THE COLORADO HORSE PARK

PROMOTING SUSTAINABILITY IN THE EQUESTRIAN INDUSTRY

by

CAITLIN R. ADMIRE

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, and Design

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2011

Approved by:

Major Professor
Laurence A. Clement, Jr.

Abstract

The word “equestrian” is generally not known to be synonymous with sustainability. Although there is a small progressive movement, sustainable design is currently not common practice in the horse industry and desperately needs promoting. Horsemen and women need to be made aware that these techniques exist as well as more information on how to implement them into the facilities that they own and manage.

The Colorado Horse Park (CHP), one of the largest equestrian event venues in the nation, has great potential to become an example of successful sustainable design. As host to dozens of events and hundreds of visitors each year, the CHP presents the perfect opportunity to educate the horse community on sustainable practices. Using the Audubon Lifestyles Program and Sustainable Sites Initiative (SITES) as guides, I will promote the sustainable equestrian movement through the implementation of sustainable elements and an interpretive landscape at the CHP. The goal of this new design will be to educate site users on sustainable practices as well as motivate and inspire them to make changes to their own lifestyles and facilities.

Using the theories established through research and precedent studies, a new design for the CHP was developed. There are three principles to this design: using circulation systems to make the facility more functional, implementing sustainable elements into the facility to serve as examples, and providing the visitors with educational opportunities in the form of interpretive exhibits. Function and safety are two major concerns at this type of venue, and are addressed through the re-organization of site elements and the establishment of a circulation system which creates separation between differing traffic types. Sustainable practices are applied in the forms of vegetated drainage ways, protection of riparian areas, xeric plantings, habitat restoration, and a manure composting operation. An interpretive landscape of signage and displays highlights each sustainable element and relates information on how visitors can incorporate sustainable techniques in their own facilities.

The Colorado Horse Park

Promoting Sustainability in the Equestrian Industry

Caitlin Admire | MLA Project and Report | Spring 2011

Table of Contents

List of Figures

PART VII - Design Solution

Supplemental Files

Base Maps

These maps, gathered from Design Workshop and Douglas County, allowed me to have the base site information necessary to create a successful design.

CAD Files:

- Existing conditions, including context vegetation, contours, and floodplain (2000)
- Colorado Horse Park site plan (2000)
- Boundary and Topographic Survey, including roads, utilities, and spot elevations (1999)
- Development Plan (2000)

Douglas County GIS Maps:

- Census Information
- Contours
- Centerlines
- Legal Boundaries
- Hydrology
- Land Use
- Transportation Networks
- Trails
- Zoning
- Utilities

Support Information

This information mostly became part of my inventory section and allowed me to conduct accurate site studies on which to base my design.

Google Earth aerial imagery
Bing maps
Personal photographs of the site
USDA information:
    Hardiness zone
    Eco-regions
    Climate
Boarding Facility Site Improvement Plan PDF
    (1990, 1”=100’)
Parcel Boundaries PDF
Soils map from Web Soil Survey

Contacts

The people listed below were instrumental in assisting me with gathering the base maps and supplemental information on the previous page.

CHP Board of Directors

CHP Facility Manager

Douglas County Government:

Dan Dertz, Public Outreach Planner
100 3rd Street
Castle Rock, CO 80104
303.814.4399

Mark Rankin, GIS Analyst
100 Third Street
Castle Rock, CO 80104
303.663.6247

Design Workshop:

Kristen Walsh
1390 Lawrence Street, Suite 200
Denver, CO 80204
303.623.5186

Related Courses and Experience

Listed here is my personal background as it relates to this project. As you can see, I do have some expertise when it comes to the workings of equestrian facilities and the experience of actually being a user of the CHP site.

- Personal experience of attending, working at, and competing in events at CHP as well as years upon years of horse riding, ownership, and competition.

- Equine Science Certificate, KSU, including an equine event planning course.

- Internship at equestrian architecture firm, Pegasus Design Group in Golden, Colorado. The principal and owner, Holly Matt, focused mostly on private facilities, but we did a lot of research on how to incorporate sustainability into her projects.

- Four years worth of coursework within the Department of Landscape Architecture, Regional and Community Planning.

Acknowledgements

Graduate Committee Members
Lorn Clement, Associate Professor, Landscape Architecture Regional Community Planning
Stephanie Rolley, Department Head, Landscape Architecture Regional Community Planning
Ted Cable, Professor, Horticulture Forestry and Recreation

To my Family
None of this would have been possible without all of your support!

To my Studio Mates
Thank you for all the memories and making the last five years in Seaton memorable!

Part I - Project Introduction

I knew by my second year of college that I wanted to do some sort of equestrian facility for my master's project. Through my experiences in school I also knew that my master's project would, in some way, involve sustainability. During the summer of 2010 I was competing in a hunter jumper event at the CHP and was waiting between my rounds when I realized that the CHP would be the perfect opportunity for a project that I could really enjoy.

Process

I developed my dilemma and thesis statements as the basis for my project and formed research questions that needed to be answered in order to frame my solution. My research questions led me to literature on sustainable equestrian design and interpretive education.

The RESEARCH QUESTIONS WERE NOT STATIC, allowing them to continually be shaped as the literature provided me with more insight on the subject of interpretive design. I then chose precedent projects, both equestrian facilities and interpretive landscapes, which seemed to be successful based on what I read during my research.

Armed with information from my research, I began my design. I started with programming, in order to get a better idea of what the site and users required of the design in order to meet my goals. Then I completed site inventory and analysis that allowed me to study how the site currently functioned and how my new design might best fit with the existing natural and social systems. Finally, I began design development moving from the larger scale into the most detailed, ensuring a holistic design solution which addresses all scales of the project site.

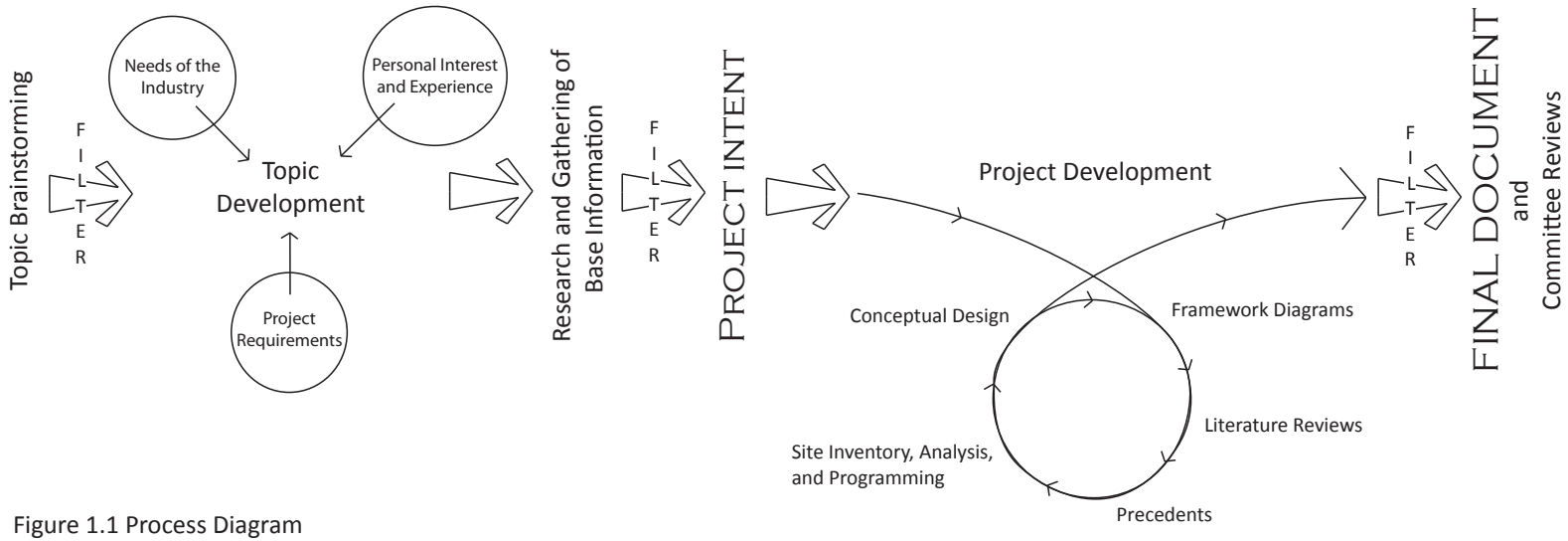
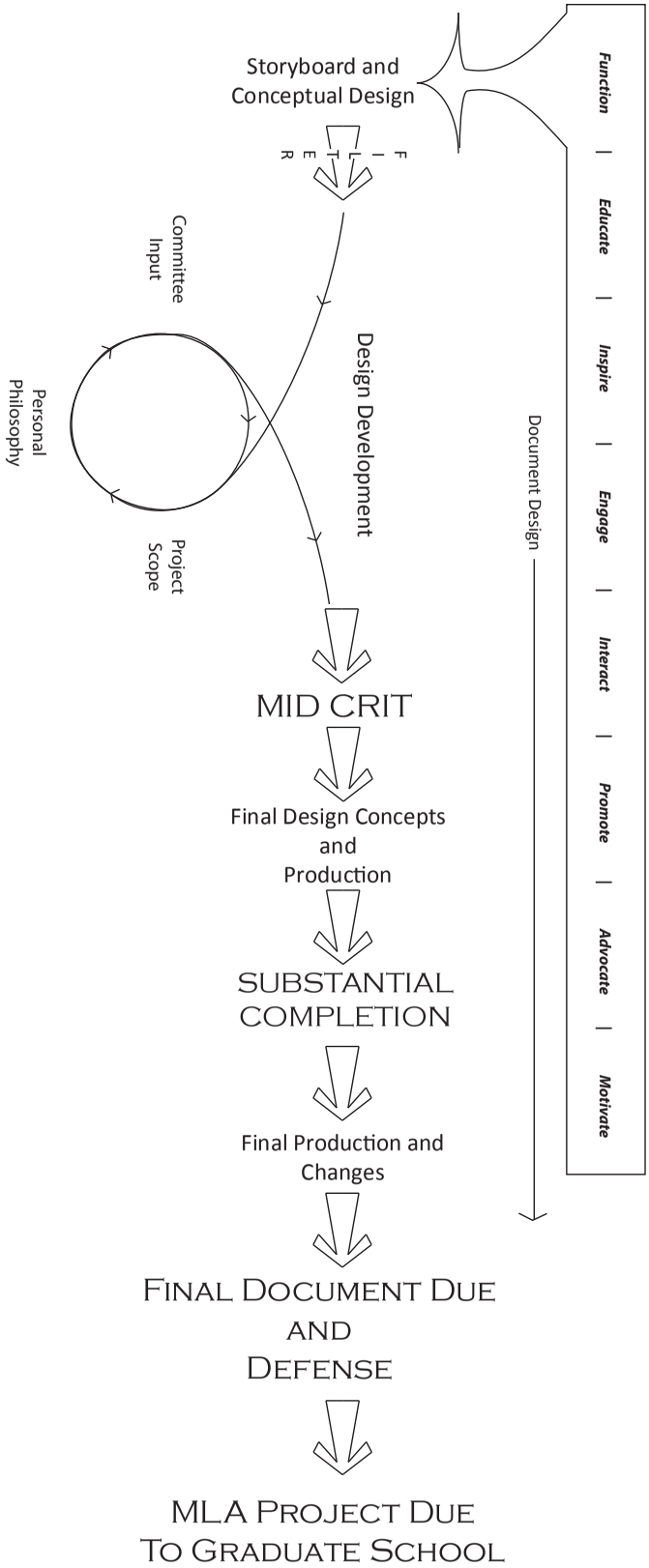


Figure 1.1 Process Diagram
(Caitlin Admire)


Storyboard and
Conceptual Design
FILTER
Committee
Input
Personal
Philosophy
Design Development
Project
Scope
Document Design
Function | Educate | Inspire | Engage | Interact | Promote | Advocate | Motivate
MID CRIT
Final Design Concepts
and
Production
SUBSTANTIAL
COMPLETION
Final Production and
Changes
FINAL DOCUMENT DUE
AND
DEFENSE
MLA PROJECT DUE
TO GRADUATE SCHOOL

Personal Goals and Objectives

TO COMBINE MY PASSIONS OF LANDSCAPE ARCHITECTURE AND HORSES.

To discover my personal design philosophy.

To explore the design dilemmas specific to equestrian facilities.

To figure out how the design of a landscape can reach out to the users of the site in order to educate and inspire them.

To become more familiar with sustainable design practices.

To advance the efforts of those in the equestrian community who are currently promoting sustainable design in our facilities.

TO PROVE TO MYSELF, CAPD FACULTY, AND POTENTIAL EMPLOYERS THAT I HAVE DEVELOPED THE SKILLS NECESSARY TO BECOME A SUCCESSFUL LANDSCAPE ARCHITECT.

Design Philosophy

Throughout my five years of study at Kansas State, I have developed a personal philosophy which I use to approach each project. Keeping this statement in mind as I design and develop each project allows me to stay true to my responsibilities as a landscape architect.

Each project has the duty to CREATE A UNIQUE DESIGN SOLUTION THAT IS BENEFICIAL TO THE CLIENT AS WELL AS THE COMMUNITY OF USERS AND THE ENVIRONMENT. This is accomplished by working with, rather than against, the three things that influence each project: the designer, the client, and the site itself. The personal experiences and philosophy of the designer, along with his or her educational background, both in school and/or the firm he or she works for, will greatly affect the aesthetics of the final product. The ideas of the designer or firm are what will make the project unique. The client is also influential in that they have certain expectations for the final product and they set the budget for the project.

As a service profession, keeping the client happy is the key to success. The site context is of utmost importance in any project. By considering the existing people and natural systems in and around the site we ensure that the final solution is as highly functional as possible for all the users. In the end, all projects should strive to leave the client happy and the site in a better condition than it was before, with healthier social, economic, and environmental systems.

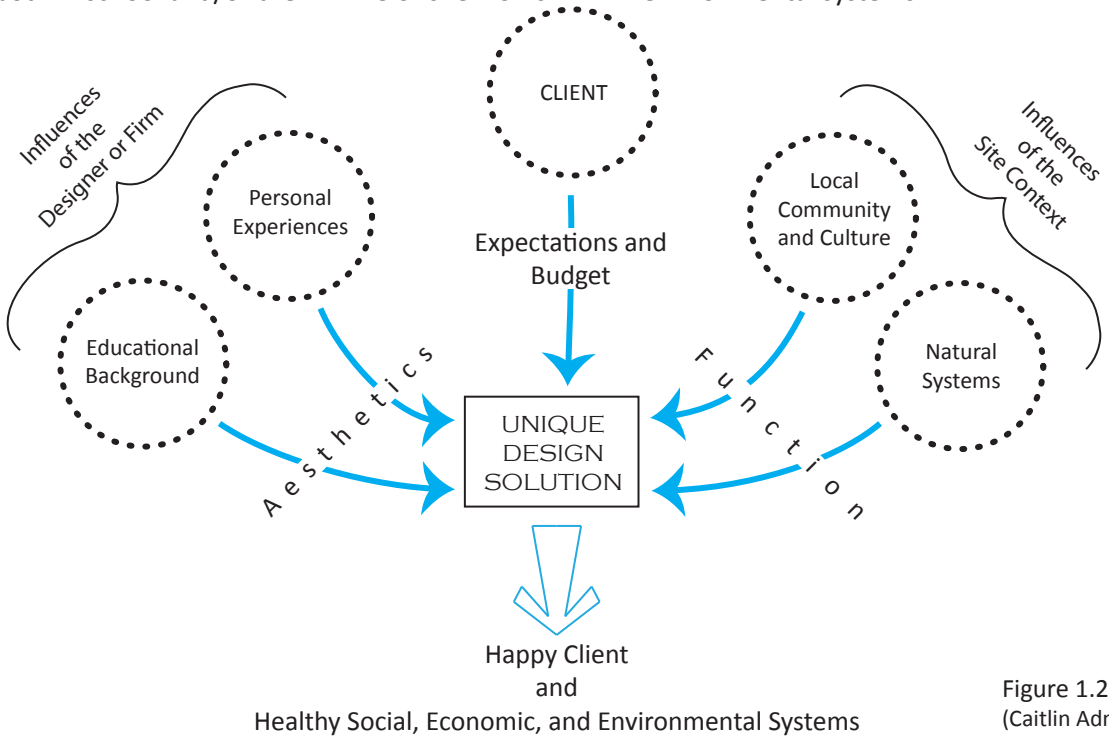


Figure 1.2 Design Philosophy Diagram
(Caitlin Admire)

Dilemma

"Equestrian" is generally not known to be synonymous with "sustainability". Although there is a small progressive movement within the industry and the techniques have been established, SUSTAINABLE DESIGN IS CURRENTLY NOT COMMON PRACTICE IN THE HORSE INDUSTRY and desperately needs promoting. Horsemen and women need to be made aware that these techniques exist as well as more information on how to implement them into their own facilities. The main issues facing equestrian design in terms of sustainability include:

Stormwater and manure management: Fecal matter and chemical residues often enter the local water supplies through ground water seepage and runoff from equestrian facilities. The large amount of these products being produced on these sites makes this an especially important issue to address.

Harmony with the natural environment: The need for large, flat areas to accommodate parking, barns, turn outs, and arenas does not generally work well with natural site features or ecosystems. Considerations for things such as soils, drainage, resource conservation, and animal and insect habitat, are often overlooked for convenience and cost reasons.

Safety and function: This is a particularly important topic in equestrian design because of the specific needs of the animals as well as the potential for dangerous situations when working with horses. Especially at large equestrian venues, there are often multiple circulation conflicts between vehicular, equine, and pedestrian traffic.

Thesis

The CHP, as one of the largest venues of its kind in the nation, has great potential to become an example of successful sustainable design at an equestrian facility. As host to dozens of events each year, the Colorado Horse Park presents the perfect opportunity to educate the horse community. The site users should be made aware of the new sustainable practices at the CHP as well as how to incorporate them into their own private training and boarding facilities.

Using the Audubon Lifestyles Program and SITES as guides, I will promote the sustainable equestrian movement through the IMPLEMENTATION OF A FUNCTIONAL AND SUSTAINABLE EQUESTRIAN FACILITY at the CHP. There will also be an educational aspect to the landscape, one that INFORMS BUT ALSO MOTIVATES AND INSPIRES THE SITE USERS TO GO BACK AND CHANGE THEIR LIFESTYLES and facility operations to be more environmentally friendly.

Research Questions

Project Goals

To create an equestrian event venue that is functional and safe.

To create a facility that is sustainable.

To create a landscape that educates people on sustainable practices.

To create a landscape that inspires people to change their behaviors related to consumption of energy and natural resources.

Research Questions

How does one create a functional equestrian facility?

How does one create a sustainable equestrian facility?

How can a design educate people?

How can a design inspire people to change their behaviors?

- How does a designed landscape inspire people to adopt sustainable habits?
- How can a landscape be designed to make people recognize and value sustainable design?
- How can a landscape help connect people to their natural environment?

Key Issues Relevant to Contemporary Landscape Architecture

Industry Trends

Equestrian facilities have become more and more popular in the past decade as developers strive to offer unique amenities in their communities. As these types of large facilities become more sought-after, the horse industry is beginning to understand the importance of hiring a professional to design a fully functional, comfortable, and safe facility. “In virtually every instance where an equestrian community has not achieved true success, the reason is the lack of preliminary analysis to determine exactly how and why the site should be designed” (Donovan, 2007). This demonstrates the important expertise that, specifically, landscape architects can provide to equestrian design projects.

Sustainability

Sustainable design is one of the foremost topics in many design disciplines today. Designers and clients alike are attempting to earn the recognition that comes with a LEED certified project. Landscape architects play a special role in this process in that they have training in understanding how the environment works and are qualified to lead the effort toward sustainability. Landscape architects have a natural instinct when it comes to the land and the values that we need to place on it” (Conant, 2010). The horse industry is a bit behind the curve in this area, but efforts are being made to bring equestrian design up to standards with the rest of the design community. Without proper attention to site design, equestrian facilities can be detrimental to a site’s natural systems, but with the help of a design professional they can become models of environmental stewardship.

Learning Landscapes

“Educating people is the highest form of service we can perform” (Spanier, 2002). This quote is not speaking directly of landscape architecture, but it applies to us as professionals who have an opportunity to directly affect the communities within which we work. Part of the job of landscape architects as environmental stewards is to extend our concern for sustainable design to the public. This can often be done through a landscape design that is in some way educational to the users, often called learning landscapes. These types of jobs take a new level of knowledge as the designer must understand how people think about, comprehend, and learn from the landscape. Adding an educational component takes landscape architecture to another level and allows our projects to be that much more valuable to the community in which they serve.

Part II - Research

The amount of knowledge available is almost endless. A review of literature on my research topic is useful in order to explore how this information can be used in the project and how it can help to SHAPE THE DILEMMA AND THESIS. A literature map graphically represents how the sources connect to one another as well as to the project topics. One of my key resource became Interpretation for the 21st Century by Larry Beck and Ted Cable, and is summarized in the following pages. The complete literature review, which provides summaries of all the key pieces of literature and their POTENTIAL VALUE TO THE PROJECT, can be found in the appendices. The two other primary resources are the

Precedent studies are utilized to analyze project examples that have issues similar to those in this project. This allows us to LEARN FROM THE EXPERIENCES OF OTHERS and understand how our design might benefit from their successes or mistakes. My precedents include six projects: one functional equestrian event venue, the Kentucky Horse Park; one sustainable equestrian facility, The Oaks Equestrian Center; and four different interpretive landscapes, the Arizona Sonora Desert Museum, the Lady Bird Johnson Wildflower Center, the Vancouver Land Bridge, and Crissy Field. These studies revolve mostly around the theory behind the project, rather than the actual site layout, with exception of the first case of the Kentucky Horse Park.

Literature Map

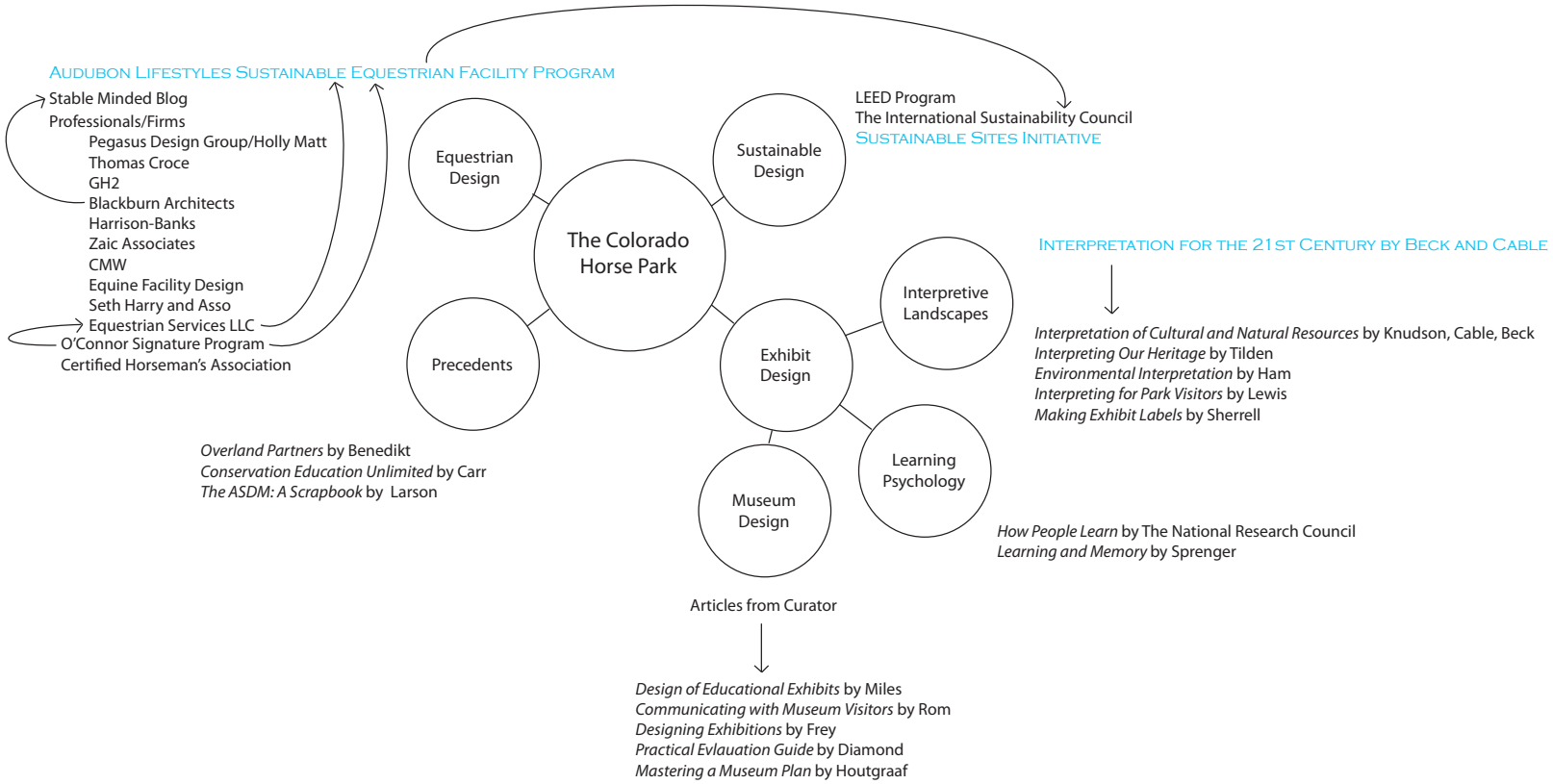


Figure 2.1 Literature Map
(Caitlin Admire)

Interpretation for the 21st Century

Beck, Larry and Ted T. Cable. "Interpretation for the 21st Century: Fifteen Guiding Principles for Interpreting Nature and Culture". Champaign, IL: Sagamore Publishing, 2002.

The basic premise of interpretive sites is to OFFER EDUCATIONAL OPPORTUNITIES IN A WAY THAT IS INSPIRING AND INSIGHTFUL THROUGH PROVIDING THE USER WITH A DEEPER UNDERSTANDING AND MORE ENRICHING EXPERIENCE. This can be achieved through multiple modes of communication, although this project will focus primarily on signage and displays to convey our messages. The principles in this book outline an interpretive philosophy which will act as the theoretical framework behind my design project.

Interpretation...
...is informational and inspirational.
...is an educational activity that aims to reveal meaning and enhance understanding of and appreciation for the subject through first-hand, experiential learning.
...is defined as to give meaning to a foreign landscape or event from the past or present.
...is a process by which visitors see, learn, experience, and are inspired.
...elicits responses such as astonishment, wonder, inspiration, action, and sometimes tears.
...provokes visitors to initiate a long-term path of exploration and learning.
...encourages greater sensitivity, heightens awareness, and creates a meaningful link.

The rest of the book focuses on explaining the 15 guiding principles of interpretation. The first six are based on Freeman Tilden's principles, and the rest were created by Beck and Cable.

Fifteen Principles of Interpretive Design

1. ***Lighting a Spark***: to spark an interest, interpreters must relate the subject to the lives of the people in their audience.
- Sites must touch on the visitors' personalities, experiences, or ideals in order to be significant.
- Messages must be interesting to capture attention, meaningful to make people care, and compelling to make people act differently after hearing them.
- Knowing user demographics and what motivates them.
- Effective delivery in the way of good mechanics, personal language, stating questions, being enthusiastic
- Stimulating interest by leading the visitor on a path of personal discovery
- "Awaken people's curiosity, it is enough to open minds...put there just a spark and if there is some good inflammable stuff it will catch fire!" Anatole France

2. ***Interpreting in the Information Age***: the purpose of interpretation goes beyond providing information to reveal deeper meaning and truth.
- Using information properly so as to appeal to

the imagination and reason.
- Linking the tangible (structures, vegetation, systems) to the intangible (beauty, community, responsibility)
- Process: create a list of tangibles, intangibles, and universal concepts then consider the audience and create relevant interpretation
- Raw information must be of good quality, accurate, and in sufficient quantity

3. ***Importance of the Story***: the interpretive presentation, as a work of art, should be designed as a story that informs, entertains, and enlightens.
- Clear introduction, body, and conclusion
- Story should be "an improvement to the silence"
- Bridge the unfamiliar with the familiar

4. ***Provocation***: the purpose of the interpretive story is to provoke people to broaden their horizons
- Adding information to emotion to evoke emotion and behavioral changes
- Promote the genius loci of the place
- Responsible behavior emanates from self-respect
- 3 levels of program goals
    - Entry level goals: overview info for general awareness, opportunities for comprehension, awareness of policies and objectives, and experiences that inspire appreciation
    - Ownership goals: foster awareness of the actions of the visitors, encourage investigation of the issues
    - Empowerment goals: encourage visitors to embrace responsible action
- Elements of an effective vision
- Upbeat and optimistic tone
- Communication of ambitious goals
- Highlight personal benefits
- Reach a peak

5. ***Holistic Interpretation***: interpretation should present a complete theme or thesis and address the whole person.
- The site should focus on themes, preferably no more than 7, with all information being linked to one of the themes
- Going beyond physical boundaries to incorporate region or world as a whole

6. ***Interpretation Throughout the Lifespan:*** interpretation for children, teenagers, and seniors should follow fundamentally different approaches
- Designs for children may need to include corrective as well as formative measures and assist children to have positive perceptions
- Encourage vocalization and movement, children learn best through action and participation, combination of action, fantasy, and instruction elements

7. ***Bringing the Past Alive***: every place has a history, interpreters can bring the past alive to make the present more enjoyable and the future more meaningful
- How far do we go with the facts: balancing facts with fun and entertainment value as well as censoring facts that are not appropriate for the site's visitors

8. ***Modern Tools of Interpretation***: technology can reveal the world in exciting new ways.

However, incorporating technology into the program must be done with foresight and thoughtful care.

- Technology should be engaging, dependable, and used to reveal something that the visitor would not otherwise be able to see
- Websites can: disperse the site's information to the world, allow guests to prepare themselves, provide links
- Website information is best when presented as narratives, simulations or games, and guided activities

9. ***Enough is Enough***: interpreters must concern themselves with the quantity (selection) and quality (accuracy) of the information presented. Focused, well researched interpretation is more powerful than longer discourse.
- Seeing too much of something leads to diffusion of interest and in turn to numbness
- Studies show that the short term memory of most people can handle about 7 pieces of information at a time
- Use humor carefully

10. ***Technique Before Art:*** before applying the arts in interpretation, the interpreter must be familiar with basic communication techniques. Quality interpretation depends on the interpreter's knowledge and skills, which must be continually developed over time.
- Interpreters must be as knowledgeable about communication as they are about their subject matter

11. ***Interpretive Writing***: interpretive writing should address what readers would like to know, with the authority of wisdom and its accompanying humility and care.
- Essential questions
    - What do you want to say? Choose a subject with which you are able to relate to the reader as well as create meaning in a brief and inspiring way.
    - What does the visitor want to read? Let the needs and interests of the audience guide the decisions.
- Composition: wording, clarity, brevity, liveliness, inclusiveness

12. ***Attracting Support and Making Friends***: the overall interpretive program must be capable of attracting support (financial, political, volunteer, and administrative) for the program to flourish.
- Funding? Labor? Things to think about…

13. ***Interpreting Beauty***: interpretation should instill in people the ability and the desire to sense the beauty in their surroundings, to provide spiritual uplift and to encourage resource preservation
- BEAUTY DEFIES DEFINITION
- Nature is unique in that its beauty is… timeless, immense, immersive, dynamic, encompassing of all the senses
- Creating an "atmosphere" instead of something "beautiful"
- Use meaning to modify the perception of beauty

14. ***Promoting Optimal Experiences***: interpreters can promote optimal experiences through intentional and thoughtful programs and facility design.

- Purpose: clear goals and expectations must be presented in order to keep visitors focused and motivated.
- Attention: exhibits must be compelling enough to engage the visitors and keep them concentrating on the task at hand.
- Challenge: there must be a balance, too challenging of activities will discourage the visitors while activities that are not challenging enough will cause them to lose interest.
- Involvement: the merging of action and awareness, what the visitors are doing should be inseparable from what they are thinking.
- Feedback: letting the visitor immediately track their progress and successes
- Immersion: immersing participants into the experience and letting them see beyond themselves.
- Control: allow visitors to have a sense of control over their experience encourages personal autonomy and responsibility.
- Sense of Time: true immersion in the interpretation will usually cause the visitor to have an altered sense of time, either faster or slower.

15. ***Passion***: passion is the essential ingredient for powerful and effective interpretation, passion for the resources and for those people who come to be inspired by it.

Summary of Interpretation for the 21st Century

Seven of the fifteen principles will be especially valuable.

