

How Much Should You Pay for Engineering Services?

Why You Need to Balance Cost With Quality



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INTRODUCTION

How Much Should You Pay for Engineering Services?

When making major project decisions – such as how to budget your dollars and which A/E consultant(s) to partner with – a delicate balance between cost and quality must be struck. Cost efficiency is critical, but prioritizing engineering cost alone can increase expenses over the life of your project and limit the value you receive.

Throughout this eBook, experts from the A/E consultant and client sides reveal the cost and quality “sweet spot” while examining the variables most relevant to helping you answer: How much should you pay for engineering services?

Short Elliott Hendrickson Inc. (SEH®) is a multidisciplined, professional services firm made up of 800 engineers, architects, planners and scientists who provide complex solutions to clients throughout the U.S. With 31 offices across the Midwest, Colorado and Wyoming, SEH focuses on improving mobility, improving infrastructure, engineering clean water and creating better places. Our commitment and core purpose revolves around Building a Better World for All of Us®.

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COST VS. QUALITY

How to Find the Sweet Spot

Prioritizing engineering cost over quality can increase your lifecycle project expenses and limit the value you receive. Here's how you can find the sweet spot.

The Engineering Sweet Spot Lowers Total Cost, Improves Quality

If you spend too much on engineering, there is a point of diminishing returns and your total project cost will be higher than necessary. Conversely, rushed or a lack of strategic engineering can lead to poorly planned and inadequately designed projects – leading to more change orders, inaccurate construction contractor bids, as well as higher construction and maintenance costs.



Engineering costs in comparison to construction costs



Engineering costs in comparison to construction and maintenance costs

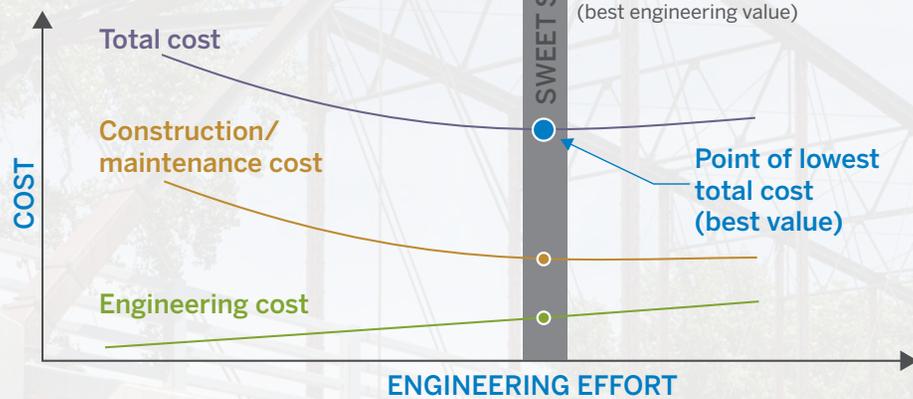


The cost of engineering (or A/E services) is a small fraction of total project costs. Yet, it influences nearly every phase of your projects.

Specifically, the cost of engineering for a typical project is often just **10-20 percent** when considering engineering and construction. When you factor lifecycle maintenance into that equation, the cost of engineering services is even less, at just **1-2 percent** of total costs. Yet, the impact of engineering is far reaching as it influences nearly every aspect of a project:

- Budget
- Schedule
- Site selection
- Permitting
- Design alternatives
- Aesthetics
- Operating costs
- Maintenance needs and costs
- Community outreach
- Stakeholder buy-in

Long-Term Value of Engineering



This chart is a schematic designed to provide visual clarity for readers and is not to scale. It's also important to note that every project requires a customized approach. However, the thesis discussed below proves true.

While engineering represents a fraction of total project costs, investing the right amount in this phase can result in long-term savings and greater return. The *Long-Term Value of Engineering* illustration to the left represents what we've learned over decades of experience. Specifically, not enough engineering can dramatically increase the lifecycle costs of your project; too much can also increase costs. Finding the engineering "sweet spot" can lower your construction and maintenance costs, lower total cost, and provide you with the best possible value for your dollars.

