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Annexure 1.1

SCHEDULE OF LUMP SUM PRICES

Part A

Item	Description	Lump Sum (US \$)		Lump Sum (INR)	
		(In Words)	(In figures)	(In Words)	(In figures)
1	Raman Mandi – Bathinda Pipeline	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
2	Raman Mandi – Bahadurgarh Pipeline	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
	SUB-TOTAL	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
	----- % Service Tax	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
	TOTAL	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]

Part B

Item	Description	Lump Sum (US \$)		Lump Sum (INR)	
		(In Words)	(In figures)	(In Words)	(In figures)
1	Raman Mandi – Bathinda Pipeline	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
2	Raman Mandi – Bahadurgarh Pipeline	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
3	Raman Mandi Marketing Terminal	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
4	Additional tankage and associated facilities at Bathinda	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
5	Additional tankage and associated facilities at Bahadurgarh	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
	SUB-TOTAL	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
	----- % Service Tax	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]
	TOTAL	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]	[Do not quote here.]

Bidder shall quote the percentage rates of taxes except service tax (as on bid due date) included in their quoted rates.

Taxes	% Considered (Do not quote rates/amount)
1)
2)
3)
4)
5)
6)
7)
8)

Duly filled list of taxes and their percentages shall be submitted along with the both, un-priced as well as priced bid.

Annexure 1.2

UNIT RATES

Annexure 1.3

BREAK-UP OF MAN-HOURS

Sr. No.	Major Milestones	Part A			
		Pipeline	Mainline & Booster Pumps	Control Valves	Total
		GGSRP : RAMAN MANDI – BATHINDA PIPELINE			
1	BASIC DESIGN & PROCESS				
2	DETAILED ENIGNNERING				
3	PURCHASE AND TENDERING UPTO PLACEMENT OF ORDER				
	TOTAL				

Part A					
GGSRP : RAMAN MANDI – BAHADURGARH PIPELINE					
	Major Milestones	Pipeline	Mainline & Booster Pumps	Control Valves	Total
1	BASIC DESIGN & PROCESS				
2	DETAILED ENIGNNERING				
3	PURCHASE AND TENDERING UPTO PLACEMENT OF ORDER				
	TOTAL				

PART B											
GGSRREP : RAMAN MANDI TO BAHADURGARH PIPELINE											
MAJOR MILESTONES	PIPELINE	MAINLINE & BOOSTER PUMPS	CONTROL VALVES	TELECOM SYSTEM	ARCH./ CIVIL/ STRUCTURAL	ELECTRIC	TEMP. CP SYSTEM	PERMANENT CP SYSTEM	SCADA	INSTRUMENTATION	TOTAL
1	BASIC DESIGN & PROCESS										
2	DETAIL ENGINEERING										
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER										
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS										
5	EXECUTION & INSPECTION										
6	MATERIAL MANAGEMENT										
7	CONSTRUCTION SUPERVISION										
8	COMMISSIONING / OPERATION MANUAL										
9	AS BUILT DRAWINGS										
	TOTAL										

PART B											
GGSRP : RAMAN MANDI TO BATHINDA PIPELINE											
MAJOR MILESTONES	PIPELINE	MAINLINE & BOOSTER PUMPS	CONTROL VALVES	TELECOM SYSTEM	ARCH/ CIVIL/ STRUCTURAL	ELECTRIC AL	TEMP. CP SYSTEM	PERMANENT CP SYSTEM	SCADA	INSTRUMENTATION	TOTAL
1	BASIC DESIGN & PROCESS										
2	DETAIL ENGINEERING										
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER										
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS										
5	EXECUTION & INSPECTION										
6	MATERIAL MANAGEMENT										
7	CONSTRUCTION SUPERVISION										
8	COMMISSIONING / OPERATION MANUAL										
9	AS BUILT DRAWINGS										
	TOTAL										

PART B													
GGSRREP : Receipt, Storage Cum Dispatch Terminal at Raman Mandi													
Sr. No	MAJOR MILESTONES	Storage Tanks	Effluent Treatment Plant	Fire Fighting	Internal P/L	Const. of Compound Wall	Land Development	Roads and Drains	Civil	Electrical	Instrumentation	Communication	TOTAL
		1	BASIC DESIGN & PROCESS										
2	DETAIL ENGINEERING												
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER												
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS												
5	EXPEDITING & INSPECTION												
6	MATERIAL MANAGEMENT												
7	CONSTRUCTION SUPERVISION												
8	COMMISSIONING / OPERATION MANUAL												
9	AS BUILT DRAWINGS												
	TOTAL												

Part B		GGSR – Additional Tankage at Bathinda						
MAJOR MILESTONES	Sr. No.	Storage Tanks	Internal P/L	Fire Fighting	Effluent Treatment Plant	Instrumentation	TOTAL	
1	BASIC DESIGN & PROCESS							
2	DETAIL ENGINEERING							
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER							
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS							
5	INSPECTION							
6	MATERIAL MANAGEMENT							
7	CONSTRUCTION SUPERVISION							
8	COMMISSIONING / OPERATION MANUAL							
9	AS BUILT DRAWINGS							
	TOTAL							

Part – B		GGSRP – Additional Tankage at Bahadurgarh				
MAJOR MILESTONES	Sr. No	Storage Tanks	Internal P/L	Fire Fighting	instrumentation	TOTAL
	1	BASIC DESIGN & PROCESS				
	2	DETAIL ENGINEERING				
	3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER				
	4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS				
	5	INSPECTION				
	6	MATERIAL MANAGEMENT				
	7	CONSTRUCTION SUPERVISION				
	8	COMMISSIONING / OPERATION MANUAL				
	9	AS BUILT DRAWINGS				
		TOTAL				

Annexure B

**DRAFT COMPOSITE BANK GUARANTEE FOR SECURITY
DEPOSIT/PERFORMANCE GUARANTEE**

(On Non-Judicial stamp paper of appropriate value)

TO : Hindustan Petroleum Corporation Limited
(Address as applicable)

IN CONSIDERATION OF MESSRS. HINDUSTAN PETROLEUM CORPORATION LIMITED, a Government of India Company registered under the Companies Act, 1956, having its registered office at 17, Jamshedji Tata Road, Mumbai-20 (hereinafter called "The Corporation" (which expression shall include its successor in business and assigns) having placed an order on Messers a partnership firm/sole proprietor usiness/a company registered under the Companies Act, 1956 having its office at (hereinafter called "the supplier" (which expression shall include executors, administrators and assigns) vide order No..... dated..... (hereinafter called "the order" which expression shall include any amendments/alterations to "the order" issued by "the Corporation") for the supply of goods to/execution of services for "the Corporation" and "the Corporation" having agreed : a) not to insist upon immediate payment of Security deposit for the fulfilment and performance of the said order b) to pay "the supplier" as and by way of advance upto a sum of Rupees _____ (Rupees _____ only) being ___% of the value of the order"; c) that "the supplier" shall furnish a security for the performance of "the supplier's" obligations and/or discharge of "the supplier's" liability in connection with the said "order"; and "the Corporation" having agreed with "the supplier" to accept a composite Bank Guarantee for the mobilisation advance, security deposit, retention money and performance guarantee.

We, _____ Bank having office at _____ (hereinafter referred to as "the Bank" which expression shall includes its successors and assigns) at the request and on behalf of "the supplier" hereby agree to pay to "the Corporation" without any demur on first demand an amount not exceeding Rs..... (Rupees.....only) against any loss or damage, costs, charges and expenses caused to or suffered by "the Corporation" by reason of non performance and fulfilment or for any breach on the part of "the supplier" of any of the terms and conditions of the said "order".

2. We, Bank further agree that "the Corporation" shall be sole judge whether the said "Supplier" has failed to perform or fulfill the said "order" in terms thereof or committed breach of any terms and conditions of "the order" and the extent of loss, damage, cost, charges and expenses suffered or incurred or would be suffered or incurred by "the Corporation" on account thereof and we waive in the favour of "the Corporation" all the rights and defences to which we as guarantors and/or "the Supplier" may be entitled to.

3. We, Bank further agree that the amount demanded by "the Corporation" as such shall be final and binding on "the Bank" as to "the Bank" 's liability to pay and the amount demanded and "the Bank" undertake to pay "the Corporation" the amount so demanded on first demand and without any demur notwithstanding any dispute raised by "the Supplier" or any suit or other legal proceedings including arbitration pending before any court, tribunal or arbitrator relating thereto, our liability under this guarantee being absolute and unconditional.

4. We, Bank further agree with "the Corporation" that "the Corporation" shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said "order"/or to extend time of performance by "the Supplier" from time to time or to postpone for any time to time any of the powers exercisable by "the Corporation" against "the Supplier" and to forbear to enforce any of the terms and conditions relating to "the order" and we shall not be relieved from our liability by reason of any such variation or extension being granted to "the Supplier" or for any forbearance, act or omission on the part of "the Corporation" or any indulgence by "the Corporation" to "the Supplier" or by any such matter or things whatsoever which under the law relating to sureties would but for this provision have the effect of relieving us.

5. However, it has been agreed between "the Supplier" and "the Corporation" that there shall be only one Composite Bank Guarantee for both the advance and security deposit performance guarantee/Retention Money @ of ___% valid till the end of the defects liability period as per the terms of the P.O. No. _____ dated _____ and that in proportion with the recovery of advance @ _____% per bill the same amount/value automatically stands credited to the defects liability account/security deposit or retention money as the case may be

and will continue to be credited/treated till the entire advance of Rs. _____ is fully recovered from the running bills and from the date of full recovery of the advance of Rs. _____ this guarantee automatically, shall stand valid towards the ____% retention money/defects liability, fully valid in all ® respects unto a further period of **3 (three)** months, as per the Purchase Order of "the Corporation".

- 6. Notwithstanding anything contained herein above :
 - i) Our liability under this guarantee shall not exceed Rs.....
 - ii) This Bank Guarantee shall be valid upto and including; and
 - iii) We are liable to pay the guarantee amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before the expiry of 30 days from the date of expiry of this guarantee.

7. We, Bank further undertake not to revoke this guarantee during its currency except with the previous consent of "the Corporation" in writing.

8. We, Bank lastly agree that "the Bank"'s liability under this guarantee shall not be affected by any change in the constitution of "the Supplier".

9. "The Bank" has power to issue this guarantee in favour of "the Corporation" in terms of the documents and/or the Agreement/Contract or MOU entered into between "the Supplier" and "the Bank" in this regard.

IN WITNESS WHEREOF the Bank has executed this document on this day of

For Bank
(by its constituted attorney)
(Signature of a person authorised to sign on behalf of "the Bank")*

Annexure C

INTEGRITY PACT

INTEGRITY PACT

Between

Hindustan Petroleum Corporation Limited (HPCL) hereinafter referred to as “The Principal”, and..... hereinafter referred to as “The Bidder/Contractor”

Preamble

The Principal intends to award, under laid down organization procedures, contract/s for The Principle values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidders/s and Contractor/s.

In order to achieve these goals, the Principal cooperates with the renowned international Non-Governmental Organisation “Transparency International” (TI). Following TI’s national and international experience, the Principal will appoint an external independent Monitor who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

1. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for him/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.
2. The principal will, during the tender process treat all Bidders with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any Bidder confidential / additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.
3. The principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder / Contractor

(1) The Bidder / Contractor commits itself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in

the tender process and during the contract execution.

1. The Bidder / Contractor will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
2. The Bidder / Contractor will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelisation in the bidding process.
3. The Bidder / Contractor will not commit any offence under the relevant Anti-corruption Laws of India; further the Bidder / Contractor will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
4. The Bidder / Contractor will, when presenting his bid, disclose any and all payment he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

(2) The Bidder / Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3-Disqualification from tender process and exclusion from future contracts

If the Bidder, before contract award has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or credibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

- (1) If the Bidder/Contractor has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is entitled also to exclude the Bidder / Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.
- (2) A transgression is considered to have occurred if the Principal after due consideration of the available evidence, concludes that no reasonable doubt is possible.
- (3) The Bidder accepts and undertakes to respect and uphold the Principal's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or

question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

(4) If the Bidder / Contractor can prove that he has restored / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.

Section 4 – Compensation for Damages

(1) If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to Earnest Money Deposit/Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principle is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to Security Deposit / Performance Bank Guarantee.

(3) The bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder / Contractor can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount of the liquidated damages, the Bidder / Contractor shall compensate the Principal only to the extent of the damage in the amount proved.

Section 5 – Previous Transgression

(1) The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders / Contractors / Subcontractors

(1) The Bidder / Contractor undertakes to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

(2) The Principal will enter into agreements with identical conditions as this one with all Bidders, Contractors and Subcontractors.

