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**To:** [lanceclarke@lowerchurchillproject.ca](mailto:lanceclarke@lowerchurchillproject.ca)  
**Subject:** Fw: Astaldi Information for MWH  
**Date:** Thursday, October 17, 2013 9:05:01 AM  
**Attachments:** [\\_png](#)  
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[Astaldi - Work History.pdf](#)  
[Astaldi - Proposed Subcontractors Manufacturers and Material Sources.pdf](#)  
[Astaldi - CV's.pdf](#)

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Have you or Paul reviewed this? Gotta be honest...."big" hydro experience doesn't jump off the page in their work history summary to the extent I thought it might....which I think is what MWH is focused on. Who is the guy on their team that has done 12 hydro projects as big or bigger than MF? They seem to have locked onto to that statement. We should highlight that.



**James Meaney, CFA**  
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----- Forwarded by James Meaney/NLHydro on 10/17/2013 08:59 AM -----

From: Scott O'Brien/NLHydro  
To: James Meaney/NLHydro  
Cc: Ron Adamcyk/LCP/NLHydro, Ed Over/LCP/NLHydro  
Date: 10/17/2013 05:55 AM  
Subject: Fwd: (Astaldi Information for MWH)

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Jim

As requested.

Scott

**Scott O'Brien**

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From: "James Meaney" <[JamesMeaney@nalcorenergy.com](mailto:JamesMeaney@nalcorenergy.com)>  
Date: October 10, 2013 at 15:50:59 NDT  
To: "Paul Harrington" <[PHarrington@lowerchurchillproject.ca](mailto:PHarrington@lowerchurchillproject.ca)>,"Lance Clarke"  
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Subject: Astaldi Information for MWH

Hi Folks,

MWH/CBB have asked for the following information on Astaldi:

1. A list of the hydro projects they have completed to date highlighting any prior Canadian experience, experience in cold climates & experience with projects in excess of 500MW
2. A breakdown of the contract price & the final price for each of the projects referenced
3. A list of their principal subcontractors
4. Resumes of principal personnel

Would much of this have been provided as part of their technical submission for the CH0007 RFP....the only one I wasn't sure of was #2? From a timing perspective, we'd need to get this information to them by early next week and possibly be prepared for a call with MWH.

Let me know if you have any questions.

Thanks,  
Jim

James Meaney, CFA  
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Astaldi - Work History.pdf



Astaldi - Proposed Subcontractors Manufacturers and Material Sources.pdf



Astaldi - CV's.pdf



NALCOR ENERGY  
LOWER CHURCHILL PROJECT  
MUSKRAT FALLS

CONSTRUCTION OF INTAKE AND POWERHOUSE, SPILLWAY  
AND TRANSITION DAMS

PACKAGE CH0007  
CORE TECHNICAL PROPOSAL

APPENDIX A1  
TECHNICAL REQUIREMENTS AND QUESTIONNAIRE

ATTACHMENT 1  
**ASTALDI WORK HISTORY**



Work History

Exchange rate used: Bank of Canada on December 17, 2012 - 1.00 EURO = 1.30 CAD.

Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
<b>HYDRAULIC AND HYDROELECTRIC PROJECTS</b>							
1	Albania	Bovilla Hydroelectric Power Plant: Excavation for plant, spillway and tunnels; earth and concrete gravity dam (Vol. 650.000cu.m., H=91m), r.c. intake works (H=61m, sect. 20 sq.m.) , diversion tunnel (L=297m, with arch section wide 3,5 m, high 4m; cap. 150 cu.m./sec.), drain channel, stilling basin, access roads, hydromechanical installations and consolidation works.	10	09/1993	06/1994	12/1996	Ministry of Works - Albanian Water System Board
2	Algeria	Takebt Dam : The Takebt Dam offers an example of a project to collect and carry drinking water. It is an earth dam with a clay core protected by filtering elements and drains, the dam stands 75 metres tall with a peak of 511 metres and boasts a reservoir with a capacity of 175 millions m3 of water. In order to allow for perfect water-tightness, the clay core was built directly on intact rock lying under the alluviums. The works also included a diversion tunnel (which drains approximately 1,250m3 of water per second), an intake tower with four intake points at various levels, a spillway (maximum flow rate of 2,450m3/sec), various drainage tunnels and a control system to check the dam' s safety. . Main Quantity Earth dam ( H=75m, L= 511m) with clay core, volume of excavation : 2,9 millions m3 and volume of embankment 6,3 millions m3 - volume of concrete 80,000m3 for diversion tunnel /bottom outlet tunnel (L= 513m, diameter 7,000mm), intake tower (H = 70m), drainage tunnel (L = 1,420m, section 3x4m) and spillway (capacity 2,450m3/sec)	146	06/1993	07/1993	11/2001	Ministère Des Ressources En Eau - Agence Nationale Des Barrages
3	Algeria	Kramis Dam: The Kramis Dam is a work of great importance for the Orano Region in because it makes it possible to meet the local population' s water requirement and encourages the development of agriculture. The project involves a main earth dam with a clay core (height 48m, length 650m, volume 3,805,200m3) and a smaller dam with similar characteristics (height 21m, length 150m, volume 225,800m3), a reinforced concrete bottom outlet (length 350m, diameter 2,600mm), a reinforced concrete intake tower (height 56m, diameter 3,500mm), a walkway to access the intake tower, a spillway (capacity of 1,161m3/sec), a stilling basin, a tailrace, hydro-electromechanical systems, reinforcement works and access roads	91	08/2001	08/2001	03/2005	Ministère Des Ressources En Eau - Agence Nationale Des Barrages
4	Bolivia	Rio Taquesi Hydroelectric Power Plant: The Rio Taquesi Hydroelectric Power Project is a run-of-river hydroelectric project with an effective capacity of 89.5 MW of renewable electricity. The Project includes two plants in cascade. It is located along the Taquesi and Unduavi Rivers, approximately 90 km northeast of La Paz, Bolivia.Civil works construction for 2 power stations (75 MW), Choilla and Yanacachi. Choilla power station features: access road (5 km), cyclopean concrete dike (20,000 m3), intake works (7 m3/s), headrace tunnel (3,627 m), penstock (d = 1,600 mm – L = 1,274 m), 34 MW powerhouse hall (6 storeys). Yanacachi power station features:diversion tunnel (200 m), cyclopean concrete dike (17,000 m3), intake works (11 m3/s), headrace tunnel (3,627 m) penstock (d = 1,800 mm – L= 1,216 m), 34 MW powerhouse hall (5 storeys). The project positively impacts economic development of the region by producing significantly cheaper electricity for the national grid by utilizing existing site, substation and transmission facilities, reducing project costs per MW and minimizing construction impact. Both temporary and permanent jobs were created during the construction and operation of the plants. The project adds momentum to developing clean independent power production in Bolivia	50	08/1998	08/1998	02/2002	Hidroelectrica Boliviana S.A. - Tenaska (USA)



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5	Chile	Chacayes Hydroelectric Power Plant: The Chacayes Project consists of the following components: Cipreses intake at elevation 1,130 m on the Río Cipreses; Chacayes intake at elevation 1,105 m on the Río Cachapoal; combined design flow from the two intakes of 72.5 m <sup>3</sup> /s; desander for the combined flow from the two intakes;; approximately 7 km of canals and 3.7 km unpressured canal of tunnels; intra-daily peaking storage pond 800,000m <sup>3</sup> ; 2.6 km of pressure tunnel; two shafts; a surface powerhouse with an installed capacity of 111.1 MW (2x55.5MW vertical Francis Turbine (ANDRITZ, manufactured in Schio, Italy), 2x65.6MVA synchronous generators (13.8kV/cosφ 0.9/50Hz) (ANDRITZ, manufactured in Vienna, Austria); an AIS substation and interconnection with SIC grid. Expected annual energy production is about 540GWh. Wildlife preservation: being Los Cipreses National Park one of the few nesting places of Loro Tricahue (a Chilean parrot), a curtain was built to avoid disturbing the fauna. Close the nesting spots this curtain was a 3-meters high wooden wall. These measurements were part of a comprehensive environmental management plan, shared with local entities (winemakers, park rangers) and population. Finally several measurements (e.g. modification of the angle of reflectors installed on powerhouse) were taken to reduce light pollution and electromagnetic pollution (Line-Of-Sight antenna as radio back-up SCADA communication)	277	09/2008	05/2009	10/2011	Spv Chacayes: Pacific Hydro Chile- Astaldi Concessioni (Astaldi' s Project Financing Division)
6	China	The Xiaolangdi dam is located on the Yellow River, near the Luoyang town, in the province of Henan. The contract, given out to the Yellow River Contractors Joint Venture on 28 May 1994, included the building of the following works: partly solid jetty consisting of a earth and rock embankment, with a foundation maximum height of 154 m, crest length of 1,667 m and volume of 50,600,000 m <sup>3</sup> ; stop logs for river diversion, the upstream stop log is a rock and earth embankment of 3,000,000 m <sup>3</sup> in volume; the downstream stop log is a rock and earth embankment of 140,000 m <sup>3</sup> in volume. Reinforcement and sealing work of the dam' s foundations: - membrane built under the upstream stop log with jet-grouting method, for an overall area of 11,000 m <sup>2</sup> and an average depth of approx. 30 m; - membrane in concrete, under the core of the main dam, built with the construction method of bentonite slurry trench. The membrane area (max. depth of 70 meters) is approx. 5,200 m <sup>2</sup> ; - Reinforcement, grouting and drainage works for building a reinforcement shield under the dam. The overall drilling length totaled 138,740 m, the total amount of cement grouted is approximately 50,000 tons. Ancillary civil works: supply and installation of the dam's monitoring instruments, quarry exploitation, permanent road on the dam crest and all the required provisional works. Main quantities: open cut 9,190,000 m <sup>3</sup> ; embankments 50,740,000 m <sup>3</sup> ; concrete works 79,631 m <sup>3</sup> .	458	05/1994	05/1994	01/2001	YRWHDC (Yellow River Water and Hydroelectric Power Development Corporation)



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7	Republic of Congo (ex Zaire)	<p>Inga Hydroelectric Project consists in a series of stages to be completed in a vast scheme to exploit the power potential of the river Zaire, at the Inga rapids, estimated at 40.000 MW. The Company performed the whole project in 3 phases including civil engineering and electro-mechanical works as well as access roads, camps and start-up of the plant. Details of the Works:</p> <p><b>Inga I</b>                      - 2 headrace channels excavated entirely in rock, for a total length of 5 Km. approx., volume of excavation 4.000.000 m3, having a flow of 2.200 and 5.000 cusecs respectively; - buttress dam 600 m. long and 52 m. high, volume of concrete : 210.000 m3; - spillway channel 1.250 m. long with a 780 cusecs flow, volume of excavation 800.000 m3; - 7 earth-rockfill auxiliary dams, volume 2.000.000 m3; - 2 concrete overflow dams with 1.615 long spillway, volume of concrete 60.000 m3; - 6 steel penstocks each 5,50 m. in dia. and 86 m. long, to feed 6 Francis turbines 60 MW each; - open-air power station 135x15 m; outlet channel of the power station.</p> <p><b>Inga II</b>                      - water intake: 4 14,5 m. wide spans; - headrace channel and fore bay 1.000 m. long having a 2.200 cusecs flow, volume of excavation 2.200.000 m3; - 3 massive dams and 1 retaining wall of 130.000 m3; - main dam across the for eBay, having 8 concrete buttresses, 180 m. long and 45 m. high, volume of concrete 160.000 m3; - 8 steel penstocks each 8,50 m. in dia. and 105 m. long; - partially embedded (60 m.) open-air power station 320x46 m., volume of concrete 250.000 m3; - electro-mechanical installation of the 8 160 MW Francis turbines, 56,20 m. useful head, 365 cusecs flow, rotation rate 107 r.p.m., total output 1.280 MW, annual output 9,5 billion KWH; - control buildings; - transformers; - sub-station.</p> <p><b>Inga II bis</b>                      - building structures for the installation of the second series of penstocks No. 5 6 7 and 8; - assembling of suction fans, turbines and penstocks; - accessory works in the penstocks area and in the transformers area, upstream the powerhouse.                      Main Quantity: total volume of excavation (mostly rock) 21.000.000 m3; total volume of concrete 1.700.000 m3.</p>	598	05/1968	05/1968	07/1981	SNEL
8	Costa Rica	<p>Hydraulic Project of Sandillal Dam: Construction of earth dam (L= 48) with spillway consisting of: earthworks 1.530.000 m3, r.c. 31.000 m3, stiffening steel 1.370 t.</p>	13	05/1991	05/1991	10/1992	ICE (Instituto Costarricense de Electricidad)
9	Costa Rica	<p>Pirris Hydroelectric Project: Construction of a RCC (Roller Compacted Dam), triangular section; intake tower leaning on the dam's upstream face; bottom outlet box culvert; spillway consisting in a concrete chute and a ski jump as dissipation structure; stilling pond and a downstream auxiliary concrete dam; diversion works consisting in an RCC upstream cofferdam and a rock fill downstream cofferdam, diversion tunnel with an horseshoe section. Design, supply and install of electromechanical works and instrumentation.                      Main Quantity Construction:                      Height of the dam: 113 m; Length of the dam's crest: 266 m; RCC volume: 728,000 m3; Total concrete: 140,000 m3; Steel reinforcement: 1,700 tons; Diversion tunnel length 373 m, tunnel's section area 42 m2, n° 1 sluice gate 7 x 6 m; Intake's design flow 18 m3/1" , n° 1 sluice gate 3,25 x 3,25 m; Bottom discharge culvert with steel lining, section 3,7 x 4,8 m, n° 1 emergency sluice gate 3,7 x 4,8 m, n° 1 regulation radial gate 3,7 x 4,8 m; Spillway with three sections, total width 42,1 m, crest with a create profile, design flow 2,350 m3/1" , n° 3 radial gates 11,7 x 10,5 m, n° 1 stop log gate 11,7 x 10,5, n° 1 gantry crane capacity 30 t; Auxiliary dam at the end of the stilling pond, 27 m high, 51 m long; Supply and install dam instrumentation.                      Design, supply and installation:                      N° 1 elevator; Intercommunication and Louds peaking Equipment; Remote Control System and Intake Monitoring; N° 1 Gantry Crane; N° 1 Emergency Diesel Plant; N° 1 Trash-rack Cleaner; Drainage System; Electric System (Power Supply and Lighting); Electrical Service Equipment; Water Level Measuring Equipment; Ventilation of the Galleries; Access System for Gate House.</p>	126	08/2006	08/2006	03/2012	Instituto Costarricense De Electricidad



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10	Honduras	Nispero Hydroelectric Plant: The plant is located on the Palaja river approx. 40 Km. from the Yojoa Lake and has a head of nearly 175 m. An access road to the site is also included in the contract. Details of the Works: concrete water intake; 7 m. high retention dam with chute spillway; 300 m. long diversion: Earth excavation 610.000 m3; Rock excavation 110.000 m3; Embankment 280.000 m3; Underground excavation 2.550 m3; Drilling 2.250 m; Concrete 33.750 m3; Reinforcing steel 1.500 tons; Penstocks 210 tons; Bentonite gates 7.800 m2; Earthworks for the road 710.000 m3; channel with inlet sluice gate; 2 Km. long adduction tunnel, concrete lined; vertical shaft 150 m. high with a 3,00 m. inner dia.; 200 m. long and 2,80 m. dia. steel penstock embedded in the rock; slurry trench: 8.000 m2; open-air power station with a 22.5 MW generating unit (Francis turbine); electro-mechanical installations.	42	05/1979	05/1979	09/1982	ENEE (Empresa Nacional de Energia Elctrica)
11	Honduras	El Cajon Hydroelectric Powerplant: The plant is located on the Humuya River about 80 Km. south-east of San Pedro Sula, in the central part of Honduras. Lot 1 - awarded to the Company - including the underground powerhouse and appurtenant works. Details of the Works: powerhouse in cavern 110x49x29,5 m. (max. dim.) underground excavation: 108.000 m3 volume of concrete: 29.000 m3 equipped with 4 Francis-type 75 MW units; access tunnel to the cavern 600 m. in length, section 83 m2; two 43° inclined pressure shafts (with horizontal and vertical ends and final bifurcation) 200 m each in length, section 19 m2; 4 tailrace tunnels under the river's level 100 m. in length, section 17 m2; 4 bulkhead shafts with elliptic section 3.40x6.50 m., 25 m. high; service galleries and rooms for a total length of 1.800 m. with various sections from 19 to 25 m2; inclined aeration shafts dia. 2.20 m., 90 m. long, lined with shot-Crete, excavated from bottom to top; adit to the lower part of the powerhouse 5.00x6.00 m., 13% gradient with bifurcation to the penstocks total length 250 m; adits to the vault of the powerhouse 250 m. long, 5.50 x 5.00 m; outdoor switchyard (154x140 m), including steel structures; extension of the existing switchyards of El Progreso (150x60 m) and Suyapa (200x100 m), including steel structures; switchyard control building; supply, transport, erection and installation of all auxiliary electro-mechanical equipment; transport, erection and installation of electro-mechanical equipment and steel hydraulic structures supplied by the Employer.	160	05/1980	05/1980	03/1985	ENEE (Empresa Nacional de Energia Elctrica)
12	Honduras	El Coyolar Dam: Construction of a RCC dam leaning on the existing dam, the construction of a concrete spillway, two drainage tunnels in the abutments of the dam, consolidation works by drilling and injections in the masonry dams and a waterproof blanket. Main Quantities : rollcrete 40.000 m <sup>3</sup> ; reinforced concrete 6.000 m <sup>3</sup> ; tunnel excavation 1.600 m <sup>3</sup> - drilling 6.500 m cement grouting 400.000 kg	10	10/1994	03/1995	06/1996	Ministerio de Recursos Naturales, Dirección General de Recursos Hidricos
13	Honduras	Concepcion Dam is the first roller compacted concrete dam built in Central America. Its maximum height is 68 m and its lenght in crest is 695 m. The spillway on the left abutment is made by a channel lined with conventional concrete (10.000 cu.m.) 80 m wide and 120 m long. Total RCC volume is 380.000 cu.m.. The total volume of the dam and spillway excavations has been of 150.000 cu.m. The greatest part of excavations is made in decomposed rock that has required the use of explosive for almost the 80% of its volume. Resulting from the geological investigations, it has been considered adequate using, as aggregate for RCC, the rock of the same geological formation that also constitutes the foundations of the dam. This rock is mixed with suitable natural materials, extracted from alluvional deposits located 1 Km. upstream the dam. To waterproof the upstream face, it has been adopted a sys-tem which avoids 100% water filtration in the dam body. The project includes also the construction of: - an intake structure made of a vertical tower; - an inlet tunnel under the dam; - a water plant and booster stations - a steel watermain to Tegucigalpa town 9.500 m. long, diameter 1.100/1.000/900 mm.; - a unlined tunnel 600 m. long with an excavation diameter of 4,20x3,80 m.; - a water treatment plant with a capacity 1.500 lt/sec.; - access roads: 5.000 m. All electro-mechanical supplies and installations are included in the contract.	50	12/1988	12/1988	12/1990	SANAA (Servicio Nacional de Acueductos y Alcantarilados)