The first principle, LIGHTING A SPARK, discusses how to make your message significant to the visitors by knowing what motivates them and then tailoring the information to appeal to their ideals. The second principle, INTERPRETING FOR THE INFORMATION AGE, talks about how interpretive design goes beyond simply providing information by linking tangible objects on the site to intangible ideas, such as beauty or responsibility. The fourth principle, PROVOCATION, addresses the best way to persuade visitors to actually make changes, which is to keep an optimistic tone, so as not to discourage, and highlight the personal benefits that they will receive if they do certain things. The fifth principle, HOLISTIC INTERPRETATION, promotes the use of a theme for the site with about seven topics under which all the information can be organized, in order to appear as a complete story. The ninth principle, ENOUGH IS ENOUGH, is concerned with how the information is offered and says that it should be focused and accurate. The eleventh principle, INTERPRETIVE WRITING, is important in its ideas about composition of text in exhibits, which should be clear, brief, and lively. Finally, the fourteenth principle, PROMOTING OPTIMAL EXPERIENCE, give ideas on how the site design can affect the educational experience by creating involvement and immersion with the information.

Overview of the Sustainable Sites Initiative (SITES)

The Sustainable Sites Initiative, also called SITES for short, is defined on the official website as "an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin and the United States Botanic Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction and maintenance practices." It is modeled after the LEED program, but is geared towards use by landscape architects as it is more easily applicable to sites without buildings. The nine categories include: site selection, pre-design assessment and planning, water, soil and vegetation, materials selection, human health and well-being, construction, operations and maintenance, and monitoring and innovation.

The SITES guidelines and performance benchmarks include 15 prerequisites, which are required to be met, and 51 other credits that are optional, but a certain number of which must be met in each category. "The Sustainable Sites committee members completed a series of weighting exercises to establish a ranking system for the 51 credits based on the Initiative's Guiding Principles":

- Do no harm
- Precautionary principle
- Design with nature and culture
- Use a decision-making hierarchy of preservation, conservation, and regeneration
- Provide regenerative systems as inter-generational equity
- Support a living process
- Use a systems thinking approach
- Use a collaborative and ethical approach
- Maintain integrity in leadership and research
- Foster environmental stewardship

"This resulted in the development of a 250-point system. It reflects committee members' current consensus regarding the potential level of impact that given benchmarks may have on improving site sustainability. Prerequisites are required and therefore are not assigned a point value. Credits are assigned a point value and in many cases they offer a range of points, providing projects additional flexibility in selecting the level (or benchmark) that is appropriate and achievable for them" (Sustainable Sites Initiative, 2009).

2009 SITES Rating System: 250 Points Total
- One Star: 100 points (40% of total points)
- Two Stars: 125 points (50% of total points)
- Three Stars: 150 points (60% of total points)
- Four Stars: 200 points (80% of total points)

Figure 2.2 SITES Logo (www.dirt.asla.org)

Overview of the Audubon Lifestyles Sustainable Equestrian Facilities Program

"The Audubon Lifestyles programs have been created as a way to assist individuals, businesses, neighborhoods, and communities seeking to take steps towards living sustainably. The basic objective of the Audubon Lifestyles Sustainable Equestrian Facility Program is to reduce the consumption of non-renewable resources, minimize waste, create healthy, productive environments, and inform the public, residents, guests, clients and employees about the benefits of sustainably managed equestrian facilities. Through participation in the program, Audubon Lifestyles assists equestrian facility managers, staff, and planners who desire to manage and operate their equestrian facilities sustainably. The program is geared toward assisting those seeking to become local, regional, national and international models of sustainability by incorporating sustainable principles, concepts, and management strategies" (Audubon Lifestyles, 2008).

Figure 2.3 Audubon Lifestyles Logo
(www.audubonlifestyles.org)

The Audubon Lifestyles program rating system works much like the SITES in that there are required credits, which are mandatory and therefore have no point value, and then a minimum amount of points that must be met in each category through implementing a number of the criteria options. The criteria are weighted and given more or less points depending on their effect in achieving the goals of the program. The five categories of the Audubon program include: economics and business, horse care and safety, facility and operations, environmental, and outreach and education.

2008 Audubon Rating System: 360 Points Max.

- One Star: 160 points
- Two Star: 200 points
- Three Star: 230 points (At three stars and above the project also earns a seal from the International Sustainability Council.)
- Four Star: 260 points
- Five Star: 300 points

Figure 2.4 ISC Logo
(www.thesustainabilitycouncil.org)

The Kentucky Horse Park (KHP)

Location: Lexington, Kentucky
Date: WEG Construction Completed Summer 2010
Designers: EOP Architects of Lexington, KY
Client: Commonwealth of Kentucky, Kentucky Horse Park

Background and Context

The KHP is the largest equestrian competition venue in the nation, each year hosting between 250-300 events, the most famous of which is the Rolex Kentucky Three-Day Event. As well as being a competition venue, the KHP is also a working farm and educational theme park that strives to showcase the equine industry. Construction is ongoing as the park continues to expand; the most recent development is a new facility for the upcoming Alltech FEI World Equestrian Game which was held at the park in October 2010. The WEG is often referred to as the "Olympics of the horse industry", and brought 507,022 visitors, 632 athletes, and 752 horses from 58 different countries. The KHP is located in Fayette County, Kentucky about 10 miles north of downtown Lexington, surrounded by mostly agricultural land. It is within the Bluegrass Region, also known as the "horse capitol of the world", where the equine industry is one of the largest contributors to the local economy.

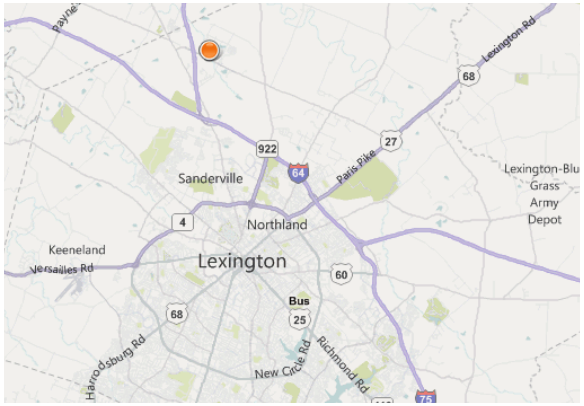


Figure 2.5 KHP Location Map (Bing Maps)

Significance

The KHP has proven itself to be a successful equestrian competition venue. Although larger in scale than the site I am dealing with, the KHP's size highlights the conflicts that are present at such a facility, which I need to be aware of and address. I will evaluate the layout and function of the KHP, focusing especially on the potential circulation conflicts and how the KHP handles the separation of pedestrian, equine, and vehicular traffic.

Question Answered

How does one design a functional equestrian competition venue?

Program

• Competition Venue: The KHP has 1200 acres of world class facilities capable of hosting almost any type of equestrian event.
  - 6000 seat indoor arena
  - 1100 seat covered arena
  - 7500 seat outdoor arena, with 22,500 temporary seats for the WEG
  - 6000 seat temporary stadium
  - Dressage arena complex
  - Cross country course
  - Polo fields
  - Hospitality area
  - Trade show
  - Campground with 260 camp sites
• Educational Theme Park: The KHP includes an area of educational opportunities for children and adults.
  - Museums: International Museum of the Horse (a Smithsonian affiliate), American Saddlebred Museum, Hall of Champions, sculpture throughout
  - Shows: Parade of Breeds, Mare and Foal Show, Draft Horse Exposition
  - Facility Tours

Figure 2.6 KHP Pastures (www.flickr.com)

Figure 2.7 KHP Aerial View
(www.dressagedaily.com)

Figure 2.8 KHP Sign
(www.kentuckytourism.com)

The Kentucky Horse Park, Continued

Design Principles

Minimization of vehicular traffic: Circulation and Parking

- Keeps all parking to the front of the park, in order to stop traffic from driving through the park.
- The public amenity areas, such as the museums and trade show, are clustered near the parking so that the visitors who are here for those areas don't cause more pedestrian traffic elsewhere in the park.

Separation of uses: Safety

- Separation of horsey and non-horsey uses, such as camping from stables, minimizes the risks of injury to horses and people.
- Roads and paths are of a proper scale for the type of traffic that will be utilizing them.
- Entire site is fenced to contain loose horses.

Proximity of elements: Function

- The competition venues are near stables, for convenience to the exhibitors.
- The public amenity areas, such as the museums and trade show, are clustered near the parking, for convenience to those visitors who are here specifically for those purposes.

Utilization of a resource: Manure

- A new energy-from-waste facility uses a biomass gasification process where horse manure will create a "producer gas" that can be used to generate electricity. There is an opportunity to produce approximately 1.6 Megawatts of electricity annually from KHP's muck productions.

Creation of a comfortable environment: Aesthetics

- Formal plantings, natural areas, water features, and artwork provide a comfortable and enjoyable environment for the humans and animals that come to the site.

Teaching Opportunities

- As listed in the program elements, the KHP utilizes its ability to reach a large amount of people to educate the public on horse breeds, history, etc. through museums and programs.

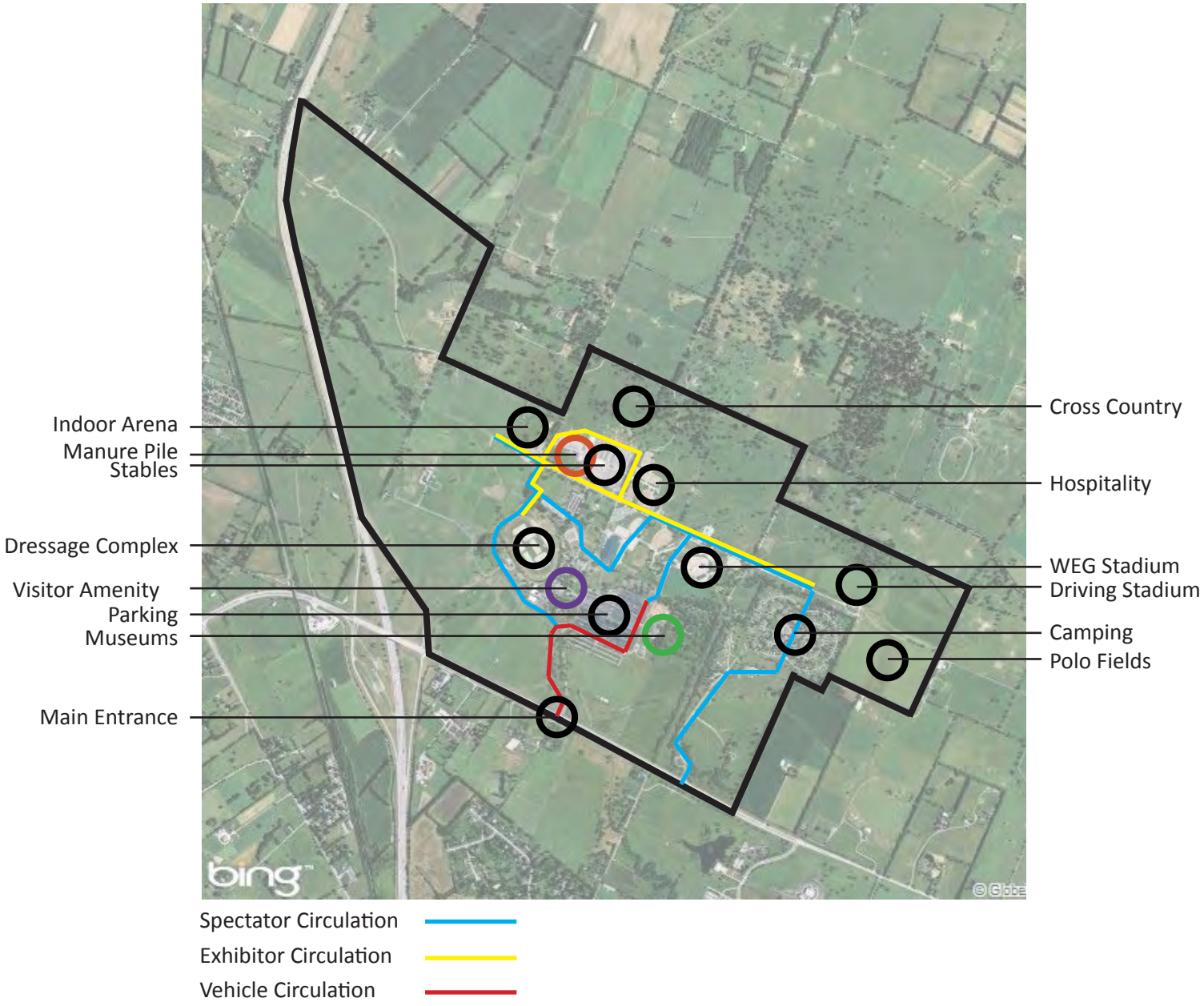


Figure 2.9 KHP Diagram (Bing Maps, modified by Caitlin Admire)

The Oaks Equestrian Center

Location: Lake City, Florida
Date: Completed Summer 2009
Designers: Equestrian Services, LLC and O'Connor Signature Program
Client: The Oaks of Lake City Development

Background and Context

The Oaks is the first equestrian center in the world to achieve a 5-star rating from the Audubon Lifestyles Sustainable Equestrian Facilities Program. It was also issued the Seal of Sustainability from the International Sustainability Council, is the only Certified Horsemanship Association accredited facility, and is the first facility to be branded a "Gold" O'Connor Signature equestrian facility. Lake City is a small town of about 10,000 people, but is within 100 miles of three major cities: Ocala, Jacksonville and Tallahassee. The Oaks E.C. is situated within The Oaks of Lake City, a 1200 acre planned community that is focused on the equestrian. The Oaks is a low density development, with lots available from 1 to 6 acres.

Significance

Although my facility will be a bit different functionally, The Oaks has essentially achieved the same sustainable goals that I would like to at the CHP. I will study the sustainable elements that The Oaks implemented in their facility and look at how the designers made them both functionally sustainable as well as useable within the every-day workings of the facility.

Question Answered

How does one create a sustainable equestrian facility?

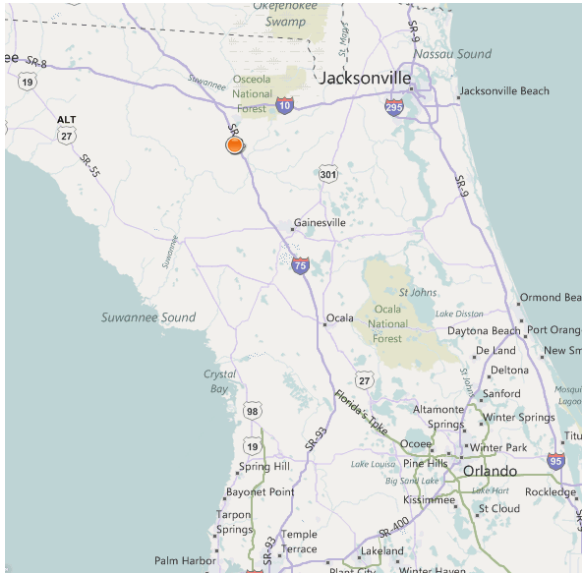


Figure 2.10 Oaks Location Map (Bing Maps)


Figure 2.11 Oaks Exterior View (www.eqsv.com)

Program

- Facility: The Oaks EC provides a state-of-the-art equestrian facility that offers the following:
  - 33-stall barn
  - 122' x 225' covered riding arena
  - 60 foot covered round pen
  - 15 miles of looped trails
  - O'Connor-designed 11-acre cross-country course.

- Sustainability: The Oaks EC has implemented a variety of sustainable elements at their facility including:
  - Utilization of natural lighting and ventilation
  - Recycled materials
  - Erosion minimalization techniques
  - Manure management and composting
  - Wildlife corridors
  - Native vegetation
  - Porous pavement

Design Principles

The Oaks closely followed the requirements of the Audubon Lifestyles Equestrian Facility Program. The basic objective of the Audubon Lifestyles Sustainable Equestrian Facility Program is to reduce the consumption of non-renewable resources, to minimize waste, to create healthy, productive environments, and to inform the public, residents, guests, clients and employees about the benefits of sustainably-managed equestrian facilities. Along with following the Audubon Lifestyles Program, designers of The Oaks focused on the three pillars of sustainability: environmental stewardship, social responsibility, and economic vitality.

Included in the Audubon Lifestyles Program:

- Developing a Nutrient Management Plan
- All persons under the age of 18 are required to wear helmets
- Ensuring that horses have access to fresh water at all times
- Having only non-barbed wire fencing
- Providing proof of negative Coggins tests for horses at the facility

The Nutrient Management Plan is of specific interest. This plan takes into consideration the management of manure and pastures in order to preserve the water quality of the local watershed from both environmental and economic perspectives. Nutrient program recommendations include:

- Mow pastures regularly to control weed growth
- Drag pastures to break up manure piles, which makes the nutrients available to the grass as well as prevent parasite breeding
- Pile manure as far as possible from water sources and surrounding housing
- Cover manure with tarps during wet weather
- Compost manure on site, it can then be spread on pastures or hauled away
- If manure is spread on pastures, do so only during the grass growing season and never when the ground is frozen because the nutrients cannot be absorbed
- Remove horses from pastures that have been grazed below 3 inches and only return them when the grass is at least 6 inches high, this requires having multiple turn out areas that are of adequate size.

Figure 2.12 Oaks Interior View (www.theoakslakecity.com)

Arizona-Sonora Desert Museum

Location: Tucson, Arizona
Date: Opened Labor Day 1952
Designers: Multiple, including Jones & Jones
Client: Pima County, ASDM Board of Directors

Background and Context

The ASDM is a private, nonprofit organization dedicated to the conservation of the Sonoran Desert. It is a world-renowned zoo, natural history museum, and botanical garden with almost 2 miles of paths on 21 acres. The mission is "to inspire people to live in harmony with the natural world by fostering love, appreciation, and understanding of the Sonoran Desert." It is also home to the Center for Sonoran Desert Studies and the ASDM Art Institute, programs that help to promote conservation of the desert through science and art. The ASDM is located 15 miles west of Tucson and is bordered by the Tucson Mountains, the Sonoran Desert, and the Saguaro National Park, all sensitive desert ecosystems.

Significance

The ASDM is known to be "at the forefront of developing exciting exhibits and interpretation for those who visit the museum in order to ensure the greatest educational and inspirational impact." I plan to look at the educational strategies the ASDM has utilized in their exhibits and which techniques they have found to be most effective in providing inspiration to the visitors.

Question Answered

HOW CAN DESIGNED SPACES INSPIRE PEOPLE TO ADOPT SUSTAINABLE HABITS?

Program

The site is a montage of zoological, natural history, and botanical exhibits, with 85% of those being outdoors. Included in the ASDM collections are:

- 100 acres of preserved desert landscape
- 300 different animal species
- 40,000 plants representing 1300 different species
- Geology - gem, mineral, and fossil specimens from the Sonoran Desert region
- Collection of stored plant and animal parts for hands-on experience by visitors
- A library of reference material
- Recovery programs for threatened and endangered plant and animal species.

Figure 2.13 ASDM Location Map
(Bing Maps)

Design Principles

The exhibit designers at the ASDM focused on IMMERSION OF THE GUESTS INTO THE ENVIRONMENT in order to give them a better appreciation for their surroundings. The layout is open, so the visitors can take whatever path they choose, which promotes learning because the guests aren't forced through a specific sequence. One of the techniques that the ASDM sees as being most powerful is the "SPONTANEOUS OR UNEXPECTED EXPERIENCES that augment and interpret natural surroundings." For example, "a snake on the path, a hillside of wildflowers, a red rock canyon, a summer rain." Most of the exhibits are LIVING EXHIBITS, "which simulate natural habitats and their interrelationships of plants, animals and geology."

The animal exhibits were originally the classic concrete and chain link enclosures seen at many zoos designed in the 1950s, Today, these exhibits have been creatively redesigned to more closely resemble natural habitats that allow visitors to discretely view the animals from a variety of perspectives, including some from underground or underwater. Notice the lack of typical enclosure elements, such as fencing, in Figure 2.15. Instead the ASDM uses artificial rock that looks and feels like the natural rock formations of the animals' habitats. In their demonstration desert garden, the ASDM not only aimed at using native, water-wise plant species, but also to design them in a way that created an attractive setting in which the museum visitors learn to enjoy and accept them.

The ASDM also strives to demonstrate important ecological connections between plant and animal communities, creating even greater meaning to the visitors. The grassland exhibit, designed in the early 1990s by English architect David Hancock, incorporates many of these design principles. First, it uses false perspective to create the illusion that the prairie goes on forever. A trail network allows visitors to actually get into the exhibit and experience the beauty of the grasses. Finally, it focuses on the entire community and interrelationships of the animal species (including humans), rather than just the individuals.

Figure 2.14 ASDM Landscape
(www.planetware.com)

Figure 2.15 ASDM Demonstration Garden
(www.arizona-vacation-planner.com)

Figure 2.16 ADSM Distant View
(www.flickr.com)

Figure 2.17 ASDM Animal Exhibit
(www.rv-boondocking-the-good-life.com)

Lady Bird Johnson Wildflower Center

Location: Austin, Texas
Date: Completed 1995
Designers: Robert Anderson, Overland Partners
Client: The Lady Bird Johnson Wildflower Center

Background and Context

The former first lady, Lady Bird Johnson, and actress Helen Hayes established an organization in 1982 with the goal to protect the natural landscapes of North America. This site started as the National Wildflower Research Center, a facility aimed at introducing people to the native wildflowers of Texas and preserving the state's endangered plants. It later took on its current name and in 2006 became a research unit for the University of Texas Austin. The center's mission is "to increase the sustainable use and conservation of native wildflowers, plants and landscapes".

Significance

I want to look at how Overland Partners incorporated the sustainable elements in a way that is attractive and therefore makes it appealing to visitors.

Question Answered

HOW CAN A LANDSCAPE BE DESIGNED TO MAKE PEOPLE RECOGNIZE AND VALUE SUSTAINABLE DESIGN?

Program

- A collection of buildings such as a visitors' center, learning center, auditorium, and gift shop which houses the largest rain-water harvesting system in the nation.
- A central meadow of native grasses dotted with wildflowers and surrounded by several hundred Texas trees.
- A display of all 53 species of oak trees native to Texas
- Specimen trees, including black walnut, bald cypress, pecan and sycamores
- Informal gathering areas, such as groves for picnicking
- A "Hall of Texas Heroes" including descendants of Texas historical trees such as Austin's Treaty Oak, the Alamo Live Oak and the Sam Houston Kissing Bur Oak.
- Formal demonstration areas, such as a collection of plants for use in dry conditions and another that demonstrates trees for use under utility lines.

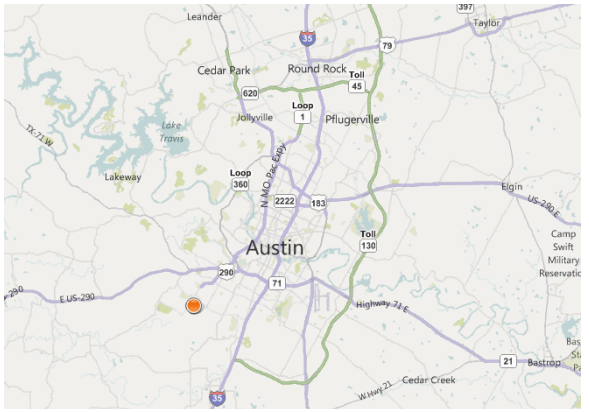


Figure 2.18 LBJWC Location Map (Bing Maps)

Design Principles

Overland Partners made a point not to hide the sustainable elements on site; instead they made the sustainable design elements incredibly conspicuous and treated them as the FOCAL POINTS of the design. For example, the materials chosen for and placement of the rainwater harvesting system makes it hard for anyone to miss. This technique helps to foster appreciation for sustainable design because visitors are able to see these elements function while enhancing the aesthetics of the space and the user experience.

The Wildflower Center also focuses on SHOWCASING THE BEAUTY OF NATIVE PLANTINGS. At the site, native plants of Texas are exhibited in both natural settings as well as formal demonstration gardens. Since beauty is interpreted differently by each person, this showcase of the plants' versatility allows them to appeal to a more broad range of visitors.

One of the newest additions to the Wildflower Center is a classic arboretum including all the oak species, as well as other woody species, that are found naturally in the Texan landscape. Allowing visitors the CONVENIENCE to see such a variety of trees in a relatively compact area provides an experience that is otherwise impossible. The arboretum is set along a trail that surrounds a recreational lawn area, providing the visitors with a DESTINATION within the exhibit.

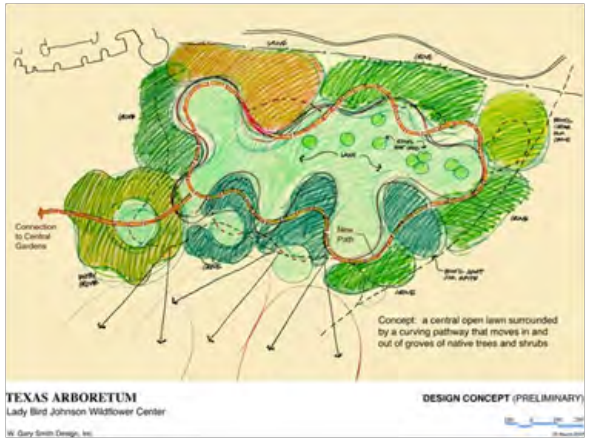


Figure 2.19 LBJWC Arboretum Sketch
(www.wildflower.org)

Figure 2.20 LBJWC Sustainable Structures
(www.overlandpartners.com)

Figure 2.21 LBJWC Natural Water Feature
(www.soa.utexas.edu)

Figure 2.22 LBJWC Landscape
(www.overlandpartners.com)

Figure 2.23 LBJWC Demonstration Gardens
(www.inhabitat.com)

Vancouver Land Bridge

Location: Vancouver, Washington
Date: Completed 2008
Designers: Jones and Jones Architects and Maya Lin
Client: The Confluence Project, National Park Service, City of Vancouver and Washington State Department of Transportation

Background and Context

This project stemmed from the need to provide a pedestrian connection between historic Fort Vancouver and the Columbia River waterfront over Washington State Highway 14. The solution was a 40 foot wide, earthen bridge that restores the natural landscape and exemplifies the change in the native landscapes from prairie to river bank. There is also a cultural aspect in the inclusion of historical information about the regional Native Americans and the Lewis and Clark expedition that had a major impact on the area. The land bridge is one of seven sites to be designed as part of the Confluence Project, an initiative to reclaim the historic Columbia River Basin. The goal of the Confluence Project is “to use place and art to explore possibilities for a better future”.

Significance

The Vancouver land bridge provides a functionally safe crossing for pedestrians as well as educational opportunities. The site users utilize the bridge to get across the highway, but in the process they are provided with information about the natural landscape and cultural history. This works much like my site will, in that the people are there for entertainment or recreational reasons but in the course of their visit will be educated about sustainable practices.

Question Answered

How can a landscape help connect people to their natural environment?

Program

- A walking path leads across the bridge through an interpretive landscape of prairie, grassland and forest native plants, a rain water collection system and artworks created by the design team and native artists.
- green roof
- 3 historical interpretive areas
- Four represented ecosystems: grassland, dry prairie, wet prairie, and bottomland.

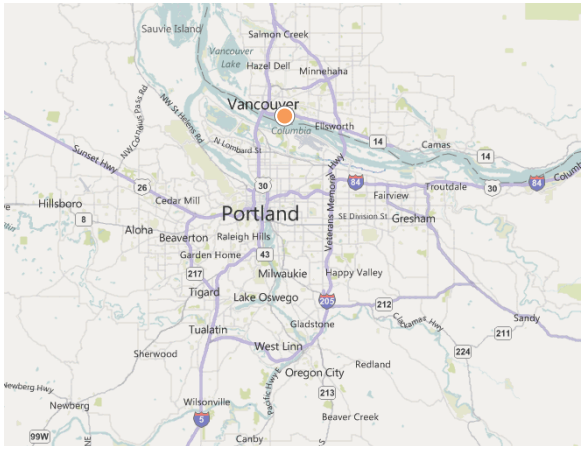


Figure 2.24 Landbridge Location Map
(Bing Maps)

Design Principles

The concept of the Land Bridge, according to designer Johnpaul Jones, was to "grab the prairie and pull it over the highway." Jones and Jones architects took the STRICTLY FUNCTIONAL NEED TO GET PEDESTRIAN TRAFFIC OVER A HIGHWAY, RECOGNIZED ITS POTENTIAL, AND TURNED IT INTO RICH EXPERIENCE. Utilization of art, views, and strategically placed rest areas provide the LOGICAL LOCATIONS FOR EDUCATIONAL EXHIBITS BECAUSE THEY DRAW PEOPLE INTO THE SPACE FOR A PURPOSE AND THEN ALLOW THEM TO BE EDUCATED at the same time. This concept can be seen in the sketch and master plan on the opposite page. Each of the three overlooks has its own theme (people, land, and river) that fits into the over-arching topic of the site's history, an interpretive technique. The informative panels are incorporated into the structure of the bridge, rather than the usual free-standing signage often seen in educational landscapes.

There was a lot of resistance to the project because it was going to cost so much more than implementing a typical highway overpass. Proponents of the design were able to save the project through the demonstration of its social and economic value to Vancouver. Socially, the project is important in making the people aware of the importance of good environmental stewardship. As the director of the Confluence Project, Jane Jacobsen explained that the bridge had to be different "not just for what it would represent, but for what it could bring." Economically, certain features of the bridge plan to save the city money and stimulate the local economy. The native plantings and rainwater harvesting system not only reduce runoff, but also ensure that the city need not provide water for irrigation purposes. Also, the bridge turns what was a three mile drive into a quarter mile walk to access the riverfront area, which is good for businesses as well as the citizens' health and provides opportunities for redevelopment.

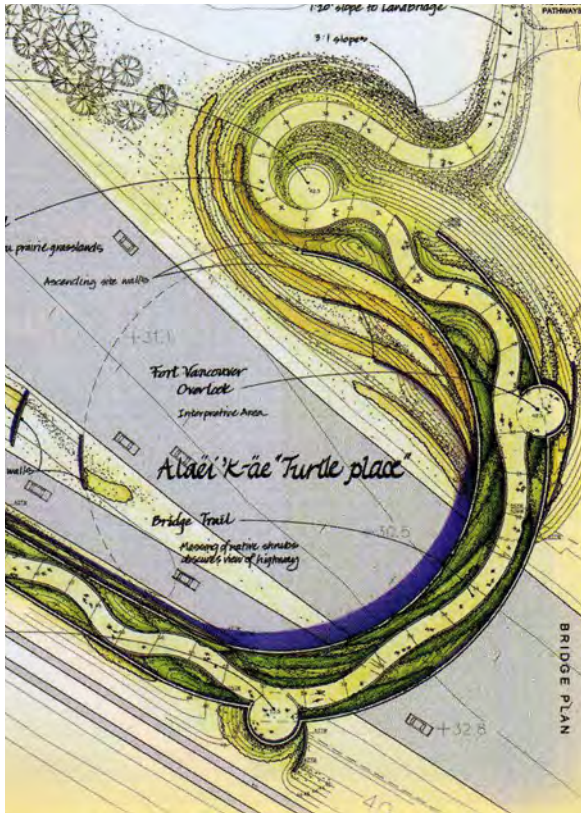


Figure 2.27 Landbridge Plan
(Landscape Architecture Magazine)

Figure 2.25 Landbridge Aerial Image
(Bing Maps)

Figure 2.26 Landbridge Aerial View
(www.jonesandjones.com)

Figure 2.28 Landbridge Interpretive Overlook
(www.confluenceproject.org)

Crissy Field

Location: San Francisco, California
Date: Construction began December 2009, estimated completion 2014
Designers: Hargreaves and Associates
Client: Golden Gate National Parks Conservancy

Background and Context

The site has a rich history as an Oholone Indian gathering ground, the landing site of foreign traders and explorers, the site of the Panama-Pacific International Exposition in 1915, and then an airfield for the US Army's Presidio Base. It finally became a recreation area in the 1990s as a result of the Base Closure Act, when both the historic buildings and natural systems were restored. 87,000 tons of contaminated soils were removed from the site and 50,000 native plants were reintroduced. Today, Crissy Field provides programs and amenities that create a convergence of the urban, natural, and historic environments of the site as well as connect the people of the Bay Area to their surroundings and teach them about sustainability issues. Crissy Field is located in the Presidio along the San Francisco Bay waterfront and lies close to the base of the Golden Gate Bridge. It is very much within the urban boundaries of the city, which provides the site with plenty of visitors on most days. It has become a one of the most popular running and dog-walking spots in San Francisco.

Significance

I will look at the strategies that Hargreaves used to draw visitors' attention toward the environmental issues on the site and connect them to the landscape through cultural and historical context.

Question Answered

HOW CAN A DESIGN FOSTER APPRECIATION TOWARD THE NATURAL ENVIRONMENT?

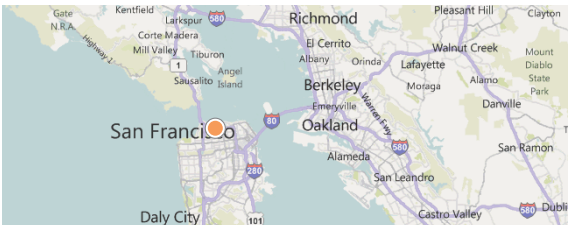


Figure 2.29 Crissy Field Location Map (Bing Maps)


Figure 2.30 Crissy Field Panorama (Caitlin Admire)

Program

- Hargreaves divided the design into six major zones:
    - Rehabilitation of the grassed airfield
    - A mile-long promenade
    - Restored tidal wetland
    - Restored beach dunes
    - The West Bluff as a picnic area
    - The East Beach as a gathering place.
- The grass field, promenade, West Bluff and East Beach all serve as open recreation areas, while the wetlands and dunes are there for functional environmental reasons but can be viewed from foot paths along which there are educational opportunities.