(3) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 – Criminal charges against violating Bidders/Contractors/Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

**Section 8 – External Independent Monitor / Monitors (three in number depending on the size of the contract)
(to be decided by the Chairperson of the Principal)**

- (1) The Principal appoints competent and credible external independent Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- (2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal.
- (3) The Contractor accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to this project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder / Contractor / Subcontractor with confidentiality.
- (4) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- (5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or heal the violation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendation. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Independent External Monitor shall give an opportunity to the bidder / contractor to present its case before making its recommendations to the Principal.
- (6) The Monitor will submit a written report to the Chairperson of the Board of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the 'Principal' and, should the occasion arise, submit proposals for correcting problematic situations.
- (7) Monitor shall be entitled to compensation on the same terms as being extended to / provided to Outside Expert Committee members / Chairman as prevailing with Principal.
- (8) If the Monitor has reported to the Chairperson of the Board a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

(9) The word ‘Monitor’ would include both singular and plural.

Section 9 – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by Chairperson of the Principal.

Section 10 – Other provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Mumbai. The Arbitration clause provided in the main tender document / contract shall not be applicable for any issue / dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

(3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

(4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

For the Principal For the Bidder/Contractor

Place.....

Witness 1:

Date.....

Witness 2:

Annexure D

**HEALTH, SAFETY & WELFARE PLAN
DURING CONSTRUCTION**

List of Contents

- Chapter 1 : Guidelines for Development of Construction HSE plan
- Chapter 2 : Safety precaution recommended during Excavation and Scaffolding works activities.
- Chapter 3 : Essential checklist for most commonly hazards at Construction sites.
- Chapter 4 : Golden rules to reduce risk at site.
- Chapter 5 : HSE Passport- A Good practice guide
- Chapter 6 : Important provision under -
 - The building and other construction workers (regulation of employment and conditions of service) act, 1996
 - The building and other construction worker's (regulation of employment and conditions of service) central rules, 1998.

Chapter 1

Guidelines for Development of Construction HSE Plan

General

Not all information relating to the project may be available to fully develop the health and safety plan before the start of construction. This could be because not all the design work may have been completed or many of the subcontractors who will be carrying out the work have yet to be appointed. However, site layout drawings covering the project at different stages, completed design information and the pre-tender stage health and safety plan will be valuable in developing the health and safety plan so that:

- The general framework is in place (including arrangements for welfare); and
- It deals with the key tasks during the initial work packages where design is complete.

For projects where a significant amount of design work will be prepared as construction proceeds, specific arrangements for dealing with this work may need to be set out in the health and safety plan. This is important to ensure that the health and safety aspects of the design work are considered and dealt with properly by designers and the planning supervisor. This will particularly occur under the various design and build and management contracting forms of procurement.

The health and safety plan will need to be added to, reviewed and updated as the project develops, further design work is completed, information from the subcontractors starting work becomes available, unforeseen circumstances or variations to planned circumstances arise, etc.

What should the health and safety plan start with?

The health and safety plan can usefully open with:

- A description of the Project
- A general statement of health and safety principles and objectives for the project;
- Information about restrictions which may affect the work (eg, neighbouring buildings, utility services, vehicular and pedestrian traffic flows and restrictions from the work activities of the client).

What should be the role of contractor in HSE Plan:

Principal contractors shall co-ordinate and manage health and safety issues during the construction work. One of the duties placed on the planning supervisor is to ensure that a pre-tender stage health and safety plan is prepared before arrangements are made for the principal contractor to carry out or manage construction work.

The principal contractor is then required to develop the health and safety plan before work starts on site and keep it up to date throughout the construction phase. The degree of detail required in the health and safety plan for the construction phase and the time and effort in preparing it should be in proportion to the nature, size and level of health and safety risks involved in the project. Projects involving minimal risks will call for simple, straightforward plans. Large projects or those involving significant risks will need more detail.

What should the health and safety plan cover for the construction phase?

The health and safety plan should set out the arrangements for securing the health and safety of everyone carrying out the construction work and all others who may be affected by it.

It should deal with:

- The arrangements for the management of health and safety of the construction work;
- The monitoring systems for checking that the health and safety plan is being followed;
- Health and safety risks to those at work, and others, arising from the construction work, and from other work in premises where construction work may be carried out.

What arrangements should be set out in the Health and Safety plan for managing and organizing the Project?

These can include:

1 : Management

- The management structure and responsibilities of the various members of the project team, whether based at site or elsewhere;
- Arrangements for the principal contractor to give directions and to coordinate other contractors.

2 : Standard setting

- The health and safety standards to which the project will be carried out. These may be set in terms of statutory requirements or higher standards that the client may require in particular circumstances.

3 : Information for contractors

- Means for informing contractors about risks to their health and safety arising from the environment in which the project is to be carried out and the construction work itself.

4 : Selection procedures

The principal contractor has to make arrangements for ensuring that:

All contractors, the self-employed and designers to be appointed by the principal contractor are:

- Competent and will make adequate provision for health and safety;
- Suppliers of materials to the principal contractor will provide adequate health and safety information to support their products;

- Machinery and other plant supplied for common use will be properly selected, used and maintained; and that operator training will be provided.

5: Communications and co-operation

- Means for communicating and passing information between the project team (including the client and any client's representatives) the designers, the planning supervisor, the principal contractor, other contractors, workers on site and others whose health and safety may be affected;
- Arrangements for securing co-operation between contractors for health and safety purposes;
- Arrangements for management meetings and initiatives by which the health and safety objectives of the project are to be achieved;
- Arrangements for dealing with design work carried out during the construction phase, ensuring it complies with the duties on designers (CDM regulation 13) and resultant information is passed to the appropriate person(s).

6: Activities with risks to Health and Safety Arrangements need to be made for the identification and effective management of activities with risks to health and safety, by carrying out risk assessments, incorporating those prepared by other contractors, and also safety method statements which result. These activities may be specific to a particular trade (eg, false work) or to site-wide issues, and may include:

- The storage and distribution of materials;
- The movement of vehicles on site, particularly as this affects pedestrian and vehicular safety;
- Control and disposal of waste;
- The provision and use of common means of access and places of work;
- The provision and use of common mechanical plant;
- The provision and use of temporary services (e.g. electricity);
- Temporary support structures (e.g. false work);
- Commissioning, including the use of permit-to-work systems;
- Protection from falling materials;
- Exclusion of unauthorised people.

Control measures to deal with these should be clearly set out, including protection of members of the public.

7: Emergency procedures

- Emergency arrangements for dealing with and minimising the effects of injuries, fire and other dangerous occurrences.

8 : Reporting of RIDDOR information

- Arrangements for passing information to the principal contractor about accidents, ill health and dangerous occurrences that require to be notified to the Health and Safety Executive (HSE), HQO

9: Welfare

- The arrangements for the provision and maintenance of welfare facilities.

10: Information and training for people on site

Arrangements need to be made by which the principal contractor will check that people on site have been provided with:

- Health and safety information;
- Health and safety training; and
- Information about the project (eg relevant parts of the health and safety plan);

Arrangements also need to be made for:

- Project specific awareness training;
- Tool-box or task health and safety talks;
- The display of statutory notices.

11: Consultation with people on site

Arrangements that have been made for consulting and co-ordinating the views of workers or their representatives.

12: Site rules

Arrangements for making site rules and for bringing them to the attention of those affected. The rules should be set out in the health and safety plan. There may be separate rules for contractors, workers, visitors and other specific groups.

13: Health and safety file

- Arrangements for passing on information to the planning supervisor for the preparation of the health and safety file.

14: Arrangements for monitoring

Arrangements should be set out for the monitoring systems to achieve compliance with:

- Legal requirements; and
- The health and safety rules developed by the principal contractor through regular planned
- Checks, and by carrying out investigations of incidents (whether causing injury, loss, or 'near miss') and complaints.

This may involve:

Co-operation and regular meetings between senior management and those who provide health and safety advice to them.

This may also involve monitoring of:

- Procedures, eg contractor selection and the management of certain trades;
- On-site standards actually achieved compared with those set for the Project;
- Reviews throughout the project, as different trades complete their work and at its conclusion.

This means that the lessons learnt in terms of the standards that were set and those actually achieved can be taken forward.

Chapter 2

Safety precaution recommended during Excavation and Scaffolding works activities

Excavation

Introduction:

Every year, people are killed or seriously injured when working in excavations. Excavation work has to be properly planned, managed, supervised and carried out to prevent accidents. This information sheet provides advice for those involved in excavation work.

Planning:

Before digging any excavations, it is important to plan against the following:

- Collapse of the sides;
- Materials falling onto people working in the excavation;
- People and vehicles falling into the excavation;
- People being struck by plant;
- Undermining nearby structures;
- Contact with underground services;.
- Access to the excavation;
- Fumes; and
- Accidents to members of the public.

Make sure the necessary equipment needed such as trench sheets, props, baulks, etc, is available on site before work starts.

Excavation collapse

- Prevent the sides and the ends from collapsing by battering them to a safe angle or supporting them with timber, sheeting or proprietary support systems.
- Do not go into unsupported excavations.
- Never work ahead of the support.
- Remember that even work in shallow trenches can be dangerous. You may need to provide support if the work involves bending or kneeling in the trench. materials falling into excavations
- Do not store spoil or other materials close to the sides of excavations. The spoil may fall into the excavation and the extra loading will make the sides more prone to collapse.
- Make sure the edges of the excavation are protected against falling materials. Provide toe boards where necessary.
- Wear a hard hat when working in excavations. People and vehicles falling into excavations
- Take steps to prevent people falling into excavations. If the excavation is 2 m or more deep, provide substantial barriers, eg guard rails and toe boards.

- Keep vehicles away from excavations wherever possible. Use brightly painted baulks or barriers where necessary.
- Where vehicles have to tip materials into excavations, use stop blocks to prevent them from over-running.
- Remember that the sides of the excavation may need extra support. Undermining nearby structures
- Make sure excavations do not affect the footings of scaffolds or the foundations of nearby structures.
- Walls may have very shallow foundations which can be undermined by even small trenches.
- Decide if the structure needs temporary support before digging starts. • Surveys of the foundations and the advice of a structural engineer may be needed.

Avoiding underground services

- Look around for obvious signs of underground services, eg valve covers or patching of the road surface.
- Use locators to trace any services. Mark the ground accordingly.
- Make sure that the person supervising excavation work has service plans and knows how to use them.
- Everyone carrying out the work should know about safe digging practices and emergency procedures.

Access

- Provide good ladder access or other safe ways of getting in and out of the excavation.

Fumes

- Exhaust fumes can be dangerous. Do not site petrol or diesel-engined equipment such as generators or compressors in, or near the edge of, an excavation unless fumes can be ducted away or the area can be ventilated.

Protecting the public

- Fence off all excavations in public places to prevent pedestrians and vehicles falling into them.
- Where people might get onto a site out of hours, take precautions (eg backfilling or securely covering excavations) to reduce the chance of them being injured.

Supervision

- A competent person must supervise the installation, alteration or removal of excavation support.
- People working in excavations should be given clear instructions on how to work safely.

Inspecting excavations

- A competent person must inspect excavations:
 - At the start of each shift before work begins;
 - After any event likely to have affected the strength or stability of the excavation; and;
 - After any accidental fall of rock, earth or other material.
- A written report should be made after most inspections. Stop work if the

Inspection shows the excavation to be unsafe.

Scaffolding

Introduction:

Falls from a height continue to be the biggest killer on construction sites. This information sheet provides advice for users of ladders and access scaffolds. It will also help those who select and specify equipment.

Work at height should be carried out from a platform with suitable edge protection. Occasionally this may not be possible and a ladder may have to be used. However, ladders are best used as a means of getting to a workplace and should only be used as a workplace for light work of short duration.

Selecting equipment:

When deciding what equipment to use think about what the job includes, how long it will last and where it needs to be done. It is tempting to use a ladder for all sorts of work but you should always consider a working platform first, for example, a properly erected mobile scaffold tower or a mobile elevated working platform (MEWP).

Jobs such as removing or installing guttering, installing replacement windows, painting or demolition work should usually be carried out from scaffolds or mobile access equipment.

Scaffold erection

- A scaffold should be designed, erected, altered and dismantled by competent people, with all scaffolding work under the supervision of a 'competent person'.
- Scaffolders should always adopt a safe system of work during the erection, altering and dismantling of scaffolds. This will usually include the use of fall arrest equipment.
- All scaffolds require bracing to help prevent them from collapsing. The platform of a general purpose scaffold should be at least four boards wide. All scaffolds, including 'independent' scaffolds, should be securely tied, or otherwise supported. More ties will be required if:
 - The scaffold is sheeted or netted due to the increased wind loading;
 - It is used as a loading platform for materials or equipment; or
 - Hoists, lifting appliances or rubbish chutes are attached to it.
- System scaffolds should be erected following the manufacturer's instructions and may require more tying than independent scaffolds.

Safe use of scaffolds

- Do not take up boards, move handrails or remove ties to gain access for work.
- Changes should only be made by a competent scaffolder.
- Never work from platforms that are not fully boarded.
- Do not overload scaffolds. Make sure they are designed to take the loads put on them. Store materials so the load is spread evenly.
- Make sure there is suitable stair and ladder access onto the working platform.

