

## School of Construction Management and Engineering



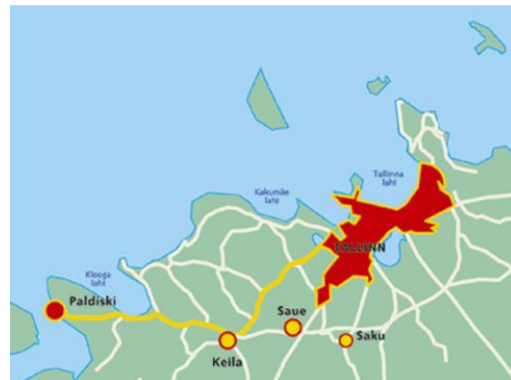
MSc Construction Management  
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### Case Study of road project in Estonia

*You are required to submit your answer by 09.00 on Tuesday 17th January 2012. There is no word limit; your answers should be as comprehensive as possible. Make any assumptions you feel appropriate.*

#### Location and scope of the project

The Estonian Road Administration have proposed to build a new road from Tallinn to Saue, a distance of 20km, using a build operate transfer (BOT) arrangement for a period of 25 years. BOT is the term used in Estonia for a public private partnership project. The concession company will be responsible for designing, building, financing, operating and maintaining the road for 25 years. The Estonian Road Administration will pay the concession company an annual amount for the use of the road based upon traffic usage. If the traffic is above the forecast level agreed between the parties, the concession company will be paid higher usage fees for the year. This project is one of the largest road construction projects in Estonia. This is the second BOT project constructed in Estonia; hence there is little experience of this type of procurement and project delivery arrangement.



The project has one twin tunnel with an aggregate length of 1 km (one in each direction, a total of 2 km), four interchanges and 6 bridge sites. The contract period is 25 years, from 2012 to 2040, hence all design and construction must be completed by 2015. The award of the project is scheduled

for March 2012. The concession period will last 25 years starting from completion of construction.

## The country

Estonia is located on the Baltic Sea. It is south of Finland, north of Latvia and west of Russia. The population is 1.36 million, with 400,000 living in Tallinn, the capital city. There is heavy snowfall in winter months. The average temperature is  $-7^{\circ}\text{C}$  in January and  $+22^{\circ}\text{C}$  in July. It is dark by 15.00 in the wintertime, but the summertime the sun sets for only a few hours. Estonia is a member of the European Community. Its currency, the Kroon, is pegged to the Euro. The official language is Estonian. However, Finnish, Russian, German and the English languages are widely spoken. Ethnic Estonians make up 68% of the population, with 26% Russian, Ukrainians 2%, and the remainder from Belarus, Finland, and other countries.



Estonian construction activity was high between 2000 and 2007, but the economic downturn has led to a shortage of work in the industry. It has also led to a skills shortage in the construction sector. Many workers come from overseas to work on construction sites, particularly from Poland, Lithuania and Russia. Estonia has lumber, aggregates, cement, and steel production. There are a number of precast concrete plants that serve the sector.

The estimate produced by the Road Authority for the finance, design and build is €90 million and for routine and major maintenance over the 25 year concession is €35 million. The investment can be divided into road construction (€45 million), bridge construction (€22 million), tunnel construction (€15 million) and design (€8 million). Telematics and all other technical systems (€2 million) are included in the road and tunnel construction estimates.

## The project

There are no contractors in Estonia of sufficient size to undertake the project; the plan is to invite bids from international companies. The Estonian government is insisting that wherever possible local labour and materials should be used. They have agreed that import levies will be waived on plant and equipment used for the project. The government wants the project to use sustainable materials where possible.

The ground conditions are good. The climate will be a challenge as the country experiences high winds in the winter, combining with the low temperature to have a chill factor sometimes around -15 degrees C in January and February.

There are consultant engineering design firms in Estonia who would have the ability and the capacity to design the road.

