AIA

On Compensation

Considerations for Teams in a Changing Industry

AIA Integrated Practice Discussion Group

Disclaimer

The AIA makes no recommendation as to the appropriateness of any method of compensation described within this document on a particular project, nor does the AIA suggest that the methods listed include all methods that are possible, practical or in actual use. The use of any of the compensation methods described within this document, singly or in combination with other methods, is a business decision for the owner, the architect, the constructor and other interested team members. Further, the AIA makes no recommendations and has no guidelines or schedules that specify the amount of compensation any team member should be paid.

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Introduction

Compensation: A Case for Change

As the design and construction industry moves toward a transformed future based on highly collaborative project teams and the expanded use of sophisticated technology, the "fit" of traditional compensation models for stakeholders comes into question. These new methodologies and tools not only require different allocations of resources and effort, but also involve changes in the nature of what we do and the time required to accomplish necessary tasks. In general, project success depends upon providing appropriate project compensation models for all stakeholders. Given the radical changes underway with respect to project delivery, it stands to reason that project stakeholders should explore new compensation approaches to appropriately implement and nurture these new project delivery models.

Fundamental Principles
To be effective, any form of compensation must 1) be fair to all and 2) must motivate appropriate behaviors.

On Compensation is a resource for owners and other team members to use when considering appropriate compensation structures for projects involving new methodologies and tools. It is based on two fundamental principles: that to be effective, any form of compensation must 1) be fair to all; and 2) must motivate appropriate behaviors. The pages that follow look at new value propositions, basic stakeholder motivations, "ingredients" of compensation structures, and conclude with a suggested "checklist" to serve as a point of departure for consideration, negotiation, and development of value propositions and project compensation paradigms. If this document is considered holistically and its concluding checklist is used openly and with an attitude of respect for all team members, it is likely that a model for compensation will emerge that is fair, beneficial for all and an appropriate solution for the situation at hand.

Value Proposition "Checklist"
- Team Member Motivations and Values
- Project Goals and Outcomes
- Project Type and Scope
- Professional Services Compensation
  - *Business Expenses and Overhead*
  - *Goods and Services*
  - *Risk and Liability*
  - *Expertise and Value*
- Performance Incentives (individual and group)
  - *Project Delivery Performance Incentives*
  - *Business Enterprise Performance Optimization Incentives*
  - *Metrics*
- Miscellaneous Considerations

While every project should end up with the right compensation model, there's no need to start from scratch: many successful models already exist and simply can be modified to better accommodate some of the considerations outlined in this document. "Best for project" thinking is a fundamental principle of collaborative models; wherever possible, compensation should be structured in ways that acknowledge the value contributed by the different team members, compensates each member appropriately for the value delivered while also encouraging and supporting collaborative behaviors. Teams are encouraged to be creative in their solutions—no single model will fit all instances, and the rate of change in the industry suggests that new approaches will continue to emerge.

While this document may be applicable to compensation conversations for all delivery models, many may read this document looking specifically for solutions for Integrated Project Delivery (IPD). Readers of *On Compensation* should reflect on the idea that a prescriptive compensation approach for IPD cannot—and probably should not—be the objective of a resource like this document. Indeed, creativity and experimentation is encouraged. While commonalities may exist among IPD projects, sufficient variability will exist in team composition, project characteristics, owner objectives, etc. as to make a customized, or tailored, approach both necessary and desirable in almost every case. While

On Compensation lays out important principles and concepts related to compensation in an IPD environment, each team – and each team member – will need to adapt those principles and concepts to the specific realities, and the opportunities, inherent in their own individual situation.

As we move toward a new era for design and construction, successful project delivery will depend upon open communication and mutual respect among the team members. The key values underlying integrated, collaborative models can serve teams well as discussions about team structure begin and unfold (see "Integrated Project Delivery: A Guide" and "Integrated Project Delivery: First Principles for Owners and Teams," both available at www.aia.org/ipd). In general we encourage readers of *On Compensation* to approach this topic in the broadest possible context of Integrated Project Delivery, regardless of delivery model.

We wish you success in your endeavors and hope this resource adds value and richness to your enterprise.

- *The AIA 2008 Integrated Practice Discussion Group, a discussion group of the AIA Board of Directors focused on matters of industry transformation*

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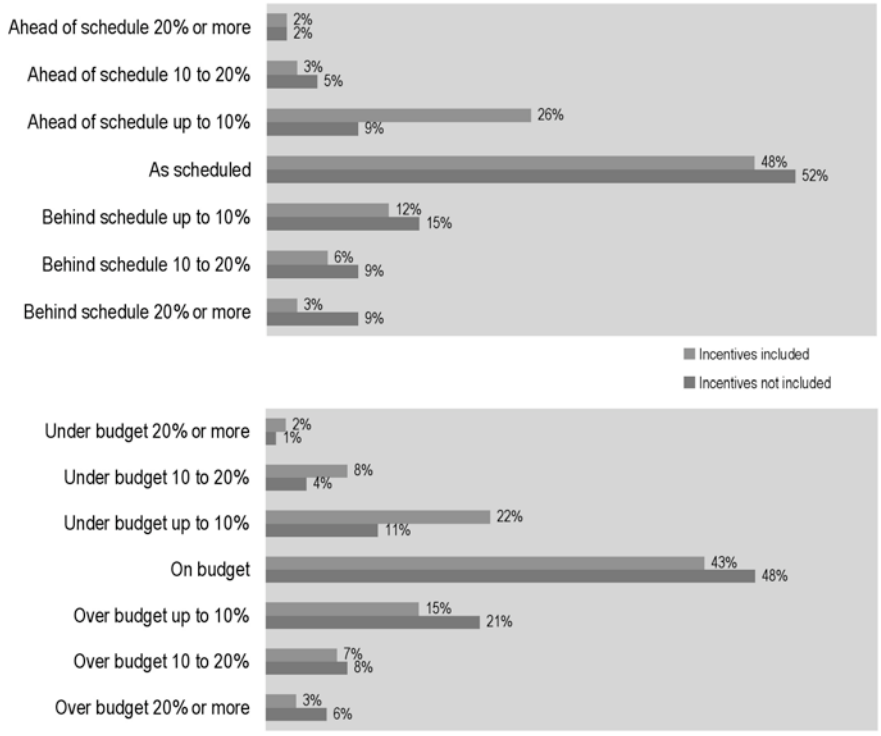
1. New Value Propositions

Transforming forces are sweeping through the design and construction industry. Project drivers—such as energy reduction, sustainability ratings and meeting increasingly tight schedules and budgets—are becoming strong enough within the design and construction industry to place team performance in these areas under ever greater scrutiny. One result of this increased scrutiny is the evolution of new compensation models in the marketplace that rely on "performance based" or "outcome based" structures. For good reason: projects that incentivize performance to attain certain targets are significantly more likely to accomplish those targets, as evidenced by performance data from a 2008 AIA survey:



Project Performance to Schedule and Budget (1052 total projects, 11% with incentives, 89% without)

Principles of IPD

- Mutual Respect and Trust
- Mutual Benefit and Reward
- Collaborative Innovation and Decision Making
- Early Involvement of Key Participants
- Early Goal Definition
- Intensified Planning
- Open Communication
- Appropriate Technology
- Organization and Leadership

The transforming forces mentioned above also include the emergence of collaborative delivery models based on the nine fundamental principles of IPD defined in AIA/AIACC's 2007 *Integrated Project Delivery: A Guide*. These principles are applicable not only to overall project delivery issues but also to discussions about compensation; teams would be well served to approach value proposition conversations from the perspective of these fundamental principles.

In light of emerging marketplace models, and while a range of models may be considered for any particular situation, the strongest new value propositions are likely to emerge from the principles of IPD and will include three primary components: Professional Services Compensation, Project Delivery Performance Incentives, and Business Enterprise Performance Optimization Incentives. A range of other influencing factors also exists. Different models will have varying components included in different ways and under

different names but the considerations will be similar, as follows.

Professional Services Compensation

Programming, Planning, Design and Construct Phase Support

This component of a compensation model is focused on delivery of the project, and covers services of team members from project inception to the end of construction. Individually structured for each team member, this component is prescriptive in nature and can be connected cleanly to specific roles and responsibilities. Considerations here should include all ingredients of compensation outlined later in this document. Compensation for services may cover costs plus a profit or just costs, depending on the overall compensation model.