Ladders

- Ladders should be in good condition and examined regularly for defects. You should have a management system in place to ensure that this is done. They should be secured so they cannot slip, usually by tying them at the top.
- The ladder should be angled to minimise the risk of slipping outwards and as a rule of thumb needs to be 'one out for every four up'.
- Access ladders should extend about 1 m above the working platform. This provides a handhold for people getting on and off.
- Do not overreach: if you are working from a ladder, make sure it is long enough and positioned to reach the work safely.
- Do not climb or work off a ladder unless you can hold onto it. Protecting the public:
 - Contact the appropriate highway authority before erecting a scaffold on a public highway or on any roads, pavements, paths or routes used by the public.
 - Ensure the scaffold is designed to carry the load from stored materials and equipment.
 - Scaffolds should be designed to prevent materials falling. You may need to provide brick guards, netting or sheeting. Where the risk is high, or for example during demolition or facade cleaning, you should provide extra protection in the form of scaffold fans or covered walkways.
 - Erecting and dismantling scaffolds should preferably be undertaken during off times. People should be prevented, with suitable barriers and signs, from walking under the scaffold during erection or dismantling.
 - Stop unauthorised access onto the scaffold, for example by removing all ladders at ground level, whenever it is left unattended.
 - Never 'bomb' materials from a scaffold. Use mechanical hoists or rubbish hutes to move materials and waste.

Scaffold inspection

Scaffolds must be inspected by a competent person:

- before first use;
- after substantial alteration;
- after any event likely to have affected their stability, for example, following strong winds; and
- at regular intervals not exceeding seven days.

Any faults found must be put right before contractors allow their workers to use someone else's scaffold they must make sure it is safe.

The reports which have to be made following certain inspections. Those in control of workplaces should ensure inspections are carried out by a competent person.

All employers and people in control of construction work should make sure that places of work are safe before they allow their workers to use them for the first time.

Stop work if the inspection shows it is not safe to continue.

Reports

The competent person must complete the inspection report before the end of the working period and provide the report or a copy to the person for whom the inspection was carried out, within 24 hours.

Reports must be kept on site until the work is complete. Reports should then be kept for three months at an office of the person for whom the inspections were carried out.

A report is only needed for a tower scaffold if it stays in the same place for seven days or more and where an inspection of a working platform or any personal suspension equipment is carried out before being used for the first time;

or –

after any substantial addition, dismantling or other alteration;

Only one report is needed for any 24-hour period; where an inspection of an excavation is carried out and only one written report is needed in any seven day period unless something happens to affect its strength or stability.

Your record must include the following information:

- Name and address of person on whose behalf the inspection was carried out;
- Location of the workplace inspected;
- Description of workplace or part of workplace
- Inspected (including any plant and equipment and materials, if any);
- Date and time of inspection;
- Details of any matter identified that could lead to a risk to the health and safety of anyone;
- Details of any action taken as a result of any matter identified in the last point;
- Details of any more action considered necessary; and
- The name and position of the person making the report.

Cement

Introduction

Cement is widely used in construction. Anyone who uses cement (or anything containing cement, such as mortar, plaster and concrete) or is responsible for managing its use should be aware that it presents a hazard to health.

Health effects

Cement can cause ill health mainly by skin contact, inhalation of dust; and manual handling.

Skin contact

Contact with wet cement can cause both dermatitis and burns.

Dermatitis

Skin affected by dermatitis feels itchy and sore, and looks red, scaly and cracked. Cement is capable of causing dermatitis by two mechanisms - irritancy and allergy.

Irritant dermatitis is caused by the physical properties of cement that irritate the skin mechanically. The fine particles of cement, often mixed with sand or other aggregates to make mortar or concrete, can abrade the skin and cause irritation resulting in dermatitis. With treatment, irritant dermatitis will usually clear up. But if exposure continues over a longer period the condition will get worse and the individual is then more susceptible to allergic dermatitis.

Allergic dermatitis is caused by sensitisation to the hexavalent chromium chromate) present in cement. The way this works is quite distinct from that of irritancy. Sensitisers penetrate the barrier layer of the skin and cause an allergic reaction. Hexavalent chromium is known to be the most common cause of allergic dermatitis in men.

Research has shown that between 5% and 10% of construction workers may be sensitised to cement and that plasterers, concreters and bricklayers are particularly at risk. Once someone has become sensitised to hexavalent chromium, any future exposure may trigger dermatitis.

Some skilled tradesmen have been forced to change their trade because of this. The longer the duration of skin contact with a sensitiser, the more it will penetrate the skin, and the greater the risk of sensitisation will become.

Therefore, if cement is left on the skin throughout the working day, rather than being washed off at intervals, the risk of contact sensitisation to hexavalent chromium will be increased. Both irritant and allergic dermatitis can affect a person at the same time.

Cement burns

Wet cement can cause burns. The principal cause is thought to be the alkalinity of the wet cement. If wet cement becomes trapped against the skin, for example by kneeling in it or if cement falls into a boot or glove, a serious burn or ulcer can rapidly develop. These often take months to heal, and in extreme cases will need skin grafts or can even lead to amputation. Serious chemical burns to the eyes can also be caused following a splash of cement.

Inhalation of dust

High levels of dust can be produced when cement is handled, for example when emptying or disposing of bags. In the short term, exposure to high levels of cement dust irritates the nose and throat. Scabbling or concrete cutting can also produce high levels of dust which may contain silica.

Manual handling

Working with cement also poses risks such as sprains and strains, particularly to the back, arms and shoulders from lifting and carrying cement bags, mixing mortar etc. More serious damage to the back can be caused in the long term if workers are continually lifting heavy weights.

Health prevention and health surveillance

Skin contact

You should first consider using elimination or substitution to prevent the possibility of contact with cement. Otherwise, you should apply control measures which minimise contact with the skin either directly or indirectly from contaminated surfaces in the working environment.

An important way of controlling cement dermatitis is by washing the skin with warm water and soap, or other skin cleanser, and drying the skin afterwards. Sinks should be large enough to wash the forearms and have both hot and cold (or warm) running water. Soap and towels should be provided. Facilities for drying clothes and changing clothes should also be available.

Gloves may help to protect skin from cement, but they may not be suitable for all aspects of construction site work. Caution is advised when using gloves as cement trapped against the skin inside the glove can cause a cement burn. You should provide protective clothing, including overalls with long sleeves and long trousers. Employers are required to arrange for employees to receive suitable health surveillance where there is exposure to a substance known to be associated with skin disease and where there is a reasonable likelihood that the disease may occur. This means you should provide health surveillance for workers who will be working with wet cement on a regular basis.

Health surveillance is needed to protect individuals and identify as early as possible any indicators of skin changes related to exposure, so that steps can be taken to treat their condition and to advise them about the future and give early warning of lapses in control.

Health surveillance must never be regarded as reducing the need to control exposure or to wash cement off the skin.

Simple health surveillance will usually be sufficient. Skin inspections should be done at regular intervals by a competent person, and the results recorded. Employers will probably need the help of an occupational health nurse or doctor to devise a suitable health surveillance regime and they will need to train a 'responsible person', for instance a supervisor, to carry out the skin inspections.

A responsible person is someone appointed by the employer who, following instruction from an occupational health physician or nurse, is competent to recognise the signs and symptoms of cement-related dermatitis. The responsible person should report an findings to the employer, and will need refer cases to a suitably qualified person (eg an occupational health nurse).

Inhalation of dust

Exposure to dust should be eliminated where possible, for example, by purchasing ready mixed concrete. Where this is not possible, the risk should be assessed and appropriate control measures implemented.

Manual handling

Manual handling of heavy loads should be avoided. In particular, cement should be supplied in 25 kg bags or ordered in bulk supply. Where manual handling does take place, you should assess the risks and adopt appropriate risk control measures.

Chapter 3

Essential checklist for most commonly hazards at Construction sites

General Safety Guidelines:

When we employ or control people doing work for us, directly or thru a contract, we must ensure that:

- Workers & Supervisors should use the safety helmet and other requisite Personal Protective Equipment according to job & site requirement. They should be trained to use personal protective equipment.
- Ensure the usage of correct and tested tools and tackles. Don't allow the make shift tools and tackles.
- No loose clothing should be allowed while working near rotating equipment or working at heights.
- Ensure that workers are trained and competent to do the job safely and without putting their health at risk.
- Ensure that workers are informed about the work before they start and they are given clear instructions by supervisors.
- Ensure that workers have the right tools, equipment, plant and protective clothing.
- Areas which are likely to pose danger to workers are clearly indicated.
- Check the health and past safety performance of the people we plan to use.
- Give them the health and safety information they need for the work.
- Ensure that workers have access to washing and toilet facilities.
- Make sure that you have provided everything you agreed e.g. safe scaffolds, the right plant, access to welfare, etc.

Essential Checklist:

The following will provide an essential checklist of some of the most common hazards which are found at construction sites.

The questionnaire will help to decide whether the site is a safe and healthy place to work. Please note that this is not a full list.

1. Housekeeping

- Ensure proper storage of materials & equipment at work place and removal of scrap, inflammable material, waste and debris etc. from site at appropriate intervals to ensure proper house keeping.
- Loose materials, which are not required for use, to be removed from work place.
- Workplaces and passageways, that are slippery owing to oil, grease or other causes, should be cleaned up or strewn with sand, sawdust, ash etc.

2. Excavation

- All excavation work should be planned and the method of excavation and the type of support work required should be decided considering the stability of the ground and ensuring that the excavation will not affect adjoining buildings, structures or roadways.
- Sites of excavations should be thoroughly inspected on daily basis, prior to each shift and after interruption in work of more than one day, after every blasting operation, after an unexpected fall of ground, after substantial damage to supports, after a heavy rain, frost or snow, and boulder formations are encountered.
- Safe angle of repose while excavating trenches, based on site conditions, to be provided of excavation in all soils except hard rock or provide proper shoring and strutting to prevent cave-in or slides.
- As far as possible, excavated earth should not be placed within one meter of the edge of the trench or depth of trench whichever is greater.
- Don't allow vehicles to operate too close to excavated area. Maintain proper distance from edge of excavation. No load, plant or equipment should be placed or moved near the edge of any excavation where it is likely to cause its collapse and thereby endanger any person unless precautions such as the provision of shoring or piling are taken to prevent the sides from collapsing.
- If any excavation is likely to affect the stability of a structure on which persons are working, precautions should be taken to protect the structure from collapse.
- Necessary precautions should be taken for underground utility lines like cables, sewers etc. and necessary approvals/clearances from the concerned authorities shall be obtained before commencement of the excavation job.
- During rains, the soil becomes loose. Take additional precaution against collapse of side wall.
- In case of mechanised excavation, precaution shall be taken to not to allow anybody to come near the extreme reach of the mechanical shovel. The mechanised excavator shall be operated by a well-trained experienced operator. The excavator should be kept on firm leveled ground with mechanical shovel resting on ground, when not in use. Suitable precautions should also be taken for dozers, graders and other heavy machines, as per manufacturer guidelines

3. Scaffolding

- Every scaffold should be constructed, erected and maintained so as to prevent collapse or accidental displacement when in use. • All scaffolds should be provided with safe means of access, such as stairs, ladders or ramps. Ladders should be secured against inadvertent movement.
- Boards and planks used for scaffolds should be protected against splitting. Materials used in the construction of scaffolds should be stored under good conditions and apart from any material unsuitable for scaffolds.

- Scaffolds should be inspected and certified before being taken into use, at periodic intervals thereafter as prescribed for different types of scaffolds and after any alteration, interruption in use, exposure to weather or seismic conditions or any other occurrence likely to have affected their strength or stability.
- Every scaffold should be maintained in good and proper condition, and every part should be kept fixed or secured so that no part can be displaced in consequence of normal use.
- Double guard rails and toe boards, or other suitable protection should be provided at every edge to prevent falling.
- Additional brick guards should be provided to prevent materials falling from scaffolds.
- Effective barriers or warning notices should be kept in place to stop people using an incomplete scaffold, e.g. where working platforms are not fully boarded.

4. Reinforcement

- Ensure that workers use Personnel Protective equipment like safety helmet, safety shoes, gloves etc.
- Ensure proper safety procedures/precautions to carry out welding/cutting of reinforcement steel rods.
- For supplying of rods at heights, proper staging and/or bundling to be provided.
- Ensure barricading and staging for supplying and fixing of rods at height.
- For short distance carrying of materials on shoulders, suitable pads to be provided.

5. Concreting

- Ensure stability of shuttering work before allowing concreting.
- Barricade the concreting area while pouring at height/depths.
- Keep vibrator hoses, pumping concrete accessories in healthy conditions and mechanically locked.
- Pipelines in concrete pumping system shall not be attached to temporary structures such as scaffolds and formwork support as the forces and movements may affect their integrity.
- Check safety cages & guards around moving motors/parts etc. provided in concreting mixers.
- Use Personal Protective Equipment like gloves, safety shoes etc. while dealing with concrete and wear respirators for dealing with cement.
- Earthing of electrical mixers, vibrators, etc. should be done and verified.
- Cleaning of rotating drums of concrete mixers shall be done from outside. Lockout devices shall be provided where workers need to enter.
- Where concrete mixers are driven by internal combustion engine, exhaust points shall be located away from the worker's workstation so as to eliminate their exposure to obnoxious fumes.
- Ensure adequate lighting arrangements for carrying out concrete work during night.
- Don't allow the workers to work on concrete job for more than 12 hours. Insist on shift pattern.
- During concrete pouring, shuttering and its supports should be continuously watched for defects.

