

TRAINING STEEL DETAILERS



Hugh Dobbie is president of Dowco Consultants Ltd. His firm, with offices in Burnaby, British Columbia and Mississauga, Ontario, has a staff of 64. A strong proponent of education, he chairs the National Steel Detailing Committee for the Canadian Institute of Steel Construction.

WHEN I ARRIVED IN CANADA FROM SCOTLAND IN 1956, I HAD JUST GRADUATED FROM HIGH SCHOOL AND NEEDED A JOB. I was fortunate because I had two opportunities to consider. One was a commercial artist with a company that prepared ads for the Yellow Pages, and the other was a draftsman with Dominion Bridge Company in Burnaby, B.C. At the time, Dominion Bridge was the largest steel fabricating company in Canada. The commercial artist job required me to take two buses from the suburbs into downtown Vancouver, a journey of about 45 minutes, while the job at Dominion Bridge was a 15-minute walk from where I lived.

The choice was therefore easy, and before I realized the ramifications of the decision I was making, I became a steel detailer. I knew what a commercial artist was, but I had no idea what a steel detailer was, only that it involved drafting and that I liked drafting. In essence, I became a steel detailer by accident. As it turns out, my entry into steel detailing is not so unusual. In the 43 years I have been in the industry, I have come across very few people who actually chose steel detailing as a career. Most of them, like me, landed in the business by accident.

Steel detailing is an important part of the process of bringing architectural and engineering designs to completion. We can no longer wait for individuals to find steel detailing by accident. I believe our industry can and should be attractive to graduating students. My part of this presentation will focus on what is happening "from a Canadian perspective," and how we might pool resources and work together towards a common goal.

Current Training Options

CAREER PREPARATION

High school students are struggling to determine a path to follow graduation. To help them with their decision, many school districts have introduced career preparation, where the student will spend 40-100 hours at a company learning first-hand the expectations of them in a particular career. There is no cost to the company and the student receives academic credit. Unfortunately steel detailing is not listed as a bonafide career in most high school career preparation brochures so requests for career training seldom develop.

Because of the high degree of technology employed by our company and our extensive use of computers, we are regularly approached to provide career preparation. We generally invite 2 or 3 high school students each year to train in our offices. We introduce them to detailing through our 3D software and a self-paced online tutorial. Students today are totally confident with computers and expect and want them in any career option they select.

COLLEGE PROGRAMS

We are fortunate in B.C. to have two colleges currently training steel detailers. Vancouver Community College (VCC) has been training since the 1960s, while the British Columbia Institute Of Technology (BCIT) expanded their drafting program to include more steel detailing a few years ago. More than 60% of the staff at Dowco are graduates from this course.

NIGHT SCHOOL COURSES

Night School courses are an excellent vehicle for upgrading a steel detailer's engineering and management skills. Several provinces in Canada have, in the past, run specialty courses on steel detailing and connection design. The

volatility of our industry over the years, particularly through the recessions of the early 1980s and 1990s, made it difficult to maintain the continuity of these courses and many were canceled.

CORRESPONDENCE COURSES

I am surprised that this vehicle has not been used more effectively. Correspondence courses are generally self-paced within a certain time frame. A correspondence course in Connection Design has been developed under the auspices of the Canadian Institute of Steel Construction (CISC). This course, which is handled from B.C., involves participants from across Canada.

IN-HOUSE TRAINING PROGRAMS

Steel detailers are continually being exposed to on-the-job training. This remains an effective but slow way to gain experience. In-house training can take many forms, but to maximize effectiveness, in my opinion, it must be highly structured. To this end, last year our company embarked on a bold initiative aimed at increasing our detailing capacity.

In previous years, as a matter of course, we accepted three graduates from the college steel detailing programs. Running advertisements for qualified, trained steel detailers proved ineffective in our B.C. market, as it does in most areas. Detailers at present appear to be comfortable where they are; most are earning good salaries and are therefore not motivated to move.

However, our ads did reveal an abundance of engineers and architects who had immigrated to Canada but were unable, for one reason or another, to pursue their chosen profession. We decided to tap into this vast resource of underutilized talent and chose nine candidates from a group of these immigrant professionals. We offered them an opportunity to pursue a career in steel detailing. We then hired a drafting instructor, the recently

retired department head of the steel detailing program at the Vancouver Community College. This instructor spent eight hours each Saturday for eight weeks, using the CISC Steel Detailing Manual as his text. All nine participants completed the course and the final exam, and are all now employed full-time with Dowco.

To further accelerate their training, we have matched these detailers and other new hires from colleges with senior detailers who act as "mentors" to guide them in the early stages of their career. To date, the results are positive.