As you evaluate how much you should pay for engineering services, it's essential to recognize that with every project there is a direct relationship between **total cost**, **construction and maintenance costs**, and **engineering costs**. As shown in the illustration above, they shift together depending on your investment. Strategically balancing engineering, construction and maintenance costs ensures your total project cost lands in the sweet spot – that is, the greatest value.

How can you find the cost and quality sweet spot? We offer one solution beginning on the next page.

“

Speaking as a former public works director, quality-based selection doesn't lead to higher expenses; in fact, it secures objectivity and fair competition, and removes the possibility of low-ball, impractical proposals.

Todd Blomstrom, former public works director, SEH project manager



History of Quality-based Selection

In 1972 Congress adopted the Brooks Act (also known as the Selection of Architects and Engineers statute) – which says all federal agencies seeking A/E services must use QBS. Today, recognizing its value, 46 state governments have enacted QBS mandates while many local municipalities are adopting QBS regulations of their own modeled after the Brooks Act.

Why Quality-based Selection Leads to Greater Value

Cost is often the first thing project owners look at when soliciting proposals for engineering services and making project hiring decisions. It's understandable why this is so; return on investment, financial viability and the economic health of your community are top priorities. However, focusing on cost over quality can also lead to less value:

- Higher operations and maintenance costs (therefore higher total project costs)
- Rushed, sub-par or too much infrastructure
- A consultant partner who cares only about the project at hand rather than your long-term goals

Because of this, quality-based selection (QBS) is the selection process of choice for many project owners. It's being used to uncover the engineering cost sweet spot. QBS is the practice of selecting consultants based on their competency, qualifications and experience rather than price factors. Once the QBS process is complete, only then do price negotiations commence.



The Quality-based Selection Process



PROJECT OWNER ANNOUNCES NEED FOR A/E SERVICES and invites interested firms to submit qualifications (e.g., team, experience and expertise). The proposed project budget or capital improvement plan budget is often shared with competing firms.



SHORTLIST OF 2-3 FIRMS IS DEVELOPED. Interviews are often conducted to discuss each firm's qualifications, philosophies, experience and overall approach to the project.



PROJECT OWNER RANKS EACH A/E CONSULTANT BASED ON QUALITY. The top-ranked firm is invited to negotiate a formal agreement – including discussion of owner's concepts and goals, alternatives, specific scope of work and compensation. Here, the owner has the opportunity to carefully evaluate cost proposals.



PROJECT OWNER IS FREE TO TERMINATE NEGOTIATIONS if they're unsatisfied with approach or price. If unsatisfied, the owner can elect to move on to the next most qualified A/E consultant.

3 Proven Benefits of QBS

01 QBS protects your budget
A well designed project and qualified team will keep things on schedule and budget. This also ensures fewer change orders during design and construction, and reduces maintenance. In fact, research by the University of Colorado and Georgia Tech found that QBS lowers construction costs and makes it more likely for schedules to be met.

02 QBS creates fully defined, aligned project scopes
QBS gives you the ability to fully craft and define your project scope during the selection process or in partnership with the selected A/E consultant. This process creates an aligned, cost-efficient partnership from day one which limits change orders, ensures quality infrastructure and activates accountability.

03 QBS supports public health and safety
Engineers design our highways and bridges, our water treatment systems, and the public service and safety buildings that serve our communities, to name just a few – meaning design services directly impact the health and safety of the public. QBS ensures these systems are delivered at the highest possible quality.



Use QBS to Develop a “Pool”

Many municipalities and private project owners use QBS to develop a trusted, qualified pool of A/E consultants to hire and go back to for future projects. With this pool, project owners are confident in the quality they’ll receive; they can freely assign projects based on specialty; and they know with certainty they’re receiving value for their dollars. Fee negotiations take place, but the process is seamless given the trusted relationships in place.



QBS lays the foundation for higher quality and lower costs, and removes all fear of receiving low-ball or impossible to deliver on offers. Once you have a pool of A/E consultants to select from, each specializing in a specific area, your return maximizes tenfold.

Dave Hutton, former director of public works/city engineer, SEH project manager

For example, *City X* has bridge renovation, water tower inspection and fire station re-design projects on the horizon. The City can select the best suited firm from their pool for each project; procuring the consultant with more water engineering experience to undertake the tower inspection while assigning the fire station design to a dedicated architecture team with relevant experience.

