CONVEGNO ANCE-AICQ
IL RISK MANAGEMENT IN ASTALDI

ROMA, 06/12/2018

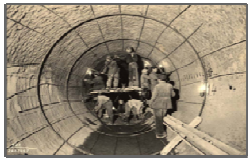
GRUPPO ASTALDI

1. Il Gruppo
2. L'Enterprise Risk Management
3. Il Project Risk Management
4. Case study – Progetto Haga Rock Tunnel – Goteborg - Svezia

1. Astaldi – Company Profile - Il Gruppo in pillole

IERI

Impianto idroelettrico del Cimego
Italia, *appalto tradizionale*



Autostrada dell'Anatolia
Turchia, *general contracting*

Strada Statale Jonica
Italia, *general contracting*

Impianto idroelettrico di Chacayes
Cile, *concessione*

- Viene costituita *Impresa Astaldi Estero*
- Direttissima Roma-Firenze, Italia
- Impianto idroelettrico di Inga, Congo
- Fusione di *Impresa Astaldi Costruzioni* e *Lavori Pubblici* e *Impresa Astaldi Estero*
- Acquisizione di *Italstrade* e *Gruppo Dipenta Costruzioni*
- Viene costituita *Impresa Astaldi Costruzioni* e *Lavori Pubblici*
- Sante Astaldi fonda la ditta individuale *Ing. Sante Astaldi*
- Autostrada dell'Anatolia, Turchia
- Consolidamento del posizionamento competitivo del Gruppo
- Razionalizzazione delle partecipazioni e del posizionamento geografico
- IPO
- Nuovo Ospedale di Mestre-Venezia, primo PPP sanitario in Italia
- Approccio integrato: *general contracting* e PPP/PF
- Nuove acquisizioni: *nBI Impianti ed Energia* (Italia) e TEQ (Canada)
- *Leadership* nel mercato italiano

1929 · '50s-'80s · 1986 · 1987 · 1997 · 2000 · 2002 · 2005 · 2011 · 2012

Fatturato: € 300 milioni

Fatturato: € 858 milioni

Fatturato: € 2,5 miliardi

OGGI

- Gruppo integrato Costruzioni-Concessioni ed impianti
- Portafoglio Ordini capiente e diversificato

Fatturato: ≈ € 3 miliardi

1. Astaldi – Company Profile - Rilevante track record su progetti complessi

TRACK RECORD

- **4.800 km** di ferrovie //
- **15.000 km** di strade e autostrade //
- **200 km** of tunnel //
- **160 km** di ponti e viadotti

- **6.000 MW** di capacità installata //
- **33** impianti idroelettrici //
- **68** dighe //
- **80** acquedotti //

- **20** ospedali //
- **8.500**+ letti //
- **19** aeroporti //

ULTIME OPERE COMPLETATE

3rd Bridge on Bosphorus (Northern Marmara Highway Project) – Turchia
- $3bn+ investimento
- Ponte sopseso più largo al mondo

Izmit Bay Bridge (Gebze-Orhangazi-Izmir Motorway Project) – Turchia
- $7bn investimento per l'intero progetto
- 4° ponte sospeso più lungo al mondo

Metropolitana di Varsavia Linea 2 (Lotto 1) – Polonia
- €800m di investmento
- 6 km di linea metropolitan e 7 stazioni

Pulkovo International Airport in St Petersburg – Russia
- €710m di investimento
- Il più importante aeroporto della Regione Baltica, con capacità di trasporto di 14.000.000 passeggeri/anno

Metropolitana di Milano Linea 5 – Italia
- €1,4bn di investimento
- Transport Deal of the Year 2015 (PFI Award)

1. Astaldi – Company Profile

LEADER MONDIALE IN PROGETTI EPC – SPECIALIZZATO IN INFRASTRUTTURE TECNICAMENTE AVANZATE

Leading global contractor[1]

Bridges	Mining	Mass Transit & Rail	Hydro plants	Healthcare
#3	#10	#13	#4	#13

Core areas of IHI leadership

Focus on "mission critical" complex projects

3rd Bosphorus Bridge	ELT ESO Observatory	Brenner Base Tunnel
		
World's largest and longest hybrid bridge	*World's largest telescope*	*World's longest underground railway connection*
EPC ✓	✓	✓

1. Astaldi – Company Profile

LEADER MONDIALE IN PROGETTI EPC – SPECIALIZZATO IN INFRASTRUTTURE TECNICAMENTE AVANZATE

Strategic partnership	IHI
Technical know-how	Bridges; Tunneling/excavation; Subways and Hydroelectric Power; Project management & control
Trust by partners	Ansaldo STS A Hitachi Co.; FCC; DAELIM; GÜLERMAK; BOMBARDIER; Arendal; VINCI; RELIANCE; OHL; FLUOR; SSANGYONG
Track record	>15,000km of roads built; >4,500km of railways built; 33 hydroelectric power plants; ~€325mm concession disposals
International experience	Over 75% revenues outside Italy; Developed and emerging markets; Europe; N. America; S. America; Asia

2. Corporate Risk Management in Astaldi

2. Il Corporate Risk Management in Astaldi

1926

Nasce il Gruppo Astaldi

2002

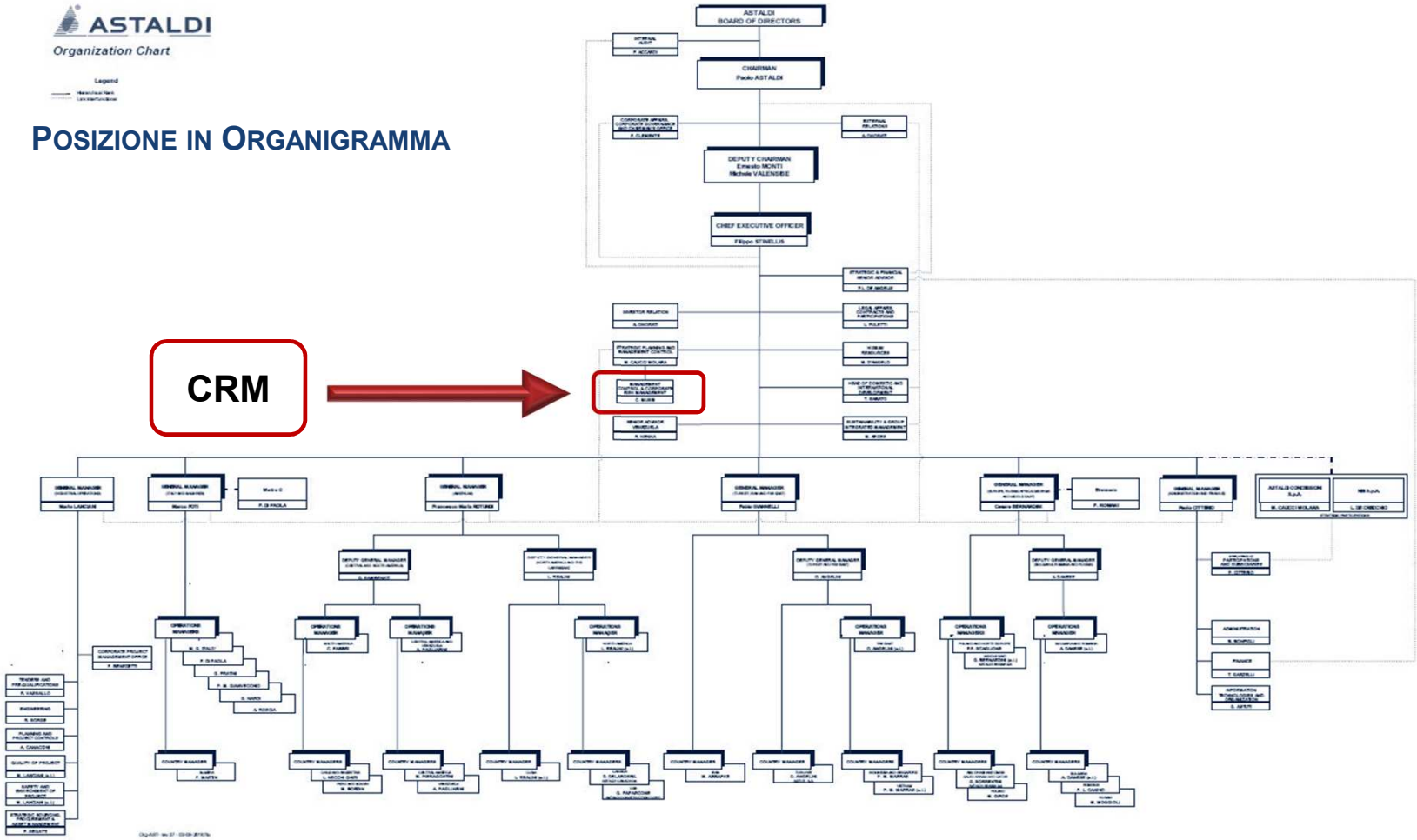
Astaldi S.p.A.
viene quotata alla
Borsa di Milano

2010

Viene istituito il servizio
Corporate Risk Management

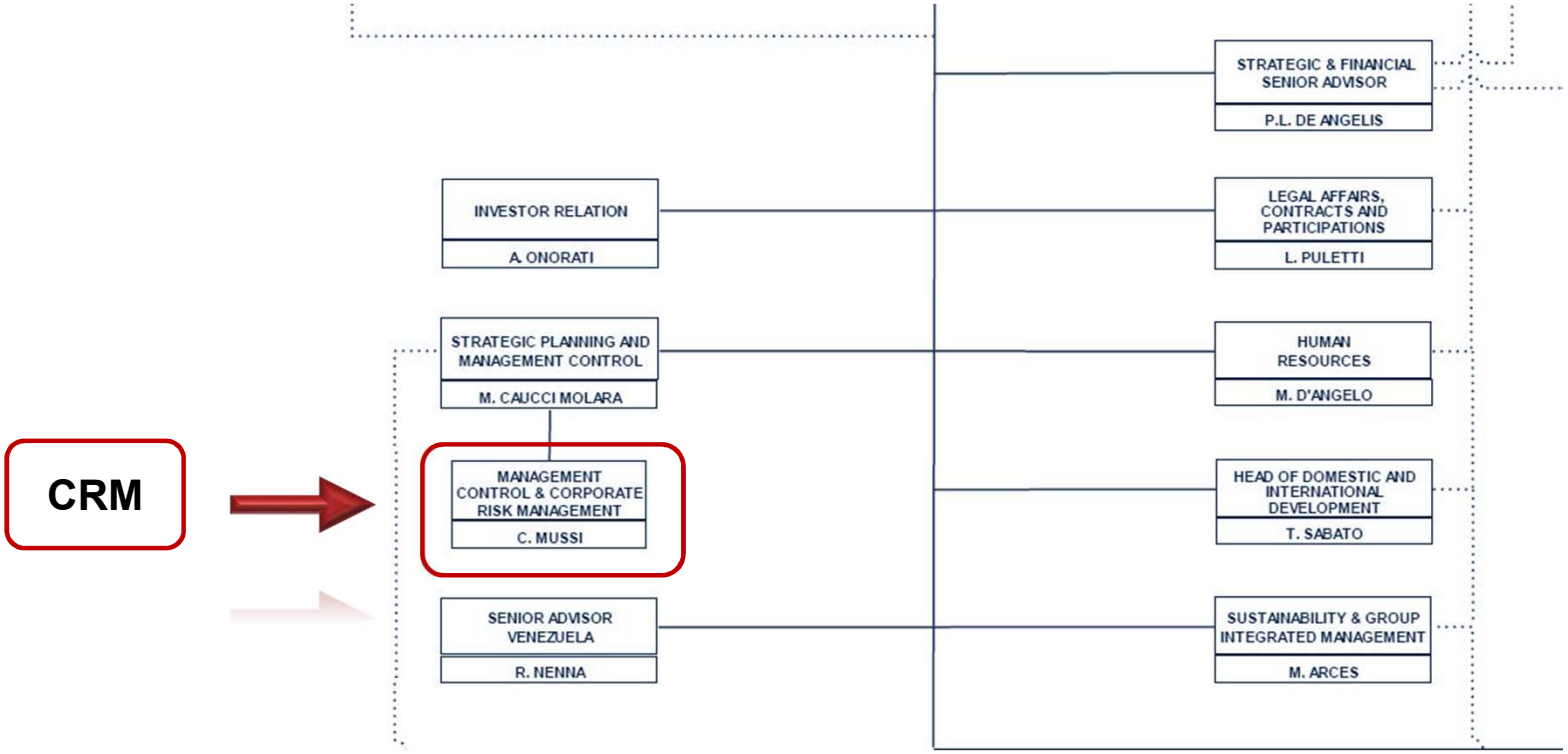
2. Il Corporate Risk Management in Astaldi

