Annual Environmental Audit Report - 2017

Hubli Dharwad BRTS Limited (HDBRTS)

August 2017
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Appendix

Annexure 1: Review of legal documentation
Annexure 2: Photographic evidences
Hubli – Dharwad state highway is one of the most congested road stretches in North West Karnataka region. To ease the growing traffic from Hubli – Dharwad, the Government of Karnataka, has taken up the widening of the existing two lane state highway to a divided four lane carriageway. To provide better transportation facilities between the two urban areas of Hubli and Dharwad, and with an objective to improve travel speeds, reliability, and quality of public transport services, a BRT facility is proposed along the corridor. A SPV, Hubli-Dharwad BRTS Company Limited has been formed under the Companies Act to take up the construction of proposed infrastructure facilities for the BRTS. As a part of the BRTS, some of the existing facilities like workshop, depots, terminals etc., are proposed to be upgraded.

About the project corridor

The project includes implementation of a 22.3 km BRTS, consisting of the 11.8 km long corridor between Hubli and Dharwad and extensions into the central districts of the two cities. The project corridor starts from Hubli City Bus Terminal (CBT) and extends to Dharwad CBT (22.25km). The segregated corridor starts from Hubli railway station and ends at Jubilee circle, Dharwad. Under the Karnataka Road Development Corporation Ltd (KRDCL) road project the following upgradation activities are planned:

(i) Widening of 18.9 km of the highway to a seven lane carriageway (three lane for BRTS and four lane for mixed traffic) in city limits
(ii) Two lane undivided carriageway to eight lane carriageway (four lane for BRTS and four lane for mixed traffic) between Unkal Lake to JSS college.

The HDBRTSCL will be responsible for developing the BRTS corridor within city limits between Hosur cross to CBT in Hubli and similarly between Jubilee circle to CBT in Dharwad. As per the revenue records, the project corridor traverses through 10 villages (MT Sagar (CTS), Unkal (CTS), Unakal Revenue, Bhairindervarakoppa, Amaragol, Rayapur, Sattur, Navalur, Lakkanmanahalli and Dharwad (CTS). The corridor is neighbouring many educational institutions and open land.
Objective of the study

HDBRTS Company Limited ("HDBRTSCL") has appointed EY LLP ("EY") to assess the implementation of Environmental management plans, identify constraints (if any) during implementation, document best practices, if any and suggest measure for effective implementation and monitoring for sound construction management practices as to have minimal impacts to environmental. This report represents the findings from the third annual environmental audit for HDBRTSCL. For the purpose of the third year audit, the primary focus of the site visits was on the Interchange at Hosur Road (Package 10), Dharwad Terminal (Package 2), OCBS (package 9) the divisional workshop and Hubli depot (Package 8), Mixed traffic lane (MTL), FOB (Package 3) and bus stop construction (package 5).

The specific objectives of the audit are as follows

To review:
- The EIA and the EMPs of the Hubli-Dharwad road and BRTS project
- The implementation status of recommendations/mitigation measures regarding various aspects
- The records and documentation relating to impacts, actions taken to manage them and aspects of performance

To assess:
- The status of implementation of Environmental management plans,
- The major environmental non-compliances and propose corrective actions
- The efficacy of monitoring of implementation of EMP and identify shortcomings
- To conduct site observations at all locations:
- To check that environmental measures and controls are operating as described and intended.
- To identify constraints and document best practices, if any
- To suggest measures for effective implementation and monitoring to minimize impacts to environment

Limitations of the study

Professional judgments expressed herein are based on facts and information provided. Wherever EY has not been able to make a judgment or assess any process, it has been highlighted as an information gap and suggested a way forward.

EY has exercised all reasonable skill, care and diligence in carrying out the study.