Proven Results with QBS

Source: QBS, Georgia Tech, University of Colorado



The City is able to skip the time-consuming, expensive effort of developing and releasing a full request for proposal (RFP) – along with evaluation, vetting, interviews and selection – because they have done the work to create a group to confidently choose from. Once the City selects its team, they can collaborate to determine the precise scope of work. Above all, the City knows it’s paying for and receiving the best value before signing any contracts.

For example, the State of Florida relies on QBS while price is “the dominant selection factor” in the State of Maryland. As a result, according to a comprehensive study by The American Institute of Architects, Maryland’s A/E selection process is “significantly more time consuming and expensive than Florida’s.”



In Summary: 5 Frequently Asked Questions Surrounding QBS

1 Why shouldn't we bid A/E services similar to construction contracts?

A/E consultants take a project owner's idea and create its definition. This demands high quality to ensure it's done right or all other phases can fall apart. Construction contractors then take this "definition" and build it. As a result, bidding and selecting a construction contractor differs greatly from selecting an A/E consultant for design. With a precise set of plans and specifications from the A/E consultant, you can confidently award construction contracts to the lowest (most responsible) bidder because all major aspects of the project have been developed – including type and amount of materials needed.

2 Why isn't price a factor in the QBS process?

Cost discussions cannot be meaningful until the project owner and consultant understand in detail what services and solutions are needed. By focusing first on qualifications, project owners are certain the selected consultant has the technical capabilities, experience and judgment to turn their vision into reality. Trust is also established, leading to fair cost negotiations and the best possible value.

3 Does QBS promise fewer project challenges?

Studies by the Government Finance Officers Association, American Council of Engineering Companies (ACEC), Georgia Tech and University of Colorado, among others, have shown that projects completed using QBS have shorter schedules and fewer change orders. Fewer change orders keeps your budget a priority and ensures the lowest possible cost. QBS followed by cost negotiations creates a transparent relationship between you and the A/E consultant from day one.

4 Does QBS increase total project costs?

Negotiated design fees are usually 1-2 percent of a project's total lifecycle costs. Yet, the time spent uncovering the best solution for your project has a dramatic impact on long-term operations and maintenance. QBS places you and the selected consultant on the same page regarding budget, schedule and goals. You then have full power to negotiate a contract you're confident in. This limits your costs and lays the groundwork for the highest return on investment through the life of your project.

5 How can we know for certain we're getting a fair price?

You need to have detailed discussions around your project scope and expectations. This will enable the selected A/E consultant to develop the most accurate professional services budget. From here, you can compare the A/E consultant's proposed budget to budgets from successful past projects to ensure you're getting the fairest price. Once trust is established with your consultant, or the well of consultants you rely on, cost remains a priority but never at the expense of quality.

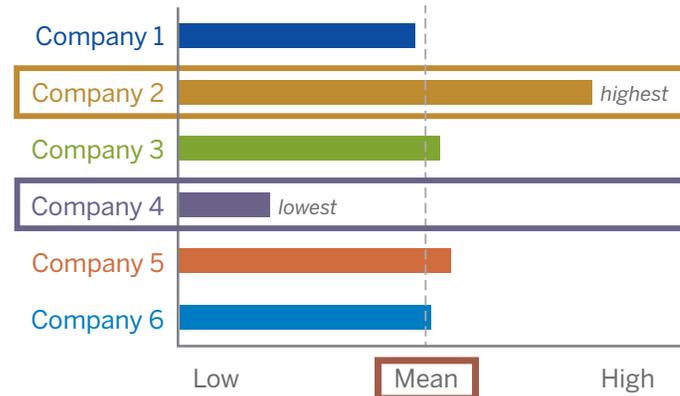


COST PREDICTIONS

5 Cost Proposal Warning Signs

If cost remains your driving force, it's important to look out for fee proposal warning signs. Here, we reveal red flags that what an A/E firm is offering might not be feasible or is only possible at the expense of quality.

You need to identify the warning signs as you seek an answer to the “How much should you pay for engineering services?” dilemma. Awareness brings you one step closer to knowing with certainty that you're receiving the best value at the most responsible cost.



