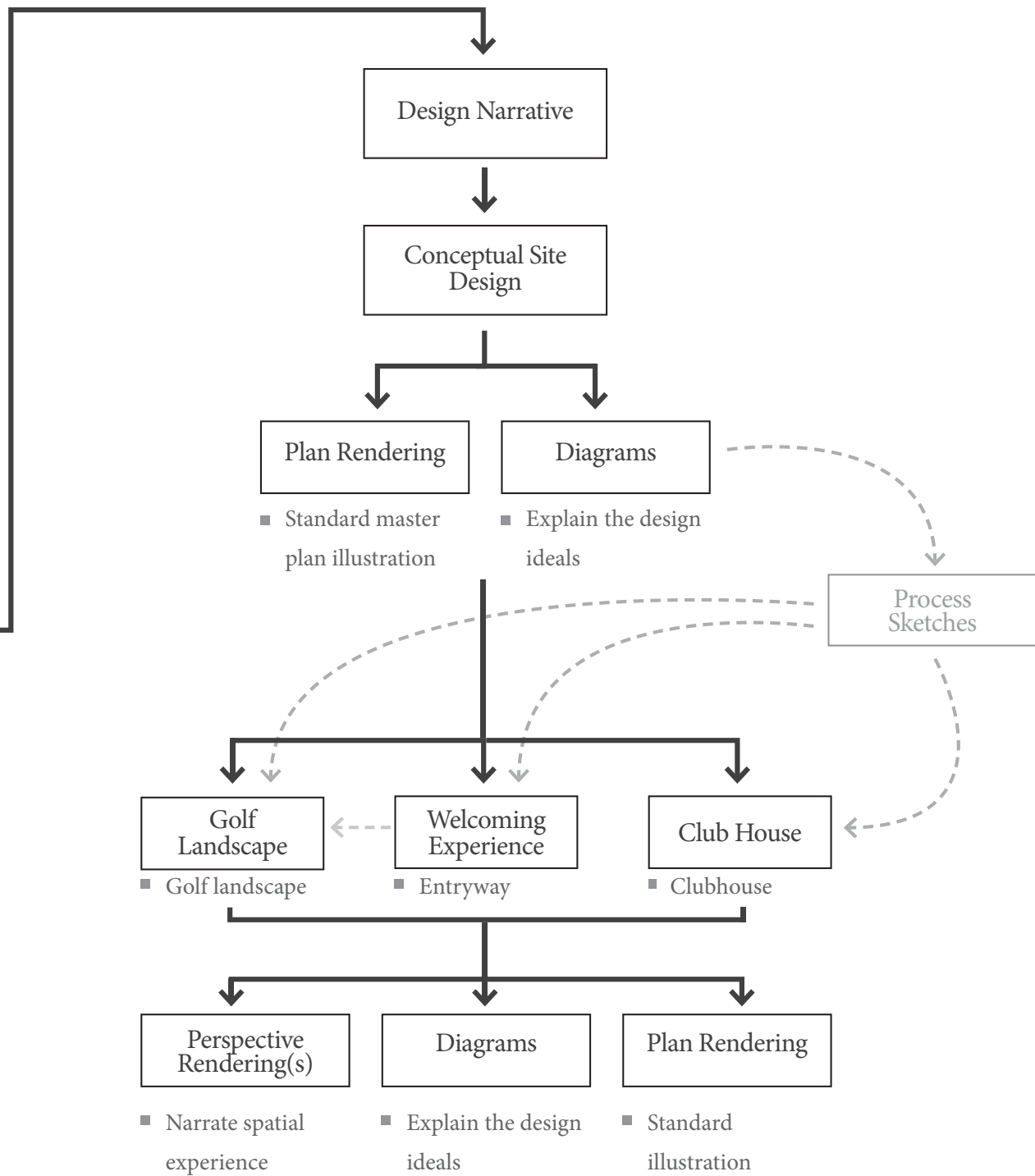


Figure 6.3 | Design process diagram
 (Author, 2014)

Master Plan





Figure 6.4 | Deer Creek Renovation Master Plan
(Author, 2014)

Program Zones

The Master Plan can be divided into three program areas which can be further illustrated and diagramed to better understand the design of the spaces. The three program zones employed in the design are the:

1. Golf Course
2. Club House
3. Entryway
4. Opportunity Area

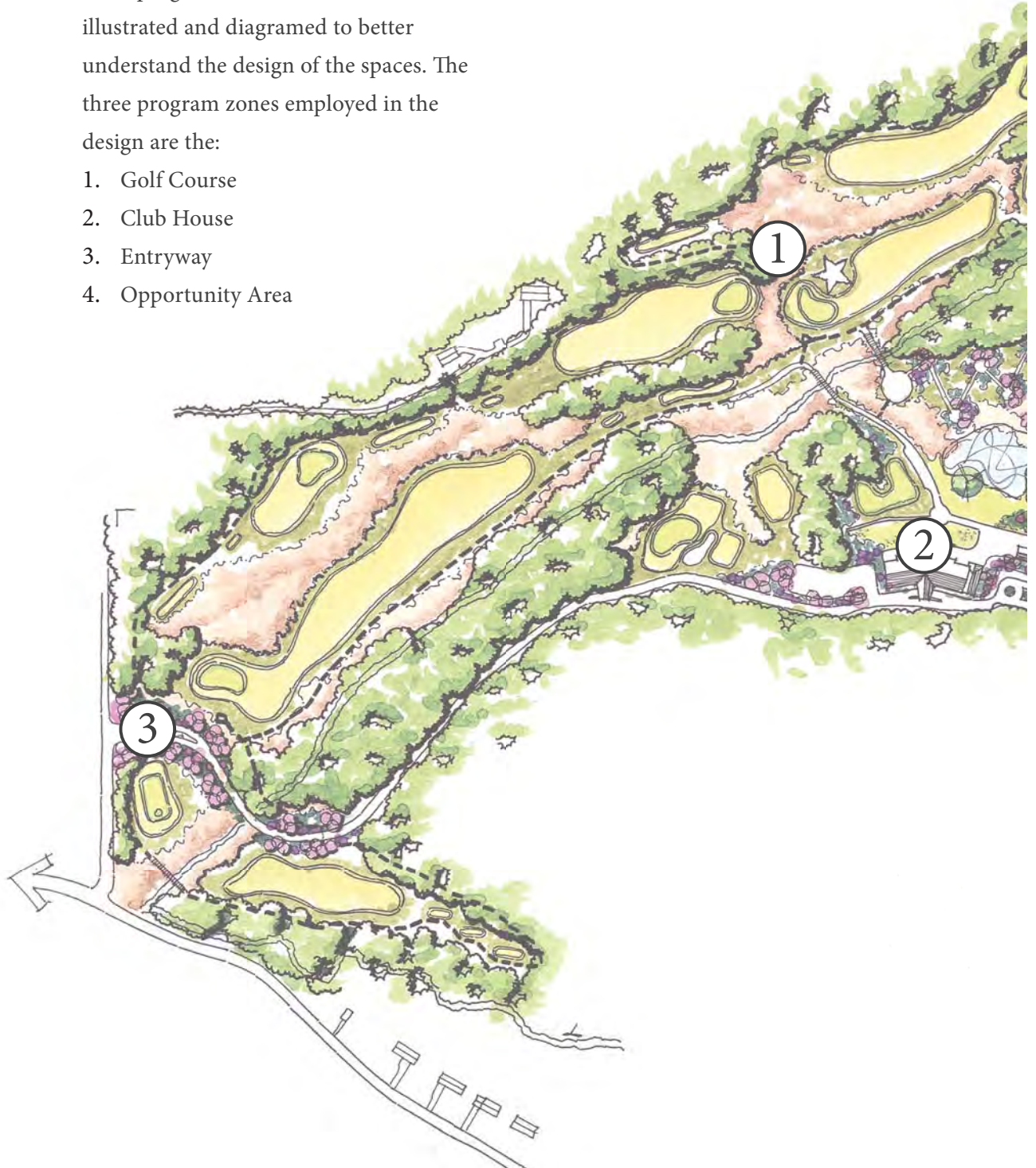
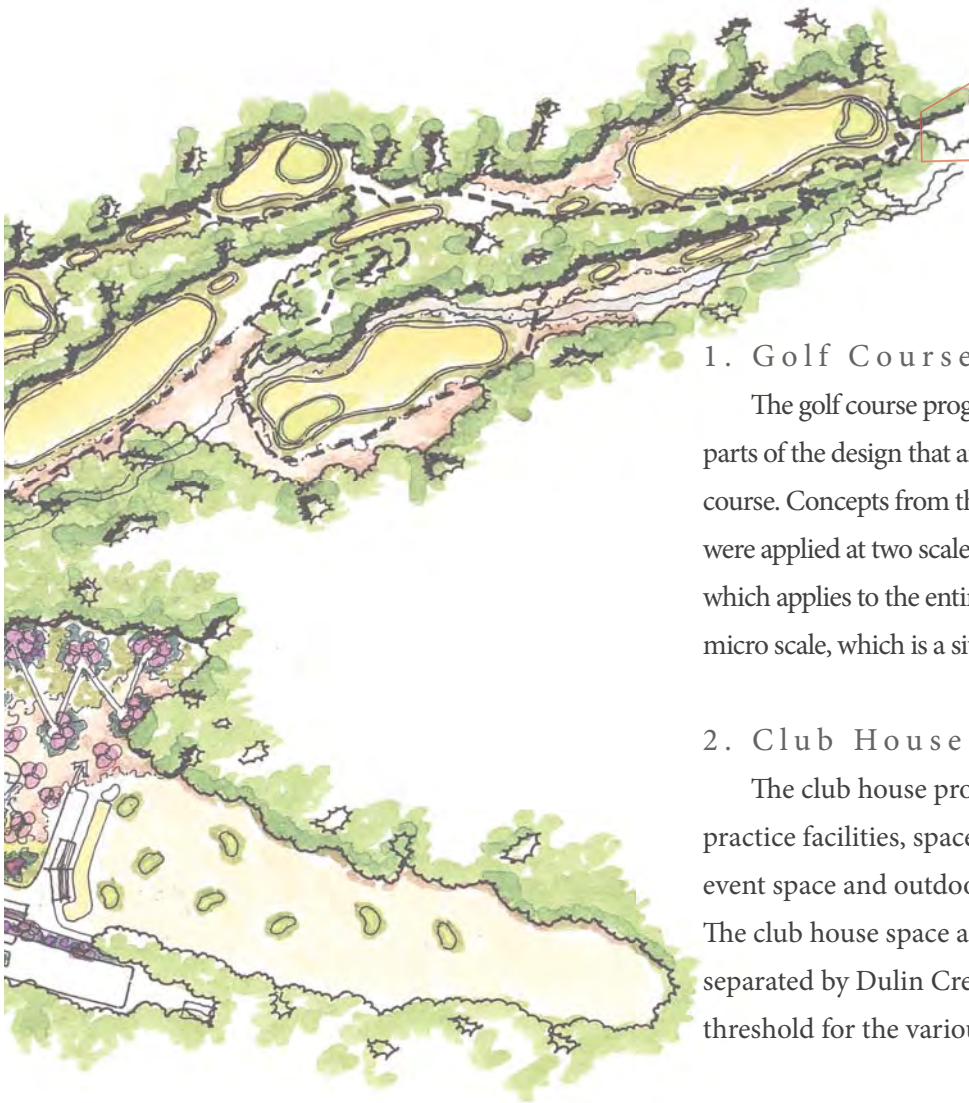


Figure 6.5 | The masterplan program zones
(Author, 2014)



1. Golf Course

The golf course program zone describes the parts of the design that are related to the golf course. Concepts from the interpretation phase were applied at two scales, the macro scale, which applies to the entire golf course, and the micro scale, which is a site specific and focused.

2. Club House

The club house program zone includes practice facilities, space for non-golfers, event space and outdoor eating and seating. The club house space and the golf course are separated by Dulin Creek which provides a threshold for the various activity zones.

3. Entryway

The entryway program zone includes the new entrance to Deer Creek USA and preceding entry drive. The new entrance modified the deficient primary vehicular circulation and secondary cart path circulation.

4. Opportunity Area

This space is reserved for a potential residential component, practice golf holes or a future expansion to an 18 hole facility. This space however is outside of the current project scope.

The Golf Course

The golf course Renovation Master Plan is the result of the interpreted knowledge base from the previous chapters. Design guidelines from the interpretation phase were applied to the golf course at two different scales, the first being the macro

scale. At the macro scale, select guidelines were applicable to the entire golf course. The following describes the macro scale design principles that were incorporated into the Renovation Master Plan:

Golf Course Design

- Slices stay inside the course
- Set back from primary waterway
- Full length golf holes (3,150 yds)
- Par 36 layout: (2) Par-3, (5) Par-4, (2) Par-5
- Minimized earthwork and grading

Therapeutic Landscapes

- Never overlapping safety envelopes
- Variety of tee locations per hole
- Frequent and legible signage
- Familiar golf course design features
- Buffered unattractive views and sounds
- Bird boxes incorporated for increased wildlife
- Provided habitat to increase wildlife on site
- Maintained ADA accessibility standards
- Grouped holes according to difficulty
- Eliminated circulation hazards and threats
- Avoided intersecting cart paths
- Provided shade at focus areas
- Maximized plant diversity and plated areas
- Avoided dangerous blind shots

Memorial Landscapes

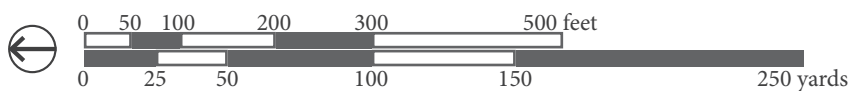
- Each hole tells a part of the Veteran's Journey
- Core values engraved in stone on each hole
- Used design elements to reflect the narrative



Figure 6.6 | The golf course
(Author, 2014)



Hole	Name	Par	Yards
1	The Oath	5	550
2	Train-Up	4	330
3	Mobilization	3	200
4	Deployment	4	340
5	Employment	4	380
6	Re-deployment	3	160
7	Post-deployment	4	340
8	Reconstitution	4	350
9	American Veteran	5	500
Total:		36	3,150



Design Narrative

The design narrative focused on a single goal, to honor US combat veterans and service members. The concept employed to achieve the goal is to tell their story through an exploration and study of the process that it takes to become a U.S. combat veteran. The experiential qualities of a memorial landscape are used here to frame the design concept for the Renovation Master Plan for Deer Creek USA (United States Department of Defense, 2011).

Establish *Meaning* in the Landscape

Each golf hole on the honor course is inspired by a different stage in the veteran's journey, regardless of the branch of military the veteran serves or served in. The golf course incorporates therapeutic design elements intended to improve health outcomes for veterans with PTSD.

Incorporate *Ritual* Experiences

The golf course has engravings set in stone that occur throughout the golf landscape. Veterans and civilians alike are invited to play the course and find the core values that are attributed to each stage in the veteran's journey.

Narrate the Meaning to an Audience

Each golf hole, as described earlier, is designed and inspired by a stage in the journey to becoming a US combat veteran and service member. The honor course narrates the story by incorporating elements into each hole's design that corresponds to the stage of the narrative. The proposed golf course is a nine hole layout, which means there are nine stages to the veterans' journey.