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14	Honduras	Development of Water Resources for Valle de Nacaome Project: Nacaome Dam. Construction of a rolled compacted concrete (RCC) dam (volume of concrete: 315.000 m3) part is built in rock fill (250.000 m3), H=48m, L=295m, impermeabilization upper bank in PVC (7.000 m2), basin (capacity 40.000.000 m3), spillway in c.a. (4.000 m3/s), intake tower (H=54m), penstock (L= 400 m, dia. 4 m), pumping station (4,6 m3/s) and pipeline in r.c. (L= 40 Km, dia. 400÷1.200 mm).	98	05/1993	05/1993	10/2001	Ministerio de Recursos Naturales, Dirección General de Recursos Hidricos
15	Honduras	Development of Water Resources of Valley of Nacaome : The scope of works is the realization of a water basin of 43.000.000 m3 for drinking water and irrigation water supply to the Nacaome Valley. Dam: The central embankment and the right side of the dam are built in rolled compacted concrete (RCC), the left side is built in rock fill with waterproofing core in cement-bentonite. Length of approx. 295.00 m. from station 0+040 up to station 0+335.40; minimum height of approx. 90.00 meters a.s.l.; maximum crest height of 137.50 meters a.s.l.. Spillway: It is built on the central embankment of the dam between station 0+104.45 and station 0+217,25 towards the centre line of the dam; perpendicular longitude to the centre line of the dam: 89.11 m.. The structure consists of the following: Spillway channel: height from crest: 129.00 meters a.s.l.. Gradient: 0.8 - H: 1V, max. height a.s.l.: 121.00 metres; min. height: 89.00 meters a.s.l.. Stilling basin: height a.s.l.: 89.00 meters equipped with vertical weir crest on the toe Intake structure: It is built on the left side of the dam and consists of a mat from elevation 80.00 up to elevation 93.00 meters a.s.l.; the intake tower is built at an elevation of 93.00 and 137.50 meters a.s.l.. The volume of concrete used is 22,700 m3. Outlet tunnel: It is made of an open excavation with trapezoid-shaped section starting at an elevation of 83.00 meters a.s.l. and a gradient of 1:1.000. Penstock: It consists of 400 meters of underground iron pipeline of 4 meters in diameter. Main Quantity Construction of a rolled compacted concrete (RCC) dam (volume of concrete: 315.000 m3) part is built in rock fill (250.000 m3), H=48m, L=295m, impermeabilization upper bank in PVC (7.000 m2), basin (capacity 40.000.000 m3), spillway in c.a. (4.000 m3/s), intake tower (H=54m), penstock (L= 400 m, dia. 4 m), pumping station (4,6 m3/s) and pipeline in r.c. (L= 40 Km, dia. 400÷1.200 mm).	98	05/1993	05/1993	10/2001	Ministerio de Recursos Naturales – Dirección General de Recursos Hidricos
16	Indonesia	Hydroelectric Power Plant In Balambano: The Balambano dam project sprang from the need to increase electric power production so as to supply the industrial extraction area used to produce nickel located on the island of Sulawesi in Indonesia. The works involved the construction of a RCC dam with a volume of 520,000m3, a hydroelectric plant equipped with two 137MW Francis turbines, a diversion tunnel, cofferdams, a spillway, an intake structure and 2 penstocks measuring 320 metres in length and with a diameter of 5 metres plus ancillary works. The total duration of the works was three years thanks to the RCC technique used. Astaldi had acquired considerable experience in using said technique with the Concepción and Nacaome plants in Honduras. An upstream face lined with an impermeable geomembrane was also the choice for the Balambano dam (surface area of 17,730m2); a technical solution which made it possible to get round one of the limits of RCC technology represented by the dam's permeability. Main Quantity: Construction of a RCC (520,000m3) dam (H=95m, L=365m), drainage (L= 9300m, dia. 100mm), impermeabilization of upper bank in PVC (17,730m2), spillway in r. c. (37,000m3), intake works in r. c. (32,000m3), reinforced concrete penstock (L= 320m, dia. 5m); civil works for the Hydraulic Power Plant (12,000m3); steel bridges (274t) and access roads.	86	10/1996	10/1996	09/1999	P.t. Inco indonesia





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17	Italy	Design and construction "turnkey" of the Pont Ventoux-Susa hydroelectric plant Final: 150MW pumping-storage HPP with mean 457GWh/y production. Design and construction "turnkey" of: intake structure (34 cu/sec), storage tank (560,000 m3), headrace tunnel (14km, dia. 4m), pressure tunnel (4.5km, dia. 4m), surge tank lined in r.c. (H= 80 m, dia. 12m), steel penstock (1.5km, dia. 4÷2.8m), access tunnel to the plant (1.3 km, size 6x8m), underground power station (size 18x41x48 m) equipped with 2 Francis turbines (production: 150 MW) and a pump (flow: 13 cu/sec, discharge head: 515,5 m), technological installations, start-up and management of the plant for the initial period. E&M equipment is divided in two groups: binary (vertical axis Francis turbine and generator) and tertiary (turbine, generator and pump) equipment. Pumping is foreseen overnight when the electricity price at spot market drops due to imports of nuclear power from nearby France. The plant is connected to Venaus substation via a 132kV line. It is the first project in Italy which has implemented and obtained the V.I.A. procedure (Assessment of Environmental Impact) and develops mostly underground. The work, entrusted as construction concession, includes: Implementation of the authorization, Expropriating procedure and purchase of the areas' real rights, Elaboration of the executive project, Elaboration of the construction project, Realization of civil, electromechanical and electronic works, Provisional management of the plant, Training and assistance to the personnel of the Customer. Driven and managed by means of a sophisticated control system, it guarantees the maximum safety under all aspects and has important environmental operative and functional characteristics. Gorge of Susa dam: Max. height of the retention barrage: 29.70 m; Crest length: 88.50 m ,Reservoir capacity: 420,000 m3 ,Non-utilized capacity: 15,000 m3; Elevation of max. storage: 531.20 m a.s.l. , Spillway elevation: 536.69 m a.s.l.; Elevation of min. storage: 515 m a.s.l.; Temporary diversion tunnel and bottom outlet: 285 m in length; Demodulation tunnel: 530 m in length; Volume of the body of dam: 47,000 m3	460	01/1995	03/1995	02/2006	Former Aem (Municipality Of Turin), Currently Iride Energia S.P.A
18	Italy	Palazzo II HEPP : Mormanno dam and intake works: Construction of a concrete gravity dam (L= 250 m, concrete : 26.800 cu.m.), intake works of the water to the Mormanno stilling basin for Palazzo II Hydroelectric Power Plant, pressure diversion tunnel, r.c. surface discharge (cap. 1.000 m3/sec) .	12	01/1990	01/1990	02/1995	ENEL
19	Italy	Satriano Hydroelectric Power Plant / Cardinale Dam 1° Phase - 2nd Phase A r.c. arch-gravity dam (H=25m, L=126,5m, r.c. =26.500m3 ); (1 phase) semi-underground powerhouse 50MW (r.c.=5.100m3) and steel penstock (L=490, dia. 1,75m) of the plant; (2nd phase): completion works of the inlet tunnel of Beltrame stream and a pressure diversion tunnel (L=1.265m, dia. 2,80m).	33	11/1986	12/1986	09/1993	ENEL
20	Italy	Retaining dam on the Lampeggiano stream: Construction: earth arch-gravity dam, H=32 m, L=420 m (volume 630.000 m3), upper bank coating in bitumen conglomerate (27.000 m2), basin (capacity 6.000.000 m3); works in r.c. (60.000 m3) including spillway , headrace and tailrace, bottom outlet tunnel (L= 528m, dia. 4,20m, flow 50 m3/s), manhole, pressure tunnel (dia. 1.000 mm)	26	06/1988	06/1988	11/1992	Consorzio di Bonifica Apulo Lucano - Bari
21	Italy	Construction of the Blufi Dam on Southern Imera River: Construction of a part of an earth dam with clay core. The crest is 710 m long, 10 m wide and max. height 68 m.. Embankment volume 4.785.000 cu.m. core volume 855.000 cu.m. spillway capacity 1.000 cu.m./sec. lower spillway capacity 120 cu.m./sec.	52	08/1989	12/1990	04/1996	Regione Siciliana - Ente Acquedotti Siciliani - Palermo, Italy
22	Italy	Arcichiaro Dam Completion works: Construction of an earth dam (1.600.000 cu.m., H=69 m, L=940 m), reservoir (capacity 12.500.000 cu.m.), impermeabilization of upper bank with bituminous concrete layers (140.000 sq.m.), bottom outlet tunnel (L= 450m, dia. 5m, flow 195 cu.m/s), reinforced concrete spillway (L= 80m, flow 900 cu.m/s) and access roads.	32	11/1998	09/1998	08/2001	E.R.I.M.(Ente Risorse Idriche Molise)



## Work History

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Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
23	Morocco	Sidi Said Dam on Oued Mouloya Construction of an arch-gravity RCC dam (L=600m, H=115m, RCC=600.000cu.m.), main spillway (cap. 1.432 m3/s), auxiliary spillway (cap. 2.097 m3/s), bottom outlet rectangular sect.(dim. 3,20x4,90m, cap. 410 m3/s), tower intake for drinking water (cap. 1 m3/s), intake works for irrigation (cap. 50 m3/s), r.c. diversion tunnel rectangular sect. (L=94m, dim. 4,50x6,10m, cap. 400 m3/s).	61	12/2000	04/2001	05/2006	Ministère de l'Équipement - Direction Général de l'Hydraulique
24	Mozambique	Pequeños Libombos Hydroelectric Scheme: Earthfill dam: maximum height 46.00 m; Maximum width: 198.30 m; Crest elevation: 51.50 m a s.l.; length of crest 1540.00 m; width of crest: 8.00 m; volume of excavations: 500,000.00 volume of dam: 3,200,000.00 m³.	78	1983	1983	1988	Ministerio dos Obras Publicas e Habitação Direcção Nacional se Aguas
25	Rwanda	Ruzizi River Dam: Concrete dam with 2 gates, 2 channels excavated in rock and under water, excavation volume: 25.000 cu.m.	3	10/1974	10/1974	06/1976	SNEL
26	Turkey	Sir Hydrelectric Plant in Ceyan River: Construction of a concrete arch-cupola dam (l=342m, h=120m, r.c. 310.000 m3), access tunnels to the plant and in crest of the dam in r.c. (l. 1.230m, dia. 6.200 mm, tot. 19.850m3), intake works (cap. 115 m3/sec. each), 3 steel penstocks (total length = 186m, dia. 5.300 mm); power plant (dim. 30x80m, concrete 40.000m3), 3 vertical axis turbines type Francis; and 3 generators (cap. 315 mva), surface spillway (cap. 7.460m3/sec.), construction of the drain channel rectangular section (dim. 4x5m, cap. 700m3/sec.), stilling basin, upstream cofferdam in rcc (38.000m3), storage basin cap. 1.162.000m3 .	102	10/1986	06/1987	01/1991	Cukurova Elektrik A.S.
27	Turkey	Karakaya hydroelectric plant in Euftrate River: The hydroelectric plant of Karakaya was the second of three such plants to be realized by the Turkish Energy Department (D.S.I) for the exploitation of the upper course of the Euphrates. The contribution of the Karakaya Dam to this programme consisted of 7.354 million Kw.h. produced, with an installed power of 1.800 Mw. The plant, in the province of Diyarbakir, an ancient outpost of the Roman garrisons was installed in the area against the indomitable Parthians. The works comprised: a concrete dam of the gravity arch type which is 173 metres high and 462 metres long, with a maximum base thickness of 52 metres, a minimum crowning of 10 metres and a total volume of 2.000.000 cubic metres; a power station at the foot of the dam with 6 Francis groups, each of 300 Mw, fed by an equal number of intakes and penstocks incorporated within the dam. The building of the power station was of exceptional size: 184 x 81 x 60 metres and for its realization demanded 600.000 cubic metres of reinforced concrete and with approximately 40.000 tons of ribbed steel; a spillway with ten ports, each of which controlled by a radial sluice gate, a chute along the face of the dam, a passageway above the roof of the Power Station and a final spectacular springboard with a water jump the capacity of which can reach 17.000 cubic metres/second in the underlying lake determined by the Ataturk Dam. The construction of this work had previously required the deviation of the River Euphrates by way of two diversion tunnels excavated in the right bank of a diameter of 11.5 metres and a length respectively of 568 and 698 metres; an upstream cofferdam of a height of 50 metres, with a volume of 450.000 cubic metres of rock fill, as well 1 as a counter cofferdam placed downstream having a height of 12 metres with a volume of 100.000 cubic metres.	598	09/1976	09/1976	12/1987	D.S.I. (Devlet Su Isleri) Ministry of Power and Natural Resources - General Directorate of State Hydraulic Works



Work History

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Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
28	Venezuela	San Agaton Hydroelectric Powerplant: The plant is part of the project for the exploitation of the Uribante and Caparo rivers. It consists in the construction of a powerhouse, an inlet tunnel, related civil engineering works and the installation of electro-mechanical equipment. Details of the Works: - civil works and electro-mechanical installations for the open-air 175 MW powerhouse equipped with 2 units; - 2 access inspection tunnels having a total length of 900 m with 6 to 9 m. dia.; - inlet tunnel 8.000 m. long with a 6,70 m. inner dia., concrete lined over 6.900 m. and steel lined in the remaining 1.100 m.; - 2 underground penstocks, each 350 m. long, steel lined; with a 4,5 m. inner dia.; - 1.500 m. long 2,4 m. inner dia. drainage tunnel of the penstocks and the inlet tunnel; - vertical shaft for the control installations of the gates of the water intake, 60 m. high with a 9,00 m. inner dia.; - surge tank, concrete lined, 13 m. deep with a 13,5 m. inner dia.; - vertical shaft linking the 2 sections of the inlet tunnel, 300 m. deep with a 6,70 m. inner dia.; - power station equipped with 2 150 MW Pelton turbines; - access roads. Main Quantity: underground excavation 365.000 m3; open-air excavation 1.500.000 m3; embankment and protection works 300.000 m3; concrete (above ground) 70.000 m3; concrete (underground) 200.000 m3; penstocks steel 3.500 tons.	256	01/1979	01/1979	05/1987	CADAFE - C.A. de Administracion y Fomento Electrico

TRANSPORTATION INFRASTRUCTURE: ROAD AND RAILWAY WORKS							
Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
29	Algeria	East-West Highway, Oued Fodda - Khemis Millana Section ( 73 Km): Sub contractor for structural works: Motorway section (73 km long) including the construction of 5 viaducts (totalling 1,757 m in length and 59,262 sq. m of deck); 7 overpasses (totalling 353 m in length and 3,676 sq.m. of deck); 7 box-shaped underpasses (total area 4,900 sq. m); construction of piles (20.360 m - dia 1.200 mm) totalling 23.000 cu. m. of concrete, 1.227 pre-stressed beams of various type (overall length 36.732 m totalling 18.810 cu. m. of concrete), concrete for foundations, abutments, piers, pulvinos and scaffolding totalling 58,180 cu. m., H.A. steel 9.600 tons and harmonic steel for pre-stressed r.c. ton 1.100; excavations 63.000 cu.m., filling material 65.000 cu.m	155	12/2004	01/2006	09/2009	ANA (Agence Nationale des Autoroutes)
30	Florida (USA)	PGA Blvd. (SR786 at Alt. A1A): The Project took the at-grade Railroad Crossing and made a flyover interchange. The Project consisted of the Construction of SR 786 (PGA Blvd.) over the top of the FEC Railroad and Alternate A1A with new interchange ramps to old Dixie Highway and new ramp to I-95 over the top of the FEC Railroad. In addition there was the installation of traffic separator and pedestrian walkway, with architectural elements such as MSE Planter walls and architectural Towers. All roadway pavement was done by asphalt paving. Main Quantity Three concrete Florida U beam bridges one with an overall length of 250 LF and two bridges with an overall length of 410 LF. In addition there was one structural steel curved bridge with an overall length of 650 LF. The substructure consisted of 4,865 LF of 36" diameter post grouted drill shafts, 180650 Square feet of MSE retaining / planter walls and 338,143 Cubic Yards of embankment.	33	06/2001	01/2002	07/2005	FDOT (Florida Department of Transportation) - District 4
31	Florida (USA)	SR 826 (Palmetto Expressway): Asphalt reconstruction and widening of the major interchange described as the Palmetto Expressway and NW 36th Street. Stretching 1.2 miles (1.9 km) along Mainline SR 826 and 0.5 miles (800 m) along NW 36th Street. Reconstruction of Mainline bridges over Dressel' s Dairy Canal using AASHTO Type II prestressed concrete beams. Widening of NW 36th Street Bridge over Dressel' s Dairy Canal. Raising Mainline by 8 feet (2.4 m) to increase clearance along NW 36th Street. Dredging of Dressel' s Dairy Canal to increase flow volume and Maintenance of traffic (MOT) using 10 phases and allowing a minimum of 8 lanes of mainline traffic at all times. Main Quantity Replacement of Mainline bridges over NW 36th Street with 175 LF (53 m) simple span bridge with overall width of 230 LF (70 m) using 7 foot (2.1 m) structural steel girders. Additional embankment of over 280,000 CY (215,000 CM). Improvements to signalization, lighting and drainage including over 7,700 LF (2.3 km) of French drain systems and asphalt paving. Construction of containment wall system for the removal of approximately 80,000 CY (61,000 CM) of solid waste.	37	01/2004	01/2004	09/2006	FDOT (Florida Department of Transportation) - District 6



Work History

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Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
32	Florida (USA)	Santa Barbra Blvd. (Davis Blvd. to Copper Leaf Lane & Radio Road Santa Barbra to Davis Blvd.): The Project included the expansion and improvement of Santa Barbra Blvd. from 4 lanes to six lanes for 5.25 mile and Radio Road from two lanes to four lanes for 1.22 miles. The scope of work also included bridge widening over interstate I-75 and Golden Gate Canal, asphalt works, drainage improvements, utility relocations, noise walls, signalization and roadway lighting along with landscaping improvements. Major Works The Project consisted of 171,068 Cubic yards of embankment, 37,029 linear feet of drainage pipe in various sizes from 18" to 54" . There were 178,624 Square Yards of Base Rock and 72,507 Tons of Asphalt and 70,616 Square feet of Sound walls.	62	11/2006	02/2006	07/2009	Collier County, Mr. Jay Ahmad, P.E. Transportation Engineering Department Director
33	Florida (USA)	Santa Barbara Boulevard Extension (Rattlesnake Hammock Road to Davis Blvd.): Santa Barbara Boulevard Extension is a roadway project to extend Santa Barbara Boulevard south of Davis Boulevard to Rattlesnake Hammock Road in Collier County - Florida. The project length is approximately 2,1 miles (3,3 km) and the new roadway section is a four lanes divided road with new sidewalks, curbs and gutters, landscaping and new lighting and signalization system. Main quantities of work are as follows: Excavation: 274,130 cubic yards; Embankment: 216,386 cubic yards; Superpave asphalt: 116,800 square yards; Noise concrete barrier walls: 60,736 square feet; Asphaltic friction course: 140,759 square yards; Drainage concrete pipes (various diameters): 24,730 linear feet; Sidewalks: 14,003 square feet; Curbs and gutters: 42,036 linear feet.	19	09/2008	01/2009	07/2010	Collier County Board of County Commissioners
34	Florida (USA)	West Palm Beach - SR 9 (I-95) 12th Avenue South to North of Forest Hill Blvd., Widening & Resurfacing: Widening, milling and resurfacing, and adding HOV lane on SR 9 (I-95) from 12th avenue south to 10th avenue north). Steel bridge over 6th avenue and concrete viaduct over lake worth drive, retaining walls and other concrete structures. Quantities of major items: 4,402 miles (7,1Km) of roadway and 0,181 miles (291,3m) bridges.	58	07/2004	07/2004	05/2008	FDOT (Florida Department of Transportation) - District 4
35	Florida (USA)	SR93 (I - 75): Widening and Reconstruction Improvements on SR 93 I-75 widening from north of River Road to SR 681 Venice Connector. Key Work Features: Work involves excavation, embankment, 6 bridge widening and 2 new bridges, drainage work, lighting, signage & signalization, fencing, pavement marking, landscape & asphalt works. This project consist of approximately 62,532 TN of super-pave asphalt, and 19,564 TN of friction course. Total Roadway Length: 9.368 Miles	32	05/2010	05/2010	05/2012	FDOT (Florida Department of Transportation) - District 1
36	Guinea	Construction of a bridge on Fatala river and relevant accesses : Construction of a bridge in pre-stressed reinforced concrete over the Tibola River (length 106.50 m, width 12 m, central span 36.00 m and two 35.25-m side spans); construction of a bridge in pre-stressed reinforced concrete cast in situ over the Fatala River (length 325.00 m, width 12 m, central span 160 m and two 82.50-m side spans); construction of new asphalted road (length 19 km) including earthworks, drainage system and reinforced concrete structures.	40	07/2001	07/2001	06/2004	Ordonnateur National Du Fed De La République De Guinée, Ministère De L'Economie Et Des Finances



