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Schedule E - Maintenance Requirements - DELETED

Schedule F - Applicable Permits

(See Clause 3.1.7(a))

Applicable Permits

Applicable Permits

1.1 The Employer / SPV will acquire/has already acquired the following Permits as required:-

LIST OF APPROVALS

A. APPROVALS OBTAINED BY SPV

1. Height Clearance- approved from Airport Authority of India (AAI).
2. Layout Plan- approved by South Delhi Municipal Corporation (SDMC).
3. Two numbers of Road connectivity from West Side of Project Site- approved by Delhi Development Authority (DDA).
4. TOR -approval for Environmental Impact Assessment (EIA) obtained from Environment Audit Committee (EAC).
5. Concept Layout plan approval obtained from Delhi Urban Arts Commission (DUAC) .
6. Power Sourcing approval obtained from BSES Rajdhani Power Ltd (BRPL)
7. Environmental Clearance obtained from MoEFCC/EAC
8. Water Requirement approval obtained by Delhi Jal Board (DJB).

B. APPROVALS TO BE OBTAINED BY EMPLOYER / SPV

1. 3rd Road connectivity approval by DDA/ Unified Traffic and Transportation Infrastructure Planning and Engineering Centre (UTTIPEC).
2. External Circulation Plan approval from UTTIPEC
3. Tree Cutting / Afforestation approval by Department of Forest, Delhi.
4. Building Plan Approval by SDMC/ DUAC (all assistance / documentation to be provided by PEAC).
5. Revised Layout Plan approval from SDMC & DUAC.(all assistance / documentation to be provided by PEAC).
6. Revised Height Clearance/ Approval by Airport Authority of India (AAI) (all assistance / documentation to be provide by PEAC).
7. Consent to Establish approval from DPCC .

8. Approval of Storm water Layout Plan by SDMC (all assistance / documentation to be provided by PEAC).
 9. Approval of Water Supply layout plan by DJB (all assistance / documentation to be provided by PEAC).
 10. Approval of Sewer Layout Plan by DJB (all assistance / documentation to be provided by PEAC).
- 1.2 The following Applicable Permits will be acquired by the EPC Contractor
1. NOC from Delhi Traffic Police
 2. Building Plan Approval by DDA/ SDMC for Phase -1 Development
 3. Permission from Department of Mines for Excavation
 4. Permission from Central Ground Authority (CGWA) for Piling/ Boring
 5. Intimation to DDA/ SDMC before 7 day of start of Construction
 6. Environmental monitoring and compliance every 06 months
 7. Intimation to Health and Safety Department before start of Construction
 8. Permission from Central Ground Water Board for Rain Water Harvesting Network Layout .
 9. Approval from Chief Controller of Explosive Nagpur (for Storage of Diesel / Petrol)
 10. Obtaining IGBC Green Building Platinum V3 certification from Indian Green Building Council for Phase-1 Development.
 11. NOC from Lift Inspector, Government of National Capital Territory of Delhi
 12. NOC for Fire Inspection
 13. NOC from BRPL (Power supply).
 14. NOC from DJB for Water and Sewerage connection
 15. Consent to Operate (COP) Certificate from DPCC
- 1.3 All other Applicable approvals/Permits under law will be acquired by the EPC Contractor.

Official Fees paid to the Approving authority shall be the responsibility of the EPC Contractor and the same shall be reimbursed on actual basis by DMICDC on producing documentary proof / challans and receipt.

Schedule G - Form of Bank Guarantee

(See Clause 7.1.1, 7.5.3 and 19.2)

Annexure-I

(See Clause 7.1.1)

Performance Security

.....
Employer.....,
New Delhi

WHEREAS:

- (A)[name and address of contractor] (hereinafter called "the Contractor") and [name and address of the EMPLOYER], ("**the EMPLOYER**") have entered into an agreement (the "**Agreement**") for "Design and Construction of India International Convention & Expo Centre at Sector 25, Dwarka, New Delhi on Engineering, Procurement and Construction ("EPC") basis, subject to and in accordance with the provisions of the Agreement.
- (B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the Construction Period and Defects Liability Period (as defined in the Agreement) in a sum of Rs Crore (Rupees Crore) (the "Guarantee Amount").
- (C) We,through our branch at(the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during and under and in accordance with the Agreement, and agrees and undertakes to pay to the Employer, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the guarantee amount as the EMPLOYER shall claim, without the EMPLOYER being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the EMPLOYER, under the hand of an officer not below the rank of [.....of EMPLOYER], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the EMPLOYER shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the EMPLOYER and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the EMPLOYER shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the EMPLOYER to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The EMPLOYER shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfillment and/or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the EMPLOYER against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the EMPLOYER, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the EMPLOYER of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the EMPLOYER or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the EMPLOYER in respect of or relating to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.
7. Notwithstanding anything contained herein before, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the EMPLOYER on the Bank under this Guarantee all rights of the EMPLOYER under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Performance Security shall cease to be in force and effect 90 (ninety) days after the end of the Defects Liability Period as set forth in Clauses 7.1
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the EMPLOYER in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the EMPLOYER that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the end **** month in the year ***** or until it is released earlier by the EMPLOYER pursuant to the provisions of the Agreement.

Signed and sealed this..... day of..... 20at.....

SIGNED, SEALED AND DELIVERED

Detailed Design, Construction, Testing & Commissioning of India International Convention & Expo Centre at Sector 25, Dwarka, New Delhi on EPC Basis

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annexure-II

(Schedule-G) (See Clause 7.5.3)

Form for Guarantee for Withdrawal of Retention Money

.....
EMPLOYER,
New Delhi

WHEREAS:

[Name and address of contractor] (hereinafter called "the Contractor") has executed an agreement (hereinafter called the "Agreement") with the [name and address of the EMPLOYER], (hereinafter called "the EMPLOYER") for the " India International Convention & Expo Centre at Sector 25, Dwarka, New Delhi on Engineering, Procurement and Construction (the "EPC") basis, subject to and in accordance with the provisions of the Agreement.

- a. in accordance with the Clause 19.18 of the Agreement, whenever the amount of the retention money (hereinafter called "Retention Money") held by the EMPLOYER exceeds 1% (one per cent) of the Contract Price, the Contractor may, at its option, withdraw the Retention Money after furnishing to the EMPLOYER a bank guarantee for an amount equal to the proposed withdrawal.
- b. We,.....through our branch at.....(the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") for the amount of Rs.....(.....in words) (the "**Guarantee Amount**").

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the EMPLOYER, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the EMPLOYER shall claim, without the EMPLOYER being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the EMPLOYER, under the hand of an officer not below the rank of [.....of EMPLOYER], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the EMPLOYER shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the EMPLOYER and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the EMPLOYER shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the EMPLOYER to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The EMPLOYER shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Retention Money and any of the rights and powers exercisable by the EMPLOYER against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the EMPLOYER, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the EMPLOYER of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the EMPLOYER or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the EMPLOYER in respect of or relating to the Retention Money.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the EMPLOYER on the Bank under this Guarantee all rights of the EMPLOYER under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The guarantee shall cease to be in force and effect 90 (ninety) days after the end of the Defects Liability Period specified in Clauses 17.1 of the Agreement.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the EMPLOYER in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the EMPLOYER that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the end **** month in the year ***** or until it is released earlier by the EMPLOYER pursuant to the provisions of the Agreement.

Signed and sealed thisday of 20 at

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

Detailed Design, Construction, Testing & Commissioning of India International Convention & Expo Centre at Sector 25, Dwarka, New Delhi on EPC Basis

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annexure-II
(Schedule-G) (See Clause 19.2)

Form for Guarantee for Advance Payment

.....EMPLOYER,
New Delhi

WHEREAS:

- (A) [name and address of contractor] (hereinafter called "the Contractor") has executed an agreement (hereinafter called the "Agreement") with the [name and address of the EMPLOYER], (hereinafter called "the EMPLOYER") for the "India International Convention & Expo Centre at Sector 25, Dwarka, New Delhi on Engineering, Procurement and Construction (the "EPC") basis, subject to and in accordance with the provisions of the Agreement.
- (B) in accordance with the Clause 19.2 of the Agreement the EMPLOYER shall make to the Contractor an interest bearing advance payment (hereinafter called "Advance Payment") equal to 10% (ten per cent) of the contract price for mobilization expenses and acquisition of equipment; and that the Advance Payment shall be made in three installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equal to the 110% amount of each installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement; and the amount of (first/second/third) installment of the Advance Payment is Rs. **** cr. (Rupees ***** crore) (the "Guarantee Amount").
- (C) We,through our branch at.....(the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") for the Guarantee Amount. NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:
1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the EMPLOYER, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the guarantee amount as the EMPLOYER shall claim, without the EMPLOYER being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
 2. A letter from the EMPLOYER, under the hand of an officer not below the rank of [.....of EMPLOYER], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the installment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the EMPLOYER shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the EMPLOYER and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
 3. In order to give effect to this Guarantee, the EMPLOYER shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not