6. Road work

- Site shall be barricaded and provided with warning signs, including night warning lamps at appropriate locations for traffic diversion, if any.
- Filled and empty bitumen drums shall be stacked separately at designated places.
- Mixing aggregate with bitumen shall preferably be done with the help of bitumen batch mixing plant, unless operationally non-feasible.
- Workers handling hot bitumen sprayers or spreading bitumen aggregate mix or mixing bitumen with aggregate, shall be provided with PVC hand gloves and rubber shoes with legging up to knee joints.
- If bitumen accidentally falls on ground, it shall be immediately covered by sprinkling sand, to prevent anybody stepping on it. Then it shall be removed with the help of spade.
- For cement concrete roads, besides site barricading and installation of warning signs for traffic diversion, safe practices mentioned in the chapter on "Concreting", shall also be applicable.

7. Cutting / Welding

Common hazards involved in welding/cutting are sparks, molten metal, flying particles, harmful light rays, electric shocks etc. Following precautions should be taken while doing job of cutting and welding:

- Ensure that only approved and well-maintained apparatus, such as torches, manifolds, regulators or pressure reducing valves, and acetylene generators, be used.
- The welding receptacles shall be rated for 63 A suitable for 415V, 3-Phase system with a scraping earth. Receptacles shall have necessary mechanical interlocks and earthing facilities.
- All covers and panels shall be kept in place, when operating an electric Arc welding machine.
 - All cables, including welding and ground cables, shall be checked for any worn out or cracked insulation before starting the job. Ground cable should be separate without any loose joints.
 - All gas cylinders shall be properly secured in upright position.
 - Acetylene cylinder shall be turned and kept in such a way that the valve outlet points away from oxygen cylinder.
 - Acetylene cylinder key for opening valve shall be kept on valve stem, while cylinder is in use, so that the acetylene cylinder could be quickly turned off in case of emergency. Use flash back arrestors to prevent backfire in acetylene/oxygen cylinder.
 - When not in use, valves of all cylinders shall be kept closed. All types of cylinders, whether full or empty, shall be stored at cool, dry place under shed.
 - Store acetylene and oxygen cylinders separately.
 - Ensure that hoses are free from burns, cuts and cracks and properly clamped.
 - During cutting/welding, use proper type goggles/face shields and fire extinguishers.

8. Ladders

- Ensure that ladders are in good condition and rest against a solid surface and not on fragile or insecure materials.
- Ensure that ladders are secured to prevent them slipping sideways or outwards.

- Ensure that ladders rise a sufficient height above their landing place? If not, make sure that other hand-holds available.
- Ensure that the ladders are properly positioned so that users don't have to over-stretch.
- On average approx. 24 % of total construction accidents 24 % accounts towards falls and a third of those who died were painters and decorators. A construction worker was killed when he fell from an unsecured ladder while trying to climb onto a flat garage roof.

9. Roof work

- During industrial roofing work ensure that nets have been provided to stop people falling from the leading edge of the roof and from partially fixed sheets.
- When work is being carried out on sloping roofs, sufficient and suitable crawling boards or roof ladders should be provided and firmly secured in position.
- During extensive work on the roof, strong barriers or guardrails and toe-boards should be provided to stop a person from falling off the roof.
- Where workers are required to work on or near roofs or other places covered with fragile material, through which they are liable to fall, they should be provided with suitable roof ladders or crawling boards strong enough and when spanning across the supports for the roof covering to support those workers.
- A minimum of two boards should be provided so that it is not necessary for a person to stand on a fragile roof to move a board or a ladder, or for any other reason.
- Ensure that people are kept away from the area below the roof work.
- Over 50% of fatal injuries to roofers are falls through fragile materials and over 30% are falls from edges and openings. A roofer was killed when he fell through an unprotected fragile roof light while stripping and re-sheeting an industrial pitched

10. Manual Handling

- If there are heavy materials such as roof trusses, concrete lintels, kerb stones or bagged products which could cause problems if they have to be moved by hand, ensure to use wheelbarrows, hoists, telehandlers, and other plant or equipment so that manual lifting of heavy objects is kept to a minimum.
- Avoid the repetitive laying of heavy building blocks weighing more than 20 kg and train people on how to lift safely.

11. Demolition

- Structural details and builders' drawings should be obtained wherever possible, before demolition operations begin and the work should be planned and undertaken only under the supervision of a competent person.
- Details of the previous use should be obtained to identify any possible contamination and hazards from chemicals, flammables, etc.
- Necessary precautions, methods and procedures should be adopted, including those for the disposal of waste or residues, when the demolition of any building or structure may pose danger to workers or to the public.
- Any structural problems and risks associated with flammable substances and substances hazardous to health to be identified and a method of demolition should be formulated after the survey and recorded in a method statement having taken all

the various considerations into account and identifying the problems and their solutions;

- As far as practicable, the danger zone round the building should be adequately fenced off and sign posted. To protect the public a fence should be erected enclosing the demolition operations and the access gates should be secured outside working hours.
- Where plant has contained flammable materials, special precautions should be taken to avoid fire and explosion.
- The plant to be demolished should be isolated from all other plant that may contain flammable materials. Any residual flammable material in the plant should be rendered safe by cleaning, purging or the application of an inert atmosphere as appropriate.
- Care should be taken not to demolish any parts, which would destroy the stability of other parts.
- Structures should not be left in a condition in which they could be brought down by wind pressure or vibration.
- When equipment such as power shovels and bulldozers are used for demolition, due consideration should be given to the nature of the building or structure, its dimensions, as well as to the power of the equipment being used.
- All precautions should be taken to prevent danger from any sudden twist, spring or collapse of steelwork, ironwork or reinforced concrete when it is cut or released.

12. Traffic, Vehicles and Plant

- An experienced ground worker was crushed and killed by a slewing 360 excavator as it moved into position. He tried to pass between the machine and a trench box.
- A person was struck and killed by a van reversing at a road works site. The turning area in the site was blocked by parked cars and the driver reversed without assistance.
- Ensure that vehicles and plant are properly maintained, e.g. steering, lights, handbrake and footbrake are working properly.
- Ensure that drivers have received proper training and they are competent for the vehicles or plant they are operating.
- All loads should be properly secured and also make sure that plant and vehicles are not used on dangerous slopes.

13. Tools and Machinery

- Ensure that the right tools or machinery are being used for the job and all dangerous parts are guarded, e.g. gears, chain drives, projecting engine shafts.
- All tools and machinery should be maintained in good condition and all safety devices to be ensure for operating correctly.

14. Emergencies

- Ensure that workers at site are aware of the procedures for evacuating the site in case of any emergency at work place.
- Nos. of contacting the emergency services shall be displayed at site?
- Provision of first aid shall be ensure at site.

15. Hazardous substances

- All harmful substances and materials, such as asbestos, lead, solvents, paints, cement and dust should be identified at work place.
- Workers should the information and training so they know what the risks are from the hazardous substances used and produced on site, and what they need to do to avoid those risks.
- Health surveillance for people using certain hazardous substances (eg lead) should be arranged.

16. Noise

- Workers should have information and training so they know what the risks are from noise on site, and what they need to do to avoid those risks.
- Suitable hearing protection should be provided and worn in noisy areas.
- Health surveillance for people exposed to high levels of noise should be arranged.

17. Hand –Arm Vibration

- Workers should have information and training so they know what the risks are from hand-arm vibration (HAV) on site, and what they need to do to avoid those risks.
- Risks to workers from prolonged use of vibrating tools such as concrete breakers, angle grinders or hammer drills should be identified and assessed.
- Health surveillance for people exposed to high levels of hand-arm vibration, especially when exposed for long periods should be arranged.

18. Electricity and other services

- All tools and equipment should be checked by users, visually examined on site and regularly inspected and tested by a competent person.
- All necessary services should be provided at work place before work begins and existing services present on site shall be identified (e.g. electric cables or gas mains) and effective steps should be taken to prevent any danger from them, if necessary.
- Low voltage tools and equipment should be used for work.

19. Welfare:

- Ensure the availability of toilets and that are they kept clean & properly lit.
- Place to change, dry and store clothing should be arranged near work place for workers.
- Drinking water facility should be provided for the workers at work place.
- A place shall be identified where workers can sit and take rest during their recess hours.

Chapter 4 Golden rules to reduce risk at site

Construction is a high-risk activity. This chapter covers the '5 Golden rules' that will help you keep safe and healthy.

Remember to:

- Plan and organize what you do

- Make sure you're trained and competent and know the special risks in your trade
- Raise problems with your supervisor or safety representative.

Rule # 1: THE BASICS

Tidy sites and decent welfare

Tidy sites and decent welfare are the basics of a good site. Slips and trips are the most common cause of injuries at work.

An untidy site is a poorly managed site.

All sites need decent welfare facilities. The minimum welfare requirements are:

- Clean toilets
- Running hot and cold water with soap and towels
- Basins large enough to immerse your arms up to the elbows
- Drinking water
- Some where warm, dry and clean to sit and eat

Poor welfare facilities can lead to ill health

Rule # 2: PROTECTION TO AVOID FALLS FROM HEIGHT

Falls from height are the biggest cause of fatal and serious injuries in construction. They account for 50% of all deaths. Many accidents involve falls from roofs, through fragile materials, from ladders and from leading edges.

Generally, make sure you:

- Work from a safe and secure place or platform with proper edge protection
- Use scaffolds and scaffold towers that are competently erected
- Use powered access equipment safely
- Protect holes and leading edges, e.g. with guardrails and toe boards

When working on roofs never:

- Work in poor weather
- Work on sloping roofs without edge protection
- Throw down waste or equipment

Take care when working on or near fragile material - you can fall through as well as off it.

Ladders:

.Only use ladders for light work of short duration if there's no safer alternative .Angle and secure them to prevent slipping (1 out for 4up) .Always make sure ladders are properly maintained

Never over-reach

Rule # 3: PROPER MANUAL HANDLING

Manual handling injuries from working with heavy, awkward materials, often in wet conditions, are one of the most common reasons why workers leave construction. Injuries are made worse by repetitive jobs, such as laying heavy blocks.

- Use mechanical means, e.g. hoists, teleporters and chutes
- Choose equipment suitable for the job and keep it maintained
- Change to lighter materials, bags etc.
- Avoid repetitive handling
- Avoid awkward movements

Protect yourself and reduce the strain

Rule # 4: PROPER TRANSPORT ARRANGEMENTS

Workplace transport incidents are the second most common cause of fatalities after falls from height.

- Use barriers and warning signs to separate vehicles and people
- Create clearance around slewing vehicles
- Avoid reversing – where you can't, use trained banks men
- Make sure loads are secure
- Don't use plant and vehicles on dangerous slopes
- Only take passengers on vehicles designed to take them
- Make sure vehicles are maintained and operators are trained

When people and vehicles collide, people come off worse - so keep them apart!

Rule # 5: PRECUATION WHILE WORKING ON ASBESTOS

If you're thinking of working in a building that was built or renovated up until the 1980s, you should assume it contains asbestos until proved otherwise.

The main asbestos-containing materials (ACMs) are lagging, asbestos insulating board, sprayed insulation, decorative coatings and asbestos cement.

- Check if there is any ACM
- Find out what you need to do to work safely

If in any doubt, leave it to the experts!

Chapter 5

HSE Passport - A Good practice guide

This chapter on good practice guide describes that what a HSE Passport scheme is and also answers to some basic information about it and gives advice on good practice including a suggested core syllabus.

HSE Passport scheme ensure that workers have basic health and safety awareness training and are a way of improving health and safety performance. They also help promote good practice and can help reduce accidents and ill health caused by work. They are especially useful for workers and contractors who work in more than one industry or firm.

What are health, safety and environment Passports?

- HSE Passport shows that a worker has up-to-date basic health and safety or health, safety and environment awareness training. Some cover other subjects too.
- HSE Passports are a way of controlling access to work sites – only workers with valid Passports are allowed to work.
- They shall be of credit card size and made of strong plastic with a photograph and signature.
- Workers can hold more than one HSE Passport if they have been trained for work in more than one industry.
- They are a very simple way for workers who move from one industry to another, or work in more than one industry, to show employers they have basic training.
- A HSE Passport belongs to the worker not the employer.
- Some Certification Schemes operate like Passports.
- HSE Passport is a starting point for workers training for health, safety and environment qualifications.

What should HSE Passport training cover?

