Environmental and Social Monitoring Report

Fifth Quarterly Report
August 2016

IND: Jaipur Metro Rail Line 1-Phase B Project

Prepared by Jaipur Metro Rail Corporation Limited for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 31st March 2016)

Currency unit	-	Indian Rupee (INR)
INR 1.00	=	$ 0.01507
$1.00	=	INR 66.3329

ABBREVIATIONS

ADB	-	Asian Development Bank
ADF	-	Asian Development Fund
CEC	-	Continental Engineering Corporation
CSC	-	Construction Supervision Consultant
ES	-	Environmental Specialist
DMRC	-	Delhi Metro Rail Corporation
EMP	-	Environmental Management Plan
EA	-	Execution Agency
EIA	-	Environmental impact Assessment
EARF	-	Environmental assessment and review framework
ESMS	-	Environmental and social management system
EMR	-	Environmental Monitoring Report
GPR	-	Ground penetrating radar
HSO	-	Health and Safety Officer
IEE	-	Initial environmental examination
IPP	-	Indigenous People Plan
JMRC	-	Jaipur Metro Rail Corporation
PAM	-	Project Administration Manual
PCAG	-	Public Consultation and Addressing of Grievances
RP	-	Resettlement Plan
SHE	-	Safety Health & Environment Management Plan
SPS	-	Safeguard Policy Statement
VMR	-	Vibration Monitoring Results

WEIGHTS AND MEASURES

km	-	Kilometer
m	-	Meter

NOTES

In this report, "$" refers to US dollars

CONTENTS

EXECUTIVE SUMMARY

1. This report is the 5th quarterly report on environmental and socialsafeguards compliance of the Jaipur Metro Rail Line -1 Phase B Project. It coversthe period from January 2016 to March 2016. Line 1-Phase B of the project inlcudes constrcution of 2.3 km underground portion from Chandpole to Badi Chaupar, with two stations. Line 1–Phase B is being financed by ADB and expected to be completed by March 2018 at a cost of INR 1126crore.

2. Jaipur Metro Rail Corporation (JMRC) is the Executing Agency for the Project. The sole civil works contract package under the project was awarded to Continental Engineering Corporation (CEC) in September 2013. The General Consultant overseeing the design and supervision of physical works is Delhi Metro Rail Corporation Limited (DMRC).

3. Progress in construction works as of March 2016 are: i) TBM 1 has reached Badi Chauper completing tunnelling of approximate 1438 rings (1725.6m) and is only 19 ringsaway from touching badi Chaupar Station area ii) TBM 2 has reached the center portion of Choti Chauper station. TBM 2 has completed tunneling of approximately 836.4 m iii) Chhoti Chauparstation work using cut & cover method has progressed as scheduled iv) For constrcution work of D Wall at Badi Chaupar, traffic has been blocked at Hawa Mahal side with one way still open for movement of general traffic, this is with permission of Traffic Police, Jaipur and as per consensus with Business community.As of March 2016, total physical and financial accomplishments are about 35.76% and 40.46% respectively. The contract has achieved physical 1.43% and financial 16.18% progress during this reporting quarter ending March 2016. The incremental increase in physical progress of work is due addition of scope of work.

4. So far no damage has been reported during the tunneling work. Extra precautions had been taken to ensure no mishap happens during the tunneling process. 12 prisms had been installed on both sides of the gate to keep a check on the vibrations with monitoring the reading every hour. Additionally, 10 crack meter and six strips of glass have also been put on the gate to receive any information if the cracks widen. Moreover, eight Multi Point Borehole Extensometer (MPBX) have been installed at the depth of 2.5 meter and 5 meter. The status of all the relevant structures have been regulaly monitored. Sites are being regularly visited by JMRC Heritage/strcutural experts i.e., M/s Abha Narain Lambah Associates and M/s Shashank Mehendale & Associates.

5. The environmental and social safeguards of the project are being implemented in compliance with the loan covenants, project agreement and contractor is complying with the proposed mitigation measures described in the Environmental Management Plan (EMP); Safety, Health and Environment (SHE) Manual and the contract specifications.The implementation of environmental and social safeguards are being monitored at Project Managementand General Consultant (GC) level. With exception of few issues the project is being implemented in compliace with project requirements.

6. With regards to the baseline study carried out on heritage structures located in the project area before the start of work of Phase 1B, during the reporting period of report i.e. up to March 2016 no major changes in the condition of structures have been reported.

7. The list of structures requiring immediate action was submitted to Jaipur Nagar Nigam, so that to ensure no damage during the tunneling work.Preventive measures like

propping of the verandahs and the repair of shops along the above length have been taken up during the tunneling work and beyond.

8. For structures located around the Chaupars (station sites) where construction works are ongoing, proactive measures of providing propping support to unstable structures is already in place and are taken care by by the contractor under instructions of the 'engineer' (General Consultants). In addition regular monitoring of weak structures through installation of crack, tilt and vibration meters and building settlement markers is also being done on regular basis.

9. The minor social and resettlement impacts such as the acquisitionof a strip of private land (10 by 10 meters) outside Chandpole station and at the tunnel construction start point, as the shops (3 Shopkeepers) on that strip are blocking traffic. JMRC has already rehabilitated the shop owners across the Chandpole Metro Station near Church land. 6 Temples at Chhoti Chaupar, which were infringing the station box area have all been rehabilitated and given built up structures as per their satisfaction at Old Atish market land.7 temples at Badi Chaupar have been identified which are infringing the station box area, out of these 7, As on date none of them has been relocated.

10. Civil Administration and JMRC has ensured round the clock availability of Rescue team consisting of Ambulance, Civil defence, Earth movind Machines & Crane, staff from Jaipur Discom and PHED. This is to ensure quick response to any problem which may arise during construction.

11. After complete and detailed documentation of Badi Chaupar and handing over of Gaumukh to A & M Department,Government of Rajasthan, the old water tank has been refilled and the station work will begin soon after completetion of D Wall/ top slab work.

12. The construction works are proceeding in accordance with the provisions of the EMP such as review of monitoring reports, regulatory compliance action plan and approval by the GC. The environmental monitoring plan is successfully being implemented by the JMRC through an instrumentation company M/s AMIL engaged by executing agency with theapproval of 'Engineer'.

13. JMRC and DMRC officials have regularly been meeting with the local people and business associations in the project area to inform them about the construction works. Measures have been taken to address concerns of the local businesses such as stopping of work and providing proper pathways for customers during festivals. All reports and information on the project isdisclosed on the JMRC website. In addition JMRC has a full-time Public Relation Officer dealing with media/press issues and also maintains a facebook page and twitter account for disclosing project information and responding to queries and concerns from the general public.

14. Various proactive measures are being taken to implement project in compliance with requirements,prevent damages to heritage structures, coordination with relevant agencies, communicate with the public and address grievances of the local public. Areas such as public communications,documentation and reporting need further enhancement.

15. There were no significant environmental impacts observed during the reporting period. All environent related observations are regularly recorded and monitored and in case of any short-comings necessary corrective measures are taken up.

I. INTRODUCTION

A. Purpose of the Report

1. The objective of environmental monitoring is to allow ADB and the Jaipur Metro Rail Corporation (JMRC) gather information to: i) evaluate the environmental management plan (EMP) progress by establishing compliance status, ii) detect and correct non-conformances, iii) identify unanticipated impacts and implement necessary mitigation measures, and iv) provide evidence to support enforcement of penalty provisions of the civil works contract to deter non-compliance.

2. Environmental monitoring and disclosure of quarterly or semi-annual monitoring reports is an ADB requirement for environmental category-A projects like Jaipur Metro Rail Line-1 Phase B. Environmental monitoring is part of project implementation process to be complied by both ADB and JMRC. The preparation and submission of the quarterly or semi-annual monitoring reports is the responsibility of JMRC while supervision to provide guidance is the role of ADB.

3. As many sensitive heritage structures of the Pink City exist above the metro underground alignment, it was agreed during project preparation that quarterly environmental monitoring reports will be prepared and disclosed for this project. Since the significant physical construction works started in July 2015, the first environmental and social semi-annual monitoring report for the period July 2014 – December 2014has been submitted to ADB and disclosed on ADB and JMRC websites. Thereafter quarterly monitoring reportsare being regularly submitted to ADB and disclosed on ADB and JMRC websites. This is the fifth quarterly environment and social monitoring report for reporting period January 2016 to March 2016.

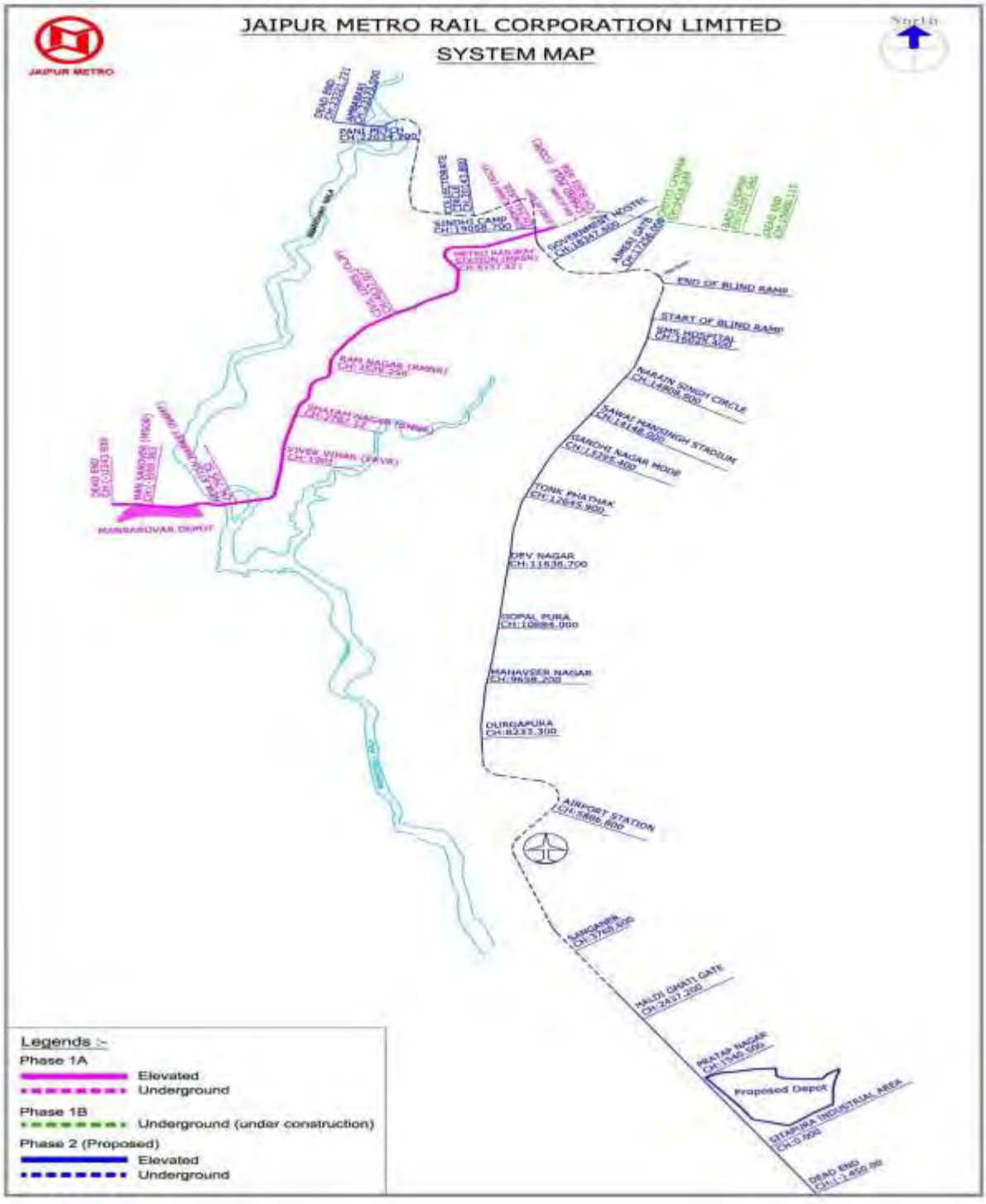
B. Project Description

4. Jaipur, the capital of the Indian state of Rajasthan, is one of the fastest growing cities in India. The fast paced industrial and commercial development has resulted in a steep rise in travel demand, but the city's existing public transport infrastructure is inadequate in terms of capacity and service. With the growing economy, passengers are shifting to private modes of transport, as evident in the rise in vehicle ownership, aggravating congestion and pollution. The modal share for public transport was 19% in 2009—one of the lowest in cities with more than 3 million inhabitants in India[1].

5. In 2009, Jaipur Development Authority developed a comprehensive mobility plan, seeking to provide an overall transport plan, up to 2031, that emphasizes the preeminence of public transport for the movement of people, not just vehicles, and integrating land use with transport networks. The plan recommended, among others, the development of high capacity metro lines along the east–west corridor of 12 km from Mansarovar to Badi Chaupar, and the north–south corridor of 23 km from Ambabadi to Sitapura. In January 2010, the government of Rajasthan established the Jaipur Metro Rail Corporation (JMRC) to implement the metro rail lines. Line 1- Phase A (9.7 km elevated portion from Mansarovar to Chandpole) and Line 1-Phase B (2.3 km underground portion from Chandpole to Badi Chaupar, with two stations).

[1]http://www.adb.org/sites/default/files/project-document/79730/46417-001-rrp.pdf

6. Line 1 – Phase B is being financed by ADB and expected to be completed by March 2018 at a cost of Rs. 1126 Crore[2]. Figure 1 show the system map of the Project.



Source: JMRC

Figure 1. JMRC Project System Map

[2]https://www.jaipurmetrorail.in/Present%20Status

C. Project Implementation Arrangement

7. The Government of Rajasthan acting through the Urban Development and Housing Department and Jaipur Metro Rail Corporation (JMRC) is the executing agency of the Project. JMRC has established an environment safeguard cell to look after implementation and monitoring of the safeguards measures associated with the Project. It constitute six officials of JMRC. Organization structure of Safeguards Cell is show in Figure 2.

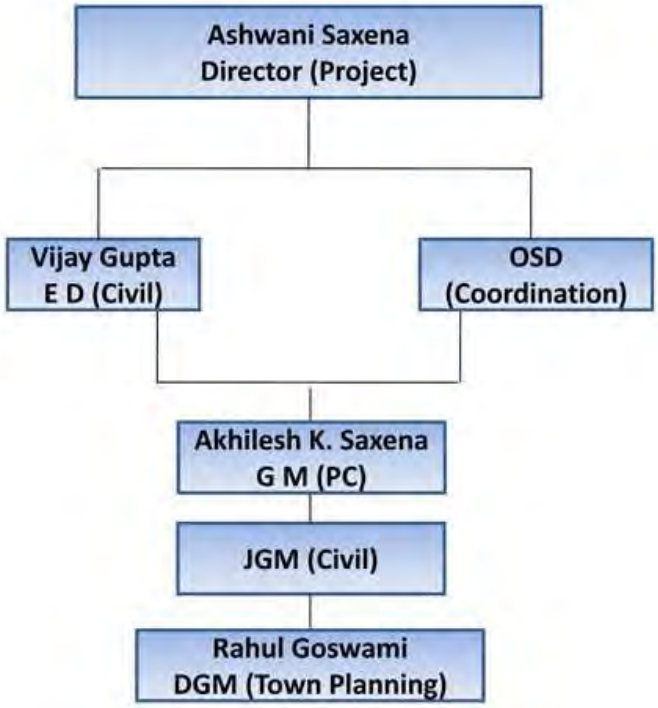
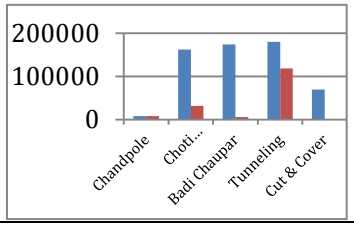


Figure 2: Organization Structure of Safeguards Cell of JMRC

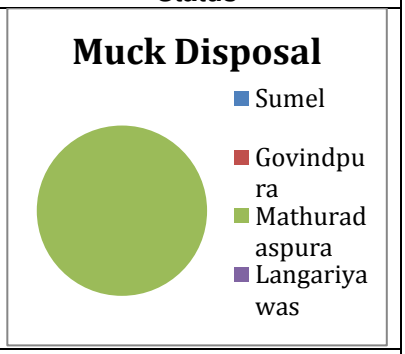
D. Project Implementation Progress

8. As of March 2016, total physical and financial accomplishment are about 35.76% and 40.46%, respectively. The status of various construction activities is provided in the Table 1.Photolog demonstrating the progress of works is provided in Appendix 1.

Table 1: Status of Construction Works as of March 2016

<table>
<tr><th>S.N.</th><th>Activities</th><th>Location</th><th>Status</th></tr>
<tr><td>1</td><td>Earthworks:
Earthwork is to be done for construction of Launching shaft at Chandpole, construction of underground stations at Chhoti Chaupar and Badi Chaupar by cut &cover method. During the tunneling earth will be excavated with Tunnel Boring Machine (TBM-I & II).</td><td>
<table>
<tr><th>Location</th><th>Estimated quantity (in cum)</th></tr>
<tr><td>Chandpole</td><td>8000</td></tr>
<tr><td>Chhoti Chaupar</td><td>162000</td></tr>
<tr><td>Badi Chaupar</td><td>174000</td></tr>
<tr><td>Tunneling Work</td><td>180000</td></tr>
<tr><td>Cut & cover</td><td>70000</td></tr>
</table>
</td><td>
<table>
<tr><th>Location</th><th>% Completion</th></tr>
<tr><td>Chandpole</td><td>100%</td></tr>
<tr><td>Chhoti Chaupar</td><td>19.75%</td></tr>
<tr><td>Badi Chaupar</td><td>3.5%</td></tr>
<tr><td>Tunneling Work</td><td>66.0%</td></tr>
<tr><td>Cut & cover</td><td>0%</td></tr>
</table>


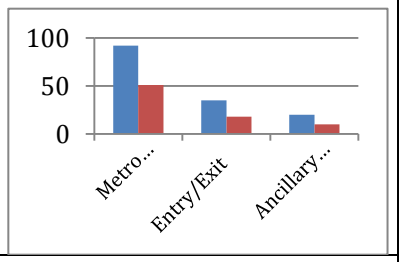
</td></tr>
<tr><td>2</td><td>Spoils Disposal:
<table>
<tr><th>Location</th><th>Estimated quantity *(in cum)</th></tr>
<tr><td>Chandpole</td><td>8000</td></tr>
<tr><td>Chhoti Chaupar</td><td>145800</td></tr>
<tr><td>Badi Chaupar</td><td>156600</td></tr>
<tr><td>Tunneling Work</td><td>180000</td></tr>
<tr><td>Cut & cover</td><td>70000</td></tr>
</table>
*Estimated quantity of soil which will be disposed during complete project duration</td><td>1. Sumel
2. Govindpura/Ropada
3. Mathuradaspura
4. Langariyawas</td><td>➢ Jaipur Development Authority has allotted following soil disposal sites vide letter dated 01.09.2014
1. Sumel
2. Govindpura/Ropada
3. Mathuradaspura
➢ Jaipur Nagar Nigam has allotted following soil disposal sites vide letter dated 08.09.2014:
1. Langariyawas
➢ Spoil disposed at different disposal sites during the reporting period is as under:
<table>
<tr><th>Location</th><th>Estimated quantity (in cum)</th></tr>
<tr><td>Sumel</td><td>0</td></tr>
<tr><td>Govindpura/ Ropada</td><td>0</td></tr>
<tr><td>Mathuradaspura</td><td>90813</td></tr>
<tr><td>Langariyawas</td><td>0</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S.N.</th><th>Activities</th><th>Location</th><th>Status</th></tr>
<tr><td></td><td></td><td></td><td> 
</td></tr>
<tr><td>3</td><td>Vegetation and Plant Clearing:

Some trees are coming in the metro route in launching shaft at Chandpole, station box and in entry exit at Chhoti Chaupar and Badi Chaupar. These trees are to be cut or relocated with the prior approval of District Collector.</td><td>• Location of the trees as per survey which are to be cut or located as under:

<table><tr><th>Location</th><th>Trees</th></tr><tr><td>Metro route</td><td>92</td></tr><tr><td>Entry/Exit at Chhoti Chaupar & Badi Chaupar</td><td>35</td></tr><tr><td>Ancillary Building area at Chhoti Chaupar</td><td>20</td></tr></table>
• The tree species include Gulmohar, Banyan tree &Pipal tree.
• The trees are being transplanted at Ghat ki Guni, Sylvan Bio diversity forest Agra road Jaipur & Ram Niwas Bagh, JDA Jaipur.</td><td>Permission for cutting/ transplantation of 20 trees has been obtained from ADM, Jaipur vide their letter dated 24.04.2015.

