

Technical Committee 3.3 "Road Tunnel Operations"

PIARC International Seminar

1st Announcement

PIARC International Seminar on

"Binational mountainous road tunnel operations"

15-17 April 2015

Escuela de Ingeniería de Caminos de Montaña - UNSJ

Av. Libertador 1109 (Oeste) - San Juan - Argentina

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www.seminariodetuneles.com.ar

General Introduction

Seminar Overview

The World Road Association in conjunction with the School of Mountain Road Engineering, San Juan National University, Argentina, are pleased to announce an International Seminar on "Binational mountainous road tunnel operations" that will be held in San Juan, Argentina, from 15th to 17th April 2015.

This seminar is part of the International Seminars Programme promoted by the World Road Association. The seminar provides you with an excellent opportunity to share your expertise and experiences; to identify challenges and explore with colleagues innovative solutions for the benefit of all conference delegates.

The primary objective of the seminar is to gain knowledge and share experience that can be applied to the operation and safety of future long, binational, high altitude, isolated road tunnels across the Andes, on strategic Atlantic- Pacific transportation corridors in South America.

The Seminar is open to international experts on road tunnel operations who are interested in gaining and sharing knowledge on this type of infrastructure, and likely to have a key role in regional integration and economic development. The participation of local and regional expertise is an important and integral part of the overall seminar programme.

The Seminar will feature:

- Plenary presentations by national and international speakers
- Plenary panel discussions
- Facilitated theme-specific workshops
- Daily plenary conclusion and resolutions
- Technical tour
- A Technical Exhibition of tunnel design, construction and operation related activities

Social events to enable networking and further opportunities to explore topics discussed during the various sessions will be arranged to maximize the benefit that all delegates will get from attending the seminar.

Seminar Topics

The Seminar provides an opportunity to address both technical and management issues broadly based on the following topics:

- Regulations and best practices to reach a high level of safety and quality in operations in binational road tunnels
- Safety during road tunnel operations in long, high altitude road tunnels
- Traffic management during normal situations and during incidents from remote control centres
- Environmental issues in operations
- Design for sustainable operations
- Training of emergency services
- Road tunnel driver training

Technical visit

A full one-day technical visit will be offered in order to visit the site of a recently built 20 km long road segment in a very rugged mountainous area, comprising several road tunnels and bridges, on the **Porto Alegre** (Atlantic) – **Coquimbo** (Pacific) road corridor, at Ischigualasto.

The visit will provide an opportunity to acknowledge the use of tunnels as a relevant design tool to solve complex topographic challenges in mountainous environments.

Languages

The official languages of the seminar are English and Spanish.

Seminar venue

The seminar will take place from Wednesday 15th April to 17th April 2015 at Auditorio “Eloy Camus”, Centro Cívico de San Juan, Argentina.

<http://infraestructura.sanjuan.gov.ar/salones/>



Views of San Juan's Civic Center and its "Eloy Camus" Auditorium, San Juan, Argentina

San Juan City & accommodations

San Juan is a medium size city of mid-western Argentina, completely rebuilt after the 1944 Earthquake. Most of the interesting parts of the city are not far away from the Centro Cívico Building and the Eloy Camus Auditorium, where the Seminar sessions will take place.

Hotel accommodation is available within walking distance from the site of the Seminar.



Views of San Juan's 25 de Mayo main Square, Ullum reservoir and Del Bono Park Hotel, which is a 15 minute walk from the Seminar Auditorium.

Seminar Organizing Committee

Honorary President: José Luis Gioja, Governor of the Province of San Juan

Executive President: Juan Marcet, Director of the School of Mountain Roads Engineering, the local institution in charge of the preparation of the seminar

Executive Secretary: Adriana Gómez (School of Mountain Road Engineering)

Julio Ortiz Andino (Argentina's PIARC First Delegate)

José Tomás Strada (Minister of Infrastructure of San Juan)

Edgardo Güerci (Director General, San Juan's Roads Administration)

Rubén Lomas (San Juan's District Chief, National Roads Administration)

Oscar Mario Fernández (Vice Director, School of Mountain Road Engineering)

Guillermo Adrover (San Juan's Ministry of Infrastructure)