Evoke a Dialogue

The concept behind the golf course intends to tell the story of all US combat veterans and service members. The design of the course is not dedicated to a single war or conflict, the course is not dedicated to single branch of the United States Armed Forces and finally, the golf course is not dedicated to only those with PTSD. The golf course is built in honor of all members of the United States Armed Forces.

Pre-Deployment Deployment

1. The Oath | COMMITMENT

Each veteran begins their journey by making a *commitment* to the United States that they will protect and defend the freedoms of the United States of America.[illustrated]

2. Train-Up | HONESTY

After taking the oath, individuals begin the traditional field training cycle respective to their service branch. Physical and mental health examinations are conducted to ensure that the individual, and their families, are prepared for extended deployments. *Honesty* is required to pass through the examinations (United States Department of Defense, 2011).[illustrated]

3. Mobilization | LOYALTY

Near the end of the *Train-Up* phase, military personnel are alerted to a possible deployment in the near future. The unit receives orders to mobilize, and prepare to leave their home installation for their respective theatre of operations. Units remain *loyal* to their oath and begin to prepare to fulfill their commitment (United States Department of Defense, 2011).

4. Deployment | COURAGE

The deployment phase begins when units and personnel move away from their home installations to their theatre of operation. The *courageous* service members leave the safety of their home installations knowing of the dangers and risks abroad (United States Department of Defense, 2011).

5. Employment | DUTY

During the employment phase, individuals perform their assigned *duties* in support of the mission. Through the employment phase, military personnel can be exposed to traumatic events and life threatening situations (United States Department of Defense, 2011).

6. Re-Deployment | INTEGRITY

Near the end of the deployment phase, units begin to prepare equipment and material to return to their home installation. Units return home with integrity after having performed their duty (United States Department of Defense, 2011).

Post-Deployment

7. Post-Deployment | RESPECT

Once back in their pre-deployment home installations, personnel undergo post-deployment briefings, training, medical evaluations and counseling to help service members reintegrate into civilian life (United States Department of Defense, 2011).

8. Reintegration | HUMILITY

After completing the post-deployment recovery program, units are approved to reintegrate back into civilian life. Service members are welcomed home into their families and home communities. This is a humbling experience for many (United States Department of Defense, 2011).

9. American Veteran | HONOR

The outcome of the entire process yields an American Veteran. An honor that cannot be stripped, or lost, it is carried with them for the remainder of their life. US combat veterans and service members should receive due honor for their sacrifices.

[illustrated]

“The Oath”

Hole 1: Par 5 | 550 Yards

1. Golf Landscape
 - a. 75-180 yd. carry
 - b. Landing area
 - c. Lay-up
 - d. Bail-out

2. Therapeutic Landscape
 - a. Partially enclosed tee box ^A
 - b. Native grass and wildflower seed mix ^{B,C}
 - c. Sensory plants ^{B,C}
 - d. Wide landing area for a welcoming tee shot ^D
 - e. Shade ^E
 - f. Choice from tee box ^A

[letter superscripts denote DSM-IV-TR criteria]

3. Memorial Landscape
 - a. 5 bunkers each representing a branch of the United States Armed Forces
 - b. *Commitment* stone embedded into landscape

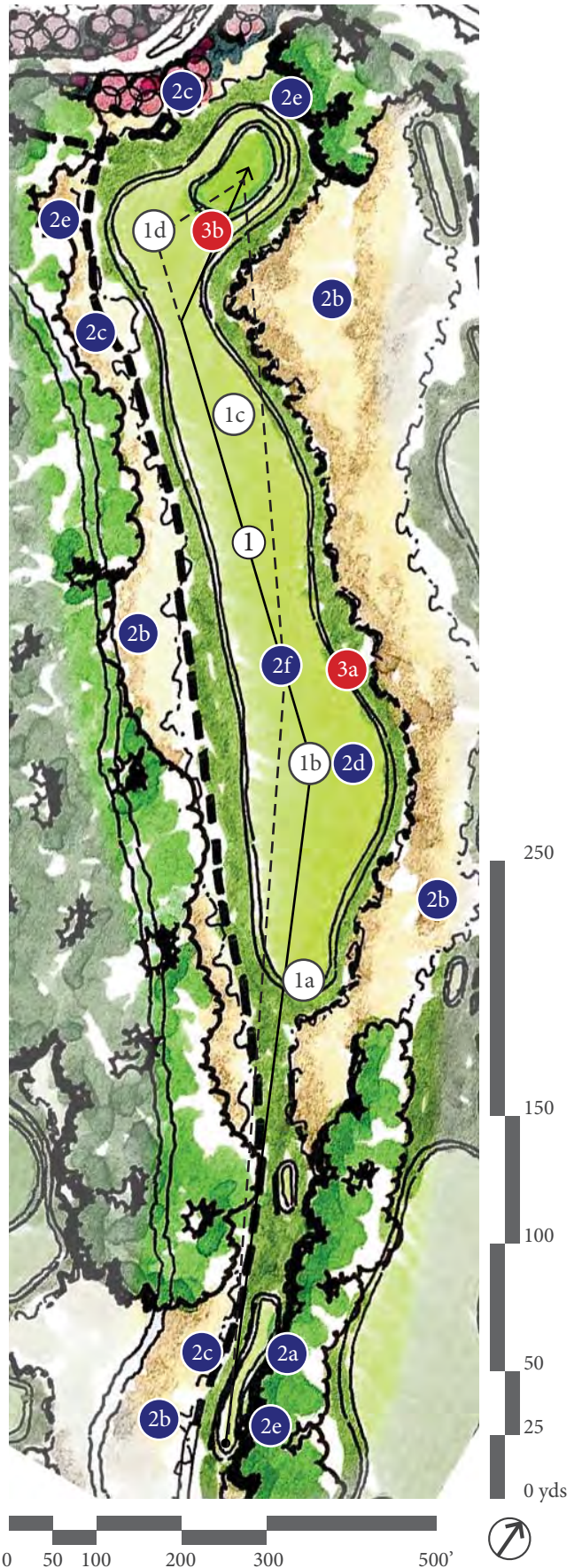
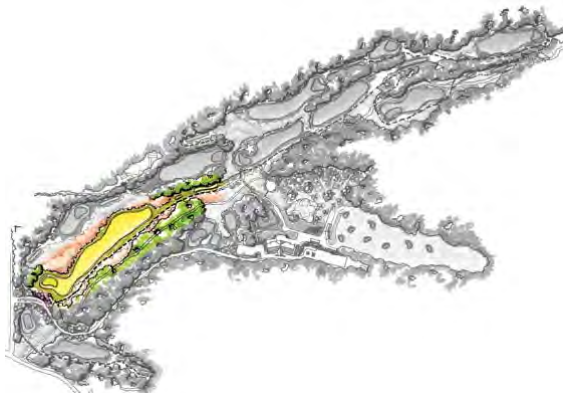


Figure 6.7 | Hole 1: “The Oath”
(Author, 2014)

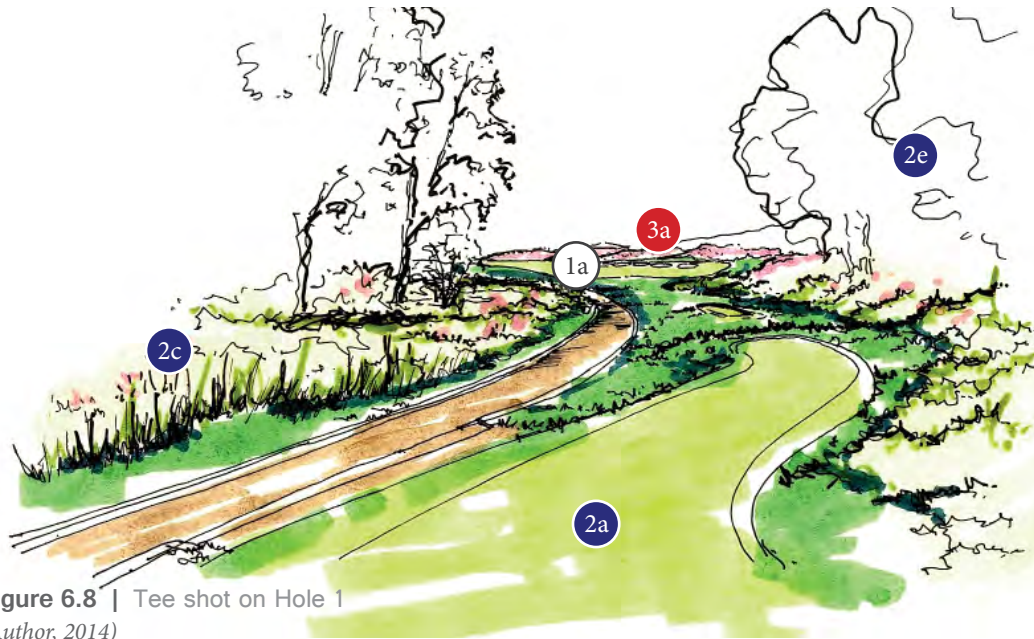


Figure 6.8 | Tee shot on Hole 1
(Author, 2014)

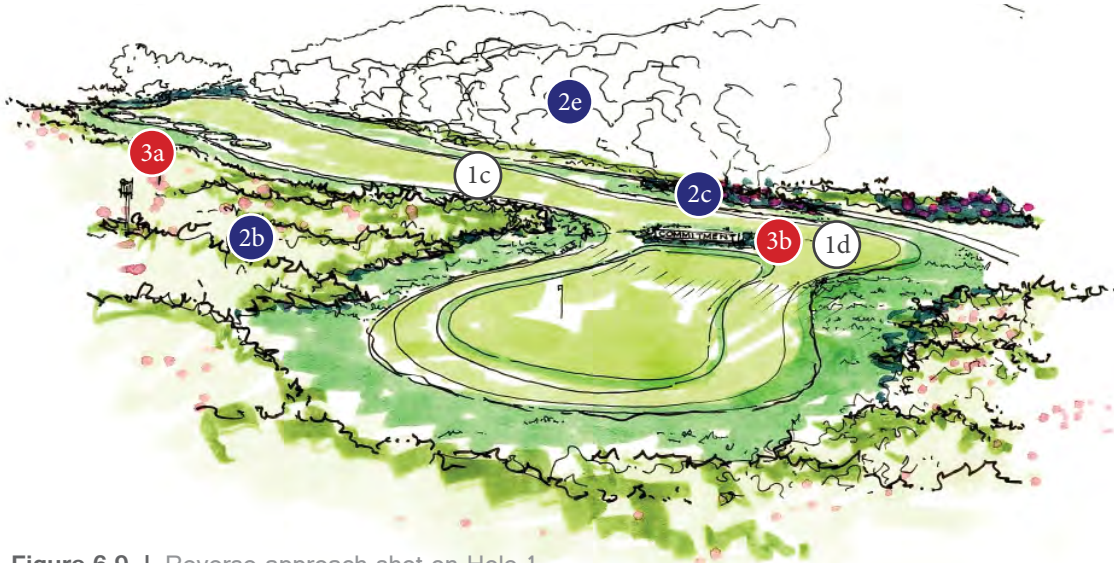


Figure 6.9 | Reverse approach shot on Hole 1
(Author, 2014)

The first hole of the golf course is called *The Oath*, which is symbolically the first step in becoming a US combat veteran or service member. The person makes a *commitment* to the nation that they will protect and defend the freedoms of the United States of America.

From the tee, the surrounding woodlands create a comfortable setting of enclosure (2a), while framing the open fairway (2d). Golfers are encouraged to hit with a driver from the tee

and aim for one of the five sand bunkers (3a) on the right side of the fairway, where golfers will notice each one is dedicated to a branch of the military (Figure 6.8).

After reaching the green, the players can now see the *commitment* stone (3b) embedded into the side of the green complex. It is intended that veterans will recognize the correlation between the *commitment* stone (3b) and *The Oath*.

“Train-Up”

Hole 2: Par 4 | 330 Yards

1. Golf Landscape
 - a. 100-180 yd. tee shot & 150 yd. approach
 - b. 160-240 yd. tee shot & 90 yd. approach
 - c. 230-300 yd. forced carry from tee
 - d. Fairway slopes right to left

2. Therapeutic Landscape
 - a. Enclosed tee box ^A
 - b. Elevated tee box with prospecting view ^A
 - c. Sensory plants ^A
 - d. Narrow fairway ^E
 - e. Shade ^E
 - f. Choice from tee box ^A
 - g. Native planting and riparian zone ^{C, D}
[letter superscripts denote DSM-IV-TR criteria]

3. Memorial Landscape
 - a. “Balancing Logs”
 - b. “Island Hopper”
 - c. Dog-tag shaped green
 - d. *Honesty* stone embedded into landscape

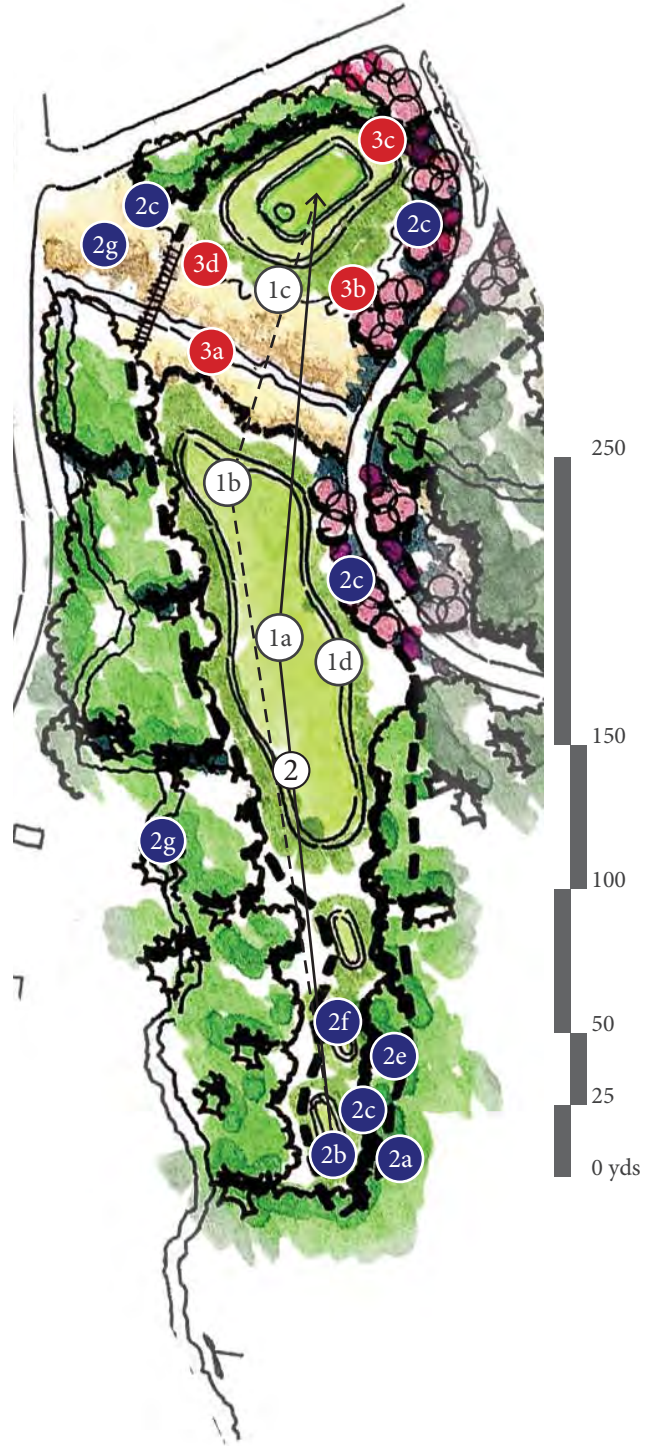


Figure 6.10 | Hole 2: “Train-Up”
(Author, 2014)