Work History

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Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
37	Italy	A5 Aosta Motorway – Mont Blanc Tunnel. (lot no. 3): Construction work of lot no. 3 of Morgex - Monte Bianco Tunnel (L=1525m) consisting of the realization of 3 viaducts (various spans), 2 sections of artificial tunnel, access and exit lanes Construction methods including principal equipment and plant utilised: VERRAND Viaduct: 605 l.m. long single formed by n°5 spans (3 x 135 l.m.) and (2 spans x 97,5 l.m.), in Corten steel continuous welded structure complete with orthotropic deck pushed in sections on concrete piers from 9,00 to 13,00 l.m high. Foundations in micro piles and pits 30 l.m deep. Cut & fill motorway section . Bridge on the VERRAND River Twin Viaduct 75 l.m long on two piers 25 l.m span. IALLA Viaduct . T Twin concrete viaduct 385 l.m long . formed by n°7 spans : 5 spans x 60 l.m., 1 x 45 l.m., and 1 x 40 l.m. on concrete piers up to 13 l.m high. Artificial by-pass Artificial tunnel under National Road for Courmayeur connection. Bridge on the VERRAND River – Courmayeur exit A bridge 39 l.m span in steel structure on this connection . Bendini mobile cranes 25 – 35 ton. tower crane Potain 185, Jet grouting equipment for rock consolidation, micropiles drilling equipment	49	07/1993	07/1993	06/2002	Raccordo Autostradale Valle D'aosta S.p.A.
38	Italy	Highway construction in variation to the National Road 18 - Stretch between Vallo della Lucania and Policastro Bussentino Stations - 3° Lot: from Futani to Centola Station: Construction of 10,112 km (PK. 21+683 - PK 31+795) of a 2-lane motorway (in some sections, also 3-lanes) including important structures works : 5 viaducts (164 m - 248,90 m - 537,80, 627,80 m, 717,80, 1 natural tunnel (215 m) , 3 artificial tunnels. Main Quantities Earthworks (1.074.000m3), steel for r.c.. (11.695 tons), Concrete (139.200m3), micro-piles -ties & drains (158.000ml), Corten steel (7.800 tons).	78	09/2002	05/2001	02/2006	Amministrazione Provinciale di Salerno
39	Italy	Caltanissetta-Gela: Motorway Construction of Caltanissetta and Pietraperzia Interchange: Construction of a cloverleaf interchange linking the motor-way to the town. Details of Bridges Works: The interchange is made of a main bridge 726 m. long (22 spans x 33 m.) and 8 viaducts and ramps for a total length of 1.125 m. (45 spans x 25 m.). The main bridge has a width of 13,00 to 24,00 m., varying in accordance with the number of traffic lanes. It is made of p.r.c. beams loaded on elastomeric supports with pre-compression cables and continuous structural in-situ casting in order to eliminate the necessity of neoprene joints. The piers are 10,00 m. in elevation. The ramp-viaducts are made of pre-stressed hollow box girders cast with pad joints and Dywidag bars to have structural continuity. Type of foundations: pile foundations.	17	05/1991	05/1991	07/1995	Ministry of Public Works
40	Italy	National road N° 64 "Porrettana" - 1st and 2nd job section: The rehabilitation works of Riola by pass between Marano (km 45+815) to Carbona (km 53+360), 1st and 2nd Phase, have included the execution of a natural tunnel (L=1.692m) and 5 viaducts (Total Length. 2.555m), of which n°2 with foundations in the river. The construction method used is the same for both bridges: micro-piles of 300 mm diameter, armed with steel tubes dia. 177,8m and foundation piles dia. 1,200 mm, max. deep 36 m, at the top of which the foundation block is cast to support the round-section pier of dia. 3 m, and 21 m. max. heigth. Characteristic of viaduct: Viaduct "RENO I°": length 930 m, formed by n° 26 spans, 33 m long each and one span 72 m long. Each span is formed by n°5 beams; Viaduct "RENO II°": length 367,40 m, with reinforced concrete deck , formed by n° 7 spans, 33 m. long each, n°1 span 72 m long and n°2 spans 32,20 m. long each. Viaduct "OREGLIA°": length 295,40 ml with reinforced concrete deck, formed by n°7 spans 33 ml long. each and n°2 spans of 32,20 ml.	60	04/991	04/991	11/1997	ANAS S.p.A. - Compartimento di Bologna



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Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
41	Romania	Basarab Road Overpass: The Basarab Overpass is a combination of two bridges and a multi span / viaducts, as follows: 1 arch bridge of 120 m length, 1 cable stayed bridge of 360 m length and a prestressed concrete viaduct of 1,200 m length and 97 spans. Main works and quantities : - large diameter piles : 660 pcs ( 36,040 cu.m. concrete) ; - concrete in structures : 55,000 cu.m - metallic decks : 6,400 tons ; - stays : 442 tons ( 60 pcs); - asphalt mixtures: 100,000 sq.m. ( on bridges and roads) - tramway ( new lines ) : 5.3 km	208	07/2006	07/2006	07/2011	Bucharest City Hall
42	Romania	Bucharest-Constanta highway, design and construction of the Medgidia-Constanta Section: Motorway Medgidia – Constanta investment part of Corridor for auto transport PAN EUROPEAN IV which provide the link road between Berlin and Istanbul and is making the connection between Bucharest and the most important port from Black Sea, Constanta, facilitating access to international goods and travel to the center and the west country. Now the motorway Bucuresti – Constanta is executed up to Cernavoda, where traffic is directed to DN 22C who is making the connection with DN 3, representing the main route to Constanta. The Motorway sector Medgidia - Constanta is framed in a general network of motorways provided to achieve in our country, and represent the final sector of Bucuresti – Constanta Motorway. As described in the main contract, the activities include the design and construction of the followings works : Design, Verification and Approvals of the Works; Motorway standard road between Cemavoda – Medgidia Motorway and Motorway By-Pass Constanta; DJ 381 Interchange; Maintenance Centre; Service and Parking Area; Culverts & Drainage; Fencing and Safety Fencing. Bridge No. 20 – Bridge over the Danube – Black sea channel, km 193+650; length 312 m; spans 77,5 m – 155 m – 77,5 m; Balanced cantilever girder, 3 spans; prestressed (total) concrete deck; cast in situ segments: 15+15, L = 4,0 – 5,0 m; single box-girder section, parabolic intrados shape H = 10,0 – 2,40 m, seismic bearings (friction pendulum type)- foundations: diaphragms concrete; total quantities: 22,000 cu.m. concrete; 2,700 ton reinforcement	236	06/2009	06/2009	11/2012	Romanian National Company Of Motorways And National Roads
43	Turkey	Anatolian Motorway - Gumusova-Gerede: Section 2 from Km 215+000 to Km 240+000 (Bolu Mountain Crossing): Design / construction and one year of maintenance of Section 2 for a development of 25km of motorway (in seismic areas) from 3-lane roadway, comprising: 4 double viaducts and 3 twin bridges (total length 5.561m), 2 natural galleries side by side approx. 3km each, excavated by NATM method, with 3 lanes each	1,038	01/1990	02/1990	12/2010	General Directorate Highways
44	Congo	D&B Congo-Ocean Railway: Between Bilinga and Loubomo (88,2 Km.), 19 bridges for 61 spans, 3 tunnels, shunt stations on line	329	07/1976	07/1976	09/1985	A.T.C.
45	Gabon	D&B Transgabon Railway, Phase 1: Section Owendo-Boque (340 km), 19 bridges for a total of 2,795 m, track laying, ballasting (1,000,000 cu.m.), shunt, stations on line	370	01/1975	01/1975	02/1983	O.C.TRA
46	Italy	Railway junction between the pass lines and the new Genoa-Voltri port basin: Design/construction of the civil works: double track natural tunnel in r.c.(l=5.381m, section 115 sq.m), single track tunnel in r.c. (l=2.136 m, section 70 sq.m), shunting cavern in r.c. (l=101 m, sections 195-394 sq.m), viaducts and overpasses in p.r.c. (tot. l=1.100 m), technological plants (fire-fighting, lighting and telephonic system) and minor structures.	203	12/1991	12/1991	02/2001	Italferr S.p.A.



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Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
47	Italy	Engineering design and construction of the high speed railway line Milan - Naples section Rome - Naples from km 11+880 to km 216+616 and relevant infrastructure and junctions in Frosinone, Cassino and Caserta: Monitoring for the environmental setting of the works, hydrological and archaeological studies, recovery and protection of archaeological works, execution of civil works for a total of 77 km of embankments, 53 km of trenches, 38 km of viaducts (spans of 33.60), 26km tunnels excavated by the traditional method (excavation section 130 ÷ 150 square meters), 10 km of cut-and-cover tunnels, technological buildings, superstructure and electrification of the entire double track railway section. The monitoring activity for integrating the works within the environment, the hydrogeological and archaeological investigations, and the recovery and protection of archaeological assets; 77 km of embankments of an average height of 5.00 m and railroad base of a width of 13.60 m, laying on different kinds of soils, and including various works for soil consolidation; 53 km of trenches having an average depth of 10.00 m and railroad base of a width of 13.60 m, excavated in soils having different characteristics, and including various works for soil consolidation; 26 km of tunnels excavated by the traditional method, excavation cross-section area of 130.00/150.00 m2, crossing pyroclastic, tufaceous, calcareous and granular soils, by using explosives, mechanical equipments and by adopting various kinds of technologies for consolidation of loosen materials, and with concrete lining; 10 km of cut-and-cover tunnels (excavation width up to 17.20 m), by means of reinforced concrete diaphragms and reinforced concrete piles driven each next to the other (diameter 800/120 mm, depth 15.00/18.00 m), 38 km of viaducts generally made of prestressed reinforced concrete box girder, prefabricated prestressed reinforced concrete beams and metal beams, spanning 20.00 m to 57.50 m and railroad base of a width of 13.60 m, laying on hollow piles of an average height of 14 m and based on reinforce concrete plinths having average dimensions of 8.00x11.00x2.00 m and reinforced concrete piles of a diameter of 1200/1500 mm, shafts and jet-grouting down to a depth of approx. 40 m;No. 59 housings for technological plants;Superstructure (for a total length of 409.4 km of single-track railway), electrification and ERMTS (Level 2) signalling system throughout the whole section and relevant junctions	5,776	01/10/1991 and additional deed dated 02/1994	02/1994	12/2009	T.A.V. (Treno Alta Velocita' )
48	Venezuela	Railway Transport System of the Central Region, "Caracas-Tuy Medio" First Stage: The Caracas-Tuy railway line represents the first phase of a plan to improve railway infrastructures which is considered a priority for' s development. is involved in this plan and is currently working on 3 different key projects which will lead to the construction of a total of over 550km of new railway lines. The project as a whole involved the construction of 24 railway tunnels (90m2 section, total length +58 239 248966420.4km) and 28 viaducts measuring a total of 8.4km, with shaft deep foundations, reinforced concrete piles with a maximum height of 60m and steel girders with spans varying from 30 to 95m. Earthworks totalled approximately 1 million m³. Moreover, works to reinforce slopes were performed along with laying of the permanent way and electrification of the route for a length of 40km. Major Quantity Double track rail (41.5km), with: 20.4km of natural tunnels (diameter 10.7m), 8.4km of viaducts, 4 stations, 2 stores / workshop , equipment, electrification, signaling and telecommunication.	2,073	02/1992	05/1996	03/2009	IFE (Instituto De Ferrocarriles Del Estado)
<b>BUILDING WORKS</b>							



Work History

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Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
49	Italy	Executive design, works management, and turnkey construction of the so-called "new exhibition pole" (Nuovo Polo Espositivo) in Milan: The new Expo Fair Centre in Milan, the largest in the world with its 516,446 square metres under cover, is one of the projects that symbolises Astaldi Group's capacities and capabilities. Concurrent engineering, in other words design activities carried out at the same time as construction activities, also allowed for the centre to be completed in 36 months (30 months of construction activities and 6 months of inspections), basically at a rate of one square metre per minute. A record, an example of cooperation and synergy among various professional figures, which also involved the designer, the architect Massimiliano Fuksas, with an end result that combines emotional impact with the functionality needed for a building such as a trade fair centre. The centre's "firsts" include the eight pavilions (each measuring 40,000m2) constructed without expansion joints and built using metal spans measuring almost 50 metres in length. Major Quantity The project has a gross area of approximately 465,000 sq.m. – exhibit net area: 200,000 sq.m. – developed over a territorial area of approximately 1,400,000 sq.m. Construction of 8 pavilions (4 single-storied, 2 increased height single-storied and 2 two-storied), 80 congress halls, 25 bars and 20 restaurants, warehouses over an area of 9,500 sq.m., offices and support services over 6,500 sq.m., 14,000 parking spaces for visitors, 3,500 parking spaces for exhibitors	837	08/2002	10/2002	06/2005	SVILUPPO SISTEMA FIERA S.p.A.
50	Italy	Design, Construction and Management of the New Hospital In Mestre: The new hospital in Mestre, a symbol of project finance employed in the healthcare sector in Italy, is a complex that revolutionises the concept of hospital. Indeed, it is a facility built on a human scale which combines architectural beauty with functionality and the quest for patient wellbeing. What stands out immediately when visiting the complex for the first time is the quest to obtain harmony, the perception of areas and the attention to detail. At long last visitors can feel "accompanied" and guided around a "difficult" complex such as a hospital complex. A feeling of airiness amplified by contact with the nature that surrounds and runs through the building. But Mestre also means state-of-the-art technology: systems such as RIS-PACS will soon make medical records a thing of the past since they make it possible to transmit patients' details online thus benefiting quick diagnoses. Major Quantity The hospital is a building constituted of 7 floors above ground level , plus 2 underground floors with an availability of 680 beds (of which 50 private beds), 25 dialysis beds and 20 cradles, a commercial area for shops, the "Banca degli Occhi" (ophthalmologic department), and further includes an auditorium for 200 people and a parking lot for 1,300 cars.	287	10/2002	02/2004	01/2008	AZIENDA ULSS N° 12 VENEZIANA
51	Italy	Construction of the New Hospital in Olbia : 1st Execution Lot: The 1st Execution Lot, which concerns this project directly, includes the construction of one of the hospitalization pavilions ("D1"), the emergency pavilion ("E"), the pavilion of services ("S"), the pavilion of technological plants ("T") and the link "Tunnel". The main structures are reinforced concrete structures, with the sole exception of metal structures of the ambulance access to first aid, and of the freight yard at pavilion "S". The main external finishing works included in the design are the following: granite lining, curtain walls and painted plasters. Project works may be summarized as follows: Pavilion E, constituted of 4 floors for a total area of 7,678.10 square meters, intended for emergency hospitalization; first aid, operation theatres, electrical substations and premises housing technological plants and installations; Pavilion D1, constituted of 5 floors for a total area of 10,122.20 square meters, intended for ordinary hospitalization activities: day hospital, laboratories, personnel's dressing rooms, electrical substations and premises housing technological plants and installations; Pavilion S, constituted of 5 floors for a total area of 4,522.80 square meters, intended for	17	03/2000	03/2000	08/2005	Azienda Sanitaria Locale N. 2 in Olbia
52	Italy	Salerno University: The current grounds of Salerno University, one of the few campus universities to date in Italy, immediately represented a major attraction for Southern Italian regions thanks to their strategic position and to the university's functionality. The university is located in a decentralised position, yet close to major motorway links which help favour access. The various buildings form part of a rational architectural design featuring correct distribution of internal areas. Large green areas have been created around the buildings which allow students to breathe in a quiet, laid-back atmosphere, far removed from urban pollution. Major quantity: volume of construction 500,000 c.m.; surface 65,000 sq.m.	81	01/1982	01/1982	01/1992	Italposte S.p.A.





Work History

Exchange rate used: Bank of Canada on December 17, 2012 - 1.00 EURO = 1.30 CAD.

Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
53	Italy	Headquarters of the Pescara Court-House: Pescara Courthouse is one of the most important projects performed by Astaldi Group in the judicial construction sector. The high design and safety standards achieved from an architectural, plant engineering and security viewpoint make this one of the most state-of-the-art facilities in Italy. The complex occupies an area measuring 200,000m <sup>2</sup> and comprises 3 buildings (connected one to the other) made of steel and reinforced concrete, complete with internal/external finishing, mechanical and electric plants, lifts, external settlement works and a green area. Major quantity: earthworks 136,022m <sup>3</sup> ; drilled foundation piles d = 800 > 1500mm 38,021lm; concrete 44,121m <sup>3</sup> ; reinforcement iron 4,804 tons; bearing panels 89,998m <sup>2</sup> ; steel, iron, cast iron, tinwork, and other structure 1,269 tons; marble linings 43,935m <sup>2</sup> ; masonry 62,389m <sup>2</sup> ; waterproofing 410,970m <sup>2</sup> ; plastering 65,180m <sup>2</sup> ; flooring 94,743m <sup>2</sup> ; lining 13,565m <sup>2</sup> ; false ceilings 22,794m <sup>2</sup> ; fittings and walls 48,890m <sup>2</sup> ; painting 108,519m <sup>2</sup> ; PVC and polyethylene pipes d = 32 > 630 mm 23,119 lm.	79	03/1996	03/1996	02/2003	SAPRO Consortium Concessionaire of the Municipality of Pescara

HARBOURS AND MARINE WORKS							
54	Florida (U.S.A.)	Miami River Dredging Project, Submarine Cable Replacement : Submarine cables replacement at 6 Bascule Bridges on the Miami River.	6	11/2002	11/2002	09/2003	DFDOT DISTRICT 6
55	Italy	"Mar Grande" Naval Station in Taranto: The naval station include: a 450 m long offshore pier, consisting of floating caissons, for a total of approx. 83.000 cu.m; 2) A dry dock, 200 m wide and 500 m long, the majority of its quays consisting of diaphragms with a T-shaped cross-section and a depth of 20 m, for a total of 16.200 sq. m; four piers, for a total length of 510 m and 12 m wide, placed on piles having a diameter of Ø 1200 (for a total length of approx. 7000 m). accessory works on the quays Underwater and underground demining. The water within the port area is 10 metres deep.	47	11/1989	11/1989	08/1995	Direzione del Genio Militare per la Marina (Directorate of Naval Engineers)
56	Italy	Improvement, Refurbishment, Hydraulic And Biological Settlement Of Fishing Activities In Santa Gilla Lagoon. The project includes: reinforced concrete headworks, at sea; two rubble-mound breakwaters from the headworks to land, thus forming a protected basin; inside the basin thus formed, a series of fish-farming enclosures, made of PVC screens, supported by reinforced concrete poles made on land and then put in place inside boreholes; cross-beam with screens adaptable to the tides; rubble mounds outside the basin, for mussel farming.	11	10/1985	07/1985	07/1990	Regione Autonoma Della Sardegna - Assessorato Della Dell' ambiente
57	Italy	Industrial Port in Olbia - Lot 1: Construction of approx. 500 meters of wharf built with cellular caissons; Dredging of loose material (cu. m. 286.644) and submarine rock excavation (cu. m. 67.639); Formation of yards for goods storing; Buildings serving the Port; Technological installations serving the Port; aqueducts and port sewerage	30	04/1990	02/1991	07/1999	Consorzio Per Il Nucleo Industriale Di Olbia



Work History

Exchange rate used: Bank of Canada on December 17, 2012 - 1.00 EURO = 1.30 CAD.