María José Gioja (San Juan's Ministry of Infrastructure)

Seminar Technical Committee

Official coordinator nominated by TC3.3:

Juan Marcet, TC3.3 Spanish Speaking Secretary, Director of the School of Mountain Road Engineering, San Juan National University, Argentina

TC3.3 Representatives:

Ignacio del Rey (TC3.3 President: Spain)

Pierre Schmitz (TC3.3 Vice President: Belgium)

Rafael López Guarga (Spain)

Carlos Méndez (México)

Argentina representatives:

Julio Ortiz Andino (Argentina's PIARC First Delegate)

Jorge Deiana (TC3.3 Corresponding Member, Vialidad Nacional's supervisor of the Porto Alegre – Coquimbo road corridor segment at Ischigualasto, under construction)

Chile representatives:

José Miguel Ortega Julio (Chile, Member of PIARC's Executive Committee)

Ligia Alvarado (TC3.3 Corresponding Member, Vialidad Nacional's supervisor of the operation contract for the "La Polvora" Tunnel, at Valparaíso)

Delegates to the seminar

The organizing committee anticipates that there will be strong attendance at the seminar with representation from:

- Members of World Road Association Technical Committee on Road Tunnel Operations from Europe, North America and Asia;
- Argentina ,Chile and Andean neighbouring countries government officials related to road and tunnel infrastructures
- Representatives from customs administrations, first aid and fire and rescue services.
- Representatives from ITS regional chambers.
- Students of civil, electromechanical and communications engineering
- Representatives from Commerce and Tourism regional chambers.
- Representatives from consultants, contractors, etc.,

Additional information

For the Registration forms, fee and other information, please go to the link below:

www.seminariodetuneles.com.ar

Programme of the International Seminar on "Binational mountainous road tunnel operations"

(Draft programme as October 2014)