APPRENTICESHIP PROGRAM

Apprenticeship programs take a great deal of time and require considerable cooperation from all involved stakeholders. To be successful, the steel detailer, fabricator, educational institute, the government, and in some cases, the union in the fabricator's shop, must all be on board.

Governments favor anything that can create jobs and will lend their support and expertise to bring the program to fruition. Money, on the other hand, is something they are not likely to bring as readily. However, the problem of insufficient and untrained detailers is ours, and we in the industry should be prepared to pay to rectify the current situation. The educational institutes have a mandate for further education but they cannot set up courses unless they are reasonably assured of positions for graduates. The steel detailer and the fabricator are the greatest beneficiaries of such programs and are logically the ones responsible for initial funding. The shop union provided the only possible stumbling block because part of the apprenticeship involves shop experience. Assurances must be given to the union that any shop experience of the steel detailer will not effect the jobs of their members. Such assurances are unusually accepted by the union.

At this time, Alberta has an apprenticeship program in place, and B.C. is currently in the process of implementing their program. Ontario is also planning to embark on the apprenticeship route. With the experience of these three provinces, the objective is to take the program national.

Certification Programs

Once we have training in place, we must give the detailer added incentive to pursue continual improvement. In B.C., we now have a Certification Program in place, registered with the Provincial Government. This program was developed with the cooperation of the Steel Detailing Institute of B.C. (SDIBC), the Canadian Institute of Steel Construction (CISC) and the Applied Science Technologists & Technicians of B.C. (ATTBC). The certification recognizes three levels of competence:

1. Associate Steel Detailer (ASD) is a graduate of a steel detailing program with two years practical experience.
2. Certified Steel Detailer (CSD) is an Associate Steel Detailer (ASD) who has taken additional courses and gained an additional two years related experience.
3. Registered Steel Detailer (RSD) recognizes a Certified Steel Detailer (CSD) who has taken additional courses and gained a total of 5 years related experience as a detailer. An RSD is permitted to use his seal on detail drawings to indicate that they have been reviewed by a competent checker. The seal does not assume any responsibility for connection, which remains with the engineer on the project.

The NISD also has an Individual Detailer Certification program.

Vision Statement

"Our vision is to create an environment conducive to continual improvement and improve the status of the steel detailer to a quasi professional status."

I believe that by certifying steel detailers, and by constantly impressing the value of continuous improvement, we can bring the profession into the next millennium with a higher profile and awareness that presents the steel detailing profession as a viable career.

GOALS AND OBJECTIVES

It is now clear that the emphasis must be on additional training to improve the competence of steel detailers. We would all like to see the steel detailer improve his productivity, but we must provide the detailer with the necessary tools to make this happen.

Finding ways to attract new blood into the industry is essential to our goal of meeting the fabricators' requirements. We can encourage new steel detailers into the industry by successfully using new technology. Drafting is no longer identified as merely producing drawings for a specific task. With the arrival of computers, drafting has become a much more exciting vocation, particularly concerning the new 3D programs for steel detailing. The level of automation has now reached the point where even a junior detailer can produce shop detail drawings after only a few weeks training. A junior detailer can be taught how to build a 3D model on the computer and add pre-selected connections in the appropriate locations. He or she can quickly, with adequate supervision, become a valuable productive member of the team.

I would guess that approximately 80% of our work is relatively routine, encompassing beams, columns and bracing in various configurations. Many of

our connections are standard and explained in our steel manuals. This is not meant to diminish the complex project we are called to work on, but I believe they represent approximately 20% of the market. The computer has enabled us to address the challenges of these more complex projects more effectively and to bring them to successful completion.

A major problem detailers face is one of image - or lack of it. Most people have no idea of what a steel detailer is or does. We have not done a good job of advertising the profession as a worthwhile career. In most career-planning curriculum, steel detailing is not even listed as a viable career (like architecture and engineering). Counselors and teachers generally are not aware of the attributes of a steel detailing career.

Today's Situation

HOW DID WE GET HERE?

Looking back on my entry into steel detailing, I was very fortunate, indeed. I was part of a class of 17 high school graduates who had been selected for an intensive training program at Dominion Bridge in Burnaby. In those days, the large fabricators would import experienced detailers from Great Britain and other parts of Europe. Dominion Bridge decided to supplement these experienced detailers with new trainees. As trainees, we spent six months of eight-hour days under the tutelage of several detailing specialists, and then three months practical experience in the fabricator's shop, moving through the various operations. During this intensive nine-month training period, we were also enrolled in a course in Selected Units of Structural Engineering with the International Correspondence Schools. Throughout the nine-

month period, Dominion Bridge paid us a salary. While this provided participants with excellent training, it was an expensive experience.

