Challenges for International Contractors in Europe

The Victor L. Regnier Traveling Fellowship for Construction Science

Summer 2007

Sponsored by:
The Regnier Family Foundation
in collaboration with
The American Council for Construction Education

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Dedication

This is dedicated to any person who has ever wished to trek off on alone to explore a passion. Especially to all of the young construction industry professionals, I hope to illustrate that the world is so much bigger than anyone can ever imagine. Go and carpe diem in many different languages!

Acknowledgments

I would first like to thank Professor Victor Regnier who created this traveling fellowship program. This generous contribution to my professional and personal development has been a life changing experience that could not have otherwise been possible. I would also like to thank The American Council for Construction Education and the whole selection committee including Mr. Mike Holland, Professor David Fritchen, Chris Tatum, Mark Montoya, Dr. Abdol Chini, and Bruce Anderson. In addition, I would like to thank my cousins Roger and Tina Rogonia for taking in this weary traveler and making Italy feel a bit like home. Special thanks go to my "host family" in Detmold, Germany including Bengt Elling, Hanno Schröder, and especially Nils Grote who slept on the couch, as well as all of the staff and students from the Fachhochschule and the University of Florida (UFL)-Gainesville. I will bleed purple forever, but GO GATERS! I would also like to thank Petr Vogel for his time arranging interviews, translating, and giving me someplace to call home for a couple weeks. Without his help, my time in the Czech Republic would not have been nearly as fruitful.

I would also like to thank the following people for their time for assistance overseas, interviews, or site tours: Dr. Jimmie Hinze, professor at the UFL-Gainesville and organizer of Study Abroad 2007; Prof. Michael Jablonski, professor at the Fachhochschule in Detmold, Germany; Icon Venue Group for allowing a tour of the O2 stadium; Bill Mannarelli, project manager for the O2 stadium; Bianka Aversente, Office Manager for the O2 stadium in Berlin; the representatives from the Alexa Mall shopping center; Staatsverwaltungsbau Dresden Construction Managers of the Dresden Royal Palace; Dipl.-Ing. Ekkehard Voss, president of nps tchnoban voss; Bernard Heiming, president of Terragon GmbH, Frank Kehlenbach, Director Head of Overseas Division and International Relations for Die Deutsche Bauindustrie; Manuela Steinert; Ing. Hans-Ulrich Litzner, chief executive officer for Deutscher Beton- und Bautechnik-Verein E.V. German Society for Concrete and Construction Technology; the entire Hensel Phelps US Embassy team for their time and support including Gary Johnson, project manager; Blake Christian, project engineer; Eric Niec, project engineer; Alex Bertolin, project manager; Dipl.-Ing. Rolf Reppert, Reppert Terminplanung; Dipl.-Ing. Andrea Jütten, 3d-A-VIS; Prof. Ing. Federico Gervaso, Politecnico di Milano, JE Jacobs Italia S.p.A including Nicola Magistretti; Andrea Brunetti, API biotech & chemical manager; Matthew Mangosi, project controls department manager; Maria Elena Gasperini, quality manager; Ing. Andrea Bonetti, construction manager; Jeoff Iddison, project controls manager; Alberto Margreth, health, safety and environmental manager; Alberto Falciola; and many more JE employees at the site in Florence; Prof. Ing. Giuseppe Mancini, Sintecna Engineering Consultants and professor at Politecnico di Torino; Skanska CZ including Leos Vrzalik; Ing. Julius Janeba, project specialist; Petra Hajná, strategy

department; Vladimír Myšička, Executive Concrete Structures Division; Karel Kobliha, Commercial Manager; Petr Kymlička, partner in charge consulting Deloitte Czech Republic; Hochtief CZ a.s. including Ing. Jan Samec, site manager – building production; Ing Petr Bartušek, marketing director and deputy commercial director; Ing. Milan Hořický, head of quality management department; Ing. Aleš Benda, project team leader-building production; and finally Ing. Jíří Skála, secretary of foreign relations Association of Building Entrepreneurs of the Czech Republic for days of interviews and site tours.

Also, many individuals took a great deal of time assisting me with travel arrangements and programs including: Abdol Chini, UFL- Gainesville; Chris Blythe, CEO of CIOB, Terry Lane, professor Emeritus of Nottingham University; Hensel Phelps Construction Co., Rebecca Brown, project manager; Turner International LLC, Michele Garvey, communications manager; Thomas McCool, general manager Europe, Art Latt, project manager; Bob Meyer, vice president; Cheryl Leweke; Kateřina Kopecká, Hochtief CZ Personální marketing/personnel marketing; Paola Di Mauro, ANCE Estero; Barbara Ludovico, Jacobs Pierluigi Montanini, principal architect; Warren Dean, EVP; JE Jacobs Italia S.p.A; State of Missouri European Trade & Investment Office Elizabeth Hobbs, senior office support assistant; Ian Parker, director; Giorgio Mazzeri, ProgettoCMR; Comini Grazia, Politecnico di Milano; Klaus Böde, director of finance Hochtief PPP Solutions (UK) Ltd; Sunrise Senior Living including Peter Gosling, European construction director and Paul Regan UK project manager; Wates Group Limited including Barry Ross, key accounts manager; Emma Borg; Scurr & Partners Architects Co. UK including Bob Stares, managing director; Samantha Capewell, P.A.; David Duckworth, divisional director; Helen Tissington, PA; and Denise Naughton, personnel manager; Baillie Knowles including Simon Knowles; John R.P. Walker; Black and Veach including Ted Andry, Brent Burklund, project controls manager; Dr. Andrew Platten, project manager -Constructing the Future; and Mr. Douglas Barrett, British Expertise.

And on a personal note…to my friends and family, the countless emails and early morning or late evening skype calls and free text messages made home seem just that much closer. In addition, I know I would not be where I am today without my education. The Kansas State University in the Architectural Engineering and Construction Science department teaching staff's personal dedication and drive to inspire young minds has given me the background needed to not only make the most out of this experience, but to make the most out of my career.

Finally, I must thank my parents, Gene and Kathy Evans. This trip could not have been possible without their love and support throughout the proposal, trip planning, and the entire overseas expedition. Their encouragement to set and achieve seemingly impossible goals not only made this trip possible, but so much more. They have also both put significant time into proofreading and revising my work. Reading my reports, they have been so impressed with the things I have seen and done, and I do not believe either of them truly understands how impossible this fellowship would have been without their guidance. I can't thank either of them enough.

Introduction

The Regnier Traveling Fellowship grants a senior in an accredited Construction Management degree program the opportunity to travel after graduation to perform research on a topic of his or her choosing. This fellowship provides up to $20,000 in compensation to the recipient for the travel expenses for research spanning approximately three to six months. I was lucky enough to be chosen as the 2007 recipient of this award.

I spent approximately three months in Europe, in Germany, Italy, and the Czech Republic. Initially, I had planned on visiting the United Kingdom as well, but unexpected circumstances eliminated this portion of my research. For this reason, the article to follow will address construction in the mainland of Europe. I found throughout my time overseas that much of the construction industry remains somewhat similar. However, I was advised by many of my interviewees that a visit to England would provide many unique experiences. As unfortunate as it was to cut my fellowship short, perhaps the final research document will have more congruency.

My proposal was to discover the "hidden costs" of construction as seen by an international contractor, specifically the challenges for an American contractor in Europe. I compiled my research in a number of ways. I spoke with professors at technical universities, architects, construction managers, industry organization representatives, and contractors. Although I came to these interviews prepared with a list of questions, I found that, upon explaining the purpose of my research, the interviewee knew better than I what would be interesting and useful. The questions served more as an intellectual spark to further discussions as the conversation came near an end. The interviews lasted anywhere from an hour to two full days. I also had the opportunity to tour numerous job sites in a wide range of building sectors. This allowed me to view the typical construction practices and to speak with the contractors when the language constraints permitted. Finally, I was able to understand the interviews more thoroughly because I was actually submersed in the culture and daily life.

As one could imagine, my research was continually morphed by new insights and experiences. This was not only anticipated but encouraged by the review committee, whose members provided ample support toward development of the initial topic and planning of the trip. As a result, the following document will first outline factors a contractor must consider for growth internationally in the mainland of Europe. I will then explain my findings about each country as I visited them, starting with Germany, then Italy, and finally the Czech Republic. The report for each country will contain my list of the top ten challenges to achieving success and an overview of major considerations in that nation's construction market, followed by a brief summary. This research is not exhaustive by any means, and I emphasize that these findings are per my experiences and my subjective evaluation of priorities. Nevertheless, with the scope of information, it is my hope that all will find something of value.

The report will conclude with a case study. While in Germany, I was able to spend two weeks visiting with Hensel Phelps Construction Company, based out of Greeley, Colorado, at their US Embassy project in Berlin. This jobsite experience is by far the longest and most detailed I was able to schedule. Having interned with Hensel Phelps in Colorado during the previous summer, I was better prepared to compare their international and stateside construction practices. It was an exceptional opportunity to experience exactly what my research proposed to investigate, the initial exploration by an American contractor into the European construction market. In addition, Hensel Phelps has been more than courteous to share information and allow for publication of this document.

International Growth

"Business is global, but success is local." Ekkehard Voss, nps

Exchange Rates

Signing contracts in a different currency can pose problems. For example, if a contract was signed in euros when the exchange rate was approximately $1.20 to every euro, the American contractor would be loosing great amounts of money now that the euro is worth over $1.50. With the currently declining value of the American dollar and uncertainty in times to come, this is a very real and dangerous risk. One may mitigate this risk slightly by buying most of the foreign currency in the beginning of a project, when the exchange rate is known.

Language Barriers

The language barrier affects many aspects of the construction market. First of all, European construction is complicated by multiple languages in all stages of the process from buyout with suppliers to subcontractors from various nationalities. However, English is the international language of business, so many people know enough to communicate fairly well, but there is still a diversity of accents and expressions. The biggest components of the language differences that must be recognized are the concepts lost in translation. Some technical or legal construction terms may hold differing implications from one country to another, or may not exist at all. In my experiences, this happens much more often than one would imagine, especially when the parties have less initial language difficulties and assumptions are made.

Wood and Steel Framed Construction

Figure 1: A typical interior wall system of brick and insulation instead of the standard metal stud partition often utilized in the US.

These forms of construction are much less common overseas. Often, Europeans feel a structure should be strong, sturdy, and built to last. The heavier masonry and concrete structures create this preferred impression. Also, the thermal mass of concrete and masonry adds to the energy conservation. For this reason, there are no shingled roofs either. Most roofs are either flat, built of precast or concrete, or sloped and tiled with clay or stone. The cultural perception and desire for a heavy, "sturdy" structure are very important considerations for development. A typical American home would be viewed as light, flimsy, and of poor quality.

Energy Conservation and the Environment

The European countries I visited are very concerned about energy conservation, not only for the environment but because energy is also extremely expensive. The delegation of energy expenses during construction is a major aspect to consider and outline in a contract and monitor throughout the project. A misunderstanding in the estimation phase could be very costly. In addition, one must understand the differing requirements in the finished product. Air conditioning, if used at all, is limited. Typically, when one walks into an American building on a hot day, he or she would feel a blast of cold air. European buildings will not provide this initial shock. The objective for the air conditioning system is to keep the occupants at a "comfortable" temperature, not always at 70 degrees. Also, lighting is used as little as possible. Many lights are on timers, and as a culture Europeans turn on lights only when necessary. I performed many interviews in offices dimly lit by natural light. Interior lights are also often high efficiency lights, which may look more industrial when compared to incandescent bulbs. Windows are high efficiency, double-paned, insulated, and efficiency coated. Also, recycling and trash separation are common and often required, even during construction.