This report is not deemed to be any undertaking, warranty or assurance / certificate.
<table>
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<tr>
<th>S. No</th>
<th>Observation</th>
<th>Implication</th>
<th>Conclusion</th>
<th>Rating</th>
<th>Packages</th>
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</table>
| 1     | Several instances were observed, where PPEs were not being used by the workers. This was a common issue across all packages. This issue was prevalent during previous year audits as well  
- Personnel were observed not wearing safety shoes (except package 10)  
- Work at height was being done without a safety harness (package 10, grade separator)  
- Personnel were observed doing masonry as well as concrete work with bare hands (package 10). Also gloves being used by other personnel were of substandard quality which are subject to easy wear and tear (package 10)  
- Safety shoes, gloves, helmets and reflector jackets were not worn by workers working at storm water construction site (MTL package) and FOB package  
- No PPEs were used by workers at package 9 (OCBS). After the interview of a worker it was noted that he was not given an induction training and issue of PPES before commencement of work | In the absence of usage of PPEs, risk of injury to the workers will increase. | Penalties should be imposed on the contractor for every non-compliance related to PPEs.                                                   | Moderate | Across all packages |
<p>| 2     | Near the KIMS bus stop, it was observed that onward road had two separate gradient (elevation) without proper barricading, hence there are high chances of barricading between the two lanes would | Absence of barricading between the two lanes would | It is recommended to close one of the                                             | Moderate | MTL                |</p>
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<td>accident during night time. Ideally such roads with two different elevation should not be open for traffic movement</td>
<td>increase the risk of accident, since traffic is currently being allowed on both the lanes</td>
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<td></td>
<td>lanes for traffic movement</td>
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<td>3</td>
<td>Absence of barricading or insufficient barricading was observed at several places</td>
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<tr>
<td></td>
<td>• Absence of barricading around open pits (package 10)</td>
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<tr>
<td></td>
<td>• Insufficient barricading at the periphery of the excavated pit (Package 9)</td>
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<td></td>
<td>• Work at height was being carried out at the FOB without barricading (package 3)</td>
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<td></td>
<td>Absence of barricading would increase the risk of person falling from height or in an excavation/pit</td>
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<td></td>
<td>It should be ensured that 100% barricading is provided at all places where there is a risk of fall.</td>
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<td></td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Package 10 Package 9 Package 3</td>
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<td>4</td>
<td>Certain instances were observed wherein the standard scaffolding practices were not followed</td>
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<td>• There was an instance where in a scaffolding of approximately 30 feet height was not anchored (package 10)</td>
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<td>• There was no proper working platform (Package 9 and Package 10)</td>
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<td>• Scaffolding was not mounted on a firm surface (Package 2)</td>
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<td>Unsafe scaffolding practices may lead to collapse of scaffolding or personnel falling down from improper working platforms leading to injury</td>
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<td></td>
<td>Standard scaffolding practices should be followed at all sites. A standard checklist should be prepared for inspection of scaffolding prior to use.</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Package 10 Package 9 Package 2</td>
</tr>
<tr>
<td></td>
<td>Inspection checklist for scaffolding to be prepared in general for all sites</td>
</tr>
<tr>
<td>5</td>
<td>Licenses for operation of construction vehicles was in general not available at the sites. Instances were observed wherein the driver was not carrying his license (package 10) or having licenses for LMV (package 10, package 9)</td>
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<tr>
<td></td>
<td>In the absence of trained operators for the specialized equipment, chances of their unsafe operation will increase leading to accidents</td>
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<td></td>
<td>It should be ensured at the time of induction that the driver/operator of the construction equipment/vehicle have the necessary training/licenses. The copy of licenses/training certificates should</td>
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<td>Moderate</td>
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<td></td>
<td>Instances were noted in Package 10 and Package 9. However, recommendation should be implemented in all packages.</td>
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<tr>
<td>6</td>
<td>There was no secondary containment for Lube oil (FOSROC) and diesel storage at package 10 (Hosur Interchange)</td>
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| 7 | a) The DG set near the batching plant at Hosur interchange has single body earthing instead of double body earthing. This was also disconnected, Double body earthing is required as per Regulation 41 (XII) of CEA (Measures relating to safety and electric supply) Regulations, 2010. This issue was also observed during last year's audit.  
   b) DG set was directly connected to equipment at package 5 and package 2. This issue was observed in package 5 in last year’s audit. | Non-compliance with electrical safety norms would increase the electrical hazard risk | a) Body of the DG sets should be earthed by two separate and distinct connections to earth  
   b) All electrical equipment should be connected through standard distribution boards having MCB and ELCB. | a) Package 10  
   b) Package 5 and Package 2 |
| 8 | a) Drinking water was not available at the work location of storm water drain construction adjacent to MTL (MTL package). This issue was observed in previous year as well at MTL package.  
   b) In all the packages test reports for drinking water were not available. In most of the packages either bore well water or tanker water is being used (except package 10). This issue was observed in previous year as well | Absence of drinking water facilities can lead to dehydration and related illness. Also contaminated water if used for drinking can lead to spread of water borne diseases. | Clean drinking water facilities should be available at every construction site and should be easily accessible to the workers. | Moderate | a) MTL package  
   b) All packages |
<table>
<thead>
<tr>
<th>Package</th>
<th>Description</th>
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</table>
| 9       | **Hygiene in the toilets in labor camp at package 10 was not maintained**  
- Toilets were not cleaned  
- There were no lights inside the toilet  
- There was no water supply inside the toilets  
These issues were observed in package 10, in last year's audit as well. |
| 10      | **First aid boxes were not available at MTL work site and package 8. This issue was observed in MTL package last year as well.**  
As per section 36 of the Building and Other Construction Workers Act, 1996, every employer shall provide in all the places where building or other construction work is carried on such first-aid facilities as may be prescribed.  
Also as per point 2.1.4.1.2 of table 4-1 of the EMP, Contractor shall ensure that medical staff, first aid |

