



Construction Industry Institute®

Leading Industry Practices for Estimating, Controlling, and Managing Indirect Construction Costs

Construction Industry Institute

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Leading Industry Practices for Estimating, Controlling, and Managing Indirect Construction Costs

**Prepared by
Construction Industry Institute
Research Team 282, Indirect Construction Costs**

**Research Summary 282-1
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Executive Summary

In response to the pressures of current market conditions, including intense global competition, low barriers to entry, and the low-cost global exchange of digital information, the Construction Industry Institute (CII) identified the optimization of indirect construction costs (IDCC) as a strategic focus area for process improvement. Specifically, CII established Research Team (RT) 282 to investigate the leading industry practices for optimizing IDCC.

Since all projects incur IDCC, all owners and contractors face responsibilities, obligations, and opportunities with respect to IDCC. Contractual provisions, corporate cultures, standard operating procedures and many other business- and project-specific factors determine the categorization of discrete project costs as either direct or indirect. Differences of understanding, perspective, and opinion can lead to misunderstanding, lack of communication, and, at times, mistrust. Yet, RT 282 found that owners and contractors agree on what constitute the most important IDCC. This finding suggests that, despite differences of perspective, an opportunity exists for collaborative, mutually-beneficial process improvement with regard to IDCC.

The research team conducted rigorous investigation into IDCC (including structured workshops within the research team, interviews with industry experts, and numerous validation steps). From the data collected, the team formulated a three-part operational definition that owners and contractors can use to establish a common IDCC language and to enable productive communication about the construction functions generally regarded as IDCC. After formulating four primary categories and 16 subcategories, the team sharpened its focus, identifying four primary groupings of IDCC and collecting leading industry practices for optimizing them. To provide a resource to industry practitioners, the team compiled them in a comprehensive how-to manual, *Implementation Resource (IR) 282-2, Playbook of Leading Industry Practices for Estimating, Controlling, and Managing Indirect Construction Costs*. This resource

includes a chapter on each of the four key IDCC groupings: 1) **major construction equipment**, 2) **construction management and supervisory personnel**, 3) **scaffolding**, and 4) **temporary provisions**. The leading industry practices for optimizing these IDCC are presented in a consistent format of consideration checklists, detailed process flowcharts, and representative practical tools. Each chapter is organized into sections covering practices for estimating, controlling, and managing the costs in each category. In addition to these four chapters, the playbook dedicates a chapter to four innovative IDCC-related practices.

RT 282 also aims to motivate industry professionals to improve their IDCC processes by demonstrating that increased implementation of the identified leading industry practices will improve project performance. The team gathered this evidence through three project-level validation case studies. The case study results confirm that, by implementing more of the playbook practices, companies can improve project performance.

This research has found that collaborative owner-contractor project teams who use the playbook's leading industry practices to estimate, control, and manage IDCC will gain a better understanding of IDCC, achieve more purposeful IDCC planning, and increase trust among project parties. Moreover, using these practices will result in an overall improvement of the predictability and probability of desired project outcomes.

Introduction

Pressured by the competitive nature of the global marketplace, owners and contractors alike must consider every possibility for improving project performance, including optimizing the value created by spending on IDCC. The proven and innovative industry practices in the key IDCC groups identified by the team offer owners and contractors an opportunity to strategically plan, carefully control, and purposefully manage these costs.

Purpose of Research Team 282

The Construction Industry Institute (CII) established Research Team (RT) 282 to investigate leading industry practices for estimating, controlling, and managing IDCC. The team addressed the following essential research question: *What best or innovative practices are now available or utilized for managing construction indirect costs (and the associated component elements) such that risks, schedules, and costs are properly optimized for both contractor and owner.* In response to this essential question, the research team developed two specific goals for the research:

1. Develop an operational definition for IDCC consisting of a definition, an aggregate chart of accounts, and a categorization framework.
2. Identify, document, and disseminate leading industry practices for estimating, controlling, and managing the most important groups of IDCC.

To accomplish these goals, the following specific research objectives were identified:

- Develop a definition and categorization framework for IDCC.
- Identify the groups of IDCC that have the greatest impact on project outcomes.

- Document the leading industry practices for estimating, controlling, and managing the key groups of IDCC.
- Assess the relationship between the level of use of certain IDCC practices and the outcome of the project, using the nine standard performance metrics tracked by the CII Benchmarking & Metrics program.

After formulating an operational definition of IDCC that both owners and contractors can use, the team solicited input on practices from a diverse sample of more than 100 construction industry professionals, representing both owner and contractor companies. The next step was to document and compile the leading practices in an industry-targeted guidebook.

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Methodology

The team's research methodology comprised three primary steps:

1. Understand IDCC.
2. Collect and analyze leading industry practices.
3. Verify and validate findings.

Table 1 summarizes the primary research activities, lists the data collection instruments, and reports the number of responses or participants (as applicable) for each activity.