Design Principles

The first goal of Crissy Field is to engage the community in the site. This is achieved by providing the people with a DIVERSITY OF RECREATIONAL OPPORTUNITIES, which have been the key factor in the park's popularity. In order to maximize the use of the land that is scarce in the Bay Area, the recreation areas are generally UN-PROGRAMMED OPEN SPACE IN ORDER TO ALLOW FOR THE MOST VARIETY OF POSSIBLE USES. The designers also utilized the postcard-like views that the site has of the San Francisco Bay and Golden Gate Bridge to create enjoyable spaces where people want to be. While the visitors enjoy the active spaces and viewsheds on the site, they are provided with the educational opportunities. Adjacent to the recreational uses are passive areas made up of trails through the reclaimed wetlands.

Along the path there is educational signage that explains the modern restoration processes as well and the historical context of the landscape that visitors are looking at. Hargreaves confronts visitors with the landscape by AMPLIFYING THE NATURAL FORMS in order to make them more obvious and therefore memorable. For example, the convoluted landscape forms that greet visitors into the park and the restored beach front habitats were inspired by the sand dunes of the native landscape that are carved by the wind and waves.

Figure 2.31 Crissy Field Multi-Use Path
(Caitlin Admire)

Figure 2.32 Crissy Field Beach
(Caitlin Admire)

Figure 2.33 Reconstructed Wetland
(Caitlin Admire)

Application of Research

The overall motive for this research was to answer the research questions which were posted earlier in the document. The following paragraphs summarize how the research answered these questions and how the findings can be directly incorporated into this project.

The study of the Kentucky Horse Park answers the first research question, how does one create a functional equestrian facility? The main ideas that will be taken from the KHP are the first three design principles, which deal with the placement of site elements and the circulation between them. INTRUSIVE VEHICULAR TRAFFIC SHOULD BE MINIMIZED by directing vehicles to parking areas near site entries, rather than allowing vehicles to drive throughout. Also, when SITE ELEMENTS ARE CLUSTERED BY USE it minimizes the potential for horse traffic and pedestrian traffic to cross paths and makes it more convenient for site users to access the portions of the site which they are there to utilize. The UTILIZATION OF MANURE AS A RESOURCE will happen at the CHP, but in a simple composting operation, rather than the energy-from-waste process which the KHP uses.

The second research question, how does one create a sustainable equestrian facility, is answered by the study of The Oaks Equestrian Center, which directly coincides with the Audubon Sustainable Equestrian Facilities Program, this will be discussed in detail later.

The last two research questions, how can a design educate people and how can a design inspire people to change their behaviors, are both answered by the literature and precedents related to interpretive design. Much of the literature on interpretive landscapes discusses content of the exhibits and how to effectively present it. The recurring topics include: physically involving the visitors in the learning, as FIRST-HAND EXPERIENCES are recognized as the most effective way to absorb information and ensure retention, presenting the information effectively so that it is organized and can be easily comprehended, and finally, connecting the information to the visitors, by MAKING IT INTERESTING OR OF VALUE to them in some way. These three principles will be the basis for my design of the interpretive area for this project.

Physically involving the visitors in the learning requires the site design to ALLOW THEM TO CREATE THEIR OWN EXPERIENCE AND PROVIDE OPPORTUNITIES TO INTERACT WITH THE OUTDOOR EXHIBITS. There will not be anyone giving tours of the site, so this project will incorporate self-guided exhibits which have signage with text and graphics explaining the sustainable practices. The signage will be located within or nearby the actual physical element to which it relates, so

there will be some sort of tangible display of the practice at work. Digital technology is probably not the best choice for this project because of the cost and maintenance. There may, however, be brochures outlining how the visitors may incorporate best practices in their own facilities and why the practices are beneficial.

Presenting the information effectively begins with the ORGANIZATION OF INFORMATION AROUND AN OVERARCHING THEME. It also requires the signage to be visually attractive and the text content to be BRIEF AND CLEARLY WRITTEN. It is also important that the information is correct and provides accurate facts.

Connecting the information to the visitors begins by determining their interests and previous knowledge and how the information in the exhibits can appeal to them. I will RELATE TO MY VISITORS' CONSCIENCE AND THEIR FINANCIAL CONCERNS by showing the how sustainable practices can help the environment as well as save money.

Some of the sources discuss special considerations that apply to sites where there is a focus other than the interpretation, including recreation areas such as my site. These considerations mean making sure the INFORMATION DOES NOT INHIBIT THE OTHER ACTIVITIES going on at the site and that it can be absorbed quickly while the visitors are in the process of doing these other activities. In a project such as this, the visitors are considered a non-captive audience, meaning that they only pay attention to the information because they want to, not because they have to for some reason. This means the information must be especially important and/or entertaining in order to make it worth the visitors' time to pay attention.

Preferably, interpretive exhibit placement would be determined by where the actual practice to which the exhibit relates is in place on the site. Given the large size and safety concerns of my site, this will not be completely possible; instead, the exhibits will demonstrate the practices which are happening elsewhere on-site. There will not be a specific sequence that visitors must follow, but they are, instead, free to choose their own path among the exhibits making it a more PERSONAL EXPERIENCE. There should, however, be an introductory sign at the entrance from spectator parking which provides an overview of the project and a map which locates the different exhibits on the site. This "open" plan also allows the site users to experience the exhibits as they go about the daily workings of the facility without having to go through the entire sequence. This will require an innovative site layout that provides areas of movement for the workings of the facility and areas of pause and reflection for the exhibit experiences.

Part III - Site Introduction

Site Location and Size

Address: The Colorado Horse Park, 7522 S. Pinery Drive, Parker, CO 80134

100 acres of private facility

80 acres of competition facility

250-300 acres of Douglas County open space land (used for cross country course)

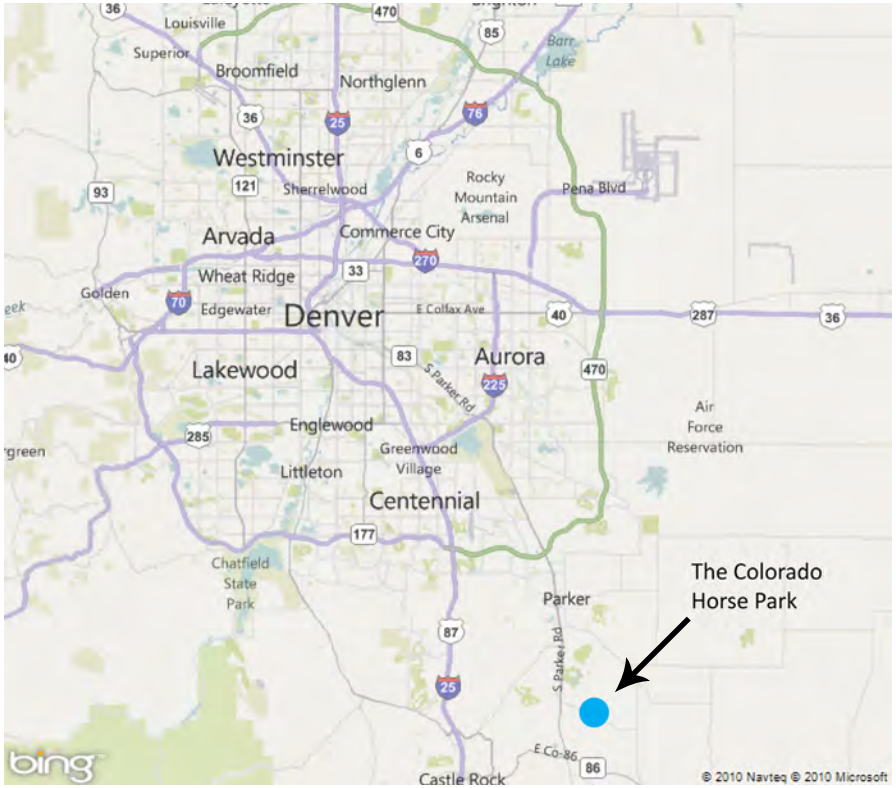


Figure 3.1 CHP Location Map (Bing Maps)

Figure 3.2 CHP Context Aerial Photo (Bing Maps, modified by Caitlin Admire)

A – pastures for private facility
B – private boarding and training facility complex
C – competition arenas
D – competition stall barns and pads for temporary stalls
E – small turnout pens for competition horses
F – parking for trailers, RVs, and cars
G – open area for expansion
H – western complex
J – cross country course, land owned by Douglas County open space

Critical Site Conditions

Jurisdiction

The CHP is a privately owned and run facility, the land on which the boarding and event facilities are located are owned by the CHP, but the land used by the cross country course is owned by Douglas County. In order to make changes on the portion of the site below Bayou Gulch Road we would need to go through the county.

Sprawl

Parker is one of the fastest expanding areas of the Denver metro area. The CHP is quickly being surrounded by suburban sprawl, specifically The Pinery and a 1300 acre development to the southeast, High Prairie International Polo Club, which has its sales office at the CHP. This means that the CHP must act as a good neighbor.

Existing Uses

The CHP currently has a mix of private and public facilities. What happens to the boarders, trainers, and horses at the private facility if there is a re-design of the facility?

Sustainability

Currently, the CHP seems to have little in the way of sustainable design, and virtually no remnants of the natural ecosystem, except for a small tract set aside for future expansion. Also, there is a creek running through the cross country course that desperately needs restoration.

Expansion

Buying land adjacent to the CHP for expansion would be difficult because it is surrounded by an established housing development, The Pinery, to the north, a middle and high school to the east and west, and Douglas County Open Space to the south.

Division

The CHP is separated from the cross country course by Bayou Gulch Road, which is not very busy at this point, but may become a problem as new development continues in the area. Right now, horses and riders must cross the road in order to get from the main facility to the cross country course.

Figure 3.3 Stream Condition
(Caitlin Admire)

Figure 3.4 View to Ponderosa High School
(Caitlin Admire)

Figure 3.5 Entry from Bayou Gulch Road
(Caitlin Admire)

Figure 3.6 View to XC Course
(Caitlin Admire)

Figure 3.7 Housing Development behind Arena
(Caitlin Admire)

Figure 3.8 Stables and Barren Ground
(Caitlin Admire)

Part IV - Programming

The following pages describe the initial steps in the design process for this project. Programming is the initial planning stage in which the activities and physical elements to be incorporated into the design are established. This step allows us to find out what is required of the design and what considerations must be made in order to ensure completion of the project goals.

Program Process

There are three groups of programming elements in this project: the equestrian venue elements, the sustainable practices, and the interpretive exhibits. Facility elements were decided based on my personal experience as well as a phone conversation with the manager of the CHP. Sustainable practices to be implemented at the site were taken from the criteria set forth in the Audubon Equestrian Facilities Program and SITES. Both programs have been analyzed to select the criteria that are most applicable to this project as well as which criteria are assigned the most points, demonstrating that they are of the utmost importance. Finally, the sustainable practices were grouped logically into broader topics, which became the interpretive exhibits.

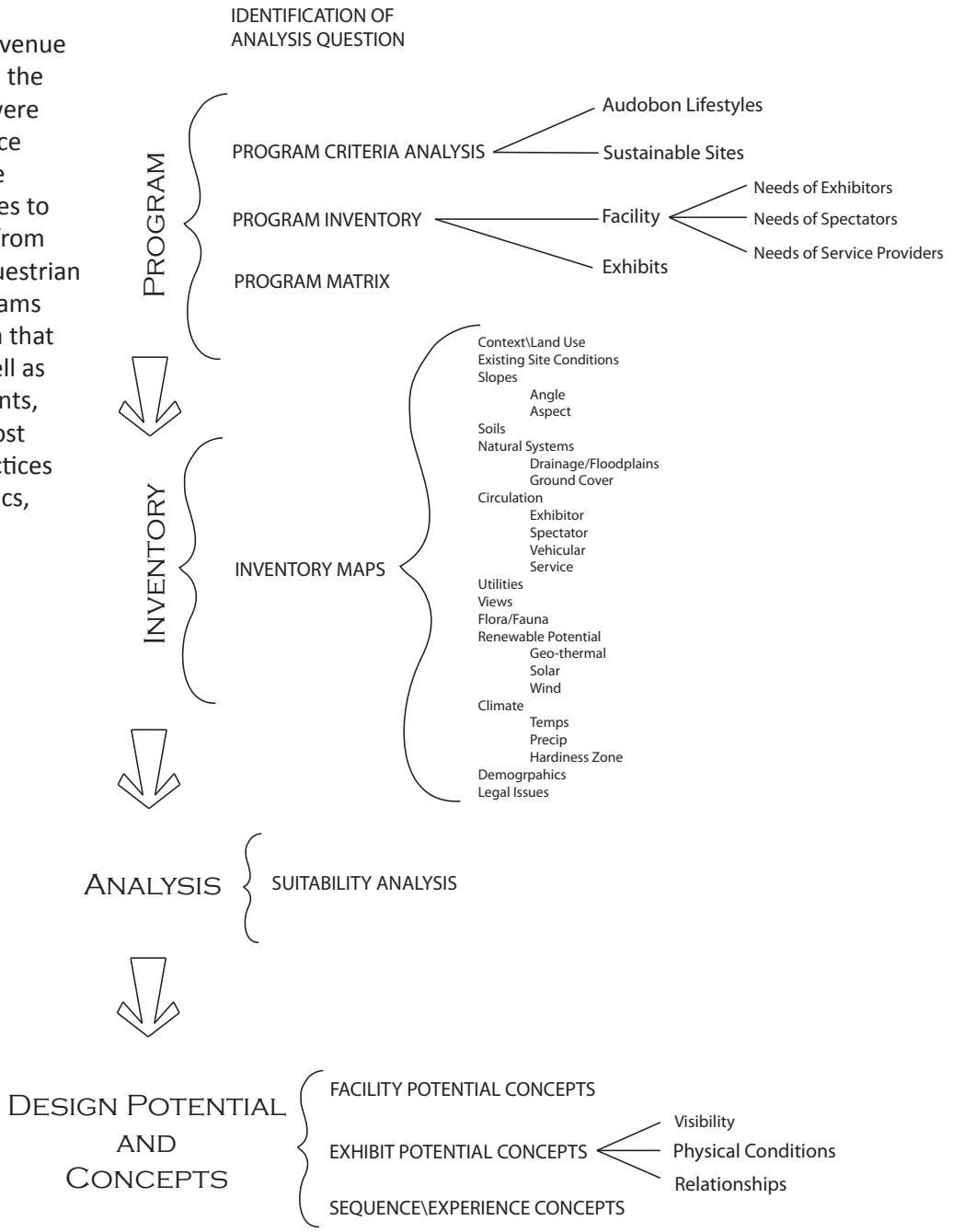


Figure 4.1 Pre-Design Process Diagram
(Caitlin Admire)

Program Requirements

Facilities (Equestrian Event Venue Elements):

Stall Barns
Arenas: Hunter/jumper, Derby, Dressage, Western, Warm Up
Administration/Show Office
Storage and Maintenance
Camping
Entry Areas
Circulation: Exhibitor with horse, vehicular service, spectator/ pedestrian, spectator vehicular, trailer vehicular
Manure Piles
Parking: spectator, day trailer, overnight trailer, staff/employee
Stands
Turnouts and/or hot walkers
Vet/Farrier Area
Crossy Country Course
Trails

Sustainable Practices:

Soil Stabilization
Vegetated Buffers
Restoration of Native Plants and Habitat
Passive Heating and Cooling
Native and Xeriscape Plantings
Physical Safety Concerns
Drainage ways
Natural filtration
Compost Operation
Eco-friendly Materials

Interpretive Exhibits:

Introductory
Site Selection
Water Quality
Habitat Restoration
Resource Conservation
Vegetation
Management Practices
Manure Management
Materials
Children's Area

Program Matrix

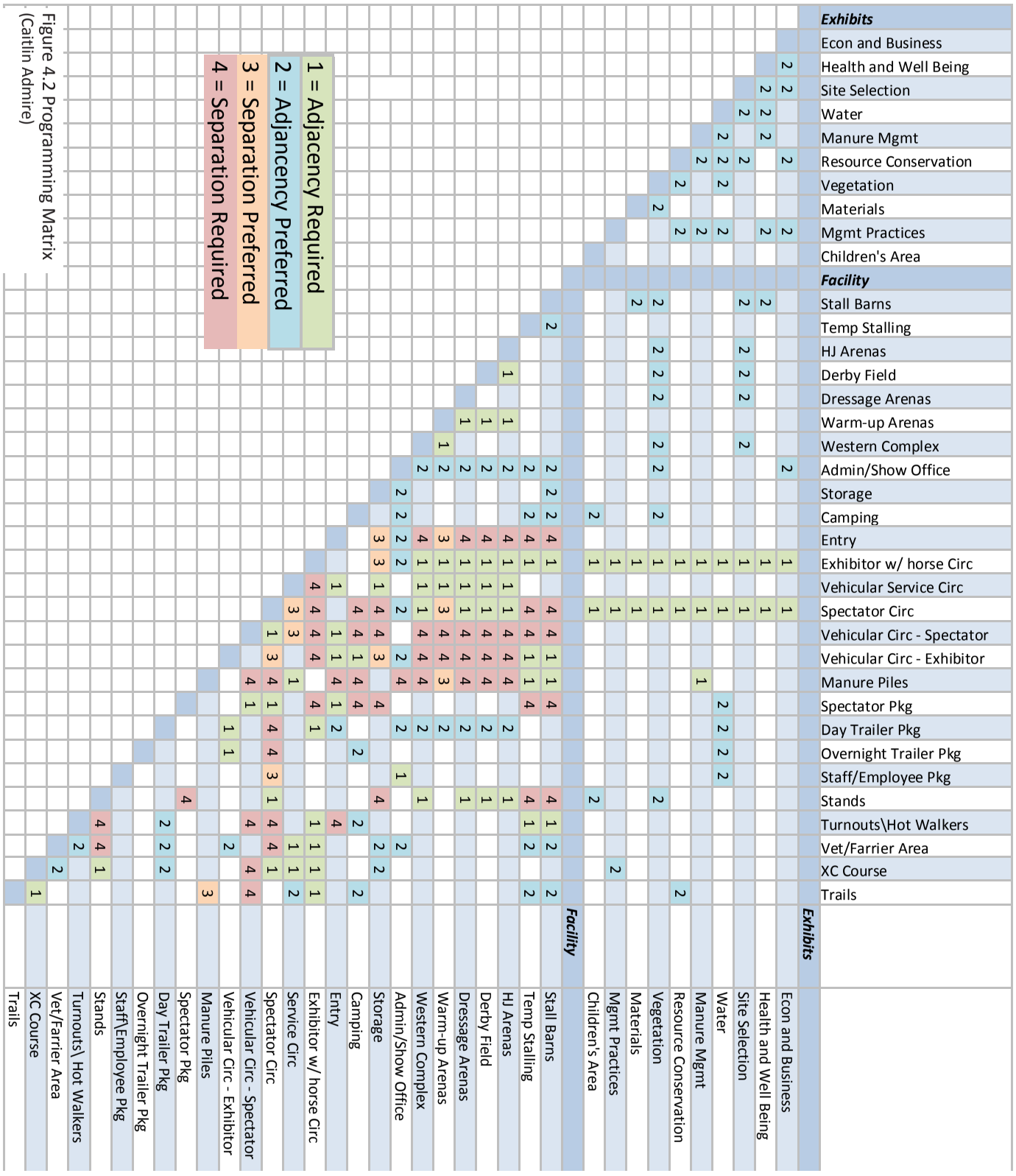


Figure 4.2 Programming Matrix (Caitlin Admire)

Question Chart

This chart outlines the goals and objectives that my design will strive to fulfill and the possible strategies for achieving them. Concept adapted from *Problem Seeking: An Architectural Programming Primer* by William M. Peña and Steven A. Parshall.

	GOALS	FACTS	CONCEPTS	NEEDS	PROBLEMS
FUNCTION	Spread knowledge about and promote sustainability in equestrian facilities.	It is accpected that interpretive landscapes are very effective techniques for information retention.	Provide the exhibitors and spectators at the CHP opportunites to learn about the techniques employed on-site through emersion.	Literature and research on the theory of interpretive landscapes.	Since the CHP is most importantly a working competition venue, the theoretical aspect of the project may be forced to take a back seat to functional site design.
FORM	Design the sustainable elements in such a way as to create an interpretive landscape that still allows for the recreational activities to continue uninhibited.	Circulation and safety are two of the most important aspects of equestrian facilities	To create a separation of circulation and facility uses and allow the visitors a convenient way to experience the exhibits as they continue their other activities.	Keep horse and non-horse traffic away from one another and especially contain vehicular traffic near the entry of the site. Also, a study of how the site is used and the placement of exhibits so that they are visible and accessible to as many visitors as possible.	The interpretive exhibits need to seen by both the exhibitors and spectators, which will be difficult if they are kept too separate.
ECONOMY	Provide the CHP a marketing opportunity.	My users a are very speific economic demographic, not necessarily the people who live in the area.	Make this project innovative so as to draw attention from within the industry.	Modes of media that are far reaching. Magazine publication? Website?	This is an area of expertise which I have little knowledge of.
TIME	Inspire people to change their environmental habits, in order to preserve our natural resources for the future.	Present sustainability in a way that it appeals to site visitors in a variety of ways in order to be truly effective.	Demonstrate the envoironmental, aesthetic, and economical benefits sustainability.	Quantitative data for credibility and space for physical demonstration.	Getting number proving the effectiveness of our design will take many years.

Figure 4.3 Question Chart
(Caitlin Admire)

	Program Element	Uses or Topics Addressed	Size Standard	Quantity Required	Materials Involved	Other Considerations
Facilities	Stall Barns	Housing for competition horses during multi-day events.	10x10 stalls min., 12' aisles min.	3 barns, 100 stalls each	building, flooring, roof, stall partitions	lighting and ventilation
	Temporary stalling	Pads for erecting temporary structures during larger competitions.	10x10 stalls min., 12' aisles min.	7 pads, 100 stalls possible on each	soil	
	Hunter and Jumper Arenas	Arenas for holding competitive hunter\jumper events.	150' x 300'	2 hunter rings, 1 jumper ring	fencing, footing	multi-use? Room for exhibitors to wait at the gate area. Announcers'' and judges' stands
	Derby Field	Arena for holding competitive hunter derby events, generally has an irregular shape and small terrain changes.	varies	1	fencing, footing	multi-use? Room for exhibitors to wait at the gate area. Announcers'' and judges' stands
	Dressage Arenas	Arenas for holding competitive dressage events.	20m x 40m (66’ x 132’) or 20m x 60m (66' x 198')	2	fencing, footing	multi-use? Room for exhibitors to wait at the gate area. Announcers'' and judges' stands
	Western Complex	Arenas for holding competitive western events, including pens for holding livestock.	100' x 200'	2 arenas	fencing, footing	multi-use? Room for exhibitors to wait at the gate area. Announcers'' and judges' stands
	Warm Up Areas	Small arenas that provide exhibitors an area to prepare for their competition rounds. This also includes round pens that allow for lungeing.	80' x 120' min for arenas, 60' dia. Round pens	1 for each set of arenas, 5 round pens	fencing, footing	
	Show Office	A small building that houses the administration workings during events; should be accessible to all visitors.	varies	1	building, roof	
	Storage	A shed or steel building for storing shavings, machinery, tools, jumps, etc.	varies	varies	building, roof	
	Camping	Provides exhibitors an economical and convenient place to stay during multi-day competitions.	varies	72 exist sites	paving	primitive vs. premium sites, restrooms
	Entry	Provides access into the site from major roadways	NA	NA	paving	signage, safety precautions
	Exhibitor w. horse Circulation	Provides access between the stables and competition areas	8' min width	NA	natural path	safety
	Vehicular Service Circulation	Provides for deliveries, access to arenas for tilling and watering, and manure piles for manure removal, requires semi-truck and large tractor use	40' turning radius, 12' min lane width	NA	permeable paving	pull through circulation or turn around areas
	Spectator/Pedestrian Circulation	Provides access to viewing areas from parking	5' min width	NA	natural or paved	safety, ADA accessibility
	Vehicular Circulation - spectator	Should only need to provide access to parking areas, requires use by passenger vehicles, including large trucks.	25' turning radius, 12' min land width	NA	permeable paving	needs to be contained as quickly as possible after entering site
	Vehicular Circulation - Exhibitor	Provides access to stabling for loading and unloading horses and supplies, requires use by trucks and trailers which can get up to semi-trailer size	40' turning radius, 12' min lane width	NA	permeable paving	
	Manure Piles	Provides a place for the dumping of manure and soiled bedding taken from the stall barns. May also include on-site composting.	7200 sq ft @ 5 ft high (72 sq ft per 3 horses)	1-3 dumping areas	concrete?	smell could affect surrounding areas, function/ease of dumping, fecal matter in run off
	Spectator Parking	Provides a place for spectators to leave their vehicles while they attend events.	9' x 20'	40	natural or paved	should be contained near entry to remove as much vehicles from the site as possible.
	Trailer Parking - Day	Provides a place for exhibitors to park their trailer and tie their horses during single-day shows. Can be used as overflow overnight trailer parking for larger shows.	24' x 70' spaces	50	natural	
	Trailer Parking - Overnight	Provides a place for exhibitors to leave their trailers during multi-day shows. Can be used as overflow day trailer parking for large shows.	24' x 70' spaces	50	natural or paved	
	Staff\Employee Parking	Allows the employees of the park to have "VIP" parking spots close to the event areas.	9' x 20'	20	permeable paving	
	Stands	Provides the spectators a place to sit comfortably and watch events.	seating for 25-300, depending on the area which it accompanies.	per needed at competition arenas	building material	weather protection?

Figure 4.4 Table of Program Elements
(Caitlin Admire)

	Program Element	Uses or Topics Addressed	Size Standard	Quantity Required	Materials Involved	Other Considerations
	Turnouts and Hot Walkers	The hot walkers are utilized as a way to keep horses moving as a means of cooling down after vigorous activlity. The turnouts allow exhibitors to get their horses out of the stalls and stretch during multi-day shows or to contain those horses which do not stand tied well to a trailer during single day shows.	30' x 30' min	42	fencing	
	Vet\Farrier Area	Provides an area for the on-site veterinarian and farrier to set up during large competitions.	varies	2 - one at the competition arenas and one at the XC course	non-slip footing, building	stocks?
	Wash racks	A space with water access for exhibitors to hose off or bathe horses.	varies, but must have enough space for a person to safely move around the horse	5 min	non-slip footing, concrete?	chemical runoff
	XC Course	An open tract of land with jumping elements used during eventing competitions.	2.75-4 miles of trail	1	mowed path	access across Bayou Gulch Rd from main facility...
	Trails	A path for horse and rider to be used for recreational hacking.	8' min width 12' vertical clearance	NA	natural paths	maintenance, safety and separation, can they connect to any outside trail systems?
Exhibits	Economics and Business	Information on how to run a horse business and the vital components to making a facility financially stable.				
	Health and Well Being	Focuses on both horse and human safety as well as horse health, especially the spread of diseases, which is of great concern in a place where you have many horses coming and going through the facility.				
	Site Selection	Emphasis on the effect of soils and slopes on building placement as well as erosion minimalization.				
	Manure Mgmt	Discusses proper management of manure piles and suggests environmentally friendly disposal options, such as composting.				
	Resource Conservation	Talks about stream and floodplain buffers, water conservation, renewable energy options, and how to manage storm water runoff in order to increase water quality. It also discusses the use of vegetation to minimize heating and cooling requirements of buildings.				
	Vegetation	Demonstrates or discusses habitat restoration, the management of invasives, and the use of natives, also includes a list of plants toxic to horses.				
	Materials	Suggests the use of recycled, salvaged, and low VOC materials.				
	Mgmt Practices	Emphasizes proper site management for environmental stewardship and sustainability.				
	Children's Area	Takes basic ideas from the other exhibits and presents them in a way that is more interesting and understandable for our younger visitors. Instills in them respect for the environment from a young age so as to hopefully be a life-long mentality.				

Part V - Inventory

Site inventory is a study of how the site currently operates, including mappings of the existing site conditions. This involves both the existing human uses as well as the natural systems. Required inventory maps were determined by what information was necessary in order for me to site the program elements properly and successfully implement the sustainable practices.

Site Context

The Colorado Horse Park is located southeast of Denver in Douglas County near Parker, Colorado. In the past, the regional land use has been mainly agricultural. Rangeland and pasture are common, with small areas of cropland, although urban and suburban development has increased in recent years, expanding out from Colorado Springs and the greater Denver area.

Economic Impact of the Industry

The Colorado horse industry produces goods and services valued at $956 million. 102,400 estimated Coloradans are involved in the industry as horse owners, service providers, employees, and volunteers, and even more participate as spectators. The Colorado horse industry directly provides 5,800 full-time equivalent jobs. Spending by suppliers and employees, in Colorado and other states, generates additional jobs in Colorado for a total employment impact of 21,300 jobs. (Horse Properties, 2010)

Demographics of the Industry

There are 256,000 horses in Colorado, over 70 percent of which are involved in showing and recreation. The largest group of horse owners (45%) is drawn from the middle class with an annual household income between $25,000 and $75,000. Only 9% of the population earns greater than $150,000 yearly and a full 11% of horse owners have an annual income of less than $25,000. Horses are found in all types of communities from rural to urban. The majority of horses (57%) are concentrated in communities with less than 20,000 people. Cities also have a significant number of animals with 26% of horses residing in areas with population densities of over 50,000. Horse ownership appeals to people of all ages. The majority of horse owners (41%) are between the ages of 45 and 59. The 30-44 age bracket is the next most significant group with 35% of horses. The youngest demographic (18-29) is also coming on strong and owns 16% of all horses in America. (American Horse Council, 2010)

Figure 5.1 CHP Location - Global Scale
(Bing Maps, modified by Caitlin Admire)

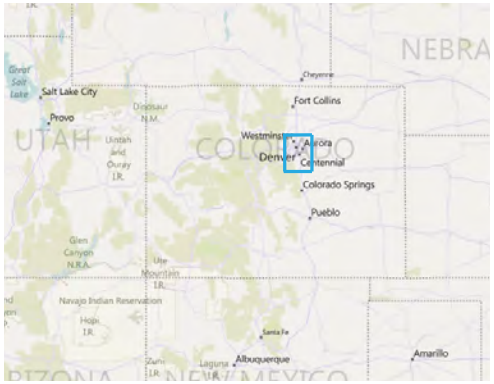


Figure 5.2 CHP Location - Regional Scale
(Bing Maps, modified by Caitlin Admire)

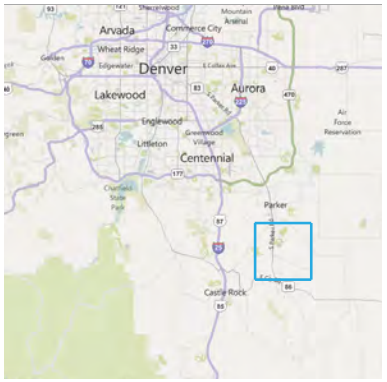


Figure 5.3 CHP Location - City Scale
(Bing Maps, modified by Caitlin Admire)

Climate

This area is in USDA Hardiness Zone 5 with an average annual minimum temperature of between -10 to -20 degrees Fahrenheit. (United States National Arboretum, 2010) The annual precipitation for the region of 14 to 20 inches is mostly in the form of snow and is highest during the month of March. The area is way above the national average on the amount of sunshine days, with between 70 and 80 percent of days being sunny. Winds are moderate with a speed of 13 to 15 mph and generally come in from the north. (City-Data, 2010)

Eco-Region

The site is located in Region 26, the Southwest Tablelands, described by the USDA as areas of "red hued canyons, mesas, badlands, and dissected river breaks. Unlike most adjacent Great Plains ecological regions, little of the Southwestern Tablelands is in cropland. Instead, much of this region is in sub-humid grassland and semiarid rangeland. The boundary to the east in Colorado represents a transition from the more extensive cropland to the generally more rugged and less arable land within the Southwestern Tablelands eco-region. The natural vegetation in the Colorado portion of this region is mostly grama-buffalograss, with some juniper-scrub oak-grass savanna on escarpment bluffs." More specifically, the site is in Section 26j of Region 26, which is the foothill grasslands. This region is again described by the USDA as follows: "a mix of grassland types, with some small areas of isolated tallgrass prairie species that are more common much further east. The proximity to runoff and moisture from the Front Range and the more loamy, gravelly, and deeper soils are able to support more tallgrass and midgrass species than neighboring eco-regions. Big and little bluestem, yellow Indiangrass, and switchgrass occur. Although grasslands dominate, scattered pine woodlands also occur" (US EPA, 2010)

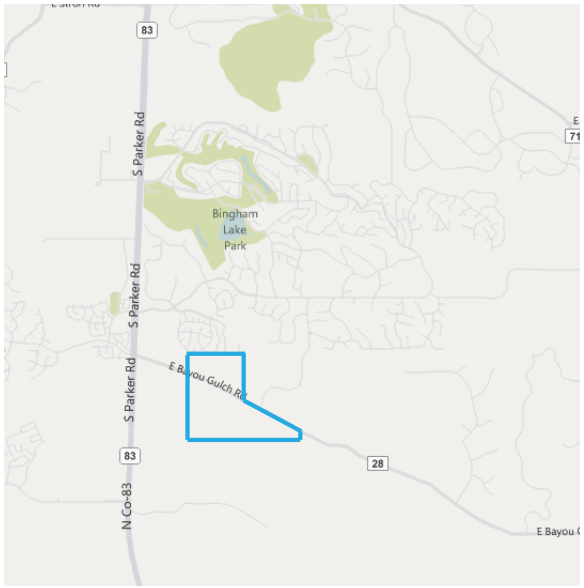


Figure 5.4 CHP Location - Local Scale
(Bing Maps, modified by Caitlin Admire)

Figure 5.5 CHP Location - Aerial Image
(Bing Maps, modified by Caitlin Admire)

Existing Conditions

Figure 5.6


Figure 5.7


Figure 5.8

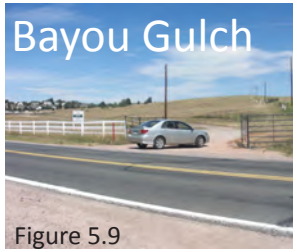


Figure 5.9


Figure 5.10


Figure 5.11

Figure 5.12


Figure 5.13


Figure 5.14

Figure 5.15


Figure 5.16


Figure 5.17


Figure 5.18


Figure 5.19


Figure 5.20

Surroundings: The upper section of the site is bordered to the north by The Pinery development and the CHP boarding operation. To the east is Sagewood Middle School and to the west is Ponderosa High School. To the south is primarily Douglas County Open Space.

