Embracing Gospel Principles to Confront Major Global Moral Issues

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Engineers are educated to solve problems. These problems range from making simple decisions about effective uses of items to the complex design of things such as computers, skyscrapers, medical implants, and spacecraft. Engineers are taught to use a simple, straightforward, step-by-step approach as they address these complex problems. The basic components of this step-by-step engineering approach include the following:

1. Stating clearly the problem to be solved
2. Gathering and listing known information about the problem
3. Identifying principles that can provide direction for the problem's solution
4. Investigating previous solutions to similar problems
5. Formulating and implementing a solution

This chapter uses this basic engineering problem-solving approach to address a major problem that faces our world today: the rampant graft and corruption that exist in the international engineering and construction industry. Using the step-by-step engineering approach defined above, this chapter first makes a clear statement of the problem to be solved. Next, known information and data about the problem are presented. I will then explore some basic gospel principles that provide direction for a possible solution to the problem. Several examples will demonstrate the success of using these principles to solve major problems.

Step 1. Stating Clearly the Problem to Be Solved

The first step in my approach is stating clearly the problem to be solved. William P. Henry, past president of the American Society of Civil Engineers (ASCE), has clearly identified the magnitude of the international graft and corruption problem: "Overall, the loss [to society] from corruption is estimated to be about 10 percent of total E/C [engineering and construction] spending, that is, $340 billion a year."[1] President Henry then challenged the civil engineering community to become engaged in solving this problem: "Our aim is for all our members—those employed by design firms and construction firms, those working for public and private owners, and those who are educators—to embrace a stance of zero tolerance for fraud, bribery, and corruption in the E/C industry."[2]

Step 2. Gathering and Listing Known Information about the Problem

In response to President Henry's challenge to solve this major global engineering problem, students in an engineering ethics class at

1. William P. Henry, "Message from the President: Corruption Hurts Everyone," *ASCE News*, December 2004; http://www.asce.org/ascenews/1204/decnews_content.cfm?id=8.
2. Henry, "Corruption."

BYU have been involved in a project to find ways to reduce the problem.[3] First, the student teams gathered data and reported specific examples of graft and corruption in the engineering and construction industry that occur in specific countries. Information from this data-gathering activity has been very interesting. To date, over thirty countries have been evaluated by student teams, and the information has been formally reported back to the class and posted on a Web site. Some examples follow of the corruption that contributes to the $340-billion-a-year problem as reported by these teams.

U.S. firms have often tried to enter the competitive construction industry in Japan but cannot. This often results from bid rigging, known as *dango.* A global anti-corruption watch group reports:

> [Dango] in Japan's construction industry is understood to be rampant, particularly for government-funded projects where officials disclose bidding prices to builders in exchange of favours. . . . The US has long been critical of the industry for these practices and for being closed to foreign builders. In its annual recommendations to the Japanese government, Washington has recommended Tokyo to address the widespread problem of bid-rigging, particularly bureaucrat-led bid rigging. The recommendations said: "Such a program (of reform), if implemented successfully, could reduce public work outlays by 30 per cent and free resources for employment creating initiatives, in line with Prime Minister Koizumi's key priority of expanding the social safety net."[4]

One of the most visible signs of engineering and construction corruption in Honduras was observed following the devastation of Hurricane

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3. Steven E. Benzley, "The Small Helm Project: An Academic Activity Addressing International Corruption for Undergraduate Civil Engineering and Construction Management Students," in "Ethics and Social Responsibility in Engineering and Technology: Linking Workplace Ethics and Education," ed. Michael Stebbins and Raymond E. Spier, *Science and Engineering Ethics* 12, no. 2 (2006): 355–63.
4. "Construction companies Bid-rigging in Japan: Corruption Case," *Unicorn*; http://www.againstcorruption.org/BriefingsItem.asp?id=8559.

Mitch in 1998, which destroyed 70 percent of the country's bridges. Lorenzo Dee Belveal argues, "That seven out of every ten bridges in the Republica would have broken down or washed out their positions is patently excessive. . . . Most of the structures were deliberately and seriously sabotaged in construction, in the interests of diverting a major portion of the construction budget into political pockets."[5] Aware that road and bridge construction are one of the largest sources of corruption in their country, many Hondurans have little confidence that future bridges will be any sturdier.[6]

An example of corruption in the Russian construction industry occurred in a very large project that was started in the mid-nineties. The project, called the Moscova-City International Business Center, is estimated to be an eleven-billion-dollar project and will be the home of numerous skyscrapers. Yevgeny Yankovsky was charged with stealing over thirty million dollars from the project funds. This created many problems with other companies involved in the construction and greatly set back the construction of the project. It was planned to be finished in 2003, but because of complications from this incident and many others, the project is now scheduled to finish in 2010.[7]

The above situations are three typical examples of alleged graft and corruption in the worldwide civil and construction industry. From such examples, it is easy to see that there is a major problem that needs a solution, a solution that will significantly reduce graft and corruption in our worldwide marketplace.