in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the EMPLOYER to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The EMPLOYER shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the EMPLOYER against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the EMPLOYER, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the EMPLOYER of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the EMPLOYER or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the EMPLOYER in respect of or relating to the Advance Payment.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the EMPLOYER on the Bank under this Guarantee all rights of the EMPLOYER under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The guarantee shall cease to be in force and effect 90 (ninety) days after the end of the one year from the date of payment of the installment of the Advance Payment, as set forth in Clause 19.2 of the Agreement.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the EMPLOYER in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the EMPLOYER that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the end **** month in the year ***** or until it is released earlier by the EMPLOYER pursuant to the provisions of the Agreement.

Signed and sealed this..... day of.....20.....at.....

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

Detailed Design, Construction, Testing & Commissioning of India International Convention & Expo Centre at Sector 25, Dwarka, New Delhi on EPC Basis

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Schedule H - Contract Price Weightages - Deleted

Schedule I - Drawings

(See Clause 10.2)

1. Drawings

In compliance of the obligations set forth in Clause 10.2 of this Agreement, the Contractor shall furnish to the EMPLOYER'S Engineer, free of cost, all Drawings listed in Annex-I of this Schedule-I.

2. Additional Drawings

If the EMPLOYER'S Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the EMPLOYER'S Engineer, as if such drawings formed part of Annex-I of this Schedule-I.

Annexure-1

(Schedule-I)

List of Drawings

Refer Part 2 Vol. 1.3 - Tender Drawings

Schedule J - Project Completion Schedule

(See Clause 10.3.2)

1. Project Completion Schedule

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule J for each of the Project Milestones and the **Scheduled Completion Date**. Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the EMPLOYER of such compliance along with necessary particulars thereof.

The contractor shall submit with the bid all the activities w.r.t the proposed 4 (four) nos of milestones in the resource schedule and the same shall bear approval of the Employer after the award so that it becomes part of the Contract Agreement.

2.0 Project Milestone-I

2.1 Project Milestone-I shall occur on the date falling on the fifth (5th) month from date of Letter of Award.

2.2 Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the project components as submitted and approved by the Employer. Contractor shall submit get approved. Stage Payment Statements for an amount not less than 25 percent of the Contract Price.

3.0 Project Milestone-II

3.1 Project Milestone-II shall occur on the date falling on the tenth (10th) month from date of Letter of Award.

3.2 Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the project components and submitted to the Employer duly and validly prepared Stage Payment Statements for an amount not less than fifty (50) percent of the Contract Price.

4.0 Project Milestone-III

4.1 Project Milestone-III shall occur on the date falling on the fifteen (15th) month from date of Letter of Award.

4.2 Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the project components and submitted to the Employer duly and validly prepared Stage Payment Statements for an amount not less than seventy five (75%) percent of the Contract Price.

5.0 Project Milestone-IV

5.1 Project Milestone-IV shall occur on the date falling on the twelfth (12th) month from the date of Letter of Award.

5.2 Prior to the occurrence of Project Milestone-IV, the Contractor shall have continued with construction of the project components and submitted to the Employer duly and validly prepared Stage Payment Statements for an amount equal to Ninety Five (95) percent of the Contract Price.

6.0 Schedule Completion Date

- 6.1 The Scheduled Completion Date shall occur on the twentieth (20th) month from the date of Letter of Award.
- 6.2 On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

7.0 Extension of time

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Completion Date, as the case may be, under and in accordance with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.

Schedule K - Tests on Completion

(See Clause 12.1.2)

1. Schedule for Tests

- 1.1 The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the EMPLOYER'S Engineer and the EMPLOYER of its intent to subject the Project to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the EMPLOYER'S Engineer and the EMPLOYER detailed inventory and particulars of all works and equipment forming part of Works.
- 1.2 The Contractor shall notify the EMPLOYER'S Engineer of its readiness to subject the Project to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the EMPLOYER'S Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the EMPLOYER who may designate its representative to witness the Tests. The EMPLOYER'S Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule K.

