

Geoprofessional Challenge in a PPP Environment

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1. Introduction

SNC-Lavalin's experience comes mainly from

Projects	Services	State of Project
Autoroute 25 Montreal to Laval, Quebec (P3) (480 M\$)	<ul style="list-style-type: none">› Geotechnical (investigation and engineering)› Pavement design› Quality control of materials› Pavement performance monitoring since 2011	Completed in 2011



1. Introduction

SNC-Lavalin's experience comes mainly from

Projects	Services	State of Project
Highway 407 extension in Toronto, Ontario (P3) (980 M\$)	<ul style="list-style-type: none">› Geotechnical (investigation and engineering)› Pavement design› Pavement Performance monitoring since 2015	Completed in 2015



1. Introduction

SNC-Lavalin's experience comes mainly from

Projects	Services	State of Project
New Champlain Bridge project in Montreal (P3) (3.3 MM\$)	<ul style="list-style-type: none">› Geotechnical (investigation and engineering)› Pavement design› Environmental permitting and monitoring› Material quality control› QA on survey activity	To be completed in 2019
Eglinton LRT in Toronto (P3) (5.0 MM\$)	<ul style="list-style-type: none">› Geotechnical engineering› Pavement design› Environmental permitting and monitoring› Railway design› Material quality control	To be completed in 2020



2. Context of Contracts

- EPC (or Design/Build (DB))
 - Engineering
 - Procurement
 - Construction
- A short term agreement for the design/build of a deliverable (building, highway, etc.)



2. Context of Contracts

PPP → Public-Private Partnership

- Transfer of responsibilities
 - Financial
 - Design
 - Construction
 - Operation
 - Maintenance
 - Rehabilitation
 - Duration of contracts : from 20 to 40 years
 - Operating conditions
 - Performance specification

2. Context of Contracts (continued)

PPP → Public-Private Partnership

- \neq the best or the most durable infrastructure
- = the lowest present value cost over the duration of the contract
→ Life Cycle Cost Analysis (LCCA)
- A dollar invested in 2049 (32 years) is worth only 13¢ in today's value (at 6.5% of real interest)

3. PPP's Project Phases

- Qualification period (RFQ)
- Bid Preparation period (RFP) for qualified teams
 - Usually 3 teams
- Design period
- Construction phase
- Maintenance period (for PPP only)

3. Project Phases and Services Needed Qualification period (RFQ)

Action	Services
<ul style="list-style-type: none">› Evaluation of resource and possible partnership› Have specific Statement of Qualifications (SOQ)› Not much involvement in preparation of RFQ, except for specific experts	<ul style="list-style-type: none">› Environmental engineering› Geotechnical engineering› Tunnel engineering› Pavement engineering

3. Project Phases and Services Needed

Bid Preparation phase (RFP)

Action	Services
<ul style="list-style-type: none">› Negotiate Memorandum of Understanding (MOU)› Assemble data for 30% design› Limited or no budget available for investigation› Importance of question period to owner› Proposal preparation for final design and other services during construction	<ul style="list-style-type: none">› Permitting assessment› Environmental constraints evaluation› Geotechnical engineering› Hydrogeology› Pavement engineering› Durability plan

3. Project Phases and Services Needed

Design period

Action	Services
Part of winning team	
<ul style="list-style-type: none">› Evaluate priorities on a regular basis with Construction Team› Be prepared in advance with large enough team (don't underestimated the effort and the quantity of deliverables)› If construction hasn't begun, must perform and deliver› If design and construction are performed in parallel, level of stress is much greater	<ul style="list-style-type: none">› Environmental permitting› Survey for design› Geotechnical investigation and engineering› Pavement investigation and engineering› Hydrogeology

3. Project Phases and Services Needed

Construction phase

Action	Services
<ul style="list-style-type: none">› Coordenate and filter questions in order to prepare response› Alternative solutions or materials› Have a team leader in place to answer questions	<ul style="list-style-type: none">› Geotechnical construction engineering (work pad, temporary structures)› Environmental monitoring› Geotechnical monitoring› Material quality control› QA for survey activities

3. Project Phases and Services Needed Maintenance period (for PPP only)

Action	Services
<ul style="list-style-type: none">› Infrastructures' real life has begun› Learn from these performances	<ul style="list-style-type: none">› Pavement performance monitoring› Bridge performance monitoring› Other infrastructure performance monitoring



4. Challenges and recommendations

Bid preparation and design phases

Challenges	Recommendations
<ul style="list-style-type: none">› Contract review is very important.› Read the fine print for level of responsibility› Large project have lot of issues / structures to address, some of them might not be identified	<ul style="list-style-type: none">› Have an executive manager negotiate .› Watch clauses for delays› Take time to go through Project Agreement

4. Challenges and recommendations

Bid preparation and design phases

Challenges	Recommendations
<ul style="list-style-type: none">› Strong personalities on the Engineering Joint Venture (EJV) and Construction Joint Venture (CJV) management teams› Lots of pressure from the CJV to be “aggressive” on design; geotechnical engineers are always “too conservative”	<ul style="list-style-type: none">› Have an executive manager heavily involved from beginning to end› Working sessions (and not emails) involving EJV and CJV representatives› Let them evaluate the construction cost and the risk level

