

添付資料

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添付資料-1 議事録

協議名	JICA デリー事務所	日付・時間	2015/10/16	13:30~14:20
称	打合せ	場所	JICA デリー事務所	
<b>相手方出席者、役職、所属等</b>				
インド駐在員、南アジア部調査役、P.D.S.				
<b>協議・ヒアリング内容/確認事項等</b>				
【調査団】				
<ul style="list-style-type: none"> <li>・ 出国までに DFC 事業に関して 4 件の事故発生について情報を得ている。1 件のトラック横転事故は交通事故に分類されるもの、鉄筋の崩壊事故は負傷者が出た建設作業中の事故。事前に基づいて Preliminary Analysis を実施した</li> <li>・ 現場で詳細情報を入手しないと断言できないが、現時点では、作業員による作業過程でのミスだけでなく、図面の不備があったのでは？と想定している</li> <li>・ コンサルタントの事故分析結果は事故の直接的な原因についてのもの</li> <li>・ 我々の分析アプローチは、直接的原因と根本原因を組み合わせる今後の対策を提案するアプローチ。直接的原因は Tentative な対策で対応可だが背後に潜むヒューマンエラーなどが介在する場合、マネジメント手法の再検証も必要</li> </ul>				
【JICA コメント】				
<ul style="list-style-type: none"> <li>・ DFC 事業の Package 1~3 の事業は全て入札が完了している。SLT の SHE Manual 等で改善の余地が見い出されれば、それらの工事に反映することを考えているのか？</li> </ul>				
【調査団】				
<ul style="list-style-type: none"> <li>・ 安全関係のマニュアル類、Employer's Requirement には既に目を通したが、よくできている。これについて多くの改善提案はなさそう。我々の提案は Contract Document と現場の間に潜む課題についてとなるだろう</li> </ul>				
【JICA】				
<ul style="list-style-type: none"> <li>・ JICA にとっては、調査団の見解は進行中の事業に対して有効活用されるものと位置付けられれば良いと思う</li> <li>・ 発注者にとっては、新たな契約に基づく事業が始まる。分析の結果得られた知見の反映の仕方は？</li> </ul>				
【調査団】				
<ul style="list-style-type: none"> <li>・ 我々は発注者の契約図書内容よりもコントラクターの活動内容に焦点を当てたい。しかし、何か大きな問題に遭遇したら報告書に残す/残さないを含め JICA へまず相談する</li> <li>・ 分析の結果得られた知見の反映の仕方は注意する必要がある。新たなクレームをコントラクターから提起されることのないよう留意する必要がある。</li> </ul>				

協議名	L&T 社 ハリアナ設計担当部	日付・時間	2015/10/17	14:25~15:10
称	ヒアリング	場所	L&T 社デリー（ハリアナ）事務所	
<b>相手方出席者、役職、所属等</b>				
Head - DFE Business, L&T				
Project Manager, L&T				
Chief Track Engineer, Technical Expert, L&T				
<b>協議・ヒアリング内容/確認事項等</b>				
<ul style="list-style-type: none"> <li>・ 当事務所は早期段階の設計（Preliminary Design &amp; Technical Design）を担当している</li> <li>・ すべての図面の diagram や図面への承認（No objection）は PMC から受ける</li> <li>・ まず Preliminary Design がクリアになると Design Basis Report の承認も受け、Detailed Design を提出する流れ</li> <li>・ デリー事務所では Technical Design に対して PMC から No Objection を取得した後に、ジャイプルの現場事務所の設計担当グループに手渡す</li> <li>・ ジャイプルの現場の設計担当グループは Technical Design に基づき、色々な細かい情報を加えて Construction Design（実施設計）を行い、Construction Design Drawings（実施設計図）を作成し、PMC の No Objection を取得して“Goof For Construction” Drawings（施工使用可能図面）として施工チームに手渡す</li> <li>・ 当事務所では Detailed Design を作成するため複数のコンサル（CS2M、シストラ社、SMEC 他 2 社ほど列挙）のインドにあるローカル事務所へ外注している。我々は外注先へ設計思想や条件を提示し図面を作成させ、成果をレビュー、チェックするやり方。図面が仕上がりチェックし OK であれば鉄道省（Indian Railways）へ提出し承認を受ける</li> <li>・ Bar Bending Schedule（BBS）は JAIPUR で作成する。デリー事務所では各鉄筋の形状、継手位置は示すのみ。Bars for Assembly も JAIPUR で作成</li> <li>・ PMC の設計レビュー能力は人員も少なく限定的と感じている</li> <li>・ あえて問題は、2013 年の 8 月に設計開始したが 2014 年まで PMC が存在しなかった。PMC 不在の間も図面作成は継続していたが工事着手はしていなかった</li> <li>・ PMC から Technical Design について No objection 承認を受けるのは当事務所</li> <li>・ 現場サポートの必要があるので JAIPUR 事務所の作業が終わるまでは後方支援の意味でオベする予定</li> </ul>				

協議名	双日事務所（デリー）	日付・時間	2015/10/17	15:20～17:00
称	ヒアリング	場所	双日事務所（デリー）	
相手方出席者、役職、所属等				
所長				
協議・ヒアリング内容／確認事項等				
<ul style="list-style-type: none"> <li>・ 双日としては、大型事業の事業進行を確実にモニタする目的でハリアナ州、ラジャスタン州、グジャラート州の各州に事務所を設置し体制構築</li> <li>・ JAIPUR で開催する Monthly Progress Meeting へ毎回参加。JAIPUR 出張は月 3 回程度</li> <li>・ 日本の建設会社からの人材（Y 氏）登用により JAIPUR で Project Director と同事務所勤務してもらっている。これは有事における技術面での対応目的でもある</li> <li>・ 四半期に一度、L&amp;T（CEO クラス）と双日の幹部との間で協議の場をもっている</li> <li>・ 現状の日系企業の参加状況を見ると、今後も当 STEP 案件のように商社が参加するパターンがあると思う。その場合、商社－ローカルコントラクターが JV 参加するパターンでの安全体制の構築へも焦点を当てる必要があると考えている</li> <li>・ L&amp;T には作業員がおらず工区毎に地場から調達、各現場への Engineer の配置により管理。丸投げの印象はなく、サブコンに人材と機材を調達させ L&amp;T の指示のもと、工事を進めている</li> <li>・ 鉄筋事故は 7 月発生だったが、工事進捗が上がってきた段階で作業が集中し、事故が発生したのでは？と感じている。新しい人材も入ってきた時期でもある</li> <li>・ 個人的印象では、現場労働者はあまり柔軟に対応できていないのでは？という印象。例として、現場で“巾留め筋”が図面上指定されていなければ、危険要素として判断がつかず、図面通りに作業を進めてしまうのではないかというような点で</li> <li>・ 当地には、基本的に与えられた範囲の事だけに専念し、組織のために付加的な事をしようという姿勢は感じられない。それが昔からの慣習</li> <li>・ インドの場合、問題が起きると、皆が寄ってたかって解決するが、また散らばり、次に問題が起きるとまたその場対応。前の教訓を生かそうという発想があまり見えない。予防的な対応、システマティックな対応をしようとする発想が欠けている</li> </ul>				
【調査団】				
<ul style="list-style-type: none"> <li>・ 直前の L&amp;T の設計班（デリー事務所）との面談で、設計本部は通常の作業、役割を果たしていると感じた</li> <li>・ 現場で鉄筋を加工し、組み立てる作業を始めるまでの間の情報伝達の不備の可能性がある</li> <li>・ 労働災害の統計にも出ているが、作業員レベルの増員のタイミングに管理側の体制充実が間に合わないことがよくある</li> <li>・ 経験を積むと、逆に図面の細かなチェックもしなくなる。幹部へなればなる程、会社経営上も細部チェックから離れるのが通常。理想は経験のある人が現場近くに配置されていること。</li> <li>・ 経験者が現場に居ない場合、設計上の重要点について“抜け”がないよう、企業内工夫の必要あり</li> </ul>				

協議名	DFCCIL 本部 デリー事務所	日付・時間	2015/10/19	13:00～13:40
称	ヒアリング	場所	DFCCIL 本部	
相手方出席者、役職、所属等				
Director (Infrastructure) , DFCCIL Executive Director, WDFC, DFCCIL GGM, DFCCIL Joint General Manager, DFCCIL Joint General Manager, DFCCIL Environment Expert, NKC インド駐在員、南アジア部調査役、P.D.S. (以上 JICA)				
協議・ヒアリング内容／確認事項等				
【DFCCIL】				
<ul style="list-style-type: none"> <li>・ 調査結果に期待したい点の一つは Analytical Part. 二つ目は Preventing/Proactive/Predictive issues. 工区は IR との近接区間も多く安全 Policy を遵守することの重要性に関する強いメッセージを、L&amp;T 及び PMC、そして DFC の現地事務所へも伝えられた</li> <li>・ 安全への要求事項については、完全に SHE Requirements (Contract Agreements として規定) に拠ることとしている。これはコントラクターが遵守すべきものとしての要求事項。現場作業における規律や全ての分野における工事現場における安全事項、Traffic Management に係る安全事項、個人の安全に係る事項等が詳細に規定されている</li> <li>・ IR との近接施工エリアでは、Frag men や機械オペについて、繰り返し教育を経てからの配置が必須。これら地点では Auditing や Work Permit について DFC でも特に配慮を行っている作業地点で、定期的にもモニタリングを実施している</li> <li>・ これまで発生した 4 件の事故後は、コントラクターとエンジニアの間で extensive discussion を繰り返し実施し、他現場へ教訓を活かすための記録を残し、最近水平展開した</li> <li>・ Audit は、DFC とコントラクター／PMC の安全担当が合同参加して実施している。Package-1 は毎月実施、Package A は 4 名の担当、来月実施予定の Package B サイトも同様。より安全に critical なエリアは週単位の Audit を実施している。PMC からは Full-fledged team が参加し critical エリアに繰り返し出かけて Inspection Report を取り纏め、提出させている</li> <li>・ 鉄筋事故の際は自然環境的な要因も大きかった。強雨と強風下で発生した事故であった。</li> </ul>				
【調査団】				
<ul style="list-style-type: none"> <li>・ 今回調査で、① OSH の視点と② Safety of Works (技術的観点) でのアプローチをする姿勢。②では、現場の安全担当者の多くは engineering background を有していないだろう。彼等が技術的な問題に遭遇した場合、現場 engineer の知見に頼らざるを得ない状況になると想像する</li> <li>・ 鉄筋の崩壊事故も①と②の両方の領域の間を互いにカバーする状況が整っていなかったため発生したとも想像できる。</li> <li>・ 現場では、engineer 側は安全衛生の視点の思考を、Safety 担当者も engineering 知識を蓄積することで①及び②の領域の隙間を互いにカバーし合う必要性が大切になってくる</li> <li>・ 我々のアプローチでは、強風発生が一つの原因であれば、何故誰も強風発生を予測し対策を講じなかったのか？ということ</li> </ul>				

協議名	PMC Project Director	日付・時間	2015/10/17	10:00~11:30
称	ヒアリング	場所	PMC デリー本部事務所	
<b>相手方出席者、役職、所属等</b>				
Project Director, PMC				
<b>協議・ヒアリング内容／確認事項等</b>				
<ul style="list-style-type: none"> <li>・ Indian Railway (I.R.) は資金力もあり各国からの投資も相次いでいる。技術的に国内で満足できる程度の技術は既にある</li> <li>・ I.R. は歴史も長く組織も出来上がっている。鉄道局のうち、各工区毎に部署があり、その中で完結して仕事を行っている。補修工事なども局や工区のレベルで担当可能。橋梁の架替・補修や架線点検など、個別の部署が作業を行っても何ら問題ない仕組みが出来上がっている。そのような連中がそのまま DFCCIL へ出向してきているので、彼らの中で殆ど coordination が無い</li> <li>・ DFCC 事業は Phase 1 と 2 に分かれているが、Phase 1 全体を束ねる責任者が不在な構造。全体を束ねる責任者配置の必要性を認識していない</li> <li>・ 何か問題が生じると、工区長レベルで揉めた結果、その上の Director へ話が届くことになる。本来は問題が顕在化する前に coordinate が必要なのだが、工区別の横軸と分野別の縦軸を一括して発注者側の Project Manager (統括責任者) が普段のコミュニケーションに出てこない。コンサルもコントラクターも最終的に意思決定はその場で行わねばならないが、本来は発注者側が主導で物事を決めねばならないがそれがバラバラ。非常に困っている</li> <li>・ 現場で稼働中なのは土木と軌道。今後、電気が入ってくる。半年後には信号設置も入ってくる。すると現場の coordination 問題として、各コントラクターの間で責任範囲の問題が生じた時、調整機能が働かないこととなる。</li> <li>・ 設計の IR 承認について、Preliminary Design, Technical Design は発注者 (DFCC) の obligation にて L&amp;T⇒PMC⇒DFCC⇒IR の流れで承認手続きを取る。インド鉄道と近接施工になる部分の設計のみ</li> <li>・ IR にボックスカルバートがある場合、跨線橋の部分などは近接施工区間では DFC 工事側にも構造物設置のための掘削が入るため特に必要</li> <li>・ IR は既設構造物の補修、架替、新設を DFC との coordination 無しでどんどん進める。</li> <li>・ IR 側の方の請負業者の方の安全意識の方がかなり低い。設計の際も DFC 側が先に作成したものがあっても、IR の方の作業 (IR との取り合いがある部分) を先に進めるとかなど、設計のみならず、現場作業も競合する場合がある</li> <li>・ インドは現在、景気が良く、人材不足状態。当現場でも稼いだ金が貯まると地元へ帰ってしまい、人材が定着しない点が大きな課題</li> <li>・ KY 活動や Toolbox Meeting の必要性が認識されない。安全確保には、個人レベルでの経験も必要だが、経験が無い作業員が多くその必要性が判らない</li> <li>・ 現場は今後、大きな架設構造物や高架橋の工事が主体となってゆくので大変。グジャラートでは橋梁工事が始まっており、軟弱地盤地帯を工事が進む箇所も出てくる。IR との近接施工区間ももう少し経つとかなり出てくる。今後の工期は危険要素が増える</li> <li>・ 途上国では作業員が負傷しても補償代が 100\$-500\$ で済むような現状だと安全意識を高める状況を創り出すのが難しい</li> </ul>				