2. Tests

- 2.1 Visual and physical test: The EMPLOYER'S Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include:
- 2.2 Other tests: The EMPLOYER'S Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project with Specifications and Standards.
- 2.3 Environmental audit: The EMPLOYER'S Engineer shall carry out a check to determine conformity of the Project with the environmental requirements set forth in Applicable Laws and Applicable Permits.
- 2.4 Safety Audit: The EMPLOYER'S Engineer shall carry out or cause to be carried out, a safety audit to determine conformity of the Project with the safety requirements and Good Industry Practice.

3. Agency for conducting Tests

All Tests set forth in this Schedule-K shall be conducted by the EMPLOYER'S Engineer or such other agency or person as it may specify in consultation with the EMPLOYER.

4. Completion Certificate

Upon successful completion of Tests, the EMPLOYER'S Engineer shall issue the Completion Certificate in accordance with the provisions of Article 12.

Schedule L - Provisional Certificate

(See Clause 12.2 and 12.4)

1. I,.....(Name of the EMPLOYER'S Engineer), acting as EMPLOYER'S Engineer, under and in accordance with the Agreement dated (the "**Agreement**"), for "Design and Construction of India International Convention & Expo Centre at Sector 25, Dwarka, New Delhi in the State of Delhi through Engineering, Procurement & Construction (EPC) Basis Contract through..... (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project..... with the provisions of the Agreement.

2. Construction Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition, certain minor works are incomplete and these are not likely to cause material inconvenience to the users of the Project..... or other their safety. The contractor has agreed and accepted that as a condition of this Provisional Certificate, it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid punch list.

3. In view of the foregoing, I am satisfied that that Project.....can be safely and reliably placed in service of the users thereof, and in terms of the Agreement, the Projectis hereby provisionally declared fit for entry into operation on this theday of.....20.....

ACCEPTED, SIGNED, SEALED
AND DELIVERED

SIGNED, SEALED AND DELIVERED

For and on behalf of

For and on behalf of

CONTRACTOR by

EMPLOYER'S Engineer by:

(Signature)

(Signature)

COMPLETION CERTIFICATE

1. I,(Name of the EMPLOYER'S Engineer), acting as EMPLOYER'S Engineer, under and in accordance with the Agreement dated(the "**Agreement**"), for " India International Convention & Expo Centre at Sector 25, Dwarka, New Delhi in the State of Delhi under through Engineering, Procurement & Construction (EPC) Basis through.....(Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project.....with the provisions of the Agreement, and I am satisfied that the Project.....can be safely and reliably placed in service of the Users thereof.

2. It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Works have been completed, and the Project Works is hereby declared fit for entry into operation on this the.....day of..... 20.....

SIGNED, SEALED AND DELIVERED

For and on behalf of

EMPLOYER'S Engineer by:

(Signature)

(Name)

(Designation)

(Address)

ATTACHMENT-I: CONTRACTOR DEMOBILIZATION CHECKLIST – EIL CONTRACT CLOSING

(Refer Clause -

DATE_____

PROJECT
OWNER
NAME OF EPC CONTRACTOR
CONTRACT NO.

Activity Description	Signatures with Completion Date		
	Contractor	Employer's Engineer/ Consultant	Employer
Removal of temporary facilities – site office, temporary water / power etc.			
Clearance of site viz. debris construction material, tools & tackles, equipment, etc.			

ATTACHMENT-II: CHECKLIST FOR CONTRACT CLOSING - EIL CONTRACT CLOSING

(Refer Clause -

DATE_____

PROJECT
OWNER
NAME OF EPC CONTRACTOR
CONTRACT NO.