However, the shortage of steel detailers remained, and around this time the colleges began to develop detailing courses. Programs were being developed across Canada in Alberta, Ontario and Quebec. Until the 1960s, steel detailing was primarily the domain of the steel fabricator. Most fabricators had substantial detailing forces that, by nature of their specialized skills, had limited mobility. It was unusual for detailers to move from one fabricator to another. This changed somewhat in the 1960s, as a recession left some fabricators overstaffed, particularly in their drawing offices. Large fabricators downsized, some drastically. Smaller fabricators emerged and detailers were spread over a larger number of companies. Detailing companies were formed, mainly from the experienced detailers who had been trained by, and worked for, the fabricators. While this worked well initially, the steel detailing companies did not have the resources, nor the desire to embark on any significant training initiatives. Their objective was to do a good job, on time, and within the budget to suit the fabricator's requirements. Bringing new detailers into the industry and training them would be someone else's problem. The steel detailing companies could not be expected to train new detailers just to have them stolen by competitors or have them go into business for themselves. This shortsightedness has contributed to the current shortage of good steel detailers.

To quote Rodney Dangerfield, one of the most common refrains of the steel detailers is "We don't get no respect." This is primarily our fault, since we have not emphasized the importance of our contribution to the steel industry.

The NISD has struggled for more than 30 years to improve the status of the steel detailer. Through the dedication of a few good men and women, they have succeeded in raising the profile of the detailer by developing Industry Standards and Quality Procedure Programs for steel detailing companies. We all know that you can have the best fabricator and the best erector in the world, but if you have poor details, your job will be a mess.

The recurring theme throughout the last few years at the North American Steel Construction Conference (NASCC) has been teamwork and partnership. The steel detailer is a major player on the team and he or she must be prepared to provide the necessary training and upgrading for his or her staff. Some fabricators are now rebuilding their drawing offices to ensure accurate and timely drawings to meet their needs.

While the current shortage of skilled detailers was foreseeable over a decade ago, we have generally been slow to react. Some attempts have been made to send detailing offshore but that resulted in limited success due to cultural differences, but more particularly to the higher standards demanded in North America.

During the several recessions we have experienced since the 1960s, colleges that had training programs for steel detailers faced problems filling their classes. Colleges require continuity for their programs to survive. Once a program has been canceled, it is very difficult to resurrect it. Ontario, for instance, had a truly excellent two-year program for steel detailers that was canceled about 10 years ago, and will probably not be restarted.

Available Options

IN-HOUSE TRAINING

In-house training is something we should all be doing at some level in our companies. Mentoring is an effective way to tutor the novice in the best procedures for steel detailing. This can quickly fall by the wayside by senior staff convinced they're too busy to mentor but it is an effective tool when properly used.

CORRESPONDENCE COURSES

College courses are the most difficult to promote and certainly costly to implement. Offering bursaries to worthy students can encourage participation in existing courses. It is important to have input to the college advisory boards for those courses that best meet your needs.

COMPUTER DRAFTING SOFTWARE

Computer software for steel detailing has made major advances in the last decade. Programs are much more sophisticated, allowing the production of 3D models of structures. Detailing is more fun and results are much easier to visualize. We should not overlook training on CAD as a means of enticing new detailers into the industry. Although this can be an expensive option at the outset, returns can be significant.

INTERNET LEARNING

Internet learning is an area that is yet unexplored. This could offer exciting opportunities for online training. This could come after courses are developed on CDs.

TRAINING CDS

Interactive CDs are becoming an effective tool for training on a variety of subjects. While this vehicle is currently still fairly expensive, costs are beginning to look more reasonable.

TRAINING VIDEOS

Training videos are also expensive to create but they offer an excellent means of imparting knowledge to prospective steel detailers.

Recommendations

We have discussed a number of possible training options for steel detailers. Along with what we have been doing in Canada, the American Institute of Steel Construction and the National Institute of Steel Detailers have also been investigating opportunities to work together to train and certify detailers. I recommend that you work through and with these bodies as well as your local associations, to develop necessary training programs. We can no longer wait for someone else to do the work of solving our problem. We are all stakeholders and have a vested interest in making sure we have the numbers of skilled technicians we need to perform the tasks required by our steel industry.

I hope I have given you something to think about; and urge you to study the available options and pursue a course of action to encourage new detailers into our industry. Investigate the educational opportunities in your area, work through CISC, AISC, NISD or other local organizations connected to the industry. We all have a contribution to make.

This paper is part of the 1999 North American Steel Construction Conference session: "Training of Steel Detailers."