

STEINER
THUESEN
PLLC

GOLF COURSE ARCHITECTURE
IRRIGATION DESIGN
LANDSCAPE ARCHITECTURE

**EXPERIENCE *and*
INNOVATION**

GOLF COURSE ARCHITECTURE



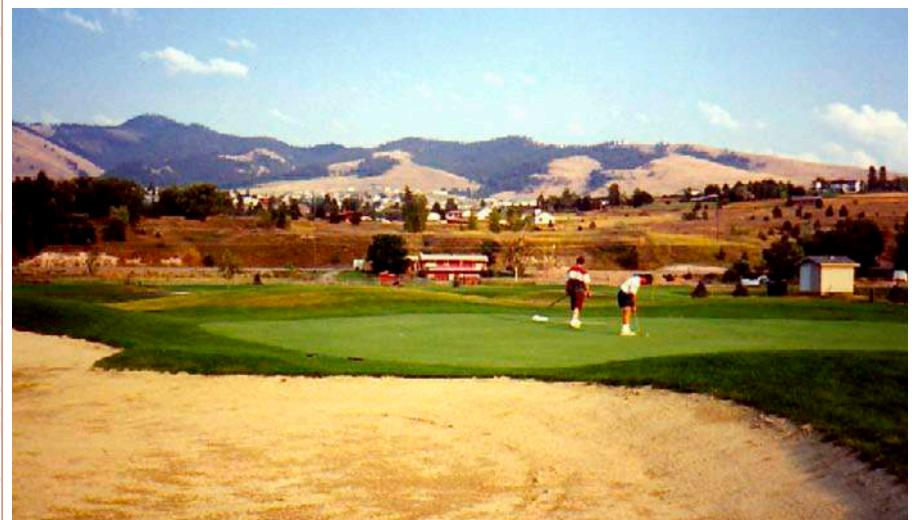
FIRM PROFILE

Steiner Thuesen PLLC is a Landscape and Golf Course Architectural Firm located in Billings, Montana. The principal is a Registered Landscape Architect who has practiced in Montana and the northern Rocky Mountain for over 20 years, providing the firm with a thorough understanding of the region's unique climate, plant materials and construction challenges. This experience is applied to each of our projects.

Founded in 1984, the practice has focused on providing creative yet practical solutions to site design and golf course architectural challenges with special attention given to client responsiveness and quality of the constructed product.

The firm provides a full range of services including master planning, site design, construction document preparation, estimating, and periodic construction observation. Recent contracts have enlisted the firm's services for community and regional parks, sports facilities, new construction and remodeling of golf courses, site improvements for retail centers and state universities, and major irrigation projects. Steiner Thuesen PLLC's experience with construction of projects is invaluable in developing realistic budgets, buildable plans and accurate cost estimates for planning and design projects.

SAND TRAP/BUNKER

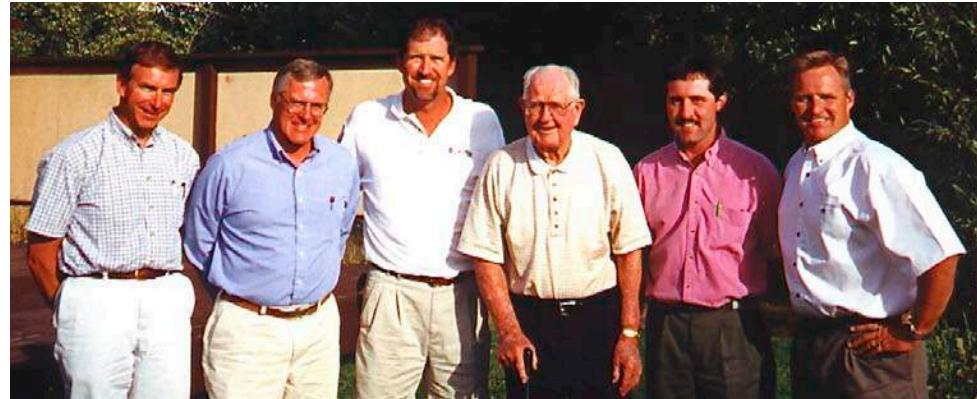


GOLF COURSE ARCHITECTURE

TETON SPRINGS GOLF & CASTING CLUB

Victor, Idaho

SAND TRAP/BUNKER



• golf course design team - left to right •

Bob Ablondi, Carl Thuesen, Steve Jones, Byron Nelson, Mike Etchemendy, Gary Stevenson

Steiner Thuesen PLLC was retained initially to provide golf corridor definition and preliminary master plan level course routing for this resort development located at the western foot of Teton Pass. The office was also responsible for extensive water use calculations to demonstrate that the development would maintain irrigation water consumption within existing water rights.

Following plan approval the firm was retained to design the golf course irrigation system, encompassing nearly 700 acres. The system provides raw water for irrigation of the golf course, landscaped commonly held open space and for the individual lots. It is automatically controlled using computers to monitor flows and to adjust for varying weather conditions. Two custom-designed computer-controlled pump stations furnish the 6,000 gallons per minute needed for system operation.

The irrigation system design was prepared working with golf architect Gary Stevenson, course superintendent Mike Etchemendy, civil engineer Bob Ablondi, consulting touring pro and US Open champion Steve Jones, and living golf legend Byron Nelson.



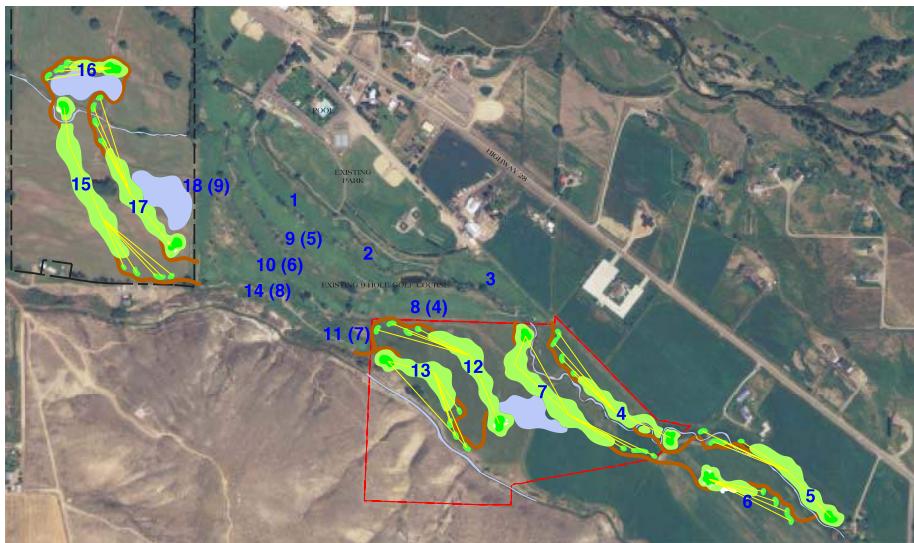
Project Master Plan

GOLF COURSE ARCHITECTURE

SALMON VALLEY GOLF COURSE

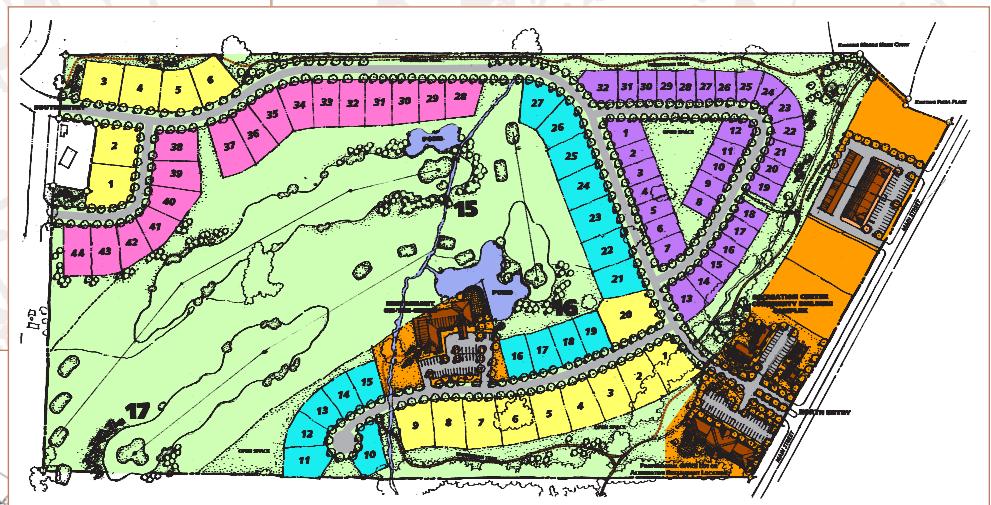
Salmon, Idaho

The Salmon Valley Golf Course commissioned Steiner Thuesen PLLC to provide master planning for their nine-hole course expansion. Early in the planning process, it became evident that it would not be feasible to develop a good portion of the available land due to the steep terrain. As the planning process continued, Steiner Thuesen PLLC developed an innovative solution that proved to be beneficial to not only the golf course but an adjacent landowner as well.



The landowner agreed to allow a portion of the golf course expansion to be located on their property. This solution allowed the golf course expansion to move forward and also provided additional amenities for the future housing and commercial development planned by neighbor. The final master plan included six new holes on golf course property to the south of the existing course and three new holes on the neighboring development to the north, providing a win-win design solution.

Our involvement in both the golf course and subdivision planning resulted in a well-integrated plan that provided better benefits to both clients.



Following approval of the Master Plan, revisions to the previously designed irrigation system were provided. The new design included a fully automated pump station that is centrally located to provide irrigation water in a more efficient manner to the existing golf course and the planned expansion.