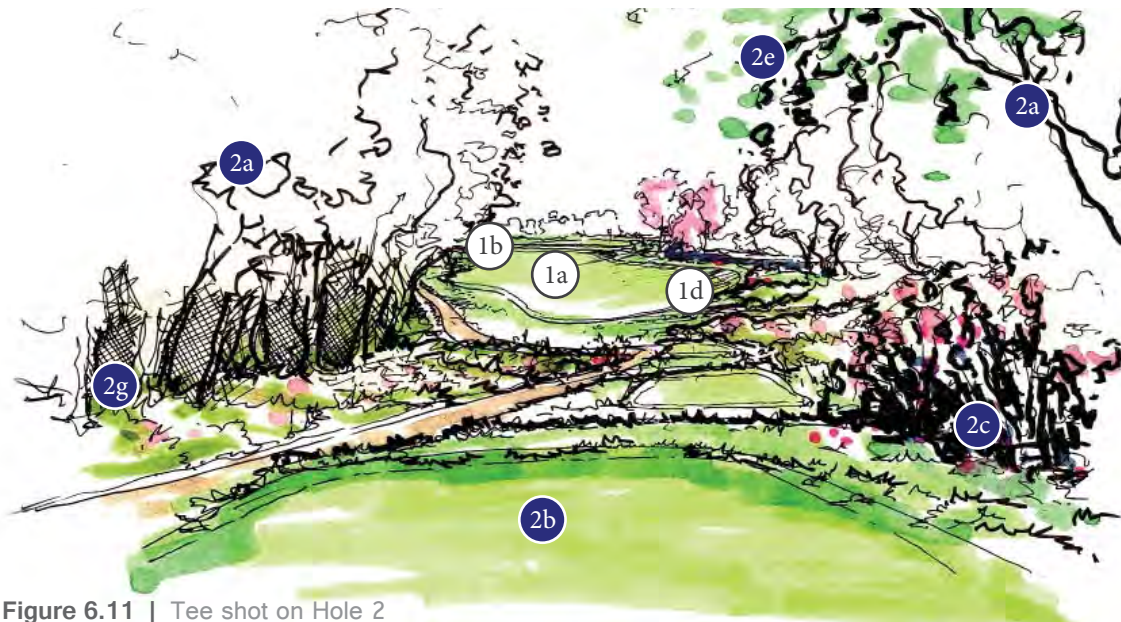


Figure 6.11 | Tee shot on Hole 2
(Author, 2014)

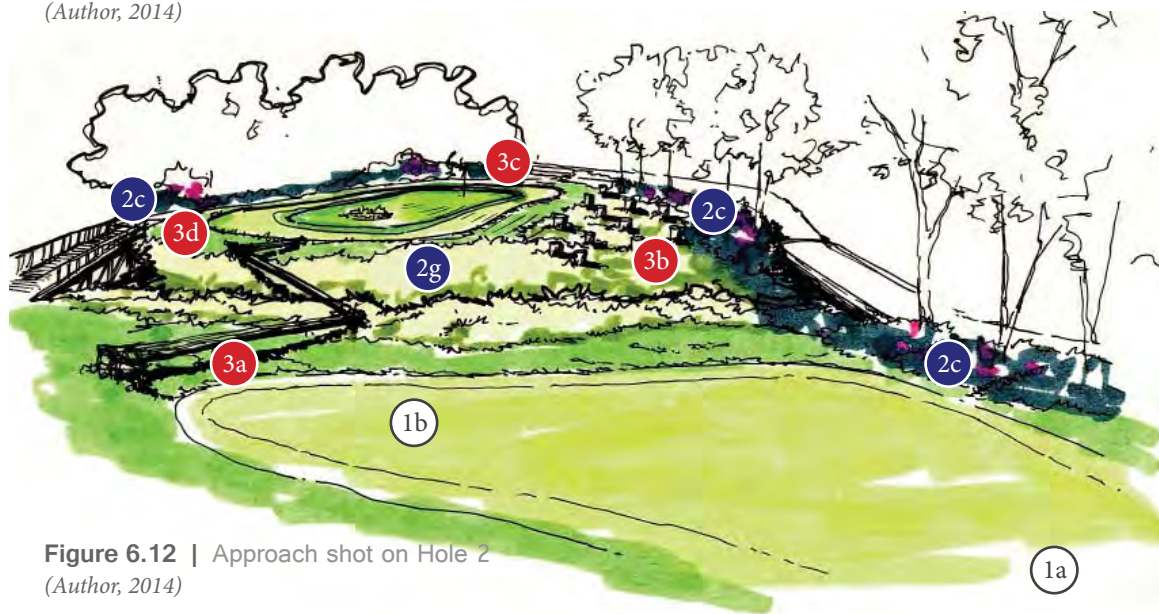


Figure 6.12 | Approach shot on Hole 2
(Author, 2014)

After taking *the oath* all military personnel go through the traditional field training cycle (United States Department of Defense, 2011). Although each branch of the military has a different standard and testing process, the concept is the same. This is where military personnel are tested and learn how to perform in their field.

From the elevated tee box, golfers take their best shot at hitting the narrow fairway (1a), *testing* their aim with an iron or fairway wood (Figure 6.11). The second shot must carry the riparian

ravine that bisects the hole (2g)(Figure 6.13), making the first shot even more critical. This hole employs two unique hazards that are inspired by the Army’s confidence obstacle course. The “*Balancing Logs*” (3a) and “*Island Hoppers*” (3b) are sculptural elements that are placed as memorial cues for the veterans (Figure 6.13) (“FM 7-22: Army Physical Readiness Training” 2012, p. 425-26). They are also in play and are placed as hazards to deter big hitters from attempting to drive the green from the tee box (Figure 6.12).

“American Veteran”

Hole 9: Par 5 | 500 Yards

1. Golf Landscape

- a. 250 yd. tee shot, 180 yd. lay-up, 70 yd. approach
- b. 290 yd. tee shot, 210 yd. approach
- c. Split fairway dictates tee shots
- d. Wide fairway at layup area
- e. Screen prevents errant shots from hitting Hole 5

2. Therapeutic Landscape

- a. Enclosed tee box ^A
 - b. Shared tee box with Hole 7 ^D
 - c. Shade ^E
 - d. Choice from tee box ^A
 - e. Native planting and riparian zone ^{C, D}
 - f. Native grass and wildflower seed mix ^{B, C}
 - g. Bird boxes for increased wildlife ^{B, F}
 - h. “Back against the wall” tee box ^A
- [letter superscripts denote DSM-IV-TR criteria]

3. Memorial Landscape

- a. “Five Pointed Bunker”
- b. *Honor* stone embedded into landscape



Figure 6.13 | Hole 9: “American Veteran”

(Author, 2014)





Figure 6.14 | Tee shot on Hole 9
(Author, 2014)

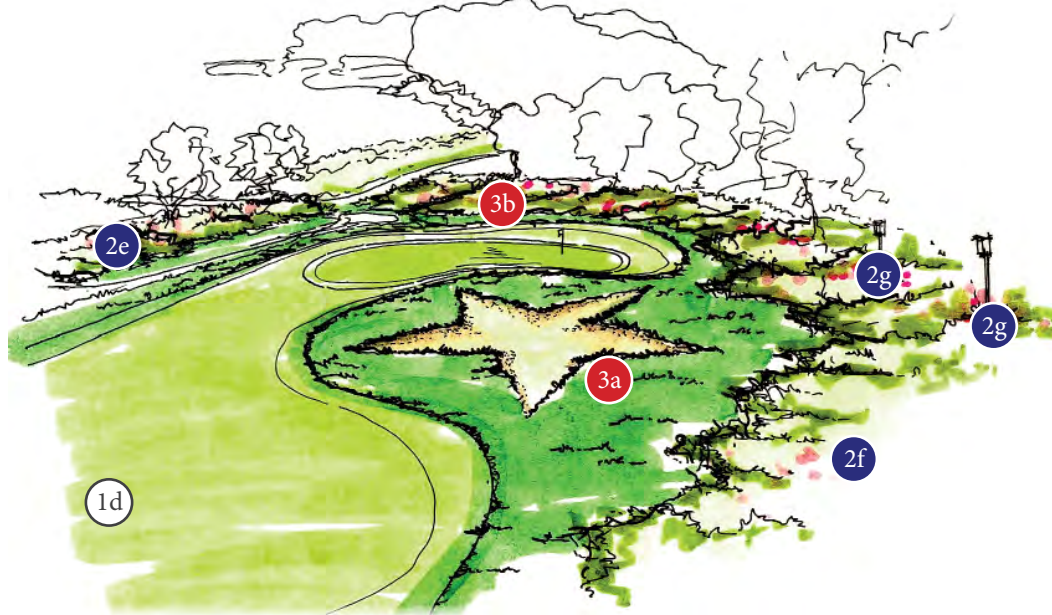


Figure 6.15 | Approach perspective on Hole 9
(Author, 2014)

The concluding hole of the golf narrative is called the “American Veteran.” The hole is symbolic of the veteran is accomplishment on two accounts. As the final hole of the golf course, veterans should feel accomplishment for completing the 9 hole golf course. This hole symbolically represents the conclusion of the American Veteran’s narrative, and this hole is designed in their *honor*.

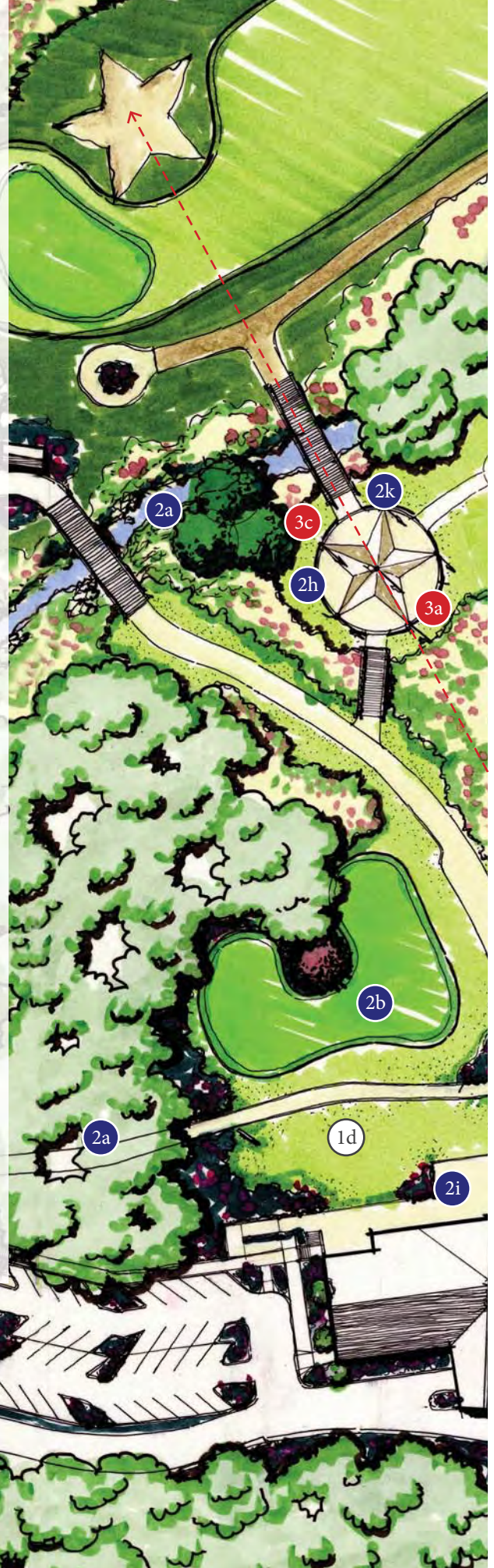
From the large shared tee box (2b), golfers might run into a casual social encounter

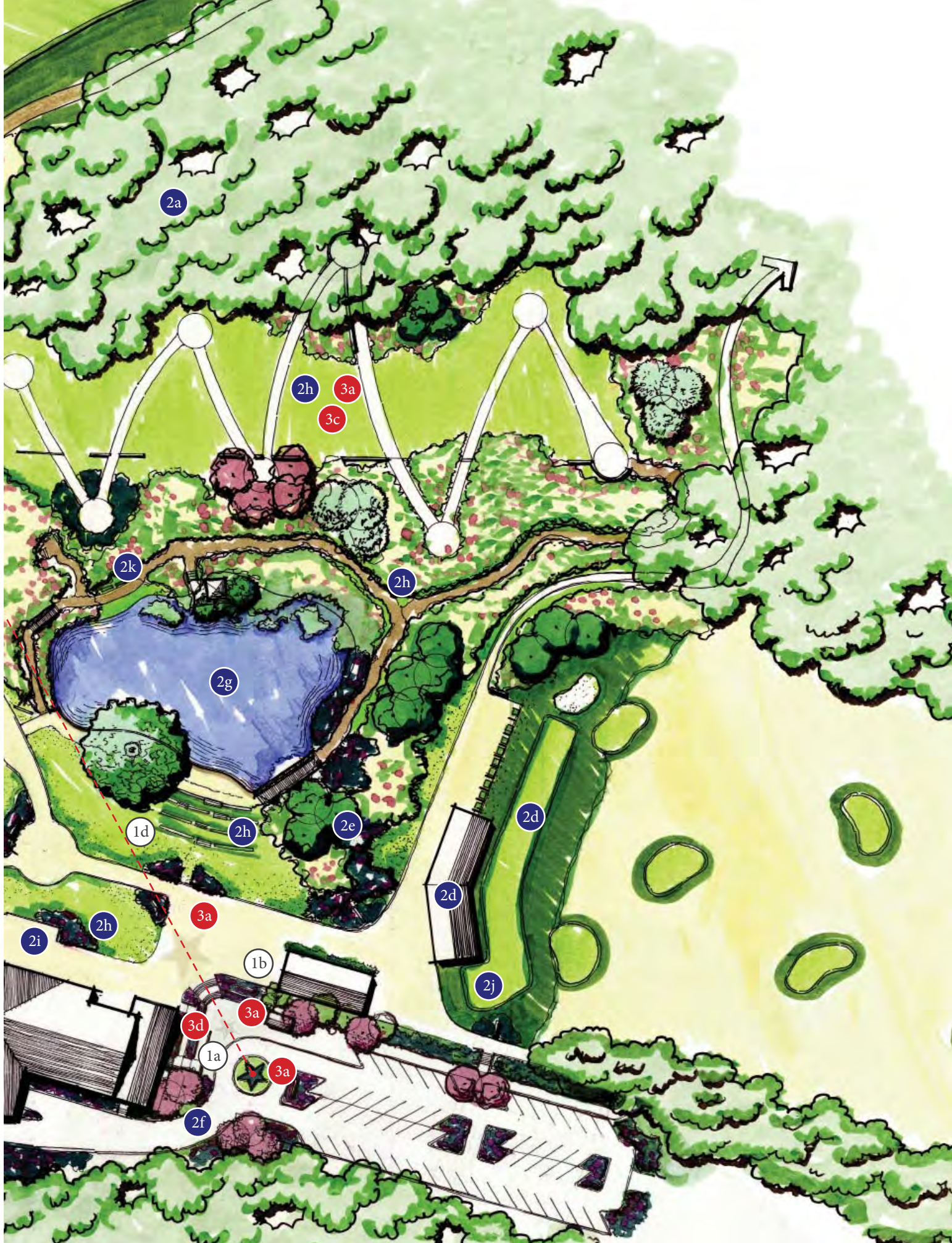
with people teeing off on Hole 7. Golfers are encouraged to use their driver off the tee and aim for the wide and forgiving fairway at the landing zone (1a), the bisected fairway hazard is not in play for the average golfer (1c)(Figure 6.14).

