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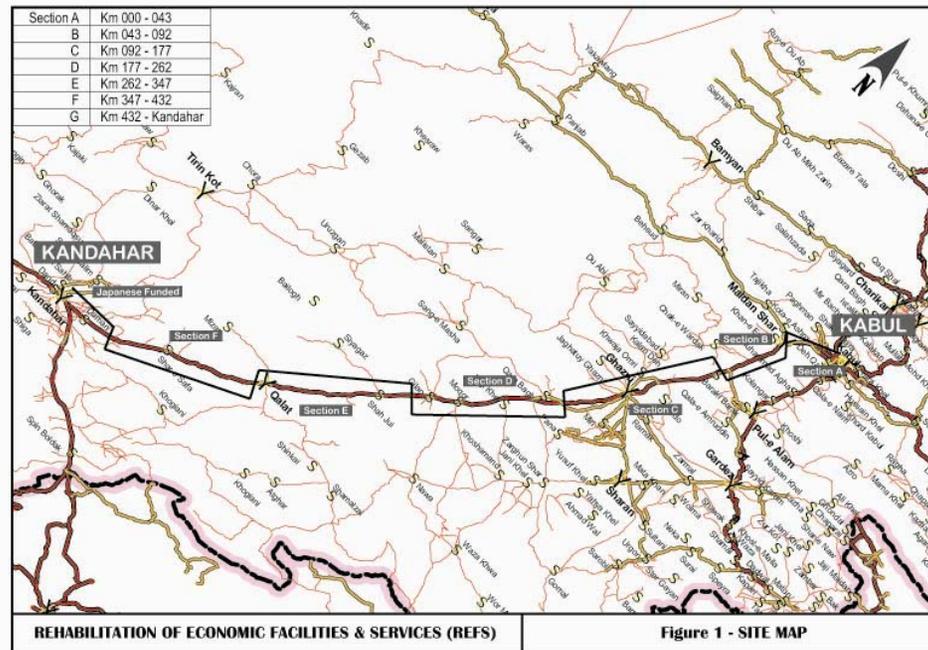
1.040 Project Management
Spring 2009

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WORKING THE GLOBE:

Improving the Built Environment



Moavenzadeh Institute of Technology

20 February 2009

The Louis Berger Group

THREE STORIES:

- ❑ Cutting Edge Urban Planning:
Abu Dhabi
 - ❑ Multicultural Joint Venturing:
Qatar
 - ❑ Post-conflict Reconstruction:
Afghanistan
-

BUT FIRST

- Context, and
- Why I think

THE GRASS IS GREENER...

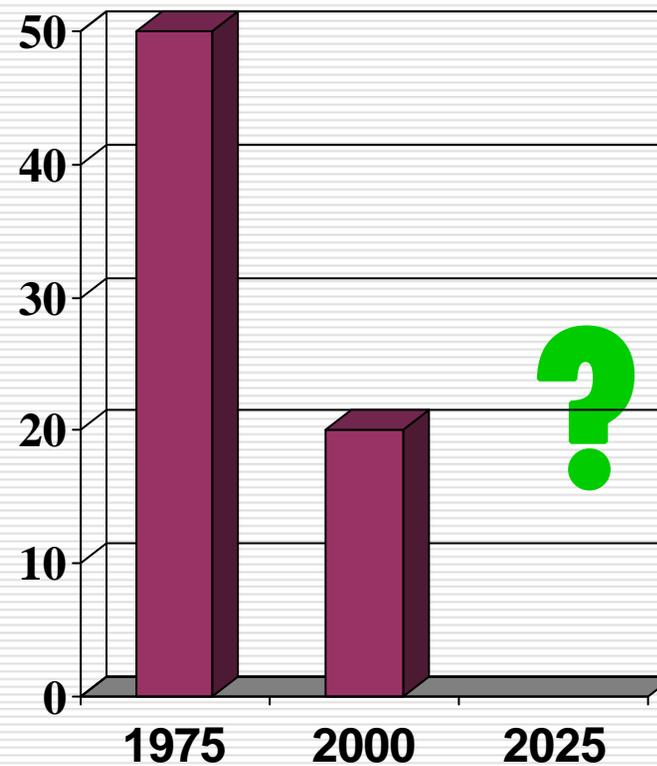
Global Construction Market

An estimated \$1 trillion in 1975

An estimated \$4 trillion in 2000

USA's Market Share

**The US
Construction
Market as a
Percentage of the
World Market**



And what will we do with the money at home?

- ❑ Changing windows and adding insulation to homes
 - ❑ Action on long deferred maintenance of vital infrastructure
 - ❑ A few wind farms, PV fields and ethanol
 - ❑ Slow movement towards mass transit and still no high speed rail
-

While the world speeds forward:

□ Maglev

- 572 kph JR test track
- Shanghai already in revenue service

□ Cutting edge cities like Masdar:

- Carbon neutral, zero waste
 - An MIT project
-

BERGER'S ROLE

□ Design Competitions

- Overall
- MIST
- HQ

□ Program Manager for HQ Building

- BIM
 - Being there
-

QATAR PROGRAM MANAGEMENT

- Barwa's Problem
 - Scope of Services
 - Organic Growth too slow
 - JV structuring
 - Conflict of Interest
-

Assisting with Post-conflict Reconstruction

- 25 countries emerging from extended periods of civil strife in addition to Afghanistan and Iraq, including Angola, Bosnia, Cambodia, Croatia, El Salvador, Eritrea, Ethiopia, Ghana, Honduras, Iraq, Kosovo, Macedonia, Mozambique, Nicaragua, Nigeria, Philippines, Romania, Rwanda, Sierra Leone, Timor, Uganda and the Democratic Republic of Congo.
-