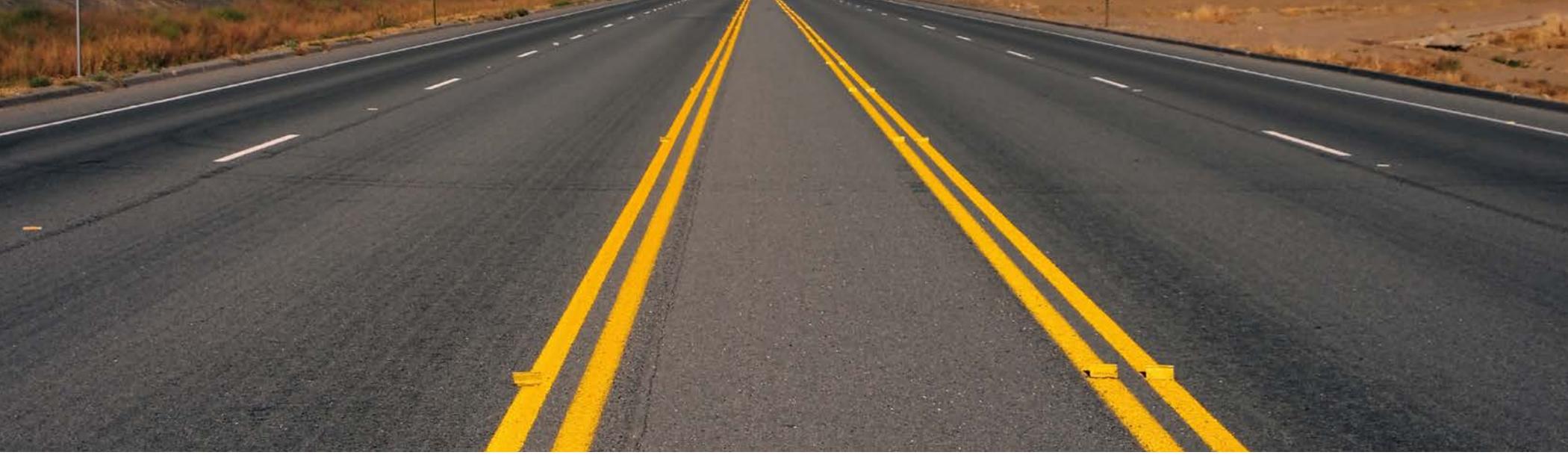
1 You receive an offer well above or below the mean

Project owners often solicit fee proposals and receive one exceptionally high offer and one exceptionally low offer, mixed with a number of offers that fall close to one another. We often encourage our clients to throw out the highest and lowest cost proposals. These usually mean firms didn't carefully evaluate your scope, or perhaps they don't have enough relevant project experience to piece together an accurate cost. High offers may have included unnecessary or optional services. For the lowest offers, at best they're making a low bid to grab your attention.

If you're against dismissing bids and want to consider the lowest offer, at the very least uncommonly low offers demand careful examination. They can signify inexperienced team members, excluded services or misunderstanding of scope. Have you looked closely at the experience of the team with the lowest cost proposal? Have you compared this proposal to proposals closer to the mean?

High and low proposals might also be a sign that your RFP or solicitation lacks important information. Did you provide a thorough scope? If a high number of questions have been submitted or if consultants have reached out with questions, have you held pre-proposal meetings to provide clarity?





2 Cost components deviate from your scope of work

There are times when competing firms quote services that are entirely irrelevant to your scope. Too often, this is a warning sign that the consultant doesn't understand your scope or didn't take the time to carefully examine project details. Have other consultants included similar costs and suggestions, or is the low/high cost proposal you're considering the only one?

Suggested changes or additions to your scope can be an important, value-added service but – as further examined in the *5 Concrete Examples of Value-Added Services and Their Impact* section ahead – the firm must be able to provide “quantifiable proof” (i.e., the value to you in terms of cost and quality) without disrupting or undermining your original scope.

3 Wishful thinking reigns over practical and realistic

The proposals you receive will always vary; experience, design alternatives and approaches are different from consultant to consultant. However, it's important to decipher the practical and realistic from wishful thinking. If an A/E firm promises more services, value and hours than any others at a cost far lower than any others, what they're offering might be too good to be true.