The “Five Points” sand trap (3a) is inspired by the Medal of Honor, the highest honor bestowed to military personnel (“A Brief History - The Medal of Honor,” 2010). *Honor* is engraved into a stone embedded in the landscape behind the green (Figure 5.15).

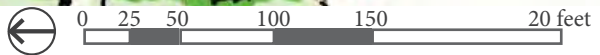
The Clubhouse

1. Golf Course Design
 - a. Bag drop
 - b. Improved cart staging
 - c. Nursery/practice area for maintenance
 - d. Event space for outings
2. Therapeutic Landscapes
 - a. Well defined spaces
 - b. Large lobed putting green by club house
 - c. Short game practice area
 - d. Improved driving range
 - e. Screened driving range for privacy
 - f. Welcoming experience and legible circulation
 - g. Water feature: calm still pool with plantings
 - h. Space for non-golfers
 - i. Outdoor eating and seating areas
 - j. Children's learning area
 - k. Reflection space for a veteran after a round
3. Memorial Landscapes
 - a. Memorial garden space for non-golfers
 - b. Five pointed star in paving
 - c. Represent all branches of military
 - d. Dedication stone





The Clubhouse

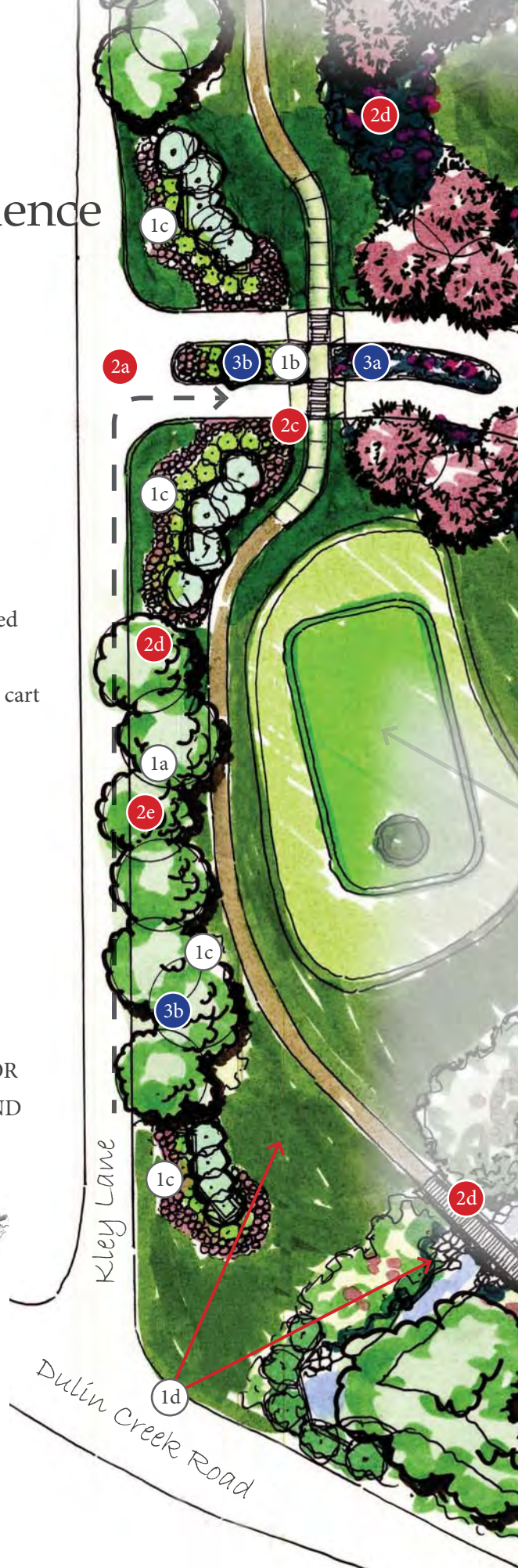
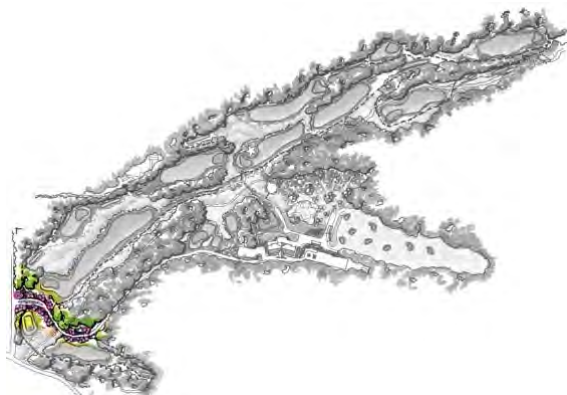


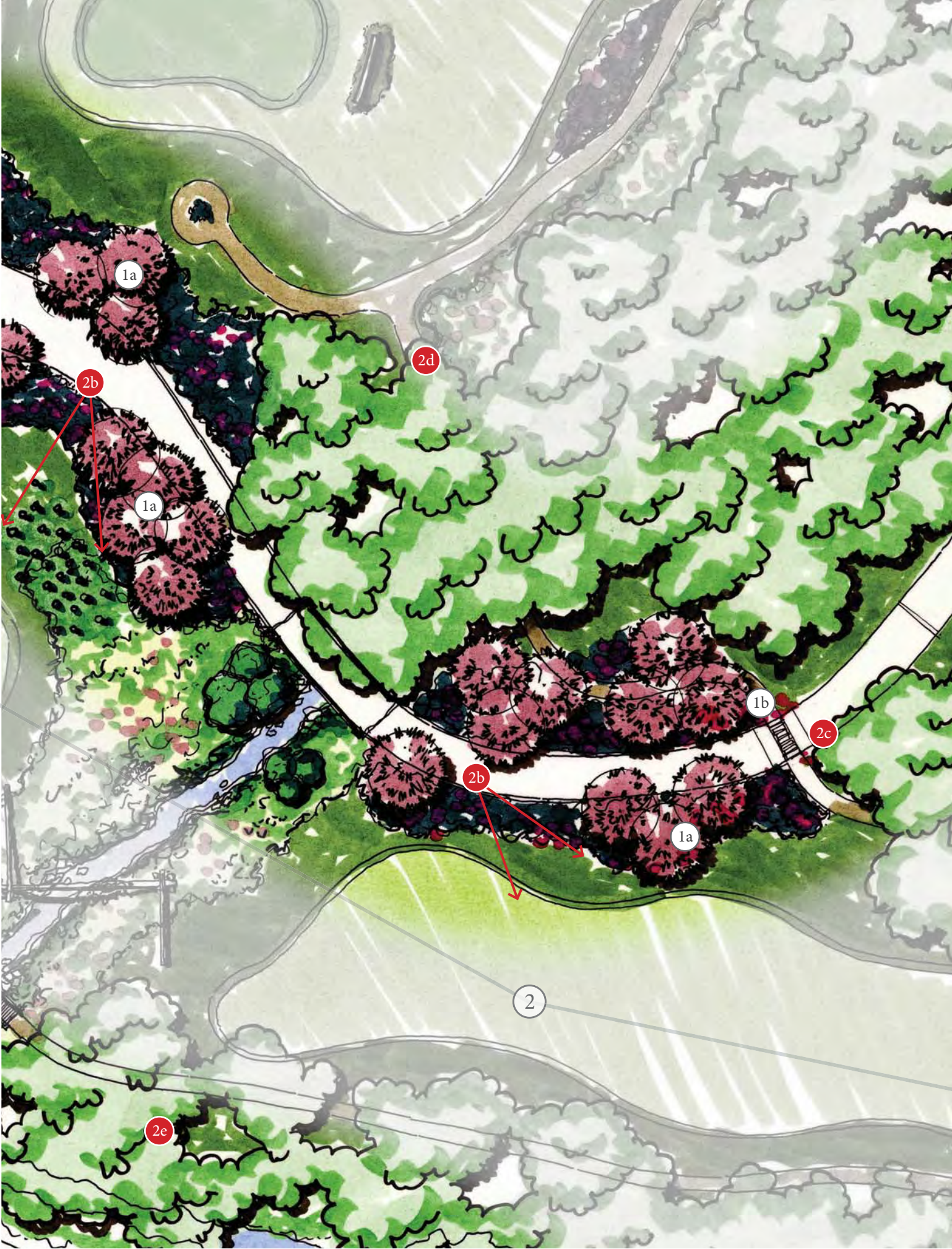
Welcoming Experience

1. **Golf Landscape**
 - a. Buffer from errant golf shots
 - b. Cart path crossing
 - c. Make a strong first impression
 - d. Maintain visual access from the street

2. **Therapeutic Landscape**
 - a. Entry experience should be clear and ordered
 - b. Visitor should know it is a golf course
 - c. Avoid creating confusing intersections with cart paths and drives
 - d. Maintain distinct boundaries between spaces
 - e. Buffer undesirable vistas beyond the site

3. **Memorial Landscape**
 - a. Flags from the five branches of the United States Armed Forces
 - b. Dedication stone, "DEER CREEK USA: A GOLF COURSE BUILT FORE HONOR FOR ALL THOSE WHO SERVE, PROTECT, AND DEFEND"





Chapter Conclusion

The Renovation Master Plan for Deer Creek USA was a single application of the design standards and guidelines from the interpretation phase. The above application is by no means the correct answer or a proven solution, it is an exploration and a conceptual vision.

The application phase of the project tested the design guidelines and attempted to design a landscape that is optimized to suit a specific population. The ultimate

goal driving the design was to design a therapeutic golf landscape to honor U.S. combat veterans and service members. By creating a golfing experience for all skill levels, optimizing the landscape for its therapeutic potential, and finally honoring U.S. combat veterans and service members by retelling their stories through a narrative golfing experience, the proposed master plan meets the design goal.

Figure 6.18 | Application process
(Author, 2014)



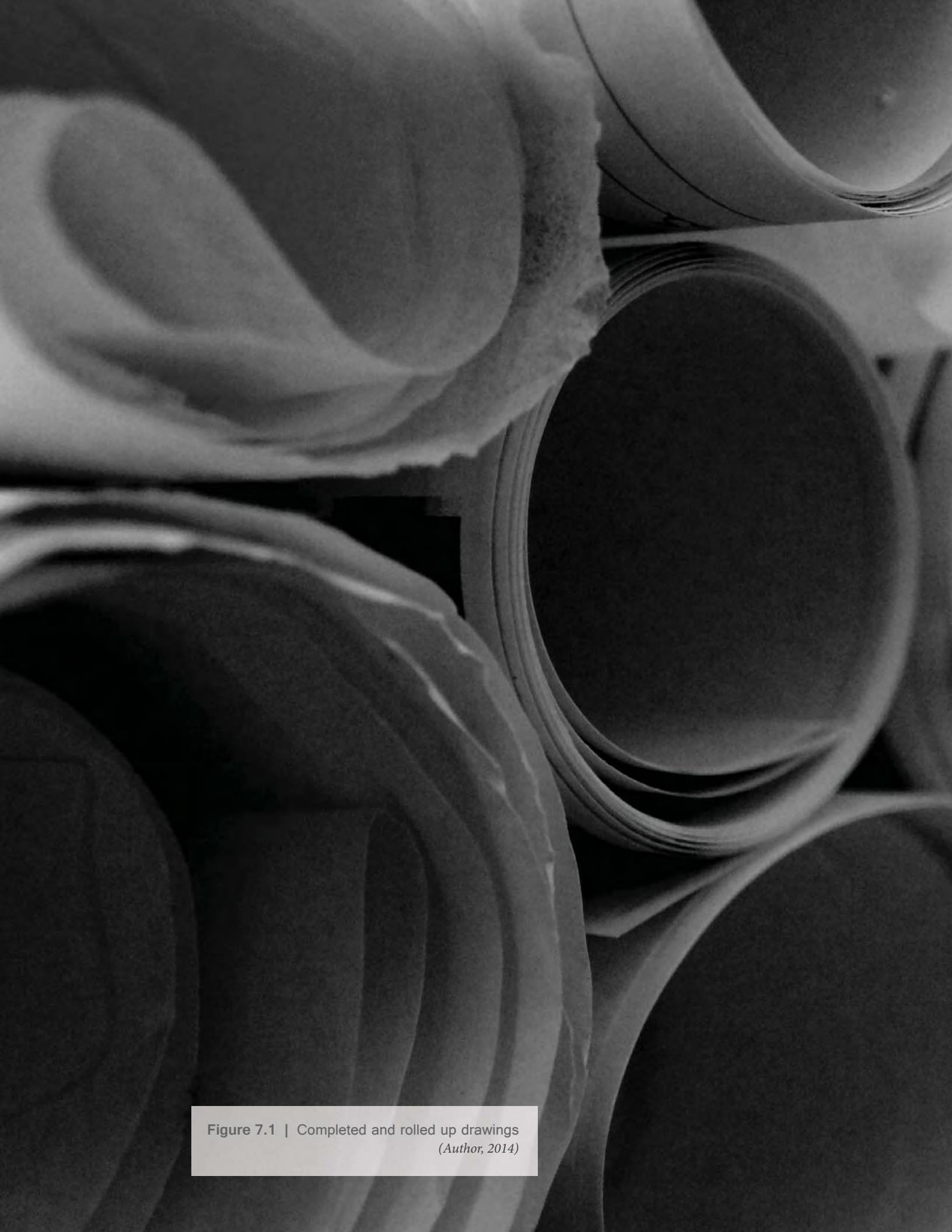


Figure 7.1 | Completed and rolled up drawings
(Author, 2014)

CONCLUSION

7

The following chapter will evaluate the conceptual master plan for Deer Creek USA and evaluate the differences between the existing conditions to the proposed solution. Future research opportunities are discussed to continue to make progress in this specific field of landscape design. The project concludes with a personal reflection.

Evaluation

A comparative study of the proposed renovation master plan and the existing conditions at Deer Creek USA is provided to illustrate how the renovation plan fulfilled the preset goals. The renovation master plan for Deer Creek USA was determined to:

1. Create an authentic and accessible golfing experience for veterans of all skill levels
2. Optimize the therapeutic golfing experience for those suffering with PTSD
3. Create a landscape that honors US combat veterans and service members

The following set of criteria for evaluating the proposed renovation master plan were devised from the Knowledge Base and Interpretation Chapters. The criteria used to evaluate the existing and the proposed conditions at Deer Creek USA were:

- Program Zones
- Circulation
- ADA Accessibility
- Safety Envelopes
- Golf Elements
- Riparian Corridor
- Wildlife Habitat

Currently, there are no memorial elements embedded in the landscape. Therefore, a comparison cannot be made between the existing site qualities and the proposed experiential qualities of the memorial landscape.