Many Masters > conflicting priorities

- Government
 - Funding Agencies
 - The People

 - Schedule
 - Cost
 - Capacity Building
-

Old Rules --- New Realities

- Communications
 - Security
 - Financing Operating Costs
 - Violence
-

Case Study

- Afghanistan and the REFS project
-

THE TREE: PROJECT OBJECTIVES

The purpose of REFS is to promote economic recovery and political stability by:

- ❑ Repairing selected infrastructure needed to lower transportation costs
- ❑ **Roadway & Bridge Reconstruction (389 KM)**
- ❑ Improving the provision of water and sanitation services
- ❑ Increasing access to education, health, and local governmental facilities
- ❑ Restoring electrical transmission and distribution systems
- ❑ Repairing/re-constructing irrigation systems, dams/diversions and canals critical to the re-activation of the agricultural sector
- ❑ Providing employment opportunities to thousands of Afghans through project designs that maximize the use of manual labor to the extent possible
- ❑ Mentoring Afghan professional staff and nascent Afghan private sector companies to the greatest extent possible



Time Frame

- Berger to begin construction of Section B by the end of 2002
 - Deliver **49 km** of paved highway (km 43 – 92) by December 2003
-

Project Participants on Kabul-Kandahar Road Project

- Interim Government of Afghanistan
 - Ministry of Public Works
 - USAID
 - Contractor: Louis Berger Group, Inc.
USA
 - Construction subcontractor:
 - SECTION B : ARC CONSTRUCTION, TURKEY
-

DO IT FASTER!

- In April 2003, the second item became:

Deliver **389 km** of paved road by December 2003

UNIQUE ASPECTS

- **Time Frame**

Project Participants on Kabul-Kandahar Road Project

- Interim Government of Afghanistan
 - Ministry of Public Works
 - USAID
 - Contractor: Louis Berger Group, Inc.
USA
 - Construction subcontractors:
 - SECTION B : ARC CONSTRUCTION, TURKEY
 - SECTION C : MENSEL CONSTRUCTION, TURKEY
 - SECTION D : KOLIN NATFER CONSTRUCTION, TURKEY
 - SECTION E : BSC & C&C CONSTRUCTION, INDIA
 - SECTION F : GULSAN/ CUKOROVA CONSTRUCTION, TURKEY
 - ACLU (AFGHAN CONSTRUCTION & LOGISTIC UNIT)
-
- SECTION J: TAISEI JV/JICA FUNDING (out of our control)

Mobilization and Transportation



- Equipment Mobilization
- Ground Transportation
- Air Transportation



UNIQUE ASPECTS

- Time Frame
 - **Contracting System**
-

Contracting Method

- Unit rate contract (bid-design-build)
 - Adjustable rates for materials
 - Rates for security related stoppages
 - Scope adjustment for performance
-

UNIQUE ASPECTS

- Time Frame
 - Contracting System
 - **Pavement Design Solution**
-

Highway Grading



- ❑ Surveying
- ❑ Embankment and Earthwork
- ❑ Compaction and Testing
- ❑ Culvert Extensions
- ❑ Inspections QC/QA



ATB Production and Application



Asphalt Treated Base Course (ATB)

- Screened Aggregate Production
- Chemcrete Modifier Binder
- Application and Inspection
- Sampling and Testing



Roadway Paving



Roadway Paving



- ❑ Asphalt Mix Design
- ❑ Asphalt Plant Production
- ❑ Application, Rolling and Compaction
- ❑ Inspections and Quality Control
- ❑ Sampling and Testing



Bridge Construction

- Bridge reconstruction
 - 6 collapsed bridges
 - Soil Investigations
 - Demolition
 - Design (safety improvements)
 - Deck width
 - Guardrails
 - Earthquake loads
 - Bridge Approaches
 - Schedule



Bridge Repairs

Minor Damage Repairs and Safety Improvements

- Structural Repairs
- Guardrail Replacement
- Pedestrian Walkways
- Bridge Approaches
- Bridge Deck Overlay



Causeways Repairs

- ❑ Assess Damages
- ❑ Design remedies
- ❑ Repairs
 - Extended Culverts
 - Replace Concrete Panels
 - Repair Expansion Joints
 - Deck overlay



UNIQUE ASPECTS

- Time Frame
 - Contracting System
 - Pavement Design Solution
 - **De-mining and Security**
-

Demining



Demining

- Coordination
 - UNMACA United Nations Mine Action Center for Afghanistan
 - LBG, Demining Coordinator
 - Subcontractors Coordinators
- Schedule ~ Sections B thru F
- Assessments ~ MEDDS system achieves 400% throughput increase
- Demining
 - Destruction of unexploded ordinances
- Clearance Certificates



Security

- Private Security Forces
- Local Security
- Highway Security Forces
- Afghanistan Ministry of Interior Forces
- United States Military



16 December 2003



Benefits: Economic and Other

- ❑ Restore Afghan National Unity
- ❑ Reduce travel time and fuel consumption
- ❑ Reduce mechanical failures
- ❑ Connect economic market places
- ❑ Revitalize rural communities
- ❑ Create business development opportunities



Benefit Cost Analysis

- ❑ Cost / kilometer \$515,700
 - ❑ Kabul-Doshi (WB) \$342,800
 - ❑ VOC Savings about \$300,000/km/yr
 - ❑ Excluded time savings (19 > 5 hrs)
 - ❑ Faster Delivery meant:
 - Higher Construction Cost: \$173,000/km
 - VOC Savings: \$375,000/km (15 months)
 - Net economic benefit: \$78 million
 - Schooling, health access, agricultural markets
-

What will you do after graduation?

Fredric S Berger, P.E.

Group, Inc

www.bergerafghanistan.com

The Louis Berger

on time solutions, by design