Project Delivery Performance Incentive

For meeting or exceeding goals related to delivery

Performance incentives are perhaps most effective when team based, that is to say, "everybody gets paid or nobody gets paid." Team-based incentive compensation can drive collaborative behaviors that foster positive project benefits, while individually based incentives may drive negative behaviors and increase antagonism on the project. Performance incentives may supplement base profits (if profits are covered in professional services compensation), or may include base profits themselves. Examples of project delivery performance incentives include but are not limited to the following:

- schedule
- cost / savings
- waste reduction
- quality
- safety
- process
- design quality
- innovation
- technologies / tools
- diversity
- workforce development (attract and retain)
- client satisfaction
- sustainability or other certification / award
- decrease in RFIs / change orders

When included as part of an overall compensation model, performance incentives and appropriate metrics should be defined clearly, carefully and as early as possible, involving as many project participants as possible. Performance metrics are critical and should be easily and objectively measurable to minimize any potential confusion about whether or not a particular goal has been accomplished. Less objectively measurable criteria, such as design quality, will require both creativity in the establishment of appropriate measuring processes and complete buy-in on the part of team members.

Business Enterprise Performance Optimization Incentive

For meeting or exceeding metrics of business efficiency / effectiveness

"Everybody gets paid or nobody gets paid" may again be the philosophy to best align efforts in this area, which focuses on desired long-term outcomes from a project related to the enterprise the project intends to support. Examples of incentivized long-term outcomes include but are not limited to:

- energy performance
- building operating cost
- increased productivity
- early or enhanced revenue
- tenant satisfaction
- user / operator satisfaction
- community satisfaction
- sustainability or other certification / award
- community economic development
- tax and grant benefits

Incentives in this category are most closely aligned with owner motivations, and are clearly long term in nature. Clear articulation of goals and complete agreement on metrics are essential—outcomes in this category may be influenced by forces outside of project team participants' ability to control. For instance, if a long-term performance incentive were connected to energy performance, it would be important to define how the team would accommodate or measure the impact of occupant behavior or proper systems maintenance on the outcome. Or, suppose an incentive were connected to increased productivity: how much improvement could be directly attributable to design and construction outcomes and how much to, say, management changes? Clearly these are complex equations. However, the complexity of establishing appropriate metrics should not be a deterrent to establishing these kinds of incentives as this is where the project team's efforts provide the highest and best value: if, because of decisions made during the design and construction of the project, the final physical solution enhances enterprise productivity by even a percentage point or two, the payback to the owner is quick and the long term value to the owner is substantial.

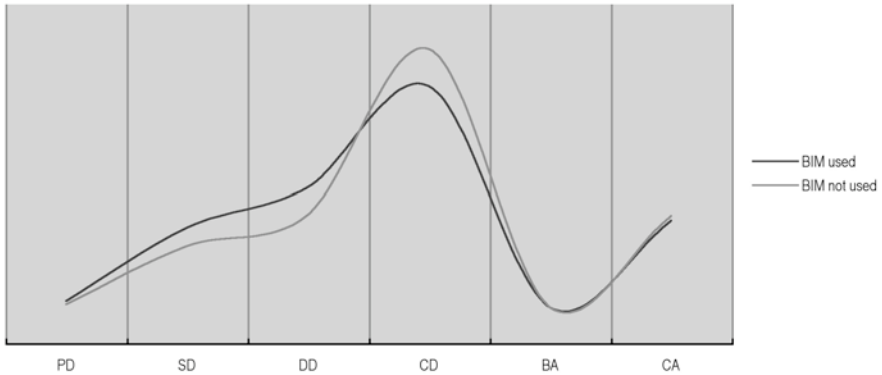
Miscellaneous Considerations and Concepts for New Value Propositions

Regardless of the compensation model used on a project or the ingredients included, there is an additional range of issues to consider due to other industry trends, including changes in cash flow, individual or group focus, pain share / gain share, and long term / short term project outcomes.

Changes in Cash Flow

The "MacLeamy Curve" illustrates the concept that decisions made earlier in the design process can be made with greater benefit at less cost *(from Integrated Project Delivery: A Guide, © AIA/AIACC, 2007)*

Anyone who has followed industry transformation conversations since 2005 probably is familiar with the concept of "shifting the curve to the left" illustrated in the "MacLeamy Curve". While that diagram is conceptual in nature, it does have real-world implications. For instance, as decision making flows to the left in a project, driven by the use of BIM technologies and collaborative processes, so does time and effort…and it is not unreasonable to think that compensation should follow. This expectation is borne out by data from a 2008 AIA survey, which shows a distinct trend toward a larger percentage of fees being associated with earlier parts of projects (graph below). Teams—and especially owners—should be aware of this shift and adjust project cash flow accordingly.



Design Fee Percentages Expended per Phase *(base: Architects, n=530. BIM used on 140 projects.)*

Individual | Group

Compartmentalized compensation can lead to divisive behaviors, with each team member doing what's best for their firm instead of what's best for the project. "Best for project" thinking is a fundamental principle of collaborative models; wherever possible, compensation should be structured in ways that acknowledge the value contributed by the different team members and compensates each member fairly for that value, but also provides mechanisms that encourage and support collaborative behaviors. Some parts of overall compensation models will lend themselves more readily to individual or group consideration (i.e., professional services compensation vs. incentives).

Pain Share / Gain Share

A term derived from the Australian "Project Alliance" delivery model—the concept of pain share / gain share—expresses the sharing of risk and reward among the team (as opposed to individual team members). If a *team* is held accountable for meeting certain project goals (in other words incurs risk), the *team* also should be allowed to share in the benefits arising from meeting those goals, to a degree mutually acceptable to all parties concerned. Similarly, all the parties should be expected to share in the impact of negative outcomes, to a mutually defined and acceptable degree. "Pain share / gain share" promotes a strong focus on project outcomes, rather than individual stakeholder effort.

Long Term / Short Term

Teams should define clearly which project goals are short term, and which are long term in nature: some project goals may not be measurable within the span of design and construction. If portions of compensation are tied to these different types of goals, teams should frame relationship structures carefully and define metrics appropriately to allow proper performance measurement. All team members should contribute to such discussions during the goal-setting stages of the project, clarifying possible influencing factors and jointly developing necessary response strategies.

Building a Stronger Foundation

The considerations outlined in this section are fundamental to team conversations about value propositions, especially within the context of emerging delivery models like IPD. They represent exciting opportunities to re-energize project teams and to motivate stronger collaborative behaviors. But, on their own, these considerations are not enough: every conversation also must address a range of underlying factors that, while basic in nature, are critical to ensure all facets of new business relationships are thoughtfully considered. Deep reflection on basic team member motivations and full exploration of the wide range of ingredients of compensation will better inform compensation conversations for teams: effective agreements must be built from the bottom up.

Owners
meeting business objectives
meeting organizational mission statement
meeting customer needs
profitability
ROI, returning shareholder value
productivity (processes, people)
accessibility to market
services clients / customers
going after new customers
development of new technologies
budget / cost control
schedule
speed to market
improved workspace for employees
corporate citizenship (needs of community)
meeting community needs
improving community living, lifestyles, quality of life
improving energy usage
improving aesthetics
corporate governance (regulatory requirements)
governmental / institutional owners--different?

Architects
profitability (project, firm)
better quality design
better quality construction
increase quality of design
improve design quality
enhanced working relationship with team
less conflict
seek to enjoy the process
creativity
creative expression
designing for what's next
anticipating tomorrow's needs
learning
challenged
groundbreaking territory
solving problems
research combined with current knowledge
creating exceptional places for people
recognition
affirmation
leadership
providing a service
helping people achieve business objectives
project well done
creating community
responsibility toward environment, "do no harm"
repeat business
fun, enjoyment
professional fun

Contractors
profitability (company, project)
economy – working towards the low cost (not necessarily the lowest price) solution
increased effectiveness, efficiency
innovative processes
add value
intellectual challenge of how to put things together (logistics, scheduling, etc)
work out the details
build things
be a maker, shaper, a builder
working with hands on
pride in craft
leave a lasting mark, leave something behind
the learning process of building is never finished
uniqueness, no project is ever the same as a previous project
customer service--giving the client what they want
help client feel good, meet goals
helping other stakeholders be successful
project well done
give back to community
community connection
repeat business
social interactions between client / designer / constructor
leadership
leave 'em smiling – a satisfied client remembers your phone number

2. Motivations of Team Members

Why Do We Do This?

In any business relationship, understanding the basic motivations of participants is essential to greatest success. In the design and construction industry, motivations vary widely by stakeholder and can run the gamut from financial to professional to personal. However, motivations or values outside of basic financial drivers are rarely considered when discussing new business endeavors. The greatest commitment to project outcomes is gained when the full range of motivations and most basic values of stakeholders are acknowledged and woven into the essential fabric of a business relationship.