A HSE Passport holder should know about:

- The hazards and risks they may face;

The hazards or risks they can cause for other people;

- .. How to identify relevant hazards and potential risks;
- .. How to assess what to do to eliminate the hazard and control the risk;
- .. How to take steps to control the risk to themselves and others;
- .. Their safety and environmental responsibilities, and those of the people

they work with;

- .. Where to find any extra information they need to do their job safely; and
- .. How to follow a safe system of work.

How HSE Passport scheme will work?

An industry or group of companies decide they want a way of ensuring that their employees and any suppliers, contractors, self-employed or agency workers they use have basic health, safety and environment training.

They need to decide or consider that :

- .. What training is needed for workers;
- .. Qualifications and resources needed by trainers;
- .. How training will be delivered and assessed;
- .. How long a Passport will be valid for;
- .. Need for refresher training before renewal; and
- .. How records will be kept and checked.
- .. A training scheme is developed, piloted and fine-tuned.
- .. Courses are offered to workers. It is important to check that training has been successful, so workers must pass a test or an assessment must be made before a HSE Passport is issued.

Once the scheme starts, the industry or group of companies will not allow workers on their sites unless they hold an up-to-date and valid HSE Passport.

Large firms often have their own 'approved' list of contractors. To join this list, contractors may have to demonstrate their health, safety and environmental performance. Having workers with Passports is one way to do this.

HSE Passports shall not be :

- .. A way of knowing or identifying that a worker is competent;
- .. A substitute for risk assessment;
- .. A way of showing 'approval' of a contractor;
- .. A reason to ignore giving site-specific information; or
- .. A substitute for effective on-site management.

Benefits and advantages of Passport schemes

- .. They can help reduce accidents and ill health caused by work.
- .. They can have a significant impact in reducing pollution incidents, minimising waste and contributing to a cleaner environment for everyone.

- .. Passports save both time and money because workers need less induction training.
- .. They show a company's commitment to having safe and healthy workers.
- .. Companies know that workers have been trained to a common, recognised and validated standard.
- .. They help to promote good practice in the supply chain between contractors and companies.
- .. Insurance and liability premiums may be reduced if a company can show that all workers have basic health, safety and environment training.
- .. Workers are more employable as they have basic training.

Can a Passport be withdrawn?

Passports are not a way of showing a worker is competent – they only show that a worker has basic training, so if a worker is found doing something wrong, the Passport is unlikely to be withdrawn. But, for example, a Passport would be withdrawn if it was found to have false information or was being misused.

Training arrangements

The length of training depends on how much needs to be covered. In some schemes half a day may be enough but other courses take longer. Some courses mix the core syllabus with training for the hazards in a specific industry and others separate the two. It is usual for supervisors to have extra training. All courses end with some form of assessment. This can be a multiple-choice questionnaire, a written test or one which involves a computer. In some schemes training is provided by external trainers and in others it is done in-house.

Refresher training

Passports shall be normally valid for a period of three years. It is usual for a worker to be given refresher training before a Passport is re-validated.

Recognition between different schemes

HSE is encouraging organisations to work together so that one scheme recognises the core training of other schemes. This means that Passport holders do not have to repeat the core syllabus if they move from one employer or contract to another, they will simply need site specific training. If they stay in the same industry they may not need to have further sector specific training. By producing a suggested core syllabus, HSE and the Environment Agencies hope to encourage more mutual recognition. In some schemes arrangements have been made to recognise any Passport which meets 80% of the suggested core syllabus and which has been issued within the last two years.

Monitoring

It is important that contractors' supervisors monitor Passport holders on a day-to-day basis by:

- .. Asking people about their work;
- .. Checking whether people are following procedures; and
- .. Observing their work.

Any site-based checking system needs to be easy for supervisors to use, for example, one which uses cards should include photographs and signatures. The standard of training provided also needs to be monitored by clients but most organisations running Passport schemes have quality assurance arrangements.

Core syllabus

Passport schemes should ideally have a common core syllabus, so that :
Passport holders won't have to repeat core training if they move from one employer or contract to another; and Duplicated effort and cost are reduced.

Effective HSE Passport training schemes would be expected to cover elements of the core syllabus below.

Health and Safety core syllabus

- Introduction to Passports and their purpose
- Overview of key health and safety issues
- Responsibilities and lines of communication of employers, contractors and individuals
- Overview of risk assessment
- The role of safety representatives and health and safety inspectors
- The workplace: Safe access and exits safety signs
- Temperature, lighting, housekeeping and welfare facilities
- Slips, trips and falls
- Reporting failures and defects
- Working at heights and falls from heights
- Plant and machinery
- Electricity
- Workplace transport
- Health
- Personal protective equipment
- Controlling harmful substances

- Manual handling
- Health surveillance or monitoring (if appropriate)
- Safe systems of work, including permit to work systems
- Emergency procedures
- Fire safety & First aid

- Reporting accidents and incidents
- Environment core syllabus
- Responsibilities of employers and employees
 - Environmental concerns in the workplace
 - Causes of on and off site pollution
 - How to prevent pollution
 - Emergencies
 - Emergency planning
 - Emergency procedures including the use of oil absorbents
 - Waste Management regulations
 - Waste segregation and minimisation
 - Safe and secure storage

Chapter -6

THE BUILDING AND OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996

SAFETY AND HEALTH MEASURES

38. Safety Committee and safety officers.-

(1) In every establishment wherein five hundred or more building workers are ordinarily employed, the employer shall constitute a Safety Committee consisting of such number of representatives of the employer and the building workers as may be prescribed by the State Government:

Provided that the number of persons representing the workers, shall, in no case, be less than the persons representing the employer.

(2) In every establishment referred to in sub-section (1), the employer shall also appoint a safety officer who shall possess such qualifications and perform such duties as may be prescribed.

39. Notice of certain accidents.-

(1) Where in any establishment an accident occurs which causes death or which causes any bodily injury by reason of which the person injured is prevented from working for a period of forty-eight hours or more immediately following the accident, or which is of such a nature as may be prescribed, the employer shall give notice thereof to such authority, in such form and within such time as may be prescribed.

(2) On receipt of a notice under sub-section (1) the authority referred to in that sub-section may make such investigation or inquiry as it considers necessary.

(3) Where a notice given under sub-section (1) relates to an accident causing death of five or more persons, the authority shall make an inquiry into such

accident within one month of the receipt of the notice.

40. Power of appropriate Government to make rules for the safety and health of building workers.-

(1) The appropriate Government may, by notification, make rules regarding the measures to be taken for the safety and health of building workers in the course of their employment and the equipment and appliances necessary to be provided to them for ensuring their safety, health and protection, during such employment.

(2) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters namely:

(a) the safe means of access to, and the safety of, any working place, including the provision of suitable and sufficient scaffolding at various stages when work cannot be safely done from the ground or from any part of a building or from a ladder or such other means of support;

(b) the precautions to be taken in connection with the demolition of the whole or any substantial part of a building or other structure under the supervision of a competent person and the avoidance of danger from collapse of any building or other structure while removing any part of the framed building or other structure by shoring by otherwise;

(c) the handling or use of explosive under the control of competent persons so that there is no exposure to the risk of injury from explosion or from flying material;

(d) the erection, installation, use and maintenance of transporting equipment, such as locomotives, trucks, wagons and other vehicles and trailers and appointment of competent persons to drive or operate such equipment;

(e) the erection, installation, use and maintenance of hoists, lifting appliances and lifting gear including periodical testing and examination and heat treatment, where necessary, precautions to be taken while raising or lowering loads restrictions on carriage of persons and appointment of competent persons on hoists or other lifting appliances;

(f) the adequate and suitable lighting of every workplace and approach thereto, of every place where raising or lowering operations with the use of hoists, lifting appliances or lifting gears are in progress and of all openings dangerous to building workers employed;

(g) the precautions to be taken to prevent inhalation of dust, fumes, gases or vapours during any grinding, cleaning, spraying or manipulation of any material and steps to be taken to secure and maintain adequate ventilation of every working place or confined space;

- (h) the measures to be taken during stacking or unstacking, stowing or unstowing of materials or goods or handling in connection therewith;
- (i) the safeguarding of machinery including the fencing of every fly-wheel and every moving part of a prime mover and every part of transmission or other machinery, unless it is such a position or of such construction as to be safe to every worker working on any of the operations and as if it were securely fenced;
- (j) the safe handling and use of plant, including tools and equipment operated by compressed air;
- (k) the precaution to be taken in case of fire;
- (l) the limits of weight to be lifted or moved by workers;
- (m) the safe transport of workers to or from any workplace by water and provision of means for rescue from drowning;
- (n) the steps to be taken to prevent danger to workers from live electric wires or apparatus including electrical machinery and tools and from overhead wires;
- (o) the keeping of safety nets, safety sheets and safety belts where the special nature or the circumstances of work render them necessary for the safety of the workers;
- (p) the standards to be complied with regard to scaffolding, ladders and stairs, lifting appliances, ropes, chains and accessories, earth moving equipments and floating operational equipments;
- (q) the precautions to be taken with regard to pile driving, concrete work, work with hot asphalt, tar or other similar things, insulation work, demolition operations, excavation, underground construction and handling materials;
- (r) the safety policy, that is to say, a policy relating to steps to be taken to ensure the safety and health of the building workers, the administrative arrangements therefor and the matters connected therewith, to be framed by the employers and contractors for the operations to be carried on in a building or other construction work;
- (s) the information to be furnished to the Bureau of Indian Standards established under the Bureau of Indian Standards Act, 1986 (63 of 1986), regarding the use of any article or process covered under that Act in a building or other construction work;
- (t) the provision and maintenance of medical facilities for building workers;
- (u) any other matter concerning the safety and health of workers working in any
- (v) of the operations being carried on in a building or other construction work.

41. Framing of model rules for safety measures .-

The Central Government may, after considering the recommendation of the expert committee constituted under section 5, frame model rules in respect of all or any of the matters specified in section 40 and where any such model rules have been framed in respect of any such matter, the appropriate Government shall, while making any rules in respect of that matter under section 40, so far as is practicable, conform to such model rules.

2. THE BUILDING AND OTHER CONSTRUCTION WORKER'S (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) CENTRAL RULES, 1998.

GENERAL PROVISIONS

34. Excessive noise, vibration, etc.- An employer shall ensure at a construction site of a building or other construction work that adequate measures are taken to protect building workers against the harmful effects of excessive noise or vibration at such construction site and the noise level in no case exceeds the limits laid down in Schedule VI annexed to these rules.

35. Fire protection.- An employer shall ensure at a construction site of a building or other construction work that,-

(a) such construction site is provided with
 (i) fire extinguishing equipment sufficient to extinguish any probable fire at such construction site;
 (ii) an adequate water supply at ample pressure as per national standards;
 (iii) number of trained persons required to operate the fire extinguishing equipment provided under sub-clause (i);

(b) fire extinguishing equipment provided under sub-clause (i) of clause (a) is properly maintained and inspected at regular intervals of not less than once in a year by the responsible person and a record of such inspections is maintained;

(c) in case of every launch or boat or other craft used for transport of building workers and the cabin of every lifting appliance including mobile crane adequate number of portable fire extinguishing equipment of suitable type shall be provided at each of such launch or boat or craft or lifting appliance.

36. Emergency action plans.-

An employer shall ensure at a construction site of a building or other construction work that in case more than five hundred building workers are employed at such construction site emergency action plan to handle the emergencies like-

- (a) fire and explosion,
- (b) collapse of lifting appliances and transport equipment,
- (c) collapse of building, sheds or structures etc.,
- (d) gas leakage or spillage of dangerous goods or chemicals,

- (e) drowning of building workers, sinking of vessels, and
- (f) land slides getting building worker buried, floods, storms and other nature calamities, is prepared and submitted for the approval of the Director General.

37. Fencing of motors, etc.-

An employer shall ensure at a construction site of a building or other construction work that.

- (a) all motors cogwheels, chains and friction gearing, flywheels, shafting, dangerous and moving parts of machinery (whether or not driven by mechanical power) and steam pipes are securely fenced or lagged;
- (b) the fencing of dangerous parts of machinery is not removed while such machinery is in motion or in use;
- (c) no part of any machinery which is in motion and which is not securely fenced is examined, lubricated, adjusted or repaired except by a person skilled for such examination, lubrication, adjustment or repairs;
- (d) machine parts are cleaned when such machine is stopped.
- (e) when a machine is stopped for servicing or repairs, adequate measures are taken to ensure that such machine does not re-start inadvertently.

38. Lifting and carrying of excessive weight.-

An employer shall ensure at a construction site of a building or other construction work that.-

- (a) no building worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight the maximum limits set out in the following table:

TABLE

Person Maximum Weight Load

Adult man 55 kg

Adult woman 30kg

Adolescent male 30kg

Adolescent female 20 kg

Unless aided by any other building worker or a mechanical device.

- (b) no building worker aided by other building workers, lift by hand or carry overhead or over their back or shoulders, any material, article, tool or appliance exceeding in weight the sum total of maximum limits set out for each building worker separately under clause (a), unless aided by a mechanical device.