Activity Description	Signatures with Completion Date		
	Contractor	Employer's Engineer/ Consultant	Employer
Final Completion Certificate Issued			
All deficiencies corrected			
Handing over of spares/ surplus materials w.r.t O&M			
As built drawings including drawing index			
O&M Manuals Received			
QC documents submission submitted			
Submission of Statutory / Govt. Bodies approval completed			
Final Documents submission Completed.			
No outstanding claims			
Back charges / recoveries accepted			
Validity of performance BG's Checked and found acceptable			

Schedule M - Payment Reduction for Non Compliance - DELETED

Schedule N - Selection of Employer's Engineer - Deleted

Schedule O - Forms of Payment Statements

(See Clauses 19.4,19.5.1 and 19.8.1)

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

- (a) The estimated amount for the Works executed in accordance with Clause 19.3.1 subsequent to the last claim;
- (b) Deleted
- (c) The estimated amount of each Change of Scope Order executed subsequent to the last claim;
- (d) Amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);
- (e) Total of (a), (b), (c) and (d) above;
- (f) Deductions:
 - (i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
 - (ii) Any amount towards deduction of taxes; and
 - (iii) Total of (i) and (ii) above.
- (g) Net claim: (e) - (f) (iii);
- (h) The amounts received by the Contractor up to the last claim:
 - (i) For the Works executed (excluding Change of Scope orders);
 - (ii) For Change of Scope Orders, and
 - (iii) Any deductions
 - (iv) Taxes deducted

2. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the EMPLOYER.

Schedule P - Insurance

(See Clause 20.1)

1. Insurance during Construction Period

1.1. The Contractor shall effect and maintain at its own cost, from the date of Letter of Award till the date of issue of the last Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) insurance of Works, Plant and Materials and an additional sum of **[15 (fifteen)] per cent** of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage or all risks including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

(b) Insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

1.2 The insurance under paragraph 1.1 (a) and (b) above shall cover the EMPLOYER and the Contractor against all loss or damage from whatsoever cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and arises from a cause occurring prior to the issue of Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

3.1 The Contractor shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Paragraph 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this agreement and occurring before the issue of the Performance Certificate. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.

The insurance cover shall be not less than: Rs. 10 Lakhs per event.

3.2 The insurance shall be extended to cover liability for all loss and damage to the EMPLOYER'S property arising out of the Contractor's performance of this Agreement excluding:

- (a) the EMPLOYER'S right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
- (b) Damage which is and unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the EMPLOYER.

Schedule Q - 3D BIM Requirements

(See Clause 3.1.7 k)

1.0 Introduction

The BIM strategy for ECC Dwarka is to deliver intelligent 3D models and IFC data to be used throughout the lifecycle of the program – from conceptual design through operation and legacy. The reuse and sharing of data across disciplines and the ECC Dwarka site throughout the course of the program will streamline communications, improve design coordination, reduce risk, and improve quality of design. The intelligent 3D models will be used as collaborative tools to facilitate communications, design proofing, constructability reviews, and clash avoidance to reduce errors in the field. The models will be exported into relevant Program Management Delivery System (PMDS) tools of data for quantification and schedule sequencing. The objective of using BIM is to make the design, construction, and operations processes more efficient and eliminate as many uncertainties as possible.

1.1 Project Objective

- DMIC mandates the use of advanced computer based dynamic 3D-model driven approach for the detailed planning, design, engineering, construction and operation of the ECC. Dwarka to allow simulation, visualization and engineering analysis of all Buildings, utilities, civil works and geospatial infrastructures.
- This includes an aggregate dynamic 3D Building Information Model (BIM) for all infrastructural developments, including buildings, utilities etc. 3D infrastructure modelling tools shall be used to develop and produce project models and simulations as required for submittals.
- The 3D infrastructure Information Models are to be used throughout the design, construction and operational life-cycle of the asset, including but not limited to for system collision detections, materials quantification, construction sequencing and carbon impact analysis.
- 3D infrastructure models use shall be maximized for project reviews, decision support, design analysis, and quality assurance during all phases of this program.

2.0 General

2.1 Purpose

- 2.1.1 The purpose of the 3D Building Information Modelling (BIM) requirements describes the use of computer aided design (CAD) and building information modelling (BIM) for the work under the Contract.
 - 2.1.2 These requirements shall be used as a reference for the Design & Build Contractor to develop specific Work Package BIM Execution Plan (BEP) that shall detail the specific CAD/BIM software used within the Work Package to control the specific BIM and CAD process. The outputs from this process will be CAD drawings and 3D models in a form of native files, non - graphical data such as COBie spreadsheet referenced with the document and PDF'S that will be input to the Project Management Information System (PMIS) system for distribution.
- i. BEPs establish the methodology for managing the production, distribution and quality of the design information generated by CAD, GIS and BIM systems, using a disciplined process for collaboration and a specified file and model naming policy.

