



Floodplain Mapping Analysis

Saratoga, WY

July 2023

S₂O Design and Engineering
318 McConnell Drive
Lyons, Colorado 80540



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Lyons, Colorado 80540

July 28, 2023

Emory Penner
Director of Public Works
Planning and Zoning Administrator
Town of Saratoga, WY

Re: Proposal for Floodplain Mapping and Analysis

Mr. Penner,

S₂O Design and Engineering is pleased to present this proposal for analysis of the preliminary floodplain mapping prepared for the Town of Saratoga, WY in order to analyze the approximate modeling to see if it accurately represents the ground and flooding potential for the Town. Based on this analysis S₂O will recommend potential comments/re-modeling of the river corridor, or potential changes to the ground in order to prevent flooding in the Town.

At S₂O, we have a passion for river restoration and river engineering. Our work is targeted to create a safe interface between the river and the communities that surround it that is rooted in river science including habitat creation, flood modeling, and river corridor planning. We feel that thoughtful development and restoration are the key to creating successful river cities.

Please find our proposal attached. This proposal details our client-based project approach, as well as our qualifications and experience. We are proud of our past work and are confident we are the best and most experienced design firm for this project. Please feel free to call us if you have any additional questions or require any clarifications.

Sincerely,



Scott Shipley, PE
President & Principal Engineer

INTRODUCTION

This proposal was prepared to address the current mapping effort for the Town of Saratoga in order to understand if the mapping accurately reflects the Town's flood risk and to propose either amendments to the modeling or changes to the river corridor in order to reduce flood risk and decrease flood insurance costs for the Town.

The first section of this proposal describes our team and our culture. S₂O was founded and is led by Olympian and three-time kayaking World Cup Slalom Champion Scott Shipley. Being a paddler-designer is part of the S₂O culture. We are trained professional engineers, architects, landscape architects, and planners; we are also avid paddlers. We bring an understanding of river dynamics and whitewater parks to the design of all of our projects. We also bring an experienced and professional design staff that listens to your objectives and priorities and transforms your needs into a functional design.

The second section describes our understanding of the project, our approach to the design process, and the scope of work to be completed. We are a team that strongly believes in the *process* of design. Our design team will work with you, the client, as well as with key stakeholders to understand the objectives, desires, and constraints of this project. It is this client-based input, combined with our experience and expertise, that defines the project.

The final sections include our General Terms and Conditions and the cost for the proposed work.



COMPANY INFORMATION

S₂O Design and Engineering, located in Lyons, Colorado, specializes in river engineering, restoration, recreation, and the design of community focused whitewater and river parks. Our team of expert boater-engineers has planned, conceived, designed, and created some of the highest profile in-stream and pumped whitewater parks in existence today. Our in-stream parks include features and river restorations that range from creating small waves to river-wide redesigns of dangerous weirs and dams. Our award-

winning pumped parks are the largest and most dynamic recirculating whitewater parks in the world. The quality of our work and the depth of our experience has made us the go-to team for discerning whitewater park projects throughout the world.

S₂O's team is made up of licensed design and engineering professionals who specialize in planning, public process, river recreation, river restoration, landscape architecture, permitting, and implementation. S₂O's advantage is its ability to incorporate cutting edge technology to produce natural and sustainable solutions.

In addition, we have a great deal of experience managing multi-stakeholder projects as many of our projects require us to work with and manage varied stakeholders such as the local community, commercial entities, and government and permitting agencies. We are experienced in project management and construction oversight and have a proven track record in completing projects on time and on budget.

S₂O has evolved a client-based design methodology that involves working with the client to define needs, desires, and constraints. We believe in a collaborative design process. We are strong advocates of open and frequent communications with the client and key stakeholders, so they are informed and engaged in the decision-making process. Our goal is to ensure that the client is completely satisfied with the final product. The most effective method of achieving this goal is to establish a transparent and close working relationship from start to finish.

EXECUTIVE TEAM



Scott Shipley, PE, MSME, S₂O President

Engineer Scott Shipley brings a varied background to the table. Scott Shipley is perhaps the best-known American kayaker in the world today. A veteran of three Olympic games ('92, '96, '00) and holder of four world titles, Shipley has more than 25 years of experience as a whitewater competitor. Scott also holds a bachelor's and master's degree in Mechanical Engineering from top-ranked Georgia Institute of Technology. Shipley's combined expertise in both whitewater and engineering design has made him the "go-to" designer for some of the world's most demanding whitewater design projects. Shipley's accolades include two "Best of What's New" design awards from Popular Science, the Everest Award, and the Jack Kelly Fair Play Award, presented by the United States Olympic Committee. Shipley is also a hall of fame inductee and has been voted a top ten athlete of the year by the USOC three times.