GOLF COURSE ARCHITECTURE

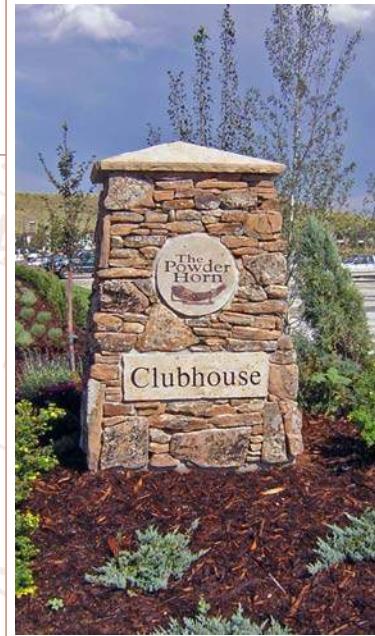
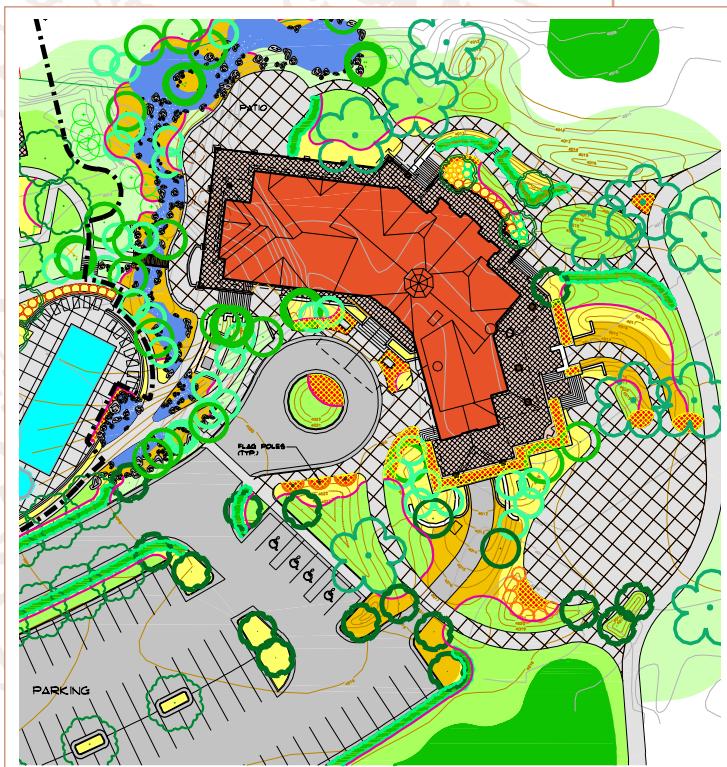
THE POWDER HORN CLUBHOUSE

Sheridan, Wyoming



SAND TRAP/DUNKER

When Sheridan, Wyoming architect Dan Stalker called to request our help with landscaping for the new clubhouse at The Powder Horn, we jumped at the opportunity to become involved. The Powder Horn development combines residential properties and a championship 27-hole golf course on a historic ranch property with spectacular views of the Big Horn Mountains. The golf course has been recognized by Golf Digest as one of the best new layouts in the west, and the clubhouse would be the finishing touch for the golfing experience.



Dan had envisioned a water feature to separate the clubhouse from the adjacent pool and spa, and to add drama to the arrival experience at the clubhouse. This concept was expanded; wrapping the lower section of the water feature around a patio located off the locker rooms and then bringing it into play along the right side of the approach to the ninth green.



GOLF COURSE ARCHITECTURE

THE POWDER HORN CLUBHOUSE

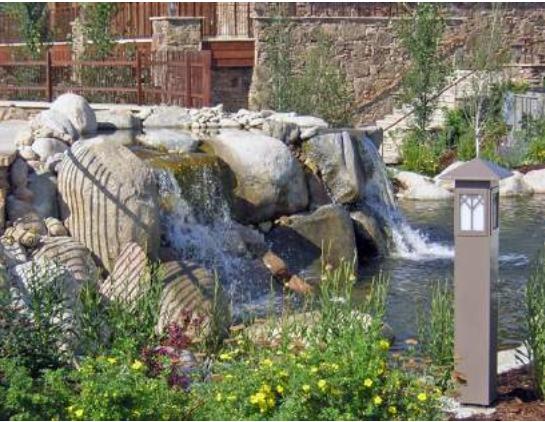
Sheridan, Wyoming

TRAP/DUNKER



A naturalistic water feature design was developed to be reflective of spring fed mountain brooks common along the east slope of the Big Horn Mountains. Along this same theme, the water feature was developed without filtration. An infiltration gallery adjacent to nearby Little Goose Creek was developed to provide the water source. Fiber-optic lighting, which can be programmed to produce a variety of effects, was incorporated in the water feature design and field located during construction. The water feature was published in the national magazine Landscape Architect and Specifier News.

While the water feature was under construction we developed site landscaping plans for the remainder of the clubhouse area, including the arrival designation, pool and parking facilities. A landscape lighting plan was completed to artistically light the grounds and building. Installation of the custom entry signage, irrigation, plantings and landscape lighting completed the clubhouse and pool environment.



GOLF COURSE ARCHITECTURE

BILL ROBERTS GOLF COURSE

Helena, Montana

A complete remodel of the front nine, including new greens, tees, bunkers, water features, tree planting and irrigation systems was performed for this municipal golf course. A multi-phased approach was used during construction, permitting the project to be funded with profits generated by operation of the golf course.



"The design and construction planning has allowed us to maintain reasonable play conditions on Bill Roberts Golf Course at all times during remodeling. You could always get in an 18 hole round."

Randy Lilje
Community Services Director



BIG SKY GOLF COURSE IRRIGATION SYSTEM REPLACEMENT

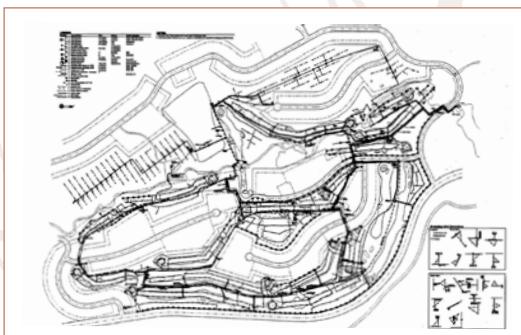
Big Sky, Montana

Construction plans were prepared to replace the irrigation system on this Arnold Palmer designed 18 hole golf course using treated effluent as a water source. The enhanced coverage provided by the wall-to-wall system covers 193 acres, delivering 3,600 gallons per minute. A central computer controls the system automatically while optimizing performance of the three variable frequency drive main pumps and three horizontal centrifugal booster pumps.



"I attribute Carl's fresh approach and irrigation design innovations with successful cost control and construction period mitigation for this difficult project."

Ron Edwards, General Manager
Big Sky Water & Sewer District



As in all of our remodeling work special design and construction methods were used to maintain golf course playability to the maximum extent possible during the construction process.



Recent efforts have included a nutrient management plan that will provide additional control of the irrigation system scheduling and application rates to prevent runoff into adjacent streams.

Steiner Thuesen PLLC's efforts provided important data that was used to make key irrigation control system programming and valuable record drawings.

GOLF COURSE ARCHITECTURE

BELL NOB GOLF COURSE

Gillette, Wyoming

Our consulting relationship with Bell Nob has been ongoing for two decades. The course was constructed by a land developer and purchased by Campbell County several years later when the developer met with financial difficulty. Many of the course construction solutions had initially been driven by economics, that is to say what would be least expensive to build, without consideration for maintainability or future quality. The County's golf course superintendent, Dwayne Dillinger, CGCS, set out to correct these deficiencies. Dwayne's goal was to improve playing conditions on the course while reducing maintenance costs and inputs.



Initially, Steiner Thuesen PLLC was retained to prepare a long range master plan for course improvements. The plan focused on adjustments to the course layout to improve play, and on development of better grassing definition to reduce the area under irrigation. Expensive potable water was used to irrigate the golf course, as it is the only suitable source available. Purchase of water was the single largest line item in Dwayne's annual budget. Recommendations were made reducing green turf by 25%, bringing native prairie more into play.

Next construction documents were prepared for replacement of the irrigation system. Although this design was not funded by the County in its entirety, it did result in replacement of the courses' aging control system with centralized computer controls. Several years later the old pumps were modernized. Once again our design served as the guideline for the replacement systems.

Most recently, we were retained to update our earlier irrigation system replacement design, which was installed during July and August 2001. The design was worked out to provide very uniform irrigation coverage using independent testing data for the sprinklers and specialized design software. Many part-circle heads and smaller heads running on block valves were used to achieve the acreage reduction and grassing definition envisioned years earlier in the master plan. Several course improvements including fairway drainage, bunker closures, mounding and tee additions were also included in the contract per the original master plan.



The golf course was not closed during construction. In fact, the Wyoming mid-am and several other tournaments were hosted while construction was in progress. A temporary hole was used to provide 18 holes of play at all times. Special installation methods resulted in virtually no damage to the golf course. Steiner Thuesen PLLC provided GPS as-built mapping of the project as it was installed. The mapped data was then converted directly to the control software format and input to the computer, permitting on screen control of individual heads from the central controller or from a palm computer.



GOLF COURSE ARCHITECTURE

POLSON COUNTRY CLUB

Polson, Montana

Nine holes were added to Polson Country Club as part of the Mission Bay development. Steiner Thuesen PLLC was retained by the City as irrigation consultant, working with golf architect John Steidel who was retained by the developer.