Did they forget an important piece or phase due to an incomplete project scope? Did they rush their response without careful evaluation? Does the proposed team have relevant experience – not just the firm but the actual team members? If a consultant promises lofty value-added services, make sure they define how this will impact your project and can prove they will be delivered.



4 The number of hours committed vary greatly from consultant to consultant

Look closely at the number of hours each firm has allocated to complete your project. As with total cost, something isn't adding up if most A/E consultants fall into a certain tier while one or two have vastly more/less hours committed. This might signify lack of effort in terms of reviewing your scope, or a low-ball offer that lacks careful planning/foresight and can't be delivered without significant change orders.

This warning sign is one reason project owners are trending toward lump sum contracts as opposed to paying for hourly rates. So long as your scope has been carefully developed, lump sum contracts limit scope creep (a subtle process that starts with small scope adjustments mid-project but results in projects that take far longer to complete). Lump sum contracts also place more accountability on the consultant, as scoped services that come in over budget contractually become their responsibility.

5 Recycling a previous scope or request for qualifications (RFQ)

While the previous four signs speak about A/E consultant efforts, number five asks you to look closely at your scope of work. It's not uncommon for project owners to reuse or repurpose project scopes or RFQs when soliciting bids because it saves time.

Generic or non-customized scopes and RFPs can lead to highly inaccurate price proposals. They can also lead to projects with a high amount of change orders during design and construction. What follows are missed budgets and lengthier schedules, among other unexpected expenses.



A/E consultants are prone to leave out an important service or add scope if the RFP doesn't make clear what you're seeking; this can increase cost variance and even proposed costs, and lead to wide-ranging proposal responses.

Todd Blomstrom, former public works director/city engineer, SEH project manager

GET SPECIFIC

The Role of Project Scopes in Maximizing Your Return

Establishing a clear project scope is the single most important step in limiting your expenses, maximizing value and figuring out how much you should be paying for engineering services.



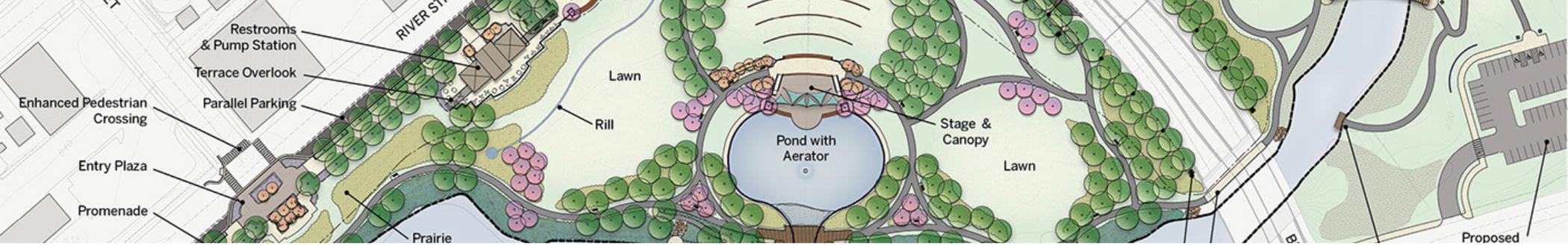
Thorough Project Scopes Bring Clarity

A quality scope of work defines the full extent of a project and ensures you're paying only for the A/E services needed. A good scope also forms the basis of the contractual relationship between you and your consultant throughout a project. Scopes that are clear and concise lead to fewer surprises, fewer change orders, and clarity around schedule and budget.

According to 900 A/E industry executives, scope misalignment between project owners, A/E consultants and construction contractors is the “key factor” contributing to cost increases and cost uncertainties.

Source: Engineering News Record, Shared Understanding of Project Scope Is Key

Conversely, a vague and poorly worded scope can be a continual source of confusion. A generic scope will likely lead to scope creep which significantly impacts your budget and timeline.



The First and Most Important Steps

There are many steps and components to developing a proper scope. But as you begin the process of scope development, these two important steps should come first:

Step 1. Clearly identify what your needs are and how you anticipate the project meeting these needs. Write this out in a project scope statement. What are your goals for this project? What do you need the project to achieve? This step lays the very foundation of your project and the services you need to complete it. Beyond that, it creates understanding around cost decisions.