Product Specifications

The contractors are typically allowed more input and value engineering from the time of the bidding phase. Specifications normally describe the quality required of a product and then the contractor is required to meet or exceed the owner's expectations as described. In this case, one would think that the submittal process would be all the more essential, but it is basically never used. Instead, the owner approves products by employing representatives to observe site activities of materials that will be concealed in the final project, a mock-up of all finishes and other exposed materials is constructed and approved, and a final walk-through, punch list, and turnover process is completed as well. This poses significant risk from the bidding phase if the contractor bids a project with materials the owner will not approve later.

Mock-ups

The European subcontractors do not have an equivalent to our material submittal. Quality control and material compliance are achieved through mock-ups and inspections. A series of mock-ups is completed and reviewed extensively with the owner as an important step to assure

Figure 2: An apartment mock-up. Through the window one can see the stage of construction of the complex.

owner satisfaction and agreement with the qualitative specifications (Jütten). I found this process to be very effective in resolving many issues. For example, in America, I have experienced situations in which an architect will approve a color by a paint chip and later request for numerous rooms to be repainted because the result was not quite what had been expected. The American construction industry could learn something from the European's use of mock-ups.

Historical Reconstruction

Historical reconstruction and maintenance are occurring all over Europe: from the rebuilding of the royal palace in Dresden, to the maintenance of the cathedral in Milan, to the Royal Gardens at the Prague Castle. Each country has a variety of laws and strong organization or government influences that dictate construction means and methods. Typically, there are also investment incentives and/or tax breaks to promote and stimulate interest in these complex, time consuming, and often expensive projects.

Figure 3: Rennovations and repairs near the Spanish Steps in Rome, Italy.

Brand Name Equity

Whenever a contractor builds overseas, the owner, investors, and other contractors must have the confidence that the foreign contractor will perform quality work and follow through on promises. This is extremely difficult for an international company to provide, unless they have a stable base in the country in which they are building or have strong international name recognition. It is also important to research and acquire the proper titles to represent the corporate structure and liability.

Technology

The uses of AutoCAD and Primavera Project Planner are internationally understood and are industry standards.

Contracting

Although each country may term the methods of contracting differently, essentially there are three main contract types. The owner may pay the contractor the cost of the project plus a fee which typically is 10%. Or sometimes in less defined scopes of work like renovations, payment per hour of work or payment per unit of work in place may be used. The most typical contract is a hard bid, lump sum (Jablonski).

Bidding

Bids are normally submitted by the contractor in a cost per quantity format with a total lump sum price. The total quantity may or may not be specified for the contractors prior to bid. Although the owner or architect commonly lists a quantity surveyed, it is often stipulated in the contract that the contractor who bids the project takes responsibility for verifying the quantity and will not be able to modify the price if the actual quantity is different. The price per quantity may also be used to settle change orders with little or no negotiations. There is risk in this as one could imagine. If a quantity is priced for the cost in bulk and later in the project only a few items are added or modified, the contractor's labor and material costs may increase or decrease significantly. The general feeling is that, overall, the losses will balance the gains.

Contractor Payment

It is typical all over Europe that the owner makes payments on contracted works within 60 to 90 days of the receipt of invoice from the contractor. The contractor may or may not bill monthly. Some interviewees said that a European contractor should have the capability to finance work for three to six months after it is performed. In comparison, according to the American Institute of Architects (AIA) documents, the standard contractual boilerplate for American contractors, the contractor may submit for payment every month to the architect. The architect then has 7 days to issue a "Certificate of Payment" to the owner (AIA A201 9.4.1). After this the owner is to pay in the time stipulated in the contract, typically another 7 to 14 days (AIA A201 9.6.1). This two to three week time period does not include dispute resolution, which is required by the documents to be done in a "timely" manner. In any case, contractors in the US typically do not have to wait for more than a month after the submission of their pay application to receive payment. The European payment system is an obvious strain and must be considered when viewing a contractor's financing capabilities for a project.

Bonds

In lieu of bonds, bank guarantees may be required. This gives the banks significant power in the course of a construction project. Payment bonds, which assure contractor payment, are essentially unknown throughout Europe. The parties are dependent on the country's laws to provide adequate compensation for the time and materials expended. Performance bonds of 100% of the contract value are nearly always required in America in case of contractor default. The European equivalent is a bank guarantee for approximately 10% of the contract value, half of which may be held against the contractor after project completion as a warranty bond. Risks from contractor default and the vast amount of influence a bank has on the construction industry must be carefully investigated prior to project buyout and signing contracts.

Liquidated Damages

Liquidated damages are often stipulated in a contract, sometimes in phases. It is important to recognize that laws typically state a maximum penalty of approximately 10%, and the legal terms for this fine change from country to country.

Building Turnover

The turnover process is similar to that of the US with punch lists and owner walk-throughs to accept the project. Often, the owner takes control of the building and, therefore, the liability before all of the contractor's work is finished. This is similar to obtaining what is termed in the United States as "substantial" completion.

Holidays and Work Hours

The views of holidays and vacations are very different in Europe. Virtually everyone will take a "holiday" or vacation for several weeks a year. During a nationally, or regionally, observed holiday, all businesses will be closed as a non-work day. It is very different from the typical American business schedule that seems to minimally recognize every holiday except for Christmas. Also, work hours were much different. Many businesses were closed on Sunday. It is difficult to find a store open later than 7 p.m. on any day of the week.

Safety

In general, construction site safety seems to be viewed quite differently. There is less protection provided to the public. Fences are very often poorly maintained and much less secure than site barriers in the United States. Tower cranes will swing loads over public sidewalks, and hardhats, sturdy clothing, and other personal protective equipment are much less stringent than the in the United States. Housekeeping also seems to be viewed as less important as well. However, some items are emphasized like the requirement of safety shoes and wearing yellow or orange vests.

Figure 4: A typical urban construction site. Notice the lack of separation of the project from the public walkway, the unorganized storage of materials, and the worker without any personal protective equipment except for an orange shirt.

Strong Regional Cultures

It is surprisingly noticeable how powerful cultural identities are from country to country and even region to region. This can be detected easily in numerous ways including social interactions, the dialects, and food. In these different cultures the time one arrives to a social event, the holidays recognized, standard meal times, typical store hours, and an invitation to dinner can all be viewed in dramatically different ways. European countries are not nearly as homogeneous as the American culture despite the increased population density. The dramatic cultural differences can only truly be described by those who have witnessed it.

Construction Industry Culture

European construction and the roles of contracting parties are somewhat different than in America and will vary from country to country. Typically, American contractors take a set of blueprints and specifications and build what is defined in those documents. Any ambiguity or discrepancy in design results in a request for clarification. European contractors are given documents with much more latitude for interpretation and essentially value engineer the project. As long as the owner receives the quality and function desired, the contract is considered to be completed successfully. Many illustrated the differences between an American contractor and a European contractor with the example that the European contractor is required to use more ingenuity and creativity, like an American contractor would in a design-build situation or while value engineering a project.

Perception of Americans

Currently, a variety of political issues make feelings between much of Europe and the United States particularly awkward, although this is not always apparent initially. Most Europeans are polite, speak English surprisingly well, and seem completely neutral toward American tourists. However, the business world is not nearly as receptive to an American presence and sometimes underlying tensions exist.

Typical Construction Practices

- Typical foundation systems are block foundations, two or three meters square by two or three meters deep, sometimes used as pier caps.
- Conduit is used much less frequently. Cable trays and conduit in the slabs are much more common. (Mannarelli)
- Because there are no formalized sets of American Institute of Architects (AIA) documents, it may be advisable to hold a preconstruction meeting in which the general practices and forms for a job are discussed. This includes the change order process, how communication through the tiers of contractors will occur, and how project documents are reviewed and discussed. Claims management proceedings may be developed as well.

Figure 5: An example of block foundations in Turin, Italy.

Germany

My Top Ten Potential Risks to Be Mitigated or Considered

1) Economy and the Industry
   - Economically, Germany experienced their first year of growth in the past decade in 2007. Although the industry projections look promising, there is still a risk of having a bad market (Kehlenbach). The unemployment rate is high. The Central Intelligence Agency World Factbook estimated it to be nearly 11% in 2006 and when I visited, some cities like Berlin were said to be ranked even higher.
   - The German construction industry, although the highest in all of Europe in terms of volume, is not very profitable due to fierce competition amongst contractors. The most profitable European market exists in the United Kingdom where profit margins are much greater. Most of the large German companies make 80% of their revenue in countries other than Germany (Kehlenbach).
   - There is currently a reciprocity law between the US and Germany. No German construction firms are allowed to perform US government funded projects and, until we allow this to occur in the US, the public sector of the German market is closed to us as well. Nonetheless, this sector is one that is doing fairly well and provides security of payment to their contractors (Kehlenbach).
   - Although the German construction market may be rather closed to contractors, there is still potential for an American investor, architect, or engineer (Kehlenbach).

2) Clearly Defined, but Potentially Complicated Standards, Norms, and Laws
   - The Vergabe-und Vertragsordnung fur Bauleistungen (VOB) describes the rights, duties and responsibilities of the contracting parties, including the architect, engineer, owner, contractors and construction managers. This document is commonly used in Germany, and all German companies understand this form of legislation. It is very unique and detailed in outlining various terms. Some terms defined are specific to German law and others, though typical in the industry, have slightly different implications. This can cause various misunderstandings with international firms. The VOB handles everything from bidding, selecting companies with which to contract, writing contracts and negotiating during construction. It is also important to recognize that this document was written in 1926 and has been modified only slightly over the years. It works well for lump sum contracts but does not account for newer contracts like Guaranteed Maximum Price (Jablonski).
   - Germany's International Standardization Organization (ISO) agency is the Deutsches Institut für Normung (DIN). The "DIN Norms" are codes that set standards for virtually everything from 700 building construction regulations to the size of paper in a three ring binder. The DIN Norms are maintained and revised by a non-governmental organization (Jablonski).
   - The rights, duties, and responsibilities of the contracting parties, e.g. the architect, engineer, and contractor, as explained in the VOB do not always reflect current changes. The role of the architect involves much of the work an

American project manager or general contractor would typically perform. Currently, German general contractors called Generalunternehmers (GU) are becoming less common. The controlled management of the construction site, typically performed by an American general contactor, is becoming the duty of a German project management team. The concept of employing a party to do nothing more than manage construction is a newer role typically seen on bigger projects, but is becoming more common. As the industry changes, there is potential for discrepancies because of the provisions of the VOB. A complete understanding of this document is once again very useful (Reppert).

- It would also be important to be familiar with the Honorarordnung für Architekten und Ingenieure (HOAI). This provides the legal pricing for architects and engineers, as well as a traditional nine step process an architect performs during construction. In more recent times, these nine processes have been delegated to other parties, such as a construction manager. Some obvious differences between German and American architects are that German architects will draft the technical drawings to the detail that an American general contractor would require of his subcontractor. About half of the projects in Germany will be bought-out and managed by the architect, not a contractor (Voss).
- Despite the clearly defined set of documents regarding contracting relationships and DIN standards, which some American contractors remarked would be nice to develop in the US, there are no such documents like AIA with standard Change Order forms, contracts, etc. These things must be outlined and agreed upon by the parties early to assure smooth project management and documentation procedures.
- Many people emphasized the need for a good lawyer due to the extensive amount of court litigation.
- Acquiring permits takes a bit of time. Terragon GmbH, a company that performs project management, allows for four to six months acquiring the building permits. The time frame may change per region and federal state in which the project is occurring similar to zoning rules (Heiming).