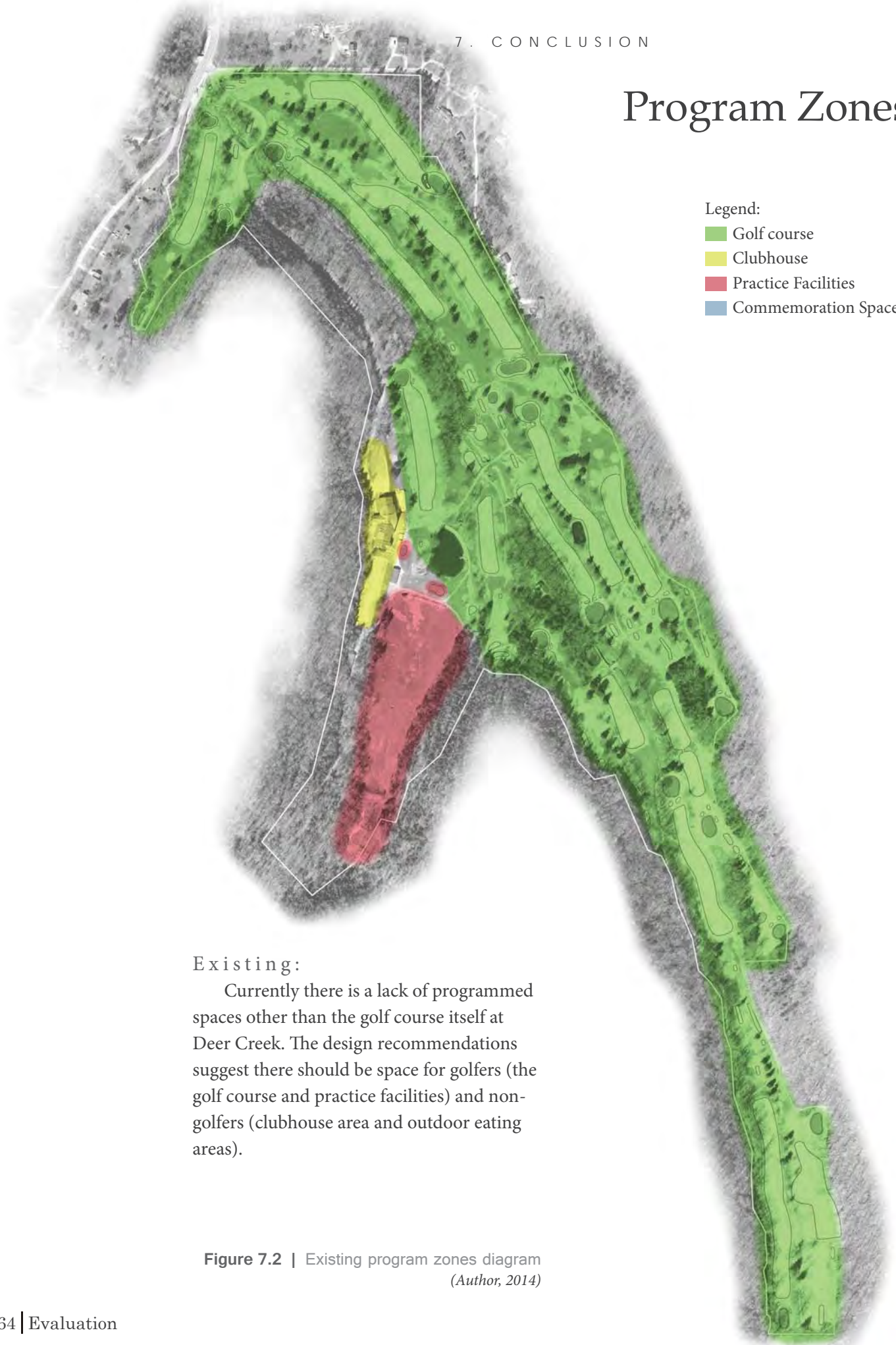
Finally, it is noted that the evaluation is not based on a built entity but a conceptual design. Therefore, the final design cannot be truly validated for its effectiveness as a therapeutic environment for US combat veterans with PTSD. Without testing, the renovation master plan is an exploration of a potential design

outcomes using the design recommendations from the Interpretation Chapter. The following evaluation is provided to illustrate the differences between the existing landscape and the proposed landscape. Each evaluation criterion is further described below.

Program Zones

Legend:

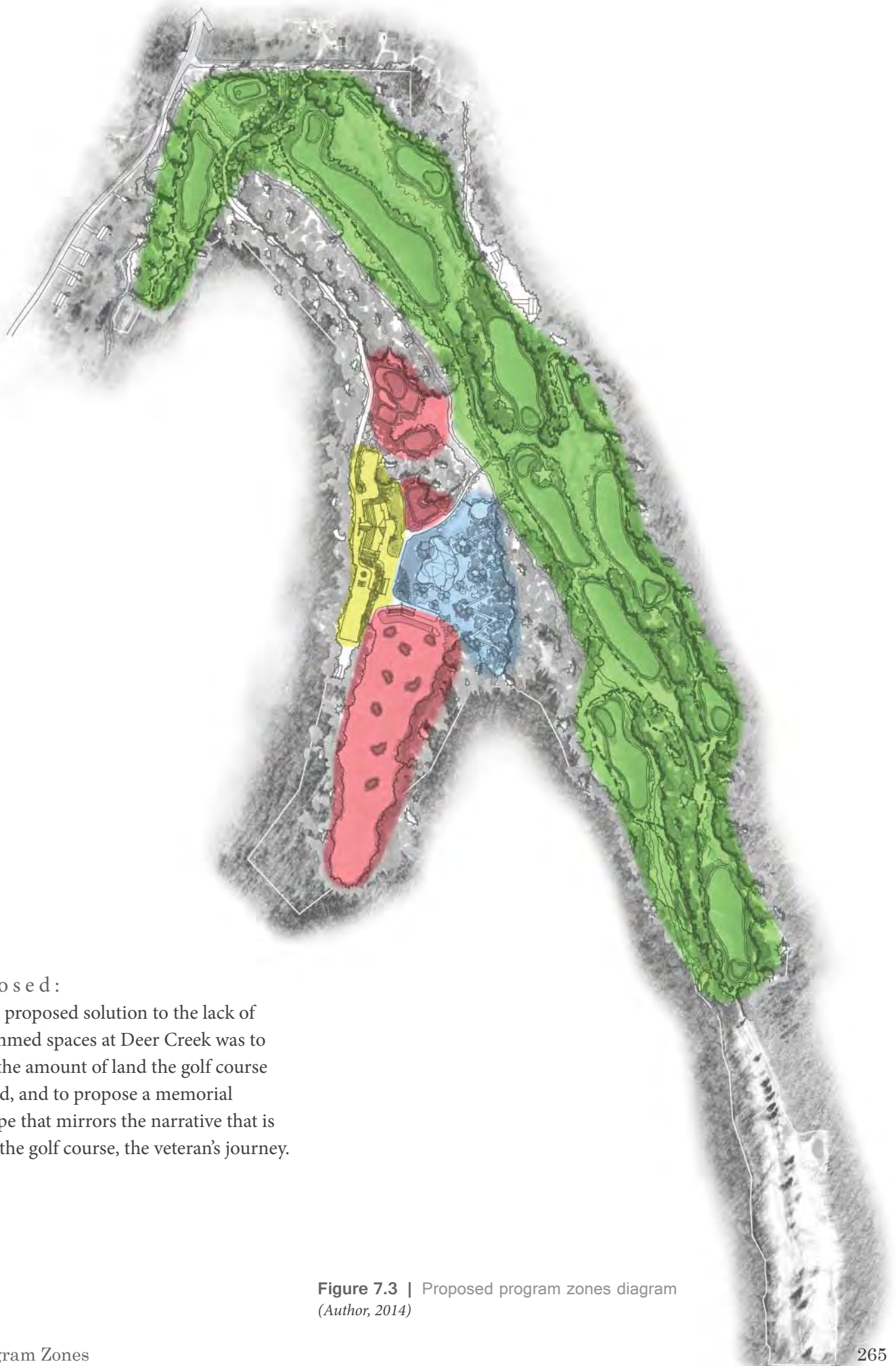
- Golf course
- Clubhouse
- Practice Facilities
- Commemoration Space



Existing:

Currently there is a lack of programmed spaces other than the golf course itself at Deer Creek. The design recommendations suggest there should be space for golfers (the golf course and practice facilities) and non-golfers (clubhouse area and outdoor eating areas).

Figure 7.2 | Existing program zones diagram
(Author, 2014)



Proposed:

The proposed solution to the lack of programmed spaces at Deer Creek was to reduce the amount of land the golf course occupied, and to propose a memorial landscape that mirrors the narrative that is told on the golf course, the veteran's journey.

Figure 7.3 | Proposed program zones diagram
(Author, 2014)

Circulation

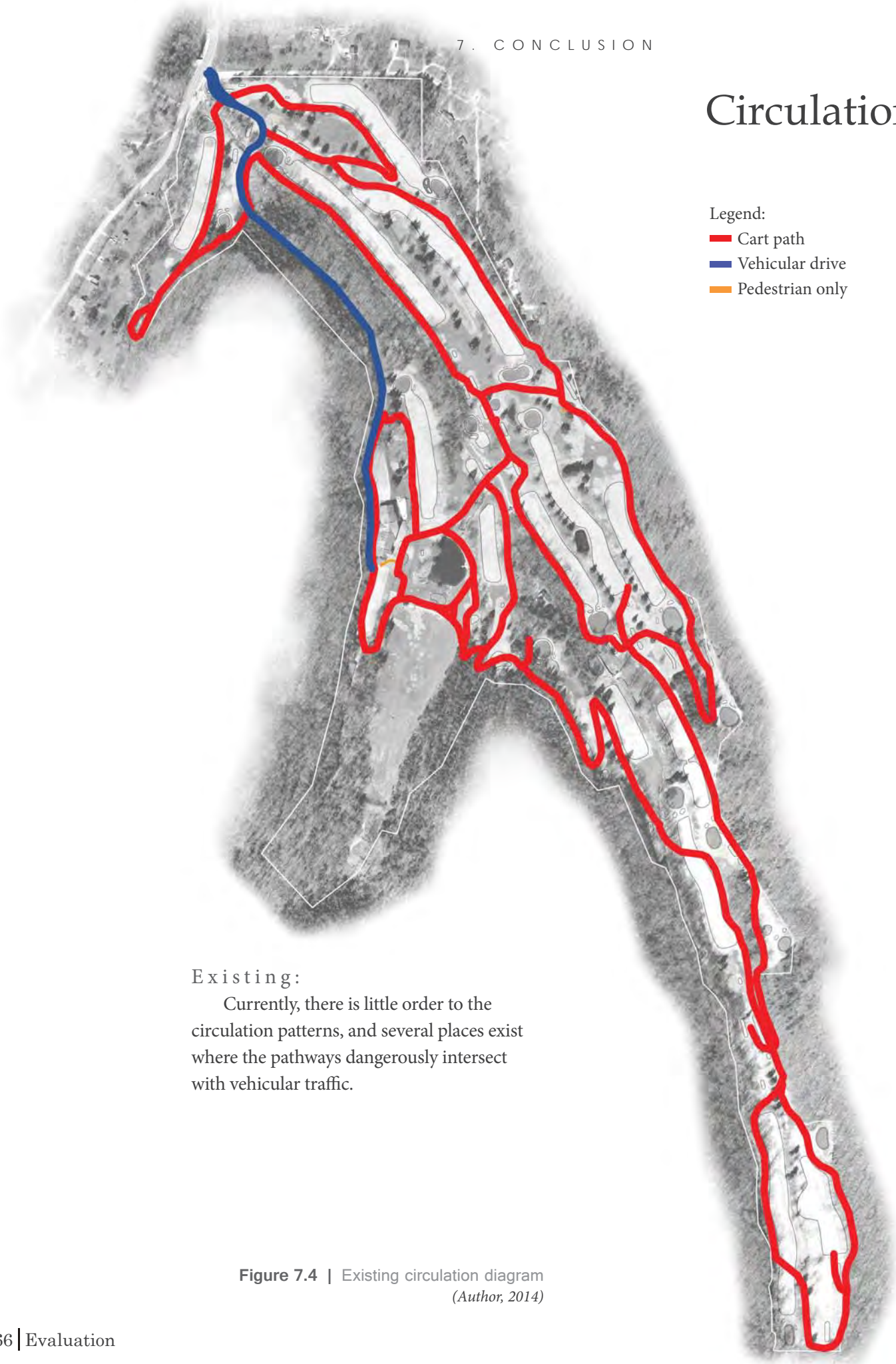
Legend:

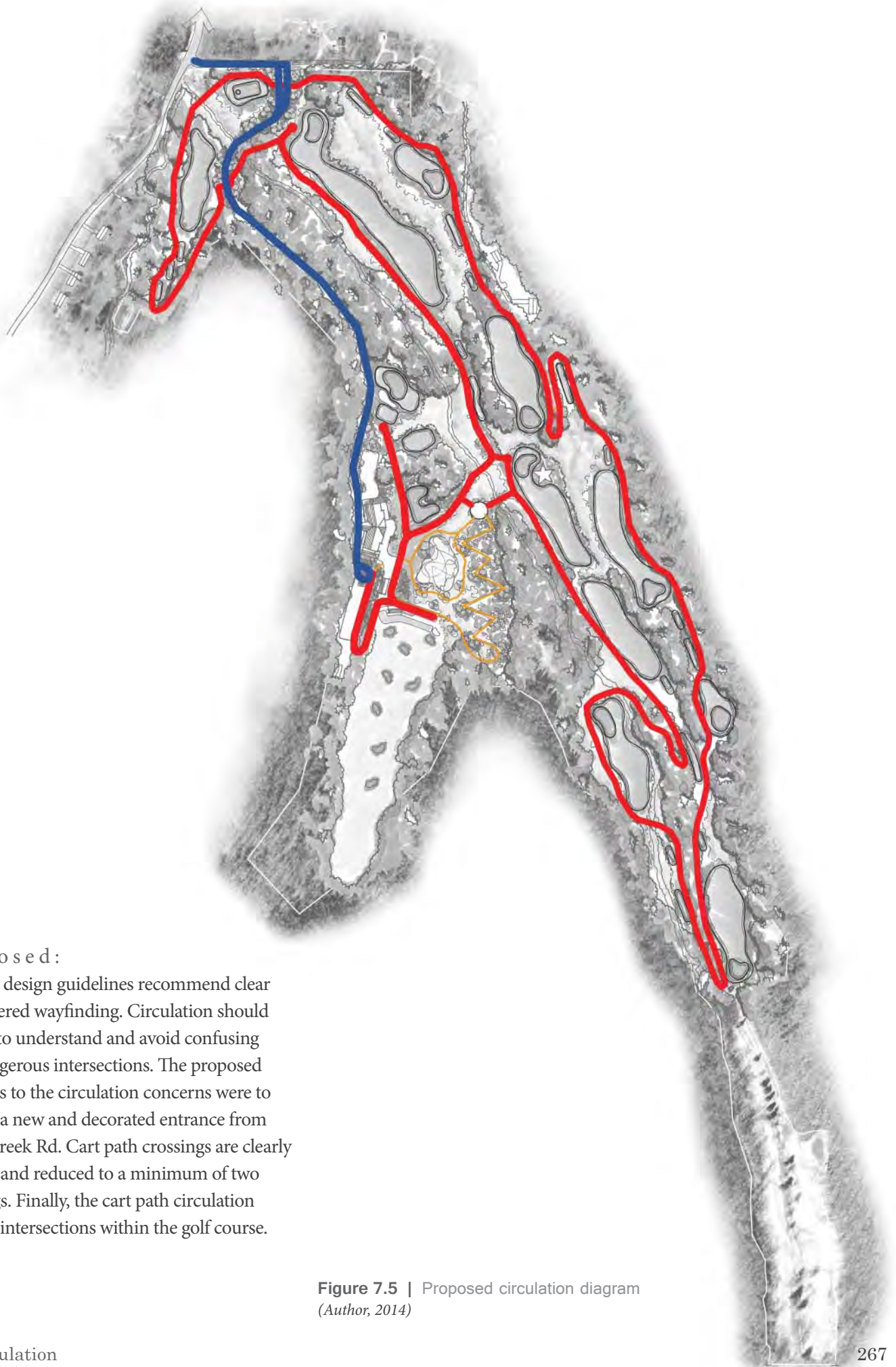
- Cart path
- Vehicular drive
- Pedestrian only

Existing:

Currently, there is little order to the circulation patterns, and several places exist where the pathways dangerously intersect with vehicular traffic.