Bayou Gulch: Bayou Gulch Road provides the main vehicular access to the site. It also divides the cross country course from the rest of the site. This will become a safety hazard as development in the area continues and traffic volume increases.

Parking: The current design offers a variety of parking including camper hookups, "VIP" vehicle parking, as well as day and overnight trailer parking. Most of the parking areas are gravel or grassy lots without formal parking spots.

Stables: The stables are typical steel pole barns with four rows of stalls, two facing into a center aisle and two facing outward on either side of the barn. The buildings are situated with the aisles running east-west. Behind the stables are three-sided concrete pads for the dumping of manure. Just west of the stables are small turnout pens made of metal tubing panels. Directly south of the permanent barns are the pads for temporary stabling.

This Page Figures 5.6-5.20 Site Photos (Caitlin Admire)
Opposite Page Figures 5.21-5.35 Site Photos (Caitlin Admire)

Figure 5.21


Figure 5.22


Figure 5.23

Amenities: There are three main amenity areas: a small park-like space, the administration buildings, and a shopping area where off-site tack and food vendors set up trailers or tents.

Figure 5.24


Figure 5.25


Figure 5.26

Competition: The competition areas consist of large, uncovered sand arenas with white vinyl fencing. The arenas are connected by wide sand pathways, usually these also serve as the holding areas for exhibitors who are waiting for their rounds. These areas also provide bleachers for spectators and enclosed judge's stands. At the main hunter and jumper arenas, there are minimal steel shade structures for spectators and exhibitors to utilize.


Figure 5.27


Figure 5.28


Figure 5.29

Figure 5.30


Figure 5.31


Figure 5.32

Open Areas: In the southeast corner of the upper section of the site there is some open land that has two western arenas. Most of this area is undeveloped with scrubby, natural vegetation and drainage-ways.

Figure 5.33


Figure 5.34


Figure 5.35

XC Course: The cross country is a large open area with mostly native grassland and some riparian areas. The existing stream is stagnant and hidden by dense vegetation, but could be a potential amenity.

Slopes

The Colorado Horse Park site does not have much in the way of extreme terrain. The steepest slopes are along the stream banks while the valley floor and much of the northern half of the site are relatively flat. There are two hills on the site, one in the undeveloped land in the northeast corner and the other in the southeast corner of the cross country course, which rise approximately 30 feet above the surrounding areas.

Figure 5.36 Topographic Map (Caitlin Admire)

The Colorado Horse Park site lies in a small valley corridor with a base elevation of about 6000 feet above sea level. The elevation rises as you move south and east across the site, with the highest elevations present along ridgelines at the southern and eastern edges.

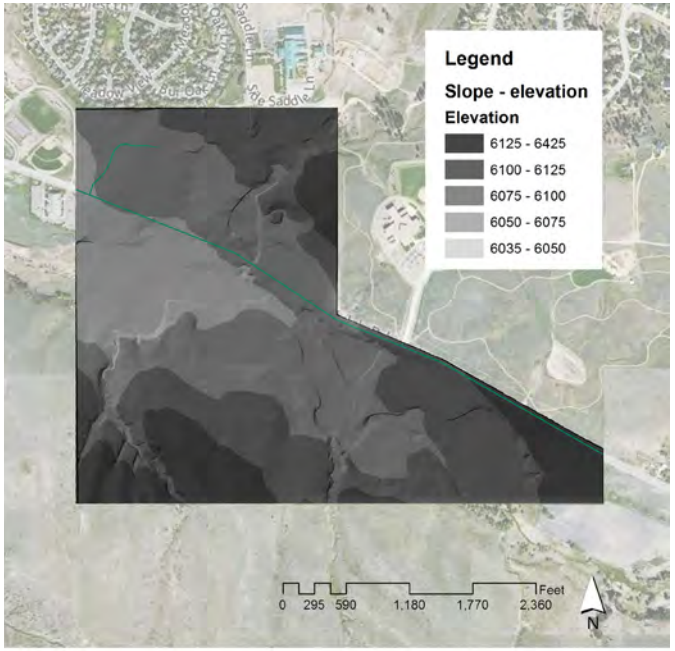


Figure 5.37 Elevation Map (Caitlin Admire)

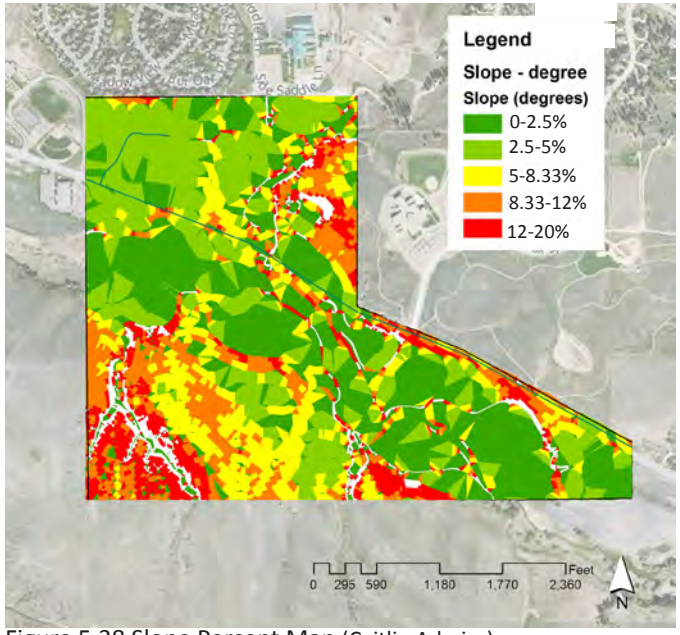


Figure 5.38 Slope Percent Map (Caitlin Admire)

Ideal Slope Requirements
(Harris and Dines, 1998):

Buildings and Barns: 0.5%-2.0%
Arenas: 0.5%-2.0%
Camping: 1.0%-8.0%
Entry: 1.0%-2.0%
Circulation: 0.5%-8.0%
Service Areas: 0.5%-2.0%
Manure Piles: 0.5%-2.0%
Vet/Farrier Area: 0.5%-2.0%
Parking: 0.5%-5.0%
Turnout Areas: 1.0%-20.0%
XC Course: 1.0%-12%
Trails: 0.5%-8.0%

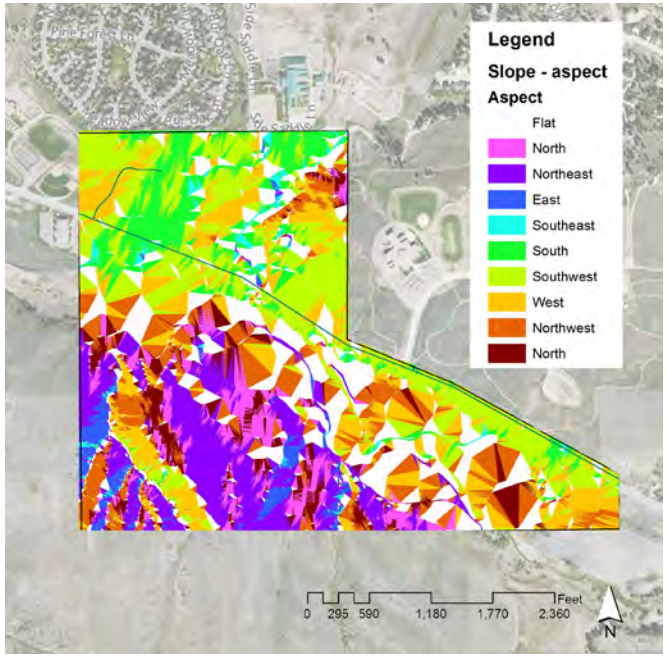


Figure 5.39 Slope Aspect Map (Caitlin Admire)

Slope aspect determines the amount of sunlight the ground receives. This is of concern because it has a great effect on vegetation type, the length of frost or snow cover, and allows us to take advantage of solar energy for passive heating. Because the site is situated in a valley, the slopes in the northern half have a generally southern aspect while the southern half has a generally northern aspect. The valley slopes down to the west, so there is a tendency for western facing slopes throughout the site as well; for example southwestern or northwestern aspects are more common than southeastern or northeastern ones. There are only a few east facing slopes, found along the backsides of the ridges.

Soils

Soils in this region are generally, loamy, gravelly, moderately deep, and mesic. They are formed from weathered arkosic sedimentary rock, gravelly alluvium, and materials weathered from sandstone and shales. Following are the descriptions of the soil types found on the CHP site. The most important property of soils is their drainage; development would preferably only happen on soils that are classified as well drained. (USDA NRCS, 2010)

BlE (Blakeland sandy loam)
- Slope: 1 to 15 percent
- Depth to restrictive feature: More than 80 in.
- Drainage class: Well drained
- Depth to water table: More than 80 in.
- Frequency of flooding: None
- Frequency of ponding: None
- Available water capacity: Low (about 4.9 in.)

Bo (Blakeland-Orsa association)
- Slope: 1 to 4 percent
- Depth to restrictive feature: More than 80 in.
- Drainage class: Well drained
- Depth to water table: More than 80 in.
- Frequency of flooding: None
- Frequency of ponding: None
- Available water capacity: Low (about 4.9 in.)

BrB (Bresser sandy loam)
- Slope: 1 to 3 percent
- Depth to restrictive feature: More than 80 in.
- Drainage class: Well drained
- Depth to water table: More than 80 in.
- Frequency of flooding: None
- Frequency of ponding: None
- Available water capacity: Moderate (about 7.6 in.)

BtE (Bresser-Truckton sandy loams)
- Slope: 5 to 15 percent
- Depth to restrictive feature: More than 80 in.
- Drainage class: Well drained
- Depth to water table: More than 80 in.
- Frequency of flooding: None
- Frequency of ponding: None
- Available water capacity: Moderate (about 7.6 in.)

BuD2 (Bresser and Truckton soils)
- Slope: 3 to 10 percent
- Depth to restrictive feature: More than 80 in.
- Drainage class: Well drained
- Depth to water table: More than 80 in.
- Frequency of flooding: None
- Frequency of ponding: None
- Available water capacity: Moderate (about 7.6 in.)

BwD (Buick-Satanta loams)
- Slope: 3 to 9 percent
- Depth to restrictive feature: More than 80 in.
- Drainage class: Well drained
- Depth to water table: More than 80 in.
- Frequency of flooding: None
- Frequency of ponding: None
- Available water capacity: High (about 9.9 in.)

Sa (Sampson loam)
- Slope: 1 to 4 percent
- Depth to restrictive feature: More than 80 in.
- Drainage class: Well drained
- Depth to water table: More than 80 in.
- Frequency of flooding: None
- Frequency of ponding: None
- Available water capacity: High (about 9.5 in.)

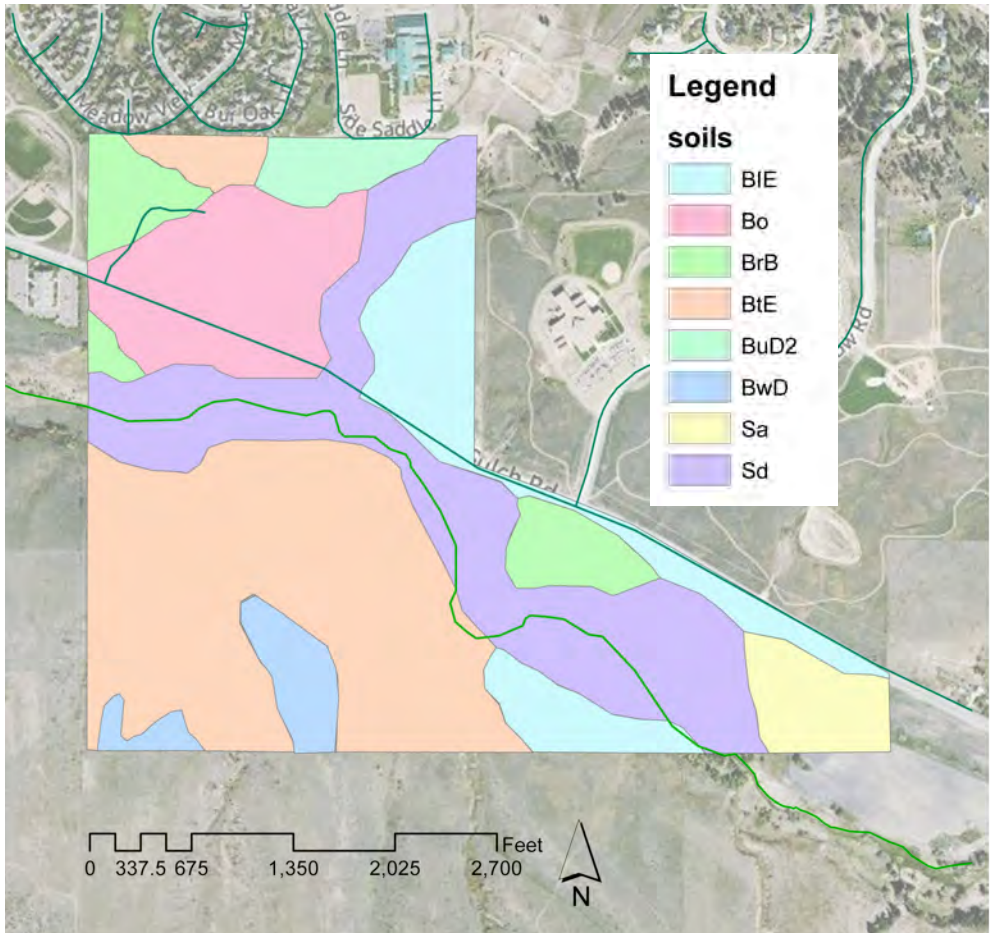


Figure 5.40 Soils Map (Caitlin Admire)

Castle Rock Area, Colorado (CO622)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BlE	Blakeland sandy loam, 1 to 15 percent slopes	163.8	28.6%
Bo	Blakeland-Orsa association, 1 to 4 percent slopes	45.0	7.9%
BrB	Bresser sandy loam, 1 to 3 percent slopes	24.0	4.2%
BtE	Bresser-Truckton sandy loams, 5 to 25 percent slopes	185.1	32.3%
BuD2	Bresser and Truckton soils, 3 to 12 percent slopes, eroded	10.9	1.9%
BwD	Buick-Satanta loams, 3 to 9 percent slopes	13.7	2.4%
Sa	Sampson loam	15.1	2.6%
Sd	Sandy alluvial land	101.7	17.7%

Figure 5.41 Soils Chart (USDA)

Sd (Sandy Alluvial Land)

- Slope: 1 to 5 percent
- Drainage class: Excessively drained
- Depth to water table: About 60 in.
- Frequency of flooding: Frequent
- Available water capacity: Low (about 4.8 in.)

Existing Circulation

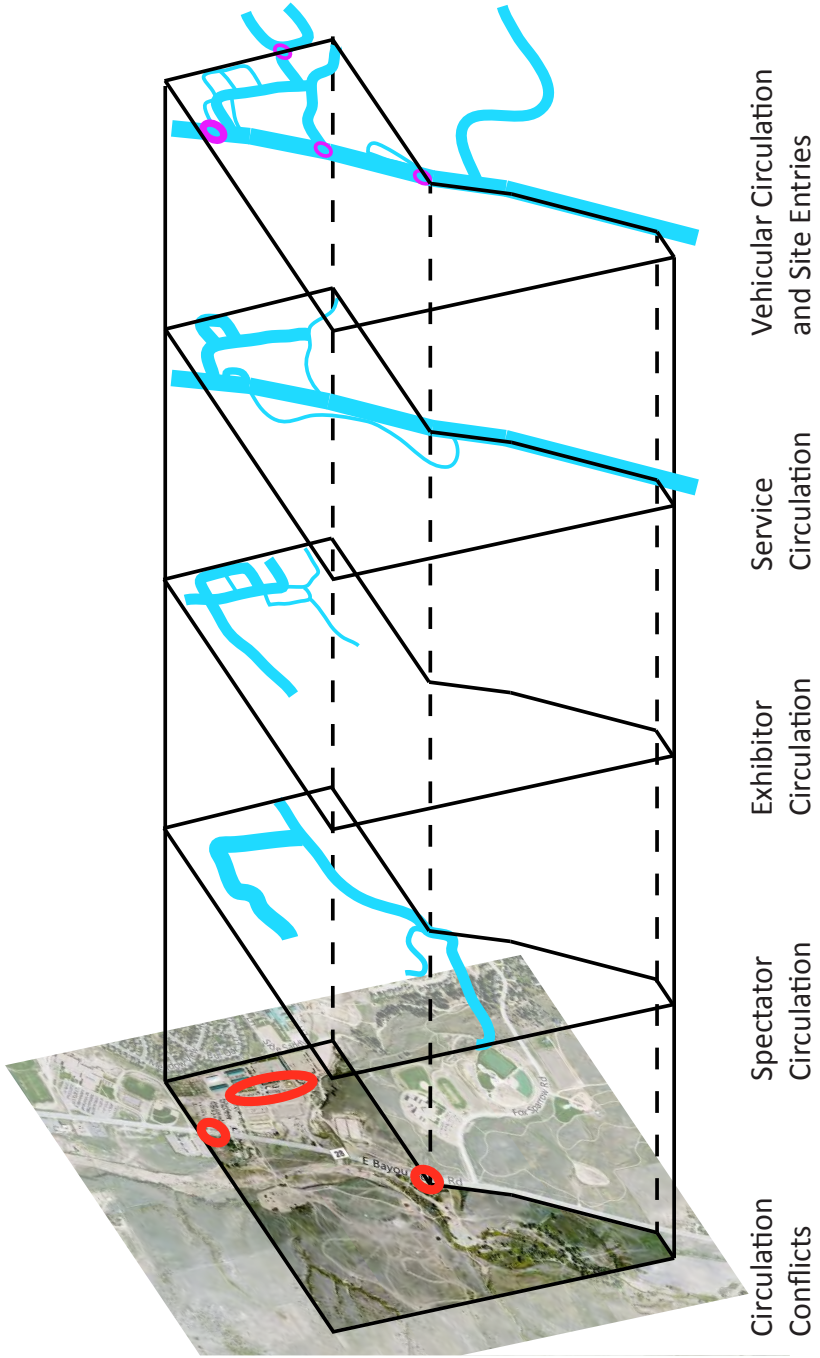


Figure 5.42 Existing Circulation Diagram
(Caitlin Admire)

There are four main types of circulation currently on site at the Colorado Horse Park: general vehicular, service vehicular, spectator, and exhibitor. General vehicular circulation includes all visitors and should be kept to a minimum in order to reduce safety conflicts. The main vehicular entry from Bayou Gulch Road is almost immediate. There are two secondary entries also along Bayou Gulch and one entry on the north coming from the boarding facility.

Vehicular service traffic is often present only in the off hours, but at the CHP access to the manure piles and arenas will be necessary throughout the site at the busiest of times during events. Spectator traffic will most likely only be substantial during the larger events. Circulation routes for spectators should be confined to the public areas and provide access from parking areas to the stands and amenity areas only. It is important to separate spectator traffic from the stables for safety and comfort of the competition horses. Finally, exhibitors will need access to almost all functional parts of the site. Especially important are those routes which they will be utilizing to travel with their horses from the stables to the competition areas. The major conflict areas exist at the entries from Bayou Gulch where vehicles are entering the sites as well as where the spectators and exhibitors are accessing the cross country course. Also, there is currently one main circulation collector between parking, stables, and the competition areas, so everyone must use this one route.

Drainage

An important aspect of environmental stewardship is the conservation of natural resources. On this site, the most important natural resource is water, therefore it is of utmost importance to respect the drainage ways by not developing in the floodplains. In order to ensure the water running into the drainage ways is non-polluting, it is critical to have it go through filtration before it is released.

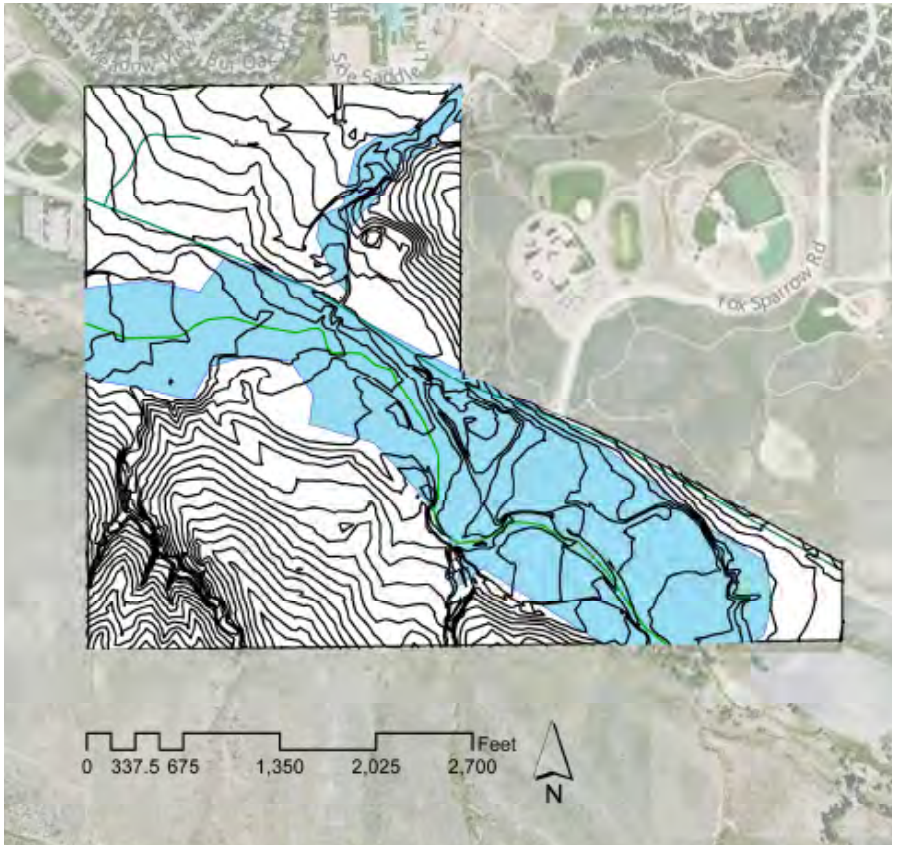


Figure 5.43 Drainage Map
(Caitlin Admire)

Landcover

The site contains three distinct types of land cover areas: barren land, which includes those areas that are already developed, grasslands, and riparian areas. Preferably, new development would happen only on the already barren land in order to preserve habitat. Some development may be appropriate on the grassland as well, but the riparian areas must be conserved.

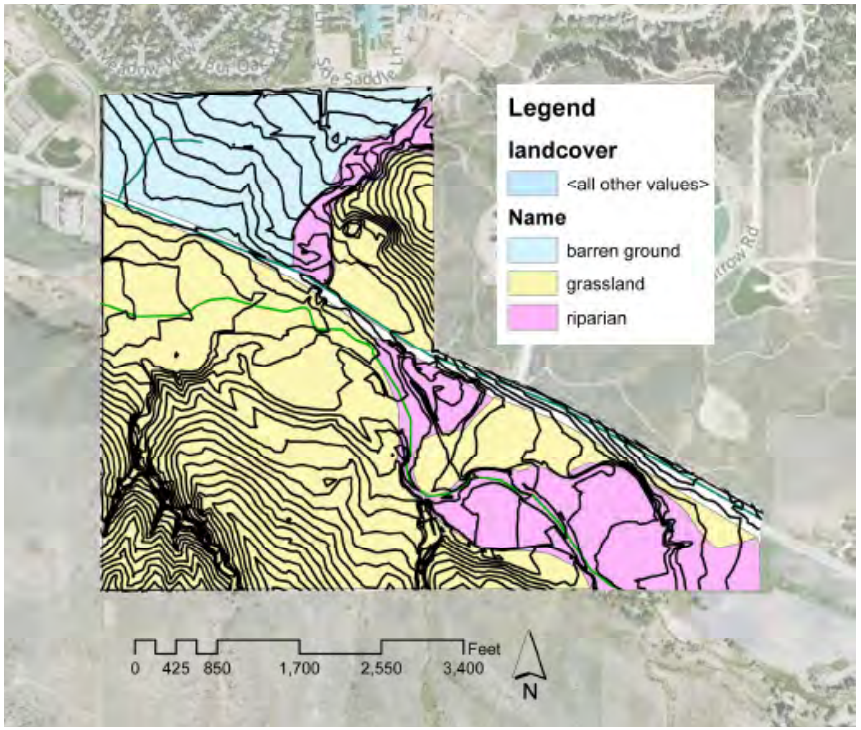


Figure 5.44 Landcover Map
(Caitlin Admire)

Sun and Wind

Solar orientation and wind patterns on the site greatly affect the orientation and situation of buildings in order to utilize passive heating and cooling as well as natural light and ventilation. Taking advantage of the natural climate to maintain comfort levels is especially important in this project because most of the buildings do not include HVAC systems.

Summer winds on the site come from the southeast and winter winds from the northwest. Therefore the stables should allow exterior openings mostly in the east/west direction to take advantage of summer breezes but not cause wind tunnels and have protection from the cold north winds in the winter.

The sun in Parker generally rises in the southeast and sets in the southwest. The inhabited areas of the site should get sun during the winter and in the mornings but shade in the afternoons during the summer. To achieve this, it is best to site structures on south facing slopes and use deciduous trees to provide shade.

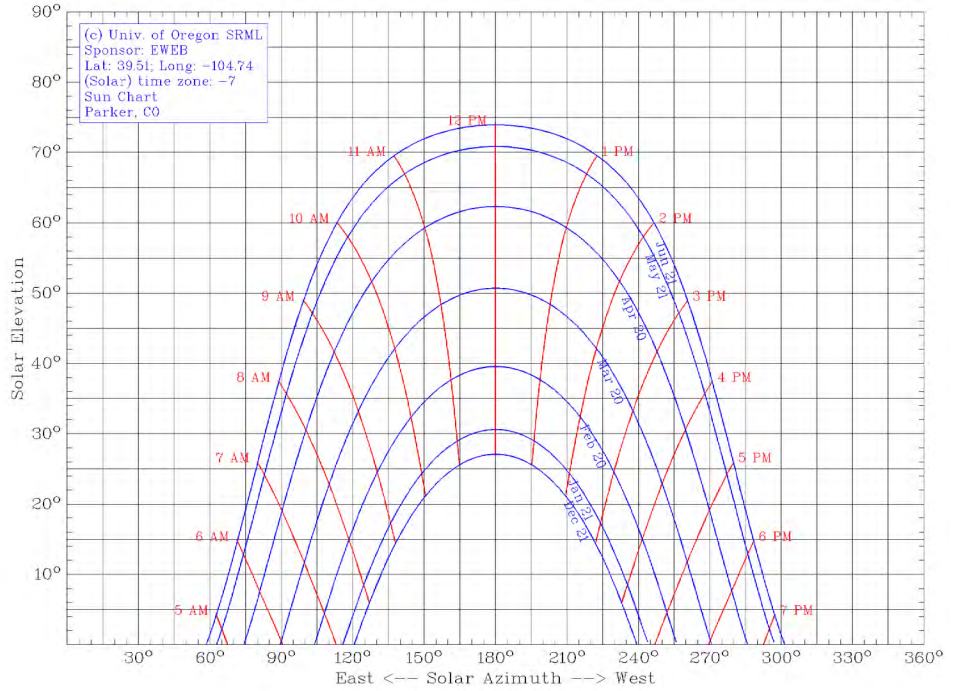
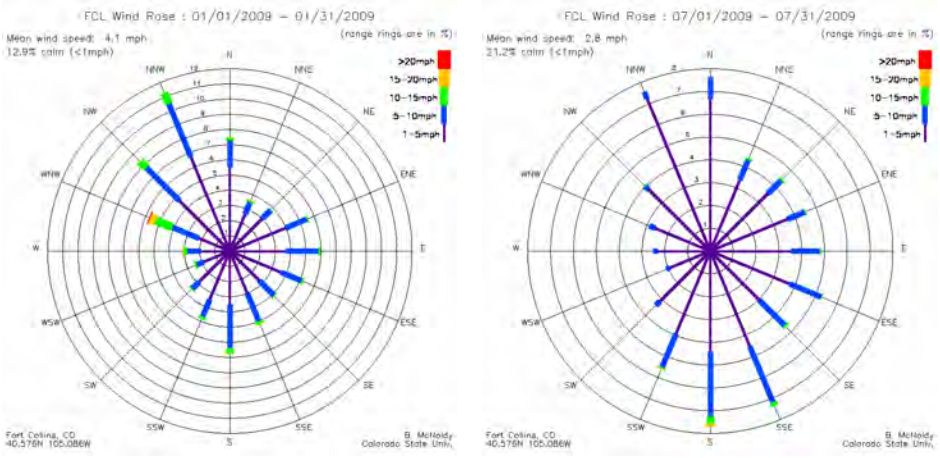


Figure 5.45 Sun Chart for Parker, CO
(University of Oregon)



January Wind Rose

July Wind Rose

Figure 5.46 Wind Roses for CO
(Colorado State Univeritsy)

Part VI - Analysis

Analysis evaluates the inventory data and helps us to understand how those conditions will shape the final design. This helps us to discover opportunities or constraints of the site based on the existing uses and function, again considering both the human and natural systems. This step ensures that the re-design will enhance, rather than clash with, the existing systems. Analysis for this project was performed in the form of suitability maps, which overlay the information from inventory and show where on the site are the locations most suitable for placement of the different program elements.

Analysis Criteria

Drainage and the Floodplain

Drainage ways and floodplains are automatically marked as unsuitable for development for many reasons. First, they usually house delicate riparian ecosystems that require preservation. Second, stream beds and banks are easily erodible, which is only augmented when disturbed by construction. Finally, they pose a safety hazard during storm events as they are prone to flooding.

Landcover

Riparian areas are the only type of landcover that are considered unsuitable for development on the site, again because they are generally more delicate and contain protected ecosystems. The barren land is most suitable because it has few positive qualities and the grassland is considered moderately suitable because, while it is physically suitable for development, it should be conserved in-tact as much as possible in order to provide habitat.

Aspect

Slope face aspect is an important factor in suitability. At the CHP site, south facing slopes are most suitable in order to take advantage of passive heating and cooling as well as protection from the occasional cold northern winds that prevail in this region. East and west facing slopes are moderately suitable, while north facing slopes are considered unsuitable.