3) German Labor, Outsourcing, and Subcontractor Tiering
   - The cost of German labor is very expensive due to the high social costs involved to employ a worker. An employer may pay an additional 100% of a worker's salary in taxes and social costs. For this reason, German contractors will typically not use their own laborers and perform more of a management role with foreign workers. This creates long subcontracting tiers that require more management and planning to coordinate (Kehlenbach).
   - German construction workers are becoming increasingly difficult to find because many are outsourcing themselves to countries with higher wage rates. Ireland's construction market is booming and currently has the highest wage rate and greatest profit margins (Kehlenbach).
   - Outsourcing of labor occurs in Germany with people from Poland, Slovakia, and other economically developing countries. Legal outsourcing can occur if the worker acquires the proper government paperwork. The company must pay the workers the minimum wage as stipulated by the union agreement and all of the

social taxes, which typically reach more than 100% of the wage. The advantage to the company for using this labor is that a union wage minimum is set by experience and training levels. Outsourced workers may be paid at the lowest wage scale for their trade, despite their experience and training, and be more than satisfied with this wage. However, as one could imagine, there is a labor black market as well. In this case, if a worker or company is caught, the offender is simply deported. Without very strict punishments, these people often return within a month, and companies will resurface under a new name. Hiring subcontractors that utilize outsourcing will produce instability during the project, but not utilizing the lowest bid may make a company less competitive or drive down profit margins. For a large international company, the ramifications of being caught employing one of these companies, either inadvertently or purposefully, runs a great risk of decreasing the quality of one's name in the market. Detecting the outsourced labor in the multiple tiers is difficult at best (Kehlenbach).

- Outsourcing of labor does not always occur, however. When I toured the Royal Palace in Dresden, in former East Germany, they were very proud that 92% of their workforce were born and raised in this particular German Federal State of Saxony. These workers were utilized in the rebuilding of other historical structures in the city. Perhaps in the eastern side of the country, the value of employing local workers is viewed as more important to continually rebuild their economy (Staatsverwaltungsbau).

4) Hard Bidding a Fast-Tracked Project
   - The design is typically incomplete when the project is put to bid by the contractor. German developers usually try to fast-track as many projects as possible. German laws state that in a lump sum contract, an owner can change up to 20% of the value of a contract and the contractor can not bill for a change order (Jablonski). For this reason, one would like to build in contingency to the bid, but the competition in the market is fierce and this, inherently, forces contractors to bid as low as possible.

5) Longer Standard Warranty Period
   - A contractor warranty period of 4 years is required by the VOB, but the safety standard of the German civil code, the Bürgerliches Gesetzbuch (BGB) requires a 5 year warranty period. Therefore, projects are warrantied for 5 years. As in the United States, an owner must be able to prove contractor fault, not normal wear and tear of the building. The owner may hold a 5% bank guarantee as stated in German law to bond the contractor to the warranty (Jablonski).

6) The Unfair Clauses Law
   - German law will read contracts against the writer, similar to America, but with the addition of an unfair clauses law. If part of a contract is ruled by the court as an unfair clause, then it is completely eliminated from the contract, while the rest of the contract is maintained. There are no negotiations to new terms of the unfair clause; that portion of the contract just disappears. In addition, if a clause is

ruled as unfair in a standard contract used by a company, this will void the exact same clause in all other contracts. For this reason, the courts' rulings are watched very closely and contracts are written very carefully. American contracts are often seen as having very strong and one-sided language as opposed to contracts used in Germany, which are often considered strict in European standards. This is another reason why a lawyer in Germany is so very important-to soften these clauses (Heiming).

7) Building Materials, Certifications, and Quality Standards, both Actual and Perceived
   - Building materials are also a major consideration. First of all, some of the typical materials used in Germany are different than in America. Due to the high cost of energy, timed and motion-sensor lighting, low energy lighting, and external sun blinds are utilized. The air conditioning systems are set much higher (no blast of cold air at entryways), and all windows are efficiency glazed. In addition, the Germans typically prefer more natural materials, which means plastics are used less, and wood is oiled instead of lacquered. Prefabrication of entire pre-cast kitchens and bathrooms, which utilize tile and stone instead of plastic, is quite typical. However, prefabrication of other building units like wood roof trusses is never seen. Because of building materials like plaster, brick, and concrete, there are more acoustical concerns and regulations, and a building is less likely to have a sprinkler system installed. Building products must also meet the DIN norm standards and certifications. For example, Sunrise Senior Living homes in Germany will only use wallpaper and select furniture pieces from America because all furniture in a public space must meet the DIN fire rating (Heiming).

Figure 6: An apartment utilizing the combination of pre-cast and cast-in-place concrete construction in

8) Subsurface Conditions
   - Subsurface conditions have potentially greater risks than American contractors typically consider. Beyond hitting rock or a high water table, as seen all over in marshy Berlin, historical landmarks and, the most feared, unexploded bombs remaining from the wars, can halt a project for months. A contractor needs to be aware of the hazard and plan for the delays. It is almost imperative, and often is the case, that the owner of the land is responsible for these subsurface conditions. However, there have been attempts to legally transfer this responsibility, and a contractor must understand the associated risks (Manarelli).

9) Change Order Laws
   - Change orders may be tricky. According to German law, read very stringently, a contractor must wait for the owner to approve changes in price and schedule before continuing with the work. However, in real life situations, this is often not feasible, and all parties understand this. Even to the point to which the cases end up in litigation, a German court will almost always grant the contractor at least partial compensation for the work to perform the change without the official directive. Despite this, many contractors may still refuse to do work until the price is set because of the strict stereotype of the German court system (Heiming).

10) The Power of the Banks and the Lack of Project Bonding
   - Projects are normally financed by a bank which, once again, gives banks a significant influence over the construction industry.
   - A bank guarantee of about 10% of the contract sum is issued by the bank in the beginning of a project as a form of a bid bond, which will then serve as a performance bond and be held in lieu of retention. Finally, this same bond becomes a warranty bond, and typically is reduced to only 5% of the contract value. This warranty bond will be held for the full five years of the warranty (Jablonski).

Major Considerations

Construction

- A work day will typically start around 7 a.m. and end around 4 or 5 p.m. A 40 hour work week with a 25% overtime bonus is standard. (Jablonski)
- There are only a few large contractors in Germany. Most of the other contractors deal mainly on medium sized contracts and most of the companies are subcontractors. (Kehlenbach)
- Precast goes up very quickly. (Mannarelli)
- Labor to capital investments are made much differently here. Tower cranes are viewed as a common piece of equipment and used much more often. For the O2 stadium, a 165 million euro project, the workforce will peak at about 100 workers, and at one point there will be five tower cranes utilized simultaneously. The focus is on employing managers to oversee the workers and assure that machines are being utilized efficiently.

Figure 7: A small portion of the tower crane scattered skyline of Heffen City in Hamburg, Germany.

- Unions, or Gewerkschaften, are present here and have the ability to strike. Unions will set wages and minimum work standards, but are typically only dealt with by large companies (Jablonski).
- There are many holidays in Germany and these are strict “no work” days. The holidays are not always nationwide. Many vary by geographical location and federal state. For example, Bavaria, a federal state in the south of Germany, has numerous Christian holidays that other states do not observe (Niec).
- Typically, German contracts are not very formalized. They are usual simple agreements between the parties with a notary stamp as stipulated in the VOB. (Jablonski)
- Public sector work is often seen as less profitable due to the strictness and variety of regulations that apply. Many companies find it easier and more profitable to work mainly in the private sector. Companies that do well in the public sector, however, realize the mitigated risk of nonpayment by the owner and the stability in the project funding (Jablonski).
- Courts will maintain and provide lists of owners who have been delinquent on payment to the contractor (Jablonski).

Safety

- For a site employing more than 15 workers, the architect must produce a safety plan and employ a safety supervisor. The safety and health coordinator required by law is typically employed by the controlling architect (Voss).
- Inspectors from the safety association, the Berufsgenossenshaft (BG) has a much friendlier relationship with contractors than the Occupational Safety and Health Association (OSHA) and US employers, which can be viewed as a positive. However, the BG has no real power to enforce the rules (Hinze).

Typical Building Types and Materials

- Germany is currently looking at energy conservative buildings such as a passive energy house. This house requires no heating and if one wished to warm the house, two candles in the basement would warm the house one degree Celsius. They also have a special test to prove the air tightness of the construction.
- Due to the weight of the building materials commonly used, the structures are typically between 2 and 5 stories tall (Voss).
- Fire ratings are much more severe in Germany (Manarelli).
- Typical building materials are “hard” and “solid.” The solid concrete structures, brick interior walls, hard lid ceilings, and carpet with less cushion cause many acoustical issues which are compensated by thicker insulation between floors and other isolation techniques. Flimsier looking systems like acoustical ceiling tiles are virtually impossible to find.

Figure 8: A concrete structure and electrical wiring typical of German construction.

The Future of the Building Industry

- Looking ahead to the future of investments in construction, a significant amount of infrastructure improvement work in Western Germany will be needed in the next 10 to 15 years. After the reunification of Germany, the focus of the country was to rebuild East Germany. Over time, this has lead to neglect of the Western side. Inevitably, there will be some time in the near future when funding will switch to the West. (Heiming)
- Although the German construction market has limited opportunities for foreign contractors, it would most easily be entered by an acquisition of another company or through specific projects, like the US Embassy being built by Hensel Phelps.

Conclusions

To build in Germany…

1) Get a good lawyer. Consult with the legal staff regularly and verify the implications and potential consequences of contracts before signing and during construction.
2) Have copies of the VOB and DIN norms in English. Know and understand them.
3) Have staff acquainted with the German language and culture. Other language skills, especially Italian and Polish, are also desirable due to the multinational subcontractor labor pool.
4) Use the dollar as much as possible in contracts and purchases. When this is not possible, estimate the euro high in contracts and buy a cash supply of euros. If the value of the euro drops, perhaps some potential profit will be reduced, but the risk of losing money will be mitigated.

Italy

My Top Ten Potential Risks to Be Mitigated or Considered

1) Italian Culture:
   - The Italian culture is very strong, even in business dealings. In-depth awareness and understanding of various cultural aspects is essential. Many say to be successful in the Italian business world, specifically in contracting, you would need to spend years living and working in Italy to begin to understand the culture and to be accepted. Much of Italian business is completed over "wine and pasta," not a conference table with lawyers. As one could imagine, it is much more difficult to comprehend the specific aspects of the business world one would need to know to be successful. (Gervaso).
   - In fact, the strength of this culture is such that the market is essentially closed. International contractors are not really present in Italy. Spanish contractors, perhaps because the Spanish culture is considered the most similar to Italian when comparing it to the rest of Europe, have been known to survive in Italy. Occasionally, a French or German contractor and most recently a Japanese contractor may procure a project or two as well. This is not for the lack of attempts. Recently, Hochtief attempted to build in Italy but closed their office after spending only a short time there (Gervaso).
   - There is also formalized hierarchy at the construction site that must be recognized. For example, the workers would greet their supervisor with a "Good morning, Mr. Engineer," instead of the "Hi, Jack! How was your weekend?" which would be more typical on a site in the United States (Bonetti).
   - Italy is notably famous for organized crime. Whether or not organized crime has anything to do with the profitability of the construction industry, it can be reasonably noted that public sector construction in Italy has been virtually profitless since 1992 when 300 people employed by the largest and most popular contractors were sent to prison for corruption. This event was named "Mani pulite," which translates to "clean hands" (Gervaso).
   - The challenges of the Italian culture are much more problematic for contractors than for developers or architects. It would be possible for an American contractor to perform a construction management role, but owners do not often employ a separate construction manager in Italy. However, American developers, architects, and engineers can do quite well in Italy because when it comes to luxury, no one can compete with the Italians. Everyone is willing to pay for Italian beauty, luxury, and innovation (Gervaso).