| Testing of water should also be conducted as per IS 10500 to determine its potability. |
| Lights should be provided at the toilets in the labour camps  
Toilets should be cleaned regularly everyday  
Water supply should be provided inside the toilets |
| Low |
| Package 10 |

| In the absence of easily accessible first aid boxes, there will be delay in attending to injuries on site.  
Also non provision of first aid boxes will be non-compliance of the Building and Other Construction Workers Act, 1996. Penalty for the |
<p>| First aid boxes should be available at each construction site. |
| Moderate |
| MTL Package 8 |</p>
<table>
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| 11 | Permissions for ground water withdrawal for construction purpose could not be evidenced at the sites visited. This issue was observed last year as well.  
   | Offence would be in accordance to section 50 of the act.  
   | Either the tanker water should be used or permission for withdrawal of ground water should be taken from the concerned statutory authorities. If approval has been taken copy of the approval should be maintained by the site.  
   | Moderate  
   | All packages which are having borewell |
| 12 | Age and identity proof of laborers were not being maintained except package 10.  
   | In the absence of age proof of workers, there is a risk of child labour.  
   | Age and identity proofs should be maintained for every worker at the site.  
   | Low  
   | All packages (except package 10) |
| 13 | Report on stack emission from Hot Mix Plant of RNS contractor (MTL package) not available for review.  
   | In the absence of stack emission, it cannot be verified whether the stack emissions are within the prescribed limits.  
   | Site should monitor stack emissions once every quarter  
   | Moderate  
<p>| MTL |</p>
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<tr>
<th></th>
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<th>This could lead to violation of Air Act</th>
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<tr>
<td>14</td>
<td>Except package 10, Records of accident and first aid cases could not be evidenced. This issue was observed last year as well.</td>
<td>In the absence of records on first aid cases and accidents, root causes will not be identified and risk of similar accidents will still remain</td>
</tr>
<tr>
<td>15</td>
<td>Labour license is taken for 40 workers by RNS for MTL package, however reportedly there are approximately 50-100 workers (RNS - MTL)</td>
<td>This would be violation of Contract Labour (Regulation &amp; Abolition) Act</td>
</tr>
<tr>
<td>16</td>
<td>Traffic management and diversion plan for MTL was not available for review at MTL</td>
<td>In the absence of traffic management plan, the risk of road accidents will increase</td>
</tr>
<tr>
<td>17</td>
<td>Quarry redevelopment plan was not available with RNS for review</td>
<td>This would be a violation of The Mines and Minerals (Development and Regulation) Act, 1957</td>
</tr>
<tr>
<td>Risk</td>
<td>Description</td>
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<td>-------</td>
<td>---------------------------------------------------------------</td>
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<tr>
<td>High</td>
<td>Immediate threat to environment or possibility of loss of limb/life, Major legal non compliance</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>Possibility of environmental hazard or injuries</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Opportunities for improvement</td>
<td></td>
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<tr>
<td>Activity</td>
<td>Management Measure</td>
<td>Implementation Status</td>
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<tr>
<td>Site Clearance</td>
<td>Site clearance including clearance of marked trees for felling (if any) and removal has to be carried out much before the actual construction takes place. Structures and utilities (power transmission lines, cable connections, telephone lines, stand posts, etc.) shall be relocated; clearing or grubbing activities are to be undertaken as these activities may damage structures (private and govt.) and essential facilities/utilities of public use. All works shall be carried out in a manner such that the damage or disruption to flora is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from Engineer – In charge of CSC.</td>
<td>Site clearance stage has been crossed. It is pending in some areas where there are legal issues. 80% have been finished. The utility shifting for electric and water supply in the city area is pending.</td>
</tr>
<tr>
<td>Clearing and Grubbing</td>
<td></td>
<td>Request for inspection (RFI) is initiated by the contractor prior to start of work. PMC after inspection gives approval only for tree felling/clearing of shrubs only if it is required</td>
</tr>
<tr>
<td>Generation &amp; disposal of Debris</td>
<td>Debris generated due to the dismantling of the structures shall be suitably reused in the proposed construction. The Contractor shall suitably dispose off unutilized non-toxic debris either through filling up of borrow areas located in wasteland or at pre-designated disposal sites, subject to the approval of the Engineer In-charge of CSC. The pre-designated disposal locations shall be part of Comprehensive Solid Waste Management Plan to be prepared by Contractor in consultation and with approval of Engineer In-charge of CSC and approval local competent authority.</td>
<td>Site has been identified for disposal of construction and demolition waste. (Municipal dump yard at Karwar road). Any construction and demolition waste being generated at site is disposed after inspection and approval from PMC. Also reportedly asphalt waste had been used to fill low land areas covered with good quality of soil for temporary diversion roads to divert traffic during construction. This waste was also used for temporary road maintenance to fill pot holes. Documented solid waste management plan was not available at the contractor site offices visited [All packages]</td>
</tr>
</tbody>
</table>
Construction wastes disposal
Location of disposal sites shall be finalized prior to completion of the earthworks. The Engineer shall approve these disposal sites conforming to the following:
(a) These are not located within designated forest area
(b) The dumping does not impact natural drainage courses
(c) No endangered/rare flora is impacted by such dumping.
(d) Settlements are located at least 1.0km away from the site.