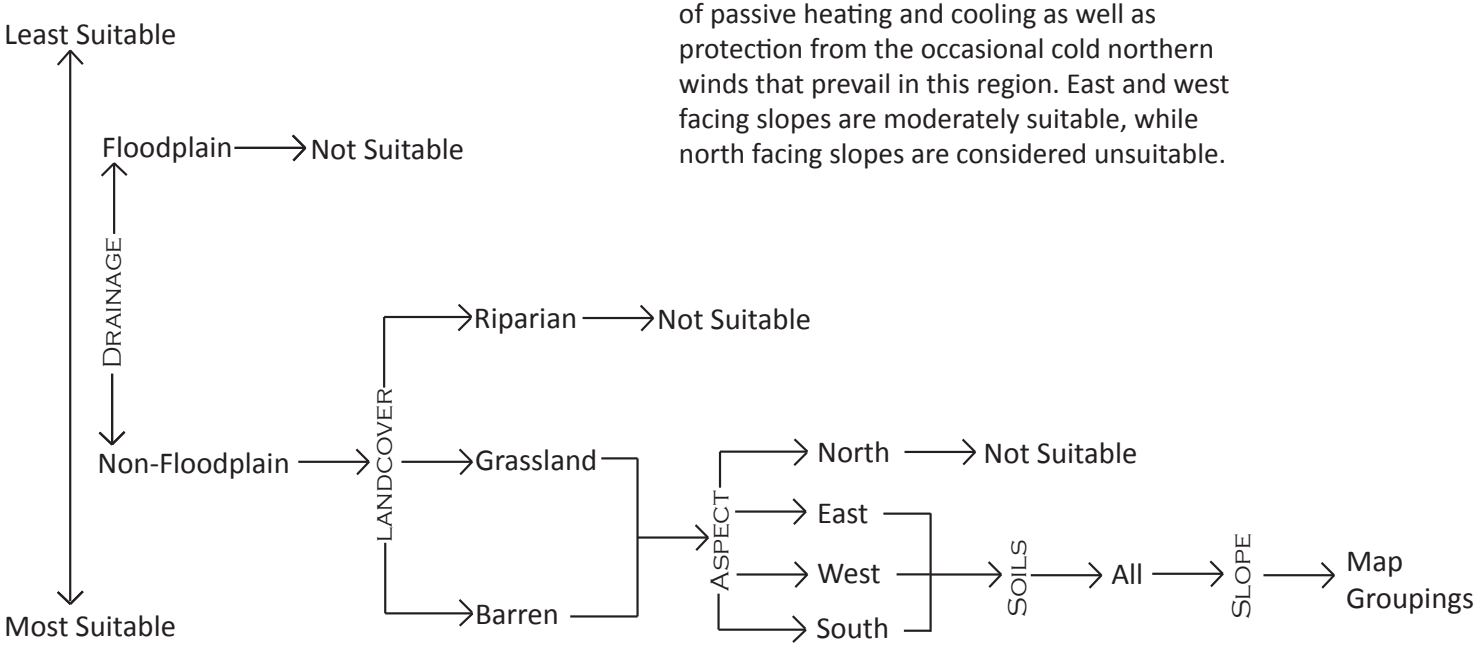


Figure 6.1 Analysis Diagram (Caitlin Admire)

Soils

Drainage ability is the most important characteristic of soils for the CHP site; luckily, all of the soils present are classified as well draining. The only protected or otherwise unsuitable soils are present in the floodplain, so this category poses no additional constraints on the site development.

Slope

Slope is the only criteria in which program elements require unique suitability ranges. Any slopes under 0.5% are automatically considered unsuitable because they do not provide adequate drainage. Ideal slope ranges were established for each program element, as seen in the chart on the opposite page, with the moderately suitable ranges generally being the values on either side. Any value over 20% slope was also considered unsuitable for any development because of erosion potential and the special engineering required for building in these areas.

	Program Element	Slope
Facilities	Stall Barns	0.5%-2.0%
	Temporary stalling	0.5%-2.0%
	Hunter and Jumper Arenas	0.5%-2.0%
	Derby Field	0.5%-2.0%
	Dressage Arenas	0.5%-2.0%
	Western Complex	0.5%-2.0%
	Warm Up Areas	0.5%-2.0%
	Show Office	0.5%-2.0%
	Storage	0.5%-2.0%
	Camping	1.0%-8.0%
	Entry	1.0%-2.0%
	Exhibitor w. horse Circulation	0.5%-8.0%
	Vehicular Service Circulation	0.5%-5.0%
	Spectator/Pedestrian Circulation	0.5%-8.0%
	Vehicular Circulation - spectator	0.5%-8.0%
	Vehicular Circulation - Exhibitor	0.5%-8.0%
	Manure Piles	0.5%-2.0%
	Spectator Parking	0.5%-5.0%
	Trailer Parking - Day	0.5%-5.0%
	Trailer Parking - Overnight	0.5%-5.0%
	Staff\Employee Parking	0.5%-5.0%
	Stands	0.5%-2.0%
	Turnouts and Hot Walkers	1.0%-20.0%
	Vet\Farrier Area	0.5%-2.0%
	Wash racks	0.5%-2.0%
	XC Course	
	Trails	0.5%-8.0%
		1.0%-20.0%
Exhibits	Economics and Business	0.5%-8.0%
	Health and Well Being	0.5%-8.0%
	Site Selection	0.5%-8.0%
	Manure Mgmt	0.5%-8.0%
	Resource Conservation	0.5%-8.0%
	Vegetation	0.5%-8.0%
	Materials	0.5%-8.0%
	Mgmt Practices	0.5%-8.0%
	Children's Area	0.5%-8.0%

Figure 6.2 Table of Ideal Slopes (Caitlin Admire)

Analysis Summary

Program elements are split into 5 groups based on similar ideal slope ranges, then a suitability map was created for each group. The suitability maps are all relatively similar, as the site is not very diverse.

In general, the portion of the site above Bayou Gulch Road is the most suitable for all uses, with exception of the small drainage way and floodplain. This area of the site has gradual slopes with southern faces and is already developed, so there is not potential to disturb sensitive habitat. Also, this is the land which the CHP already owns; the land to the south of Bayou Gulch is owned by Douglas County and may be hard to develop on only due to jurisdiction, not even having to consider its northern aspect, steeper slopes and more coveted land covers.

Suitability

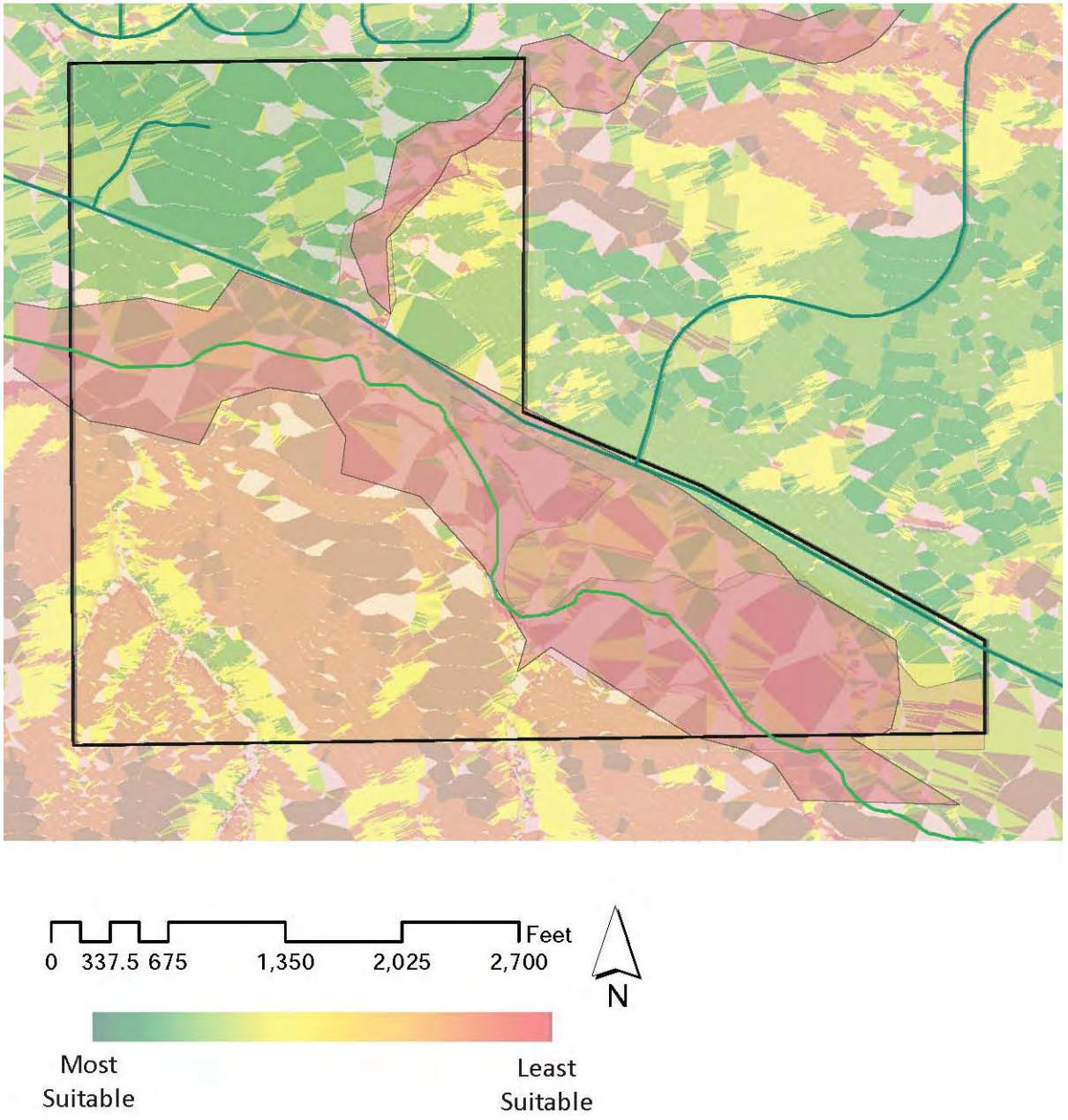


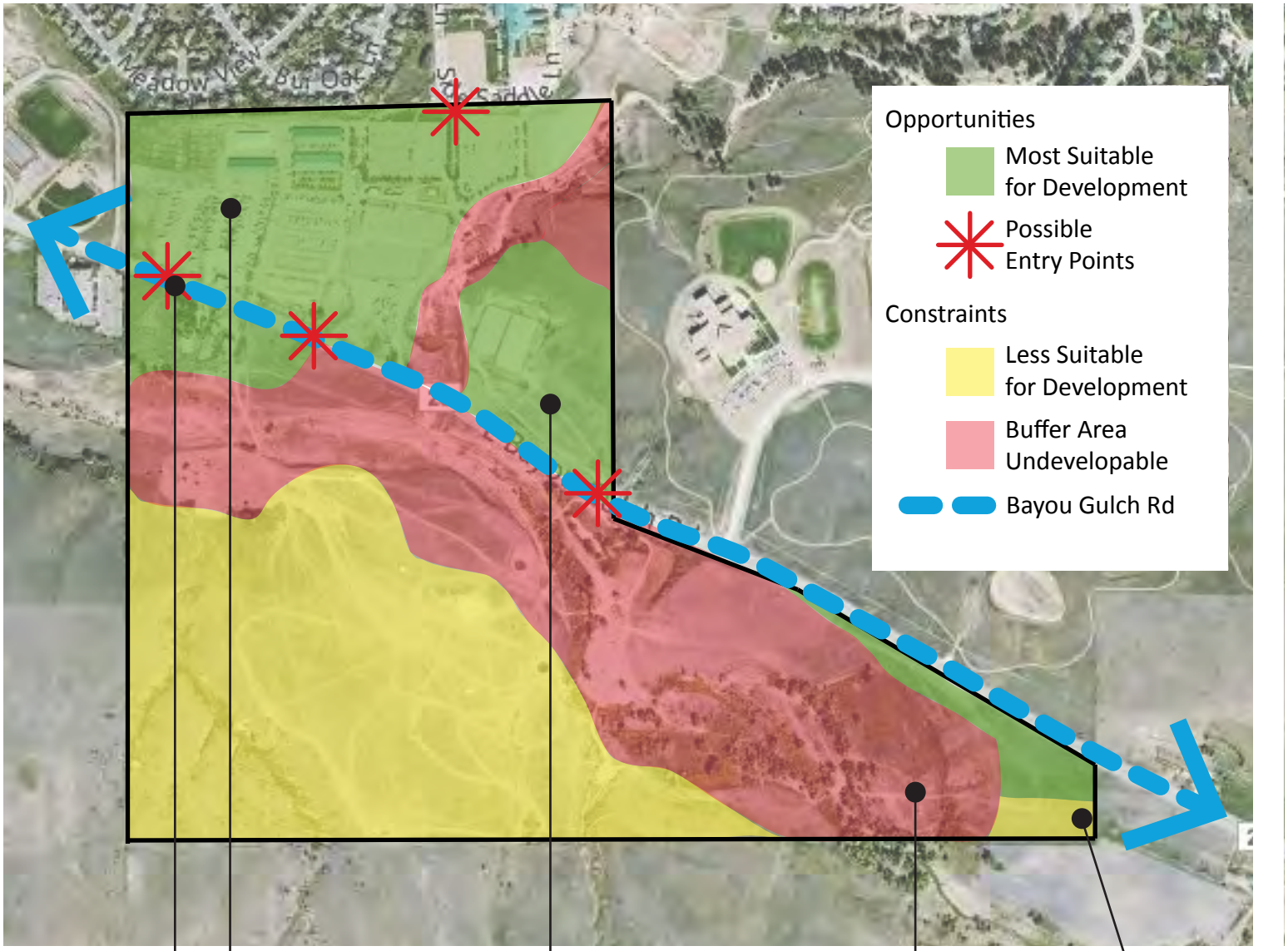
Figure 6.3 Suitability Map (Caitlin Admire)

Analysis of Opportunities and Constraints

The suitability maps are all relatively similar, as the site is not that diverse. In general, the portion of the site north of Bayou Gulch Road is the most suitable for all uses, with exception of the small drainage way and floodplain. This area of the site has gradual, southern facing slopes and is already developed, so there is no potential to disturb habitat. Also, this is the land which the CHP already owns; the land to the south of Bayou Gulch is owned by Douglas County and may be hard to develop due to jurisdiction. Besides that, the southern portion of the site is not desirable because of its northern aspect, steeper slopes, and more sensitive land covers.

At least one of the entries across Bayou Gulch Road must incorporate a safe pedestrian and horse crossing to the XC staging area. Suitable for buildings and parking, the land north of the road is the largest area suitable for development, so it will most likely be the location for the main venue and facility elements. Suitable for buildings and parking, the area east of the small floodplain is separated from the rest of the site by the buffer and has its own entry; it could be a good location for non-horsey activities. The less suitable or undevelopable areas to the south of the road will continue to house the XC course and could be opportunities to create a trail system.

Opposite Page
Figure 6.4 Opportunities and Constraints Map
(Caitlin Admire)



At least one of the entries across Bayou Gulch Road must incorporate a safe pedestrian and horse crossing to the XC staging area.

Suitable for buildings and parking, this is the largest area suitable for development so it will most likely be the location for the main venue/facility elements.

Suitable for buildings and parking, since this area is separated from the rest of the site by the buffer and has its own entry it could be a good location for non-horsey activities.

The less suitable or undevelopable areas will continue to house the XC course and could be opportunities to create the trail system

This small, developable area could be parking, storage or maintenance areas for the XC course in order to separate those uses.

Part VII - Design Solution

The following design for the Colorado Horse Park is a potential solution for my dilemma that addresses how to promote sustainability in the horse industry. It synthesizes all of the previous research and studies in an attempt to achieve the project goals of creating a functional equestrian facility, creating a sustainable equestrian facility, educating the visitors on sustainable practices, and inspiring the site users to modify their own behaviors to be more sustainable. The design development began at the larger site scale with conceptual master plans, gradually honed into the plaza scale, and finally down into the details of site furnishings and materials. This approach ensured that each part of the design could relate to its larger context.

A THREE-PART STRATEGY emerged in this design project: 1) using circulation systems to make the facility more functional, 2) implementing sustainable elements into the facility to serve as examples, and 3) providing the visitors with educational opportunities in the form of interpretive exhibits. Note that the re-design is limited to the portion of the site north of Bayou Gulch because it is more suitable, in general, for development and will provide the most opportunities for people to experience the interpretive exhibits.

Master Plan

The plan leaves most of the existing stables and arenas in their present locations in order to conserve resources. In reality, it would waste more precious resources to rebuild these elements than to leave them be. However, the PARKING AREAS HAVE BEEN RE-ORGANIZED in order to create a safer and more efficient circulation system.

Figure 7.1 Master Plan (Caitlin Admire)

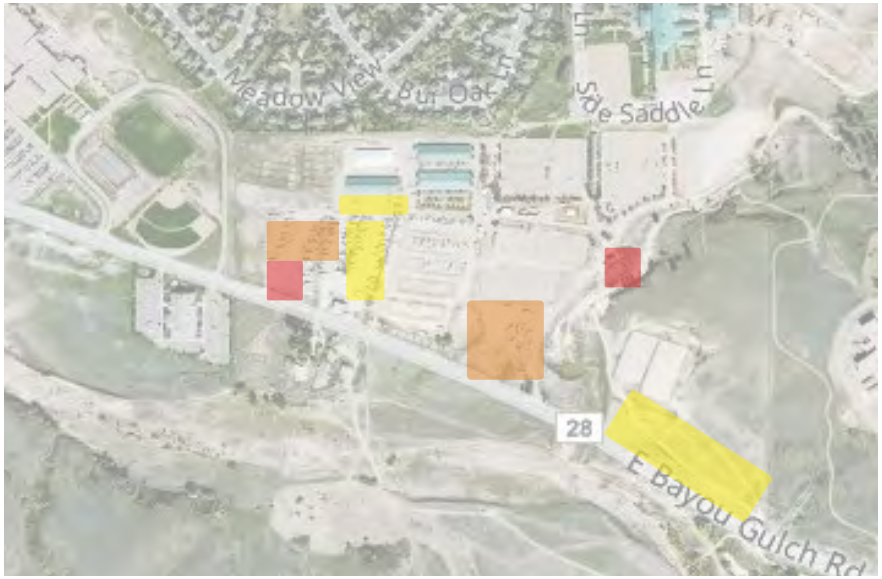


Figure 7.2 Existing Parking Diagram
(Caitlin Admire)

Figure 7.3 Proposed Parking Diagram
(Caitlin Admire)

Safety and Function of Facility Design: Parking

To begin, all PARKING AREAS ARE LOCATED NEAR AN ENTRANCE, which encourages visitors to immediately park and walk, limiting vehicular traffic throughout the site. Secondly, locating the parking for exhibitors versus spectators on opposite sides of the site creates a SEPARATION OF CIRCULATION, with spectators coming into the venue from the east and exhibitors with horses from the west, reducing opportunities for conflicts.

Spectator Parking

Trailer Parking

Service Parking

Safety and Function of Facility Design: Circulation

There are TWO MAJOR CIRCULATION SPACES, the equestrian promenade and the pedestrian plaza. The promenade is a linear corridor leading exhibitors and their horses from the stables, along a lane of gardens and trees to the competition arenas. The plaza space is where all of the pedestrian pathways meet and creates an excellent opportunity for my interpretive exhibits. It is also adjacent to the midway area where the shopping and food carts are held, meaning spectators and exhibitors alike must pass by the exhibit spaces in order to reach it from the arenas, making it un-avoidable. The plaza leaves the main circulation paths un-inhibited and fills the residual spaces with a bosque of trees under which the interpretive exhibits are situated.

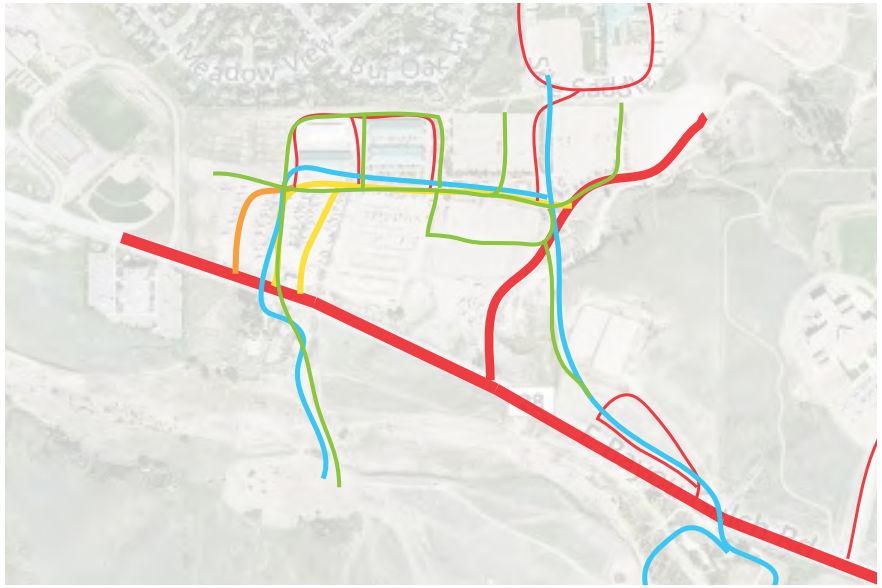


Figure 7.4 Existing Circulation Diagram
(Caitlin Admire)

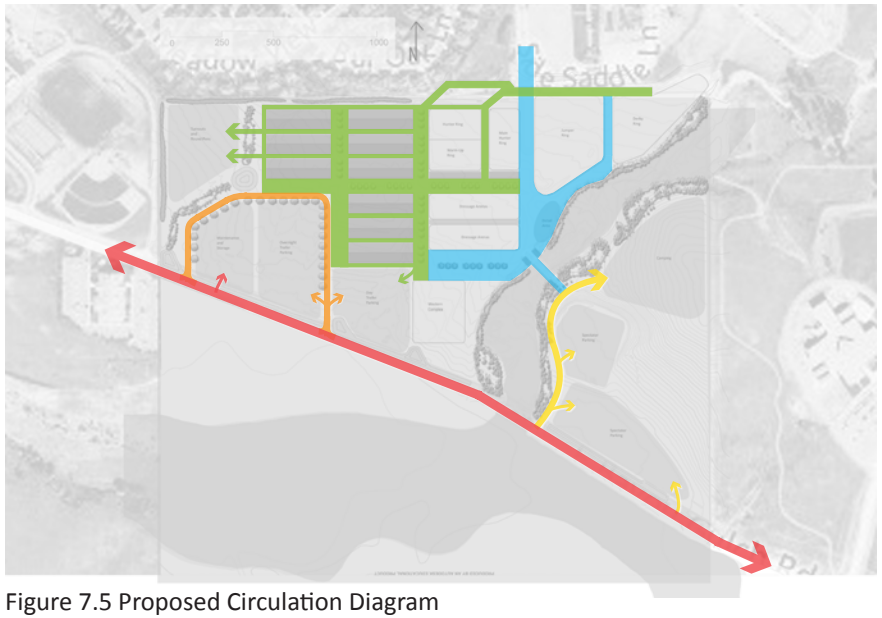


Figure 7.5 Proposed Circulation Diagram
(Caitlin Admire)

Sustainable Practices

Figure 7.6 Sustainable Opportunities Diagram (Caitlin Admire)

The Horse Park offers many sustainable facility and land management opportunities. To begin, development is restricted within the floodplain area and vegetation is planted along riparian corridors in order to stabilize the soil and act as a buffer.

Natural vegetation is restored within the floodplain which provides habitat and promotes bio-diversity. These plants will also slow the water flow during storm events, preventing further erosion of the banks.

Native and xeriscape plant species are used throughout the site as landscape planting also, as they require much less maintenance and help to conserve resources, especially water.

A compost operation is set up alongside the storage and maintenance area for easy access. This allows the park to dispose of large amounts of animal waste in a way that is beneficial to the environment and prevents contamination of run-off.

Also, all new construction will be composed of environmentally friendly materials, discussed in more detail later.

Drainage

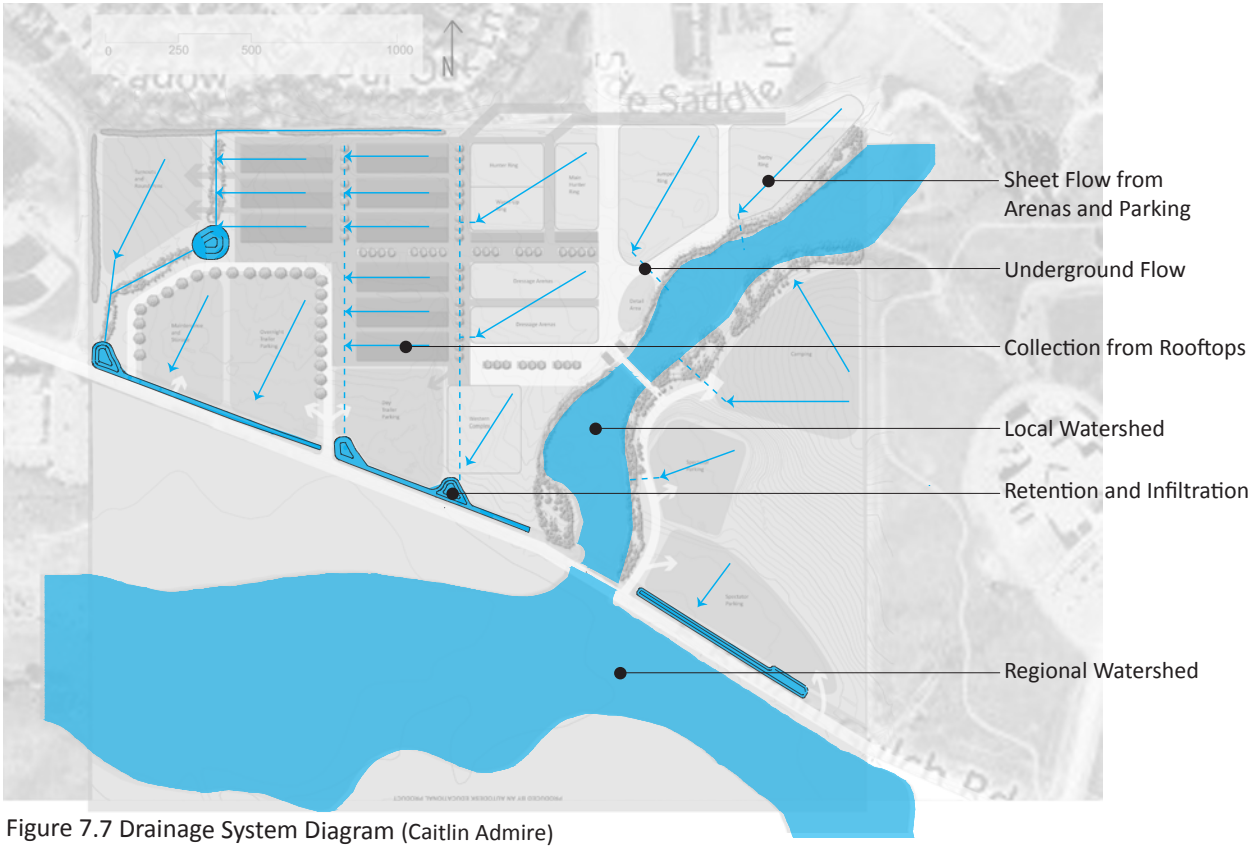


Figure 7.7 Drainage System Diagram (Caitlin Admire)

Drainage is dealt with through a series of rain gardens and bio-swales, which filters and cleans the water of chemical residue before it is released into the watershed, improving regional water quality. The rain gardens form promenades between the stables, which create a comfortable and aesthetically pleasing environment, helping to showcase the fact that sustainability can be beautiful and functional. These rain gardens also allow for trees to be planted between stables, providing shade for passive cooling.

This drainage creates a complicated system, beginning from the roofs of the stables and ending in the bio-retention areas along Bayou Gulch. Water is first collected from the stable roofs, taken through gutters and down rain chains into planters. Overflow from the planters is then funneled through underground pipes into the larger rain gardens. After passing through a series of rain gardens the water is taken into one of the bio-swales and/or bio-retention areas where it is allowed to filter slowly into the ground. Surface drainage from arenas and parking is also collected into the system along the way.

Materials: Surfaces

Material choices greatly affect the spatial character of the site as well as its ability to function sustainably. All ground surfaces on the site are permeable or porous to minimize runoff. Also, high traffic areas, such as parking lots and equestrian paths, will be stabilized with grid systems to prevent erosion.

Figure 7.8

Figure 7.16 Engineered Sand
(Caitlin Admire)

Figure 7.9

Figure 7.10

Figure 7.11

Figure 7.17 Permeable Concrete
(www.urbanhydrologics.com)

Figure 7.18 Reclaimed Wood
(www.sandal-woodsblog.com)

Figure 7.19 Flagstone
(www.stonemasonrywork.com)

Figure 7.12

Figure 7.20 Porous Asphalt
(www.lowimpactdevelopment.org)

Figure 7.15

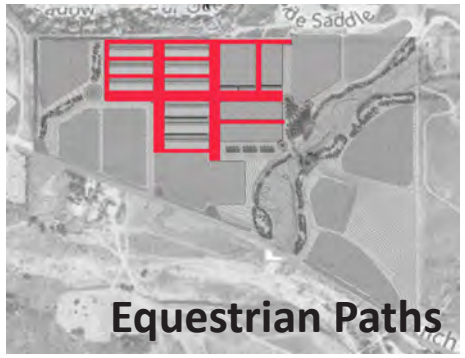


Figure 7.13

Figure 7.21 Geo-Grid
(www.gravel-lok.blogspot.com)

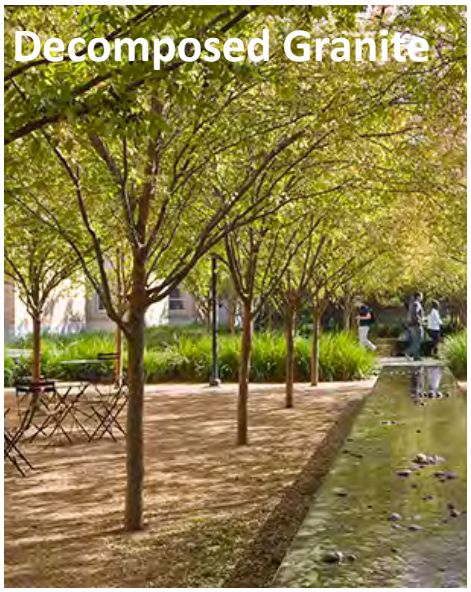


Figure 7.23 Decomposed Granite Plaza
(www.thirdnaturestudio.com)

Figure 7.14

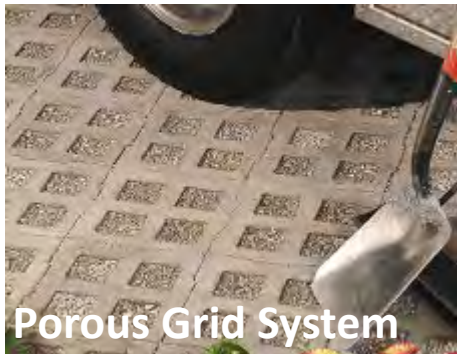


Figure 7.22 Porous Grid System
(www.buildinggreen.com)

This and Opposite Page
Figures 7.6-7.13 Material Maps
(Caitlin Admire)

Materials: Tree Species Seasonal Characteristics

Figure 7.24
(www.brueckner-rhododendron-gardens.blogspot.com)

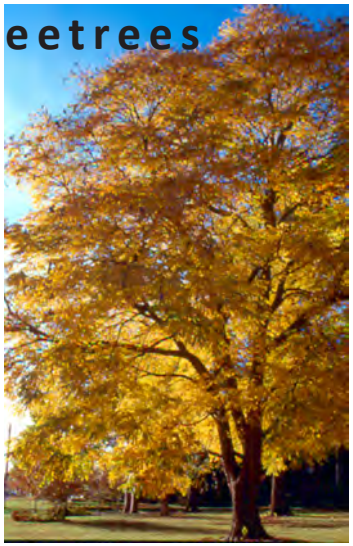


Figure 7.25
(www.garden-photos-com)

Figure 7.26
(www.flickr.com)

Figure 7.27
(www.landscapeonline.com)

Figure 7.28
(www.landscapeonline.com)

Figure 7.29
(www.vanagensodfarm.com)

Figure 7.30
(www.njtrees.org/blog/)

Figure 7.31
(www.freeplant.net)

Materials: Plants

Plant material choices are just as important as the hardscape. In the bosque Kentucky Coffeetrees (Gymnocladus dioicus) will be used because they are a good shade tree as well as being tolerant of urban conditions, such as drought and soil compaction. It will take some maintenance, however, to clean up the pods that they drop. At the entries, Ornamental Plums (Prunus species) will be used because of their aesthetic values and seasonal interest. Both of these species are considered xeric and are tolerant of USDA hardiness zone 5.

The rain gardens and other landscaped areas on the site will be strictly xeric and/or native species. Xeriscape can come in a variety of styles and provides many design possibilities for the landscape. This site should showcase xeric plantings with lots of color, in order to grad attention.

Since Colorado is a relatively arid climate, bio-swales do not need to be as elaborate as those found in other parts of the country. They can be simple, shallow depressions with a bit of native grass species. Just enough grade change is required to hold water during storm events long enough to allow it to seep into the ground.

Opposite Page

Figures 7.22-7.25
Kentucky Coffee Trees

Figures 7.26-7.9
Ornamental Plums

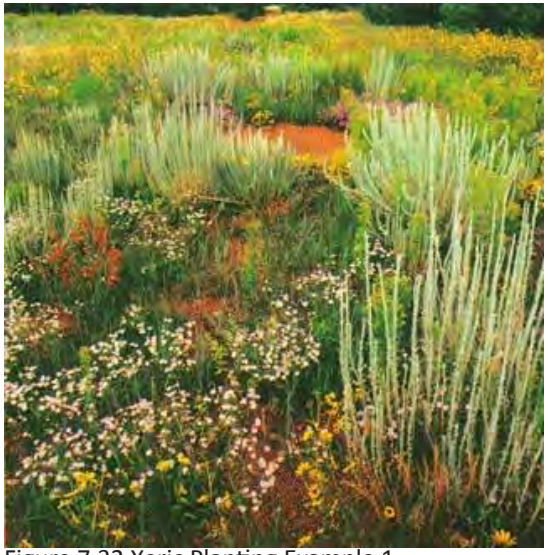


Figure 7.32 Xeric Planting Example 1
(www.landscapeonline.com)

Figure 7.33 Xeric Planting Example 2
(www.creativecountrymom.blogspot.com)

Figure 7.34 Bio-Swale in Boulder, Colorado (www.dkahn.com)

This portion of the site is more EXPERIENTIAL AND INTENDED TO EVOKE EMOTION AND REACTION from the site users. The overall form and creation of space, however is still based on the circulation system and desire lines as they relate to the larger site. There is a DEFINITE DISTINCTION BETWEEN THE LINEAR CIRCULATION SPACE OF PAVED PATHWAYS AND THE BOSQUE SPACES with trees and decomposed granite.