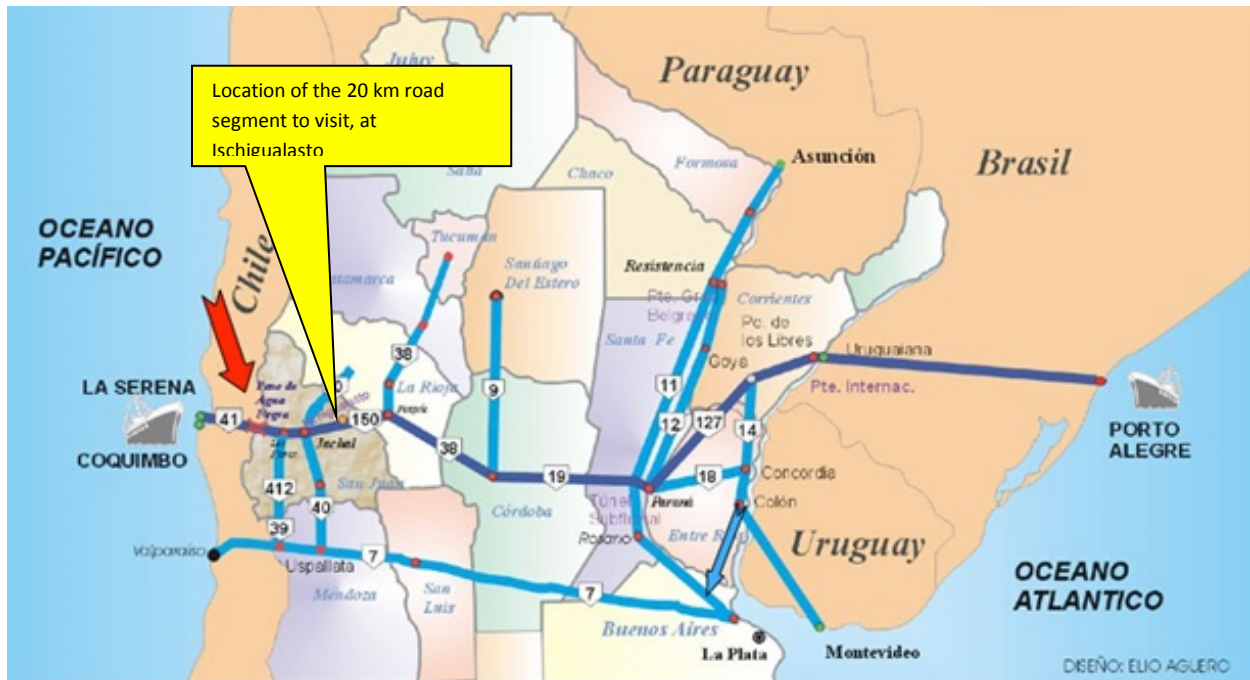
Day	Time	Sessions	
Wednesday April 15 th	9:00 to 9:30	Registration	
	09:30 to 10:10	Welcome and seminar opening by the Argentinean, Chilean and PIARC Authorities	
		<i>Julio Ortiz Andino</i> , General Coordinator of Vialidad Nacional de Argentina and Argentina's PIARC First Delegate and <i>Mario Fernández Rodríguez</i> , National Director of Vialidad de Chile and Chile's PIARC First Delegate.	
		Representative of Chile's IV Region (Coquimbo) Government <i>José Luis Gioja</i> , Governor of the Province of San Juan, Argentina	
	10:10 to 10:40	"PIARC and its Road Tunnel Operations Technical Committee" <i>Ignacio Del Rey</i> , PIARC Technical Committee 3.3 President, UPM, Spain	
	10:40 to 11:30	Coffee break & Official inauguration of the Seminar Technical Exhibition	
	11:30 to 13:00	Session 1 : General presentation of the Agua Negra Tunnel project	
		11:30 to 12:00	"The Agua Negra International Tunnel: possibilities and technical challenges of a milestone of regional integration" <i>Juan Enrique Marcet</i> , EICAM, PIARC, Argentina
		12:00 to 12:30	"The Agua Negra Tunnel: gateway to markets in Asia-Pacific" <i>Jose Miguel Ortega</i> , MOP, PIARC, Chile
		12:30 to 13:00	Questions and answers
	13:00 to 14:30	Lunch	
	14:30 to 16:00	Session 2 : Binational road tunnels	
		Part 1 : Binational road tunnel operations	
		14:30 to 14:50	"The binational Cristo Redentor Tunnel: present and future" (speaker to be designated by Chile)
		14:50 to 15:10	"Experience from 50 years of Mont Blanc tunnel binational operations" <i>Bernard Falconnat</i> , PIARC, Egis, France
		15:10 to 15:30	"12 years' experience in operation and safety exercises in the Sampont binational tunnel" <i>Rafael López Guarga</i> , PIARC, Ministerio de Fomento, Spain (tbc)
15:30 to 16:00		Questions and answers	
16:00 to 16:30	Coffee Break		

	16:30 to 18:00	Session 2 : Binational road tunnels	
		Part 2 : Incident response in binational road tunnels	
		16:30 to 16:50	“La Pólvara” Tunnel in Valparaiso, Chile : experience on incident response” <i>Ligia Alvarado, Vialidad Nacional, Chile</i>
		16:50 to 17:10	“Uranga-Sylvestre Begnis Tunnel under the Paraná River, Argentina: drills for efficient incident response” <i>Pablo Serra Menghi, Director, Santa Fe Government Tunnel Authority</i>
		17:10 to 17:30	“Incident response in the Col de Tende binational tunnel ” <i>Jean-Claude Martin, PIARC, CETU, France</i>
	17:30 to 18:00	Questions and answers	
Thursday, April 16th	Technical visit to the Porto Alegre – Coquimbo road corridor, at Ischigualasto.		
	8:00 to 19:00	8.00: Departure from the car park of the commercial centre next to the Del Bono Park Hotel. Northbound trip to a recently built 20 km long road segment in a very rugged mountainous area, comprising several road tunnels and bridges, on the Porto Alegre (Atlantic) – Coquimbo (Pacific) road corridor, at Ischigualasto. 19:00: Return to San Juan City	
Friday April 17th	09:00 to 10:30	Session 3 : High altitude road tunnels	
		Part 1 : Specific operational issues related to high altitude	
		09:00 to 09:20	“Colombian experience in high altitude road tunnels” (tbc) <i>Héctor Salazar Bonilla</i> Civil Engineer, M.Sc., Ph.D., Colombia
		09:20 to 09:40	“Specific operational issues for tunnels in very challenging mountainous areas” <i>Bernard Falconnat, PIARC, Egis, France</i>
		09:40 to 10:00	“Fire characteristics in high altitude road tunnels” <i>Miguel Pérez, Mechanical Engineer, M.Sc.Fire Safety Engineering, IDIEM Universidad de Chile</i>
	10:00 to 10:30	Questions and answers	
	10:30 to 11:00	Coffee Break	