Details of trees cut or transplanted is as under:

<table><tr><th>Location</th><th>Trees</th></tr><tr><td>Metro route</td><td>51</td></tr><tr><td>Entry/Exit at Chhoti Chaupar & Badi Chaupar</td><td>18</td></tr><tr><td>Ancillary Building area at Chhoti Chaupar</td><td>10</td></tr></table>
 
</td></tr>
<tr><td>4</td><td>Utility Shifting:

Utility shifting is an important activity for underground station work.

Underground electric cables, water supply lines and telecom lines are to be realigned at Chandpole for launching shaft and underground station at Chhoti Chaupar and Badi Chaupar.</td><td><table><tr><th>Chandpole – Launching shaft</th></tr><tr><td>Electric cables</td></tr><tr><td>Water supply lines</td></tr><tr><td>Telecom lines</td></tr><tr><th>Chhoti Chaupar</th></tr><tr><td>Electric cables</td></tr><tr><td>Water supply lines</td></tr></table></td><td>Status during reporting period is as under:

<table><tr><th colspan="2">Chandpole – Launching shaft</th></tr><tr><td>Electric cables</td><td>100%</td></tr><tr><td>Water supply lines</td><td>100%</td></tr><tr><td>Telecom lines</td><td>100%</td></tr><tr><th colspan="2">Chhoti Chaupar</th></tr><tr><td>Electric cables</td><td>100%</td></tr><tr><td>Water supply</td><td>100%</td></tr></table></td></tr>
</table>

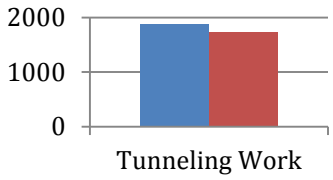
S.N.	Activities	Location	Status
		Telecom lines **Badi Chaupar** Electric cables Water supply lines Telecom lines	lines Telecom lines 100% **Badi Chaupar** Electric cables 100% Water supply lines Work in Progress Telecom lines 100%
5	**Traffic Management and Diversion**: For the construction of launching shaft at Chandpole, underground stations at Chhoti Chaupar and Badi Chaupar, traffic is to be diverted. Project specific traffic management plan has been developed and the same has been approved by Jaipur Traffic Authority.	**Chandpole Launching Shaft** Traffic from Station Road to Jhotwara Road has been diverted via Pareek College Road. **Chhoti Chaupar** Direct access from Chandpole Bazar to Tripolia Bazar. Traffic is diverted via Nahargarh Road – Gangauri Bazar – Cheeni Ki Burj. **Badi Chaupar** Traffic Diversion Plan is under preparation	**Chandpole Launching Shaft** Traffic Management & diversion is continuing. **Chhoti Chaupar** Road is open for traffic from all directions. **Badi Chaupar** Out of 4 lanes, 2 lanes have been closed for diaphragm wall work. Two-way traffic is flying through the remaining two lanes.
6	**Launching shaft:** Launching shaft is to be constructed for tunnel boring machine. A launching shaft has diaphragm wall/concrete wall and it is built to be permanent. Once the access shaft is completed, Tunnel Boring Machine will be lowered to the bottom and excavation will start. Launching shaft is the main entrance & exit of the tunnel until project is complete. Launching shaft is rectangular in shape and constructed with reinforce cement concrete M50 grade. Walls of launching shaft are 800 mm thick. Dimension of launching shaft at Chandpole is 24m X 20m and a depth of 14m.	Chandpole	Launching shaft work has been completed.

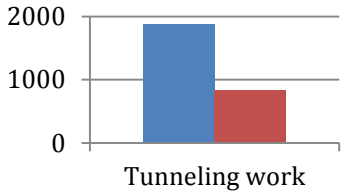
<table>
<tr><th>S.N.</th><th>Activities</th><th>Location</th><th>Status</th></tr>
<tr>
<td>7</td>
<td>Tunnel Boring Machine

Tunnel boring machine will be used in excavating and advancing tunnels through any type of ground strata for the complete tunnelling work.

The underlying principle of the EPB method is that the excavated soil or muck itself is used to provide continuous support to the tunnel face by balancing earth pressure against the forward pressure of the machine.

As the shield advances at the face, the cutter head on the TBM rotates through the earth. The excavated soil is then mixed together with a special foam material that actually alters its viscosity or thickness and transforms it into flowing material. The use of a foaming agent to break down muck into a liquefied form provides some obvious benefits. The muck is then stored and controlled in a pressurized chamber located inside the cutter head, and is used to apply support and balance pressure to the tunnel face during the excavation process. The foam acts as a lubricant that conditions the soil to a suitable fluidity, in effect reducing the risk of clogging in the pressurized chamber head or muck storage area.

A screw conveyor then removes excess fluidized muck in controlled volumes from behind the cutter head and in front of the "Pressure bulkhead", synchronizing the screw conveyor with the actual speed of the tunnel boring machine, and equalizing the actual volume of soil travelling into and out</td>
<td>The main activities of these TBMs are as under:
<table>
<tr><th colspan="2">TBM 1</th></tr>
<tr><td>Refurbishment</td><td></td></tr>
<tr><td>Lowering in launching shaft</td><td></td></tr>
<tr><td>Tunneling work</td><td>1875 meter</td></tr>
<tr><th colspan="2">TBM 2</th></tr>
<tr><td>Refurbishment</td><td></td></tr>
<tr><td>Lowering in launching shaft</td><td></td></tr>
<tr><td>Tunneling work</td><td>1875 meter</td></tr>
</table>
</td>
<td>
<table>
<tr><th colspan="2">TBM 1</th></tr>
<tr><td>Refurbishment</td><td>100%</td></tr>
<tr><td>Lowering in launching shaft</td><td>100%</td></tr>
<tr><td>Tunneling work</td><td>92% (1725) tunneling completed.</td></tr>
<tr><th colspan="2">TBM 2</th></tr>
<tr><td>Refurbishment</td><td>100%</td></tr>
<tr><td>Lowering in launching shaft</td><td>100%</td></tr>
<tr><td>Tunneling work</td><td>45% (836) tunneling completed.</td></tr>
</table>
TBM-1


TBM-2


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</tr>
</table>

<table>
<tr><th>S.N.</th><th>Activities</th><th>Location</th><th>Status</th></tr>
<tr><td></td><td>of the machine and establishes earth pressure balance during excavation, thereby also reducing the risk of surface or ground settlement. The performance of the EPBV machine, however, largely depends on the actual properties of the excavated muck. The soil may be coarse sands, gravel or stiff clays.

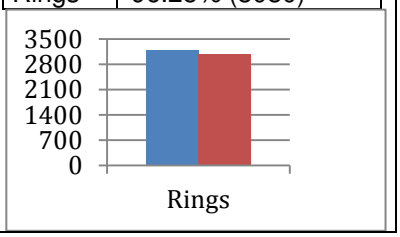
The EPB TBM also has the unique capability of placing a continuous ring of segment liners from within the tail shield of the machine inside the tunnel as it advances. These concrete segments provide critical additional reinforcement and support and accomplish all tunnel construction in one pass.

Tunneling works from Chandpole to Badi Chaupar will be done by the two TBMs.

Diameter of the cutting head of TBM is 6.55 meter. The tunnel size is of 5.60 meter internal diameter.</td><td></td><td></td></tr>
<tr><td>8</td><td>Segment casting:

Internal lining of the tunnel will be done by precast reinforced cement concrete segments. The segments are to be constructed with M 50 concrete having outer diameter of 6.35 meter. One ring comprises 6 segments.</td><td>Segment casting will be done at casting yard in Bhankarota.

<table><tr><td>Rings</td><td>3200 (19200 segments)</td></tr></table></td><td>Rings casted are as under:

<table><tr><td>Rings</td><td>96.25% (3080)</td></tr></table> 
</td></tr>
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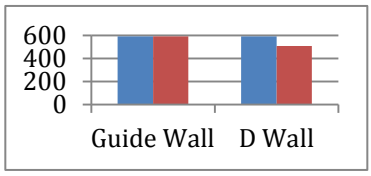
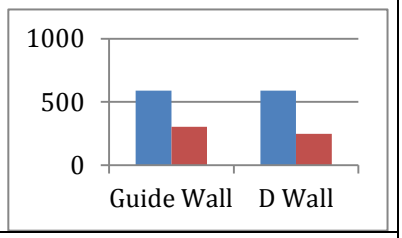
<table>
<tr><th>S.N.</th><th>Activities</th><th>Location</th><th>Status</th></tr>
<tr><td>9</td><td>Guide wall and D wall at Chhoti Chaupar & Badi Chaupar stations:

For the construction of D-Wall initially guide walls are constructed so as to keep the D-Wall in proper alignment.

Guide walls are constructed with reinforce cement concrete of M20 grade. The thickness of guide wall is about 600 mm and depth is 1.5 m.

Diaphragms walls are constructed with reinforce cement concrete of M35 grade. The thickness of diaphragms wall is about 800 mm and depth is about 26 m.</td><td>
<table>
<tr><th>Location</th><th>Length (m)</th></tr>
<tr><td colspan="2">Chhoti Chaupar</td></tr>
<tr><td>Guide Wall</td><td>590</td></tr>
<tr><td>D-Wall</td><td>590</td></tr>
<tr><td colspan="2">Badi Chaupar</td></tr>
<tr><td>Guide Wall</td><td>590</td></tr>
<tr><td>D-Wall</td><td>590</td></tr>
</table>
</td><td>
<table>
<tr><th>Location</th><th>% Completion</th></tr>
<tr><td colspan="2">Chhoti Chaupar</td></tr>
<tr><td>Guide Wall</td><td>100%(590)</td></tr>
<tr><td>D-Wall</td><td>85.93%(507)</td></tr>
<tr><td colspan="2">Badi Chaupar</td></tr>
<tr><td>Guide Wall</td><td>51.35%(303)</td></tr>
<tr><td>D-Wall</td><td>41.8%(247)</td></tr>
</table>
<u>Chhoti Chaupar</u>
 

<u>Badi Chaupar</u>
 

</td></tr>
<tr><td>10</td><td>Roof Slabs at Chhoti Chaupar & Badi Chaupar Station

Stations are to be constructed with top down method. Top slab, roof slab, concourse slab & base slab are to be constructed.</td><td>
<table>
<tr><th>Location</th><th>Area (sqm)</th></tr>
<tr><td colspan="2">Chhoti Chaupar</td></tr>
<tr><td>Top slab</td><td>7000</td></tr>
<tr><td>Roof slab</td><td>7000</td></tr>
<tr><td>Concourse</td><td>7000</td></tr>
<tr><td>Base slab</td><td>7000</td></tr>
<tr><td colspan="2">Badi Chaupar</td></tr>
<tr><td>Top slab</td><td>7000</td></tr>
<tr><td>Roof slab</td><td>7000</td></tr>
<tr><td>Concourse</td><td>7000</td></tr>
<tr><td>Base slab</td><td>7000</td></tr>
</table>
</td><td>
<table>
<tr><th>Location</th><th>Area (sqm)</th></tr>
<tr><td colspan="2">Chhoti Chaupar</td></tr>
<tr><td>Top slab</td><td>3860</td></tr>
<tr><td>Roof slab</td><td>3792</td></tr>
<tr><td>Concourse</td><td>0</td></tr>
<tr><td>Base slab</td><td>0</td></tr>
<tr><td colspan="2">Badi Chaupar</td></tr>
<tr><td>Top slab</td><td>0</td></tr>
<tr><td>Roof slab</td><td>0</td></tr>
<tr><td>Concourse</td><td>0</td></tr>
<tr><td>Base slab</td><td>0</td></tr>
</table>
Top slab work at Tripolia & Chandpole sides has been completed at Chhoti Chaupar.

D-wall construction at Chhoti Chaupar is under progress.

D-wall construction at Badi Chaupar is under progress</td></tr>
</table>

<table>
<tr><th>S.N.</th><th>Activities</th><th>Location</th><th>Status</th></tr>
<tr><td>11</td><td>Establishment of construction camp:

➢ A construction camp for laborers has been established near to casting yard area in November 2014.</td><td>Casting Yard, Bhankrota

<table><tr><td>Number of blocks</td><td>9</td></tr><tr><td>Total Camp Area</td><td>6227 sq.m</td></tr><tr><td>Capacity</td><td>9X48</td></tr><tr><td colspan="2">Facilities to be provided</td></tr><tr><td>Bathing room</td><td></td></tr><tr><td>Dining room</td><td></td></tr><tr><td>Urinal& toilet</td><td></td></tr><tr><td>Drinking water with cooling facility</td><td></td></tr><tr><td>fans</td><td></td></tr><tr><td>playground</td><td></td></tr></table></td><td>Completed.

<table><tr><td>Number of blocks</td><td>9</td></tr><tr><td>Area of each block</td><td>692sqm</td></tr><tr><td>Workers staying</td><td>190</td></tr><tr><td colspan="2">Facilities installed</td></tr><tr><td>Bathing room</td><td>Yes</td></tr><tr><td>Dining room</td><td>Yes</td></tr><tr><td>Urinal& toilet</td><td>Yes</td></tr><tr><td>Drinking water with cooling facility</td><td>Yes</td></tr><tr><td>fans</td><td>Yes</td></tr><tr><td>playground</td><td>Yes</td></tr></table></td></tr>
<tr><td>12</td><td>Other Facilities:

➢ Batching Plant,
➢ Laboratory,
➢ RO Plant
➢ Chiller Plant
➢ Diesel Generating Set
➢ Briquette Boiler</td><td>Following facilities are provided at casting Yard, Bhankrota:

<table><tr><th>Item</th><th>Capacity</th></tr><tr><td>Batching Plant</td><td>(i) 30 cum/hr
(ii) 60 cum/hr</td></tr><tr><td>Quality Control Laboratory</td><td>Installed</td></tr><tr><td>RO Plant</td><td>2 kl/hr</td></tr><tr><td>Chiller Plant</td><td>100 TR</td></tr><tr><td>Diesel Generating Set</td><td>500 KVA</td></tr><tr><td>Briquette Boiler</td><td>2 TPH</td></tr></table></td><td>Completed.</td></tr>
</table>

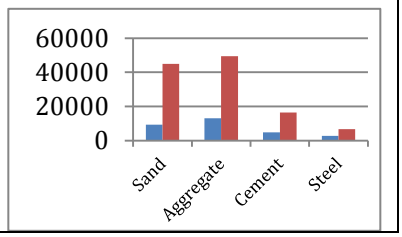
<table>
<tr><th>S.N.</th><th>Activities</th><th>Location</th><th>Status</th></tr>
<tr><td>13</td><td>Establishment and operation of quarry/ borrow area:

For the construction work following material is sourced:

➢ Sand
➢ Aggregate
➢ Cement
➢ Steel</td><td>Quarry area and borrow area of construction material is as under:

<table><tr><th>Material</th><th>Quarry / borrow area</th></tr><tr><td>Sand</td><td>Banas</td></tr><tr><td>Aggregate</td><td>Shakun, Lakher</td></tr><tr><td>Cement</td><td>Lafarge</td></tr><tr><td>Steel</td><td>SAIL, VIZAG,TATA</td></tr></table></td><td>Volume of the material extracted is as under:

<table><tr><th>Material</th><th>Quantity (MT)</th></tr><tr><td>Sand</td><td>9397.36</td></tr><tr><td></td><td>44935.91*</td></tr><tr><td>Aggregate</td><td>13086.90</td></tr><tr><td></td><td>49453.59*</td></tr><tr><td>Cement</td><td>4823.36</td></tr><tr><td></td><td>16548.47*</td></tr><tr><td>Steel</td><td>2815.39</td></tr><tr><td></td><td>6685.96*</td></tr></table>* Up to date quantity

 
</td></tr>
</table>

II. COMPLIANCE TO SAFEGUARDS PROVISIONS IN AGREEMENTS UNDER THE PROJECT

A. Compliance to Loan Agreement

9. The environmental and social safeguard requirements are explicit provided in the Loan Agreement 3062-IND between ADB and State of Rajasthan through the Urban Development and Housing Department (UDH)and Jaipur Metro Rail Corporation (JMRC). These loan agreement provisions and compliance status are provided in Table 2.

Table 2: Status of Compliance to Environmental Provisions of the Loan Agreement

S.N.	Environmental Provision	Compliance Status
1	**Schedule 4. Item 7(a):** <u>Conditions for awards of contracts, commencement of Works</u> 7. As condition for award of any contract under the project the EA shall ensure the following: a. JMRC shall not award any Works contract which involves environmental impacts until JMRC incorporated the relevant provisions from the EMP and SHE into the Works	Complied. SHE (Safety, Health and Environment) Manual and Environmental Management Plan (EMP) is a part of bidding document. Section 6 of Contract Agreement includes condition of contract on SHE and EMP, requiring the Contractor to implement the EMP and comply with requirements of SHE.

S.N.	Environmental Provision	Compliance Status
	contract,	
2	**Schedule 4. Item 8:** Conditions for award of contracts; commencement of Works 8. "As a condition for commencement of Works contract under the Project which involves environmental impacts and if it requires environmental clearances, the State thorough the JMRC shall ensure that the final approval of environmental clearances including the EIA, SHE, from appropriate ***authority*** has been obtained."	Complied. The project did not require environmental clearance, as railways including metro projects in India are not included in the EIA Notification 2006 of GoI.
3	**Schedule 5. Item 3:** Environment 3. "The Borrower shall ensure or cause the State through JMRC to ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project facilities comply with (i) all applicable laws and regulations of the Borrower and State relating to environment, health, and safety including SHE; (ii) the Environmental Safeguards; and (iii) all measures and requirements set forth in the EIA and the EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report."	Being complied. ➢ Requirements on permits and clearance are being followed. ➢ SHE is strictly being complied with. ➢ Requirements of EIA and EMP are being implemented.
4	**Schedule 5. Item 4(a):** Land Acquisition and Involuntary Resettlement 4 (a) Where the need arises, the Borrower shall ensure or cause the State through JMRC to ensure that all land and all rights-of-way required for the Project, and all Project facilities are made available to the Works contractor in accordance with the schedule agreed under the related Works contract and all land acquisition and resettlement activities are implemented in compliance with (i) all applicable laws and regulations of the Borrower and State relating to land acquisition and involuntary resettlement; (ii) the Involuntary Resettlement Safeguards; and (c) all measures and requirements set forth in the respective RP, and any	Being complied. All land acquisition and resettlement activities are implemented as per provisions of Indian Law.

S.N.	Environmental Provision	Compliance Status
	corrective or preventative actions set forth in a Safeguards Monitoring Report.	
5	**Schedule 5. Item 4 (b)** Land Acquisition and Involuntary Resettlement 4 (b) Without limiting the application of the Involuntary Resettlement Safeguards, or the RP, the Borrower shall ensure or cause the State through JMRC to ensure that no physical or economic displacement takes place in connection with the Project until: (a) compensation and other entitlements have been provided to affected people in accordance with the RP; and (b) a comprehensive income and livelihood restoration program has been established in accordance with the RP.	Being complied. Compensation and other entitlements are being provided to affected people in accordance with applicable laws by JMRC.
6	**Schedule 5. Item 5** Indigenous Peoples 5. Where the need arises, the Borrower shall ensure or cause the State through JMRC to ensure that the preparation, design, construction, implementation and operation of the Project, and all Project facilities comply with (a) all applicable laws and regulations of the Borrower and the State relating to indigenous peoples; (b) the Indigenous Peoples Safeguards; and (c) all measures and requirements set forth in the respective IPP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	Not applicable. No issues on Indigenous peoples have arisen during the reporting period.
7	**Schedule 5. Item 6(a) & 6(b)** Human and Financial Resources to Implement Safeguards Requirements 6 (a) "The Borrower shall ensure or cause the State through JMRC to ensure that all necessary budgetary and human resources to fully implement the EMP, and the RP and the IPP as required" 6 (b) "The Borrower shall ensure or cause the State through JMRC to ensure that at least one expert each is designated to supervise implementation of the EMP, and the RP and the IPP as required"	Being complied. ➢ Safeguards cell comprising of 06 officers has been established in JMRC since 2013. ➢ A JV of M/s Abha Narain Lambah Associates and M/s Shashank Mehendale & Associates has been engaged as Heritage Consultant through ICB. ➢ The Heritage Consultant is to monitor the heritage structures lying along the metro route of Phase 1B.