Index	Country	Name of Project and Work Description	Amount Equivalent in mln CAD	Award Date	Start Date	End Date	Employer
58	Italy	<p>Construction works for the new seawall of the Porto Torres and Porto Torres Harbour - Technical functional adjustment - Segni, Customs and South-West readjustment works of the wharves: - Lump sum and unit price works for the realignment of presently existing quays (Segni, Dogana and Sout West) of the commercial port of Porto Torres (Sassari) with the construction of a new quay made up of cellular caissons and back yards (total extension 530 m), the main quay being 300.00 m long. Dredging of loose material (cubic meters 21,550) and underwater excavation of rock (cubic meters 37,486); removal of existing quays (cubic meters 79,000)</p> <p>Main quantities: Underwater excavation of loose material cu.m. 21,550; Underwater excavation of rock cu.m. 48,278; . Removal and hauling cu.m. 79,000; Rockfilling and embankments cu.m. 197,045; . Cellular caissons (total volume) cu.m. 41,200; Concrete cu.m. 9,000 , Rebar kg. 10,400; . Machined steel, cast iron, etc. Kg 66,500</p> <p>Paving Sq. m. 23,370</p> <p>- Lump sum works for the construction of the new western breakwater (breakwater and wave trap) and new cellular-caisson quay of a length of approx. 900 m for mooring of ferry boats of a length of 215 m presently on duty. Dredging of loose material (cubic metres 153.318) and underwater rock excavation (cubic metres 63.492); removal and haulage of rocks and reef core (cubic metres 275.000); filling and embankments (cubic metres 800.000)</p> <p>Main quantities: underwater excavation cu. m. 216.810 ; - removal and haulage activities cu. m. 275.000 ; - Filling and embankments cu. m. 800,000 ; rock filling and facing cu. m. 162,000 ; concrete cu. m. 39,100 ; rebar kg 169,500 ; machined steel, cast iron, etc. kg 155,000 ; paving sq. m. 105,650 ; reinforced concrete cellular caissons total volume cu.m. 60,900</p>	53	04/2002	06/2002	05/2008	Ministero Delle Infrastrutture E Dei Trasporti
59	Italy	<p>Construction works for the east-side dock of the Portovesme Industrial Port : Construction of the East dock of the Portovesme port, construction of the dock's general installations, arrangement of yards, underwater excavation (dredging) (267,708 m3)</p> <p>- The works concern the construction of the eastern quay of a length of m 450 and a width of m 25;</p> <p>- From a structural point of view, the quay is constituted of a rectangular reinforced-concrete deck laid on drilled reinforced-concrete piles, having a dia. of 1,200 mm, and having intermediate joints every 80 m;</p> <p>- The piles are arranged on trestles of four elements each, with longitudinal distance between each pile of 7.50 m, driven in the seabed by drilling down to -45.00 m, for a total of m 11,700 and protected by a disposable sheet casing;</p> <p>- The deck laid thereon, having its extrados at +3.15 above sea level, is constituted of prefabricated beams placed on proper pile caps;</p> <p>- The base necessary for the construction of the quay was obtained by underwater excavation at a depth of -14.00 m of approx. 300,000 cubic meters by means of a suction-discharge dredge;</p> <p>- Construction of stocking yards of approx. 35,000 square meters.</p> <p>Main quantities:</p> <p>- underwater excavation (dredging) cubic meters 267,708; Filling and embankments cubic meters 252,000 ,</p> <p>- concrete cubic meters 22,150 ; rebar kg 4,175,000 ; machined steel, cast iron, etc. kg 120,000 ;</p> <p>- paving square meters 33,300 ;</p> <p>- installations € 505,000</p>	20	06/2000	10/2000	03/2005	Consorzio Per Il Nucleo Di Industrializzazione Del Sulcis-Iglesiente
60	Somalia	<p>Construction of the Bosaso Port Drainage works at depths ranging from 3.5 to 8 m. for a total volume of 1,090,000 cu.m; Outer dike made of antifer blocks with weight ranging from 4.4 to 30 tons and breakwater; reef made of natural rocks with size ranging from 0.3 to 3 tons; docks for ships, with total length of 350 m; building in the port area and facilities.</p>	74	03/1986	06/1986	07/1990	Ministero degli Affari Esteri - Direzione Generale della Cooperazione allo Sviluppo



NALCOR ENERGY  
LOWER CHURCHILL PROJECT

PACKAGE CH 0007  
CORE TECHNICAL PROPOSAL

**APPENDIX A16**  
**PROPOSED SUBCONTRACTORS, MANUFACTURERS**  
**AND MATERIAL SOURCES**



Bidder shall provide the following information, where applicable:

## SOLUTION 1: CONCRETE PRODUCTION, FORMING AND CONCRETING SELF-PERFORMED BY ASTALDI

### a) Proposed Manufacturers

List of Bidder's proposed manufacturing plant(s) including the material that they will fabricate and indicate whether they are registered to ISO 9001:2008 or an internationally recognized equivalent quality management standard.

Index	Name of Manufacturer	Location of Manufacture (country of origin)	Location of testing and inspection	Item(s) of Manufacture	ISO registered ("YES" or "NO")*	Relative value of the Work (x \$1 million)	Any other pertinent information
1	ESSROC Italcementi Group	1370 Hwy 49 Picton, Ontario K0K 2T0	1370 Hwy 49 Picton, Ontario K0K 2T0	Bulk Cement	Yes	72	Supplied to Astaldi Value includes transportation
2	JV CEMENT MUSKRAT FALLS (HOLCIM - LAFARGE)	435, Jean-Neveu, Longueuil (Québec) J4G 2P9	435, Jean-Neveu, Longueuil (Québec) J4G 2P9	Bulk Cement	Yes	76	Alternative solution
3	SUPERMETAL STRUCTURES Inc	1955, 5e Rue, St-Romuald, Québec G6W 5M6	Factory/Site	Structural Steel	Yes	30	
4	Arcelor Mittal	Canada	Factory/Site	Reinforcing Steel	Yes	17	Supplied and bent by AGF STEEL Inc.
5	Arcelor Mittal	Canada	Factory/Site	Reinforcing Steel	Yes	17	Supplied and bent by OLYMPIC METALS Ltd. + PISHUMUSS WELDING & FABRICATORS Ltd.
6	VicWest	Canada	Factory/Site	Insulated Metal Wall Panels	Yes	1.2	Supplied by Enterprise de Construction TEQ Inc
7	VicWest	Canada	Factory/Site	Siding	Yes	0.6	Supplied by Enterprise de Construction TEQ Inc

\* If not ISO 9001:2008 registered, identify registered internationally recognized equivalent quality



management standard, if applicable.

b) Proposed Subcontractors

List of Bidder's proposed Subcontractors (whether on-site or off-site) and the part of the Work that will be subcontracted to them, along with confirmation of whether they are registered to ISO 9001:2008 or an internationally recognized equivalent quality management standard.

Index	Name of Subcontractor	Location of Subcontractor (country of origin)	Services Provided	ISO registered ("YES" or "NO")*	Relative value of the Work (x \$1 million)	Any other pertinent information
1	ATLANTIC UNDERGROUND SERVICE Ltd	425, Pine Glen road, Riverview, NB E1B 4J8	CIVIL WORKS - DRILLING PRESSURE GROUTING AND DRAINAGE AND GEOTECHNICAL INSTRUMENTATION	NO	3.3	
2	GEO - FOUNDATION Contractors Inc. (subsidiary of Hayward Baker Canada Ltd)	302 Main Street North Acton, ON L7J 1W9	CIVIL WORKS - DRILLING PRESSURE GROUTING AND DRAINAGE AND GEOTECHNICAL INSTRUMENTATION	YES	5.5	Alternative solution
3	BIG LAND CONSTRUCTION Ltd	43, Cleary Drive, Goulds, NL A15 1C3	CIVIL WORKS - EARTH WORKS	NO	1.7	
4	ENTERPRISE DE CONSTRUCTION TEQ Inc	4001, Rue St. Antoine Ouest, Montreal	CONCRETE WORK - PRECAST	YES	3.2	
5	SUPERMETAL STRUCTURES Inc	1955, 5e Rue, St-Romuald, Québec G6W 5M6	STRUCTURAL STEEL	YES	39.4	
6	PENNECON ENERGY Ltd.	650 Water Street St. John's, NL	ELECTRICAL WORKS	YES	3.1	
7	GJ CAHILL & COMPANY Ltd.	PO Box 1674, 240 Waterford Bridge Rd. St. John's NL A1C 5P5	ELECTRICAL WORKS	NO	3.4	Alternative solution
8	JSM Electrical Ltd.	Saint-John's	ELECTRICAL WORKS	NO	7.5	Alternative solution
9	LIANNU-PENNECON	P.O.Box 21189, 456 Logy Bay Road, St.John's, NL A1A 5B2	MECHANICAL WORKS	YES	12.4	



Index	Name of Subcontractor	Location of Subcontractor (country of origin)	Services Provided	ISO registered ("YES" or "NO")*	Relative value of the Work (x \$1 million)	Any other pertinent information
10	BLACK & McDONALD Ltd	10, Payzant Ave, Darmouth, NS B3B 1Z6	MECHANICAL WORKS	NO	19.0	Alternative solution
11	GROUPE PLOMBACTION Inc	575 Boul. Pierre-Roux Est. Victoriaville QC, G6T 1S7	MECHANICAL WORKS	YES	16.2	Alternative solution
12	ENTERPRISE DE CONSTRUCTION TEQ Inc	4001, Rue St. Antoine Ouest, Montreal	ARCHITECTURAL WORKS	YES	10.7	
13	BIG LAND CONSTRUCTION Ltd	43, Cleary Drive, Goulds, NL A15 1C3	CIVIL WORKS - ACCESS ROAD, ACCESS RAMP AND PADS	NO	0.4	
14	ADF GROUP Inc.	300, Henry-Bessemer, Terrebonne, Québec J6Y 1T3	TEMPORARY BRIDGE OVER THE SPILLWAY	YES	1.0	
15	SUPERMETAL STRUCTURES Inc	1955, 5e Rue, St-Romuald, Québec G6W 5M6	TEMPORARY LATERAL SUPPORT AND BRACINGS FOR PIERS OF THE SPILLWAY	YES	0.2	
16	BIG LAND CONSTRUCTION Ltd	43, Cleary Drive, Goulds, NL A15 1C3	CIVIL WORKS - ROAD MAINTENANCE AND SNOW REMOVAL	NO	2.7	
17	ADF GROUP Inc.	300, Henry-Bessemer, Terrebonne, Québec J6Y 1T3	WINTER COVER SYSTEM for POWERHOUSE and INTAKE	YES	16.5	
18	Constructions PROCO Inc.	516, Route 172, Saint-Nazaire, Lac Saint-Jean (QC) G0W 2V0	WINTER COVER SYSTEM for POWERHOUSE and INTAKE	YES	17.1	Alternative solution

\* If not ISO 9001:2008 registered, identify registered internationally recognized equivalent quality management standard, if applicable



c) *Proposed Material Suppliers*

List of Bidder's proposed material suppliers and the material that they will supply, along with confirmation of whether they are registered to ISO 9001:2008 or an internationally recognized equivalent quality management standard.

Index	Material Supplied	Name of Supplier	Location of Supplier (country of origin)	ISO registered ("YES" or "NO")*	Relative value of the Work (x \$1 million)	Any other pertinent information
1	REINFORCEMENT STEEL	AGF STEEL Inc.	113 GLENCOE DRIVE DONOVANS INDUSTRIAL PARK MOUNT PEARL, NL A1N 4S7	YES	40	
2	REINFORCEMENT STEEL	OLYMPIC METALS Ltd. + PISHUMUSS WELDING & FABRICATORS Ltd.	100 Chemin St.-Simon, Caraquet, NB Canada E1W 1B3	NO	40.1	Alternative solution
3	PRECAST - Prefabricated Longitudinal Concrete Fire Walls	PENNECON CONCRETE Ltd.	PO Box 8274 Str. A St. John's NF A1B 3N4	YES	3.2	

\* If not ISO 9001:2008 registered, identify registered internationally recognized equivalent quality management standard, if applicable

Information from this Appendix will form Exhibit 8 of the Agreement detailed in Part 2 of this RFP.



**SOLUTION 2: CONCRETE PRODUCTION SUB-CONTRACTED**

a) *Proposed Manufacturers*

List of Bidder's proposed manufacturing plant(s) including the material that they will fabricate and indicate whether they are registered to ISO 9001:2008 or an internationally recognized equivalent quality management standard.

Index	Name of Manufacturer	Location of Manufactur e (country of origin)	Location of testing and inspection	Item(s) of Manufact ure	ISO registe red ("YES" or "NO")*	Relative value of the Work (x \$1 million)	Any other pertinent information
1	ESSROC Italcementi Group	1370 Hwy 49 Picton, Ontario K0K 2T0	1370 Hwy 49 Picton, Ontario K0K 2T0	Bulk Cement	Yes	72	Supplied to Astaldi Value includes transportation
2	Holcim/Lafarge	Canada	Montreal Quebec	Bulk Cement	Yes	76	Supplied through Lafarge-Capital Ready Mix Value Includes transportation
3	SUPERMETAL STRUCURES Inc	1955, 5e Rue, St-Romuald, Québec G6W 5M6	Factory/Site	Structural Steel	Yes	30	
4	Arcelor Mittal	Canada	Factory/Site	Reinforcin g Steel	Yes	17	Supplied and bent by AGF STEEL Inc.
5	Arcelor Mittal	Canada	Factory/Site	Reinforcin g Steel	Yes	17	Supplied and bent by OLYMPIC METALS Ltd. + PISHUMUSS WELDING & FABRICATO RS Ltd.
6	VicWest	Canada	Factory/Site	Insulated Metal Wall Panels	Yes	1.2	Supplied by Enterprise de Construction TEQ Inc
7	VicWest	Canada	Factory/Site	Siding	Yes	0.6	Supplied by Enterprise de Construction TEQ Inc

\* If not ISO 9001:2008 registered, identify registered internationally recognized equivalent quality management standard, if applicable.





b) Proposed Subcontractors

List of Bidder's proposed Subcontractors (whether on-site or off-site) and the part of the Work that will be subcontracted to them, along with confirmation of whether they are registered to ISO 9001:2008 or an internationally recognized equivalent quality management standard.

Index	Name of Subcontractor	Location of Subcontract or (country of origin)	Services Provided	ISO registered ("YES" or "NO")*	Relative value of the Work (X \$1 million)	Any other pertinent information
1	ATLANTIC UNDERGROUND SERVICE Ltd	425, Pine Glen road, Riverview, NB E1B 4J8	CIVIL WORKS - DRILLING PRESSURE GROUTING AND DRAINAGE AND GEOTECHNICAL INSTRUMENTATION	NO	3.3	
2	GEO - FOUNDATION Contractors Inc. (subsidiary of Hayward Baker Canada Ltd)	302 Main Street North Acton, ON L7J 1W9	CIVIL WORKS - DRILLING PRESSURE GROUTING AND DRAINAGE AND GEOTECHNICAL INSTRUMENTATION	YES	5.5	Alternative solution
3	BIG LAND CONSTRUCTION Ltd	43, Cleary Drive, Goulds, NL A15 1C3	CIVIL WORKS - EARTH WORKS	NO	3.4	
4	ENTERPRISE DE CONSTRUCTION TEQ Inc	4001, Rue St. Antoine Ouest, Montreal	CONCRETE WORK - PRECAST	YES	3.2	
5	AGF STEEL Inc.	113 GLENCOE DRIVE DONOVANS INDUSTRIAL PARK MOUNT PEARL, NL A1N4S7	REINFORCEMENT STEEL	YES	92.7	
6	SUPERMETAL STRUCTURES Inc	1955, 5e Rue, St-Romuald, Québec G6W 5M6	STRUCTURAL STEEL	YES	39.4	
7	PENNECON ENERGY Ltd.	650 Water Street St. John's, NL	ELECTRICAL WORKS	YES	3.1	
8	GJ CAHILL & COMPANY Ltd.	PO Box 1674, 240 Waterford Bridge Rd. St. John's NL A1C 5P5	ELECTRICAL WORKS	YES	3.4	Alternative solution
9	JSM Electrical Ltd.	Saint-John's	ELECTRICAL WORKS	NO	7.5	Alternative solution



Index	Name of Subcontractor	Location of Subcontract or (country of origin)	Services Provided	ISO registered ("YES" or "NO")*	Relative value of the Work (X \$1 million)	Any other pertinent information
10	LIANNU-PENNECON	P.O.Box 21189, 456 Logy Bay Road, St.John's, NL A1A 5B2	MECHANICAL WORKS	YES	12.4	
11	BLACK & McDONALD Ltd	10, Payzant Ave, Darmouth, NS B3B 1Z6	MECHANICAL WORKS	YES	19.0	Alternative solution
12	GROUPE PLOMBACTION Inc	575 Boul. Pierre-Roux Est. Victoriaville QC, G6T 1S7	MECHANICAL WORKS	YES	16.2	Alternative solution
13	ENTERPRISE DE CONSTRUCTION TEQ Inc	4001, Rue St. Antoine Ouest, Montreal	ARCHITECTURAL WORKS	YES	10.7	
14	BIG LAND CONSTRUCTION Ltd	43, Cleary Drive, Goulds, NL A15 1C3	CIVIL WORKS - ACCESS ROAD, ACCESS RAMP AND PADS	NO	0.8	
15	ADF GROUP Inc.	300, Henry-Bessemer, Terrebone, Québec J6Y 1T3	TEMPORARY BRIDGE OVER THE SPILLWAY	YES	1.0	
16	SUPERMETAL STRUCTURES Inc	1955, 5e Rue, St-Romuald, Québec G6W 5M6	TEMPORARY LATERAL SUPPORT AND BRACINGS FOR PIERS OF THE SPILLWAY	YES	0.2	
17	BIG LAND CONSTRUCTION Ltd	43, Cleary Drive, Goulds, NL A15 1C3	CIVIL WORKS - ROAD MAINTENANCE AND SNOW REMOVAL	NO	5.3	
18	ADF GROUP Inc.	300, Henry-Bessemer, Terrebone, Québec J6Y 1T3	WINTER COVER SYSTEM for POWERHOUSE and INTAKE	YES	16.5	
19	Constructions PROCO Inc.	516, Route 172, Saint-Nazaire, Lac Saint-Jean (QC) G0W 2V0	WINTER COVER SYSTEM for POWERHOUSE and INTAKE	YES	17.1	Alternative solution

\* If not ISO 9001:2008 registered, identify registered internationally recognized equivalent quality management standard, if applicable



c) *Proposed Material Suppliers*

List of Bidder's proposed material suppliers and the material that they will supply, along with confirmation of whether they are registered to ISO 9001:2008 or an internationally recognized equivalent quality management standard.

