

## Appendices

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Appendix-1      Questionnaires

## Safety and Quality Control System Checklist for the Employer

Notes 1: This questionnaire is to be answered by the Employer.  
2: To confirm how to fill in the questionnaire, the attached sample checklist can be referred to.

Country: India

Project Name: Western Dedicated Freight Corridor Project

Filled by:		
Items to Confirm	Items to be Confirmed	Confirmation Result
(1) Laws and various standards related to safety and quality control	Availability of laws and various standards related to safety and quality control, as well as the names of those laws and contents of related provisions (1) Names of laws (2) Contents of related provisions	1. Indian railways Permanent way manual (IRPWM, Chapter 11,12 & 13) which includes safety at work sites. 2. SHE Framework and Management as per chapter no. 16 of contract agreement, Part III. It includes general obligations, compliance; contractor's SHE Plan and Policy, organization with the contractor for its compliance, training and inspection, audit, accident reporting and investigation and emergency response plan. 3. Applicable labor laws of the country as per chapter no. 16 of contract agreement, Part III. It includes daily wage rates, condition of labor and labor camps, labor laws, labor safety, working hours, etc. 4. Occupational Health and Safety, Environmental & Social Safety and Management, site safety for temporary and permanent works covered under chapter no. 16 of contract agreement, Part III.
	Availability of safety and quality control manuals at the executing agency (Employer) (1) Names	1. Contract Agreement for Pckg 1 & 2, Part III (chapter 16). 2. Contract Agreement PMC WDFC Ph. I (Appendix A,

Items to Confirm	Items to be Confirmed	Confirmation Result
(2) Contents (examples of items to be described)	<ul style="list-style-type: none"> <li>● Is the method of patrolling the sites (frequency of such patrols, etc.) indicated as reference?</li> <li>● Is the frequency with which consultants and contractors are consulted indicated as reference?</li> <li>● Are the rules and regulations (or manuals) governing safety and quality control included?</li> </ul>	Annexure II). 3. Indian railways Permanent way manual (IRPWM, Chapter 11,12 & 13).  Yes (Frequency of patrolling of sites, etc. indicated in it for officials responsible for Safety.)  Yes (SHE meetings and other safety related meetings for consultation with contractor and engineer provided in clause no. 8.2 of the chapter no. 16 of contract agreement, Part III.) Yes (covered under chapter no. 16 of contract agreement, Part III.)
(2) Assigned missions of departments in the executing agency in charge of safety and quality control, and assigned tasks of the staffs	Identification of the safety and quality control department and number of staff members  Details of the assigned missions of the department in charge of safety and quality control (1) Current status of implementation of site patrols (2) Availability of accident statistics related to all projects under jurisdiction of the executing agency (Employer)(Attach accident data for the past three years) (3) Guidance and instructions for consultants and contractors (4) Documents on the mandates of the department in charge of safety and quality control (Attach the document) (5) Others (Describe specifically)	<ul style="list-style-type: none"> <li>● No. of total staff members at the executing agency (Employer): 38</li> <li>● Name of the safety and quality control department: DFCCIL, Jaipur for their jurisdiction.</li> <li>● No. of staff members in the department above: 38</li> </ul> 1. Regular visit by field officials & safety officials. 2. Details provided in this para below for CTP 1 & 2 contract. Other contract packages - EMP 4 has just started and STP 5 & 5A recently awarded. 3. SHE and other safety meetings are held regularly as per provisions in the Pckg 1 & 2 contract agreement, Part III, Chapter 16 and PMC contract agreement, Appendix A, Annexure 2. These are participated by Employer and interacted with the Engineer and Employer. 4. Environment Health & Safety Handbook, Railway Construction Safety Booklet. (copy of booklets attached)

Items to Confirm	Items to be Confirmed	Confirmation Result
		5. SHE policy of DFCCIL.
	Current conditions of implementation of training for staff in charge of safety and quality control (Reference) <ul style="list-style-type: none"> <li>● Training in the safety and quality management system</li> <li>● Training in matters related to laws</li> <li>● Training in developing awareness of the dangers of accidents</li> <li>● Training in the role of safety and quality control in the executing agency (Employer)</li> <li>● Training in construction method and method of safety and quality control</li> <li>● Training in method of collecting accident statistics and their effective utilization</li> <li>● Training in accident prevention techniques</li> <li>● Others</li> </ul>	(Describe the contents of training) All training modules are organized by SLT at regular intervals attended by staff of this office which includes safety induction training to new entrants and employees of sub – contractor, tool box meeting, audio visual safety film presentation, mock drill, fire fighting and counseling workers on safety precautions while working along IR track. Apart from this, training at Zonal Training Centre, Udaipur for safety is attended by staff at induction level. Various training programs, conferences and seminars on railway safety, OHS at construction sites, accident prevention and quality control conducted by reputed professional institutes and agencies are attended by staff of the employer from time to time.
	Information concerning past accidents in construction, etc. (1) Has the information concerning past accidents been accumulated? In addition, ascertain what the policy is for accumulating accident information (e.g., recording information on only accidents resulting in death in accordance with the organizational rules). (2) Components and contents of accident information (Reference) <ul style="list-style-type: none"> <li>● No. of accidents</li> <li>● Situation in which accidents occur</li> <li>● Scale of accident (amount, number of casualties, existence or</li> </ul>	Details of the accidents on the Project as below :- 1. On 07-09-2015 one truck (dumper) overturned at Kachera site. No casualty. 2. On 24-01-2015 on truck carrying steel bar overturned due to uneven surface in Bhagega sleeper plant. One casualty. 3. On 20-07-2015 shuttering of bridge no 1A collapsed at Rewari detour area. No casualty. 4. On 27-07-2015 shuttering of via duct collapsed at Renwal. No casualty. 5. On 20.10.2015 one labourer was run-over by the grader roller. Detailed report awaited.

Items to Confirm	Items to be Confirmed	Confirmation Result
	nonexistence of third-party injuries) <ul style="list-style-type: none"> <li>● Emergency response</li> <li>● Cause of accident</li> <li>● Future prevention method</li> <li>● Others (Describe specifically)</li> </ul>	In all such cases, investigation reports have been prepared, details shared with the employer as well as contractor, necessary corrective/ preventive measures implemented, and consultation/ awareness programs organized by contractor and engineer also participated by the employer.
(3) Assignment plan for staff in charge of safety control related to the Japanese ODA loan project	Assignment plan for staff in charge of safety control related to the Japanese ODA loan project (1) No. of staff members in charge of safety control (2) Is there any specific assignment plan, with a specific job description for each person?	<ul style="list-style-type: none"> <li>● No. of the total staff members in the executing agency : 38 Persons (CPM, Jaipur unit)</li> <li>● No. of construction management staff: Approximately 24 persons (Engineer)</li> <li>● No. of staff members in charge of contractors: 61 persons</li> </ul>
(4) Capacity and experience of staff in charge of safety and quality control	Projects in which the staff handled safety and quality control (1) Projects handled (2) Names of positions the staff held or their status therein (3) Details of the service performed	More than 50% staff at DFCCIL is from Indian Railways having adequate experience in safety and quality control. All of them have handled more than one assignment and have responsibly handled safety and quality control in railway projects. The new inductions to the organization are trained through an elaborate course designed to sensitize and work with these aspects given priority at the highest level.
(5) System of ensuring safety and quality control in the executing agency	Method of ensuring safety and quality control in the executing agency (Employer) (1) Regular consultative meetings with construction managers and contractors (2) Site patrol (3) Others (Describe specifically)	For ensuring safety, apart from safety experts of DFCCIL, regular visit by field engineers is done. SHE and other safety meetings are held regularly as per provisions in the Pckg 1 & 2 contract agreement, Part III, Chapter 16 and PMC contract agreement, Appendix A, Annexure 2. These are participated by Employer.

Items to Confirm	Items to be Confirmed	Confirmation Result
(6) Preventive action procedure	Availability of preventive action procedure to prevent occurrence of an accident or an undesirable situation and current situation of implementation of such procedure	Responsibility lies with the contractor as per contract agreement. However Engineer has a specific task to ensure safety along the IR track, for OHS as well as for general public also.
(7) Framework for emergency response system to accidents	<p>Specific method of sharing information within the executing agency (Employer) when an accidents occurs</p> <p>* Briefly describe the framework for sharing information when an accident occurs. Attach a phone calling tree, relevant regulations, etc. as needed.</p> <p>(1) The manual for responding to an accident</p> <p>(2) Is the department to contact in the case of an accident described in the manual?</p> <p>Method of keeping staff members in the executing agency (Employer) informed about the framework for responding to an accident</p> <ul style="list-style-type: none"> <li>Implementation status of holding a briefing session to inform all staff members about the manual and its contents.</li> <li>Submission of an accident report and holding of investigative commissions</li> </ul>	<p>Contractor has prepared a manual for responding to any emergencies in an accident.</p> <p>Emergency contact numbers have been displayed at all site huts and major construction sites as well. Ambulances have been provided at all major site offices by the contractor for immediate relief and medical support.</p> <p>A control room has been set up in Ajmer by contractor which functions round the clock and in case of any accident it functions as the nerve centre for all relevant information.</p> <p>All these are as per contractual provisions listed above and contractor's SHE Plan approved by the Engineer.</p> <p>In Monthly SHE meetings, SHE Director of contractor briefs about all incidents &amp; accidents in the previous month and also shares the completed enquiry reports. These meetings are attended by employer, engineer and contractor.</p>
(8) Method adopted by the executing agency to confirm training programs in safety and quality control provided by	<p>Method of confirmation adopted by the executing agency (Employer)</p> <ul style="list-style-type: none"> <li>Method of confirmation of the training schedule before construction (in-house education, qualification training)</li> <li>Method of confirmation of the training schedule during</li> </ul>	<p>More than 50% of staff in DFCCIL is on deputation from Indian Railway and therefore have adequate knowledge and experience of safety and quality control procedures and rules.</p> <p>For new entrants on joining DFCCIL, they are given induction</p>

Items to Confirm	Items to be Confirmed	Confirmation Result
contractors for workers	construction (safety conventions, consultative meetings to discuss safety, post accident response conference, etc.)	<p>and orientation training on safety. Thereafter they are sent to Indian Railways training school in Udaipur where they are given detailed training in all aspects.</p> <p>Accidents reports are shared with all employees of DFCCIL and meeting held thereafter to discuss the shortcomings and prevention of the same thereafter.</p>

## Questionnaire for Safety & Quality Management for the Consultant

Notes 1: This questionnaire is to be answered by the Consultant.  
2: The Consultant is expected to obtain the Employer's approval prior to submission of the answered questionnaire to the JICA study team.

Country: India

Project Name: Western Dedicated Freight Corridor Project (Rewari – Vadodara Section of Phase 1)

Items	Points to be Clarified	Answer
<b>A. General</b>		
A1. The Consultant overall project management	<ol style="list-style-type: none"> <li>Project Management Plan as Attachment-A1</li> <li><u>Monthly Reports</u> Latest, for the months of peak time, accidents, right before accidents as Attachment-A2</li> </ol>	<ol style="list-style-type: none"> <li>Inception Report: A. Work Plan, B. Service Approach and C. Our Methodology.</li> <li>PMC Monthly Report ( Aug., July. and Feb. 15)</li> </ol>
<b>B. Occupational Safety &amp; Health (OSH)</b>		
B1. Provisions related to OSH in the Consultancy Contract with the Employer	<ol style="list-style-type: none"> <li>Copy of the Contract to be attached as Attachment-B1</li> </ol>	<ol style="list-style-type: none"> <li>The brief description to the Contract Provisions related to OSH are given in the "Annexure to Description of Services" of the Contract Agreement (p.90-109) as a) Annex 1 – Impact Assessment for Environmental and Social Aspects, and b) Annex 2 – Safety, Health and Environment (SHE) Requirements. However, the detailed Employer's Requirements also applying to the Consultancy Contract are stipulated in the Bid Documents (Vol. II and III) of the respective Contract Packages.</li> </ol>
B2. The Consultant OSH management plan submitted	<ol style="list-style-type: none"> <li>Copy to be attached as Attachment-B2</li> </ol>	<ol style="list-style-type: none"> <li>Consultant's monitoring, supervision, and</li> </ol>

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to the Employer, if any		management plan of Contractor's SHE activities is submitted in the Inception Report - C1.5.
B3. Staffs in charge of OSH management in the consultant organization	<ol style="list-style-type: none"> <li>Names and job title of the staffs in charge of OSH management</li> <li>Job description of the above staffs and power or authority delegated to them including qualifications required</li> <li>Copy of the Consultant overall organization charts (Initial &amp; Peak time/Latest) to be attached as Attachment-B3</li> </ol>	<ol style="list-style-type: none"> <li>Inception Report - Annexure 02, SHE Team Organization Chart</li> <li>Inception Report - Annexure 04, PMC Service Contract Appendix A - TOR 7 Staffing for supervising consultancy services</li> <li>Inception Report - Annexure 02</li> </ol>
B4. OSH-related procedure & documentation which the Consultant to implement before commencement of construction of each part of work	<ol style="list-style-type: none"> <li><u>Procedure</u></li> <li><u>Documents to be submitted by the contractor to the consultant</u></li> </ol>	<ol style="list-style-type: none"> <li>Consultant to submit inception report</li> <li>Contractor to submit, 1) SHE Policy, 2) SHE Plan, Site SHE Plan 3) Traffic management plan, 4) Construction design drawings, 5) Method statement (including hazard and risk assessment) before commencement of each part of work</li> </ol>
B5. OSH-related site inspection conducted by the Consultant	<ol style="list-style-type: none"> <li><u>Inspection procedure</u> Timing of Inspection, qualification of an inspector, how to carry out inspection, how to cope with defects detected</li> </ol>	<ol style="list-style-type: none"> <li>Inspections are carried out every week by qualified and experienced SHE personnel. Observations by the consultant are shared with the contractor's site in charge. Inspection reports are issued to the contractor within a few days after inspection. The contractor to submit compliance report as soon as all the issues are resolved and confirmed by the Consultant during re-inspection.</li> </ol>

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B6. OSH Meeting structure organized/managed by the Consultant	1. <u>Meeting Structure</u> Name, timing/frequency, participants, protocol	1. <u>SHE Committee Meeting</u> – Monthly Contractor: Project Director, SHE Director, Chief Accident Prevention Officer (CAPO), Senior Accident Prevention Officers (SAPO), (Package/Section managers) PMC: Chief Safety Expert, Environmental Engineer, ARE Labor Protection DFCC: Project Managers/Assistant Project Managers(l/c of Safety & SHE Issues)  <u>Site SHE Committee Meeting</u> – Weekly (Section-wise) Contractor: Package/Section managers, Site Engineer/ SAPO, Senior Health Officer (SHO) PMC: Resident Engineer (RE),Assistant Resident Engineer(ARE), SHE members of Zonal Field Team (ZFT).  These meetings are carried out as per Provisions in the SHE Requirements of the Contract Agreement. Whenever Monthly SHE Committee Meeting is held at site, joint safety patrol is conducted before the safety meeting.
C. Safety of Works / Quality		
C1. Provisions related to Quality Control/Management in the Consultancy Contract with the Employer	1. Copy of the Contract to be attached as Attachment-C1	1. Contract agreement. Part 2, appendix 7 is specifically for the quality. Please see attached.

	2. <u>Review Procedure &amp; Documentation</u> Timing of review, qualification of reviewer, preparation of comments, review of comment reply, process for approval etc.	and 528) 2. The contractor prepares and submits method statement before commencing the work. The consultant review and give comments on it. The consultants gives notice of no objection once the contractor incorporate all the consultant's comments.
C7. Quality-related site inspection by the Consultant	1. <u>Inspection procedure</u> Timing of Inspection, qualification of an inspector, how to carry out inspection, how to cope with defects detected	1. The inspection procedure is based on the Contractor's quality procedure for inspection and testing. The inspection by the Engineer on the responsibility of the ZFT ( zonal field team).Timing of the inspection is base on the schedule mentioned in the RFI ( request for inspection from the Contractor). Ways and means on how to carry out inspection was in the Inception report, B.5 clause (2) and C.1.7. Once a defect/s is detected, an Engineering instruction to raise non conformance report to address the defect will be issued to Contractor. The Contractor shall issue the NCR in accordance with its quality system.
C8. Design/Quality-related Meeting structure organized/managed by the Consultant	1. <u>Meeting Structure</u> Name, timing/frequency, participants, protocol	1. QA/QC meeting ( Contractor-Engineer) is being conducted every 2 weeks at the Engineer's conference office. The Design team also is conducting separate meeting with the Contractor regarding design issue.
D. Risk Management		
D1. The Consultant Risk Management Plan submitted	1. <u>Risk Management Plan</u>	Not available

C2. The Consultant Quality Plan submitted to the Employer, if any	1. Copy to be attached as Attachment-C2	1. Inception report. A.2. Quality assurance policy and plan and quality assurance and quality control, C.1.7
C3. Staffs in charge of Quality Control/Management in Organization of the Consultant	1. Names and job title of the staffs in charge of Quality Control/Management 2. Job description of the above staffs and power or authority delegated to them including qualifications required	1. Inception report – Annexure 02, The quality head is the chief Quality Engineer, Mr. Kunesada ( out of the work from Dec 2014 to present) and being supported by chief quality expert, Emilio Mason ( as acting Chief quality Engineer since Dec 2014)
C4. Review of permanent works design	(Before Construction) 1. <u>Review Procedure of Consultant/Independent Design Checker</u> Timing of internal review, qualification of reviewer, process for approval etc. (During Construction, including in case of design change) 2. <u>Review Procedure of Consultant/Independent Design Checker</u> Timing of internal review, qualification of reviewer, process for approval etc.	1. This is a design and built contract. The contractor responsible for the design. The consultant to reviewed the drawings submitted by the contractor and give notice of no objection. Technical design drawings are reviewed at CMT.
C5. Role of the Consultant at the review of construction drawings, design of temporary works, and shop drawings	1. <u>Review Procedure &amp; Documentation</u> Timing of review, qualification of reviewer, preparation of comments, review of comment reply, process for approval etc. 2. <u>Responsibilities of Independent Design Checker, if specified</u>	1. This is a design and built contract. The contractor responsible for the design. The consultant to reviewed the drawings submitted by the contractor and give notice of no objection. Construction design drawings are reviewed at ZMT
C6. Review of method statements	1. <u>Requirements for Method Statement contents</u>	1. Employer's Requirement Volume III: (pp.57,364

to the Employer, if any	Copy to be attached as Attachment-D1 2. <u>Procedure &amp; Documentation</u>	
E. Accidents		
E1. Information on accident & near misses (including unofficial information)	1. <u>Accident Reports</u> Copy to be attached as Attachment-E1 2. <u>Near Miss Reports (Hiyari-Hatto Reports)</u> Copy to be attached as Attachment-E2	1. Following reports are to be attached – a) Fatal accident report on truck toppling (Jan 2015). b) Serious injuries report on rebar cage collapse (July 2015). c) Near miss reports during last 2 months (Aug & Sept 2015) d) Any other – Hiyari-Hatto Reports

## Documents to be attached:

- A1: Project Management Plan
- A2: Monthly Reports - Latest, for the months of peak time, accidents, right before accidents
- B1: Provisions related to Occupational Safety & Health (OSH) in the Consultancy Contract
- B2: The Consultant OSH management plan (or Safety Plan, etc.)
- B3: The Consultant overall organization charts (initial), highlighting staffs in charge of OSH management  
The Consultant overall organization charts (peak time/latest), highlighting staffs in charge of OSH management
- C1: Provisions related to quality control/management in the Consultancy Contract
- C2: The Consultant Quality Plan
- D1: The Consultant Risk Management Plan
- E1: Accident Reports
- E2: Near Miss Reports (Hiyari-Hatto Reports)

**Questionnaire for Safety & Quality Management for the Contractor**

Notes  
 1: This questionnaire is to be answered by the Contractor.  
 2: The Contractor is expected to obtain the Consultant's approval prior to submission of the answered questionnaire to the JICA study team.

Items	Points to be Clarified	Answer
A. General		
A1. The Contractor overall project management	1. Project Management Plan as Attachment-A1	File attached -Folder A1 Plans have been produced and submitted to the PMC for approval in with the contract requirements
	2. <u>Monthly Reports Latest, for the months of peak time, accidents, right before accidents as Attachment-A2</u>	File attached monthly PRM reports PRM is a monthly management review chaired the Project Director or Managing Director. SHE is part of the agenda where performance and objectives are discussed

Items	Points to be Clarified	Answer
B. Occupational Safety & Health (OSH)		
B1. Provisions related to OSH in the Construction Contract with the Employer	1. Copy of the Contract to be attached as Attachment-B1	Volume 3- Clause 16 SHE Requirements attached These documents were produced at the early stage of the project and is regularly revised and updated. Copies are sent to all sites
B2. The Contractor OSH management plan submitted to the Employer	1. Copy to be attached as Attachment-B2	Submitted vide SLT letter no.2030 dated 06-02-2015 As above these are cascaded to sites
B3. Staffs in charge of OSH management in the contractor organization	1. Names and job title of the staffs in charge of OSH management	SHE Director- Mr Nigel Wirtz submitted vide letter no 368 dated 22.03.2014 (UK National)
	2. Job description of the above staffs and power or authority delegated to them including qualifications required	Submitted vide letter no.2906 dated 30.04.2015 - job descriptions are provided in line with the contract requirements and L&T standards
	3. Copy of the Contractor overall organization charts (Initial & Peak time/Latest) to be attached as Attachment-B3	Organization Chart Attached - This was created at the beginning of the contract and is updated as when required
B4. OSH-related procedure & documentation which the Contractor to implement before commencement of construction of each part of work	1. <u>Procedure</u>	Included in the SHE Plan
	2. <u>Documents to be submitted by the contractor to the consultant</u>	Method statement & HIRA

B5. OSH-related site inspection conducted by the Contractor internally, including HQ's safety patrol	1. <u>Inspection procedure</u> Timing of inspection, qualification of an inspector, how to carry out inspection, how to cope with defects detected	1. SHE Inspection conducted based on Monthly SHE activity plan 2. Defectives sent to office by weekly basis in Inspection tracker & being discussed in Site SHE committee meeting
B6. OSH Meeting structure organized/managed by the Contractor internally, including in HQ	1. <u>Meeting Structure</u> Name, timing/frequency, participants, protocol	1. Project SHE committee meeting conducted once in every month at Apex level. 2. Site SHE committee meeting conducted once in every week at site.