Posizione in Organigramma



2. Il Corporate Risk Management in Astaldi

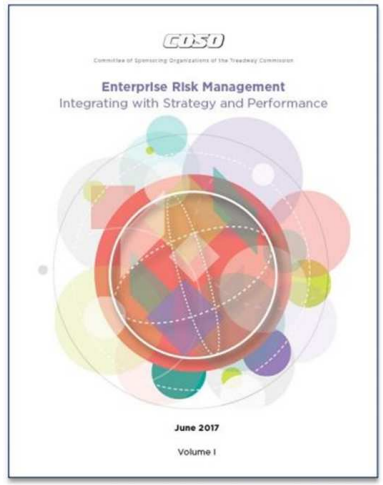
Posizione in Organigramma



2. Il Corporate Risk Management in Astaldi

Allo scopo di creare un **processo proattivo integrato** con i processi decisionali e di pianificazione, Astaldi ha:

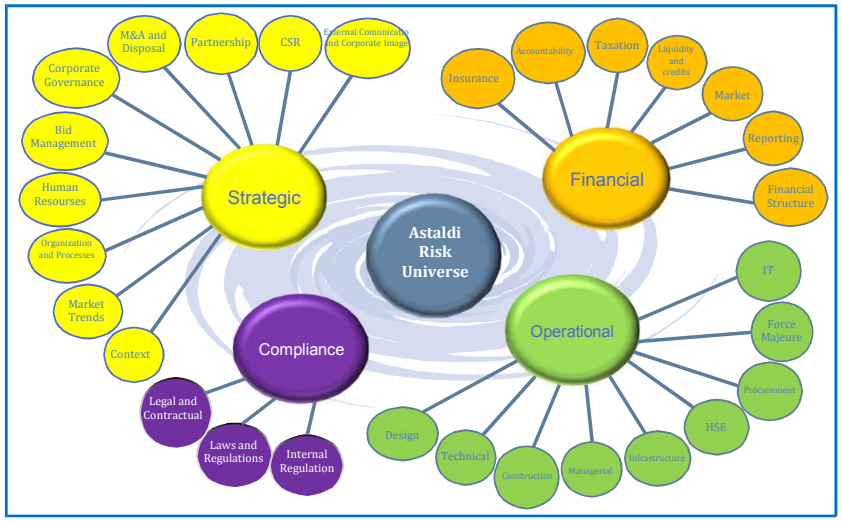
- ✓ Creato il servizio "Corporate Risk Management";
- ✓ Emesso due procedure (PG-AST-023 e PG-AST-024) per definire e governare i processi di Risk Management (Project RM e Enterprise RM)
- ✓ Sia a livello di impresa (enterprise) che di commessa (project) il modello di governance dei rischi è ispirato a quanto prescritto dal Codice di Autodisciplina di Borsa Italiana (Art. 7 – Sistema di Controllo Interno e Gestione dei Rischi) a tutela degli azionisti nonché alle linee guida previste dalla norma ISO 31000 e all'Enterprise Risk Management framework pubblicato dal COSO (Committee of Sponsoring Organization of the Tradeway Commission) nel 2004 e poi aggiornato nel 2017

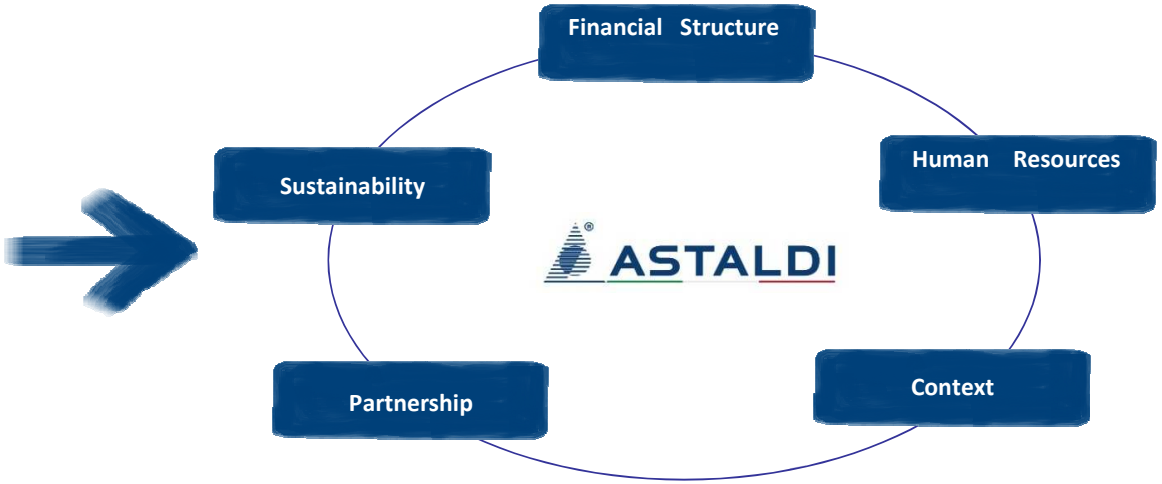


2. Il Corporate Risk Management in Astaldi

Risk Universe & Top Risk

- Nella fase di startup il servizio Corporate Risk Management ha sviluppato il **Risk Universe**, che è attualmente composto da circa 140 eventi di rischio. **5 Categorie cc.dd. Top Risk** sono state selezionate in relazione agli approfondimenti sull'evoluzione del business di Gruppo condivisi con il Top Management.
- Risk Universe e Categorie Top Risk vengono **riviste/aggiornate** approssimativamente ogni due anni, anche con il contributo di tutti I maqnager coinvolti nel processo di risk management, sia a livello Corporate che di Progetto

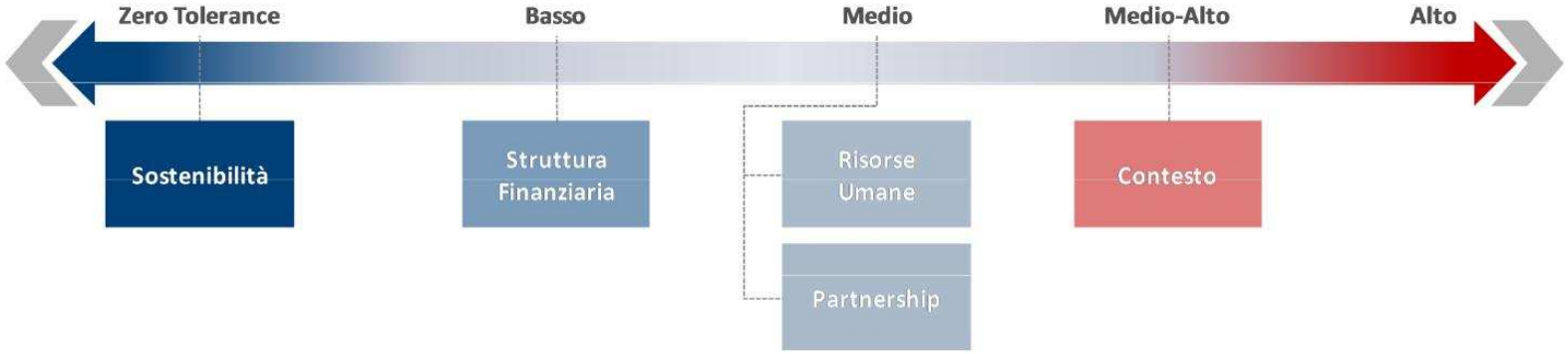




2. IL CORPORATE RISK MANAGEMENT IN ASTALDI

RISK APPETITE STATEMENT

Nello scorso mese di marzo il Consiglio di Amministrazione ha esaminato e approvato il nuovo **Risk Appetite Statement** che, in linea con quello approvato nel 2016, definisce il livello di rischio che la società è disposta ad assumere (c.d. appetito al rischio) e le relative soglie di tolleranze in relazione alle Categorie Top Risk quali principali fonti di criticità nel perseguimento degli obiettivi di Piano Strategico



" L'ammontare di rischio che, a livello generale, un soggetto è disposto ad accettare per il perseguimento del valore"

(***CoSo - Risk Appetite***)

" Ammontare e tipo di rischio che un'organizzazione è pronta a pereseguire, trattenere o assumere"

(***ISO 31000 and ISO Guide 73 on Risk Appetite***)

2. Enterprise Risk Management in Astaldi

2. ENTERPRISE RISK MANAGEMENT IN ASTALDI

L'Enterprise Risk Management

- … è un processo proattivo integrato con i processi decisionali e strategici già esistenti in azienda…
- … che ha come obiettivo finale quello di supportare il Management nella previsione e nella gestione dei principali rischi con impatto sui risultati aziendali…
- … contribuendo al tempo stesso a rispondere alle più recenti evoluzioni in tema di Corporate Governance (i.e., maggiore attenzione da parte degli investitori e degli analisti alle tematiche del rischio, evoluzione delle best practice internazionali in materia, reporting periodico al CdA secondo il Codice di Autodisciplina di Borsa Italiana).

2. Enterprise Risk Management in Astaldi

Enterprise Risk Management: Tavoli di lavoro cross-funzionali & Reporting

- ✓ **Tavoli Cross-Funzionali**: sono gruppi di lavoro composti da figure direzionali / top management. Hanno l'obiettivo di monitorare tutti i Key Risk Indicator, usando specifici cruscotti, individuando le appropriate azioni correttive da mettere in atto, allo scopo di rispettare le soglie di tolleranza fissate per ciascuna categoria di rischio
- ✓ **Reports**: su base trimestrale viene predisposto un report direzionale con informazioni aggiornate. In particolare, il cruscotto di Struttura Finanziaria viene aggiornato con I dati della Situazione Patrimoniale e Finanziaria trimestrale approvata mentre I cruscotti di Partnership e Contesto vengono aggiornati in relazione a accordi in sottoscrizione con nuovi partner e/o in paesi non considerati a analizzati in precedenza.

2. ENTERPRISE RISK MANAGEMENT IN ASTALDI

ENTERPRISE RISK MANAGEMENT: TAVOLI DI LAVORO CROSS-FUNZIONALI & REPORTING

2. Scostamento delle metriche di riferimento rispetto ai valori di Piano industriale	Cadenza monitoraggio	Formula	Valore Rilevazione Precedente	Scostamento al 30/06/2017	Risk Tolerance	Criticità	Valore Puntuale Rilevato	Valore Target
EBIT	trimestrale	(EBIT alla data rilevazione) - (EBIT da Piano Industriale)/EBIT da Piano Industriale	178%	139%	> (10%)		184.701	77.186
PFN	trimestrale	(PFN alla data rilevazione) - (PFN da Piano Industriale)/PFN da Piano Industriale	12%	15%	> (10%)		(1.271.970)	(1.500.373)
NWC / Revenues	trimestrale	Capitale Circolante Netto (Last 12m) / Ricavi (Last 12m)	30%	32%	Riferita ai risultati dell'anno precedente		32,1%	20,0%
3. Scostamento del cash flow di pase/commessa rispetto al budget	**Cadenza monitoraggio**	**Formula**	**Valore Rilevazione Precedente**	**Scostamento al 30/06/2017**	**Risk Tolerance**	**Criticità**	**Valore Puntuale Rilevato**	**Valore Budget**
Canada	trimestrale	Cash flow di commessa alla data della rilevazione - Cash flow di commessa da budget	9.896	(63.190)	Scostamento < 10 milioni di euro del cash flow (in positivo o in negativo)		(67.174)	(3.984)
Cile	trimestrale	Cash flow di commessa alla data della rilevazione - Cash flow di commessa da budget	11.033	31.769	Scostamento < 10 milioni di euro del cash flow (in positivo o in negativo)		16.187	(15.581)
Turchia	trimestrale	Cash flow di commessa alla data della rilevazione - Cash flow di commessa da budget	(2.993)	(45.999)	Scostamento < 10 milioni di euro del cash flow (in positivo o in negativo)		(18.869)	27.129
Russia	trimestrale	Cash flow di commessa alla data della rilevazione - Cash flow di commessa da budget	3.101	5.029	Scostamento < 10 milioni di euro del cash flow (in positivo o in negativo)		(11.296)	(16.325)
Centro America	trimestrale	Cash flow di commessa alla data della rilevazione - Cash flow di commessa da budget	23.841	(6.536)	Scostamento < 10 milioni di euro del cash flow (in positivo o in negativo)		9.838	16.374