When asked *"what motivates you to do what you do?"* the three primary members of the team (owner, architect, and contractor) each identified a wide range of motivational considerations (see samples to left). Upon reflection, the motivations for each of the three stakeholders can be sorted into major categories. Here things become interesting: the motivations of the owner clearly are unique in the project team, and while the *specific* motivations differ between the architect and contractor, theirs organize neatly into similar *general* motivational categories:

Owners
- Improve enterprise productivity
- Respond to project drivers
- Make a statement (the "iconic" building)
- Do the right thing
- Meet mandatory considerations
- Tailor project / process to my unique situation

Architects and Contractors
- Make a reasonable profit
- Improve quality
- Embrace challenge and fulfillment
- Make a contribution
- Build a relationship / reputation
- Have fun

These motivations—when the subject of thoughtful and respectful mutual consideration and discussion—can bring powerful benefits to teams beginning new collaborative work.

Motivations of Owners

Improve Enterprise Productivity

With the general exception of residential and religious structures, owners typically build to support enterprise or institutional goals. Since the measures of success will vary by type of enterprise and by the values of the enterprise's leaders, the specific goals of a project—as it relates to the enterprise—should be considered at the outset. Those goals may reflect some basic considerations and questions: What are the objectives of the enterprise? What is the organization's mission? How are stakeholder needs met? What is the desired return on investment? Profitability? Productivity rates, for both processes and people? Return on stakeholder investment? Institutional performance? These questions and others may define desired project outcomes. For instance, the success of an airport renovation might be measured by increased throughput of travelers, while the success of a new manufacturing facility might be measured by an increase in units produced per unit time or per employee, etc. In every case, enterprise considerations require a baseline assessment for comparison purposes and specific metrics to gauge project success.

Respond to Project Drivers

Beyond the enterprise drivers outlined above, other specific forces might influence owners on a project: budget, schedule, speed to market, etc. Project teams should explore all possible drivers, establish their relative priorities and quantify their connections to the project.

Make a Statement (the "iconic" building)

For some owners, the desire to "make a statement" is a significant—and personal—motivator. This motivation may respond to the personal drive of a particular individual's ego or may relate to the nature of the business enterprise (think art museum). Whatever the reason, when this motivator is present, teams would be well served to know it early.

Do the Right Thing

Increasingly, an influential force in the design and construction industry is the desire to be "green" or sustainable. Some enterprises choose this path because they see it as "a good return on investment", while others see it as "the right thing to do." The desire to mitigate project impacts on communities, neighborhoods and cities also can fall into this category, as can the desire to do the best thing for enterprise employees. For that matter, owners also can be motivated by the desire to "do the right thing" as it relates to project team members!

Meet Mandatory Considerations

Not all aspects of a project are voluntary: some may be dictated by federal, state, or local jurisdictions. Corporate governance also may come into play. Impacts of these considerations on a project vary dramatically. Examples include restrictions on procurement techniques, necessary energy reductions, sustainability rating certifications, numbers of special unit types in multi-unit residential, etc., etc. Owners and teams must work through these drivers together.

Tailor Project / Process to My Unique Situation

Among project team members, owner needs and motivations are unique. Owner motivations also vary dramatically from one owner type to the next. Public-sector owners approach their projects in a fashion radically different from private sector owners. Even within the public sector, one finds considerable differences among the motivations of military owners, public universities, local municipalities, etc. Within the private sector, retail owners, office owners, hotel owners, residential owners, etc., each convey considerable differences. This variety arises from the material difference of each project type, the requirements of the project delivery process, funding approaches, anticipated project life cycle, etc. These factors underscore the critical importance of carefully examining—and responding to—the unique motivations and needs of each individual owner.

Motivations of Architects and Contractors (and others providing services on a project)

Make a Reasonable Profit

Firms that support an owner's construction project don't do it for free, nor do they seek to simply cover expenses. All such firms share an expectation to profit from their work, and owners must acknowledge this as a basic fact of the business world. Profits are necessary to delivery quality projects, attract top staff, reinvest to ensure future performance, and compensate firm owners for the risks they incur. Profit expectations can vary from company to company, but generally speaking, all companies seek to maximize profits on their endeavors–especially with respect to the risks associated with providing their services.

Improve Quality

The desire to improve one's work product and one's work process is intrinsic to many participants in the AEC industry. How can design quality, construction quality, documentation, team safety, working relationships and project outcomes be improved? Whether explicitly discussed or not, team members are driven to pursue these questions. Understanding these desires is important to understanding the team and motivating appropriate behavior from its members.

Embrace Challenge and Fulfillment

Design and construction teams are creative hotbeds: both architects and constructors enjoy solving problems and overcoming complex challenges! Breaking new ground, making processes better and faster, leaving a mark, anticipating the future, achieving a sense of pride in one's work, working with the mind and with the hands, bringing something from imagination to reality—tangible elements like these provide a tremendous sense of satisfaction and make up a large part of why these team members do what they do.

Make a Contribution

This motivation is similar to the idea of "doing the right thing" for owners. Give back to a community, improve the environment or the world, serve clients well and help them meet their own goals and objectives – all of these examples illustrate different ways that architects, engineers and contractors aspire to making a contribution.

Build a Relationship / Reputation

Doing work for a client again—and again and again—is a measure of success and an affirmation of worth for many team members. The forging of strong relationships that last over time is one of the best ways for companies to enhance their reputations, gain new work and provide significant corporate and personal satisfaction. While working on a project, most team members think regularly about *"what's the next thing we can do together?"* knowing that their performance on the current job may influence those future possibilities.

Have Fun!

Most architects and constructors will say that enjoying the process of designing and building a project—though that process may be difficult and time-consuming—is an important part of what they do. Most also can share profoundly unhappy work experiences

in their past that were devoid of fun. Teams perform better work when they enjoy the experience. Finding ways to make projects more enjoyable and satisfying is an important consideration for many in the AEC world.

What's Changing in Motivations

Within the realm of new value propositions, the primary revelation is the fact that non-monetary motivations should be fundamental to team and compensation conversations. *Any* collaborative effort will be most successful when the different stakeholders acknowledge and respect—in an open and explicit manner—the *complete* set of goals and values for every team member. This revelation certainly is true when one looks at the design and construction industry.

In general overall motivations are not changing so much as is their relative importance. For example, environmental responsibility (i.e. *"do the right thing"*) has become an increasingly important driver for all stakeholders, as is the desire to enhance community and individual well being—compared to the past, when financial considerations generally formed the predominant (if not sole) basis for decisions.

3. Compensation for What?

Ingredients of Compensation

compensation:
something (such as money) that is given or received in return for goods or services; remuneration; money paid for work or a service.

A construction project commences; money flows, exchanging hands between the owner and other project participants. Expenditures are made—not only to acquire actual materials and systems for the project itself, but also to engage other necessary expenses, services, and less tangible items—which together make up the project cost structure. In this context, we would be well served by a return to basics when making compensation arrangements for project teams, reminding ourselves of the actual costs of doing business, the total scope of goods and services required on a project, the relative risks assumed by the different parties and the value-added expertise of the various team members.

Business Expenses and Overhead

Every business incurs costs simply by existing. Some costs are considered a reimbursable expense and are passed directly through to the customer as a basic cost of doing business (with or without a markup), while some costs are borne internally and considered to be overhead; direct costs—generally related to project scope—also are incurred. Those costs considered reimbursable and those which represent overhead vary significantly by business type or market sector, business / owner preferences, and also changes over time. Regardless of type, all costs must be covered by revenue for the enterprise to survive and thrive.

In the design professions, examples of appropriate overhead expenses generally include such costs as office space, marketing, equipment costs and office staff not directly involved in projects. Reimbursable expenses vary widely and are the most sensitive to changes in the operating environment over time. For instance, during the early stages of the architectural profession's transition to CAD, many firms charged computer time as a reimbursable expense; this practice diminished—and eventually vanished—as CAD became a standard industry tool. Printing, telecommunication costs, mileage and travel expenses are other examples of project costs that agreements sometimes consider reimbursable and, at other times, are included as part of the fixed fee. The treatment of all design firm costs vary with changing industry conditions over time.

In the contractor's world, many of the expense and overhead considerations are similar, though some are more specific to construction. The contractor's "general conditions" usually itemizes those expenses directly related to a specific construction project and can include the items similar to those listed above, but also might include such items as project site office, temporary heat or utilities, project toilets and the like.

Teams need to consider the relationship of both project specific expenses and corporate overhead to the compensation model—the inclusion (or not) of any particular expense is negotiable and should be discussed openly, clearly itemized, and policies about their handling should be defined.