This second area houses the exhibits, which are seemingly randomly placed throughout the space, ENCOURAGING THE USERS TO CREATE THEIR OWN CIRCULATION PATTERN. The exhibits are grouped by the specificity of their topic. The first area after the introductory exhibit holds just the site selection exhibit; the second space has the vegetation, resource conservation, and management practices exhibits; the third houses the water quality, habitat restoration, and manure management exhibit; and finally, the center space contains the materials exhibit and the children's area.

Along the floodplain bank, an amphitheater CREATES A DESTINATION, drawing people through the exhibit spaces. The plaza provides plenty of seating to be utilized during event downtime and as overflow for the midway area.

Circular transition spaces, based on the form created by the amphitheater, are defined by a change in paving patterns and curved benches along the perimeter of the space. These spaces connect the interpretive area to the rest of the site. Each of these transition spaces also contains an equestrian themed statue, SIGNALING THE VISITOR THAT THEY ARE NOW PASSING INTO AN AREA WITH A SPECIAL FOCUS.

Throughout the entire interpretive area there is a motif used of an organic, swooping form which was taken from the CHP logo. It can be seen in the forms of the benches in the entry plaza, the roofline of the ticketing office, and in the structures of the exhibits.

The interpretive plaza also focuses on SUSTAINABLE MATERIALS, including pervious pavements and recycled structural materials.

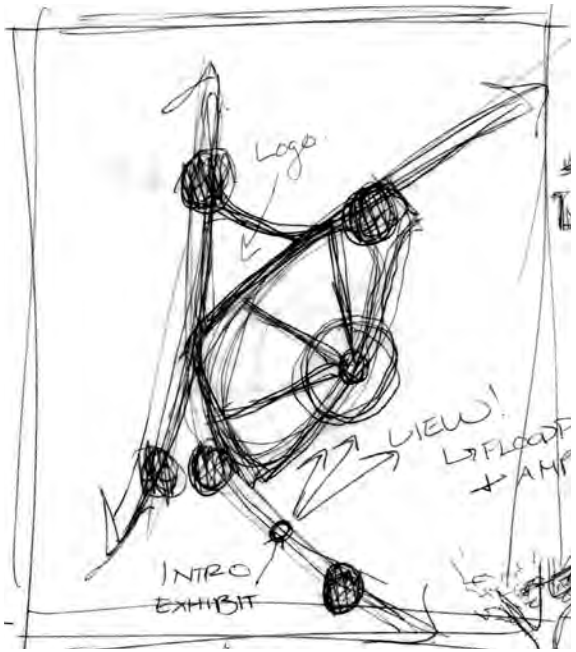


Figure 7.35 Detail Parti
(Caitlin Admire)

Figure 7.36 CHP Logo
(www.andybarnhart.com)

Figure 7.37 Detail Plan
(Caitlin Admire)

Exhibits

1. Site Selection
2. Resource Conservation
3. Vegetation
4. Management Practices
5. Water Quality
6. Habitat Restoration
7. Manure Management
8. Materials
9. Children’s Area

CHP Detail Section

Scale 1”=12’

Figure 7.38 Detail Section
(Caitlin Admire)

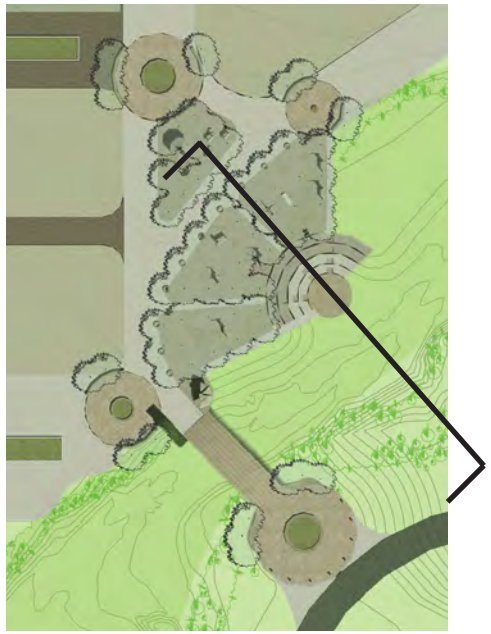


Figure 7.39 Section Cut
(Caitlin Admire)

Match Line

Experiential Sequence

Spectators enter the site on foot through an entry plaza and bridge over the small floodplain, immediately cREATING A SENSE OF IDENTITY for the site.

The plaza and bridge are TRADITIONAL AND FORMAL IN STYLE, mimicking many of the equestrian disciples which use the park. The entry plaza uses elements such as bollards, flagpoles, statuary, stone benches, and flowering plum trees to create the spatial definition and character. Along the bridge, visitors are also PROVIDED GLIMPSES of the interpretive plaza and amphitheater, piquing interest.

At the end of the bridge they encounter the ticketing booth with its green roof and the first of the interpretive exhibits. This initial exhibit is an overlook with views into the vegetated riparian area and panels which introduce the new site and its goals of environmental stewardship.

The bosque of trees creates a WELCOMING AND COMFORTABLE SPACE with ample seating to draw people in off the main path. Kentucky Coffeetrees are the species chosen for this area because they create great dappled shade, are tolerant of urban conditions, such as soil compaction, and have low water requirements. The exhibits are placed within UN-DIFFERENTIATED SPACE, which means there is no set path to take and allows the visitors us create their own sequence between them.

The small amphitheater is built into the stream bank along and will generally be used as seating and passive recreation space, although it is capable of holding small performances, LEAVING ROOM FOR THE INTERPRETIVE PROGRAM TO EXPAND in the future.

The formal entry plaza is defined by custom-designed benches, bollards, ornamental pears and sculpture. It also showcases flags of the United States, the State of Colorado, and the Colorado Horse Park.

Figure 7.40 Entry Plaza Perspective
(Caitlin Admire)

After the plaza, visitors cross a pedestrian bridge from which they view the vegetated riparian habitat in the floodplain and enter the site between the ticketing booth and introductory exhibit overlook.

Figure 7.41 Aerial View of Entry Plaza and Bridge
(Caitlin Admire)

The wide pathways within the interpretive plaza allow for uninhibited circulation at large events, while the trees create a much more human-scale and comfortable space within which visitors can enjoy the exhibits.

Figure 7.42 Bosque Perspective
(Caitlin Admire)

The amphitheater allows for overflow seating during large events and for visitors to get close to the riparian area. In the future, this area may also hold small presentations

Figure 7.43 View of Amphitheater across Floodplain
(Caitlin Admire)

Transition areas into the interpretive plaza house modern, equestrian-themed sculptures.

Figure 7.44 Sculpture in Transition Space Perspective
(Caitlin Admire)

Part VIII - Exhibit design

The following spreads present each interpretive exhibit and the text content of the displays. It was important for me to include this in my project because how the information is written and presented is a big part of interpretation and is ESSENTIAL IN ORDER TO PROVIDE A HOLISTIC INTERPRETIVE DESIGN.

Overview

To provide an organized approach to the information, I use the basic interpretive idea of creating a theme which each exhibit's content will relate back to. My theme statement is that UPON LEAVING THE EXHIBIT AREA THE VISITOR SHOULD UNDERSTAND THAT SUSTAINABLE EQUESTRIAN FACILITIES ARE ESSENTIAL TO THE FUTURE AND WHAT THEY CAN DO IN THEIR OWN BACKYARD TO BE MORE SUSTAINABLE.

Based on my research, I keep in mind some major techniques while producing my interpretive writing: using good quality writing that is simple as well as kept to a length so as not overwhelm the reader and ensures they easily understand as well as remember the information. As mentioned before, this is a site where the people are there to enjoy equestrian events, so the information must be available in a format which grabs their attention and then allows them to quickly absorb the main points. This also requires the information to give off a generally upbeat vibe and present sustainability in a positive way which does not discourage the reader and frighten them away from the whole idea.

Linking the theories to tangible objects in the surrounding environment makes the information more memorable, which is where the exhibit design comes into play. Preferably, the exhibits would be placed adjacent to the on-site practice to which they relate, but safety and function reasons do not make this a feasible option at the CHP. Therefore, where experiencing the actual practice is not possible, there will be scaled-down demonstrations of the practices as part of the exhibit. Evoking emotion from the reader is another important aspect of interpretive writing because this is how the readers will be inspired to change their own behaviors. Giving reasons why each sustainable practice is important and beneficial to the reader and their environment as well as the knowledge needed in order to implement it will be the most effective way to reach our goal of promoting sustainability in the equestrian industry.

Taking all of this into account, the general format for the content of each exhibit began with a simple introduction of the sustainable practices and then explain why they are important and the benefits of doing so. Then it continues by giving basic tips on how these practices are put into action and relating the topic to the immediate surroundings, either in the form of viewing the actual operation or through an interactive representation.

Exhibit Detail

The exhibits and furnishings on the site are made primarily from reclaimed materials, in order to be sustainable and preserve resources. Each exhibit has an interpretive panel which accompanies the interactive portion. These panels are made of reclaimed wood from local barns or highway snowfence. The element which displays the exhibit name will be the motif from the CHP logo in rusted metal, also reclaimed locally. Furnishings such as benches and retaining walls are made of modular Colorado sandstone, also found locally. These materials mimic the vernacular and historical architecture of the Parker area.

Figure 8.1 Exhibit Panel Detail
(Caitlin Admire)

Figure 8.2 Rusted Metal
(www.klingon-empire.org/forum)

Figure 8.3 Reclaimed Wood
(www.freestocktextures.com/texture/id/176)

The New Colorado Horse Park

This exhibit is situated at the end of the entry bridge and serves as an introduction to the new CHP, the physical site as well as the goals of environmental stewardship. Along with the ticket office, it creates a threshold into the site. The exhibit includes panels on an overlook with shade structure that allows the visitors to view out into the floodplain as they experience the exhibit.

Figure 8.4 The New CHP Exhibit
(Caitlin Admire)

Over the past decade, sustainability has become a household word and sustainable design is quickly becoming a standard in the modern world. Unfortunately, the equestrian world is a bit behind-the-curve because of our specific needs for functional, safe facilities, which often take precedence over sustainable concerns. However, there is progress within the horse industry to incorporate sustainable practices into our facilities in ways which are harmonious with everyday stable workings and performance.

The Colorado Horse Park (CHP) has chosen to help advance the efforts of those in the equestrian industry who are currently promoting sustainable design by offering our facility as an example. Our goal is that, upon leaving, you all will understand that sustainable equestrian facilities are essential to the future and how to implement the practices necessary to create them in your own backyards. Even the smallest steps toward sustainability can make a difference!

Behind you is the first example of our new sustainable practices. The ticketing office is topped with what is called a green roof or living roof, and simply refers to a structure with vegetation on the roof. These roofs act just as the natural ground would have, allowing for rain water to soak into the roof soil, creating habitat for birds and insects, and preventing the building from reflecting hot sun rays back into the atmosphere.

Site Selection

This exhibit includes a to-scale three-dimensional topographic model of the CHP on the ground plane. This model allows visitors, especially children to climb around on it and literally get into the site. The purpose is to help them to understand the idea of slopes and contours. This is also be the exhibit where the informational panel is introduced, which will show up in each of the following exhibits.

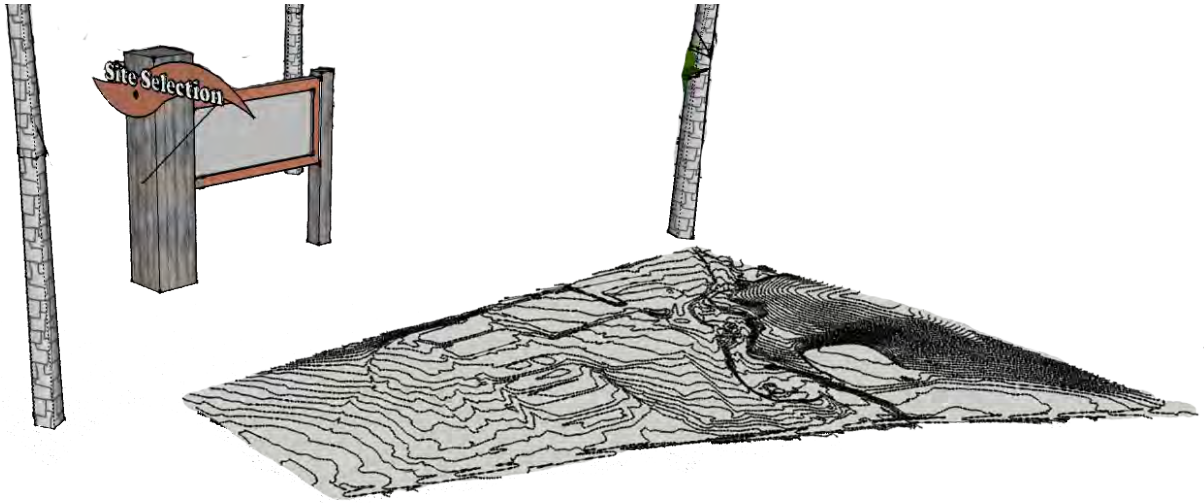


Figure 8.5 Site Selection Exhibit
(Caitlin Admire)

Site selection is one of the first elements in creating a sustainable facility. This includes using a study of soil types and slopes on your site to determine where development should and should not happen. This is especially difficult in equestrian facilities because of our requirement for large, flat areas of land to accommodate barns, arenas, and pastures. It is worth the effort though, as it sets the foundation for the rest of the facility.

A soil survey can tell you which soils are present on your site. It is important to stay away from soils that are easily erodible, considered to be characteristic of a floodplain, or otherwise categorized as important. This step ensures that your buildings will be placed on good, solid ground and reduces concern for erosion or flooding in the future. A soil survey from the USDA's website (www.websoilsurvey.nrcs.usda.gov) can tell you which soils are present on your site.

Slopes are also an important feature of any site to keep in mind. Building a barn or arena on slopes which are too steep will require extra construction work and causes excess erosion. Placing elements on a slope which is too flat will not let water drain off the area when it rains, causing flooding and damage to foundations.

The model on the ground behind you is a scaled down topographic model of the Colorado Horse Park. The major concern for our site selection dealt with staying away from the floodplain in order to preserve the fragile soils and ecosystems there.

Resource Conservation

This exhibit is a panel with a ten foot tall re-creation of a wind turbine, the blades of which visitors can turn by hand. The turbine attracts attention because it is interesting and a bit mysterious to the general public. No electricity is actually generated from the turbine; it is just for demonstration purposes. This is one of the exhibits which cannot logically be near the actual practice on-site, so being able to make the turbine spin manually creates the interactive portion.

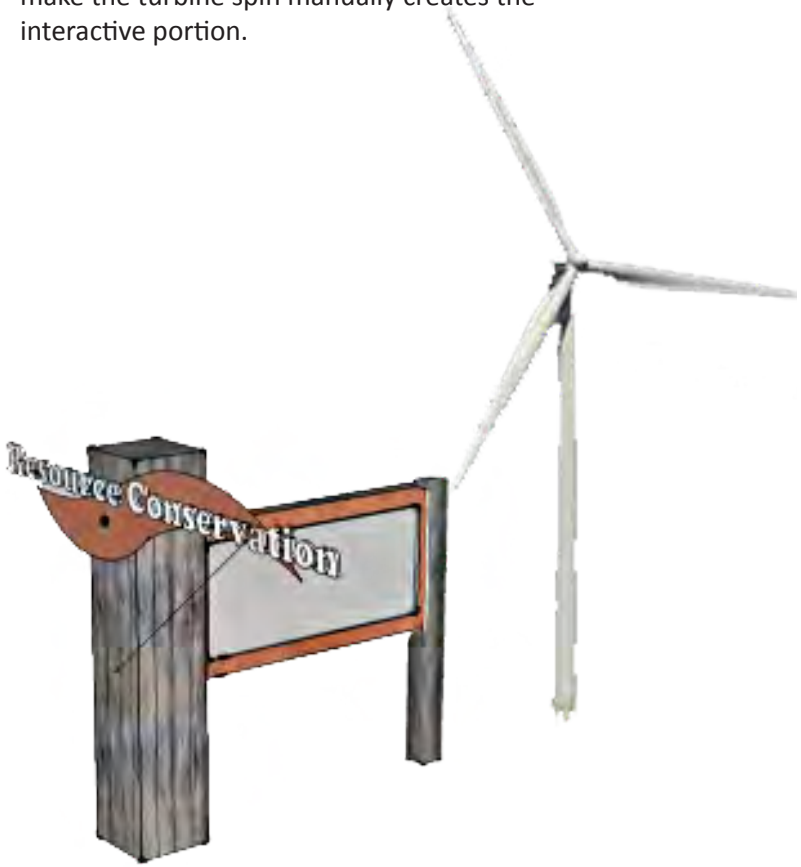


Figure 8.6 Resource Conservation Exhibit
(Caitlin Admire)

Conserving resources means using less water and energy. This is important because there are limited amounts of these resources for us to use and they can run out if we use too much of them. This is one of those things that we can do now to ensure our quality of life can continue in the future.

This includes being more mindful of water and energy use, such as:

- *Not letting water tanks overflow*
- *Putting shut-off fixtures on the ends of hoses*
- *Turning lights off when not in use*
- *Using florescent light bulbs*
- *Changing thermostat settings by the seasons*

These small steps seem as though they would almost be insignificant, but if everyone began doing these things it would add up quickly!

Skylights and windows allow natural light and ventilation in the barn. This is better for horse and human mental health and makes you less dependent on electrical lights during the day. Passive cooling is a practice where buildings take advantage of breezes and shade from trees in order to keep structures cooler during summers.

Renewable energy sources allow you to actually make your own energy on-site, reducing or sometimes even negating the need for standard electricity. The two most popular form of renewable energy are solar and wind power. These techniques harness the energy of either the sun or wind and transform it into a useable form or power. The turbine to your right is a smaller recreation of the real deal, which can be up to 200 or 300 feet tall!

Vegetation

This exhibit utilizes demonstration gardens in order to show visitors how xeric plantings can be used in a landscape setting. The purpose of the demonstration garden is to prove that sustainable plant species can be just as aesthetically pleasing as more traditional landscaping. The planting beds are abstract, organic forms, which allow the traffic of visitors to flow easily around them and create a sub-space within the exhibit area. There are also take home pamphlets on suggested plants species for the region.

Figure 8.7 Vegetation Exhibit
(Caitlin Admire)

It is important to choose the correct plant species in order to reduce maintenance costs and prevent poisoning the horses. Xeriscape is a form of landscaping that uses drought tolerant plant species to reduce the amount of water required. Often, xeric landscapes include plants native to the area because they are highly adapted to the local conditions.

Poisoning from toxic plants is a concern specific to equestrian facilities. As most of us have experienced, horses will eat almost anything, so it is important to use plants that are non-toxic. It is best to search the property for and remove any existing plants that may be poisonous to horses and be sure to use only non-toxic plants in landscaping.

An invasive species is a plant or animal that is introduced into an area from an outside source and has an ability to adapt, thrive, and reproduce quickly. In extreme cases, certain plants can completely take over and destroy the native ecosystem. It is important to consult with a regional agricultural office for information about what species are invasive in your area.

The surrounding planting beds are xeric demonstration gardens. They are an example of how sustainable plants are the best of both worlds, in that they can be just as beautiful as traditional landscape plants but require less maintenance and resources.

Management Practices

This exhibit incorporates a simple interactive game into the panel. In order to view the information, visitors move a toy horse that is mounted on the panel over a track to different areas. When the horse reaches a certain point a small panel flips over revealing the exhibit content. This movement simulates the rotation of horses through pastures.

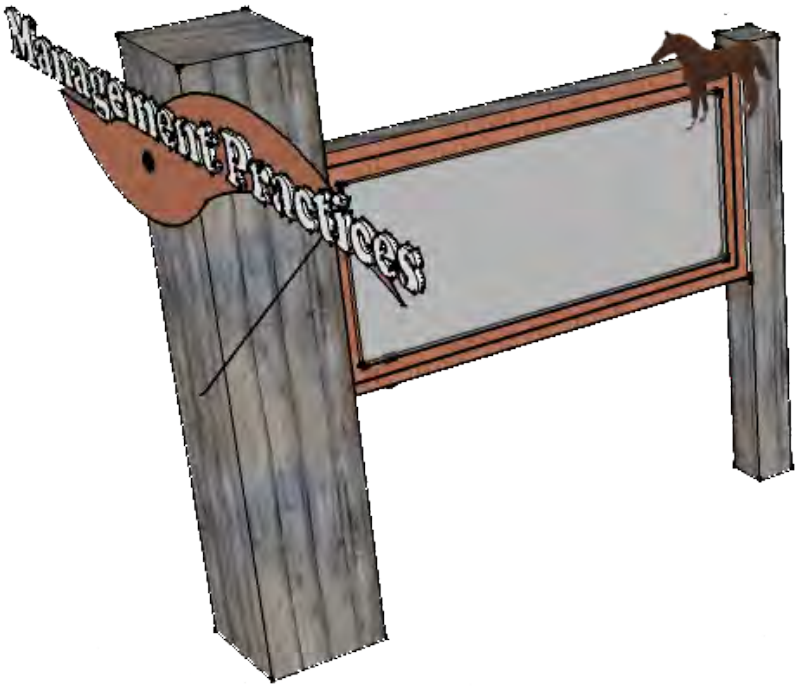


Figure 8.8 Management Practices Exhibit
(Caitlin Admire)

Good management practices are essential to any equestrian facility in order to ensure the general health, safety, and well-being of the horses.

There are two practices commonly used to control the common issue of muddy pastures: pasture rotation and sacrifice areas. If you have enough acreage, you can fence the pasture area into smaller paddocks and rotate where the horses are turned out in order to allow the land to recover. Sacrifice areas are smaller paddocks with sand or gravel footing which are used to turnout horses when the pastures are wet in order to minimize damage. This is the better option for farms with less land area.

The spread of disease is another common topic among horse owners. As preventative measures, all horses on the property should have proof of a negative coggins and put on a regular vaccination schedule. It is also suggested to disinfect stalls and pick manure from pastures regularly. Daily turnout and dust control methods for arenas can also help to avoid respiratory issues.

Horses are known to be prone to accidents, so being aware of any potential hazards is key. Popular sources of injury are:

- *Broken fencing*
- *Exposed drainage pipes*
- *General clutter or trash*
- *Wire fences of any kind, but especially barbed wire*

If any of these are present on the site they should be dealt with immediately.

Water Quality

This exhibit is an interpretive panel situated on the edge of the floodplain in order to provide a view into the naturalized area. This allows visitors to see what they would be protecting and hopefully inspire them to do so.

Figure 8.9 Water Quality Exhibit
(Caitlin Admire)

Water is one of our most precious resources here in Colorado, so we need to ensure that what little water we do get is kept at a good quality. Our facilities release many harmful resides into the ground, such as chemicals from bathing and fecal matter, which pollutes the groundwater.

Luckily it is simple to remedy this situation by containing rainwater on the site and allowing it to pass through a natural cleansing system before seeping into the ground.

Another concern is the amount of sediment, such as soil or sand, which gets into the water. Although natural materials, excess sediment in a stream or other water body can block sunlight essential for the growth of aquatic plants or eventually settle and begin to fill in a pond.

Some options to improve water quality include:

- *Bio-swales - shallow, landscaped depressions which filter the water as is seeps into the ground.*
- *Sediment basins - series of sand lined basins which slow the water and allow sediments to settle out and then filter the water as it seeps into the ground.*
- *Vegetated buffers - planting trees and shrubs along streams helps to stabilize and prevent the erosion of stream banks, reducing sediment in the water.*

Before you, is an example of how the CHP has used vegetation to help improve the quality of water coming from our site.

Habitat Restoration

This exhibit is an interpretive panel which sits on the edge of the floodplain and provides views into the habitat restoration happening there, and possibly some wildlife. Again, this actually shows the visitors what they would be helping to achieve through habitat restoration and hopefully will inspire them to take action.

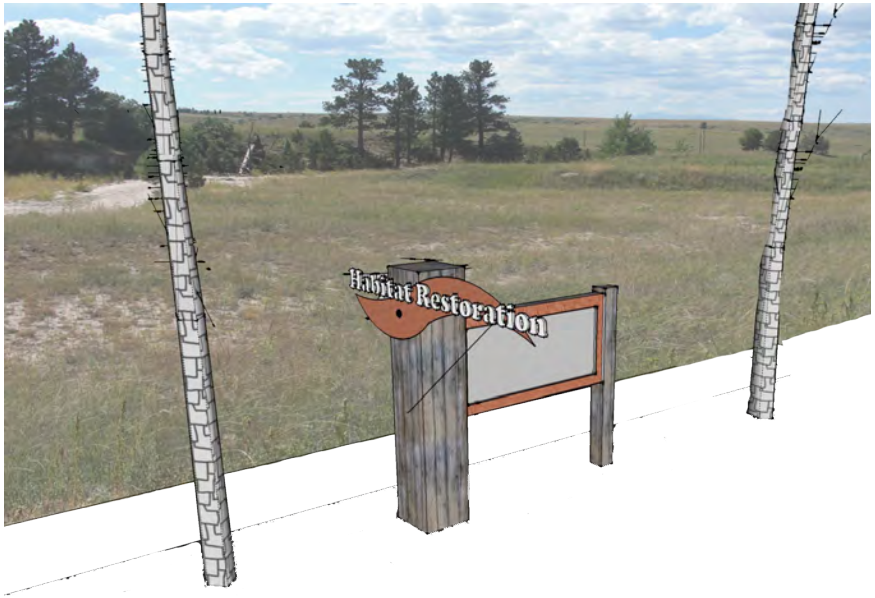


Figure 8.10 Habitat Restoration Exhibit
(Caitlin Admire)

The goal of habitat restoration is to return the function of the natural systems as close as possible to their state before human interaction. These areas help to alleviate some of the pressures that human impact has on the environment. Restored habitats:

- *Increase water quality through natural filtration*
- *Minimize erosion by stabilizing soils*
- *Promote bio-diversity by providing habitat and migration paths for animals and insects.*

The key to habitat restoration is to understand the natural systems on your site and how they progress over time. Also, how the ecosystem works as a whole network, not just as individual parts. An ecosystem is said to be in a stable state when all species of plants and animals benefit from the system as well as contribute to it.

The USDA has created eco-regions which can provide guides for what the natural habitat should be like in certain regions. Here at the CHP we are in region 26, the Southwest Tablelands and the sub-region 26J, the Foothill Grasslands. Based on the USDA description of this region, we used a mix of tallgrass and medium grass species with scattered pine woodlands to recreate the native habitat. This restoration can be seen in the floodplain in front of you.

Manure Management

The manure management exhibit consists of two parts, an interpretive panel and a model of the compost process. The model is a cut-away of a small compost bin that shows the process from organic material to useable compost.

Figure 8.11 Manure Management Exhibit
(Caitlin Admire)

Manure management is a concern unique to equestrian facilities and also one of our best opportunities to practice sustainability. When not managed properly, manure can contaminate ground water and facilitate insect breeding. The first step in manure management is to contain the manure in an area where it cannot leach into the groundwater, such as on a concrete pad.

Horse manure can be a great resource. The easiest option is to compost it on-site and use it as fertilizer or sell it to a commercial composting company. Composting speeds up the natural decomposition process by controlling heat and moisture in the manure pile. Manure compost is actually the most beneficial type of compost and can be used in your gardens by:

- *Adding it between plants already growing*
- *Mixing it into the soil in the spring just before planting*
- *Spreading it over soil just before winter*
- *All of the above!*

To your left is a cut-away of a compost bin showing how the manure changes into compost. These simple types of bins are good for small scale composting. Larger operations require rows of manure to be stored on concrete pads in three to four foot tall rows about seven feet across. To know which type is best for you, start with an approximate calculation of how much manure will be produced from your facility.

Materials

This exhibit is a gazebo structure made of entirely sustainable materials that has benches and interpretive panels built into the structure. The gazebo's purpose is to showcase how the versatile uses for sustainable materials in landscape structures and demonstrate that they still provide a desirable character.

Figure 8.12 Materials Exhibit Demonstration Gazebo
(Caitlin Admire)

As sustainability becomes more widely practiced, an industry has emerged which provides us with seemingly un-ending options of eco-friendly material choices. This can include:

- *Recycled or salvaged materials, both which prevent waste and promotes resource conservation.*
- *Low VOC, meaning volatile organic compound, refers to materials which do not release harmful gasses into the atmosphere.*
- *Materials which are from local sources use fewer resources to transport to the building site and stimulate the local economy.*
- *Materials which allow for natural process to continue less inhibited. For example, pavements which are considered pervious, meaning that they allow water to filter through them and into the ground.*

Any wood material you use should not be considered endangered and preferably would be a species which can be renewed quickly, such as bamboo or cork. Some type of wood, such as walnut, can poison horses and cause laminitis, so you should be aware of this and stay away from these species.

These exhibits use mostly salvaged materials, such as barn or snow fence wood and rusted metal. This gazebo as well as the paving and exhibits throughout the site are made of sustainable materials.

Children's Area

This area focuses more on simply educating children about horses, rather than sustainability. There are games and play structures which introduce kids to horse health, colors, different disciplines and tack, and grooming tools. First, there is a series of three life-size horse models which showcase the internal health systems modeled on them. Horse coat colors are demonstrated on a game with pieces that have horses with different coat colors on one side and spin around to reveal what those are called on the other. There is also another horse model with grooming tools attached that children can use to mock-groom the horse. Finally, there are different types of tack mounted on small horse models which the children can actually sit in.

The images here are of a sculpture at Purdue University's Veterinary School, Continuum by Larry Anderson. These are an example of what the life-size, internal system models would be, except with all horses.

Figure 8.13 Cat with Nervous System
(www.vet.purdue.edu/alumni/continuumstory.html)

Figure 8.14 Pig with Circulatory System
(www.vet.purdue.edu/alumni/continuumstory.html)

Figure 8.15 Horse with Skeletal System
(Allison Gerth)

Part IX - Assessment and Conclusions

Assessment of Design through the Audubon and SITES Programs

*See appendices for both audit charts.

Both the Audubon Sustainable Equestrian Program and Sustainable Sites Initiative have elements that are directly applicable to this project and others that to not apply. Certain sections of the Audubon program are directed mostly at boarding facilities and were disregarded in this project as they simply do not apply to a competition venue, for example staff certifications and lesson programs. On the same note, The Audubon program also has sections which my design project does not address, such as business and marketing plans. Since this is a theoretical project some sections of SITES, such as engage users and stakeholders in design or monitoring performance, are also just not practical for this project.

That being said, I have gone through the Audubon and SITES program audits and estimated what the potential point earning for the new CHP could be. For the Audubon program, it seems that with the new design the CHP could easily achieve the FIVE-STAR AUDUBON LIFESTYLES RATING WITH 313 POINTS, passing the minimum for all categories. Of course, as mentioned above, this is the potential, which means it would take the implementation of my design along with COOPERATION WITH THE FACILITY STAFF AND MANAGERS to ensure the facility operates under Audubon requirements. If my designs were to be implemented, but the facility staff did not change their operations also, the CHP could earn 137 points, earning them no Audubon Lifestyles rating as the minimum points for a one-star facility is 160. With this, they would however, still pass the Economics and Business, Facilities and Operations, and Environmental categories. For comparison, in its current state the CHP would earn 112 points and the only category it passes is Economics and Business.

For the SITES program I believe the CHP's new site could earn up to 211 POINTS, AGAIN WITH COOPERATION FROM THE FACILITY STAFF, AND RECEIVE A FOUR-STAR RATING. Without cooperation from staff in the form of sustainable maintenance, the CHP would not even meet the SITES prerequisites, and therefore would not be eligible to earn any rating at all. In its current state, the CHP would earn basically no points from the SITES program.

I was surprised at how easily this facility could get a rating from both the Audubon and SITES programs. These ratings applied mostly to the master planning portion of my project, and really many of the changes I proposed would not take too much money or effort on the part of the CHP. However, the take-home message here is that the initial design is a relatively small portion of a sustainable equestrian facility. It is imperative that the facility staff is also on-board and is willing to continually practice sustainable operations as well as MAINTAIN THE SUSTAINABLE DESIGN ELEMENTS so that they can continue to function.

Assessment of Design through Project Goals

TO CREATE AN EQUESTRIAN EVENT VENUE THAT IS FUNCTIONAL AND SAFE. This redesign for the CHP definitely made the venue more highly functional. Most of this was achieved through restructuring the circulation systems throughout the site which included creating a separation between vehicles, pedestrians, and horses, making the site inherently safer for all users.