Planning for Traffic Diversions and Detours for Terminals
Detailed traffic control plans for terminals, Depot shall be prepared by the contractor and the same shall be submitted to the Engineer – In charge of CSC for approval.

Construction Materials
Earth from Borrow Areas for Construction
No borrow area shall be opened without permission of the Engineer – In charge of CSC. Borrow pits shall not be dug continuously in a stretch. The location, shape and size of the designated borrow areas shall be as approved by the Engineer and in accordance to the IRC recommended practice for borrow pits for road embankments (IRC 10: 1961). The borrowing operations shall be carried out as specified in the guidelines for siting and operation of borrow areas. The unpaved surfaces used for the haulage of borrow materials shall be maintained dust free by the contractor. Since dust rising is the most significant impact along the hauled roads, sprinkling of water shall be carried out twice a day along such roads during their period of use.

Quarries
The Contractor shall obtain materials for quarries only after the approval of Department of Mines and Geology, Karnataka and the District Administration. A copy of this

Site has been identified for disposal of construction and demolition waste. (Municipal dump yard at Karwar road). Any construction and demolition waste being generated at site is disposed after inspection and approval from PMC.

C&D waste is also being used to fill low areas and for temporary filling of pot holes during road maintenance.
Traffic management plan reportedly has been prepared by PMC based on IRC SP 55. However these are not available onsite [All packages]

During site visit it was observed that near KIM's Bus stop, it was observed that the onward road had two separate gradients (elevations) without proper barricading, hence there were chances of an accident during night time.

Currently, there is no use of borrow materials onsite. The earth requirement at the infrastructure site is met by excavated materials which were being kept safe to reuse at site at BRTS.

For MTL there is one borrow site which is on contractors own land. Material being used with permission of PMC.

MTL has got approval from the Department of Mines and Geology, Karnataka and the District Administration.

Discussion with PMC
Discussion with PMC and site visit
Discussion with PMC
Water Extraction

Consent must be submitted to SPV through Engineer-in-charge of CSC. The Contractor shall develop a Comprehensive Quarry Redevelopment Plan, as per the Mining Rules of the State and submit a copy to SPV and CSC prior to opening of the quarry site. The quarry operations shall be undertaken within the rules and regulations in vogue.

Procurement of water is to be carried out as per Section 1.2.4.3. The contractor shall minimize wastage of water during construction. The contractor shall source the requirement of water preferentially from surface water bodies, as lakes and tanks in the project area. The contractor shall be allowed to pump only from the surface Water bodies. Boring of any tube wells shall be prohibited. To avoid disruption/disturbance to other water users, the contractor shall extract water from fixed locations. The contractor shall consult the local people before finalizing the locations. Only at locations where surface water sources are not available, the contractor can contemplate extraction of ground water. Consent from the Engineer that "no surface water resource is available in the immediate area for the project" is a pre-requisite prior to extraction of ground water. The contractor shall need to comply with the requirements of Irrigation Department, Karnataka and seek their approval for doing so.

Transportation of Construction Materials

All vehicles delivering materials to the site shall be covered to avoid spillage of materials. All existing highways and roads used by vehicles of the contractor, or any of his sub-contractor or suppliers of materials and similarly roads which are part of the works shall be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles. The unloading of materials at construction sites close to settlements shall be restricted to daytime only.

Drainage and Flood Control

Contractor shall ensure that no construction materials like earth, stone, ash or appendage disposed off so as not to block the flow of water of any water course and cross drainage channels. Where necessary adequate

Quarry redevelopment plan was not available for review during site visit.