Index	Material Supplied	Name of Supplier	Location of Supplier (country of origin)	ISO registered ("YES" or "NO")*	Relative value of the Work (x \$1 million)	Any other pertinent information
1	REINFORCEMENT STEEL	AGF STEEL Inc.	113 GLENCOE DRIVE DONOVANS INDUSTRIAL PARK MOUNT PEARL, NL A1N 4S7	YES	40	
2	REINFORCEMENT STEEL	OLYMPIC METALS Ltd. + PISHUMUSS WELDING & FABRICATORS Ltd.	100 Chemin St.-Simon, Caraquet, NB Canada E1W 1B3	NO	40.1	Alternative solution
3	CONCRETE	LABRADOR READY- MIX Ltd	8090, Boyer, C.P. 87041, Succ. Charlesbourg, Québec, (Québec) G2L 1S9	NO	130	
4	CONCRETE	LAFARGE - CAPITAL READY MIX PARTNERSHIP	Québec, (Québec) G2L 1S9	YES	140	
5	PRECAST - Prefabricated Longitudinal Concrete Fire Walls	PENNECON CONCRETE Ltd.	PO Box 8274 Str. A St. John's NF A1B 3N4	YES	3.2	

\* If not ISO 9001:2008 registered, identify registered internationally recognized equivalent quality management standard, if applicable

Information from this Appendix will form Exhibit 8 of the Agreement detailed in Part 2 of this RFP.



NALCOR ENERGY  
LOWER CHURCHILL PROJECT  
MUSKRAT FALLS

CONSTRUCTION OF INTAKE AND POWERHOUSE, SPILLWAY  
AND TRANSITION DAMS

PACKAGE CH0007  
CORE TECHNICAL PROPOSAL

APPENDIX A13  
EXECUTION PLAN

ATTACHMENT 3  
**CURRICULUM VITAE - CONTRACTOR REPRESENTATIVE -  
EMMANUEL TRIASSI**

Mr. Emmanuel Triassi is an experienced business man in the construction industry in Canada. He has an impressive academic background and an extensive experience. He successfully executed projects on budget and schedule including apartment building, schools, sports complexes, public buildings, offices, hotels, and other infrastructures projects. Mr. Triassi is the founder and president of TEQ Enterprise in Montreal, Quebec.

## EDUCATION

### **Master in Engineering Building Studies-Project Management**

Concordia University – 1979

### **Bachelor in Engineering**

McGill University – 1974

### **Quantum Shift Fellow**

Richard Ivey School of Business - 2007

### **Administrateur de sociétés certifié**

Collège des administrateurs de sociétés, University of Laval - 2010

## LANGUAGES

English, French, Italian

## PROFESSIONAL ASSOCIATIONS

*Ordre des Ingénieurs du Québec/Quebec Order of Engineers*

Project Management Institute

Canadian Institute of Quantity Surveyors

Les Économistes en construction du Québec Inc.

Italian Chamber of Commerce in Canada - Montreal

## AWARDS and DISTINCTIONS

2004 : Honourary title of *Grande Ufficiale, Ordine al Merito della Repubblica Italiana* awarded by the President of Italy.

1997 : Honoray titly of *Commendatore, Ordine Al Merito della Repubblica Italiana* awarded by the President of Italy

1996 : Golden Seal for project management by the Canadian Construction Association.

1991 : Mention for the project *Quartiers de l'Héritage* by the Quebec Order of Architects

1990 : Governor General's award for *Quartiers de l'Héritage* by *Canadian Royal Institute of Architecture*

**PROFESSIONAL EXPERIENCE**

2012 – present	Chief Executive Officer <b>Astaldi Canada inc.</b>
1984 – present	President and Principal <b>GROUPE TEQ</b> Construction Project Management and General Contractor
December 2002 – March 2003	Interim President <b>ROYAL CANADIAN MINT</b>
1999 – 2002	President <b>ACMON INC. et</b> <b>LES ENSEMBLES URBAINS LTÉE</b> Important North American firm specialized in property management
1982 – 1985	Partner and Project Manager <b>DÉVELOPPEMENT GENDEV INC.</b> Developer/Constructor
1979 – 1981	President & Partner <b>ENTREPRISES T.T.S INC.</b> Developer/Constructor
1974 – 1976	Junior Engineer <b>MONTREAL ENGINEERING CO. LTD.</b> Consultants

**RESEARCH & TEACHING**

1992 – to 1998	Adjunct Professor, McGill University Department of Civil Engineering
1986 – 1988	Researcher & recipient of grant from C.M.H.C. for a project entitled “Project Management for the Small Housing Contractor”
1985 – 1988	Participant in the University/industry program for NSERC entitled “Advanced Computer Based Management Technologies for the Canadian General Contractor”
1983 – 1984	Researcher & recipient of grant from C.M.H.C. for a project entitled “Field Trial of Experimental Planning, Scheduling and Control for Highrise Housing Constuction”

**RESEARCH & TEACHING**

1982 – 1984	Co-supervisor on research entitled “Project Management Information Systems for Small Contractors”, leading to thesis for Masters by Simon Lo, Concordia University
1976 – 1983	Lecturer Dawson College, Montréal Department of Civil Technology

**NOMINATIONS**

2009 - present	Board Member of Theatre du Nouveau Monde
October 2007 - present	Board of administration, Hydro-Québec Member of Audit, Finance and HR Committees
1999 - 2005	Chairman of Board of administration of Royal Canadian Mint
2005	Chairman, Strategic Planning Committee Royal Canadian Mint
1999, to date	Governor of the Italian-Canadian Community Foundation
2001 - 2004	Member, Board of administration Leonardo da Vinci Italian Community & Cultural Centre
2001 - 2003	Member, Board of World Association of Italian Chambers of Commerce
2002 to date	Chairman of board, Italian Chamber of Commerce of Canada
1996 - 2002	Member of board of Les Ensembles Urbaines Ltée
1995 – 2002	President, Italian Chamber of Commerce of Canada
1991 – 1995	Vice-President Italian Chamber of Commerce of Canada
1999 - 2001	Member of task group for SME for Ministry of Foreign affairs and International Business of Canada
1995 - 1999	President Council of North-American Italian Chambers of Commerce
1991	Member special Committee for the integration of parents at à Vanguard School

**PHILANTHROPIC WORKS**

2008 – present	Co-President of L'Institut de recherches cliniques de Montréal (IRCM) fund capital campaign raising 2007-2011
2008 - 2009	Co-President of St-Jean Ambulance fund raising campaign
2005	Member of Organisor Committee for The Red Cross fund raising,
2002 et 2003	President of <i>Bal des Gouverneurs</i> , fundraiser for the Italian Canadian Community Foundation
1998, 2000 et 2001	Honorary Chair and organizer with the Italian Chamber of Commerce, fundraiser to help finance the Leonardo da Vinci Community Cultural Center
1999	Honorary Chair and Organizer of fundraiser with Italian Chamber of Commerce 1999 for New Dimension Foundation for children with learning disabilities
1998	Honorary Chair of the <i>Ballo di Venezia</i> , the 1998 fundraiser event for <i>Virage</i> , support group for cancer victims and their families
1997	Honorary Chair and organizer with the Italian Chamber of Commerce for a fundraiser for the Santa Cabrini Hospital

**PUBLICATIONS & ARTICLES**

1. Triassi, E. "The Building Contractor and Project Control: Case Study" Report N<sup>o</sup> CBS-74, Center for Building Studies, Concordia University, Montreal 1979
2. Russell, Alan D. & Triassi, E. "General Contractor Project Control Practices and MIS" Journal of the Construction Division, ASCE, Vol. 108, N<sup>o</sup> CO3, Sept. 1982, pp. 419-437
3. Russell, Alan D. & Triassi, E. "Requirements for Building Contractor Project Management Information Systems", Proceedings of the 6<sup>th</sup> INTERNET Congress, Farmisch-Partemkirchen. 1979, Vol. 3, pp. 247-261
4. Russell, Alan D. & Triassi, E. "Characteristics of the Building Contractor and Project Management Information Systems", Proceedings of the Canadian Society of Civil Engineers, Montreal, 1979, pp. 79-85
5. Triassi, E. "Field Trial of Experimental Planning Scheduling and Control for High Rise Housing Construction", report submitted to C.M.H.C. for External Research Program, May 1984





NALCOR ENERGY  
LOWER CHURCHILL PROJECT  
MUSKRAT FALLS

CONSTRUCTION OF INTAKE AND POWERHOUSE, SPILLWAY  
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ATTACHMENT 4  
**CURRICULUM VITAE -  
PROJECT START-UP TASK FORCE LEADER -  
GUIDO VENTURINI**

**GUIDO VENTURINI**  
**Project Coordinator**

Mr. Guido Venturini is a mining engineering and an engineering geologist with 21 years of experience in planning, study and execution of hydroelectric projects. Mr Venturini has experience in project and execution of traditional and EPC contracts for infrastructure projects in more than 9 countries including preparation of technical and feasibility study for the Santo Antonio Hydro Power Plant on the Rio Madeira in Brazil with a total installed capacity of 3150 MW.

*Education and/or Professional Qualifications:*

**Engineering geologist – University of Turin (IT)**  
**Doctor in Engineering Geology – University of Lausanne (CH)**  
**Diploma in mining Engineering – University of Lausanne (CH)**

*Linguistic ability:* English, French and Spanish

*Professional Experience:*

<b>1996-To Date</b>	<b>Astaldi SpA – Rome (Italy)</b>
<b>2012-to Date</b>	Technical manager for large infrastructure project Astaldi Canada
<b>2009- 2011</b>	Technical manager for the Cerro de Aguila Hydro Power Plant (under construction) (Peru) <ul style="list-style-type: none"> <li>▪ 1 concrete dam of 420.000 m3 (crest 293 meters)</li> <li>▪ 11 kms of tunnels, under very high topographic covers (1.300 m)</li> <li>▪ Underground powerhouse, valve chamber and transformer hall</li> <li>▪ Surge tanks, tailrace tunnels</li> </ul>
<b>2008 - 2012</b>	Technical advisor during bidding and construction for the St. Teresa hydro power plant (Peru) <ul style="list-style-type: none"> <li>▪ 5 kms of tunnels, under very high topographic covers (1.100 m)</li> <li>▪ Underground powerhouse, valve chamber and transformer hall</li> <li>▪ Surge tanks, tailrace tunnels</li> </ul>
<b>2007 - 2011</b>	Technical advisor during bidding and construction for Hunza hydro power plant (Peru) <ul style="list-style-type: none"> <li>▪ 65.000 m3 concrete dam</li> <li>▪ 10 kms of tunnels</li> <li>▪ 700 meters high penstock</li> <li>▪ Open air powerhouse (56.000 m3 concrete)</li> </ul>
<b>2008</b>	Technical advisor during bidding for Nido de Aguila hydro power plant (Chile)
<b>2007</b>	Technical advisor during bidding for Chacayes hydro power plant (Chile)
<b>2006 - 2007</b>	Technical advisor during bidding for Quitaracxa and Pucara hydro power plant (Peru)
<b>2006</b>	Technical advisor during bidding and for Tocomá hydro power plant (Venezuela) <ul style="list-style-type: none"> <li>▪ 1.150.000 m3 concrete in the powerhouse and intake, very similar as scheme to Muskrat Falls Project</li> </ul>

**GUIDO VENTURINI**  
**Project Coordinator**

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- 2006 - 2007** Technical advisor for bidding and planning and for Santo Antonio hydro power plant (Brazil)
- 5.450.000 m3 concrete in the powerhouse and intake
  - 32.000.000 m3 of earth works
- 2005 - 2007** Technical advisor for construction of Melito Dam (Italy)
- 11.000.000 m3 rockfill dam
  - 112.000 m3 of concrete
- 2004** Technical advisor for construction of Premadio hydro power plant (Italy)
- 1996 – 2003** Technical manager of all the geoengineering issues related to the construction of Pont Ventoux Hydro Power Plant (Italy)
- 34 kms of tunnels (3 TBMs)
  - Rockfill dam
  - Concrete Dam 65.000 m3
  - Underground powerhouse 72.000 m3 concrete
- 1993 – 1996** **Technical advisor for the construction of several hydro plants in Italy (ENEL)**



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ATTACHMENT 5  
**CURRICULUM VITAE - PROJECT MANAGER -  
VITTORIO AGABIO**

**VITTORIO AGABIO**  
**Project Manager**

Mr. Vittorio Agabio is a certified professional project manager with more than 30 years of experience as project manager in projects in Italy and overseas. He has planned and built major infrastructure projects successfully. He has a strong commercial background in international law and implementation of project management methodologies, processes and procedures.

*Education and/or Professional Qualifications:*

**Industrial Engineering, Politecnico de Torino (1975), Italy**

*Linguistic ability:* English and Spanish

*Certifications:* Professional Project Manager (PMP) by PMI  
 Neuro Linguistic Programming (NLP) Master Practitioner

*Professional Experience:*

- 2011-2012                    **Astaldi SpA – Rome (Italy)****  
 Huanza Hydroelectric Project (Peru)  
 Independent Consultant  
 Turnaround Management Projects (Project in Oman)  
 Start-up Management Projects (Project in Honduras)  
 Project Management and General Management Trainer (various )
- 2009 –2010                    **Impregilo SpA – Milan (Italy)****  
 Senior Project Manager with the responsibility of the start-up of Infrastructure Projects in Tripoli and Misurata (Temporary Contract for 1 year finished in June)
- 2008 – 2009                    **Orion Holding SC – Reggio Emilia (Italy)****  
 Operations Director/Portfolio Manager with the responsibility of Turnaround Management Project until June 2009 (reporting directly to the President). The first aim is to transform a “Functional Organization” into a “Strong/Project Matrix Organization” and to carry the financial and economic results to a satisfactory level for the shareholders
- 2001 – 2007                    **Impregilo – Astaldi – Ghella Joint Venture - Country: Venezuela.****
- 2006 – 2007    Senior Manager of Technical and Contractual Department in the Italian Enterprises Group Joint Venture as General Contractor for Middle Venezuela Railways Construction.  
 Project amount: 2500 million US\$
- 2001 – 2006    Senior Project Manager in the Contuy Medio JV as General Contractor for Caracas-Cúa Railways Construction.  
 Project amount expectation: 2500 million US\$ (Amount managed: 1000 million US\$).
- 1988 – 2000    Impregilo SpA  
 Project manager/General manager  
 General contractor for the Construction and the Commissioning of Public and Private Infrastructures in:  
 1999 – 2000: Dominican Republic  
 1996 – 1998: Ecuador  
 1993 – 1995: Chile  
 1992 – 1993: Dominican Republic  
 1991 – 1992: Mozambique  
 1990 – 1991: México

VITTORIO AGABIO  
Project Manager

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1988 – 1990: Dominican Republic  
1987 – 1988: Cavanna SpA - Novara – Italy.

**1985 – 1986**            **Lis (Lavori Idraulici Stradali) Vercelli - Italy**  
Project manager (accounting directly to the Owner)

**1977 – 1985**            **Cogefar SpA - Milan - Italy**

1982 – 1985    Project Plant Manager in Hydroelectric Plant construction (Tanzania)

1978 – 1982    Project Engineer in Hydroelectric Plant construction (Guatemala)

1977 – 1978    Project Engineer Deputy in Milan Office Headquarters



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**CURRICULUM VITAE - CONSTRUCTION MANAGER -  
VITTORIO ROBIATI**

VITTORIO A. ROBIATI  
Construction / Production Manager

Mr. Vittorio A. Robiati is a world class construction / production manager with more than 45 years of experience in projects in more than 15 countries and four continents. Mr. Robiati has received recognition awards from clients and employers for his outstanding works and efficient management of projects during execution.

*Education and/or Professional Qualifications:*

**Technical Civil Engineering – Cattaneo Civil Engineering Institute - 2000**

*Linguistic ability:* English, Spanish, French

*Professional Experience:*

**2012 to Date Astaldi SpA – Central America**

Area Construction Manager for Panama, San Salvador, Honduras, Nicaragua, Guatemala, Costa Rica.

Responsible for project execution of dams in Central America. Supporting preparation of Muskrat Project RFP regarding project execution and construction methodology.

**2010 - 2012 Contractor – GUPC - Grupo Unido Por El Canal - Panama  
Sacyr, Impregilo, Jan De Nul, Cusa**

Construction Manager.

Responsible for execution of construction activities in both sides of the projects (Atlantic and Pacific ocean). Contract Value: US \$ 1,900 million. The work includes 17 million of m3 excavation, 2 million m3 of concrete, installation of 300,000 ton of reinforcing steel. The project consist a 2,300 m long structure, 4 Lock-heads, and 3 lock structures for a total jump of 27 meters. Canal with 55 meter wide and 30 meters high walls. It is expected the Canal may accommodate 250,000 ton ships during operation.

**1998 - 2009 Consortium Sembenelli – Astaldi**

Area Construction Manager

**2008 – 2011** El Chaparral Hydroelectric Project, El Salvador  
Responsible for construction works of the El Chaparral hydroelectric project in Salvador. Contract value: US \$ 280 million. Project includes a 85 meters high RCC dam (300 m crest length), underground powerhouse, shafts, diversion tunnel (12 m diameter), spillway (32 meters high a 400 m long), discharge tunnel and other elements. Contract was suspended due to force majeure and geological problems.

**2008 - 2007 Pirris RCC Dam, Costa Rica**  
Responsible for construction works for the Pirris RRC project in Costa Rica. Contract value: US \$ 150 million. Project consisted of 800,000 m3 of roller compacted concrete (RCC), diversion tunnel, spillway, intake works, penstocks, gates and other minor elements.

**2007 – 2004 Construction of Highway Milano - Bergamo (4<sup>th</sup> lane), Italy**  
Contract value: US \$ 600 million.

Responsible for execution of the work. Project includes construction of the 38 km. long 4th lane of the Motorway Milano to Bergamo, demolition of 38



VITTORIO A. ROBIATI  
Construction / Production Manager

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	intersections, construction of 42 new intersections with spans between 54 and 58 m long.
<b>2004 - 2002</b>	Mr. Robiati did not participate in any construction project due to the fact that he took some time off.
<b>2001 -1998</b>	<b>Impregilo S.p.a. – Milano - Italy</b>  Project Manager  Kali Gandaki “A” Hydroelectric project - Nepal. Contract value: US \$ 180 million. Project includes diversion dam, desander , power conduit, collector channel, intake, long circular headrace tunnel, concrete lined (10 m diameter), surge shaft, penstock shaft and power house with a total capacity installed of 150 MW.
<b>1998 - 1997</b>	<b>Astaldi, Federici, CMC, Condotte d'acque</b>  Project Manager  Porce II Hydroelectric Project, Medellin, Colombia Responsible for construction execution of the works. Project includes a RCC dam – 128 meters high, 1,450,000 m3 and associated works, intake tower, crest spillway bottom discharge tunnels, etc.
<b>1997 – 1987</b>	<b>Icla – Napoli – Italy</b>
1997/1994	Construction of igh speed railway line between Rome - Napoli Contract value: US \$ 600 million.  Project Manager  Responsible for construction of the works. Project includes railway line (300 km/hr), 16 km of tunnels, 18 km of Viaducts including civil, mechanical and electrical works. Contract value: US \$ 600 million.
1994/1992	Construction of four lane Highway Limassol – Paphos, Cyprus  Project Manager  Responsible for construction of the works. Project includes construction of 20 km of four lane highway, 12 bridges with span up to 60 meter long, 9 overpasses and 2 concrete lined tunnels excavated in limestone Contract value: US \$ 70 million.
1992 - 1987	Area Construction Manager.  Construction of the Genova Voltri - Passi di valico 12 km long tunnel, with stations and underground connections. Contract value: US \$ 250 Million.  Construction of motorway Calitri – Bisaccia (70 km) including tunnels, bridges and micelanneous works. Contract value: US \$ 200 Million.
<b>1987 – 1981</b>	<b>LPI System - Milan – Italy (Minister or Public Works)</b>  Area Construction Manager  Responsible for construction of different projects in Italy.

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VITTORIO A. ROBIATI  
Construction / Production Manager

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Construction of cruise missile bases, hospitals, courts, housing, schools, university buildings, prefabrication factories, post office, post offices and other government facilities. Contract value: US \$ 500 million.

**1981 - 1977**

**Cogefar of Milano - Italy**

Area Construction Manager

Construction of the Champagne Hydroelectric Project in the Island of Mauritius. The project includes a rock-fill concrete face dam, intake shaft, conduction tunnel (3 km long), surge shafts (220 m), superficial powerhouse and spillway. Contract value: US \$ 45 Million.