2) The Power of Unions:
   - Although unions exist throughout Europe, the presence of unions in Italy is very apparent. Virtually every company with 15 or more workers is unionized.
   - A contractor will typically have to deal with two levels of unions. The first, handled at a national level, is called the "Contractti Collettivi Nazionali di Lavoro." The second tier, which holds collective bargaining at the regional, company, or association level, is called the "Contratti Integrativi" or "Contratti Aziendali."

- Union contracts are typically effective for between three to four years and may cover issues including training, basic salaries for different categories of workers, salary increases, overtime pay, temporary leave, and the holidays recognized, to name a few (Jacobs Italia S.p.A.).
- In my short time traveling, I personally witnessed a union's ability to shut down public services and the entire Italian railway system. Surprisingly, the railway strike was announced prior to the shutdown and the Italians did not seem to view this as strange or unusual. Pickets, strikes, and collective bargaining should be viewed as inevitable encounters at some point in any length of time spent in Italy (Jacobs Italia S.p.A.).

3) The Structure of the Italian Government:
   - While numerous political parties exist in the US, there are basically two that control our government. In short, Italy is quite different. There are numerous political parties with a wide variety of platforms. Every election provides enormous potential for great change of political dynamics unlike any American election. As one can imagine, this poses numerous concerns to players in the construction industry including new or amended laws, government investments, and federal projects. This aspect of the industry was one issue I discovered early in my research prior to traveling and was one of my main reasons to pick Italy over other countries. The "Straights of Messina" bridge project, a bridge to span from the mainland of Italy to the Island of Sicily, has been debated for 40 years. This project has been designed, sent to bid, and had contracts awarded but was subsequently canceled due to a change in political climate after an election. Various sources stated there are still rumors of the bridge project being brought back to life, but the controversy and mass amounts of time and money involved would require the country's continual support. This volatility of the political goals was also apparent in the years of negotiations between Italy and France that were required for the Lyon-Turin project, a massive railway tunnel through the Alps.

4) The Labor Laws and Hiring Employees:
   - The labor laws are very strict. If an employer has 15 or more employees, an employee must either be contracted or hired "for life." It is almost impossible to fire someone once you have hired them. According to Italian labor laws, the employer needs a "very good reason" which is typically something along the lines of committing a very serious crime. Many employees who are fired will take their cases to court and often win against the employers who are then forced to rehire the worker. For this reason, many companies are small, family owned organizations (Jacobs Italia S.p.A.).

- Contracting of employees can occur in one of two ways. The employer may contract with the person for a specific scope of work for a limited period of time, or the contract may stipulate that the worker is hired for a set amount of time. Once this scope of work or time expires, the employer may contract with the employee one more time after waiting six months. At this point, the employer must either hire the worker as a full time employee or contract with another individual (Jacobs Italia S.p.A.).

5) Finding Stable Subcontractors:
   - Due to the strict labor laws, 95.2% of Italian companies have less than ten employees and the average size of a company is less than four persons. These microcompanies are extremely hard to manage. First of all, they are typically comprised of family and friends, who may have a collective agenda other than creating the best contracting company to span decades. Also, the fierceness of competition and high demand for labor make it very difficult to find a consistent workforce (Jacobs Italia S.p.A.).
   - The multi-tiering of subcontractors that must occur further increases the need for good management and provides potential for much inefficiency. To view this statistically, the Italian construction industry is ranked fourth internationally, but has only two contractors that are ranked in the top 260 international companies in terms of annual revenue. This shows the shear volume of construction that occurs with these microcompanies (Jacobs Italia S.p.A.).

6) Financing the Project and Delays in Payment:
   - Although some contractors submit for payment every month, often Italian contractors request payment every two months. By law there is then a 30 day review period by the owner's representative, and then the owner has 30 days to pay. This means many contractors may wait four months for payment of work in place. As stated earlier, the AIA documents outline that the contractor may submit for payment to the architect every month. After architectural review and time allotted for owner payment, the contractor can typically expect payment within the month following the submission of the billing application. Larger Italian contractors may be used to receiving owner payments on a longer basis of 120 to 180 days. Invoices may expire and delayed payments are not that uncommon due to financial difficulties. (Jacobs Italia S.p.A.) It can sometimes be difficult to maintain the required capital to finance the project for such an extended period of time. Some Italian Contractors I spoke with said waiting six months for payment is not uncommon. American contractors are concerned and budget for cash flow. Otherwise, waiting two or three times longer than normal for payment of performed work would seem unreasonable or almost impossible (Gervaso).
   - Also, as is typical, retainage may be held unless the contractor supplies a bond. This bond for 10% will release the funds and provide the security to the owner (Iddison).

7) Unforseen Conditions:
   - Italian Law stipulates that in the case of unforeseen events, the project cost for time and materials must exceed 10% of the original contract price before the contractor has a right to ask for revisions to the contract including time and price (Italian Civil Code Article 1664). AIA A201 4.3.4 states that for concealed or unknown conditions the contractor has the right to an "equitable adjustment." One could mitigate this potential cost by over bidding their work by ten percent consistently, but the fierceness of competition continually drives down these lump sum bids.

8) Warranty Issues:
   - Italian law states that a warranty period of ten years is required for portions of the building that are supposed to withstand "long durations of time." This includes roofing, waterproofing, the façade, etc. During this warranty period, the contractor is also liable for ruin of the property that the construction defect may have caused. In addition the owner has a full year to notify the contractor of this claim (Italian Civil Code Article 1669). If one considers the suits occurring in the US about issues such as mold or the damage a leaky roof may cause to a computer room, the ramifications of a defect may be very detrimental to a contractor over the duration of a warranty period.
   - Most buildings are warranted for two years after the owner takes possession of the premises (Italian Civil Code Article 1667). This is unlike the typical one year contractor warranty required in the US.

9) Individual Liability:
   - Upon entry onto any construction site, a sign will be displayed with a list of names. Each name is assigned to a title. Italian law outlines each of these numerous positions and their responsibilities for the project. The construction industry does not hold companies liable; it looks at individuals. For example, each project will have a denoted director of construction, safety manager, structural designer, etc. The person listed will be directly responsible for his or her portion of the project instead of the company for which they work. Sometimes the same individual may have multiple responsibilities. On the other hand, two closely related duties maybe delegated to people in different companies (Jacobs Italia S.p.A).

10) Italian Legal System:
   - As stated earlier, most of Italian business takes place over "pasta and wine." This is most likely the result of the vast amount of time required to pursue a court case in the Italian legal system. It may not be uncommon for a case to remain unsettled for ten years. Because of the complications and time required for this process, typically only large international disputes result in a court case (Falciola).
   - Contracts may stipulate arbitration as a remedy for disputes instead of involving the Italian legal system. The arbitration process will typically result with a verdict of about 50/50 to each party (Falciola).

Major Considerations

Construction:

- General contractors are rare and are mainly seen on large civil projects. These are the largest Italian contractors. They will self-perform about 20% of the work and then subcontract out the remainder of the project (Jacobs Italia S.p.A).
- Italy is actively adopting the European Union (EU) set of norms and standards. However, rights, duties, and responsibility of the contracting parties in construction are still defined by the International Federation of Consulting Engineers, FIDIC. The Italian norms, similar to the German DIN norms, are abbreviated UNI (Gervaso).
- Retrofitting is common in Italy, even in newer structures. Often, in the US, it is seen as easier and more cost effective to tear down a structure and build a new one to fit the owner's needs. However, Italians will typically retrofit a building approximately every 20 to 30 years to update its systems or change its intended use (Falciola).
- Concrete and pre-cast are typical building materials instead of steel. Pre-cast floors are very common.
- Most European contractors are viewed as having in-house design capabilities. For this reason, preliminary design documents are often used for in the bidding phase. Italian contractors, however, are not usually quite as engineering orientated. Although the creativity to solve field problems effectively exists, far better than in other countries according to some sources, the initial overall design must be more complete than in other European countries (Jacobs Italia S.p.A).
- The majority of outsourced labor is of Moroccan or Albanian decent (Iddison).
- Various forms of insurance may be required including a "Contractor's All Risk" insurance policy or a "Ten Year Liability" (Jacobs Italia S.p.A).

Figure 9: A concrete structure using precast columns and cast in place shear walls.

- Building permits are very difficult to obtain in Italy. To receive a building permit, one must submit to the local municipality the preliminary design of electrical systems, an energy savings report by mechanical designer, and a report about handicap accessibility of the project. The building permit is typically the responsibility of the General Director of Construction (Jacobs Italia S.p.A).

Safety:

- Each project must have an official "Safety Coordinator During Design," who produces the Hazard and Safety Action Plan (HASAP), and a "Safety Coordinator During Construction," who is responsible for completing the job site inspections (Jacobs Italia S.p.A).
- There were 263 deaths in construction in 2005 in Italy alone. The owner, engineer, and each contractor must each employ their own safety manager. Safety agencies in Italy do have quite a bit of power. A safety organization is a "special police force" that can be called upon to check a worksite. The agency can take people to court and even send them to jail for not following the rules (Gervaso).

The Future of the Construction Industry:

- Currently, one of Italy's largest problems is the lack of good transportation infrastructure including high-speed railways, new roads, and better international connections. There is a lot of money to be found in this market. The vast scope of this work can be seen in projects like the Lyon-Turin Connection, which will span from Lyon, France to Turin, Italy, and eventually pass throughout Italy easing transportation of goods and people through the Alps. Other extensive projects, like the Straights of Messina Bridge, which will connect Southern Italy to Sicily, are being considered as well (Mancini).
- In addition, massive repairs to existing structures are required. Just over half of the funding spent on public works is spent on bridge repair. After the Second World War, there was a big push to rebuild and improve the infrastructure. The focus in design was for strength, not durability. Now, these massive projects' weaknesses are being discovered and the appropriate changes in the engineering for these civil works are being noted in new construction. Nonetheless, many recent structures are also in need significant repair (Mancini).

Figure 10: Repair of the Ramat Bridge near Turin, Italy. The concrete surface is removed, and a new surface is applied with additional reinforcement.

Contracting:

- Liquidated damages can be stipulated in the contract and typically range between five to ten percent of the contract value, with 10% usually seen as a maximum. However, Italian law does not uphold a maximum in a case of negligence or willful misconduct (Falciola).
- The owner can change more than one sixth the original contract price before the contractor has the opportunity to terminate the contract (Falciola).
- An owner can terminate the contract at any time, providing that he or she pays the contractor for the work that has been completed and a fair indemnity of typically about 10% of the contract value (Italian Civil Code Article 1660).
- Typically, the owner withholds 5 to 10% of the monthly payments to the contractor as retention. 50% of this money is released at what is called "provisional acceptance," when the owner begins to occupy the building but there may still be some minor contractor duties remaining. This is similar to our substantial completion. The remaining 50% will be released at the final acceptance of the project (Falciola).
- A contractor mark-up of 15% is standard for overhead and profit (Falciola).

The General Director of Construction: As explained previously, Italian law requires an individual person to be responsible for each specific aspect of the project. One of these people is called the "Direttore Lavori Generale" or the General Director of Construction. The following lists some of the aspects of this person's responsibilities in the construction process (Jacobs Italia S.p.A.).