Surface water is not being used currently. Either ground water or tanker water is being used. However permissions for ground water withdrawal for construction purpose could not be evidenced at the sites visited. [All Packages with bore well at site]

No such instances were observed during the site visit.

Pumps were available at the Hosur interchange for draining out water. Site visit observations.

Site visit observations.
mechanical devices to bail out accumulated water from construction sites, camp sites, storage yard, excavation areas are to be pre-settled and arranged well in advance of the rainy season besides providing temporary cross drainage systems.

**Slope Protection and Control of Soil Erosion**

The contractor shall construct slope protection works as per design, or as directed by the Engineer – In charge of CSC to control soil erosion and sedimentation through use of dykes, sedimentation chambers, basins, fiber mats, mulches, grasses, slope drains and other devices as required under specific local conditions.

**Water Pollution**

**Water Pollution from Construction Wastes**

The Contractor shall take all precautionary measures to prevent the wastewater generated during construction from entering into water bodies or the irrigation system. All waste arising from the project are to be disposed off in the manner that is acceptable to the Karnataka State Pollution Control Board or as directed by Engineer – In charge of CSC. The Engineer – In charge shall certify that all liquid wastes disposed off from the sites meet the discharge standards.

**Water Pollution from fuel, lubricants and chemicals**

Contractor shall ensure that all vehicle/ machinery and equipment operation, maintenance and refuelling shall be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors shall be provided for vehicle parking, wash down and refuelling areas as per the design provided. Contractor shall arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites approved by the Engineer – In charge. All spills and collected petroleum products shall be disposed off in accordance with MoEF and KSPCB guidelines. Engineer – In charge shall certify that all arrangements comply with the guidelines of KSPCB/ MoEF or any other relevant laws.

**Measures taken for slope protection was seen at MTL construction site.**

**Consent had been obtained from Karnataka State Pollution Control Board for batching plant at package 10 and HMP plant for MTL package. The method of disposal specified is septic tank and soak pit. However the consent is only for treatment of domestic effluent and specifies permitted quantity of industrial waste as “nil”.

Waste disposal records could not be evidenced at any of the packages.**

**Site visit observations.**

**Site visit observations.**
Dust Pollution

The contractor shall take every precaution to reduce the level of dust (SPM and RSPM) from crushers, material storage yards, haul roads and construction sites (including earthwork, dismantling, scarification and material mixing sites) by sprinkling of water, mist spray, encapsulation of dust source and erection of screen / barriers. Batch mix plant shall be fitted with dust extraction units and mist spray to keep down the dust emission levels. The suspended particulate matter value at a distance of 40 m from a unit located in such a cluster should be less than 500 μg/m³. The contractor shall provide necessary certificates to confirm that all crushers used in the project conform to relevant dust emission control legislation. Air pollution monitoring shall be conducted as per the Pollution Monitoring Plan and results shall be used to strengthen/rectify problematic areas. If other existing crushers are used, such units need to have valid license from the KSPCB.

Emission from Construction Vehicles, Equipment and Machineries

Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm to the emission standards specified by the CPCB. Certification issued for such contrivances obtained from designated/approved authority shall be submitted along with the specified reporting format. The contractor shall maintain a separate file and submit PUC certificates for all vehicles/equipment/machinery used for the project. Monitoring results shall also be submitted to CSC and SPV as per the Pollution Monitoring Plan in the specified format.

Since the assessment was during monsoon, no instances of dust pollution could be evidenced.

PUC certificate (test date and due dates) of all vehicles are being maintained by the MTL package and Hosur Interchange.

Site observations visit

Report on stack emission from Hot Mix Plant of RNS contractor (MTL package) not available for review.

Noise Pollution

Noise Pollution: Noise from Vehicles, Plants and Equipment

The Contractor shall confirm the following:

- All plants and equipment used in construction shall strictly conform to the MoEF/CPCB noise standards.
- All vehicles and equipment used in construction shall be fitted with exhaust silencers.
- Servicing of all construction vehicles and machinery shall be done regularly and during routine servicing operations, the effectiveness of exhaust silencers

All new machineries are fitted with exhaust silencers. Maintenance records were seen for equipment owned by the contractor. However majority of the construction vehicles are hired, hence records of maintenance could not be verified.

For construction of a bus station, it was observed that DG set was being used
shall be checked and if found defective shall be replaced.