KEY RISK INDICATORS - PARTNERSHIP

		Economic-Financial Section (A) (€'000)			Technical - Commercial Section (B)					Reputational Section (C)							
Partner	Country of origin	Revenues	Backlog	Net Financial Position (NFP)	Market share (leader/ listed/ network)	Quality	Timeliness (during tender and/or	Reliability (in ATI or JV)	Technical experience/ Certifications	Litigations JV vs. Client		Litigations Astaldi vs. Partner		Litigations Partner vs. Client		Black List	INTERNAL RATING (A+B+C)
										Historic	Curren	Historic	Curren	Historic	Curren		
Aecom	USA	6.290.390	18.818.216	(353.999)	1		2	1	1								
Al Huda	Qatar	303	n.d.	22													
American Bridge	USA	408.656	n.d.	n.d.	1		2	4	2								
Andrade Gutierrez S.A.	Brasile	1.188.692	n.d.	(88.348)	1	1	n.d.	n.d.	1								
Arcadis	Italia	3.328.762	13.141	(494.100)	1	1	n.d.	n.d.	1								
Arcers Sia	Lettonia	28.188	n.d.	(7.897)	n.d.	n.d.	n.d.	n.d.	n.d.								
Arendal	Messico	81.594	n.d.	(157.671)	4	3	n.d.	n.d.	4								
AS Link Industries	Lettonia	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.								
Balfour Beatty	UK	10.907.805	1.612.663	(512.261	2		2	2	2								
Binders Sia (Arcers Sia)	Lettonia	56.611		(9.256)	n.d.	n.d.	n.d.	n.d.	n.d.								
Casais	Portogallo	81.180	n.d.	(9.263)	n.d.	n.d.	n.d.	n.d.	n.d.								
CC1	Vietnam	244.559	n.d.	(172.631	1	2	1	1	3								
Cimolai	Italia	446.177	n.d.	(102.322	3	1	n.d.	n.d.	1								
CLF	Italia	116.902	n.d.	(611.490)	4	2	2	1	2								
Cocige	Panama	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.								
Community Asphalt (OHL Group)	USA	n.d.	n.d.	n.d.	1	2	2	2	1								
Condotte	Italia	1.315.000	n.d.	(461.000)	2	2	n.d.	n.d.	1								
Constructora Malaga	Perù	93.193	271.576	(36.648)	3	3	n.d.	n.d.	3								
Constructora Nase	Venezuela	n.d.	n.d.	n.d.	2	2	2	1	2								
Constructora Vialpa	Venezuela	n.d.	n.d.	n.d.	3	3	3	2	3								
Corsan/Corvan	Spagna	2.134.187	7.107.000	(1.276.043)	3	3	3	4	1								
Cosapi	Perù	264.977	1.682.371	(422.764)	1	2	n.d.	n.d.	3								
Cosider TP	Algeria	175.448	n.d.	n.d.	1	3	3	3	2								
Daelim	South Korea	6.365.004	16.116.437	(223.019)	1	2	1	1	4								

KEY RISK INDICATORS - CONTESTO

	Quantitativo														KRI
	Rating internazionale			Presence	Anni paese	Backlog - Giu 17		Ricavi - Giu 17		EBIT - Giu 17		NWC - Giu 17		Fixed Asset - Giu 17		100%
€'000	Moody's	Outlook				val. ass.	% su tot	val. ass.	% su tot	val. ass.	% su tot	val. ass.	% su Ric LTM	val. ass.	% su tot	
Algeria	/	-		P	>10	60.773	0,3%	58.765	4,2%	21.678	10,4%	57.006	53,1%	2.694	0,4%	
Canada	Aaa	Stable		P	3	370.236	2,0%	246.307	17,5%	3.805	1,8%	(10.390)	(2,1%)	17.853	2,6%	
Chile	Aa3	Stable		P	7	1.360.328	7,4%	211.790	15,0%	54.817	26,3%	3.525	0,7%	70.253	10,4%	
Costa Rica	Ba2	Negative		P	> 10	-	0,0%	11.315	0,8%	2.179	1,0%	(19.879)	(177,8%)	11	0,0%	
El Salvador	Caa1	Stable		P	> 10	-	0,0%	401	0,0%	(396)	(0,2%)	1.388	278,6%	4.407	0,7%	
Honduras	B2	Positive		P	> 10	28.983	0,2%	17.711	1,3%	1.370	0,7%	17.629	60,0%	9.255	1,4%	
Indonesia	Baa3	Positive		P	-	62.001	0,3%	808	0,1%	(301)	(0,1%)	(4.893)	(336,3%)	254	0,0%	
Italy	Baa2	Negative		P	> 10	5.536.000	30,3%	306.696	21,8%	35.286	16,9%	(1.691.262)	(307,5%)	307.733	45,6%	
Nicaragua	B2	Stable		P	> 10	9.877	0,1%	3.917	0,3%	(15)	(0,0%)	7.378	159,2%	1.374	0,2%	
Oman	Baa1	Stable		P	X	-	0,0%	35	0,0%	(416)	(0,2%)	3.665	7282,9%	133	0,0%	
Peru	A3	Stable		P	6	69.900	0,4%	16.592	1,2%	2.176	1,0%	(16.647)	(56,0%)	16.024	2,4%	
Poland	A2	Stable		P	7	777.707	4,3%	128.986	9,2%	5.130	2,5%	(49.691)	(18,3%)	15.824	2,3%	
Romania	Baa3	Stable		P	> 10	755.543	4,1%	56.914	4,0%	3.354	1,6%	141.055	118,4%	12.752	1,9%	
Russia	Ba1	Stable		P	4	267.238	1,5%	89.311	6,3%	(19.364)	(9,3%)	100.118	36,3%	29.361	4,3%	
Saudi Arabia	A1	Stable		P	9	5.869	0,0%	0	0,0%	(685)	(0,3%)	(406)	(12,9%)	(129)	(0,0%)	
Tunisia	Ba3	Negative		P	7	4.796	0,0%	3.628	0,3%	60	0,0%	494	9,0%	-	0,0%	
Turkey	Ba1	Negative		P	> 10	7.571.960	41,4%	210.824	15,0%	111.769	53,6%	189.419	34,6%	171.876	25,4%	
United States of America	Aaa	Stable		P	> 10	509.748	2,8%	41.929	3,0%	(10.355)	(5,0%)	(81)	(0,1%)	2.151	0,3%	
Venezuela	Caa3	Negative		P	> 10	881.748	4,8%	2.032	0,1%	(167)	(0,1%)	421.740	2428,9%	1.288	0,2%	

3. Project Risk Management in Astaldi

3. PROJECT RISK MANAGEMENT IN ASTALDI

COSA È IL PROJECT RISK MANAGEMENT

Il **Project Risk Management** include, a livello di singolo progetto, i processi di predisposizione del risk management plan, identificazione, analisi, pianificazione azioni di risposta, monitoring e controllo dei rischi.

Obiettivi del Project Risk Management è l'incremento di probabilità e impatto degli eventi incerti positivi e la riduzione di probabilità e impatto degli eventi incerti negativi del progetto.

3. PROJECT RISK MANAGEMENT IN ASTALDI

PROJECT RISK MANAGEMENT: PROCESSO

Il Project Risk Management è un processo ciclico che si ripete fino alla conclusione del progetto

3. PROJECT RISK MANAGEMENT IN ASTALDI

PROJECT RISK MANAGEMENT: PROCESSO

Risk classification

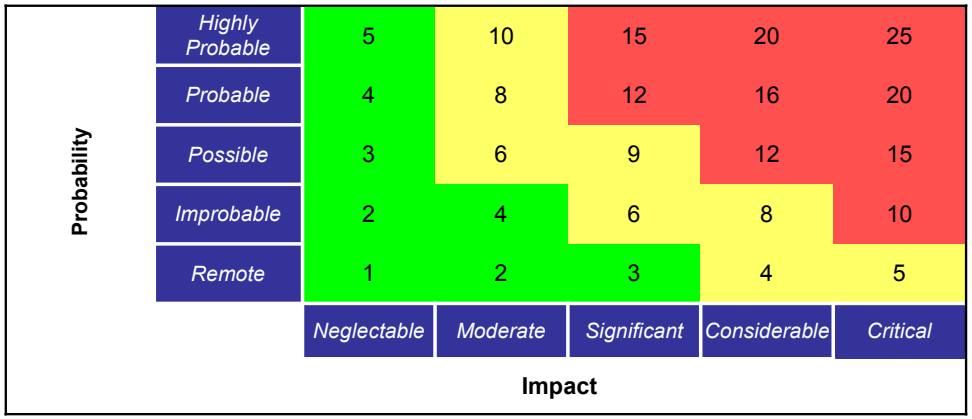
Nella fase preliminare della nuova iniziative commerciale, viene assegnata la classe di rischio del progetto (Basso, Medio, Alto).

Risk identification

La prima attività di identificazione dei rischi viene prodotta durante la fase di **gara/acquisizione** considerando i seguenti elementi:
"Country Risk Report" (in particolare per progetti in nuovi paesi); "Partner Risk Report" (in particolare per progetti con nuovi partner); Schede SAPO e ASPO; Report mensile attività sviluppo commerciale; Studio di fattibilità del progetto e ogni altro documento di progetto disponibile; Risultati del processo di Risk Back Analysis process (Tagetik database "lessons learned").
L'identificazione dei rischi viene ripetuta durante la fase di **start-up** del progetto sulla base della Scheda di Offerta.
Il proposal manager / risk manager / project manager è responsabile della preparazione del Risk Register.

Risk evaluation

I rischi identificati vengono valutati con una metodologia **qualitatia e/o quantitativa**. La valutazione qualitative è basata su una scala da 1 a 5 per impatto e probabilità, mentre la valutazione quantitative prende in considerazione 3 scenari (Worst – Base – Best). Il risk assessment viene quindi caricato nel tool Tagetik per elaborare la simulazione Montecarlo e l'analisi EBIT@Risk.



3. Project Risk Management in Astaldi

Project Risk Management: Processo

Risk management

Risk management plans (action plans) vengono definiti per i principali rischi di un progetto, definendo la strategia da adottare, milestone, risk owner e tempi di monitoraggio. Nella fase di studio del risk management plan, vengono analizzati I benefici attesi, usando la misurazione qualitative piuttosto che la stessa metodologia utilizzata per l'analisi EBIT@Risk. L'action plan viene poi formalizzato nel Risk Register.

Risk monitoring

Il Risk Register viene **aggiornato** durante le varie fasi del progetto, dall'acquisizione al collaudo, almeno annualmente in sede di nuovo Piano Industriale. Viene aggiornata la valutazione (sia qualitative che quantitative) e monitorata l'implementazione dell'action plan.