What's Changing in Business Expenses and Overhead

Many industry participants report changes in owner attitudes regarding reimbursable expenses, with a

gradual shift toward inclusion of such charges into the basic fee. Teams should keep abreast of industry trends on such issues. Government schedules represent a good resource for those interested in current considerations about "appropriate" overhead and reimbursable expenses.

Goods and Services

Within the context of a building project, all members of the design and construction team —with the exception of the owner—are in the business of providing some type of good or service in support of that project. These offerings differ by stakeholder: architects, engineers, and other consultants generally provide services related to the design of the structure (programming and other pre-design services, conceptualization, criteria design, detailed design, implementation documents, sustainability strategies / systems tracking, etc.) while firms on the construction side (contractors, subcontractors or the like) generally provide services related to the actual assembly of the building (estimating, scheduling, permitting, construction labor coordination, site supervision, sustainability plan fulfillment, etc) as well as providing the physical building materials, products and systems (goods). Services can occur quite early in the process, with team members providing assistance with business enterprise goals, long range planning, master planning and the like, and can occur quite deep in the project life-cycle, ranging from building commissioning to actual assistance with facility management and operations. Lines are not always clearly drawn; contractors may provide consulting services in the design phase of a project, just as designers may provide services during construction. Services may be actual work performed by the parties themselves or may involve the coordination of the work provided by others.

Markups
Markups are not uncommon in the industry in both the design and construction worlds. Rationale for markups include but are not limited to the following: time for coordination and handling (of materials and consultants), to cover taxes incurred as costs are passed through to become revenue, to cover risk and to generate profit.

What's Changing in Goods and Services

New opportunities are emerging, especially with the advent of BIM, sustainability and collaborative models, including but far from limited to the following list. Keep up with leading-edge strategic industry conversations and consistently watch for opportunities to provide (architects, constructors, consultants, subcontractors, etc)—and demand (owners, tenants)—emerging services.

- file storage, model updating, file and data management, versioning, other technology management issues
- building operations
- model commissioning (everything is modeled and working correctly, according to technology protocols, etc)
- IPD (or other collaborative delivery model) coordinator
- model use by owner (lease-back / maintain)
- funding consulting
- branding and identity consulting
- tax asset consulting
- enterprise opportunities for ongoing relationships (architect and contractor together add value)
- existing buildings: laser-scanning and modeling, conditions assessments, sustainability consulting, asset management (deferred maintenance, etc)
- connections to GIS
- software systems and controls

- information handling
- knowledge engineering/expert systems/rules based programming
- architectural and construction software development
- new partnering arrangements with subcontractors, suppliers, manufacturers
- 3rd party design assessments (energy, codes, functionality, etc.) using model checking tools

Risk and Liability

Risk
the possibility of loss or injury; peril; the chance of loss or the perils to the subject matter of an insurance contract; the degree of probability of such loss

Liability
the quality or state of being liable; something for which one is liable; especially pecuniary obligation

Risk and liability are different sides of the same coin. Risk represents the possibility, or chance, of loss or injury; liability represents the corresponding responsibility for that loss and usually plays out as a financial obligation. Inherently, every construction project involves risks. As with many other project facets, the risks, and liabilities, vary by stakeholder, project type or size, owner and team characteristics, and approach.

From the designer's perspective, risks include the possibility of errors or omissions in contract documents, non-performance of consultants or owner consultants (to quality, time and budget), failure to design to budget (with or without market cost changes taken into account), project suspensions and/or extensions, changes in scope and expectations, lack of timely information and decisions, changing code requirements and interpretations, long-term catastrophic failures, and the ultimate functionality of the project (design shortcomings, equipment problems, etc.) and the like. Much of the designer's risk is defined by the professional 'standard of care' associated with negligence analyses and with protection of public health, safety and welfare.

From the constructor's view, risks may include the possibility of market cost fluctuation, non-performance of owner, designers, engineers, subcontractors or suppliers (to quality, time and budget), site safety, deficiencies in the construction documents, delays in receiving information from the owner or designer, hidden conditions, catastrophic failures during or after construction is complete, weather, and the like.

From the owner's side, risks may include the possibility of negative impact on revenue or enterprise due to schedule delays or design quality shortcomings, cost overruns, difficulties associated with financing, market cost changes, performance of design and construction professionals, and similar concerns.

To a great extent—outside of those areas governed by law—the allocation or assignment of risk is negotiable among the parties. Compensation should relate directly to the scope of risk assumed by the various parties. A carefully quantified, detailed and fair assessment of risks on every project is essential, along with open understanding and fair appreciation for the risks assumed by the various players.

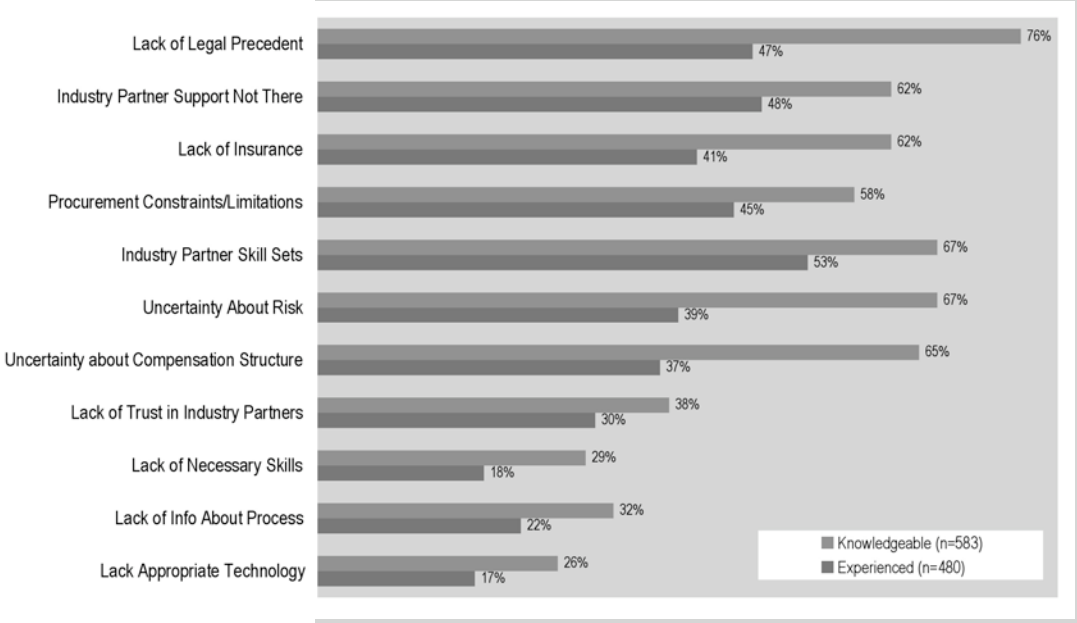
What's Changing in Risk and Liability

Rapidly expanding use of digital technologies, like BIM, and new collaborative methodologies, like IPD, generate concerns about increased risk and liability among many stakeholders. Stakeholders should monitor carefully industry conversations about these topics; resources include the National

Institute of Building Science's buildingSMARTalliance (www.buildingsmartalliance.org), the AIA's Integrated Practice / Integrated Project Delivery webpage (www.aia.org/ipd), and the AGC's BIMForum (www.bimforum.org).

New standard form contracts are being offered up in the marketplace that address issues of risk and liability. Among others, interested parties may look at the AIA's E202 BIM Protocol Exhibit, A295/A195/B195 Family of Agreements for Integrated Project Delivery, and the C195 SPE Agreement for IPD; others include the ConsensusDOCS 300 series and BIM Addendum and the Relational Form of Agreement from the Lean Construction Institute. These new agreements certainly will continue to evolve and other new agreements will emerge; insurers (both professional and general liability as well as sureties) will offer new products. Again, teams should stay abreast of industry trends through sources such as those listed earlier.

In a 2008 survey conducted by the AIA, respondents were asked to prioritize various issues perceived as barriers to adoption of integrated project delivery. Those respondents identified as "experienced" in IPD methodologies vs. those categorized simply as "knowledgeable" expressed significantly less concern about the barriers to adoption; this finding suggests that the "actual risks" associated with IPD are less significant than the "perceived risks" expressed by those who have not yet employed IPD methods.



Perceived Barriers to IPD

What is Value?
Value may be defined as the degree to which project goals and outcomes may be increased in effectiveness plus the degree to which total lifecycle costs (including first costs) can be diminished.

Expertise » Effectiveness » Value
Defined differently by every owner for every project, value may be enterprise outcome based, it may be lifecycle cost, it may be speed to market, it may be enhanced sustainability outcomes. Every project should begin with a conversation of desired value, which can then be effectively supported through team member expertise. Appropriately, compensation should reflect "value delivered."