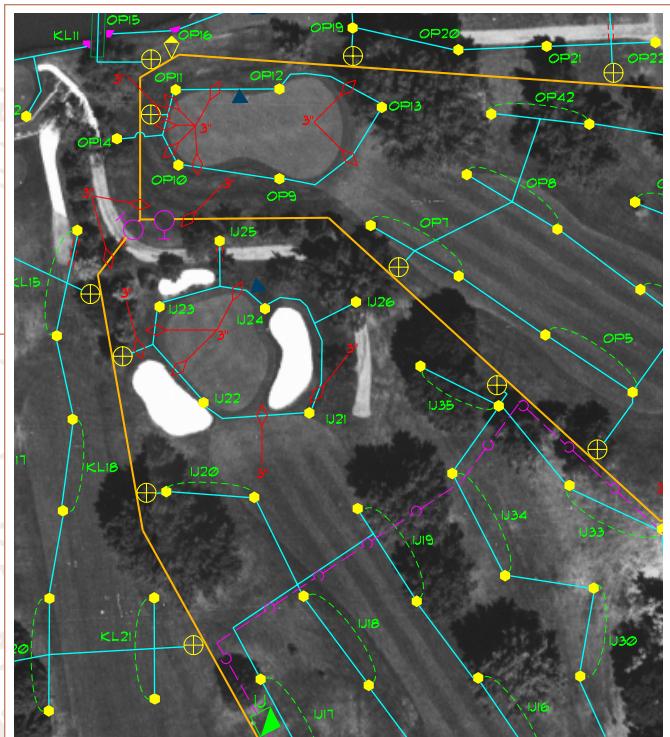
The firm provided an extensive hydrologic analysis of the golf course irrigation supply and developed plans which permitted the City to expand its existing well. An alternative water source was developed using existing water rights from a canal which crossed the golf course property. The two water sources, and corresponding reservoirs, were interconnected using the irrigation system piping and pumps so that water could be used from either source automatically.

A wall-to-wall irrigation system was designed, making extensive use of part-circle equipment to provide full coverage from property line to property line through the golf corridor. The Owner's existing irrigation control system was updated and incorporated in the new design.

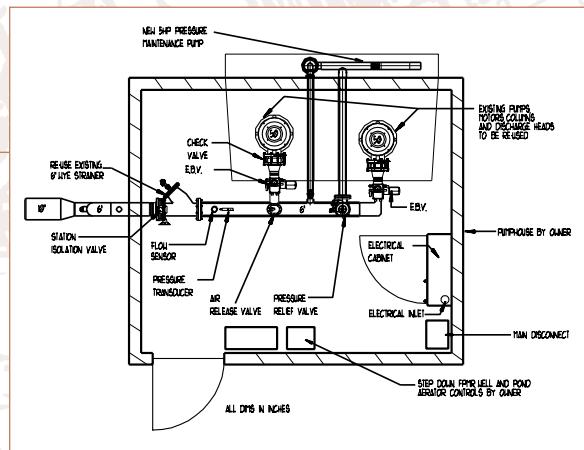


HILANDS GOLF CLUB IRRIGATION SYSTEM REPLACEMENT

Billings, Montana



After a thorough evaluation and budgeting process, plans were prepared to replace the aging irrigation system at this classic 9 hole golf club. The existing pumps were renovated with the addition of new self-governing controls and a pressure maintenance pump. Existing pump electrical systems were replaced. The remainder of the irrigation system was completely replaced with new sprinkler equipment, computerized controls, and piping. To minimize disruption of the course by the replacement construction the controls used radio communications. The entire property was irrigated, fence to fence.



GOLF COURSE ARCHITECTURE

KENDRICK GOLF COURSE

Sheridan, Wyoming

Comprehensive long-range master plans were prepared for this municipal golf course. The plan analyzed long-range water consumption, and proposed systems of on-site storage to meet projected needs. Other points of particular focus were the practice area, and the need to integrate a cart storage facility into the clubhouse site development.



"The City Golf Commission is happy with the Master Plan we have received and we think it will allow us to make Kendrick Golf Course even more challenging and beautiful than it already is."

Bernie Spielman, Chairman
City Golf Commission

Following completion of the master plan the firm was retained to remodel all greens on the front nine. The project included efforts to better frame the greens through extensive work on the surrounding areas, irrigation system modifications, and complete reconstruction of the greens to USGA specifications. Modifications to several tees were also made according to the master plan to improve playability.

Steiner Thuesen PLLC recently completed the design of the replacement irrigation system for the entire golf course.

WILLISTON MUNICIPAL GOLF COURSE

Williston, North Dakota

SAND TRAP/DUNKER

Complete course development services were commissioned by the City, including layout and master planning, preparation of construction documents, and construction management. The project was designed to act as a waste site for excess earth generated by construction at the adjacent municipal airport.



"Working with both governmental bodies and citizens committees, his patience, assessment of needs and rapport were highlights in our working relationship."

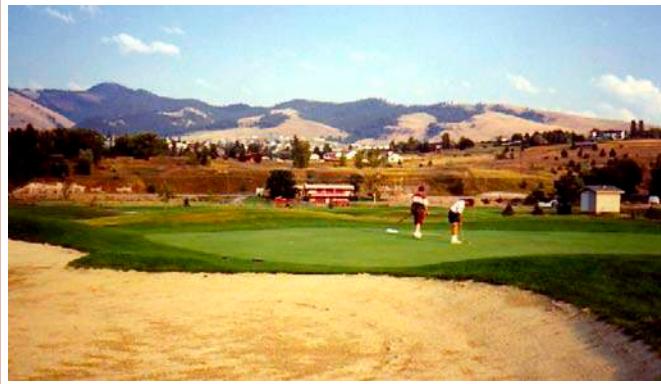
Steven M. Neu
Director of Parks & Recreation



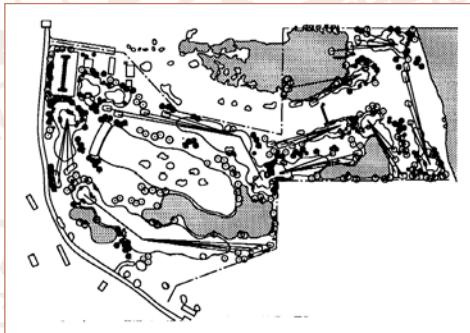
GOLF COURSE ARCHITECTURE

LINDA VISTA EXECUTIVE GOLF COURSE

Missoula, Montana



Design of this nine-hole executive golf course entailed development of an environmentally sensitive site within the Bitterroot River floodplain. The course was routed to strictly avoid wetland areas, eliminating the need for a Section 404 Permit. A Special Use Permit and Floodplain Development Permit were granted by the County Planning Board. Master planning, construction documents and construction management services were commissioned in addition to reports for permitting.



BILLINGS PAR-3 GOLF COURSE Billings, Montana

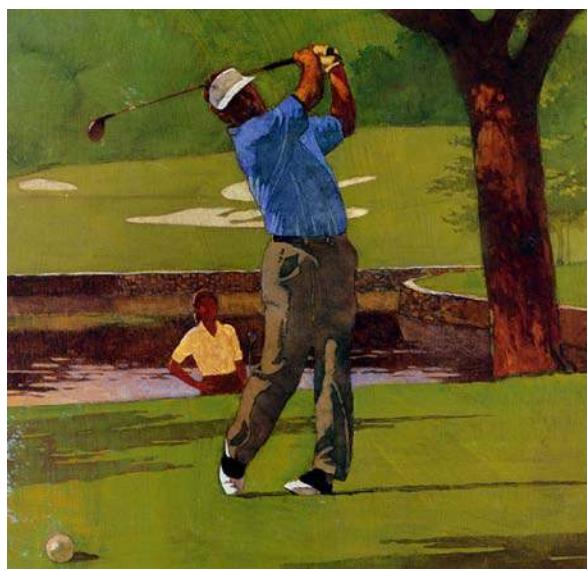
SAND TRAP/DUNKER



Construction documents were prepared for this highly successful 18-hole municipal golf course. Construction management services were also provided for the project.

"We have been pleased with Carl's work and recommend him highly."

Mike Hink, Director
Department of Parks, Recreation &
Public Lands



GOLF COURSE ARCHITECTURE

PONDEROSA BUTTE GOLF COURSE

Colstrip, Montana

The Colstrip Park and Recreation District commissioned design of Ponderosa Butte Golf Course as part of a \$2.2 million capital improvements program for their park system. The course wraps around a pine-studded scoria butte, from which it takes its name, and integrates Armell's Creek as an important design feature effecting play.

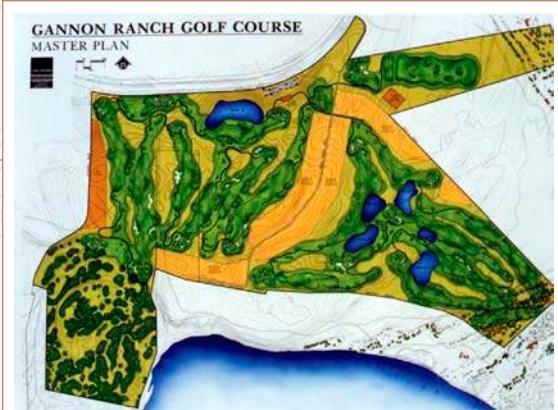


"We feel that we will have a golf course that will not only take care of the local golfers, regardless of skill level, but will also provide a draw for golfers in the region to come to Colstrip."

Rick Harbin, Executive Director
CPRD

GANNON RANCH GOLF COURSE

Great Falls, Montana



The Gannon family retained Steiner Thuesen PLLC to develop a master plan for development of their ranch property located on the Missouri River west of Great Falls. A championship length 18 hole course was planned in conjunction with subdivision for single family housing. The family was able to build much of the golf course in-house from the detailed master plan documents, resulting in significant savings. The firm also provided construction design for the golf course irrigation system.

COLVILLE ELKS GOLF COURSE

Colville, Washington

A detailed master plan for a nine hole addition was provided to Colville Elks Golf Course. The hole routing was cleverly laid out to optimize use of the natural rolling character and water features present on the property. By fully utilizing the site features an estimated savings of at least \$200,000 will be realized by the Club during project construction. A very detailed master plan was provided to facilitate in-house construction at minimal expense.



GOLF COURSE ARCHITECTURE

MEADOW LARK COUNTRY CLUB

Great Falls, Montana



A beautification project to construct new tees, remodel bunkers, and provide new practice facilities was commissioned by this prominent Club. Several existing water features were enhanced, while a new pond was built. In order to address the course's unusual length for women, four rated tee positions were installed on each hole, with special forward tees provided for the ladies.

Design and construction period services were provided for the recent replacement of the golf course irrigation and control systems.

TWIN LAKES VILLAGE

Rathdrum, Idaho



Designs for remodeling the existing nine-hole course and a nine-hole addition were prepared as consultants to Landmark of Coeur D' Alene, who were planning the new community development. The nine-hole addition was laid out through mixed forest to provide challenging golf play and to capitalize on existing site amenities. Routing and location of features on the course were also used to define several sites for housing construction



"We feel that having Mr. Thuesen as our golf consultant made our finished plan and our project more successful. He has demonstrated to us his experience and service represent the best value available in the region today."