S.N.	Environmental Provision	Compliance Status
		➢ JMRC has also engaged 3 senior Archaeological Consultants to supervise the excavation of Chhoti Chaupar and Badi Chaupar. ➢ Safeguards experts are part of the PMC (DMRC) team and civil works contractor team. ➢ Adequate budget allocation has been made for implementation of safeguards activities.
8	**Schedule 5. Item 7(a)** Safeguards – Related Provisions in Bidding Documents and Works Contracts. 7 (a) "comply with the measures and requirements relevant to the contractor set forth in the EIA, the EMP, SHE, the RP and the IPP as applicable (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set out in a Safeguards Monitoring Report.	Being complied. Safeguards experts are part of the PMC (DMRC) and civil works contractor teams are implementing safeguard measures. Adequate budget allocation is being made for implementation of safeguards activities.
9	**Schedule 5. Item 7(b)** Safeguards – Related Provisions in Bidding Documents and Works Contracts. 7 (b) "make available a budget for all such environmental and social measures"	Being complied.
10	**Schedule 5. Item 7(c)** Safeguards-Related Provisions in Bidding Documents and Works Contract. 7 (c) "provide the JMRC with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks if any, or impacts that arise during construction, implementation or operation of the Project that were not considered in the EIA, the EMP, and the RP and the IPP if any;"	Being complied. Appropriate measures are being and will be taken to address these issues, as they arise.
11	**Schedule 5. Item 8(a)** Safeguards – Related Provisions in Bidding Documents and Works Contracts. 8 (a) submit quarterly Safeguards Monitoring Reports to ADB and disclose relevant	Being complied. Quarterly Environmental and Social Monitoring Reports are being timely

S.N.	Environmental Provision	Compliance Status
	information from such reports to affected persons promptly upon submission"	submitted by JMRC to ADB. The reports are also being disclosed on ADB and JMRC websites.
12	**Schedule 5. Item 8(b)** <u>Safeguards – Related Provisions in Bidding Documents and Works Contracts.</u> 8 (b) "if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the EIA, the EMP, SHE, and RP and IPP as applicable, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan.	Being complied.
13	**Schedule 5. Item 8(c)** <u>Safeguards – Related Provisions in Bidding Documents and Works Contracts.</u> 8 (c) Report any breach of compliance with the measures and requirements set forth in the EMP, SHE and the RP or the IPP if any, promptly after becoming aware of the breach.	Being complied.
14	**Schedule 5. Item 9** 9. The Borrower shall ensure or cause the State through JMRC to ensure that no proceeds of the Loan under the Project are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of ADB's Safeguard Policy Statement (2009).	Being complied
15	**Schedule 5. Item 10** <u>Other Social Measures</u> 10. The EA shall ensure that civil works contracts under the Project follow all applicable labor laws of the Borrower and State and that these further include provisions to the effect that contractors; (i) carry out HIV/AIDS awareness programs for labor and disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction; and (ii) follow and implement all statutory provisions on labor	Complied. ➢ Various awareness programs have been conducted during the reporting period. ➢ HIV/AIDS awareness programsare conducted on regular basis. ➢ Special programs were conducted on 4th March 2016 as part of National Safety Day celebration. ➢ Monthly environmental training,

S.N.	Environmental Provision	Compliance Status
	(including not employing or using children as labor, equal pay for equal work), health, safety, welfare, sanitation, and working conditions. Such contracts shall also include clauses for termination in case of any breach of the stated provisions by the contractors.	physical training and general housekeeping training are conducted in line with India Government's Swachha Bharat Abhiyan. Details of Awareness Programs and Meetings are provided in **Appendix 2**
16	**Schedule 5. Item 11** 11. The EA shall ensure the safety and status of the heritage sites and structures involved in the Project site at its own cost and in this regard ensure all appropriate steps included as detailed in the PAM.	Being complied. ➢ In the bidding document, provision was made to conduct Baseline Building condition survey, wherein the structural stability of structures lying on 30 m on either side of the route alignment of Phase 1B was recorded so as to help monitor any changes which may occur during construction. ➢ JMRC through CEC (AIMIL) got the Building Condition Survey before commencement of work at site. ➢ For the purpose of monitoring heritage structures along with the metro route alignment of Phase 1B, JMRC has engaged Heritage Consultant M/s Abha Narain Lambah Associates and M/s Shashank Mehandale & Associates (JV). ➢ Mitigation and preventive measures are being taken up by M/s CEC in order to avoid any damage.
17	**Schedule 5. Item 12** <u>Gender</u> 12. The EA shall ensure that the Project is undertaken in conformity with the stakeholder communication strategy as agreed between ADB, the Borrower, State, and JMRC and referred in the PAM.	Being complied.

B. Compliance to Project Administration Manual

10. The Project Administration Manual[3] (PAM), describes how the JMRC will implement the project and deliver the results on time, with quality, within budget, and in accordance with government and Asian Development Bank (ADB) policies and procedures. The PAM is

[3]http://www.adb.org/sites/default/files/project-document/79731/46417-001-pam.pdf

mandatory and serves as the main document describing implementation details. The status of implementing the safeguards requirements set out in PAM are provided in Table 3.

Table 3: Compliance to PAM

SN	Details	Compliance Status
1.	**Section VII.** **Safeguards** **40. Implementation of SHE and EIA.** The safeguards cell within JMRC will coordinate and ensure that all environment safeguard requirements under the project are met. The SHE and EIA report including site specific EMP will be included in the contract documents. The contractors must include in their bid adequate budget for implementation of all items in the SHE and EIA. The safeguards cell through the project management consultant (Delhi Metro Rail Corporation) will monitor and report on the environmental compliance of contractors with the SHE and EIA and ensure proper implementation of the grievance and redress mechanism. Key implementation activities for each stage of the project are as follows:	Being complied. Sample monthly monitoring report is provided in **Appendix 3.**
2.	**(i) Pre-construction**: All contractors will complete the following activities no later than 30 days from the issuance of Notice to Proceed: 1. Submit appointment letter and resume of the Contractor's Health and Safety Officer (HSO) who will be the on-site focal person for environment safeguards;	Being complied. HSO's CV was submitted on 9 May 2014 and it was approved by GC on 15 May 2014.
	2. HSO will engage CSC-Environment Specialist, and JMRC safeguards cell to a meeting to discuss in detail the SHE and EIA seek clarification and recommend corresponding revisions if necessary;	SHE and EIA have been discussed in detail by HSO with CSC-Environment Specialist, and JMRC safeguards cell. Details of meetings provided in **Appendix 2**.
	3. HSO will request CSC-ES copy of monthly monitoring formats and establish deadlines for submission;	Formats for Monthly Monitoring Report has been finalize with CSC-Environment Specialist. Monitoring report is being sent on monthly basis in prescribed format.
	4. HSO will submit for CSC-ES approval an action plan to secure all permits and approvals needed during construction stage such as for operation	HSO has submitted plan and action is being taken accordingly.

SN	Details	Compliance Status
	of crushers and hot mix plants, transport and storage of hazardous materials, waste disposal sites, use of ground water etc.	
	5. HSO will submit for approval of CSC-ES the construction camp layout before its establishment where camps are required, and	Camp has been constructed as per approved layout diagram.
	6. Before start of construction, the contractor will post signs in and around the construction site with information on the names, positions, contact numbers, and addresses of key people for receiving grievances	Adequate relevant signage has been displayed. Photolog is in **Appendix 1**.
3.	**(ii) Construction**: The JMRC safeguards cell through the PMC will monitor the Contractor's compliance to the SHE and EIA. In case of non-conformances, the safeguards cell will recommend corrective measures and ensure their timely implementation. If any unanticipated impacts become apparent, the safeguards cell will inform ADB. If required the EIA report will be updated, and mitigation measures and resources to address the new impacts will be identified	Being complied.
4.	**(iii) Post-construction**: The safeguards cell through the PMC will certify works completed in accordance with SHE and EIA and ensure all construction sites are satisfactorily rehabilitated and restored or otherwise recommend withholding of payments	Not yet due. Will be done in accordance with SHE & EIA.
5.	**41. PMC Environmental Specialist:** JMRC will ensure PMC (Delhi Metro Rail Corporation) to provide an Environmental Specialist who will, full time during construction, to monitor compliance by the contractor to the SHE and EIA in support of JMRC safeguard cell. The key qualification and experience consist of (a) minimum of a Master's Degree in Environmental Impact Assessment (EIA) or Environmental Engineering orrelated subjects; and (b) experience of minimum of 5 years of working experience in conducting Environmental Assessments, implementing and/or supervising environment management activities in infrastructure projects. The objective is to ensure contractor's compliance to the Safety Health and Environment (SHE) Guidelines and EIA in accordance with the requirements of the ADB	Complied. Mr. S.A. Verma, Sr. AGM/DMRC/Delhi is designated by PMC as its Environmental Specialist to monitor compliance by the Contractor for SHE and EIA. His assistants are doing full time monitoring in Jaipur.

SN	Details	Compliance Status
	Safeguard Policy Statement (SPS) 2009 as well as relevant policies of the Government of India. The main output is the Quarterly monitoring report during the construction period. The responsibilities include:	
6.	• Review EIA report including site specific EMP and SHE guidelines to understand the environmental issues in the project area and mitigation and monitoring requirements of the project.	Complied. EIA, EMP and SHE guidelines have been reviewed.
	• Update the site specific EMP if there are any significant changes in the project scope or environmental conditions to incorporate all new environmental issues and mitigation measures	Being complied. EMP will be updated as per requirements.
	• Prepare monitoring checklists/ templates for daily or weekly monitoring on implementation of the SHE and site specific EMP by the contractor.	Complied. Site specific monitoring checklists/ templates for daily or weekly monitoring on implementation of the SHE and EMP has been prepared.
	• Organize a consultation meeting with JMRC safeguards cell, contractors Health and Safety Officers (HSO), Site Engineer and Heritage Expert before the start of physical works to clarify roles and responsibilities of each party. After start of physical works organize a coordination meeting at least every quarter to provide updates, clarify and follow up on pending issues etc.	Being complied. A consultation meeting between JMRC's Safeguard Cell, Contractor, Health and Safety Officers (HSO), Site Engineer and Heritage Expert held before the start of physical work to clarify roles and responsibilities of each party. Coordination meetings in between JMRC's Safeguard Cell, Contractors, Health and Safety Officers (HSO), Site Engineer and Heritage Expert are being held regularly.
	• Where necessary organize technical training programs to enhance the field level staff's understanding on environmental issues such as health impacts of dust and noise, waste/debris disposal and management, safety issues etc.	Being complied. Environmental training programs are conducted on regular basis. The training is conducted by contractor's HSO. If required additional training will be provided by third party agencies on environmental issues. Details of training sessions are provided in **Appendix 2**.
	• Monitor implementation of the SHE and site	Being complied.

SN	Details	Compliance Status
	specific EMP by the contractor on a daily or weekly basis. In doing so complete the daily or weekly monitoring checklists.	Monitoring of implementation of SHE and site specific EMP are being done by Contractor's HSO on regular basis. SHE meeting is held with participation from JMRC, DMRC and Contractor and sub-contractors to ensure compliance and implementation of SHE requirements and EMP.
	• Provide site based technical advice to the contractors where necessary during construction activities	Site based technical advice to the contractors is being given by DMRC experts.
	• Co-ordinate with the contractor's site engineers on monitoring and data collection on noise and vibration generated during tunnelling works and operation of heavy machinery	PMC's environment team is coordinating with contractor's site engineers on monitoring and data collection on noise and vibration generated during operation of heavy machinery. It will also be monitored during tunnelling works.
	• Coordinate with the Heritage Expert on getting data on monitoring and status of heritage structures above ground.	PMC's environment team is coordinating with the Heritage Expert on getting data on monitoring and status of heritage structures above ground.
	• Facilitate the functioning of the Grievance Redress Mechanism and maintain proper records of all environment related grievances and details on how they were addressed.	A system is in place to facilitate the functioning of the Grievance Redress Mechanism and maintain proper records of all environment related grievances and details on how they are addressed.
	• Prepare quarterly Environmental Monitoring reports based on monitoring site visits, completed checklists and quarterly meetings for submission to JMRC safeguards cell and ADB. Amongst other environment safeguard issues, the monitoring report must cover: ➢ compliance to the SHE and site specific EMP by the contractor ➢ vibration monitoring activities conducted by contractor's engineers ➢ grievances redress mechanism ➢ monitoring and status of heritage sites above ground	Noted for compliance. ➢ For compliance of the SHE and site specific EMP by the contractor regular visit is being done by the Environmental team of CSC. ➢ For monitoring of the vibration during the construction instrumentation has been done by M/s CEC as per approval given by CSC. The monitoring will be done by a third party agency i.e. M/s. AIMIL. ➢ Grievances redress mechanism is in place.

SN	Details	Compliance Status
		➢ For monitoring the status of heritage site above the ground a Heritage Consultant i.e. M/s Abha Narain Lambah Associates and M/s Shashank Mehendale and Associates (JV) has been appointed by JMRC. During the tunneling the team of heritage consultant will be at site to monitor the status of buildings and heritage structures along the metro route.
7.	**42. Monitoring of Heritage Structures** JMRC through DMRC will retain at its own cost the current Heritage architect as the Heritage site expert during construction of the underground metro section. The expert will be responsible for conducting a baseline survey of heritage sites above the metro alignment and conducting regular monitoring of the status of the heritage sites throughout the construction period. The expert will be responsible for coordinating necessary procedures if any historical/traditional artifacts are found during tunneling works. He/she will also provide advice on technical measures during construction to prevent damages to the heritage structures. In the event of any damage to a heritage structure he/she will immediately alert JMRC and recommend appropriate mitigation or restoration measures. Key outputs are: (a) Monthly monitoring report; (b) No damage on heritage structures; and (c) in the event of damage, implementation of immediate restoration and mitigation measures. The main responsibilities are:	Being complied. ➢ JMRC through competitive bidding has engaged heritage consultant M/s Abha Narain Lambah Associates and M/s Shashank Mehendale & Associates (JV) to monitor the heritage structures lying along the metro route of Phase 1B. ➢ JMRC has also engaged 3 senior Archaeology Consultants to supervise the excavation of Chhoti Chaupar and Badi Chaupar. ➢ Heritage Consultant got conducted Baseline survey for existing building's condition along the metro route and has submitted Building Inventory report. ➢ Structural survey of buildings along the metro route has also conducted and submitted report, wherein they categorized buildings under 3 categories 1. Unstable Structures requiring preventive propping and immediate demolition/ evacuation. 2. Part of structure unstable requiring propping & partial replacement /demolition.

SN	Details	Compliance Status
		3. No major instability. These reports have been shared with ADB and concerned local agency who will be further taking necessary action. A re-evaluation for the structural condition of the shops along Chandpole launching site (from Chandpole gate to Chhoti Chaupar) was conducted by the Joint team of JMRC, DMRC and M/s CEC engineers. Preventive measures like propping of the verandahs and the shops along the above length have been taken by contractor. The consolidated list of unstable structures requiring immediate attention will be further shared with local agency (Jaipur Municipal Corporation) for further course of action.
8.	• At least one month before the start of construction activities conduct a baseline survey of all heritage structures above the metro alignment and record detailed information including, but not limited to: list of heritage structures with details on location and distance from the metro alignment, exact height of structures above ground, existence of cracks/ damages prior to start of construction, detailed photographs etc. • Monitor the condition of the heritage structures on a monthly basis throughout the construction period and compare the status with the baseline status to ensure that there are no changes from the baseline condition. • Coordinating necessary procedures if any historical/traditional artifacts are found during tunnelling works. • Provide advice on technical measures during construction to prevent damages to the heritage structures. • In the event of observation in any damage to any heritage structure/s immediately alert JMRC and recommend appropriate mitigation or restoration measures. • Provide technical advice on and supervise the mitigation or restoration activity.	Complied. ➢ Before the start of construction activity, Building Condition Survey of all structure along the metro route with photograph of existing cracks and damages was conducted by CEC through AIMIL. ➢ Before the start of construction activity, Baseline Survey of all the structure along the metro route with detailed photographs was conducted by Heritage Consultant i.e. M/s Abha Narain Lambah Associates and M/s Shashank Mehandale and Associates (JV). ➢ Based on the reports and survey submitted by Heritage consultant, CEC is regularly monitoring status of buildings and the status is reported through daily and weekly reports.

SN	Details	Compliance Status
	• Prepare a monitoring report on a monthly basis to record activities implemented and monitoring findings and submit to JMRC safeguards cell as well the Environmental Specialist. Findings of the report will be included in the quarterly environmental monitoring report that will be prepared by the environmental specialist.	➢ Heritage Consultant entrusted to advice on measures during construction to prevent damages to the heritage structures. ➢ Heritage Consultant is submitting monitoring report on monthly basis to record activities implemented and monitoring findings to JMRC.
9.	**Section VII- Safeguards** **b) Social – Involuntary resettlement.** 44. If any changes or additional land requirements or involuntary resettlement impacts are identified, a resettlement plan will be prepared in accordance with the ADB ***Safeguard Policy Statement (2009)*** and the same is further approved by ADB before award of related civil works contract and implemented before commencement of the relevant section of the civil works contract as applicable.	Being complied. 6 Temples at Chhoti Chaupar, which were infringing the station box area have all been rehabilitated and shifted to a newly constructed Temple complex at Old Atish market land as per their satisfaction of Temple Trusts. Government is continuously in touch with the stakeholders and is in process of ensuring that sentiments of people at large are not hurt. Rozgareshwar Temple at Chhoti Chaupar will be relocated back to its original position after completion of Station work at Chhoti Chaupar. 7 temples at Badi Chaupar have been identified which are infringing the station box area. These temples are still to be relocated. Lately the government is in discussion with all the representatives of temples of Badi Chaupar and will be shifting one of the temple Gauri Shankar Mahadev to the plot behind Manak Chowk Thana. The discussions are in progress for final decision.
10	**Section VII - Safeguards** **c) Social – Indigenous people**	

SN	Details	Compliance Status
	45. In case of any adverse impacts if identified during implementation on indigenous people, the JMRC will ensure that the Indigenous Peoples Plan (IPP) is prepared in accordance with the ADB ***Safeguard Policy Statement (2009)*** and the same is further approved by ADB before award of related civil works contract and implemented before commencement of the relevant section of the civil works contract as applicable.	Not Applicable.
11	**Section VIII - Gender and Social Dimensions** **47 Gender consultation and participation** Meaningful consultations that are gender inclusive and responsive will be carried out as early as in the project preparation stage and will be carried out on an ongoing basis throughout the project cycle. JMRC shall ensure that the bidding documents provide clauses to ensure that all civil works contractors comply with labor laws by not employing child labor; encouraging the employment of the poor, particularly women; and not offering different wages to men and women on work of equal value.	Complied. This provision is a part of the bidding document.
12	**Section VIII - Gender and Social Dimensions** **49. HIV and AIDS** JMRC will ensure that all civil works contractors (i) carry out awareness programs for labor on the risks of sexually transmitted diseases/AIDS and human trafficking; and (ii) disseminate information at worksites on the risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction. Contracts for the project will include specific clauses on these undertakings, and compliance will be strictly monitored by JMRC.	Complied. Periodically awareness about HIV/AIDS is discussed in morning tool box talk and apart from this the medical officer visits the labour camp and explains the risk of sexually transmitted disease on periodic basis. **Appendix 2**.