Expertise and Value

Owners engage design and construction professionals to access the expertise each brings to the project table. The type of expertise varies widely: it may be expertise associated with a particular project type, a certain technical area, a specialized tool, or a phase of the project. Skills as creative thinkers, effective team builders, communicators or collaborators also are areas of expertise that owners consider.

Expertise is closely related to value. Consider the ability of a team member to make the project and its outcomes more effective. "Effective" can have many meanings: making the design and construction process more economical and efficient, shaping a design to best support project purpose or enterprise outcomes, maximizing the use of resources for the project and its operations—all are examples of effectiveness. The expertise of individual team members allows effectiveness to flourish on a project—when effectiveness increases, so does value.

What's Changing in Expertise and Value?

While first-cost decision making remains common today, there is an increasing emphasis on "value" and its meaning in the design and construction industry. Naturally, conversations about compensation also need to embrace concepts of "value".

Research methodologies are ever more sophisticated, and allow teams to better understand the true results of their efforts. For instance, consider a project where value has been placed on the long-term reduction of energy use and specific goals have been identified. It's a relatively simple matter to track that building's performance over time to see if the targets have actually been met, even with variables of operational maintenance and user variability thrown into the mix. This is true value: it can represent a substantial savings in the long term operating costs of the facility, especially when compared to the relatively low investment required during the design and construction phases to achieve that goal. Suppose the same project team sets goals related to improved work environments, placing value on studies that show increases in productivity and decreases in absenteeism in well-designed workplaces. It's possible then, with appropriate measures, to establish a direct connection between design and construction efforts and long-term productivity gains for an enterprise—again, added value. Project teams should consider how the entire range of "value delivered" can be connected to, and enhanced by, appropriate compensation models for the key participants in the project team.

Most owners recognize the value in safety planning and upfront business planning. Collaborative models and appropriate compensation provide similar returns on investment to the owner and should be considered in light of their value added.

The expertise added through effective collaboration models, the expansion of services made available through technological and other advancements, and the additional efforts required on the part of teams employing these value-adding techniques are all appropriate topics for conversation when considering compensation.

4. Navigating New Waters

A Value Proposition "Checklist" and Last Words

Combining all topics covered thus far, teams are encouraged to consider the following whenever compensation models are being discussed, while at the same time keeping in mind current trends and the rapidly changing nature of the industry. Organized roughly to move from general to specific, a value proposition checklist might look something like this:

- Team Member Motivations and Values
  - *Why do we do this; identify core values and motivations for all team members*
- Project Type and Scope
  - *What is it; Intensified, early project planning and definition; clear parameters set*
- Project Goals and Outcomes
  - *Clear, objectively measurable milestones, targets, goals, or outcomes; short and long range*
- Professional Services Compensation
  - *What are the ingredients; Profit, Business Expenses and Overhead, Goods and Services, Risk and Liability, Expertise and Value*
- Performance Incentives
  - *Individual or group; Project Delivery Performance Incentives, Business Enterprise Performance Optimization Incentives, Metrics*
- Miscellaneous Considerations
  - *Anything else that might support and enhance "best for project" behavior*

If this list is used to guide conversations openly and with an attitude of respect for all team members (it may be useful to consider the services of a facilitator), it is likely that a compensation model will emerge that will be fair and beneficial for all and represent an appropriate solution for the project. It's important to establish the right model for each project, but there's no requirement to start from scratch: many successful models already exist and simply can be adapted to accommodate many of the considerations outlined in this document.

Consider a Facilitator
It's difficult at times to break away from the historically adversarial behaviors typically exhibited in the design and construction industry. A strong facilitator may be of use to teams working to strip away traditional boundaries and enhance collaboration.

Last Words

Make no assumptions; come to the table without preconceived outcomes. Understand—and respect—the base motivations of everyone at the table. Tailor goals and outcomes for the specific project type and scope. Clarify and appreciate the range of factors that drive stakeholder businesses. Establish incentives that motivate "best for project" behaviors. Consider project context and examine influencing forces. Then, in light of all of these things, shape an appropriate proposition that is fair to all concerned.

Remember: no single model fits all situations. The rate of change in the industry suggests that new influences and new models will continue to emerge.

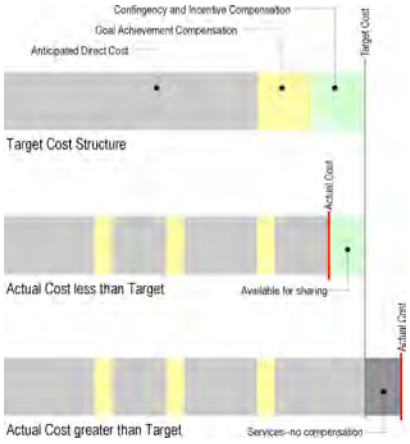
Listen. Consider. Collaborate.

And innovate.

Appendix A: Three Sample Models

AIA C195 SPE; ConsensusDocs 300 Multi-Party; Project Alliance

While the ideas put forth in *On Compensation* may be applied to any contractual model, new value propositions are most clearly exhibited in the emerging collaborative models of integrated project delivery. This appendix will examine three of the most well known examples; teams may use them as additional references when considering appropriate models for their own projects.



AIA C195 2008 | Compensation Structure

AIA Document C195™–2008 – Single Purpose Entity (SPE) IPD Family

C195-2008 is the cornerstone of the AIA's SPE IPD Family of documents. C195–2008 is a standard form Single Purpose Entity Agreement through which the owner, architect, construction manager, and perhaps other key project participants, each become members of a limited liability company ("the SPE"). The sole purpose of the SPE, as stated in C195–2008, is to furnish the design and construction of a project utilizing the principles of Integrated Project Delivery established in *Integrated Project Delivery: A Guide.* C195–2008 provides the framework for a collaborative environment in which the Company operates in furtherance of cost and performance goals that the members jointly establish. For purposes of this example, it is assumed that the members of the SPE consist of the owner, architect and construction manager only.

The agreement envisions that the actual design and construction of the project is achieved via separate contracts the SPE enters into with the individuals and entities that will provide the necessary services. In the assumed structure of this example (owner, architect, and construction manager are the only SPE members) the architect would enter into an agreement with the SPE to provide design and contract administration services and the construction manager would enter into an agreement with the SPE to provide construction administration services (collectively "the non-owner members").

The compensation model in the non-owner member agreements is team based, goal-oriented and provides incentives for collaboration in completion of the project. The non-owner members can potentially receive three types of compensation: direct services compensation, goal achievement compensation and incentive compensation, as addressed below.

Direct Services Compensation. In the non-owner member agreements, the non-owner members are required to provide services to the SPE at cost. In essence, the non-owner members perform their services at a break-even rate, with no element of profit built into this element of compensation. The purpose for this structure is to move profit margins into incentive and goal based mechanisms in order to align individual member goals with overall project goals. (Note: no construction is performed as part of these agreements.)

Goal Achievement Compensation. The first form of profit available to the non-owner members is Goal Achievement Compensation. As the initial stages of the project develop,

C195–2008 requires the members to jointly negotiate and agree upon certain project goals that, if achieved, result in additional compensation to the non-owner members. As part of this negotiation, the members must also agree on the means by which goal achievement will be measured. The possibilities are endless with respect to what types of goals these may be and will inevitably vary depending on individual team and project characteristics. Within the SPE IPD documents, however, it is intended that these goals be "all for one" goals. Stated another way, if a goal is achieved all the non-owner members will receive Goal Achievement Compensation. Conversely, if a goal is not achieved, none of the non-owner members will receive compensation for that goal. The focus, therefore, of Goal Achievement Compensation is to incentivize and encourage "best for project" behavior though the collaborative achievement of project goals. Note that once earned, the profits of Goal Achievement Compensation may not be taken away.

Incentive Compensation. In addition to profit earned via Goal Achievement Compensation, the non-owner members may earn profit as Incentive Compensation. In the SPE IPD documents, Incentive Compensation is built around a Target Cost concept. The members are required to jointly develop and agree upon a Target Cost for the project. The Target Cost includes all the costs associated with designing and constructing the project. If the actual cost for the project comes in under the Target Cost, the non-owner members receive a negotiated portion of those savings as Incentive Compensation.