協議名	インド鉄道省本省	日付・時間	2015/10/19	16:30~17:30
称	ヒアリング	場所	インド鉄道省本省	
<b>相手方出席者、役職、所属等</b>				
Executive Director Perspective Planning Director Planning (Special)				
<b>協議・ヒアリング内容／確認事項等</b>				
【調査団】				
<ul style="list-style-type: none"> <li>・ 今回調査では、トップマネジメントから現場作業員に至るまでの“人”のコミュニケーションに着目する。エンジニアと作業員間の情報交換、コミュニケーションが安全管理には大切</li> <li>・ 事業計画書等、書類上では連携を取る表現となっても、実際はコミュニケーションや知見が共有されていない場合が多い。充分コミュニケーションを取れるということは、言語も含め、同様な技術的・業務的背景を有している者同志である必要がある</li> <li>・ エンジニアは技術用語を用いて話し、作業員は農家出身者が多く、作業内容について相互理解し合えるコミュニケーション体制を築ることが必須</li> <li>・ 同様に、エンジニアは図面を“読める”が作業員は“読めない”場合があり、マネジメント側は双方のギャップを認識する必要がある</li> </ul>				
【鉄道省】				
<ul style="list-style-type: none"> <li>・ 鉄道事業者は、特に“人”の関係に依存した組織 (man intensive organization)</li> <li>・ DFC については、殆どのことを DFCCIL へ委譲している。DFCCIL の Managing Director があらゆる点において事業遂行の責任を有す。入札から工事までの過程は DFC の主導で実施</li> <li>・ 省が介入するのは、工事が進む過程で他省庁と何らかの調整事項が必要な場合のみ</li> <li>・ 近接区間では IR エリアと DFC の施工エリアを仕切るフェンス設置が必要。工事車両の通行がある場合、IR と DFC が協力して車両通行の安全を確保するよう努めることを規定</li> <li>・ 安全施工のガイドラインとしては、Guideline for Indian Railways, Guideline for Working between DFC and IR がある</li> <li>・ 近接施工に関するガイドラインは、DFC 事業のみならず、既存 IR への近接エリアでの工事で遵守すべき事項が General Guideline として規程されている。鉄道省で起草するも Ministry of Law により発出され政府承認されたもの</li> <li>・ General Guideline は、現在、改訂作業中</li> <li>・ IR と DFC 間の工事上の調整事項も、この General Guideline に準拠する</li> <li>・ 省の Safety Officer は DFC 事業の設計には関与しない。橋やカルバート等の General Design が DFC で作成後、IR の zonal railways のエンジニア部門が設計に credit を付与</li> <li>・ 鉄道省は省としての機能と Board としての 2 つの機能を併せ持つ</li> <li>・ DMRC は都市開発省管轄の事業。鉄道事業はどの団体間も IR 出身者が循環しており様々な知見を共有しつつ各々の事業に関係している</li> <li>・ 現場労務者について、彼等は事業に一時参加し、ある収入を得ると事業から離れる就業形態。現場教育も都度実施する必要がある</li> <li>・ IR から DFC へ安全研修のための講師等の派遣はない。DFC は独自の安全研修を実施している。</li> <li>・ 鉄道事業関連団体は IR 出身者が循環 (circular) している。</li> </ul>				

<b>協議名</b>	労働雇用省工場指導・労働研究総局	<b>日付・時間</b>	2015/10/20	10:20～11:10
<b>称</b>	ヒアリング	<b>場所</b>	労働研究総局デリー支部	
<b>相手方出席者、役職、所属等</b>				
Director In-charge, DGFASLI Assistant Director (Safety), DGFASLI Dy Director, Regional Labour & Institute Dy Director (Medical), Regional Labour & Institute				
<b>協議・ヒアリング内容/確認事項等</b>				
<ul style="list-style-type: none"> <li>・労働雇用省 工場指導・労働研究総局 (DGFASLI) の本部はムンバイ (2009 年設置)。当事務所は Regional Technical Institute の一つ</li> <li>・各事務所では労働安全衛生に関する調査、Safety inspection、training や教育を実施。</li> <li>・研修や各種教育活動、Safety Audit 等のコンサルタントサービスの他、労働安全衛生関連の法律の施行 (enforcement) の促進のための活動も展開</li> <li>・関連法の改訂は労働雇用省本省が作業中。同事務所は研修や教育の観点から法改訂に係る助言を行う立場。同省傘下の労働紛争委員会 (CLC (C) : Chief Labour Commission, Central) も改訂への助言を行っている</li> <li>・法的枠組みとして港湾事業が別扱いされているのは、港湾は特別なエリアであるため</li> <li>・初めは Factories Act しかなく、労働者の作業現場の基本法として適用してきたが、その後 The Dock Workers Safety, Health &amp; Welfare Act, 1986 や Building &amp; Other Construction Act 等が制定されてきた</li> <li>・建設/建築分野の安全に係る法は、前述の法律の後で検討されてきた経緯。Building and Other Construction Workers Act (BOCWA) は 1996 年に制定。労働雇用省は同法の制定後、施行は CLC(C)へ委ねることとなっており、研修は DGFASLI が担当する</li> <li>・Audit 対象とする事業の選定は、プロジェクト発注者からのリクエストに応じて。自ら Audit のために出掛けることはない。</li> <li>・DGFASLI が抱える Engineer 等は Doctor, Industrial Engineer, Physiologist, Psychologist で Structural Engineer はいない</li> <li>・現在、インドで建設分野をカバーしているのは BOCWA。製造分野は Factory Act</li> <li>・中央政府は法施行に関する権限を有しておらず、アドバイザーサービスの提供のみ。州政府が enforcement の役割を担う</li> <li>・法改正等について、労働省は 44 の法を所管しているが、それらを大きく 4 分類の法で統合する流れにある</li> <li>・一方、BOCWA、Factory Act、Mine Act、Dock Safety Workers Act 等 7 つの現行法を統合し、コンパクト化して一つの法を制定する予定。首相指示で政府が優先的に検討を進行中</li> <li>・鉄道事業における安全管理問題は労働雇用省傘下の CLC(C)の管轄下。鉄道事業は多くの manufacturing unit があるので Factories Act でカバーされる部分が多い</li> </ul>				

<b>協議名</b>	DFCCIL ジャイブール事務所	<b>日付・時間</b>	2015/10/21	10:20～11:30
<b>称</b>	ヒアリング	<b>場所</b>	DFCCIL ジャイブール事務所	
<b>相手方出席者、役職、所属等</b>				
Chief Project Manager, DFCCIL Deputy Chief Project Manager, DFCCIL Project Manager, PMC ARE, Labour Protection, PMC				
<b>協議・ヒアリング内容/確認事項等</b>				
<ul style="list-style-type: none"> <li>・鉄筋事故のサイトは interesting site である。技術的な問題もある場所。鉄筋の Safety Arrangement も Supporting Arrangement も機能していたと思うが、サポートの支持力が弱まって事故に至ったと分析している</li> <li>・連日、支持を確認して大丈夫であったが、7月のモンスーン時期に入り強雨も続いて事情が変わり崩壊に至った</li> <li>・支持力を得るための工夫とサポート数の増加を支持し、現場はその後対応した</li> <li>・我々にとって施工リスクの観点で最も重要なサイトは IR との近接施工区間。IR から 6～8m 程度の離間距離での施工区間がある。近接施工区間における施工マニュアルもあり、IR 軌道の中心線から 6m 以内の施工範囲での作業で適用される Contract Provision がある。これは法規定に基づくもので、それに従った作業を義務付けている</li> <li>・IR から 3.5m 以内の範囲では、列車通過を作業員へ知らせる (ための人員配置の義務付け?) 必要がある</li> <li>・IR から 3.5～6m 内のエリアでの作業は、バリケード設置と十二分な対策を講ずることを義務付けており、SLT/PMC から DFC への事前連絡無しでの作業を禁じている</li> <li>・というように、IR 軌道から①3.5m 以内、②3.5～6m 以内、③6m 以上で作業ルールが分かっている</li> <li>・Monthly Progress Review Meeting では、安全、品質、工程の 3 点について議論する</li> <li>・我々は full fledge の安全班を SLT と PMC に有しているが、事故は発生してしまう。鉄筋崩壊は技術的な問題だが、自然要素 (強雨後の強風) も重なった</li> <li>・安全班は定期的に会議や小セミナーを実施している、booklet も数千部、ローカル言語 (ヒンズー後) でも用意して作業員の安全意識向上のために配布している。地方採用の作業員や運転手はヒンズー語しか使わない者が大勢いる</li> <li>・SLT/PMC の安全担当が危険を感じたら工事をストップさせるべき</li> <li>・全ての仮設計はコントラクターが行うことと定めており、PMC が No objection で approve する手続き</li> </ul>				

協議名	DFC 事業 PMC ジャイブール事務所ヒアリング	日付・時間	2015/10/21	12:10~13:30
称	ヒアリング	場所	PMC ジャイブール事務所	
<b>相手方出席者、役職、所属等</b>				
Chief Safety Expert ARE/Labour Issue ARE/Labour Protection ARE/Safety (Civil) Engineer/Safety Electrical Safety Engineer Environmental Engineer				
<b>協議・ヒアリング内容/確認事項等</b>				
<ul style="list-style-type: none"> <li>・会議出席の7名で600km以上の工区(4か所)管理を担当中。各工区でPMCは非常に限定数のスタッフで従事</li> <li>・PMCのSafety Staffの主務は、SLTのSafety Staff(40~50名程度)の安全関連活動(研修、教育含め)の履行を促すこと。エンジニアは700名以上が各工区に展開</li> <li>・PMCの安全担当はAuditと称してもよい定期的なinspectionを実施している。月に平均で4~5回程度。不安全行動を特定した際はレポートに残し、纏め、SLTへ改善を求めべく提示する</li> <li>・別に品質管理班があり、現場でseriousな状態での不安全行動、作業を見つけると、直ちに作業を止めさせ改善を指示する。エンジニアが不在の場合は直接作業員へ指示する</li> <li>・鉄筋の建込みについて、他国での工事例と比較すると当現場の作業手順は少し特殊。通常は、本ケースのように長い鉄筋を建て込まず、鉄筋を建て込んだあとにフォーチングコンクリを打設後、固まった後に足場を組んでから鉄筋を継ぎ足す手順だが当地は違う</li> <li>・インド国内では他現場でも同様な作業を行っていることを知っている。デリーメトロも同様な問題を抱えている。Engineering的な観点を考慮して設計にも取り込むべき</li> <li>・設計側も現場を想定し、どのような設計を行えば現場作業を安全に進められるかについて考えるべき。PMCも同様。それがSLTに対してMethod Statementや作業手順書の提出を要求する理由。我々も考える姿勢が大切</li> <li>・現場状況は場所により異なる(IRとの近接、低湿地、深い掘削が必要な場所等々)ので、設計側も少なくともこれらの状況を考慮する姿勢が必要</li> <li>・設計が現場へ届く前にも、original designは上のことを考慮すべき、何か適切な作業手順なのか、何が安全につながるのかという点について。全ての設計図について</li> </ul> <p><b>【調査団】</b></p> <ul style="list-style-type: none"> <li>・安全面(OSH的観点)と技術面(設計的観点)との間にmissingがあるとそこが事故の原因となりかねないので、Safety Officerとengineerは互いに相手方の知識も兼ね備える努力が必要</li> </ul> <p><b>【PMCコメント】</b></p> <ul style="list-style-type: none"> <li>・そのためPMCのSHE documentがある。設計、建設段階の両方で安全配慮が必要と謳っている。</li> <li>・鉄筋事故当時は、かなりの雨で橋脚基礎の床掘箇所が水没したのと強風が重なった。事故前から</li> </ul>				