Nathan Werner, PE, S₂O Project Manager

Nathan brings a combination of engineering design and whitewater experience to the team. Nathan has a bachelor's degree in Civil Engineering with a concentration in Soil and Water Resources from Colorado State University. Nathan brings over 14 years of water resource engineering to our team, specializing in hydraulic analysis and modeling, natural channel design, construction management, and GIS. Nathan was instrumental in the completion of flood recovery projects throughout the Front Range, with efforts in planning, design, permitting, and construction of restoration and river-based recreation projects. He has designed whitewater parks and large water resource projects in Colorado and Wyoming, including dams and irrigation structures.



Christine Clark, PLA, AICP, S₂O Designer

Christine has a balanced athletic, and educational and professional design background that complements her enthusiasm for whitewater park design and recreation. She has a master's degree in Landscape Architecture and in Urban and Regional Planning from the University of Colorado Denver. She also has a bachelor's degree in Environmental Design in Architecture from the University of Colorado Boulder. Her experience lies in master planning and recreational design. She focuses on creating multifaceted spaces and networks that allow the users to freely move and experience indoor and outdoor spaces. She integrates her landscape design aesthetics into the highly functional engineering design of whitewater parks.



Riley Adams, EI, S₂O Project Engineer

Riley has an extensive background in Construction Engineering and Project Management. He graduated from the University of Maine with a bachelor's degree in Civil Engineering and completed a Graduate Certificate program in GIS at Oregon State University. Riley has over 13 years of experience ranging from heavy civil infrastructure and hydropower projects to small marine construction and restoration projects. He has held leadership positions in engineering, construction management and contract management roles. Since joining S₂O, Riley has completed planning, permitting, hydraulic analysis and design, project management and construction oversight tasks on multiple river restoration and whitewater projects. His strength is in his experience, leadership, and the ability to collaborate with all members of a project team. This centers around honest and organized communication to solve problems, track progress and manage work to complete projects efficiently and meet client goals.



Danial Mason, EI, S₂O Associate Engineer

Danial is a civil engineer specializing in river engineering and design. He has a B.S. in Civil Engineering, Environmental and Water Resources from the University of Maryland. Danial's 5 years of experience include using Rosgen methods to design and restore rivers. His expertise includes floodplain modeling in 1 and 2-d, design verification, and working with clients to define and execute projects.



Sarah Mosier, EI, S₂O Project Engineer

Sarah is the newest member of S₂O, bringing to the team a robust engineering background and lifetime love of rivers. She graduated from Duke University with a degree in Civil Engineering, focused on water resources and environmental engineering. Sarah previously worked in engineering consulting as an environmental engineer handling remediation and water projects for public and private clients, where she developed a passion for partnering with municipalities and other community leaders to assist in improving their natural and built environments. As a project engineer at S₂O, she is responsible for designing and implementing river engineering projects, including developing designs from concept to construction and effectively managing projects throughout their lifecycle to ensure a quality delivery for the client.

PROJECT EXPERIENCE



S₂O has created the world's leading whitewater parks, including the design of pumped water parks such as the London Olympic Whitewater Park for the 2012 Games; the US National Whitewater Center in Charlotte, NC; the \$40 million Riversport Rapids Whitewater Center in Oklahoma City, OK; and the newly opened Montgomery Whitewater Park in Montgomery, AL.

Our in-stream parks and river restoration projects successfully balance recreational access with ecological benefit, and result in recreation enhancement, beautification of the river corridor, and habitat restoration. S₂O designed in-stream parks include Meadow Park in Lyons, CO; The Durango Whitewater Park in Durango, CO; and The Camphill Surf Park in Wanaka, NZ. S₂O's parks are widely used, highly valued, and provide significant economic impacts to the surrounding communities.

PROJECT UNDERSTANDING



S₂O recommends that the project be designed in phases. The first phase will be information gathering and analysis to look at the site and the mapping, including the source survey and methodology, in order to understand if it accurately reflects the conditions in Saratoga. The hydraulic model will be reviewed; however, no additional modeling will be conducted in this stage. Following this step S₂o proposes one of two different tasks, to be contracted by addendum. The first option would be that S₂o has significant concerns about the mapping and suggests that a remapping or significant comments be made to the mapping for FEMA. In this case the Design Team would submit a proposal that would include additional engineering work and potential site survey tasks.

