

STRUCTURAL PRACTICES

practical knowledge beyond the textbook

In the first of this two-part series (STRUCTURE® January 2011), we discussed the first seven of sixteen key skill sets that engineers in a structural engineering practice should have in order to achieve results and make significant contributions to a firm. Those seven skill sets followed the broad theme of technical skills. In Part 2, we explore the broad theme of management skills.

As discussed in Part 1, younger structural engineers tend to be task-oriented, whose metrics might include: How many hours did I work this week? Was my day filled with productive work? Did I complete my assignment on time? Was the input data on my structural model correct? As those younger engineers grow and become more experienced, some will be interested in becoming results-oriented engineers, whose measurable metrics might include new clients, profit, revenue, problem solving, good risk management, creative solutions, etc.

Each of the following nine skill sets has a set of questions intended to make you think. These are followed by some suggested ways to get better at the associated skill set.

Becoming a Results-Oriented Structural Engineer

Ability to Manage or Direct the Work of Others, Mentoring Skills, Management Skills, and People Skills

Part 2: Management Skills

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Are you seen and used as an internal resource? Do you routinely teach others? How well do you manage and direct other engineers and drafters? Are you approachable and easy to talk to? How well do you communicate verbally? Are you easy to get along with? Do you act professionally and knowledgeably in a project meeting?

- Routinely visit with engineers and drafters working for you to review the project status, ask questions, answer questions, guide decisions, etc.

- Develop an area of expertise and become a resource.
- Be curious about other people's projects and discuss them together, even if you are not associated with that project.
- Be open and approachable to answering questions others may have
- Act professional and cordial at all times.
- Learn to speak in front of peers or clients in meetings or in giving presentations with clear, concise language.

Ability to Manage Budgets and Set Profitable Fees

How efficiently do you work? How aware of the budget progress are you? How do you manage the time of drafters and other engineers? How do you deal with a problem budget? Have you ever given input regarding the project fee? Do you know what it takes to produce a particular size/type project? What is a fair fee and will this win the project? Do you know what fees the market will bear? What can you offer to your client that will make you stand apart from other firms?

- Learn to work quickly and accurately.
- At least twice a month, review the status of the project budget and make

sure everyone on the team is aware of the budget status.

- If a budget is heading for trouble, act on it immediately.
- Read the proposal or contract, and be sure you and everyone else working on the project knows what is included in the scope and what is not.
- Be aware of "scope creep" and make the client aware of this immediately.
- Ask for additional services when appropriate, and do so as soon as possible.
- Consider taking a time management or project management class or seminar.

Knowledge of Proposals and Contracts, Liability Consciousness, and Risk Management

Can you write a tight proposal with a well defined scope of work? Can you excel in an interview or proposal presentation? Do you read and understand the contract? Do you understand the Terms and Conditions part of a contract? Do understand your firm's insurance coverage? Do you know how to manage a dispute? Do you know what words to avoid in correspondence? Do you understand the

firm's liability associated with field reports, correspondence, e-mails, and reports? Do you understand Risk Management?

- Read every proposal you can to gain an understanding of variations.
- Read and understand the American Institute of Architects (AIA) C401-2007, AIA B101-2007, and any other "custom" contracts you can find.

- Read and understand your firm's standard Terms and Conditions.
- Read DPIC's "Lessons in Liability" booklet.
- Review your firm's Certificate of Insurance and know what coverage you have and what it means.
- Always try to manage disputes through discussion first.
- If a problem exists on a project, be proactive in solving the problem, even if it was not caused by you.

Ability to Understand Projects from Owner's and Contractor's Perspectives

How well do you understand the Contractor's schedule concerns and consequences of not meeting the schedule? Do you understand the sub-contractor's role? Where does the money for a project come from? How does the structural work fit into the big picture? Why do Owners have a budget to hit?

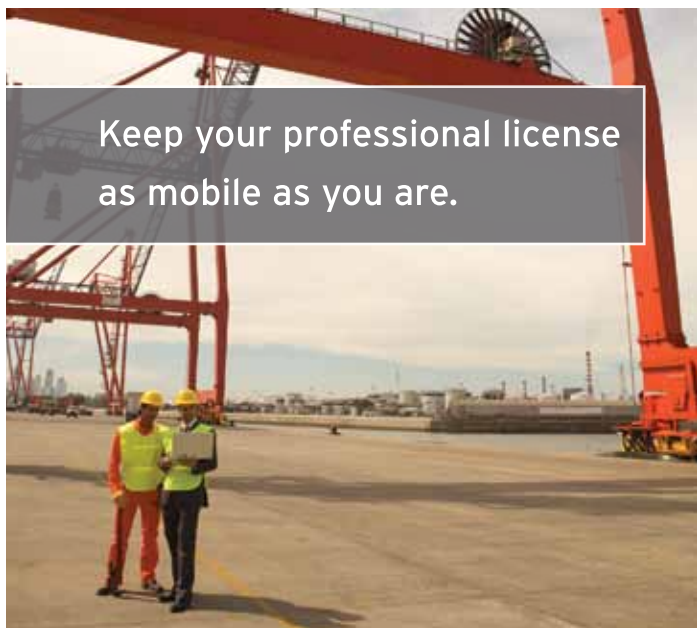
- Ask contractor why the shop drawings need to be turned around so fast.