Items	Points to be Clarified	Answer
C. Safety of Works / Quality		
C1. Provisions related to Quality Control/Management in the Construction Contract with the Employer	1. Copy of the Contract to be attached as Attachment-C1	Volume 3 produced
C2. The Contractor Quality Plan submitted to the Consultant	1. Copy to be attached as Attachment-C2	DOC/CTP 1 & 2 /QAQC/POAP/01 REV 2 DATED 05.05.2015 Approved by NKC vide letter no.L-NKC-SLT-PMC-1505-118 DATED 18.05.2015
C3. Staffs in charge of Quality Control/Management in Organization of the Contractor	1. Names and job title of the staffs in charge of Quality Control/Management	This is has been submitted to PMC
	2. Job description of the above staffs and power or authority delegated to them including qualifications required	This is has been submitted to PMC
C4. Review of permanent works design	(Before Construction) 1. <u>Review Procedure of Contractor/ Independent Design Checker</u> Timing of internal review, qualification of reviewer, process for approval etc.	The method statement is produced in advance o the work and is submitted to PMC for approval
	(During Construction, including in case of design change) 2. <u>Review Procedure of Contractor/ Independent Design Checker</u> Timing of internal review, qualification of reviewer, process for approval etc.	
C5. Preparation of construction drawings, design of temporary works and shop drawings	1. <u>Preparation Procedure &amp; Documentation</u> Timing of preparation, qualification of engineers in charge, process of internal review, etc.	
	2. Responsibilities of Independent Design Checker, if specified	
C6. Preparation of method statements	1. <u>Standard format of Method Statement</u>	Standard orm is used throughout the company
	2. <u>Preparation Procedure &amp; Documentation</u> Timing of preparation, qualification of engineers in charge, process of internal review, etc.	F standard forms

C7. Quality-related site inspection by the Contractor internally	1. <u>Inspection procedure</u> Timing of inspection, qualification of an inspector, how to carry out inspection, how to cope with defects detected	
C8. Design/Quality-related Meeting structure organized/managed by the Contractor internally	1. <u>Meeting Structure</u> Name, timing/frequency, participants, protocol	
D. Risk Management		
D1. The Contractor Risk Management Plan submitted to the Consultant, if any	1. <u>Risk Management Plan</u> Copy to be attached as Attachment-D1	Attached
	2. Procedure & Documentation	All method statements are accompanied with a risk assessment known as a HIRA. These are submitted by letter to PMC for approval
E. Accidents		Accident Data base attached
E1. Information on accident & near misses (including unofficial information)	1. <u>Accident Reports</u> Copy to be attached as Attachment-E1	Accidents and Incidents are recorded at project level and reported up within the company. Bulletins from accidents on other projects are received and shared to all sites
	2. <u>Near Miss Reports (Hiyari-Hatto Reports)</u> Copy to be attached as Attachment-E2	Near Miss reports are treated the same as accident report with investigation and reporting forms

Documents to be attached:	Responsibility	Status
A1: Project Management Plan	Management Team	
A2: Monthly Reports - Latest, for the months of peak time, accidents, right before accidents	Management Team	
B1: Provisions related to Occupational Safety & Health (OSH) in the Construction Contract	Safety Dept	
B2: The Contractor OSH management plan (or Safety Plan, etc.)	Safety Dept	Attached
B3: The Contractor overall organization charts (initial), highlighting staffs in charge of OSH management The Contractor overall organization charts (peak time/latest)	Safety Dept	Attached

C1: Provisions related to quality control/management in the Construction Contract	Quality dept	
C2: The Contractor Quality Plan	Quality dept	
D1: The Contractor Risk Management Plan	Safety Dept	
E1: Accident Reports	Safety Dept	Attached (Accident/ Near miss register)
E2: Near Miss Reports (Hiyari-Hatto Reports)	Safety Dept	Attached (Accident/ Near miss register)

Appendix-2      Safety Presentation

# Safety, Health & Environment (SHE)



## WDFC CTP 1 & 2 Project

# Sojitz – L&T Safety Pledge



## SAFETY PLEDGE

*I solemnly affirm that I will do everything possible for the prevention of accidents, occupational diseases and protection of environment in the interest of self, my family, my organization, my community and the nation at large*

## सुरक्षा शपथ

मैं सत्यनिष्ठा पूर्वक यह शपथ लेता हूँ कि मैं स्वयं अपने, परिवार, संगठन, समुदाय एवं व्यापक राष्ट्र के हित के लिए दुर्घटनाओं, व्यवसायिक बिमारियों की रोकथाम तथा पर्यावरण संरक्षण का हर संभव प्रयास करूँगा।

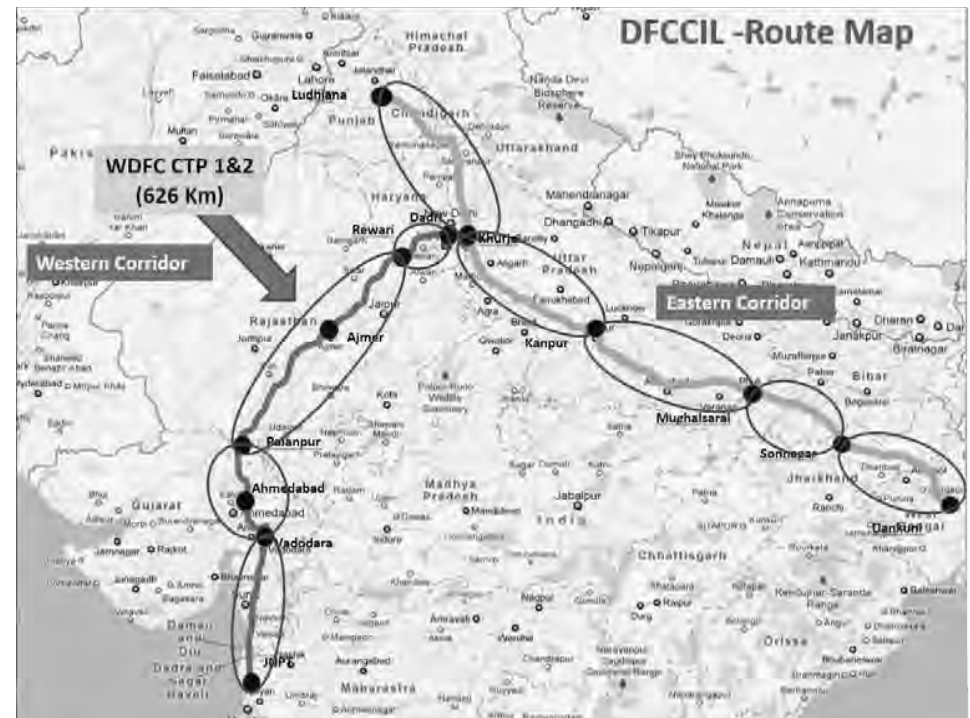
# Safety First & Welfare!



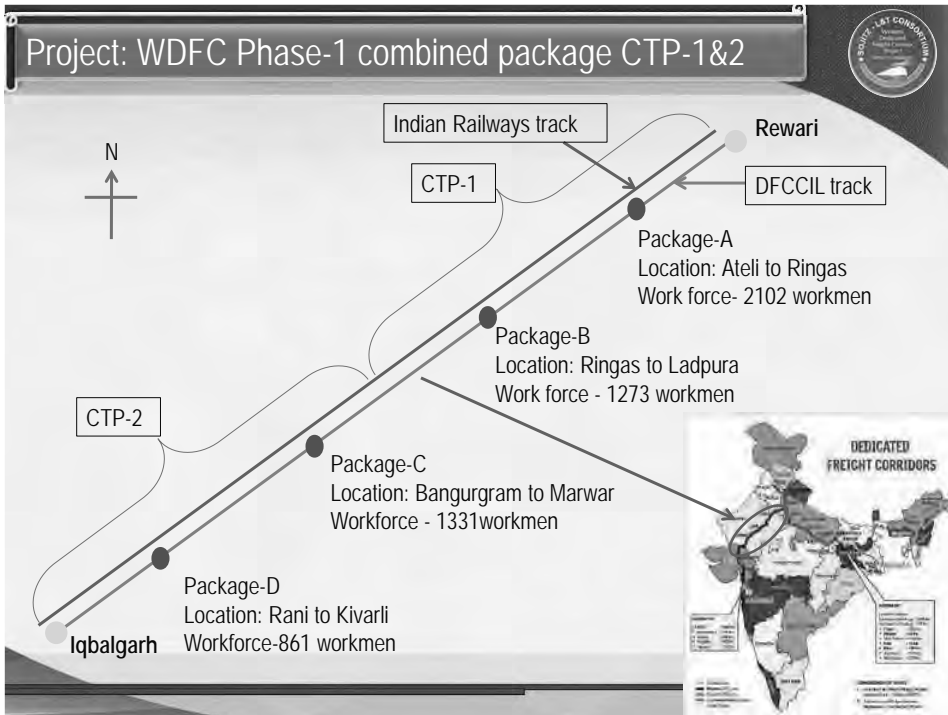
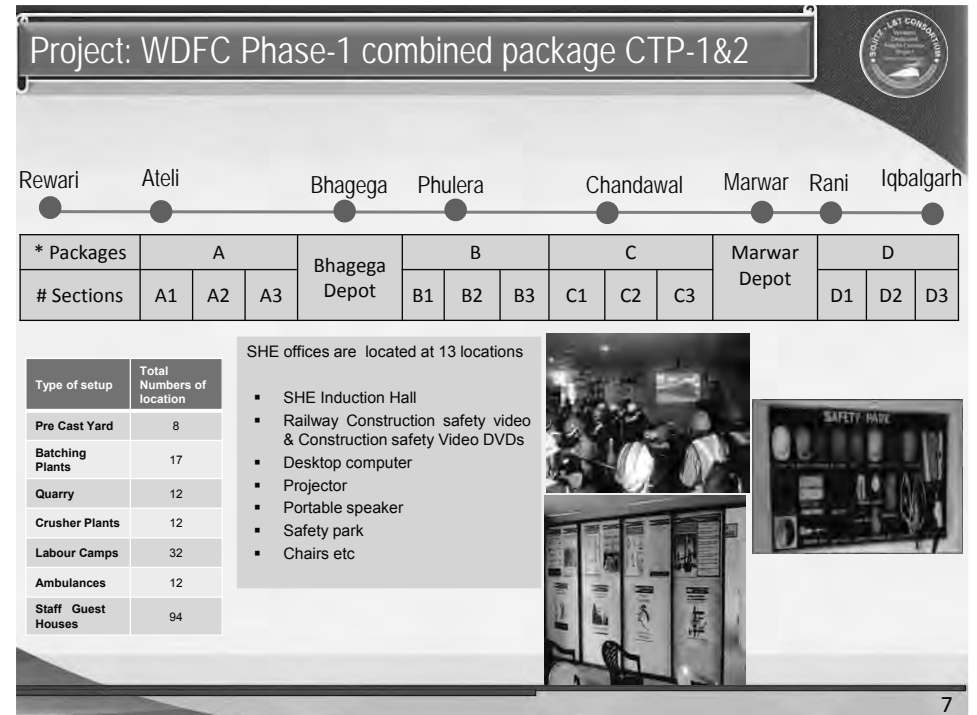
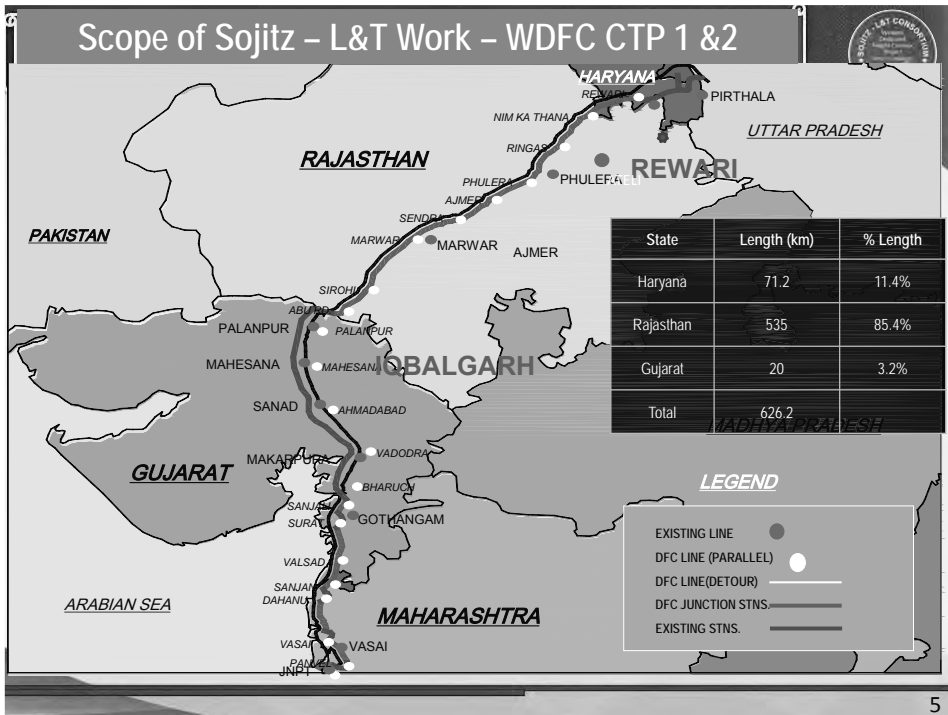
- Fire
  - Alarm
  - Exits
  - Assembly point
- Welfare
  - Breaks
  - Toilets



Please turn off MOBILE PHONES during the training period







### Sojitz – L&T SHE POLICY

**SAFETY, HEALTH & ENVIRONMENT (SHE) POLICY**

SOJITZ L&T Consortium affirms its commitment to provide a safe and healthy workplace for all project's employees & associates and ensure all operation of the project are carried out in manner that protects the environment and community in general.

**Our Philosophy**

- All accidents, injuries and adverse environmental impacts are preventable.
- No task is so important that risk to people in the form of injuries or damage to the environment is justified.
- The objectives of the policy shall be achieved at all workstations by:
  - Promoting a positive Safety, Health & Environment culture.
  - Complying with all applicable Safety, Health & Environment legislation.
  - Identifying hazards including specific hazards in working in close proximity to running Railway Tracks, Signals, Electrical & other installations and environmental aspects that could cause injury, illness or environmental harm and implement the necessary measures to mitigate the risk/hazard.
  - Ensuring the safety of running trains and passengers by adhering to laid down rules for construction activities.
  - Providing training and adequate resources to maintain Safety, Health & Environment Management Plan.
  - Integrating Safety, health & Environment procedures into every operation of the project, including in safe working along existing running Railway Lines.
  - Employing contractors who aspire to accept the Safety, Health & Environment Management Plan in their work and adopt same safety, Health & Environment standard.
  - Maintaining the Safety and Health of all employees and of the general public while engaged to construction activities whether on or off-site.
  - Continually improving the Safety, Health & Environment performance.

The Senior management shall visibly uphold the principles of the Safety, Health & Environment policy and integrate throughout the project. The management/supervisory personnel shall be responsible and accountable for implementing and maintaining the Safety, Health & Environment management Plan necessary to sustain the policy.

All Departments including Services shall adopt this policy.

Working safely and in an environment friendly manner are conditions of the employment.

21<sup>st</sup> November 2013

Signature: Ojwasu Seno, Vivek Narayan Gokhale

**संस्का, स्वास्थ्य एवं पर्यावरण नीति**

संस्का, स्वास्थ्य एवं पर्यावरण नीति

संस्का, स्वास्थ्य एवं पर्यावरण नीति

21 नवंबर 2013

डॉ. विवेक नारायण गोकुल

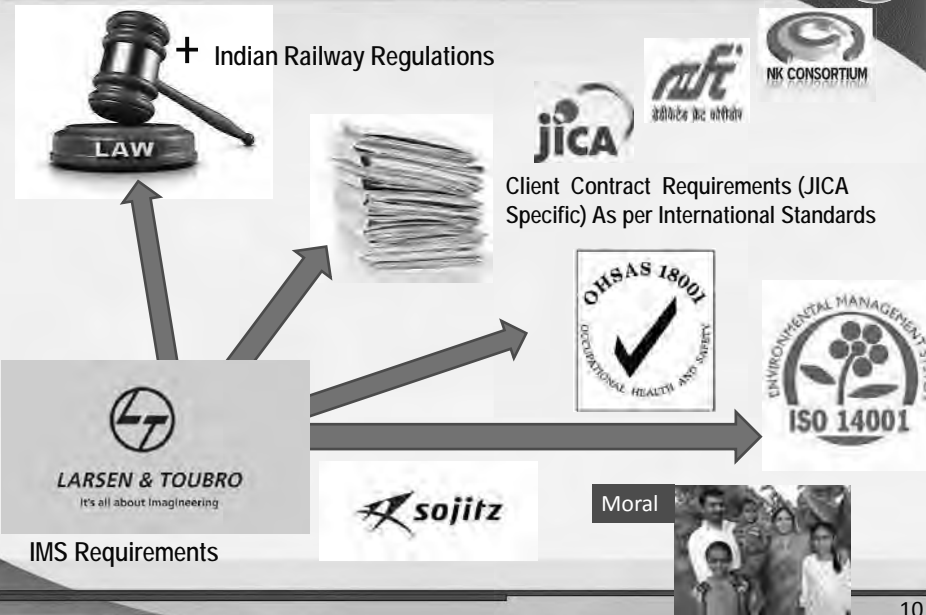
8

# Sojitz - L&T WDFC SAFETY CULTURE

*“the product of individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and proficiency of, an organisation’s health and safety performance.”*



# Sojitz – L&T WDFC SHE Compliance



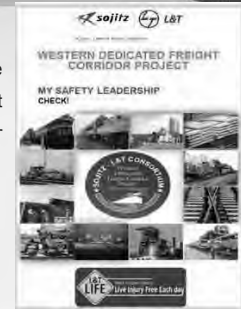
# Sojitz – L&T Leadership & Commitment

Quoted: Project SHE Policy states

SOJITZ - L&T Consortium affirms its commitment to provide a safe and healthy workplace for all employees and associates of the project and ensure that the execution of the project is carried out in a manner that protects the environment and community in general.

## Planned Actions

- ❖ Project Director and Project Heads are accountable for their SHE performance and it is linked to personal KPIs
- ❖ Management reviews at all levels in the organization begins with SHE discussions & SHE Committee
- ❖ Annual SHE Strategy is agreed by Project Heads and driven throughout the year for improving performance
- ❖ All project management up to project head to conduct regular & independent inspections and demand for SHE improvement.

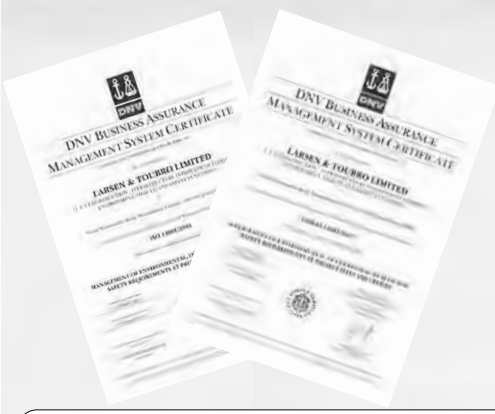


# Sojitz – L&T SHE Principles

- All SHE incidents shall be reported and investigated
- L&T employees, JV partners and subcontractors must always demonstrate SHE leadership by working in compliance with the project SHE Plan.
- All persons entering the project shall be inducted and trained in SHE requirements and assessed as being competent to undertake activities.
- All project activities shall be carried out in an environment friendly manner.
- All potential occupational health & hygiene hazards at workplace shall be identified and appropriate control measures shall be implemented.



# Sojitz - L&T SHE Integrated Management System

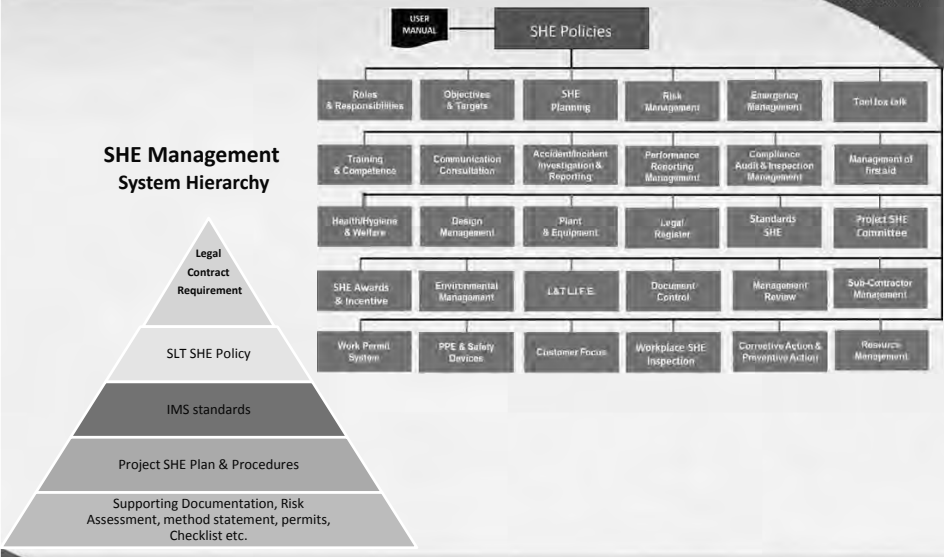


Certified to Integrated Management System conforming to OHSAS 18001:2007, ISO 14001:2004 accredited by DNV since 2010

# Sojitz - L&T WDFC CTP 1&2 SHE ORGANIZATION



# Sojitz - L&T SHE Management System & Structure



# Sojitz - L&T Ultimate SHE Goal



# L&T L.I.F.E Frame work:(Live Injury Free Each day)



**'ZERO HARM VISION'**

- Z  
E  
R  
O**
- ✓ Zero Fatalities
  - ✓ Zero disabling injuries
  - ✓ Zero injuries to members of the public
  - ✓ Zero Long-term harm to health
  - ✓ Zero Impacts to the Environment
- H  
A  
R  
M**



**L&T L.I.F.E. Framework (Live-Injury-Free-Each day) + Commitment to Action**

**The Journey How We Get There**

# WDFC Safety Customer Focus



- Safe passage of trains operating on the Indian Railway adjacent to WDFC work activity
- Plant and machinery safety
- Railway risk awareness by SLT staff and contractors
- Traffic Management Safety on WDFC approach roads and highway
- Occupational health risks associated with working in the desert heat and sanitation etc.
- Environmental Compliance - maintenance of natural habitats etc.
- Construction risks such as
  - Railway Construction using NTC, Tamper, Regulars and Other Machinery
  - Working at height on structures
  - Safe use of plant and machinery
  - Electrical Safety and Buried Services
  - Excavations
  - Hot works such as flash butt welding etc.



# Sojitz – L&T Project Risk Management



SHE Risk Management is driven from Project Director

- Project level Risk Review team is formed and Project SHE Risk Register is launched which forms basis for Project SHE Risk reviews
- Activities causing death or serious injuries are classified to be Class 1 Risk Activities and highest thrust is given to manage them
- 5 Steps Risk Management Process is followed as given:
  1. Identify Hazards / Aspects
  2. Evaluate the Risk / Impacts
  3. Determine controls
  4. Implement controls
  5. Review & update
- Simple 10 point Safe Work Method is developed and implemented
- SHE Risk is briefed to workforce on daily basis



- WDFC Class 1 Risk Activities**
- Working on or near Indian Railway
  - Working at Height
  - Vehicles, Plant & Equipment
  - Quarrying & use of Explosives
  - Excavations & Ground Disturbance
  - Confined space working
  - Working with Electricity
  - Working adjacent to or near public area
  - Structures & Formwork systems
  - Cranes & Lifting
  - Traffic Management, Vehicle, Plant & Equipment
  - Presence of Overhead Traction lines
  - Working over or adjacent to water



# Sojitz – L&T Project SHE Challenges



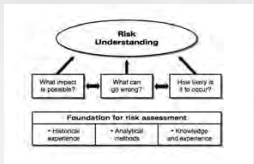
- Safety of Vehicles & Plant at site, including licences and PPE compliance.
- Traffic Management of all site routes
- Trespassers on the formation and approach roads
- The monthly SHE programme compliance
- Maintenance of barrication on IR
- Long traveling distances to worksites
- Railway Safety Training and Awareness
- Buried Services Risk Awareness
- PPE Compliance in some locations
- Implementation of the Environmental Monitoring Programme
- Management of Dust on Site
- Train movements
- Cranes and Plant Near the Railway
- Protection of Stations & Structures
- Protection of Embankments
- What not to do on or near the railway



# Sojitz – L&T Risk Management



## SHE Risk Management Procedure



## Integrated Site work permit

Activity	Permit No.	Issued To	Valid From	Valid To	Location	Supervisor	Authorizing Officer
...	...	...	...	...	...	...	...

## Daily Pre-Start Verification & briefing report

Date	Activity	Permit No.	Issued To	Valid From	Valid To	Location	Supervisor	Authorizing Officer
...	...	...	...	...	...	...	...	...

### Project Risk

Risk ID	Description	Category	Severity	Probability	Overall Risk	Control Measures
...	...	...	...	...	High	...