Construction of the Song Lou hydroelectric project in Cameroon – Africa. Contract value: US \$ 100 Million. Project includes concrete dams, intakes, gated spillways, open spillways and a rock-fill dam.

**1977 – 1965**

**Impresa Generale di Costruzioni – Giuseppe TORNO – Milano – Italy**

Project Manager

Saudi Arabia – Highway Project in the Ghassim area  
Construction of 120 km long motorway project. Project includes 12 million m<sup>3</sup> of excavations and fills, 15 km of bridges, 200 pre-fabricated Armco type culverts and 100 concrete box culverts, 12" crusher run base and 6" thick of various asphalt premixed courses. Contract Value: US \$ 100 million.

South West Africa – Namibia – Cosint / Torno's Branch)  
Construction of the Cunene Hydroelectric project. Contract value: US \$ 100 million. Project includes underground powerhouse, penstock, lining conduction tunnel, 4 penstocks, spillway and other facilities.

Zambia - Construction of a Military airport in Mumbwa. Work includes construction of 2500 meters long asphalt paved runway 60 meters wide, taxi areas, apron, dispersal areas, helicopter pads, firing butts, ammunition deposits, access roads and all related infrastructures including fuel deposits, lighting, etc.

Zambia – Aqueduct and access roads for the Mumbwa Military airfield,  
Contract value: US \$ 10 Million. Project includes construction of access roads to the new project, pumping station, 20 km of 8" pipeline and distribution system including lined receiving reservoir.

Zambia - Lunkwakwa Army Dam. Contract value: US \$ 15 million. Project includes construction of an earth-fill dam 40 meters high and 120 meters long, a 120 m long concrete spillway with a 60 meter long Ogee crest, and a semi-submerged shaft and one pumping station.

Zambia – Construction of the Great East Road.  
Construction of 360 km highway from Chipata (Fort Jameson) to Nyimba .  
Contract value: US \$ 100 million. Work includes 7 million m<sup>3</sup> between excavations and compacted embankments and 5 small bridges with spans up to 30 m long.



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**CURRICULUM VITAE - DEPUTY PROJECT MANAGER -  
KEN CHRYSOLOR**

**KEN CHRYSSOLOR**  
**Deputy Project Manager**

Mr. Ken Chryssolor is a civil engineer with more than 50 years of diversified construction background experience in heavy and underground construction projects in Canada, United States and Mexico. Mr. Chryssolor has been involved in projects from conception and feasibility stage through proposal preparation, design, construction, start-up, commissioning and turn-over to the client. He has particular experience in construction of hydroelectric projects with specific emphasis in powerhouses, dams and penstocks.

*Education and/or Professional Qualifications:*

**Civil Engineer - McGill University, Canada (1960)**

*Linguistic ability:* English and French

*Professional Experience:*

<b>2011 – To Date</b>	<b>C.G.C Consultants</b>  Provides third party opinions on validations of estimates prepared by Contractors, Engineering firms, Consultants and other clients for civil engineering projects. Clients include J.V.P. (Joint Venture Panama, composed of SNC-T-avalin, Techinet of Chile and Gym Peru Ltd) Mina de Cobre Panama Project and others.
<b>2005 – 2010</b>	<b>Groupe Aecon Ltee</b>  Participant in claim preparation for Eastman 1 powerhouse.
<b>2003 – 2005</b>	<b>Groupe Aecon Ltfce</b>  Project manager for construction of Eastmain 1 powerhouse, intake structure and associated works.
<b>2003</b>	<b>Groupe Aecon Ltee</b>  Consultant for review of estimate and tender preparation for construction of Eastmain 1 powerhouse, intake structure and associated works.
<b>1979 – 2002</b>	<b>Les Constructions du Saint-Laurent Ltee Saint-Lawrence Construction (Western) Ltd Saint-Lawrence Construction (USA) Ltd</b>  Vice-president, Chief engineer and project manager
<b>1977 – 1978</b>	<b>Bechtel Quebec Ltd</b>  Construction manager
<b>1975 – 1976</b>	<b>Walsh-Brais Construction Limited</b> Director, Vice-President of construction and General Manager
<b>1969 – 1975</b>	<b>Fitzpatrick Construction Ltd</b> Manager of heavy construction
<b>1968 – 1969</b>	<b>Perini Corporation</b>

**KEN CHRYSSOLOR**  
Deputy Project Manager

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Assistant to manager of the tunnel division

**1966 – 1968**

**Inspiration Ltd**

Project manager, heavy construction division

### **MAJOR PROJECT PARTICIPATION**

1. Hydro electric developments with SEBJ.
2. James Bay Hydroelectric Eastmain-1.
3. Construction of Caniapiscou Reservoir (Dams, dykes. Diversion tunnels - KAI & KA3).
4. Construction of Caniapiscou reservoir (Dikes KA4 to KA13 including dam KA5).
5. Construction of Control structure Caniapiscou (Spillway).
6. Control structure LG4 site Construction of LG3 dikes and related works Construction of dykes, Fontanges site Excavation and concrete work of LG2A.
7. Powerhouse and access tunnels.
8. Fabrication of concrete supply LG4 (Brisay, James Bay - (excavation of intake canal),
9. Construction of Lac Robertson hydro electric development, dams, powerhouse and spillway.
10. Excavation and partial concrete works powerhouse.



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**CURRICULUM VITAE - CONTRACTS ADMINISTRATOR -  
GIUSEPPE CALCAGNO**

**GIUSEPPE CALCAGNO**  
**Contracts Manager**

Mr. Giuseppe Calcagno is a professional engineer with more than 15 years of experience in commercial management of infrastructure projects. He has been responsible to perform contract administration in traditional and Design-Build contracts for private and public clients. In addition, Mr. Calcagno is well know by his strong knowledge of scheduling and time analysis.

*Education and/or Professional Qualifications:*

**Geology Engineering – La Sapienza University of Rome(1985)**

*Other Training:*

*Linguistic ability:* English, French

*Professional Experience:*

<b>2011 to Date</b>	<b>Astaldi S.p.A.</b>
	Area Contract Manager Responsible for commercial management and contractual functions for Astaldi proejects in Bulgaria and Romania.
2008 - 2013	Bulgaria
	Construction of the Plovdiv-Svilengrad Railway Electrification and Upgrading of Corridors IV and IX. Civil, Track and Electrification works for phase 2: Parmovai–Svilengrad – Turkish/Greek Borders: Executive design, construction, superstructure, electrification, testing and starting of a single truck railway between Svilengard, Parvomai and the Greek/Turkish border, for an extension of 104 Km approx.
2005 – 2008	Romania
	Pitesti by-pass Project: Construction of 15.0 km. of new Motorway by-passing the town of Pitesti, including approximately 2,000 lm.of new Bridges and Overpasses with concrete and steel structures, and a railway Underpass.
2002 - 2005	Romania
	Construction of Motorway AO2 Bucarest-Costanza - 1° Lot Bucarest-Fondulea Km 0+000 - 26+500: Construction of a 26,5 Km concrete motorway with designed speed : 120 km/hr. Platform width : 26 m, carriageway width : 2 x (2x3,75 m), bridges, overpasses: n°9 - n°2 motorways intercchanges, n° 1 maintenance and coordination center, n°1 parking and service area- Concrete pavement : 119.600 m3 - New bridges : 30.000 m2;
1998 – 2002	Romania
	Rehabilitation of DN 19A Salaj County Boundary - Satu Mare Boundary: Widening and strengthening of 48 km of road, including the construction of one new bridge (70 m long), the rehabilitation of six bridges, the reconstruction of 14.000 sqm of existing road structure and the construction of no. 1020 new access culverts
	Rehabilitation of DN 1F km 89+800 lm 123+012: Widening and strengthening of 33 km of existing road with the reconstruction of 25.000 sqm of existing road structure. rehabilitation of six existing bridges and construction of three new bridges;

**GIUSEPPE CALCAGNO**  
Contracts Manager

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	Rehabilitation of DN 19A (km 54+577 to km 61+697): widening and strengthening of 7,1 km of existing road towards the Romanian – Hungarian border with the new construction of the 3rd lane in Petea and three new precast culverts
1996 – 1998	Romania  Rehabilitation of Arad-Timisoara-Moravita Highway: Road Rehabilitation of 70 km asphaltting, widening and structures
1993 – 1995	Impregilo, Tanzania  Deputy Project Manager  Musoma-Sirari and Mukuyu-Isebania Road Project: The Project is located in Tanzania (82.5 km.) and Kenya ( 28.5 km.) and involved approximately 2,000,000 cu.mt. of earthworks, two bridges and Asphalt Concrete Pavement.
1992 – 1993	Cogerarimpresit, Zambia  Lusaka-Kabue Road Rehabilitation Project: Diversion of the traffic and reconstruction of the existing road including a double surface treatment and a slurry seal;
1991 – 1992	J.V. C.D.K. (Cogefar Impresit- Dywidag- Koekelberg), BELGIUM  Responsible for the implementation of the Quality Assurance Programme for the construction of the “Nouvel Immeuble destiné au Conseil des Ministres de la CEE”: The building is formed of two blocks with a mixed structure of concrete and steel carpentry for a total surface of 225,000 sqm.
1988 – 1991	Tanzania, Various Projects  Pemba North Feeder Road Project: reconstruction of 49 km of road, with a double seal surface.  In charge of the concrete laboratory and of the geological survey on the Zanzibar and Pemba Ports Rehabilitation Projects. In Zanzibar: construction of two new wharves with 750 lm. of driven piles. In Pemba: Jetty head in rock-fill, concrete and gabions.





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**CURRICULUM VITAE - QUALITY MANAGER -  
GIANFRANCO PASTORE**

**GIANFRANCO PASTORE**  
**QA – QC Manager**

Mr. Gianfranco Pastore is a professional certified QA-QC with expertise in implementation of QA-QC systems in infrastructure projects. He has been responsible to implement successfully QA-QC system in different projects. He worked as the QA/QC Manager at the Grand Ethiopian Renaissance Dam Project in Ethiopia which is under execution and will be one of the largest hydro projects ever built.

*Education and/or Professional Qualifications:*

**Geology Engineering – Napoli Engineering (1989)**

*Other Training:*

- "Technical Norms for the constructions - (DM 14/09/2005) roles, responsibility and innovative aspects for enterprises in the sector of the constructions" held by the ICIC (Institute of Certification Undertook quality and services for Constructions) in Bologna - January 2007.
- Plain Concrete & Concrete Technology offered by Professor Collepari in Treviso - September 2004 -
- "Quality System Management" Course at AICQ in Milan - December 2003
- "Earth embankments construction and laboratory tests" held by Prof. La Forgia (Bari University) at the Central Laboratory of the TREESSE Joint-Venture, Scarperia (Florence) - September 2003.
- "Cements and concrete technology and laboratory test" held by Prof. La Forgia (Bari University) at the Central Laboratory of the TREESSE Joint-Venture, Scarperia (Florence) - June 2003.
- "Asphalt roads technology and laboratory test" held by Prof. La Forgia (Bari University) at the Central Laboratory of the TREESSE Joint-Venture, Scarperia (Florence) - May 2003.
- Advanced course of computerized mix-design held by the Prof. Collepari at the ENCO S.r.l. - February 2002.
- "Winch " course on the techniques of physician-scientific information - June 1990.

*Linguistic ability:* English, French, Turkey

*Professional Experience:*

**2011 to Date                    Astaldi Oman Branch**  
**Bid-Bid Sur Motorway, Oman**

QA/QC Manager

Responsible for the QA/QC system for the project including management of audits and all related quality assurance and quality control activities. The project includes construction of 42 kilometres of new motorway and refers to the first phase of the project to double the BidBid-Sur road, one of the main stretches of Oman's road network which links the capital to the Country's eastern regions. Contract value: USD 324 million (Astaldi holds a 51% stake) of consortium with Ozkar (Turkey).

**2011                                Salini Costruttori S.p.A.**

Grand Ethiopian Renaissance Dam Project, Ethiopia

Responsible for all QA/QC tasks associated with the contract. The project includes Construction of the for the Ethiopian Electric Power Corporation (EEPCo) on the Blue Nile in Ethiopia. Contract value: US \$ 4,200 million. The dam is a 145 m high, 1800 m long gravity-type composed of Roller Compacted Concrete (RCC) and one powerhouse with 15 turbines and a total installed capacity of 5250 MW.

GIANFRANCO PASTORE  
QA – QC Manager

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- 2009 - 2010      **Alstom Signaling – ITALY**
- QA-QC Manager
- Construction of the High Speed Railway between Rome and Napoliagola
- 2008              **Todini Constructions S.p.A. - DUBAI (UAE)**
- QA/QC Manager
- Construction of the road link close to the Sheik Zayed road, Road and Transport Administration project R 881/3A. Contract value: US \$ 115 million. 85 million of Euro.
- Astaldi S.p.A. – Bulgaria**
- QA/QC Manager
- Construction of the railway line among Parvomai and Svilengrad. Contract value: US \$ 210 million.
- 2000 - 2007      **CAVET - Joint Venture Impregilo, CMC and Maire Technimont**
- QA/QC Specialist
- Construction of high speed railway between Florence and Bologna. Contract value: US \$ 4,000 million. He was responsible for activities as follows:
- Management of CAVET quality system issuing the quality manual, the procedures and operational instructions.
  - Internal Audits to all joint-venture sites including the rail construction and the Technologies.
  - External Audit to the suppliers and subcontractors.
  - Audit to the Saturno joint-venture for the technologies among the societies Alstom Transport, Alstom Transport System, Ansaldo Signaling, Ansaldo Transports, Balfour Beatty Rail and Sirti.
  - Management of the non conformity and corrective and preventive actions.
- 1996 - 2000      **Astaldi S.p.A. – Turkey Branch.**
- QA/QC Specialist
- Construction of the sketch 2 of the Gümüşova-Gerede highway between Istanbul and Ankara. Contract value: US \$ 680 million. He was responsible for activities as follows:
- Relationships with the external laboratories and the Universities for material testing.
  - Concrete mix designs studies and batching plant control, setting and monitoring.
  - Quality control of beams and other products of the precast factory.
  - Checking and control of the borrow areas and quarries for aggregates productions.
  - Asphalt mix designs and checking during production by testing.
  - NATM (New Austrian Tunneling Method) application and monitoring especially for fiber reinforced shotcrete.

GIANFRANCO PASTORE  
QA – QC Manager

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1995

**Astaldi S.p.A. – Algeria**

QA/QC Specialist

AFT joint venture of Astaldi S.p.A., Federici S.p.A. & Todini S.p.A. for the construction of the Taksebt dam.

- Responsible for laboratory and management of activities as follows:  
Relationships with the external laboratory.
- Concrete mix design and their quality control.
- Batching plant & crushing plant calibration and monitoring.
- Definition, characterization and acceptance of quarries.
- Cores controls and their geological descriptions.

1988 – 1994

**Passante S.c.a r.l. – Italy**

Temporary Association of enterprises Torno S.p.A., Cogefarimpresit S.p.A., Lodigiani S.p.A. & C.M.B. S.r.l., for the construction of the sketches 3p/5p/6p Railway Connection in Milan. Contract value: US \$ 220 million.

QA/QC Specialist

Responsible for activities as follows:

- Concrete technology, mix design studies related to the railway station construction and Mitsubishi EPB shield (Earth Pressure Balanced shield).
- Check and monitoring of concrete supplier.
- Laboratory test on concrete and earths.
- Management of the EPB shield, diameter 8 m, for foam (Obayashi System) and extruded concrete.



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**CURRICULUM VITAE - PROJECT CONTROLS MANAGER -  
JUAN CARLOS BASSI**

**JUAN CARLOS BASSI**  
**Project Controls Manager**

Juan Carlos Bassi is a Project Manager with over 25 years of experience in project management, program management, planning, construction and administration of projects in Colombia, Mexico, Malaysia, Bolivia, Puerto Rico, Chile, Russia, Canada, Turkey and the United States. Mr. Bassi has served as a project and program manager from the prospective of an engineer, a design builder, and a traditional construction contractor. He has planned, supervised, built and managed various hydro, mining, water, wastewater, oil pipeline, highways, bridges and other infrastructure projects in which he has brought effective coordination, management and efficient interaction between project members.

*Education and/or Professional Qualifications:*

**Civil Engineer – National Autonomous University of Mexico (1984)**  
**M.CE – Civil Engineering - National Autonomous University of Mexico (1994)**  
**M.Sc. – Project Management - The University of Texas at Austin (1996)**

*Linguistic ability:* English and Spanish

*Professional Experience:*

**2010-to date**                    **ASTALDI S.p.A. – Rome (Italy)**

**2011-2012**                    **Project Director – Astaldi Turkey Branch, Turkey**

**Suspension Bridge - Izmit Crossing**

- Responsible in behalf of construction joint venture Nurol – Ozaltin – Makyol – Astaldi – Yuksel – Gocay (NOMAYG) for project execution of the Izmit Crossing Suspension Bridge (3,062 m) and South Viaduct connection (1,407 m). Budget: US \$ 1.5 billion and schedule: 44 months.
- Responsible to prepare project execution plan (PEP), setup group teams, provide guideline and leadership for project execution, preparation and implementation of project management procedures, definition of responsibilities for project participants, setup and follow up of project budgets and schedules, definition and implementation of Management Information System (MIS) for both projects, lead contractual approach of JV with client and project participants, management of subcontractors (IHI and local Turkish firms) and sub-consultants (AECOM, Louis Berger, Scott Wilson, Capita Symonds, SETEC, SECOA and others).

**Operations Manager - Astaldi Turkey Branch, Turkey**

- Pulkovo 1 International Airport - St. Petersburg, Russia. The project includes construction of a new terminal, links and new aprons to update the operation capacity up to 14 million passengers per year. Scope of work includes also refurbishment of existing terminal, build new airways, de-icing facilities and commercial areas. Budget: US \$910 million. Schedule: 36 months. The project is executed in JV (Astaldi S.p.A. - 50% and IC Ictas – 50%).

**1998 – 2009**                    **BLACK & VEATCH, Overland Park, KS, USA**

**2007 – 2009**                    **Project Manager, New Desalination Plant (NDP), Santiago, Chile.**  
**Minera Escondida Limitada (MEL) – BHP Billiton.**

- Project includes design of 3,200 l/s desalination plant, 180 km of pipeline 90" diameter, 4 high pressure pump stations, 5 substations and 180 km of

**JUAN CARLOS BASSI**  
**Project Controls Manager**

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duplex transmission lines between Coloso port (0.00 m.a.s.l.) and La Escondida mine (3,100.00 m.a.s.l.)

- Coordinating professional services provided to MEL in KC, USA and Chile. Tasks include supervision of staff working under my responsibility (120 people). Project management tasks associated with engineering, estimating, procurement and construction management.
- Executed contract management between B&V and MEL. Tasks include claims preparation, payment applications, COs preparation and negotiations, etc.
- Responsible for project financing of the contract.

**2005 – 2007 Program Manager, City of Toledo, Ohio. Toledo Waterways Program**

- Program includes improvement of existing facilities including design and construction of Grit Facilities, Ballasted Flocculation, Equalization Basin and Effluent Pump Station to treat a maximum of 400 MGD. Program Budget: \$115 million. Construction Schedule: 3 years.
- Performed project management for budget, schedule and contract administration for sub-consultants firms (six) and general contractors (four) involved with the program. Technical and management support to Owner when interaction with contractors, third parties and federal and state regulatory agencies.
- Reviewed, disputed, negotiated and closed claims issued by contractors (305 claims) in behalf of the Owner.
- Completion of program on schedule and under budget.
- Direction, coordination and management of daily site issues regarding the program.
- Implemented, trained and tracked program using contract administration tools via internet.