Figure 7.4 | Existing circulation diagram
(Author, 2014)





Proposed:

The design guidelines recommend clear and ordered wayfinding. Circulation should be easy to understand and avoid confusing and dangerous intersections. The proposed solutions to the circulation concerns were to provide a new and decorated entrance from Dulin Creek Rd. Cart path crossings are clearly marked and reduced to a minimum of two crossings. Finally, the cart path circulation reduces intersections within the golf course.

Figure 7.5 | Proposed circulation diagram
(Author, 2014)

ADA Accessibility

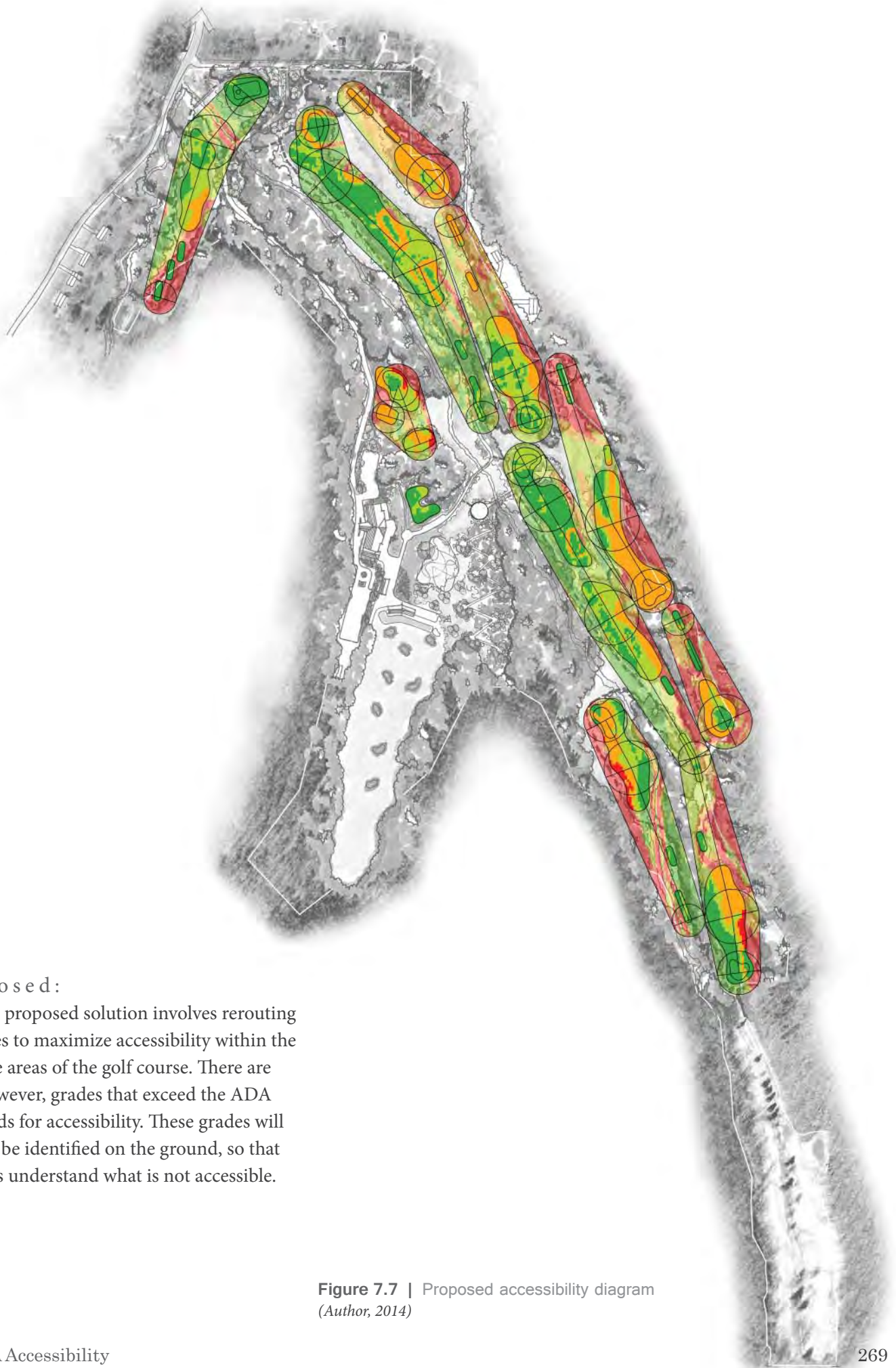
Legend:

- 0-2%
- 2-5%
- 5-8.33%
- 8.33% +

Existing:

The design guidelines recommend that the golf landscape be accessible by ADA standards. Given the existing terrain of the site, this is a challenging task. The existing golf course, however, clearly was not designed to be accessible by ADA standards.

Figure 7.6 | Existing accessibility diagram
(Author, 2014)



Proposed:

The proposed solution involves rerouting the holes to maximize accessibility within the playable areas of the golf course. There are still, however, grades that exceed the ADA standards for accessibility. These grades will need to be identified on the ground, so that veterans understand what is not accessible.

Figure 7.7 | Proposed accessibility diagram
(Author, 2014)

Riparian Corridor

Legend:

- 100' Riparian corridor buffer applied to Dulin Creek
- Breached buffer: putting greens, tee boxes and fairways
- Outside buffer: putting greens, tee boxes and fairways

Existing:

After applying the recommended 100' riparian corridor buffer to Dulin Creek, it became apparent that the existing golf course encroaches on sensitive land. Nine out of the 18 holes breach the riparian corridor and polluting Dulin Creek with compromised run off.

Figure 7.8 | Existing riparian corridor diagram
(Author, 2014)



Proposed:

The proposed Renovation Master Plan for Deer Creek mostly respects the 100' buffer. Unfortunately, due to space limitations, the riparian buffer was breached in one location. The tee boxes and nearly half of the fairway on Hole 8 are within the buffer. The breach, however, was strategically done upstream, so that potentially contaminated water has more time to be intercepted before leaving the site.

Figure 7.9 | Proposed riparian corridor diagram
(Author, 2014)

Wildlife Habitat

Legend:

- Wildlife habitat
- Marginal habitat



Existing:

The golf course at Deer Creek is laid out in the valley bounded on either side by forested ridgelines. The hills, for the most part, have not been developed, and retain an ecological value as habitat for local species. There is little habitat within the Deer Creek property. The research stressed the importance of wildlife and increasing the frequency of interaction between veterans and local wildlife.

Figure 7.10 | Existing wildlife habitat diagram
(Author, 2014)



Proposed:

The proposed solution was to increase habitat space within the property boundary at Deer Creek. Reducing the total golf holes in half left more space for habitat between golf holes. The 100' buffer applied to the riparian corridor also provides valuable habitat space for local wildlife.

Figure 7.11 | Proposed wildlife habitat diagram
(Author, 2014)

Safety Zones

Legend:

- Not Safe
- Safe green, tee or fairway
- Safety envelope
- Outside of playing area

Existing:

Safety, regardless of the intended playing population, is a critical concern in the golf course experience. This is especially true for a veteran population suffering from PTSD. The current golf course at Deer Creek is not safe, and there are immediate concerns regarding the physical safety of the players.

Figure 7.12 | Existing safety zones diagram
(Author, 2014)



Proposed:

The first step of preparing the Renovation Master Plan for Deer Creek was to lay out the golf course in the safest possible way. There is one condition where two neighboring holes overlap their safety envelopes (Hole 5 and 9). The proposed renovation for Deer Creek is far safer than the existing conditions.

Figure 7.13 | Proposed safety zones diagram
(Author, 2014)

Future Research

The final outcomes of the current research raised questions and potential research opportunities beyond the scope of the current work. The current project discussed three realms within landscape architecture, and considered each through the lens of PTSD. Researching each individual realm of design theory, and applying them in a holistic conceptual design for Deer Creek USA, effectively defined design considerations for future work. Unanswered questions and paths remain for more research opportunities.

The current research, as stated above, gathered existing research and interpreted them to fit within the golf landscape. A limitation to this approach is a potential disconnect between the interpretation and observational research. There is a future opportunity to map and observe U.S. combat veterans and service members playing golf. A complementary survey distributed amongst veteran golfers will also reveal specific design considerations that are inspired by the actual golfers, not the research necessarily. To

provide an example of a potential disconnect between the existing research and the observational findings, the standard safety envelope is examined. The existing safety envelope considers the average golfer and their hitting tendencies. The dimensions used in the standard safety envelope may not be a perfect equivalent for wounded warriors or golfers that have to use a single rider golf car. It is plausible to assume that a non-standard swing from a single rider golf car would reveal a non-standard safety envelope (Figure 7.14). Field observations accompanied with a survey can be used to determine whether it is necessary to modify the standard safety envelope for non able-bodied golfers that use single rider golf cars. Unfortunately, the current research project took place during the golf off-season, so there was a lack of opportunity to make these observations.

Other suggestions for future research opportunities are to implement some of the observed design recommendations and test whether or not they are perceived as expected by the target population. It is

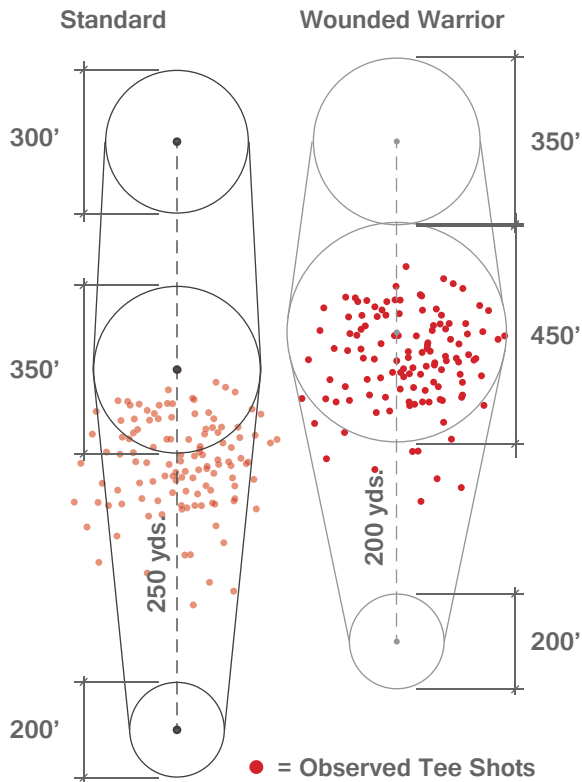


Figure 7.14 | Potential future safety envelope study
(Author, 2014)

important in therapeutic landscape design, especially for military personnel, to remain flexible, and make necessary adjustments when a design solution is not functioning as expected (Marcus & Sachs, 2013). Before implementation, veteran golfers can record their experience by taking a

survey or completing an interview. After implementation, veteran golfers can fill out the same survey and participate in an interview to reflect on the differences in the landscape. The feedback from the surveys and the interviews can be used to update or adjust the design of the landscape to suit the needs of the intended population.

Finally, golf course architects and recreational therapists can be interviewed to better understand their profession's perspective on the proposed concept for a therapeutic golf landscape. Golf course architects already consider aesthetics an important part of golf course design, but are they aware of the potential therapeutic value that a golf course can have on certain populations? Recreational therapists have used golf as a therapeutic activity, but are they aware of the setting's impact on the therapeutic outcomes? Do they consider all golf courses the same? If answered, these questions may help close the gap in the research.

Reflection

When this project began, it was an opportunity for me to pursue my passion in golf course design. It wasn't long before I learned that this project was worth much more than just personal fulfillment. I learned about the awesome potential for landscape architecture professionals, in collaboration with health professionals, to create environments suitable for improving the quality of life for people suffering from disabilities, both visible and invisible. This study explored an innovative approach to help those who have sacrificed their lives and limbs for my freedoms. Without the selfless sacrifices made each day by the courageous warriors of the United States Armed Forces, this opportunity would not have been possible. My sincere gratitude goes out to all those who have been wounded during their service to our country.

Thank you.