- Review and understand detailed cost estimates for a project.
- Understand the differences between a contracting contingency, a design contingency, and an owner's contingency. How much should they be?
- Find out if and how the owner is financing a project.
- What is a bond issue and how does it affect your firm's workload?

- What percentage does the structure account for in the total cost of the project? Does this vary from project type to project type? Why?
- Become proficient in determining approximate material quantities.
- Gain an understanding of construction costs for all types of materials and building types.
- Study project schedules and lead times to see what elements of the building have to be ordered by the contractor first in order to build the project.

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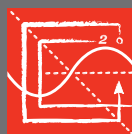
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Construction Knowledge and Practicality

Do you understand how a project gets built (who designs concrete formwork, what is a mill order, how is a wall braced, what is re-shoring, how is concrete finished, how does OSHA affect your work, is field welding cheaper than field bolting, how does concrete get placed, etc.)? Can you develop details that are economical and easy to construct in the field? Are you familiar with construction tolerances? How well do you interact and collaborate with the field? What is the difference between Design/Build and Design/Bid/Build, and how does this affect our work?

- Visit job sites as often as possible—observe and ask questions.
- Visualize how something that is drawn physically gets built.
- Spend some time building stuff.
- Read the AISC *Code of Standard Practice*, ACI 301, OSHA Standards, etc.
- Observe all construction projects wherever you are.
- Become familiar with the general contractors and subcontractors in your area.

Client Management, Client Communication, and Client Satisfaction

Who is the client? How well do you manage client expectations? Is the client kept well-informed of the project status? Do you make commitments and how do you keep them? Is the client happy during and after the project? Will the client return? Are you developing long-term relationships with clients?

- Do what you promise to do.
- Keep the client (architect, mechanical engineer, civil engineer, owner, contractor, internal clients, etc) informed of your needs so you can all meet schedules.
- If a schedule or a commitment is in jeopardy for some reason, discuss this with the client immediately.
- Seek to understand your client's business.
- Do not be afraid to make a commitment – just make sure to keep it.
- Your goal is to have a happy client that returns – exceed their expectations.
- If there is a problem on a project, be proactive in solving the problem, even if it was not caused by you.
- Develop long-term relationships with clients – people change firms and you never know where it may lead you.

Commitment to the Good of the Office or Firm

Are you aware of the financial performance of your firm or office? How can you affect the overall success of the office? Why is good financial performance desirable? In what ways do you add value to the office? Do you care about the perpetuation of the firm or office? Do you sometimes have to make personal sacrifices for the benefit of others and the office as a whole?

- Workload is usually cyclical but manpower is generally constant. Therefore, it is sometimes necessary to work extra hours in a week to meet deadlines and keep clients happy.
- Seek to understand your office's and firm's financial performance and how you can affect it.
- Cover for coworkers when vacations or other commitments prevent them from meeting project and client demands.
- Recognize and offer to help others when they seem to be struggling.
- Always try to promote your firm without being pushy or aggressive.

Ability to Make Good Decisions on Your Own

Do you know when to ask a question, and when not to ask and figure it out yourself? Do you have the confidence and good judgment to make a decision? Would you say you possess a lot of "common sense?" Do you understand the effects of your decisions? Are you willing to take responsibility for your decisions?

- Know when to ask questions, particularly of the Engineer of Record.
- Understand that when you make a decision you are accountable for that decision.
- Try to take emotions out of decision making.
- When it is appropriate to ask a question, try to be prepared with your own answer.
- Think about the consequences of your decisions. What does this do to the construction cost and design budget? How does this affect the schedule? Does this help the project? Is this someone else's decision to make? Do I need input from others?
- Use past experiences to guide you.
- Know when to research and when to just ask someone so as not to reinvent the wheel.

Level of Ownership Taken on Projects

Do you care about the quality of the documents you send out the door? If there is a problem on one of your projects, do you step up to help find a solution? Do you take responsibility for the budget on your projects? Do you know how to set and maintain a schedule? Do you care about a project if you are only helping out on it short-term? Do you keep the Engineer of Record (EOR) informed of the project status? Do you think your responsibility stops at the discipline border? Would the client want to hire you on the next project? Do you take pride in your work?

- Problems are a normal part of our business. When you encounter one, do not just show up with the problem, but show up with a good solution.
- When a problem occurs, work to resolve it immediately. Doing so usually prevents little problems from becoming big problems.
- Pay attention to details.
- Keep a close watch on project progress to assure that the schedule and budget can be met.
- Keep the EOR informed, and involve the EOR in any major decisions.
- Seek to publish your work.

Successful engineering firms not only need engineers who are technically excellent at what they do, but they also need well-rounded engineers who can manage people, risk, and projects effectively, represent their firm professionally, and view the Big Picture. Mastering the sixteen technical and management skill sets discussed in this two-part series should help round out your ability to make a significant contribution to the success of your firm and help achieve results. ■