- Supervise contractors to assure that the work is being completed per contract and in compliance with Italian laws.
- Make periodic visits to the site to acquire an overview of the project, make suggestions, and give orders to the contractors when appropriate.
- Represent the owner during construction up until acceptance of the project.
- Review the design prior to construction and notify the designer of any errors or omissions.
- Acquire the building permit.
- Produce contract documents between the owner and contractor. This includes notification that construction has begun, final billings, and temporary and final inspection certificates.
- Supervise inspections and testing of the work.

Conclusions

To build in Italy

1. Understand the culture!
2. Have a unique niche and/or good stable clientele worth making the required effort.
3. Research your subcontractors.
4. Ensure your company has the required capital and cash flow to continue work for months without payment.

The Czech Republic

My Top 10 Potential Risks to Be Mitigated or Considered

1) No Strategic Acquisitions:
   - Currently, the construction companies in the Czech Republic of a size or strategic position worth acquiring are all foreign owned and not up for acquisition, except for three or four middle sized contractors. The leading contractors exist in the form of joint stock companies whose acquisition would be very expensive. In many ways, the Czech market was an ideal candidate for a company looking to expand internationally in the 1990's when the country was struggling toward economic recovery and needed foreign investments. Essentially, once a country begins to prosper, and one hears about how well contractors are doing there, it is too late to establish a strategic position for significant growth (Kymlička).
   - European countries looking to expand into foreign markets and acquire new companies are looking into countries like Poland, Bulgaria, Serbia, Romania, the Ukraine, and Russia. Infrastructure in these countries is poor and in need of massive revitalization through extensive public works projects. However, these countries pose significantly more risk than the Czech Republic did a decade ago. The shear size of the contracts, complex political ties, and post-Soviet corruption make these countries much more risky to enter (Kymlička).

2) A Saturated Market:
   - The Czech construction market is dominated by a few large players. There are about eight large contractors. After that the size of contractors decreases dramatically. The major contractors have such a stronghold on the market that other contractors either maintain their small niche in the market and maximize their profits in that way or do not enter into the competition at all. In many ways it is like an invitation only event. Unless one of the major contractors has some serious financial or ethical issues in the foreseeable future, there is not much room for a newcomer (Vrzalik).

3) Public Sector Work:
   - Due to the shear volume of public works, these projects are very well defined by laws that regulate the entire process, starting with procurement. A construction company must undergo a complicated screening process to bid public works. The government will examine the company's profile for a variety of factors including: previous projects in the last three years, any similar projects completed, financial status (as well as any previous financial problems), and the capacity to complete the work. A company will not be considered for a project unless it can perform much of the work itself. Due to previous issues with contractor default, a contractor will not be allowed to bid a project if he has to subcontract out a significant portion of the work. The only exception when this may occur is in a situation where the contractor is hired only as a design and consulting company to manage the construction site. The company also has to provide the required bank guarantees and warranties (Skála).

- If a company clears this screening process, bids may be placed on public works for up to two years. This lengthy process and nine certificates that must be acquired may be shortened to one qualification certificate if another more involved screening process is accomplished. Although this certification is required to work on public projects in all EU countries, it is based on national regulations and is not transferable from country to country within the EU. Despite the difficulty to enter the public sector, these work projects are substantial, profitable, and provide the contractor security of payment. In addition, because of the long list of requirements and certificates, the large public projects are often limited to participation by only 10 of the biggest contractors (Skála).
- These large infrastructure projects require vast amounts of capital. As described above, the government looks at the ability of a contractor to self-perform the project (Skála).
- A list of public works projects is obtainable on the internet. It is updated and monitored closely by all members of the construction industry (Skála).
- The issue of corruption during project procurement has been recognized and eliminated. There is a formalized process of sealed envelopes and official openings of the bids (Skála).

4) The Language Barrier:
   - The Czech language presents many initial obstacles. First of all, it is not a Germanic language like English. In fact, it uses a different alphabet altogether. This increases the difficultly in deductive interpretation of words and enhances the potential for misunderstandings by various accents. There are numerous different letters, symbols, accents, and sounds that are very difficult for English speakers to learn and pronounce.
   - The challenges presented by the language are helpful in some ways. Unlike English, each letter in the Czech alphabet has a unique sound and every letter in a word is pronounced. Therefore, once someone learns the basic alphabet, the language becomes fairly easy. In addition, the obvious language differences make the speaker much more careful to assure the proper meaning is being communicated.
   - The older generation, during the time of the Soviet rule, was legally not allowed to learn English. However, many Czech natives understand or can speak some German, which is similar in a lot of ways to English. Also, in recent years, English has been emphasized as a foreign language, especially for the younger generations in the schools. There is a significant amount of knowledge of the English language, but it is noticeably less than in other parts of Europe.

5) Decreasing Interest in the Construction Industry Craft:
   - The younger Czech generation's interest in the construction industry has shifted dramatically. The view of a career as a craftsperson has plummeted and been replaced by the role of a construction management professional. This decline can be most easily observed when looking at the brick masons. The Czech Republic has a well developed, reputable training program for craft that typically lasts for about 3 years. During the past year, among the top brick masons' schools in Prague, only five registered bricklayers were certified. For this reason, the big contractors provide the foreign workers their own training programs for proper construction techniques and modern technological systems (Skála).
   - Currently, only 10% of the construction workforce is foreign, and these persons are mostly from Slovakia, Poland, and the Ukraine. As it becomes more and more difficult to find Czech construction workers, the number of outsourced workers, and perhaps black market workers, is likely to increase. This has been recognized by the government which is actively attempting to eliminate the black market workforce. As mentioned before, outsourced workers require additional management, may have less training, and are less likely to provide a stable pool of workers for the full duration of a project (Skála).

Figure 11: Three gypsy construction workers placing a brick sidewalk in the traditional Czech style.

6) Decreasing Population:
   - There is a continuing decline in the general population. This decrease is feared to have a significant impact on the workforce in the next 50 years and, therefore, the economy and investments. In fact, the country views this as a big enough issue that they are considering providing financial support to couples who have children. However, this is a controversial issue because the people that would be encouraged to have children for the monetary incentive may not be able to provide the best homes and growth environment for these children. This is seen as a very significant macroeconomic problem for the Czech Republic (Skála).

7) Foreign Investments in the Private Sector:
   - International developers are attracted to places like the Czech Republic that are going through a time of growth, prosperity, and reconstruction. However, many of these foreign investors will only finance a project or two. The lack of a repeat client relationship increases the risks associated with the private sector immensely. The time and money a construction company devotes to seek out quality projects and the effort required to satisfy the owner do not often result in repeat work. For this reason, private procurement costs are much greater in the Czech Republic than one would normally expect (Hořický).
   - Unlike the German VOB or Italian FIDIC, standard Czech contracting documents are not established by national law and function more as suggestions (Hochtief Risk Management). Many foreign investors come to the Czech Republic with their own standardized contract forms. This means a contractor has to be well versed in many different foreign laws and standards (Hořický).
   - As I described earlier, European culture varies dramatically from one nationality to another. To deal appropriately with a multitude of different international investors, contractors must not only be able to communicate effectively, but culturally adapt to the owner.

8) Public Private Partnership Projects
   - Public Private Partnership, or PPP, projects are a huge cash cow for large contractors in many European countries, most notably in the United Kingdom. In PPP development, the government issues an entire project to a contractor from design to maintenance and operation of the building for perhaps 10 or 20 years beyond completion of construction. With complete control over the entire project, this gives the contractor the ability to apply construction value engineering and also motivation to find additional cost saving measures such as designing a prison to minimize the number of guards required to supervise the inmates. The contractor is often paid based upon the performance of the structure. For example, a contractor hired to build and maintain a prison may be evaluated in terms of the contentment of the inmates by qualitative factors from surveys or quantitative data like of the number of suicides. The Czech Republic is just beginning to explore this type of project delivery method and has passed a bill in the past year which will allow for this type of development. As with any new idea, there will be initial issues that will need to be worked through and various evaluation methods will undoubtedly be explored, but in the long term, PPP projects will most likely make a large presence in the Czech Republic due to the large amounts of public development needed. The issue for an international contractor would be the time commitment involved. Then one must consider the profitability to maintain a presence in the Czech Republic for that amount of time (Vrzalik).

9) Your Reputation:
   - One may have to consider that the Czech Republic can fit inside the state of Kansas. In a country this small, with a limited number of key players in the construction market, a company's reputation is everything. After a couple of bad projects, nonpayment to subcontractors or other financial difficulties, a company may be unable to acquire new work and financing through the banks may be next to impossible. For this reason, many disputes do not go to court. Issues amongst contractors are often settled privately (Skála).

10) The Czech Culture:
   - Perhaps one of the most noticeable observations while traveling was the difference in culture from country to country. In the United States, we joke about a northern state's accent, remark about Southern charm, and say things like "don't mess with Texas," but all in all, the view of America as a "melting pot" is fairly accurate. While crossing boarders of countries in Europe, people need not even open their mouths to speak and one can recognize that he or she is in a new place. Sometimes it is not even necessary to change a nationality. Comparing Sicily to mainland Italy was a distinct culture shift. The Czech Republic is no different. Throughout history, being as small as it is, it has been taken over and dominated by many different countries. The Czech people have fought hard for autonomy and are proud of how they have recovered so well after World War II without the support countries like Germany received. Their past, however, makes their people more cautious of outsiders and sometimes rather mistrustful. I noticed this right away with my interviews. Although virtually every interview request was granted, the Czech Republic was the country where I was questioned most intensely about the purpose of my research. In addition, I am almost positive that the interviews I had would have been nearly impossible without my acquaintance with Mr. Petr Vogel, a former exchange student at Kansas State University, who studies building design at the technical university in Prague, and professional contacts made in previous countries. However, after the initial discussion, the people were more than willing to take ample amounts of time and set up extensive research programs for me.
   - While in the Czech Republic, I lived in an apartment outside of the city center, away from areas where one would typically find tourists. When trekking off on my own, the Czech Republic was the first place where I experienced apparent disdain towards my presence. There were a few times when people would refuse to deal with me because I was speaking English. Outside the touristy parts of the city, accommodations for English speakers were much more difficult to find. For example, the idea of an "English menu" at many places Petr took me seemed like an unreasonable request. In fact, I was refused service at two restaurants in Prague, most likely because they did not want to deal with the translation issues. Nonetheless, I made many Czech friends through Petr that I maintain contact with to this day.

Major Considerations

Construction

- Industrial, cookie-cutter looking buildings do not appeal to the Czechs. This is a result from the Soviet era poorly constructed, mass produced buildings, especially housing units referred to as "panel-locks." For this reason, a prefabricated unit such as the well constructed, pre-cast bathroom that was bragged about by the Sunrise Group in Germany would not be viewed favorably in the Czech Republic.

Figure 12: A new subway station uniquely designed in an effort to offset the panel-lock construction of the surrounding area.

- Pre-cast is used less often than throughout other parts of Europe. Probably the biggest reason for this is decrease in labor cost compared to the other countries I visited. The second reverts back to the flexibility of concrete design. The need for unique shapes and patterns of cast-in-place concrete is preferred and more accepted by the culture.
- Civil engineering works are by far the most typical form of building construction saturating just over 40% of the market as of 2004 for companies with more than 20 employees. The Industrial sector follows with about 23% of the buildings by volume. Then non-residential, non-industrial buildings and residential construction each hold about 18% of the buildings constructed (Ministry of Industry and Trade).