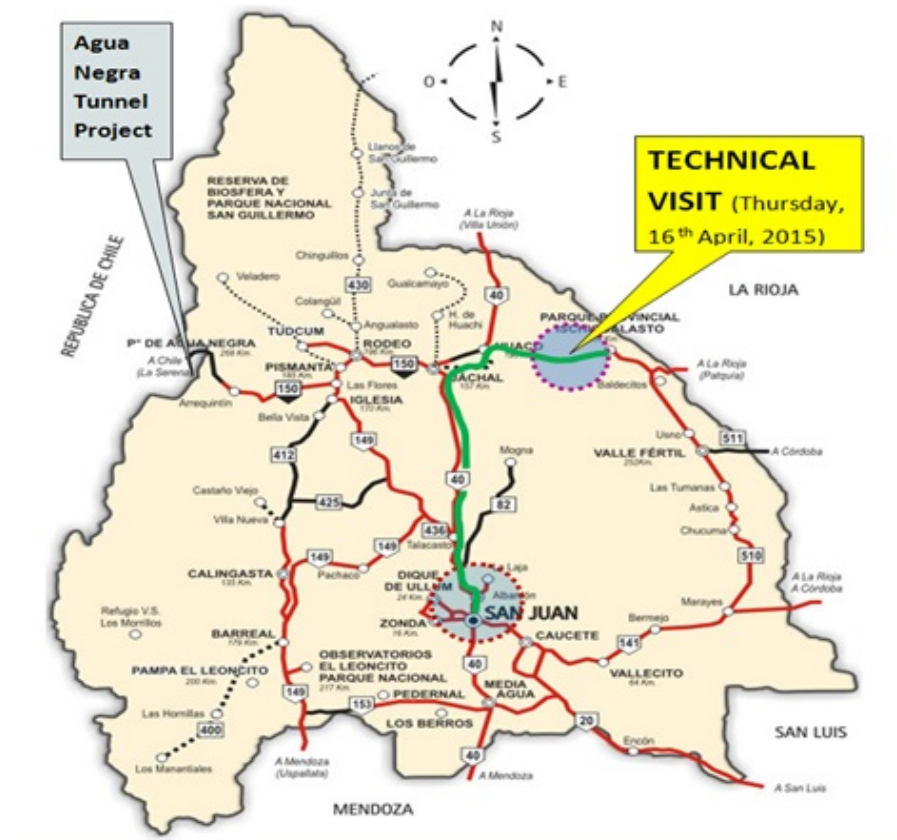
11:00 to 12:30	Session 3 : High altitude road tunnels	
	Part 2 : Specific safety issues related to high altitude	
	11:00 to 11:20	“Health related issues at a high altitude mega mining resource in San Juan, Argentina” <i>Physician of Barrick Corporation, Argentina, to be designated.</i>
	11:20 to 11:40	“Road maintenance, operation and safety issues related to winter mobility in high altitude industrial settlements “ <i>Ing. Alfredo Cevallos, Barrick Corporation, Argentina</i>
	11:40 to 12:00	“Safety issues for high altitude road tunnels: recommendations” <i>Pierre Schmitz, PIARC TC3.3 Vice-President, Belgium</i>
12:00 to 12:30	Questions and answers	
12:30 to 14:00	Lunch	
14:00 to 15:30	Session 4 : Binational tunnel control centre	
	14:00 to 14:30	“Experience of binational control centres in Spain” <i>Rafael López Guarga, PIARC, Ministerio de Fomento, Spain (tbc)</i>
	14:30 to 15:00	“Technical aspects of binational control centres” <i>Urs Welte, PIARC, Amstein + Walthert AG, Switzerland</i>
	15:00 to 15:30	Questions and answers
15:30 to 16:00	Coffee Break	
16:00 to 17:00	Session 5 : Emergency services and road tunnel driver training	
	16:00 to 16:20	“Training of emergency services” <i>Leslie Fielding, PIARC, London Bridge Associates, UK</i>
	16:20 to 16:40	“Road tunnel user training” <i>Marc Tesson, PIARC, CETU, France (tbc)</i>
	16:40 to 17:00	Questions and answers
17:00 to 17:30	Closing Session	
	Tomás J. Strada Minister of Infrastructure, San Juan, Argentina.	
	Ignacio Del Rey PIARC Technical Committee 3.3 President	
20:00	Official seminar dinner	