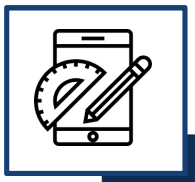
Overview of PRM (PMBOK Guide)

3. PROJECT RISK MANAGEMENT IN ASTALDI – RISK UNIVERSE

3. Project Risk Management in Astaldi – Risk Universe

Operational (1)

Design:



- **R-O001** Design errors/Faulty design increases costs and creates delays
- **R-O002** Unexpected delays during the design phase
- **R-O003** Change in design conditions during engineering phase (quantities and/or quality of works).
- **R-O004** Difficulties between the civil works and the electro mechanical works
- **R-O005** Unexpected impacts during the operational phase regarding certain design choices made (concession)

Technical:

- **R-O006** Increased construction costs due to the site's morphology
- **R-O007** Unexpected geological/hydrological conditions causing an increase in construction costs
- **R-O008** Difficulties with site's logistics (mobilization problems)
- **R-O009** Transmission/Interconnection difficulties with the Electricity Lines
- **R-O010** Delays regarding expropriation (land purchasing)
- **R-O011** Increased costs due to land purchasing issues
- **R-O012** Increased costs related to interferences

3. Project Risk Management in Astaldi – Risk Universe

Operational (2)

Construction:

- **R-O013** Difficulties/Unexpected events regarding the site's mobilization
- **R-O014** Difficulties/unexpected events regarding the necessary permits/authorizations
- **R-O015** Unexpected interruptions due to external factors (related to construction) during the execution of the works
- **R-O016** Lack of local availability of construction materials or other productive factors
- **R-O017** Non-compliance between the construction compared to the design

Managerial:

- **R-O018** Errors/Delays with planning works and/or supplies
- **R-O019** Errors/Delays in the setup and management of the project organization
- **R-O020** Errors/Inefficiencies/Delays in the management of subcontractors
- **R-O021** Ineffective/Inefficient partners management
- **R-O022** Ineffective/Inefficient client management

3. PROJECT RISK MANAGEMENT IN ASTALDI – RISK UNIVERSE

OPERATIONAL (3)

HSE:

- **R-O024** Difficulties/Delays related to environmental issues and waste disposal (connected to licenses,environmental impact studies,etc.)
- **R-O025** Overexpenditure/Unexpected costs regarding waste disposal (i.e. distance from the dump, type of waste materials)
- **R-O026** Non compliance regarding environmental regulations or health and safety of workers
- **R-O027** Accidents that damage the environment and/or health of local communities
- **R-O028** Accidents at work that injure people (employees and subcontractors)

Procurement:

- **R-O029** Astaldi depends excessively on critical suppliers/subcontractors
- **R-O030** Weak financial situation, quality/compliance, integrity and reputation) of suppliers / subcontractor /outsourcers (unreliable)
- **R-O031** Escalation/increase in the price of supplies
- **R-O032** Costs and delays in clearance of goods/materials/equipments
- **R-O033** Procurement errors/inefficiencies
- **R-O034** Frauds by suppliers/subcontractor
- **R-O119** Fleet/asset management delays and/or not efficient

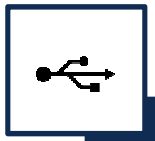
3. PROJECT RISK MANAGEMENT IN ASTALDI – RISK UNIVERSE

OPERATIONAL (4)

Force Majeure:

- **R-O043** Climatic factors
- **R-O044** Natural calamities
- **R-O045** External accidents
- **R-O046** Terrorist attacks

IT:



- **R-O047** Weak/Ineffective IT security
- **R-O048** Downtime of IT systems
- **R-O049** Connection difficulties on the construction site
- **R-O050** Lack of systems allignment/upgrade with respect to business demands

Infrastructure:

- **R-O023** Errors/untimeliness/low quality of services/works during delivery phase

3. Project Risk Management in Astaldi – Risk Universe

Financial (1)

Insurance:

- **R-O051** Incorrect estimate insurance costs
- **R-O052** Inaccurate insurance contracts compared to actual risks, both corporate and project
- **R-O053** Delays with insurance refunds / other difficulties in paperworks management
- **R-O118** Difficulties with transfering/covering risk completely (insurance company will not allow it)

Accountability:

- **R-O054** Incomplete accounting data
- **R-O055** Incorrect accounting data
- **R-O056** Untimely/Late accounting data (according to the required deadlines)
- **R-O057** Incorrect depreciation allocation

3. Project Risk Management in Astaldi – Risk Universe

Financial (2)

Taxation:

- **R-O058** Incorrect tax planning
- **R-O059** Errors with calculating taxes/other duties
- **R-O120** Raise in taxes

Market:

- **R-O063** Variability of interest rates
- **R-O064** Securities /stocks /Bond volatility
- **R-O065** Fluctuations in exchange rates
- **R-O066** Commodities (ie: EE, fuel, steel) price volatility

Liquidity and Credits:

- **R-O060** Lack of financial capacity regarding payment obligations or investment needs
- **R-O061** Default of the financial counterpart
- **R-O062** Missed/Delayed receipts and default of the business conterpart
- **R-O121** Credit line is not renewed

3. Project Risk Management in Astaldi – Risk Universe

Financial (3)

Reporting:

- **R-O067** Incomplete/inaccurate/late accounting data for balance sheet
- **R-O068** Incomplete/inaccurate/late analitical and magerial data of projects

Financial Structure:

- **R-O069** Debt / equity level is unbalanced (problems with covenants)
- **R-O070** Misaligned structure between debt and revenue life cycle
- **R-O071** Unavailability/Difficulty to access owners' equity
- **R-O072** Difficulty to comply with covenants
- **R-O073** Lack of funding/refunding of the projects
- **R-O074** Difficulties in funding projects
- **R-O075** Inadequate management of bid/performance bonds
- **R-O122** Ulterior funding is necessary
- **R-O123** Interruptions/delays with financing

3. Project Risk Management in Astaldi – Risk Universe

Strategic (1)

Context:

- **R-O076** Trend of the business cycle / macroeconomic variables
- **R-O077** Country Risk (political/governmental, safety, social, economical/financial, rigidity of regulations/bureaucracy)
- **R-O078** Conflicts with critical stakeholders (e.g. local communities, environmentalists)
- **R-O079** Unstable/difficult Regulatory environment and regulatory development with an impact on the business activities of the Group
- **R-O124** Hostage takeover/ assets takeover

Market Trends:

- **R-O080** Difficulties with Competitors
- **R-O081** Dynamics of (private and public) demand for infrastructure and energy
- **R-O082** Dynamics regarding technological innovation

3. Project Risk Management in Astaldi – Risk Universe

Strategic (2)

Organization & Processes:

- **R-O083** Decision-making based on erroneous forecasts / erroneous recognition of strategic opportunities
- **R-O084** Strategies /Business model /Organization model are disalligned partially
- **R-O126** Mismatching between central and local organization model

Human Resources:

- **R-O035** Difficulties in hiring employees with technical specialistic skills
- **R-O036** Lack of definition of managerial continuity plans
- **R-O127** Ineffective/Inefficient execution of change management policies
- **R-O128** Lack of / Inadequate training of human resources
- **R-O129** Errors/Inefficiencies in the recruiting process
- **R-O037** Difficulties in retaining human resources (high turnover)
- **R-O038** Negative labor cost trend
- **R-O039** Difficulties in management of industrial/trade union relations (strikes)
- **R-O040** Difficulties in obtaining work permits
- **R-O041** Difficulties with cultural/social integration
- **R-O042** The MBO incentive systems are disalligned with corporate/project targets

3. PROJECT RISK MANAGEMENT IN ASTALDI – RISK UNIVERSE

STRATEGIC (3)

Bid Management

- **R-O087** Errors in the evaluation of organizational and financial skills of partners
- **R-O088** Misinterpretation of the tender documents
- **R-O089** Errors in the project assessment and profitability
- **R-O090** Lack of transparency / Discretion in the tender process

Corporate Governance:

- **R-O091** Incorrect definition / Ineffectiveness in the proxies and power of attorney system
- **R-O092** Ineffective management and control committess within the Group (Internal Control System)
- **R-O093** Incorrect creation of company
- **R-O094** Corporate govenance issues with Astaldi's foreign companies

3. Project Risk Management in Astaldi – Risk Universe

Strategic (4)

M&A and Disposal:

- **R-O095** Difficulty to find/identify potential targets
- **R-O096** Errors with valuation operations/acquisitions (i.e. overpriced, under estimated risk/contingencies)
- **R-O097** Difficulties with the legal, contractual and responsibilities regarding transactions (m&a)
- **R-O098** Delays and/or other difficulties regarding M&A (i.e. difficulties with integration (post))

Partnership:

- **R-O085** Errors in the evaluation and selection of the partners
- **R-O086** Financial instability/insolvency of the partners
- **R-O130** Ineffective process for the definition of shareholders agreements
- **R-O131** Partnership management (i.e. partner selection, management of shareholder agreements)

3. Project Risk Management in Astaldi – Risk Universe

Strategic (5)

CSR:

- **R-O132** Lack of execution of Corporate Social Responsibility policies
- **R-O133** Reputational damages for HSE and compliance issues
- **R-O134** Reduction in funding from investors (i.e. Dow Jones Sustainability Index) due to lack of execution of CSR policies

Internal/External Relations:

- **R-O100** Conflicts with mass media (bad publicity)
- **R-O101** Relation difficulties with national/local government/institutions
- **R-O125** Ineffective/untimely communications
- **R-O102** Ineffective/late comunication with the market/financial community
- **R-O103** Market relations are not in line with the applicable laws and regulations

3. PROJECT RISK MANAGEMENT IN ASTALDI – RISK UNIVERSE

COMPLIANCE

Legal and Contractual:

- **R-O104** Contracts do not protect the company sufficiently
- **R-O105** Contract clauses are not respected (non compliance)
- **R-O106** Contractual claims/Arbitration
- **R-O107** Intellectual property Issues

Laws and Regulations:

- **R-O108** Non compliance with Antitrust regulations
- **R-O109** Non compliance with Corporate Criminal Liability (i.e. 231, FCPA)
- **R-O110** Non compliance with Privacy regulations
- **R-O111** Non compliance with 262/2005 law
- **R-O112** Non compliance with local regulations

Internal Regulations:

- **R-O113** Internal frauds
- **R-O114** Policy/procedure non compliance
- **R-O115** Lack of assignment of proxies and power of attorney
- **R-O135** Failure to comply with assigned duties
- **R-O116** Non compliance with Ethics code
- **R-O117** Conflict of interest created by administrators and employees

3. PROJECT RISK MANAGEMENT IN ASTALDI

RISK REGISTER (1)

Il **Risk Register** è il principale strumento per l'identificazione, analisi e monitoraggio dei rischi. Va prodotto fin dalla fase di gara e per tutta la durata del progetto.

Una volta inseriti nel registro, i rischi non vengono cancellati anche se gli eventi corrispondenti non possono generare alcun più alcun impatto. In tal modo è possibile monitorare l'evoluzione del progetto e raccogliere le informazioni utili a produrre la **"Risk Back Analysis"**.

ASTALDI — Risk Management Register for: Project name — Last Update:

				Risk Identification					Qualitative Risk Assessment			Contingency			Quantitative Risk Assessment					Risk Response Plan		Monitoring and Control		
Risk Category	Sub-Category	Code	Risk	Description	Mitigation	Threat or Opportunity	Primary Objective	Risk Owner	Probability	Impact	Risk Value	Yes	No	Value (€)	% Probability	Worst Case (€)	Base Case (€)	Best Case (€)	% Reliability	Response Strategy	Response Actions	Status	Start Date	End Date
		R-O004	Difficulties between the civil works and the electro mechanical works								0													
		R-O005	Unexpected impacts during the operational phase regarding certain design choices made (concession)								0													
		R-O006	Increased construction costs due to the site's morphology								0													

3. PROJECT RISK MANAGEMENT IN ASTALDI

RISK REGISTER (2)

Il **Risk Register** viene:

- ✓ preparato per ogni nuova iniziativa commerciale;

- ✓ aggiornato durante le differenti fasi del progetto;