In the SPE-IPD documents, the Target Cost is set very early in the design process—no later than the end of Criteria Design. This portion of compensation, therefore, serves to incentivize the non-owner members to work collaboratively and efficiently to maximize project performance. Given the relatively early stage at which the Target Cost is set, the non-owner members should have substantial opportunity to bring their collaborative efforts to bear on the completion of the project. To the extent those efforts result in costs savings, which is a benefit all owners will appreciate, the non-owner members will individually benefit. On the flip side, to the extent the actual costs exceed the Target Costs, the non-owner members are obligated to continue providing services until the project is complete at no cost. Additionally, once the Target Cost has been exceeded, the non-owner members have lost out on their chance to earn profit on the project, except to the extent they have successfully achieved other project goals, earning associated Goal Achievement Compensation.

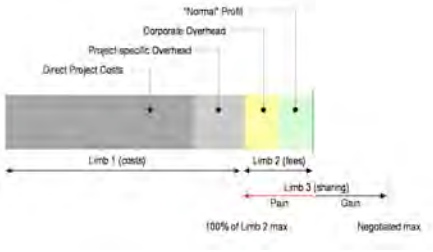
Project Alliancing

Project Alliancing is an integrated delivery model approach in which the key project participants execute a single agreement, generally referred to as the Project Alliance Agreement. The Project Alliance Agreement provides the framework by which the parties to the agreement agree to manage and deliver the project. The primary hallmarks of Project Alliancing are collective sharing of project responsibilities and risks, creation of an integrated project team selected on a best person for each position basis, no disputes between and among the parties, unanimous decision making by the parties on all key project issues, and a three-limbed compensation system that encourages best for project

behavior.

The three limbs of Project Alliancing compensation are comprised as follows.

Limb 1 compensation consists of compensation to the service/construction providing parties for the expenditure of work and project-specific overhead and actual cost. There is no element of profit or overhead otherwise included in Limb 1 compensation. The actual costs include costs associated with mistakes or required rework. The invoiced amounts are 100% open book and subject to audit.



Project Alliance | Compensation Structure

Limb 2 compensation consists of a fee paid to the service/construction providing parties that reflects their customary corporate overhead and profit. It is expected that Limb 2 compensation represents an equitable return to the parties for delivering a project in-line with pre-agreed targets. The assumption being that because the chosen parties are selected on a best-in-class basis, the project will already benefit from the parties' high level of performance and the participant should not be withheld profit merely because they failed to exceed their own historical above average success. This assumption forms an important element to Limb 3 compensation.

Limb 3 compensation represents a pre-arranged share of the pain or gain on the project. The gain share represents a share of the benefit related to the project bettering jointly identified project targets. The pain share represents a share in the failures of a project to the extent the parties failed to meet those project targets. The pain/gain share mechanism residing in Limb 3 compensation must be geared to project outcomes that add to or detract from the project's value to the owner.

Limb 3 compensation seeks to incentivize the parties to deliver an outstanding project to the owner. Note that under Limb 2 compensation, the participants are already receiving profit for their expected high level of performance. The project targets set as a part of Limb 3 compensation should assume high performing parties and set the Limb 3 compensation goals accordingly. Functionally speaking, Limb 2 compensation sets a base line level of profit the parties can earn on the project. Limb 3 compensation serves to increase that level of profit if the parties successfully deliver an outstanding project as measured by the agreed project targets. If, however, those targets are not met, Limb 2 compensation is reduced to the extent the parties are required to share in the pain.

ConsensusDOCS 300

ConsensusDOCS 300 is a multi-party relational contract executed by an owner, designer and constructor. The document is intended to provide the framework for an integrated project in which the designer and constructor agree to deliver a project to the owner utilizing the principles of collaboration and lean project delivery. And while less specific in structure regarding compensation than the preceding two examples, it contains many similar moving parts:

Pursuant to the terms of ConsensusDOCS 300, the owner, for basic services, agrees to pay the designer its actual cost for the designer's personnel, the services of its consultants, and identified reimbursable expenses, as well as a fee representing customary non-project related overhead and profit. The designer may also negotiate a compensation system for additional services. Similarly, the owner agrees to pay the constructor for preconstruction services, the cost of the work and a fee representing customary non-project related overhead and profit.

In addition to this base compensation paid to the designer and constructor, ConsensusDOCS 300 requires the management team to develop a financial incentives program to encourage the parties to meet the owners goals. The incentive program is funded by any project savings consisting of preservation of contingencies and/or reduction in the overall project costs as compared to the amounts contained in an agreed to Project Target Cost Estimate (PTCE). To the extent there are such savings, the designer and constructor share in such savings in accordance with their negotiated share.

While the document specifically provides for the opportunity share in savings, it should also be noted that ConsensusDOCS 300 provides the opportunity for the parties to also share in any overages incurred on the project. To the extent the PTCE is exceeded, the parties can choose to either have such costs completely absorbed by the Owner or shared by the parties on an agreed to basis. If the parties choose to share the risk of such costs, the parties can also choose whether or not the designer and constructor's respective fees are at risk and, if they are at risk, whether or not such fees are the limit of the designer and constructor's liability for costs in excess of the PTCE.

Appendix B: Current Compensation Models

A number of models exist today for compensation of team members. They vary by stakeholder, with some being used more often than others, to varying degrees of satisfaction of the different team members. In 2008 the AIA gathered data about current models as groundwork for *On Compensation*, looking for patterns between current compensation arrangements and delivery approaches. A brief overview of the most common models is included here, followed by current model usage and satisfaction statistics.

Current Models: Architects

There are at least ten methods of computing compensation for architectural services. Four of these methods are time-based, reflecting in different ways the time spent by the Architect on the Project. Other methods may be indirectly related to time expended on the Project and do not use time as a factor in the calculation. Note that reimbursable expenses are generally not included in these arrangements unless specifically agreed upon otherwise.

1. Stipulated Sum, in which compensation is listed as a fixed dollar amount.
2. Percentage of Cost of the Work, in which compensation is calculated by applying an assumed percentage to the estimated or actual Cost of the Work, whichever is most certain at the time the calculation is made.
3. Professional Fee Plus Expenses, in which the salaries, benefits and overhead of designated personnel are the expense and the fee may be a multiplier, percentage or lump sum representing profit.
4. Hourly Billing Rates, in which salaries, benefits, overhead and profit are included in the rate for designated personnel.
5. Multiple of Direct Salary Expense, in which direct salaries of designated personnel are multiplied by a factor representing benefits, overhead and profit.
6. Multiple of Direct Personnel Expense, in which the salaries plus benefits of designated personnel are multiplied by a factor representing overhead and profit.
7. Multiple of Consultants' Billing, in which Consultants' bills are multiplied by a factor representing the Architect's administrative costs, overhead and profit.
8. Square Footage, in which the square footage of the structure is multiplied by a pricing factor.
9. Unit Cost, in which the number of certain units such as rooms, acres, etc., is multiplied by a pricing factor.
10. Royalty, in which compensation is a share in the Owner's income or profit derived from the built facility.

Current Models: Constructors

The number of arrangements for compensating constructors is fewer than those for designers, with five models predominating in the current market. General conditions (the constructors project-related expenses) may or may not be included.

1. Stipulated Sum / Lump Sum / Fixed Fee, in which compensation is listed as a dollar amount.
2. Cost plus a fee without a Guaranteed Maximum Price (GMP), in which the constructors direct costs are passed through to the owner with a fee charged on top to cover overhead and profit. The fee may be set as a stipulated sum or a percentage of construction costs or a time-based management rate. In the case of "without a GMP" the constructor is generally covered for all costs incurred.
3. Cost plus a fee with a Guaranteed Maximum Price (GMP), in which the constructors

direct costs are passed through to the owner with a fee charged on top to cover overhead and profit. The fee may be set as a stipulated sum or a percentage of construction costs or a time-based management rate. In the case of "with a GMP" the constructor is not covered for costs above the maximum, and usually keeps part or all of savings should costs incurred be below the GMP.