<p>鉄筋群のサポートは施していた。それなりに対策すべきことはやっていた。</p> <ul style="list-style-type: none"> <li>・現場視察の際に、鉄筋サポート部について、計算に基づいて対策であるか確認をしたが、現場エンジニアからは明確な回答が返ってこない。ワイヤーの太さについて訊ねると“大丈夫だ”と回答があるのみ。計算根拠に基づいたものではない</li> <li>・General Method Statementしか作成していないと場所毎に代わるので計算結果など出せない</li> <li>・事故後の対策段階になって初めて計算に基づいた図面を提示するようになった</li> <li>・事故前ほどの工種についても同様な対応であった。それを現在、改善しようとしている段階</li> <li>・当初より、長尺鉄筋を建て込んで作業してきた状況に対して注意喚起してきたが、経済性、耐震性(からくる継手位置問題等)の観点から指示が実行されずにきた経緯がある</li> <li>・当事業の設計担当もIR出身者が多く、IRの設計ではこうなっているから大丈夫、世界一の設計だと考えているスタッフが多く、ゆずらない</li> <li>・真横をIRが走っている地点もあり怖い場所もある。IRのtrackから3.5mギリギリの場所に7m高の擁壁の設置中の場所もある。現時点で鉄筋が崩壊したサイトのような状況となっている地点もあるが、倒れたらそのままIR線路へ影響が生じる。そのような場所がかなりある</li> </ul> <p><b>【調査団】</b></p> <ul style="list-style-type: none"> <li>・デリーでL&amp;Tの設計部を訪ねたのは設計情報の流れの確認のため。明らかなのは、設計本部とJAIPURが離れており、双方で承認の署名者が異なる</li> <li>・設計本部はPreliminary DesignとTechnical Designは設計本部の責任者で、Construction Design以降はJAIPUR。すると、意識的に本部と当地が連携していない可能性がある。本部側では図面をJAIPURへ送ったらあとは知らない、という姿勢も感じた</li> </ul> <p><b>【PMCコメント】</b></p> <ul style="list-style-type: none"> <li>・当地では、さらにJAIPUR事務所と現場の間の設計情報の温度差がある。JAIPUR事務所で作成したら、それを現場へ送付するだけ。そこに何のコミュニケーションもないというか、interactionがない</li> <li>・承認を受ける必要があるのは、Preliminary Design、Technical Design、Construction Designの3点。Construction DesignはJAIPURで承認</li> <li>・そもそも現場で各々の構造物に合わせた図面作成がJAIPURで行われていない。JAIPURではTechnical Drawing的な図面があり、Generalな図面があり、そこにこの構造物はこうしなさい、という注記的な表現方法の図面がない</li> <li>・BBSは作成している。しかし図面の質として、同じものを日本の鉄筋工に示しても首をかしげてしまうであろう程度のもの</li> </ul>
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協議名	SLT ジャイブール事務所	日付・時間	2015/10/21	15:10~18:30
称	ヒアリング	場所	L&T 社 ジャイブール事務所	
<b>相手方出席者、役職、所属等</b>				
Project Director, L&T Head of Environment, Health & Safety, L&T Project Manager, Sojitz (MAEDA Corporation) ほか				
<b>協議・ヒアリング内容／確認事項等</b>				
<ul style="list-style-type: none"> <li>・DFC 事業に限らず国内事業一般にも言えるが、特に本事業における最大の課題は、事業規模は無論のこと、数千名に及ぶ労務者（作業員）が固定しないこと</li> <li>・鉄筋事故が発生した時期（7月）はモンスーンの季節で、その季節的な境でも多くの作業員が替わるタイミングであった</li> <li>・言語は英語及びヒンズー語の使用により当事業においては問題ない。安全に関するマニュアルも英語／ヒンズー語で作成している</li> <li>・エンジニアと労務者間のコミュニケーションについて、技術的には SV が現場に居り、関係者間の情報伝達をカバーしている</li> <li>・作業員にエンジニアリングの背景を有している人材は通常はいない</li> <li>・事業ではエンジニアは 850 名（土木、安全、機械等の分野における）配置。そのうち、65%程度が 5 年以上のエンジニアリング経験を有している</li> <li>・L&amp;T では直接 Engineering college から新卒や diploma を採用している。2 年企業で経験を積み職員として正式採用するシステム</li> <li>・鉄筋の fabrication について、BBS (Bar Bending Schedule) は Site Engineer により準備される。Site Engineer が BBS に対する要求事項を出し現場で BBS を作成する</li> <li>・工区により各々の班があり Engineer も異なるが、各々の図面にに基づき、bending machine で切断、曲げ等を行い、鉄筋を現場へ運搬して施工する</li> <li>・Site Engineer は Bar Bending の要求を出すだけ</li> <li>・Cut &amp; Bend は基本的には工場作業だが、場所により機材が現場にある場合は現場で行うこともある。大量の Cut &amp; Bend が必要となる場合は工場作業</li> <li>・Construction Drawings にミスがあった場合は Site Engineer が指摘し、図面を設計班へ差し戻し校正させる手順で、PMC から図面が（承認後）戻ってくる</li> <li>・カップラー導入について、配置位置の変更程度は、site facility 問題なのでジャイブールの PMC に確認を取れば良い</li> <li>・ラッピング位置の選択は PMC が承認している。Design matter でなく Construction matter と捉えている</li> <li>・PMC に Design 承認を与えられるスタッフがいるのでジャイブールでの対応。彼が判断できない問題はデリーまで戻して判断手続きを取る問題もある</li> <li>・Technical Design の承認は PMC から得ている。PMC の設計承認者はデリーから appoint された人材であり、Design 班の一部</li> <li>・Good for Construction Drawings はカップラーを表現していない</li> <li>・工事現場のスタッフは design に関する判断をしない。Design に関する問題が発生した場合は当</li> </ul>				

<p>事務所（ジャイブール）の設計担当がカップラーの設置位置等の提案をし、PMC の設計担当の承認を得て、BBS の変更等を経て現場へ feedback する流れ</p> <ul style="list-style-type: none"> <li>・カップラー導入の“判断”については事故後の決定。カップラー導入の提案は事故前からあったが、カップラー導入による作業の手間、複雑さにより導入の判断をしかつた。</li> <li>・カップラーを挿入する高さは設計担当者が指示している。合計が 4m~5m 以上に及ぶ場合に採用している</li> <li>・Construction Drawings は当事務所（ジャイブール）で作成するが、Coordinates と BBS（現場で作成）は現場から情報が届く。それをもとに図面を当事務所で作成する</li> <li>・Drawings 作成のための基本情報を現場へ提供し、現場でのレイアウト情報等詳細な情報を当事務所へ戻させ、当事務所で Construction Drawings を作成という、ダブルチェックの手続きを取っているということ</li> <li>・Preliminary Design では、例としてボックスカルパートの design について、規格や設置位置は契約図書に記載されており、PMC デリーの設計班と当事務所の設計担当が基本設計を行うが、現場では現地調査（測量等により）正確な Coordinates を出し、図面変更の必要性の有無について当事務所で判断し、PMC と DFC の署名を以て決定とする</li> <li>・設計（承認）の手順について、IR の近接区間では、DFC 側の設計は PMC と DFC の設計承認を得たあと、IR へ提出され IR の承認を得る</li> <li>・我々は Construction Design を初めに現場へ提供するのではない。承認を得たものについて Drawings のみを現場へ送る。Reinforcement Drawings もそう。Reinforcement Drawings に基づき現場で BBS と Layout Drawings を作成し、前述のとおり、当事務所へ返信してくる</li> <li>・この 2 種の図面が Construction Design の一部となり、PMC 承認を経て現場へ戻して作業へ移る</li> <li>・Technical Design は現場へ始めに送られ、その後、Construction Design 作成準備のために当事務所へ戻される。何故なら、現場では Technical Design を参照して BBS と Layout Drawings を作成するので。この手続きは、特に Layout Drawings について PMC、DFC や SLT 関係側から承認を得るのにより良い手続き</li> <li>・Technical Design Drawings が一度承認を受ければ 2 日以内に現場へ送り BBS と Layout Drawings を作成する</li> <li>・Method Statement は当事務所（ジャイブール）で Safety、Quality Plan と併せて作成する。Construction Design matter なので</li> <li>・Additional support の設計は当事務所の設計担当。Support design のための input は現場から。前述のとおり、BBS と Layout Drawings に関する情報提供は現場から</li> <li>・Method Statement も構造物毎に個別に作成している</li> <li>・橋梁の一つ一つにも Method Statement を作成している。Construction Design Package (CDP) に分類されることなので</li> <li>・現場では作業種別に作業員を割り振っており、ある作業員がコンクリート打設を行い、別の日には鉄筋組みを担当させるなどの人員配置はしていない</li> <li>・3 件の鉄筋事故のうち、始めの 2 件は豪雨／強風等が原因で support が機能しなくなり崩壊に至った。3 件目は我々のミスである。SHE bar (?) の崩壊による事故。ミスとは Sequence of tying の点について。Shortcut を試みた結果の pure mistake である</li> <li>・前 2 件は強風とモンスーン期の豪雨により地盤が緩んでいたことに起因する部分が大きいと分析</li> </ul>
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している。鉄筋群を支えていた support をフーチング周辺の砂質地盤でアンカーを取り、支えていたが、その地盤が緩み support による支持力が減衰したことに拠る。床掘りを施していた部分へ豪雨により水が溜まっていたことにも原因がある

- ・本日、現場の実態を詳細に説明差し上げたが、このフローの中で欠けている点（missing points）や足りない手続きがあれば指摘いただきたい、真摯に受け止めて、現在のシステムで足りない部分については改善へ向けた検討と行動へ移してゆきたいと思う

<b>協議名</b>	JICA デリー事務所	<b>日付・時間</b>	2015/10/30	15:25～17:25
<b>称</b>	報告	<b>場所</b>	JICA デリー事務所	
<b>相手方出席者、役職、所属等</b>				
所長、インド駐在員				
<b>協議・ヒアリング内容／確認事項等</b>				
【調査団報告】				
<ul style="list-style-type: none"> <li>・ DFC 工事で 7 月に発生していた鉄筋崩壊事故については、事前入手情報の分析により、L&amp;T 内部の設計担当と現場の間の十分なコミュニケーション不足が問題では？と想定し現地入りしたが、調査の結果、その通りの結果であった</li> <li>・ 現地調査では、上述の L&amp;T 内部の設計情報のコミュニケーションの掘り下げを目的としていたが、現場視察段階で、仮設施工サイトで複数、(術的観点でリスク高の施工現場を確認し、より大きな、かつ潜在的にリスク大の存在と課題抽出に迫られた</li> <li>・ 一番の問題は、現場の安全担当（ローカル）が技術的なリスク状況を認識できない点。基礎知識不足に起因する問題。</li> <li>・ 設計班と現場のコミュニケーション不足問題は、DFC 事業の組織が大きすぎて機能していないという指摘は正当</li> <li>・ コミュニケーション不足問題の改善、管理体制上の不備を抽出し、個々に改善しないと現場での様々な事故は解決できない。管理レベルの組織体制を変えないと、末端の個別の事故対策を講じていても限度がある</li> <li>・ 手当てを早く行わないと、現場は佳境に入るのでまた事故が起きかねない</li> <li>・ 既に改善対応に動き出している様子だが、それが十分な対応か否かは SLT や PMC の邦人スタッフに今後確認する必要がある</li> </ul>				
【JICA コメント】				
<ul style="list-style-type: none"> <li>・ IR との近接工区であるがゆえに施工に注意せねばならない点は現場関係者から良く聞いているが、今回指摘された DFC 橋台設置箇所や擁壁施工箇所での施工リスクに気付かない点は大きな問題</li> </ul>				
【調査団コメント】				
<ul style="list-style-type: none"> <li>・ 本来は、線形図を利用し、施工リスクの高い地点のマップ（危険箇所のデータベース）を作成、場所毎に危険要素を抽出して対応策検討の作業を着工前に実施する。当現場では 2 年が経過した現在、作成中</li> <li>・ 現場スタッフは、①日々の業務に忙殺され、Critical な点を俯瞰して観る姿勢が忘れられている、②知識とそのベースとなる経験がローカル作業員に圧倒的に欠けている、この 2 点を痛感</li> <li>・ SLT の安全管理のトップは OSH 面での安全は厳格に管理しているが、施工上の技術的な観点は観れない。現メンバーで技術的な視点で現場を観れる方は PMC と SLT の日本人技術者のみ</li> <li>・ 危険箇所の登録データ（Risk Register）作成を急ぎ、今後は邦人技術者を交えて対応を検討すると良い。Risk Register 作成は、本来、L&amp;T のデリー事務所の設計担当が作成すべき</li> <li>・ 更に、Risk Register 作成の話は PMC から指示を出しても良い話。その点、PMC のデリー事務所は人員が大勢いるが、彼等の業務の優先順位はどうなっているか？と思う</li> </ul>				

・PMC スタッフは、日々、レター作成と提出に追われ、管轄の現場を俯瞰する姿勢に欠けているのでは？という見方もできる。PMC のトップ（邦人技術者）は全体を見渡しているが、ローカルの実務レベルスタッフに多様な視点が欠けている

#### 【JICA コメント】

・PMC の人員数の件は、DFC、PMC、SLT との定例協議でよく出る主張であり、現場管理が行き届いていないという事情は想像できる

#### 【調査団コメント】

- ・DFC 事業の大きさに原因する影響が様々出ている。結果、管理側の目の不行き届きが 6 件の事故となって現れたとも言える。
- ・現場の管理システムは構築され、スタッフも日々努力しているが、事業規模の観点で色々課題がある
- ・現場運営体制は上意下達の仕組み。小さな事業では可でも事業規模が大きいと、縦／横方向の連絡が取りづらくなる。現場の情報が上に上がるのも時間を要する結果となる。一番の問題は意志決定が遅くなる（現場スタッフからの確認事項）点
- ・組織のマネジメントのスタイルの強化、または改善の必要があると考える。安全のみの視点でなく、巨大プロジェクトのマネジメントという視点で対策を考える必要性を感じた
- ・安全面については、労働者の出入りが著しく、現場に定着しない点について多くの関係者がコメント。教育が追いつかない。しかし教育面については現場で努力が重ねられており、4 Package ある中で現場が上手に運営されている Package もある
- ・今回、我々は現場の Package レベルでなく、L&T のマネジメント層から現場のエンジニアまでの上位レベルで改善策を講じるべき、という提案をした。その部分の改善策は、人数の多い末端レベルの改善よりも手が付けやすい部分。人数は少なくとも知的レベルは高い

#### 【JICA コメント】

- ・現場の抱える潜在的なリスクが大きく、何かしらの具体的な対策を講じる段階にあると理解した
- ・トップへの理解は進み、現場へも提案内容が伝えられ、改善に着手したということは非常に良いこと

#### 【調査団コメント】

- ・現場に対し主張したのは、①現場と事務所間での連携を密にすること、②現場への権限委譲。現場で判断できるようにという主張で、これは動き出している筈
- ・今回の視察は 2、3 の現場のみ。IR との近接施工区間で施工リスクの高い現場は他にも多数存在する可能性は大
- ・現在の出来高は 20%。すると、現在抽出できる問題箇所は物理的に考えてもそんなに多くないはず。住境に入る今後、より多くの現場が（現状だと）リスクを抱えることとなると考えるべき
- ・安全については、人の安全と構造物の安全の 2 種類がある。DFC の現場では前者はよく企画、活動しているが、後者が軽視されている印象

#### 【JICA コメント】

- ・JICA としては、発注者／コンサル／コントラクター全てに安全は JICA の Highest Priority なのでしっかり取り組んでもらいたいと普段から説明している
- ・本日の提案内容の先方への伝達を通じ、インド側に意識醸成ができてきた時に、“誰が”“具体的に”“何を”“どうやって”という部分を明示されたい
- ・Risk Register 作成後のフォローをお願いしたい。
- ・視察されていない箇所にも（今後含めて）大きなリスクを抱えることとなる箇所が存在する可能性があると感じた
- ・考えられる対応の一つは、今回（限定的にでも）観られた地点を、具体的な対応策検討のパイロットケースと位置づけ、課題抽出～対応策検討の過程を日本人でなく、インド人に考えさせ、今はまだ顕在化していない（将来の）現場へ水平展開できるような流れを構築する支援をいただけると良い
- ・本日の報告では、Safety Review から離れがちな感を抱いたが、様々な施工リスクの説明を受け、事業運営体制の根幹を見直す必要があると、極めて重要な話だと感じた
- ・JICA デリリーとして期待したい点は、今回の知見を DFC 事業のみならず、他国他事業へも水平展開したい。規模の大きな複数の円借款事業の予定が今後出の中で、インドにおける事業体制の問題の洗い出しと対策について様々な解決策のオプションを用意しておくことを真剣に考えたい
- ・繰り返しだが、DFC の現状改善のためには、具体的なアクションをどう起こすかに限る。調査団が短期間で指摘してもらっても、帰国されると何も変わらないことは十分にあり得る。意識改革を継続性をもって如何に進めるか、しかもそれを彼等に考えさせる手法を検討されたい
- ・もう一度、是非来いいただき、DFC 事業に対する具体的な提案の進捗をチェックいただきたい。デリリー事務所からもサポートしたい。このまま帰国され 1 月にレポートが当地へ届くだけでは何も改善は進まない可能性が大