- Limits for construction equipment used in the project such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter distance from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986.
- Idling of temporary trucks or other equipment shall not be permitted during periods of unloading or when they are not in active use. (MoRTH - Section: 201.2)

At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, concrete mixing, batching shall be stopped during the night time between 9.00 pm to 6.00 am. No noisy construction activities shall be permitted around educational institutes/health centers (silence zones) up to a distance of 100 m from the sensitive receptors i.e., school, health centers and hospitals between 9.00 am to 6.00 pm. Monitoring shall be carried out at the construction sites as per the monitoring schedule and results shall be submitted to Engineer-In charge of CSC. Engineer shall be required to inspect regularly to ensure the compliance of EMP. (Refer MoRTH - Section 111.3)

Safety
Safety Procedures

The Contractor shall:

- Comply with all applicable safety regulations,
- Take care for the safety of all persons entitled to be on the site,
- Use reasonable efforts to keep the site and works clear of unnecessary obstruction so as to avoid danger to these persons, provide fencing, lighting, guarding and watching of the works until completion and taking over and 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 of owners and occupiers of adjacent land.

without sound enclosure hence there will No noise pollution. Monitoring of ambient noise is being done only in package 10 and MTL package.

Safety related lapses such as equipment without guarding, non-usage of PPEs, non-conformance to electrical safety norms, unsafe acts etc. were observed.

[Refer site visit observations for details]
| Care and Supply of Documents | The Contractor shall prepare, submit and obtain approval of the Engineer for Construction Safety Management Plan 14 days prior to commencement of Construction Works at site. | This stage has passed, however during site visit these documents were not available for review. [All packages] | Discussion with PMC |
| 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: | Seasonal labour force work on site, hence there are new/labour workers working on site periodically. So, health records of labours are not maintained, on site. | Site visit observations |
| Personal Safety Measures for Labour, Material handling, Painting etc. | Contractor shall provide all necessary safety appliances such as safety goggles, helmets, safety belts, ear plugs, mask etc. to workers and staff.  
- Protective footwear and protective goggles to all workers employed on mixing asphalt materials, cement, lime mortars, concrete etc.  
- Welder’s protective eye-shields to workers engaged in welding works | Instances where PPEs not conforming to IS code, non-replacement of damaged PPEs, unsafe scaffolding etc. were observed. [Refer site visit observations for details] | Site visit observations |
- Protective goggles and clothing to workers engaged in stone breaking activities and workers shall be seated at sufficiently safe intervals.
- Earplugs to workers exposed to loud noise (above 75dB (A)), and workers working in crushing, compaction, or concrete mixing operation.
- Adequate safety measures for workers during handling of materials at site are taken up. The contractor shall comply with all regulations regarding safe scaffolding, ladders, walking platforms, gangway, stairwells, excavations, trenches, and safe means of entry and egress.
- The contractor shall not employ any person below the age of 14 years for any work and no woman shall be employed for the work of painting with products containing lead in any form.
- The contractor shall also ensure that no paint containing lead or lead

Traffic Safety & Pedestrian Safety
Pedestrian Safety shall be ensured. Pedestrian circulation shall be demarcated prior to start & unsafe areas shall be cordoned off.

Risk from Electrical Equipment(s)
The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that:
- No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public.
- All necessary fencing and lights shall be provided to protect the public in construction zones.
- All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Engineer – In charge.

First Aid
The contractor shall arrange for:
- A readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone.

In general barricading is there, but instances of insufficient barricading were observed. [Package 10, 9 & 3]

Site observations visit
Instances were observed wherein moving body safety guards of machine was not in place, body earthing of DG sets not in place and electric connection to machinery without ELCB and plug socket etc.

First aid box was not available at the MTL project site and package 8. Training records on first aid also could not be evidenced.

Site observations visit
• Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital
• Equipment and trained nursing staff at construction camp.

Labour Camp Management
Location of construction camps

• The contractor shall provide, if required, erect and maintain necessary (temporary) living accommodation and ancillary facilities during the progress of work for labour to standards and scales approved by the Engineer- In-charge.
• Contractor shall follow all relevant provisions of the Factories Act, 1948 and the Building & other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction & maintenance of labor camp.
• Construction camps shall not be proposed within 1000m from the nearest habitation to avoid conflicts and stress over the infrastructure facilities, with the local community. The location, layout and basic facility provision of each labour camp shall be submitted to Engineer prior to their construction.

The construction shall commence only upon the written approval of the Engineer – In-charge.

Potable Water

The Contractor shall construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing, within the precincts of every workplace in an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.

The contractor shall also guarantee the following:
• Supply of sufficient quantity of potable water (as per IS) in every workplace/labor camp site at suitable and easily accessible places and regular maintenance of such facilities.
• If any water storage tank is provided that shall be kept such that the bottom of the tank is at least 1mt. from the surrounding ground level.

MTL and Package 8

Labour camp of package 10 was in area close to the site. Also it was not in proximity to other habitation.