TO CREATE A FACILITY THAT IS SUSTAINABLE. Based on my previous assessment of the site through the Audubon and SITES programs, it seems the project was successful in creating a sustainable facility.

TO CREATE A LANDSCAPE THAT EDUCATES PEOPLE ON SUSTAINABLE PRACTICES. This goal is a bit difficult to assess in that it's hard to prove whether the project is successful at educating people without a post-occupancy study. True education is not purely presenting the information, but doing so in a way that encourages people to remember it. This is where interpretive design comes in, as it has been proven to be very successful in information retention. Based on my research of interpretive design and the techniques I have used in this design, in theory, my project should accomplish this goal.

TO CREATE A LANDSCAPE THAT INSPIRES PEOPLE TO CHANGE THEIR BEHAVIORS RELATED TO CONSUMPTION OF ENERGY AND NATURAL RESOURCES. Again, this is hard to prove, as it would take a number of post-occupancy evaluations to prove whether the design was successful in influencing the CHP visitors to actually make changes in their lifestyles. And again, based on my research of interpretive design, my project should accomplish this goal, in theory. I can write with confidence that the project would at least get the visitors thinking about sustainability in equestrian facilities, which is a good first step.

Accomplishment of Personal Goals

Does the final product successfully complete my personal goals and the project goals?

To combine my passions of landscape architecture and horses. This project has shown me how my two passions can be combined into a career opportunity. Although a definite niche in the design industry, this project proves that equestrian facilities can benefit from the work of a professional landscape architect in order to be more functional, more aesthetically pleasing, more comfortable for all site users, both the two and four-legged variety, and better for the environment.

To discover my personal design philosophy. Although it has been developing throughout my five years at K-State, and throughout my entire life for that matter, this project helped me really nail down my personal design philosophy. As the first time where I was truly in charge of the direction my studio project took, I think it forced me to figure out exactly what was important to me as a landscape architect.

To explore the design dilemmas specific to equestrian facilities. Through my experience growing up riding and showing horses I already had a pretty good idea of what problems generally existed at equestrian facilities, so looking back, this goal really should have been to explore how to FIX design dilemmas specific to equestrian facilities. I have definitely explored those dilemmas, and I think been successful in remedying many of them at the CHP.

To figure out how the design of a landscape can reach out to the users of the site in order to educate and inspire them. This was a topic which I had very little experience with before this year; my research on interpretive design was definitely something new to me. I believe that I have learned a great deal on this subject, but also that I have only scratched the surface!

To become more familiar with sustainable design practices. Before this project, I had used some sustainable practices in my studio projects and had heard of SITES and even visited that website a few times, but nothing more that. This year I have become familiar with sustainable practices and would feel comfortable telling that to a potential employer. However, sustainability is a relatively new movement in the design professions meaning that new practices and technology are being produced constantly, so it is an area that I will really have to continuously address following graduation.

To advance the efforts of those in the equestrian community who are currently promoting sustainable design in our facilities. This is one goal that I think I really nailed with this project. I have proven that sustainability is possible at an equestrian facility and provided an example of how it can be done. If this project were to be built, I think it would cause a lot of talk among the equestrian industry.

Although it was a bit of a bumpy road at times, those bumps were the best learning experiences. I definitely learned more about myself as a designer and was forced to face and improve some of my weaknesses. In the end, I do feel more confident in my skills as a future landscape architect after completing this project. So yes, I think that I have proven that I am ready to graduate and start practicing landscape architecture!

Further Possibilities

This research could be continued a few different ways. First, there could be a collaboration with the Audubon Program to create an addition which is focused on event venues where there are no permanent horse residents.

Also, it would be interesting to actually talk to the CHP about the possibility of implementing some of these things, or even just becoming more sustainable. Although it might be a long stretch to think about a total re-design of the site, they may be open to implementing some of the sustainable practices. Better compost management and habitat restoration in the riparian areas seem to be good candidates for initial efforts in implementing these ideas.

This leads to another option. Taking this design and assessing the quantitative effects it would have would be very interesting. For example, how much more water would actually be returned to the ground or how many chemical residues are actually filtered out of the water before it enters the stream. Probably the most important in the eyes of the CHP, how much money is saved through the implementation of this design?

Finally, any efforts toward the promotion of sustainability in the equestrian industry would be a continuation of the primary goals of this project. Possibly an addition to the CHP website about sustainable equestrian facilities. Even if they do not actually implement anything on their site, they can still promote sustainability by spreading the knowledge necessary for others to do so.

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Appendices

Glossary

Amenity - anything on a site that serves the specific purpose of enhancing the site experience, may be functional or strictly aesthetic.

Audubon Lifestyles Program - thematic programs associated with the Audubon Society that have been created as a way to assist individuals, businesses, neighborhoods, and communities seeking to take steps towards living sustainably, of specific interest is the equestrian facility program.

Boarding or private facility – an equestrian facility that is either used to exclusively house the owner's horses or out of which a boarding and/or training business is run. These can be of various sizes and sometimes host horse shows, but are much smaller than competition venues and generally have horses housed on-site permanently.

CHP – abbreviation for the Colorado Horse Park located in Parker, Colorado.

Circulation - the routes by which people move through a site, either by foot or vehicle. The four types of circulation of concern in this project are spectator, exhibitor, general vehicular, and service vehicular, all of which are defined in this glossary also.

Competition venue or private facility – a facility that is specifically used for larger equestrian events and contain a variety of elements depending on the location and size. There are no horses permanently housed at these facilities, although they usually have stall barns for horses competing in multi-day shows and may be associated with a nearby boarding facility.

Educational or learning landscape – often used to describe designs for a school or other project in association with a building used for educational purposes, but in this report it will simply refer to a landscape which is meant to educate the user.

Environmental stewardship – defined by the EPA as "the responsibility for environmental quality shared by all those whose actions affect the environment."

Equestrian - having to do with, pertaining, or relating to horses

Equestrian facilities – any facility which caters to equestrian based activities, two types, private and public, are discussed in this report and defined in this glossary.

Exhibit or educational opportunity - when referred to in this report, an exhibit is a space which aims to provide some sort of educational opportunity about a certain topic.

Exhibitor - an individual who comes to an equestrian event or competition for the purpose of participating, this includes the persons actually in the event or anyone that may be associated with them, such as family or trainers. They have almost full access to the facility. Exhibitor circulation serves to transport people and horses between the competition areas and other parts of the site.

Interpretation - an educational activity that aims to reveal meaning and enhance understanding of and appreciation for a subject through first-hand, experiential learning; proven to be extremely effective in knowledge retainment.

LEED - Leadership in Energy and Environmental Design; "an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions."

Service - may refer to two things: service areas which are locations within the venue that provide important functional tasks, goods, or services; including, but not limited to, storage buildings, manure piles, and vendor areas. May also be referring to service circulation, which includes those routes, generally vehicular, that are required for maintenance and the every-day workings around the site.

SITES – Sustainable Sites Initiative; "an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin and the United States Botanic Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction and maintenance practices."

Spectator - someone who comes to an equestrian event or competition for the purpose of watching, they do not participate and do not have a horse with them on-site. They should have limited access to the site. Spectator circulation serves to get people from the parking lot to the observation and amenity areas.

Sustainability – officially defined by the United Nations as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." A functionally sustainable project will take into consideration the environmental, social, and economic aspects of a project along with the needs of the client, and either leave the existing systems undisturbed or improved.

Vehicular - having to do with or catering to vehicles. Vehicular circulation includes those areas where vehicles have access, including passenger cars as well as truck-and-trailer combinations.

Complete Literature Review

Interpreting for Park Visitors by William J Lewis. Philadelphia, Pennsylvania: Eastern Acorn Press, 1981.

This book acts as a guide for people wanting to become interpreters. It begins by discussing what interpretation is and exactly what the expectations are of an interpreter. Chapter one explains the accepted assumptions about how people learn, but also that each person learns differently based on their perceptions gained from previous experiences. Chapter three provides guidelines on how to structure an interpretive presentation, which could also be applied to written narrative. Especially helpful are the sections about choosing a theme, proper structure, and appropriate language for presenting interpretive information. Chapter seven, which is about special considerations, has an interesting part on how to incorporate interpretive education into recreation areas, where the visitors' goals are different from those who visit sites for the primary reason of learning.

Interpreting Our Heritage by Freeman Tilden. Chapel Hill: University of North Carolina Press, 1977.

Tilden begins by defining interpretation as "a kind of elective education that is superior, in some respects, to the classroom for here he [the visitor] meets the thing itself." Then, he describes his six principles of interpretation, which later become the first six principles of Beck and Cable's book. Chapter eight discusses how to go about thinking about written interpretation. It does not necessarily give exact techniques for writing, but rather suggests a framework or process on how to go about thinking about the text and what the necessary questions to ask are.

Environmental Interpretation: A Practical Guide for People with Big Ideas and Small Budgets by Sam Ham. Golden, Colorado: North American Press, 1992.

The first chapter of this book starts off similarly to the other in discussing what interpretation is, but it seems to be more technical and focused on how to actually create the desired end product. There is also an additional section about what it means to have non-captive audiences and the best methods to use with them. Chapter two, again, discusses themes and how to use them effectively in order to provide the visitors with the most knowledge retention. Chapters eight and nine provide specific techniques and design strategies for creating successful exhibits and self-guided tours on a tight budget

Interpretation of Cultural and Natural Resources by Douglas M. Knudson, Ted T. Cable, and Larry Beck. State College, Pennsylvania: Venture Publishing, 1995.
Chapter three of this book discusses how interpretive education benefits the individual as well as society, which will provide me with some good evidence to back up my project. Chapter seven is a summary of learning psychology as it applies to interpretation. This is helpful in that it pairs such a broad topic down into parts that

are applicable to my project and saves me from having to research this on my own. Chapter eight talks about distribution of information to the masses, such as through electronic media, which can greatly increase a project's area of influence and how many people can benefit from the information. Chapter nine is about "the printed word" and what is the most effective way to communicate information through text. Chapter ten gives specific design tips and strategies for museum exhibits and how people use these types of spaces. Finally, chapter eleven briefly talks about the features necessary in creating a self-guided experience through an interpretive design.

The Design of Educational Exhibits by Roger S. Miles. London, Boston: Allen & Unwin, 1982.

This book is a compilation of information dealing with educational exhibit design. Produced by a team from the British Museum of Natural History, the research was done in order to develop a new approach to exhibit design that focused on educating its visitors rather than simply displaying objects. This "new approach" focuses on teaching through interaction and creating new behaviors, which is exactly what I want to achieve.

Chapter three, about the psychology of education, is of specific interest to me. There is a mountain of information out there about the relationship between psychology and learning, and this chapter consolidates and analyzes the information specifically helpful to educational exhibits, as well as writes it in much simpler terms than the actual psychology books. This chapter is a huge time-saver for me!

Also helpful are chapters seven and eight, which deal with the physical layout of exhibits and how to make them as functional and effective as possible. These chapters include information on the sequencing of the entire plan as well and the graphic representation of the individual exhibits, which will both be important factors in my final design.

Exhibit Labels: An Interpretive Approach by Beverly Serrell. Walnut Creek: Alta Mira Press, 1996.

This book focuses on creating interpretive design through labels or narrative text. The first few sections of this book give an overview of interpretive labels and discuss the general goals of interpretation. The section I find most useful is part three, called "Tasks". Here, Serrell outlines exactly what needs to be done in order to create effective interpretive text and provides tips on the exact details on how to make interpretive text successful. I can see this book being extremely useful as I get into the detail design of my spaces.

Mission, Message, and Visitors: How Exhibit Philosophy has Evolved at the Monterey Bay Aquarium by Ramberg, Rand, and Tomulonis. Curator. 45 (2003)

This article is about how exhibit designers at the Monterey Bay Aquarium looked at changing their museum from a passive to mutli-sensory visitor experience. It explains the procedures that the team took while designing their exhibits, what questions they asked, and the steps they took to answer those questions. Their procedure might prove to be a good starting point for me. The most useful thing this article did was list their case studies and references, which will likely end up being some of my precedents and primary resources.

Educating Zoo Visitors about Complex Environmental Issues by Stoinski, Allen, Bloomsmith, Forthman, Maple. Curator. 45 (2002): 129-143.

This article looks at what methods, specifically what types of imagery, are most effective in educating the public. They found that shocking images, such as those animals killed illegally in Africa, had the most impact on visitors, but did not necessarily lead to more knowledge. In the end they concluded that "static displays of text and photographs may not be the most effective methods for educating about complex issues" and that exhibits should offer interactive opportunities for the people. This article may not add a lot of useful information to my project, but it does support my goal of using interactive exhibits to inspire the public.

On Making Exhibits Engaging and Entertaining by The Curator Forum. Curator. 45 (2002): 167-173.

This article discusses the difference between the two types of exhibits found in museums: information based and experience based. Through examining recent (at that time) Curator articles, it finds that actually engaging the visitors in the learning, rather than just telling them, enhances their experience as well as leads to a deeper understanding of the topics.

Again, like the last article, there isn't much here that I will end up using, but it does add more support for my overall project goals.

Understanding Museum Learning from the Visitor's Perspective by Kelly. Curator. 46 (2003): 362-366.

This article explains studies that Australian museums are conducting on what people learn after visiting museums. It brought up two interesting ideas. First, how do I know people are learning from my exhibits? I could possibly add some sort of post-occupancy review to my program which will prove whether or not my design is actually achieving its goals. Second, what is learning? The article lists six types of evidence that confirm learning has happened: increase of knowledge, ability to memorize and reproduce, actions that apply the new knowledge, understanding of the issues, seeing something in a new or different way, and personal change or visitors seeing themselves as an "agent of change". This article's value is that it simply gives me some new things to think about.

Creating Extraordinary Learning Environments by Charlie H. Walter. Curator. 45 (2002): 277-288.

This article talks about the process which goes into turning an exhibit into an effective learning environment. It emphasizes the importance of having a strong foundation of the projects expectations, purpose, and values to begin and then looking at the scope, type of interactivity, techniques, tone, and overall design. This, again, gives me a starting point when it comes time for me to begin my design. The author is also very clear on the importance of working with a team including multiple designers from different backgrounds as well as marketing and financial people in order to have a truly successful project. This may not be very practical for my project, but I may want to get some feedback from the CHP board on the financials of my project.

Designing Exhibitions: A Compendium for Architects, Designers, and Museum Professionals by Bertron Schwarz Frey. Basel, Boston: Birkhauser, 2006.

This book is essentially the exhibit design process. Each section represents a different part of the process, including concept, design, planning, production, and implementation. Although it is more geared toward the indoor museum experience, it does focus on creating spaces that promote interpretive education and some of the ideas could be successful in my project.

Practical Evaluation Guide: Tools for Museums and Other Informal Educational Settings by Judy Diamond. Walnut Creek, California: Alta Mira Press, 1999.

This book provides technical approaches that can be used to evaluate the success of an educational design. Chapter two discusses the general goals of "informal learning", which have a lot of similarities to interpretation. Chapter four, which is about observational tools for evaluation, would be the applicable

to my project. Practices in this chapter include doing general visitor number counts as well as tracking the behavior and movements of a specific visitor. I am not sure if I will directly use the information from this book, but it provides me with a lot of good things to keep in mind while designing my spaces, specifically the circulation between spaces and how visitors may behave in my design.

Mastering a Museum Plan: Strategies for Exhibit Development by Houtgraaf and Vitali. Leiden: Naturalis, Lanham, Maryland. Distributed by Alta Mira Press, 2008.

This book gives another look at the process behind museum design. Especially useful are the many diagrams that they provide to graphically explain their methodology. I can see this book influencing the process diagram for my spring semester work.

Buildings and Arena Suitability

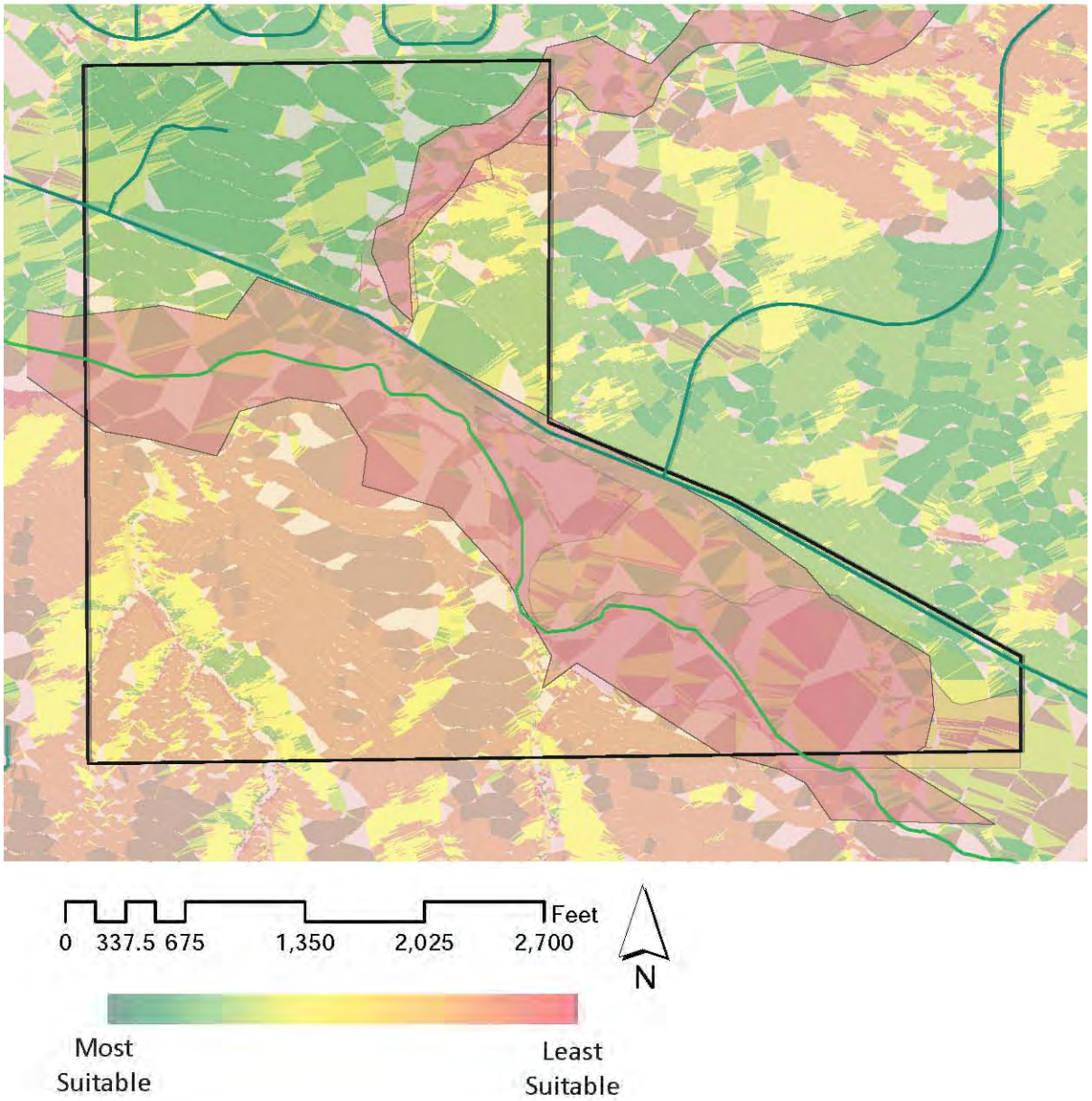

Figure A.1 Building and Arena Suitability Map (Caitlin Admire)

Service and Parking Suitability

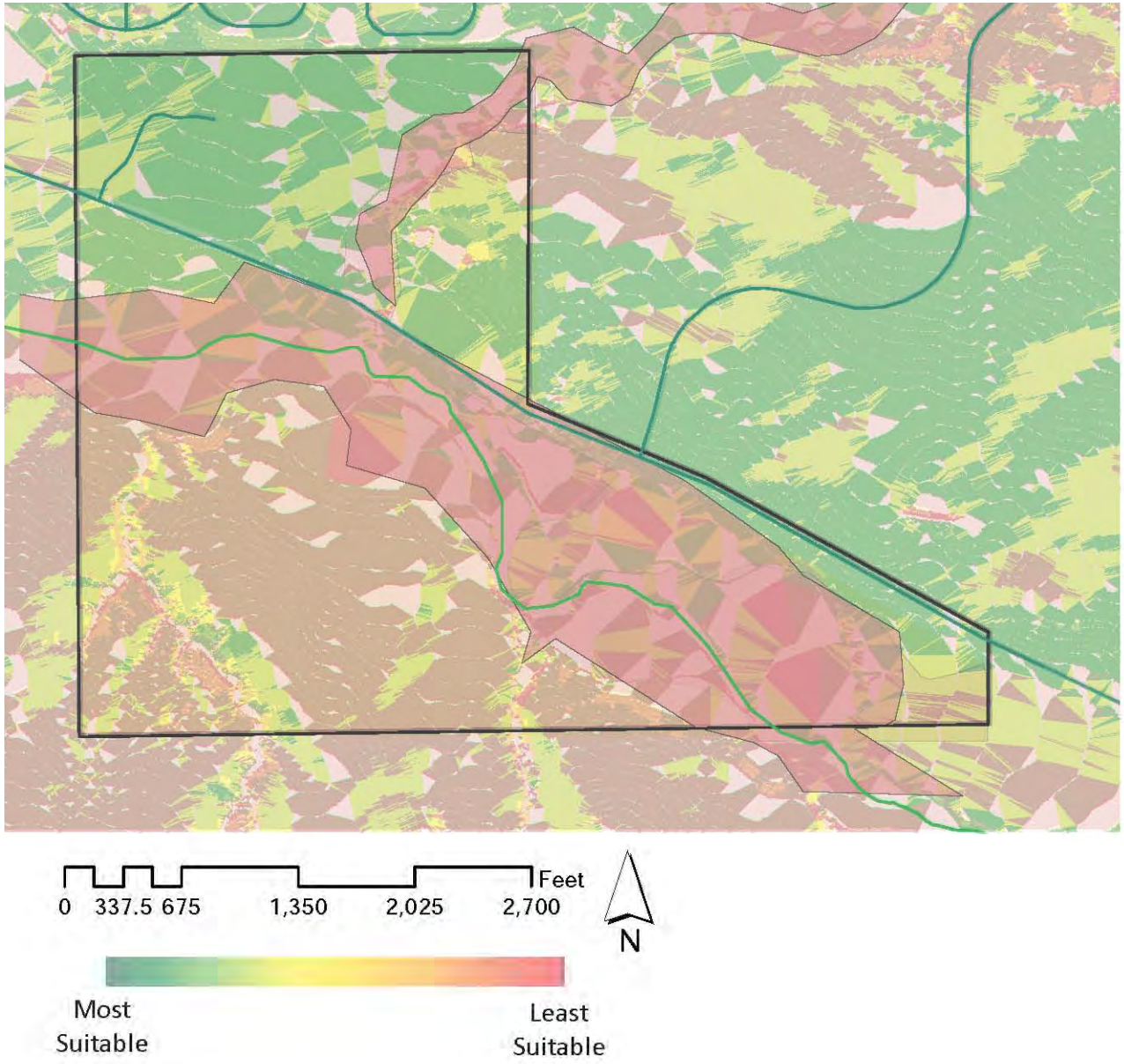

Figure A.2 Service and Parking Suitability Map (Caitlin Admire)

Circulation and Exhibit Suitability

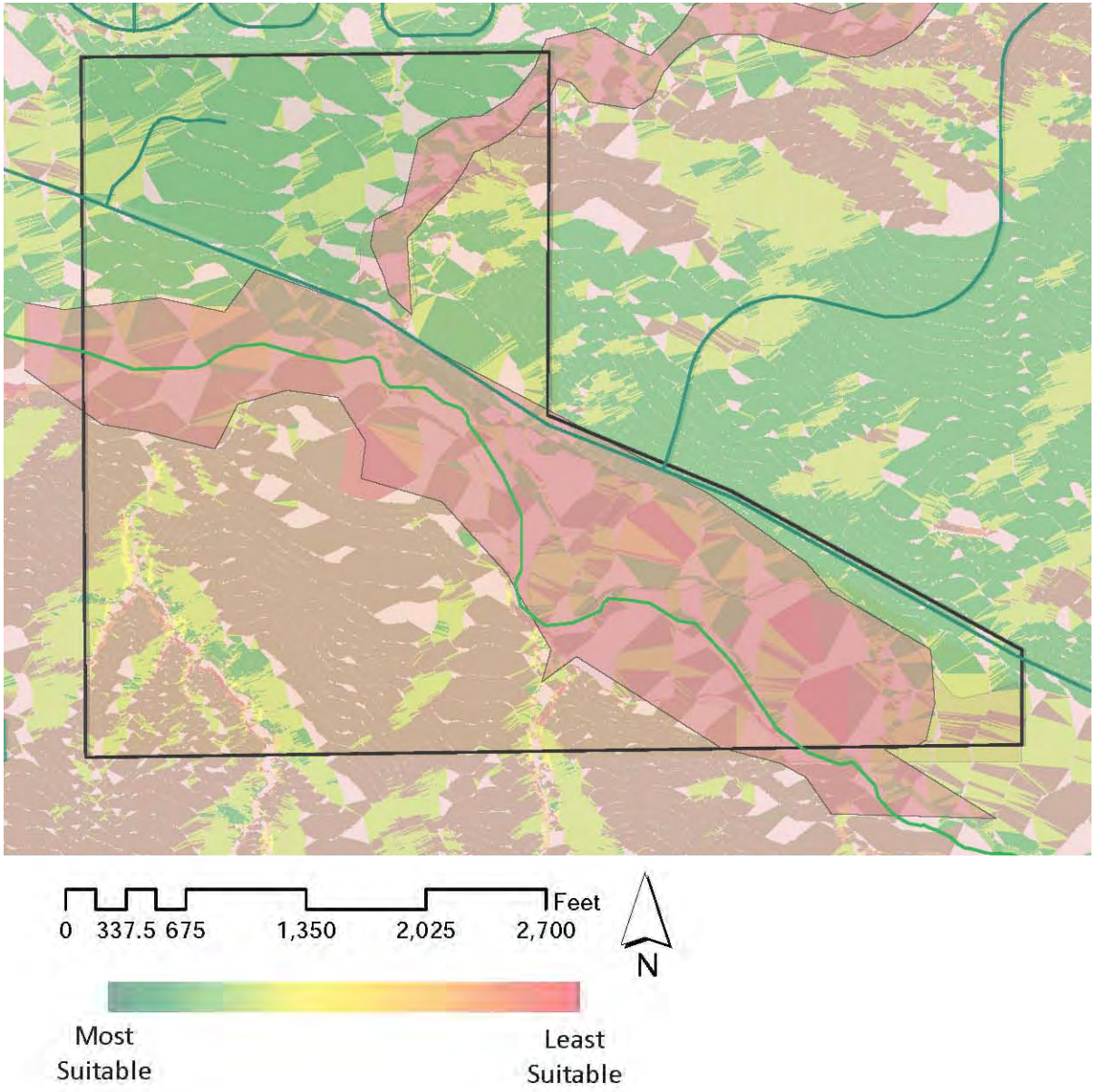

Figure A.3 Circulation and Exhibit Suitability Map (Caitlin Admire)

Entry Suitability

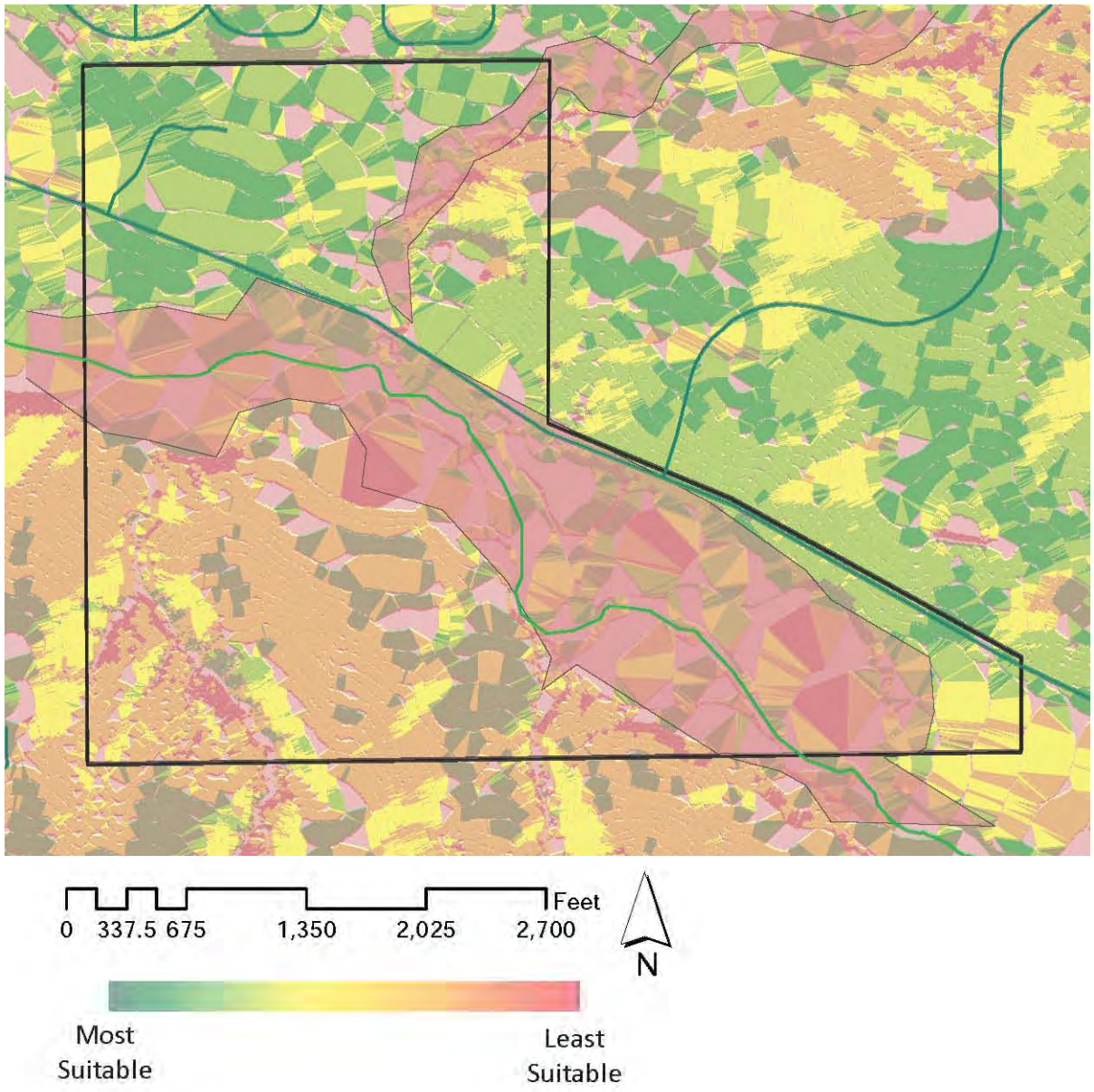

Figure A.4 Entry Suitability Map (Caitlin Admire)