添付資料-2

質問票

## 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. <u>Procedure &amp; Documentation</u>	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)

添付資料-3 安全プレゼンテーション



# 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, व्यावसायिक बिमारियों की रोकथाम तथा पर्यावरण संरक्षण का हर संभव प्रयास करूँगा।

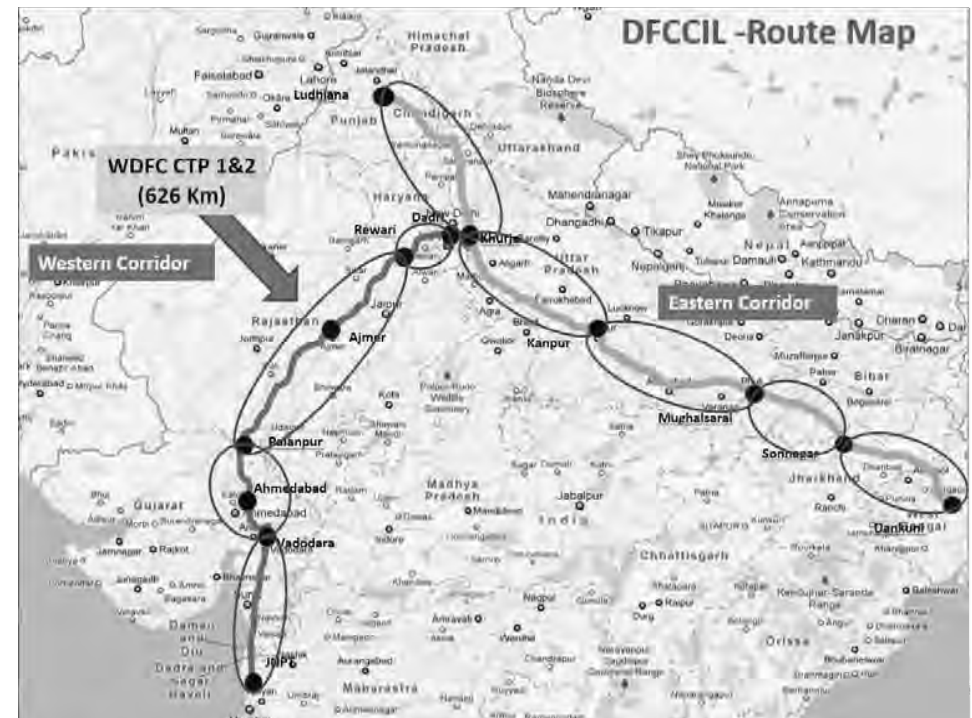
# Safety First & Welfare!



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



Please turn off MOBILE PHONES during the training period





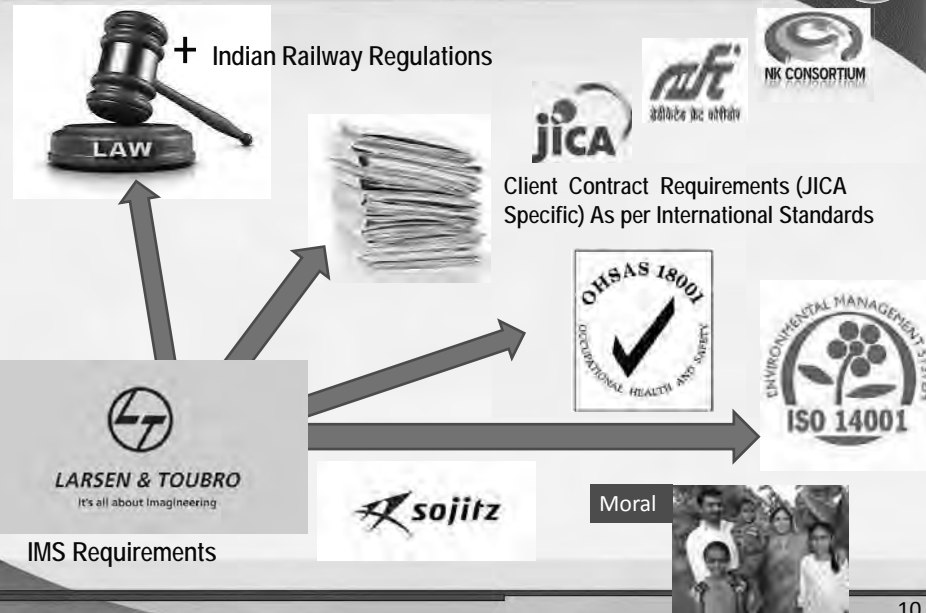
## Sojitz - L&T WDFC SAFETY CULTURE

*“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.”*



9

## Sojitz – L&T WDFC SHE Compliance



10

## 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.



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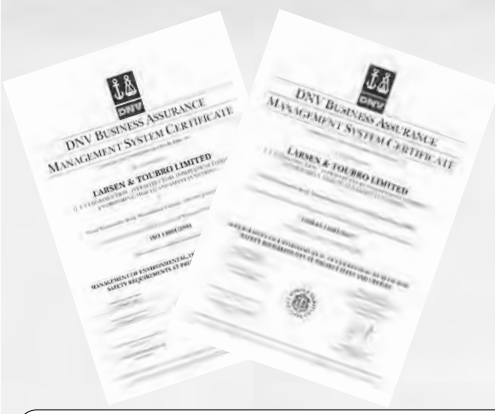
## Sojitz – L&T SHE Principles

- 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.



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# Sojitz - L&T SHE Integrated Management System

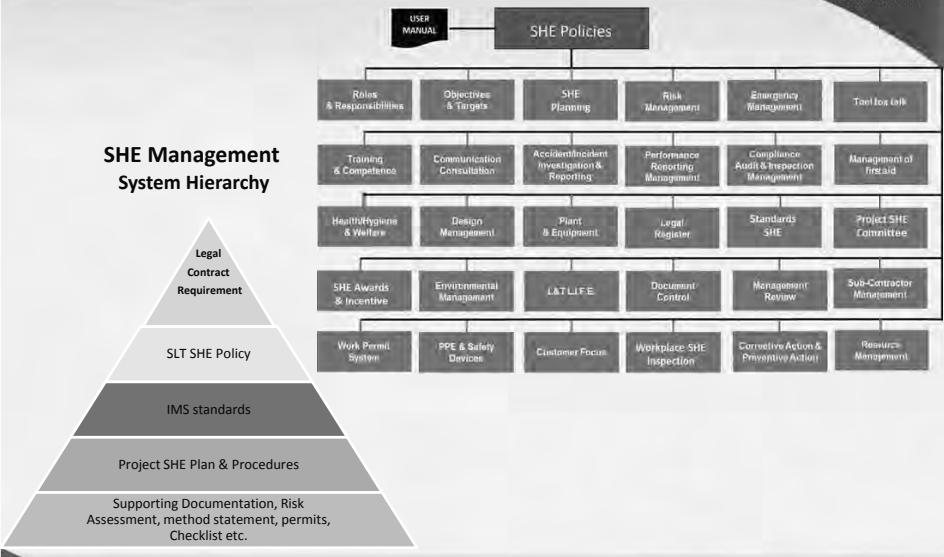


Certified to Integrated Management System conforming to OHSAS 18001:2007, ISO 14001:2004 accredited by DNV since 2010

# 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



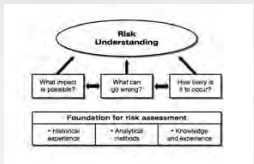
- Safety of Vehicles & Plant at site, including licences and PPE compliance.
- Traffic Management of all site routes
- Trespassers on the formation and approach roads
- The monthly SHE programme compliance
- Maintenance of barrication on IR
- Long traveling distances to worksites
- Railway Safety Training 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 Until	Location	Work Description	Supervisor	Authorizing Officer	Start Date	End Date	Status
...	...	...	...	...	...	...	...	...	...	...

## Daily Pre-Start Verification & briefing report

Activity	Permit No.	Issued To	Valid Until	Location	Work Description	Supervisor	Authorizing Officer	Start Date	End Date	Status
...	...	...	...	...	...	...	...	...	...	...

### Project Risk

Risk ID	Description	Category	Severity	Probability	Overall Risk	Control Measures	Responsible Party	Due Date
...	...	...	...	...	...	...	...	...

Project Risk Register for class-1 Risk

# Sojitz – L&T Training, Competence & Awareness

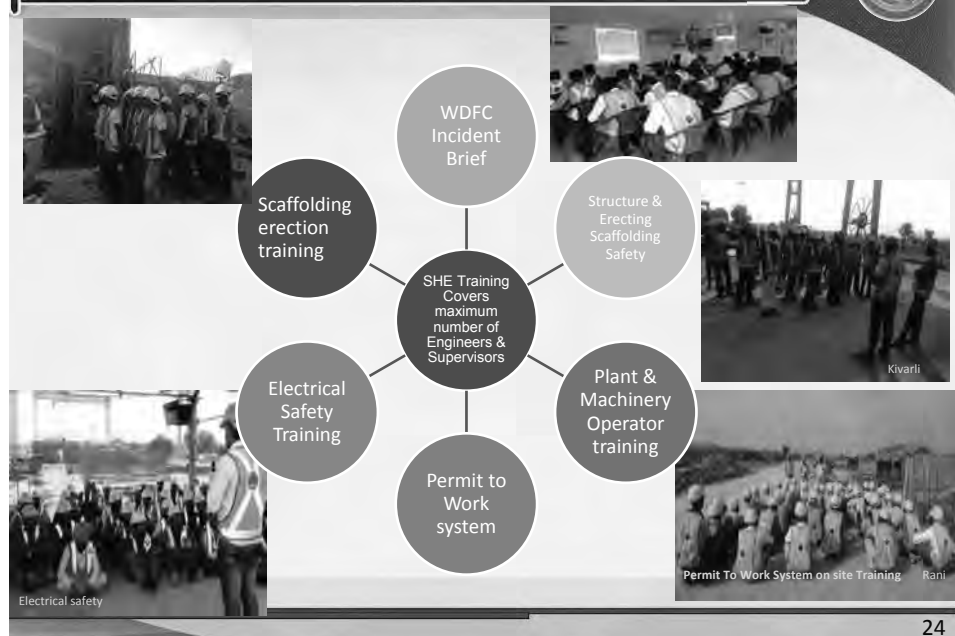


# Sojitz – L&T SHE Project Strategic Plan 2015/16



- 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



Sl. No.	Item	Value	Unit	Remarks
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## 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

## Sojitz – L&T Review & Change



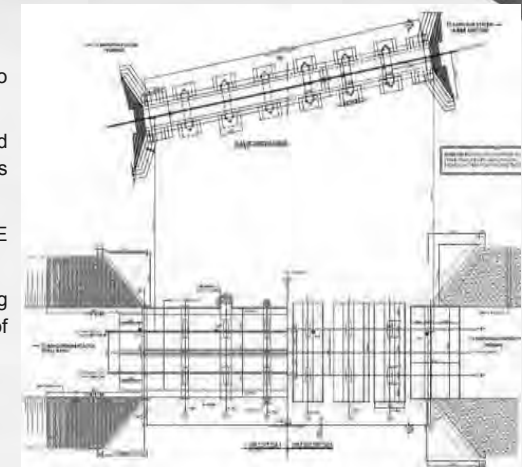
- SHE Management Review Meeting
- SHE Committee review meetings at projects on regular basis

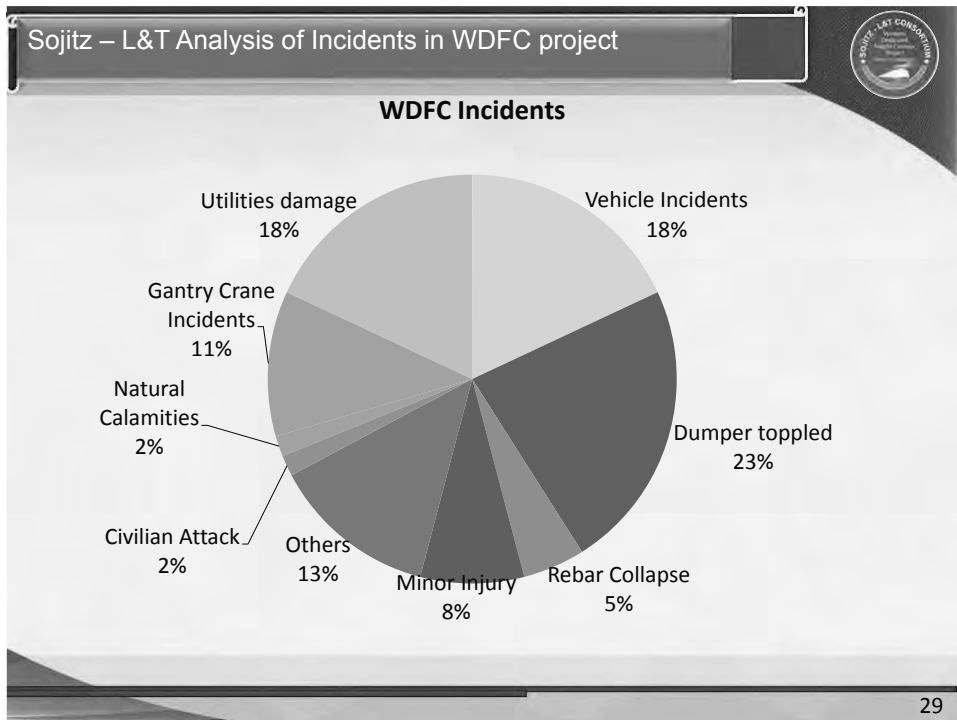


## Sojitz – L&T SHE in Design



- 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





### 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 classroom training etc
- Alcohol testing of drivers and traffic management plans