**2003 - 2004 Commercial Manager, Program Management - Various**

- South San Joaquin Irrigation (SSJID) – Program Management. System Project included Program Management activities for nine contractors and six consultants. The program included lake watershed protection, raw water facility, water treatment plant (40 MGD - membranes), 162,000 ft of water transmission lines of 30", 36", and 48" diameter, turnout pump stations facilities and steel storage tanks 1.0, 2.0 and 3.0 MGD. Coordinated construction activities, project controls and contract management tasks associated with the program.
- PRASA Program Management – Leading field activities regarding Wastewater - Water Treatment Plants Inspections in Puerto Rico. Inspected 20 WWTP's, 51 WTP and 58 pump stations owned by PRASA (Puerto Rico Aqueduct and Sewer Authority). Identified issues affecting operability, capital improvement (CI) review, cost evaluation for CI and legal frame for facilities improvement in compliance with EPA and Health Department regulations.
- Toledo CSO Program - The City of Toledo, Ohio - Commercial, financing and program management tasks. Prepared sub-consultant contracts and also negotiated and closed contracts agreements with sub-consultants. Prepared program procedures and construction manuals as defined by contract services agreement. Prepared budget and schedule baseline, tracked and managed budget and schedules during project work. Prepared and implemented procedures for reporting, invoicing and risk evaluation.

**JUAN CARLOS BASSI**  
**Project Controls Manager**

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- 2000 – 2002      Construction Manager, Rio Taquesi Hydroelectric Project, Bolivia**
- Managed at-risk construction of two EPC hydroelectric projects “in cascade” (dams, tunnels, penstocks, powerhouses, switchyards, substation, access roads, jet grouting, turbine and generator erection, transmission lines) at isolated, remote mountainous site. Completed civil works on schedule by working around six-month design delay.
  - Employed unusual construction methods demanded by site conditions, e.g. cableways, cyclopean concrete, hand-drilled tunneling, and placing concrete through chutes up to a half-mile long.
  - Evacuated staff on foot when civilian roadblocks shut job down. Protected archaeological discoveries.
  - Commercial and construction management of international contractors (Italy, Brazil, Austria, Bolivia) including management of local staff (Bolivia) and international partners (Switzerland and USA).
  - Implementation and follow up of Information Management Systems during construction.
- 1998 – 1999      Project Controls Manager, Construction Services, Kansas City, KS**
- Project controls support for national and international water and hydro projects (California, South Carolina - Philippines, Switzerland, Bolivia and Puerto Rico) including contract negotiations and follow up, scheduling, budgeting, cash flow, etc.
- 1988 – 1998      GRUPO ICA, Mexico City, Mexico**
- 1997 - 1998      Construction Manager, Emergency Plan, Hermosillo, Mexico.**
- The project included supply, installation and testing of 55 km of water pipe (8” – 60”), fittings and 14 pump stations.
- Responsible for planning and executing construction and commercial tasks. Prepare claims, new unit prices, backcharges, invoicing and associated commercial tasks. Field Staff: 325 people, claims prepared and approved by the owner: US \$1.1 million.
  - Prepared budget revisions and financial reports. Implemented and coordinated ISO 9000 standards. Implemented and followed up the environmental program. Environmental Baseline Survey report and “metrics score analysis”. Implemented “Zero Accident Techniques” and safety regulations. Evaluation and subcontractors administration including construction performance and commercial management.
- 1996 – 1997      Subcontractor Manager, Bakun Hydroele. Project, Sarawak, Malaysia**
- Prepared contract documents, estimates, subcontractors’ administration, scheduling control, payment approval, safety and QA/QC management. Oversaw construction, arranged utility relocations for initial construction activities, including interferences and impact to project residents. Bakun was the largest hydroelectric project to be built in Asia. Construction suspended due to Owner’s financial difficulties.
- 1995 - 1996      Conducting Master in Science (Project Management). The University of Texas at Austin**
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**JUAN CARLOS BASSI**  
**Project Controls Manager**

**1993 – 1994      Conducting Master in Civil Engineering - Construction Management.**  
 The National Autonomous University of Mexico

**1990 – 1993      Construction Manager, Aguamilpa Hydr. Project, Nayarit, Mexico.**

Project includes cofferdams, dam, tunnels, powerhouse, intake works, access roads, diversion tunnels, penstocks, spillway, bridges, and substation. Project budget: US \$ 420 million. Site Staff: 3,850 (peak).

- Responsible for planning, inspecting and executing site activities. Construction and contract management tasks including production on site and management of cost, budget, cash flow, scheduling, etc.
- Claims preparation, negotiations and closing (US \$22 million in claims approved by the owner). Responsible for production at intake works (2,200,000 m<sup>3</sup> - rock excavation, 35,000 m<sup>3</sup> - concrete, 115,000 m - rock bolts, 6,000 m<sup>3</sup> - shotcrete, 5,000 ton - steel piping – Field Staff: 780 people), access roads (350,000 m<sup>3</sup> - rock excavation – Field Staff: 125 people), penstocks (3 tunnels, 9.10 m diameter and 160 m length – Field staff: 125 people), rock fill dam (187 m high and 15,000,000 m<sup>3</sup> of compacted embankment, grouting rock and rock support – Field Staff: 885 people).
- Intakes Work and Penstock Shafts. Finished civil and mechanical works on schedule by working around five-month delay due to unexpected geology conditions.

**1989              Field Engineer, Mexico City, Mexico.**

- Responsible for construction of tunnel and two stations for the Massive Transportation System in Mexico City (Subway) using a TBM. Activities included daily planning of construction tasks, evaluation of traffic and residents disturbances, preparation of monthly report and invoicing to the Client, cost and scheduling control, claims preparation and negotiations, inspection and supervision of construction staff, client management and administration of QA/QC and safety programs. Budget: \$65 million. Field Staff: 165 people.

**1988 -1989      Field Engineer, Various Construction Projects, Colombia.**

- Responsible for excavation of 500,000 m<sup>3</sup>/month of coal at Cerrejon project in Colombia. Responsible for coordination of resources on site and management of schedule and budget for the contract.
- “El Silencio” water tank included 25,000 m<sup>3</sup> - concrete, 7500 ton - reinforcing steel, 350,000 m<sup>3</sup> - excavation. Site Staff: 215 workers. Responsible for construction management tasks including planning, construction and contract management.
- “La Palma” included dam - 125,000 m<sup>3</sup>, 8,000 m<sup>3</sup> - concrete. Site Staff: 250 people. Responsible for construction management tasks including planning, construction and contract management. Budget: US \$ 10 million.
- Caño - Limon - Coveñas Oil Pipeline. Responsible for pipeline installation and maintenance during operation. Maintenance and repair work based on damages caused by civil riots. Work included excavation, pipeline installation, backfill and testing. Specific tasks included coordination of construction staff, preparation of daily reports, site documentation, and claims preparation. Field Staff: 225 people. Budget: US \$ 40 million



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**CURRICULUM VITAE - ENVIRONMENTAL MANAGER -  
SANDRO CAPADONA**

**SANDRO CAPADONA**  
Environmental Manager

Mr. Sandro Capadona is a certified professional with more than 10 years implementing environmental systems in infrastructure projects. He was directly responsible for implementation of environmental management system for projects in Turkey since 2002. During last two years he has been involved in preparing environmental impact assessments for BOT projects in behalf of Astaldi Turkey Branch. In addition, Mr. Capadona is responsible to perform audits for all Astaldi projects in Turkey.

*Education and/or Professional Qualifications:*

**Architect - University of Florence, Italy - 1990**

**M. Architecture - Middle East Technical University, Ankara, Turkey - 2001**

*Linguistic ability:* English, Turkish, Greek, French

*Professional Experience:*

<b>2002 – to Date</b>	<b>Astaldi Turkey Branch</b>
<b>2011</b>	<b>Environmental, Quality and Safety Coordinator</b>
	Construction of a New International Terminal in Milas Bodrum Airport mainly referred to: Earth Movement • Civil Works • Architectural Finishes • Electromechanical Works • Electronic Works • Security and Safety Works • Infrastructure • Apron • Viaduct • Parking Area • Landscaping
<b>2007 – 2010</b>	<b>Environmental, Quality and Safety Manager</b>
	Kadiköy-Kartal Metro Supply Construction and Electro-mechanical Systems procurement, Installation and Commissioning Works: Heavy Metro System, total length of line 21km, section about 65m <sup>2</sup> , 17 km of tunneling (tunnel excavation by TBM), 16 underground stations: Heavy Metro System, total length of line 21,7km, section about 65m <sup>2</sup> , 17 km of tunneling (tunnel excavation by TBM), 16 underground stations. Execution of the Tunnel Excavation by TBM, signalization works and design works relevant to the 4,5Km Kartal-Kaynarks section which is the continuation of the 21,7 Kadikoy-Kartal Rail System Line. Two years for maintenance period.
<b>2002 – 2007</b>	<b>Environmental &amp; QA/QC Manager</b>
	Anatolian Motorway - Bolu Mountain Crossing: : Section 2 from Km 215+000 to Km 240+000: Design/construction of Bolu Mountain Crossing, for a total 25 Km, 3,2 km long twin tunnel.
<b>2000 – 2001</b>	<b>Ahmet Yagcioglu &amp; Partner's Construction Company</b>
	Architect: Ahmet & Mehmet Yağcıoğlu. ARKAS Group Administration Building's Project (Alsancak - IZMIR) 1/200, 1/100, 1/50 Preliminary design drawings (around 8.000 m <sup>2</sup> ). Preparation of the Final Project Drawings and Municipality drawings. Proposal for a housing development for 6 families, 1/100 (Narlidere – IZMIR)
<b>1999 – 2000</b>	<b>Middle East Technical University</b>
	Revolving Fund Administration Recreational Center for the Turkish Republic Central Bank (Ümitköy-ANKARA) Project Responsible: Arch. Prof. Dr. Murat Balamir

**SANDRO CAPADONA**  
Environmental Manager

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Preparation and submission of 1/500,1/200,1/100, 1/50 project drawings (65.000 m2).

**1997 - 1998**

**Uygur Architecture Company, Turkey**

Architects: Semra & Özcan Uygur  
Republic of Turkey – Turkish National Assembly, Offices Project  
Preparation and submission of project drawings (45.000 m2).  
Republic of Turkey – Presidential Symphony Orchestra Project.  
Preparation and submission of Chorus Buildings Acoustic Details Drawings

**1994 - 1994**

**Architect Can Cinici**

Republic of Turkey - Ministry of Public Works and Settlement  
Trainee Architect  
Proposal for the Ballet, Conference and Opera Building (Ankara)

**1993 - 1993**

**Tirnakli Construction Company**

Architect: Ferhat Tirnaklı  
Trainee Architect  
Commercial Building. Supervision and follow up at Construction Yard (Yenişehir - Izmir)

**1992 – 1992**

**Tirnakli – Capadona Construction Company, Turkey**

Architect: Ferhat Tirnaklı  
Trainee Architect  
Residential Building. Supervision and follow up at Construction Yard (Alsancak - Izmir)



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**CURRICULUM VITAE - HEALTH, SAFETY -  
FEDERICO MORO**

**FEDERICO MORO**  
**HSEC Manager**

Mr. Federico Moro has more than 15 years of experience implementing and managing HSEC for infrastructure projects. In addition, he has responsible to perform audits to Astaldi projects in-country and overseas. He has an international HSEC certification for the EU and it is currently the HSEC manager for the Breshia Light Rightway.

*Education and/or Professional Qualifications:*

**Safety Engineering - Escuela Carlo Bazzi (Milano in 1991)**

*Linguistic ability:*

English

*Training and Certifications:*

- Fita Confindustria, Italy (in 05/2005). Course of Eco Audit for a sustainable development. UNI EN ISO 14000 Environmental Management System Auditor. CEPAS Qualified Auditor in Quality Management Systems.
- Chamber of Commerce of Caserta – ASIPS, Italy (in 06/2005) CEPAS Qualified Auditor in Quality Management Systems, Quality Management System Auditor.
- UNIFORM GROUP Consulenza & Formazione – ANGQ, Italy (02/2006).
  - Quality Master “*Esperti in Qualità, Qualità Ambientale e Sistemi di Gestione Aziendale ISO 9000, Vision 2000, ISO 14000. Emas Rules, L.D. 626/94, OHSAS 18001, BS 8800, SA 8000.*”
  - *Expert assigned to Environment, Quality, Safety and Environment Systems. Course Certificate ANGQ qualified CEPAS as Quality Management Auditor, Course Certificate as Health and Safety Management Auditor in situ, Course certificate of Environmental Systems Auditor, Course Certificate of OGC Model Auditor, Course Certificate of SA 8000 Model Auditor.*

**01/2004 – to date**

**Astaldi S.p.A.**

**ITALY**

Safety Manager

Brescia Light Railway: 1st functional lot "PREALPINO -S. EUFEMIA": Design/execution, Construction, Technical Management ,usual and unusual maintenance of the light railway at driving constrained in own place by integral automation; development of 14 Km about, with 18 stations and the warehouse including all the activities and the relatives functions to the management and the administration of the system. The layout is composed of 4,8 km in covered trench, 6,1 km in deep tunnel, 1,3 km at ground level and 1,8 km in viaduct.

**10/2001 – 10/2004**

**ITALY**

Safety Manager

- Regional underground railway system - 1st. Phase - Lot A: Section Padoue-Castelfranco Veneto: Construction of a bridge on Brenta river, elimination of no. 21 level crossings, rehabilitation works of no. 5 stations.
- Regional underground railway system - 1st. Phase - Lot B Mestre-Castelfranco Veneto: Elimination of no. 17 level crossings, rehabilitation works of no. 5 stations and Trebasalge new railway stop.

FEDERICO MORO  
HSEC Manager

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- Regional underground railway system - 1st. Phase - Lot C : Treviso-Mestre and Mestre-Mira Buse: The project foresees 5 typologies of works: elimination of level crossings, 6 underpasses for cars, 3 underpasses for channel crossings, rehabilitation works of the stations and 2 railway stop of the underground, 2 new level crossings, electrification work of a single track railway line section between mestre and mira buse (approximately 8 km), realization of a new highway interchange in Borbiago di Mira Buse

**04/2001 – 09/2004**

**CONSORZIO CAVET, ITALY**

Assigned to Health and Safety Site Office

High Speed Railway line Milan – Naples: Bologan-Florence Section

**04/1997 -09/2001**

Safety Manager

Construction of the High Speed Railway, section Milan – Naples: Florence-Bologna stretch, Mugello worksite excavation of n° 3 railway tunnels: Firenzuola tunnel 6500 lin.m. and Osteto and Marzano adits 2500 lin.m.



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**CURRICULUM VITAE -  
ADMINISTRATION AND FINANCIAL MANAGER -  
GABRIELE CASTELLUCCI**



**GABRIELE CASTELLUCCI**  
**Administration & Financial Manager**

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Mr. Gabriele Castellucci has over 20 years of progressive experience in project financing and administration of infrastructure projects in Italy and overseas. Mr. Castellucci has specific experience in the administration of large projects. He has served as CFO of Astaldi in Turkey and the United States for the last 9 years. Additional relevant experience includes financing of BOT projects, tax law and human resources management.

*Education and/or Professional Qualifications:*

**Economics Degree (Urbino University, in 1991)**

*Linguistic ability:* English, Spanish

*Professional Experience:*

<b>2004 – to date</b>	<b>Astaldi S.p.a.</b>
<b>08/2010 to date</b>	<p><b>ASTALDI CONSTRUCTION CORPORATION (ASTALDI GROUP), FLORIDA</b>  Administrative Manager  Chief Financial Officer (also Secretary and Treasurer in the Board of Directors)  SR 862 - From West of SRS (US1) to East of McIntosh Road (T4255): the improvements under this contract consist of the construction of 4 bridges, MSE walls, flexible and rigid pavement, milling and resurfacing, construction of ramps, a single track railway to Port Everglades, ponds, signals, signing and pavement marking, landscape, lighting, relocation of a water main and a force main on SR 862 Eller Drive Intermodal Container Facility (ICTF) from West of US-1/SR-5 to East of McIntosh Road, Broward County.</p>
<b>03/2004 07/2010</b>	<p><b>TURKEY</b>  Administrative and Financial Manager</p> <ul style="list-style-type: none"> <li>- Construction works for Halic Metro Crossing Bridge of Istanbul Metro in Golden Horn area</li> <li>- Civil and Electro-Mechanical Works for Kadikoy - Kartal Metro, Phase II</li> <li>- Realization and operation of the Gebze - Orhangazi - Bursa - İzmir Motorway</li> <li>- Anatolian Motorway - Bolu Mountain Crossing: Section 2 from Km 215+000 to Km 240+000: Widening to three lanes of the motorway section from Km 45+170 to Km 50+856</li> </ul>
<b>06/1998 – 12/2003</b>	<p><b>CARLI S.R.L., ITALY</b>  Administrative and Financial Manager  The company specialized in restoration works in public contracts.</p>
<b>1995 – 1998</b>	<b>ASTALDI S.P.A.</b>

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**GABRIELE CASTELLUCCI**  
**Administration & Financial Manager**

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**10/1995 – 05/1998**

**TURKEY**

Administrative Manager  
Anatolian Motorway - Bolu Mountain Crossing: Section 1 from Km 186+165 to  
Km 215+000 and Section 3 from Km 240+000 to Km 302+125

**10/1993 – 10/1995**

**HONDURAS**

Assistant Administrative Director for Central America and Caribbean Area  
and Site Administrative Manager

**07/1992 – 10/1993**

**ITALY**

Administrative Collaborator for the administrative direction of America Area in  
Italy



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**CURRICULUM VITAE - PROCUREMENT MANAGER -  
ALDO DUSSI**

**ALDO DUSSI**  
Procurement Manager

Mr. Aldo Dussi is a professional with more than 35 years of experience in Procurement and Logistic for international projects. He has experience working overseas and also implementing successfully QA/QC systems in activities under his supervision. During last 3 years he was the Procurement Manager for the Kadikoy - Kartal Metro in Istanbul, Turkey which is one of the most successful projects of Astaldi in recent years.

*Education and/or Professional Qualifications:*

**Scientific Secondary School in Izmit, Turkey (1973)**

*Linguistic ability:* English, French, Spanish and Turkish

*Professional Experience:*

**1994 – to date                      Astaldi Turkey Branch**

**TURKEY**

Procurement Manager

- Civil and Electro-Mechanical Works for: Kadikoy - Kartal Metro, Phase II: Heavy Metro System, total length of line 21km, section about 65m<sup>2</sup>, 17 km of tunneling (tunnel excavation by TBM), 16 underground stations.
- Anatolian Motorway - Gumusova-Gerede: Section 2 from Km 215+000 to Km 240+000 (Bolu Mountain Crossing): Design/construction and one year of maintenance of 25 Km (in seismic zone) having 3 lanes for carriageway including 4 double viaducts and 3 double bridges (total length 5,561 m).
- Anatolian Motorway - Gumusova-Gerede: Section 1 from Km 186+165 to Km 215+000 and Section 3 from Km 240+000 to Km 302+125: Design/construction and one year maintenance of Section 1 Gumosova – Uckopru and Section 3 Yumsukaya – Gerede of 91 km motorway (in Seismic zone) having 3 lanes for carriageway 2 carriageways), 12.000 m of viaducts Huanza Hydroelectric Project: Implementation of civil works of the hydroelectric power station of Huanza, construction of RCC dam (34,000 sq m) and by traditional concrete intake tower, a gallery of 10,500 ml, piezometric shaft, penstock of 600 m, the engine room. Conay intake tower and PVC pipes of 5 km.

**1992-1994**

**MAROCCO**

Purchasing Office Supervisor and Warehouse Responsible.