Future of the Construction Market:

- The public sector, civil engineering projects are expected to remain in high demand. And recently, laws concerning Public Partnership Projects have been passed. Now, many of the large key players, like Skanska or Hochtief, with experience in PPP will have another sector to explore (Skála).

Figure 13: A large-scale public contract for the construction of the Royal Gardens at the Prague Castle.

- Development is profitable and looks to remain that way. Many construction companies are expanding to become construction and development firms. However, development does include more risks and is not yet seen as a stable foundation for a construction company, despite the potential returns (Vrzalik).
- Both government and privately funded renovations of existing, typically Soviet era, structures will continue to challenge contractors for years to come, especially in the housing and infrastructure sectors. These sectors should remain booming as these structures require modernization. It will take at least 10 years for this market to become saturated and meet the needs of the Czech Republic. After that point in time, the market may begin to level (Skála).
- Industrial and nonresidential construction sectors have no real end to the boom in sight (Skála).
- Since 2000, the construction industry turnover annually increases between 5 to 8% and according to a strategic study of development, elaborated by the Association, this trend should last for another seven to nine years (Skála).

Renovation of Existing Structures

- One of the first things that attracted my attention to the Czech construction market, and was much more prevalent than in other parts of Europe, is the idea of something called “brownfield” construction. The concept of “brownfield” construction is to take an old, abandoned factory or industrial building, most likely from war-time, and turn it into something like a shopping mall. This type of project is looked at by many as a very efficient use of an existing structure and a needed renovation (Skála).
- The Czech Republic has little land mass and the amount of untouched land and farmland is considered very valuable. As opposed to “brownfield” construction, “greenfield” construction, or construction of a building on what was once previously green space, is considered by many as wasteful and discouraged in many cases (Skála).
- Another interesting construction practice I noticed was the use of the exterior building shell. In many circumstances, the whole building will be demolished except for the exterior front building façade. Keeping the façade, the building that replaces the existing one will have all of the conveniences of a modern building but blend in perfectly with the surrounding area, even during construction. This keeps the city looking the way it does, like one has traveled centuries back in time. Preserving the sense of history is something very important to many people in the Czech Republic.

Figure 14: An example of the exterior face of a building being saved while the rest of the structure is virtually

Conclusions

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To build in the Czech Republic

1. Of all the countries I visited, the Czech Republic would seem the easiest for an international contractor to enter because it is the most open to foreign investments. The contractor would, however, have to find a method to enter this market, probably through an acquisition or development opportunity. The largest obstacle would be the difficultly of finding a quality strategic acquisition.
2. A contractor's reputation is the key to acquiring work. A contractor's project portfolio and the subcontractors' opinions are extremely important. Trust is everything.
3. Have ample multilingual staffing.

CASE STUDY -- UNITED STATES EMBASSY, BERLIN

This case study was of particular interest to me for several reasons. First, during the summer prior to my fellowship, I interned in Colorado for the general contractor of the project, Hensel Phelps Construction. Hensel Phelps feels that a summer internship is a great opportunity for potential new hires to learn as much as possible about the company by attending numerous corporate culture seminars, meetings, and training sessions. Their internship also treats the individual exactly like a full time employee. For these reasons, I feel I had the background to observe the similarities and differences between my Hensel Phelps experiences in the United States versus an international project.

Secondly, I had signed my letter of intent to work for Hensel Phelps after completion of the fellowship. For this reason, they were more than happy to accommodate my studies. The required paper work was filed to grant me access to the job in Berlin much like a full time employee. I spent two full weeks on the project, accepted by the team as one of their own, in hopes that I could develop a report of observations to be used by the company as a learning tool. Other companies were kind enough to grant me access to their sites for two or three days maximum, which was quite generous, but their priorities were understandably elsewhere. Over the longer course of time in Berlin, I was able to observe things that may have been less apparent, overlooked, or difficult to relate in an interview situation. I also became friends with my fellow Hensel Phelps employees and was able to speak freely about relocation and lifestyle concerns to even better understand some of the issues American workers face overseas.

Finally, Hensel Phelps is the type of contractor my research targets. They wish to grow, and are exploring directions to expand. If Hensel Phelps chooses to become a more international company, which types of jobs, markets, or countries would present the best growth opportunities? For all of these reasons, I found that the US Embassy in Berlin was a very insightful and useful project to use as a case study.

Location:	Berlin, Germany
General Contractor:	Hensel Phelps Construction Co., International District
Architect:	Moore Ruble Yudell Architects and Associates
Owner:	United States of America State Department Overseas Building Operations, OBO
Original Contract Value:	$82,800,000
Current Contract Value:	$90,239,178
Contract Type:	Fixed lump sum
Delivery Method:	Design-Bid-Build

Reasons Hensel Phelps Procured this Project

Opportunities for Growth

Hensel Phelps is being very selective in the international projects they decide to pursue. They currently have more work opportunities in the US than they can staff. However, Hensel Phelps doubles in size every six years on average. At this rate, although the US market is big enough to provide the workload required now, either new markets in America must be obtained or the company must become international. Although there is still quite a bit of growth potential in domestic markets, such as what was recently seen in the healthcare market, eventually prospects overseas must be considered. Procuring international projects, such as embassies, allows the company to experience the inevitable learning curve of international work during a time of financial security and stability. This project was only the sixth international job for Hensel Phelps and the first time to build in a country that did not use English as one of the primary languages (Christian).

Previous Work Experience

Hensel Phelps has performed numerous government projects and held contracts with the Army Corps of Engineers for years. They have an entire district of the company dedicated to the capital region which has done work on the Pentagon. Due to their comfort with government projects and the relative security of building internationally with the state department, the pursuit of embassy projects began in the mid-nineties. Prior to procurement of the embassy in Berlin, Hensel Phelps was building an embassy in Cape Town, South Africa which, at the time of bidding the embassy in Berlin, was quite successful and viewed as a great learning tool (Johnson).

The Contract

The main contract is in US dollars, not euros or some other form of foreign currency. During a time of economic fluctuations, and the continuing decrease of the US dollar, this was very important to the financial security and profitability of the project. In addition, having the government as the investor in a project assures a contractor payment, which is a major concern of private foreign investors (Johnson).

Contract Documents

Because this is an US Embassy in Germany, the design and contract documents were all performed by American architects and designers. This allowed the project management staff to deal with all of the standard construction documents in a familiar format that they understood. Also, the subcontractors allowed to work in the noted “Cleared Access Areas” (CAA) spaces had to be American, and some were even chosen and sponsored by Hensel Phelps to more or less work together due to previous projects and relationships. These American subcontractors’ familiarity with the contract documents and the overall American construction culture provided additional ease of operation and mitigation of risk.

Problems did arise, however, because this building was originally designed to be built in the US and not in Berlin, Germany. In adapting the domestic building design, there were conflicts and differences in codes to be considered. Although this was the government's responsibility as the owner, it still had numerous indirect effects on the construction management team and caused many concerns. This aspect of the project, in many people's point of view, could have been designed and planned better.

There were also occasions when Hensel Phelps did not necessarily have to conform to German law because the project was an embassy, but would do so to ease any tension that may possibly occur with the local governments. For example, German law states that a "proof engineer" must approve all rebar drawings. Despite no legal requirement to do so, the project team decided it would be best to submit their rebar drawings to the proof engineer for approval in the areas not critical to security (Christian).

Direct Monetary Costs of Building Overseas

In general, from the experiences of the project manager, if this project was built in the US, it would cost 40% less.

The Euro

One of the big risks of building overseas is the fluctuation in the relative value of the currency agreed upon in the initial contract. Hensel Phelps chose to mitigate this risk by working for the government. The main contract, the purchase orders of the American shipped materials, and the contracts with the American subcontractors were all made in US dollars. However, most subcontracts and purchase orders with the foreign subcontractors were in euros. An initial estimate of these costs was made and a cash supply of euros purchased in advance. Contractually, all conversions from dollars to euros in the accounting system were done at a 1.25 dollars to every euro conversion factor, a rate calculated according to the relative values of the currencies and economic projections at the initial phase of the project. Although this eases accounting, sometimes the rate was lower and sometimes it was higher. Hensel Phelps was lucky enough to do most of their purchase orders and sign the contracts when the exchange rate was somewhat lower than the 1.25 rate. However when I visited, they were in the position of buying additional euros and signing the remaining contracts at the current exchange rate which had skyrocketed to almost 1.50 dollars for every euro. Hensel Phelps was wise to try to minimize risk as much as possible in the beginning, and for this reason the impact of buying the remaining euros will not be as severe (Johnson).

Relocation of the Staff

On a typical project, Hensel Phelps will charge a project with the relocation costs of moving the employees to the site, while the next project will bear the costs to move them again. Due to the additional expense of moving from country to country, the embassy project provided relocation expenses to move the employees both to the project and home afterwards. The project manager compared this relocation expense to nearly five times the cost allocated for a project of similar size in the US (Johnson).

Shipping Costs

One of the important lessons learned by Hensel Phelps on the Embassy project in Cape Town, South Africa was how much they needed to budget for shipping. For the Embassy in Berlin, the estimate was closer, but still under. The shipping costs for the project were approximately 1.5 million dollars (Johnson).

The People

Cleared American and Non-Cleared American Contractors

For security reasons, a certain amount of the construction of “sensitive” areas, or Cleared Access Areas (CAA), had to be performed by contractors who were considered “cleared Americans.” The company first had to be sponsored for this type of work by another cleared American contractor. Then each of their employees had to complete an extensive background check to acquire the proper security clearances. Due to the extensive cost of relocating these American contractors to Berlin, any scope of work that was not in the heightened security area was performed by a local contractor, referred to as a “non-cleared American” contractor. As one can imagine, this created a variety of problems that will be discussed throughout the remaining case study.

The German Subcontractors

Upon discussion with the project superintendent, who had been on the project since the first day, he feels that the local workers are some of the best and most skilled he has ever seen. They take true pride in their work and produce to a very high degree of quality. He explained that the German construction workers view their job as a career with unique skills that require extensive training. This perception of a construction worker’s job as a career and the prestige of work have diminished in the United States for years and is a continuous battle in the industry (Coffman). Numerous Hensel Phelps staff agreed with this overall feeling and commented specifically about the concrete workers. During some of the coldest days of the winter, the concrete crews worked long, hard days. Contractually, the subcontractors were allowed to work up to 60 hours a week and typically would. Longer work days seemed to be more standard with overtime pay being anything greater than 50 hours a week instead of the standard American 40 hour week.

This project was divided into 80 subcontracts, approximately twice what Hensel Phelps would normally see on this size of a project. This is more standard of a practice in Germany and is thought to be a money saver despite the additional management required. In general, the work was divided into three major parts with the German subcontractors. HSG, a mechanical and electrical firm held a 10 million euro contract. The concrete structure was given to Alpine, and Manz and Krauss performed all the drywall, finishes, and build-out of the nonCAA spaces.

Although unions do have a presence in Germany, there were no specific fears of a union picket or collective bargaining dealt with on this job (Johnson).

Hensel Phelps Salaried Staff

For this project, Hensel Phelps employed 14 office and field staff. Some employees were requested for this job due to language skills, but many volunteered to go. Among the 14 individuals were three German construction industry personnel contracted to assist with language and cultural barrier.

Relocation of the American Workers

Surprisingly, most of the Hensel Phelps staff completely relocated to Germany. They brought their families, made additions to their families (the fourth staff baby was born the week before I arrived), and only one held onto an American address. Hensel Phelps pays all of the relocation expenses, a subsistence package and an additional overseas bonus to all salaried employees. Cultural and language classes were also given to the employees and their families to help them adapt to the changes. Many of the employee's children attend German school and the company has also employed some spouses (Johnson).