39. Health and safety policy.-

(l)

- (a) Every establishment employing fifty or more building workers shall prepare a written statement of policy in respect of safety and health of building workers and submit the same for the approval of the Director General;

(b) the policy referred to in clause (a) shall contain the following, namely:

- (i) the intentions and commitments of the establishment regarding health, safety

- and environmental protection of building workers;
- (ii) organisational arrangements made to carry out the policy referred to in clause (a) specifying the responsibility at different levels of hierarchy;
- (iii) responsibilities of the principle employer, contractor, sub-contractor, transporter or other agencies involved in the building or other construction work;
- (iv) techniques and methods for assessment of risk to safety health and environment and remedial measures therefor;
- (v) arrangements for training of building workers, trainers, supervisors or other persons engaged in the construction work;
- (vi) other arrangements for making the policy referred to in clause (a), effective;
- (c) the intention and commitment referred to in sub-clause (i) clause (b) shall be taken into account in making decisions relating to plant, machinery, equipment, materials and placement of building workers.

(2) A copy of the policy referred to in clause (a) of sub-rule (1). Signed by an authorised signatory shall be sent to the Central Government.

(3) The establishment shall revise the policy referred to in clause (a) of subrule (1) as often as necessary under the following circumstances, namely:

- (i) Whenever any expansion or modification having implication on safety and health of the building workers is made in such building or other construction work; or
- (ii) Whenever any new building or other construction work, substances, articles or techniques are introduced having implication on health and safety of building workers.

(4) A copy of the policy referred to in sub-clause (a) of sub-rule (1) shall be displayed at the conspicuous places in Hindi and a local language understood by the majority of building workers at a construction site.

40. Dangerous and harmful environment .-

An employer shall ensure at a construction site of a building site of a building or other construction work that,-

(a) When an internal combustion engine exhausts into a confined space or excavation or tunnel or any other workplace where neither natural ventilation nor artificial ventilation system is adequate to keep the carbon monoxide content of the atmosphere below fifty parts per million, adequate and suitable measures are taken at such workplace in order to avoid exposure of building workers to health hazards;

(b) no building workers is allowed to enter any confined space or tank or trench or excavation wherein there is given off any dust, fumes or other impurities of such nature and to such extent as is likely to be injurious or offensive to the building worker or in which explosives, poisonous, noxious or gaseous material or other harmful articles have been carried or stored or in which has been fumigated or in which there is a possibility of oxygen deficiency, unless all practical steps have been taken to remove such dust, fumes, or other impurities and dangers which may be present and to prevent any further ingress thereof, and such workplace or tank or trench or excavation is certified by the responsible person to be safe and fit for the entry of such building workers.

41. Overhead protection.-

(1) The employer shall ensure at the building or other construction work that overhead protection is erected along the periphery of every building under construction which shall be of fifteen metres or more in height when complete.

(2) Over head protection referred to in sub-rule (1) shall not be less than two metres wide and shall be erected at a height not more than five metres above the base of the building and the outer edge of such overhead protection shall be one hundred fifty millimeters higher than the inner edge thereof shall be erected at an angle of not more than twenty degrees to its horizontal sloping into the building.

(3) The employer shall ensure at the building and other construction work that any area exposed to risk of falling material, article or objects is roped off or cordoned off or otherwise suitably guarded from inadvertent entry of persons other than building workers at work in such area.

42. Slipping, tripping, cutting, drowning and falling hazards.-

(1) All passageways, platforms and other places of construction work at the building or other construction work shall be kept by the employer free from accumulation of dust, debris or similar material and from other obstructions that may cause tripping.

(2) Any sharp projections or protruding nails or similar projections which may cause any cutting hazard to a building, worker at the building or other construction work shall be removed or otherwise made safe by taking suitable measures by the employer.

(3) No employer shall allow any building worker at building or other construction work to use the passageway, or a scaffold, platform or any other elevated working surface which is in a slippery and dangerous condition and shall ensure that water, grease, oil or other similar substances, which may cause the surface slippery, be removed or sanded, saw dusted or covered with suitable material to make it safe from slipping hazard at a building or other construction work.

(4) Wherever building workers at a building or other construction work are exposed to the (hazard of falling into water, they shall be provided by the employer with adequate equipment for saving themselves from drowning and rescuing from such hazard and if the Director General considers necessary, well-equipped boat or launch manned with trained personnel shall be provided by the employer at the site of such work.

(5) Every open side or opening into or through which a building worker, vehicle or lifting appliance or other equipments may fall at a building or other construction work shall be covered or guarded suitably by the employer to prevent such fall except where free access is necessary by reasons of the nature of the work. (6) Wherever building workers at a building or other construction work are exposed to the hazards of falling from height while employed on such work, they shall be provided by the employer with adequate equipment or means for saving them from such hazards. Such equipment or means shall be in accordance with the national standards.

(7) Whenever there is possibility of falling of any material, equipment or building worker at a construction site relating to a building or other construction work, adequate and suitable safety net shall be provided by employer in accordance with the national standards.

43. Dust, gases, fumes, etc.-

An employer shall prevent concentration of dust, gases or fumes by providing suitable means to control their concentration within the permissible limit so that they may not cause injury or pose health hazard to a building worker at a building or other construction work.

44. Corrosive substances .-

The employer shall ensure that corrosive substances, including alkalis and acids, shall be stored and used by a person dealing with such substances at a building or other construction work in such a manner that it does not endanger the building worker and suitable protective equipment shall be provided by the employer to a building worker during handling or use of such substances at a building or other construction work and in case of spillage of such substances on the building worker, immediate remedial measure shall be taken by the employer.

45. Eye protection.-

Suitable personal protective equipment for the protection of eyes shall be provided by an employer and used by the building worker engaged in operation like welding, cutting, chipping, grinding or similar operations which may cause hazard to his eyes at a building or other construction work.

46. Head protection and other protective apparel.-

(1) Every building worker required to pass through or work within the areas at building or other construction work where there is hazard of his being struck by falling objects or materials shall be provided by the employer with safety helmets of type and tested in accordance with the national standards.

(2) Every building worker required to work in water or in wet concrete or in other similar work at a building or other construction work, shall be provided with suitable waterproof boots by the employer.

(3) Every building worker required to work in rain or in similar wet condition at building or other construction work, shall be provided with waterproof coat with hat by the employer.

(4) Every building worker required to use or handle alkalis, acid or other similar corrosive substances at a building or other construction work shall be provided with appropriate protective equipment by an employer, in accordance with the national standards.

(5) Every building worker engaged in handling sharp objects or materials at a building or other construction work which may cause hand injury, shall be provided with suitable hand-gloves by the employer, in accordance with the national standards.

47. Electrical hazards .-

Before commencement of any buildings or other construction work, the employer shall take adequate measures to prevent any worker from coming into physical contact with any electrical equipment or apparatus, machines or live electrical circuit which may cause electrical hazard during the course of his employment at a building or other construction work.

(2) The employer shall display and maintain suitable warning signs at conspicuous places at a building or other construction work in Hindi and in a local language understood by the majority of the building workers.

(3) In workplaces at a building or other construction work where the exact location of underground electric power line is not known, the building workers using jack hammers, crow bars or other hand-tools which may come in contact with a live electrical line, shall be provided by the employer with insulated protective gloves and footwear of the type in accordance with the national standards.

(4) The employer shall ensure that, as far as practicable, no wiring, which may come in contact with water or which may be mechanically damaged, is left on ground or floor at a building or other construction work.

(5) The employer shall ensure that, electrical appliances and current carrying equipment used at a building or other construction work are made of sound material and are properly and adequately earthed.

(6) The employer shall ensure that all electrical installations at a building or other construction work comply with the requirements of any law for the time being in force.

48. Vehicular traffic.-

(1) Whenever any building or other construction work is being carried on, or is located in close proximity to a road or any other place where any vehicular traffic may cause danger to building workers, the employer shall ensure that such building or other construction work is barricaded and suitable warning signs and lights displayed or erected to prevent such danger and if necessary, he may make a request in writing to the concerned authorities to control such traffic.

(2) The employer shall ensure that all vehicles used at construction site of a building or other construction work comply with the requirements of the Motor Vehicles Act, 1988 (59 of 1988) and the rules made thereunder.

(3) The employer shall ensure that a driver of a vehicle of any class or description operating at a construction site of a building or other construction work holds a valid driving license under the Motor Vehicles Act, 1988 (59 of 1988).

49. Stability of structures.-

The employer shall ensure that no wall, chimney or other structure or part of a structure is left unguarded in such condition that it may fall, collapse or weaken due to wind pressure, vibration or due to any other reason at a site of a building or other construction work.

50. Illumination of passageways, etc.-

The employer shall ensure that illumination sufficient for maintaining safe working conditions at a site of a building or other construction work is provided where building workers are required to work or pass and for passageways, stairways and landing, such illumination is not less than that provided in the relevant national standards.

51. Stacking of materials.-

The employer shall ensure, at a construction site of a building or other construction work that-

- (a) all building materials are stored or stacked in a safe and orderly manner to avoid obstruction of any passageway or place of work;
- (b) material piles are stored or stacked in such a manner as to ensure stability;
- (c) material or equipment is not stored upon any floor or platform in such quantity as to exceed its safe carrying capacity;
- (d) material or equipment is not stored or placed so close to any edge of a floor or platform as to endanger the safety of persons below or working in the vicinity.

52. Disposal of debris.-

The employer shall ensure at a construction site of a building or other construction work that-

- (a) debris are handled and disposed of by a method which does not cause danger to the safety of a person;
- (b) debris are not allowed to accumulate so as to constitute a hazard;
- (c) debris are kept sufficiently moist to bring down the dust within the permissible limit;
- (d) debris are not thrown inside or outside from any height of such buildings or other construction work;
- (e) on completion of work, left over building material, article or other substance or debris are disposed of as soon as possible to avoid any hazard to any traffic or person.

53. Numbering and marking of floors.-

The employer shall ensure that each floor or level of a building or other construction work is appropriately numbered or marked at the landing of such floor or level.

54. Use of safety helmets and shoes.-

The employer shall ensure that all persons who are performing any work or services at a building or other construction work, wear safety shoes and helmets conforming to the national standards.

SAFETY ORGANISATION

208. Safety Committees.-

(1) Every establishment wherein five hundred or more building workers are ordinarily employed, there shall be a Safety Committee constituted by the employer which shall be represented by equal number of representatives of employer and building workers employed in such establishment. In no case the number of representatives of the employer shall be represented by representatives of the recognised unions wherever such unions exist.

(2) The main functions of the Safety Committee shall be -

- (a) to identify probable causes of accident and unsafe practices in building or other construction work and to suggest remedial measures;

- (b) to stimulate interest of employer and building workers in safety by organising safety weeks, safety competition, talks and film shows on safety, preparing posters or taking similar other measures as and when required or as necessary
 - (c) to go round the construction site with a view to check unsafe practices and detect unsafe conditions and to recommend remedial measures for their rectification including First Aid Medical and Welfare Facilities;
 - (d) to look into the health hazards associated with handling different types of explosives, chemicals and other construction material and to suggest remedial measures including use of proper personal protective equipment;
 - (e) to suggest measures for improving welfare amenities in the construction site and other miscellaneous aspects of safety, health and welfare in building or other construction work;
 - (f) to bring to the notice of the employer the hazards associated with use, handling and maintenance of the equipment used during the course of building and other construction work.
- (3) The Safety Committee shall meet at regular intervals at least once in a month and it shall be chaired by the senior person having overall control over the affairs of the construction site.
- (4) The agenda and minutes of the meeting shall be circulated to all concerned and it shall be in the language understood by majority of the building workers and shall be produced to the Inspector on demand for inspection.
- (5) The decisions and recommendations of the Safety Committee shall be complied with by the employer within reasonable time limits.

209. Safety Officer.-

- (1) In every establishment wherein five hundred or more building workers are ordinarily employed, the employer shall appoint Safety Officers as per the scale laid down in Schedule VIII annexed to these rules, Such Safety Officers May be assisted by suitable and adequate staff.
- (2) Duties, qualifications and the conditions of Safety Officers appointed under sub-rule (1) shall be as provided in Schedule VIII annexed to these rules.
- (3) Wherever number of workers employed by single employer is less than five hundred, such employers with prior permission of Director General.