Jonathan Mueller, ASLA
Landmark

GOLF COURSE ARCHITECTURE

PETER YEGEN JR. GOLF CLUB

Billings, Montana

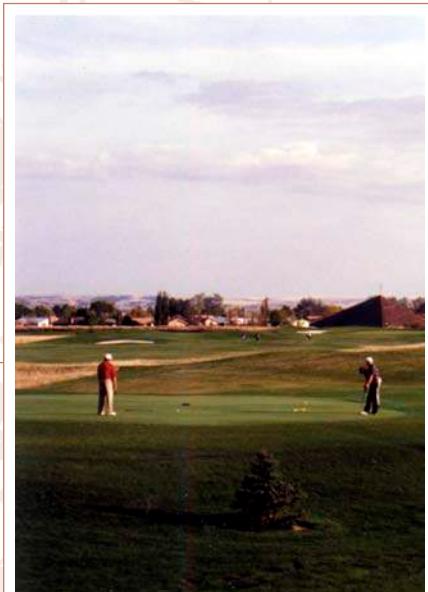
This assignment included master planning, construction design and supervision services for an 18-hole daily fee golf course. Since the site had been leveled for farming, it was necessary to move in excess of 400,000 cubic yards of earth to sculpt the golf course and to create positive drainage. As a public course designed for heavy use, the practice facilities were generously sized and lighted for extended night use.



"Beginning with a flat site was difficult. The great variety of topography and shot values created make this course an outstanding public facility."

Dan Wiley, Managing Partner
Montana Golf Properties

SAND TRAP/BUNKER



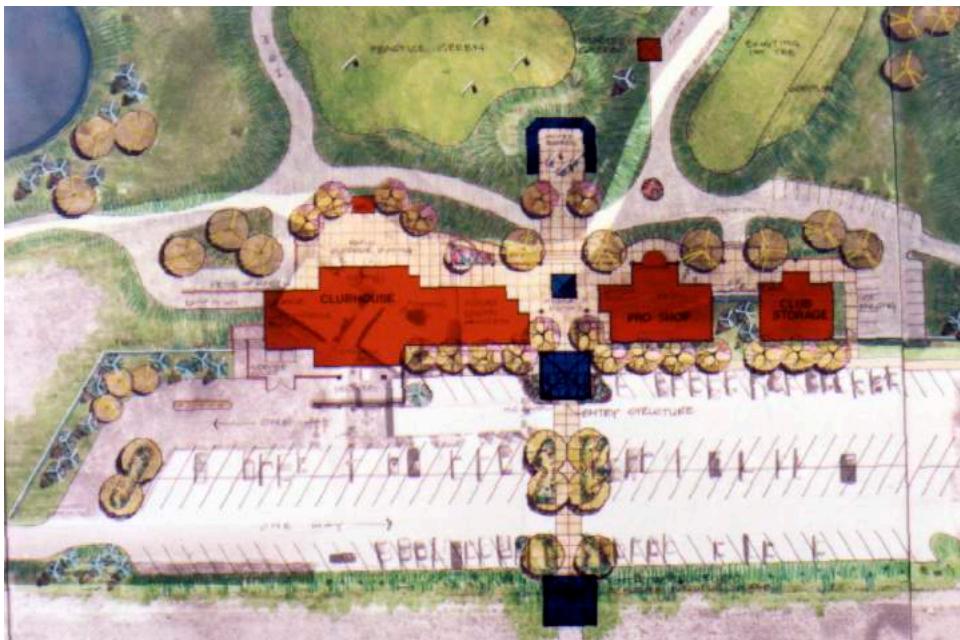
LARCHMONT GOLF COURSE

Missoula, Montana

Steiner Thuesen PLLC was retained to plan the club-house area for this public golf facility. The parking area was redesigned and improved pedestrian management was provided accessing the pro-shop, snack bar and clubhouse. Exterior "rooms", using paving materials and landscaping with removable awning roofs, were proposed to expand these buildings and increase their serviceability at minimal cost.

SAND TRAP/BUNKER

DRIVING RANGE



Two new practice greens were designed and constructed according to the master plan proposals. These practice greens are still in use. Solutions for the practice range were also offered.

GOLF COURSE ARCHITECTURE

YELLOWSTONE COUNTRY CLUB

Billings, Montana

Steiner Thuesen PLLC was retained to prepare construction documents for replacement of the irrigation system that services the 18-hole course. The wall-to-wall design, including 1,400 sprinkler heads, replaced the old irrigation system including the control system and pump station. Independent irrigation head test data and specialized design software was used to provide uniform irrigation coverage resulting in an overall reduction of water and energy use.

Historically, the golf course irrigation cycle could not be completed in a timely manner due to undersized pumps and mainlines. This caused conflict with golfers and maintenance work. The new design uses a fully automated, 3,800 gallon per minute, pump station to supply water



to the new irrigation system. The station includes (4) 100 horsepower and (1) 30 horsepower vertical turbine pumps with premium efficient motors, all running on variable frequency drives. Automatic filtration and a fertigation pump were included in the station design. The new design features correctly sized mainline piping to convey the water to the course, allowing complete and efficient use of the pumps' full capabilities. If needed, under stress or tournament conditions, the entire grounds can now be irrigated in just a few hours.

Formost Construction Company, the largest golf course irrigation contractor in the world, installed the new system using custom built machinery pictured above. The construction cost was approximately \$1.85 million.



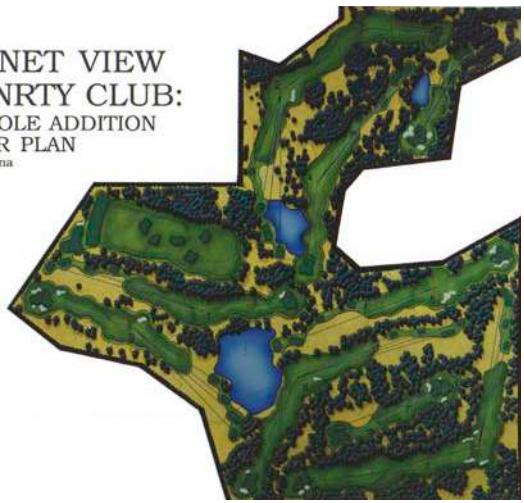
GOLF COURSE ARCHITECTURE

CABINET VIEW COUNTRY CLUB

Libby, Montana

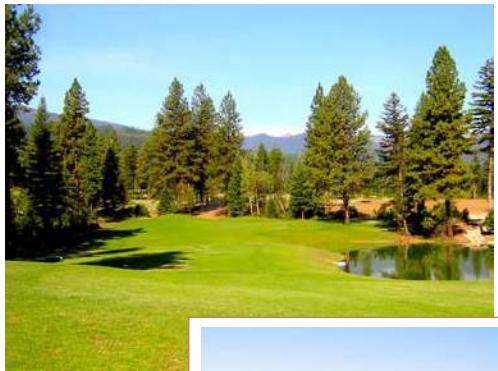


CABINET VIEW
COUNTRY CLUB:
NINE HOLE ADDITION
MASTER PLAN
Libby, Montana



This long-term project originated with preparation of a master plan to develop property owned by the Club as a subdivision and nine-hole golf course expansion. The master plan also served as the preliminary plat submittal for the housing development.

Following the preliminary plat approval, preliminary construction documents to facilitate layout and staking of the golf course for clearing were prepared. Course clearing was critical to success of the project, since the fairways were carved out of the forest. Steiner Thuesen PLLC provided assistance to the survey crew on-site during staking, and thus were able to make decisions concerning adjustment of the clearing limits to exclude selected specimen trees.



The Club engaged our services to prepare grading plans and detailed plans for construction of greens, tees and bunkers. The back nine addition was completed recently.



GOLF COURSE ARCHITECTURE

HILANDS GOLF CLUB RANGE REMODEL

Billings, Montana

Steiner Thuesen PLLC provided design and construction assistance services to remodel the Hilands Golf Club driving range as part of a comprehensive course remodeling effort spanning several years. The existing range area was small and short, being sandwiched in between holes 3, 4 and 7. Netting was used historically to protect play on hole 4, since shots hit with driver could easily hit the fairway or even be driven off the Club property. When a severe storm damaged the netting system, the Club took the opportunity provided by the insurance settlement to re-examine the range function.

Since several other local courses provide full sized driving ranges suitable for full swing with woods, we suggested the Club consider renovating the range to focus on providing practice for iron shots and the short game. This approach would provide a unique facility, and the unsightly netting could be eliminated in the process.



Working in concert with superintendent Pete Grass and the Greens Committee, a concept was developed offering multiple target greens placed at continuous distances from 30 to 200 yards, using the existing range tee without modification. The plan also capitalized on several large existing trees in the range to enhance shot making opportunities and to provide chipping practice from multiple directions. An earthwork plan was developed to sculpt the existing level range so that continuous undulations created positive drainage, and the target greens and their surroundings were highlighted. The shaping also included a deep contoured swale along the end of the range to capture and contain any long shots and rolling balls before they could enter number four fairway.



The construction work was completed through the winter and early spring months to minimize impact to the membership. Embracing the new range facility, the golf professional has implemented a new teaching and player development program focusing on improvement of short game skills as a means to lower scores.

GOLF COURSE ARCHITECTURE

As part of a conservation motivated conversion from potable water to well water for the golf course irrigation source, a new reservoir was created to store and facilitate blending of water originating from multiple wells. The two existing pumps, located one on each nine holes, could not access the new reservoir. They were salvaged and remarketed. Acting as general contractor for the project, Dwayne Dillinger the County's golf course superintendent, invited Steiner Thuesen PLLC to design a new centralized pumping plant and water service line for the existing irrigation system. Having previously designed the golf course irrigation system, we were pleased to assist.