Project Risk Register for class-1 Risk

# Sojitz – L&T Training, Competence & Awareness

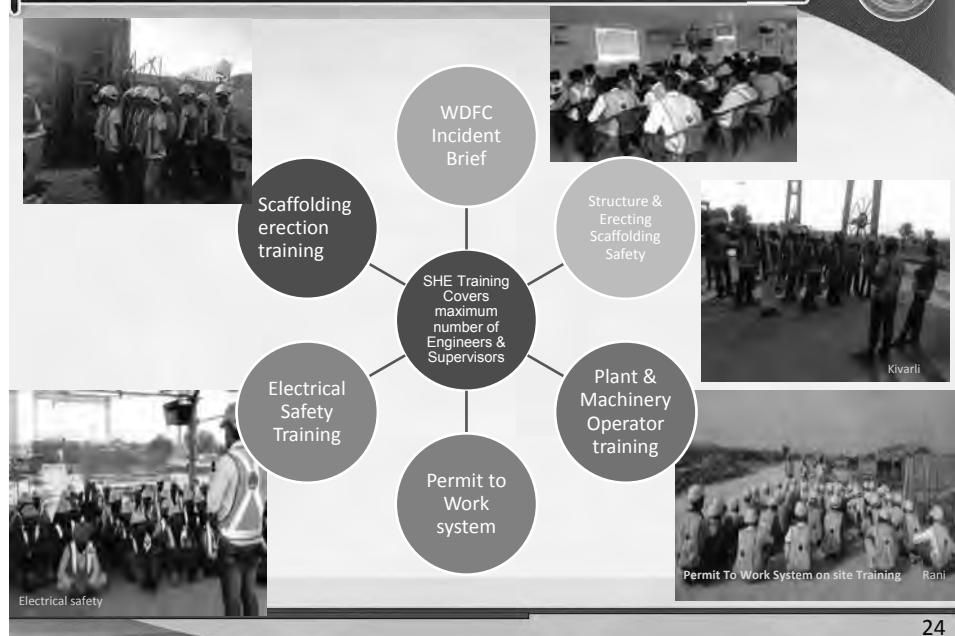


# Sojitz – L&T SHE Project Strategic Plan 2015/16



- STRATEGIC KPIs**
  - SHE KPIs for Leadership
  - Specific Project Leading KPIs
- SHE STAFF STRUCTURE**
  - KPIs for SHE Personnel
  - FAIR Rating for SHE Personnel 2015/16
  - SHE Roles & Responsibilities
- MANAGEMENT SYSTEM**
  - SHE Management System & Structure
  - Update of SHE Plan, Procedures & Standards
  - Near-miss Reporting
  - SHE Performance Audit, Measuring & Monitoring
- RISK BASED**
  - Hazard & Risk Management
  - SHE in Design
- TRAINING & DEVELOPMENT**
- STAKEHOLDER ENGAGEMENT**
  - Subcontractor / Supplier SHE Management

# SHE Training conducted at WDFC project sites





## Sojitz – L&T Communication & Consultation



- Before starting the work conducting Prestart verification & briefing
- Safety Moment on Incidents & SHE Code of practices shared to all employees
- L&T Helmet magazine
- Monthly SHE performance reports issued to key stakeholders
- EIP Vidhya online portal for SHE knowledge sharing



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25

## Sojitz – L&T Measuring Performance



- Executive SHE Inspection Tours
- Internal SHE Audits – from sites
- Audits from Accreditation Audit
- Project SHE Inspection Programs
- Project SHE committee inspection
- Periodical testing & Monitoring of safety devices and monitoring devices

26

## Sojitz – L&T Review & Change



- SHE Management Review Meeting
- SHE Committee review meetings at projects on regular basis

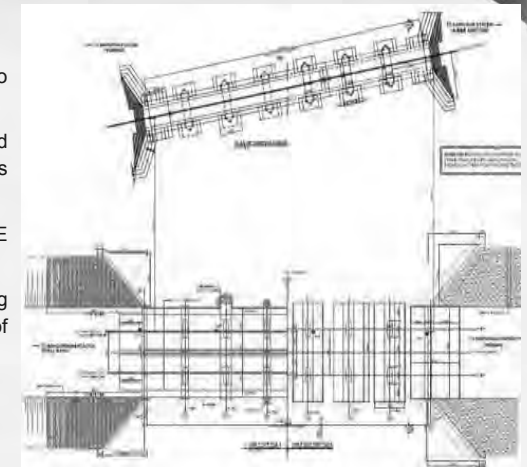


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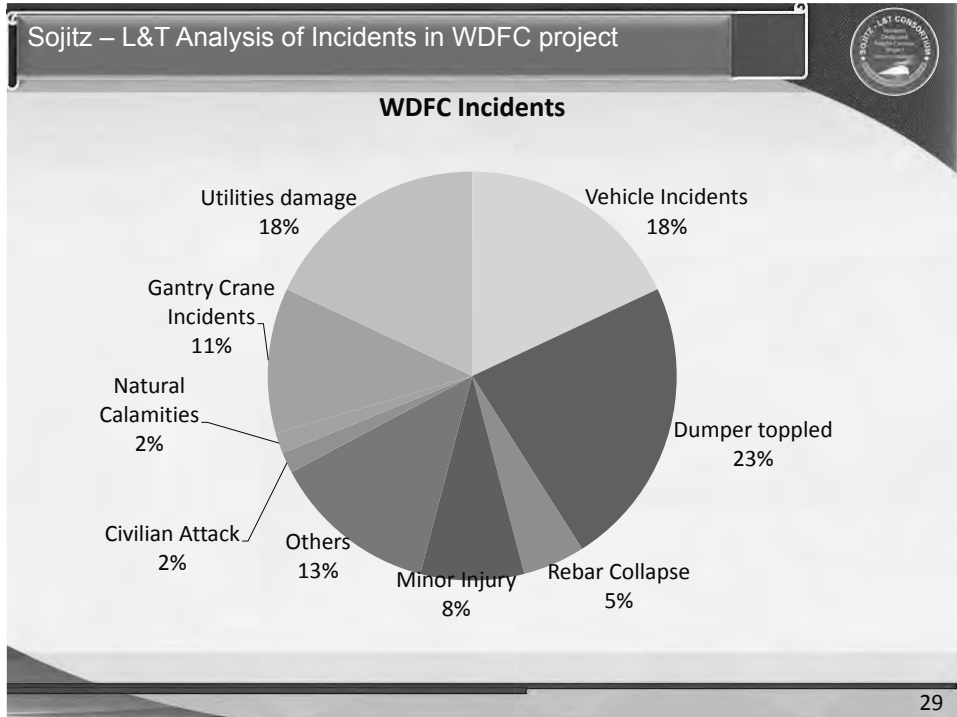
## Sojitz – L&T SHE in Design



- SHE in design policy is being developed to address the SHE risk from design stage
- Design SHE Risk review is conducted before issuing construction methods drawings
- Designers tips carries the necessary SHE information
- Basic design safety training is being developed and to be delivered as part of SHE Strategy 2016



28



### Incident analysis & remedial action taken to prevent reoccurrence

Remedial action has been taken for all of the above, including

- Infrastructure Improvements
- Training
- Awareness including SHE bulletins, posters and class room training etc
- Alcohol testing of drivers and traffic management plans

31

### Incidents & Remedial action taken to prevent Reoccurrence

Driver Safety phamplates issued to drivers

30

### WDFC Safety & Health Site - Control Measures

Work Experience

		Risk/Impact Rating (Matrix)				
		LOW (L) = ALARP (As low as reasonably practicable) & HIGH (H) = SIGNIFICANT				
PROBABILITY		1	2	3	4	5
		5				
4						
3						
2						
1						
		SEVERITY				

32

## Sojitz – L&T Subcontractor / Supplier SHE Management

- SHE consideration starts from subcontractor / supplier selection onwards
- Contractor to accept and obliged by L&T SHE systems and practices in order to bid for contract
- SHE performance criteria is part of General condition right at tendering stage
- SHE performance of contractor is evaluated through site inspections on monthly basis and reported for improvement. Defaulting contractors are disciplined.



Meeting with Hired agency

### 17. SAFETY RULES & REGULATIONS

Subcontractor will abide by all safety standards, specifications & practices in construction. Subcontractor is responsible for the safety of subcontractor staff & employees, employees of other

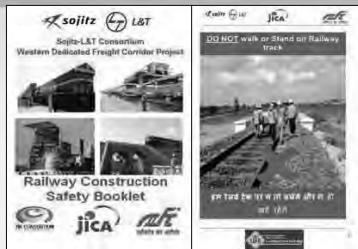


33

## SHE Bulletins Produced on the WDFC Project in both English/Hindi

35

## Sojitz – L&T Safety Resources Produced for the Project



Railway Construction Safety Handbook

- The Project Team have produced the 4 Nos of WDFC Safety Information hand book specifically related to
- The booklet is aimed to ensure that all the safety requirements of working near the Indian Railway are clearly understood and complied to.



Driver Safety Handbook Booklet



Environmental, Health & Safety Handbook - English & Hindi Language



SHE Handbook in Hindi Issued to all workmen

34

## Special SHE Initiatives – Site Performance monitoring

36



## Sojitz – L&T SHE Awareness Alert

**Electrol powder issued to Workmen**

**Use a fan to lower temperature**  
Apply cold compresses  
Have victim lie down  
Have victim drink fluids  
GET IMMEDIATE MEDICAL HELP!

**Use a fan to lower temperature**  
Apply cold compresses  
Have victim lie down  
Have victim drink fluids  
GET IMMEDIATE MEDICAL HELP!

**Confusion**  
Lack of Coordination  
Shivering  
Cold Body  
Urges to Urinate

**EBOLA VIRUS**  
HOW TO STOP THE SPREAD OF EBOLA

**SWINE FLU - H1N1**

**SMALL BUT BIG THREAT!**

**Awareness Alert**

**37**

## SHE Inspections Tours by SHE Director & CAPO along with Customer & Clients

**JICA & CPM Visit to Bhagega**

**Tool Box Talk Given to Senior Managers**

**On Site SHE Training**

**Joint Site SHE Inspection with PMC Team**

**39**

## Sojitz – L&T Special SHE initiatives

**First Aid Training imparted to 125 Nos of Employees by St. John Ambulance**

**Gas cylinder Handling & Kitchen Safety delivered to all Cooks resident at site.**

**Alcohol testing**

**Driver Safety Instructions in Hindi Language Issued to all Vehicle & Machinery operators**

**Coding provided for Vehicles plying in WDFC**

**Railway Construction Safety Awareness to Local School children's**

**Recreation for Labours- Film Shows a Labour Colonies**

**SHE Training Covers maximum number of Engineers & Supervisors**

**38**

## SHE Inspections Tours by SHE Director & CAPO along with Customer & Clients

**TFL Office-Jaipur**

**External Audit**

**Documentation Review at Project site**

**Discussion with Doctor visiting at Site**

**40**

## Project SHE Committee & Weekly site SHE committee meetings



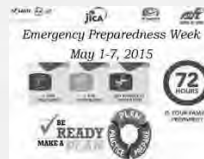
SHE Committee Meetings organized every month at Project level and every week at individual construction sites



## List of awareness days celebrated in WDFC



Day/Month	Programs
1st Monday to Sunday of January	Road Safety Week (Subjected to confirmation from Ministry of Road Transport, Govt. of India every year.)
16 <sup>th</sup> February	Kyoto Protocol Day
March	Red Cross Month
4 <sup>th</sup> March	National Safety Day
7 <sup>th</sup> April	World Health Day
14 <sup>th</sup> April	Fire Safety Day
18 <sup>th</sup> to 22 <sup>nd</sup> April	Earth Week
20 <sup>th</sup> April	Earth Day
20 <sup>th</sup> April	Noise Awareness Day
28 <sup>th</sup> April	ILO World Day for Safety and Health at Work Day
1st to 7 <sup>th</sup> May	Emergency Preparedness Week
5 <sup>th</sup> June	World Environmental Day
12 <sup>th</sup> June	World Day against Child Labours
9 <sup>th</sup> July	Occupational Health Day
17 <sup>th</sup> October	World Trauma Day
1 <sup>st</sup> December	World AIDS Day



## L&T Safety Month (January)- Celebrations



### Events

- Safety Exhibition
- PPE Demo
- Poster Competition
- Essay Competition
- Safety rally
- Signature campaign- Safety First
- Prizes distribution for Workmen & Supervisors

### Week 1 - Road Safety Week

- Road Safety pamphlets issued to public
- Awareness campaign at National Highways
- Awareness training on road signs
- Driver safety booklet issued to public

### Week 2 - Railway Safety Week

- Railway Construction Safety training delivered to all Engineers
- Railway Pamphlets issued to public

### Week 3 - Work at Height

- Training conducted by External Agencies
- Demo at all Packages

### Week 4 - Electrical Safety

- Training program on Electrical Safety
- Delivered Good/ scope of improvement at Electrical safety.



## L&T Safety Month



PPE demo

## L&T Safety Month- Road Safety Week



## Sojitz – L&T Awareness Days



## Safety Café organized at Project Site



All client representatives, staff, workmen getting information about safety equipment's at site



## Sojitz – L&T Awareness Day Celebrations



## Sojitz – L&T Occupational Health Day- 9th July



General Health Checks

Blood Camp

Occupational Health Day

Health Awareness Training

64 Nos of Volunteers donated blood

## Sojitz – L&T Awareness Days



NATIONAL SAFETY DAY WEEK CAMPAIGN - 2015

THEME FOR NATIONAL SAFETY DAY WEEK CAMPAIGN - 2015

BUILD A SAFETY CULTURE FOR SUSTAINABLE SUPPLY CHAIN

समझाव देना कामकाज रखने हेतु सुरक्षा नाशकृति बनाए रखें

National Safety Day

World Health Day

Awareness Days

World Earth Week

Fire Safety Day

## Awareness Day Celebrations- World Environmental Day



685 Nos of saplings planted at WDFC Project site.

Quiz Competition & prize Distribution

World Environmental Day

Housekeeping campaigns

Client Participations

Awareness Training Programs

## Sojitz – L&T Awareness Day Celebrations- World AIDS Day



Street Play

Street Play organized by Rajasthan State AIDS Control Society

Street Play conducted by RSACS

World AIDS Day

Training Programs

Health Campaigns

Condom promotion

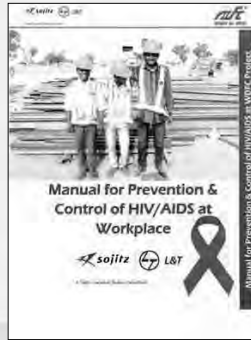
Signature Campaign



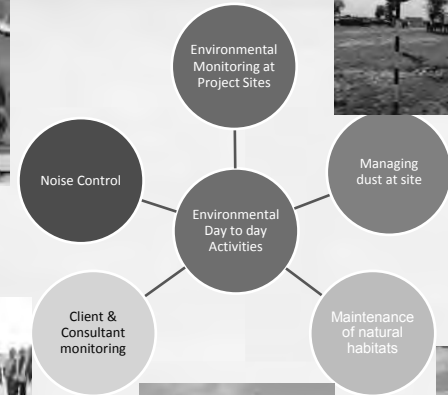
## Sojitz – L&T HIV/AIDS Awareness Program



- The Spread of HIV/AIDS by Workmen staff is a major concern on the project & therefore the WDFC project have become a program of awareness that would deliver a monthly basis to all parts of the project. This will include general awareness of risks & Prevention.
- As a part of WDFC Contract requirement L&T organizing HIV/AIDS Awareness Program at project sites on regular intervals
- Peer Educators participated in the Awareness Program
- Organized by SLT with Technical Support from RSACS and the NGO "Support Trust"



## Sojitz – L&T Environmental Monitoring activities at WDFC



## Sojitz – L&T HIV/AIDS Awareness Program



Voluntary Participation

Successfully conducted HIV/Aids Peer Educators training around WDFC project sites



Officials from Ministry of Health & Family Welfare visited Pkg-D- Location Rani & appreciated HIV/AIDS Control Activities conducted by SLT at WDFC

Organized by SLT with Technical Support from RSACS and the NGO "Support Trust"



## Sojitz – L&T Emergency Planning - Mock Drills



- Flooding & Drowning- Monsoon
- Person hit by Earth Mover
- collapse of lifting appliances & transport equipment
- Falling from height
- Tipper truck Incident
- Spillage of Dangerous goods or chemicals
- Fire Rescue operations

Utilities/ Cables damage – communication procedure

- Vehicle toppled/ breakdown near IR track/ unmanned level crossing- Emergency rescue procedure
- Utilities/ Cables damage-communication procedure
- Vehicle Incident during Monsoon
- Collapse of building/ structures
- Structural Collapse



## Sojitz – L&T Emergency Planning- Mock Drills



### Person hit by Earth Mover Location: Bhanwsa (Package-B)



### Person hit by Earth Mover Location- Rani (Package-D)



57

## Sojitz – L&T Emergency Planning - Mock Drills



### Flooding & Drowning- Monsoon



### Mock Drill on Heat Stress – Chandawal (Package-C)



58

## Sojitz – L&T Collapse of lifting appliances & transport equipment



### Marwar (package-C)



### Marwar (package-C)



59

## Sojitz – L&T Emergency Planning - Mock Drills



### Falling from height



### Spillage of Dangerous goods or chemicals



60

## Sojitz – L&T Emergency Planning - Mock Drills



### Fire Rescue operations Location-Pacharmalikpur (Package-B)



### Fire Rescue operations Location-Bhagega depot



61

## Sojitz – L&T Emergency Planning - Mock Drills



### Tipper incident



### Structural Collapse- Bangurgram (Package-C)



62

## Sojitz – L&T Emergency Planning - Mock Drills



### Collapse of building/ structures

#### Location :Bhanwsa(Package-B)



#### Mock Drill At Kivarli (Package-D)



63

## Emergency Response- Ajmer Control Room



Sojitz-L&T Consortium established a 24 hours Emergency Control Room at Ajmer in Rajasthan state

- 24X7 round the clock functional
- Computer facilities with 24 hours Internet Service.

#### Emergency Numbers

0145-2624567 (Landline-BSNL)

96100-06600 (Vodafone)

77259-30666 (Airtel)



64

## SHE AWARDS & Recognition



Since the beginning of the Project the WDFC Project have completed 15 Safe Million Man hours with an average Manpower of 5000 workmen



Voluntary reporting of all accidents



65

## Sojitz – L&T Safety, Health and Environment



Thank You for your attention

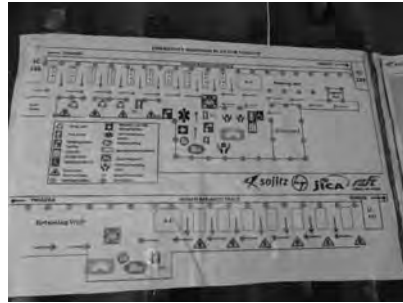
“Let’s go and build a railway together.....safely!!”

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Appendix-3      Site Visit (A)

Renwal



Renwal



Renwal



Renwal



Renwal



Renwal



Renwal



Bhagega





Bhagega



Bhagega



Sleeper Plant



Structure 17



Appendix-4      Site Visit (B)



Site Visit (Section C) on 26 October 2015



Earthworks (Blasting)



Casting Yard & Site Office



Bridge Construction

Appendix-5 Seminar Materials

**Safety Review Study of On-Going ODA Loan Project  
in India**

29/30 October 2015

Dedicated Freight Corridor Corporation of India Ltd.  
Japan International Cooperation Agency  
Landtec Japan Inc.  
Infrastructure Development Institute

<Western Dedicated Freight Corridor – Phase 1>



**Section 1:  
Safety Management Framework  
at the National Level and in ODA Projects**

**<Seminar Programme of 29/Oct/15>**

13:30 – 14:00: Registration  
14:00 – 14:10: Opening Address DFCCIL  
14:10 – 16:00: Seminar JICA Study Team (Mr. Toshio Takebayashi / Mr. Fujio Ito)

**Introduction**

**Section 1: Safety Management Framework - at the National Level and in ODA Projects**

Occupational Safety and Health Framework in Japan India  
Occupational Safety and Health Framework in ODA Projects

<Q&A (brief)>

**Section 2: JICA Team's Observations on Safety of WDFC**

<Q&A (brief)>

**Section 3: Recommendations on WDFC Project**

<Q&A (brief)>

**Section 4: Root Cause Analysis for the Issues of WDFC Project**

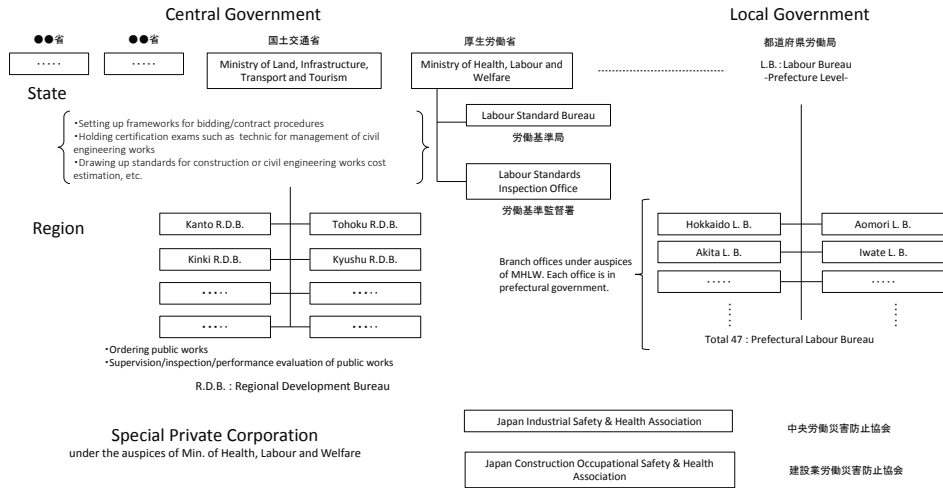
<Q&A>

16:00 – 17:00: Free Discussions

**1.1 Occupational Safety and Health Framework  
in Japan**

# Occupational Safety & Health Framework in Japan

## ① Administrative System



# Occupational Safety & Health Framework in Japan

## ② OSH Relevant Act Framework

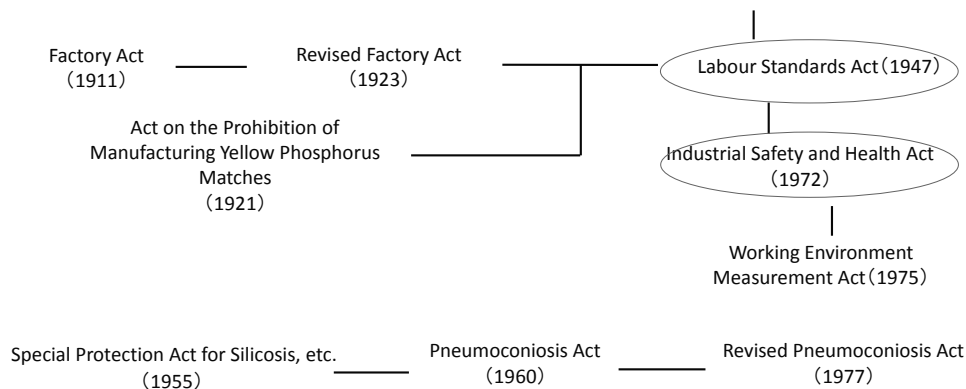
### Features of Industrial Safety and Health Act of Japan

- Purpose : To secure the safety and health for workers
- Executor : Employer/Project Operator
- Protection Target : Worker
- Contents of the Act : Compulsory enforcement of **measures for the prevention of dangers or health impairment** as minimum standards through implementation of penalty
- Compliance Structure : Enforcement by the Labor Standards Inspector authorized with judicial and police powers