SN	Details	Compliance Status
13	**Section VIII - Gender and Social Dimensions** **50. Health**. JMRC shall ensure that contractors provide adequately for the health and safety of construction workers and further ensure that bidding documents include measures on how contractors will address this, including an information and awareness raising campaign for construction workers on sexually transmitted diseases, HIV/AIDS, and human trafficking.	Complied. Various type of awareness programme has been conducted during this period. Apart from this monthly environmental training, physical training and general housekeeping training are conducted in line with India Government's Swatch Bharat Abhiyan.
14	**Section VIII - Gender and Social Dimensions** **51. Labor** JMRC shall ensure that: i. civil works contractors comply with all applicable labor laws and regulations, do not employ child labor for construction and maintenance activities, and provide appropriate facilities for women and children in construction campsites; ii. people directly affected by the projects are given priority to be employed by the contractor; iii. contractors do not differentiate wages between men and women for work of equal value; and iv. specific clauses ensuring these will be included in bidding documents. The construction supervision consultants monitor the provisions.	Complied. ➢ Civil work contractor is complying with all applicable labour laws and regulations. ➢ No child labour is employed. ➢ Preference is being given to people directly affected by the project. ➢ Complying with equal remuneration Act. ➢ Specific clause for ensuring labour law etc. has been included in the bidding document.
15	**Section IX - Performance Monitoring, Evaluation, Reporting and Communication** **B. Monitoring.** **Disclosure of Environmental Assessments and Monitoring Reports** ADB and JMRC will disclose on their respective websites the EIA Report. The quarterly monitoring reports will also be disclosed on the ADB website.	Being complied. EIA report has been disclosed on ADB and JMRC websites. Also 1st Semi Annual and subsequent Quarterly Environmental and Social Monitoring Reports are also disclosed on ADB and JMRC websites. www.jaipurmetrorail.in

SN	Details	Compliance Status
		This is the 5th quarterly report (January 2016 – March 2016) on environmental and social safeguards compliance.
16	**Section IX - Performance Monitoring, Evaluation, Reporting and Communication** **B. Monitoring** **55. Safeguards monitoring - Resettlement** If impact is identified during project implementation, a monitoring system will be established based on the ADB ***Safeguard Policy Statement (2009)*** and Government of India regulations.	Being complied. All resettlement and relocation issues will be settled on mutually agreed terms.
17	**Section IX - Performance Monitoring, Evaluation, Reporting and Communication** **B. Monitoring** **56. Indigenous People** If impact is identified during project implementation, a monitoring system will be established based on the ADB ***Safeguard Policy Statement (2009)*** and Government of India regulations.	No impact is identified.
18	**Section IX - Performance Monitoring, Evaluation, Reporting and Communication** **B. Monitoring** **58. Grievance Redress Mechanism** Grievances related to the implementation of the project, particularly regarding the land acquisition and R&R will be acknowledged, evaluated, and responded to the complainant with corrective actions. Any grievance regarding the land acquisition and R&R is received by OSD (Land), JMRC and is addressed through the decision of the "Negotiation Committee".	Being complied JMRC regularly conducts meetings with project affected people and maintains proper documentation to track their redressal. The details are at Table 12 in this report.

C. Compliance to the Civil Works Contract Agreement

11. The contractor is liable to comply with the safeguards clauses included in the contract agreement. Table 4 below provides an update on the status of safeguards compliance by the civil works contractor.

Table 4: Compliance to the safeguards Clauses of the Civil Work Contract

S.N.	Description	Compliance Status
1	**GCC Sub Clause 4.8** **Safety Procedures** The Contractor shall: a) comply with all applicable safety regulations, b) take care for safety of all persons entitled to be on the Site, c) use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons, d) provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause 10 [Employer's Taking Over], and e) Provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and the owners and occupiers of adjacent land.	Being complied. Contractor is taking adequate measures to comply with regulations on safety of workers.
2	**GCC Sub-Clause 6.7** **Health and Safety** The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to Issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.	Being complied. Contractor is taking adequate measures as per the provision of SHE, which is also a part of bidding document. HSO is also working as accident prevention officer.

S.N.	Description	Compliance Status
	The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.	Being complied.
	PCC Sub-Clause 4.8 and 6.7 **Safety Procedures and Health & Safety** "The Contractor shall throughout the execution of the Works including the carrying out of any testing, commissioning (including Integrated Testing and Commissioning), or remedying of any defects: (a) take full responsibility for the adequacy, stability, safety and security of the Works, Plant, Rolling Stock, Contractor's Equipment, Temporary Works, operations on Site and methods of manufacture, installation, construction and transportation; (b) have full regard for the safety of all persons on or in the vicinity of the Site (including without limitation persons to whom access to the Site has been allowed by the Contractor), comply with all relevant safety regulations, including provision of safety gear, and insofar as the Contractor is in occupation or otherwise is using areas of the Site, keep the Site and the Works (so far as the same are not completed and occupied by the Employer) in an orderly state appropriate to the avoidance of injury to all persons and shall keep the Employer indemnified against all injuries to such persons; (c) provide and maintain all lights, guards, fences and warning signs and watchmen when and where necessary or required by the Engineer or by laws or by any relevant authority for the protection of the Works and for the safety and convenience of the public and all persons on or in the vicinity of the Site; and (d) where any work would otherwise be carried out in darkness, ensure that all parts of the Site where work is being carried out are so lighted as to ensure the safety of all persons on or in the vicinity of	Being complied. Adequate health and safety measures are being implemented as per the provision of SHE, which is also a part of bidding document.

S.N.	Description	Compliance Status
	the Site and of such work. Contractor is required to take note of all the necessary provisions in Employer's Safety, Health and Environment Manual (SHE Manual) and the Contractor's price shall be inclusive of all the necessary costs to meet the prescribed safety standards. Precaution shall be taken by the Contractor to ensure the health and safety of his staff and labour. The Contractor shall, in collaboration with and to the requirements of the local health authorities, ensure that medical staff, first aid facilities, sick bay and ambulance service are available at the accommodation and on the Site at all times, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as per the Engineer's requirement and will ensure complete compliance with relevant clauses of Employer's Health, Safety and Environment Manual (SHE Manual). The Contractor's Site Safety Plan shall be developed from his Outline Safety Plan as per Employer's Requirements and SHE Manual of the Employer. The Contractor shall appoint a member of his staff at the Site to be responsible for maintaining the safety, and protection against accidents, of personnel on the Site. This person shall be qualified for his work and shall have the authority to issue instructions and take protective measures to prevent accidents.	
	Safety Precautions Within 8 weeks of the date of Notice to Proceed, the Contractor shall submit a detailed and comprehensive contract-specific Site Safety Plan based on the Employer's Safety, Health and Environmental Manual (SHE Manual). The Contractor is required to make himself aware of all the requirements of the Employer's Safety, Health and Environmental Manual in this regard and comply with them. The Site Safety Plan shall include detailed policies, procedures and	Being complied. Contractor has submitted site specific Safety plan and the same have been approved by CSC.

S.N.	Description	Compliance Status
	regulations which, when implemented, will ensure compliance with Sub-Clauses 4.8 and 6.7 of the General Conditions of Contract.	
	GCC Sub-Clause 4.18 **Protection of the Environment** The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations. The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values indicated in the Employer's Requirements, and shall not exceed the values prescribed by applicable laws.	Being complied.
	PCC Sub-Clause 4.18 **Protection of the Environment** The Contractor shall be responsible and liable for any stoppage, closure or suspension of the works due to any contravention of statutory requirements relating to the protection of the environment and shall indemnify and keep indemnified the Employer in this regard. The Contractor's Site Environmental Plan shall be developed from his Employer's Safety. Health and Environmental Manual (SHE Manual), as per the Employer's Requirements and Special Conditions of Contract. Nothing extra shall be payable to the Contractor on this account and his Bid price shall be inclusive of expenditure required to be incurred for working as per SHE Manual. Outline Environmental Plan means the environmental plan forming part of the Tender, setting out, in summary form, the Contractor's proposed means of complying with his obligations in relation to environmental quality. Site Environmental Plan means the site environmental plan including all supplements thereto, or any amended or varied version thereof, as submitted by the Contractor in accordance with Employer's Safety, Health and	Being complied.

S.N.	Description	Compliance Status
	Environmental Manual (SHE Manual), this Clause and which has received the Engineer's consent. The Site Environmental Plan shall include detailed policies, procedures and regulations which, when implemented, will ensure compliance with this Clause. The Contractor is required to make himself aware of all the requirements of the Employer's SHE Manual in this regard and comply with them. Within 8 weeks of the date of the Notice to Proceed, the Contractor shall submit a detailed and comprehensive Site Environmental Plan based on the Employer's Safety, Health and Environmental Manual (SHE Manual), and shall include such further material, which the Contractor considers necessary and relevant. Upon the Engineer notifying his consent to the Site Environmental Plan, or any supplemental part thereof, the Contractor shall adhere to the principles and procedures contained in such document save to the extent that the Engineer may give his consent to any amended or varied version thereof. The Contractor shall provide all necessary access, assistance and facilities to enable the Engineer and the Employer to monitor and conduct tests to verify that the Site Environmental Plan is being properly and fully implemented."	

III. COMPLIANCE TO THE ENVIRONMENTAL MANAGEMENT PLAN

12. Theenvironmental management plan (EMP) for the project was provided in Annexure 4 of the EIA report and also attached to the contract documents. As per EMP, five (05) environmental management activities were required to be implemented during the pre-construction stage (PC 1 – PC5);ten (10) activities are required to be implemented during the construction stage (C1.0 – C1.4, C.1.4.1 and C2 – C6); and three (03) activities are required to be implemented during the operation stage (O1 – O3). The following Table 5 lists out the status of activities during the pre-construction and construction stage as of March 2016.

Table 5: Status of Compliance to the EMP

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
		PRE-CONSTRUCTION STAGE			
PC1	Contractor Preparatory Works (Upon issuance of Notice to Proceed)	The Contractor will complete the following activities no later than 30 days upon issuance of Notice to Proceed			
		1) Submit appointment letter and resume of the Contractor's Health and Safety Officer (HSO) and environmental focal person to CSC.	Yes. Mr. Ramaraju has been appointed as Contractor's HSO and he is working full time on site. CV was submitted to CSC.		
		2) HSO will engage CSC-Environment Specialist to a meeting to discuss in detail the EMP, seek clarification and recommend corresponding revisions if necessary	Yes. EMP and SHE have been discussed with CSC-Environment Specialist.		
		3) HSO will request CSC-ES copy of monthly monitoring formats and establish deadlines for submission.	Yes. Formats and schedule of monthly monitoring reports has been finalized. Sample attached in **Appendix 3 & 4.**		
		4) HSO will submit for CSC-ES approval an action plan to secure all permits and approvals needed to be secured during construction stage which include but not limited to-	Yes.		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
		i). operation of crushers and hot mix plants,	Partial. No crushers and hot mix plant established by contractor. However the permit for the batching plant has not been secured yet.	Initial application for permit to establish batching plant was applied with State Pollution Control Board on 04.11.2015 **Appendix 6**.	Action plan for securing permits and approvals is still under preparation
		ii) transport and storage of hazardous materials (e.g. fuel, lubricants, explosives),	Yes		
		iii) waste disposal sites and disposal management plan,	No, under process	Application for securing consent for storing hazardous waste at site will be processed once approval for establishing batching plant is obtained.	
		iv) temporary storage locations,	Yes		
		v) water use, and	Permission has been obtained from state authority for extraction of ground water for drinking purpose at Chhoti Chaupar.	Application for extraction of ground water for construction purpose will be submitted to authority immediately.	Action plan for securing approvals to be submitted by contractor.
		vi) emission compliance of all vehicles. Arrangements to link with government health programs on hygiene, sanitation, and prevention of communicable diseases will also be included in the action plan.	Yes.		
		5) HSO will submit for approval of CSC-ES the construction camp layout before its	Yes, Construction camp has been		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
		establishment.	established as per approved layout plan.		
PC2	Coordinate with the Jaipur Development Authority on Traffic Management Plan to avoid nuisance from traffic congestion	The Contractors will discuss and coordinate the implementation of the traffic re-routing scheme particularly in Chhoti Chaupar and Badi Chaupar when it starts the cut and cover activities and the hauling and disposal of excavated materials to the Ambabari village. At the minimum, the traffic management plan will have the following components: construction traffic, ensuring access to properties, accommodating pedestrians, parking, access by construction vehicles, faulty traffic lights and problem interchanges, use of public roads, parking provision during construction, use of residential streets and traffic diversion due to temporary road closures, and construction and use of temporary access roads.	Yes, Proper traffic management plan is in place in coordination with government agencies.		
PC3	Community Liaison to avoid complaints and/or address complaints if any	To ensure that ongoing feedback is provided on the progress of the JMRP together with feedback on the environmental management performance of the project. Contractor will provide a minimum of two (2) weeks notification to directly affected residents, businesses and other relevant groups of the intended construction commencement date. In providing a mechanism for communication between the contractor and the community and informing the public of construction details (timing, expected impacts), the concessionaire will undertake consultation and information activities.	Yes		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
PC4	Ground staking to address chance find of artifacts	At least 30 days before the start of tunneling, the Contactor with supervision from the Archeology Department will employ a ground penetrating radar (GPR), detect the presence of buried artifacts along the tunnel alignment. The Contractor, in behalf of the JMRC, will coordinate with the Archeology Department to designate an on-site representative during the entire duration of the project.	Yes. GPR survey has already been submitted and has been uploaded on JMRC website. https://www.jaipurmetrorail.in/pdf/2015.04.16%20GPR%20Recieved%20from%20CEC.pdf JMRC is coordinating with Archeology Department for excavation work.		
PC5	Briefing on working near heritage resource to avoid damages to heritage resources and avoid cultural conflicts	All workers will undergo a briefing with the Archeology Department to ensure safeguarding of heritage resource and cultural/religious practices. A proof of compliance to this requirement to include the name of participants and date and location of briefing will form part of the monthly report to the CSC.	Yes. Briefing is being carried out by the Archaeological Consultant namely Mr. R.D. Singh, Dr. S.K. Sharma and Mr. P.K. Jain engaged by JMRC on regular basis.		
		CONSTRUCTION STAGE			
C1.0	Avoid damage to the following heritage resources during tunnel	No heritage resources are inadvertently damaged during construction.	Yes. No heritage resources are inadvertently damaged during construction.	Complying through instrumentation & online monitoring of structures of historic importance.	

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
	boring namely Chandpole Gate, IsarLat, Jantar Mantar, Hawa Mahal, Chhoti Chaupar, and Badi Chaupar.				
C1.1	To avoid ground settlement under the Chandpole Gate during tunnel boring	The contractor will ensure that no inadvertent damage is incurred to the Chandpole gate. Estimated settlement under the Chandpole gate is less than 5mm. The contractor will ensure that the design value is not exceed and the trigger value = 3.5mm and Allowable value = 4.2 meters are implemented. Tilt meters will be installed at key positions on the gate to ensure the 2/1000 design value is observed with trigger and allowable values of 1.4/1000 and 1.7/1000, respectively Crack meters will be installed at key positions to ensure design value of 3.0mm is not exceeded with 2.1mm trigger value and 2.5 mm allowable value The contractor will immediately cease all operation if any of the trigger values are breached. The CSC will advise the contractor mitigation measures and practices to control settlement, tilt, and cracks to include but not limited to structural reinforcement and operation parameters of the TBM.	Yes. Complied ➢ Under passing scheme prepared by M/s Omikron Kappa, of Greece, structural consultant of M/s CEC has been proof checked by M/s Ayesa of Spain. ➢ Structural consultant of Heritage consultant has also given his comments on the underpassing scheme of M/s CEC. ➢ Under passing scheme of Chandpole gate has also been		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
		The contractor will ensure that no structural damage is incurred and cosmetic damages are repaired under the supervision and control of the Jaipur Archeology Department.	proof checked by IIT Delhi. ➢ Work will be done as per approved method statement & GCC		
C1.2	To avoid cosmetic and structural damages to the structures along the underground metro alignment along Chandpole Bazar and Tripola Bazar due to vibration from the tunnel boring machine	Expected vibration at the Chandpole Gate during tunneling is 0.682 mm/s which is lower that internationally accepted 5mm/s. However, to be on the safe side and as practice in DMRC, the Contractor is to ensure that vibration levels at the Chandpole Gate foundation will not exceed 2.0 mm/s	Complied		
C1.3	To minimize surface noise from excavating equipment in Chhoti and Badi Chaupar and avoid disturbance to patients	The contractor will ensure that noise from construction activities does not result to exceedances of relevant limits prescribed in the Indian Ambient Air Quality Standards for Commercial Area and Silence Zone. Mitigation measures to be implemented by the Contractors are: 1) liaise with local residents on how to best minimize construction noise along the Chhoti and Badi Chaupars. 2) local residents and shop owners should be	Yes, Only newly manufactured equipment & regular servicing of equipment is being used in construction. Noise monitoring is		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
	in the Pink City Hospital near Chandpole, Chaudhary Hospital, Maharaja School at the corner of Chhoti Chaupar. To avoid damage and nuisance to Jantar Mantar, and Hawa Mahal.	informed of the nature and duration of intended activities prior to commencement and kept updated as to changes in the management and mitigation plan 3) equipment compounds will be located off-site 4) noise barriers will be installed at critical work areas particularly around the Chaupars 5) enclose especially noisy activities if above the noise limits 6) employ transportable noise screens between noise sources and identified noise sensitive areas for the duration of noisy construction activities 7) maximize the possibility of scheduling noisy activities at the same time to minimize the duration of exposure Noise from vehicles particularly for hauling of excavated materials to the dump site will be controlled through strict adherence to operating and maintenance instructions, routing of heavy vehicles way from noise sensitive areas whenever possible, conform with speed limits, and construction vehicles will only use routes specified in the traffic management plan.	being done and necessary mitigation measures are taken as required.		
C1.4	To ensure careful demolition and proper restoration of Chhoti and Badi Chaupars	The project calls for the demolition of the Chhoti and Badi Chaupar and its restoration to its original condition as a requirement from Jaipur Development Authority. The demolition and restoration will be under the supervision and control of these agencies.	Yes, ➢ JMRC through competitive bidding has engaged heritage consultant M/s Abha Narain		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
			Lambah Associates and M/s Shashank Mehendale & Associates (JV) to monitor the heritage structures lying along the metro route of Phase 1B. ➢ JMRC has also engaged 3 senior Archaeology Consultants to supervise the excavation of Chhoti Chaupar and Badi Chaupar. ➢ The work will be done as per approved method statement. Also the work will be done under the supervision of said agencies.		
C1.4.1	To address Chance heritage finds during the cut and fill	Please refer to FIDIC Sec. 4.24 Fossils. Recording (including chain of custody) will be made by the contractor to be validate by the CSC, and expert verification will be made by the Jaipur Archeology Department. Temporary	Yes During the excavation of Chhoti Chaupar,		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
	operations	work stoppage in the immediate area of the chance find for up to 72 hours to allow for the on-site representative of Archeology Department to visit the site to make an assessment and provide instructions. Work in the areas adjacent to the chance find will continue as provided in the detailed design.	Gomukhs were extracted & were handed over to Archeological & Museum Dept., Government of Rajasthan. Similar practice will be undertaken during Badi Chaupar		
C2	To avoid the following issues from spoil disposal activities: generation of sediment laden runoff from the work site during monsoon; Contamination of disposal sites from construction debris; Community hazard of uncollected and improperly	A spoil management plan will be implemented that details the location of spoil disposal sites, transporting soil, and disposing of soil. The Contractor will perform the following: 1) disposed spoils on permitted sites as instructed by the JMRC 2) ensure the adequacy of the disposal site to handle the volume of spoils the will be generated 3) Prepare, submit and seek approval from the CSC a spoil dump plan that provides the: i) dump size, layout, and form, ii) means of controlling water and wind erosion, iii) measures to prevent spoil dump contamination, vehicular, and public access. 4) Explore the possibility of using spoil materials to rehabilitate borrow pits to 5) All hauling vehicles should be maintained at an acceptable working order and serviced regularly 6) Haul vehicles should be routed away from noise sensitive areas 7) Speed limit in built up areas is 40 km/h 8) All haul vehicles should be covered or soil	Yes, Are being disposed in the approved area only. All other conditions are also being fulfilled.		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
	disposed materials.	sprayed with water before leaving the site specially during windy condition 9) Spoil dumps shall have slopes no steeper that 1V:2.5H 10) Final shaping, top soiling, and immediate revegetation 11) No vehicles are to be allowed to enter in revegetated spoils dump			
C3	To avoid depletion of groundwater and competition with existing groundwater users due groundwater Extraction for the construction works	The Contactor shall secure permission for groundwater extraction from CGWA pertinent groundwater authorities before establishing borewells. Water conservation and recycling will be observed in all aspects of constructions to include water main breaks, watering roads for dust control, spraying concrete, equipment cleaning and site clean-up.	Partial,	Application under preparation	
C4	To avoid nuisance from temporary damage or shifting in utilities particularly buried water pipes and electrical lines and disruption of essential services	The Contractor will ensure that the public will be minimally affected when constructing in close proximity to essential services through: 1) coordinate and secure necessary permits for utility shifting with the Jaipur Development Authority and other service utility agencies to locate al services prior to construction in any particular area 2) inform residents of planned interruptions through local media, fliers, and public address system 3) all planned interruptions schedules will be submitted to the safeguards cell JMRC no later than 10 working days before the interruption 4) all affected landowners, tenants,	Yes, Care is taken to avoid inconvenience to uses by shifting as per instruction of concerned authorities.		