The design featured a specialized inlet structure fabricated of composite materials mounted at the bottom of the reservoir to maximize access to storage. A 30 inch PVC suction flume leads from the inlet structure to the wet well, a 5 x 12 x 30 foot deep precast concrete structure. The high efficiency pump station, custom designed by Steiner Thuesen PLLC and fabricated to order by Watertronics, is capable of delivering 3,300 GPM at 140 PSI using three 100 HP main pumps and a 30 HP jockey pump all running on variable frequency drives. The pump piping and electrical components were designed with the capability to add another main pump in the future if pumping capacity expansion is needed. The pump was also connected into the course's existing Toro central control computer to enable real time remote monitoring of all pumping functions.



BELL NOB CENTRALIZED PUMP Gillette, Wyoming



A system of 14" and 10" piping was designed to convey water from the pump to the irrigation system. By using multiple connection points into the existing golf course mainlines, the service pipe size was economized and more uniform pressures were delivered to the course.

This raw water supply system has been in service since 2009 with excellent performance and reliability delivered to the golf course irrigation system.



GOLF COURSE ARCHITECTURE

BELL NOB CLUBHOUSE

Gillette, Wyoming

Kevin Atkinson, of Phelps – Atkinson Golf Course Design, retained Steiner Thuesen PLLC to provide irrigation design services for this course improvement project undertaken by Campbell County Parks and Recreation. Having previously worked with Kevin, and also having designed the irrigation system and new centralized pumping plant for Bell Nob, this commission was accepted with enthusiasm.

Due to the confined space and the need to fit many functional elements and circulation routes in that small space, several adjustments to the golf course were triggered. The new clubhouse was sited on the existing practice putting green. To replace it, a new and enlarged putting green was designed and sited where existing tees for hole number one were located. Accordingly, one tees were moved up the fairway, resulting in a shorter hole. In response, the first green was moved back and adjacent to the number two tees, resulting in appropriate length for the initial hole and a strategic dogleg to the right. Moving the first green opened up an opportunity to adjust the two rear tees on hole number two. Additionally, a new chipping hole was added between the driving range and hole number one.

SAND TRAP/BUNKER



RANGE

Steiner Thuesen PLLC designed a heavy-duty commercial level landscape irrigation system to serve the ornamental landscape plantings and lawns associated with the new clubhouse grounds. New golf irrigation systems were designed for the practice green, first and second tees, first green and chipping area. Both designs included extensive temporary provisions to keep the existing irrigation system in operation during the construction efforts, and to bring water back online as the project construction progressed. One new satellite controller was added to the golf course centralized irrigation control system to provide the additional control capability demanded by the expansion.



Clubhouse area landscaping and traffic management solutions were developed for the new owners of Lake Hills Golf Course, in an effort to reimagine and rebrand the course core services area and to address several existing issues. The design included expansion of the practice putting green and the addition of a secondary championship tee on hole number one.

In conjunction with remodeling the golf shop, the focal feature of the design was a new outdoor patio housing snack bar and grill. The new space included flexible seating, and a high capacity grill, with cold drinks served from coolers, which was delineated by new special pavers. The snack area was located at the junction of on-course traffic, and between the golf shop and putting green. This location was chosen to provide great interest around the eatery, to intercept golfers moving from one side of the course to the other and present an opportunity for refreshments, and to help manage course traffic flow.



The landscape area at the vehicular entrance to the parking and clubhouse front door was also renovated. An old micro water feature was removed. Retaining seat walls were added, and the planting was designed to present a look reminiscent of California desert courses. A new accessible footpath was designed to connect the clubhouse entry walk with the lower golf shop/patio space. Movable planters were installed at the end of the service road to limit vehicular access to the new patio eating area, and a new curving path was designed connecting the west parking field directly to the golf shop/patio area. These circulation improvements were designed to get golfers to the shop quickly and efficiently while moving them through a pleasant outdoor environment.

LAKE HILLS CLUBHOUSE LANDSCAPING AND PRACTICE GREEN

SAND TRAP/BUNKER

Billings, Montana



A concept to enlarge the putting green was developed as well. The new green was ringed with mounding and planting reflective of the entry landscaping, tying the visual image of the whole clubhouse area together. Drainage improvements were added to serve the patio area and the putting green. Special attention was given to design of the patio and putting green spaces with consideration for the view from the upper floor of the clubhouse.



GOLF COURSE ARCHITECTURE

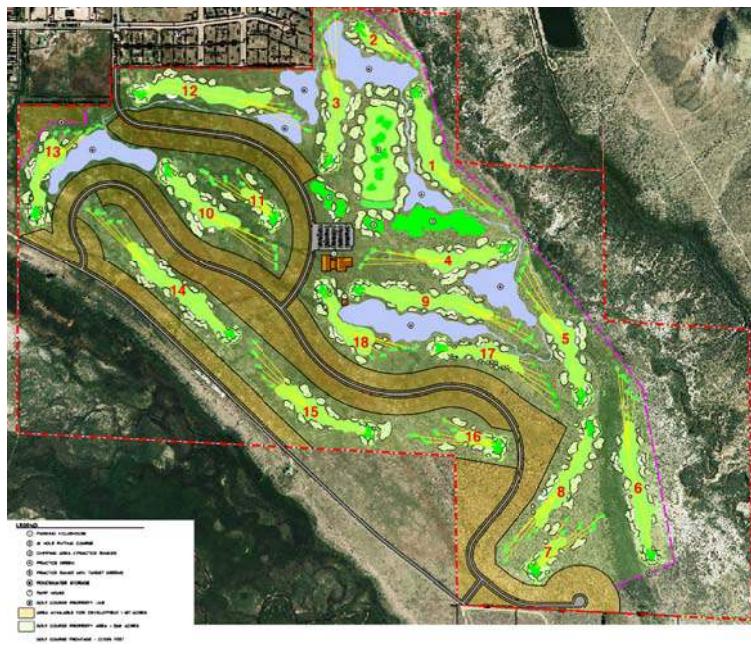
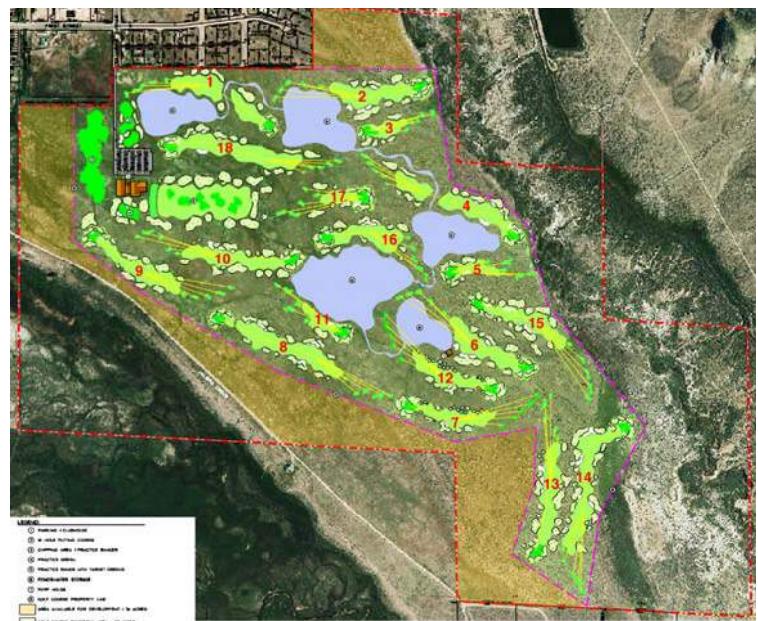
BIG PINEY GOLF COURSE

Big Piney, Wyoming

Southwest Wyoming experienced an economic and population boom due to rapid development of natural gas fields. As the town of Big Piney grew rapidly, development of recreational facilities that could be used by all ages lagged behind the increase in residents. This was also true of its nearby sister town, Marbleton. Big Piney Mayor Phillip Smith, and local surveyor Scott Scherbel, conceived a vision of building a golf course to meet the pent up recreational demand, and to make the area a better tourist destination in the future.

Steiner Thuesen PLLC worked with the Mayor and his action committee to evaluate several potential sites for a golf course. Eventually, the group settled on an open parcel of land located between the two towns that had relatively good soils, access to both raw water for irrigation and town services, and good accessibility. At that point, Steiner Thuesen PLLC was commissioned to develop conceptual illustrations of how a golf course, or golf course with associated residential development, could work on the selected site. These illustrations were intended to convey visual impressions as an aid to discussions leading to acquisition of the property by the Town.

SAND TRAP/BUNKER



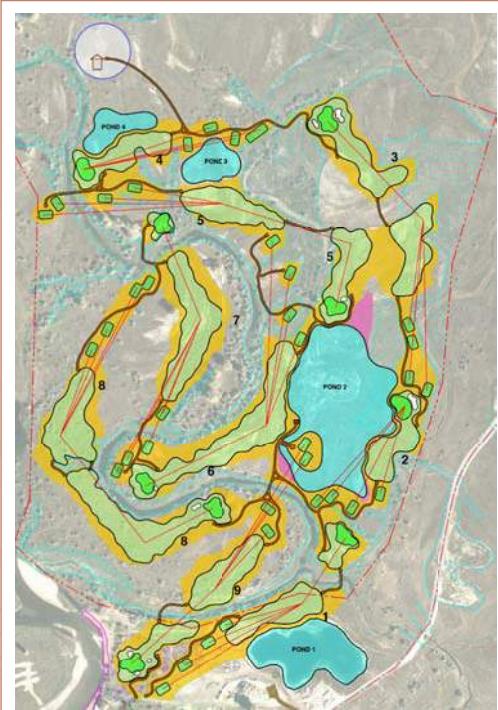
Policy changes affecting natural gas were implemented as the national administration changed in 2008, bringing a reduction in the local energy based economy, and reduction in the Town's available budget. Although this economic downturn caused the golf course project to be temporarily shelved, the dream for a golf course located in southern Sublette County endures.