Site visit observations.

Potable Water

Bore well water or tanker water is being directly used for drinking and other purposes without any disinfection/purification except package 10 where water purifier was available.

Site visit observations.
• If water is drawn from any existing well, which is within 30mt. proximity of any toilet, drain or other source of pollution, the well shall be disinfected before water is used for drinking.
• All such wells shall be entirely covered and provided with a trap door, which will be dust proof
• A reliable pump shall be fitted to each covered well. The trap door shall be kept locked and opened only for cleaning or inspection, which will be done at least once in a month.
• Testing of water shall be done every month as per parameters prescribed in IS 10500:1991.
• Compliance to EMP shall be reported to Engineer - Incharge every week. Engineer - Incharge shall inspect the labour camp periodically, to ensure compliance of the EMP.

Sanitation and Sewerage System
The contractor shall ensure that -
• The sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place
• Separate toilets/ bathrooms, wherever required, screened from those from men (marked in vernacular) are to be provided for women
• Adequate water supply is to be provided in all toilets and urinals
• All toilets in workplaces are with dry-earth system (receptacles) which are to be cleaned and kept in a strict sanitary condition
• Night soil is to be disposed off by putting layer of it at the bottom of a permanent tank

Toilets of the labour camp (Hosur interchange) did not have lights.
Site visit observations

Toilets at labour camp are reportedly connected to septic tank.

Water has to be separately taken from the washing facilities, as there is no separate tap or flushing facility inside these toilets.
The bathing/washing area is currently open.

[Package 10]

Waste Disposal
The contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Engineer - Incharge. Unless otherwise arranged by local sanitary authority. The contractor has to make arrangements for disposal of night soils (human excreta) either by suitably

Garbage bins could not be evidenced at the labour camp
Site visit observations

[Package 10]
Stock Yards
Location for stockyards for construction materials shall be identified at least 1000 m from water course and separated and sufficiently away from the labour camps. Separate enclosures shall be planned for storing construction materials containing fine particles such that sediment-laden water does not drain into nearby storm water drain & underground sewerage pipes.

Fuel storage and refueling areas

No such instances were observed where stock yards and fuel storage/refueling areas are close to any water course.

