I would like to thank Professor Vaicaitis for inviting me to this dinner honoring this year’s graduates from Columbia’s Civil Engineering Department. It is an annual event that I always look forward to attending. When Professor Vaicaitis asked me to say a few words tonight, I asked him on what topic and for how long. He said to talk about life in the real world and take 10 minutes. When I finally began to think about this, both constraints seemed daunting.

So, I started to think about my reality as a graduate of the Civil Engineering Department in 1975 and the reality of my engineering career over the last 27 years. The first thing that struck me is I suspect that most if not all of tonight’s honorees were not yet born in 1975 and this fact itself was sobering for me for many reasons.

I tried to think back to the 1971 to 1975 period, reflect on what I thought then, and see if I could have predicted in any way what I’m doing today and the short answer is a resounding NO.

In 1971, there was a war going on and every week more than 100 soldiers, most, younger that then tonight’s honorees, were coming back home in body bags. We had a President who resigned in disgrace and our perception of public officials changed forever. The US was in the midst of a Cold War with the Soviet Union and the reality of global annihilation was not just a plot from Tom Clancy novel. Make no mistake that these global events affected everything and the repercussions trickled right down to where one might find their first job after graduation.

From a technology perspective, there were no pocket calculators until my sophomore year and they cost $150. Tuition at the time was about $3000 per year. (Think about the computing power you can buy today for the same 5% of your tuition). Computers, such as they were, were only accessible from punched cards; there were literally no commercial programs to do structural analysis and there was no effective Internet.

I was learning civil engineering from many of the same people in this room today. 1975 was not a good time to be graduating, as there were literally no jobs available. Therefore, I stayed in school, got a Master’s Degree, and in 1976 went to work at a company called Burns & Roe on the design of a commercial nuclear power plant in Washington State. This industry and the thousands of engineering jobs associated with it were wiped out in part by the Three Mile Island nuclear accident in 1979. I left B&R to join Weidlinger Associates and have been there ever since. Today, I am the head of the Applied Science Division following another Columbia graduate, Dr. Mel Baron, in this position.

So, what is my real world?

First, engineering is an apprentice art. The drop that I felt and perhaps you will feel in your first job will be greater then the drop that you felt when you were the smartest person in the world as a high school senior to what you perhaps felt and I know that I felt after your first freshman
physics test at Columbia. You’ve learned a lot but what you will find is that you can’t even
design a beam until some senior person tells you what the boundary conditions and load are.
Every building, every engineering job is unique. The trick is to figure out the proper idealization.
To do this, you need the time to see a lot of different situations and the time it takes to do this is
related to the amount of mentoring you get on the job. I was fortunate in that I was blessed with
wonderful mentors in my early career and I have never forgotten this. My advice is, if you find
yourself in a situation where you are not getting the proper mentoring, complain. If your
complaints are not heeded, then get a new job. Don’t waste your time.

The second part of my real world is that you have to work hard. This sounds trite but the bottom
line is you didn’t get where you are today by taking it easy. And if you think you worked hard in
school, you ain’t seen nothin’ yet. If you approach engineering as a 9 to 5 job, you will be
limiting your potential. You don’t want to have 2002 knowledge, 27 years from now or literally
even 5 years from now. Things are changing fast and if you don’t keep up and realize that
learning is a lifelong process, you will be marginalized. As opposed to the mentoring aspect, this
is part of your development that is somewhat in your hands but look for a work environment that
encourages this.

Next, be flexible since times change. If Weidlinger’s Applied Science Division had stagnated in
the mid-80’s at the height of the Reagan defense buildup and cold war, I wouldn’t have a job
today. In my group, there are individuals who were the first in the world to do transient
nonlinear dynamic analysis on missile silos subjected to nuclear attack who are now working on
the World Trade Center post-mortem, computationally flying airplanes into buildings and
bringing out possible physics-based scenarios that may ultimately make buildings safer. One
thing that you will come to realize is that you are selling what is in your brain. You will be faced
by unimaginable time demands to produce results. Clients will come back to those to produce. If
you don’t realize what your product is and cannot adapt to change, Darwin has shown us that we
will become extinct.

Fourth, learn to communicate effectively. Another way to view our jobs is the communication of
complex physics to decision makers who do not have a technical background. The absence of a
technical background does not make these individuals stupid; in fact, most times, you’ll find a
keener intellect that you might have expected. This communication could be talking to an
ambassador about upgrading the security of his embassy building, or talking to and Admiral
about new ways to do shock testing of naval vessels or even talking to a Congressman about
appropriating funding for corrosion research or new concepts in blast mitigation for buildings. If
you cannot convey your message, your point will be lost and your work will be wasted. Society
relies on engineers. 9/11 is our nation’s worst disaster and at this time, society has turned to
engineers to lead us out of tragedy both in the near term with rescue and clean-up efforts and in
the longer term re-development, as well as with the efforts just beginning, to improve building
safety. Communication between engineers and the public will be crucial in developing the
lessons learned and the ways to address them.

Fifth is learning to work effectively in groups. The hardest part of my job is to get groups of
individuals to work together as a team. I could go on and on here but everything boils down to
communications and respect. Keep this in mind; you will always have to work on this.
Lastly, you do need a little luck; being in the right place at the right time does help.

So where does this leave us? I can assure you that you received an excellent education. This is not a self-serving statement. Weidlinger has succeeded over that last 53 years in large part do to its association with this department. The success of the graduates of this department, of course, has gone far beyond Weidlinger as evidenced by the esteemed alumni here tonight and those many others unable to be here. We recruit from several excellent programs particularly in the northeast. Time after time, we find that the qualities required for success are embodied in the graduates of this department.

Where will you be in and what you will be doing in 27 years or even 10 years? I guarantee whatever you think, you’ll probably not be correct. I do know that you do have the where with all to get back all of what you put into this profession and then some. I hope that you’ll also remember to give something back. In closing, remember the words from an old song “Life is what happens to you while you’re busy making other plans.” Make the most of what you have; you owe it to yourself. In closing, I would like to say, CONGRATULATIONS! And, don’t forget, have some fun, you’ve earned it. Thank you