GOLF COURSE ARCHITECTURE



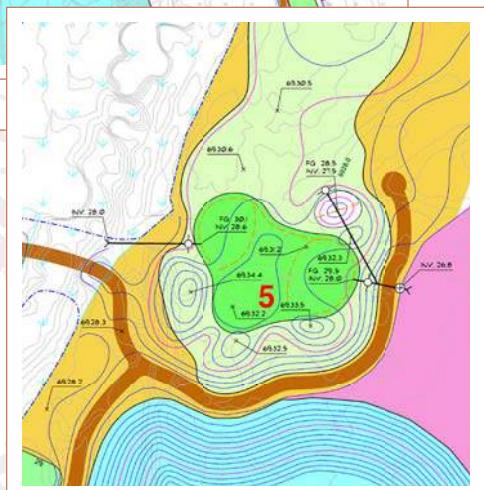
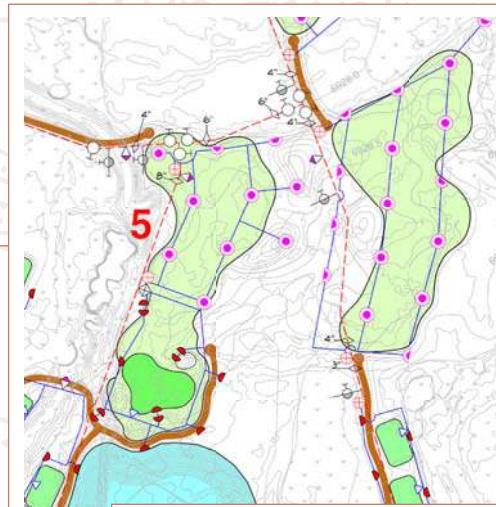
This private nine-hole golf course was created as part of a family retreat located in the high desert of southwest Wyoming. The site, located in the Green River bottomland, presented several opportunities and challenges that applied formative influence on the golf course routing and construction.

The course routing was carefully crafted to lay the holes in between the extensive wetlands and old river channels that were lined with willow and cottonwood. This design preserved wetlands and wildlife habitat, resulting in the project's acceptance and permitting by jurisdictional agencies including the Army Corps of Engineers and Wyoming Game and Fish. It also resulted in several interesting strategic golf play conditions. The course was also designed to run between the extensive fields of wild iris, which in several areas define the edge of the course roughs.



NINE HOLE GOLF COURSE

Southwest, Wyoming



Grading and shaping for the course was primarily accomplished using fill material excavated to create three ponds within the course. The fill was used to build up the golf course play corridor to create positive drainage by lifting the fairways above the existing high groundwater conditions. Existing contours on the site were subtle. The golf features were located to capitalize on these features, and the grading plan was developed to work with the natural lay of the land. This resulted in a very natural looking golf course that blends smoothly with its surrounding natural environment. Several holes also were oriented to capture views of the Wind River Mountains in the distance, and natural features along the Green River close by.

Gravity fed flow was reintroduced into the old river channel from the Green, including flow through the constructed ponds. To accomplish reliable flow, the channel was thoughtfully enhanced and reconstructed, creating a water feature that is in play on the golf course, enhances wetlands and habitat, and adds to the natural beauty of the course setting.

GOLF COURSE ARCHITECTURE

BILL ROBERTS GOLF COURSE IRRIGATION AUDIT

Helena, Montana

The City of Helena retained Steiner Thuesen PLLC to provide inspection and auditing services for the irrigation system at Bill Roberts Golf Course. The irrigation system has reached the end of its useful life and is in desperate need of replacement. The golf course is irrigated with an antiquated 34-year-old system and another out dated 20-year-old system. The course employs two pump stations, three different types of controllers, four different sprinkler head series types and an age span between the two systems of 16 years. The age difference itself causes considerable challenges.

The current irrigation system presents a number of problems inherent to old systems. These include a lack of dependability, unavailable parts due to the age of the equipment, and severe inefficiencies in terms of application of water, energy use, and labor management. Prior to the audit, the Owner performed a system evaluation and tune-up making any necessary adjustments so that the irrigation system in the areas being evaluated was operating as close to peak performance as possible.



Using the information obtained from the audit, a base irrigation schedule was developed using a five-step process that considers the following; 1) Plant water requirements; 2) Sprinkler performance; 3) Soil reservoir; 4) Scheduling run-times, and; 5) Scheduling-programming.

Several recommendations came out of the audit process. The key recommendations included replacement of the irrigation system with newer equipment capable of providing Distribution of Uniformity in the 0.70 – 0.80 range and a new irrigation control system with a weather station allowing for ET-based irrigation and fine tuning of the system over the entire course. Additional heads at the greens were also recommended as well as automation of the well pumps that fill the irrigation reservoirs.

GOLF COURSE ARCHITECTURE

LAKE HILLS STORMWATER DESIGN

Billings, Montana

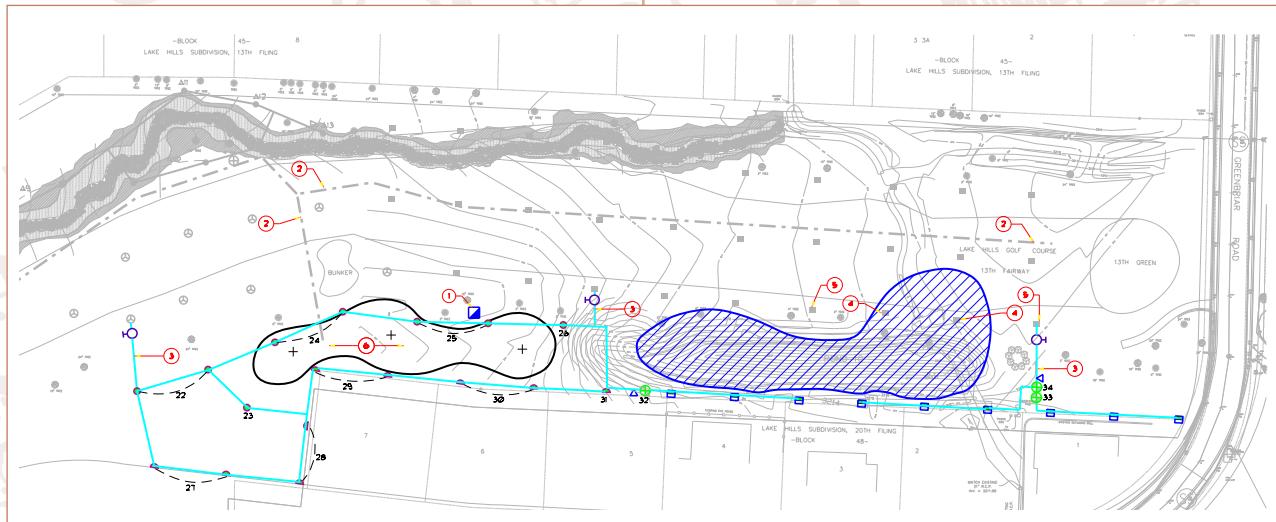
SAND TRAP/BUNKER

Lake Hills Golf Course is located in a part of Billings, Montana, that has experienced rapid growth and urbanization during the past decade. Since the golf course is at a low point in this part of the city, it tends to receive much of the increasing stormwater runoff generated by the increase in hard surfaces. Interstate Engineering and the Billings Public Works Department retained Steiner Thuesen PLLC to assist their design efforts to allow stormwater detention at Lake Hills, while attempting to make the impacts of the drainage related improvements positive assets for the golf property.

Steiner Thuesen PLLC evaluated the engineering proposals and formulated concepts for modifications to the golf holes, course shaping, drainage, and play strategy to best integrate them into the existing golf course environment. This involved locating man made streams, reshaping existing and building new ponds, reshaping and relocating greens and tees, mitigation planning for the construction work, and restoration of the course irrigation systems.



The result was completed construction that improved the play experience at Lake Hills. The construction was completed with the course remaining in play, and impacts to the membership and golfers was minimized.



GOLF COURSE ARCHITECTURE

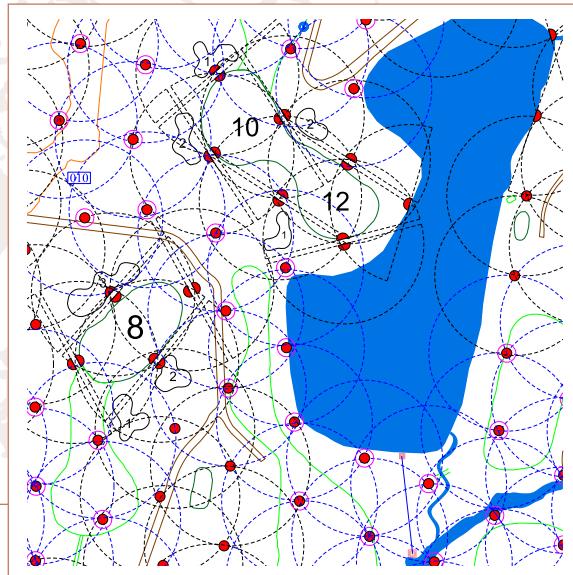
VALLEY VIEW IRRIGATION PLANNING

Bozeman, Montana

Valley View Golf Club had identified replacement of their irrigation system as a long-range course improvement goal. The urgency, relative cost, and impact on the membership experience for this project was being weighed along with several other course improvement and remodeling projects, so establishing an accurate budget for the work was important. Steiner Thuesen PLLC was retained to develop a sound concept design and an accurate budget for the construction project.