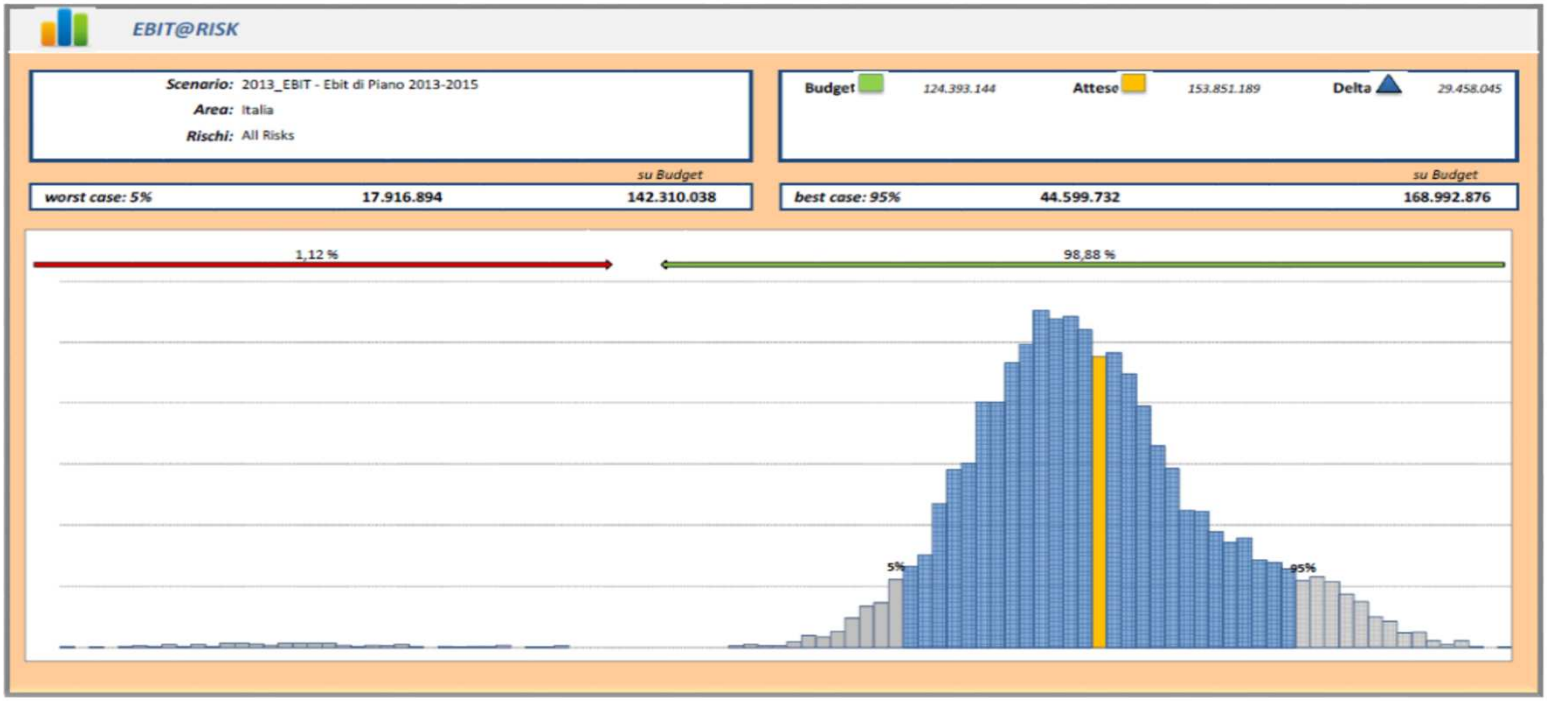
- ✓ condiviso tra le varie funzioni aziendali preposte, sia sul progetto che presso la sede centrale;

- ✓ caricato nel tool Tagetik allo scopo di alimentare il database per l'elaborazione della simulazione Montecarlo, l'analisi EBIT@Risk, la Risk Back Analysis e per creare il reporting.

3. PROJECT RISK MANAGEMENT IN ASTALDI

PROJECT RISK MANAGEMENT: SIMULAZIONE MONTECARLO

EBIT@Risk Analysis: una volta identificati Rischi/Opportunità, la loro probabilità di accadimento, la quantificazione del loro potenziale impatto (Maggiori/minori costi o ricavi) e caricati I dati nel tool Tagetik, la c.d. “Simulazione Montecarlo” può essere elaborate allo scopo di valutare l’impatto totale atteso sull’ EBIT per ogni singolo progetto o per una intera area di interesse.



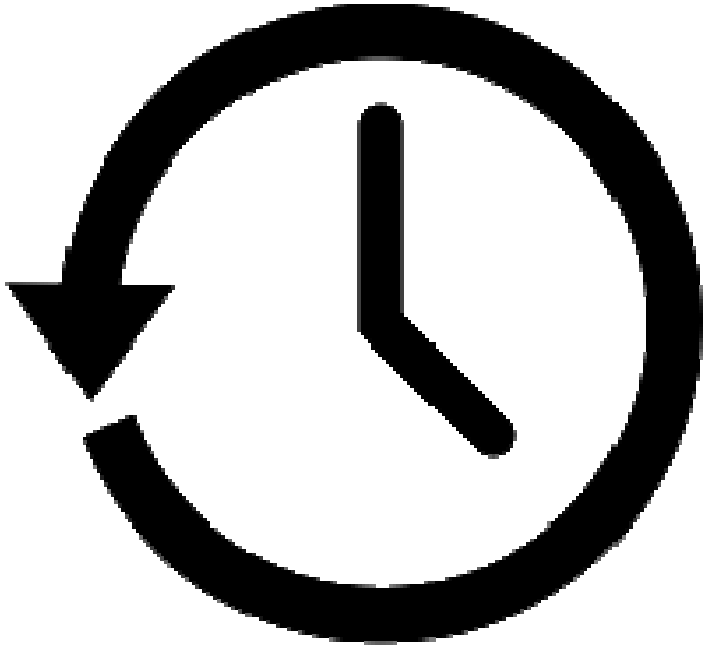
3. PROJECT RISK MANAGEMENT IN ASTALDI

RISK BACK ANALYSIS

La **Risk Back Analysis** è basata su dati storici derivanti da analisi dei rischi di progetti eseguiti in precedenza.

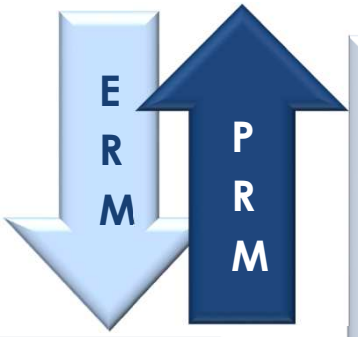
Viene eseguita **comparando** i rischi attesi rispetto agli eventi effettivamente accaduti, confrontando le differenti strategie e I action plans utilizzati per gestirli ad I loro livelli di efficienza.

L'**obiettivo** è di creare un database per tipo di contratto, per settore e per area con informazioni rilevanti, a supporto di future analisi dei rischi allo scopo di incrementare le capacità di previsione e di prevenzione dei rischi e di diffondere la cultura dei rischi in azienda.



3. CORPORATE RISK MANAGEMENT IN ASTALDI

Il Risk Management è un processo proattivo integrato con i processi decisionali e di pianificazione



TOP-DOWN

- Linee guida strategiche (targets e obiettivi)
- Policies e procedure
- Risk Universe e selezione delle categorie Top Risk
- Risk Appetite (KRI, Tolerance, ecc..)
- Country Risk Assessment

BOTTOM-UP

- Project Risk Analysis (database di info rilevanti: risk events frequency, contingencies, response strategies e action plans, efficienza del processo)
- Impatti attesi sul Budget
- Partnership information
- Country experience (Clienti, market, competitor, ambiente di lavoro, ecc..)

L'approccio ERM e l'approccio Project Rmsono pertanto strettamente collegati e complementari

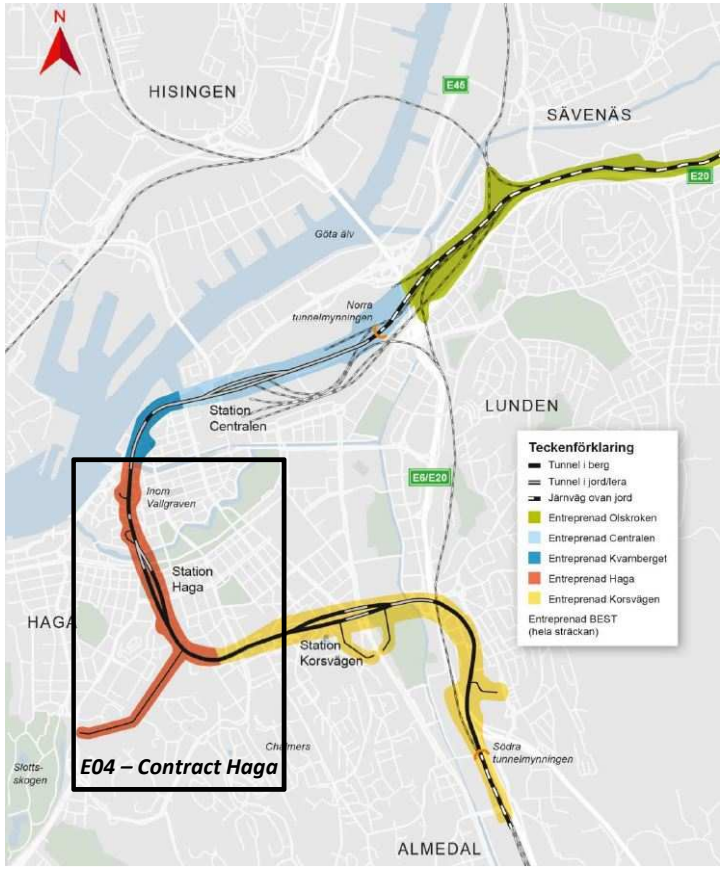
4. Case Study

The West Link Project - E04 Contract Haga

Progetto e costruzione della stazione ferroviaria Haga lungo la nuova linea ferroviaria di penetrazione di Göteborg - Svezia

Il Progetto - Descrizione

- Il progetto riguarda la costruzione di un tunnel ferroviario a due binari sotto la città di Göteborg, in Svezia, della lunghezza di circa 1,5 Km.
- Il progetto fa parte di un più grande piano infrastrutturale chiamato «The West Link Project» che interesserà l'intera città di Göteborg. Il tratto interessato si connetterà a nord con il «Kvarnberget project» ed a sud con «Korsvägen project».
- Il progetto include, oltre al tunnel ferroviario principale, la costruzione di una stazione interrata, di tunnels di servizio paralleli alla main line ed di un tunnel di servizio perpendicolare ad essa di circa 900m (punto di accesso per la realizzazione della linea principale).
- Il progetto dello scavo si suddivide in due parti, la prima in roccia da effettuare in «Drill and Blast», la seconda in terreno argilloso, in corrispondenza dell'attraversamento di un fiume, da effettuare in «Cut and Cover».

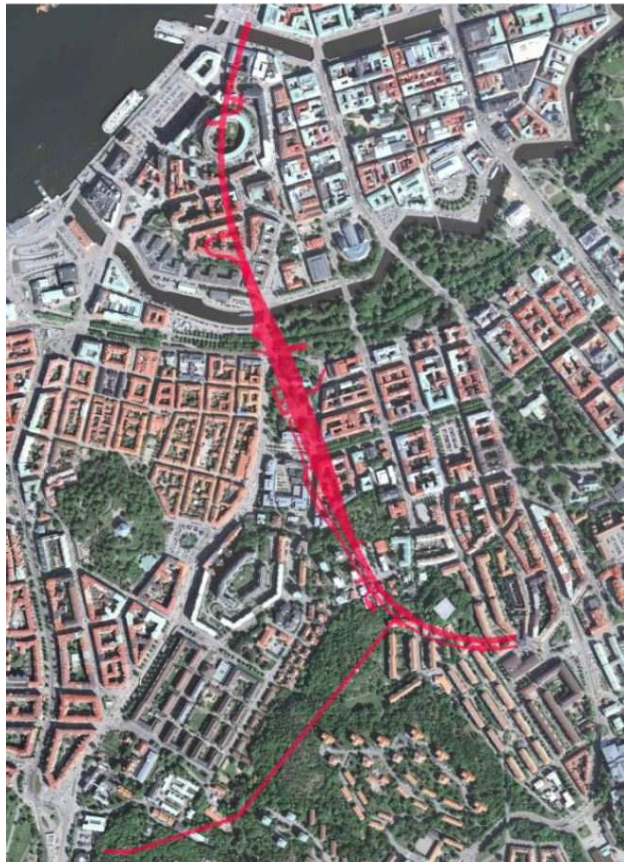


The West Link Project – Piano Schematico

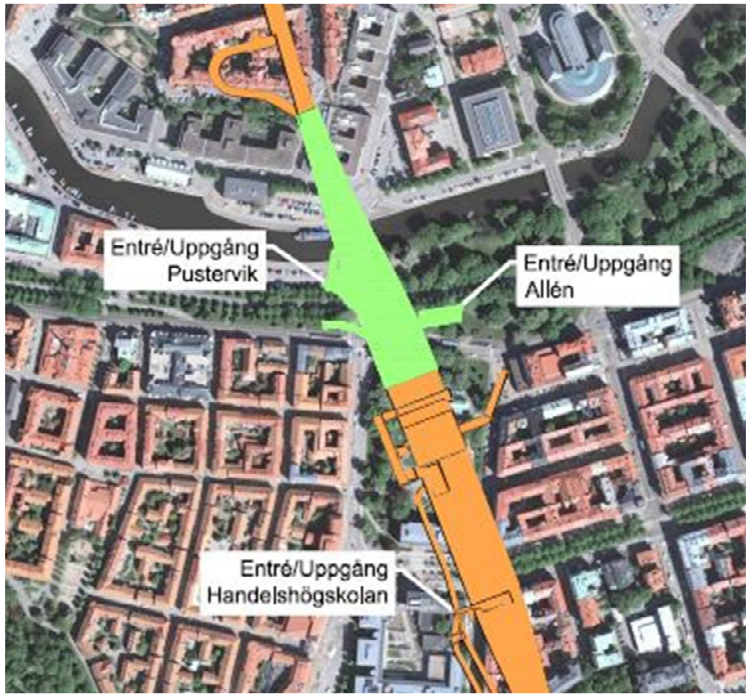
Il Progetto – Caratteristiche principali