Figure 7.15 | Completed and rolled up drawings
(Author, 2014)

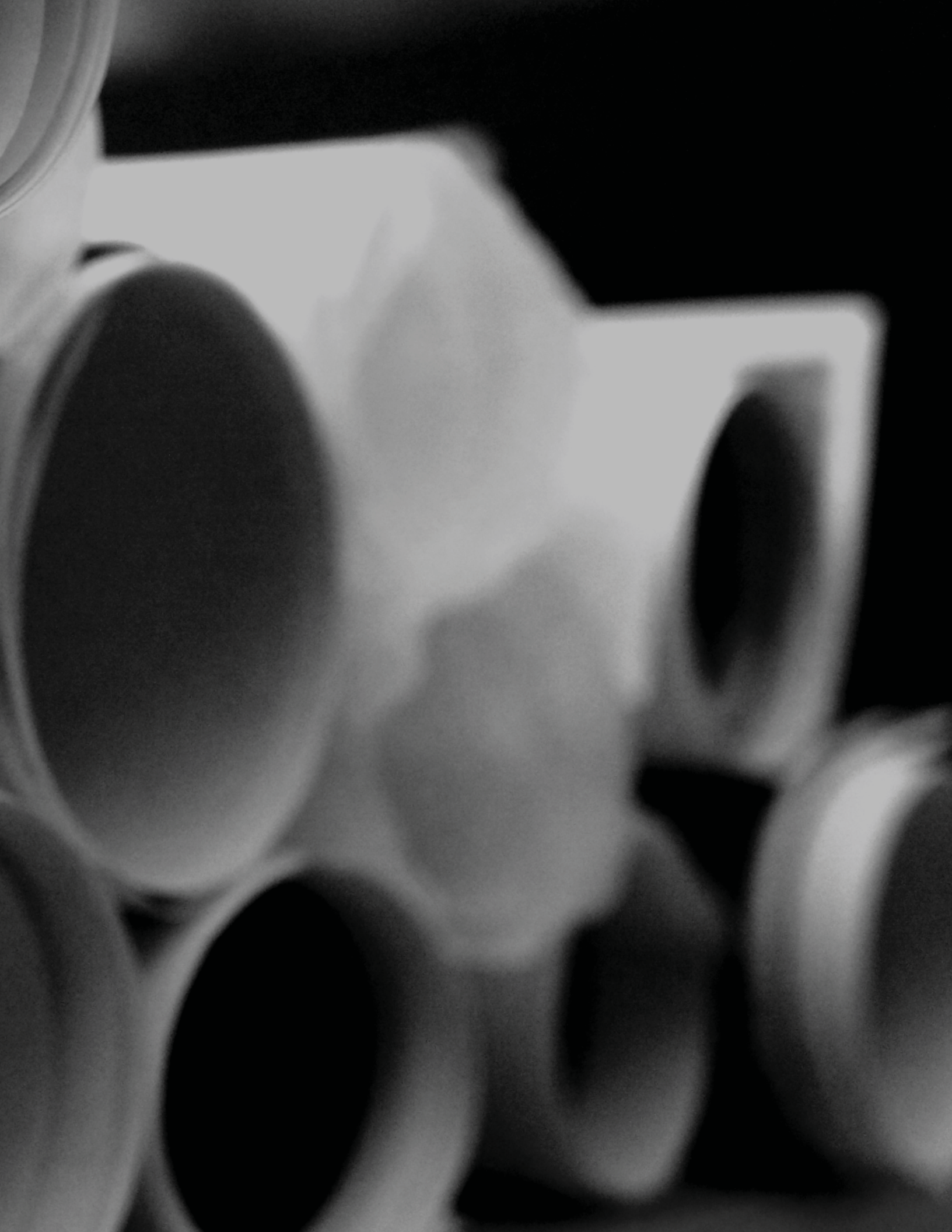




Figure 8.1 | Out of the woods
(Author, 2014) p. 23



APPENDICES

Appendix A: Glossary

Fairway

The fairway is the turf area that occurs between the tee box and putting green of a golf hole, and is the target for golfers on all holes other than par-3s. Fairways are one of the three intensely managed turf areas in a golf landscape.

Golf Landscape

A golf course is a landscape on which golf is played, a golf landscape considers environmental conditions beyond the playability and functionality, and focuses on the landscape setting.

Hazard

Anything on a golf landscape that is designed to be penal including, sand bunkers, water features, and any feature that impedes the golfers ability to complete their stroke

Par

Par is the number of strokes an expert golfer is expected to use to complete a hole, or all the holes on a golf course.

Memorial Landscape

Places that are designed to honor someone who has died or serves as a

reminder of a significant event where several people died. This definition, however, forgets the experiential dimensions of a memorial landscape. This study defines the experience of a memorial of having four essential qualities including meaning, ritual, narrative and dialogue.

Post-traumatic Stress Disorder (PTSD)

An emotional response to a terrible event like an accident, rape or natural disaster. Immediately after the event, shock and denial are typical. Longer term reactions include unpredictable emotions, flashbacks, strained relationships and even physical symptoms like headaches or nausea (American Psychological Association, 2013).

Putting Green

The putting green, is the culmination of a golf hole, where the flagstick and hole are located. Putting the golf ball into the hole is the object of the game of golf.

Rough

Rough refers to areas on a golf course outside of the fairways where the turf is higher and thicker for added challenge.

Tee box

The tee box refers to the teeing ground, which is the starting point of each hole in a golf landscape.

Therapeutic Landscape

A therapeutic or healing landscape must aid in providing some degree of relief from both mental and physical pain, aid in stress reduction and provide an improvement in one's overall sense of well-being.

Traumatic Brain Injury (TBI)

A TBI is caused by a bump, blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain. The severity of a TBI may range from "mild," i.e., a brief change in mental status or consciousness to "severe," i.e., an extended period of unconsciousness or amnesia after the injury ("Traumatic Brain Injury," 2014).

Wounded Warrior

Any disabled veteran who has served on active duty since September 11, 2001, has fewer than 20 years of military service, and has received either a Memorandum Rating of 30 percent or greater from their service Physical Evaluation Board or a VA service-

connected disability rating of 30 percent or greater is eligible to apply for positions with this program. Candidates for employment must have been honorably discharged and possess a high school diploma or GED certificate ("Wounded Warrior Program: Frequently Asked Questions," 2014).

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Figure 4.48 | Tucker, Tyler. (2014). The Statues Reflected in the Mural Wall [Photograph] Retrieved April 24, 2014, from: Tyler Tucker. (Image modified by Author) (Permission granted on April 24, 2014 by Tyler Tucker)

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Figure 4.63 | Mannix-Slobig, Brendan (Author). (2014). Interpretation process [Photograph]

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Figure 5.1 | Mannix-Slobig, Brendan (Author). (2014). Evaluation process [Photograph]

Figure 5.2 | Mannix-Slobig, Brendan (Author). (2014). The clubhouse from tee box on Hole 9 [Photograph]

Figure 5.3 | Mannix-Slobig, Brendan (Author). (2014). Deer Creek USA Hole 17 tee shot [Photograph]

Figure 5.4 | Google Earth. (2012). House Springs, Missouri [Satellite Imagery] Retrieved April 24, 2014, from: Google Earth 38 23 28.50" N 90 34 34.63" W. eye alt 47186 feet.

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Figure 5.15 | Mannix-Slobig, Brendan (Author). (2014). Hole 10 tee shot at Deer Creek USA [Photograph]

Figure 5.16 | Mannix-Slobig, Brendan (Author). (2014). Sand bunker on Hole 14 at Deer Creek USA [Photograph]

Figure 5.17 | Mannix-Slobig, Brendan (Author). (2014). Putting green on Hole 7 at Deer Creek USA [Photograph]

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Figure 5.28 | Mannix-Slobig, Brendan (Author). (2014). Evaluation process [Photograph]

6. Application

Figure 6.1 | Mannix-Slobig, Brendan (Author). (2014). Application process [Photograph]

Figure 6.2 | Mannix-Slobig, Brendan (Author). (2014). Design process drawings [Photograph]

Figure 6.3 | Mannix-Slobig, Brendan (Author). (2014). Design process diagram [Computer Graphic]

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7. Conclusion

Figure 7.1 | Mannix-Slobig, Brendan (Author). (2014). Completed and rolled up drawings [Photograph]

Figure 7.2-13 | Mannix-Slobig, Brendan (Author). (2014). [Hand drawn and Computer graphics]

Figure 7.14 | Mannix-Slobig, Brendan. (2014). Potential future safety envelope study [Computer Graphic]

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8. Appendices

Figure 8.1 | Mannix-Slobig, Brendan (Author). (2014). Out of the woods [Photograph]

Front Cover

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Appendix D: Summary of PTSD Framework

DSM-IV-TR Diagnostic Criteria for Post-traumatic Stress Disorder (American Psychiatric Association, 2000)

A. Stressor

The person has been exposed to a traumatic event in which both of the following were present:

1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.
2. The person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior.

B. Intrusive Recollection

The traumatic event is persistently reexperienced in one (or more) of the following ways:

1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions.
2. Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.
3. Acting or feeling as if the traumatic event were recurring
4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

C. Avoidant / Numbing

Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma
2. Efforts to avoid activities, places, or people that arouse recollections of the trauma
3. Inability to recall an important aspect of the trauma
4. Markedly diminished interest or participation in significant activities
5. Feeling of detachment or estrangement from others
6. Restricted range of affect (e.g., unable to have loving feelings)
7. Sense of a foreshortened future

D. Hyper-arousal

Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

1. Difficulty falling or staying asleep
2. Irritability or outbursts of anger
3. Difficulty concentrating
4. Hypervigilance
5. Exaggerated startle response

E. Duration

Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

F. Functional Significance

The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Concepts Extracted from Literature Review

Therapeutic Concepts Associated with Treatment	Physical Translation within a Landscape	
<ol style="list-style-type: none"> 1. Adaption Level 2. Need to Feel Safe 3. Sense of Control 	<ul style="list-style-type: none"> • Public spaces for social challenge • Familiarity • Balance of prospect and refuge • Reduced perceptual sensory distortion • Space to be alone • Space to be in a group or with company • Avoidance of ambiguity and abstraction • Defensible spaces 	<ul style="list-style-type: none"> • Offer choices within landscape • Plants and water to touch • Avoid spaces reminiscent of where a sniper could hide • Moveable furniture that the user can interact with • Provide zones of challenge • Offer choices of where to look, sit, ambulate
<ol style="list-style-type: none"> 1. Nature 2. Positive Distractions 	<ul style="list-style-type: none"> • Incorporate native plantings into the planting design • Increase wildlife habitat area • 70% Nature / Landscape space (minimum) • 30% Hardscape (maximum) • Provide water features • The environment should “feel like a garden” 	
<ol style="list-style-type: none"> 1. Soft Fascination 2. Complexity 	<ul style="list-style-type: none"> • Long range views of soft landscape • Use landscape plantings that are inviting to smell, touch, and taste • Provide spaces for ritual • Provide space for reflection • Use a high degree of plant diversity 	<ul style="list-style-type: none"> • Create a rich landscape setting • Provide spaces to engage with the landscape
<ol style="list-style-type: none"> 1. Social Support 2. Social Capital 	<ul style="list-style-type: none"> • Provide picnic spaces for outdoor eating • Include a space for smoking • Design places and activities for children and family members • Avoid negative sounds like airport, loud bangs, heavy traffic and shrieking noise 	<ul style="list-style-type: none"> • Provide relaxing places to sit with others • Design for places that encourage casual encounters
<ol style="list-style-type: none"> 1. Controlled / Graded Stressors 2. Physical and Emotional Security 3. Physical Movement and Exercise 	<ul style="list-style-type: none"> • Include a physical challenge course • Minimize U.V. glare and exposure • Use landscape elements and planting patterns that are familiar with the audience • Provide varied levels of physical challenges 	
<ol style="list-style-type: none"> 1. Meaningful / Purposeful Activities 2. Coherence / Order 	<ul style="list-style-type: none"> • Farming and other horticultural activities • Dog training • Provide space for children • Maintain an orderly and organized plan to avoid confusion • Include outdoor spaces for exercise in nature 	

Therapeutic Interpretation in the Golf Landscape

Physical Design Considerations

A. Stressor	<ul style="list-style-type: none"> • Keep playing area outside of landing area/safety envelope of other adjacent golf holes. • Provide a variety of tee boxes to give the golfer more choices within the landscape. • Design a large practice putting green by the clubhouse to foster social interaction • Driving range with separated / screened booths for privacy and comfort • Provide a practicing facility for those who are trying to learn how to play golf • Make signage frequent and legible, use a large font and legible colors • Avoid designing spaces that are exposed to the back, design “back against a wall” spaces 	<ul style="list-style-type: none"> • Provide the golfer options from the tee box, where they have to think left/right or short/long • Avoid blind tee shots and dangerous hole design • Stay with conventional golf course design, familiar hazards and geometries • Provide welcoming plants and water features in gathering spaces to promote interaction with nature • Use buffering to block or screen unattractive vistas within and beyond golf course • Welcoming experience should be clear and obvious, the visitor should know that it is a golf course
B. Intrusive Recollection	<ul style="list-style-type: none"> • Rich planting palette • Use plants to restore a naturalistic design • Increase planted areas • Provide large buffers at riparian areas, to increase habitat space • Design habitats for native and desired biota (deer, birds, fish and insects) • Avoid putting golfers in danger of habitat (snakes and other potentially harmful animals) 	<ul style="list-style-type: none"> • Include water features for purpose of spectacles • Design a sensory experience (audible, visual, smell, etc...) • Use water as an accessible feature • Design enclosed space to feel like a garden • Use consistent forms and planting features to create a connected experience.
C. Avoidant / Numbing	<ul style="list-style-type: none"> • Provide vistas from high points to feel prospect • Plant large swaths of grasses and other native grasses for viewing • Proximity of sensory plants to gathering / focus areas • Avoid using plants with thorns • Avoid using plants, shrubs and trees with volatile aromas • Provide space by club house for reflection after a round of golf 	<ul style="list-style-type: none"> • Incorporate spaces between holes for ritual and reflection • Use plant layering to increase landscape experience • Memorial landscape setting to reflect emotive response
D. Hyper-arousal	<ul style="list-style-type: none"> • Permit smoking on golf course? • Provide scaled experiences based on ability • Design spaces to allow family, children, friends and other non-golfers to experience the place • Make it a welcoming experience from the entry drive to the clubhouse • Provide sufficient audible buffering from adjacent land and traffic through fares 	<ul style="list-style-type: none"> • Provide outdoor eating and seating space with moveable furniture • Provide large putting greens to make for more welcoming approach shots • Wide fairways and landing areas are more welcoming tee shots • Shared greens, tee boxes and fairways can foster casual encounters and social interaction
E. Duration	<ul style="list-style-type: none"> • Uphill paths and approaches to green area and tee box areas can create brief physical challenges • Provide well shaded areas at focus and gathering space • Avoid using reflective and glaring features, finishes should be matte • Maintain an A.D.A. accessible golf course as much as possible • Provide handrails on steep climbs for those who are physically handicapped 	<ul style="list-style-type: none"> • Use recognizable golf features and hazards • Design uphill golf holes to challenge the golfer to think and swing harder • Group holes according to difficulty • Provide extra holes to replace easier holes • Reduce all risk of being hit by a golf cart, a car, a ball and a club
F. Functional Significance	<ul style="list-style-type: none"> • Include landscapes that need to be maintained and taken care of, management areas • Provide wildlife habitat areas, where there is opportunity to maintain the home of wildlife • Simplify the management program of the golf course so that anyone could take care of it • Maintain distinct boundaries between spaces 	<ul style="list-style-type: none"> • Avoid crossing paths and confusion in the cart paths and circulation patterns • Use consistent golf hole designs by feature. • There should be a children’s area where adults can teach them golf as they learned