31

### Incidents & Remedial action taken to prevent Reoccurrence

30

### WDFC Safety & Health Site - Control Measures

32

**Risk/Impact Rating (Matrix)**  
 LOW (L) = ALARP (As low as reasonably practicable)  
 MEDIUM (M) & HIGH (H) = SIGNIFICANT

PROBABILITY	SEVERITY				
	1	2	3	4	5
5					
4					
3					
2					
1					



## 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

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

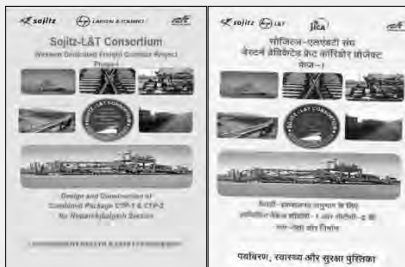


Railway Construction Safety Handbook

- 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

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

35

## 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 WITH 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**

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

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

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

**Coding provided for Vehicles plying in WDFC**

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

**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

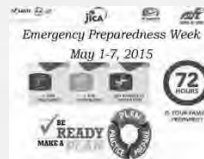


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## List of awareness days celebrated in WDFC



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



42

## 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.



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## L&T Safety Month



PPE demo

44

## 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

49

### 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

सम्लाय वैन कायम रखने हेतु सुरक्षा नांस्कृति बनाए रखें

National Safety Day

World Health Day

Awareness Days

World Earth Week

Fire Safety Day

51

### 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

50

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

Street Play

World AIDS Day

Health Campaigns

Signature Campaign

Condom promotion

Training Programs

Street Play organized by Rajasthan State AIDS Control Society

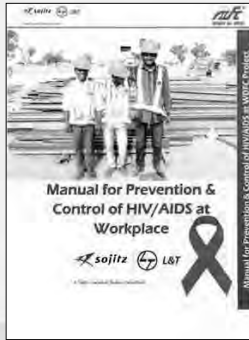
Street Play conducted by RSACS

52

## 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 HIV/AIDS Awareness Program



Voluntary Participation

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

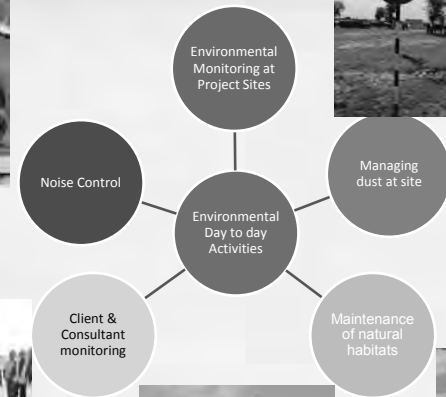


Officials from Ministry of Health & Family Welfare visited Pkg-D- Location Rani & appreciated HIV/AIDS Control Activities conducted by SLT at WDFC

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



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



## 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)



57

### 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



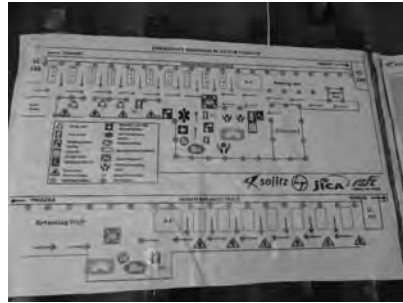
Thank You for your attention

"Let's go and build a railway together.....safely!!"

66

添付資料-4 現場視察状況 (A)

Renwal



Renwal



Renwal



Renwal



Renwal



Renwal



Renwal



Bhagega



Bhagega



Bhagega



Sleeper Plant



Structure 17





添付資料-5 現場視察状況 (B)

Site Visit (Section C) on 26 October 2015



Earthworks (Blasting)



Casting Yard & Site Office



Bridge Construction

添付資料-6

セミナー資料

**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**

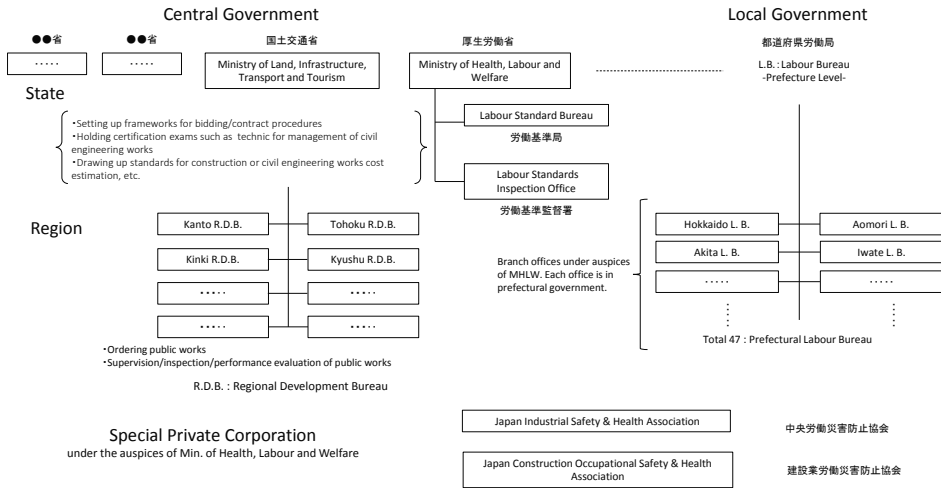
<Q&A>

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

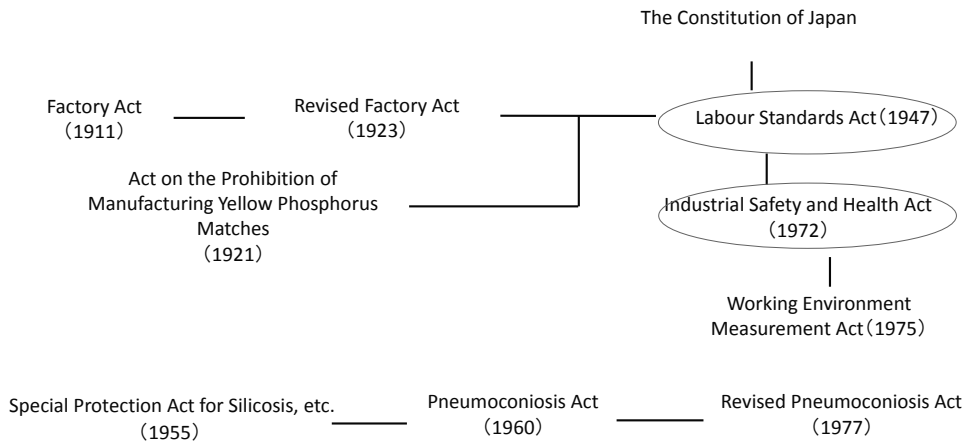
## ② OSH Relevant Act Framework

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

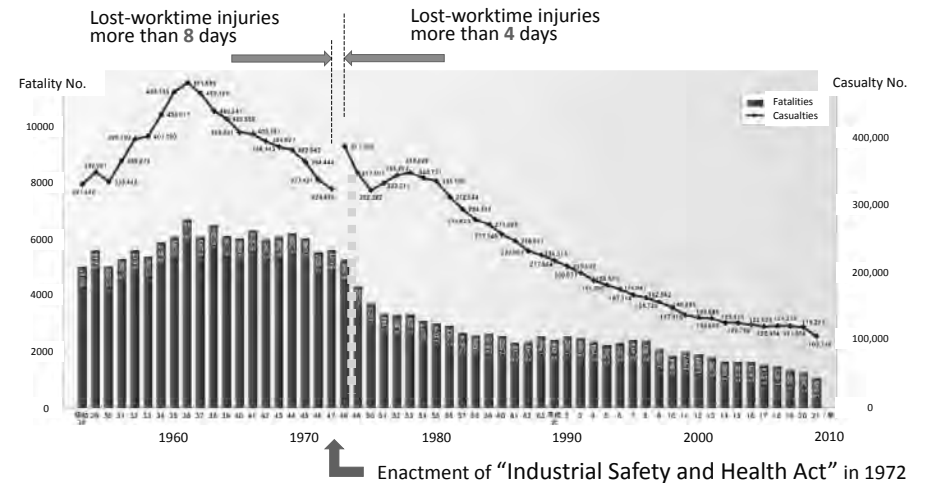
- Purpose : To secure the safety and health for workers
- Executor : Employer/Project Operator
- Protection Target : Worker
- Contents of the Act : Compulsory enforcement of **measures for the prevention of dangers or health impairment** as minimum standards through implementation of penalty
- Compliance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

# Occupational Safety & Health Framework in Japan

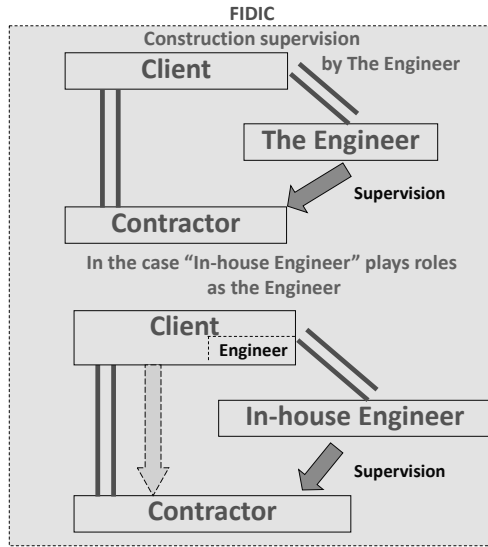
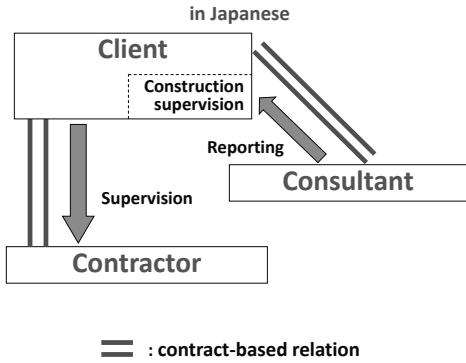
## ② OSH Relevant Act Framework



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

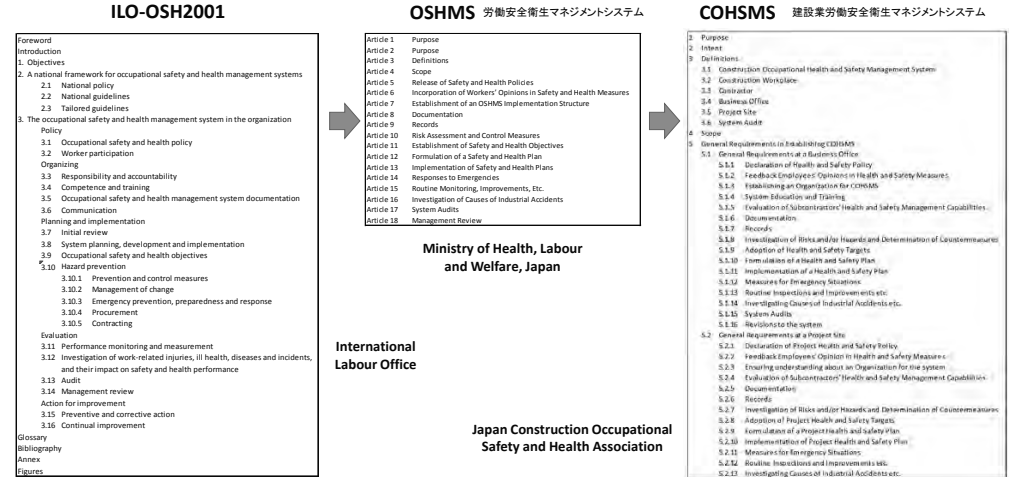


## Comparison of Contract System in Japan and in the FIDIC world



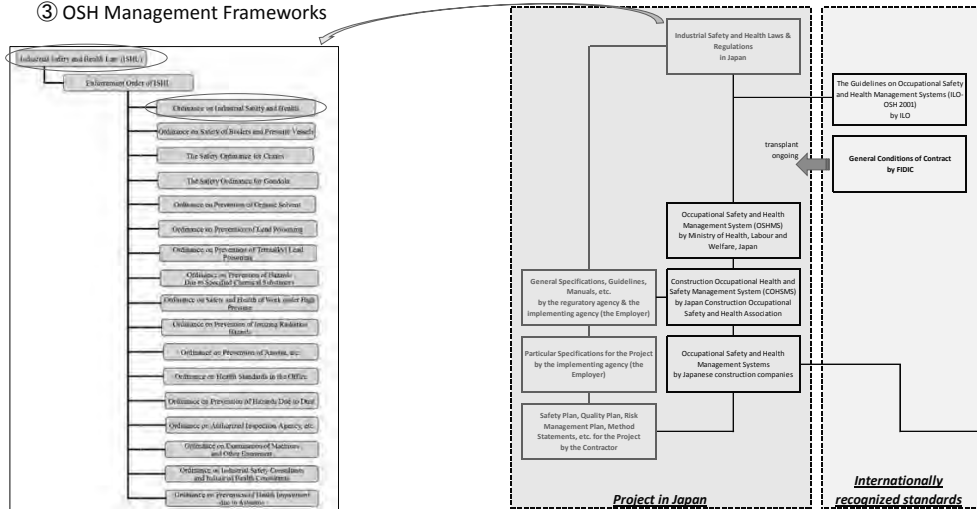
## Occupational Safety & Health Framework in Japan

### ④ Guidelines for OSH Management Systems



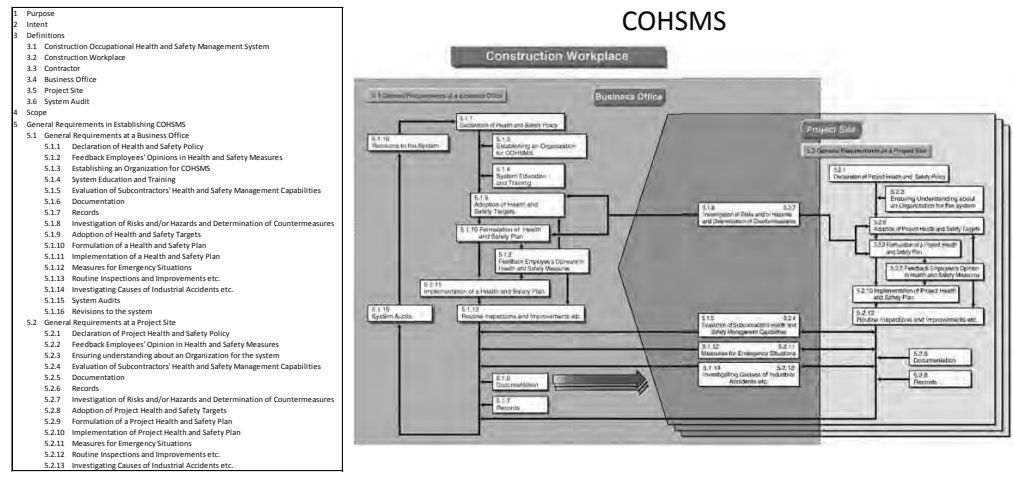
## Occupational Safety & Health Framework in Japan