SN	Activity	Mitigation measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance	Issues for further action and target dates
		institutions, and businesses to be notified in writing prior to commencement and kept updated in changes of schedule 5) in the event of unforeseen disruptions, the contractor will take all reasonable actions to have the service promptly restored 6) relevant utility agencies will be informed of the construction proximity to essential service line and be kept on standby in the event of unforeseen disruption All unplanned interruption will be immediately reported to the safeguards cell within 24 hour through an incident report.			
C5	To address occupational health and safety issues of the construction workers and local community	The contractor will comply with the occupational health and safety requirements as provided in SHE.	Yes		
C6	Implementation of Cleanup Operations and Restoration and Rehabilitation	Contractor shall prepare site restoration plans, which shall be subject for review and approval by the CSC, JMRC Safeguard Cell, Jaipur Development Authority and the Archeology Department to ensure consistency with zoning and town plans. The clean-up and restoration operations are to be implemented by the Contractor prior to demobilization. All spaces excavated and not occupied by the foundation or other permanent works shall be refilled with earth up to surface of surrounding ground.	Not yet due.		

IV. ACTIVITIES UNDERTAKEN FOR PROTECTION AND MONITORING OF HERITAGE STRUCTURES

A. Findings in Badi Chaupar and Chhoti Chaupar

13. Under Jaipur Metro Rail Project Phase 1B, an underground Metro line is under construction from Chandpole to Badi Chaupar. While Metro tunnel will be constructed using Tunnel Boring Machines, the two underground Metro Stations at Chhoti Chaupar and Badi Chaupar will be constructed by cut and cover method, requiring excavation from top to bottom.

14. To enable construction of underground stations at Chhoti Chaupar and Badi Chaupar, the dismantling of existing Chaupars and excavation underneath was necessary. In this regard, historical background of Chaupars was studied, both the Cahupars were well documented. The two layers of water tank at both the Chaupars with tunnels on all four cardinal direction were encountered. Under the guidance of heritage consultant M/s Abha Narain lambah Asscoiates and JMRC archaeology consultnats the excavation of the taks were taken up. Documention including detailed drawings, photography and vidoegraphy of the all the layers of old water tanks of Chaupars have been prepred. Gaumukhs of both the Chaupars have been handed over to Albert Museum for safe keeping.

15. Both the water tanks at Chhoti Chaupar and Badi Chaupar will be restored at their present site after constrution of underground stations. JMRC has ensured and approved designs, wherein the waters tanks have been incorporated over the station design.Designs have been approved by heritage consultant of JMRC.

B. D-Wall Construction

16. The D-walls (Diaphragm Walls) act as a structural member for the station box. Prior to the commencement of the D-walls, the utilities are diverted. The construction of D-walls is executed through grabbing machines after completion of the guide wall which act as the guide for the excavation. During the operations the grabbing machines removes the soil, the soil is stabilized using Polymud to avoid the collapse of soil. After reaching the desired level, the

grabbing operations are stopped and the reinforcement cage is lowered into the excavated area and concrete is poured through tremie.

17. To monitor the impact of the operations we have provided tilt meters, crack meter and settlement meters to measure the impact and report any abnormality in the reading. Aprat from the above, to protect the existing verandahs, we have done the propping and jacking and also in the shops identified as critical.

C. Chandpole Gate Tunnel Underpass Scheme/ Isarlat Side Pass Scheme

Chandpole Gate Tunnel Underpass Scheme

18. Chandpole Gate is coming right in the center of alignment, attracting maximum settlement, but original drawings relating to its foundation were not available. Therefore, the foundation of Chandpole Gate has been physically examined by a team of engineers, by making several trial pits around the gate.

19. For the determination of the structure's foundation, special survey was carried out by CEC and nine trial pits were executed in certain locations near the gate.

20. The foundation of Chandpole Gate has been found to be in a sound condition which can sustain the impact of tunnel-making underneath.

21. To assess the ground settlement due to tunneling by TBM & its effect on structural safety of Chandpole Gate, a detailed 3D analysis has been carried out by M/s Omikron Kappa – Indus Consultrans JV and a detailed report submitted.

22. As per this report, considering that Chandpole gate is in category "Slight" according to the pre-condition survey, "negligible" damage is expected for settlements <6.7mm and angular distortion <1/750. As already derived from the 3D analysis, the maximum calculated settlements and angular distortion are 5mm and 1/1200 respectively, values which are related with "negligible" damage even in the case of "High" vulnerable structures.

23. Considering all the above, a set of values were established for the displacement and deflection of the Chandpole Gate, as presented in the following table.

Measurement	Trigger Level	Alarm Level	Limit values
Settlements	4mm	5mm	6mm
Angular Distortion	1/1400	1/1200	1/1000

24. On the advice of Archaeology & Museums Department, the work of further examination/proof check of underpassing scheme of Chandpole Gate was assigned to Indian Institute of Technilogy (IIT) Delhi. After conducting the proof check of underpassing scheme of Chandpole Gate, IIT Delhi has reported that analysis and other details given in the report are in order. The scheme of Chandpole Gate underpassing by Tunnel Boring Machines is considered safe as it will have no impact on the stability of existing Chandpole Gate.

25. Archaeology & Museums Department, GoR, vide its letter dated 19.06.2015 has issued license under Rule 20 of the Rajasthan Monuments, Archaeological sites and Antiquities Rules, 1968 for construction of twin metro tunnels under Chandpole Gate. The license validity was extended time to time and finaly for 2 months i.e. up to 18.02.2016 by the Archaeology & Museums Department, GoR vide its letter dated 15.12.2015.

26. Now both TBMs have crossed underneath Chandpole Gate. The gate sustained no damage during the tunneling process.

Isarlat Side Pass Scheme

27. As per report of structural expert of Heritage Consultants, Abha Narain Lambah Associates & Shashank Mehendale& Associates (JV), physical condition of Isarlat is found to be generally sound and it is located at safe distance from the tunnel axis. There will be no adverse impact on the Isarlat during tunnel construction.

28. However, as advised by the structural expert of heritage consultants, a detailed study of Isarlat was taken up through Omikron Kappa, on the lines of the detailed study already carried out for Chandpole Gate. Proof check of the structure/report will be done by IIT Delhi.

29. JMRC will seek permission for conducting instrumentation monitoring from A&M Dept, GoR

D. Results of the Ground Penetrating Radar

D.1 Introduction

30. Ground penetrating radar survey is a non-destructive geophysical method that produces a continuous cross-sectional profile or record of subsurface features, without drilling, probing, or digging. Ground penetrating radar (GPR) profiles are used for evaluating the location and depth

of buried objects and to investigate the presence and continuity of natural subsurface conditions and features. It is a high-resolution geophysical method, which is based on the propagation of high frequency electromagnetic waves. The GPR method images structures in the ground that are related to changes in dielectric properties. In sediments, the water content primarily causes the changes in dielectric properties.

31. The equipment used for the scanning includes SIR-3000 (GPR) of Geophysical Survey Systems Inc. (GSSI), USA, 100 MHz paired antenna with other peripherals as shown in the Figure 2.

Figure 2: Equipments used for GPR survey

D.2 Methodology

32. GPR model SIR-3000 of GSSI, USA was used for the survey along with 100 MHz paired antenna (with fiber optic) for scanning down to depth of 22m or so as it was indicated that the average depth of the tunnel bottom would be around 16m or so. The use of 100 MHz pair antenna provides good resolution down to a depth of 22-25m but it does not provide good resolution in the upper layers where there could be a number of utilities. The resolution within first 5m or so becomes poor using 100 MHz pair antenna alone and therefore, nothing can be inferred down to a depth of 5m. It becomes imperative to use 400 MHz to detect utilities which are normally available within first 3-4m. The same was also demonstrated during the survey. A part of the entire stretch was also taken up for utility survey. The results of the same have also been provided towards the end of the report. As the objective of the work was to scan the subsurface for different litho units down to a depth between 15-22m, 100 MHZ paired antenna was used.

33. The methodology adopted for the study includes:

- Geophysical survey using Ground Penetration Radar (GPR) with 100 MHz paired antennae for subsurface scanning
- Processing and assimilation of GPR surveys using RADAN software of the scans collected using 100 MHz pair antennae

D.3 Study Area

34. In order to prioritize the scanning work, the entire stretch between Chandpole & Badi Chaupar has been sub-divided into following sectors:

Sector-1: Along the tunnel alignment for the stretch between Chandpole Metro station to Chhoti Chaupar.
Sector-2: Chhoti Chaupar Metro station.
Sector-3: Along the tunnel alignment for the stretch between Chhoti Chaupar to Badi Chaupar.

D.4 Conclusion

35. Survey using Ground Penetration Radar with 100 MHz paired antenna has provided scanning down to a depth of 22m.

36. The interpretation of all these scans shows that two distinct layers exits upto the scanned depth for the entire stretch between Chandpole and Badi Chaupar. This is depicted in the scans provided at Figure 10 to 27 of the report. The 3-dimensional model (surface and block) provides variation in terms of depth for the two layers. The drill hole core too in the area indicates presence of two layers of silty sand/sandy silt as defined by grain size analysis of the soil as per geotechnical report. A small portion in the entire stretch indicates more reflective zone which could be on account of anomalous material such as presence of metallic substance, high moisture content or an object.

37. A part of the entire stretch was also taken up for utility survey. This indicates the importance of GPR survey for locating utilities before excavating the area. This helps in planning the excavation work without damaging the existing utilities.

38. The summary report of the GPR done for the project is available online at JMRC webportal.

V. SUMMARY OF ENVIRONMENTAL MONITORING

A. Summary of Inspection Activities

39. A total of 08 SHE Walk inspections were conducted by the CSC-ES during the reporting period. Further details on the inspections carried out and key findings are provided in Table 6.

Table 6: Field Inspections carried out during reporting period

Date of Inspection	Location	Participants	Key Findings
22.01.2016	Chandpole	07	Safety & Environment
29.01.2016	Chandpole	16	Safety & Environment
12.02.2016	Badi Chauper	16	Safety & Environment
26.02.2016	Casting Yard	15	Safety & Environment
11.03.2016	Choti Chauper	14	Safety & Environment
18.03.2016	Chandpole	13	Safety & Environment

Note: Sample copy of SHE Walk attached with Appendix.

B. Monitoring of Cracks, Settlements of Structures

40. The entire area where the stations as well as the tunnels underpasses fall under heritage structures. In order to observe the conditions and behaviors of the structures during the operations, monitoring is being done through instrumentations.

41. **Location and Quantity of Instrument which is installed:** Chandpole area we have installed Inclinometer in the D-Wall of Shaft area.In Chhoti Chaupar station area we have installed some building instruments and their quantity is mentioned below.

SN	Instrument Name	Location	Total Quantity
1	Inclinometer	Chandpole Shaft Area	3
2	Tilt Meter	Chhoti Chaupar	35
3	Crack Meter	Chhoti Chaupar	58
4	Optical Target	Chhoti Chaupar	70
4	Building Settlement Point	Chhoti Chaupar	48
5	Pavement Settlement Point	Chhoti Chaupar	12

42. **Monitoring Frequency at Station, C&C and Launching Shaft**

SN	Instrument	Frequency
1	Inclinometer	Once daily during excavation then once weekly
2	Soil Settlement Marker	Once daily during excavation then once weekly
3	Pavement Settlement Marker	Once daily during excavation then once weekly
4	Crack Meter	Once daily during excavation then once weekly
5	Tilt Meter	Once daily during excavation then once weekly

Note: Monitoring frequency may be changed depending upon whether any deformation is observed.

43. **InclinometerModel AIM-741 or equivalent:** The purpose of inclinometer monitoring is to observe and monitor any lateral movements within structures or strata and analysis whether remedial works are required to subdue any such movements.

44. **Tilt meter-Model AIM-5410 or equivalent:**Portable tilt meters are mainly used to monitor buildings, structures, utilities, etc. As well as the inclination and rotation of retaining walls, dams, piers, piles, etc. It may also be used to evaluate the performance of bridges, struts and the stability of structures in land slide areas.

45. The EAN-70 portable tilt meter system consists of three components: tilt plate, tilt meter, and readout unit.

46. **Crack meter- Model AIM-100SC or equivalent:**The crack meter is suitable for measuring structured cracks ranging from 0.5 to 100 mm with a hairline cursory markin two directions i.e. vertical and horizontal.The advantages of this instrument are: reliable and accurate, simple to install, simple to operation and low cost. This is very simple and accurate instrument to monitor the hair crack. The mechanical crack meter is made of polycarbonate transparent sheet with graduated marks. The both sheets will be assembled on crack with the help of fasteners.

47. **Bi- Reflex Target:**

48. The bi-reflex target is one of the surveying equipment to measure deformations and settlements of the structures surrounding the construction site. It is rugged prcise and low cost with an accurancy of +/- 0.1mm.

1. Vibration Monitoring:

49. **Need for Vibration Monitoring:** The construction of underground rail and road infrastructures in metropolitan and cosmopolitan cities are mostly through developed area under challenging soil conditions. The alignment of structure is passing through densely inhabited areas with many heritage structures falling in the zone of influence of construction activities.

50. Construction vibration sources generate elastic waves in soil and have a wide range of energy, displacement, velocity and acceleration transmitted on the ground. These may be harmful to adjacent and remote structures, sensitive instruments and people. Their effects range from serious disturbance of working conditions for sensitive devices and people, to visible structural damage.

51. It is important to assess the dynamic effect before the beginning of construction activities and at the time of construction. Therefore monitoring of construction vibrations have to be started prior to the beginning of construction works at a site and be continued during construction to provide the safety and serviceability of sound and vulnerable structures.

52. It is required to carry out base line monitoring to determine the Pear Particle Velocity and their respective frequency band that are persisting even before carrying out any construction activities. The recorded values shall form the base line and shall be compared to the corresponding values recorded during construction activities and the influence of construction may be determined accordingly.

2. Methodology:

53. **About the Equipment:**The equipment used for monitoring ground vibrations should be able to evaluate the parameters of vibrations in all three planes i.e. Longitudinal, Transverse and Vertical. Kelunji Echo, Seismic Recorder is used for the present monitoring requirement. This equipment can be universally used for many seismic monitoring applications, including earthquake monitoring (permanent or portable installations), structural monitoring, as well as blast and other vibration monitoring.

54. The equipment consists of Geophones and Kelunji Echo Seismic Recorder which is able to monitor the effect of vibration on all three planes. It is equipped with three geophones, capable of picking up signals in all the three planes described above. It is able to perform full field analysis of the event to evaluate the peak pulse velocity, peak frequency, peak acceleration and peak displacement.

55. The Echo is simple to use, easy to install and maintain, and light and robust enough to enable use of single equipment for monitoring different locations of the same structure or different structures. Ethernet based communications such as VSAT, ADSL, and some radios allows easy configuration of networks for data telemetry. GSM, GPRS, CDMA & PSTN are also supported.

56. The core Echo, by using it a built-in GPS timing system, can act as a Network Time Server for synchronizing other NTPv4 enabled timing-critical equipment. From this core base, the Echo can be expanded with an internal tri-axial accelerometer, external 3-channel sensor interface, internal PSTN modem, LCD panel, Compact Flash memory, or any combination of these optional modules. Every Echo comes supplied with eqWave software for waveform analysis and manipulation. EqWave runs on most computing platforms that run a Java Virtual Machine, including Windows, Unix, Linux and MacOS X. Echo seismic data is recorded in PC-SUDS file format, stored in a standard file system. A logical hierarchy is implemented for simple copying to PC using a CF-USB reader or via FTP. In telemeter applications, ES &S produces a range of software to compliment the Echo. Collectively known as eqSuite, the programs automatically process Echo data for on-screen display and archiving, raises event alerts, and prepares data for interactive refinement.

Table 7: Vibration Monitoring

Station/ Tunnel	Location (Shop/House No.)	Land Mark	Structure Id (BCS)	Category
Chhoti Chaupar	Shop No. 189	In front Corner Column	CP-CC-UP-0071	Very Severe
CP to CC Tunnel	Up Line Wall Design No. 31 Left Wall while entering the wall 30 cm. In & 40 cm. from Corner (near CP-0016)	Chandpole Wall UP	CP-0016	Very Severe
CP to CC Tunnel	Up Line Small Gate near Noor Bhai Pahalwan Shop aprox 3.5 mtr before & 30 cm. in From Small Gate.	Chandpole Gate	CP-CC-DN-0154	Severe
Chhoti Chaupar	Up Line Verandah of Shop No.379 Left Col. From Shop Just before 25 CM. From Left Col. Direction L-R for distance. (RHS Col. Of Shop No. 380).	In front Corner Column	CC-BC-DN-0001	Very Severe

Photograph of the location where Vibration Monitoring Reading has been taken.

C. Noise Monitoring

57. Noise level survey was conducted by 3rd party M/s. EKO PRO Engineering pvt.Ltdat all project sites for Day & Night shifts viz Bhankrota, Chandpole launching shaft Area, Pink City Hospital, Chhoti Chaupar, Maharaja school, Chaudhry Hospital, Krishna temple, Hawa Mahal, and Jantar Mantar for Day & Night shifts.

58. It has been observed from the results that no major noise level exceedance was recorded at any site except at Hawa Mahal for day time. Results are summarised in Table 8 and 9 and graphical representation of results are also given below. Complete monitoring reports are provided in Appnedix 4.

Table 8: Noise Monitoring Results (Day time)

Date	Leq Day dB(A)							
	Location							
	Casting Yard	Chand pole	Maharaja School	Chaudhri hospital	Pinkcity Hospital	Krishna Temple	Jantar Mantar	Hawa Mahal
21.01.2016 to 25.03.2016	67.7	67.0	69.1	64.7	66.1	70.5	74.9	76.4
18.02.2016 to 20.02.2016	66.2	68.2	70.1	62.8	64.8	71.5	75.0	77.8
15.03.2016 to 20.03.2016	63.7	72.1	71.7	64.3	66.3	69.0	74.1	75.8

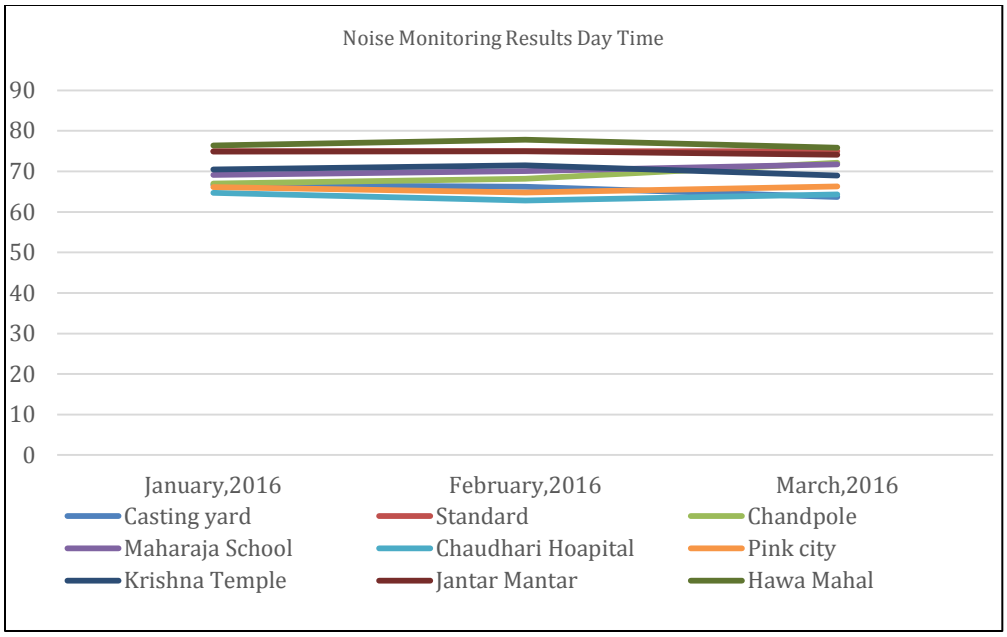
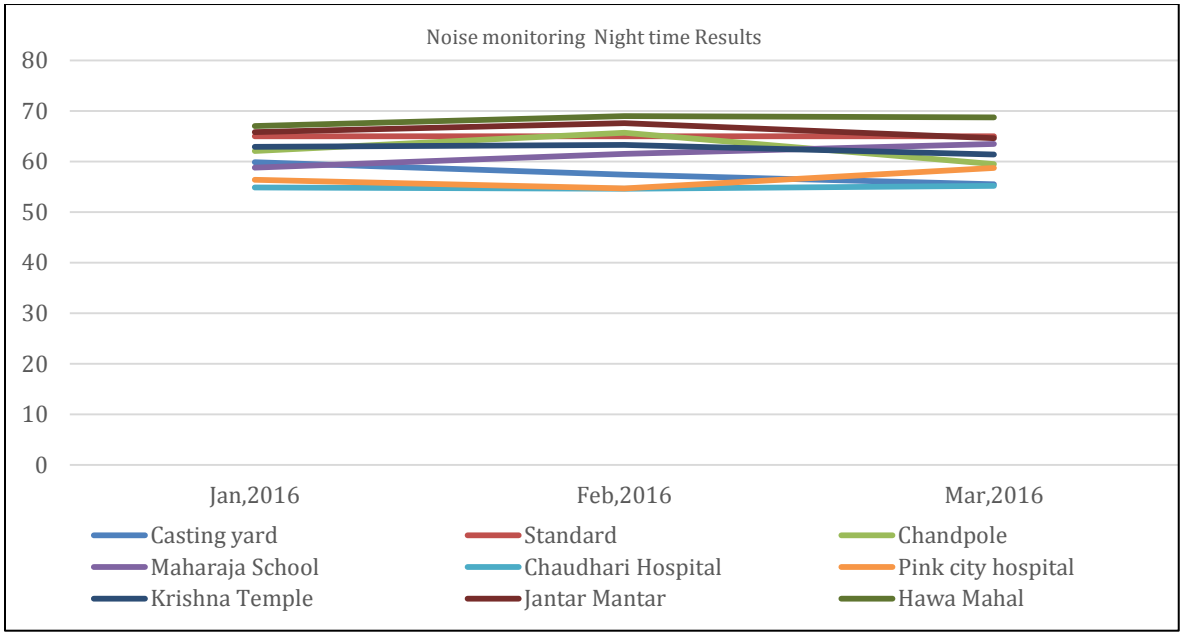