# Occupational Safety & Health Framework in Japan

## ② OSH Relevant Act Framework

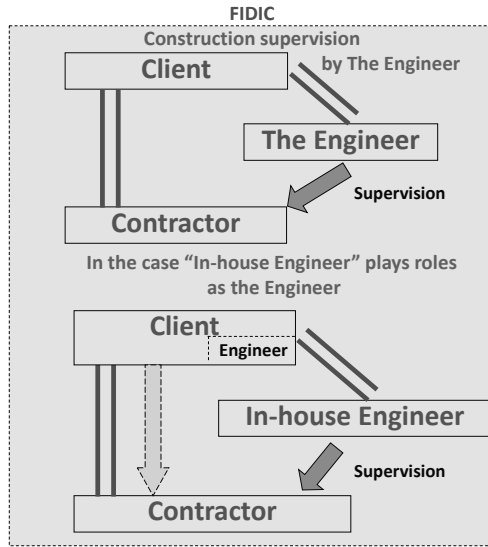
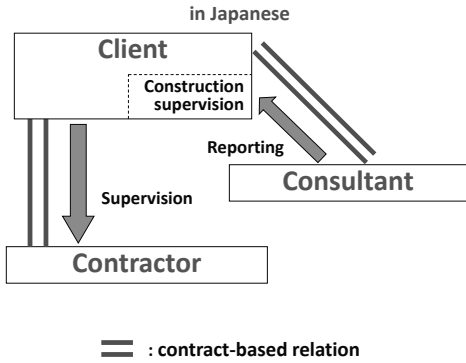
### The Constitution of Japan



## Transition of the Numbers on Fatalities/Casualties at Workplaces, Japan

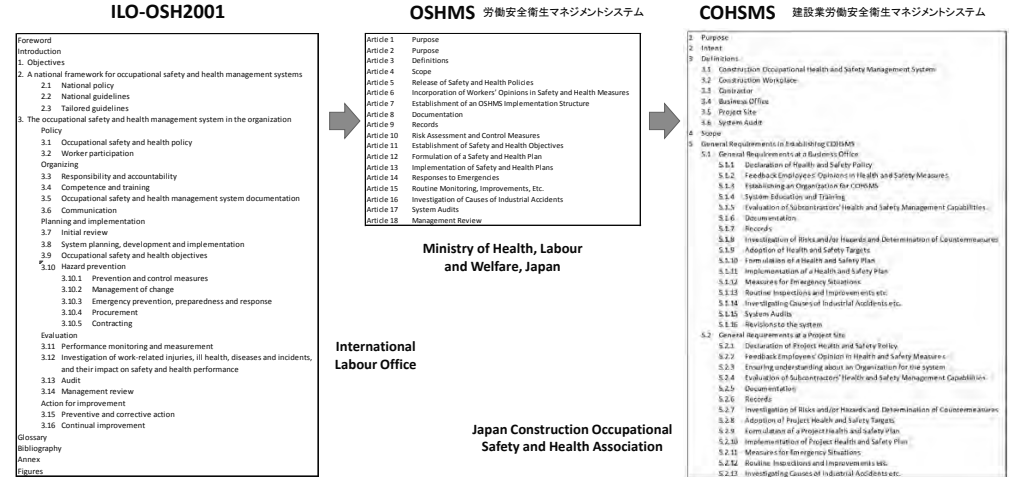


## Comparison of Contract System in Japan and in the FIDIC world



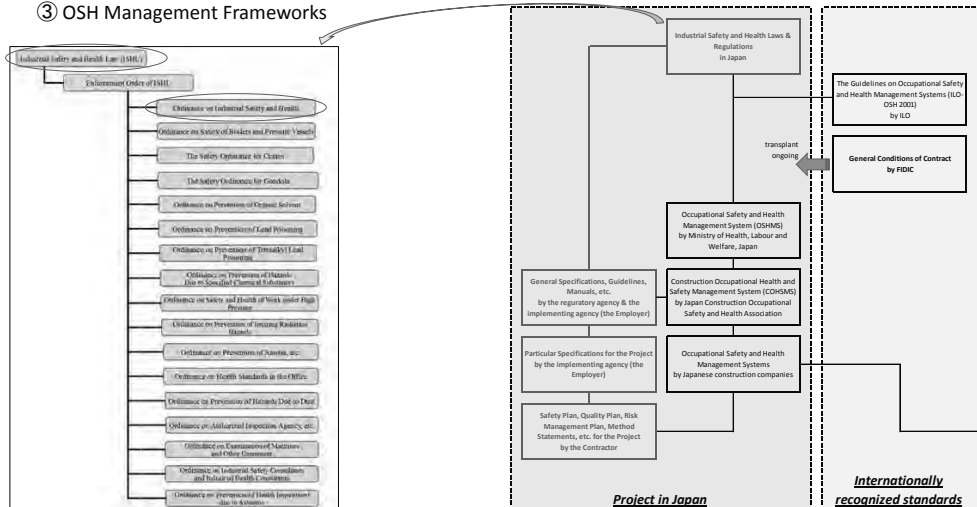
## Occupational Safety & Health Framework in Japan

### ④ Guidelines for OSH Management Systems



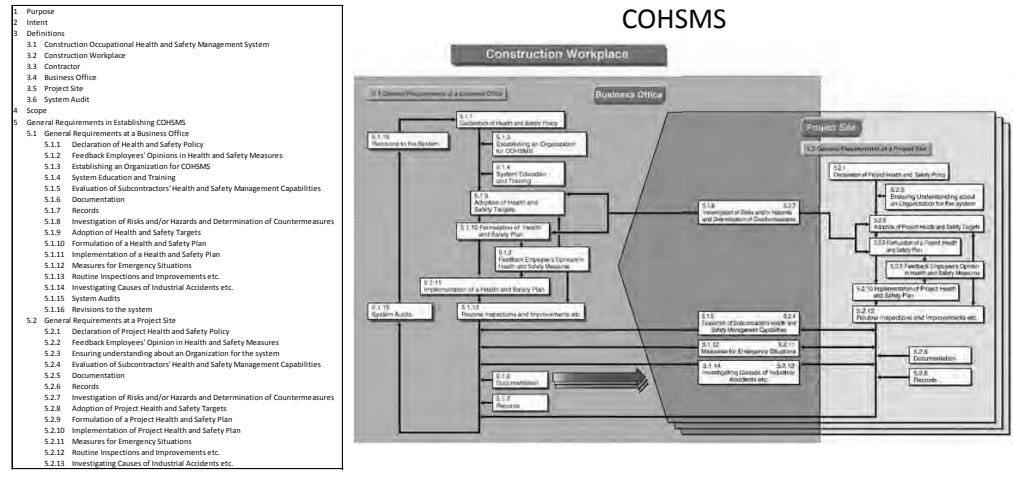
## Occupational Safety & Health Framework in Japan

### ③ OSH Management Frameworks



## Occupational Safety & Health Framework in Japan

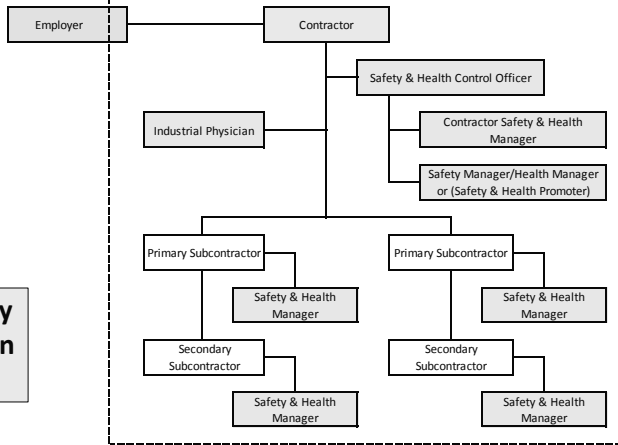
### ⑤ Construction Occupational Health and Safety Management System (COHSMS)



**Laws and Regulations on Occupational Safety and Health in Construction Works**

Labour Standards Inspection Office  
(Labour Standards Inspector)

(judicial police officials)



**Typical Framework for Safety Management in Construction Projects in Japan**

**SAFETY AND HEALTH MANUAL IN CONSTRUCTION**

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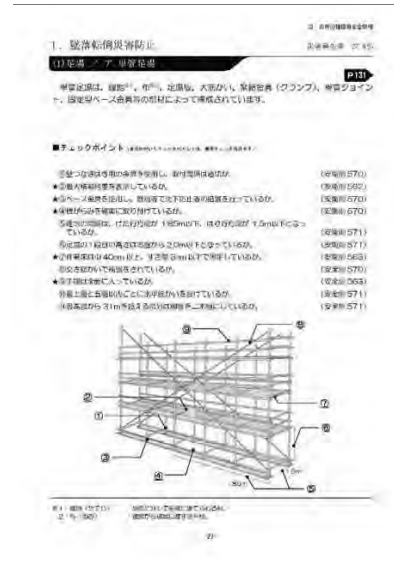
**APPENDIX**

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3. Format of Occupational Safety and Health Card



**SAFETY AND HEALTH MANUAL IN CONSTRUCTION**

Chubu Regional Development Bureau  
Ministry of Land, Infrastructure, Transport and Tourism  
Japan



**(1) Scaffolding (pipe scaffolding)**

Pipe scaffolding is composed of vertical pipes, horizontal pipes, planks, cramps, joints, metal bases and so on.

Check Points (\* denotes important item)

[1]	Are metal fittings to wall used at the appropriate intervals?	OSH Article 570
[1]*	Is maximum loading capacity of scaffolding indicated?	OSH Article 562
[2]	Are metal bases for pipes used with base plates to avoid settlement?	OSH Article 570
[1]*	Are horizontal pipes near metal base installed?	OSH Article 570
[5]	Are vertical pipes located at the appropriate intervals (L1.85m max. & W1.5m max.)?	OSH Article 571
[10]	Is the elevation of first platform less than 2m?	OSH Article 571
[11]	Is the platform width more than 40cm and fixed with the gap less than 3cm?	OSH Article 563
[12]	Are cross bracings used to reinforce the scaffolding?	OSH Article 570
[13]*	Are handrails installed in a full length?	OSH Article 563
[14]	Are horizontal loadings installed at the top layer and less than every 9 layers?	OSH Article 571
[15]	Are the pipes made double installed beyond 31m from the top?	OSH Article 571

OSH: Ordinance on Industrial Safety and Health

**Article 570 (Steel Pipe Scaffolding)**

(1) The employer shall, as regards steel pipe scaffolding, see also articles 565 conform to the following provisions:

(a) For the use of scaffolding involving workers, scaffolding with controls to take measures such as preventing bridge, landing or falling.

(b) For the use of scaffolding with workers, to take measures such as security, fixing the corners with a cable, or other braces, post, etc., at the corner of the scaffolding to a sound building, in order to prevent scaffolding from moving unexpectedly.

(c) In case of frame the opening portions or cranes, portions of steel pipes especially seem unsafe fittings.

(d) For single row scaffolding, double row scaffolding or chimney scaffolding, to provide size so as not to stay dislocated by influence.

(e) The manner to set new steel pipes to the right column of the following table or the corresponding in the type of steel pipe scaffolding fixed to the left column of the same table.

Type of steel pipe scaffolding	Interval [m]	
	Vertical direction	Horizontal direction
Tube and coupler scaffolding	1.5	1.5
Pre-fabricated scaffolding consisting of those having height of less than 5 m	1.5	1.5

(2) When the scaffolding are composed of section members and compression members, the interval between these members is to be within 1.0 m.

(3) When the scaffolding are composed of section members and compression members, the interval between overhead power line and it, as showing the safe distance at least one meter or installing protective equipment for the scaffolding.

(4) The provision of articles 571 to 575 shall apply mutatis mutandis to the scaffolding of the structural steel of all of the preceding paragraphs. In this case, the term "level" of paragraph (1) in paragraph 1 of the same articles shall be replaced by "level" of paragraph (1) of article 570.

**EXAMPLE - 1**

**1.1 足場 (1) 内部足場**

竹組足場は、縦材、交差筋のみ、又は筋束材、異径ジョイント、ジョイント型ベース等異質の部材によって構成されています。本規定では、足場の設置と解体の作業高の範囲を拡大した「半層式足場」を指すことが可能です。

■チェックポイント

- ① 足場は適切な間隔で設置し、斜行部は適切に (OISH Article 570)
- ② 作業高が 4.0m を超え、また 3m を超えて設置している (OISH Article 563)
- ③ 足場に手摺を設置している (OISH Article 510)
- ④ フォールネットを使用し、網目で以下は適切な設置を行っている (OISH Article 570)
- ⑤ 網目の間隔は、最大 1.8m を超えず、かつ開口が 1.5m を超えていない (OISH Article 570)
- ⑥ フォールネットは、作業高範囲に入っている (OISH Article 570)
- ⑦ 網目の開口は適切に (OISH Article 562)

**EXAMPLE - 2**

**(1) Scaffolding (prefabricated scaffolding)**

Scaffolding is composed of frames, bracings, base joints, jack bases and so on.

Check Points (\* denotes important item)

1	Are metal fittings to wall used at the appropriate intervals?	OISH Article 570
2	Is the platform width more than 40cm and fixed with the gaps less than 3cm?	OISH Article 563
3*	Are handrails installed at the end sides?	OISH Article 510
4	Are metal bases for pipes used with base plates to avoid settlement?	OISH Article 570
5*	Are horizontal pipes near metal base installed?	OISH Article 570
6	Are vertical pipes located at the appropriate intervals (11.85m max. x W1.5m max.)?	OISH Article 571
7	Are cross bracings used to reinforce the scaffolding?	OISH Article 570
8	Are ledger frames fixed firmly?	OISH Article 570
9*	Is maximum loading capacity of scaffolding indicated?	OISH Article 562

OISH: Ordinance on Industrial Safety and Health;

**Article 510**

(1) The employer shall provide enclosures, handrails, covers, etc., (hereinafter referred to as "enclosures, etc." in this Article), to places having a height of 2 m or more and where it is liable to cause dangers to workers due to a fall, such as at an end of a working floor and an opening.

(2) The employer shall, when it is extremely difficult to provide enclosures, etc., pursuant to the provision of the preceding paragraph, or when removing enclosures, etc., temporarily for necessity for work, take the measures of setting a protective net, having workers use safety belts, etc., to prevent the workers from dangers due to fall.

**1.2 Occupational Safety and Health Framework in India**

**1.1 開口部 (1) 開口部**

開口部において、作業高が墜落の危険のある箇所には、一定高さの柵いすすし、圍いすすしを設ける必要がありす。

■チェックポイント

- ① 柵や手摺を設けける高さは適切に (OISH Article 510)
- ② 柵の高さは 0.9m を超えて 1.2m を超えていない (OISH Article 510)
- ③ 柵の開口部が適切に (OISH Article 510)
- ④ 柵の開口部が適切に (OISH Article 510)

**EXAMPLE - 3**

**(3) Openings**

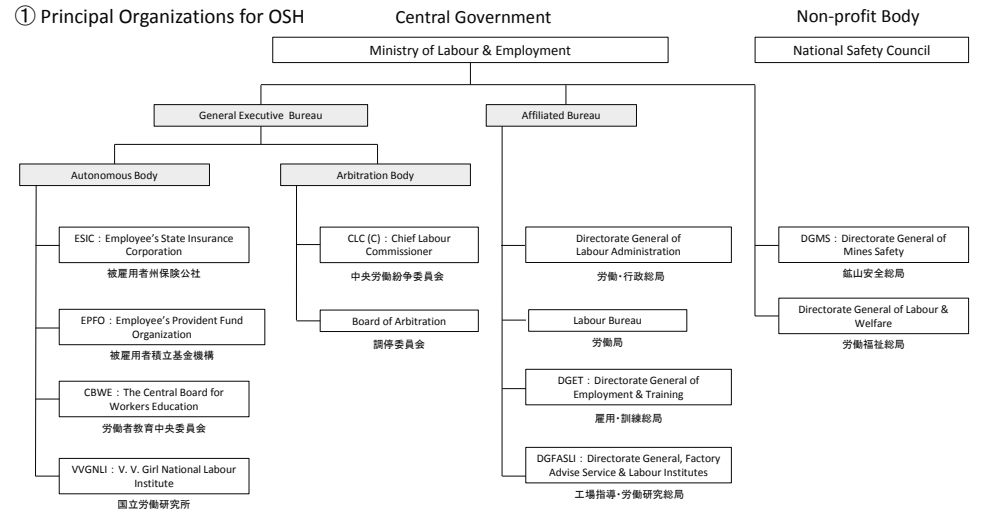
Fence, handrail and cover must be set up at the potential area of workers falling.

Check Points (\* denotes important item)

1*	Is there any facility to tie safety belt?	OISH Article 539
2*	Is the height of handrail more than 1m?	OISH Article 539
3	Are there any materials placed near the opening?	
4	Are toe boards installed around the opening?	
5*	Is a caution sign shown at the opening?	

OISH: Ordinance on Industrial Safety and Health

**Occupational Safety & Health Framework in India**





## Occupational Safety & Health Framework in India

### ① Principal Organizations for OSH

Central Government	
DGMS : Directorate General of Mines Safety	The mission of the DGMS is to continually improve safety and health standards, practices and performance in the mining industry and upstream petroleum industry
Labour Bureau	Labour Bureau is responsible for the collation, collection and publication of statistics and related information on wages, earnings, productivity, absenteeism, labour turn-over, industrial relations, working and living conditions and evaluation of working of various labour enactments etc.
DGET : Directorate General of Employment & Training	The Directorate General of Employment & Training (DGE&T) in Ministry of Labour is the apex organization for development and coordination at National level for the programs relating to vocational training including Women's Vocational Training and Employment Services.
DGFASLI : Directorate General, Factory Advise Service & Labour Institutes	The DGFASLI is an attached office of the Ministry of Labour & Employment, Government of India and serves as a technical arm to assist the Ministry in formulating national policies on occupational safety and health in factories and docks.
CLC (C) : Chief Labour Commissioner	The Organization of the Chief Labour Commissioner (C) was set up in April, 1945 in pursuance of the recommendation of the Royal Commission on Labour in India and was then charged mainly with duties of prevention and settlement of industrial disputes, enforcement of labour laws and to promote welfare of workers in the undertakings falling within the sphere of the Central Government.
ESIC : Employee's State Insurance Corporation	Employee's State Insurance Scheme of India, is a multidimensional social security system tailored to provide socio-economic protection to worker population and their dependents covered under the scheme.
VVGNLI : V. V. Girl National Labour Institute	V.V. Girl National Labour Institute is a premier national institution involved with research, training, education, publication and consultancy on labour related issues. The Institute, established in 1974, is an autonomous body of the Ministry of Labour and Employment, Government of India.
Non-profit Body	
National Safety Council	National Safety Council is a premier, non-profit, self-financing and tripartite apex body at the national level in India. It is an autonomous body, which was setup by the Government of India, Ministry of Labour and Employment in 4th March 1966 to generate, develop and sustain a voluntary movement on Safety, Health and Environment (SHE) at the national level.

## Occupational Safety & Health Framework in India

### ② OSH Regulatory Framework

Constitutional provisions form the basis of workplace safety and health laws in India by imposing a duty on the State to implement policies that promote the safety and health of workers at workplaces. In addition, safety and health statutes for regulating occupational safety and health (OSH) of persons at work exist in different sectors, namely manufacturing, mining, ports, and construction.

#### -National Policy on Safety, Health and Environment at Work Place, 2009

The policy seeks to bring the national objectives into focus as a step towards improvement in safety, health and environment at workplace. The objectives are to achieve: Continuous reduction in the incidence of work related injuries, fatalities, diseases, disasters and loss of national assets.

Acts;

#### -The Factories Act, 1948 (amended in 1949, 1950, 1954, 1956, 1976, 1989)

To ensure adequate safety measures and to promote the health and safety and welfare of the workers employed in factories. The act also makes provisions regarding employment of women and young persons, annual leave with wages etc.

#### -Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996

To provide for conditions of employment of construction workers, occupational safety, inspection of worksites, welfare fund administration, and registration of workers as beneficiaries of welfare funds.

#### -Dock Workers (Safety, Health and Welfare) Act, 1986

#### -The Mines Act 1952

### in DGFASLI, Faridabad



## 1.3 Comparison of OSH Framework in India & Japan

## Acts/Laws in the field of Labour

	India	Kenya	Japan
Labour Law/Act (Comprehensive)	➤ None	None	None
Labour Related Laws/Acts	<ul style="list-style-type: none"> <li>➤ Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act (1996)</li> <li>➤ The Mines Act (1952)</li> <li>➤ Dock Workers (Safety, Health and Welfare) Act (1986)</li> <li>➤ The Plantation Labour Act (1951)</li> <li>➤ The Industrial Disputes Act (1951)</li> <li>➤ .....</li> </ul>	<ul style="list-style-type: none"> <li>➤ Employment Act</li> <li>➤ Labour Relations Act</li> <li>➤ Occupational Safety and Health Act</li> <li>➤ Work Injury Benefit Act</li> <li>➤ Industrial Training Act</li> <li>➤ Industrial Court Act</li> <li>➤ Labour Institutions Act</li> <li>➤ .....</li> </ul>	<ul style="list-style-type: none"> <li>➤ Labour Contract Act</li> <li>➤ Labour Standards Act</li> <li>➤ Industrial Safety and Health Act</li> <li>➤ Equal Employment Act</li> <li>➤ Minimum Wage Law</li> <li>➤ Labour Relations Act</li> <li>➤ Labour Relations Adjustment Act</li> <li>➤ Employment Insurance Act</li> <li>➤ .....</li> </ul>
OSH Related Acts/Policies	<ul style="list-style-type: none"> <li>➤ National Policy on Safety, Health and Environment at Work Place (2009)</li> <li>➤ Dock Workers (Safety, Health and Welfare) Act (1986)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Occupational Safety and Health Act</li> <li>➤ Work Injury Benefit Act</li> </ul>	<ul style="list-style-type: none"> <li>➤ Industrial Safety and Health Act (1972)</li> </ul>
Factories Act	<ul style="list-style-type: none"> <li>➤ The Factories Act (1948)</li> <li>Minor changes afterwards</li> </ul>	<ul style="list-style-type: none"> <li>✓ Rules such as Noise Prevention and Control Rules etc. are legal ground</li> </ul>	<ul style="list-style-type: none"> <li>✓ Factory Act (1911) was repealed in 1947 by Labour Standards Act</li> </ul>
Laws/Acts for Specific Industry	<ul style="list-style-type: none"> <li>➤ The Mines Act (1952)</li> <li>➤ Dock Workers (Safety, Health and Welfare) Act (1986)</li> </ul>	<ul style="list-style-type: none"> <li>➤ National Social Security Fund Act</li> </ul>	<ul style="list-style-type: none"> <li>✓ Type of works basis ordinance framework have been established.</li> </ul>

## Activities for Compliance of Labour Laws in India & Japan

### In India,

**Enforcement of the Laws;**  
44 Labour Laws being administered by Ministry of Labour & Employment, MoLE, are enforced by Central and State Enforcement agencies in their respective spheres. CLC(C), MoLE, play a role of enforcement.

**Inspection of Construction/Building Site Safety;**  
DGFASLI of MoLE carry out site inspections through dispatching qualified safety officers for sites by project owner's request basis.

**Penalty for noncompliance;**  
For an example, (by Industrial Disputes Act) At maximum 6 months sentence and/or pay a fine at maximum 5,000 INR in case of closing a project operation entity without prior consent.

One specific measure for the promotion of law compliance in India;  
MoLE has developed a single unified web portal for Online Registration of units, Reporting of inspections, submissions of annual returns and redressal of grievances.

### In Japan,

**Enforcement of the Laws;**  
Through the establishment of enforcement ordinance by the government and with penal provisions on the Law, business operator (Contractors) comply with laws.

**Inspection of Construction/Building Site Safety;**  
DGFASLI of MoLE carry out site inspections through dispatching qualified safety officers for sites by project owner's request basis.