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5. Lorenzo Dee Belveal, "How Honduras Built an Infrastructure Catastrophe," *Lorenzo Dee Belveal's Central America and Honduras for Newcomers*, 1998; http://www.ldbelveal.com/articles/how_hondo_built.htm.
6. Jon Kohl, "Honduras Must Do Its Hurricane Homework on Time," *Honduras This Week Online*, May 29, 2000; http://www.marrder.com/htw/special/environment/70.htm.
7. Natalya Davydova, "Clouds Gather over Moskova-City Project," *Moscow News*, July 2003; http://english.mn.ru/english/issue.php?2003-33-7; and "Russian Developer Sentenced to 8 Years for Stealing $33M from Moscow-City Project," *MosNews*, November 15, 2004; http://www.mosnews.com/news/2004/11/15/yankovsky.shtml.

Step 3. Identifying Principles That Can Provide Direction for the Problem's Solution

Our holy scriptures provide important counsel about the issue of graft, corruption, and bribery. For example, the Psalmist writes: "Gather not my soul with sinners, . . . in whose hands is mischief, and their right hand is full of bribes" (Psalm 26:9–10). The great prophet Isaiah, in writing of this subject, actually tells us of the rewards of the righteous, who do not take bribes: "The sinners in Zion are afraid; fearfulness hath surprised the hypocrites. Who among us shall dwell with the devouring fire? who among us shall dwell with everlasting burnings? He that walketh righteously, and speaketh uprightly; he that despiseth the gain of oppressions, that shaketh his hands from holding of bribes, that stoppeth his ears from hearing of blood, and shutteth his eyes from seeing evil; he shall dwell on high: his place of defence shall be the munitions of rocks: bread shall be given him; his waters shall be sure" (Isaiah 33:14–16).

Elder Bruce R. McConkie, in commenting on Isaiah's teaching, explains: "'He that shaketh his hands from holding of bribes.' That is, we must reject every effort to buy influence, and instead deal fairly and impartially with our fellowmen. God is no respecter of persons. He esteemeth all flesh alike; and those only who keep his commandments find special favor with him. Salvation is free; it cannot be purchased with money; and those only are saved who abide the law upon which its receipt is predicated. Bribery is of the world."[8]

President Gordon B. Hinckley has taught that we must all practice focusing on and implementing important virtues. He teaches that men and women need to stand up against the forces of evil. He asks us all to humble ourselves before God and to stand "up, in every arena of our lives, for the virtues that will make our individual lives, our families, and our society strong and vibrant."[9]

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8. Bruce R. McConkie, "Think on These Things," *Ensign*, January 1974, 45.
9. Gordon B. Hinckley, *Standing for Something: Ten Neglected Virtues That Will Heal Our Hearts and Homes* (New York: Three Rivers, 2000), 211.

The early Saints of this dispensation were confronted with many major problems as the Church was being established. Among the most troubling were the severe persecutions they suffered at the hands of their enemies. They received divine counsel in section 123 of the Doctrine and Covenants about how to deal with these persecutions. In particular, verses 15 and 16 read: "Let no man count them as small things; for there is much which lieth in futurity, pertaining to the saints, which depends upon these things. You know, brethren, that a very large ship is benefited very much by a very small helm in the time of a storm, by being kept workways with the wind and the waves."

It was not enough to just take the persecution. The Saints had to counteract the corruption in the world. A related gospel principle clearly taught in the Book of Mormon is that "by small and simple things are great things brought to pass" (Alma 37:6). This principle was first stated by the prophet Nephi as he beheld the workings of the directing instrument we know as the Liahona: "And there was also written upon them a new writing, which was plain to be read, which did give us understanding concerning the ways of the Lord; and it was written and changed from time to time, according to the faith and diligence which we gave unto it. And thus we see that by small means the Lord can bring about great things" (1 Nephi 16:29).

This same principle was also stated by the prophet Alma as he counseled his son Helaman: "Now ye may suppose that this is foolishness in me; but behold I say unto you, that by small and simple things are great things brought to pass; and small means in many instances doth confound the wise" (Alma 37:6).