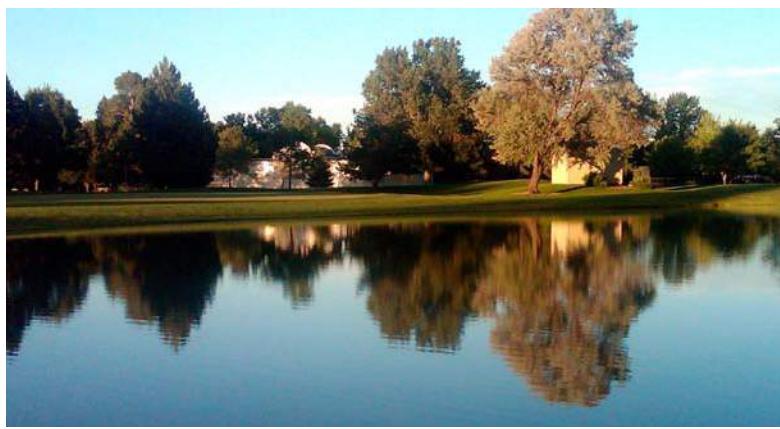
Accurate mapping of the entire golf course was produced initially. As a wall-to-wall irrigation project, the entire golf course was then walked with mapping in hand, making notes and photo documenting items that would need to be addressed in the design to provide the best coverage. Then, working with the superintendent, and using sophisticated sprinkler performance modeling software, the sprinkler body, nozzle, pressure, flow and spacing variables were worked out and the sprinkler heads were selected. Next the selected sprinklers were deployed on the course as a preliminary head layout, and part and full circle sprinklers were identified. The head layout determined the number of each type sprinkler needed to complete the project, as well as allowing reasonable projections regarding pumping and control system needs. With this information and quantities, and using historical bidding data records maintained by Steiner Thuesen PLLC, an accurate project budget was derived.



GOLF COURSE ARCHITECTURE

PAR 3 LONG RANGE PLANNING

Billings, Montana



Having been responsible for the original golf course design and construction management in 1976, Carl Thuesen was pleased when the Par 3 Board of Directors invited Steiner Thuesen PLLC to provide ideas for long term improvement of the golf course in 2011. The effort included working with the superintendent, golf professional and Board, as well as scrutinizing the entire facility to formulate a prioritized list of improvement ideas that could be implemented over time. The items range from simple to do and inexpensive tasks like pruning trees to complex and costly projects like enclosing the driving range tee for all-weather use. Order of magnitude budgetary needs for the improvement items were also established as an aid to budget planning.

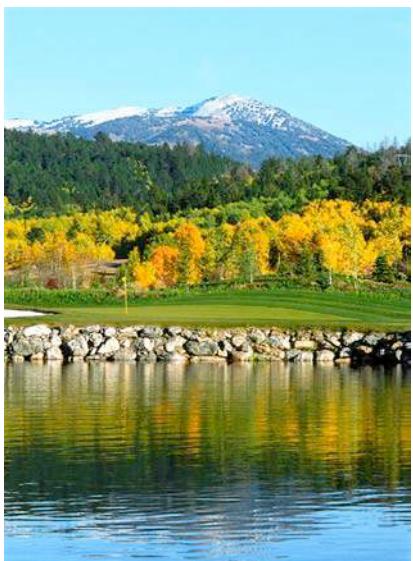


GOLF COURSE ARCHITECTURE

EXPERIENCE LIST

Fairmont Hot Springs Golf Course
Fairmont, Montana 2016 – 2017
18 Hole Public Course
Irrigation System Replacement Design

Wapika Ranch Golf Course
Southwest Wyoming 2015 - 2017
9 Hole Private Golf Course
Conceptual Layout, Master Planning, Construction Plans and Construction Period Services



Lake Hills Golf Course
Billings, Montana 2014 – 2015
18 Hole Public Golf Course
Design of Clubhouse Landscaping, Putting Green Expansion, and Secondary Championship Tee at Hole No. 1.

Hilands Golf Club
Billings, Montana 2014
Private Club
Range Remodel Design

Big Sky Resort Golf Course
Big Sky, Montana 2013 – 2014
Resort Golf Course
Nutrient Management Plan and Irrigation System Programming and Record Drawings

Ponderosa Butter Golf Course
Colstrip, Montana 2013
9 Hole Public Golf Course

Big Piney Golf Course
Big Piney, Wyoming 2012
18 Hole Public Golf Course
Site Selection and Conceptual Master Planning

Bill Roberts Golf Course
Helena, Montana 2012
18 Hole Public Golf Course
Irrigation System Audit

Bell Nob Golf Course
Gillette, Wyoming 2012
27 Hole Public Golf Course
Irrigation Design for Clubhouse and Course Improvements

Exchange City Par 3 Golf Course
Billings, Montana 2011
18 Hole Public Golf Course
Long Range Planning



Valley View Golf Club
Bozeman, Montana 2009
18 Hole Private Club
Irrigation System Head Layout and Budget Development

Casper Municipal Golf Course
Casper, Wyoming 2009
27 Hole Public Golf Course
Irrigation System Head Layout and Budget Development

GOLF COURSE ARCHITECTURE

EXPERIENCE LIST

Lambert Golf Course
Lambert, Montana 2008
9 Hole Public Golf Course
Golf Course Master Plan

Lake Hills Golf Course
Billings, Montana 2008 – 2009
18 Hole Public Golf Course
Golf Improvements for Storm Water Management

Bell Nob Golf Course
Gillette, Wyoming 2007
27 Hole Public Golf Course
Centralized Irrigation Pump Design

Hilands Golf Club
Billings, Montana 2006 – 2009
Private Club
Remodeling Holes 1, 2, 3, 4, 6 and 8



Kendrick Golf Course
Sheridan, Wyoming 2006
18 Hole Municipal Golf Course
Irrigation System Replacement Design

River Rim Ranch
Tetonia, Idaho 2005
Exclusive Private Club
Golf Course Master Plan

Yellowstone Country Club
Billings, Montana 2005
18 Hole Private Club
Irrigation System Replacement Design

Niobrara Country Club
Lusk, Wyoming 2005
Public Golf Course
Irrigation System Replacement Design

Lenhardt Farm
Billings, Montana 2005
18 Hole Public Golf Course
Master Plan

The Powder Horn
Sheridan, Wyoming 2004
18 Hole Private Club
Clubhouse Landscape Design
Water Feature Design
Sales Office Landscape Design

Paradise Valley Golf Course
Casper, Wyoming 2004
18 Hole Public Golf Course
Irrigation System Replacement Design

Salmon Golf Course
Salmon, Idaho 2004
Public Golf Course
Master Plan for 9 Hole Addition



Sleepy Hollow Golf Course
Dillon, Montana 2003
Public Golf Course
New Irrigation System Design

Riverton Country Club
Riverton, Wyoming 2003
18 Hole Private Club
Irrigation System Replacement Design

GOLF COURSE ARCHITECTURE

EXPERIENCE LIST

Wee Links at Bell Nob Golf Course

Gillette, Wyoming 2003

18 Hole Public Golf Course

9 Hole Par Three Golf Course Addition Design

Cabinet View Country Club

Libby, Montana 2003

Public Golf Course

9 Hole Addition Design

Canyon Valley Golf Course

Ten Sleep, Wyoming 2002

Public Golf Course

Master Plan for 9 Hole Addition

Phantom Links Golf Course

Missoula, Montana 2001

18 Hole Private Club

New Irrigation System Design

Boulevard and Clubhouse Landscape Design

Fox Ridge Golf Course

Helena, Montana 2001

18 Hole Public Golf Course

Irrigation System Design

Douglas Golf Club

Douglas, Wyoming 2001

18 Hole Public Golf Course

Irrigation System Replacement

Cut Bank Golf & Country Club

Cut Bank, Montana 2001

Public Golf Course

Design of irrigation system for 9 hole golf course.

Teton Lakes Irrigation

Rexburg, Idaho 2001

9 Hole Addition to Municipal Golf Course

New Irrigation System Design

Teton Springs Irrigation

Victor, Idaho 2000

27 Hole Resort Golf Course

New Irrigation System Design

Briarwood Irrigation Replacement

Billings, Montana 2000

18 Hole Private Club

Irrigation System Replacement Design

Bell Nob Golf Club

Gillette, Wyoming 2000-2001

Public Golf Course

Design of replacement irrigation system for existing 18 hole golf course.

North Carlton Links

Florence, MT 2000-2001

Public Golf Course

Routing and master plan for daily fee golf course.

Public Golf Course

Bozeman, MT 2000-2001

Public Golf Course

Routing and master plan for daily fee golf course.

Teton Springs Golf & Casting Club

Victor, Idaho 2000-2001

Resort Golf Course

Master planning and irrigation design for 27 hole golf resort with housing development.



Briarwood Country Club

Billings, Montana 2000-2001

Private Golf Club

Design of replacement irrigation system for existing 18 hole golf course.

Castle Rock Golf Course Irrigation

Billings, Montana 2000

Public Golf Course

Design of irrigation system for new 18 hole golf course.

EXPERIENCE LIST

Niobrara Country Club
Lusk, Wyoming 2000
9 Hole Municipal Golf Course
Remodeling master plan.

Teton Springs Golf & Fishing Club
Victor, Idaho 1999
Resort Golf Course
Routing and master plan for subdivision plat approval.



Butte Country Club
Butte, Montana 1999
Private Club
Remodeling concept plans for three greens.

Sidney Country Club
Sidney, Montana 1999
Public Golf Course
Irrigation system for nine hole addition.

Salmon Golf Course
Salmon, Idaho 1999
Public Golf Course
Irrigation system replacement.

Olive Glenn Country Club
Cody, Wyoming 1999
18 Hole Private Club
Irrigation system replacement.

Laurel Golf Club
Laurel, Montana 1998
18 Hole Private Club
Irrigation system replacement.

R.O. Speck Golf Course
Great Falls, Montana 1998
18 Hole Municipal Golf Course
Irrigation system replacement and raw water supply system.

Gannon Ranch Golf Course
Great Falls, Montana 1998
18 Hole Public Golf Course
Routing plan, golf course master plan and irrigation system construction plans.

Fallon County Golf Course
Baker, Montana 1998
Public Golf Course
Irrigation system replacement.

Elks Club Golf Course
Colville, Washington 1998
Public Golf Course
Master plan for 9 hole addition.

Double Arrow Ranch Golf Course
Seeley Lake, Montana 1998
Public Golf Course
Irrigation system replacement.

Devils Tower Golf Club
Hulett, Wyoming 1998
Public Golf Course
Irrigation system replacement.

Anaconda Country Club
Anaconda, Montana 1998
Private Club
Irrigation system replacement.

University of Montana Golf Course
Missoula, Montana 1997
18 Hole Public Golf Course
Golf course safety enhancements.