**Penalty for noncompliance;**  
At maximum 3 yrs. sentence or pay a fine in range of 5,000 US\$ to 30,000 US\$.

## Comparison of SHE Descriptions on National Policy/Act in India & Japan

### National Policy on Safety, Health and Environment at Work Place (2009) , India

- Chapter 1. Preamble
- Chapter 2. Goals
- Chapter 3. Objectives
- Chapter 4. Action Program
  - 4.1. Enforcement
  - 4.2. National Standards
  - 4.3. Compliance
  - 4.4. Awareness
  - 4.5. Research & Development
  - 4.6. Occupational Safety & Health Skill Development
  - 4.7. Data Collection
  - 4.8. Review
- Chapter 5. Conclusion

### Industrial Safety and Health Act (1972), Japan

- Chapter 1. General Provisions
- Chapter 2. Industrial Accident Prevention Plan
- Chapter 3. Organization for Safety and Health Management
- Chapter 4. Measures for Preventing the Dangers or Health Impairment of Workers
- Chapter 5. Regulations concerning Machines, etc. and Harmful Substances
- Chapter 6 Measures in Placing Workers
- Chapter 7 Measures for Maintaining and Promoting Workers' Health
- Chapter 7-2 Measures for Creating a Comfortable Work Environment
- Chapter 8 License, etc.
- Chapter 9 Safety and Health Improvement Plan, etc.
- Chapter 10 Inspection, etc.
- Chapter 11 Miscellaneous Provisions
- Chapter 12 Penal Provisions

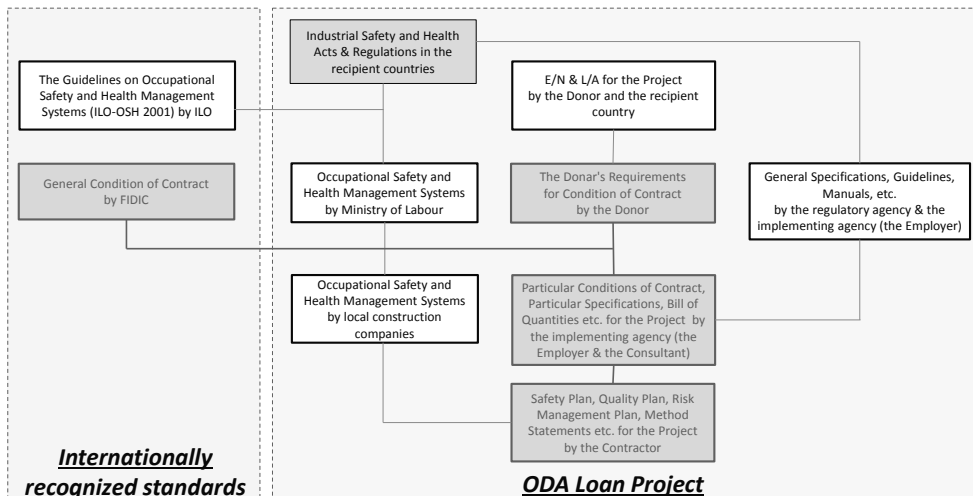
## Features of Safety Management Framework in JAPAN

- Industrial Safety and Health Act; **Law**  
Very strict law with detailed enforcement regulations, rules.
- Strict Monitoring System for Workplaces; **Monitoring**  
by the Labour Standards Inspectors authorized with judicial and police powers
- Suspension of Bidding Qualification for Contractors; **Penalty**  
Restriction for next bidding opportunity if one contractor caused a fatal accident/serious accident. -Up to several months.

## 1.4 Occupational Safety and Health Framework in ODA Projects

## Guidance for The Management of Safety for Construction Works in Japanese ODA Projects

Framework of Construction Safety and Health in ODA Loan Project



## Chapter 1: General Rules

### 1.1 Purpose

The Guidance contains the basic policies for safety management, and technical guidance on specific methods for safe execution of works in order to prevent occupational accidents and public accidents on ODA construction projects for public and other facilities.

By fully understanding the Guidance and complying with the regulation therein, Project Stakeholders will be in a position to respect the basic human rights of all parties involved in ODA construction projects. This will help prevent the occurrence of occupational and public accidents by creating a culture of safety, and help realize social development in the recipient country. This is the purpose of the Guidance.

### 1.2 Scope of Application

The Guidance applies to works for public and other facilities to be constructed with ODA support (including both grants and loans) (hereinafter "ODA Projects").

### 1.3 Plans for Safety Management

Two plans for the safety management for construction work sites shall be prepared and implemented by the Contractor, namely the "Safety Plan" and "Method Statements on Safety."

### 1.4 Roles and Responsibilities of Project Stakeholders

The roles and responsibilities of Project Stakeholders (i.e. Employer, Engineer, Contractor, Subcontractor, Workers) specified.

## Chapter 1: General Rules (Plans for Safety Management)



	Safety Plan	Method Statements on Safety
When	At the pre-construction stage	At the construction stage
Prepared by	Contractor	Contractor
Role	Basic Plan (basic policies on the general safety management and operation for the entire works at site)	Detailed Plan (specifics for the safe execution of works and safety measures for each type of work)
Items to be incorporated	<ol style="list-style-type: none"> <li>(1) Basic Policies for Safety Management</li> <li>(2) Internal Organizational Structure for Safety Management</li> <li>(3) Promotion of the PDCA Cycle</li> <li>(4) Monitoring</li> <li>(5) Safety Education and Training</li> <li>(6) Voluntary Safety Management Activities</li> <li>(7) Sharing Information</li> <li>(8) Response to Emergencies and Unforeseen Circumstances</li> </ol>	<ol style="list-style-type: none"> <li>(1) Construction plant and machinery</li> <li>(2) Equipment and tools</li> <li>(3) Materials</li> <li>(4) Necessary qualifications and licenses</li> <li>(5) The order of command for the works</li> <li>(6) Work items</li> <li>(7) Procedure for the execution of the works</li> <li>(8) Foreseeable risks</li> <li>(9) Precautionary measures</li> </ol>
Timing of Submission	<ul style="list-style-type: none"> <li>• at the time specified in the tender/the contract documents</li> <li>• no later than seven (7) days prior to the commencement of the relevant works</li> </ul>	<ul style="list-style-type: none"> <li>• prior to commencement of the relevant works according to the execution plans</li> <li>• Date specified in the contract documents</li> </ul>
Reviewed by	Employer, Engineer	Employer, Engineer

## Chapter 5: Technical Guidance for Safe Execution (by the Type of Work)

5.1 Excavation Work  
 5.2 Pile Foundation Work  
 5.3 Formwork and Form Shoring System Work  
 5.4 Reinforcing Bar Work  
 5.5 Concrete Work  
 5.6 Work over Water  
 5.7 Demolition Work  
 5.8 Work where there is danger of oxygen deficiency  
 5.9 Slings Work

## Chapter 6: Technical Guidance for Safe Execution (by the Type of Accident)

6.1 Measures for Prevention of Fall Accidents  
 6.2 Measures for Prevention of Accidents Involving Flying or Falling Objects  
 6.3 Measures for Prevention of Accidents Involving Collapse of Structures  
 6.4 Measures for Prevention of Accidents Involving Construction Machinery  
 6.5 Measures for Prevention of Explosion Accidents  
 6.6 Measures for Fire Prevention  
 6.7 Measures for Prevention of Public Accidents  
 6.8 Measures for Prevention of Traffic Accidents  
 6.9 Protective Gear

## Chapter 2: Basic Policies for Safety Management

2.1 Basic Principles of Safety Management  
 2.2 Compliance with Relevant Laws and Regulations  
 2.3 PDCA for Safety Management

## Chapter 3: Contents of the "Safety Plan"

3.1 Composition of the "Safety Plan"  
 3.2 Basic Policies for Safety Management  
 3.3 Internal Organizational Structure for Safety Management  
 3.4 Promotion of the PDCA Cycle  
 3.5 Monitoring  
 3.6 Education and Training for Ensuring Safety  
 3.7 Voluntary Basis Safety Management Activities  
 3.8 Sharing Information  
 3.9 Response to Emergencies and unforeseen Circumstances

## Chapter 4: Contents of the "Method Statement on Safety"

4.1 Composition of the "Method Statements on Safety"  
 4.1.1 Items for inclusion in a "Method Statements on Safety"  
 4.1.2 Method Statements on Safety – Template  
 4.2 Applicable Standards for the "Technical Guidance for Safe Execution of Works"  
 4.2.1 Technical Guidance for Safe Execution of Works  
 4.2.2 Applicable Standards for the Method Statements on Safety  
 4.2.4 Applicable Standards for the Technical Guidance for Safe Execution (by the Type of Work)

## Q & A for the Guidance

1. Is English version of the Guidance available?

- YES

2. When will the application of the Guidance commence ?

*Grant projects: already started*

*Yen Loan projects: will judge/decide at the project formation stage  
will judge/decide on a project-by-project basis*

3. In case the Guidance is used as a part of tender documents, what is the priority of each document?

*- It is not envisaged to use the Guidance as a part of tender documents, but to assume the borrower to prepare the tender documents taking account of the local laws and regulations as well as respecting the spirit of the guidance.*

4. If the guidance is not directly used as a part of the tender and/or contract documents, how/where the safety control-related information is incorporated in the documents; SCC, Specification, Employer's requirements or Safety Plan?

*- It is assumed the safety control requirements are incorporated in the specification. The significance of the safety plan will remain unchanged.*

5. How to state the safety guidance requirements in the minutes of discussions signed by JICA and the borrower at the loan preparation stage?

Template for the TOR for DD/CS consultant regarding the safety guidance?

Standard method as to how to deal with the guidance in tender/ contract documents?

How to reconcile with local safety & health laws/regulations and/or criminal laws in the borrower's country?

Any influence on the contractor's all risk insurance and/or the DD/CS consultant's professional indemnity insurance?

*- JICA will build consensus with the borrower on the following points:*

- To include safety requirements with reference to the borrower's local laws/standards and the safety control guidance, and, as necessary, international safety standards such as international organizations' safety guidelines.*
- To confirm, at the consultant's review stage, the above requirements are met in the tender documents.*

6. Are there any differences between STEP and ordinary Yen loan projects in terms of the Guidance?

- There are no particular differences.*
- Dissemination of the guidance will be conducted through safety control seminars by JICA or loan negotiation with the borrower on new projects. In principle, we hope the safety control guidance will be applied to all Yen loan projects.*

7. Any influence to payments to the contractor regarding the Guidance?

- Whether or not conforming with the guidance may not affect payments to the contractor.*

8. Will incorporation of the guidance requirements into BOQ be obliged?

- It is expected that the expenditures related to the safety control requirements set out by the Employer and the Consultant in other parts of tender/contract documents will be included in BOQ. The guidance itself will not be incorporated directly.*

## Section 2: Observations on Safety of WDFC Project

## 2.1 Project - Challenges

*Unprecedentedly Large as a Single Contract and Stretched Logistic Routes*

### 1.2.2.1 General Feature of Loan

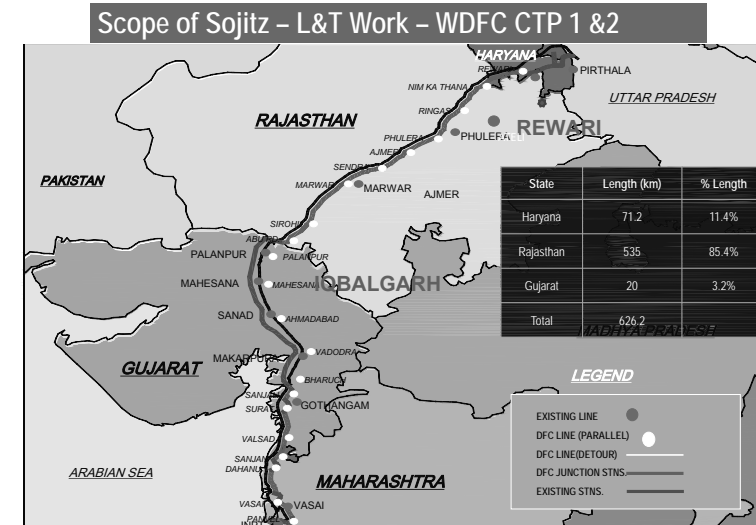
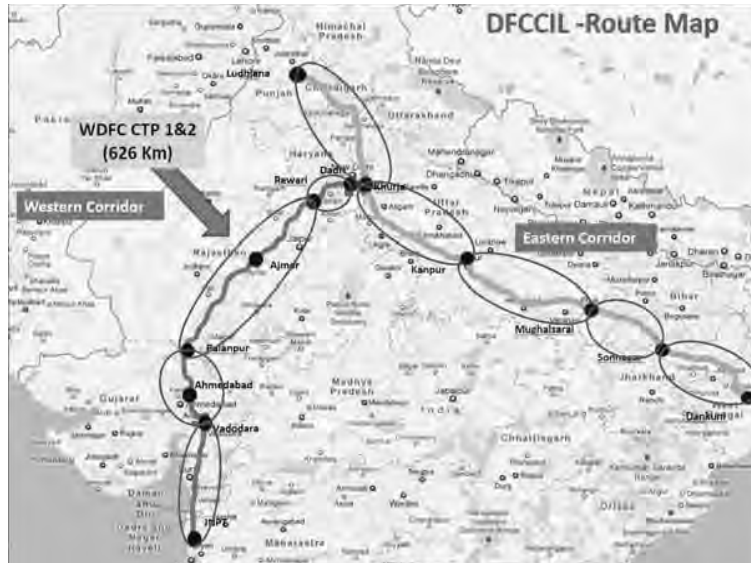
L/A number	: ID - P209
L/A signed date	: March 31, 2010
L/A effective date	: February 18, 2013
L/A validity period	: 10 years (Closing Date: February 18, 2013)
L/A amount	: Yen 90,262,000,000 (Yen 71,974,000,000 for Local Portion)
Completion (Target)	: June 2019

### 1.2.2.2 Allocation of Loan

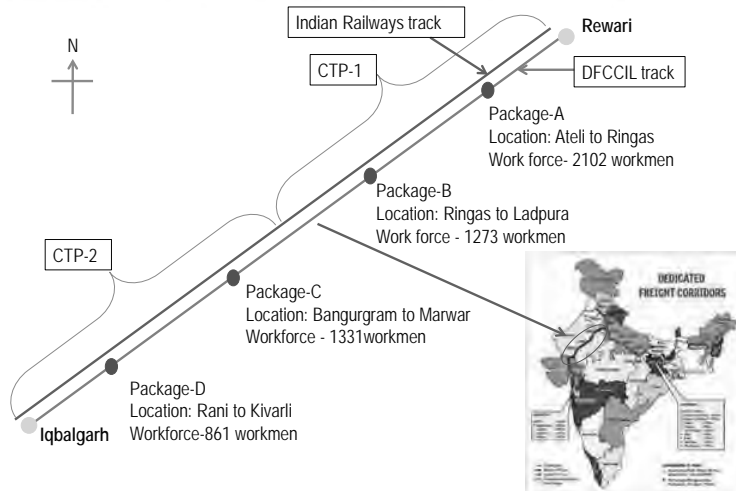
Category	Amount Allocated (Million Yen)	% of Expenditure to be financed
(1) Civil Works and Procurement	79,806	100
(2) Consulting Services	2,474	100
(3) Contingencies	7,982	0
(4) Unavailable Balance	0	0
<b>Total</b>	<b>90,262</b>	<b>-</b>

### Contract Packages

No.	Contract Package	Works	Remarks	Contract System
1	CTP-1	Civil/Building/Track Works Rewari - Ajmer Section	Combined Package	Design-Build Lump Sum, Apply FIDIC
2	CTP-2	Civil/Building/Track Works Ajmer - Ikabalgah Section		
3	CTP-3	Civil/Building/Track Works Ikabalgah - Vadodra Section (excluding bridges across river Mahi and Sabarmati)	Revised: CTP-3(R)	Yellow Book (1999)
4	CTP-3A	Special Steel Bridges across river Mahi and Sabarmati	Revised: CTP-3A(R)	Design Build Lump Sum, Apply FIDIC
5	EMP-4	Electrical & Mechanical (E&M) Works (Rewari - Vadodara: 922 km)	-	Yellow Book (1999)
6	ST P-5	Signal & Telecommunication, Rewari - Vadodara Section	Additional: 5A*	Yellow Book (1999)
7	PE P-6	Plant and Equipment for Operation and Maintenance		
8	RS P-7	Rolling Stock Cum Maintenance and Depot Works	Out of scope of the present PMC Services	

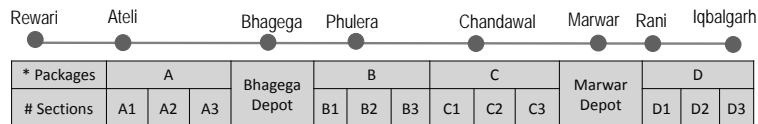


Project: WDFC Phase-1 combined package CTP-1&2



Schedule to handle Large Quantities

Project: WDFC Phase-1 combined package CTP-1&2



Type of setup	Total Numbers of location
Pre Cast Yard	8
Batching Plants	17
Quarry	12
Crusher Plants	12
Labour Camps	32
Ambulances	12
Staff Guest Houses	94



**Construction Status - Major Items**

Description	Unit	Scope	Progress upto Aug'15		Progress PTM Sep'15		Cumulative upto Sep'15	
			Planned	Achieved	Planned	Achieved	Used Plan**	Rev/Plan*
Design	L	543	80	5	7	131	95	87
Cutting	Cum	3,769,790	3,994,897	53,658	76,081	3,929,249	3,686,515	3,672,936
Embankment	Cum	23,666,895	8,178,124	3,037,492	1,038,050	36,784,720	9,215,618	9,186,232
Subgrade	Cum	7,656,480	1,932,236	378,521	362,103	8,588,716	2,294,239	2,294,239
Blanket	Cum	5,807,631	237,624	96,439	100,223	6,045,255	343,663	343,663
Mass Earthwork	Cum	646	-	-	-	-	-	-
Concrete Minor Str	Cum	561,002	39,821	10,661	7,583	600,823	47,404	47,404
Concrete Major Str	Cum	460,001	35,944	14,319	12,420	495,945	46,739	46,739
Wear Supply (80%)	MT	168,000	27,357	3,508	4,920	175,357	31,865	31,865
Sleeper Supply (80%)	MT	2,350,000	22,200	30,000	19,600	2,379,600	22,200	22,200
Track Laying	TKM	1,389	-	3	0	1,389	3	3
Ballast Supply	TKM	1,389	112	22	16	1,501	138	138
Track Surfacing	TKM	1,389	-	-	-	1,389	-	-
Junction & Crossing	Mts	20	-	-	-	20	-	-
Utility, Office etc.	Lot	648	-	150	130	648	150	130
POB	Lot	799	-	-	-	799	-	-
Station Substructure Bldg	Item	26,122	-	-	-	26,122	-	-
Post Building	Item	206	-	-	-	206	-	-
Testing & Commissioning	Item	648	-	-	-	648	-	-
<b>Work Done Value as per revised rate</b>	<b>Cum</b>	<b>8,999.5</b>	<b>664.9</b>	<b>133.8</b>	<b>126.3</b>	<b>9,664.4</b>	<b>791.1</b>	<b>766.6</b>

Note: Actual physical progress value is 14.72% which is equivalent to Rs.945.9 Cr.

\* Scope for work done based on approved design and survey data.  
 \*\* Used plan value for invoicing.

⚠ **Major gap between work done value & invoicing due to unviable billing schedule.**

Constraints: 1. Low Dependence equipment 2. Not allowing extended hour working night working 3. Unavailability of large concrete pump, the concrete progress is hampered.

Monthly Progress Report Sep'15

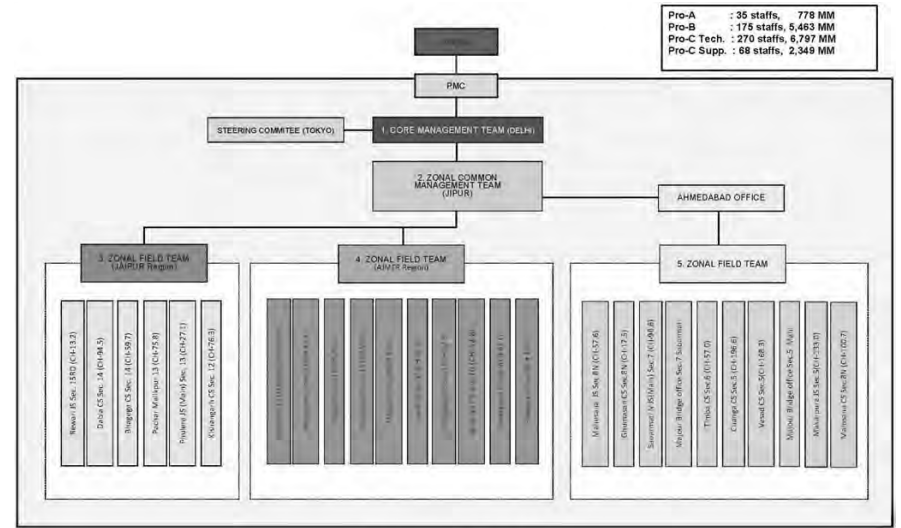
**Look ahead plan (Major Items) upto Dec'15 - Overall**

Description	Unit	Scope	Cumulative upto Sep'15		3 Months Look ahead			
			Planned	Achieved	Oct'15	Nov'15	Dec'15	
Design	L	543	80	5	7	131	95	87
Cutting	Cum	3,769,790	3,994,897	53,658	76,081	3,929,249	3,686,515	3,672,936
Embankment	Cum	23,666,895	8,178,124	3,037,492	1,038,050	36,784,720	9,215,618	9,186,232
Subgrade	Cum	7,656,480	1,932,236	378,521	362,103	8,588,716	2,294,239	2,294,239
Blanket	Cum	5,807,631	237,624	96,439	100,223	6,045,255	343,663	343,663
Mass Earthwork	Cum	646	-	-	-	-	-	-
Concrete Minor Str	Cum	561,002	39,821	10,661	7,583	600,823	47,404	47,404
Concrete Major Str	Cum	460,001	35,944	14,319	12,420	495,945	46,739	46,739
Wear Supply (80%)	MT	168,000	27,357	3,508	4,920	175,357	31,865	31,865
Sleeper Supply (80%)	MT	2,350,000	22,200	30,000	19,600	2,379,600	22,200	22,200
Track Laying	TKM	1,389	-	3	0	1,389	3	3
Ballast Supply	TKM	1,389	112	22	16	1,501	138	138
Track Surfacing	TKM	1,389	-	-	-	1,389	-	-
Junction & Crossing	Mts	20	-	-	-	20	-	-
Utility, Office etc.	Lot	648	-	150	130	648	150	130
POB	Lot	799	-	-	-	799	-	-
Station Substructure Bldg	Item	26,122	-	-	-	26,122	-	-
Post Building	Item	206	-	-	-	206	-	-
Testing & Commissioning	Item	648	-	-	-	648	-	-
<b>Work Done Value as per revised rate</b>	<b>Cum</b>	<b>8,999.5</b>	<b>664.9</b>	<b>133.8</b>	<b>126.3</b>	<b>9,664.4</b>	<b>791.1</b>	<b>766.6</b>

Note: Look ahead for concrete has been revised based on availability of construction Design package.  
 • Look ahead for earthworks has been revised as productivity of equipments is getting affected due to design constraints ( upto 1.5m).  
 • Scope has been revised based on available design and site survey data.  
 • Part Payment of DPC 14, DPC 15, DPC 16 till not released even after 6-8 months.

\* This is tentative value expected only flow will be positive.