2.2 Scope

2.2.1 This BIM requirements documents outlines the roles and responsibilities that are necessary for a successful collaborative 3D Building Information Modelling (BIM) approach

- i. The PMIS and Common Data Environment (CDE) setup by the PMNC are mandated for the structure and the controlled sharing of the building information with known provenance and status in a multi-disciplinary environment.
- ii. Contractor's BEPs are required to control the production and coordination of the design information within each Works Package

b. Standards and Specifications Reference for Design

2.3.1 In order to establish a consistent approach to collaboration, the Contractor shall refer with the Standards and Specifications for Drawing and Modelling as given below.

Sr	Description	Code/Document No.
1	BS 1192:2007 Collaborative production of architectural, engineering and construction information.	BS 1192:2007
2	BS 7000-4:1996A Design management System.	BS 7000-4:1996A
3	PAS 1192-2:2013. Specification for information management for the capital/delivery phase of construction projects.	PAS 1192-2:2013
4	PAS 1192-3:2014 Specification for information management for the operational phase of assets using building information modelling.	PAS 1192-3:2014
5	BS 1192-4: 2014 Collaborative production of information.	BS 1192—4:2014
6	PAS 1192- 5: Specification for security-minded building information management, digital built environments and smart asset management.	PAS 1192-5
7	Classification : Uniclass 2 : classification system for structuring Information.	Uniclass 2
8	CAD Symbols (Singapore Standard Code of Practice for Construction Computer Aided Design (CAD).	CP 83

2.4 BIM Use

i. BIM uses that have been established as required thus far are:

BIM Uses	Description/Comments
Existing Conditions Modelling	This will require the gathering of existing conditions information from a range of sources, and validating the quality, accuracy and reliability of that information for use on the project. The physical extent of what is needed to be modelled is to be determined, based on location, physical/spatial/visual relationship and potential impact on the project. Areas or elements identified as posing risk to the project should be communicated clearly to inform future risk mitigation efforts. In the absence of anything better, a default standard will be used to achieve this.
Site Analysis	The site context should be understood thoroughly and acknowledged within the design, accounting for factors that may impact on Siting/position of proposed construction works, such as interfaces with existing structure or services, vistas, nearby land use, hydraulic analysis, geotech and topographic conditions, site access/egress issues, traffic flows, other infrastructure and so on.
Design Authoring	A process in which software is used to develop a Building Information Model based on criteria important to the communication of the building's design. Two types of software applications are core to the BIM-based design process: design authoring tools and audit and analysis tools. Authoring tools are used to create models while audit and analysis tools draw from or enhance the richness of information in a model. Most audit and analysis tools can be used for Design Reviews and Engineering Analysis BIM Uses. Design authoring tools are required in the first instance, and employ a powerful database of properties, quantities, means and methods, costs and schedules.
Design Visualization	The BIM can be used to generate rendered images, animated fly-through and read-only versions of the model as requested by the Client (with due notice) to support effective communication of the design intent of building. This is critical for stakeholder engagement at a number of levels and project stages.

<p>Interference Detection</p>	<p>General coordination will take place during early design via visual inspection and design coordination workshops. In particular, coordination efforts will be applied to key pinch points, such as cores, risers, plenum spaces, and plant areas. Aggregation/intensity of interferences detected will further inform priority zones and element types. Late in the design process, and particularly for preconstruction planning (during early construction stage), interference severity criteria will be defined and interference rules configured that will support element-level coordination. Good interference rule definitions will be key to avoiding ‘false positives’ and ensuring efforts are spent on eliminating real issues.</p>
<p>Design Review</p>	<p>A process in which stakeholders interrogate and interact with a 3D model to validate various design criteria. These may include evaluating the ability to meet the program, previewing spatial or visual relationships in a virtual environment, layout, sightlines, lighting, security, ergonomics, acoustics, textures and colours, etc. This BIM use can be achieved with the BIM software, a computer and display, and someone to ‘drive’ the model.</p>
<p>Planning of Construction Scheduling and Sequencing</p>	<p>This focuses on planning or staging and sequencing of major works, predominantly for stakeholder communication and buy-in, in order demonstrate that the design is buildable. The contractor shall adhere to employers preferred systems on the construction methodology to be employed, and would be responsible for modelling and communicating this as part of their work. Typically this is something that engineers are able to provide (as part of validating design approach), though for actual works by the contractor, the contractor will be responsible.</p>
<p>Record Modelling</p>	<p>This entails updating the project federated model to represent an as-built record of the as-constructed works. The basis for the model updates is currently sketches and other records provided by the contractor to the design team during construction. The precise level and method of field verification that is to occur is yet to be determined.</p>

