



PUNJ LLOYD

update



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**SGP Offsite and Utilities
mechanical work for Asset
Development Project by
Parsons/Fluor Daniel JV (PFD)
for Tengizchevroil (TCO) in
Kazakhstan.**

38,230 m³ Capacity LPG
Storage Tank Project by
the Reliance Industries,
Jamnagar

EPC Project for
Construction and
Commissioning of a
Protection Facility
(BeAAT) by Takreer,
Abu Dhabi

Mechanical PX2
Panipat Refinery
Project by Indian Oil
Corporation, Panipat

31.50 km. long Silchar
to Balachera Section
of NH 54 Project by
the National Highways
Authority of India



update

**Sulphur Recovery Unit and
Tail Gas Units for Asset
Development Project by
Parsons/Fluor Daniel JV (PFD)
for Tengizchevroil (TCO)
in Kazakhstan.**

New Projects





update 

each reactor
weighed 590 MT
the fractionator
was 73 m high

Enabling Heavy Lifting

Installation of heavy and critical equipment for the hydrocracker unit of Indian Oil's Panipat Refinery Expansion project in Haryana, India. Punj Lloyd was chosen as a sub contractor to Daelim, Korea. We bagged this project based on our past successful completion of the hydrocracker unit for Indian Oil at Mathura. The equipment which was to be installed, consisted of two reactors, each weighing 590 MT, with a diameter of 5.96 m and height of 24 m and one product fractionator weighing 253 MT, with a diameter of 5 m and height of 73 m.

The foremost challenge was to strengthen the soil to bear the combined weight of cranes and

equipment, totalling 1500 MT. While the existing load bearing capacity of soil was a mere 5 t/m² at a depth of one meter, it needed to withstand the weight of 95 t/m². A soil analysis was conducted and the topsoil of selected areas was strengthened upto a depth of 3 m with an engineered mix of stone and soil. To ensure proper distribution of load, 36 mm and 25 mm thick steel plates were placed under the body of the main crane and its counterweight trolley, respectively.

The complexity of the challenge increased manifold because the equipment had to be lifted in a single piece. Since the hydrocracker unit was congested, it

allowed very little space for accommodating the cranes and other lifting accessories.

To install the two reactors, a 1000 MT American crane was used as the main crane and a 450 MT Liebherr crane was deployed as the tailing crane. Each reactor had a total lifting weight of 628 MT including lifting accessories. To lift the fractionator, a 350 MT Manitowoc crane along with a 208 MT tailing crane were utilised. The fractionator had a total lifting weight of 284 MT, including lifting accessories.

On April 12, the first reactor was installed. It took just an hour to achieve the heaviest installation in Punj Lloyd history. After a gap of two days, the second

reactor was successfully installed using the same technique.

To install the fractionator, a special 300 MT capacity lifting beam was designed in-house, fabricated and tested at site. On April 22, the fractionator was installed in two and a half hours. The most challenging part of this operation was the use of the longest boom measuring 99 m of the main crane and operating this within the restricted area of the site.

Team Punj Lloyd heaved a sigh of relief when the single piece installation of these three heavy equipment was completed successfully. With this accomplishment, Punj Lloyd has broken new ground and has established itself firmly in the field of Heavy Lifting.

◆ Amitava Bose



As a vital component of its expansion plans, when the Delhi Metro Rail Corporation Ltd. (DMRC) decided to lay a new 23.19 km long subterranean as well as elevated track to connect Dwarka to Connaught Place, Punj Lloyd was awarded the most challenging task of constructing a 6.3 km long elevated track between Kirti Nagar and Tilak Nagar.

Apart from the enormity of the work involved, the biggest challenge faced by the Punj Lloyd team was to manage and carry out the entire job within a narrow 8 m wide sanitised corridor, made even more congested due to the presence of a 5 m wide piling rig.

The Delhi Metro

Accomplishing an impossible task

Scope of work

The project includes casting of 253 spans by segmental construction method, and their subsequent launch at the site by an auto-launching girder. The substructure consists of 260 piers resting on about 1200 large diameter piles (1500 mm) bored with the help of hydraulic and mechanical piling rigs. The depth of the piles range from 25 to 30 metres.

Since the proposed metro track runs through the heart of the city, passing through some of the most densely populated areas having an intricate subterranean network of sewerage, water pipelines, electrical cables and OFC lines, the team faced severe constraints.