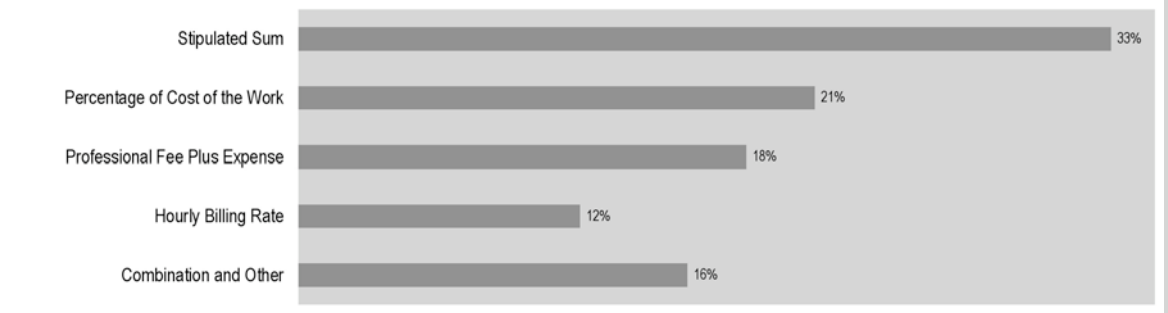
4. Unit Prices, in which the number of certain units such as rooms, square feet, certain assemblies, etc., is multiplied by a pricing factor.
5. Percentage of a benchmark cost (like Means) (Job order contract) (Center for job order contracting excellence)

Current Models: Consultants and Subcontractors

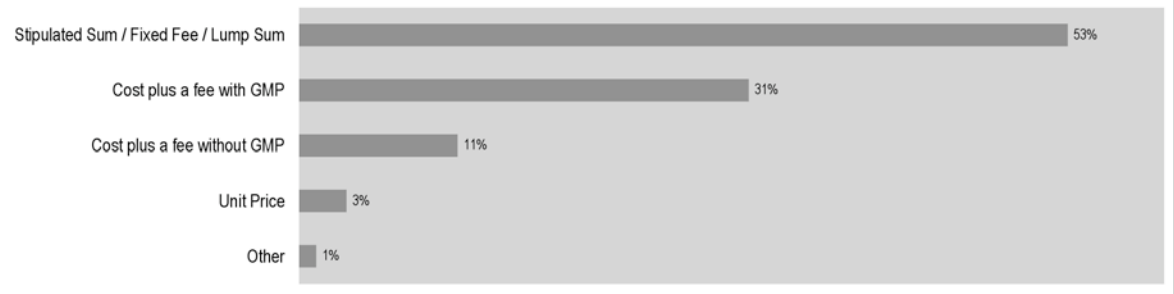
The range of models for design consultants and subcontractors tend to follow the same range of models for the prime party under which they work. That is to say, options for design consultants generally come from the same list of common methods shown above for designers; similarly for subcontractors with constructors.

Observations on Current Models

In a fall 2008 AIA survey, owner, designer and constructor respondents were asked a range of questions regarding one recently completed project of the respondents' choosing. In all, data was gathered on 1052 projects ranging broadly in scope and type. Some of the survey questions focused on compensation models for the respondent's projects; relevant data is shared here with a series of numbered observations.

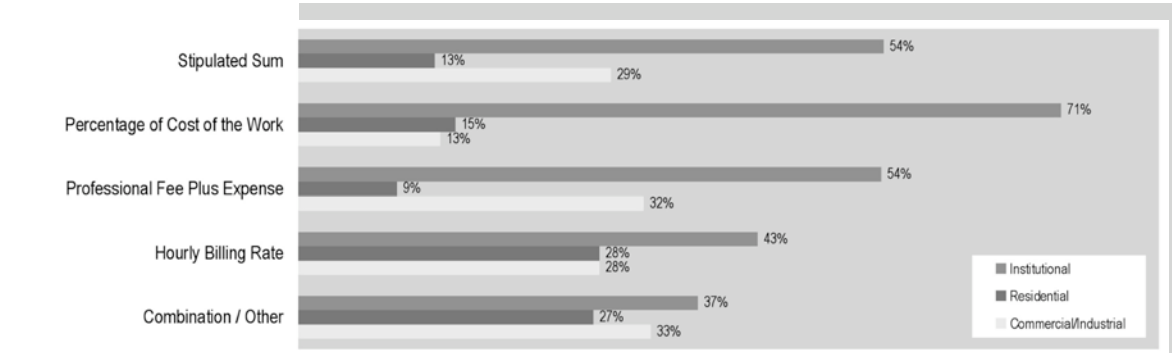


Design Compensation Model Breakdown *(base: Architects and Owners, n=714)*

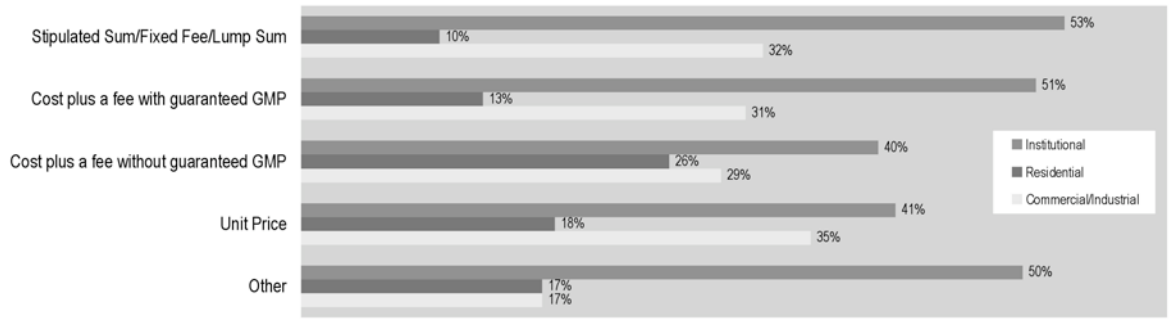


Constructor Compensation Model Breakdown *(base: Constructors and Owners, n=510)*

1. Model usage for designers responding to the survey varied significantly more than model usage for constructors, but stipulated sum was the predominant method for both groups for the projects covered by the survey.

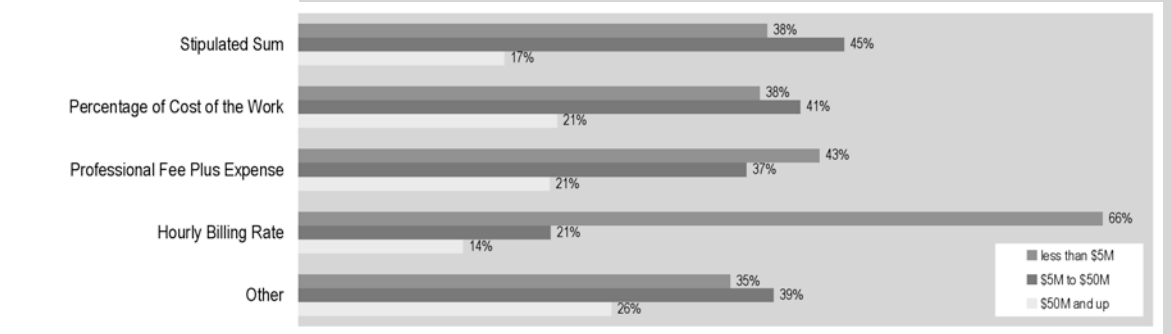


Design Compensation Model Breakdown by Project Type *(base = Architects and Owners, n=714)*

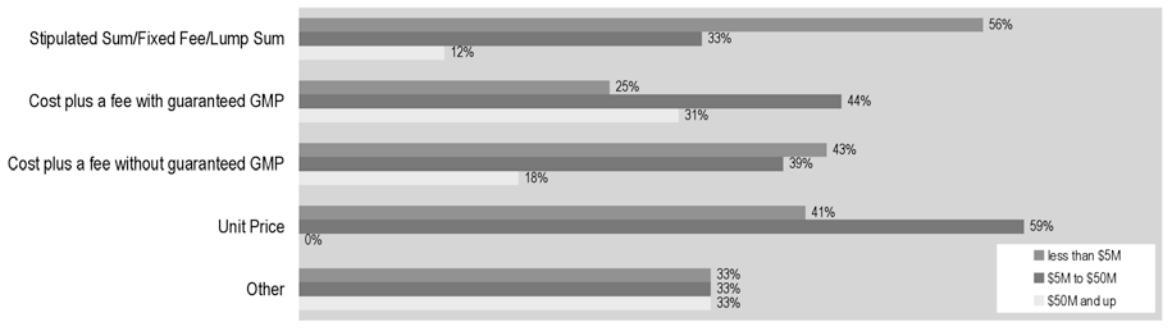


Constructor Compensation Model Breakdown by Project Type *(base = Constructors and Owners, n=510)*

2. Project type in the survey seemed to have little influence on constructor models. For designers, institutional projects were more likely to use a percentage calculation method and residential projects were more likely to use hourly approaches than other models for those project types.