### ③ OSH Management Frameworks



## Occupational Safety & Health Framework in Japan

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









## 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

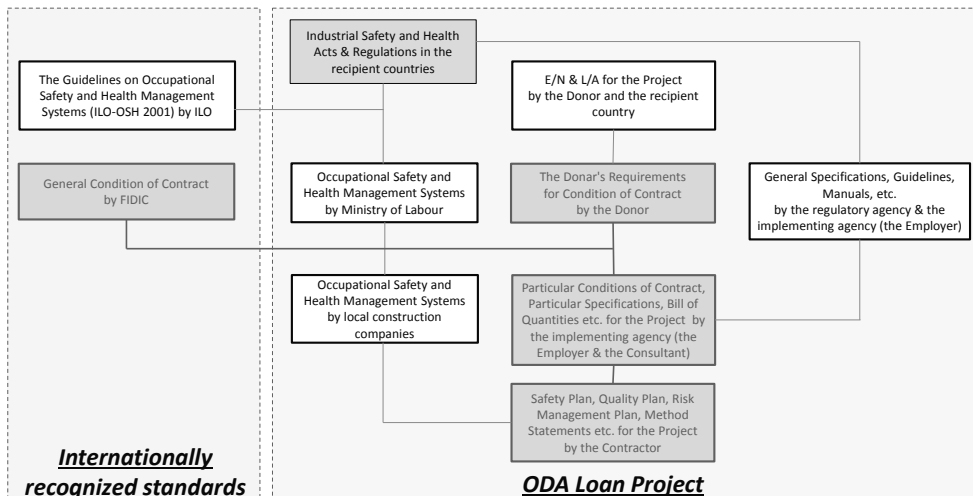
## Features of Safety Management Framework in JAPAN

- 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

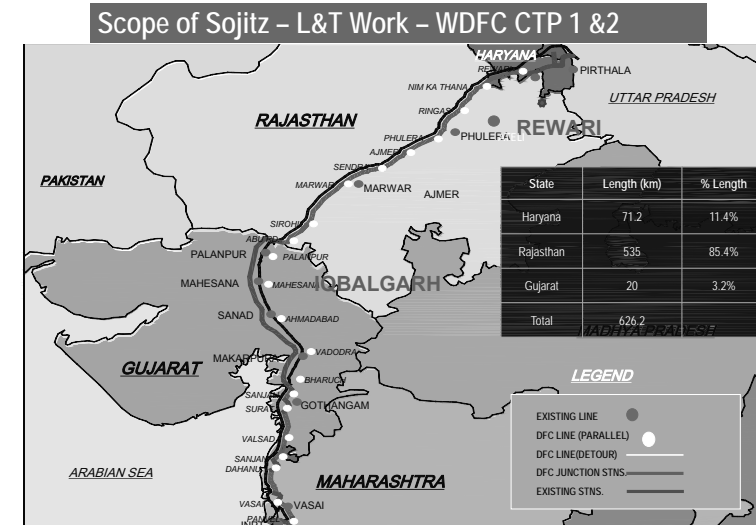
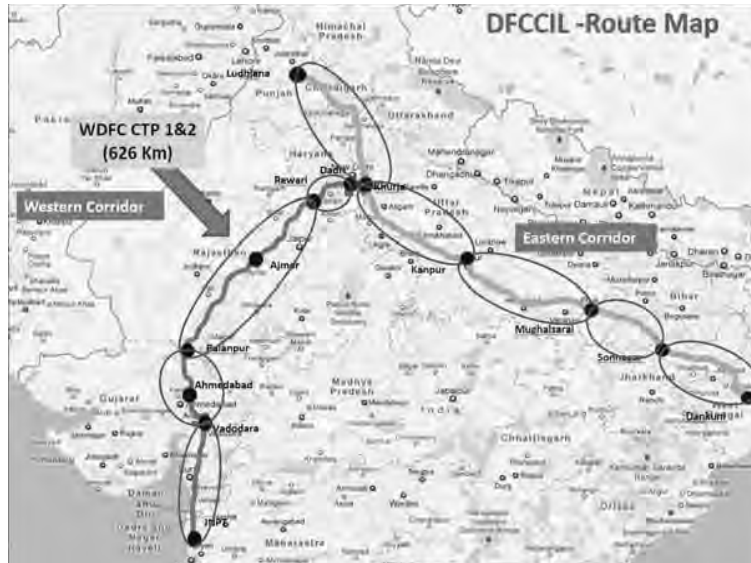
L/A number	: ID - P209
L/A signed date	: March 31, 2010
L/A effective date	: February 18, 2013
L/A validity period	: 10 years (Closing Date: February 18, 2013)
L/A amount	: Yen 90,262,000,000 (Yen 71,974,000,000 for Local Portion)
Completion (Target)	: June 2019

### 1.2.2.2 Allocation of Loan

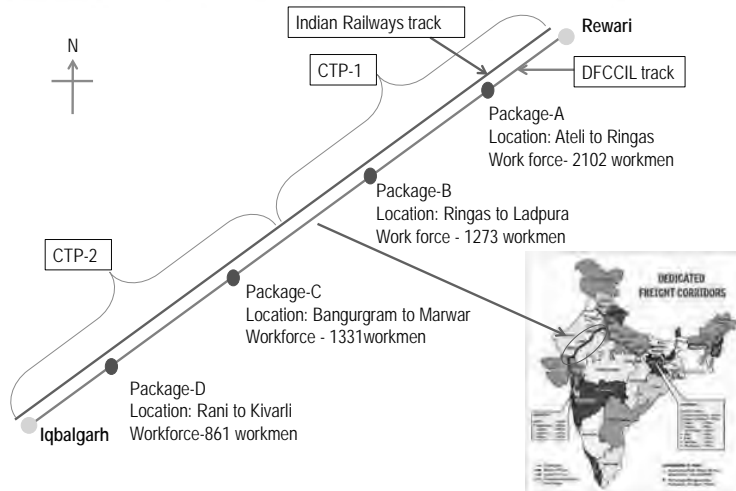
Category	Amount Allocated (Million Yen)	% of Expenditure to be financed
(1) Civil Works and Procurement	79,806	100
(2) Consulting Services	2,474	100
(3) Contingencies	7,982	0
(4) Unavailable Balance	0	0
<b>Total</b>	<b>90,262</b>	<b>-</b>

### 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	

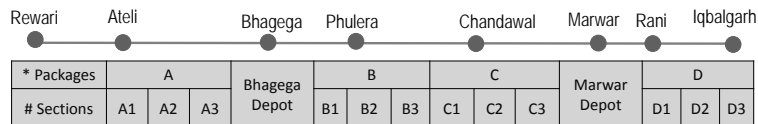


Project: WDFC Phase-1 combined package CTP-1&2



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 PFM Sep'15		Cumulative upto Sep'15	
			Planned	Achieved	Planned	Achieved	Used Plan*	Rev/Plan*
Design	Cr	541	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	23,666,695	8,178,124	3,037,692	1,038,050	31,784,739	9,215,619	9,186,232
Subgrade	Cum	7,616,480	1,832,236	378,521	362,103	8,448,716	2,194,239	2,166,206
Blanket	Cum	5,807,631	237,624	36,439	100,273	6,045,255	337,863	337,863
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	2,372,200	41,600	41,600
Track Laying	TKM	1,389	-	3	0	1,389	3	3
Ballast Supply	TKM	1,389	112	22	15	1,501	127	127
Track Surfacing	TKM	1,389	-	-	-	1,389	-	-
Junction & Crossing	Mts	20	-	-	-	20	-	-
Utility, Office etc.	km	648	-	150	130	648	310	310
POB	km	293	-	-	-	293	-	-
Station Substructure bldg	km	26,122	-	-	-	26,122	-	-
Post Building	km	248	-	-	-	248	-	-
Testing & Commissioning	km	648	-	-	-	648	-	-
<b>Work Done Value as per revised rate</b>	<b>Cr</b>	<b>8,995.5</b>	<b>664.9</b>	<b>132.8</b>	<b>126.3</b>			

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

\* Scope for work done based on approved bills of material only.

\* This is possible since revised rate flow will be positive.

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	Cr	145	80	87	102%	92	8
Cutting	Cum	3,769,790	3,889,515	3,872,938	99%	1,10,871	98,094
Embankment	Cum	23,666,695	9,215,619	9,186,232	100%	1,141,972	1,078,852
Subgrade	Cum	7,616,480	2,194,239	2,094,076	95%	477,904	475,226
Blanket	Cum	5,807,631	337,863	340,847	104%	153,000	180,000
Mass Earthwork	km	646	-	-	-	20	20
Concrete Minor Str	Cum	600,823	50,482	47,404	94%	12,786	12,547
Concrete Major Str	Cum	495,945	47,263	45,364	96%	19,449	21,220
Wear Supply (80%)	MT	168,000	29,857	32,287	108%	5,000	7,500
Sleeper Supply (80%)	MT	2,350,000	63,200	62,800	99%	35,000	45,000
Track Laying	TKM	1,389	3	3	100%	15	15
Ballast Supply	TKM	1,389	127	127	92%	24	30
Track Surfacing	TKM	1,389	-	-	-	10	15
Junction & Crossing	Mts	20	-	-	-	5	5
Utility, Office etc.	km	648	310	130	87%	20	45
POB	km	293	-	-	-	-	20
Station Substructure Building	km	14,122	-	-	-	-	20
Post Building	km	248	-	-	-	780	2,980
Testing & Commissioning	TKM	648	-	-	-	2,980	3,500
<b>Work Done Value as per revised rate</b>	<b>Cr</b>	<b>8,995.5</b>	<b>788.7</b>	<b>788.7</b>	<b>100%</b>	<b>189.2</b>	<b>214.9</b>

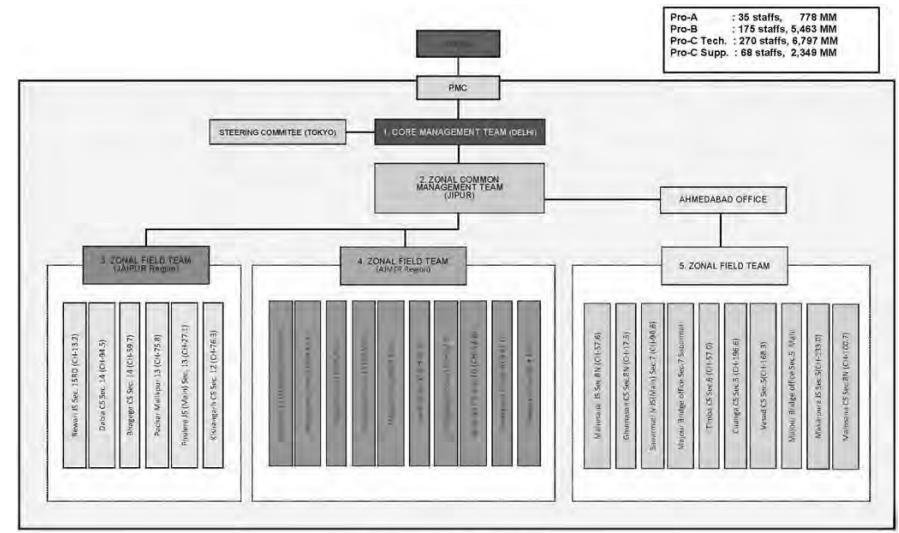
Note: Look ahead for concrete has been revised based on availability of construction Design package.

\* 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 will not released even after 6-8 months.

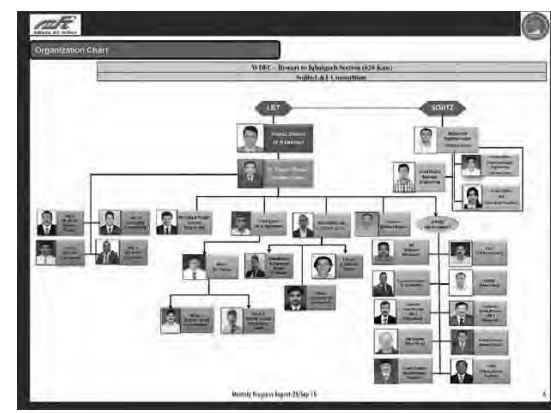
Monthly Progress Report Sep'15



Pro-A : 35 staffs, 778 MM  
 Pro-B : 175 staffs, 5,463 MM  
 Pro-C Tech : 270 staffs, 6,787 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**

TR & 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	3
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>

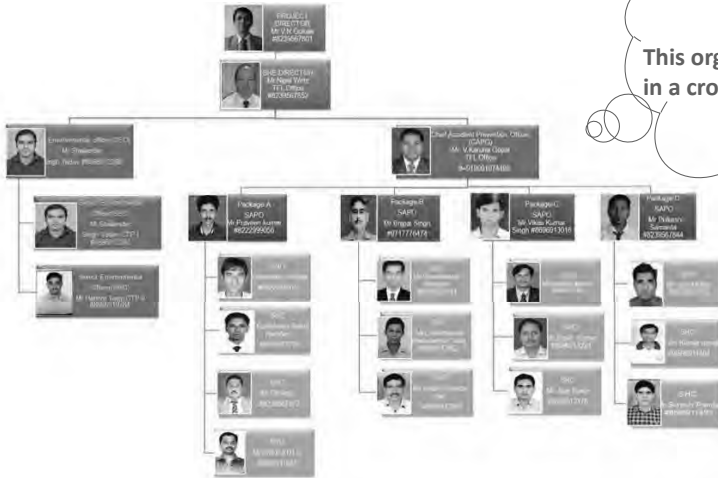
**Design staff Strength of Agencies**

Agency	ENR	CH2M	S&B	Total
Engineers	23	18	15	56
Design Man	12	5	25	42

**STATUS OF LABOUR DEPLOYED AT SITE**

Category	High skilled	Skilled	Semi-skilled	Unskilled	Total Nos
Plg A	35	959	255	662	1651
Plg B	89	278	280	458	1105
Plg C	23	322	304	349	998
Plg D	35	801	131	338	1205
<b>Total</b>	<b>190</b>	<b>1658</b>	<b>970</b>	<b>1687</b>	<b>4705</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>

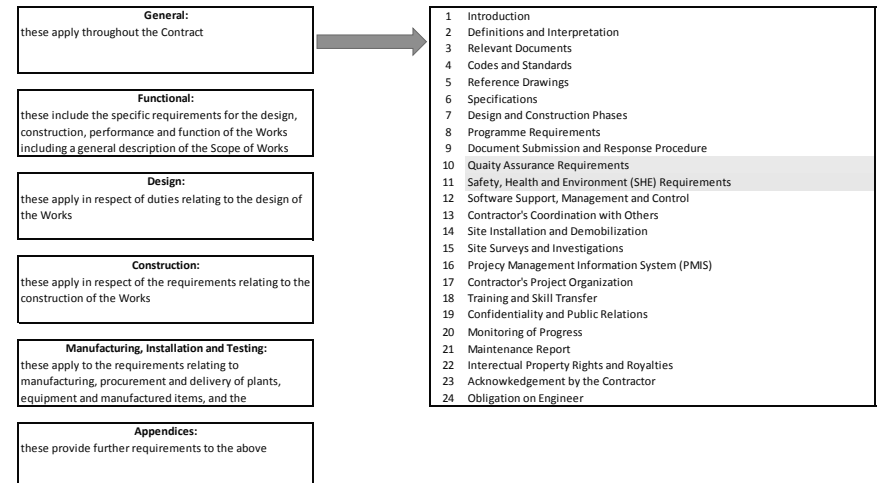
- ❑ General Conditions of Contract
- ❑ Special Conditions of Contract
- ❑ Employer's Requirements
- ❑ Specifications
- ❑ Reference Drawings

Note: This is a Design & Construction Contract.