Table 9: Noise Monitoring Results (Night time)

Date	Leq Night dB(A)							
	Location							
	Casting Yard	Chand pole	Maharaja School	Chaudhri hospital	Pinkcity Hospital	Krishna Temple	Jantar Mantar	Hawa Mahal
21.01.2016 to 25.01.2016	59.9	62.1	58.8	54.9	56.4	62.9	65.8	67.0
18.02.2016 to 20.02.2016	57.4	65.7	61.5	54.6	54.7	63.3	67.6	69.0
15.03.2016 to 20.03.2016	55.5	59.5	63.5	55.2	58.7	61.4	64.6	68.7



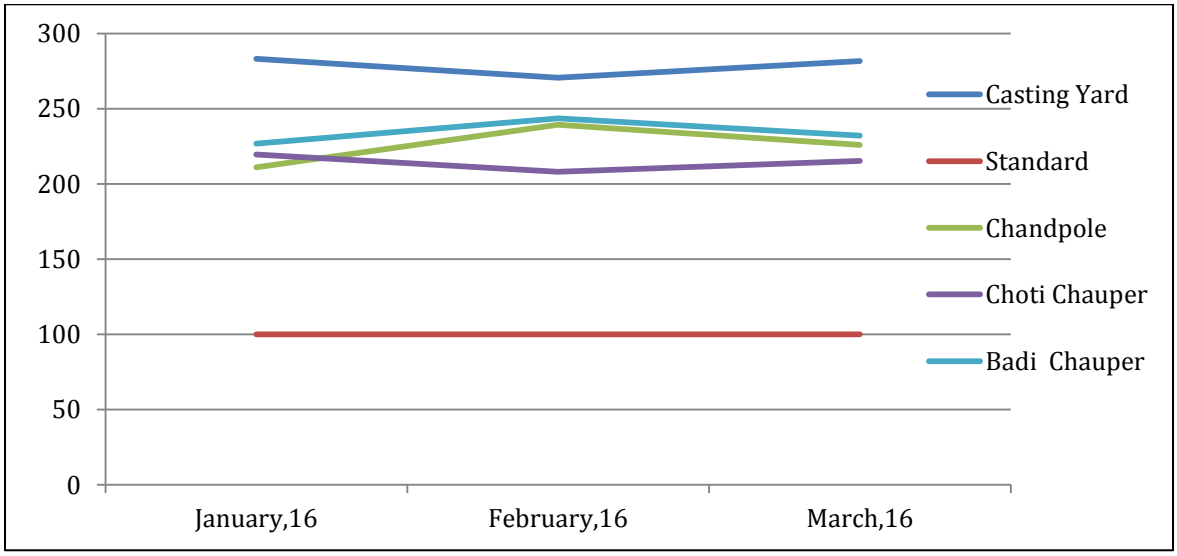
D. Air Quality

The ambient status of five major air pollutants viz. Total Suspended Particulate Matter (TSPM); PM_{10}, Sulphur Dioxide (SO2), Oxides of Nitrogen (NOx) and Carbon Monoxide (CO) representing the quality of pollution level have been assessed by monitoring air quality at four locations viz. Casting Yard,Chandpole launching shaft, Chhoti Chaupar & Badi Chaupar..The air quality monitoring results indicate that PM_{10} concentration exceeds the limits specified by CPCB for all sites. However the concentration of PM_{10} was above baseline concentration value of 180 $\mu g/m^3$ (2012 monitoring) for all three months.

Air monitoring was carried out from January 2016 to March,2016. Testresults are summarised in Table 10. Complete monitoring reports are given in **Appendix 4**.

Table-10: Air Quality Monitoring Results

Date	PM $_{10\ (Unit\ \mu g/m^3)}$			
	Location			
	Casting Yard	Chandpole	ChhotiChaupar	BadiChaupar
21.01.2016 to 23.01.2016	283.1	210.9	219.5	226.7
18.02.2016 to 20.02.2016	270.5	239.2	208.1	243.6
15.03.2016 to 17.03.2016	281.6	225.8	215.3	232.1



59. **Air Pollution Control:** The mitigation measures, which have adopted to reduce the air pollution are: all transportation of construction materials should be covered manner. To minimize dust emission due to handling of aggregate and cement at site, there are two time sprinkling of water on the internal roads. Vehicle speed restriction of 5-10 km/hrs have been followed at site, tyre washing facility have been provided for cleaning of vehicles/tyresat Chandpole exit gate.

E. Water Quality

60. Water samples were collected from nearby bore wells during February,2016to check the quality of the water. Quarterly water analysis results are compared with IS 10500:2012 and found within permissible limited. Results are summarised in Table 11 and monitoring reports are provided in **Appendix 4**.

Table 11: Water Quality Monitoring Results

Sr. No	Parameters	Units	Results	
Sample Identification			Casting Yard	Chandpole
1.	pH(at 25 ºC)	-	7.58	7.52
2.	Turbidity	NTU	< 1.0	< 1.0
3.	Conductivity	µs/cm	114.8	184.6
4.	Total Dissolved Solids	mg/L	74.0	120.0
5.	Total Suspended Solids	mg/L	<5.0	<5.0
6.	Oil and Grease	mg/L	ND	ND
7.	Dissolve Oxygen	mg/L	5.9	6.1
8.	E.coli	Per 100 ml	Absent	Absent

VI. SOCIAL AND RESETTLEMENT IMPACTS

A. Impacts on Structures

A.1 Shifting of Temples

61. When the work of Phase 1B started it was found that6 temples fell within the station box area of ChhotiChaupar and BadiChaupar where digging is necessary for construction of stations, required immediate relocation.Three of these templeswere at ChhotiChaupar& another three at BadiChaupar, as under:

1. Hanuman Mandir (Chhoti Chaupar)
2. Shiv Mandir (Chhoti Chaupar)
3. Rojgareshwar Mandir (Chhoti Chaupar)
4. Shiv Mandir (Badi Chaupar)
5. Ganesh Mandir (Badi Chaupar)
6. Hanuman Mandir (Badi Chaupar)

62. As per the decision taken by High Power Committee chaired by Chief Secretary GoR, an office order was issuedon 16.10.2014, that GAD land at Tripolia Bazar i.e. TanwarJikaNauhra (around 200 mt fromChhotiChaupar) which has two courtyards admeasuring 542 sqmt and 645 sqmt respectively be handed over to Jaipur Metro Rail Corporation for relocation of 6 temples and development of Two Wheeler Parking, respectively.

63. The possession of the land was taken over by JMRC from Public Works Department on 17.11.2014.

Figure a: Location of TanwarJiKaNauhra (Land identified for temple relocation)

64. As the planning and designing of station at Chhoti Chaupar and Badi Chaupar progressed, 7 additional temples were identified which etiher infringed the entry exit strcuture or came in mid of the traffic diversion scheme. The detail of the additional temples is as below:

1. Barah ling Mahadev (Chhoti Chaupar)
2. Rameshwar Mahadev (Chhoti Chaupar)
3. Bajrangbali Mandir (Chhoti Chaupar)
4. Peepleshwar Mahadev (Badi Chaupar)
5. Mahadev Ji/Mataji/Hanuman Mandir (Badi Chaupar)
6. Mahadev Mandir (Badi Chaupar)
7. Mahadev/Hanuman Mandir (Badi Chaupar)

65. Proper documentation and measurement were taken and recorded for all the temples.

66. Necessary measures have been taken for relocation of identified temples and 6 Temples of Chhoti Chaupar have already been relocated at Old Atish market.

67. On 11.05.2015/12.05.2015, six temples of Chhoti Chaupar were shifted to Old Atish Market and Murti Sthapna was done along with proper ritual ceremony.

68. As per earlier directions, following was the status of the matter related to shifting of 7 temples at Badi Chaupar is as below:

Temple No.	Temple Name	Owner Name	Existing Area (sqmt)	Proposed Shifting to	Area Allocated at new site
1	Shiv Mandir, Sh Gaurishankarji, On Median towards Chhoti Chaupar	Sh. Jeetendra Vyas	2.747	Tanwar Ji Ka Nauhra	6.25 sqmt (2.5 x 2.5 mt)
2	Dhruv Mukhi Mahaveer Hanuman Mandir, NW Khanda	Sh. Abhishek Sharma	3.781	Ramnagari yaYojana	45 sqmt (Plot No. A363)
3	Ganesh ji Shivalay Mandir, SE Khanda	Sh. Vishnu Kr Sharma	3.132	Rajarampu raAwasiya Yojana	45 sqmt (Plot No. 229)
4	Peepleshwar Mahadev, Hanumanji, Ganesh mandir- SW Khanda	Sh. Rajnarayan Vyas	8.02	Tanwar Ji Ka Nauhra	8.00 sqmt (3.2 x 2.5 mt)
5	Mahdev ji, Mataji, Hanuman Mandir- SE Khanda	Sh. Purushotam Bharti	39.97	Tanwar Ji Ka Nauhra	40.0 sqmt(6.325 x 6.325 mt)
6	Mahadev Mandir, Outside Police thana- NE Khanda (Shri Jamneshwar Mahadev Trust)	Sh. Dinesh Vyas	5.096	Ramnagari yaYojana	Combined Plot (Plot A434) 90 sqmt
7	Mahadev / Hanuman Mandir, Outside Police thana- NE Khanda (Shri Amneshwar Mahadev Trust)		4.899	Ramnagari yaYojana	

Ongoing construction work at Tanwarji Ka Nauhra (Badi Chaupar Temple Shifting)

69. All matters related to compensation and relocation of temples at Chhoti & Badi Chaupar are beingdealt with at the level of Collector, Jaipur.

70. Government is continuously in touch with the stakeholders and is in process of ensuring that sentiments of people at large are not hurt. Rozgareshwar Temple at Choti Chaupar will be relocated back to its original position after completetion of Station work at Choti Chaupar.

71. Lately the government is in discussion with all the representatives of temples of Badi Chaupar and will be shifting one of the temple Gauri Shankar Mahadev to the plot behind Manak Chowk Thana. The discussion are in progress for final decision.

B. Land Acquisition and Resettlement

72. For the purpose of easing the traffic diversion near Sanjay Circle, Chandpole, JMRC has processed for acquisition of 3 shops located at Sansar Chand Road. Details are given below:

SN	Shop Detail	Name of Shop Owner	Name of Shopkeeper	Area (sq.m)
1	Shekhawat Rajput Dhaba (Part of Shop No. 12)	Mohd. Salim, S/o Yaseen Khan	Mukut Bihari, Satynarayan, S/o Banshilal Mehra	7.49
2	Bharat Cold Drink (Part of Shop No. 12)			3.90
3	Shiv Pan Bhandar (Part of Shop No. 12)		Bihari Lal S/o Nandlal Saini	1.30
4	DCB ATM	Smt. Mamta Kanwar W/o Sohan Singh Shekhawat	DCB Bank	5.46

73. Considering the time required for land acquisition process per new Land Acquisition Act of GOI, it was agreed and decided by JMRC (in consultation and discussion with shop owners)to resettle the shop owners on the other side of the road near Chandpole station (Near Church land). Besides resettling shops, JMRC also agreed to provide assistance during relocation process including any loss of income during the relocation process. Shop owners also agreed that new shops will be rented to same shopkeepers who are currently running these shops.

74. The shopowners have given their consent to the proposal.JMRC is in the process of getting written consents from shopowners and shifting will be done in consutations with shop owners before start of work near these shops.

75. The site selected for relocation of these shops is getting prepared and construction is ongoing. Very soon the shop owners will be given possession of the newly constrcuted shops.

VII. PUBLIC CONSULTATIONS AND ADDRESSING OF GRIEVANCES

A. Public Consultations carried out

76. Consultations are being held regularly with the local people in the project area including relevant government agencies, the business associations in the project are such as the Chandpole Bazaar Vyapar Mandal and Tripolia Bazaar Vyapar Mandal.

77. JMRC has taken all possible measures to ensure that following concerns are regularly addressed:

a) Heritage character of Jaipur
b) Traffic diversion during construction
c) Inclusion of all key stakeholders

78. During the period of this report (January2016–March 2016) following consultations were held:

Table 12: Consultations held during the reporting period

Date	Venue	Participants	Detail of discussion held	Action Taken
18.01.2016	Ramganj	Ramganj Vyapar Mandal	Discussion with business community over traffic Diversion at Badi Chaupar	Shopkeepers were informed about progress of the work and discussion was held over proposed Traffic Blockade on Ramganj side.
09.02.2016	Mayor Office	Mayor and other public representatives from walled city area	Discussion over traffic diversion on Tripolia and Ramganj Side	The grievances of local citizens were heard and relevant and possible changes to the Traffic Diversion plan were proposed.
20.02.2016	Govt. School,	Head Master, Govt. School	Matter related to safety of Children of the school from	Discussion was made over to ensure safety and

Date	Venue	Participants	Detail of discussion held	Action Taken
	Hawa Mahal		where Traffic Diversion was proposed.	provision of facilities for children and school staff, Directions were goven to Traffic Police to marshal the area for safe passage to school children and general public
24.02.2016	JMRC Office	Representatives of Jaipur Vyapar Mahasangh of wall city	To discuss the progress of Metro work, tunneling and traffic diversion	Representatives and office bearers of Vyapar Mahasangh were apprised of the ongoing work and were requested to cooperate, also the inputs from Vyapar sangh were taken and worked upon.

B. Complaints and Requests Received

79. During the period of reporting (January 2016 to March 2016) no written grievances and requests application was received from the local people in the project area.

VIII. UNANTICIPATED SAFEGUARD ISSUES

80. During the reporting period from January 2016 to March 2016, no such anticipated safeguard issues were come across.

IX. CONCLUSION

A. Summarize the overall Progress of Implementation of safeguard Measures[4]

81. The implementation of environmental management measures in this project face some difficulties but it can be concluded that the overall progress of implementing environmental and social safeguard measures show a highly satisfactory level. Table 13shows a comparative scenario of implementing environmental management measures for each package.

Table 13: Overall Progress

Site Safety	Workers Safety	Protection of Environment	Protection of Heritage structures	Statutory Approvals	Filling of Checklists	Overall Rank
1	1	1	2	2	1	2

[4]Overall sector environmental management progress could be described in qualitative terms or be evaluated based on a ranking system, such as the following:

1. Very Good
2. Good
3. Fair
4. Poor
5. Very Poor

Additional explanatory comments should be provided as necessary.

B. Problems Identified and Actions Recommended

82. During the previous reporting period (October 2015-December 2015) some of the issues were identified such as follow-up with regulatory / government agencies to get pending approvals/permits, full time environmental specialist by the CSC, proper documentations and record keeping, and information disclosure. However, these issues are still pending.

83. Table 14 present the actions that areproposed in the previous monitoring report and actionstaken to address these problems:

Table 14: Status of Actions suggested in previous Monitoring Report

Action Recommended	Measures Taken	Remarks
Follow-up with regulatory / government agencies to get pending approvals/permits.	Conducted several rounds of meeting with both State Pollution Control Board and Central Ground Water Authority regarding consent to establish batching plant and extraction of ground water for construction use respectively. Revised applications have been submitted in the first week of November 2015.	Expedite process to get pending clearance on priority basis.
PMC's environmental specialist to provide technical support and guidance to the contractor and JMRC on full time basis	DMRC has deputed junior expert to the site to provide technical support to contractor and JMRC.	Full time environmental specialist is required at site. JMRC to take action on priority.
Appoint a consultant for community mobilization and more effecting community liaison particularly with regard to heritage issues, safety issues, utility shifting and anticipated temporary suspension of services. He will also facilitate Consultation with concerned stakeholders to clearly explain particularly to people who do not have access to the internet, the precautionary measures being taken to protect the heritage structures and to retrieve the lost layers of history.	A JV of M/s Abha Narain Lambah Associates and M/s Shashank Mehendale & Associates has been engaged as Heritage Consultant through ICB. JMRC has also engaged 3 senior Archaeological Consultants to supervise the excavation of Chhoti Chaupar and Badi Chaupar. These consultants together with JMRC are responsible for maintaining regular communications with communities and stakeholders.	Continuous follow up required.
Improvements in maintenance of records and reporting of interactions and communication with the stakeholders.	Records of the stakeholder and community interactions are being maintained at Contractor, DMRC and JMRC end.	

84. Finally, according to the field observations and investigations it was able to identify that the most of the environmental requirements are being complied with regulations. Actions such as regular follow up with regulatory agencies to get pending permits; mobilization of full time environmental staff from supervision consultant side, and contineous coordination with shopkeepers and tample authorities to relocate the temples and shopsrequire immediate followup.

Appendix 1: Photolog of Progress

View of tunnel towards Badi Chauper and Chandpole

View of TBM-2

View of TBM-1

Monthly SHE Committee meeting

Casting Yard

French Collum Excavation at Chhoti Chaupar

Soil Excavation for Top slab at Chhoti Chaupar

National Safety Day Inauguration

National Safety Day Inauguration

Medical Camp on site

96-HoursTraining on Site

Awarding BEST ENVIRONMENTALPRACTICES to Mr. Yogesh Sarangal& Team.