Managing the movement of material, equipment and manpower amidst the heavy traffic of Delhi was another major challenge. As the 40 to 70 tonne segments required to construct the super structure were cast in a factory located 25 km away from the site, they had to be transported to the site on trailers, which could move only during the night due to heavy daytime traffic. To deal with this situation, we had to use the "Traffic Management Plan".

Moreover, besides overcoming the odds of space and incredibly heavy Delhi traffic, the team is required to complete this project within a challenging timeframe. The project is scheduled to be completed in January 2005 and we are confident of completing the project on schedule in spite of all the hurdles.

◆ Ranjan Wazir



Bridging the Gap

The "Golden Quadrilateral Project", conceived under the wider Rs 54,000 crore National Highways Development Project (NHDP)

The "National Highways Authority of India" (NHA) is the nodal body responsible for the overall supervision and execution of this project. Amidst stiff competition, Punj Lloyd was awarded the contract of constructing the 77 km long Belgaum-Maharashtra Border Road (km 515 to km 592 of NH-4).

The Belgaum-Maharashtra Border Road

This annuity project is a joint venture involving Punj Lloyd, IL&FS and CTNL controlled through a Special Purpose Vehicle (SPV), the North Karnataka Expressway Ltd that was established specifically for this project. It sets the foundation of a trend by displaying the success of a partnership between Government

and the private sector in realising the infrastructural dreams of India.

Initiated in June 2002, this project was completed five months ahead of its schedule. Out of the annuity projects of the "Golden Quadrilateral", this Punj Lloyd project has the distinction of being the first and only one to be completed so far, thereby recording the fastest completion of a road project of such magnitude and complexity in India.

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**successful partnership
between Government and
the private sector in
realising the infrastructural
dreams of India**



Punj Lloyd used state of the art plant, machinery and equipment to implement this prestigious project. In order to coordinate a plethora of complex engineering activities at each stage, four construction camps were built along the 77 km road to accommodate office, laboratory, central store, mechanical workshop, weigh-bridge, reinforcement and shuttering yard, casting

Scope of Work

The scope of the work involved in the project was enormous. It has been detailed concisely in the following table:

Facility	Type/Size	UOM	Qty.
Road Length	Dual Carriageway	km	78
Rigid Pavement	2 Lane/3 Lane	km	92
Flexible Pavement	2 Lane	km	64
Service Roads	4 - 7 m wide	km	144
Major Bridges	90 - 200 m length	Nos.	6
Minor Bridges	< 60 m Length	Nos.	12
Grade Separators	24.5 m x 21.4 m x 7.5 m	Nos.	7
Vehicular Underpasses	24.5 m x 11.1 m x 7.5 m	Nos.	6
Pedestrian Subway/Underpasses	24.5 m x 7.5 m x 4.7m	Nos.	7
Cattle Walk cum Cattle Tracks	27.5 m x 3.5 m x 3.5 m	Nos.	19
Culverts	Box/Pipe	Nos.	128
At Grade Junctions	'T' & 'X' shaped	Nos.	14



The "Golden Quadrilateral Project" interlink four major metros, namely Delhi, Kolkata, Mumbai and Chennai by constructing 5,952 km of new roads to interconnect existing national highways.

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Quantities

Earthwork	3,000,000 m ³
GSB	295,000 m ³
WMM	253,000 m ³
DBM	141,000 m ³
BC	47,500 m ³
Stone Pitching	74,000 m ³
Concrete work	160,000 m ³
Kerb	70,000 RM
Metal Crash Barrier	26,000 RM
Access Control Fencing	43,000 RM

yard for pre-cast elements, hot mix plant, concrete batching plant, material stacking area, cement godown as well as residential area.

One of our special achievements was the complete rehabilitation of the 200 m long Ghat Prabha River bridge in only 90 days.

During the course of this project, Punj Lloyd also created several job opportunities for the local people and employed local engineers including seven lady civil engineers, thereby defying gender

prejudices associated with the male dominated construction industry. A total of 14.5 million man-hours of work went into completing this project.

At Belgaum, the progress of the project was hindered due to inordinate delay in getting a municipal clearance to shift the water pipeline of Nepani town. The incessant rain during the monsoon of last year also made execution of work extremely difficult. With sustained efforts, meticulous, detailed planning and hard work,

we completed the project and received the completion certificate with the opening of the highway to traffic.

Thus, by completing the project ahead of schedule, the Punj Lloyd team has once again proved its prowess in highway engineering and construction.