The Saints in this dispensation received this same counsel through the Prophet Joseph Smith: "Wherefore, be not weary in well-doing, for ye are laying the foundation of a great work. And out of small things proceedeth that which is great" (D&C 64:33).

These scriptural teachings point out that the evils of the world are to be rebutted, and those who do such will be blessed. It is also clear from these passages that small things can be effective in solving large, difficult problems. In the next section, I present some examples of how this principle has been applied.

Step 4. Investigating Previous Solutions to Similar Problems

Malcolm Gladwell, in his bestselling book *The Tipping Point: How Little Things Can Make a Big Difference*, provides some excellent empirical illustrations of how some seemingly small things have major impacts. A clever example he suggests is to consider a simple paper-folding exercise. Note that the thickness of a typical sheet of paper is about 0.005 inches. If you fold the paper in half, the thickness of the folded paper is 0.01 inches. Folding the stack in half again produces a thickness of 0.02 inches. Folding and doubling the size again, the stack becomes 0.04 inches. Now you can continue to actually fold it a few more times, each time doubling the thickness of the stack. But soon it becomes impossible to keep folding the paper. You might imagine that you could do it fifty times. When asked what the thickness of the stack of paper might be after fifty folds, you might guess about the height of a door or the height of a typical room. If one could actually fold the paper fifty times, the height of the stack of paper would be equal to about the distance from the earth to the sun.[10] The calculations of this hypothetical experiment are:

$$\text{Height} = 0.005 \times 2^{50} = 5.6295 \times 10^{12} \text{ inches} = 88{,}849{,}424 \text{ miles}$$

This graphic example shows how a very simple thing can have astronomical results.

A real-life example Gladwell presents is the manner in which New York City dealt with rampant crime in the eighties and early nineties. In 1992 the number of serious crimes committed in New York City was 626,182, and 2,154 of these crimes were murders. However, within a period of only five years, total crime had dropped by almost one-half, and murders had dropped 64.3 percent. Gladwell proposes a likely reason for this dramatic reduction in crime: what happened to the city's subway system. The graffiti was cleaned from the cars and stations, and a major effort was directed at stopping the fare beaters. Fare beaters are people who enter the system without paying for the privilege. With the improved condition of the transit system, the propagators of

10. Malcolm Gladwell, *The Tipping Point: How Little Things Can Make a Big Difference* (New York: Little, Brown and Company, 2000), 144–46.

crime seemed to leave the facility, and a much more law-abiding crowd came.[11] The example seems to show that crime can be prevented by such simple and straightforward acts as scrubbing off graffiti and arresting fare beaters.

An example of small means producing great things is the workings and results of the Perpetual Education Fund of The Church of Jesus Christ of Latter-day Saints. The basic elements of this program are to provide financial support to assist ambitious, worthy, and needy Church members in underdeveloped countries, so they have the means to obtain an education. President Hinckley has said the following about this program:

> With good employment skills, these young men and women can rise out of the poverty they and generations before them have known. They will better provide for their families. They will serve in the Church and grow in leadership and responsibility. They will repay their loans to make it possible for others to be blessed as they have been blessed. It will become a revolving fund. . . . The beneficiaries will repay the money, and when they do so, they will enjoy a wonderful sense of freedom. . . . Education is the key to opportunity.[12]

To date, over 26,000 loans have been provided.[13] The obvious effect of this program on the lives of the beneficiaries is profound. President Hinckley has further commented:

> And so we have begun this work of making it possible for our faithful and able young men and women to climb the ladder which will assure them of economic success. With greatly improved opportunities, they will step out of the cycle of poverty which they and those before them have known for so long. They have served missions, and they will continue to serve in the Church. They will become leaders in this great work

11. Gladwell, *The Tipping Point*, 133–68.
12. Gordon B. Hinckley, "The Perpetual Education Fund," *Ensign*, May 2001, 52–53.
13. Earl C. Tingey, "Prophets—Pioneer and Modern Day," *Ensign*, May 2007, 31.