210. Reporting of accidents .-

- (1) Notice of any accident on the construction site which either-
 - (a) causes loss of life, or
 - (b) disables a building worker from working for a period of forty-eight hours or more immediately following the accident, shall forthwith be sent by telegram, telephone, fax or similar other means including special messenger within four hours in case of fatal accidents and seventy-two hours, in case of other accidents involving building worker, to
 - (i) the Regional Labour Commissioner (Central), having jurisdiction in the area in which the establishment in which such accident or dangerous occurrence took place is located. Such Regional Labour Commissioner (Central) shall be the authority appointed under section 3 of the Act;
 - (ii) the Board with which the building worker involved in accident was registered as a beneficiary;

- (iii) the Director General, and
(iv) the next of kin or other relative of building worker involved in accident.
- (2) Notice of any accident at a construction site of a building or other construction work which-
- (a) cause loss of life; or
 - (b) disables such building worker from work for more than ten days following the accident, shall also be sent to
 - (i) the officer incharge of the nearest police station;
 - (ii) the District Magistrate or if the District Magistrate by order so desires to the Sub-Divisional Magistrate.
- (3) In the case of an accident falling under clause (b) of sub-rule (1) or clause (b) of sub-rule (2) the injured building worker shall be given first-aid and immediately thereafter be transferred to a hospital or other place for medical treatment.
- (4) Where any accident causing disablement subsequently result in death of a building worker, notice in writing of such death shall be communicated to the authorities as mentioned in sub-rule (1) and sub-rule (2) within seventy-two hours of such death.
- (5) The following classes of dangerous occurrences shall be reported to the Inspector having jurisdiction, whether or not any death or disablement is caused to a building worker, in the manner prescribed in sub-rule (1), namely
- (a) collapse or failure of lifting appliances or hoist or conveyors or other similar equipment for handling building or construction material or breakage or failure of rope, chain or loose gears; overturning of crane used in building or other construction work; falling of objects from height;
 - (b) collapse or subsidence of soil, any wall, floor, gallery, roof or any other part of any structure, platform, staging, scaffolding or any means of access including formwork;
 - (c) contact work, excavation, collapse of transmission;
 - (d) explosion of receiver or vessel used for storage, at a pressure greater than atmospheric pressure, of any gas or gases or any liquid or solid used as building material;
 - (e) fire and explosion causing damage to any place on construction site where building workers are employed;
 - (f) spillage or leakage of hazardous substances and damage to their container;
 - (g) collapse, capsizing, toppling or collision of transport equipment;
 - (h) leakage or release of harmful toxic gases at the construction site.
- (6) In case of failure of a lifting appliance, loose gear, hoist or building and other construction work machinery and transport equipment at a construction site of a building or other construction work, such appliances gear, hoist, machinery or equipment and the site of such appliances, gear, hoist, machinery or equipment and the site of such occurrence shall, as far as practicable, be kept undisturbed until inspected by the inspector having jurisdiction.

(7) Every notice given under sub-rule (1), sub-rule(2) or sub rule (4) shall be followed by a written report to the Inspector, authority under section 39 of the Act, f the Board and thhe Director General in Form XIV under proper acknowledgement.

211.Procedure for enquiry into causes of accident or dangerous occurrence.-

(1) The enquiry under sub-section (2) or sub-section (3) of section39 of the Act, as the casee may be, shall bee conducted by the authority referred to in such-clause (i) of clause (b) of sub-rule (1) rule 210, in the following manner, namely:

(a) the enquiry shall be commenced as early as it may be, and in any case, within fifteen days of the receipt of notice of accident or dangerous occurrence under rule 210;

(b) the enquiry may be conducted by the authority referred to in sub-clause (i) clause (b) of sub-rule (1) of rule 210 himself or by an enquiry officer appointed by such authority; (c) the authority or enquiry officer, as the case may be, shall serve or cause to be served, notices in writing, informing the date, time and place of such enquiry to all persons entitled to appear in such enquiry and whose names and addresses are known to such authority or enquiry officer.

(d) notwithstanding the provision of clause (b), for the purpose of notifying other persons who may in any way be concerned or be interested in such enquiry, the authority or enquiry officer, as the case may be, may publish notice of such ednquiry in one or more local newspapers, informing the date, time and place of such enquiry.

(2) The person entitled to appear at the enquiry may include-

(a) an inspector or any officer of the Central Government or the State Government or an undertaking or public body concerned with the enforcement or compliance of safety provisions of the Act and the rules in the concerned establishment;

(b) a trade union or a workers' association oran employers' association;

(c) the worker involved in the accident or his legal heir or authorised representative;

(d) the owner of the premises in which the accident took place;

(e) any other person, at the discreation of the authority or the enquiring officer, as the case may be, who may be interested in or be concerned with the clause ofan accident or may have knowledge about such cause or is likely to give material evidence or produce a relevant document in conneciton with such accident or dangerous occurrence.

(3) In, case the entitled person referred to in sub-rule (2) is a body corporate, a company, or any other organisation, association, group of persons such group may be represented through an authorised representatives including a counsel or a solicitor.

(4) Subject to the provisions of sub-rule (5) the enquiry shall be held in public.

(5) In cases where-

(a) the Central Government is of the opinion that the matter of the enquiry or any part of it are of such nature that it would be against the interest of national security to hold the enquiry in public and directs thç said authority or the enquiry officer, as the case may be, to hold the enquiry in camera; or

(b) on an application made by any party to the enquiry, the authority or the enquiry officer, as the case may be, referred to in sub-rule (1), if it or he is of the opinion that the holding of public enquiry will lead to disclosure of information relating to a trade secret, decides to hold the enquiry of such part of it in camera, such enquiry shall not be held in public.

(6) Information disclosed by any person during the course of hearing or evidence in the cases covered under sub-rule (5) shall not be disclosed to any person except for the purpose of the enquiry.

(7) The person entitled to appear under sub-rule (2), called for evidence or representing in an enquiry shall be entitled to make an opening statement, give evidence, request the enquiry officer to call for specified document or evidence, cross-examine other person or to the extent and at the stage permitted by the authority or enquiry officer holding the enquiry.

(8) Any evidence in an enquiry may be admitted at the discretion of the authority or enquiry officer during the enquiry, who may, also direct that documents to be tendered in evidence may be inspected by any person entitled or permitted to appear at such enquiry and that facilities be afforded to such person to take or obtain copies thereof.

(9) The authority or the enquiry officer holding an enquiry may authorize any person, being an officer of the central Government, to assist such authority or enquiry officer where necessary, for the purpose of conducting the enquiry, and the officer so authorised may enter the premises of the concerned establishment during working hours, inspect the records relevant to such enquiry, investigate and take such evidence as may be required to conduct such enquiry.

(10) The findings of the enquiry along with all evidence, in original including statements of witnesses shall be forwarded to the authority specified under section 39 of the Act within five days of the completion of the enquiry in cases where sub-enquiry was not conducted by such authority itself.

(11) A copy of the findings along with a brief statement of facts relating to an enquiry conducted under this rule shall be forwarded to the Director General and the Central Government by the authority referred to in sub-rule (1) of rule 210

Annexure – E

GRIEVANCE REDRESSAL MECHANISM

1.0 **Background**

Hindustan Petroleum Corporation (HPCL) has developed the following mechanism to deal with references / grievances if any that are received from Parties who participated/intends to participate in the Corporation Tenders. The scheme is as under :

2.0 **Definitions : Grievance**

For the purpose of this scheme, the word 'Grievance' would mean a written and signed representation received from party, who has participated/intends to participate in the tender of the Company, seeking inter-alia a review of the **process of finalisation of tender** on the grounds that his right as a party to the tender has been affected for the reason to be provided by him which needs to be examined and decided in the interest of equity.

Grievance Redressal Cell (GRC)

It is the group that will review the references received from the Parties and decide the matter.

3.0 **Authorities to handle grievances**

3.1 There will be a process to deal with the grievances received from the tendering parties or the prospective tenderers based on the Tender document issued.

3.2 The first level of such process will comprise of a Grievance Redressal Cell. This Cell will consist of the following :

VISAKH REFINERY

ED - Refinery

Head- Finance

Head- Materials

(Co-ordinator)

MUMBAI REFINERY

ED - Refinery

Head - Finance

Head - Materials

(Co-ordinator)

MKTG. /CorporateED - Retail/Direct Sales/
Corporate (Finance)

LPG/Projects & Pipelines

GM - O & D

DGM - Aviation

Head Finance

(Commercial)

Head- Procurement (SBU/

Dept. concerned)

(Co-ordinator)

3.3 The Co-ordinator for each of the Cell is respective Head - Materials/Procurement of - Visakh Refinery, Mumbai Refinery, Marketing SBUs & Corporate.

3.4 All the grievances will be lodged with the Co-ordinator of the Cell.

- 3.5 This Cell will examine the grievances and decide the matter.
- 3.6 The second level of Grievance Redressal Mechanism is the Executive Committee - Refineries for both Mumbai & Visakh Refineries, Executive Committee - Marketing & Executive Committee -Corporate for respective functions. The decision of the Executive Committee is final.

4.0 Grievance Redressal Process
LEVEL - I

- 4.1 If a grievance is received by the Grievance Redressal Cell, the Co-ordinator will first acknowledge the receipt of the grievance to the aggrieved party within 48 hours from the time of receipt of the grievance (Excluding intervening Holidays).
- 4.2 The Grievance Redressal Cell (GRC) will forward the Grievance to the Tender Inviting Authority at the earliest, who will offer his comments/views to the Cell within 2 days of receipt from GRC.
- 4.3 On receipt of comments from Tender Inviting Authority, the Grievance Redressal Cell will meet and look into the grievances expressed by the aggrieved party along with the views/comments of the Tender Inviting Authority. The Grievance Redressal Cell can call for relevant records and documents to enable it to firm up its decision on the grievance.
- 4.4 The Grievance Redressal Cell will decide the matter within 14 days and thereafter communicate the decision to the aggrieved party.

LEVEL - II

- 4.5 The second level of Grievance Redressal Mechanism is the Executive Committee - Refineries for both Mumbai & Visakh Refineries and Executive Committee - Marketing & Executive Committee -Corporate for respective functions which would examine and decide on any appeal / representation on the decision of the Grievance Redressal Cell.
- 4.6 Parties aggrieved by the decision of the Grievance Redressal Cell, can appeal / represent to the Executive Committee. The decision of the Executive Committee is final.

5.0 Time limitations for the handling of grievances

- 5.1 Grievances regarding the Pre-qualification process should be lodged by the aggrieved party within one week from the date of Publication calling for pre-qualification bid. Grievances received after one week from date of Publication will not be considered.
- 5.2 The decision on Grievance pertaining to Pre-Qualification should be finalised before the shortlisting of the parties is concluded.
- 5.3 Specific Grievances regarding the Notice Inviting Tender (NIT) should be lodged by the aggrieved party within one week from the last date of sale of tender document, or one week prior to the Due date for Bid Submission, whichever is earlier. Grievances regarding NIT, received thereafter shall not be considered.

- 5.4 Grievances relating to the tender process (other than “Notice Inviting Tender related grievances”) should be lodged within one week from the date of opening the unpriced bids.
- 5.5 The Grievance Redressal Cell shall examine the case and decide within 15 working days from the date of receipt of the grievance and advise the function concerned of the same so that they can process the tender further.
- 5.6 Any grievance after price bid opening should be redressed before award of the contract. No grievances shall be entertained which are received after one week of price bid opening.
- 5.7 The Co-ordinator of the Grievance Redressal Cell, on receipt of the grievance by the aggrieved party, should inform the Tender Inviting Authority not to finalise the contract till the disposal of the grievance by the Grievance Redressal Cell. The grievance lodged should be disposed of within a reasonable period of 14 working days so that there is no undue delay in awarding the contract.

6.0 Interim Suspension of Tendering Process

- 6.1 After any grievance is received by the Co-ordinator of the Grievance Redressal Cell, the Cell Members will meet and examine whether the tendering process relating to the concerned matter is to be suspended or not in consultation with the Tender Inviting Authority. The Cell will examine whether there exists a prima facie ground for suspending the tendering process and decide the matter. It may consult, if required, the Executive Committee as to whether the tendering process has to be suspended till a final decision is taken on the grievance.
- 6.2 The decision to suspend the tendering process or not and disposal of the grievance should preferably be taken by the Grievance Redressal Cell and/or Executive Committee at the earliest but not later than 14 working days from the receipt of grievance keeping in mind the schedule of activities connected with the tender concerned.
- 6.3 When it is decided to suspend the Tendering Process, the grievance should be examined and disposed off by the Grievance Redressal Cell & Executive Committee at the earliest, but not later than 15 days since it will be necessary to either continue with the tender as per earlier norms or it is decided to re-invite the tender with suitable changes.

7.0 Other General Provisions

- 7.1 A final written reply to the aggrieved party will be given by Coordinator of Grievance Redressal Cell / Executive Committee within 21 working days from the date of receipt of the grievance, in line with the minutes of respective GRC/ EC.
- 7.2 The Grievance Redressal Cell / Executive Committee, while firming up its recommendations, can seek the views of other relevant Departments like Finance, Vigilance and Legal or any other Department concerned with the issue.