In the second Instance S₂o would submit an addendum to this contract for design work in order to minimize flood risks through the creation of either additional conveyance zones or flood protection berms in order to protect life and property.

PROPOSAL FEE

S₂O agrees to complete the tasks outlined in this proposal for the lump-sum costs (in U.S. Dollars) shown in the table below. Below is an estimate for travel and reimbursable expenses but actual expenses are to be paid by the Client. We believe travel expenses will be less than what is quoted. The costs outlined below will be honored for 90 days from the date of this proposal. If the proposal is not executed within 90 days of the proposal date, all costs are subject to re-negotiation by S₂O Design and Engineering.

Engineering Services		
Work Item	Task	Cost
1	Information Gathering: Client supplies all relevant mapping including ownership mapping and electronic basemap in .dwg format or similar if available. Client also to supply all additional reports, soils data, hydraulic data, and flow information relevant to the project. Client also to supply the name and station number of the most relevant gauge and indicate inflows and outflows between the gauge and the proposed project site(s).	To be supplied by the client
2	Floodplain Analysis: Reviewing floodplain mapping, survey information, flow information, and all other relevant data in order to understand the accuracy of the current mapping.	\$ 7,000.00
Total (U.S. dollars)		\$ 7,000.00

A \$500.00 deposit is required prior to making any travel arrangements. Progress billings will be made monthly and/or at the submission of progress sets of drawings. Payments are due within 30 days of receipt of invoice. Late payments will be charged a service fee of 1.5% per month. Late payments will also result in a stoppage of work until all invoices are paid in full.

ADDITIONAL SERVICES

Additional services shall include, but are not limited to, renderings, additional meetings or tasks, additional design work, additional tasks or tasks related to making revisions or additions to drawings, specifications, reports, or other documents outlined, when such revisions are inconsistent with instructions previously given, or other services that are not outlined in this Agreement. Additional services can be accomplished through an addendum to this agreement or through a separate agreement.

GENERAL TERMS AND CONDITIONS/ENDORSEMENT

The attached General Terms and Conditions are made a part of this agreement by reference.

We appreciate this opportunity and look forward to working with you on this project. If the above meets with your understanding and approval, please sign a copy of this proposal and return to S₂O for its signature. A fully executed copy will be sent to you for your files. Receipt of the signed copy will serve as our authorization to proceed.

Submitted by:

Scott Shipley
S₂O Design and Engineering
318 McConnell Drive
Lyons, CO, 80540
(303) 819-3985

Date

Approved by:

Name:
Address:
Phone:
Email:

Date

GENERAL TERMS AND CONDITIONS

1. The General Terms and Conditions outlined below are part of the attached letter agreement and are hereby incorporated by reference. If **S₂O** does not receive a response to the letter agreement within ninety (90) days, the fees for the design services will be subject to change. Please read these General Terms and Conditions carefully. Your acceptance of this agreement constitutes your acceptance of the foregoing terms and conditions.
2. The standard of care for all professional services performed or furnished by **S₂O** under this agreement will be the skill and care used by consulting engineers and architects practicing under similar circumstances at the same time and in the same locality. Whitewater design projects often include the need to tune and refine a specific design to optimize the shape to best meet client objectives **S₂O** makes no warranties, either express or implied, under this agreement or otherwise, in connection with **S₂O's** services.
3. The Client shall provide **S₂O** with development program information regarding the requirements and objectives for the Project. Additionally, **S₂O** shall be entitled to rely upon the accuracy and completeness of any information, reports and/or site surveys/base information supplied by the Client or by others authorized by Client.
4. If **S₂O's** services under this letter agreement do not include services during the construction phase of the project, then Client assumes responsibility for the application and interpretation of **S₂O's** drawings, specifications and other instruments of service; the observation and evaluation of Contractor's work and the performance of any other necessary construction phase engineering or professional services; and Client waives any claims against **S₂O** that may be connected in any way thereto.
5. If **S₂O's** services under this letter agreement include limited services during the construction phase of the project, then Client assumes responsibility, to the extent that **S₂O** is not contracted to provide professional services for the project, for the application and interpretation of **S₂O's** drawings, specifications and other instruments of service; the observation and evaluation of Contractor's work and the performance of any other necessary construction phase engineering or professional services; and Client waives any claims against **S₂O** that may be connected in any way thereto.
6. In addition to professional fees outlined in the attached letter agreement, the Client shall pay all out-of-pocket expenses which are defined as actual expenditures made by **S₂O**, their employees, and/or professional consultants in the interest of the project and include, but are not limited to, the following expenses:
 - a. Air Travel, including departure taxes (Business Class for flights scheduled for four [4] hours or greater) and related airline/agency fees
 - b. Hotel accommodations
 - c. Meals
 - d. Ground transportation, i.e., rental cars and taxis
 - e. Postage, freight, telephone, facsimile, overnight express mail and courier services
 - f. Blueprinting, photocopying, reproductions and printing
 - g. Photographic supplies and processing
 - h. Study model materials
 - i. Special renderings, models, photographs and special consultants, when authorized by Owner