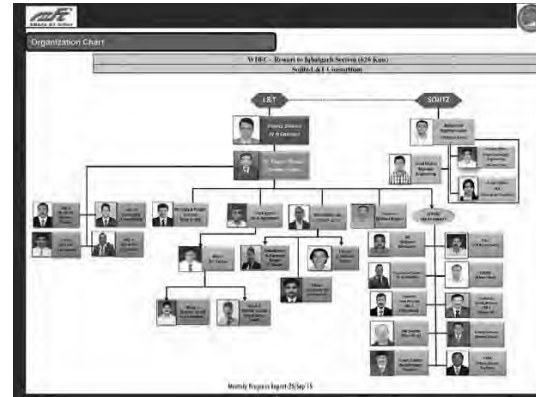
Monthly Progress Report Sep'15



Pro-A : 35 staffs, 778 MM  
 Pro-B : 175 staffs, 5,463 MM  
 Pro-C Tech : 270 staffs, 6,797 MM  
 Pro-C Supp. : 68 staffs, 2,349 MM

Overall Organization Chart of PMC Phase 1

## Resources & Hierarchy to handle the Project



**STATUS OF STAFF MOBILIZED AT SITE**

TFL & Package	Total	Design Team	Total
General Manager	2	General Manager	1 (Export)
Joint General Manager	4	Joint General Manager	1
Sr. Deputy General Manager	6	Sr. Deputy General Manager	2
Deputy General Manager	12	Deputy General Manager	1
Sr. Manager	16	Sr. Manager	5
Manager	56	Manager	7
Asst. Manager	140	Asst. Manager	21
Sr. Engineer	135	Sr. Engineer	24
Engineer	41	Engineer	10
Supervisor	415	Supervisor	14
Non technical staff	19		
<b>Total</b>	<b>948</b>	<b>Total</b>	<b>85</b>

**Design staff Strength of Agencies**

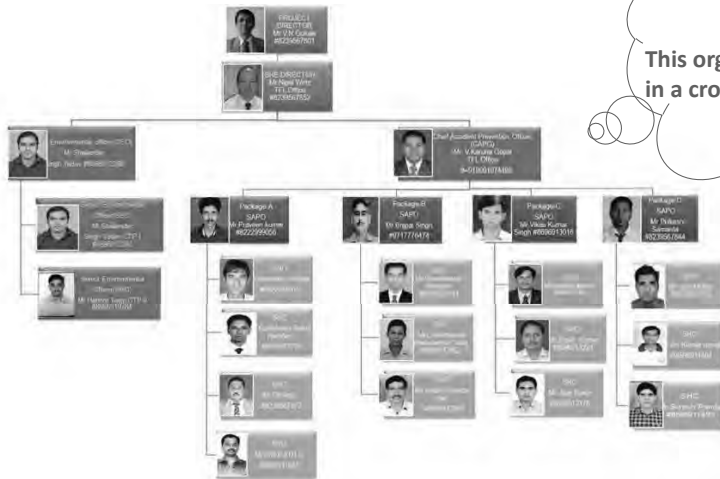
Agency	CHDM	SMB	Total
Engineers	23	19	42
Design Man	12	5	17

**STATUS OF LABOUR DEPLOYED AT SITE**

Category	High skilled	Skilled	Semi-skilled	Unskilled	Total Nos
Plg A	35	959	255	662	1620
Plg B	89	278	280	458	1120
Plg C	23	322	304	349	998
Plg D	35	801	131	338	1225
<b>Total</b>	<b>190</b>	<b>1658</b>	<b>970</b>	<b>1807</b>	<b>4725</b>



## Sojitz - L&T WDFC CTP 1&2 SHE ORGANIZATION



This organization is working in a cross-sectional way.

## WDFC – Contract Documents

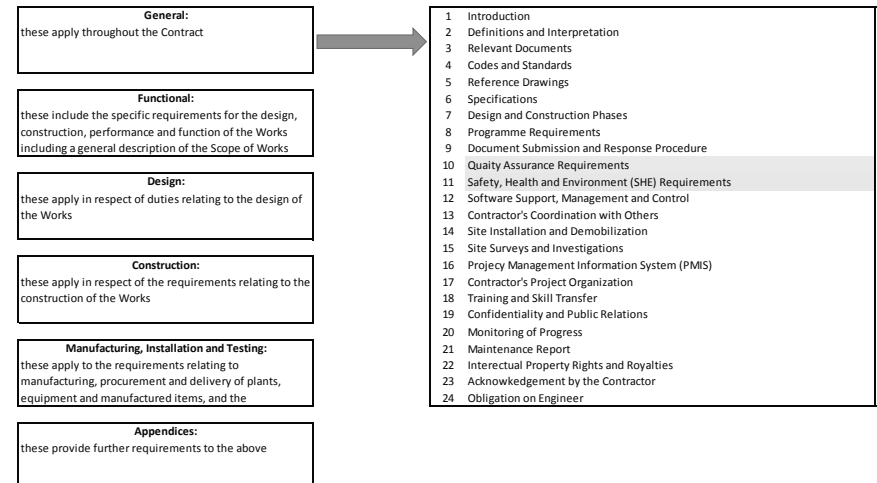
### <Contract Documents Structure>

- ❑ General Conditions of Contract
- ❑ Special Conditions of Contract
- ❑ Employer's Requirements
- ❑ Specifications
- ❑ Reference Drawings

Note: This is a Design & Construction Contract.

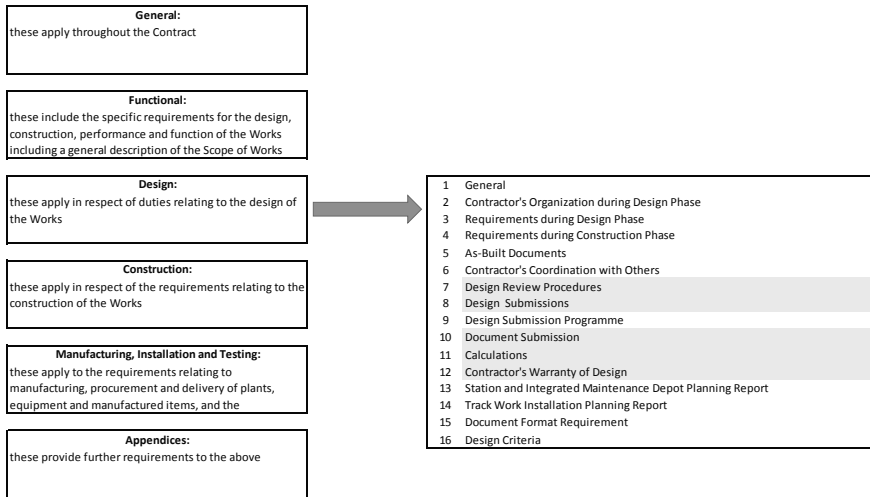
Requirements on  
**QUALITY / SAFETY**

## Employer's Requirements - General

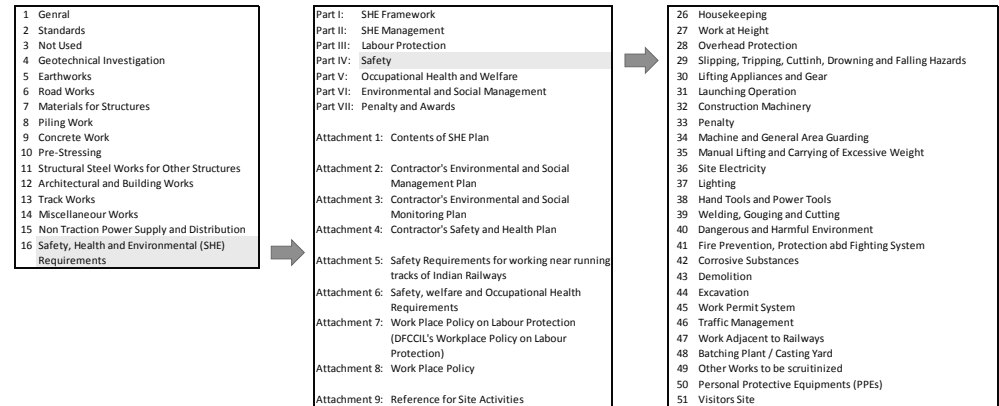


## Contract Requirements on Quality & Safety

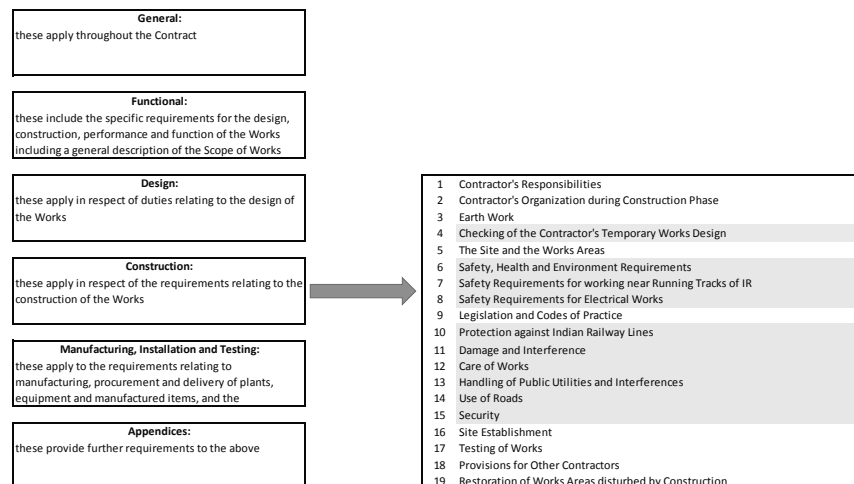
## Employer's Requirements - Design



## Specifications



## Employer's Requirements - Construction



## Specifications: SHE Management - Role of Design Team in Contractor's Organization

### <Role of Design Team in Safety, Health and Environment>

In this design-build Contract, the Contractor has a design Team in his project organization and the Design Team's primary role includes to minimise the risk to health and safety of those who are going to construct, maintain, clean, repair, dismantle or demolish the structures and others like adjoining road users/general public, who might be affected by the work.

### <General Philosophy>

When considering health and safety in the Design Team's work, they shall be expected to do what is reasonable at the time the design is prepared.

### <Hierarchy of Risk Control>

The Design Team shall need, so far as reasonably practicable, to avoid or reduce risks by applying a series of steps known as the hierarchy of risk control or principles of prevention and protection.

### <Duty to Provide Health and Safety Risks in the Drawing itself>

In case of situations where the Design Team has carried out the design work and concluded that there are risks, which were not reasonably practicable to avoid, detailed information shall be given about the health and safety risks, which remain.

### <Engineer's Consent>

Every structure like scaffold, false work, launching girder, earth retaining structures etc. shall have its design calculations included in the method statements in addition to health and safety risks. The Engineer shall examine and communicate his consent as per the contract conditions.

## 2.2 Works adjacent to Railways

### Specifications - 47. Work adjacent to Railways

#### 47.1 Protection of Live Railways

OSH: Safety Officer Matter

47.1.1 The Contractor shall design to install the temporary fencing / barricades for protection of the existing Indian Railway (IR) lines where the construction activities of all Works adjacent to the line are taking place. The fencing / barricades shall be installed as indicated in the Employer's Drawings and the fencing may be movable and reusable whereas it is stable enough not to lean and infringe the structure gauge of the IR lines. The fencing pole / barricades shall be colored to enhance visual precautionary effects. The Contractor shall submit the design of the temporary fencing / barricades to the Engineer for consent.

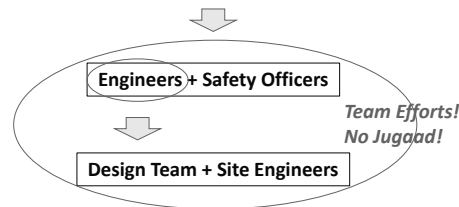
- 47.1.2 Whenever work is to be conducted in close proximity to the live railways, the following measures shall need to be addressed:
- i) The rules provided in the Railway's manual shall be followed.
  - ii) No persons are allowed to encroach onto the railway unless specific authority has been given by the owner.
  - iii) Adequate protection in accordance with the railway owner's requirements shall be followed. (Provision of Block Inspectors, Flagmen and Lookouts)
  - iv) All persons shall wear high visibility clothing at all times.
  - v) Any induction training requirements of the railways shall be strictly observed.
  - vi) Special care shall be taken to ensure safety of the travelling public, safety of existing railway and other structures located nearby, etc.

#### 47.2 Securement of Train Operation

47.2.1 Where the work to be executed is in proximity of the running railway track, the Contractor shall be required to observe all precautions and carryout all works that may be necessary to ensure the safety of the running track/trains etc. without imposition of any speed restriction thereon as may be directed by the Engineer. The Contractor shall ensure that the materials are not stacked close to the railway track, which may endanger the safety of trains and workmen.

### Railway Accidents

Cause	Effect	Consequences	WDFC Contract Documents	Safety Category	Awareness in WDFC Project
Workers	Hit by train	Lives	Specifications: SHE Requirements	Occupational Safety & Health	YES
	Affect railway operation	Financial loss			YES
Works	Damage cables	Financial loss	Employer's Requirements: Construction	Safety of Works	YES
	Damage/ Displace structures	Financial loss Lives			?



### Employer's Requirements – Construction

#### Safety Requirements for Working Near Running Tracks of Indian Railways

##### 7.1 Operational Safety

Where the work to be executed is in proximity of the running railway track, the Contractor shall be required to carryout all works that may be necessary to ensure the safety of the running track/trains etc. without imposition of any speed restriction thereon as may be directed by the Engineer. No claim whatsoever shall be entertained for either any inconvenience for the re-scheduling of the operations or for any other reasons on this account. The Contractor shall ensure that the materials are not stacked close to the railway track, which may endanger the safety of trains and workmen.

Safety of Works: Engineering Matter

7.2 Where the Schedule of Dimensions of Indian Railways for the running tracks of IR are likely to be infringed by the Contractor, the following safety measures shall be ensured

##### 7.3 Excavation Affecting Existing Tracks

While doing excavation near the vicinity of the existing tracks including for bridges and other structures, special care has to be taken to ensure that formation of the existing Railway line is not excavated, for that matter any activity involved in construction / execution of the project shall not endanger the safety of existing permanent way then, before execution of such work, the Contractor shall prepare a drawing clearly indicating such alternation / modification of the existing permanent way, and the protection measure intended to be taken by the Contractor to ensure safety of the existing running line. The effectiveness of design of such protection measures is the sole responsibility of the Contractor and the Contractor shall indemnify the Engineer / Employer towards the losses incurred due to failure of such protection measure. These protection measures duly indicating the extent of alternation / modification to the existing formation shall be incorporated in the design and drawing submitted during preliminary design submission as per the Contract. Such work shall not be undertaken unless and until these drawings are consented by the Engineer.

7.4 The Contractor shall indemnify the Engineer / Employer against any damage to the existing tracks / structures / utilities etc. caused by the actions of the Contractor or his Sub-contractors, and shall make good the same, as directed by the concerned authorities, at his own cost and shall also pay any penalty(ies) / demurrages if levied by the concerned authorities.

## Ongoing Risky Work adjacent to Railways

- ✓ What will happen if the props are removed?
  - ✓ Is the displacement of rail being monitored?
  - ✓ How to install rebar to the pilecap?
  - ✓ How to install formwork to the pilecap?
  - ✓ How to pour concrete to the pilecap?
- Temporary works design?
  - Working drawings?
  - Method statement?
  - Hazard/Aspect Identification & Risk/Impact Assessment?
  - Emergency Procedure?
  - PMC's "NO Objection to Construct"?



## Ongoing Risky Work adjacent to Railways

- ✓ Is soil between soldier piles stable?
- ✓ What will happen if it rains?
- ✓ Is the displacement of rail being monitored?

- Temporary works design?
- Working drawings?
- Method statement?
- Hazard/Aspect Identification & Risk/Impact Assessment?
- Emergency Procedure?
- PMC's "NO Objection to Construct"?



## Ongoing Risky Work adjacent to Railways

- ✓ What will happen if the vertical bars collapse?
- ✓ What will happen if something falls by strong wind?
- ✓ What will happen if scaffolding falls down?
- ✓ How to install formwork to the wall?
- ✓ How to pour concrete to the wall?

- Temporary works design?
- Working drawings?
- Method statement?
- Hazard/Aspect Identification & Risk/Impact Assessment?
- Emergency Procedure?
- PMC's "NO Objection to Construct"?



## Worst Consequences - Derailment



How much is the SLT's insurance coverage for this kind of events in this contract?

## 2.3 Major Accidents of the Project

## 2.4 What are behind the Anomalies & Accidents?

### Major Accidents (as of October 2015)

No.	Date	Package	Description	Casualties
1	24/01/2015	A	One driver was killed by track overturn.	Died: 1
2	15/07/2015	B	All vertical reinforcement bars of pier collapsed during fabrication.	Injured: 2
3	17/07/2015	C	All vertical reinforcement bars of abutment collapsed during fabrication.	None
4	20/07/2015	A	All vertical reinforcement bars of wall collapsed during fabrication.	Injured: 5
5	20/10/2015	A	An assistant of surveyor was taking a rest right in front of the compaction roller was hit and over loaded by the machine. (Detailed Accident Report yet to be submitted!)	Died: 1
6	23/10/2015	A	The drum containing flammable material exploded during gas cutting. (Detailed Accident Report yet to be submitted!)	Died: 1

## Progress & Accidents

### What changed in July 2015?

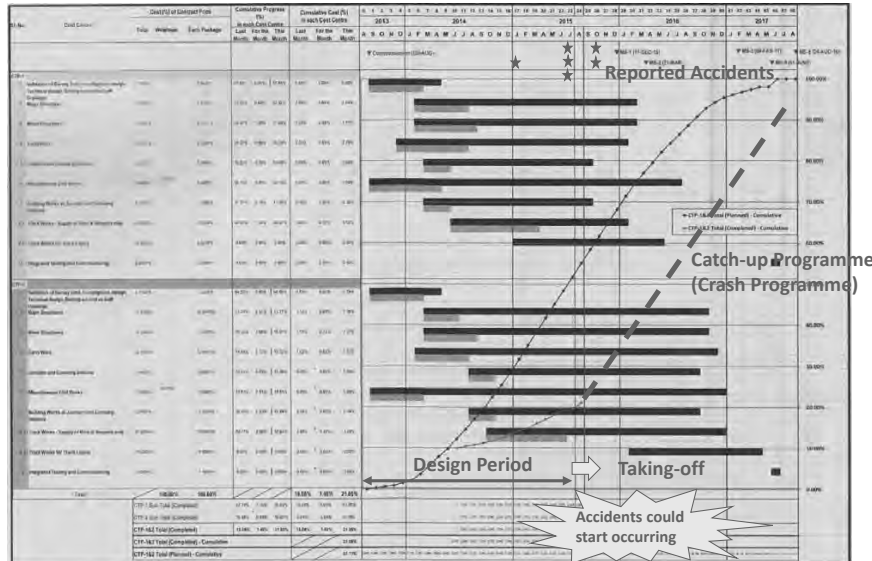
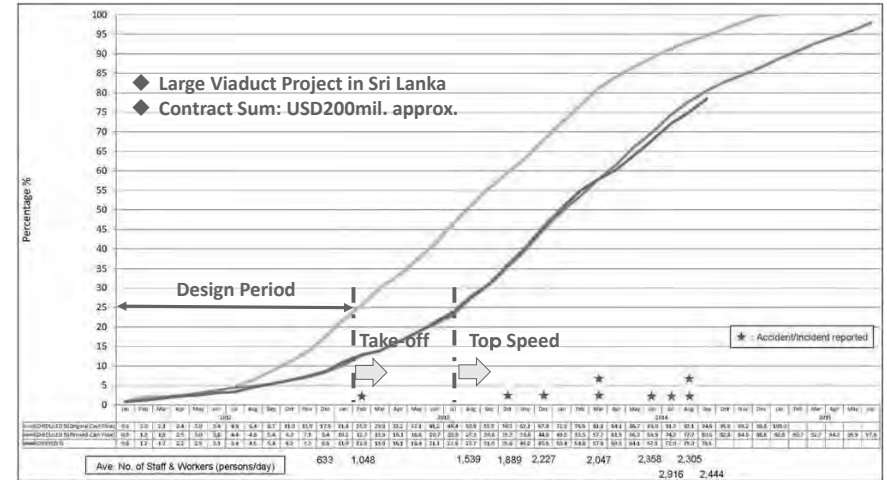
<PMC's View (Aug/15)>

<SLT's View (Sep/15)>

Phase	Work Description	Status of Works	Progress
General	Tasks throughout Services Period		
	Supporting of project management such as contract, budget, cost, quality control	On-going Total : 7 packages On-going: 3	Delayed due to low progress of construction and procurement
	Monitoring and supervision of environmental management plan	Contract signed: 2 Under Bid: 1	Re-Bid: CTP-3 Bid call not yet: PE P-6
	Support training of DFCCIL/MOR personnel	Preparation of Bid: 1	
Design Review Phase	Supporting of project management such as contract, budget, cost, quality control	On-going for 2 civil packages and 1 E&M package	Delayed due to poor contents/outputs of design reports and drawings submitted by Contractors
	Monitoring and supervision of environmental management plan		Not follow submission schedule of design that were proposed by Contractor himself
	Support training of DFCCIL/MOR personnel		
	Reporting		
Construction Supervision Phase	Carry out construction supervision works for i) CTP-1&2, ii) CTP-3A(R) and iv) EMP-4 contracts	Progress: CTP-1&2: 21.05 % (34.04 % behind)	Delayed due to low progress of design and submission of detailed drawings
	Others are not yet started	CTP-3A(R): 1.99 % (18.03 % behind)	Insufficient number of equipment and work forces such as number of site engineers, labour
Operation and Maintenance Phase: Not yet started.			

Constraints
<b>Invoice/ Payment</b>
- Part Payment of IPC 14, IPC 15, IPC 16 till not released even after 8-9 months.
- Huge gap between actual work done & invoicing. Support of Employer/Engineer needed to generate positive cash flow and better work progress.
<b>Design</b>
- Delay in Design approval of Long Duration Critical structures (RFO, ROB & IMB)
- Even after submission of Majority of design, due to pending approval there is huge shortfall in invoice. It is creating gap between invoicing and actual cost of work.
- Design - Delay in Turnout design approval to be expedited.
<b>Earthwork</b>
- (1) Depth constraint upto 1.5m for borrow earth excavation in state of Rajasthan.
- (3) EW testing on Sunday should be allowed as the progress is going to further increase in coming months.
<b>Concrete</b>
- (1) Work progress can be enhanced by allowing night working.
- (2) Wing wall & approach of R&B could not be done due to site constraints and non construction of IR R&B, which is affecting NTC Movement adversely.
<b>Others</b>
- Obstruction like BSNL cable at Viaduct, Land issue, health zone, Trees at Pig D etc. are affecting the works progress.
- Estimated productivity of equipment is not being realized because all fronts are not available due to delay in Design approval of RFO, ROB, IMB and CDP approval.
- As work has picked up in majority of work segments, more number of PMC supervision engineers are required to match up the target progress. Works in Pig B is getting affected due to above.
- Initial lifting of resources has increased the gap between invoicing and actual cost of work. Support of Employer/Engineer, needed to generate positive cash flow and better work progress.

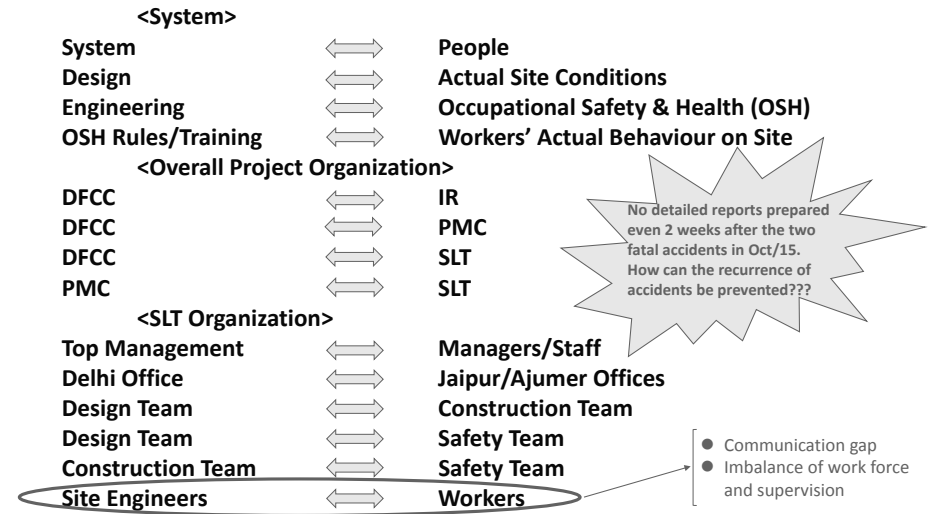
Progress & Accidents (Example)



Weakness in the Project Management

## Communication/Coordination <Overall>

Where a gap exists or may exist between:



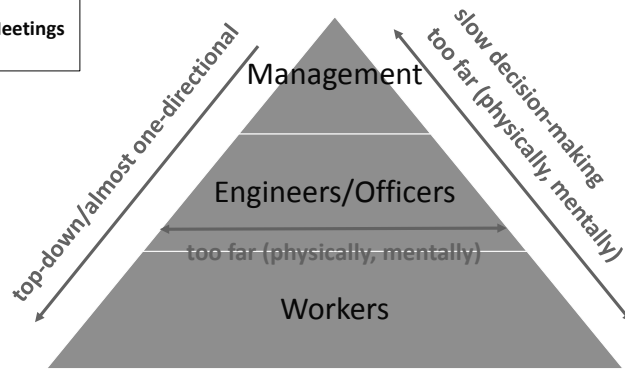
### Military-like Hierarchy of SLT Organization deployed to cope with the Size

- Management Tools (overall):**
- Employer's Requirements
  - Project Quality Assurance Plan
  - Monthly/Weekly Management Meetings
  - Monthly Reports, etc.