Awarding BEST WORKER to Mr. Durga Manji

Mr. Devender Gill Explaining the usage of Fire Extinguisher

Mosquito control on Site

Appendix 2: Record of SHE Trainings

1. Details of SHE training conducted in the month of January 2016 to March, 2016

Month of January Training

SN	DATE	LOCATION	TOPIC	No. of person	REMARKS
1	03/1/2016	Casting yard	Physical Training	57	
2	05/1/201 6	Casting yard	Hot work	13	
3	06/1/201 6	Casting yard	Work at height in noise area	12	
4	7/1/201 6	Casting yard	Lifting & rigging	08	
5	12/1/201 6	Casting yard	Safe klerlary procedure	15	
6	17/1/2016	Casting yard	Defensive driving training	35	
7	02/1/2016	Chandpole	Emergency Tunnel Safety	19	
8	05/1/2016	Chandpole	Emergency Preparedness in Tunnel Work	20	
9	05/1/2016	Chandpole	Precaution while working in Confined Space	41	
10	05/1/2016	Chandpole	Fire Drill	17	
11	07/1/2016	Chandpole	Emergency Tunnel Safety	20	
12	12/01/2016	Chandpole	Occupational Disease	20	
13	12/01/2016	Chandpole	Precautions while Ring Building	19	
14	15/01/2016	Chandpole	Behaviour Based Safety	40	
15	16/01/2016	Chandpole	Emergency Tunnel Safety	28	
16	19/01/2016	Chandpole	Emergency Preparedness	60	
17	23/01/2016	Chandpole	Defensive Driving	07	
18	28/01/2016	Chandpole	Emergency Tunnel Safety	27	
19	29/01/2016	Chandpole	Confined Space	40	
20	30/01/2016	Chandpole	Confined Space	44	
21	04.1.2016	Chhoti Chaupar	Manual Handling	15	
22	08.1.2016	Chhoti Chaupar	Safe use of power & hand tools	18	
23	13.1.2016	Chhoti Chaupar	Grabbing safety	9	
24	20.1.2016	Chhoti Chaupar	Safe use of electrical equipment	28	
25	27.1.2016	Chhoti Chaupar	Scaffolding	12	
26	30.1.2016	Chhoti Chaupar	Electrical safety	28	
27	07/1/2016	Badi Chaupar	Lifting & rigging operation	14	
28	11/1/2016	Badi Chaupar	Hot work	15	
29	19/1/2016	Badi Chaupar	Fire fighting	12	
30	26/1/2016	Badi Chaupar	Environmental awareness (Hazardous waste)	18	

Month of February Training

SN	DATE	LOCATION	TOPIC	No. of person	REMARKS
1.	05/02/2016	Casting yard	Electrical safety	08	
2.	06/02/201 6	Casting yard	Safe machinery operation	15	
3.	11/02/201 6	Casting yard	Emergency management system & environmental management system	14	
4.	16/02/201 6	Casting yard	Welding cutting & binding work	20	
5.	23/02/201 6	Casting yard	Rigging & lifting	13	
6.	03/02/2016	Chandpole	CPR Training	28	
7.	10/02/2016	Chandpole	Power tool and Hand tools	50	
8.	14/02/2016	Chandpole	Lifting procedure	49	
9.	14/02/2016	Chandpole	Rigging safety	09	
10.	18/02/2016	Chandpole	Crane safety	24	
11.	18/02/2016	Chandpole	Loco Movement	38	
12.	18/02/2016	Chandpole	Confined Space	20	
13.	22/02/2016	Chandpole	Hazards identification & risk assessment	80	
14.	23/02/2016	Chandpole	Confined Space	40	
15.	23/02/2016	Chandpole	Welding &Gas Cutting	08	
16.	23/02/2016	Chandpole	Permit to work system	40	
17.	25/02/2016	Chandpole	Waste management	40	
18.	25/02/2016	Chandpole	HSE Plan	08	
19.	27/02/2016	Chandpole	Electrical safety	14	
20.	02.02.2016	Chhoti Chaupar	How to wear full body harness	20	
21.	10.02.2016	Chhoti Chaupar	Manual handling	20	
22.	17.02.2016	Chhoti Chaupar	Lifting operation	16	
23.	18.02.2016	Chhoti Chaupar	Safe use of Power and hand tools	15	
24.	20.02.2016	Chhoti Chaupar	Permit system	06	
25.	26.02.2016	Chhoti Chaupar	SHE emergency preparedness response.	14	
26.	26.02.2016	Chhoti Chaupar	Welding, Cutting& binding work.	21	
27.	04/02/2016	Badi Chaupar	Scaffolding at side	1	
28.	06/02/2016	Badi Chaupar	Correct wearing methods of PPE’s	20	
29.	09/02/2016	Badi Chaupar	Lifting	08	
30.	20/02/2016	Badi Chaupar	Hot work	07	
31.	20/02/2016	Badi Chaupar	Heavy lifting operation	09	
32.	25/02/2016	Badi Chaupar	Welding ,cutting& bar bending	20	

Month of March Training

SN	DATE	LOCATION	TOPIC	No. of person	REMARKS
1.	02/03/2016	Casting yard	SAFE WELDING WORK	12	
2.	04/03/2016	Casting yard	welding & gas cutting operations hazards & precautions	8	
3.	09/03/2016	Casting yard	electrical safety	8	
4.	12/03/2016	Casting yard	defensive driving training	15	
5.	14/03/2016	Casting yard	permit to work system	9	
6.	16/03/2016	Casting yard	safe working with machineries	6	
7.	19/03/2016	Casting yard	safe working practices during bending & cutting of steel work	14	
8.	22/03/2016	Casting yard	safe working procedures in doing concrete works	16	
9.	22/03/2016	Casting yard	lifting operations	13	
10.	29/3/2016	Casting yard	cpr procedure of emergency first aid	50	
11.	5/3/2016	Chandpole	precautions while lifting & rigging	66	
12.	5/3/2016	Chandpole	first aid	68	
13.	9/3/2016	Chandpole	behaviour based training	59	
14.	11/3/2016	Chandpole	lifting procedures	35	
15.	12/3/2016	Chandpole	importance of ppe's	62	
16.	16/3/2016	Chandpole	training on cpr	31	
17.	16/3/2016	Chandpole	rigging safety	23	
18.	17/3/2016	Chandpole	lifting procedures	40	
19.	19/3/2016	Chandpole	tunnel safety	49	
20.	21/3/2016	Chandpole	fire hazard & precaution	5	
21.	26/3/2016	Chandpole	work permit system	15	
22.	28/3/2016	Chandpole	tunnel safety	22	
23.	28/3/2016	Chandpole	safe use of power tools & hand tools	22	
24.	28/3/2016	Chandpole	welding & gas cutting	13	
25.	29/3/2016	Chandpole	first aid training	42	
26.	29/3/2016	Chandpole	welding & cutting work	8	
27.	30/3/2016	Chandpole	tunnel safety	12	
28.	30/3/2016	Chandpole	lifting & rigging work	15	
29.	30/3/2016	Chandpole	environment management	20	
30.	31/3/2016	Chandpole	power tools & hand tools	17	
31.	03/03/2016	Chhoti Chaupar	welding cutting bending	20	
32.	09/03/2016	Chhoti Chaupar	permit to work system	20	
33.	14/03/2016	Chhoti Chaupar	safe work with compress gas	19	
34.	15/03/2016	Chhoti Chaupar	permit to work system	20	
35.	17/3/2016	Chhoti Chaupar	environment & health	15	
36.	18/3/2016	Chhoti Chaupar	scaffolding erection & inspection	17	
37.	22/3/2016	Chhoti Chaupar	traffic management	15	
39.	26/3/2016	Chhoti Chaupar	welding, cutting, bending	21	
40.	15/3/2016	Badi Chaupar	fire hazard	20	
41.	26/3/2016	Badi Chaupar	use of safety harness	21	
42	26/3/2016	Badi Chaupar	material lifting	13	

96 hrs training

SHE management Training

Safety Training

Environmental Training

Pre-start work training

Appendix 3: Sample format of Monthly SHE report

CONTINENTAL ENGINEERING CORPORATION

MONTHLY SAFETY, HEALTH & ENVIRONMENTAL REPORT MARCH- 2016

DOCUMENT No: RP/JMRC/SHE/UG1B/PHOF/021
Revision :00 ; Date 06.04.2016

	PREPARED BY	REVIEWED BY	APPROVED BY
Signature :			
NAME :	S.K. Dewedi	GSS Rama Raju	Christopher Mark Cooper
DESIGNATION :	Senior Environment Engineer	Chief SHE Manager	Project leader
DATE :	2 April, 2016	April,2016	2 April,2016

DEIIGN AND CONITRUCTION OF TUNNEL BETWEEN CHANDPOLE AND BADI CHOUPER AND REVERIAL LINE BY IHIELD TBM,UNDERGROUND METRO STATION AT CHOTI CHOUPER AND BADI CHOUPER BY CUT & COVER METHOD ON EAST-WEST CORRIDOR OF JAIPUR METRO (PHAIE 1B) AT IAIPUR, RAJAITHAN, INDIA
CONTRACT NO: JP/EW/1B/C1

MONTHLY SAFETY,HEALTH & ENVIRONMENTAL REPORT MARCH ,2016

SHE SUBMITTAL

Appendix 4: Environment Quality Monitoring Report

EKO PRO

Contact : +91 - 9810243870

EKO PRO ENGINEERS PVT. LTD.
Environmental Consultants and Analytical Laboratory
(An ISO 9001:2008 Certified Company)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009, UP, INDIA
Contact No. : [illegible] E-mail : [illegible] website : www.ekopro.in

TEST REPORT

Ambient Air Quality Monitoring

Test Report No. : EKO/EV-AA/108/180316

Issue Date : 23/03/2016

Issued To : CEC INTERNATIONAL CORPORATION
Plot No- 860
Village & Post, Keshavpura
Casting Yard Bakhrota, Ajmer Road
Jaipur

Sample Description	:	Ambient Air
Sample Drawn on	:	16/03/2016 To 17/03/2016
Sample Drawn by	:	EPEPL(Mr. Krishan Kant Mishra)
Sample Received on	:	18/03/2016
Sampling Location	:	Near Casting Yard
Sampling Plan & Procedure	:	SOP-AAQ/15
Analysis Duration	:	18/03/2016 To 22/03/2016
Sampling Time	:	24.0 Hrs.
Ambient Temprature (deg °C)	:	28.0
Average Flow Rate of SPM (m^3/min)	:	1.1
Average Flow Rate of Gases (lpm.)	:	1.0
Weather Conditions	:	Clear
Remark (if any)	:	NA

RESULTS

S.No.	PARAMETER	Test Methods	Results	Units	LIMIT AS PER EPA*
1	Particulate Matter (PM10)	IS:5182 (P-23)	281.5	µg/m3	100.0
2	SPM	IS:5182 (P-4)	539.2	µg/m3	-
3	Sulphur dioxide (as SO2)	IS:5182 (P-2) Improved West & Geake	11.5	µg/m3	80.0
4	Nitrogen Dioxide (as NO2)	IS:5182 (P-6)	24.1	µg/m3	80.0
5	Carbon Monoxide (as CO)	IS:5182 (P-10) Grab Method	<1.15	mg/m3	4.0

EKO PRO ENGINEERS PVT. LTD.
SAVE THE ENVIRONMENT

EKO PRO

Contact : +91 - 9810243870

EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

(An ISO 9001:2008 Certified Company)

Office & Laboratory : 62/A1, South Side Of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009, UP, INDIA
Contact No. : 9711159210, 9711159427 E-mail : ahsan@ekopro.in, ekoproengineers@gmail.com website : www.ekopro.in

TEST REPORT

Ambient Air Quality Monitoring

Test Report No. : EK0/EV-AA/107/180316 **Issue Date** : 23/03/2016

Issued To : CEC INTERNATIONAL CORPORATION
Plot No- 860
Village & Post, Keshavpura
Casting Yard Bakhrota, Ajmer Road
Jaipur

Sample Description	:	Ambient Air
Sample Drawn on	:	16/03/2016 To 17/03/2016
Sample Drawn by	:	EPEPL(Mr. Krishan Kant Mishra)
Sample Received on	:	18/03/2016
Sampling Location	:	Near Chandpole Metro Station
Sampling Plan & Procedure	:	SOP-AAQ/15
Analysis Duration	:	18/03/2016 To 22/03/2016
Sampling Time	:	24.0 Hrs.
Ambient Temprature (deg °C)	:	28.0
Average Flow Rate of SPM (m^3/min)	:	1.1
Average Flow Rate of Gases (lpm.)	:	1.0
Weather Conditions	:	Clear
Remark (if any)	:	NA

RESULTS

S.No.	PARAMETER	Test Methods	Results	Units	LIMIT AS PER EPA*
1	Particulate Matter (PM10)	IS:5182 (P-23)	225.8	µg/m3	100.0
2	SPM	IS:5182 (P-4)	454.6	µg/m3	-
3	Sulphur dioxide (as SO2)	IS:5182 (P-2) Improved West & Geake	16.0	µg/m3	80.0
4	Nitrogen Dioxide (as NO2)	IS:5182 (P-6)	31.7	µg/m3	80.0
5	Carbon Monoxide (as CO)	IS:5182 (P-10) Grab Method	<0.1	mg/m3	4.0

EKO PRO ENGINEERS PVT. LTD. GHAZIABAD SAVE THE ENVIRONMENT

EKO PRO

Contact : +91 - 9810243870

EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

(An ISO 9001:2008 Certified Company)

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Contact No. : 9711159210, 9711159427 E-mail : email@ekopro.in, ekopro@yahoo.com, website : www.ekopro.in

TEST REPORT

Ambient Air Quality Monitoring

Test Report No. : EK0/EV-AA/110/180316 **Issue Date** : 23/03/2016

Issued To : CEC INTERNATIONAL CORPORATION
Plot No- 860
Village & Post, Keshavpura
Casting Yard Bakhrota, Ajmer Road
Jaipur

S[illegible]ple Description	:	Ambient Air
Sample Drawn on	:	15/03/2016 To 16/03/2016
Sample Drawn by	:	EPEPL(Mr. Krishan Kant Mishra)
Sample Received on	:	18/03/2016
Sampling Location	:	Near Chotti Chauper
Sampling Plan & Procedure	:	SOP-AAQ/15
Analysis Duration	:	18/03/2016 To 22/03/2016
Sampling Time	:	24.0 Hrs.
Ambient Temprature (deg °C)	:	28.0
Average Flow Rate of SPM (m^3/min)	:	1.1
Average Flow Rate of Gases (lpm.)	:	1.0
Weather Conditions	:	Clear
Remark (if any)	:	NA

RESULTS

S.No.	PARAMETER	Test Methods	Results	Units	LIMIT AS PER EPA*
1	Particulate Matter (PM10)	IS:5182 (P-23)	215.3	µg/m3	100.0
2	SPM	IS:5182 (P-4)	460.1	µg/m3	-
3	Sulphur dioxide (as SO2)	IS:5182 (P-2) Improved West & Geake	17.5	µg/m3	80.0
4	Nitrogen Dioxide (as NO2)	IS:5182 (P-6)	35.2	µg/m3	80.0
5	Carbon Monoxide (as CO)	IS:5182 (P-10) Grab Method	<1.15	mg/m3	4.0

EKO PRO ENGINEERS PVT. LTD. GHAZIABAD SAVE THE ENVIRONMENT

EKO PRO

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EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

(An ISO 9001:2008 Certified Company)

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Contact No. : 9711159210, 9711159421, E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Ambient Air Quality Monitoring

Test Report No. : EK0/EV-AA/109/180316 **Issue Date** : 23/03/2016

Issued To : CEC INTERNATIONAL CORPORATION
Plot No- 860
Village & Post, Keshavpura
Casting Yard Bakhrota, Ajmer Road
Jaipur

S· ole Description	:	Ambient Air
Sample Drawn on	:	15/03/2016 To 16/03/2016
Sample Drawn by	:	EPEPL(Mr. Krishan Kant Mishra)
Sample Received on	:	18/03/2016
Sampling Location	:	Near Badi Chauper (Near Hawamahal)
Sampling Plan & Procedure	:	SOP-AAQ/15
Analysis Duration	:	18/03/2016 To 22/03/2016
Sampling Time	:	24.0 hrs
Ambient Temprature (deg °C)	:	28.0
Average Flow Rate of SPM (m^3/min)	:	1.1
Average Flow Rate of Gases (lpm.)	:	1.0
Weather Conditions	:	Clear
Remark (if any)	:	NA

RESULTS

S.No.	PARAMETER	Test Methods	Results	Units	LIMIT AS PER EPA*
1	Particulate Matter (PM10)	IS:5182 (P-23)	232.1	µg/m3	100.0
2	SPM	IS:5182 (P-4)	498.4	µg/m3	-
3	Sulphur dioxide (as SO2)	IS:5182 (P-2) Improved West & Geake	14.3	µg/m3	80.0
4	Nitrogen Dioxide (as NO2)	IS:5182 (P-6)	27.5	µg/m3	80.0
5	Carbon Monoxide (as CO)	IS:5182 (P-10) Grab Method	<1.15	mg/m3	4.0

EKO PRO ENGINEERS PVT. LTD. GHAZIABAD SAVE THE ENVIRONMENT

EKO PRO

Contact : +91 - 9810243870

EKO PRO ENGINEERS PVT. LTD.
Environmental Consultants and Analytical Laboratory
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Contact No. : 9711159210, 9711159427 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Noise Monitoring

Test Report No. : EKO/EV-NM/119/180316 **Issue Date : 21/03/2016**

Issued To : CEC INTERNATIONAL CORP INDIA PVT. LTD
(Jaipur Project)
Old Police Headquarter
Near Hawamahal
Jaipur

Sample Description : Ambient Noise
Sample Drawn on : 16/03/2016 To 17/03/2016
Sample Drawn by : EPEPL (Mr.Krishan Kant Mishra)
Sample Received on : 18/03/2016
Sampling Location : Chaudhary Hospital
Sampling Plan & Procedure : SOP-N/01
Environmental Conditions : Normal
Analysis Duration : 18/03/2016 To 19/03/2016
Remark (if any) : NA

S.No.	PARAMETER	TEST METHOD	RESULTS Lday db(A)	RESULTS LNight db(A)	LIMITS AS PER ENVIRONMENT (PROTECTION) ACT*
1	Leq (24 Hrs.)	SOP-N/94/01	61.3		
2	L Day		64.3	-	75.0
3	L Night		-	55.2	70.0
4	L dn		59.8		
5	L Max (24 Hrs.)		86.4	78.2	
	L Min (24 Hrs.)		52.1	38.6	
7	L 90		58.3	46.5	
8	L 50		62.0	53.2	
9	L 10		66.9	58.3	

* **Details as per EPA-1986 Ambient Noise Quality Standards, Schedule-III, (Rule-3).**

*** * End of Report * ***

Notes :

1. The results given above are related to the observed values at the time of monitoring. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

For E. P. E. P. L.
GHAZIABAD
(Authorised Signatory)

EKO PRO

Contact : +91 - 9810243670

EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

(An ISO 9001:2008 Certified Company)

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TEST REPORT

Noise Monitoring

Test Report No. : EKO/EV-NM/113/180316 **Issue Date : 21/03/2016**

Issued To : CEC INTERNATIONAL CORP INDIA PVT. LTD
(Jaipur Project)
Old Police Headquarter
Near Hawamahal
Jaipur

Sample Description : Ambient Noise
Sample Drawn on : 15/03/2016 To 16/03/2016
Sample Drawn by : EPEPL (Mr.Krishan Kant Mishra)
Sample Received on : 18/03/2016
Sampling Location : Near Casting Yard
Sampling Plan & Procedure : SOP-N/01
Environmental Conditions : Normal
Analysis Duration : 18/03/2016 To 19/03/2016
Remark (if any) : NA

S.No.	PARAMETER	TEST METHOD	RESULTS		LIMITS AS PER ENVIRONMENT (PROTECTION) ACT*
			Lday db(A)	LNight db(A)	
1	Leq (24 Hrs.)	SOP-N/94/01	60.9		
2	L Day		63.7	-	75.0
3	L Night		-	55.5	70.0
4	L dn		59.6		
5	L Max (24 Hrs.)		80.0	68.2	
6	L Min (24 Hrs.)		52.3	43.0	
7	L 90		60.3	51.7	
8	L 50		63.3	54.8	
9	L 10		65.5	58.2	

* Details as per EPA-1986 Ambient Noise Quality Standards, Schedule-III, (Rule-3).

** End of Report **

Notes :

1. The results given above are related to the observed values at the time of monitoring. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

For E. P. E. P. L.

(Authorised Signatory)

EKO PRO

Contact : +91 - 9810243871

EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

(An ISO 9001:2008 Certified Company)

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Contact No. : 9711150210, 9711159427, E-mail : ekopro@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Noise Monitoring

Test Report No. : EKO/EV-NM/115/180316 **Issue Date : 21/03/2016**

Issued To : CEC INTERNATIONAL CORP INDIA PVT. LTD
(Jaipur Project)
Old Police Headquarter
Near Hawamahal
Jaipur

Sample Description	:	Ambient Noise
Sample Drawn on	:	15/03/2016 To 16/03/2016
Sample Drawn by	:	EPEPL (Mr.Krishan Kant Mishra)
Sample Received on	:	18/03/2016
Sampling Location	:	Near Krishna Temple
Sampling Plan & Procedure	:	SOP-N/01
Environmental Conditions	:	Normal
Analysis Duration	:	18/03/2016 To 19/03/2016
Remark (if any)	:	NA

S.No.	PARAMETER	TEST METHOD	RESULTS		LIMITS AS PER ENVIRONMENT (PROTECTION) ACT*
			Lday db(A)	LNight db(A)	
1	Leq (24 Hrs.)	SOP-N/94/01	66.4		
2	L Day		69.0	-	75.0
3	L Night		-	61.4	70.0
4	L dn		65.2		
5	L Max (24 Hrs.)		85.7	73.0	
6	L Min (24 Hrs.)		54.2	43.8	
7	L 90		65.4	56.2	
8	L 50		68.1	60.3	
9	L 10		71.2	64.1	

* Details as per EPA-1986 Ambient Noise Quality Standards, Schedule-III, (Rule-3).

* * End of Report * *

Notes :

1. The results given above are related to the observed values at the time of monitoring. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

For E. P. E. P. L.