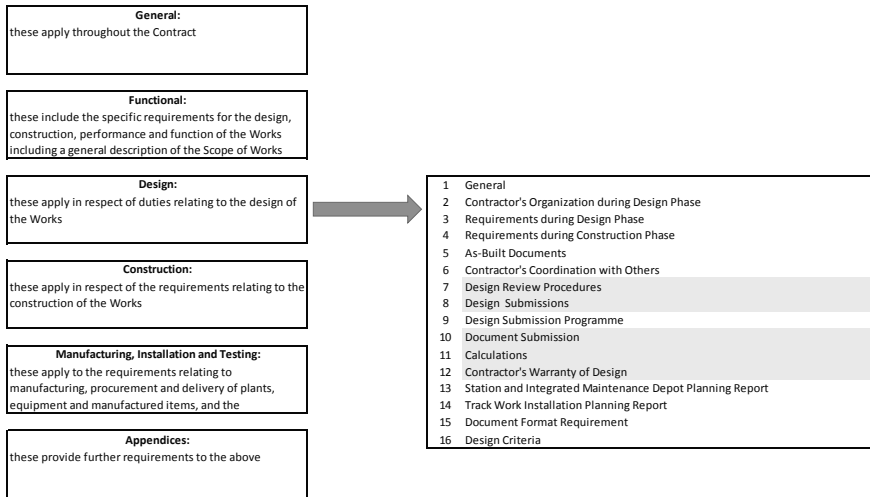
Requirements on  
**QUALITY / SAFETY**

## Contract Requirements on Quality & Safety

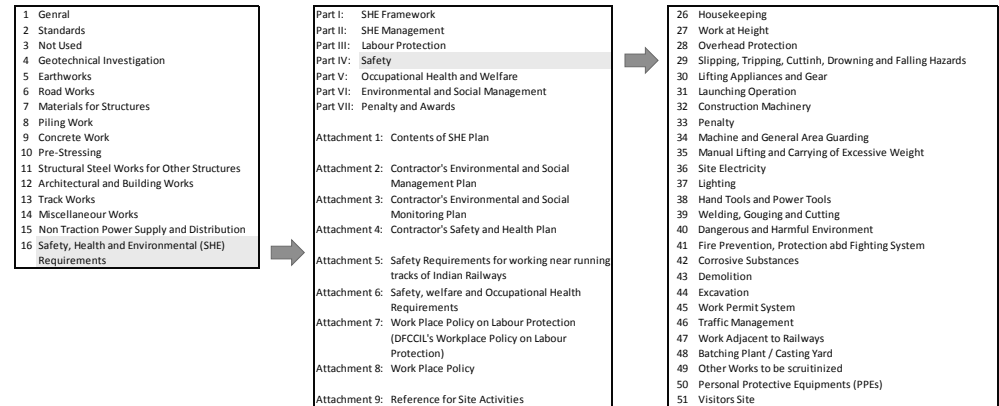
### Employer's Requirements - General



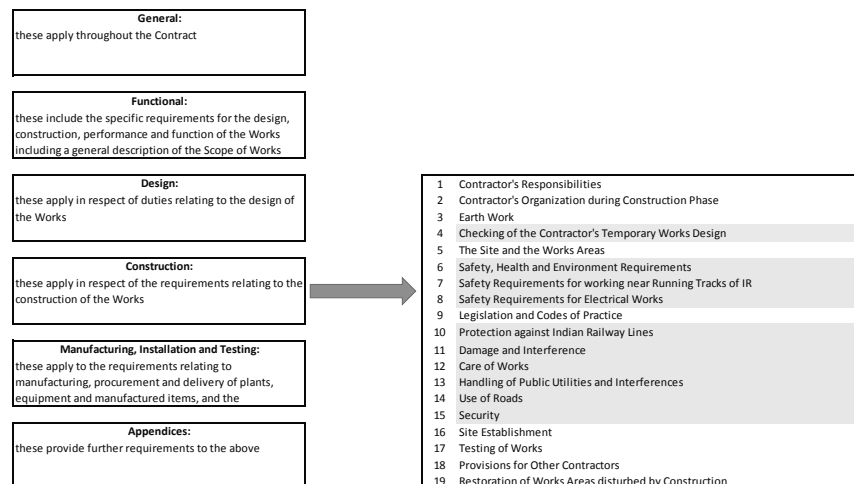
## Employer's Requirements - Design



## 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.

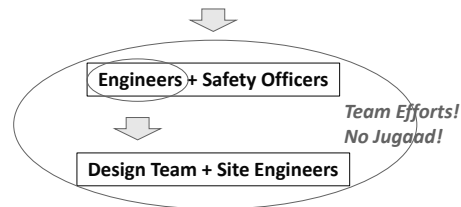
- 47.1.2 Whenever work is to be conducted in close proximity to the live railways, the following measures shall need to be addressed:
- i) The rules provided in the Railway's manual shall be followed.
  - ii) No persons are allowed to encroach onto the railway unless specific authority has been given 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 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

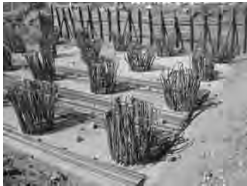
##### 7.3 Excavation Affecting Existing Tracks

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 running line of Indian Railways. If excavation or any other activity involving working and or modification and or alteration of the 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"?



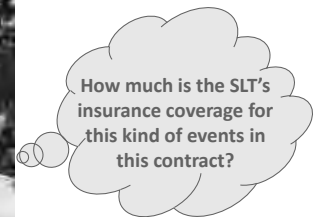
## Ongoing Risky Work adjacent to Railways

- ✓ 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



## 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

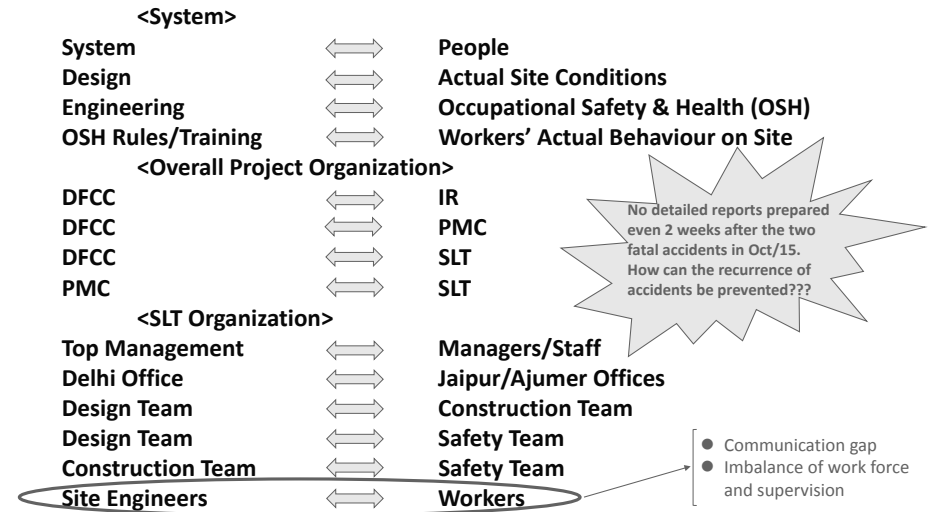
## Progress & Accidents

### What changed in July 2015?



## Communication/Coordination <Overall>

Where a gap exists or may exist between:



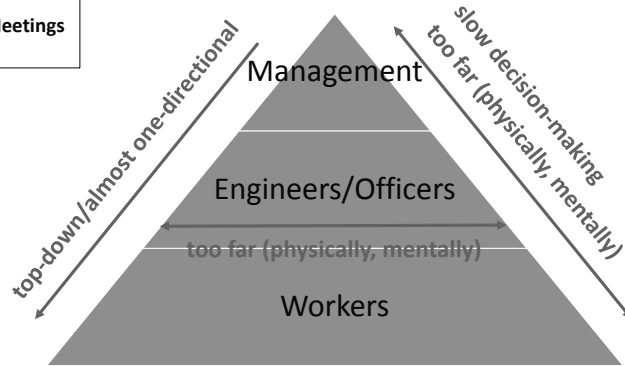
### Military-like Hierarchy of SLT Organization deployed to cope with the Size

- 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

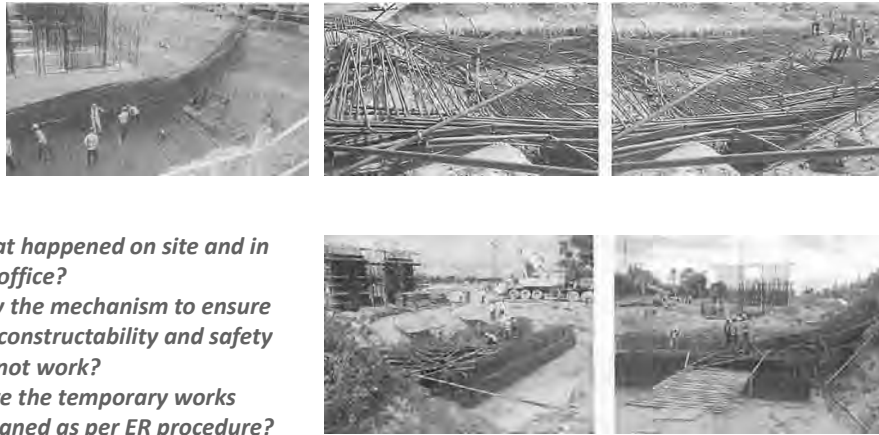


DFC Project

## 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 – 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 – 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>

### 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.

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### <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

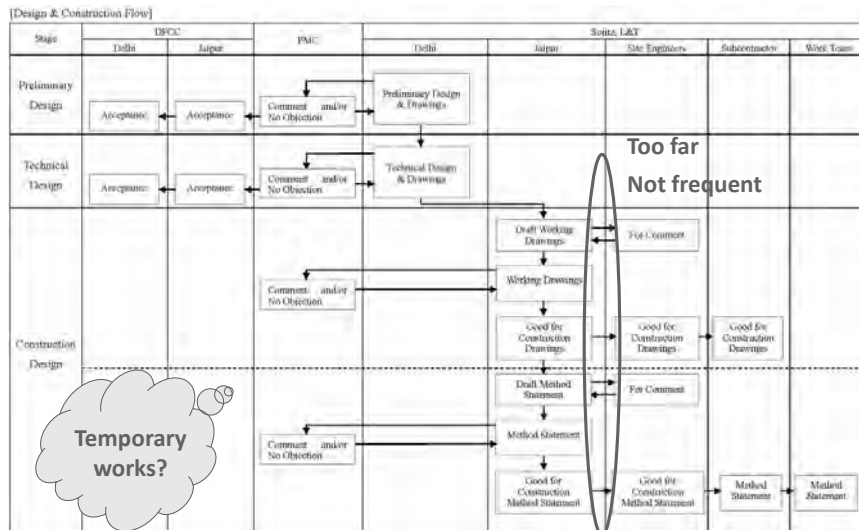
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ANNEXURE B.....	FORWARD DESIGN AND DRAWINGS
ANNEXURE C.....	CONSTRUCTION PROGRAMME

### 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

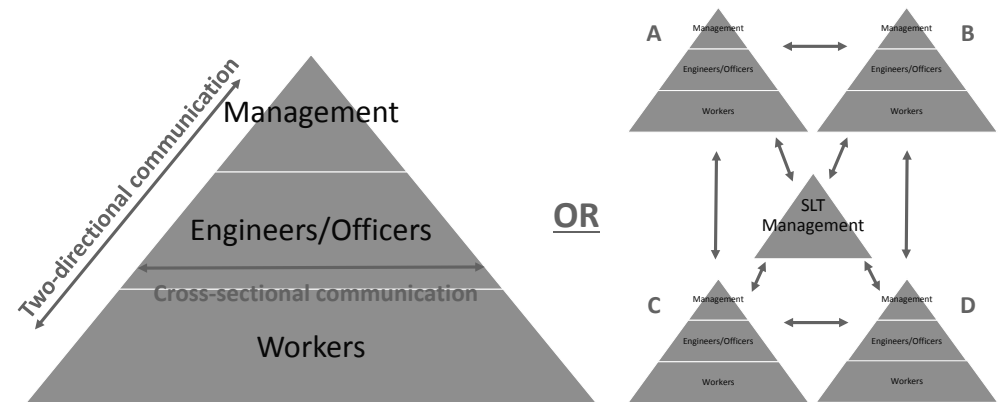
JICA Team conducted safety review study on a USD200mil. Yen-loan project in Sri Lanka in 2014 and another 200mil. Yen-loan project in Kenya in 2015.