Traffic planners have made a forecast of traffic flows through the concession period and all the documentation has been made available to the bidders. There are no guarantees given by the Road Authority about the accuracy and reliability of the forecasts. Each bidder must make their own assumptions about the traffic forecasts.

### **Your role**

Assume you have been appointed as Project Manager to the staff of Vinci Construction Grands Projets, a large French multinational construction organisation with headquarters in Paris, France. Vinci Construction Grands Projets is a specialist division of Vinci Construction which specializes in delivering complex projects around the world. Vinci Construction had an annual turnover of €13.118 billion in 2010, with an operating profit of €584 million with 64,000 employees. Vinci Construction Grands Projets designs and builds major civil engineering structures (tunnels, bridges, dams, liquefied natural gas storage tanks, road and rail infrastructure) and buildings (skyscrapers, shopping centres, hotels, major industrial facilities, nuclear power plants).

The company has engineering skills and expert project management capabilities, Vinci Construction Grands Projets has a policy of involvement at the local level wherever it operates, partnering with local firms and companies, enabling it to deploy wide-ranging solutions. Vinci Concessions, a subsidiary of Vinci, intends to be an equity investor in the project together with four international banks.

Vinci is closely involved in sustainable development. The company works with the goal of protecting the environment and contributing to regional and local economic and social solidarity. It believes performance is not confined to economic and financial results; it is also measured in terms of the extent to which projects fulfil user and societal expectations, generate environmental value and contribute to social development. Vinci Construction's goal is zero accidents, on its worksites, at its offices and during travel. This goal applies to Vinci employees, temporary workers, and employees of subcontractors working on group sites. The objective is pursued through many actions and initiatives.

Vinci Grands Projets has never built projects in Estonia. However, it does have a Russian construction business that has primarily been involved in commercial and residential development.

The company has extensive experience of building road projects across Germany, the UK, Poland, Hungary, the USA, and South America. It has a concession business that has invested in road projects as an investor.

Vinci Grands Projets would like to bid for the project, but they recognize that they need a local Estonian partner to deliver the project as a joint-venture partner. It has been agreed that Siemens will provide and install all the telematics as a supplier to the joint venture using their own directly employed labour, mainly from Germany.



Vinci Grands Projets have been selected to bid the project; there are four other bidders on the bid list, all international contractors, from Turkey, Germany, Norway and Finland.

The tunnels are to be driven using a tunnel boring machine that will be operated by a specialist company from Switzerland.

Due to a shortage of skilled labour in Estonia, some of the workers will come from Russia, Lithuania, Poland, and Latvia.

Vinci Grands Projets have decided to use an external firm of engineering design consultants, Parsons Brinkerhoff, with headquarters in New York, but with offices across the UK and Ireland, as the main design consultants for the project. They would work for a consulting fee, but would not want take any role as an investor in the project. They have no experience of working in Estonia. They would make a joint venture agreement with a local engineering design practice to deliver all design information and help with the supervision on site through to project completion. The brief provided to the design team is that state of the art CAD systems should be used on the project. Whilst they have little experience of BIM, they would like this to be incorporated in the information.

You have been asked to manage the bid from this stage to submission of the final bid as the overall project manager.

## Questions

Answer **FOUR** of the following questions from the viewpoint of your role as project manager:

1. How would you select an appropriate joint venture partner for the project? What factors would influence your choice of partner?
2. The safety record of the Estonian construction sector is not good, how would you develop and implement a safety plan for the construction of the project, and how would you communicate your plan to the client team?
3. Many local people are against the construction of the road as it will be built through a woodland area, close to a number of villages. What steps would you take to keep the local community involved in the project?
4. Describe the tasks you would undertake for the design management of the project from the early design stage, through to the submission of the tender.
5. The local building workers trade union is concerned that the project should comply with all the local wage agreements and conditions of service. What issues would you negotiate with the local trade union?
6. The Estonian Road Authority wants sustainable materials to be used wherever possible. What would be your strategy to ensure the project is sustainable?
7. Describe the project management issues you would implement to ensure delivery of the project at the construction stage.

(End of Question paper)