- 7.3 The Grievance Redressal Cell & Executive Committee is entitled to give a personal hearing to the aggrieved party, if necessary.
- 7.4 If a Grievance is related to a contract already awarded and acted upon, and if the Grievance Cell & Executive Committee is of the view that the grievance needs review for remedial action for future tenders, it would submit its recommendation to the concerned SBU/Dept. head for future tenders.
- 7.5 Company's Tender Grievance Redressal Mechanism will be displayed in its Website in the Tenders Page.
- 7.6 The Grievance Redressal Cell & Executive Committee will maintain a grievance register giving details of the tender number, date of receipt of grievance letter, nature of grievance in brief, details of the decisions taken and the date of communication to the aggrieved party.
- 7.7 The Grievance Redressal Cell & Executive Committee will also submit a quarterly report on the grievances handled to the Committee of Functional Directors. A copy of Yearly Report will be submitted to the Board for information.
- 7.8 The relevant clause/provision of Grievance Redressal Mechanism should also be incorporated in GTC of all Tender documents giving the Officer-designate of the Grievance Redressal Cell, to whom the grievance letter should be addressed.

**Table-1
WEIGHTAGES**

Sr. No.	Major Milestones	Part A				Total
		Pipeline	Mainline & Booster Pumps	Control Valves		
	GGSRP : RAMAN MANDI – BATHINDA PIPELINE					
1	BASIC DESIGN & PROCESS	10	5	2		17
2	DETAILED ENIGNNERING	25	15	5		45
3	PURCHASE AND TENDERING UPTO PLACEMENT OF ORDER	21	12	5		38
	TOTAL	56	32	12		100

UNPRICED

Sr. No.	Major Milestones	Part A				Total
		Pipeline	Mainline & Booster Pumps	Control Valves		
		GGSRP : RAMAN MANDI – BAHADURGARH PIPELINE				
1	BASIC DESIGN & PROCESS	10	5	2		17
2	DETAILED ENIGNNERING	25	15	5		45
3	PURCHASE AND TENDERING UPTO PLACEMENT OF ORDER	21	12	5		38
	TOTAL	56	32	12		100

PART B												
GGSREP : RAMAN MANDI TO BAHADURGARH PIPELINE												
Sr. No.	MAJOR MILESTONES	PIPELINE	MAINLINE & BOOSTER PUMPS	CONTROL VALVES	TELECOM SYSTEM	ARCH./ CIVIL/ STRUCTURAL	ELECTRIC	TEMP. CP SYSTEM	PERMANENT CP SYSTEM	SCADA	INSTRUMENTATION	TOTAL
1	BASIC DESIGN & PROCESS	0	0	0	1	1	2	0.5	0.5	2	2	9
2	DETAIL ENGINEERING	0	0	0	1	2	2	0.5	0.5	2	2	10
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	3	0.5	0.5	1	2	1	0.1	0.1	1	1	10.2
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	4	2	0.1	2	1	1	0.25	0.25	1	1	12.6
5	EXECUTION & INSPECTION	8	2	0.1	1	0	1	0	0	1	1	14.1
6	MATERIAL MANAGEMENT	2	0.25	0	0	0	0	0	0	0	0	2.25
7	CONSTRUCTION SUPERVISION	15.5	0.5	0	2	4	2	0.5	2	1	1	28.5
8	COMMISSIONING / OPERATION MANUAL	3	1	0	1	0	0.5	0.25	0.5	0.5	0.5	7.25
9	AS BUILT DRAWINGS	2	0.5	0.1	1	0.5	0.5	0	0.5	0.5	0.5	6.1
	TOTAL	37.5	6.75	0.8	10	10.5	10	2.1	4.35	9	9	100

PART B												
GGSREP : RAMAN MANDI TO BATHINDA PIPELINE												
Sr. No.	MAJOR MILESTONES	PIPELINE	MAINLINE & BOOSTER PUMPS	CONTROL VALVES	TELECOM SYSTEM	ARCH./ CIVIL/ STRUCTURAL	ELECTRIC AL	TEMP. CP SYSTEM	PERMANENT CP SYSTEM	SCADA	INSTRUMENTATION	TOTAL
1	BASIC DESIGN & PROCESS	0	0	0	1	1	2	0.5	0.5	2	2	9
2	DETAIL ENGINEERING	0	0	0	1	2	2	0.5	0.5	2	2	10
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	3	0.5	0.5	1	2	1	0.1	0.1	1	1	10.2
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	4	2	0.1	2	1	1	0.25	0.25	1	1	12.6
5	EXECUTION & INSPECTION	8	2	0.1	1	0	1	0	0	1	1	14.1
6	MATERIAL MANAGEMENT	2	0.25	0	0	0	0	0	0	0	0	2.25
7	CONSTRUCTION SUPERVISION	15.5	0.5	0	2	4	2	0.5	2	1	1	28.5
8	COMMISSIONING / OPERATION MANUAL	3	1	0	1	0	0.5	0.25	0.5	0.5	0.5	7.25
9	AS BUILT DRAWINGS	2	0.5	0.1	1	0.5	0.5	0	0.5	0.5	0.5	6.1
	TOTAL	37.5	6.75	0.8	10	10.5	10	2.1	4.35	9	9	100

Sr. No.		PART B											TOTAL
		GGSREP : Receipt, Storage Cum Dispatch Terminal at Raman Mandi											
MAJOR MILESTONES		Storage Tanks	Effluent Treatment Plant	Fire Fighting	Internal P/L	Const. of Compound Wall	Land Development	Roads and Drains	Civil	Electrical	Instrumentation	Communication	TOTAL
1	BASIC DESIGN & PROCESS	1	0.5	0.5	1	0	0	0.5	1	1	1	0.5	7
2	DETAIL ENGINEERING	2	0.5	1	2	0	0	1	2	2	2	0.5	13
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	3	0.5	2	2	0.5	0.5	0.5	2	2	2	0.5	15.5
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	2	0.5	1	1	0.5	0	0.5	1	1	1	0.5	9
5	EXPEDITING & INSPECTION	1	0.5	1	2	0	0	0	0	1	1	0.5	7
6	MATERIAL MANAGEMENT	1	0.5	1	1	0	0	0	0	0.5	0	0	4
7	CONSTRUCTION SUPERVISION	8	0.5	2	5.5	2	2	3	3.5	3	3	0.5	33
8	COMMISSIONING / OPERATION MANUAL	2	0.25	0.5	0.5	0	0	0	0	1	1	0.5	5.75
9	AS BUILT DRAWINGS	1	0.25	0.5	1	0.25	0	0	0.5	1	1	0.25	5.75
	TOTAL	21	4	9.5	16	3.25	2.5	5.5	10	12.5	12	3.75	100

Sr. No.	MAJOR MILESTONES	Part B							TOTAL
		GGSRREP – Additional Tankage at Bathinda							
		Storage Tanks	Internal P/L	Fire Fighting	Effluent Treatment Plant	Instrumentation			
1	BASIC DESIGN & PROCESS	3	3	1	1	3		11	
2	DETAIL ENGINEERING	3	3	1	1	3		11	
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	4	3	3	1	2		13	
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	3	3	3	1	2		12	
5	INSPECTION	1	1	1	1	1		5	
6	MATERIAL MANAGEMENT	1	1	1	0	0		3	
7	CONSTRUCTION SUPERVISION	10	7	6	2	3		28	
8	COMMISSIONING / OPERATION MANUAL	3	2	2	1	1		9	
9	AS BUILT DRAWINGS	3	2	1	1	1		8	
	TOTAL	31	25	19	9	16		100	

		Part – B				
MAJOR MILESTONES		GGSR – Additional Tankage at Bahadurgarh				
Sr. No.		Storage Tanks	Internal P/L	Fire Fighting	instrumentation	TOTAL
1	BASIC DESIGN & PROCESS	3	3	2	3	11
2	DETAIL ENGINEERING	5	4	2	3	14
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	6	6	3	2	17
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	3	2	1	2	8
5	INSPECTION	1	1	1	1	4
6	MATERIAL MANAGEMENT	2	2	2	0	6
7	CONSTRUCTION SUPERVISION	10	8	5	3	26
8	COMMISSIONING / OPERATION MANUAL	2	2	1	1	6
9	AS BUILT DRAWINGS	4	2	1	1	8
	TOTAL	36	30	18	16	100

TABLE 2
SCHEDULE FOR MAJOR MILESTONES

Major Milestones		Part A				
		GGSREP : RAMAN MANDI – BAHADURGARH PIPELINE				
Sr. No.		Pipeline	Mainline & Booster Pumps	Control Valves	Total	
1	BASIC DESIGN &	Start				
		Finish				
2	DETAILED ENIGNNERING	Start				
		Finish				
3	PURCHASE AND TENDERING UPTO PLACEMENT OF ORDER	Start				
		Finish				
	TOTAL					

Part A						
GGSRP : RAMAN MANDI – BATHINDA PIPELINE						
Sr. No.	Major Milestones	Pipeline		Mainline & Booster Pumps	Control Valves	Total
		Start	Finish			
1	BASIC DESIGN & PROCESS	Start				
		Finish				
2	DETAILED ENIGNNERING	Start				
		Finish				
3	PURCHASE AND TENDERING UPTO PLACEMENT OF ORDER	Start				
		Finish				
	TOTAL					

PART B												
GGSRP : RAMAN MANDI TO BAHADURGARH PIPELINE												
Sr. No.	MAJOR MILESTONES	PIPELINE	MAINLINE & BOOSTER PUMPS	CONTROL VALVES	TELECOM SYSTEM	ARCH./ CIVIL/ STRUCTURAL	ELECTRICAL	TEMP. CP SYSTEM	PERMANENT CP SYSTEM	SCADA	INSTRUMENTATION	TOTAL
1	BASIC DESIGN & PROCESS	Start										
		Finish										
2	DETAIL ENGINEERING	Start										
		Finish										
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	Start										
		Finish										
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	Start										
		Finish										
5	EXECUTION & INSPECTION	Start										
		Finish										
6	MATERIAL MANAGEMENT	Start										
		Finish										
7	CONSTRUCTION SUPERVISION	Start										
		Finish										
8	COMMISSIONING / OPERATION MANUAL	Start										
		Finish										
9	AS BUILT DRAWINGS	Start										
		Finish										
	TOTAL											

PART B												
GGSRP : RAMAN MANDI TO BATHINDA PIPELINE												
Sr. No.	MAJOR MILESTONES	PIPELINE	CONTROL VALVES	TELECOM SYSTEM	CIVIL/ STRUCTURAL	ELECTRIC	TEMP. CP SYSTEM	PERMANENT CP SYSTEM	SCADA	INSTRUMENTATION	TOTAL	
1	BASIC DESIGN & PROCESS	Start										
		Finish										
2	DETAIL ENGINEERING	Start										
		Finish										
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	Start										
		Finish										
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	Start										
		Finish										
5	EXECUTION & INSPECTION	Start										
		Finish										
6	MATERIAL MANAGEMENT	Start										
		Finish										
7	CONSTRUCTION SUPERVISION	Start										
		Finish										
8	COMMISSIONING / OPERATION MANUAL	Start										
		Finish										
9	AS BUILT DRAWINGS	Start										
		Finish										
	TOTAL											

PART B												
GGSRP : Receipt, Storage Cum Dispatch Terminal at Raman Mandi												
Sr. No.	MAJOR MILESTONES	Storage Tanks	Effluent Treatment Plant	Fire Fighting	Internal P/L	Const. of Compound Wall	Land Development	Roads and Drains	Civil Electrical	Instrumentation	Communication	TOTAL
1	BASIC DESIGN & PROCESS	Start Finish										
2	DETAIL ENGINEERING	Start Finish										
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	Start Finish										
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	Start Finish										
5	EXPEDITING & INSPECTION	Start Finish										
6	MATERIAL MANAGEMENT	Start Finish										
7	CONSTRUCTION SUPERVISION	Start Finish										
8	COMMISSIONING / OPERATION MANUAL	Start Finish										
9	AS BUILT DRAWINGS	Start Finish										
	TOTAL											

MAJOR MILESTONES		Part B									
		GGSRREP – Additional Tankage at Bathinda									
		Storage Tanks	Internal P/L	Fire Fighting	Effluent Treatment Plant	Instrumentation	TOTAL				
1	BASIC DESIGN & PROCESS	Start									
		Finish									
2	DETAIL ENGINEERING	Start									
		Finish									
3	PURCHASE & TENDERING UP TO PLACEMENT OF ORDER	Start									
		Finish									
4	APPROVAL OF VENDOR'S DOCUMENTS/DRAWINGS	Start									
		Finish									
5	INSPECTION	Start									
		Finish									
6	MATERIAL MANAGEMENT	Start									
		Finish									
7	CONSTRUCTION SUPERVISION	Start									
		Finish									
8	COMMISSIONING / OPERATION MANUAL	Start									
		Finish									
9	AS BUILT DRAWINGS	Start									
		Finish									
TOTAL											

MAJOR MILESTONES		Part – B						
		GGSREP – Additional Tankage at Bahadurgarh						
		Storage Tanks	Internal P/L	Fire Fighting	instrumentation	TOTAL		
1	Start							
	Finish							
2	Start							
	Finish							
3	Start							
	Finish							
4	Start							
	Finish							
5	Start							
	Finish							
6	Start							
	Finish							
7	Start							
	Finish							
8	Start							
	Finish							
9	Start							
	Finish							
TOTAL								