Technical visit

The Porto Alegre – Coquimbo road corridor at Ischigualasto



The **Porto Alegre (Atlantic) – Coquimbo (Pacific) Road Corridor**, shown in dark blue. The red arrow points to the location of the future Agua Negra Tunnel, on the international border. The Ischigualasto segment of the road corridor to visit is shown by the yellow marker, on the north east part of the Province of San Juan.



Itinerary (shown in green) from San Juan City to the location of the Technical Visit, National Route # 150, on the Ischigualasto segment of the Coquimbo – Porto Alegre Road Corridor.

Tramo a tramo

1 Quebrada del León / Caballo Anca / Pie Qda. de la Peña.	2 Pie Quebrada de la Peña / Río Bermejo.	3 Río Bermejo / empalme con ruta nacional 40 (Huaco).	4 Empalme con ruta nacional 40 (Huaco) / San Roque.
22 Km. Tramo p ^o ximo a licitar	13,4 Km. En ejecución.	36,4 Km. Adjudicado, próximo a construirse	41 Km. Tramo licitado, se adjudica el 12/07/08



Longitud túnel por túnel

- Túnel 1: 312 m
- Túnel 2: 398 m
- Túnel 3: 440 m
- Túnel 4: 542 m
- Túnel 5: 203 m
- Túnel 6: 260 m
- Túnel 7: 320 m

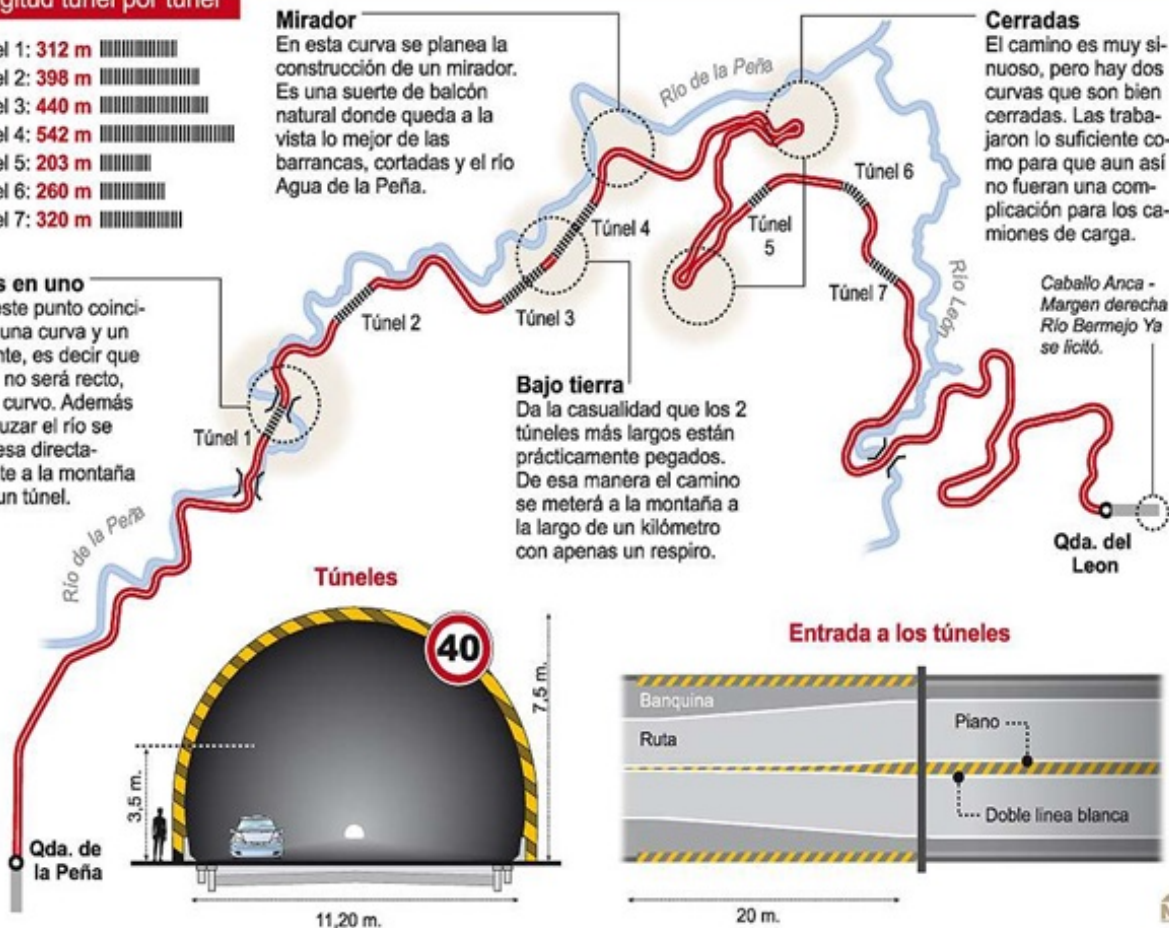
Tres en uno
En este punto coinciden una curva y un puente, es decir que éste no será recto, sino curvo. Además al cruzar el río se ingresa directamente a la montaña por un túnel.