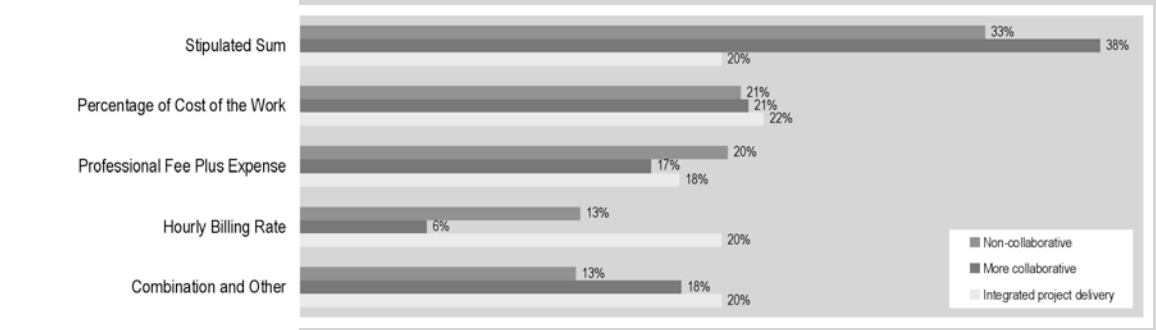


Design Compensation Model Breakdown by Project Scope *(base = Architects and Owners, n=714)*

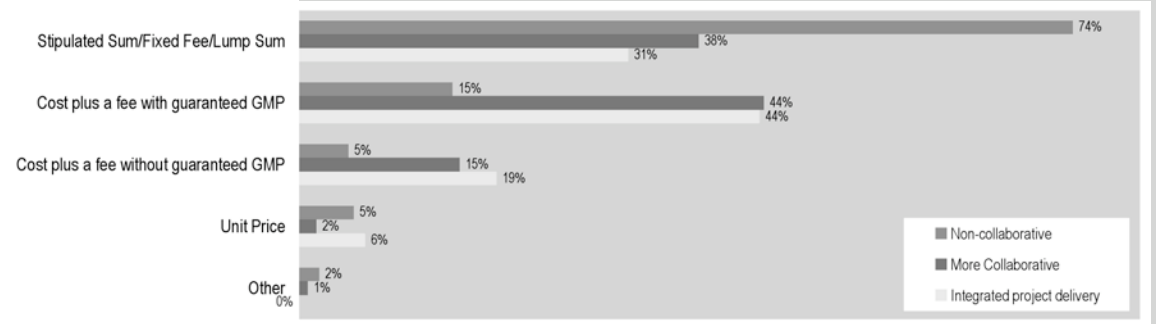


Constructor Compensation Model Breakdown by Project Scope *(base = Constructors and Owners, n=510)*

3. Project scope had little influence on either group in the survey save for hourly approaches on projects less than $5M for designers and lump sum for constructors under $5M.

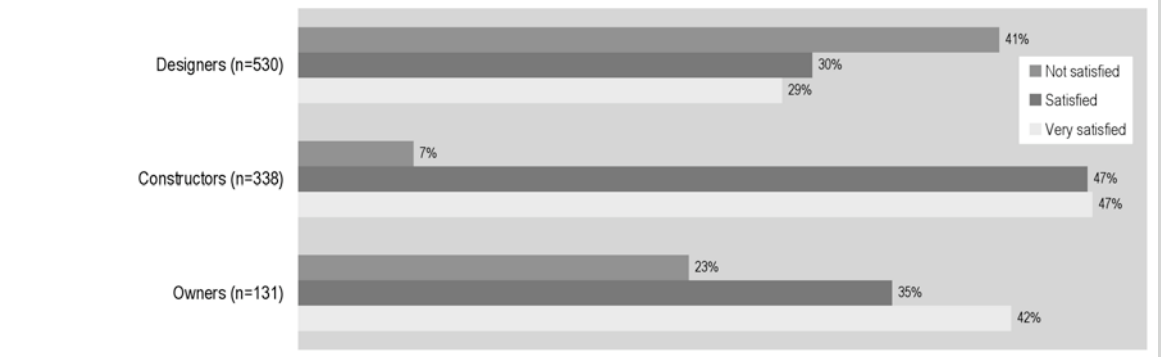


Design Compensation Model Breakdown by Delivery Method *(base = Architects and Owners, n=714)*



Constructor Compensation Model Breakdown by Delivery Method *(base = Constructors and Owners, n=510)*

4. Delivery method in projects covered by the survey had little impact on approaches to design compensation, but constructor compensation showed strong connections: non-collaborative models (design-bid-build) were far more likely to use a stipulated sum approach, while more collaborative models were much more likely to use cost plus or other arrangements.



Satisfaction with Overall Compensation vs. Effort (Designers/Constructors) or Value Received (Owners)

5. Constructors in the survey showed significantly higher levels of satisfaction with compensation in relation to efforts put forth on a project than designers, with over 40% of designers feeling unsatisfied vs. only 7% of constructors. Over 20% of owners felt unsatisfied with the value received vs. the compensation they paid, though a majority of owners was very satisfied.

Overall observations:

Considerations of project type, scope and delivery model have different influences on models for different stakeholders. When major stakeholder groups demonstrate significantly different perceptions of satisfaction with overall compensation, it may hint at more than simple dissatisfaction with compensation but rather point to dysfunctional industry processes.

Appendix C: FAQs About Compensation Models

Compensation conversations outside of specific project negotiations may be construed as collusion—what exactly *can* we talk about?

Discussions about compensation should be approached with *extreme caution*: it is not difficult to cross boundaries that could land participants (and their firms and associated professional organizations) in hot water with the U.S. Justice Department, the Federal Trade Commission, state authorities, or others for alleged violations of federal or state antitrust laws.

The primary recommendation here is that prior to engaging in any kind of conversation relating to compensation or compensation structures all individuals or groups seek timely guidance from an attorney well versed in anti-trust law. In general, it is of course permissible (and indeed essential) for an owner, designer and constructor to discuss compensation arrangements for a specific project in which they will be working together. The picture is entirely different in other settings, e.g., where designers discuss together the prices they charge to others. Such discussions always raise red flags, and are especially damaging when they involve subjects such as the following:

- Discussion about specific fee amounts—overall or by item, project phase or type
- Discussion about specific fee percentages—overall or by item, project phase or type
- Discussion about limiting market-available approaches to compensation in any way.

Discussions of this type may easily give rise to "per se" violations of the antitrust laws, resulting in possible imprisonment, fines, and civil liability.

This topic is sensitive enough legally that the primary recommendation bears repeating: prior to engaging in any kind of conversation relating to compensation or compensation structures, individuals or groups should seek guidance from an attorney well-versed in anti-trust regulations.

What kinds of contracts are available that support IPD?

There are a number of agreements available for IPD in the marketplace. The American Institute of Architects offers two: its so-called "transitional" series (the A195, B195 and A295) and its fully integrated Single Purpose Entity family (C195, C196, C197, with the C198 and C199 intended for release in 2009). An organization called "ConsensusDocs" offers its 300 series documents for collaborative delivery. The Lean Construction Institute offers its Integrated Form of Agreement for Relational Contracting. There are also several models available with some searching among industry participants though they are not formally available as standard form agreements. Each of these documents occupies a different location on the spectrum of collaboration from "not much" to "lots," and offer different approaches to the resolution of compensation issues. It is important to note that the principles of IPD may be applied to ANY contractual model, though with more success and benefit as the model becomes increasingly collaborative.

What kinds of contracts are available that support alternative compensation models?

With very careful consideration of benefits, value and ramifications, it is possible the application of compensation models like those described in this document may be applied to almost any contractual model in ways that better support the principles of IPD and that may enhance project outcomes through encouraging changed behaviors of project participants.

How far down the "food chain" do these types of compensation conversations need to go?

That is entirely dependent on the unique constraints and context of each project, project team, and agreement. However, every relationship may benefit from examination down to the level of individual motivation, whether it's a new relationship or a long-standing relationship. As the industry moves toward increasingly collaborative models, developing a rich sense of understanding, respect and trust will be necessary to support effective work habits. For this reason, we suggest that these discussions be pursued with the entering into of almost every agreement, at whatever level, however it is structured.

Other resources (IPD, compensation, etc)

Interested parties are encouraged to visit the AIA's Integrated Practice / Integrated Project Delivery web page at www.aia.org/ipd for a wide range of links and available resources. The following particular resources are all available for download at that address and may be of value:

- *Integrated Project Delivery: A Guide*
- *Integrated Project Delivery: First Principles for Owners and Teams*
- *Integrated Project Delivery: A Working Definition*
- *McGraw Hill SmartMarket Reports on BIM and Interoperability*
- *CURT WP's (NAMES)*

The reader should also become familiar and involved with the buildingSMARTalliance (www.buildingsmartalliance.org) and the National Building Information Modeling Standard development effort (www.buildingsmartalliance.org/nbims). AGC's BIMForum (www.bimforum.org), the National Institute of Building Science's Whole Building Design Guide (www.wbdg.org), and the Lean Construction Institute (www.leanconstruction.org) may also be valuable resources.