This is very well documented, but general only, and not much help for the real communication/coordination exercises.



Ordinary Projects



DFC Project

## Communication/Coordination between Design Team, Construction Team and Safety Team

### Three Rebar Cage Collapse Incidents within one week in July 2015



- ✓ *What happened on site and in the office?*
- ✓ *Why the mechanism to ensure the constructability and safety did not work?*
- ✓ *Were the temporary works designed as per ER procedure?*

### Employer’s Requirements – Design (Technical Design Submittals)

		Progress of the Project				
		(1) Inception Report	(2) Technical Design	(3) Construction Design	Field Change Notice	(4) As-Built Documents
Technical Drawings	Final Alignment Plan and Profile Drawings		●	●●		■
	Cross Section Alignment Drawings		●	●●		■
	Alignment Verification Report		●			■
	Railtrack Formation Plan and Profile Drawings		●	●●		■
	Cross Section Railtrack Formation Drawings		●	●●		■
	Structural Drawings for Railtrack Structures		●	●●		■
	Drainage System Drawings		●	●●		■
	Drawings and Documents Relating to Interface	○	●	●●		■
	Structural drawings for the Building Works	○	●	●●		■
	M&P drawings for the Building Works	○	●	●●		■
Track Installation Map and List		●	●●		■	
Works Specification		●	●●		■	
Design Manual		●			■	
Design Submission Programme		●			■	
Technical Design Report		●	●●		■	
Hydrologic Report		●			■	
Station and M&P Design Planning Report		●			■	
Track Schematic Drawings and Schedule		●			■	
Track Work Installation Planning Report		●			■	
S&E Documents	○	●	●●		■	
Testing and Commissioning Report		●			■	
Construction Method Statement	○	●	●●		■	
Construction Sequence Statement		●	●●		■	
Temporary Works Design Report		●	●●		■	
Safety Risk Assessment		●	●●		■	
Project Organization Plan		●	●●		■	
Document Control Procedure		●	●●		■	
Construction Programme		●	●●		■	
Shop Drawings		●	●●		■	
Fabrication Drawings		●	●●		■	
Temporary Works Drawings		●	●●		■	
Re-bar Drawings including Cutting/ Bending and Reference Schedules		●	●●		■	
Operation and Maintenance Manuals		●	●●		■	
Main Players	P&C	○	○	○	○	■
	SLC Design Team (Delhi)	●	●	●●	●●	■
	SLC Design Team (Jaipur)			●●	●●	■
	SLC Site Engineers			●●	●●	■
					Skilled Workers on Site	■

*What is happening?*

<The Contractor to confirm upon each submission>

- (1) complies with all relevant requirements of the Employer’s Requirements;
- (2) conforms to all interface requirements;
- (3) contains, or is based on auditable and proven or verified calculations or design criteria;
- (4) has been properly reviewed by the Contractor, according to the Contractor’s Project Quality Assurance Plan, to confirm its completeness, accuracy, adequacy and validity;
- (5) has taken account of all requirements for approval by statutory bodies or similar organizations, and that where required, such approvals have been granted; and
- (6) contains six (6) properly signed copies of the “Design Certificate”, if necessary, as required in Appendix 7 [Quality Assurance] and Appendix 14 [Requirements for Design] to the Employer’s Requirements.
- (7) In case of new products / technologies, certification from the client railway of the organized railway system certifying its established and proven record under similar atmospheric and operational conditions as specified in Clause 13.1.1 of Specifications (Volume III of Bid Documents)

### Employer’s Requirements – Appendix 9: Temporary Works

#### <Technical Design Submission>

- (1) Employees' camp
- (2) Offices, parking areas, warehouses, storage areas, and medical care services
- (3) Water supply, sewerage, sewage treatment and disposal, power supply and illumination, communication services (basically mobile phones and land phones), and fire fighting services
- (4) Temporary construction works including support systems for deep excavations, cofferdam and the support, concrete formworks and its support, temporary bridges and staging and so on
- (5) Access routes including temporary road works to all locations necessary to be reached in the course of construction in the Site and the Work Areas including public road diversions
- (6) Equipment pools and mechanical workshops
- (7) The detailed plan for operation of the Borrow Areas and Quarries as detailed hereinafter including approach roads
- (8) The Stockpile areas as detailed hereinafter including approach roads
- (9) Concrete batching & mixing plant and crushing plants, including cement storage
- (10) Fabrication Yard, Casting Yard including casting bed, lifting, curing and stacking Fabrication Yard, Casting Yard including casting bed, lifting, curing and stacking calculations and drawings
- (11) Transporting, handling and launching system for the precast concrete elements /steel fabricated elements
- (12) Material testing laboratories
- (13) Explosives magazines – their proposed locations and operation plan
- (14) Security and safety arrangements
- (15) Layout and drawings for offices for the Employer's and the Engineer's staff
- (16) Project sign boards and diversion boards
- (17) Barricades and other temporary walls and alike with pertinent design considerations & drawings

### Employer’s Requirements – Construction

#### Checking of the Contractor’s Temporary Works Design

4.1 The Contractor shall, prior to commencing the construction of the Temporary Works as detailed in Appendix 9 [Temporary Works], fully check the design and go through the Internal Authorization Process as described in Appendix 7 [Quality Assurance] and submit design to the Engineer for consent as part of the Technical Design. Through those process and procedures, the Contractor shall ensure that his Temporary Works have been properly and safely designed and checked the effect of the Temporary Works on the Permanent Works.

4.2 In addition to the above the Contractor shall also submit a Design Certificate to the Engineer, duly signed by Chief Design Engineer of the Contractor’s Design Team and Contractor’s Representative as part of Contractor’s Internal Authorisation process (as specified in Appendix 7 – Quality Control to the Employer’s Requirements) certifying that the Temporary Works have been properly and safely designed and checked including the effect of the Temporary Works on the Permanent Works and has found this to be satisfactory.



## Specifications: SHE Management - Role of Design Team in Contractor's Organization

### <Role of Design Team in Safety, Health and Environment>

In this design-build Contract, the Contractor has a design Team in his project organization and the Design Team's primary role includes to minimise the risk to health and safety of those who are going to construct, maintain, clean, repair, dismantle or demolish the structures and others like adjoining road users/general public, who might be affected by the work.

### <General Philosophy>

When considering health and safety in the Design Team's work, they shall be expected to do what is reasonable at the time the design is prepared.

### <Hierarchy of Risk Control>

The Design Team shall need, so far as reasonably practicable, to avoid or reduce risks by applying a series of steps known as the hierarchy of risk control or principles of prevention and protection.

### <Duty to Provide Health and Safety Risks in the Drawing itself>

In case of situations where the Design Team has carried out the design work and concluded that there are risks, which were not reasonably practicable to avoid, detailed information shall be given about the health and safety risks, which remain.

### <Engineer's Consent>

Every structure like scaffold, false work, launching girder, earth retaining structures etc. shall have its design calculations included in the method statements in addition to health and safety risks. The Engineer shall examine and communicate his consent as per the contract conditions.

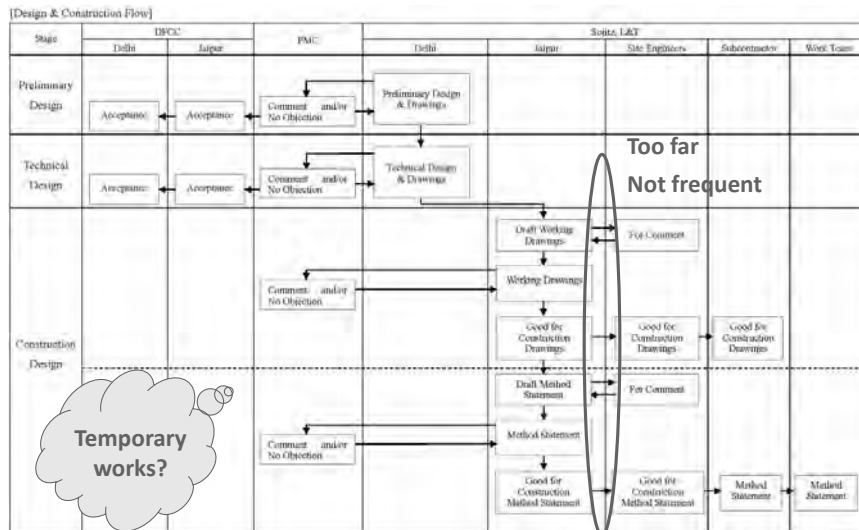
## Method Statement for Construction of Substructure for Bridges

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ANNEXURE C.....	CONSTRUCTION PROGRAMME

- What are missing
- ✓ Detailed information on specific structures
  - ✓ Consideration on the adjacent structures
  - ✓ Design Team in the organization
  - ✓ Construction Joints (C.J.) with dimensions
  - ✓ Temporary works design/construction sequence (except formwork)
  - ✓ Installation method of main (vertical) bars of pier
  - ✓ Temporary support for main (vertical) bars
  - ✓ Risk Assessment on engineering matters



## Submission of Construction Design Package for Request to Construct

DESCRIPTION	ENCLOSURE
1. Updated Technical Specifications	
a. GAD	Annexure - 01
b. RC	
c. Setting out plan	
2. Working Drawings	Annexure-02
3. Construction Practising Documents	
a. Updated Construction Method Statement	Refer: Doc. No. DOC/CTP1&2/TECH/GEN/0042 Annexure - 05 of Submittal No: SLT/NKC/CTP1&2/TECH/Br/2015/2461 dated 20.03.2015
b. Construction Sequence Statement	Annexure - 03
c. Updated Construction Programme	Annexure - 03
d. Safety Risk Assessment	Refer: Annexure - 05 of Submittal No: SLT/NKC/CTP1&2/TECH/Br/2015/1915 dated 24.01.2015 vide. Approved NONO Letter No. L-NKC-SLT-PMC-JP-1501-44 dated 29.01.2015
4. Work Management Plans	
a. Project Organization plan	Annexure - 04
b. SHE Plan	Refer: Annexure - 05 of Submittal No: SLT/NKC/CTP1&2/TECH/Br/2015/1915 dated 24.01.2015 vide. Approved NONO Letter No. L-NKC-SLT-PMC-JP-1501-44 dated 29.01.2015
c. Site Quality Assurance Plan	

- What are missing
- ✓ Construction Joints (C.J.) with dimensions
  - ✓ Temporary works design
  - ✓ Installation method of main (vertical) bars
  - ✓ Temporary support for main (vertical) bars
  - ✓ Information on crane (capacity, location)
  - ✓ Risk Assessment on engineering matters
  - ✓ Design Team in the organization

## Magic of Accidents Statistics

It is learnt that the frequency rate of casualties (= (casualties by occupational accident) / (total working hours) x 1,000,000) of WDFC is as low as those of typical civil works projects in Japan.

However, it is not adequate to jump to the conclusion that there are not many accidents occurring in WDFC.

This is magic of statistics.

The low frequency rate of casualties of WDFC is attributable to the huge total working hours of workers in this labour-intensive project.




Site people's unwillingness to report accidents to the management could also be affecting.

When there is an accident in a serious nature, in particular, having fatal casualties, statistics becomes meaningless.

Loss of life or serious injury surpasses statistics/probability from a human point of view.

## Section 3: Recommendations on WDFC Project

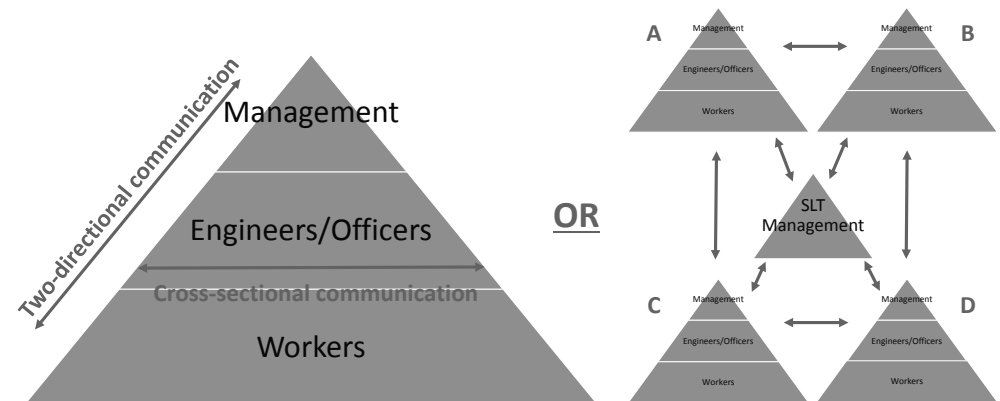
JICA Team conducted safety review study on a USD200mil. Yen-loan project in Sri Lanka in 2014 and another 200mil. Yen-loan project in Kenya in 2015.

Country	India	Sri Lanka	Kenya
Cricket	1	2	3
Former Colonizing Nation	England	England	England
General Conditions of Contract in Construction	FIDIC based	FIDIC based	FIDIC based
Occupational Safety Management Framework	1	2	3
Occurrence of Accidents in Construction			

Accidents occur in any construction projects, in any countries, whatever system in place, whoever does it!

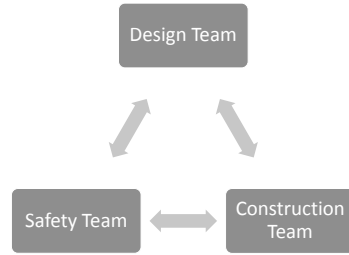
However, whether or not reducing the frequency of any accidents and preventing occurrence of major accidents can be achieved depends on the daily efforts, discipline, prudence and wisdom of all players of each project.

- 1) The overall management structure/system presently applied shall be carefully reviewed. Enhancement of two-directional/cross-sectional communication and/or breaking one large hierarchy into one management + four medium-sized cells would be alternatives.



2) The Design Team shall communicate/coordinate with the Construction Team and Safety Team before/during/after preparation of working drawings and method statements. It should be noted that people on site know the site better, while the Design Team knows design better. They should discuss the actual site conditions, design, construction methodology and safety regularly. Similar care shall be taken to the overall communication/coordination.

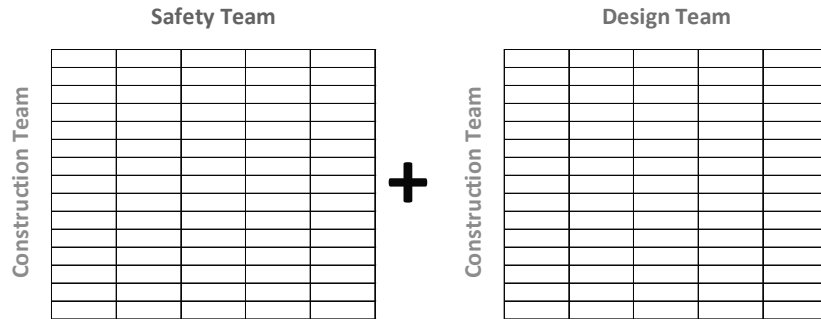
Targets of Construction Project			Players in the office/on site	
			Engineers	Safety Officers
Safety	Occupational Safety & Health → Persons	✓	✓✓	
	Safety of Works → Structures	✓✓	✓✓	
Quality		✓✓	✓	
Schedule		✓✓	✓	
Cost		✓✓	✓	



3) At design of any structure, the construction method/sequence, constructability and risks shall always be thought about. In addition to the design only the completion stage of structures, the structures in a temporary state and temporary structures, as/if necessary, shall be planned/designed together. Major/crucial temporary structures shall be registered to include in the design schedule. It is recommended to prepare a booklet on temporary works to share the knowledge/experience in the project organization, similarly to what the Safety Team is implementing.



### Functional Matrices



(this matrix exists)

(formation of this matrix is encouraged)

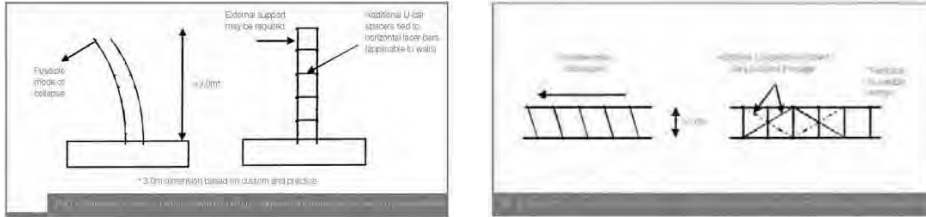
SHE = Safety, Health & Environment  
 SQE = Safety, Quality & Engineering } to be merged

### Temporary Works Design Schedule Management (Example)

ENGINEERING WORKS SCHEDULE (Temporary Works Design)												Document: W1114-DE-001		
Element No.	Title	Resp	Cat	Verifier	85% Design			100% Design			FC		LKM	Remarks
					Submission Target	Design	Response	Review Start	Submission Target	Response	Target	Actual		
<b>GENERAL</b>														
TW-010	The Establishment of Eastside Area	KO	B									10-May-04	10-May-04	
TW-011	Temporary Power Supply for Wilson Street Project	ETC	B									1-Apr-04	1-Apr-04	
TW-012	Temporary Power Supply for Eastside Office Area	ETC	B									1-Apr-04	1-Apr-04	
TW-013	Temporary Power Supply for TBM Tunneling	ETC	B									10-May-04	10-May-04	
<b>BORED TUNNEL</b>														
TW-100	TBM Temporary Facilities - Block Sign	BG&E	B									12-Apr-04	12-Apr-04	12 mths before starting up - Add ES531 - 120105
TW-101	TBM Temporary Facilities - Shift Conveyor 'R'	BG&E	B									12-Apr-04	12-Apr-04	12 mths before starting up - Add ES531 - 120105
TW-102	TBM Temporary Facilities - Pad Support of Gravity Crane	BG&E	B									12-Apr-04	12-Apr-04	12 mths before starting up - Add ES531 - 120105
TW-103	TBM Temporary Facilities - Tunnel Hoisting 'R'	BG&E	B									12-Apr-04	12-Apr-04	12 mths before starting up - Add ES531 - 120105
TW-104	Temporary Facilities - Tunnel Ventilation	Sub/Con	B									12-Aug-04	12-Aug-04	12 mths before starting up - Add ES531 - 120105
TW-105	Temporary Facilities - Lighting	Sub/Con	B									12-Aug-04	12-Aug-04	12 mths before starting up - Add ES531 - 120105
TW-110	TBM Reaction Frame & Guide at Eastside	BG&E	B									27-Oct-04	27-Oct-04	27 mths before starting up - Add ES531 - 120105
TW-111	TBM Reaction Frame at Wilson St. North	BG&E	B									27-Oct-04	27-Oct-04	Design at same time as Eastside
TW-112	TBM Crane at Wilson Station	BG&E	B									27-Oct-04	27-Oct-04	Design at same time as Eastside
TW-113	TBM Entrance Ramp	BG&E	B									27-Oct-04	27-Oct-04	27 mths before starting up - Add ES531 - 120105
TW-114	Temporary Works for Hoisting TBM at Wilson Street Station	BG&E	B									27-Oct-04	27-Oct-04	Design at same time as Eastside
TW-120	Temporary Works for TBM Assembly - AOD Crane support	BG&E	A		12-Oct-04		2-Nov-04					18-Nov-04	18-Nov-04	18 mths before TBM arrival - 120205
TW-121	Temporary Works for TBM Retrieval - AOD Crane support	BG&E	A		12-Oct-04		2-Nov-04					18-Nov-04	18-Nov-04	18 mths before TBM arrival but during construction of Retaining Box
TW-126	Ground Improvement for TBM Assembly at North Eastside Station	GC	A		4-Aug-04		24-Sep-04					8-Oct-04	8-Oct-04	8 mths before the activity - Add ES531 - 09-2304
TW-131	Ground Improvement for TBM Assembly at Wilson Street Station	GC	A		28-Feb-04		18-Mar-04					1-Apr-04	1-Apr-04	12 mths before the activity - Add WS1408
TW-132	Ground Improvement for TBM Assembly at Wilson Street Station	GC	A		01-Jul-04		16-Jul-04					1-Aug-04	1-Aug-04	12 mths before the activity
TW-133	Ground Improvement for TBM Arrival at TBM Receiving Shaft	GC	A		28-Jul-04		15-Aug-04					1-Sep-04	1-Sep-04	18 mths before the activity
TW-140	Blasting Protection - Physics Chemistry H2O2, MFC	GC	A		28-Jul-04		18-Aug-04					1-Sep-04	1-Sep-04	18 mths before tunnel passing
TW-141	Blasting Protection - North Yard Entrance	GC	A		15-Sep-04		1-Oct-04					1-Nov-04	1-Nov-04	18 mths before tunnel passing
TW-142	Blasting Protection - Huxia Street Bridge	GC	A		27-Oct-04		17-Nov-04					1-Dec-04	1-Dec-04	18 mths before tunnel passing
<b>BERTH YARD</b>														
TW-200	North Yard Out & Over Tunnel - Temporary Street Plan Wall Design	GC	A		20-Mar-04		10-Apr-04					24-Apr-04	24-Apr-04	24 mths ahead 3 mths before - programme to be reviewed again
TW-201	North Yard Out & Over Tunnel - Temporary Street & Walling Design	BG&E	A		10-Apr-04		17-May-04					25-May-04	25-May-04	25 mths before starting up
TW-202	North Yard Out & Over Tunnel - Draw clearing Design	GC	A		4-May-04		10-Jun-04					10-Jun-04	10-Jun-04	10 mths before sheet piling works
TW-203	North Yard Out & Over Tunnel - Pilework & Formwork	Sub/Con	B									23-Jun-04	23-Jun-04	23 mths before construction
TW-210	North Yard Receiving Shaft - Temporary Street Plan Wall	Sub/Con	B		17-Jun-04		10-Jul-04					14-Jul-04	14-Jul-04	14 mths before sheet piling
TW-211	North Yard Receiving Shaft - Temporary Street & Walling	BG&E	A		10-Jul-04		31-Aug-04					14-Sep-04	14-Sep-04	14 mths before sheet piling
TW-212	North Yard Receiving Shaft - Draw clearing	GC	A		30-Jul-04		16-Aug-04					14-Sep-04	14-Sep-04	14 mths before excavation in area
TW-213	North Yard - Receiving Shaft - Fences on & Formwork	Sub/Con	B									15-Oct-04	15-Oct-04	15 mths before construction
TW-214	North Yard Receiving Shaft - Temporary Services Hoisting	BG&E	A		10-Aug-04		31-Aug-04					14-Sep-04	14-Sep-04	14 mths before excavation in area
TW-215	North Yard Receiving Shaft - Temporary Hoisting	BG&E	A		10-Aug-04		31-Aug-04					14-Sep-04	14-Sep-04	14 mths before excavation in area
TW-250	North Yard Out Structure - Temporary Street Plan Wall Design	GC	A		28-Mar-04		18-Apr-04					30-Apr-04	30-Apr-04	30 mths before sheet piling
TW-251	North Yard Out Structure - Temporary Street & Walling Design	BG&E	A		27-Apr-04		18-May-04					1-Aug-04	1-Aug-04	18 mths before excavation in area
TW-252	North Yard Out Structure - Draw clearing Design	GC	A		25-Apr-04		20-May-04					30-May-04	30-May-04	30 mths before sheet piling
TW-253	North Yard Out Structure - Pilework & Formwork	Sub/Con	B									18-Jun-04	18-Jun-04	18 mths before construction
TW-254	North Yard - Temporary Support for Wilson Street Bridge Modification	BG&E	A		27-Apr-04		17-May-04					1-Jun-04	1-Jun-04	18 mths before start sheet piling in area

## Temporary Works Design - Stabilization of Rebar Cage

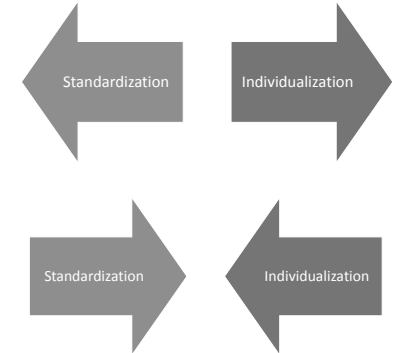
Reference: "Stability of Reinforcement Cages Prior to Concreting"



Logical Requirements	Temporary structure shall be designed to resist all expected loads. Temporary structure shall be adequate to prevent collapse or overturning. Requires checking to any temporary release of any portions of the support system. Specify minimum wind load.
Loads on Rebar Cages	Self Weight Construction Loads (P/T Wire forces, Live Load (construction workers)) Environmental Loads (Wind) These loads are not similar to the permanent loads that the reinforced concrete element was designed for. Rebar cage is part of the temporary structure.
Internal Forces in Rebar Cages	Rebar cage has structural boundary conditions at the base (fix, pin, lap-splice) and along its height (props, guy wires). Rebar cage has structural section properties: area (A), moment of inertia (I <sub>x</sub> , I <sub>y</sub> , J) Rebar cage material has Young's Modulus, E Loads will create axial forces, bending moments and shear forces in the rebar cage.
Engineering Analysis and Design	Structural engineer designed the bar reinforcements and approved the shop drawings/bar bending schedules. Construction engineers designed the propping/guying plan for the temporary structure. Who analyzes, designs and checks the rebar cages to the construction loads that are subjected to is not clear.