Mirador
En esta curva se planea la construcción de un mirador. Es una suerte de balcón natural donde queda a la vista lo mejor de las barrancas, cortadas y el río Agua de la Peña.

Bajo tierra
Da la casualidad que los 2 túneles más largos están prácticamente pegados. De esa manera el camino se meterá a la montaña a la largo de un kilómetro con apenas un respiro.

Cerradas
El camino es muy sinuoso, pero hay dos curvas que son bien cerradas. Las trabajaron lo suficiente como para que aun así no fueran una complicación para los camiones de carga.

Caballo Anca - Margen derecha Río Bermejo Ya se licitó.



Fuente: Vialidad Nacional

Gargo / DIARIO DE CUYO

Schematic layout of the Ischigualasto road segment to visit, showing the location of tunnels and bridges (taken from a newspaper article)



The Porto Alegre – Coquimbo road corridor runs across the southern part of the Ischigualasto Provincial Park, a world famous deposit of Triassic dinosaur fossils. The layout of the road had to affect the existing landscape as little as possible. Road tunnels proved an effective design alternative to comply with environmental restrictions and solved many layout dilemmas.



The Agua de la Peña Canyon, the drainage of the Ischigualasto basin, is surrounded by very high sub horizontal red sandstone stratifications. The layout of a road along its banks would have meant a serious disruption of a unique landscape.



Red Sandstones as carved by million years of fluvial and wind erosion



Intensely fractured sedimentary rock formations along the Agua de la Peña Canyon



Topographic studies had to be carried out by aerophotogrammetry and foot surveys. The rugged landscape even prevented using animals for transport purposes.



Installing grouted steel pipes at a tunnel portal for pre support of initial excavation rounds.



One of the few interventions on the red sandstone walls of the Agua de la Peña Canyon. Tunnel roads were located 150-200m away from the walls, parallel to the canyon course.



Most tunnels were excavated in formations of poor and very poor rock quality (RMR), with drill and blast methods, where a wide combination of shotcrete reinforced with steel fibres, steel rock bolts and steel ribs was used. The extremely dry climate of the area helps to avoid expensive waterproofing systems.



The bidirectional tunnels have two lanes 3,50m wide, a 1,00m central median, two 0,90m sidewalks and New Jersey barriers immersed in the tunnel walls. No lighting was initially provided, as there was no electricity in the area. A recently built transmission line, made possible by the existence of the road, will be used provide energy for tunnel lighting.



Thanks to a combination of bridges and tunnels and a fairly generous geometric design, the Porto Alegre- Coquimbo Road Corridor crosses the difficult Ischigualasto mountain range in suitable conditions for commercial long distance traffic.

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