> in their native lands. They will pay their tithes and offerings, which will make it possible for the Church to expand its work across the world.[14]
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> They will marry and go forward with skills that qualify them to earn well and take their places in society where they can make a substantial contribution.[15]

A program very similar to the Perpetual Education Fund is the BYU Marriott School of Management's Cardon International Sponsorship program. This program annually accepts approximately twenty married students from underdeveloped and developing countries. Professor Brooke Derr says the purpose of this program is to "help participants prepare for leadership positions when they return to their native countries—in their professions, communities, and Church." The recipients receive a scholarship from the college to cover tuition, textbooks, and health insurance. In addition, they receive a loan to cover living expenses during their graduate program. This loan is to be paid back.[16] To date, well over one hundred fifty students have graduated from this program.[17]

The Civil and Environmental Engineering Department at BYU recently patterned a program for graduate civil engineering students after the Marriott School Cardon Program. This program accepts two or three students each year. Those admitted to this program are Latter-day Saint students from underdeveloped or developing countries possessing an undergraduate degree in engineering. Three students have graduated with this support, and three students are currently studying with this assistance. The hope is that graduates of both the Cardon program and

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14. Gordon B. Hinckley, "Reaching Down to Lift Another," *Ensign*, November 2001, 53–54.
15. Gordon B. Hinckley, "The Church Goes Forward," *Ensign*, May 2002, 6–7.
16. "Your Contributions in Action: The Cardon International Sponsorship Program," *Marriott Alumni Magazine*, Summer 2004, 3.
17. BYU Marriott School, "About the Program," *Cardon International Sponsorship Program*; http://marriottschool.byu.edu/mba/cis/cisprogram.cfm.

the civil engineering program will have major effects in their homelands by having training and a master's degree from a recognized American university.

A touching example of very small things having major effects is that of Muhammad Yunus and his establishment of the Grameen Bank.[18] Yunus, born in 1940 in Chittagong, Eastern Bengal, received a Fulbright scholarship and attended Vanderbilt University, where he obtained a PhD in the field of economics. He subsequently became the head of the Economics Department at Chittagong University in Bangladesh in 1972. On a particularly meaningful trip with some of his students, he observed a poor woman trying to make bamboo stools for her livelihood. This woman had to borrow funds for each stool she made. The interest she paid on these loans was extreme. Yunus thought there should be a better means for her and all poor people who needed to borrow money. He therefore founded the Grameen Bank, whose purpose was to make small loans to poor people. He was persuaded by many not to begin such a venture. He was told that such individuals would not repay loans and that his idea would not be successful. He proved his critics wrong. The total amount of loans provided by the Grameen Bank since its inception is over six billion dollars, primarily to very poor individuals. The average loan provided is a little over one hundred dollars. Over 97 percent of the money is provided to women. The payback rate is over 98 percent, far more than that of large lending institutions. More important, lives of over five million individuals have been positively impacted by the small idea of Muhammad Yunus. Yunus was honored for his contribution by receiving the prestigious Nobel Peace Prize in 2006.[19]

Major effects can come from simple, but difficult, individual actions. Cliff Berkey, a graduate of the BYU civil engineering program, had an experience that provides an excellent example of how an individual can make a major difference. In 1992, Cliff was a specialist in

18. "Muhammad Yunus: Peeling off the Differences," in Rushford M. Kidder, *Shared Values for a Troubled World: Conversations with Men and Women of Conscience* (San Francisco: Jossey-Bass, 1994), 142–54.
19. Muhammad Yunus, *Banker to the Poor: Micro-lending and the Battle against World Poverty* (New York: PublicAffairs, 2003).

the U.S. Army stationed in Germany and had been invited to participate in the Army's Primary Leadership Development Course (PLDC). The PLDC prepares soldiers to advance to the rank of sergeant. As this particular course progressed, a dining event was scheduled. It was the school's policy that all PLDC participants attend the dining event. Each soldier was required to provide a ten-dollar allowance. However, the group voted that this allowance would go toward alcohol and that the mess hall would provide the food at no cost. It was against Cliff's standards to partake of alcohol, and he deeply resented having to contribute his meal allowance to the purchase of alcohol for others. Even more significant, he did not want to be in the presence of alcohol consumption. He informed the commandant that he would not participate in the event if alcohol was going to be served. Cliff's resistance set off a storm. Because of Cliff's stance, the commandant had him removed from the PLDC for disciplinary reasons. This removal automatically began a motion to have him dishonorably chaptered out of the army. However, Cliff had nothing but superior marks for his performance of duties at the PLDC. Because of these superior marks, the only reason to dismiss him was his failure to attend the dining event. Major political figures including Orrin Hatch, Slade Gordon, and Sam Nunn came to his defense. In addition, a White House inquiry, instigated by President George H. W. Bush, came through the European command, asking why such a good soldier was being dismissed over such a small matter. The result was that Cliff received orders directly from the Secretary of the Army to be transferred to a PLDC stateside that did not have the dining requirement.