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creating
employment for
the local people



Another crucial road project bagged by the Punj Lloyd team under the Golden Quadrilateral Project was the construction of a section of the NH 8, the Jaipur bypass

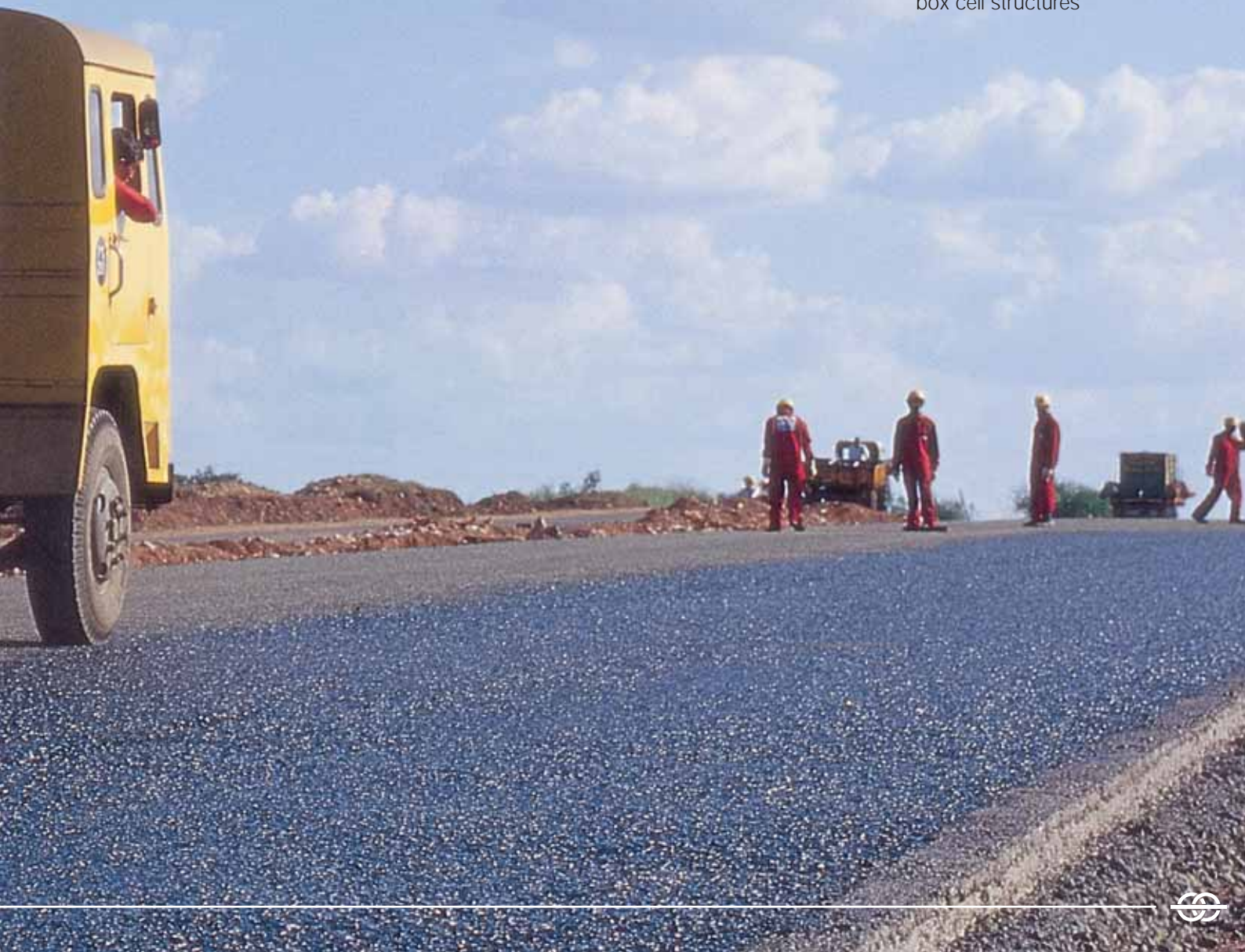
Scope of Work

4 lane divided carriageway	35 km
Service Roads	32 km
Grade Separators	2 Nos
Underpasses	11 Nos
Box Culverts	12 Nos
Camel Crossings	5 Nos
Pipe Culverts	24 Nos

The Jaipur Bypass

This project involves the construction of the 35 km long, 4-lane carriageway that connects NH-8 (Delhi-Jaipur Road) at Chandwaji, bypasses Jaipur city and finally joins NH-11 (Jaipur-Sikar Road) at Harmara. As a part of this project, Punj Lloyd is constructing service roads at strategic locations with flexible pavements, grade separators, underpasses, retaining walls and several other related structures.