Step 2. Establish a realistic project budget and timetable. Do you have or need funding? What is your budget and is it set in stone? When do you need the project completed by? Cost discussions and negotiations cannot be meaningful until you understand in detail what professional services are needed, your timetable and your budget.

It doesn't stop here; it starts. To develop a truly impactful scope you need to carefully plan and include a number of pieces, as shown in the *Snapshot of Project Scope Requirements* to the right.



As a public works director, during the proposal review process we would always look for consultants that brought experience and innovation, but also understood and respected the limits of our project scope and budget. If we were challenged in the area of scope, we looked for a partner willing and capable of carefully developing one in partnership with our team.

Wayne Houle, former public works director/city engineer, SEH project manager

Snapshot of Project Scope Requirements

- REQUIREMENTS
- STAKEHOLDERS
- SCOPE STATEMENT
- WORK BREAKDOWN STRUCTURE
 - ↳ Project phases
 - ↳ Project deliverables
 - ↳ Sub-projects
- ROLES AND RESPONSIBILITIES
- DELIVERABLES
- STAKEHOLDER BUY-IN/ACCEPTANCE
- SCOPE CONTROL

Source: Project Management Institute, Project Management Body of Knowledge Guide

INNOVATION

5 Concrete Examples of Value-Added Services and Their Impact

Value-added services is a commonly used term, yet the definition varies. It's important to uncover how this service can maximize your investments and potentially reduce costs.

Value-added services are alternatives, approaches or solutions uncovered and provided by your A/E consultant beyond what's agreed upon in your contract. It means your A/E partner is going "above and beyond" to make sure you're receiving greater value at no additional cost.

As you seek the best value, consider the following five examples to make sure promises of value-added services are more than lip service – that they are being communicated, quantified and delivered.

1

A/E firm leverages existing partnerships and relationships to find you better value, cost reductions

Your consultant will likely have other projects in the works simultaneous to yours, existing relationships and a deep archive of relevant experience. As an example of how these can lead to value-added services, an SEH team recently provided roadway design for one community when another client from a neighboring community hired the team to provide similar work.

The project team recognized that bidding and constructing the two projects together when seeking a construction contractor could increase the economy of scale and vastly decrease contractor costs for both communities. This value-added service became a win-win for both communities – limiting duplications like contractor trips to the project site and enabling single delivery of materials and machinery.

Ask the A/E firms you're considering how their existing relationships and simultaneous projects might benefit yours. Focusing on quality during selection can bring to light relationships and experiences that lead to reduced costs, efficiencies and more value for your dollars.



2 A/E firm uncovers cost- and time-saving opportunities in the midst of your project

Quality consultants won't cut corners but are always searching for cost- and time-saving value adds. As an example, while providing wetland permitting services for a roadway project, another SEH project team quickly recognized that the size of the wetland was over a certain threshold – making the federal regulatory/permitting requirements more complex and approval process far longer for a particular permit that was needed.

However, the project team recognized the opportunity to seek exemptions for certain parts of the wetlands after their research uncovered that they were man-made wetlands. This required a slight shift in the original project scope but put the client back within the regulatory threshold – reducing the length of the approval process, reducing the amount of work required and ultimately saving the client money.

3 A/E firm tells you the truth, even if at the expense of their selection status

A/E consultants should be willing to share hard truths. Perhaps they recognize your budget is too low to complete a project in full, or that your timeline isn't possible. Trusted A/E consultants will never commit to a contract they know they can't fully deliver. Some firms will find a way to commit to meeting your scope at whatever cost/schedule just to be selected, which can lead to sub-par infrastructure and damage your economic viability for many years.

Trusted consultants will make sure selection committees know the full truth even if at the expense of their selection status. Do you have budget or schedule doubts? Has one consultant vowed something is feasible while most others have said it's not possible? It's important you dig to uncover the truth.

4 A/E firm provides you with present and/or future worth analysis

Present and future worth analyses can be considered value-added services, but in reality you should expect them from your A/E consultant. These analyses assist you in determining the best way to accomplish your project.