Step 5. Formulating and Implementing a Solution

To become involved in designing solutions for the major problem of rampant corruption in the international civil and construction industry, the Small Helm Project has been implemented in several classes at BYU. "The major objectives of the project are to provide the students a learning activity that will (1) make a meaningful contribution within the disciplines being studied; (2) teach by experience a significant principle that can be valuable in numerous situations during an individual's

career; and (3) engage the minds, experiences, and enthusiasm of the participants in a real ethical challenge that is prevalent in all of their chosen professional fields."[20] Students in the project have proposed feasible solutions, which are eligible for funding, to the international corruption problem. The following proposals have been initiated.

DVD production by BYU animation team. Educational institutions are a major source of leaders in the various fields of engineering and construction management. Institutions therefore have a responsibility to address the issue of ethics. In addition, technical and professional societies, such as the American Society of Civil Engineers and the National Association of Home Builders, have student sections associated with many of these institutions that advocate ethical behavior in all aspects of their professions. One proposal uses both student chapters and national societies in support of the production of an animated DVD by the Emmy-award-winning BYU animation team. This DVD will be designed to effectively present the magnitude of the international corruption problem and to emphasize that everyone involved in the industry must work to eliminate the problem. The DVD will be made available to educational, professional, and media outlets both in the U.S. and abroad. Widespread information to and education of the stakeholders of the industry, particularly those who will hold leadership positions, will help provide the basis for an ethical industry that will resist corruption and promote quality work.

BidDesk. One of the main difficulties of the bidding process in the construction industry is the fairness in the process of selecting the lowest, but most beneficial, bid from the subcontractors. In an analogous real estate transaction between two parties, a third disinterested party will be used to hold escrow money, witness signatures, and act as an internal check to ensure a fair transaction. Bid depositories represent the construction industry's best effort to provide a third party to mediate the bid process. These depositories are physical offices with secretaries, paper forms, and pink envelopes. For them to be utilized, a general contractor must be established within a reasonable driving distance of the

20. Benzley, "The Small Helm Project," 355–56; see also 362–63.

office, and all trade contractors are required to drive the same distance to submit their bid. The depository then handles the bids until the hour they are due, at which time a copy is sent to the general contractor, who has forty-eight hours to submit the aggregate bid back to the depository, where the owner will then review the three lowest bidders. This process of paper and driving distances is inefficient. Such a system could be automated and then implemented in construction contract transactions as well.

A much better process can be implemented in this day of computer commerce. Ample examples of bidding Web sites, such as ebay, are secure and successful in their processes. Unlike ebay, however, the online bidding process required by the construction industry would allow a trade contractor to submit only one bid, and there would be no running total of all bids. An online bidding process can be effectively designed to accommodate this process. To address this problem, a software package named BidDesk is in development.

Romanian workshops. During May 2007, a team consisting of seven Ira A. Fulton College of Engineering and Technology undergraduate students directed by a faculty mentor conducted workshops on character development and engineering ethics at major Romanian technical universities in Bucharest and Cluj-Napoca, Romania. The workshops included both presentations in which the BYU students led meaningful discussion and interacted in problem-solving exercises related to actual ethical dilemmas. The objective was to focus on the issues of misbehavior in the international civil and construction industry and look at these problems from both an American and Romanian point of view. The desired outcomes of the workshops are to find areas of common ground between U.S. and Romanian cultures to address the joint problems coming from international corruption. This successful approach is described in a book called *Shared Values for a Troubled World*.

Databank of positive media. Companies have recognized the need to incorporate moral messages in their advertising. This idea has been used in a very interesting manner by the Liberty Mutual insurance company. Liberty Mutual has produced a series of commercials that depict individuals behaving in a moral manner. In one such commercial, a

young man does a simple kind act for a young mother. She in turn helps a homeless man. Another man observing this behavior is inspired to do a simple kind act for someone else. The repetition of this process left the very positive message of doing kind acts to one another. Another Small Helm student project is to catalog the moral message commercials currently available. These commercials can then be made available to interested parties to use for inspirational clips to promote moral behavior. The sponsoring companies would obviously significantly benefit from being further identified with moral behavior.

Conclusion

Dealing within the global marketplace poses numerous challenges. Many of these challenges involve the misbehavior of business and technical personnel. This chapter hopes to encourage students, professionals, and the general public to help reduce this misbehavior. Examples from around the world have shown that some very major problems can be effectively reduced by the use of small and simple ideas. Applying gospel principles can and will be effective in reducing problems as large as the $340-billion-a-year problem of corruption in the international civil and construction industry.