(Authorised Signatory)

Contact : +91 -9810243870

EKO PRO

EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

(An ISO 9001:2008 Certified Company)

TEST REPORT

Noise Monitoring

Test Report No. : EKO/EV-NM/114/180316 **Issue Date : 21/03/2016**

Issued To	:	CEC INTERNATIONAL CORP INDIA PVT. LTD (Jaipur Project) Old Police Headquarter Near Hawamahal Jaipur
Sample Description	:	Ambient Noise
Sample Drawn on	:	15/03/2016 To 16/03/2016
Sample Drawn by	:	EPEPL (Mr.Krishan Kant Mishra)
Sample Received on	:	18/03/2016
Sampling Location	:	Near Pink City Hospital
Sampling Plan & Procedure	:	SOP-N/01
Environmental Conditions	:	Normal
Analysis Duration	:	18/03/2016 To 19/03/2016
Remark (if any)	:	NA

S.No.	PARAMETER	TEST METHOD	RESULTS Lday db(A)	LNight db(A)	LIMITS AS PER ENVIRONMENT (PROTECTION) ACT*
1	Leq (24 Hrs.)	SOP-N/94/01	63.7		
2	L Day		66.3	-	75.0
3	L Night		-	58.7	70.0
4	L dn		62.5		
5	L Max (24 Hrs.)		83.0	69.5	
6	L Min (24 Hrs.)		47.1	41.1	
7	L 90		61.5	51.2	
8	L 50		65.2	57.3	
9	L 10		68.9	61.9	

* **Details as per EPA-1986 Ambient Noise Quality Standards, Schedule-III, (Rule-3).**

*** * End of Report * ***

Notes :

1. The results given above are related to the observed values at the time of monitoring. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

For E. P. E. P. L.

(Authorised Signatory)

EKO PRO

Contact : +91 - 9810243870

EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

(An ISO 9001:2008 Certified Company)

Office & Laboratory : 52-M1, Sixth Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009, UP, INDIA.
Contact No. : 9711192210, 9711139827, E-mail : ems4@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Noise Monitoring

Test Report No. : EKO/EV-NM/116/180316 **Issue Date : 21/03/2016**

Issued To : CEC INTERNATIONAL CORP INDIA PVT. LTD
(Jaipur Project)
Old Police Headquarter
Near Hawamahal
Jaipur

Sample Description : Ambient Noise
Sample Drawn on : 16/03/2016 To 17/03/2016
Sample Drawn by : EPEPL (Mr.Krishan Kant Mishra)
Sample Received on : 18/03/2016
Sampling Location : NearJantar Mantar
Sampling Plan & Procedure : SOP-N/01
Environmental Conditions : Normal
Analysis Duration : 18/03/2016 To 19/03/2016
Remark (if any) : NA

S.No.	PARAMETER	TEST METHOD	RESULTS		LIMITS AS PER ENVIRONMENT (PROTECTION) ACT*
			Lday db(A)	LNight db(A)	
1	Leq (24 Hrs.)	SOP-N/94/01	70.9		
2	L Day		74.1	-	75.0
3	L Night		-	64.6	70.0
4	L dn		69.4		
5	L Max (24 Hrs.)		93.5	73.4	
6	L Min (24 Hrs.)		60.4	50.5	
7	L 90		70.7	60.6	
8	L 50		73.4	64.0	
9	L 10		75.9	67.0	

* Details as per EPA-1986 Ambient Noise Quality Standards, Schedule-III, (Rule-3).

* * End of Report * *

Notes :

1. The results given above are related to the observed values at the time of monitoring. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

For E. P. Engineers Pvt. Ltd.
GHAZIABAD
(Authorised Signatory)

EKO PRO

Contact : +91 - [illegible]

EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

(An ISO 9001:2008 Certified Company)

Office & Laboratory : [illegible] UPSIDC [illegible] Ghaziabad - 201 [illegible] UP INDIA
Contact No. : [illegible] E-mail : [illegible] website : www.ekopro.in

TEST REPORT

Noise Monitoring

Test Report No. : EKO/EV-NM/117/180316 **Issue Date : 21/03/2016**

Issued To : CEC INTERNATIONAL CORP INDIA PVT. LTD
(Jaipur Project)
Old Police Headquarter
Near Hawamahal
Jaipur

Sample Description : Ambient Noise
Sample Drawn on : 16/03/2016 To 17/03/2016
Sample Drawn by : EPEPL (Mr.Krishan Kant Mishra)
Sample Received on : 18/03/2016
Sampling Location : Badi Chauper (Hawamahal)
Sampling Plan & Procedure : SOP-N/01
Environmental Conditions : Normal
Analysis Duration : 18/03/2016 To 19/03/2016
Remark (if any) : NA

S.No.	PARAMETER	TEST METHOD	RESULTS Lday db(A)	LNight db(A)	LIMITS AS PER ENVIRONMENT (PROTECTION) ACT*
1	Leq (24 Hrs.)	SOP-N/94/01	73.4		
2	L Day		75.8	-	75.0
3	L Night		-	68.7	70.0
4	L dn		72.3		
5	L Max (24 Hrs.)		96.2	79.5	
6	L Min (24 Hrs.)		63.2	51.6	
7	L 90		72.3	64.5	
8	L 50		74.8	68.1	
9	L 10		77.8	71.3	

* **Details as per EPA-1986 Ambient Noise Quality Standards, Schedule-III, (Rule-3).**

**** End of Report ****

Notes :

1. The results given above are related to the observed values at the time of monitoring. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

For E. P. E. P. L.
GHAZIABAD
(Authorised Signatory)

EKO PRO

Contact : +91 - 9810243870

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Contact No. : [illegible] E-mail : [illegible] website : [illegible]

TEST REPORT

Noise Monitoring

Test Report No. : EKO/EV-NM/118/180316 **Issue Date : 21/03/2016**

Issued To : CEC INTERNATIONAL CORP INDIA PVT. LTD
(Jaipur Project)
Old Police Headquarter
Near Hawamahal
Jaipur

Sample Description : Ambient Noise
Sample Drawn on : 16/03/2016 To 17/03/2016
Sample Drawn by : EPEPL (Mr.Krishan Kant Mishra)
Sample Received on : 18/03/2016
Sampling Location : Chotti Chauper (Maharaja School)
Sampling Plan & Procedure : SOP-N/01
Environmental Conditions : Normal
Analysis Duration : 18/03/2016 To 19/03/2016
Remark (if any) : NA

S.No.	PARAMETER	TEST METHOD	RESULTS		LIMITS AS PER ENVIRONMENT (PROTECTION) ACT*
			Lday db(A)	LNight db(A)	
1	Leq (24 Hrs.)	SOP-N/94/01	68.9		
2	L Day		71.7	-	75.0
3	L Night		-	63.5	70.0
4	L dn		67.6		
5	L Max (24 Hrs.)		88.1	74.6	
6	L Min (24 Hrs.)		55.8	44.0	
7	L 90		64.4	57.0	
8	L 50		70.0	62.0	
9	L 10		74.9	67.1	

* **Details as per EPA-1986 Ambient Noise Quality Standards, Schedule-III, (Rule-3).**

**** End of Report ****

Notes :

1. The results given above are related to the observed values at the time of monitoring. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
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For E.P.E.P.L.

GHAZIABAD

(Authorised Signatory)

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Contact No. : 9711159210, 9711159427 E-mail : email@ekopro.in; ekoproengineers@gmail.com; website : www.ekopro.in

TEST REPORT

Water Sample Analysis

Test Report No. : EK0/EV-WA/111/220216 **Issue Date** : 27/02/2016

Issued To : CEC INTERNATIONAL CORPORATION
Plot No- 860
Village & Post, Keshavpura
Casting Yard Bakhrota, Ajmer Road
Jaipur

Sample Description	:	Drinking Water
Sample Drawn on	:	20/02/2016
Sample Drawn by	:	EPEPL(Mr. Harish Kumar)
Sample Received on	:	22/02/2016
Sampling Location	:	From Casting Yard
Sampling Plan & Procedure	:	SOP-W/66
Sample Quantity	:	1.0 Litre
Environmental Condition	:	Normal
Analysis Duration	:	22/02/2016 To 26/02/2016
Remark (if any)	:	NA

RESULTS

S.No.	PARAMETER	Test Methods	Results	Units	IS: 10500 : 2012 (Limits)	
					Acceptable	Permissible
1	Turbidity	IS : 3025 (P-10)	< 1.0	NTU	1.0	5.0
2	pH	IS : 3025 (P-11)	7.58	-	6.5-8.5	No relaxation
3	Oil & Grease	IS : 3025 (P-39)	ND	mg/L	-	-
4	Total Dissolved Solids	IS : 3025 (P-16)	74.0	mg/L	500.0	2000.0
5	Total Suspended Solids	IS : 3025 (P-17)	< 5.0	mg/L	-	-
6	Conductivity	IS : 3025 (P-14)	114.6	µs/cm	-	-
7	Dissolved Oxygen	IS : 3025 (P-38)	5.9	mg/L	-	-
8	E.coli	IS : 1622	Absent	Per 100 mL	Shall not be detectable in 100ml sample	-

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EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory

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Contact No. : 9711159210, 9711159427, E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Water Sample Analysis

Test Report No. : EKO/EV-WA/112/220216 **Issue Date** : 27/02/2016

Issued To : CEC INTERNATIONAL CORPORATION
Plot No- 860
Village & Post, Keshavpura
Casting Yard Bakhrota, Ajmer Road
Jaipur

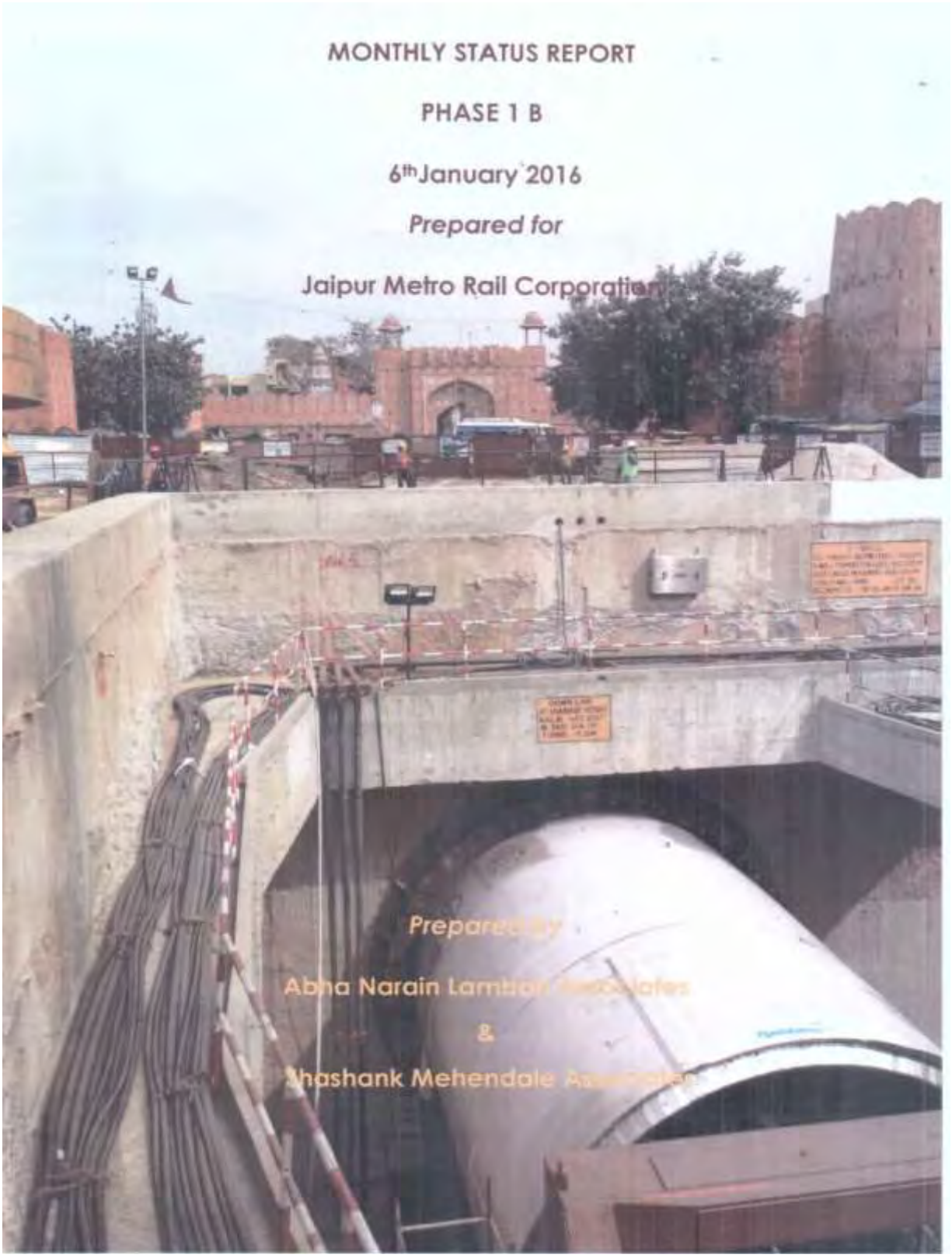
Sample Description	:	Drinking Water
Sample Drawn on	:	20/02/2016
Sample Drawn by	:	EPEPL(Mr. Harish Kumar)
Sample Received on	:	22/02/2016
Sampling Location	:	From chandpole Metro Station
Sampling Plan & Procedure	:	SOP-W/66
Sample Quantity	:	1.0 Litre
Environmental Condition	:	Normal
Analysis Duration	:	22/02/2016 To 26/02/2016
Remark (if any)	:	NA

RESULTS

S.No.	PARAMETER	Test Methods	Results	Units	IS: 10500 : 2012 (Limits)	
					Acceptable	Permissible
1	Turbidity	IS : 3025 (P-10)	< 1.0	NTU	1.0	5.0
2	pH	IS : 3025 (P-11)	7.52	-	6.5-8.5	No relaxation
3	Oil & Grease	IS : 3025 (P-39)	ND	mg/L	-	-
4	Total Dissolved Solids	IS : 3025 (P-16)	120.0	mg/L	500.0	2000.0
5	Total Suspended Solids	IS : 3025 (P-17)	< 5.0	mg/L	-	-
6	Conductivity	IS : 3025 (P-14)	184.6	µs/cm	-	-
7	Dissolved Oxygen	IS : 3025 (P-38)	6.1	mg/L	-	-
8	E.coli	IS : 1622	Absent	Per 100 mL	Shall not be detectable in 100ml sample	-

EKO PRO ENGINEERS PVT. LTD. GIVE THE ENVIRONMENT

Appendix 5: Monthly Report of Heritage Consultant



Structural Report

1st December 2015 – 31st December 2015

Site inspections by M/s Shashank Mehendale & Associates were carried out in this month to monitor the progress of works, Chandpole Gate underpassing by TBM – 2 with JMRC, DMRC and CEC officials meeting convened on 20th -22nd Dec 2015.

Key Experts Visits

Mr. Shashank Mehendale

20th– 22nd Dec 2015 - Site visit for Chandpole Gate Structure underpassing by TBM – 2.

- Site Visit to Chandpole Gate Structure immiditely Post TBM underpassing Chandpole Gate
- Site Visit to Naval Kishor Temple: Review of Retrofitting work under progress.

20.12.2015 to 22.12.2015 –Site Visit During Underpassing Jaipur Metro Chandpole Gate by TBM-2 (UP TUNNEL)

Chandpole Gate Structure was visited during tunneling work of up-line tunnel. Observations are –

A. Chanpole Gate

1. Chandpole Gate structure was closely monitored during and post tunneling work. One hairline crack is seen near staircase and slight opening of gap in floor tiles/ stones is seen, near Pyavu post gate, near point UL19R1. Same were closely monitored for 1 week by Amil / CEC and found to be inactive.
2. No structural distresses were observed on Chandpole Gate during crossing.
3. Vibrationsobserved, are not beyond trigger level.
4. We were asked to submit suggestions on repairs being carried out to Chandpole gate. Particularly re-occurring of cracks and leakage from the roof.

   - Our observations are masonry cracks are re appearing in plaster. Masonry cracks to be opened grouted sealed and then plastered.SS Staple or other crack bridging insert may be used if felt necessary.
   - Issue of cracks re appearing was discussed and agreed to first grout the masonry crack and repair properly before repairing plaster. Any other measures State archeology feels would enhance life of the structure to be adopted.

5. Structure to be closely monitored for 15 days.

B. Isarlat Structure

6. Isarlatstructure was visited with JMRCL and DMRC officials. The structure is 140 feet tall masonry structure with cantilever projections. Structure seems to be away from tunnel by at least 10 meters. However, actual foundation details should be identified and distance and depth to be noted. Vibration censor to be mounted as up in the structure as possible to monitor ambient and during tunneling vibrations. Any movements to be also noted by installing markers to note any movement using total stations.

C. Naval Kishor Temple

7. Naval kishor temple micro piling work: Site was visited with DMRC officials. D wall being already constructed current issue seems to be storm water (rain water) drain running within the verandah parallel to the road& leakages from the same. As also cavities createdin the verandah portion due to rat holes and scouring in post. The drain is built as walls on either side resting on soling PCC. However the drain has no base concrete. Thus when rainwater gushes through the said drain base soil (sand) erosion happens. Scouring is observed below wall at one of the two places observed. And tilting of side wall of drain is also observed at the same location coinciding with settlements in the verandah. It is proposed to rebuild a new RCC drain from within so as to avoid accidental scouring. Thereafter voids created in verandah could be properly filled, compacted and grouted. The structural elements viz. columns, beams and slab stones could be repaired / replaced as per requirement. Micro piling work should thus be reviewed and not executed unless, a trigger to the contrary is observed.

Shashank Mehendale,
Structural Consultant for Monitoring of Heritage Structures

Appendix 6: Application receipt from State Pollution Control Board

CONTINENTAL
ENGINEERING CORP

Ref.No.FC/RSPCB/SHE/UG1B/PHOF/15/1296

29.06.2015 Date:~~26.06.2015~~

The Regional Officer,
RSPCB, Opposite Road No. 5, VKIA Sikar Road,
Jaipur – 302013

Subject: - Application for Consent to Establish under Section 25/26 of the Water (Prevention & Control of Pollution) Act1974, and under Section 21 of the Air (Prevention & Control of Pollution) Act1981, for the construction of Underground tunnel from Chandpole to Badi Chaupar & RCC Ring Casting yard at Khasra No. 860, Keshavpura, Bhankrota, Ajmer Road, Jaipur, Rajasthan, by **M/s Continental Engineering Corporation**.

Sir,

Group: Green S.L.No. 19-Cement Products (without using Boilers)

Sir,

Please find applications for Consent to Establish under section 25/26 of the Water Act 1974, & under Section 21 of the Air Act 1981, for the construction of Underground tunnel from Chandpole to Badi Chaupar & RCC Ring Casting yard at Khasra No. 860, Keshavpura, Bhankrota, Ajmer Road, Jaipur, Rajasthan, by **M/s Continental Engineering Corporation.**

In this regard following documents merit your kind consideration:-

1. Application for Consent to Establish under Water Act, 1974.
2. Application for Consent to Establish under Air Act, 1981.
3. Feasibility Report
4. DD No. 024420 Dated 15-06-2015 for Rs. 32,000/- (Rs. Thirty Two Thousand Only) of HDFC Bank, Jaipur –Deposited through E-Mitra on 19-6-2015-Copy of receipt enclosed.
5. Land Documents/Land Agreement Documents (Annexure - I) (Land alloted free of cost for temporary use)
6. Affidavit by Project Proponent on Rs. 10/- Stamp (Annexure - II)
7. Authority Letter/Board Resolution (Annexure - III)
8. CA Certificate (Annexure - IV)
9. Water supply letter from tanker water supplying agency (Annexure - V)
10. Articles & Memorandum (Annexure - VI)
11. Site/Conceptual / Section Plan showing proposed work (Annexure - VII)

Yours Sincerely
For **M/s Continental Engineering Corporation**

Christopher Mark Cooper
Authorized Signatory

Encl: as above

Continental Engineering Corporation JAIPUR

Regional Office Rajasthan State Pollution Control Board Jaipur

CONTINENTAL ENGINEERING CORP
Tower B, 7th Floor, Signature Tower, Sector-28, NH-8, Gurgaon-122002 (HR)
Site Office : Continental Engineering Corporation, (Old Police Head Quarter) Near Jalewi Chowk, In front of City Palace, Near FRO Office, Badi Chaupar, Jaipur, Rajasthan, Pin-302002.
(e) : +91-141-4035346
Web site: www.cec.com.tw

A MEMBER OF CONTINENTAL HOLDINGS