Depending on the type of project you're undertaking, it may be appropriate for your A/E consultant to provide two or more alternatives to consider. From here, worth analyses answer:

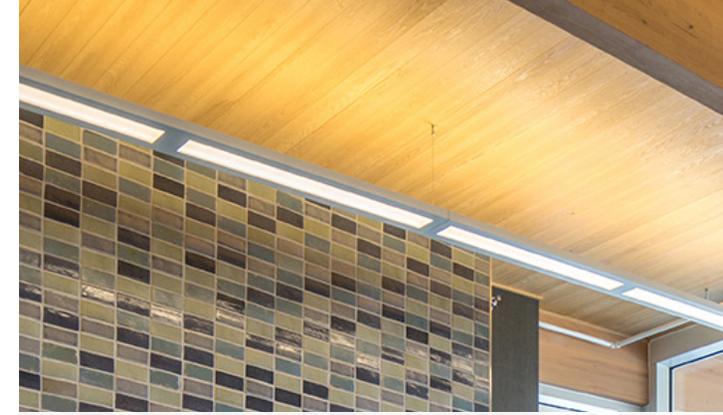
- What is the functional life for each alternative?
- What are the lifecycle costs – that is, what should we expect in terms of operational costs, maintenance costs, rehabilitation costs and when?

Worth analyses and other studies (such as lifecycle cost analyses) play an integral role in making sure you're receiving the highest return on investment.

5 A/E firm offers insight into other or future project needs without undermining original scope

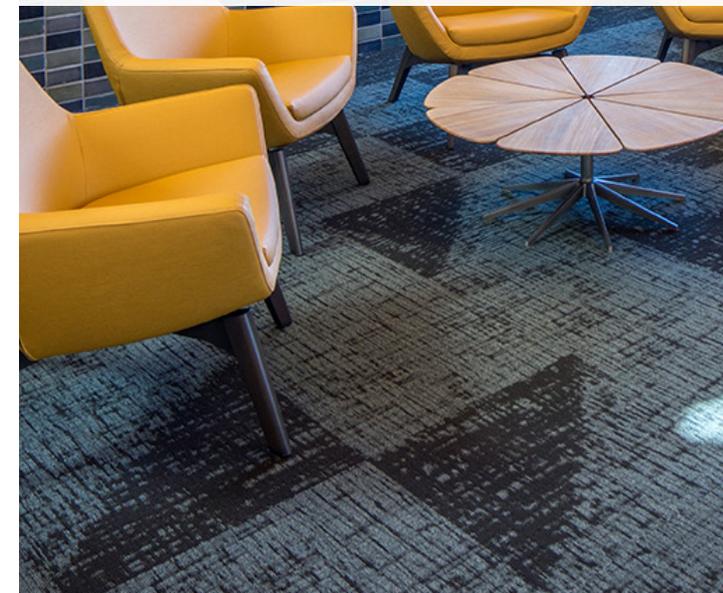
Whether you've released a full RFP and requested cost proposals or relied on QBS, a consultant's approach to your scope should include only what's needed to answer that project's particular need. However, value-adding consultants will go one step further when the project warrants.

Perhaps they find future savings in cost and maintenance by adding an environmental assessment or lighting design to your project. Or, the consultant suggests a pivot in light of upcoming regulations that will impact the project. If the firm provides quantifiable proof (i.e., the value to you in terms of cost and quality) to their suggestions without disrupting or undermining your original scope, you can be confident it's a value add as opposed to a scope deviation warning sign.



Price-based selection often limits innovative or alternative ideas, as the A/E firm is more focused on meeting a price point than the total project solution. The project scope is thus minimized in order to minimize engineering costs, which thereby limits the type of 'outside-of-the-box' thinking that can lead to lower lifecycle costs.

Benita Crow, SEH vice president, principal





FINAL ANSWER

How Much Should You Pay for Engineering Services?

Putting an exact dollar amount on hourly rates or costs for specific engineering services would be a disservice to your project.

Each project is unique, and your dollars are an investment. They should be valued and treated as such. Although there is no magic number dollar amount, there are strategies you can use to dismiss the pretenders and spur more confident cost decisions.

Ask the difficult questions, explore the opportunities presented through QBS to uncover the cost and quality sweet spot, weed out concerning cost proposals, and carefully develop and evaluate your project scopes. These strategies will increase your likelihood of receiving the highest possible value, and should provide you with confidence in what you're paying – not just for engineering services but for your projects as a whole.

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