The above listed items will be billed at the actual cost with no markup.

7. **S₂O** will provide electronic transfer media of related materials for the project if available and as requested by the Client or authorized agent for the following costs:

CD-ROM	Fee: \$15.00
FTP Transfer	No Charge

If additional special drawing modifications are requested, i.e., special blocks, drawings, setting up special layering for files, etc., the associated time will be billed **at cost plus 10%**. Prior to the preparation of transfer media, both parties will agree upon the special modifications.

8. **S₂O** will provide reproducible media of project related materials as available and as requested by the Client or authorized agent for the following fees:

MEDIA	MONOCHROME	COLOR
REPRODUCIBLE VELLUM	Fee: \$0.70 per Sq. Ft.	Fee: \$1.50 per Sq. Ft.
OCE BOND	Fee: \$0.25 per Sq. Ft.	N/A
GLOSSY COATED PAPER	Fee: \$1.00 per Sq. Ft.	Fee: \$1.75 per Sq. Ft.
COATED ACETATE	Fee: \$1.00 per Sq. Ft.	Fee: \$1.75 per Sq. Ft.
COATED MYLAR	Fee: \$1.75 per Sq. Ft.	Fee: \$2.50 per Sq. Ft.

9. All documents prepared or furnished by **S₂O** pursuant to this agreement are instruments of **S₂O**'s professional service, and **S₂O** shall retain ownership according to all applicable laws. **S₂O** grants Client a license to use instruments of **S₂O**'s professional service to construct, occupy, and maintain the project. Reuse or modification of such documents by Client, without **S₂O**'s written permission, shall be at Client's sole risk and Client agrees to indemnify and hold **S₂O** harmless from all claims, damages, and expenses, including attorney's fees, arising out of such reuse by Client or others acting through Client. In addition, reuse or modification of such documents without **S₂O**'s written permission constitute a copyright infringement and may be subject to enforcement of such rights.

10. Client acknowledges that the information and data delivered to Client in machine-readable copies of the documents may vary from that contained on paper copies of the documents. Variances may be due to the use of different software, hardware, or output devices by Client or others from those used by **S₂O** for original preparation and printing of the documents. Variances may also be the result of undocumented changes or modifications made to the machine-readable documents, whether inadvertently or otherwise and whether made by Client or others. **S₂O**, therefore, reserves the right to retain the machine-readable media upon which the documents were originally prepared, and to retain paper or reproducible documentation delivered to Client in machine-readable form, that shall govern in the event of any inconsistency or discrepancy between the two. **S₂O** also reserves the right to remove from machine-readable copies provided to Client, all identification reflecting the involvement of **S₂O** in their preparation.

Client acknowledges that the automated conversion of documents from the system or format employed by **S₂O** to that of Client or others cannot be accomplished without the introduction of inexactitude, abnormalities, and errors. In the event documents provided to Client in machine-readable form are so converted, Client agrees to assume all risks associated therewith and, to the

fullest extent permitted by law, to hold harmless and indemnify S₂O and S₂O's professional associates and consultants from and against all arising claims, liabilities, losses, and expenses including attorney fees.

11. All fees and reimbursable expenses will be invoiced monthly and shall be payable in net U.S. Dollars drawn upon a U.S. Bank unless otherwise stated in this letter agreement. The Client understands and acknowledges that these fees are net of any non-U.S. taxes and/or tariffs. If a retainer is received by S₂O, it will be applied to the final payment due unless otherwise stated in this letter agreement.
12. In the event the Client should use a foreign bank as its payment bank, the Client shall wire the funds in U.S. Dollars, net of any transaction fees, to S₂O's local bank. Bank information will be provided upon request by the client. Payment must be accompanied by the ***Project Name and invoice number(s) to be credited.***
13. All invoices are payable upon receipt. In the event payment is not received within thirty (30) days of invoice date, the past due balance may be assessed an interest penalty of one and one-half percent (1 ½%) per month.