- Lunghezza totale main line → 1.520 m circa;
- Lunghezza tratto in roccia → 1.220 m circa;
- Sezioni → Larghezza 14-50m – Area 120-620m^2
- Lunghezza tratto in terreno argilloso → 300 m circa;
- Lunghezza service tunnels in roccia → 1.350 m circa;
- Sezioni → Larghezza 6-12m – Area 39-92m^2
- Pozzi di ventilazione → N° 3 – Lunghezza 34-57-64m
- Sezioni → 36-40m^2 circa
- Volume, scavo in roccia → 640.000 m^3 circa;
- Volume, scavo in terreno argilloso → 340.000 m^3 circa;
- Pre-grouting → Circa 440.000 m di fori

Planimetria Schematica

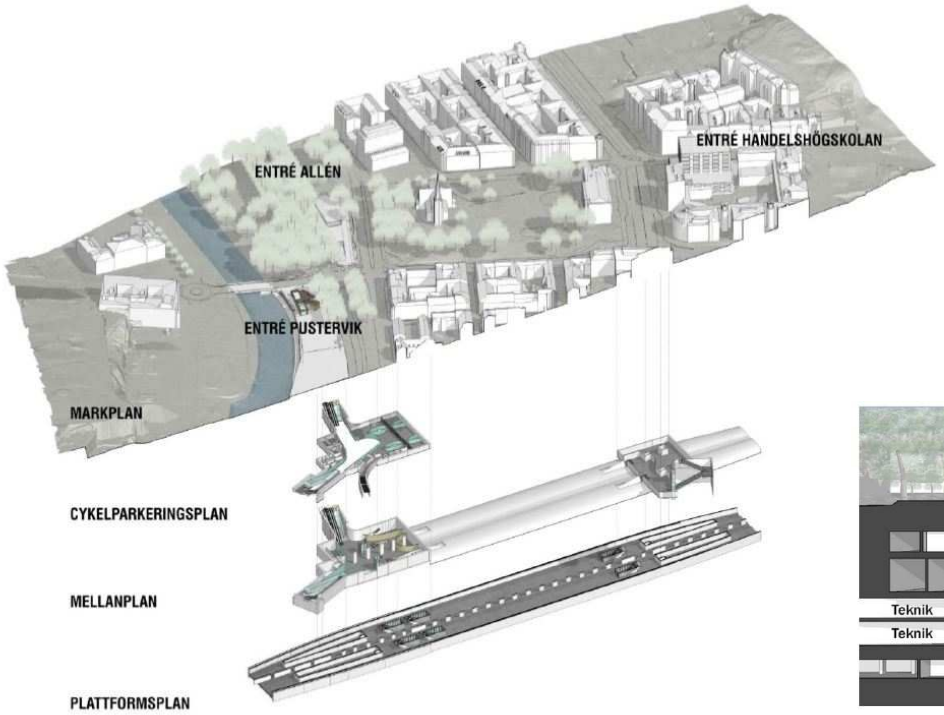


E04 Contract Haga – Schematico tracciato



Dettaglio schematico stazione:
In verde → Zona in argilla
In basso → Zona in roccia

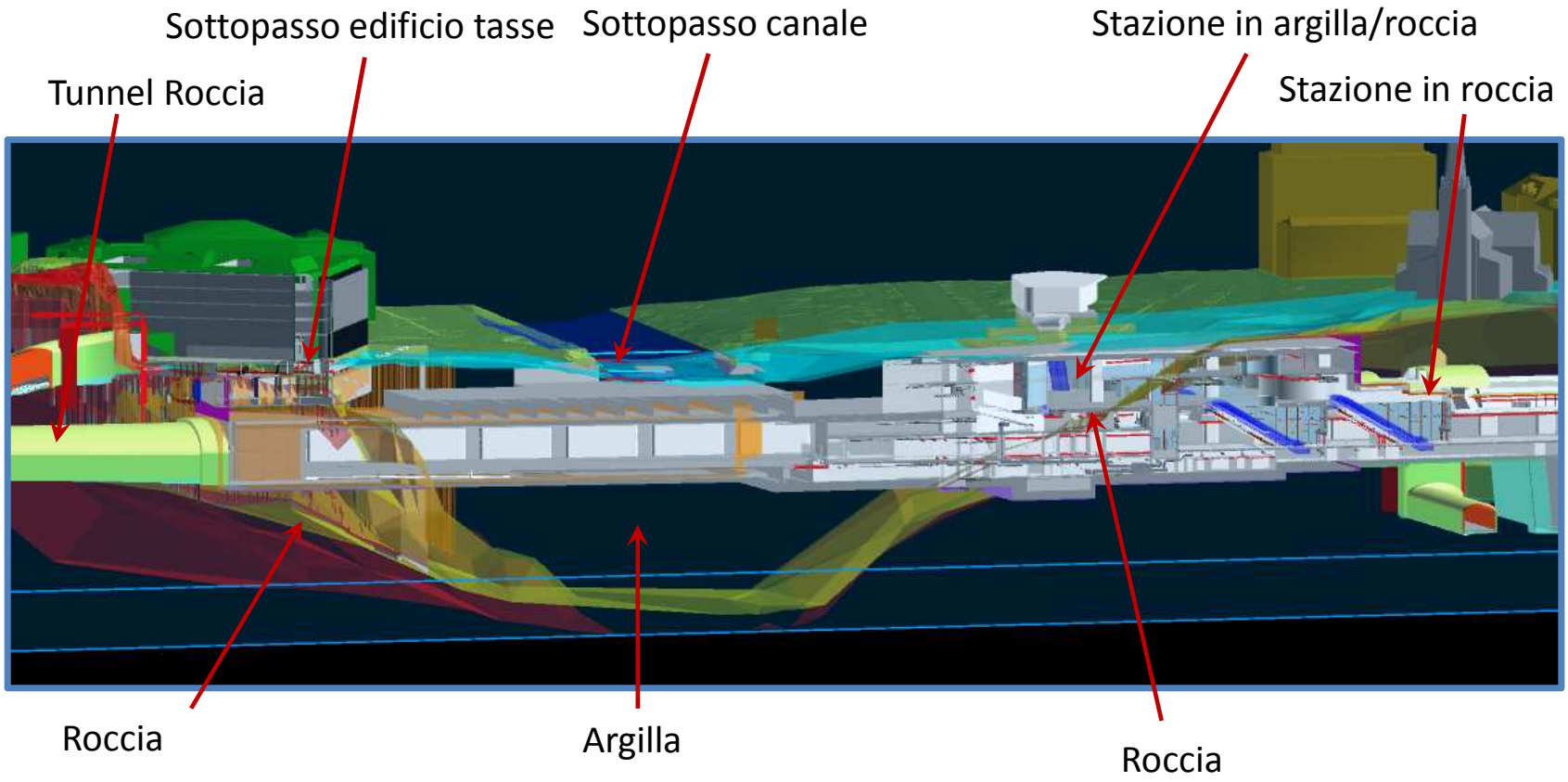
Station Haga



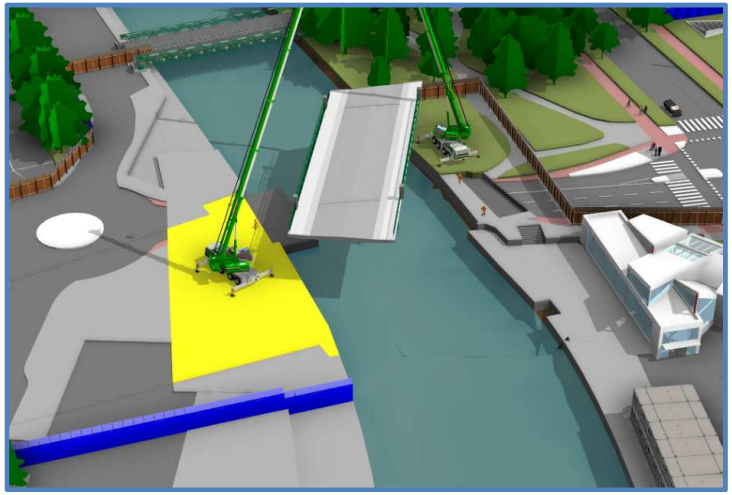
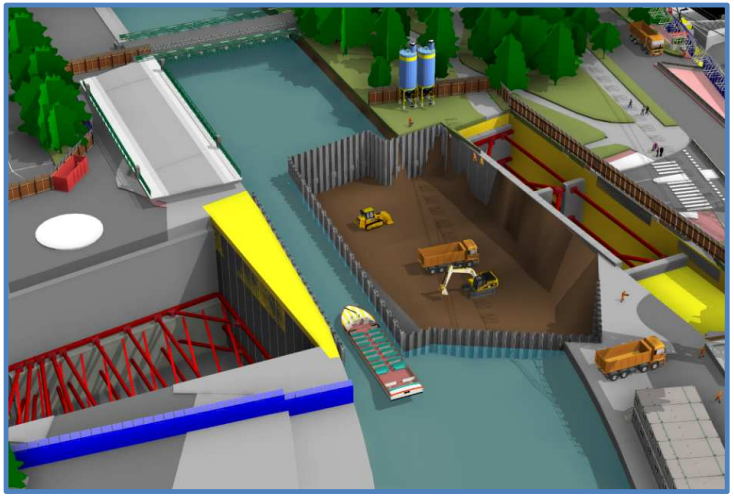
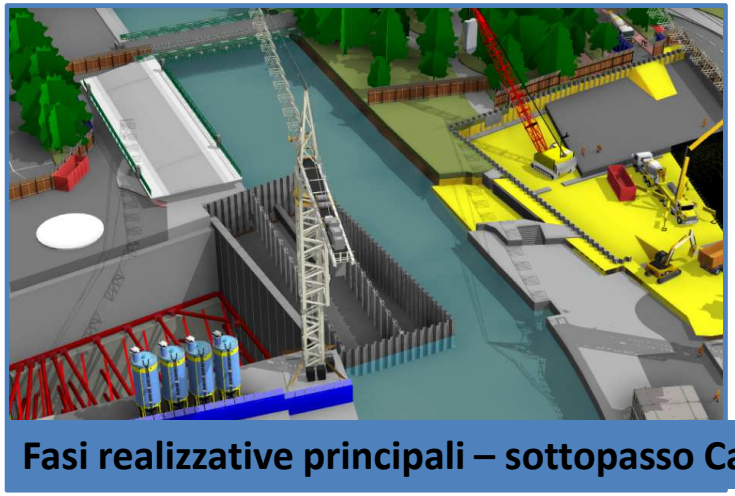
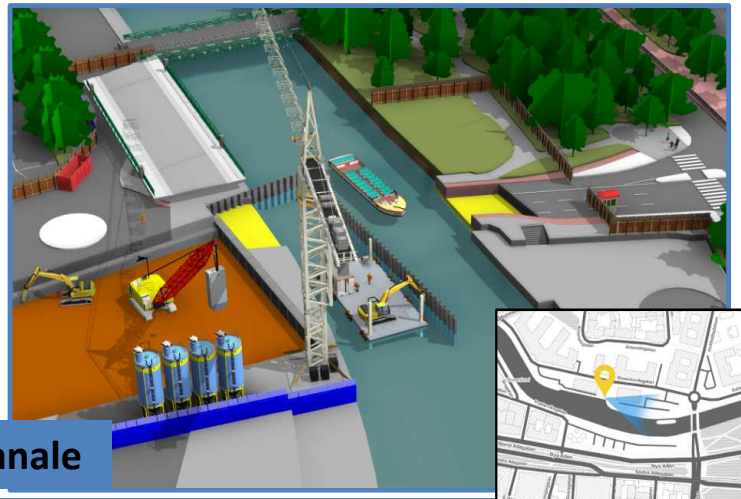
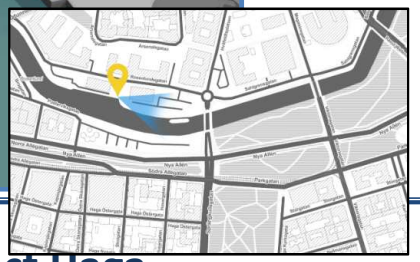
Station Haga - Assonometria