- Al Whada Earthfill dam hydroelectric power station and concrete arch dam: Earthfill dam: Height m 88, Crest length m 1.600 Volume -earth m<sup>3</sup> 27x10<sup>6</sup> -concrete m<sup>3</sup> 945,000 Reservoir: Volume m<sup>3</sup> 3.8x10<sup>9</sup> Surface ha 12,300 , Capacity m<sup>3</sup>/an. 1.2x10<sup>6</sup> Spillway: Capacity m<sup>3</sup>/s 13,000 Bottom outlet: Capacity m<sup>3</sup>/s 1,400 Length m 750 Concrete arch dam of 80.000m<sup>3</sup>, Height m 120 reservoir m<sup>3</sup> 317,000,000 Spillway for canals irrigation Destination: Agricultural irrigation.

**1989 - 1992**

**BURKINA FASO**

Purchasing Office Supervisor and Warehouse Responsible.

**ALDO DUSSI**  
Procurement Manager

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- Bagré Hydroelectric Power Plant earthfill dam: height m. 30; crest length m 4,300, backfill m<sup>3</sup> 2,300,000; concrete m<sup>3</sup> 60,000; volume of reservoir m<sup>3</sup> 1,700x10<sup>6</sup>; electric power station Outdoor type adjacent to the dam, with 2 Units each of 8 MW power.

**1987 – 1989**

**TURKEY**

General services management

- Sewer trunk lines in Istanbul, Turkey.

**1979 - 1987**

**NIGERIA**

Purchasing office

- Shiroro Hydroelectric Power Plant: earthfill dam: height m 115; crest length m 700; excavation m<sup>3</sup> 6,800,000; backfill m<sup>3</sup> 4,000,000; concrete m<sup>3</sup> 666,000.



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**CURRICULUM VITAE - TECHNICAL OFFICE MANAGER -  
ANTONIO PIZZIMENTI**

**ANTONIO D. PIZZIMENTI**  
**Technical Office Manager**

Mr. Antonio David Pizzimenti is a professional engineer with a PhD in Structural Engineering from the University of Catania, Italy. He has more than 8 years of continue experience as Technical Office Manager in infrastructure projects in Europe leading activities related to schedule, budget and particular emphasis of engineering works. During last two years, Mr. Pizzimenti has been the proposal manager lead of Astaldi for projects in Qatar and the Middle East.

*Education and/or Professional Qualifications:*

**PhD - Structural Engineering - University of Catania (ITALY) - 2003**  
**B.Sc - Civil Engineering – University of Reggio Calabria (ITALY) - 2000**

*Linguistic ability:* English

*Professional Experience:*

**2005-To Date Astaldi SpA – Rome (Italy)**

**2011 to Date Astaldi Qatar Branch - Middle East**

Proposal Manager

- Responsible as JV Leader for the Bid submission and for the Pre-qualifications (technical and financial submission).
- Identify differentiators and winning strategies, agree them with the JVs Board of Directors and translate and communicate with the bid team.
- Identify Key drivers and ensure that these are captured within the Bid.
- Positively present the company to the Client in both bid and PQQ submission
- Decide the bid team structure and clearly communicate roles and responsibilities
- Ensure that bid costs are maintained in compliance with approved budges. Prepare proposal and project execution schedules.
- Ensure that all commercial aspects of the bid conform to the company procedures.
- Ensure effective time management of self and team members.

**2009- 2011 Astaldi Bulgaria Branch – Sofia**

Engineering Manager

DB Contract for the Civil Track & Electrification Works from Plovdiv to Svilengrad and to the Turkish/Greek Borders railway section (110km railway at 200 km/h) - European Corridor IV and IX. The system design project includes electrification of the upgraded line, new signalling systems with automatic train protection (ATP), renewal of the existing telecommunications and implementation of train radio and a SCADA control system. Contract value about 200€ million

- Responsible for planning, co-ordinating and executing all technical and constructional aspects, delivering to program to or below budget.
- Responsible for overall management of the infrastructure design services provided by others by managing a group of technical specialists.
- Responsible for managing the delivery of the design from the Preliminary to the Detailed by verifying consistency in the designs produced by the design consultants with respect to adherence to the design criteria and required standards.

**ANTONIO D. PIZZIMENTI**  
**Technical Office Manager**

- Manages the scope development and tendering process by the senior engineering staff for procurement of the design consultants as well as third party reviewers.
- Participates in the VE and manages all VE studies, constructability and other workshops; and drives the on-schedule submittal of the design deliverables.
- Keeps Project Management Team informed as to changes made to ensure timely processing of contract change orders.
- Manages the responses to design RFIs and review/comment on change orders.
- Ensures all infrastructure design works are comprehensive and discussed with the various engineers for the best implementation and installation of services in coordination with other parties and contractor.
- Responsible in participate in negotiations with regulatory agencies in public meetings to support the client. Liaising with Client stakeholders, Utility Approval Authorities, Engineer of Record, Construction, Contracts and Project Controls.
- Supports the Project Director in performing other tasks as deemed necessary related infrastructure aspects of the project.

**2007 – 2009 Astaldi Rumania Branch - Bucharest**

Technical Manager

Design and Construction of Basarab flyover/overpass (Bucharest, Romania), total length about 1500m. The project consisted in three different bridges structures typology: one single tower cable stayed bridge (cable stayed length 340m, maximum width 46m - 6lanes and 2 tramways), one Bow string arch bridge over river Dambovita (length 120m, width 22m) and multiple decks (roadway and tramway) pre-stressed concrete slab bridges. All the structures are seismically isolated (Viscous dampers and Lead-rubber bearings). Contract value: 160€ million.

- Coordinator of the design team during design and construction stage for the design of the seismically isolated bridges structures.
- Planning of site activities regarding materials procurement and management of contracts with subcontractors and suppliers.
- Assist review and follow up of in house development of design.
- Review and resolve interfaces between disciplines.
- Assist and conduct technical coordination meetings among engineers of different trades. Recommend value engineering solutions when required and applicable. Liaise and coordinate with procurement engineers to make sure that all the materials that will be ordered / purchased are conforming to specifications.

**2005 – 2007 Astaldi Rumania Branch – Bucharest**

Technical Manager

Construction of a 15 km motorway on the north side of Pitesti (Romania) and 1.6 km of connecting roads. The projects includes 2 interchanges and 10 double deck bridges. The main activities performed during the works were: earth filling: 2 million cubic meter, asphalt mixture: 190000 tons, hydro-technical works: 4 km, bridges: 1000 m of pre-stressed concrete continuous beam bridges,



**ANTONIO D. PIZZIMENTI**  
**Technical Office Manager**

Launching of 4000 m of composite steel-concrete bridges, pre-casting yard production: 1000 post tensioned beams, 1700 precast deck slab. Contract value: 100€.

- Responsible for planning, co-ordinating and executing all technical and constructional aspects, delivering to program to or below budget.
- Responsible for overall management of the infrastructure design services provided by others by managing a group of technical specialists.
- Assist review and follow up of in house development of Design.
- Review and resolve interfaces between disciplines.
- Assist and conduct technical coordination meetings among engineers of different trades.
- Recommend value engineering solutions when required and applicable.
- Manages the responses to design RFIs and review/comment on change orders.
- Ensures all infrastructure design works are comprehensive and discussed with the various engineers for the best implementation and installation of services in coordination with other parties and contractor.
- Responsible for the observance of the technical specification for the works prepared by the Employer.

**2003 – 2005 Astaldi S.p.A. - Florence, Italy**

Technical Manager

Design and upgrading of a 9 km section in Metaponto-Reggio Calabria track during railway operability. The project consisted in design and construction of 5 new railway viaducts, 26 new culverts (using jacking technology under the embankment), 5 new road underpasses and 16 new pedestrian underpasses. Contract value: 60€ million.

- Responsible for planning, co-ordinating and executing all technical and constructional aspects, and delivering project on schedule and on budget. Responsible for overall management of the infrastructure design services provided by others by managing a group of technical specialists.
- Responsible for managing the delivery of the design from the preliminary to the detailed design by verifying consistency in the designs produced by design consultants with respect to adherence to the design criteria and required standards.
- Participates in the VE and manages all VE studies, constructability and other workshops; and drives the on-schedule submittal of the design deliverables.
- Keeps project management team informed as to changes made to ensure timely processing of contract change orders.
- Supports the Project Director in performing other tasks as deemed necessary related infrastructure.
- Responsible for the observance of the technical specification for the works prepared by the Employer.

**2002 - 2003**

**Senior Structural Engineer – Consultant - Calabria, Italy**

- Preparation of technical feasibility reports.
- Design and analysis of structures, bridges including the preparation of work for CAD and interaction with geotechnical engineers as appropriate.

**ANTONIO D. PIZZIMENTI**  
**Technical Office Manager**

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- Preparation of calculations, written reports and checking of contract drawings site surveys and appraisals of various structures, earthworks and foundations as appropriate Liaison with clients, attending meetings on site, progress meetings, design review meetings including cost/commercial aspects of projects.
- Design of bridge structures (pre-stressed concrete beams with reinforced concrete deck) and drainage systems for the viability along the Calopinace and Prumo channel river. Contract value 10€ million.

**2001- 2002**

**Lecturer University of Reggio - Calabria, Italy**

- Professor Associate for Structural Engineering courses for undergraduate and graduate students.
- Researcher for the Italian National Research Program "Wind and Infra-structures: Dominating Eolian Risk For Utilities and Lifelines".
- Department of Mechanics and Materials, University of Reggio Calabria, ITALY, 1, Via Graziella, loc. Feo di Vito, I-89100 Reggio Calabria, ITALY.
- Wind Engineering, Structural Dynamics, Bridge Engineering



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**CURRICULUM VITAE - PLANT MANAGER -  
ENRICO MARIA VECCIA**

**ENRICO MARIA VECCIA**  
**Plant Manager**

Mr. Enrico Maria Veccia is a professional expert in electromechanical equipment including instrumentation and control systems. He is a certified engineer with expertise in electrical systems and safety design management for infrastructure projects. During last 3 years he has been the plant engineer for metro projects in Italy and Istanbul.

*Education and/or Professional Qualifications:*

**Mechanical Engineer - University of Rome, "La Sapienza" in 1997.**  
 Registered at the Order of Engineers of Rome, in 2001 and later at the Order of Engineers of Turin in 2009)

*Linguistic ability:* English

*Additional Training:* INGEGNERI ROMANI: Course of Plant Engineering and Electrical System in 2003  
 ORDER OF THE ENGINEERS OF TURIN: Safety Course in 2004

*Languages:* English

*Professional Experience:*

**March 2003 – to date    Astaldi S.p.A.**

**ITALY**

Plant Manager

Coordinator of the design activities and erection of the mechanical equipment and hoisting system.

- Turnkey Design/Construction for new automatic Line 5 for Milan underground: Concession for Project Financing and 27 years management: Final and executive design, project management, civil works and technological works, rolled material supply and subsequent management and its possible extensions of the functional section of the M5 Line from Garibaldi station (National Railroads) to Bignani with a development of 5,645 m approx.

**1999 – 2008**

**ITALY**

Independent Consultant - Site Technical Office

Electromechanical Works Manager and Chief of the Plant

Design and Construction of the Pont Ventoux-Susa hydroelectric plant: Construction of: intake structure (capacity: 33 cu.m./sec),- storage tank (capacity: 560,000 m<sup>3</sup>); headrace tunnel (total length: 14 km, diameter: 4 m), pressure tunnel (total length: 4.5 km, diameter: 4 m), surge tank lined in r.c. (H= 80 m, diameter: 12 m) steel penstock (total length: 1.5 km, diameter: 4÷2.8 m), access tunnel to the plant (length: 1.3 km, size: 6x8 m), underground power station (size: 18x41x48 m) equipped with 2 Francis turbines (production: 150 MW) and a pump (flow: 13 cu.m./sec, discharge head: 500 m), technological installations, start-up and management of the plant for the initial period.

**03/1999 – 06/1999**

**MB PROGETTI**

ITALY

Designer

**ENRICO MARIA VECCIA**  
Plant Manager

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Realization of the project for optical fibre cable laying on FS (National Railway) Piling of Rome – Bari section



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**CURRICULUM VITAE - PROJECT MANAGEMENT OFFICE  
(ENGINEERING MANAGER) - MARCO GRINOVERO**



**MARCO GRINOVERO**  
Engineering Manager

**1982 - 1984**

**With IMPREGILO S.p.a . - Betania Hydroelectric Project, Colombia**

Chief Engineer

Hydroelectric Project including, among others, the following:

- Main earth Dam, 6,000,000 cm, having a deep waterproofing curtain;
- Main Spillway in concrete, with gates control;
- Stilling Basin;
- Secondary earth Dam, including an additional spillway with free water discharge and relevant Stilling Basin;
- Additional earth dam and Dikes;
- Four concrete intake Portals with double gates control;
- Four 8 m diameter tunnels, up to the Power House;
- Four 20 m diameter Surge shafts;
- Powerhouse with four Francis Machines;
- Steel cast Penstock to the Powerhouse;
- Two Diversion Tunnel in reinforced concrete, 12 m diameter each;
- Two inlets, two outlets and two delivery channels in reinforced concrete, for the Diversion tunnels;
- Various galleries, in R.C. for instrumentation and inspection to the Dams;
- Electromechanical installations for the whole Project;
- Main Substation;
- Access and connection roads

**1984 - 1986**

**With Girola S.p.A., Milan**

In the Head Office Engineering Department, assisting design and construction overseas sites, with site application for mobilization and start up in different Project, among others:

- Ecuador (Paute C Project), Argentina (Piedra del Águila Project)
- Argentina (Piedra del Águila Project)
  - o Tanzania Motorway
  - o Argentina (Ushuaia Airport)

**1987**

**With Cogefarimpresit S.p.a. - Jigüey and Aguacate Hydroelectric Projects, Dominican Republic**

Chief Engineer

The Project basically includes the following:

- Concrete Dam at Jigüey, incorporating spillway;
- Stilling Basin;
- Concrete Intake and two tunnels up to the Powerhouse;
- Powerhouse with two machines;
- Permanent cofferdam in R.C.C.;
- Diversion tunnel in R.C. with relevant inlets and outlets;
- Concrete Dam at Aguacate, incorporating spillway;
- Stilling Basin;
- Concrete Intake and two tunnels up to the Powerhouse;
- Powerhouse with two machines;
- Diversion tunnel in R.C. with relevant inlets and outlets;
- 2x87 km long Aqueduct in precast concrete rings up to the Capital.

**1988 - 1991**

**With Cogefarimpresit S.p.a. - Pehuecú Power Plant, Chile**



**MARCO GRINOVERO**  
Engineering Manager

Project Manager

The Project consists, among others, in:

- Pressure water tunnel 12 m diameter, in reinforced concrete;
- Pressure water shaft 12 m diameter, in reinforced concrete;
- Two tunnels 8 m diameter each, in reinforced concrete and steel lining;
- Valve Chamber;
- Two tunnels 6 m diameter each, in reinforced concrete and steel lining, up to the Powerhouse;
- Underground Powerhouse, with two Francis Machines;
- Two underground gate shafts, downstream the Powerhouse;
- Two discharge tunnels in reinforced concrete, 14 m high;
- External Portals and Discharge Channel, 800 m long;
- Various Access Tunnels;
- Permanent Access roads.

**1992 - 1996**

**With IMPREGILO S.p.a .**

Proposal Manager in the Head Office Tender Estimating Department and Site Manager for Project (either traditional and B.O.T.) mobilization of several Infrastructure and Highways Projects in Portugal, Spain, France, Switzerland, Monaco, U.K., Ireland, Sweden, Denmark, Poland, Czech Republic, Hungary, Romania, Greece, among which:

- D5 Motorway in Chech Republic
- Underground of Lisbon - Portugal
- Acheloos Project – Greece
- Gas Lavera – France
- Sauges Tunnels – Switzerland
- Evinos Project – Greece
- Butetown Underpasses – United Kingdom

**1997 - 1998**

**With IMPREGILO S.p.a .**

Project Manager for Motorway A2 in Poland: BOT Toll Motorway between the German border and East Poznan, 102 km turn key Project including Earthworks, Asphalt pavements, Bridges, Viaducts, culverts, artificial tunnels, rest and maintenance areas, Toll Plazas, etc. The Project includes maintenance and traffic operation.

**1999 – 2001**

**With IMPREGILO S.p.a . - Porto Light Railway System, Portugal**

Technical Director

The Contract refers a Finance, Design, Build and Operate Project for a whole Light Railway System in Porto and surroundings. It is a turn key, firm lump sum price Contract.

It basically consists in:

- two underground sections (2,5 and 4 km respectively) to be excavated with an EPB TBM, 8,70 m excavation diameter, for two tracks to be installed;
- Four Access Ramps;
- One link tunnel in N.A.T.M.;
- 12 underground Stations, 7 nos. in cut & cover and 5 nos. as mined stations (with N.A.T.M.), including architecture;
- 58 surface stations;
- Substations along the whole network;
- 11 km of new surface line, double track;

**MARCO GRINOVERO**  
Engineering Manager

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60 km of existing surface line, to be re-built (tracks from metric to Standard and trains from diesel to electric);  
Two new Operational, Deposit and Maintenance main Centers;  
Urban resettlements (utilities, roads, interfaces with existing buildings and monuments, landscaping);  
New structures for the trains, as three Viaducts, four Underpasses, refurbishing of the National Monument Eiffel Bridge Luis I, Building for the Client's Main Office;  
Trackway installation;  
Our J.V. Partners are directly responsible for E&M works, System design and Operation, under our general interface coordination.

**2001 - 2002**

**With IMPREGILO S.p.a . - S.Petersburg Metropolitan, Russia**

Technical Advisor for tunnelling activities (design, procedures, start up, operation, health and safety, quality assurance).

The Works consist in the construction of a twin tunnel 800m long each. Excavation shall be carried out by a Hydrosield T.B.M. Excavation Diameter is 7m and lining is built by precast concrete segments 35cm thick.

**2002 - 2003**

**With C.A.V.To.Mi. Consortium – Main Contractor for the High Speed Railway Project, linking Milano and Torino, Italy**

Technical Director, Lot 3, in Novara Province.

The Project (4,000,000,000 Euros) basically consists in the construction of the railway system between Milano and Torino, including the Novara intermediate Station.

The Contract includes as well the diversion, demolition, rehabilitation and integration of all the roadway system, utilities and channels interfering with the Railway, including the new construction of part of the Motorway Milano-Torino and consequent new interchanges and accesses.

**2003 – 2006**

**In Impregilo Concessioni Head Office**

Manager for Coordination of Project

Financing Studies, acting as Contract Representative for Impregilo Italia

Concessioni in Motorways Project, among which:

Autopista dos Emigrantes, Sao Paulo, Brasil

City Highway, Santiago, Chile Turnkey Churchill Hospitals PFI Project in Oxford, UK (33 years concession period).

**2006 – 2009**

**Working as Consultant for italian and foreign companies**

Design and technical, operational and contractual management of infrastructure Projects and public works, both in Italy and abroad (Ghana, Brasil, Emirates, Romania, Ukraina,Qatar), mainly infrastructure and road projects.

**2009 – 2010**

**Project Manager - Design and Build Contract 6R1 Rehabilitation D79**

Arad-Oradea, Romania for Astaldi S.p.A. group.

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**MARCO GRINOVERO**  
Engineering Manager

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The Project - for a section of around 100 km of National Road - includes 15 new concrete bridges and one composite bridge.

**From 2010**

**Project Manager of the Arad Timisoara Motorway Project, Romania**

Representing the Joint Venture FCC Construcción-Astaldi SpA.

The Project consists in 32 km of Motorway, two Interchanges, one Maintenance Center and two Service Areas.

It includes also 11 bridges and 15 overpasses, plus 37 main culverts.

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