Numerous elevated structures were constructed; two grade separators at either end of the highway; 11 vehicular underpasses, two separate 7 m high box cell structures



to facilitate two-way movement on the road underneath and five camel crossings to enable local movement on small roads. These structures cover almost half of the length of this elevated road.

The most striking feature of the project is the fact that this high-speed corridor is completely access-controlled with guardrails and fencing on both sides. Due to high speed traffic on the highway, this fencing is important to prevent pedestrian movement.

Because of the

construction of elevated structures and crossings, a substantial amount of earthwork was involved in this project, which measured 3,000,000 m³ and concrete work of 160,000 m³. Based on per km standards, this is very high when compared to conventional road projects.

We also constructed numerous drainage structures, extremely long retaining walls 30 km long and more than 32 km of service roads on either side at important locations.



Our major achievement was pouring 1080 m³ of concrete in a non-stop operation of 12 hours over the entire length of the project at scattered locations, by utilising the optimum efficiency of Concrete Batching Plants.

The bypass once completed will enable vehicles to travel at uninterrupted speeds upto 120 kph along the entire stretch, thus saving two hours of travel-time between Delhi - Mumbai and Delhi - Sikar - Bikaner.

◆ Akhil Gupta and S Ansari

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vehicles can travel at
uninterrupted speeds
upto 120 kph along
the entire stretch





activities carried out.

Our special achievements at this site were successful reinstatement of the Zamanti River and the innovative waste management activities carried out by us. The Zamanti River and its floodplain is home to fish, eel, aquatic and exotic plants and migratory birds. Between the periods of their migration, breeding and ecological constraints, we had only two months in the entire year to execute this important river crossing. Care was taken to preserve the top soil from the ROW and during mobilisation of equipment, reinstatement of river and its tributaries, re-contouring the land with re-growth of flora.

Waste disposal is done only by recyclers complying with the EU standards. They are audited quarterly for their Environment Management System (EMS) and environmental compliance.

Health and Safety

Punj Lloyd Limak - JV has achieved the best contractors status as measured under a series of key performance indicators. Superior performance has led to Punj Lloyd Limak - JV being awarded a second section of the pipeline in Georgia as part of the recovery plan.

Distance travelled by us till now is 12.69 million km which is equivalent to 16.5 times the distance between earth and

Health, Safety and Environment

Turkey

Environment

The Baku-Tbilisi-Ceyhan (BTC) pipeline widely referred to as the "Pipeline of the Century" will connect Baku in Azerbaijan through Tbilisi in Georgia to the port of Ceyhan in Turkey. Punj Lloyd Limak - JV of Turkey has been awarded the prestigious contract of LOT-C in the Turkish section, covering a length of 334 km.

The environmental and social considerations are paramount in this project along with health and safety.

To undertake the environmental compliance activities, Punj Lloyd Limak has appointed the reputed environmental consulting firm Environmental Resource Management. We have also established our Environmental Management Systems in compliance with ISO : 14001 and have

been certified by Det Norske Veritas (DNV).

Before beginning construction Punj Lloyd Limak - JV has conducted detailed vegetation mapping along the pipeline Right Of Way (ROW) and identified the threatened and rare species found in the area. The surveys were followed with documentation, compilation of environmental manuals, setting up of procedures,

formulation of plans, establishing of special area reinstatement methods, preparation of reports and mobilisation of resources.

During the construction phase, important areas were barricaded, erosion was controlled, ROW and rivers were protected and environmental training was imparted to all concerned.

In the post construction phase, reinstatement and bio restoration were the most important



moon, without injury to any project personnel.

We have achieved 4.14 million working hours without a day away from work till May 2004.

Indonesia

Environment

To protect the environment at TOTAL's Tunu Field Development Phase 9, PT Punj Lloyd Indonesia followed the guiding principles listed below:

- Minimal use of raw material
- Conservation of energy and water
- Promotion of the 3R principle i.e. Reduce, Reuse and Recycle.

Effective monitoring and implementation of Environment Management Plan during construction in the restricted ROW has saved the adjoining aqua culture ponds, fishnets, vegetation, flora and fauna in the Mahakam Delta.

Continuous analysis of seawater to maintain its natural quality was undertaken. This activity also ensured there was no negative impact on fishing and shrimp farming, which are important economic activities of the Mahakam Delta.

For blocking the swamp area PT Punj Lloyd Indonesia used jute sand bags in place of plastic bags to protect the environment.