Station Haga – Sezione entrata Nord

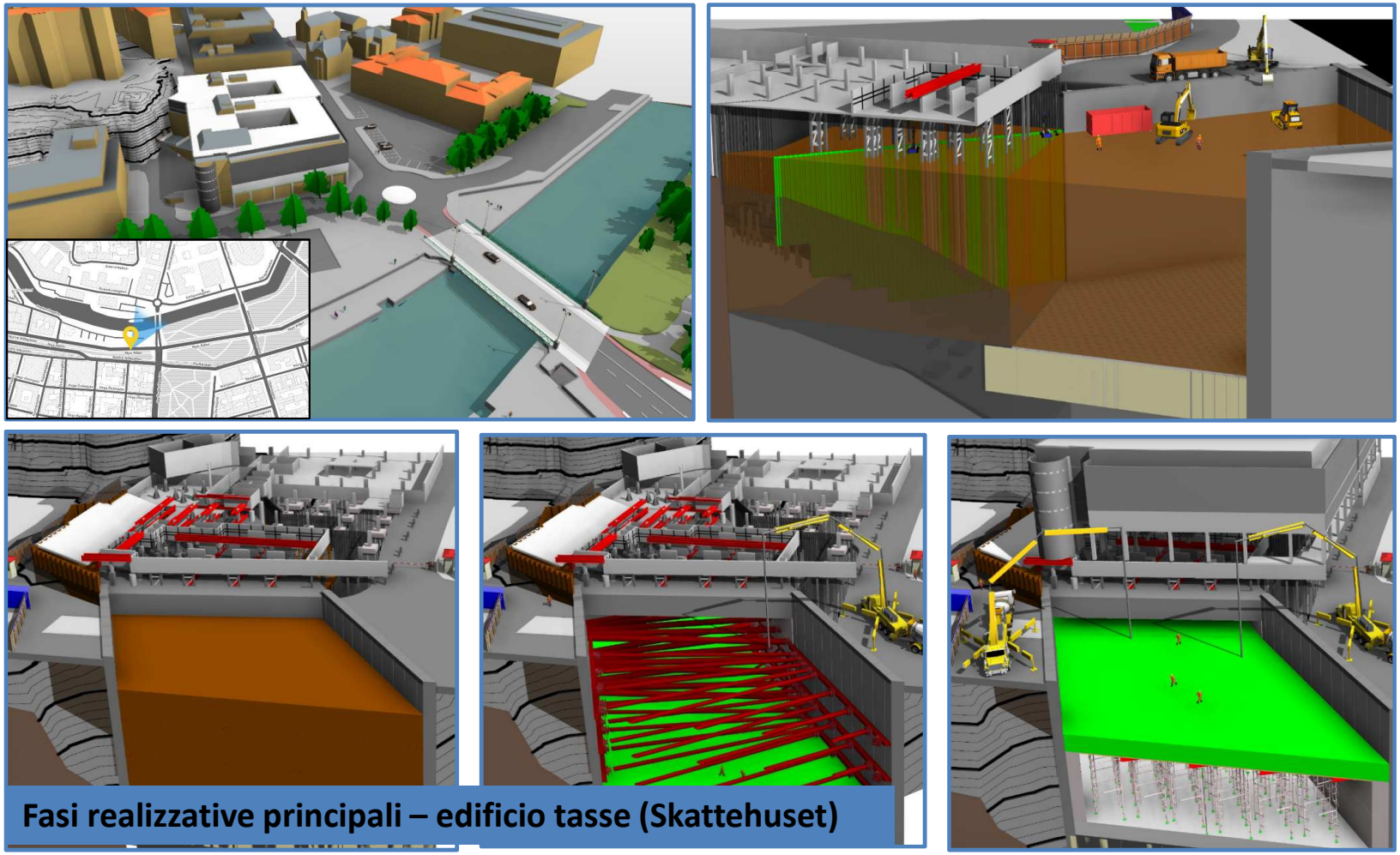
Strutture principali in argilla:



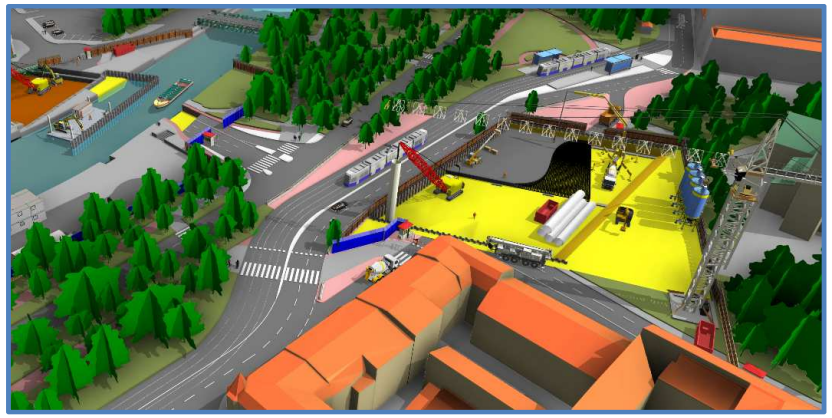
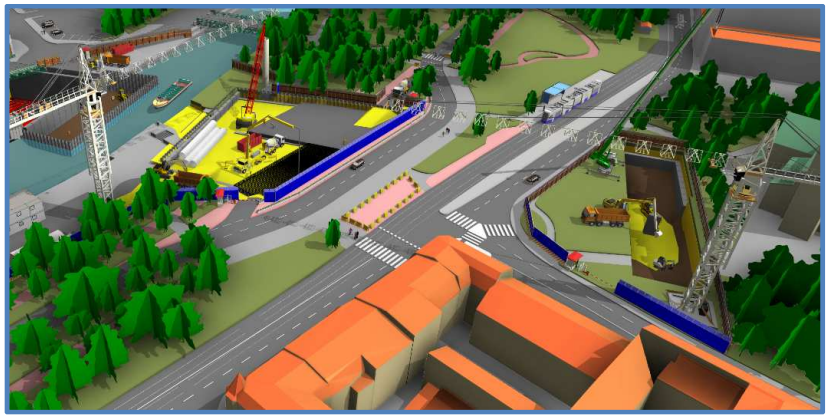
Geologia

Fasi realizzative principali – sottopasso Canale



Fasi realizzative principali – edificio tasse (Skattehuset)

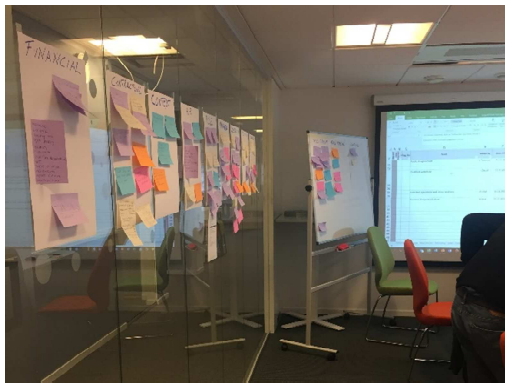



Fasi realizzative principali – Stazione in Argilla

Risk Management JV + Trafikverket

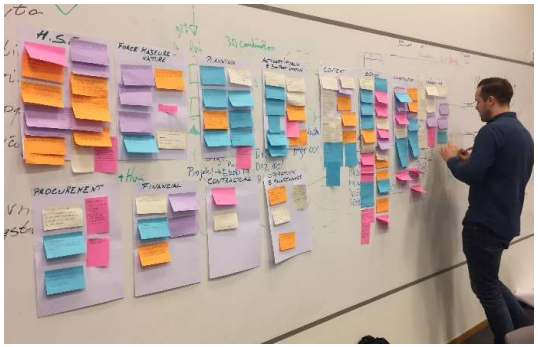
1° Risk Workshop in data 15.11.2017

Iniziata la fase di identificazione dei rischi ed opportunità con la partecipazione attiva di tutto il team di progetto.



2° Risk Workshop in data 06.12.2017

Finalizzata la fase di identificazione dei rischi ed opportunità ed iniziata la fase di valutazione qualitativa degli eventi individuati. Il meeting ha coinvolto il team di progetto ed esponenti chiave da parte del cliente.



Risk Register HAGA Rock Tunnel

AGN HAGA STATION

RISK REGISTER

Hazard Group	Sequence	Reg. n° and Ref. To AGN Risk	Event	Comments Potential Impact	Threat or Opport.	Probability (P)	Probability in Project Period	Eco.Loss to p	Eco.Loss 3P	Harm to ENV	Delay	Fat.&Inj.Wrkrs	Fat.&Inj. 3P	Comp. w. Laws	Risk Score Overall	Final Score	Assessed by	Monitor Date - Last Update	Mitigation Action Plan, what we will do
1	0	Contractual disputes																	
1	0																		
1	1	1.1	Lack of clear definition of the borders between OpenBook and UnitPriced parts may cause mistakes in financial reports	Importance of correct cost allocation during work execution into two separate accountancy system 1) Open Book 2)Unit Priced (TRV will be more involved in Open Book Part) We need to define the procurement process in every detail. Definition has to be made clearly, otherwise there might be conflict within collaboration, also questions about collaboration efficiency. Plus Mistake may cause conflict and financial loss. More clear definitions needed for General Expenses and cost related to Overheads.	Threat	3	Rarely	2	2	0	3	0	0	0	Undesirable	3	Team	15.11.2017	To be defined
1	2	1.2	Transparancy - OpenBook	This is different than Astaldi and Gülermak used to work, Adaptation to transparency has to be done as earliest as possible, otherwise it will cause conflict which mat lead delay of financial compensation	Threat	2	Unlikely	3	0	0	3	0	0	0	Medium	2	Team	15.11.2017	Collaboration (to be defined)
1	3	1.3	Collaboration	Collaboration is established by different parties from three different countries which may cause different understanding of Collaboration between the parties. Also internal risk between the consortium members, It may cause conflict in collaboration if not work, it is an opportunity if works very well.	Opportunity	5	Very likely	5	0	0	5	0	0	5	**Invest**	4	Team	15.11.2017	Meetings and events (to be defined)
1	4	1.4	Coordination between TRV departments	According to our previous experience in other projects, there might be coordination problem between Investment department and operation department of Trafikverket	Threat	2	Unlikely	3	0	0	3	0	0	3	Medium	2	Team	15.11.2017	Close follow up with TRV (to be defined)
1	5	1.5	Coordination with other Contractors (i.e.BEST)	Interfaces has to be defined in detail and on the paper. TRV will coordinate.	Threat	3	Rarely	3	0	0	3	0	0	3	Undesirable	3	Team	15.11.2017	Close follow up with TRV (to be defined)
1	6	1.6	Change Management -	Collaboration may cause unofficial agreements which may lead conflict at later stages.	Threat	3	Rarely	3	0	0	0	0	0	0	Undesirable	3	Team	15.11.2017	Proper collaboration management (to be defined)
1	7	1.7	Hindering Boat Traffic on Rosenlund kanalen	Fine and penalties. Reputation risk.	Threat	4	Likely	2	0	0	2	0	0	0	Undesirable	3	Team	15.11.2017	Tight and punctual scheduling and proper site arrangement needed.
1	8	1.8	Insufficient handling of project changes	This risk is related to the actual actions taken to handle project changes.	Threat	2	Unlikely	3	0	0	3	0	0	0	Medium	2	Team	15.11.2017	Ensure that appropriate change process is in place.A proper document control management system required.
1	9	1.9	Changes to scope of works - substantial	Substantial design change - additional scope. Possible redesign and increase in design fees. Delays to project.	Threat	1	Very Unlikely	4	0	0	4	0	0	0	Undesirable	3	Team	15.11.2017	Technical Department will follow every step in design progress comparing the tender design - Importance has to be given to Biweekly Design Review Meeting