In fact, all of the Americans who were relocated over the course of the project formed a rather unusual bond, which was pointed out to me by several different people on site and was something I noticed as well. There was more camaraderie amongst the craft, the office staff, and the American subcontractors. There were still the typical squabbles between workers about being in each other's way and debates over responsibilities for delays and damaged work, but to a much lesser extent than usual. There was a much stronger team atmosphere and many people I spoke with commented that they would miss this when they returned to the US.

Self-Performance

Hensel Phelps feels that one of the main keys to their success over the years has been through their ability to self perform all of their own concrete work. Concrete is typically the structure of the building and by using their own forces, Hensel Phelps feels it can do a better job managing the schedule and costs of a project. The cost of relocating the craft, and even finding craft willing to travel overseas made self performing the concrete of the structure far too costly and would have made their bid very uncompetitive. For this reason, the structure was subcontracted to a local German concrete contractor, Alpine. Issues with the stability of the concrete contractor would later prove to be one of the biggest financial costs to the project. Hensel Phelps did, however, relocate a few of their brick masons to do some of the interior brickwork required.

Top 10 Challenges for Hensel Phelps

1) Building for the State Department

Building for the state department presented more challenges than expected. Hensel Phelps is one of the five big embassy contractors in an Associated General Contractors group currently battling the Overseas Buildings Operations' methods of project procurement and management methods.

Many of the office staff commented about delays in acquiring information including RFI, submittal, and change estimate processing. The OBO also seems to be known for making untimely changes. This project had several costly examples. First, a major modification to the courtyard immediately before beginning the work caused one contractor to quit. There was also a modification to the required security clearance for a scope of work that changed the contractor to one with cleared American status the day before the work was to begin. These were just two examples of numerous times the contractors had to exercise flexibility and creativity to try to maintain steady work flow and remain on schedule.

Also, many people felt that the biggest single areas of difficulty were overhead coordination and design issues. The contract was originally awarded at 82.8 million dollars and by late June had been increased to 87.4 million dollars with 11 million dollars in outstanding change estimates. Contractors who build embassies for the OBO typically expect about a three to five percent change in contract value and overrun of the budget (Niec).

2) Coordination of CAA to NonCAA Spaces

CAA spaces account for approximately 40% of the project in terms of labor and materials and the remaining 60% of the project is comprised of NonCAA space, a fairly even split. Perhaps the largest problem observed by everyone on site was the coordination of the work and materials between the NonCAA spaces and the CAA spaces. For example, when a German subcontractor's pipe penetrates a wall to a CAA space, when does it become the American subcontractor's pipe? When does the material need to become the CAA material? If there are delays, who is responsible? The responsibility for delays and issues of waiting on one another were significant problems due to projects in the NonCAA spaces frequently being behind schedule. This kept contractors in the CAA spaces waiting at times. However, many of these problems often occurred due to some design issues. The nature of the coordination of NonCAA to CAA divisions of work and were virtually inevitable. Of course, more experience building embassies would have helped in planning for the eventuality of such situations.

3) Finding a Local Workforce

Not only is it challenging to find many Americans who are more than willing to leave home and travel overseas to complete a project, but there are difficulties in securing a German workforce as well. Despite the high unemployment rate in Germany, most workers were from Poland or other neighboring, less developed countries. These workers have strict time regulations on their work permits and finding a stable crew was difficult and a constant struggle. Also, without the use of bonds, the liquidity of these subcontractors was a substantial monetary risk. A 10% bank

guarantee and letter of credit was required with the German subcontractors, but that translated to an estimated 30 million dollars in risk that would not be allowed on a Hensel Phelps job in America. If just one of these unbonded subcontractors would fail, which two did, the idea of a profitable project could be very difficult if not impossible to maintain (Christian).

In addition, many of the subcontractors that would agree initially to work on the project would be unable to find workers willing to submit the required paperwork. Many foreigners were suspicious as to why the United States would require such detailed information and refused to deal with the lengthy process. And finally, once a company was cleared, the idea of firing an employee or subcontracting with a different company was nearly impossible due to the length of time needed to acquire the security clearances. On average, only 50% of the workers who supplied all of the required paperwork passed the background check in the 30 to 40 days required to process the paperwork (Johnson).

To mitigate some of the risks and management struggles with the subcontracting community, Hensel Phelps staff offered a few suggestions.

- First, the buyout process should be completed as early as possible to allow the team to evaluate all aspects of the project more completely.
- Secondly, the pool of subcontractors considered should be as broad as possible, with thorough investigation into each company to assure a true low bidder is chosen that will complete the work to the standards expected.
- Also, additional research on the work rules and culture of the local employees needs to be performed.
- Although it is standard practice to subdivide the work to approximately twice what would be standard in the American market, many Hensel Phelps staff felt the money saved was easily spent by inefficiencies and additional management required by their unfamiliarity with this system.
- And finally, documents and processes should be explained, in detail, as part of buyout and setting up the job. One should not just expect to deal with problems as they occur. This also allows the whole project staff to start from the same point and minimizes any misconceptions.

4) Security

During the building of the US Embassy in Russia, bugs were found that had been placed in the concrete. This occurrence, and the fact that the US is currently in a state of war with all of the recent terrorist threats to our country, have boosted security on this and virtually all international projects immensely. An announcement from the state department was sent to the job site about once a week alerting the staff to some new potential threat. For example, on the day I arrived the project manager had just received a notice regarding the annual G8 Summit meeting between the eight most industrialized countries, including the US, to discuss environmental issues, which was held in Germany this year. Many foreign countries do not look fondly on the US and Hensel Phelps employees have been advised to not promote themselves as Americans or talk about the project or their reason for living in Germany.

The site security was another challenge. CAA spaces had a separate set of plans and could only be entered by the American contractors Hensel Phelps brought to Germany. Each contractor, including Hensel Phelps, had to initially be sponsored, and every employee had to undergo a series of extensive background checks and months of paperwork to acquire the required security clearances. Even the contractors working in the nonCAA spaces had to submit a significant amount of paperwork and pass a background check. This proved to be more difficult than was anticipated for the foreign workers to acquire the clearance.

Access to the site was granted through one gate, called the "snake pit," which was manned by US Army personnel. Contractually, the project is allowed to work up to 60 hours a week, however there are limitations and stipulations. NonCAA workers can not enter the site any earlier than 6:30 AM and must leave by 6:30 PM every weekday. In addition, there was an hour devoted to a lunch break for the US Army personnel in which no NonCAA person could leave or enter the site. To work on a weekend, the proper paperwork had to be submitted and approved in advance. During my first day on site, I spent 45 minutes in the "snake pit" waiting for all of the paperwork and red tape to be straightened out. In general, when the gates opened in the morning, there would be lines of workers and it would take at least 15 minutes for everyone to walk through the metal detectors and send their lunch boxes through the scanners. Scheduling must accommodate for these inherent delays.

5) Materials

Similarly a wide range of requirements must be fulfilled to securely ship, unload, transport and store the materials used for the CAA spaces. Onsite, rooms containing these materials had to be barricaded, locked, and guarded. The materials in transport from the storage areas to the work site had to be accompanied by the proper escort at all times. Also, in some situations, extra materials had to be ordered and random selections were made to even further reduce the potential for tampering.

I noticed the inefficiency of this process specifically when a Hensel Phelps worker was required to sit on a pallet and wait for the truck to transport the material to the storage area offsite. Due to the traffic around the embassy's location, this person waited for nearly 45 minutes when there were numerous other tasks he could have completed.

In addition, extended lead times were required to receive the materials from the US, in part due to the security but mainly just because of distance. This aspect required a great amount of planning and foresight to minimize schedule complications and flexibility to maintain production when potential delays occurred. One member of the Hensel Phelps staff thought that material procurement from the United States could have been improved upon by having a Hensel Phelps employee inspect and verify the shipments before shipping them to Germany (Niec).

As stated previously, this project is designed as if it were to be built in the US, using a set of project specifications similar to what can be found on any major US jobsite. The state department also requires submittals, as it would for any other project. The material procurement and submittal process was not an issue for CAA subcontractors who were used to the procedures and were using American made products. However, the local subcontractors were completely unfamiliar with the use of submittals and had to be trained (Niec).

Additional complications occurred due to the differences in quality standards. The specifications were written in American testing terms with UL ratings, ASTM test rating, etc. German products are tested and rated in different terms. Verifying the compliance of the materials and testing methods used was difficult, time consuming, and a challenge for everyone. The complexity of the submittal process was something for which many of the office staff had factored some additional time, but wished they had planned for better and earlier (Niec).

Finally, most materials were bought out separately from the subcontractors. Although this is typical of embassy work, there were thoughts by many of the staff that there is potential to improve this system and ease the complication of coordinating the subcontractors with the materials. Some wished that all materials would be bought in the US to assure that they were compliant with the specifications and to eliminate the submittal process from the German subcontractors. Others thought the delays and costs of shipping those materials would outweigh the extra time required by the submittal process. It would seem to me, that an investment by the OBO to translate some of the quality and testing standards between US and EU conventions would be cost effective in the long term.

6) Safety

Hensel Phelps is self-insured and takes pride in maintaining a very low Experience Modification Rate (EMR), which determines the workman's compensation rate a company pays. This is accomplished by extensive safety programs and site inspections. In Germany, and in most countries in Europe, health care is provided by the government and there seems to be a different emphasis on safety both by companies and employees. Although the foreign companies have no impact on Hensel Phelps's EMR rating because insurance and workman's compensation are provided through a plan by the government like all OBO jobs, each worker's conduct impacts the safety of every other person on site. Therefore this job, in terms of safety, is viewed no differently than any other Hensel Phelps project. Their strictest safety policies, including 100% usage of safety glasses, were upheld despite the difficulties of various safety cultures. In fact, one of the primary responsibilities of the German project manager whom Hensel Phelps hired was to deal with safety issues and emphasize the policies to the workers. While onsite, I witnessed numerous urges about the importance of being tied off or wearing the proper personal protective equipment, especially about wearing hardhats in the heat (Johnson).

Enforcement is difficult because the local workforce views safety differently for a variety of reasons. First of all, the German safety codes are basically identical to those of OSHA. However, the German codes have no particular consequences for not following them, unlike the extensive OSHA fines. In addition, since the costs of an injury are covered by socialized medicine, an injury is viewed as no cost to the contractor. It was not that safety was not unrecognized or never viewed as important, but the German culture views many unsafe situations as common sense. The worker is expected to recognize dangerous situations and if injury occurs it is often regarded as the fault of the worker. For example, an old man broke his hip because he walked off some scaffolding and the contractor viewed this as "Well, he's old. Old people break hips." In addition, if a German gets hurt and is unable to perform his or her job, the government will pay 80% of the final salary for the rest of the person's life. With all of these factors, the incentive for workers and contractors to worry extensively about safety is minimized. These attitudes made the reporting of unsafe situations and near miss accidents even more difficult as well. Safety was a constant battle to assure that no one, not even the American contractors, grew careless (Coffman).

7) Laws and Standards

Although overall, the project is basically an American construction site on a plot of land in Germany, there were still extra issues and regulations that had to be considered. Hensel Phelps initially hired a German lawyer to review their contracts and legal notices to ensure compliance with German law standards. They felt that the additional costs associated with this were well worth it. The team also tried to understand the German legal culture throughout the job. For example, a copy of the VOB in English could be found in nearly every office. There were also times when German building codes and laws did strictly apply. A German subcontractor was employed to place the rebar in the concrete slabs. Because of the nationality of the contractor placing the reinforcing bar, it had to be inspected by a proof engineer as required by German law.