4) Since WDFC project is gigantic, it is impossible to manage the project without systemization/standardization of various works, procedures, forms, etc. including design. However, each site has its own uniqueness. In preparation of working drawings and method statements, attention shall be paid to the peculiarities (including the surroundings) of each structure. Standardization is not necessarily optimum.

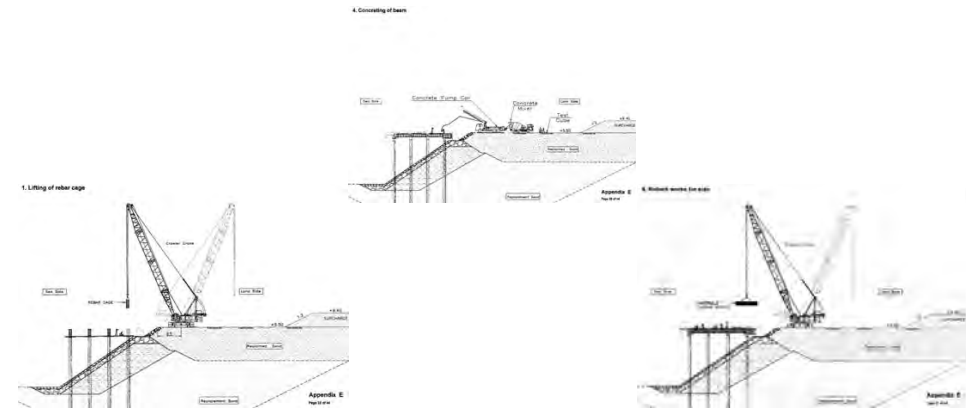
SL. No.	Type of Structure	CTP-1	CTP-2
1	Viaducts	1	-
2	Important Bridges	-	11
3	Major Bridges	15	83
4	Minor Bridges	270	530
5	ROBs	5	1
6	RUBs	171	133
7	Pedestrian Subways	12	49
8	RFOs	3	2
9	FOBs	22	31
Total No. of Structures		499	840



## Stability of Column/Wall Rebar Cages during Construction <Expected Roles of Players>

Players	Roles	
Design Consultant or Design Team	Design reinforcement bars inside concrete elements to resist code permanent loadings.	
	Specify bar reinforcement details (cover, spacing, and splice type).	
	Prepare contract document (Drawing and Special Provisions) for the reinforced concrete elements.	
Contractor or Construction Team	Must build the reinforced concrete elements according to the contract drawings, special provisions and State Standard Specifications.	
	Choose methods and means on how to build the reinforced concrete elements.	
	Utilize steel fabricators and detailer to furnish and assembly reinforcement bars.	
	Rebar Assembly	Steel Detailer prepare shop plans according to the contract drawings (bar schedule: size length, spacing, splice details).
		Structural Engineers approve shop plans.
		Steel Fabricators assemble bar reinforcement and build rebar cages using their expertise and ISS.
	Erecting Rebar Cages	Steel Fabricator transport rebar cages to site.
		Contractors choose how to erect rebar cages: number of cranes, concrete forms, type of bracing system.
		Rebar cages are part of a temporary structure that includes: props, guy wires and their connection devices and anchor blocks.
		Construction engineer design and seal temporary structure drawings.

5) In method statements, it is encouraged to use visual information rather than English writings. Site engineers' English literacy as well as their working conditions make it difficult for them to have a good grip of English-written information.

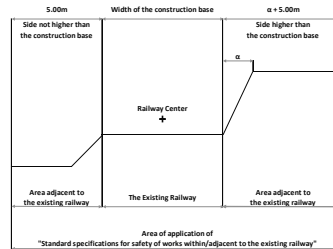


6) There two requirements to be achieved at any rate in sections adjacent to the existing IR tracks.

- a. The tracks shall not be damaged nor excessively displaced. There should be the threshold of allowable displacement.
- b. Periodical monitoring of the displacement of existing tracks shall be carried out throughout the period of the affecting construction. An emergency procedure shall be prepared in advance for excessive displacement/deformation.

**Safety Measures for Works within/adjacent to the Existing Railway in Japan**

3-1 Safety inspection sheet & safety meeting minutes	1. Safety inspection sheet 2. Safety meeting minutes 3. Procedures in emergency, such as accident
3-2 Measures for works within/adjacent to the existing railway	Works within/adjacent to the existing railway
	Procedures of closure of railway
	Preparation
	Before commencement
	At completion
3-3 Railway construction gauge	Set-off equipment
	Procedure to stop feeding
	Confirmation system at completion of construction requiring railway closure
3-4 Railway crossing exclusive for construction use	Securing construction gauge Are to store materials, equipment and machineries



8) It is not enough to conduct induction trainings/seminars. For not only labours but also engineers, it is virtually impossible to memorize everything at once and their memory will fade out as time passes by. Therefore, it is imperative to keep reminding/training them as well as yourselves of the necessity of safety and how to achieve it with patience until the completion of the project.

*Jugaad is Jugaad. Not the final goal.*



7) Sections where the DFC structures are constructed adjacent to IR tracks shall be registered in an adequate format. The register list shall describe characteristics of each section together with things to be noted from a truck/train safety point of view. The list shall be updated weekly incorporating site engineers'/safety officers' observations as well as the Design Team's follow-up comments, and reported to the management.



**Safety First**

*Safety to be secured for ethical, statutory & contractual reasons*



**Safety Costs**

*Safety not free requiring attention, personnel, efforts & money*



**Safety Pays**

*Lives, time, reputation and eventually money can be saved*



*Thank You!*



Appendix-6

Follow-up

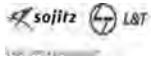
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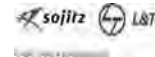
## CPM CTP 1 Site Safety Report

17-21 November 2015  
(Package A&B)



## Summary of Findings from the Safety Inspection & Action Required!

- Green Sticker for earth working machines were given to majority of machines, **all the machines must be checked** daily by each operator and periodically by responsible department;
- List of **Do's and Don'ts** to be provided for each machine respectively and operator must follow the rules;
- **Safety posters in Hindi language** should be provided to each machine and work site;
- **Competency Certificate** were not issued to majority of operators. Operators must go through induction training and operator training and get competency certificate before start operating machines;
- **Delay starters and wheel chocks** are provided for majority of machines. Operators must check around and below the machine before starting the engine;
- **Repetitious trainings** to supervisors and machine operators for safety machine operation to be delivered;
- Majority of engineers, workers and operators hold **ID Cards**. ID Card should be issued only after induction training. Work specific induction training should be given to respective worker and his/her understanding must be checked before issuing ID Card.
- ID Card should be renewed **every 6 months** and **refresher trainings** should be given to each personnel;



## Aim and Purpose

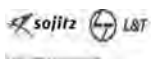
Following a review of serious accidents that have occurred on the WDFC it was made clear by Mr CL Meena WDFC CPM CTP1 of the top managements' utmost commitment to the safety to all the personnel working on project sites must be demonstrated by visibility at site and engagement with workers, engineers and subcontractors.

The message required is to make it known how seriously accidents are taken and what is necessary to ensure that all accidents are prevented.

- Safe Working Condition of every plants and machines on sites to be checked; and confirmation that Operator Safety Trainings has been delivered at all locations of project.
- To deliver Safety Pep Talks to as many site engineers/supervisors/workers at as many locations of project sites as possible.
- Safety Inspections were conducted covering earth works, structure works, temporary works and so on at various locations
- Audit of the site Safety Management System during the inspection and evaluate for improvement

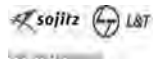
- **Vertical excavation** around structures must be avoided, and layout plan for each work area must be prepared before starting excavation work;
- **Method statement, Work procedure, Temporary work design and Design calculation, and Risk Assessment** to be provided for each structure work;
- **Work Permit** system should be properly implemented, any high risk activities should not be undertaken without the permit
- **Primary responsibilities for site Safety must rest on PMC and SLT Site Engineers** executing and supervising actual works on site.
- **PMC and SLT SHE Team must ensure site engineers' proper implementation of required safety system on sites and safety rules are followed by all the personnel on site.**
- **PMC and SLT Top Managements' utmost commitment to the safety must be demonstrated all the time till completion of the Project.**

Mr. C.L Meena  
WDFC CPM CTP1



# Package A Rewari to Narnaul

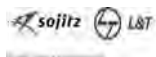
Mr CL Meena WDFC CPM CTP1



Location	Points Discussed/Issues	Action Required by
DFCC Ch 9860,9820,9780 Section 15H	OHE MAST infringement	DFCC / PMC
DFCC Ch 9700-9830 Section 15H	Tree Obstruction	DFCC / PMC
DFCC Ch 8.150 Section 15H	IOCL Pipe Line- Joint meeting between DFCC-IOCL shall be conducted.	DFCC
Section 15H- Safety	CPM checked M/s DH Construction Grader ID Cards and Working Method during stoppage and Starting of Machine. Diary for individual operator has to implemented and operators skills( Safety Awareness ) has to be checked regularly and signed by SLT /NKC/DFCC staff as and when they do checking	DFCC/PMC/SLT
Safety Cone - Safety	2 Nos of safety cone to be provided to each Grader and Roller. Same shall be used for during operation as guideline for boundary.	SLT
RUB-10 section 15H	Land problem between DFCC and PWD to be solved.	DFCC/PMC
RUB-9 - Safety	Rebar tying for wall in progress - CPM checked temporary staging for rebar tying. CPM inspected parked machineries. Wheel stoppers were provided in Rollers and graders.	
DFC Ch 3800 15H - Safety	CPM instructed to provide wheel stopper for Dumpers also while parking. Safety Green Strickers were missing in M/s Gopal ji equipments	SLT SLT
RFO -5 Section 15H	GAD Approved Technical design has to be submitted Traffic diversion and Construction sequence to be finalised.	SLT SLT
MIB-4 Section 15H	Excavated material was stacked near to the excavated area, and slope of excavation was not maintained along the edges. Sketch for Excavation and Method Statement has to be issued to site team.	SLT
RFO - 2 Section 15H	GAD yet to be Approved Traffic diversion and Construction sequence to finalised.	SLT
RUB-1A Section 15H	Current Status - Slab Completed. CPM inspected finishing of walls and suggested to minimize the formation of air bubbles on the surface.	SLT
ROB-11A Section 15RD	Current Status - GAD Approved. Design Submitted to engineer. Traffic diversion plan finalised.	SLT
Rewari Plant - Safety	Diversion road has to be prepared and traffic to be diverted.	SLT
IR Ch 14/9 Section 15RD	CPM addressed Pep Talk for Labors, Machine Operators - Regarding safety during various construction activities. CPM Visited RUB-D/12 Location which currently under hole due to space constrain. Insufficient ROW and Electric Utility obstructing the Construction of TOE / CURTAIN Wall shown to CPM. Deviation from drawing which is not affecting any structural design of structure shall be decided at site Level for Construction.	PMC
IR Ch 15.045 MIB-5 Sec-15RD	CPM instructed NKC to have change in system , that small changes which does not lead to design change shall be decided by RE and Field change Notice shall be approved by ZFT and conveyed to ZMT. Work shall be continued with the permission of RE and Field change Notice shall be required during Invoicing time.	PMC /SLT
IR Ch 20 Pugmill Plant	CPM inspected pugmill production summary and stock register and instructed pugmill incharge to maintain daywise and Hourly recroding of plant operation.	SLT
IR Ch 21 Kund quarry	CPM has visited the Kund Quarry Location and Project Manager. SLT explained CPM regarding change in Horizontal Alignment proposed by SLT to avoid retaining Wall.	
IR Ch 27 CONCOR Depot Siding	Location for Temporary LC at CONCOR Depot Siding Shown to CPM	
Ateeli Plant- Safety	CPM addressed Pep Talk for Labors - Regarding safety during various construction activities and avoiding Mobile phones during working hours.	
IR Ch 38 - Safety	CPM Inspected Roller working in Blanket Location, and roller operator gave demo of safety measures to be taken before starting machine.	
IR 40 Pugmill	CPM inspected pugmill production summary and stock register	
IR 41 LC-34 Section 15	IR Contractor Erected RUB box and excavated DFCC Formation Without information. CPM instructed to have joint meeting of IR Sub Contractor,DFC,SLT and PMC to avoid such situation in future.	DFCC /PMC /SLT

## CPM VISIT Package -A (17 to 19 November 2015)

CPM VISIT Note Package -A (17 to 19 November 2015)		
Date : 17-11-15		
Key Persons		
DFCC	PMC	SLT
CLM-CPM	MRC- Dy.CSE	SG-Dy.PD
NK- PM	AKG-Dy.PM	CP-PM
PC-APM	LV-RE	NW-Safety Director
PK-APM	AKS-ARE	AI-Section In charge
	MY – Safety Expert	AK-PI
		SDK-Section In charge



## Detour Section Near Rewari



Grader working under supervision



Safety Posters Placed on Machines should be standardized and placed in same locations



The grader operator was working without clear demarcation of the work boundaries. Safety Cones and florescent tape should be used to clearly mark the safe working area



Chocks available for grader. This are not being placed in consistent locations under wheels This should be standardized across the project

## IR Ch 40/08 LC 34

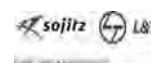
IR Ch 40/08 LC 34 has been constructed by Indian Railways who have dug a large excavation on the WDFC side. This excavation is deemed to be unsafe due to the soft soil, steep and deep sides. The excavation has evidence of collapse and this is of particular concern where this meets the approach road. There is no safety signage or barricade around the whole site.



## Joint Inspection – 18<sup>th</sup> November 2015

### CPM VISIT Note Package -A (17 to 19 November 2015)

Date : 18-11-15		
Key Persons		
DFCC	PMC	SLT
CLM-CPM	MRC- Dy.CSE	VNG-PD
NK- PM	TM-PM	SG-Dy.PD
PK-APM	LV-RE	CP-PM
VKM-APM	RKJ-ARE	NW-Safety Director MNGS,RK-Section Incharge
	RKD-ARE MY – Safety Expert	KVSB,PKP-Section Incharge
		AK-PI

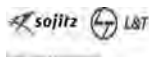


## Joint Inspection 18<sup>th</sup> November 2015

### Package A Narnaul to Neem Ka Thana

Mr CL Meena WDFC CPM CTP1

Location	Points Discussed/Issues	Action Required by
IR Ch 50 MJB-10 section 15-Safety	CPM addressed Pep Talk for Labors - Regarding safety during various construction activities and importance of house keeping at major bridge location.	
IR Ch 51 Narnaul IR Station Loading Point	Project Manger SLT explained the obstruction of loading point Road to DFCC proposed formation. CPM has instructed SLT to Start formation work immediately at this location. Also instructed DFCC APM /PM to clear the problem if any arises from IR.	SLT / DFCC
IR Ch 52 LC-43,44,45	CPM gave taining to Roller operator working in Blanket layer regarding machine operation. Integrated GAD Approval Pending at DFCC	DFCC/PMC/SLT
Pipe line Near LC-45	Pipe Line near LC-45 which is in DFCC has to be taken up.	DFCC
IR 58 Pugmill location and Amarapur jorase Plant -Safety	CPM addressed Pep Talk for Labors - Regarding safety during Plant operation and various construction activities.	
IR Ch 64.5 LC-52 Section 14	CPM suggested to design approach road as available in IR RUBs (90° turn)	SLT / PMC
Nizamapur IR Station-Formation	Project Manger - SLT explained the Infringement of IR platform with proposed DFCC Track. CPM instructed to submit complete technical proposal to PMC for further approval.	SLT/SLT / PMC
LC 53	Existing IR Cabin room infringing with DFCC proposed formation Minimum space required NTC movement ha to be checked from Dn Track Center of DFCCinform to DFCC/PMC for dismantling for further action. Proposed MIB-70 is infringing with existing IR bridge by 2.5m.	SLT / PMC/DFCC
IR 66.7 MIB-70 section 14	Possible Technical Proposal to be submitted to PMC for review. 1.Cantilever Slab to avoid dismantling of IR bridge. 2.Replacement of IR Arch bridge with BOX type. 3.Horizontal Alignment shifting.(Near by structures construction completed)	SLT / SLT /PMC
MJB-56 -Safety	CPM addressed Pep Talk for Labors - Regarding safety during various construction activities. Rolling Trophy(Monthly) for Best Safety Site has to implemented.	SLT
IR 79.800 FORMATION and Safety	Slope Stability and Drain at high embankment area to be taken to avoid rain cuts during rain. CPM Inspected Roller parked on bed during lunch time and found proper Wheel stopper , parked as per safety norms.	SLT/SLT
LC-63 -Safety	CPM Inspected RUB BOX erection at LC-63 location and verified Crane load chart and operators licences. GAD Approved	
ROB at LC-64	Technical design has to be submitted Traffic diversion and Construction sequence to finilised.	SLT SLT



## IR Ch:73/48 Major Bridge 35



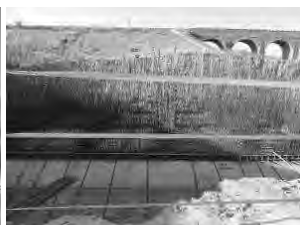
The site is well managed with good house structural arrangements with well organised material and storage. There is sufficient signages and barrication around the site. All workers were in possession of ID cards.



## IR Ch:73/48 Major Bridge 35



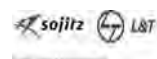
Good site arrangements, access and barrication



## Joint Inspection – 19<sup>th</sup> November 2015

### Package A – Ringus to Neem Ka Thana

Mr CL Meena WDFC CPM CTP1



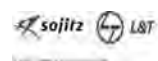
## Joint Inspection – 19<sup>th</sup> November 2015

CPM VISIT Note Package -A (17 to 19 November 2015)

Date : 19-11-15

Key Persons

DFCC	PMC	SLT
CLM-CPM	RF-PD	VNG-PD
SK-Dy.CPM	MRC- Dy.CSE	SG-Dy.PD
NK- PM	TM-PM	CP-PM
SKC- PM	Emilo-QAQC MY – Safety Expert	NW-Safety Director
PK-APM	LV-RE	KVSB,PKP-Section Incharge
VKM-APM	BS-ARE	MB-Track Work head
	RKD-ARE	JK-SLT Designer, AK - PI



Location	Points Discussed/Issues	Action Required by
LC-104	Detailed launching and traffic diversion has to be planned	
LC-103	Detailed launching and traffic diversion has to be planned. Land identification towards ROW side for Approach Road.	DFCC / SLT
LC-101	CRS approval to be taken through CBE for retaining IR embankment along the Extra RUB constructed near to existing IR RUB.	SLT / DFCC / PMC
LC-99	DFCC BOX shall be buried temporarily with extra Box for NTC movement. RUB shall be commissioned after IR BOX launching.	SLT/PMC
LC-96	CRS approval to be taken through CBE for retaining IR embankment along the Extra RUB constructed near to existing IR RUB.	SLT / DFCC / PMC
LC-94	Detailed launching and traffic diversion has to be planned	SLT
LC-91	CPM instructed to complete backfilling and retaining wall at the earliest.	SLT
Safety	CPM instructed safety team to issue all safety awarness posters in Local language(Hindi) not in English.	SLT / SLT
LC-88	Integrirty GAD Approval required,CPM instructed to start the work as the Vent size is finalised.	SLT
LC-87	Box Launching has to be planned to complete with in 2 days from starting and detailed traffic planning has to be submitted.	SLT
LC-86	DFCC BOX shall be burried temporarily with extra Box for NTC movement. RUB shall be commissioned after IR BOX launchig. Additional Land has to be required in DFCC side for Approach road.	SLT/DFCC/PMC
MJB-17	CPM inspected MJB-17 and addressed Peptalk for Labors and instructed to Complete bridge before end of December'15.	
IR Ch 119.200	CPM Inspected Density Checking using Nuclear Density Checking Instrument.	
MJB-19	CPM inspected MJB-19 and instructed to Complete bridge before end of December'15.	
LC-84	Space constrain for Retaing Wall Construction. Extra box shall be constructed to maintain the required slope.	
LC-83	IR Side Retaing Wall infringing with IR Retaing Wall Foundation.DFCC Retaining Wall Shall be Constructed by touching the IR Wing Wall.	SLT / PMC

## Kachera

Ballast Excavator operating with good markings on the formation and with the necessary green stickers. The operators were questioned and tested on their knowledge and closing down and starting drill. This was performed adequately but process needs to be more clearly defined and be the same for all sites. There was no delay starter mechanism attached to this machine.



## IR Ch:140/55LC 103



Access at this site will need to be very planned as a diversion is required and recently the access was closed as the embankment

Safety Traffic Signs are Required for this location



## RUB Construction Site



- Proper barrication around excavation need to be maintained
- Vertical excavations around structure need to be rectified
- Traffic control signs and safety signs to be provided around the site
- Back filling around structure to be done as soon as practical

## MJB 19



- Lifting operation must be done according to approved method statement
- Design calculation for the temporary supporting for the girders to be submitted
- Crane and lifting gears must be checked every day
- Work permit should be given after DFCC/PMC/SLT joint inspection before resuming any activities

## Earth Moving Machines



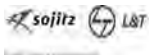
- Operators are found to be holding proper Drivers' license / ID card
- Induction training is given to operators on site
- Safety green stickers are given to majority of machines on site
- Delay starter is installed
- Periodical training to be delivered to each operator
- Safety posters in Hindi language should be put on all the machines

Joint Inspection – 20<sup>th</sup> November 2015

## Package B – Ringus to Bhawnsa

Mr CL Meena WDFC CPM CTP1

## Earth Moving Machines



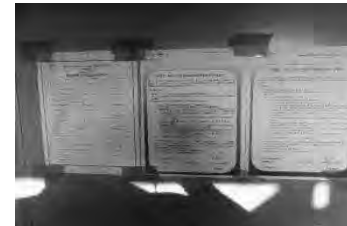
## Major Bridge 33



- Safe Access is provided with control of scaffolding, however unsafe ladder found at site.



## Major Bridge 33



Good tidy storage arrangements and good site house keeping

## Major Bridge 33



- Good Signage at Bridge 33



## Joint Inspection – 21<sup>th</sup> November 2015

## Package B –Ladpura to Bhawnsa

Mr CL Meena WDFC CPM CTP1