Risk Register HAGA Rock Tunnel

AGN HAGA STATION
RISK REGISTER

Hazard Group	Sequence	Reg. n° and Ref. To AGN Risk	Event	Comments Potential Impact	Threat or Opport.	Probability (P)	Probability in Project Period	Eco.Loss to P.	Eco.Loss 3P	Harm to ENV	Delay	Fat.&Inj.Wrks	Fat.&Inj. 3P	Comp. w. Laws	Risk Sore Overall	Final Score	Assessed by	Monitor Date - Last Update	Mitigation Action Plan, what we will do
2	0	Authority, Public & 3rd Party Interface																	
2	0																		
2	1	2.1	Environmental Court Decision	There is ongoing court for enviromental protests, result of the court may bring limitations, Delay of project because of results in environmental court (bad will)	Threat	2	Unlikely	4	0	0	4	0	0	0	Undesirable	3	Team	15.11.2017	To be defined
2	2	2.2	Public disagreement with West Link and especially with Haga Station	There are ongoing protests against project that can bring conflict with stakeholders and public Even if we have a small issue of environment, it might be exagerated in public opinion Public image of the collaboration is very important, positive image is essential to prevent further problems. Pollution, cutting trees, noise or other disturbance may cause high objection at public. Air pollutuion and tree cutting decisons may change. We may not work as fast as we plan. Removal of trees too early may raise public objection. Trees has to be moved according to schedule, not months before the construction starts	Threat	4	Likely	4	0	0	4	0	0	0	Serious	4	Team	15.11.2017	Review of new Enviromental Decision will be done. Affects will be noted and discussed with TRV. Close relations with public, assign a public relations responsible strickly obey environmental regulations
2	3	2.3	Lack of local knowledge for technical solutions	Contractors are from three different countries, Astaldi and Gülermak have limited experience in the area, which may cause delay in decision making.	Threat	3	Rarely	3	0	0	3	0	0	0	Undesirable	3	Team	15.11.2017	Working with local experts & companies, search for local knowledge
2	4	2.4	Interface between Haga and neighbouring projects and ongoing maintenance works etc. Conflict between Haga Project and maintenance contractors at service tunnel or side contractors Authority interface with stakeholders and surrounding projects	Conflict between Haga Project and maintenance contractors at service tunnel or side contractors There will be ongoing neighbouring projects and other ongoing works like maintenance of other tunnels, may cause conflict and stoppage of works if not coordinated.	Threat	4	Likely	2	0	0	2	0	0	0	Undesirable	3	Team	15.11.2017	Close collaboration with TRV
2	5	2.5	Delay of land access due to Authority interference	Delay on project shcedule	Threat	1	Very Unlikely	4	0	0	4	0	0	0	Undesirable	3	Team	15.11.2017	Close collaboration with TRV & Claim management
2	6	2.6	Delay of approval of fire strategy/calculations by authorities	Delay of approval of fire strategy/calculations by authorities leading to delay of tunnel ventilation systems.	Threat	2	Unlikely	3	0	0	3	0	0	0	Medium	2	E.Güzeller	17.11.2017	At each design step, interim review meetings will be organized resulting consensus with the approval parties.
2	7	2.7	Delay of establishment of power supply to construction sites	Delay in works.	Threat	2	Unlikely	3	0	0	3	0	0	0	Medium	2	E.Güzeller	17.11.2017	Clearly define schedule of electrical connection and ensure early engagement with supplier.
2	8	2.8	Lack of authority approval related to working hours, noise limit, environment	Enviromental court decision is arrived on 31st Jan. Changes may bring further limitations which may delay in works.	Threat	3	Rarely	4	0	0	4	0	0	0	Serious	4	E.Güzeller	17.11.2017	Review of new Enviromental Decision will be done. Affects will be noted and discussed with TRV..Take into account in scheduling these issues. Proper environment monitoring. Close relations with authorities.
2	9	2.9	Project changes due to changes to norms and regulations	Can cause severe delays.	Threat	1	Very Unlikely	4	0		3	0	0	0	Undesirable	3	E.Güzeller	17.11.2017	Check that Designers are familiar with Swedish codes.Be proactive on this issue.
2	10	2.10	Noise and vibrations - primarily during installation of retaining walls	Rather annoying noise and vibrations will occur during normal work hours for a long period. This is known to involve a great deal of noise. Especially Noise during piling	Threat	4	Likely	3	0	3	3	0	0	0	Undesirable	3	Team	15.11.2017	Investigate noise reduction techniques during equipment working
2	11	2.11	Residential and public complaints; Noise, dust, vibrations	Especially retaining walls - water tightness of excavation pit. May result in delays.	Threat	4	Likely	3	0	3	3	0	0	0	Undesirable	3	E.Güzeller	17.11.2017	Communication/Public Relation Manager
2	12	2.12	Residential and public complaints; Traffic	Traffic	Threat	2	Unlikely	3	0	3	3	0	0	0	Medium	2	E.Güzeller	17.11.2017	Communication/Public Relation Manager
2	13	2.13	Residential and public complaints; Pollution,	Pollution,	Threat	2	Unlikely	3	0	3	3	0	0	0	Medium	2	E.Güzeller	17.11.2017	Communication/Public Relation Manager
2	14	2.14	Residential and public complaints; Light	Particularly during winter at residential buildings around the sites	Threat	2	Unlikely	3	0	3	3	0	0	0	Medium	2	E.Güzeller	17.11.2017	Communication/Public Relation Manager
2	15	2.15	Delay of land access due to third party interference	Conflicts with other projects	Threat	3	Rarely	3	4	0	3	0	0	0	Undesirable	3	E.Güzeller	17.11.2017	Close collaboration with TRV & Claim management
2	16	2.16	Public operations disrupted by construction works -	Entrance areas, lifts, pedestrians, users with buildings department, traffic, parking, deliveries, skips, etc.	Threat	3	Rarely	3	3	3	0	0	0	0	Undesirable	3	E.Güzeller	17.11.2017	Respect to time schedule and close communication with authorities.
2	17	2.17	Interactions and communication with the side contractors	Not enough cooperation with other contractors (also BEST) in the West Link in the tunnel BEST and other Westlink contractors.	Threat	3	Rarely	3	0	0	2	1	0	0	Undesirable	3	E.Güzeller	17.11.2017	Being proactive and increase ways of communication.
2	18	2.18	Complications due to simultaneous work during commissioning and testing	Testing and commissioning at the Haga Station and Technical Locations.	Threat	4	Likely	3	0	0	3	2	0	0	Undesirable	3	E.Güzeller	17.11.2017	Ensure construction schedule is developed with the consideration of potential complications.

Risk Register HAGA Rock Tunnel

AGN HAGA STATION
RISK REGISTER

Hazard Group	Sequence	Reg. n° and Ref. To AGN Risk	Event	Comments Potential Impact	Threat or Opport.	Probability (P)	Probability in Project Period	Eco.Loss to p	Eco.Loss 3P	Harm to ENV	Delay	Fat.&Inj.WI x1	Fat.&Inj. 3P	Comp. w. Laws	Risk Score Overal	Final Score	Assessed by	Monitor Date - Last Update	Mitigation Action Plan, what we will do
3	0	Context																	
3	0																		
3	1	3.1	Difficulty with contracts being foreign contractor	Astaldi and Gülermak have limited experience in the area also with local subcontractros and suppliers, may cause lack of understanding the way of business. Most of subcontractors may ask Sweden contracts.	Threat	3	Rarely	3	0	0	0	0	0	0	Undesirable	3	Team	15.11.2017	Use local workforce and advisors
3	2	3.2	Unfamiliarity with legal system	Limited experience with the legal system may cause conflicts.	Threat	2	Unlikely	3	0	0	0	0	0	0	Medium	2	Team	15.11.2017	Legal advisors / Consultants
3	3	3.3	Language, Misunderstanding due to language issues	Communication in different languages may effect understanding by different people, agreeing the same thing. Not only receiving, not only hearing, but understading is important Lack of correct interpretation of words may cause conflict with Trafikverket.	Threat	3	Rarely	2	0	0	0	0	0	0	Medium	2	Team	15.11.2017	Use local workforce and advisors
3	4	3.4	Unfamiliarity with the country	Lack of experience with the local social and political life may cause lack of information on time.	Threat	3	Rarely	2	0	0	0	0	0	0	Medium	2	Team	15.11.2017	Close collaboration with 3rd parties/ events / use of local workforce and advisors
3	6	3.6	Interface and dispute with Stakeholders	Lack of information about stakeholders may cause delay in getting agreements and may cause conflicts. Fortunately Trafikverket is in the Collaboration will help in right decisions. If cooperation with stakeholders did not work, will cause delay. We have time bars but they don't. Rebellion third people, critical relation with stakeholders	Threat	3	Rarely	2	0	0	2	0	0	0	Medium	2	Team	15.11.2017	Colloboration & working with well known subcontractors
3	7	3.7	Dispute with sub-contractors and designers	Lack of information about local business rules may cause delay in getting agreements and may cause conflicts.	Threat	3	Rarely	3	0	0	0	0	0	0	Undesirable	3	Team	15.11.2017	Colloboration & working with well known subcontractors
3	8	3.8	Lack of coordination - Design and Execution teams	Lack of Coordination may cause disputes and conflicts	Threat	2	Unlikely	0	1	0	0	0	0	0	Low	1	Team	15.11.2017	Proper project management & coordination meetings
3	9	3.9	Permits to start work - delay of permits	Lack of experience in the country and required permits mat delay the start of the works	Threat	3	Rarely	2	0		3	0	0	0	Undesirable	3	Team	15.11.2017	Close follow up of permits process
4	0	Health & Safety																	
4	0																		
4	1	4.1	Entrance of 3rd Party in the site _ accident when inside	Theft, or accidential entrance may result unqualified people at site facing health and safety risk	Threat	2	Unlikely	2	2	0	0	3	0	0	Undesirable	3	H.Savurur	21.11.2017	Each employee after the first-day training will have individual site access cards printed with photo, name and company name. Each entrance will be equipped with turnstile with pass control compatible to magnetic cards. Temporary pass cards shall be given to visitors after safety training. Guards will not allowed to access anyone without access cards.
4	2	4.2	HSE risks may particularly occur	Working with the risk of falls from height greater than two meters.	Threat	3	Rarely	0	0	0	3	3	0	0	Undesirable	3	H.Savurur	21.11.2017	Installation of work platforms by licenced company or employees. Periodic control of working scaffolding and ladders. Medical check-up of the employees for working at height. MEWPs (Mobile Elevated Work Platform) operators will be trained (and licenced if needed)
4	3	4.3	HSE risks may particularly occur	Work involving a risk of falling to the same level (= tripping)	Threat	3	Rarely	0	0	0	3	3	0	0	Undesirable	3	H.Savurur	21.11.2017	Medical check-up of the employees, there will be arrangement so that electrical distribution boxes shall be sufficient amount for work activities and cables / pipes will be extended in a safe manner. Cleaning the accesses-egresses and path ways at the end of the shift. Proper and adequate illumunation of the work sites.
4	4	4.4	HSE risks may particularly occur	Work that involves risk being buried under the ground or sink into soft ground.	Threat	3	Rarely	0	0	0	3	3	0	0	Undesirable	3	H.Savurur	21.11.2017	Proper method statement will be prepared for earth works by taken into consideration of soil conditions. Excavation by the hand will be eliminated. Licence of all the operators of the machinery will be checked.
4	5	4.5	HSE risks may particularly occur	Work that could entail exposure to chemical and biological agents. Work that could entail exposure to ionizing radiation. Demolition of structures or hazardous materials or substances	Threat	3	Rarely	0	0	0	3	3	0	0	Undesirable	3	H.Savurur	21.11.2017	All hazardous material will be stored according to theirs MSDS. Employees will be trained for safe usage of the chemicals. Providing communication between specialized team (for radiation and demolition works) and other subcontractors. Arranging safest time for radiation works (i.e. at night). Preparation of safety method statements for demoliation works.

GRAZIE