Therapeutic Outcomes

<ul style="list-style-type: none"> • Design the golf course to feel comfortable and familiar even if they haven't been there before • Avoid surprises, or hidden spaces. • Views within the site should be appealing • Views beyond the site should void of any negative distraction or chaos • Screen views out for potential sniper hideouts • Circulation throughout the site should be orderly and easy to understand, thus avoiding stress and frustration • Provide choices for the golfer on what shot to make, golfers should have to think first 	<ul style="list-style-type: none"> • Enclosed spaces and contained spaces feel space, but avoid over enclosure • Provide opportunities to see others on the golf course, so that the golfer does not feel alone • Seeing others on the golf course evokes a cordial experience and social comfort • Memorial spaces on a golf course are emotional zones of challenge • Tee boxes and greens are social gathering spaces and cordial experiences • Fairways are separation spaces for personal reflection
<ul style="list-style-type: none"> • Water features are positively distracting • Wildlife evokes feelings of caring for animals • Diverse plantings restore the mind • Native plantings release stress • Swathes of native plantings can take mind away from internal struggle 	<ul style="list-style-type: none"> • The design vernacular of the golf course is much different than the war environment • Touching water can evoke feelings of cleansing • View of trees and grass can promote health and healing • Features can alleviate worries
<ul style="list-style-type: none"> • Feelings of excitement • Prospecting vistas from a high point evokes feelings of accomplishment • Long views of the landscape incites curiosity • Sensory plants are soothing and relaxing • Tee areas are locations for social interaction and gaining an attachment to others 	<ul style="list-style-type: none"> • Large putting greens and tee boxes to avoid feelings of claustrophobia • The golf hole design can inspire intrigue • Scent can evoke memories of the golfing experience
<ul style="list-style-type: none"> • A golf course can be a mentally exhausting experience, provide a space to rest after a round of golf • Golfers have a choice with which golf course they want to play • Feel welcomed with familiar forms • Quietness is peaceful and relaxing 	<ul style="list-style-type: none"> • Spaces to gather with others on the golf course is a way to provide social support
<ul style="list-style-type: none"> • Hitting onto a narrow fairway within a confined corridor of trees feels challenging • Conquering a hole feels victorious and triumphant • Familiarity in the features of the golf course • Comfort in the landscape • Feeling secure in an enclosed space 	<ul style="list-style-type: none"> • Hole design can make the golfer feel threatened • Hazards can look harder than they are to play • Make the golf hole look harder than it actually is to make the golfer feel accomplished • Zones of challenge can encourage the golfer
<ul style="list-style-type: none"> • When maintaining a golf course, there is a sense of pride in your work • You can develop a sense of identity • Golf courses engender a sense of purpose • There are feelings of a want to return to play again • There is an unlimited challenge to trying to improve • Memorable golf holes make the experience last beyond the golf course 	<ul style="list-style-type: none"> • There is a place attachment to special golf landscapes • When maintaining a golf course, you feel like a steward of the land • Downhill shots feel accomplishing, you hit it further with the same swing • Greens can be shaped to funnel golf balls toward hole locations

Therapeutic Interpretation in the Sport of Golf

Physically Therapeutic Outcomes

A. Stressor	<ul style="list-style-type: none"> • Golfer has to make a choice on how to swing the club depending on the desired shot result. • Able players have the option to walk or to take a cart. • Golfers have a set of familiar golf shots that are testing throughout the round of golf: Driving, putting, punch shots, chip shots, half-swing wedge shots, sand shots, etc... 	<ul style="list-style-type: none"> • Elevated tee shots evoke feelings of grandeur and prospect • Punch shots and lay-up shots evoke feelings of refuge • Golf holes can range in difficulty • Putting can be an ambiguous experience at first, but after repeated attempts, it becomes a familiar experience
B. Intrusive Recollection	<ul style="list-style-type: none"> • Hitting a golf shot is a positive distraction 	
C. Avoidant / Numbing	<ul style="list-style-type: none"> • Golf swing is nimble and graceful • Golf motion is unlike any war-time motion or exercise • Golf swing is complex 	
D. Hyper-arousal	<ul style="list-style-type: none"> • Swinging the golf club consistently • Letting the club “do the work” • Swing requires tempo and rhythm • Everyone has their own unique swing • The active part of the game (actually swinging the club) doesn’t take up the entire time 	<ul style="list-style-type: none"> • Standing at the ball • Walking around the green • Swing requires balance • Swinging the golf club several times in a round can be physically exhausting
E. Duration	<ul style="list-style-type: none"> • Walking the course can be demanding • There is required stretching and preparing for your body physically • Playing the game is a physical exercise • The sport is minimally demanding physically • Learn to play golf by putting first and get used to holding a club in your hand 	<ul style="list-style-type: none"> • Move on to chipping and half swings • Eventually try 3/4 and full swings to learn the golf swing • Balance is required • Walking through a variety of ground cover, from paved pathways, to sand bunkers to native grasses and woodlands • Increase grip strength • Repeating a golf swing consistently
F. Functional Significance	<ul style="list-style-type: none"> • Practice requires an ordered approach, there is a method to learning how to swing a golf club • Practicing putting require standing tolerance 	

Psychologically Therapeutic Outcomes

- | | |
|--|--|
| <ul style="list-style-type: none"> • Playing golf with others encourages a dialogue between all players in the group (maximum of 4 people in a group) • Choice of what club to use gives the golfer a sense of control on what they decide to do • Golf can be played in a group of people, or it can be played alone, golfers have the choice on what they want to do • The beginning hole of a round of golf can be nerve racking and evoke feelings of stage fright and fear, this is a mental zone of challenge. • Playing with peers can encourage you to try your best effort | <ul style="list-style-type: none"> • In golf, you are the only one that can affect your score, your peers cannot change your score, this means that the golfer has complete control on their results, regardless of playing partners • Golf challenges the players to control emotion and frustration. This is a learning experience that over time improves. • Putting greens take a mental capacity to understand the break and the speed of the desired putt • Playing golf is difficult, it has moments where the player is facing adversity, therefore there are zones of challenge throughout the round. |
|--|--|

- Refuse to let any other distractions to alter your game
- Golf encourages you to stay in the present

- Maximum (traditionally) of 4 players in a group, a comfortable and semi-private setting
- Playing partners encourage dialogue
- Cordial experience
- Golf is a competition with yourself and the golf course, not between you and the playing partners

- | | |
|---|--|
| <ul style="list-style-type: none"> • Getting over frustrations on the golf course can help golfer deal with outbursts of anger • Throughout the round of golf, there are feelings of accomplishment • A round of golf demands concentration from the golfer • Playing partners provide social support • Golf encourages dialogue and playing with others • There is a sense of belonging when playing with others that are like you | <ul style="list-style-type: none"> • There are networking opportunities and friendships that can be made on a golf course • Lowered levels of perceived loneliness • Patience is required on the golf course • There are opportunities to play team golf, where you are a member of a social construct • League play is an opportunity to gain social support • Golf challenges your reaction to poorly played shots |
|---|--|

- Build confidence as you continue to play
- Learn to play the game and feel welcomed on the golf course
- Social stressors being paired with strangers to play golf with
- Sense of membership and stewardship of the land when you belong to a golf club

- | | |
|--|---|
| <ul style="list-style-type: none"> • Golf encourages you to practice good etiquette • Helps people improve self esteem • Restore a sense of balance • Mentality to practice so that you can improve, you can't give up • You have to keep your own score, it requires honesty and integrity • League play is a scheduled event and requires team members to show up on time. | <ul style="list-style-type: none"> • Promotes responsibility and reliability in your teammates and yourself. • Hold yourself accountable • Processing between which clubs to use requires brain power • At the end of the round, you have to add up your score • Strive for excellence • Set personal goals, and break personal records |
|--|---|

Appendix E: Summary of Memorial Framework

Experiential Qualities of Precedent Memorial Landscapes

Typical Expressions of Memorial Design

Experiential Quality of a Memorial Landscape		Typical Expressions of Memorial Design	
Experiential Quality of a Memorial Landscape	What/Why? Incorporate meaning in the landscape	<ul style="list-style-type: none"> • Symbolic monument of memorable event in United States history • Bronze statues accurately depicting a historical event • Dedicated memorial by the President of the United States • Tall / Large statue atop a towering podium • Include a database of all those who were/are involved • Stainless steel statues come to life with lighting • Larger than life sized statues, heroic in scale • Highly polished black granite walls to reflect visitors • Photographic imagery of events and people • Significant numbers related to the event • Reveal the numbers of those who died, wounded, missing and taken prisoner 	<ul style="list-style-type: none"> • Emotionally charged quotes: <i>sacrifice, nation, defend</i> • Honor those who made the sacrifice, not the war • Built in honor of ALL those who serve/served • <i>The Lone Sailor</i> recognizable figure to those in the United States Navy • Engravings of historically significant messages in Naval history • Memorial below grade to reflect sacrifice • Reveal the price of freedom • Triumphant archways represent the conquering of the Atlantic and Pacific Oceans • Significant location between Lincoln Memorial and Washington Monument
	When? Incorporate ritual experiences to	Dictated	
	How? Narrate the meaning to an audience	<ul style="list-style-type: none"> • Largest bronze war memorial in the United States, a grand statue atop a podium at the top of a grass hill, creating a vertical and majestic experience • <i>Pool of Remembrance</i> is a contemplative space to sit, think and reflect • Visitors walk with the statues towards the American Flag • Visitors have 4 entrances to memorial plaza below • Ceremonial entrance to the east walks past wall of bas-reliefs that narrate the war experience • Ambulate through plaza space towards the <i>Freedom Wall</i> • Search for <i>hidden treasure</i> (Kilroy) 	<ul style="list-style-type: none"> • Large pool in the center of plaza is ceremonial in scale • Surrounding lawns and shade beneath tree canopies is contemplative space • No benches forces visitors to walk through the space, and stand before the names of those who sacrificed their life • Enter memorial at grade, sink 10' below grade, return to grade, renewed and refreshed • Search for the names of loved ones on the wall
	Who? Evoke a dialogue in the community	<ul style="list-style-type: none"> • Victorious America is depicted with bronze wreaths suspended above • Statue tells the story of one of the most influential incidents in WWII • Authentic representation of the <i>Raising of the Flag at Iwo Jima</i> according to Joe Rosenthal's photograph • Over 2,400 photographic archival images, representing all branches of the military (land, sea, air and misc.) • Plant material represents the terrain that the troops had navigate through, granite steps represent hurdles and obstacles encountered in war • 19 statues, realistic in appearance, reflected on the <i>Mural Wall</i> equals 38 statues, alluding to the 38th parallel (the boundary between North and South Korea) and the 38 months the war lasted • Story of the members of the United Nations that allied with the United States to fight oppression 	<ul style="list-style-type: none"> • Rose of Sharon is South Korea's national flower • Authentic apparel and gear according to the time period and military branch • Triangular plaza at the <i>Pool of Remembrance</i> extends into the water, representing the Korean Peninsula • Etchings in the <i>Mural Wall</i> from a far look like the distant mountains of the Korean landscape • <i>Granite Sea</i> is an exact replica of the world's oceans • Two large fountains honor the personnel of the United States Navy and the World's Navies • 26 bronze bas-reliefs surround the southern hemisphere of the <i>Granite Sea</i> and illustrates significant events and personnel in the U.S. Navy's history • <i>The Lone Sailor</i> represents all those who have served or who serve in the U.S. Navy
	<ul style="list-style-type: none"> • Located next to the Arlington National Cemetery • Dedicated to all the members of the United States Marine Corps • Each branch of the Armed Services is included in the statues and wall • 22 members of the United Nations are included, expanding the audience to an international community • American flag flown above • Intimate space • Statues show the diversity of the United States Armed Forces: race, rank and branch • All identification was removed from the photographs on the 	<ul style="list-style-type: none"> • <i>Mural Wall</i> so that the images represent a community, not an individual • Memorial of faces • Adjacent to "America's Main Street" • Engravings of quotes significant to the U.S. Navy bond those who are within the Naval community to the memorial grounds • 4.4 million visit the WWII memorial annually • 56 pillars represent the 48 States and 8 Territories of the United States • "Kilroy was here" is a message that is understood by the community of WWII veterans 	

Principles of Memorial Design

- Database contains the names of all those who sacrificed their life for the United States of America
- Built in honor of those who died in service
- Set criteria to narrow selection for who is honored
- Names listed in chronological order
- Depression or sinking experience into the landscape
- Horizontal experience vs. vertical experience
- Highly polished black walls to reflect the visitors faces on the names engraved in the wall.
- Reflections cast the future on the past and create a bond
- No hierarchy in the names of those remembered

- Significant location in context to surroundings
- Physical reflections of the visitors on the memorial
- Reveal the numbers of the total killed, wounded, missing, taken prisoner
- Remind audience of the sacrifices
- Nation
- Defend
- Price of freedom
- Engravings in stone have a sense of permanence

- Database revealing total numbers of people
- Honor the soldiers, not the war
- Depression or below grade represents a sacrifice
- Statues
- Bring the past to the present, the present to the past
- Avoid rank when honoring soldiers
- Accurate/authentic representations of the people and events

Impromptu

- Flag in the statue is to be flown 24 hours a day, 365 days of the year
- Memorial is the center piece for the weekly Sunset Parade (summer)
- Parades and pageants pass by the memorial several times a year
- Visitors leave behind mementos of their lost loved ones
- Visitors take rubbings of the names and take a piece of the memorial home with them
- Replicas of the memorial travel throughout the United States spreading the wall's influence
- Non perishable items are saved and preserved

Dictated

- Contemplative space
- Designed/intended circulation
- Designed to be experienced at night
- Where do people enter the memorial
- Central space or a focal point
- Through space, movement
- Large pools are ceremonial
- Looking for something
- Hidden features inspire curiosity and exploration through the space
- Read the memorial, stop and think

Impromptu

- Memorials as centerpieces for pageants and parades
- Replicas and scale models spread the influence of the memorial
- People leave cherished mementos with the name of the lost souls
- People like to take a piece of the memorial with them to remember their experience
- Amendments/adjustments can be made thus adding significance to the memorial

- 24 bronze bas-relief panels tell the entire story of the WWII experience, overseas and at home
- 56 granite pillars tied together by a bronze rope represents the bond between the 48 States and the 8 United States Territories
- Engravings of significant battle names and military campaigns in the paving
- Significant location in context of the National Mall
- Engravings of significant messages and quotes
- Laurels suspended above to represent America's victory
- Dates are engraved at the vertex of the walls to provide time context
- The wall illustrates the perils of war by revealing the names of all those who died in the War
- Transformed the way Americans think of war, not honorable

- Pride in victorious/triumphant, America
- Authentic representation of people and events
- Geographic reference to the region of battle
- Photography reveals authentic truths
- Each branch of the Armed Forces has forms which evoke response
- Bas-reliefs are permanent memories
- Show actual events and moments
- Represent time

- Engrave names of those who have made the ultimate sacrifice
- Significant numbers that relate to the story
- Significant words and messages
- Location specificity in relation to context and other memorials
- Tours help teach the story
- Dedicate memorial
- Teach audience of the perils of war
- Transform how people think of war and United States Veterans

- Large plaza space to accommodate large groups
- Subject of the memorial touches all Americans
- Bas-reliefs tell the stories of the troops overseas and those who were at home
- Publicly accessible space
- All names are stripped of their rank, each life is equally important
- Intimate memorial, no benches to sit, constantly exposed to surrounding conversation
- Feel a connection to other members at the wall, some who are observing some who are searching for a name
- Those who close to a veteran of the Vietnam War feel welcomed and encouraged to participate in the memorial

- Honor veterans from all states, nations, races, ranks
- National significance
- Remember those who have passed
- Honor and thank the troops and service members that are alive
- Recognize the sacrifices made at home and overseas
- Service at war
- Publicly accessible
- Keep memorial open at night for a different experience

- Events, parades and spectacles increase the community
- Remain cognisant of annual visitors
- American Flag is the national symbol for freedom
- Location context to the community
- Intimate spaces for social interaction
- Users and their relationships to the memorial and the subject