To ensure minimum environmental damage in the Mahakam Delta, the Horizontal Directional Drilling procedure

Safe Man-hours

Tunu Phase 4 & 5

0.85 million in 1996-97

Tunu Phase 7

1.31 million in 1999-2001

Tunu phase 8

1.12 million in 2001-03

Caltex

1.25 million in 1999-2001

Panaran Pemping

1.89 million in 2002-03

PECIKO

1.35 million in 2002*

Tunu Phase 9

1.50 million in 2003*

*till June 2004

was used to traverse a 2 km length of the 20" gas pipeline.

1 million mangroves have been planted by us in the swamp area of ROW at Batam to restore the environment and to prevent erosion.

Health and Safety

PT Punj Lloyd Indonesia has imparted exhaustive health and safety training to all its employees. We have received appreciation letters for outstanding safety performance consecutively for 5 projects from TOTAL.

We were awarded a rating of 86 per cent which is not only the highest score on Tunu 9 project by any contractor but is also the best safety performance in TOTAL history in a high risk category. Our successful installation of the pipeline in the NPU with live gas plants, without any lost time incident was appreciated by our client, TOTAL Indonesia.

India

Panipat

Health and Safety

At the Hydrocracker project at Indian Oil's refinery in Panipat we have completed 2.2 million man-hours without any accidents and the monthly safety award has been awarded to us six times consecutively for outstanding contribution in safety supervision at site.

Two reactors each weighing 590 MT and one fractionator of 73 M height were installed by us without any incident.

Dust suppression was ensured by regular sprinkling of water. Health Monitoring is regularly conducted by Dr S Mudgil, a leading Indian occupational health specialist for workers and staff.

Belgaum

Environment

To maintain our ISO : 14001 we undertook an exercise to monitor the consumption of paper, high speed diesel and lubrication oil, per percentage progress of project work at our Belgaum - Maharashtra project site. The exercise was initiated in 2001 and will be concluded shortly. The results would give us a benchmark against which we can measure our future performance. A similar exercise is being undertaken at our other sites.

The benefit of our

monitoring activity is already evident in the reduced usage of HSD, Paper and Lubricant oil. Oil has reduced from 103 KL to 15.16 KL, HSD from 170 KL to 120 KL and paper from 68 to 12.9 packets.

The stress on our environment has reduced through conservation of natural resources and source reduction in hazardous waste.

Banmore

Environment

At our equipment maintenance and repair facility in Banmore a treatment plant to handle waste water has been commissioned. A garden of 2,400 sq mtr with 40 different varieties of flowers has been nurtured and 600 trees of different varieties have been planted. A horticulturist has joined our team to ensure that our garden is always in full bloom.

♦ K K Saha, P Kolwalkar, P K Tripathi and Col. R K Mehta



5A1 rating assigned



Dun & Bradstreet is the leading provider of business-to-business credit, marketing, purchasing, receivables management and decision-support services worldwide.

Punj Lloyd has been assigned a rating of 5A1 based on Financial Strength and Composite Appraisal/Condition.

Financial Strength of 5A is an indicator of a company's tangible network.

The Composite Credit Appraisal/Condition of '1' is the highest rating of D&B.

The rating of 5A1 is assigned on a business's undoubted standing, where there is minimal risk associated with it. ♦

Founder's day Celebration

On June 26, Punj Lloyd celebrated its proud legacy and honoured those who have worked tirelessly to give shape to its founder's dreams, Pandit Kanahya Lal Punj. It is also the time when the Punj Lloyd 1400 strong family gets together. The ceremony this year was inaugurated by S N P Punj. He took this opportunity to enlighten the gathering about his father, the visionary who dreamt of creating one of the most respected organisations in India. Atul Punj, the Chairman, updated the entire team about the phenomenal growth that Punj Lloyd has achieved during the last year.

This occasion is also special as the long service award goes out to many veterans. Irrespective of the grade or level, long years of hard work are rewarded by the management with the distribution of 10, 15, 20, 25 and 30 year awards to the employees. This year 67 proud employees received their awards from the gracious Indu Punj.

Punj Lloyd is one of the few companies in the present age and time, which can boast of many recruits qualifying for these awards every year.

This proves the high level of satisfaction that people working in Punj Lloyd draw from their jobs. ♦



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ISO 9001 : 2000 QMS
 ISO 14001 : 1996 EMS
 OHSAS 18001 : 1999 OHSMS

Strategic Business Units

Civil Construction | Pipelines | Tankage & Terminals | Telecom | Process Plants | Plant and Facility Management | Power Plants
 High Value Engineering | Broadband Convergent Services