Mission Bay addition to Polson Country Club
Polson, Montana 1997
27 Hole Municipal Golf Course
Raw water supply and irrigation system design.

Havre Country Club
Havre, Montana 1997
18 Hole Public Golf Course
Routing refinements and irrigation system design.

GOLF COURSE ARCHITECTURE

EXPERIENCE LIST

Hilands Golf Club

Billings, Montana 1996 & 1997

Private Golf Club

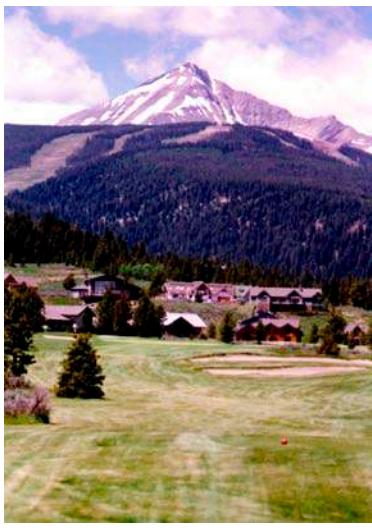
Design of replacement wall-to-wall irrigation system for existing 9 hole golf course.

Big Sky Resort Golf Course

Big Sky, Montana 1996

Resort Golf Course

Design of replacement irrigation system for Arnold Palmer designed 18 hole golf course using treated effluent as a water source.



Bell Nob Golf Club

Gillette, Wyoming 1995

Public Golf Course

Design of replacement irrigation system for existing 18 hole golf course.

Antelope Ridge Golf Estates

Meeteetse, Wyoming 1995

Public Golf Course

Master planning and construction design for nine hole minimalist style golf course with associated recreational housing development.

Bridger Creek Golf Course

Bozeman, Montana 1994

Public Golf Course

Remodeling design for back nine including irrigation system design and clubhouse site development planning.

Fairfield Golf Course

Fairfield, Montana 1994

Public Golf Course

Master plan and construction plans.

Crooked Falls Golf Course

Great Falls, Montana 1994

Daily Fee Golf Course

Preliminary property analysis and routing plans.

Spanish Meadows Golf Course

Gallatin Gateway, Montana 1994

Daily Fee Golf Course

Master plan for property development.

Anaconda Hills Golf Course

Great Falls, Montana 1994

Municipal Golf Course

Analysis of irrigation water supply system and design of new wall to wall irrigation system for front nine.

Bell Nob Golf Club

Gillette, Wyoming 1994

Public Golf Course

Course remodeling master plan with emphasis on water conservation.

Kendrick Golf Course

Sheridan, Wyoming 1993

Municipal Golf Course

Construction plans for green remodeling on front 9 holes.

Riverside Country Club

Bozeman, Montana 1993

Private Country Club

Design and construction drawings for 18 hole golf course irrigation system replacement.

Stillwater Golf Course

Columbus, Montana 1993

Public Golf Course

Master plan for remodeling tee positions on 9 hole course.

Polson Country Club

Polson, Montana 1993

Municipal Golf Course

Water supply analysis and design of new reservoir and remodeled golf holes.

EXPERIENCE LIST

Bridger Canyon Golf Club

Bozeman, Montana 1992

Resort Golf Course

Report documenting the potential for surface and groundwater pollution from construction of a golf course in an environmentally sensitive setting.

Green Meadow Country Club

Helena, Montana 1992

Private Country Club

Construction plans and field staking tee remodel to accommodate changes in the cartpath routing.

Cabinet View Golf Club

Libby, Montana 1992

Public Golf Course

Overall grading and green construction plans for 9 hole addition to existing golf course.

Marias Valley Golf & Country Club

Shelby, Montana 1992

Municipal Golf Course

9 hole addition master plan. Later retained to prepare construction plans and permitting documents for floodplain and wetlands permit applications.

Powell Country Club

Powell, Wyoming 1992

Municipal Golf Course

Master plan and construction drawings for 9 hole addition.



Peter Yegen Jr. Golf Club

Billings, Montana 1992

Public Golf Course

Master plan and construction drawings for 18 hole golf course.

Yellowstone County Golf Study

Billings, Montana 1991

Public Golf Course

Site analysis, feasibility study and preliminary master plan for publicly owned golf course.

Bill Roberts Golf Course

Helena, Montana 1991

Municipal Golf Course

Construction plans and contract administration for 6 holes of golf course and irrigation remodeling.

Linda Vista Executive Golf Course

Missoula, Montana 1991

Public Golf Course

Master plan, environmental permitting and construction drawings for 9 hole executive length golf course.

Emerald Greens Golf Course

Great Falls, Montana 1991

Public Golf Course

Master plan for 18 hole executive length golf course.

Harlem Golf Course

Harlem, Montana 1991

Public Golf Course

Construction plans and staking for 9 hole regulation length golf course.

Bill Roberts Golf Course

Helena, Montana 1991

Municipal Golf Course

Construction plans for 3 holes of golf course and irrigation remodeling.

Cabinet View Golf Club

Libby, Montana 1990

Public Golf Course

Master plan and clearing limits staking for addition of 9 holes and subdivision to existing 9 hole course.

Ponderosa Butte Golf Course

Colstrip, Montana 1990

Public Golf Course

Construction plans for 9 hole regulation length golf course.

Larchmont Golf Course

Missoula, Montana 1989

Municipal Golf Course

Practice green and chipping green remodeling plans.

GOLF COURSE ARCHITECTURE

EXPERIENCE LIST

Larchmont Golf Course

Missoula, Montana 1989

Municipal Golf Course

Practice green and chipping green remodeling plans.

The Flathead

Kalispell, Montana 1989

Public Golf Course

Master plan and feasibility analysis for 18 hole regulation length resort golf course.

Harlem Golf Course

Harlem, Montana 1989

Public Golf Course

Master plan for 9 hole regulation length golf course.

Meadow Lark Country Club

Great Falls, Montana 1989

Private Club

Remodeling construction plans for 18 hole regulation length golf course.

Kendrick Golf Course

Sheridan, Wyoming 1988

Municipal Golf Course

Remodeling master plan for 18 hole regulation length golf course.

The Point

Billings, Montana 1988

Public Golf Course

Feasibility analysis, environmental assessment, and master plan for 18 hole regulation length golf course.

Parkland Golf Course

Billings, Montana 1988

Public Golf Course

Feasibility analysis and master plan for 18 hole regulation length golf course.

University Golf Course

Missoula, Montana 1988

Public Golf Course

Construction plans and supervision for replacement of 9 hole golf course irrigation system and automation of existing pumping plant.

Larchmont Golf Course

Missoula, Montana 1988

Municipal Golf Course

Clubhouse area and parking site improvements plan.

University Golf Course

Missoula, Montana 1987

Public Golf Course

Master plan for 9 hole addition to existing 9 hole course.

Skyway Golf Course

Helena, Montana 1987

Public Golf Course

Master plan and construction plans for 18 hole executive course.

Green Meadow Country Club

Helena, Montana 1987

Private Club

Comprehensive remodeling master plan for 18 hole golf course and clubhouse.

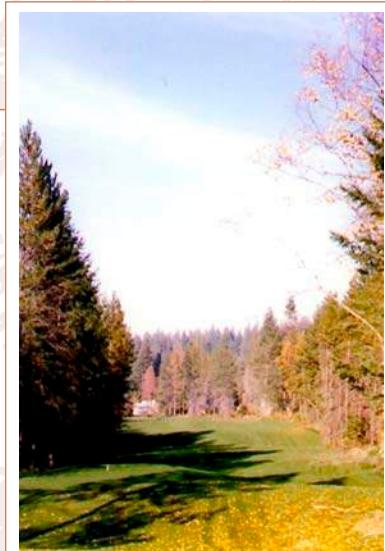
Twin Lakes Golf Course

Twin Lakes, Idaho 1986

Private Club

Master plan, construction plans and construction supervision for 9 hole addition to existing 9 hole course.

Master remodeling plan for existing 9 also provided.



Grand Avenue Golf Course

Billings, Montana 1986

Public Golf Course

Preliminary alternative layout plans.

Hidden Lake Golf Course

Billings, Montana 1986

Public Golf Course

Master plan for 18 hole regulation golf course and subdivision.

EXPERIENCE LIST

Billings Municipal Golf Course

Billings, Montana 1985

Municipal Golf Course

Master plan for 18 hole regulation golf course.

Headwaters Golf Course

Three Forks, Montana 1984

Public Golf Course

Master plan, construction plans and construction supervision for 9 hole golf course.

Pine Ridge Golf Course

Colstrip, Montana 1984

Public Golf Course

Feasibility analysis and master plan for 9 hole golf course.

Three Wolf Ranch

Billings, Montana 1983

Private Country Club

Master plan for 27 hole golf course and mixed use community development.

Powell Country Club

Powell, Wyoming 1983

Municipal Golf Course

Remodeling plan for 9 hole golf course.

Yellowstone Country Club

Billings, Montana 1983

Private Country Club

Master plan and water supply plans for addition of 9 or 18 holes and subdivision to existing 18 hole course.

The Willows (Teton Pines)

Jackson, Wyoming 1983

Resort Golf Course

Feasibility analysis and master plan for 18 hole championship golf course and subdivision.

Williston Municipal Golf Course

Williston, North Dakota 1983

Municipal Golf Course

Feasibility analysis, master plan, construction plans and construction supervision for 18 hole regulation golf course. Nine holes were constructed initially.

Scobey Golf Course

Scobey, Montana 1982

Municipal Golf Course

Profitability and note repayment analysis.

Black Butte Golf Course

Havre, Montana 1982

Public Golf Course

Property appraisal.

Ennis Golf Course

Ennis, Montana 1978

Municipal Golf Course

Feasibility analysis and conceptual plan for 9 hole regulation length golf course.

Par 3 Golf Course

Billings, Montana 1977

Municipal Golf Course

Feasibility analysis, master plan, construction plans and construction supervision for 18 hole par 3 golf course.



Jackson Hole Golf and Tennis Club

Jackson, Wyoming 1973

Private Country Club

Design of site improvements for new clubhouse, including parking area and pool.



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