4. Challenges and recommendations

Bid preparation and design phases

Challenges	Recommendations
<ul style="list-style-type: none">› The CJV (a private client) wants to make money. We are an easy prey at the bottom of the food chain of a complex organizational structure	<ul style="list-style-type: none">› Have your best knowledgeable solution driven staff on the project. Bring value, be proactive, respect schedules
<ul style="list-style-type: none">› For many services, the CJV wants lump sum prices and with “light” work programs!	<ul style="list-style-type: none">› Be very well prepared with lots of justifications for everything; If you let go a few things and that’s okay

4. Challenges and recommendations

Bid preparation and design phases

Challenges	Recommendations
<ul style="list-style-type: none">› Scope Definition and Management	<ul style="list-style-type: none">› Don't forget any element› Elaborate the scope exclusions› Have all team members aware of the scope and knowledgeable to advise the team leader of any changes that occur
<ul style="list-style-type: none">› Risk Evaluation› Risk Management› Negotiation of T&C	<ul style="list-style-type: none">› Mitigate your risk through your contract› Watch clauses for flow through clause from construction contract› Watch clauses for liquidated damages› Watch clauses for delays: - caused by contractor (like permitting) - caused by your firm for late delivery

4. Challenges and recommendations

Design phase

Challenges	Recommendations
<ul style="list-style-type: none">› For earthwork recommendations regarding reuse of cut materials	<ul style="list-style-type: none">› Adjust a knowledgeable notice (or disclaimer)
<ul style="list-style-type: none">› When our team wins a project:<ul style="list-style-type: none">- Need to be on the ground Day One.- The client, the EJV and the CJV are not organized- Contracts are not signed- Health and Safety Plan is not finalized› We are the first to be confronted to constraints that may not be required during the construction stage› Whether we are right or wrong, CJV will say we are late	<ul style="list-style-type: none">› There will be chaos at that time; VERY IMPORTANT : the executive manager, on top of your project manager, may have to be full time on the project for a few weeks in order to settle things with EJV and CJV's representatives in a complex and chaotic environment

4. Challenges and recommendations for geoprofessionals on P3 projects in Design phase

Challenges	Recommendations
<ul style="list-style-type: none">› Geotechnical reports will be reviewed by many stakeholders; expect lots of comments and delays;› If contract has penalties for delays on deliverables, be sure to well define which deliverables (30%, 60%, 90%, 100%) and before or after comments.	<ul style="list-style-type: none">› Add at least 20% time for the complexity of reviews in a large P3 project.› Demand face-to-face meetings.› Be knowledgeable of the schedule and be part of decision for target dates.

4. Challenges and recommendations for geoprofessionals on P3 projects in Design and Construction phases

Challenges	Recommendations
<ul style="list-style-type: none">› Legitimate changes in the scope may not be considered as such...	<ul style="list-style-type: none">› Have someone in your team who is dedicated to documentation of scope changes. The executive manager will have to get involved to resolve issues by meeting the right people diligently



4. Challenges and recommendations for geoprofessionals on P3 projects in Construction Phase

Phases	Challenges	Recommendations
Construction	<ul style="list-style-type: none">› Final design is done› Construction starts. Everything is fine → Job well Done!› Wrong! Job has just started. Contractor is now looking for savings → alternative materials and techniques. Optimization on details	<ul style="list-style-type: none">› Provide a budget for project manager involvement well after design is finalized› Construction and field support should be on an hourly basis
Construction	<ul style="list-style-type: none">› Quality Control, construction testing and environmental monitoring may be seen as a commodity to be awarded at very low cost	<ul style="list-style-type: none">› Value and cost savings associated to competency must be shown



5. Conclusion

Lessons Learned

- **Team effort**
 - Geotechnical eng.
 - Pavement eng.
 - Transport engineer
 - Structural engineer
 - Contractor
 - Material engineer
- **R.E.S.P.E.C.T. of all team members**
- **Communications are very important**
- **Task force meetings → efficient tool**

THANK YOU !!!

QUESTIONS ???

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5. Conclusion

PPP New Definitions

- At bid preparation

PPP

Prove

Perfect

Professional

Or

Preliminary

Plan

Penny

5. Conclusion

PPP New Definitions

Won the project → Design period

PPP

Party

Produce

Pressure

5. Conclusion

PPP New Definitions

Design not finished and construction starts

PPP

Paddle

Panic

Paramedic

5. Conclusion

PPP New Definitions

During construction

PPP

Prevent

Proper

Pragmatic

5. Conclusion

PPP New Definitions

End of construction

Monitoring start

PPP

Prove

Performance

Profit

Values that guide us

Our values keep us anchored and on track. They speak to how we run our business, how we express ourselves as a group, and how we engage with our stakeholders and inspire their trust.

Teamwork & excellence

We're innovative, collaborative, competent and visionary.

Customer focus

Our business exists to serve and add long-term value to our customers' organizations.

Strong investor return

We seek to reward our investors' trust by delivering competitive returns.

Health & safety, security and environment

We have a responsibility to protect everyone who comes into contact with our organization and the environment we work in.

Ethics & compliance

We're committed to ethical business.

Respect

Our actions consistently demonstrate respect toward our stakeholders.