8) Office Management Practices

Overall, it may be notable that the German construction management style is different than Hensel Phelps management, which I think is fairly representative of standard practices in the US. A German contractor in a similar role to Hensel Phelps on this project would be more involved with the overall project and dealings with the owner, whereas Hensel Phelps was more involved in continual monitoring of site activities. Both German construction professionals hired by Hensel Phelps agreed that the management was essentially the best they've seen and felt that this type of management could improve in the German construction industry. Nonetheless, this is a factor that must be considered in terms of the culture of the workforce and subcontractors because the workers are not used to this supervision and micromanagement (Reppert).

Also, a significant amount of time was spent training the local subcontractors how to use and submit the required paperwork. Surprisingly, many of the office staff did not mind this task, as long as the initial additional time was available. Hensel Phelps maintained the use of all of their standard forms, like pay applications, transmittals, etcetera. After an initial training session, many of the office staff found that the local subcontractors filed paperwork better than the Cleared American subcontractors because this was their first and only experience with these types of forms (Niec).

There were many instances when the means to the end results were different entirely. Although the idea of change orders was not new, the German construction culture views them differently. When subcontractors submit a change estimate in the US, they understand that the number they submit will require review from the general contractor and then undergo a negotiation process before finally getting the required owner approval. Once a price, typically lower than what was submitted, is agreed upon, the issue is settled and the monetary compensation is exactly what it was during the negotiations. The local subcontractors had to be coached in the change order culture. First of all, they seemed to be under the impression that if the additional work ended up being more than the price submitted, they could come back and claim for additional money. Also, the timeliness of the claims varied. Although many of the subcontractors seemed less concerned about submitting their change estimates immediately, they were more likely to expect the additional money right away. There were times when the Hensel Phelps staff turned in their own estimates for the subcontractors either because of the time frame or because a slight boost was needed in the change estimate to assure full compensation after the negotiations were settled (Niec). In my mind, the submission of a number for a change estimate that had not been inflated was a much better way to do business and something I wished the industry here could learn.

Another interesting aspect of Hensel Phelps' management style that seemed fairly common to me, but uncommon to the German construction managers was the amount of project documentation. Many disputes that occur on the jobsite are more "he said, she said" type of arguments and may go to court that way. People were impressed by Hensel Phelps's level of documentation and felt that it helped settle arguments efficiently (Reppert).

9) Productivity

Although the European workforce is hardworking and dedicated, productivity was very low for two major reasons. First of all, due to the high cost of employing German workers, the main contractor for a scope of work will typically subdivided his work into much smaller pieces to then employ many different even smaller companies. Although the contract between Hensel Phelps and the main subcontractor is set at a lump sum price, the subtiered companies are typically contracted at a unit price. This means that the work force is paid per hour and per materials used to put in place. How does one motivate this small group to finish their piece of the work quickly when, once they leave, they are no longer paid? If a company is being paid per bundle of material, how does one motivate them to use that material efficiently?

Secondly, the crews are vastly under-managed. The Hensel Phelps superintendent noticed that the local subcontractors would use approximately one foreman to every 25 employees. On a US jobsite one would be much more likely to find one foreman running a crew of about six workers (Coffman).

In efforts to attempt to increase productivity of the European workers, Hensel Phelps used multiple tools. A jobsite challenge between the CAA and nonCAA spaces was used to try to spark some friendly competition and motivate the whole site. In addition, some management tools such as trend charts, two week look-ahead schedules, and other methods to track progress were utilized. Although this was believed by some to be a valuable tool, many of the subcontractors took offense to this micromanagement and Hensel Phelps had to exercise great caution as to not offend anyone (Coffman).

10) Communication of Different Ideas

Many people from Hensel Phelps felt that they would be able to come into Germany, combine the skills and quality attributes from the different construction cultures, and build to the highest level by using a sort of super construction team. Everyone quickly learned, however, that combining the different approaches was a bit more difficult than they imagined.

This is most easily illustrated through an issue with the Alpine workers tying rebar. The Hensel Phelps superintendent observed the workers tying the rebar for the concrete slabs one by one, piece by piece. A crane would pick up a single bar and swing this bar to its required location, where the workers would secure it. This process is extremely inefficient, whereas the typical method seen in the US would be to build a reinforcing bar cage somewhere, perhaps even off site, and then swing the entire assembly into place with a crane and tie it to the other cages. This process is unheard of in Germany. When the Hensel Phelps superintendent confronted the German foreman with the idea of tying cages initially the foreman insisted that, “It can not be done.” After much discussion, the German subcontractor was allowed to continue.

Later, the Hensel Phelps superintendent realized that swinging in these heavy cages actually is impossible using the method of rebar tying typical in Germany. Their ties are simpler and not strong enough to support the weight and dynamic loads. In hind sight, the superintendent wishes they could have tied the rebar cages in preassembled mats with tie guns and swung them into place. These cages could then be tied by the Alpine workers in the way they are accustomed to do things. Teaching the workers to use the tie guns would have been a lot easier than teaching them a new way to tie the bar altogether. Besides, their method of tying is very fast and efficient, and the workers do it very well. In this way the combination of these skill sets would even further increase efficiency beyond what either an American or German crew could do alone. Unfortunately, the communication was not there initially to allow this to occur (Coffman).

Interesting Tid-Bits

Job Trailers

German law states that all windows must be double paned, vacuum insulated, efficiency glazed, and this included those in the job trailer. The job trailer used on this project was typical of others I saw in Europe. It was a modular, stackable, prefabricated unit. These units were much nicer than the mobile trailers typically used in the US, and many commented how much they would miss their jobsite offices and wished they could buy the units back in the states. The only amenity missing was air conditioning, which is rarely used throughout Europe. Most Americans either acclimated themselves to the weather with the assistance of fans or brought a portable window unit.

Tower Cranes

At maximum, four tower cranes were utilized. Discussions between Hensel Phelps's superintendent and the foreman of the concrete crew provided valuable insight into how equipment project planning occurs differently. The German foreman estimates the number of tower cranes by the number of workers on site. His particular estimates utilized one tower crane for 18 workers. The typical American philosophy is to look at the needs, demands, and swing radius of a crane to determine how many, if any, cranes are needed. For comparison's sake, the project superintendent I interviewed estimated that an American contractor would typically use one crane for every 45 workers (Coffman).

Scaffolding

Due to the common use of brick in structures, scaffolding is used on virtually every building façade. In many cases, it is then covered with a breathable cloth material that may be disguised to look like the completed building or printed with advertisements like a billboard. The project borders various national landmarks like the German parliament (the Reichstag), the Holocaust Museum, and the Brandenburg Gate. Because of this location, Hensel Phelps had numerous offers from companies who were willing to pay to place advertisements on the embassy's scaffolding. Hensel Phelps considered these offers, but declined due to the city of Berlin official's requests to not allow an eyesore or advertisements in this particular location.

Concrete

Many noted that German concrete, in terms of workability, is quite different. It is stickier and has altogether different tests and standards. Finding the ability to show compliance of German concrete to US concrete standards was quite difficult (Niec).

Glossary of Terms

American Institute of Architects (AIA) – **a national association that promotes the practice of architecture and publishes many standard contract forms used in the construction industry.

Associated General Contractors (AGC) – **a national trade association primarily made up of construction firms and construction industry professionals. It publishes many standard contract forms used in the construction industry.

BG – Berufsgenossenshaft, the German construction safety organization

Bid Bond – *a surety instrument that guarantees to the owner that the bearer, if awarded the contract, will enter into a binding contract and provide all required bonds.

Boilerplate – *the general conditions which outline the roles of the parties to a construction agreement and provide guidance covering procedures to follow under varying circumstances.

Builder's Risk Insurance – *construction insurance that provides coverage specifically for a project that is under construction. Although this is normally considered to be fire insurance, other types of losses are also generally covered.

Buyout – **the process of awarding subcontracts and issuing purchase orders for materials and equipment.

Change Order – **modification to contract documents made after contract award that incorporates changes in scope and adjustments in contract price and time. A commonly used form is AIA document G701.

Cleared Access Areas (CAA) – high security areas in the construction of an embassy in which only Americans with the required clearances may enter.

Cost Plus Fee Contract – *a contract in which the contractor is reimbursed for specified incurred costs, with an additional allowance provided for overhead and profit.

Design-build Method – *an arrangement by which the owner lets a single contract for both the design and the construction of a project; also known as design-construct or turnkey construction.

DIN Norms – Deutsches Institut für Normung are technical, normative standards on products and materials, including any certificates required to prove compliance (Heiming).

Experience Modification Rating (EMR) – *a factor, unique to a company, that reflects the past claims history of that company. This factor is used to increase or decrease the basic insurance premium charges.

FIDIC – International Federation of Consulting Engineers

Guaranteed Maximum Price (GMP) Contract – **a type of cost-plus contract in which the contractor agrees to construct the project at or below a specified cost.

Generalunternehmer (GU) – German term for a general contractor

HOAI – Honorarordnung für Architekten und Ingenieure, German organization of architects

Liquidated Damages – *a specified sum of money that is charged against a contractor for each day that the project completion is delayed. This amount is assumed to accurately reflect the anticipated costs of late completion.

Lump Sum Contract – *a contract in which the contractor agrees to construct a project for a specified sum of money.

Mock-ups – **stand alone samples of completed work, such as a 6-foot-by-6-foot sample of brick wall.

Occupational Safety and Health Administration (OSHA) – **US federal agency responsible for establishing job site safety standards and enforcing them through inspection of construction work sites.

Non-Cleared Access Area (Non-CAA) – areas in the construction of an embassy which may be entered by non-Americans with the required clearances.

Payment Bond – *a surety instrument guaranteeing the bearer's payments to suppliers, laborers, and subcontractors.

Performance Bond – *a surety instrument in which the faithful performance of a contractor is guaranteed up to the face value of the bond.

Public Private Partnerships (PPP) – government projects that include operations and maintenance of the structure after construction for a specified period of time.

Punch List – *a list developed at the time of substantial completion that itemizes all remaining work tasks that must be performed before the project reaches final completion.

Subcontractor – **specialty contractors who contract with and are under the supervision of the general contractor.

Submittals – **shop drawings, product data sheets, and samples submitted by contractors and subcontractors for verification by the design team that the materials purchased for installation comply with the design intent.

Substantial Completion – *a designation of when a project is sufficiently finished to be occupied by the owner. The duration of the project is measured against substantial completion to determine when the last period payment can be made.

Superintendent – **individual from the contractor's project team who is the leader on the job site and who is responsible for supervision of daily field operations on the project.

UNI Standards – Ente nazionale italiano di unificazione, Italian standards organization

Unit Price Contracts – *a contract in which payment is based on a contractor's quoted price per unit of work performed and the owner's measurement of the total number of such units installed.

Value Engineering – *a critical examination of construction contract documents performed for the owner to determine whether modifications can be made to decrease the delivered cost, reduce maintenance costs, simplify construction, reduce disputes, and the like.

Vergabe-und Vertragsordnung fur Bauleistungen (VOB) – first written in 1926, this set of German laws stipulate the bidding process, the rules for contracting and subcontracting the work, and create standard contracting methods and other construction processes. (Jablonski)

Warranty – *certification that a certain aspect of a project is of the quality it was promised to be. In construction, such assurances are generally provided for one year from substantial completion.

Workers' Compensation – *insurance coverage for the employees of a firm during their employment.

Zoning – *restrictions placed on land usage to assure orderly growth and development in a municipal area.

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see references
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