In the event S₂O does not receive payment within sixty (60) days, S₂O will stop work on the project until payment is received. Stoppage of work by S₂O due to non-payment of invoices beyond sixty (60) days will not be deemed as a default under the terms of this letter agreement. An additional fee may be required to stop and restart work due to nonpayment.
14. The Client agrees that this letter agreement shall be interpreted according to the laws of the state where the contracting S₂O office is located (Colorado), and agrees to reimburse S₂O for reasonable attorney's fees, court costs, and all expenses including without limitation, all such fees, costs, and expenses incidental to arbitration, appeals, and post-judgment proceedings that it may expend in enforcing this letter agreement. In the event of any such dispute, Client agrees that the court venue will be located in Boulder County, CO.
15. Signature of this letter agreement will signify the Client's acceptance of all the Terms and Conditions outlined herein. Accordingly, the Client warrants that the necessary funds are available to pay S₂O for the services and expenses outlined in this letter agreement and that these funds are not encumbered nor contingent upon subsequent approvals, permits or financing commitments.
16. This letter agreement will be valid for the duration of the project. However, after ninety (90) days from the date of its issuance and with written notification, fees and conditions will be subject to change.
17. Hazardous Materials. Client acknowledges that consultant's scope of services for this project does not include any services related in any way to asbestos and/or hazardous or toxic materials. Should consultant or any other party encounter such materials on the job site, or should it in any other way become known that such materials are present or may be present on the job site or any adjacent or nearby areas which may affect consultant's services, consultant may, at its option, terminate work on the project until such time as client retains a specialist contractor to abate and/or remove the asbestos and/or hazardous or toxic materials and warrant that the job site is free from any hazard which may result from the existence of such materials.
18. The Agreement may be terminated at any time, by either S₂O or CLIENT, by notification in writing. In the event of termination, S₂O shall be paid for services performed and reimbursable expenses

incurred to date of notification. Any expenses incurred by **S₂O** due to termination of project by CLIENT shall be paid by CLIENT.

19. The **S₂O** assumes no liability arising from the Agreement or the work involved except in so far as it is liable for its professional acts or the acts of its employees. CLIENT expressly waives its right to claim consequential or incidental damages notwithstanding pre-existing professional liabilities on behalf of **S₂O**. CLIENT'S sole remedy for any claim arising out of any sale of services hereunder shall be a refund of monies paid by CLIENT to **S₂O** for said services.
20. It is **S₂O**'S policy to complete its services promptly and within established schedules, however, there is no expressed or implied guarantee as to when plans will be approved by the applicable governing agencies. **S₂O** will progress its work in an expeditious and professional manner at all times.
21. Notwithstanding any provision contained in the Agreement to the contrary, **S₂O** shall not be deemed in default hereunder, or otherwise liable or responsible, if any failure of its performance shall be due to any governmental regulations or controls, the need to obtain any governmental approvals, inability to obtain any material or service, strike, act of war, act of God, act of any third party, or any other cause whatsoever beyond the reasonable control of **S₂O**, and the time for performance by **S₂O** shall be extended by the period of delay resulting from or due to any of such causes.
22. If CLIENT is a corporation or other legal entity, the individual(s) whose signature appears herein hereby personally guarantee CLIENT'S compliance with this Agreement, including payment of all charges and costs.
23. CLIENT agrees that the obligations listed in the Agreement shall not be impaired, modified, changed, released or limited in any manner whatsoever by any impairment, modification, change, release or limitation of liability of the **S₂O** or their respective estates by reason of the commencement of any case, proceeding, or other action seeking reorganization, arrangement, adjustment, liquidation, dissolution, or composition of it or its debts under any law relating to bankruptcy, insolvency, reorganization, relief of debtors or seeking appointment of a receiver, trustee, custodian, or similar official for it or all part of its property.
24. A retainer of 20% of the design fees is requested prior to commencing work on the project. This retainer will be applied to the final invoice. Progress billings will be made monthly and/or at the submission of progress sets of drawings. Payments are due within 30 days of receipt of invoice. Late payments will be charged a service fee of 1.5% per month. Late payments will also result in a stoppage of work until all invoices are paid in full.
25. We reserve the right to rely on the accuracy of this information in our design work. Client shall not hold us liable for any problems arising from inaccuracies in the information provided to us.