Table 1. Summary of Research Activities, Instruments, and Number of Participants

Research Activity	Research Instruments	Number of Participants
<i>Understand IDCC</i>	Structured research charrettes (SWOT analysis)	13 RT members
	Corporate chart of accounts of IDCC	10 RT member companies
	Priority ranking survey	12 RT members
<i>Investigation into industry practices</i>	Research assignment re: good practices for four key IDCC groups	20 RT members
	Project-level data collection surveys	14 RT members
	Data collection interviews	56 subject matter experts
<i>Verification & validation</i>	Rotational reviews	8 RT members
	Technical reviews	7 subject matter experts
	Project-level practice/ outcome surveys	40 CII member and non-member companies
	Validation case studies	3 CII member and non-member companies

Understanding IDCC

The research process began with a comprehensive literature review of CII reports and technical journals addressing indirect costs, both in general and specific to the construction industry. From a standard accounting perspective, indirect costs can be defined as those costs that are “not easily traced to a cost object” (Eldenburg and Wolcott, 2005, p. 680). The cumulative findings of the literature review confirmed three of the team’s research hypotheses: 1) little has been published specifically regarding IDCC optimization; 2) the categorization of indirect costs is not uniform across the industry; and 3) leading industry practices for estimating, controlling, and managing IDCC have not yet been rigorously compiled and disseminated.

The literature revealed a wide range of percentages relating indirect costs to total project costs, with one researcher saying 10 percent (Blattner, 2008), one reporting 21 percent (Chanmeka, 2009), and another finding a range of 20–40 percent (Ahuja and Campbell, 1988). This rather large range of percentages and the lack of a widely accepted and shared definition for IDCC confirmed research team members’ perception that the construction industry inconsistently defines and categorizes IDCC. Moreover, these literature review findings supported their observations that owners and contractors have different, and sometimes divergent, perspectives on categorizing construction costs as either direct or indirect. These findings verified the knowledge gap that CII initially identified and that motivated the establishment of RT 282. Further, an operational definition for IDCC was warranted to develop the team’s research scope, to communicate it to survey participants and interviewees, and to establish a useful and durable IDCC definition within the construction industry.

In order to collect data for the operational definition, team-member facilitators conducted “research charrettes” within the research team. A research charrette—a dynamic workshop, similar to the more commonly known design charrette—establishes a creative brain-storming environment in which researchers can accumulate and exchange a large

amount of information within a short period of time. Such charrettes are often scheduled at the beginning of a new project. In the RT 282 charrettes, 13 team members used a common reporting template to share their respective companies' definitions for IDCC and to identify their strengths, weaknesses, opportunities, and threats (i.e., a SWOT analysis) regarding IDCC. Next, 10 team members submitted their companies' internal IDCC charts of accounts; from these, the team collected more than 2,000 IDCC item descriptions. The team then critically analyzed, organized, and edited these 2,000 items into an aggregate IDCC chart of accounts, paring down the total number of IDCC item descriptions to 497. To communicate these findings graphically, the team created an IDCC categorization framework consisting of four primary categories: 1) construction equipment, 2) project supervision, 3) temporary construction, and 4) temporary facilities. Under these categories are 16 subcategories. (See Figure 1.)



Figure 1. IDCC Categorization Framework

Given the extensive scope of the IDCC items identified, the research team carefully identified four strategic groups of IDCC subcategories contained within the four primary categories. These strategic groups are 1) major construction equipment, 2) construction management and

supervisory personnel, 3) scaffolding, and 4) temporary provisions. The subcategories within these four key groups were chosen on the basis of the following two criteria: 1) the IDCC-causing function has a significant impact on project success, and 2) the project team members have an ability to influence spending on the IDCC-causing function at the project level. The industry team members were then surveyed to establish the initial prioritization of these key IDCC subcategories, and 12 valid responses were collected. Once the team had established the operational definition and had agreed on the prioritization, the refinement of the research scope was complete, and the investigation into leading industry practices for these key IDCC groups commenced.

Data Collection and Documentation

The extensive amount of data regarding IDCC and, specifically, the leading industry practices to optimize them, were gathered within an aggressive timeframe. The research team members used questionnaires and structured data collection interviews to elicit expert opinions and empirical data. To identify the leading industry practices, the team solicited consideration checklist items, detailed process flowcharts, and examples of practical tools.

Initially, the team sent out fourteen extensive project-level surveys to collect quantitative IDCC data and any representative management tools. Because it proved to be difficult to recruit enough industry volunteers to complete such a comprehensive survey and because the level of sensitive cost detail it required made it challenging to complete, the research team abandoned this independently-completed survey approach and replaced it with a less burdensome, real-time interview format. The team also produced a web-based introductory video to give the 56 subject matter expert interviewees the background they needed to prepare for the interviews.

These structured data collection interviews (DCI) were conducted in person, by telephone, and through Internet-based video conferencing. On the basis of their professional specialization (i.e., estimating, controlling, or managing), the interviewees were asked to explain in