Turnout and Cross Country Suitability

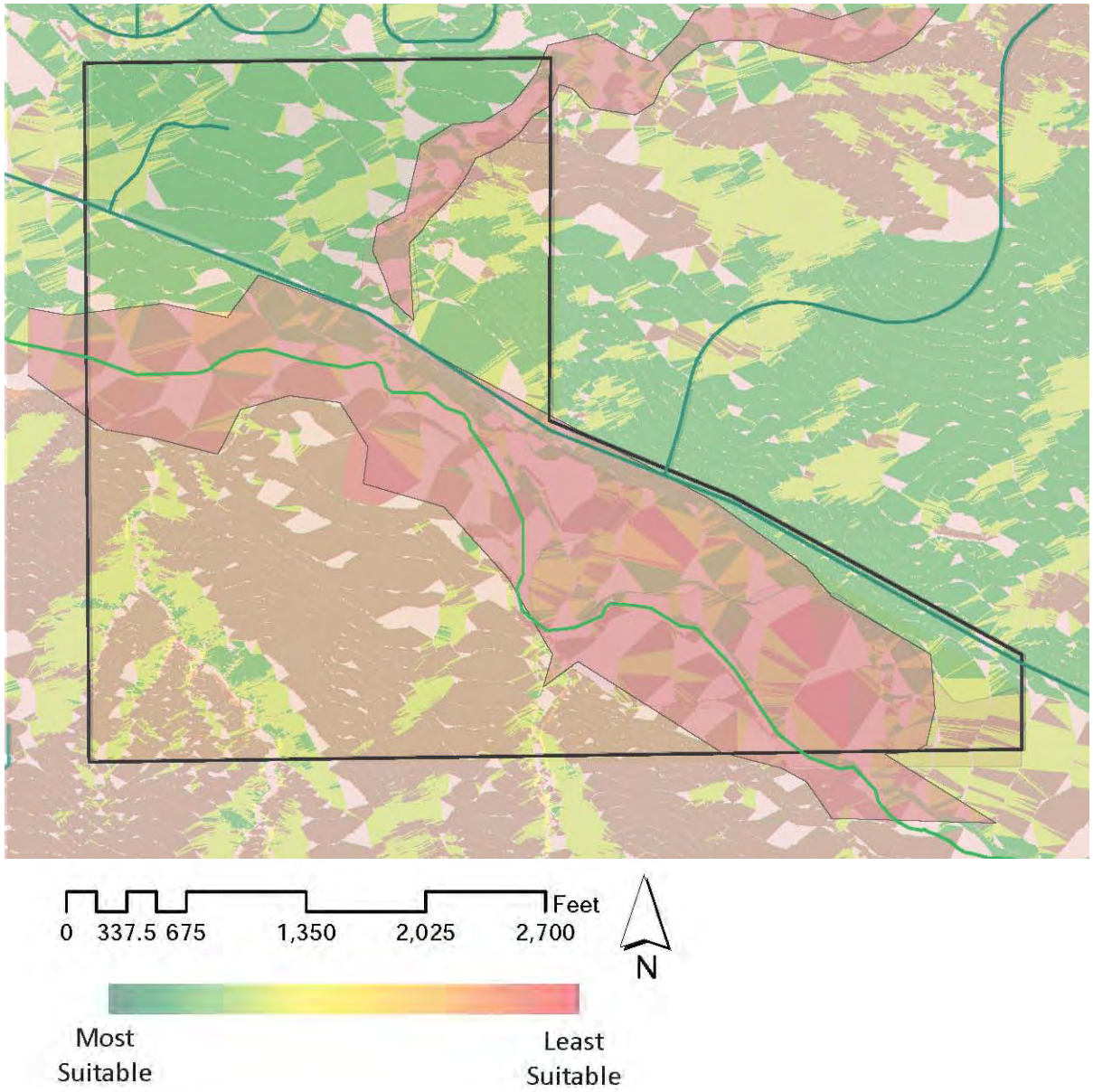

Figure A.5 Turnout and XC Suitability Map (Caitlin Admire)

Camping Suitability

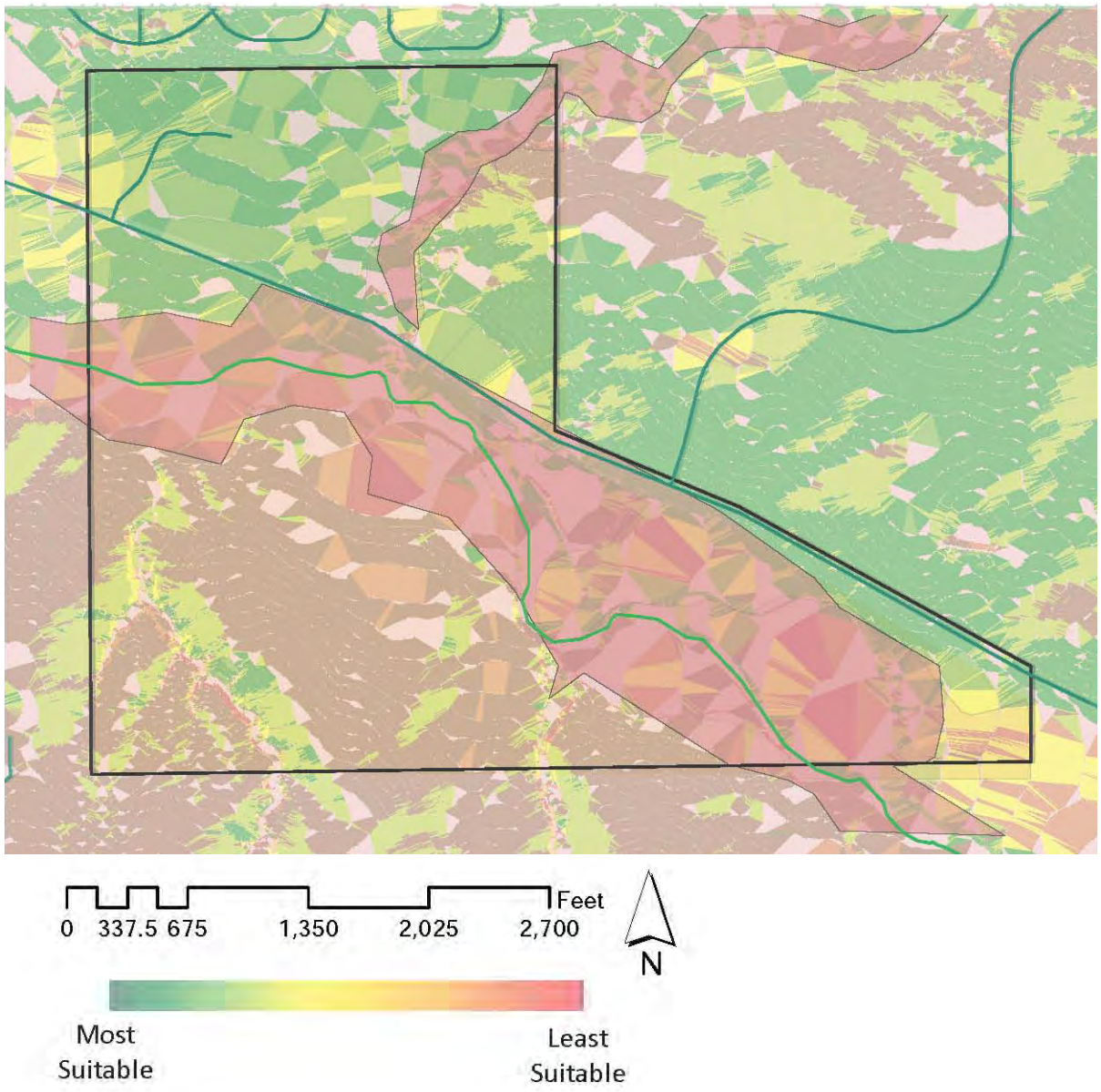

Figure A.6 Camping Suitability Map (Caitlin Admire)

Audubon Program

Audubon Lifestyles Equestrian Facility Program

Program Audit & Verification Guidelines

Facility Name _____

Applicant Name _____

Relationship to Facility _____

Address Info _____

_____

_____

Phone & Fax Numbers _____

Website address _____

Email address _____

Other Information

total site acreage _____

total horses capacity _____

total horses boarded _____

total number of employees _____

total miles of trails _____

number of ponds/lakes _____

streams/rivers onsite? _____

Program Requirements

R1	The facility is currently registered in the Audubon Lifestyles Equestrian Facility Program, and maintains annual membership fees?	Y/N
R2	The facility has adopted and publicly displays a Sustainability Charter for the Equestrian Facilities?	Y/N
R3	The facility requires that all persons under the age of 18 wear ASTM/SEI- approved helmets while mounted?	Y/N
R4	Horses at the facility have access to clean, fresh water at all times?	Y/N
R5	There is no barbed wire anywhere horses are contained on the facility?	Y/N
R6	The facility policies include a requirement for proof of negative Coggins test for all horses visiting or living in the facility?	Y/N
R7	The facility has a Nutrient Management Plan (NMP), and a copy has been sent to Audubon Lifestyles for review?	Y/N
R8	The facility meets the minimum point requirements in each section of the Audubon Lifestyles Equestrian Facility Program Audit, and a copy of the audit has been sent to Audubon Lifestyles?	Y/N
R9	An Exit Interview with an Audubon Lifestyles representative is scheduled (or has already taken place) either onsite or via telephone?	Y/N

I (print name) _____ do attest to the accuracy of every item presented within this audit. The Audubon Lifestyles Equestrian Facility Program is a voluntary program, and I recognize that the principles upon which driv e the program can only be made possible through honest participation from all participants.

Signed: _____ *Date:* _____

Economics & Business

verification options & points awarded

** Please note that only one method of verification is required for any Topic Criteria, and only one method of verification can be applied to Facility Points for any specific Topic Criteria. Multiple methods of verification does not accumualte additional Facility Points.*

	Topic	Criteria	Photo / Image	Written	Verbal	Map / Drawing	On-site Verification	✓
a01	**Business**	The facility has developed a printed business plan that encourages successful strategies for running and a managing the facility		3	1		4	
a02		The facility has a clearly written Vision & Mission Statement in Place		2	1			
a03		The facility has preformed a SWOT Analysis (strengths, weaknesses, opportunities, threats)		2	1			
a04		The facility performs an annual review of all business plans, SWOT, etc.		2	1			
a05		The facility has an appropriate accounting system in place			1			
a06		The accounting system and tax prep are reviewed by an accountant			1			
a07		The facility has preformed a Competitive Analysis		2	1			
a08		The facility has equestrian programming in place			1		2	
a09		The equestrian program is reviewed annually and changed as necessary			1			
a10		The facility has a written annual budget		2	1		3	
a11		The facility has a written marketing plan		2	1		3	
a12		The facility has adequate revenue considerations/subsidizations in place			1			
a13		There are boarding agreement for all boarded horses on file		2	1		3	
a14		A written customer service model has been created by the facility		3	2			
a15	**Marketing**	The facility has a logo that is used specifically for the facility	2		1			
a16		The facility has a brochure that is used to promote the facility		2	1		3	
a17		The facility has a website or web page specific to the facility		2				
a18		The facility has and uses a answering machine or service and returns all calls within a 24 business hour window			1			
a19		The facility has a newsletter and client data base		2	1		3	
a20	**Insurance/Legal**	The facility has a General Liability insurance policy		2	1			
a21		The facility has a Comprehensive insurance policy		2	1			
a22		The facility has Care, Custody & Control insurance		2	1			
a23		The facility has Instructor's Insurance		2	1			
a24		The facility has Loss of Use on expensive horses insurance		2	1			
a25		The facility has Workers Compensation		2	1			
a26		The facility has Health Benefits for staff		2	1			
a27		All Release of Liabilities are reviewed by an attorney			1			
a28		Proper signage regarding risk exposure has been posted	2		1		3	

a29		Barn Rules are displayed in a highly visible area	2		1		3	
a30	**Staff Housing Benefit**	Clean, safe and desirable living conditions for staff exist on site			1		2	
a31		Fire Alarms are installed and checked biannually	2		1		3	
a32		Behavior protocols are in place for anyone living on-site			1			
a33		Cleaning expectations are written		2	1			
a34	**Employees**	Job descriptions are clearly defined, written, and on file for each employee		2	1		3	
a35		References are checked for new employees			1			
a36		Annual review for employee performance are preformed			1			
a37		Drug testing performed on all employees			1			
a38		W-4 and I-9 are filed annually		2				
a39		The facility has a written employee manual or Rules and Regulations document and is given to all employees		4				
		Maximum Allowable Points	8	50	20	0	35	
		Facility Total Points						

Innovation	The facility is doing something that is not listed in this section and would like to apply for additional points. Up to two items can be listed for this section for a maximum total of 6 points. Points and items are awarded exclusively by Audubon Lifestyles, and at their sole discretion. Use the space below to list additional items for this section, and attached any nessesary verification documentation/photos etc.

Minimum Points Required	Facility Final Section Score
30	

Horse Care & Human Safety

verification options & points awarded

** Please note that only one method of verification is required for any Topic Criteria, and only one method of verification can be applied to Facility Points for any specific Topic Criteria. Multiple methods of verification does not accumualte additional Facility Points.*

	Topic	Criteria	Photo / Image	Written	Verbal	Map / Drawing	On-site Verification	☑
b01	**Safety of Horses**	A written Risk Mitigation Plan (RMP) has been created for the facility		2	1			
b02		The RMP includes a weather emergency plan		2	1			
b03		The RMP includes a fire evacuation plan		2	1			
b04		The RMP includes an emergency plan for horses in case of severe injuries		2	1			
b05		RMP drills are performed annually			1			
b06		An assessment of turn out and pasture buddies has been performed for all horses			1			
b07		A First Aid kit for horses is available	2		1		3	
b08		All horses name's are clearly posted on all stalls	2		1		3	
b09		The horse owner's name and emergency number are clearly posted	2		1		3	
b10		An Advanced Directive for every boarded horse is on file		2	1		3	
b11		A policy that requires that all dogs of clients and guests are leashed is strictly enforced		2	1			
b12		The veterinarian phone number is clearly posted	2		1		3	
b13	**Safety of Riders & Visitors**	The facility has had zero accidents that involved EMS or a trip to the doctor's office in the last year for staff, guests and clients			4			
b14		A Risk Mitigation Plan (RMP) includes human safety protocols		2	1			
b15		A Human Emergency Policy and Procedures has been written with assistance from local emergency providers, and signed off on by all employees		2	1			
b16		A procedures and protocols policy has been written to ensure the safety of riders and non-riders		3	1			
b17		A CPR-First Aid poster has been posted in a visible location	2		1		3	
b18		ASTM-SEI Certified helmets are modeled and worn by the staff			1			
b19		An Orientation Plan has been written for family and guests of participants		3	1			

b20		An Orientation Safety Program has been written for beginner riders		2	1			
b21		Barn Rules have been posted in a highly visible location	2	2	1		3	
b22		No Smoking signs have been posted in the barn	2		1		3	
b23		A Release of Liability is on file and updated annually for all (including staff)		2	1		3	
b24		A Life Flight helicopter landing area has been identified	2		1	2	3	
b25		A First aid kit is available and accessible for humans	2		1		3	
b26		Facility requires proper riding attire (boots with heel, breeches or snug fitting pants, no loose and dangling objects, hoods, jewelry, etc).			1			
b27	**Safety of Staff**	Continued safety evaluations and training for all barn staff are preformed			1			
b28		Workers compensation and other employee notices are clearly posted	2		1		3	
b29		All staff are First Aid and CPR trained		2	1			
b30	**Horses**	All horses are at the facility have a minimum Body condition Score (BCS) of 4			1		3	
b31		A schedule for farrier exists (every 6 to 8 weeks)			1			
b32		Have parasite control program established that includes fecal float analysis and strategic deworming.		2	1			
b33		The facility performs annual dental check-ups for all horses			1			
b34		Proof of appropriate vaccinations for each horses are based on facility veterinarian recommendations		2	1			
b35		Horses are fed at least twice daily or have access to ample, adequate natural forage			1			
b36		Health records are kept for each horse. Records include: health history, vaccinations, worming, injections, injuries, vet visits, dental visits, diet changes, shoeing dates, supplement changes, medications and notes, behavioral notes (eating habits, clipping habits, trailer loading, farrier habits), travel information (dates, shipped to location).		2	1		3	
b37		Night Checks are performed			1			
b38		Regular shoe checks are performed			1			
b39		Overall body are checked daily for injury			1			
b40		Staff are certified in Horse First Aid		2	1			
b41		Staff can wrap and boot legs correctly			1			
b42		Horses get stall breaks and/or turnout daily			1			

b43	**Trail Crossing Safety**	The facility maintains proper signage at all crossing locations	**3**		**1**	**3**	**4**	
b44		Run away barriers present at all trail crossings	**3**		**1**	**3**	**4**	
b45		The facility incorporates calming devices (ie speed bumbers and dips) for vehicles on approach	**3**		**1**	**3**	**4**	
b46		The facility has a written Emergency plan for trail emergencies		**2**	**1**			
		Maximum Allowable Points	**30**	**40**	**20**	**14**	**40**	
		Facility Total Points						

Innovation	The facility is doing something that is not listed in this section and would like to apply for additional points. Up to two items can be listed for this section for a maximum total of 6 points. Points and items are awarded exclusively by Audubon Lifestyles, and at their sole discretion. Use the space below to list additional items for this section, and attached any nessesary verification documentation/photos etc.

Minimum Points Required	**Facility Final Section Score**
30	

Facility & Operations

verification options & points awarded

** Please note that only one method of verification is required for any Topic Criteria, and only one method of verification can be applied to Facility Points for any specific Topic Criteria. Multiple methods of verification does not accumualte additional Facility Points.*

	Topic	Criteria	Photo / Image	Written	Verbal	Map / Drawing	On-site Verification	
c01	**Equestrian**	The facility offers a program to teach the basics of grooming			1			
c02		The facility offers a program to teach the basics of tacking			1			
c03		The facility offers a program to teach the basics of mounting			1			
c04		The facility offers a program to teach the basics of horse handling			1			
c05		The facility offers a program to teach the basics of horse anatomy			1			
c06		The facility teaches Emergency Dismount to all new riders			1			
c07		The facility teaches how to handle buck, rear, and take off to all new riders			1			
c08		Tack and equipment safety are checked regularly			1			
c09		Tack fitting for lesson horses are performed monthly			1			
c10		The facility offers a program to assess a rider's ability level			1			
c11	**Certification of Instructor**	The Certification Instructor is ARIA ,CHA USDF, ICP-USEA or BHS certified		3	1			
c12	**Certification of Barn Manager**	The Barn Manager is ARIA or CHA certified		3	1			
c13		The Barn Manager has some Hospitality /public relations training			1			
c14		The Barn Manager has completed college coursework or classes in business management, and/or accounting			1			
c15		The Barn Manager has some kind of other Professional training - demonstrated either through experience, college degree, or continuing education credits			1			
c16	**Barn/Stable**	Adequate cross ventilation exists on the Barn/stable	2			1	3	
c17		The barn/stable incorporates dust control methods			1		2	
c18		The barn/stable has wash stalls and they have appropriate drainage	2		2		3	
c19		Stalls are cleaned daily			1			
c20		Design features that encourage the use of natural lighting such as windows in the barn door, skylights, etc. exist	2		1		3	
c21		The barn/stable incorporates the use of recycled materials in its construction			1		2	
c22		The barn/stable is positioned in such a way to avoid wind tunnels			1	2		
c23		Farrier/Vet station present	2		1	2	3	
c24		The barn/stable has stalls with a size of 12x12 or larger	2		1	2	3	
c25		Clean water is available in all occupied stalls at all times			1			
c26		Flooring and/or subfloor for all areas of barn other than dirt present	2		1		3	
c27		Stall bedding is present where appropriate	2		1		3	

c28		The facility maintains a temperature controlled feed room			1		2	
c29		The facility maintains a temperature controlled tack room			1		2	
c30		Hay storage is located in a separate structure from the barn/stable	2		1	2	3	
c31		Feed stored in a place that is clean and free of contaminants and rodents			1		2	
c32		Feed and hay are free from mold			1		2	
c33		Overall, the barn is safe and free of clutter	1				2	
c34		The walls in each of the stalls are cleaned and disinfected on a schedule		2	1			
c35	**Outdoor Arena**	The outdoor arena has an engineered riding surface	2	2	1		3	
c36		Procedures are in place to mitigate dust in the outdoor arena			1			
c37		The outdoor arena is no smaller than 66' x 197' (small dressage arena)	2		1	2	3	
c38		Sub base and compacted base are present in the arena			1		2	
c39		The outdoor arena has a crowned grade design **OR**	3		1		4	
c40		The outdoor arena has a table grade design and water does not pool anywhere on area surface	2		1		3	
c41		Perimeter fencing exists around the entire outdoor arena	2		1	2	3	
c42		The outdoor arena is dragged and maintained			1			
c43	**Storage Areas**	Hay is stored in a covered structure and stacked for optimum ventilation	2		1		3	
c44		All flammable materials are stored in flame resistant cabinet(s)	2		1		3	
c45		Facility equipment is stored in a covered structure(s) (except horse trailers)	2		1		3	
c46	**Pastures**	Pastures are located near the barn to increase labor efficiency			1	1	2	
c47		Lay up paddock present in pasture			1	1	2	
c48		Safe rounded corners in pastures exists	1				2	
c49		Pastures are free from standing water, accumulated waste, sharp objects, debris and maintained for safety	1		1			
c50		Shelter (either built or natural) that protects from inclement weather conditions are available in pastures	2					
c51		Clean water is available at all times in water dispensers and free of debris and algae			1			
c52		Water dispensers are cleaned regularly			1			
c53		Fencing is well maintained and in good repair	1		1		2	
c54	**Quarantine Area**	A quarantine area exists onsite	2		1	2	3	
c55		The quarantine area is located more than 300 yards away from the herd			1	2	3	
c56		Turn out is available in the quarantine area			1			
c57		Vet access is present in the quarantine area			1			
c58		Electricity present in the quarantine area			1		2	
c59	**Quarantine Barn**	The quarantine area includes a separate barn from main facility	2		1	2	3	
c60		Hot and cold water present in the quarantine area			1		2	
c61		A written Quarantine Plan has been established with disinfectant protocols in place		2	1			

c62		The Manager requires health exam and vet records before arrival of all horses			1			
c63		Grooming tools and all other instruments are not shared or if shared they are disinfected prior to sharing			1			
c64	**Privately Owned Trails**	Less than 20% of all trails on-site are not aligned with roads	2		1	2	3	
c65		Trails are cleared from branches, downfalls and other obstacles that could injure riders or horses			1		2	
c66		Trails are established in permanent amenity areas			1	2	3	
c67		Trails are linked offsite to other recreational areas			1	2	3	
c68		Trails are designed to topography to minimize erosion			1	2	3	
c69		Natural surfaces utilized on all trails	2		1		3	
c70		Bridge crossings exist at all stream crossing locations	3		1	3	4	
c71		Trails are closed during wet seasons to prevent erosion			1			
c72		Safety and trail signage posted in multiple locations	2		1	2	3	
c73		Riders are not permitted to roam at will and are confined to maintained and managed trails			1			
c74	**Overall**	Perimeter fencing of the entire equestrian facility exists			1		2	
c75		The facility is clean, neat and orderly	1		1		2	
c76		Restroom facilities are present and are clean	1		1		2	
		Maximum Allowable Points	**50**	**10**	**30**	**30**	**60**	
		Facility Total Points						
	Innovation	The facility is doing something that is not listed in this section and would like to apply for additional points. Up to two items can be listed for this section for a maximum total of 6 points. Points and items are awarded exclusively by Audubon Lifestyles, and at their sole discretion. Use the space below to list additional items for this section, and attached any nessesary verification documentation/photos etc.						
							Minimum Points Required	**Facility Final Section Score**
							40	

Environmental

verification options & points awarded

** Please note that only one method of verification is required for any Topic Criteria, and only one method of verification can be applied to Facility Points for any specific Topic Criteria. Multiple methods of verification does not accumualte additional Facility Points.*

	Topic	Criteria	Photo / Image	Written	Verbal	Map / Drawing	On-site Verification	✔
d01	**Manure Management**	A manure system is in place to collect, store, and manage manure	3		1		4	
d02		A covered storage structure for manure exists **OR**	3		2		4	
d03		Water runoff is managed from where manure is stored	2		1		3	
d04		If manure is spread, it is spread on non-horse pasture and only where no creeks or streams are present or adjoining the property				1		
d05		Manure Storage facility is in good repair	1				2	
d06		The facility performs weekly removal of manure in pastures			1			
d07		The manure is emptied from the storage area and properly disposed of, or utilized at least twice a year, or as often as required			1			
d08		Horse manure is stored more than 200 feet from any wetland or water body			1	2	3	
d09	**Manure Composting**	Horse manure is composted	4		2		5	
d10		Manure is reused as fertilizer in appropriate locations	3		2	3	4	
d11		Smaller amounts of manure are composted in a three-bin system in which material is moved (and turned and mixed) from to bin to bin	2		1		3	
d12		Composting on a larger scale is undertaken by local agents			3			
d13		Manure is stacked into long rows on a concrete or other similar pad	3		2		4	
d14	**Habitats**	Pastures are free from poisonous plants to horses			1		2	
d15		Wildlife corridors are present between pastures	2		1	2	3	
d16		Grassy buffers for nesting birds are present along the perimeter of pastures	2		1	2	3	
d17		Native vegetation (non toxic to horses) are used in landscaping	3	3	1	3	4	
d18	**Water**	Policies and practices are in place to prevent nutrients from reaching surface waters	2	1	1	2	3	
d19		An infiltration trench exists. An infiltration trench is a rock filled trench with no outlet that receives stormwater runoff.	2				3	
d20		Porous pavement exists in the parking area as a permeable surface to reduce the amount of surface runoff before it infiltrates into the subsoil.	3		1		4	
d21		The facility uses bioretention areas. These areas are landscaping features where surface runoff is directed into shallow, landscaped depressions. These depressions act as a filtration system and pollutant removal.	3		1		4	

d22		The facility uses a sand filter system consisting of two or three chambers or basins. The first is the sedimentation chamber, which removes floatables and heavy sediments. The second is the filtration chamber, which removes additional pollutants by filtering the runoff through a sand bed. The third is a discharge chamber.	2		1		3	
d23		The facility incorporates grassed swales to treat stormwater. As stormwater runoff flows through these channels, it is treated through filtering by the vegetation in the channel.	2		1		3	
d24		All water bodies located on-site incorporate bufferzones along the water edge.	2		1	2	3	
d25		Washwater is not discharged directly to a water body, but is allowed to filter through grassy or forested areas prior to discharge.	2		1		3	
d26		Runoff from parking lots is filtered through grassy or forested areas prior to discharge.	2		1	2	3	
d27	**Pasture Maintenance**	Pastures are divided and managed for horse rest and rotation			1	2	3	
d28		Horses are pastured only in areas that are less than 10% slope			1	2	3	
d29		Sacrifice/dry lots are present in the pasture	2		1	2	3	
d30		When pastures are too wet, when pasture grass is inadequate/overgrazed/in regrowth, recently fertilized, or have been recently treated with herbicides the sacrifice areas are used			1			
d31		Pastures are mowed or used for grazing when grass reaches 6"-10" in height			1			
d32		Local agriculture extension office are consulted on pasture maintenance			1			
d33		Horses do not have access to streams, creeks, ponds, rivers or wetlands			1		4	
d34	**Erosion Control**	High traffic areas are stabilized to and from barn to prevent erosion	2		1		3	
d35		High traffic areas are stabilized in some way to prevent erosion	2		1			
d36		Gutters and downspouts exist around barn	1				2	
d37	**Integrated Pest Management**	Feed rooms include rat wire to prevent rodents	1				2	
d38		When pest problems exist, the underlying conditions are eliminated that may favor the pest, and the problem is treated quickly to reduce the risk of large-scale infestation			1			
d39		The facility disposes of and stores garbage in a way that discourages insect and rodent infestation			1			
d40		Pesticides are not stored on the premises, or are stored in contained areas designed to prevent spills	2		1		3	
d41		The Facility encourage bats, insect eating birds, or other fly predators for flying insect control	2		1			
d42		Plastic Owls or other similar deterrents have been mounted to reduce pest problems	1				2	
d43		The facility encourages other natural pest control methods			1			
d44	**Chemicals**	Chemicals are stored on plastic or metal shelving away from consumables	2				3	
d45		Liquid chemicals materials are stored below dry materials	2				3	
d46		A spill containment kit is available and list of procedures readily at hand	2	2	1		3	

d47		Pesticide containers are disposed of in a legal toxic waste facility			1			
d48	**Resource Conservation**	Compact florescent lighting is used where appropriate throughout the facility	1		1	1	2	
d49		Conservation easements exist on the property			1	2	3	
d50		The facility has and uses recycle bins for cans, bottles, paper and glass	2		1		3	
d51		The facility uses recycled paper for all daily office activities			1			
d52		Motion sensor lights are installed at the facility			1		2	
d53		Staff turns the power off on all office equipment at end of the work day			1			
d54		The facility achieves significant energy and money savings through proper use of programmable thermostat	1				2	
d55		100% of the appliances used on-site are Energy Star Rated or higher	2		1		3	
d56		Solar power, or other alternative energy system is used on-site	3		1		4	
d57		A rain water collection system is present on-site	3		1		4	
d58		At least 10% of human consumables purchased are produced locally		2	2			
d59		At least 10% of horse consumables purchased are produced locally		2	2			
d60		Hay is produced on-site			3		4	
		Maximum Allowable Points	70	10	15	28	80	
		Facility Total Points						

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Minimum Points Required	Facility Final Section Score
30	58

Outreach & Education

verification options & points awarded

** Please note that only one method of verification is required for any Topic Criteria, and only one method of verification can be applied to Facility Points for any specific Topic Criteria. Multiple methods of verification does not accumualte additional Facility Points.*

	Topic	Criteria	Photo / Image	Written	Verbal	Map / Drawing	On-site Verification	✓
e01	**Fact Sheets Onsite** *(1 point for each factsheet up to a maximum total of 10 points)*	Trail Riding Etiquette for Horse Enthusiasts		1				
e02		The Basics of Equine Behavior		1				
e03		Vaccination and Disease Primer		1				
e04		Stressing Indicators for Horses		1				
e05		Saddling and Bridling Horses Safely		1				
e06		Mounting, Dismounting and Riding Horses Safely		1				
e07		Horse Trailer Maintenance and Trailering Safety		1				
e08		Stress Management for Equine Athletes		1				
e09		Establishing and Managing Horse Pastures		1				
e10		Best Management Practices for Horse Manure		1				
e11		Composting on Small Farms		1				
e12		Equine Barnyard Management		1				
e13		The Basics of Equine Nutrition		1				
e14		Care for the Older Horse: Diet and Health		1				
e15		Safety Recommendations for the Stable, Barn Yard, and Horse/Livestock Structures		1				
e16		Horse Trailer Maintenance and Trailering Safety		1				
e17		Fire Prevention and Safety Measures Around the Farm		1				
e18		Machinery and Equipment Safety		1				
e19		Factsheets listed above are available onsite and printed on recycled paper			2		4	
e20	**Website & Internet**	The facility has a website or web page specific to the equestrian facility		4				
e21		The facility has a web pages describing the sustainable attributes of the equestrian facility		3				
e22		The facility displays the Audubon Lifestyles Logo on our website	2					
e23		The facility has a link to the Audubon Lifestyles website from their website		2				
e24		The facility has an International Sustainability logo on their website	2					
e25		The facility has a link to the International Sustainability Council Website from the website		2				
e26		The facility has publicly displayed Sustainability Charter on the website.		2				
e27		The facility has a digital newsletter that is used to provide information describing the sustainability efforts of the equestrian facility.		3				
e28		Digital versions of factsheets are available on the website (1 point for each factsheet listed up to a total of 10 points maximum)		10				

e29	**Signs & Displays**	The facility displays the Audubon Lifestyles Logo in a publicly visible location on-site	1				2	
e30		The facility displays the International Sustainability Council logo at in a publicly visible location	1				2	
e31		The facility has signs or a display at the facility describing the value of native plants	2				3	
e32		The facility has a series of plant id signs to inform guests, clientele, and staff of specific plant species located on-site	2				3	
e33		The facility has signs or a display at the facility informs the public about, local or migratory birds	2				3	
e34		The facility has signs or a display at the facility informs the public about, local wildlife	2				3	
e35		The facility has signs or a display at the facility describing the local watershed and/or the importance of watersheds	2				3	
e36	**Other Outreach Opportunities**	The facility staff has hosted a group of children (school classroom, 4-H, boy scouts, other) to the site for a tour and discussed the importance of sustainable equestrian facilities			2			
e37		The facility staff has hosted a group of children (school classroom, 4-H, boy scouts, other) to the facility and provided a workshop to create bird nest boxes.			2			
e38		The facility staff has spoken either on-site or off-site to an adult group about the importance of managing sustainable equestrian facilities.			2			
e39		The facility has adopted a local school by paying their annual membership in the Audubon International Adopt a School Program		5	5			
e40		Volunteer groups help maintain public trail systems	3		2			
e41	**Education**	Reference book available onsite: Hands-on Horse Care from Horse and Rider			1		2	
e42		Reference book available onsite: The Complete Book of Equine First Aid			1		2	
		Maximum Allowable Points	30	45	15	0	25	
		Facility Total Points						

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Minimum Points Required	**Facility Final Section Score**
20	

Equestrian Facility Summary Page

Category	Minimum Points Required	Maximum Points Allowed	Adjusted Facility Score
Economics & Business	30	70	
Horse Care & Safety	30	70	
Facility & Operations	40	80	
Environmental	40	80	
Outreach & Education	20	60	
TOTAL	160	360	0

Audubon Lifestyles Designation	Points Required	ISC Seal Earned	✔
Audubon Lifestyles Equestrian Facility – 1 Star	160	NO	
Audubon Lifestyles Equestrian Facility – 2 Star	200	NO	
Audubon Lifestyles Equestrian Facility – 3 Star	230	YES	
Audubon Lifestyles Equestrian Facility – 4 Star	260	YES	
Audubon Lifestyles Equestrian Facility – 5 Star	300	YES	

INTERNATIONAL SUSTAINABILITY COUNCIL

The Audubon Lifestyles Equestrian Facility Program was created through a collaborative process that involved experts in the fields of equestrian facility management, wildlife management, and sustainability. This includes but is not limited to individuals representing Audubon Lifestyles, Equestrian Services LLC, and the International Sustainability Council.

Pages 135-149
Figure A.7 Audubon Audit Chart
(www.audubonlifestyles.org)

SITES Program

INDEX OF PREREQUISITES AND CREDITS

7. Construction — 21 possible points

Minimize effects of construction-related activities

8. Operations and Maintenance — 23 possible points

Maintain the site for long-term sustainability

9. Monitoring and Innovation — 18 possible points

Reward exceptional performance and improve the body of knowledge on long-term sustainability

Pages 151-153
Figure A.8 SITES Credits Chart
(www.sustainablesites.org)