Site visit observations
Conclusions and recommendations

- Many safety related findings were identified including violation of electrical safety norms, PPE non-compliance, unsafe acts and conditions etc. It is recommended to increase the frequency of safety inspections, and to conduct a specialized electrical safety audit at all construction sites. Further it is recommended to introduce control measures such as imposition of penalty on non-compliances with safety norms.
- Drinking water was not available at MTL package. It is recommended that drinking water should be available at all sites. Also drinking water provided should be tested periodically (at least once every quarter) as per IS 10500.
- Toilet facilities at the labour camp of Package 10 needs to be improved. Lights and water supply should be provided at these toilets. Also they should be cleaned regularly multiple times in a day.
- Bore wells are being used for construction activities without permission from the Central Ground Water Authority. It is recommended that permission for withdrawal of ground water should be taken from the concerned statutory authorities. It is also recommended to install meters to measure the water usage.
- Labour license has been obtained for 40 workers by RNS for the MTL package. However, reportedly there are approximately 50-100 workers (RNS - MTL). The contractor should obtain a license for employing the maximum number of workers expected for performing the scope of work.
- Near the KIMS bus stop, it was observed that the onward road had two separate gradients (elevation) without proper barricading. This setup increases the chances of accidents during night time. It is recommended to close one of the lanes for traffic movement.
- Licenses for operation of construction vehicles were in general not available at the sites. It should be ensured at the time of induction that the driver/operator of the construction equipment/vehicle have the necessary training and licenses. The copy of licenses and training certificates should also be maintained at the site.
- It is also recommended to register all eligible workers under the Building and Other Construction Workers Act.
As per the new amendment dated 4th April, 2011 to EIA notification 2006, widening and expansion of existing state highways have been exempted from the ambit of environmental clearances, and have been not categorized either as Category A or Category B. Therefore, the project does not require clearances from the State Environmental Impact Assessment Authority or the MoEF. However, the project shall require obtaining consent from competent authorities such as the KSPCB, for Consent to Establish by submitting a Common Application (as per Schedule-I), under Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981 and authorization under Hazardous Wastes (Management and Handling) Rules, 1989, as amended. In addition, clearances from the Forest department1 for the felling of trees within the proposed RoW. The clearances to be obtained by KRDCL / contractor prior to commencement of civil works are presented below.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Clearances</th>
<th>Acts</th>
<th>Approving Agency</th>
<th>Applicability to the Project</th>
<th>Time Required</th>
<th>Responsibility</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No Objection Certificate (NOC)</td>
<td>Water (Prevention and Control of Pollution) Act 1974, Air (Prevention and Control of Pollution) Act 1981</td>
<td>Karnataka Pollution Control Board</td>
<td>Applicable</td>
<td>3 months</td>
<td>KRDCL</td>
<td>Consents for cruiser for MTL package has been applied. Other have the CTE and CTO</td>
</tr>
<tr>
<td>2.</td>
<td>Permission for removal of tree growth within the PROW Felling conversion and removal from stump site</td>
<td>Forest Conservation Act 1980, The Karnataka Preservation of Trees Act, 1976</td>
<td>Local Divisional Forest Officer (Deputy Conservator of Forests/Tree Officer)</td>
<td>Applicable</td>
<td>Already obtained</td>
<td>Forest department</td>
<td>KRDCL</td>
</tr>
<tr>
<td>3.</td>
<td>Permission for Withdrawal of Ground Water</td>
<td>Environment Protection Act 1986</td>
<td>Central Ground Water Board Water Resource department,</td>
<td>Applicable</td>
<td>2 months</td>
<td>Contractor</td>
<td>NOC has not been obtained. Meters also have not been</td>
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<td>S.No</td>
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<td>Acts</td>
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<tr>
<td>4.</td>
<td>Permission for Withdrawal of Surface Water from Rivers, Nala, Water harvesting structure/ Reservoirs/ Ponds/ Irrigation canals</td>
<td>Karnataka State Water Policy, 2002</td>
<td>Karnataka</td>
<td>Applicable (if the contractor is extracting surface water)</td>
<td>3 months</td>
<td>Contractor</td>
<td>KRDC, WB Projects, CSC</td>
</tr>
<tr>
<td>5.</td>
<td>Hot mix plant, Crushers, Cement Batching Plant</td>
<td>Air (Prevention and Control of Pollution) Act. 1981</td>
<td>Karnataka Pollution Control Board</td>
<td>Applicable</td>
<td>3 months</td>
<td>Contractor</td>
<td>KRDC, WB Projects, CSC</td>
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<tr>
<td>6.</td>
<td>Storage of Hazardous Chemicals</td>
<td>Hazardous Waste (Management and Handling) Rules 1989 and Manufacturing Storage and Import of Hazardous Chemicals Rules 1989</td>
<td>Karnataka Pollution Control Board</td>
<td>Applicable</td>
<td>3 months</td>
<td>Contractor</td>
<td>KRDC, WB Projects, CSC</td>
</tr>
<tr>
<td>S.No</td>
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<td>8.</td>
<td>Disposal of Construction Waste and liquid effluent from Labour camps</td>
<td>Water (Prevention and Control of Pollution) Act 1974</td>
<td>Karnataka Pollution Control Board</td>
<td>Applicable</td>
<td>2 months</td>
<td>Contractor</td>
<td>KRDCL, WB Projects, CSC</td>
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<tr>
<td>9.</td>
<td>Pollution Under Control Certificate</td>
<td>Central Motor Vehicles Act 1988</td>
<td>Department of Transport, Govt. of Karnataka</td>
<td>Applicable</td>
<td>1 Month</td>
<td>Contractor</td>
<td>KRDCL, WB Projects, CSC</td>
</tr>
<tr>
<td>10.</td>
<td>Employing Labour</td>
<td>Executing Agency of Building and other construction act, 1996</td>
<td>District Labour Commissioner</td>
<td>Applicable</td>
<td>1 Week</td>
<td>Contractor</td>
<td>KRDCL, WB Projects, CSC</td>
</tr>
<tr>
<td>11.</td>
<td>Registration of Workers</td>
<td>Labour welfare Acts.</td>
<td>District Labour Commissioner</td>
<td>Applicable</td>
<td>1 Month</td>
<td>Contractor</td>
<td>KRDCL, WB Projects, CSC</td>
</tr>
</tbody>
</table>
Photographic evidences

Grinding machine without guard

Nonstandard gloves being used by Mason

Worker working on platform at height without safety harness
Scaffolding not anchored with the building

Workers at MTL site without safety shoes, gloves and reflector jacket

DG set without sound encloser. Also it gives power to machines/equipments without ELCB
Unsafe temporary access and no barricading near deep excavation

Unsafe temporary access and no barricading near deep pit

Working at height without safety harness, safety shoes and gloves
Temporary electrical connections

Unsafe scaffolding without flat concrete base. The scaffolding is resting on unsafe base which may result in collapse of scaffolding

No water connection in the labour camp toilets. Also no light inside the toilets (Hosur Interchange)