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!

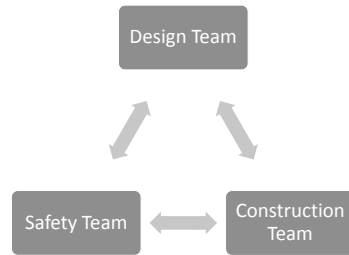
However, whether or not reducing the frequency of any accidents and preventing occurrence of major accidents can be achieved depends on the daily efforts, discipline, prudence and wisdom of all players of each project.

- 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.

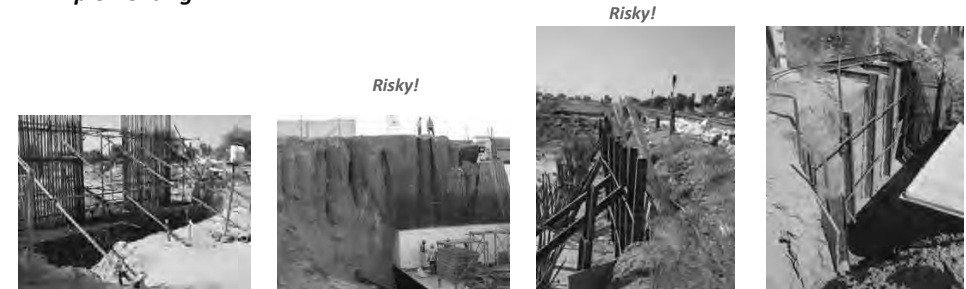


2) The Design Team shall communicate/coordinate with the Construction Team and Safety Team before/during/after preparation of working drawings and method statements. It should be noted that people on site know the site better, while the Design Team knows design better. They should discuss the actual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

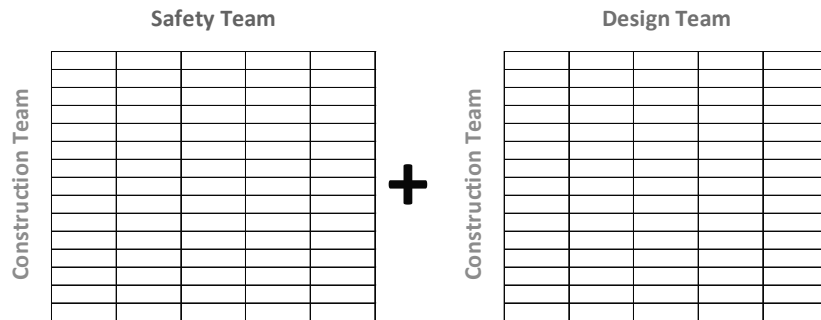
Targets of Construction Project			Players in the office/on site	
			Engineers	Safety Officers
Safety	Occupational Safety & Health → Persons	✓	✓✓	
	Safety of Works → Structures	✓✓	✓✓	
Quality		✓✓	✓	
Schedule		✓✓	✓	
Cost		✓✓	✓	



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/design 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)

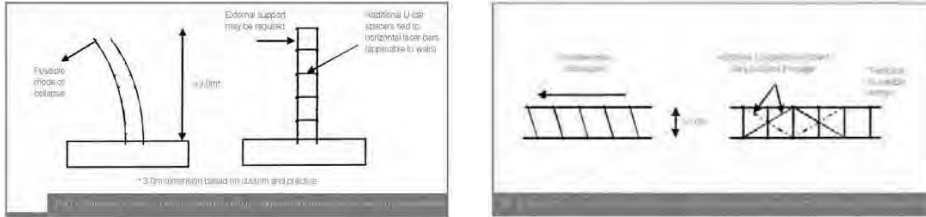
SHE = Safety, Health & Environment  
 SQE = Safety, Quality & Engineering } to be merged

### 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	Check	Response	Review Start	Response	Submission Target	Check	Response		
<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
TW-101	TBM Temporary Facilities - Shift Conveyor 'R'	BG&E	B										12-Apr-04	12-Apr-04
TW-102	TBM Temporary Facilities - Pad Support of Gravity Crane	BG&E	B										12-Apr-04	12-Apr-04
TW-103	TBM Temporary Facilities - Tunnel Hoisting 'R'	BG&E	B										12-Apr-04	12-Apr-04
TW-104	Temporary Facilities - Tunnel Ventilation	Sub/Con	B										12-Apr-04	12-Apr-04
TW-105	Temporary Facilities - Lighting	Sub/Con	B										12-Apr-04	12-Apr-04
TW-110	TBM Reaction Frame & Guide of Eastside	BG&E	B										27-Oct-04	27-Oct-04
TW-111	TBM Reaction Frame at Wilson St. North	BG&E	B										27-Oct-04	27-Oct-04
TW-112	TBM Crane at Wilson Station	BG&E	B										27-Oct-04	27-Oct-04
TW-113	TBM Entrance Ring	BG&E	B										27-Oct-04	27-Oct-04
TW-114	Temporary Works for Hoisting TBM at Wilson Street Station	BG&E	B										27-Oct-04	27-Oct-04
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
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
TW-126	Ground Improvement for TBM Assembly at North Eastside Station	GC	A		4-Aug-04		24-Sep-04						8-Sep-04	8-Sep-04
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
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
TW-133	Ground Improvement for TBM Retrieval at TBM Recycling Shaft	GC	A		28-Jul-04		15-Aug-04						1-Sep-04	1-Sep-04
TW-140	Blasting Protection - Physics Chemistry H2O2, MFC	GC	A		28-Jul-04		18-Aug-04						1-Sep-04	1-Sep-04
TW-141	Blasting Protection - North Yard Entrance	GC	A		15-Sep-04		1-Oct-04						1-Oct-04	1-Oct-04
TW-142	Blasting Protection - Huxia Shear Bridge	GC	A		27-Oct-04		17-Nov-04						1-Dec-04	1-Dec-04
<b>BERTH YARD</b>														
TW-200	North Yard Out & Over Tunnel - Temporary Sheet Pile Wall Design	GC	A		20-Mar-04		10-Apr-04						24-Apr-04	24-Apr-04
TW-201	North Yard Out & Over Tunnel - Temporary Sheet Pile Wall Design	BG&E	A		17-Mar-04		10-Apr-04						20-Apr-04	20-Apr-04
TW-202	North Yard Out & Over Tunnel - Dewatering Design	GC	A		6-May-04		6-May-04						10-Jun-04	10-Jun-04
TW-203	North Yard Out & Over Tunnel - Pilecap & Formwork	Sub/Con	B										23-Jun-04	23-Jun-04
TW-210	North Yard Recycling Shaft - Temporary Sheet Pile Wall	Sub/Con	B		17-Mar-04		17-Mar-04						16-Apr-04	16-Apr-04
TW-211	North Yard Recycling Shaft - Temporary Sheet Pile Wall	BG&E	A		10-Mar-04		31-Mar-04						14-Apr-04	14-Apr-04
TW-212	North Yard Recycling Shaft - Overhead Crane	GC	A		16-Jul-04		16-Jul-04						14-Aug-04	14-Aug-04
TW-213	North Yard - Recycling Shaft - Falsework & Formwork	Sub/Con	B										15-Oct-04	15-Oct-04
TW-214	North Yard Recycling Shaft - Temporary Services Hoisting	BG&E	A		10-Aug-04		11-Aug-04						14-Sep-04	14-Sep-04
TW-215	North Yard Recycling Shaft - Temporary Hoisting	BG&E	A		11-Jul-04		14-Jul-04						14-Aug-04	14-Aug-04
TW-250	North Yard Shear Structure - Temporary Sheet Pile Wall Design	GC	A		28-Mar-04		28-Mar-04						30-Apr-04	30-Apr-04
TW-251	North Yard Shear Structure - Temporary Sheet Pile Wall Design	BG&E	A		27-Mar-04		18-Mar-04						14-Apr-04	14-Apr-04
TW-252	North Yard Shear Structure - Dewatering Design	GC	A		25-Apr-04		25-Apr-04						30-May-04	30-May-04
TW-253	North Yard Shear Structure - Falsework & Formwork	Sub/Con	B										18-Jun-04	18-Jun-04
TW-254	North Yard - Temporary Support for Wilson Street Bridge Modification	BG&E	A		27-Apr-04		1-May-04						1-May-04	1-May-04

## Temporary Works Design - Stabilization of Rebar Cage

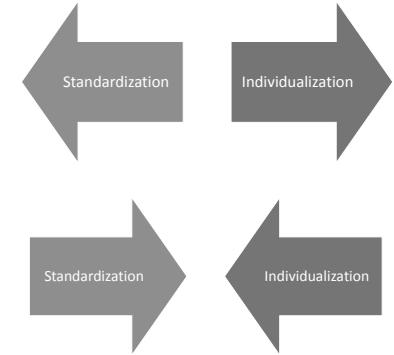
Reference: "Stability of Reinforcement Cages Prior to Concreting"



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.

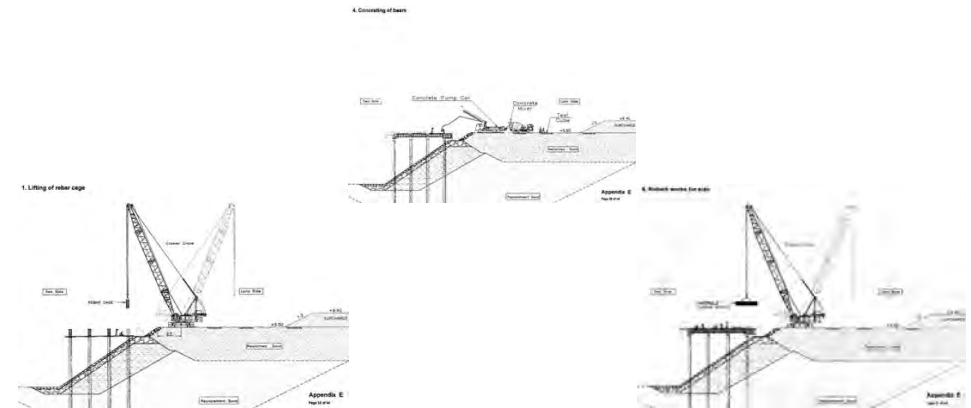
SL. No.	Type of Structure	CTP-1	CTP-2
1	Viaducts	1	-
2	Important Bridges	-	11
3	Major Bridges	15	83
4	Minor Bridges	270	530
5	ROBs	5	1
6	RUBs	171	133
7	Pedestrian Subways	12	49
8	RFOs	3	2
9	FOBs	22	31
Total No. of Structures		499	840



## 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.

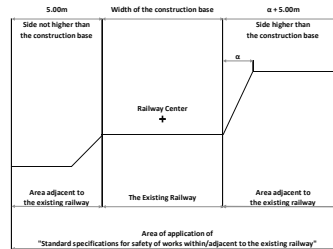


6) There two requirements to be achieved at any rate in sections adjacent to the existing IR tracks.

- 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
	Procedure 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 Railway crossing exclusive for construction use



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!*



添付資料-7      フォローアップ状況  
(抜粋のみ添付)





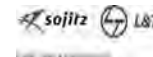
## CPM CTP 1 Site Safety Report

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

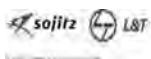
Following a review of serious accidents that have occurred on the WDFC it was made clear by Mr CL Meena WDFC CPM CTP1 of the top managements' utmost commitment to the safety to all the personnel working on project sites must be demonstrated by visibility at site and engagement with workers, engineers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

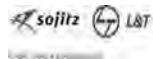
Mr. C.L Meena  
WDFC CPM CTP1



# Joint Inspection – 17<sup>th</sup> November 2015

## 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
RFO -5 Section 15H	GAD Approved Technical design has to be submitted Traffic diversion and Construction sequence to be finalised.	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



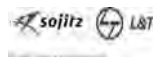
Safety Posters Placed on Machines should be standardized and placed in same locations



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

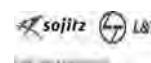
IR Ch 40/08 LC 34 has been constructed by Indian Railways who have dug a large excavation on the WDFC side. This excavation is deemed to be unsafe due to the soft soil, steep and deep sides. The excavation has evidence of collapse and this is of particular concern where this meets the approach road. 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	KVSB,PKP-Section Incharge
	MY – Safety Expert	
		AK-PI

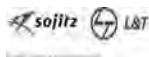


## Joint Inspection 18<sup>th</sup> November 2015

### Package A Narnaul to Neem Ka Thana

Mr CL Meena WDFC CPM CTP1

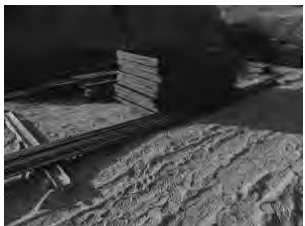
Location	Points Discussed/Issues	Action Required by
IR Ch 50 MJB-10 section 15-Safety	CPM addressed Pep Talk for Labors - Regarding safety during various construction activities and importance of house keeping at major bridge location.	
IR Ch 51 Narnaul IR Station Loading Point	Project Manger SLT explained 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 barricade around the site. All workers were in possession of ID cards.



## IR Ch:73/48 Major Bridge 35



Good site arrangements, access and barricade



## 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



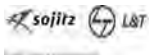
- Operators are found to be holding proper Drivers' license / ID card
- Induction training is given to operators on site
- Safety green stickers are given to majority of machines on site
- Delay starter is installed
- Periodical training to be delivered to each operator
- Safety posters in Hindi language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



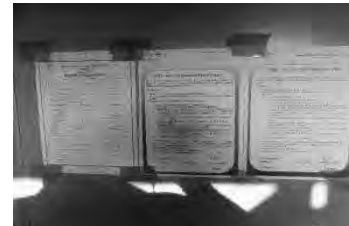
## Major Bridge 33



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



## Major Bridge 33

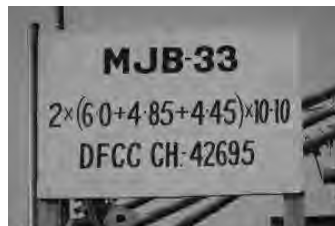


Good tidy storage arrangements and good site house keeping

## 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