2.5 Definitions

2.5.1 The following terms are specific to the BIM requirements.

- a) 3D Building Information Modelling and Management (BIM) - The managed approach to the collection and exploitation of information across the life cycle of a built environment asset. At its heart are computer generated 3D and 2D models containing all graphical and tabular information about the design, construction and operation of the asset.
- b) BIM Execution Plan (BEP) - The BIM Execution Plan (BEP) is to be submitted to address the issues raised in Design stage BEP and then with more detail post-contract award to explain the contractor's methodology for delivering the project using BIM
- c) BS1192 - Collaborative production of architectural, engineering and construction information. Code of practice
- d) Project Management Information System (PMIS) - A Common data environment (CDE) - a single source of engineering information for the project. It is used to collect, manage and disseminate all relevant approved project documents.
- e) ECM (Engineering Content Management) - Set of hardware/software and processes that control the engineering content of CAD models and drawings together with their versions within the constraints of the PMIS.
- f) Geospatial System - Name or description of the system of spatial referencing by coordinates used for geographical information.
- g) COBIE - Construction-Operations Building Information Exchange - a standard spreadsheet data format that controls the transition of as built data into operations and maintenance.
- h) Uniclass - Unified classifications for the construction industry
- i) Workspace - a predefined folder structure containing configuration and content relevant to the specific application.
- j) Master Document Index (MDI) - a list of agreed model file and drawing deliverables produced by the Contractor against agreed milestones.
- k) 2D/3D Model - A design model with entities having two/three—dimensional properties which are coordinated to the agreed geospatial reference system.
- l) Model composite - a model file containing multiple references of 2D/3D models coordinated using a common geospatial reference system to form a complete model representation of the information
- m) Model extraction - a 2D model file containing elements generated from an external 3D model, usually in the form of sections, elevations and plans. Can contain graphical or non-graphical content.
- n) Model files (MD2/MD3) - Native CAD files that can be in the form of a 2D or 3D model.

- o) Model rendition (MDR) - Output from a model file, model renditions provide static 'snap-shots' in a form that enables the information to be viewed, printed and marked up.
- p) Output file - a generated rendition of graphical or non— graphical information (a plan, section, elevation, schedule, table or other View of a project).
- q) Model view - The view within CAD files which contains entities or reference files using real - world coordinates.
- r) Originator - the author of models, drawing and documents.
- s) Production drawing - an immutable electronic plot (PDF) produced from a drawing definition, having received all necessary reviews prior to issue.
- t) Zone - A manageable spatial 2D or 3D subdivision of a model allowing more than one person to work on the model, floor plan or staircase etc. at a time. Each zone is a reference file and when all references are viewed in a 'model composite' the full model shall be represented.
- u) Status - Defines the 'fitness' of information in a model, drawing or document.
- v) WIP - Work In Progress: each individual company or discipline's own work. This is information that has not been issued or shared with other parties. Refer to B81192.
- w) Shared - Information that has been reviewed and is available to other parties. Refer to BS 1192.
- x) Published - Documents and other data output from Shared information. Typically this shall include contract drawings, reports and specifications but can also include information for data exchange between BIM software, such as Land XML, IFC files. Refer to BS 1192.
- y) Component - an individual building element that can be reused. Examples include doors, stair cores, furniture or internal room layouts, facade panels, etc. Components are typically inserted and moved/rotated into the required position.
- z) Assembly - A composition or collection of components and/or modelled elements arranged to define part or all of a building model, structure or site. An assembly typically contains information that can be referenced without repositioning.
- aa) Container - an optional 'parent' repository which can be used to compile assemblies and components for specific purposes including export and publication.
A Container can exist for each individual profession/discipline or for multiple disciplines, for buildings or for a complete project.
- bb) Layer/Level - Attribute given to entities within CAD files that enables their visibility to be controlled. Further values may be assigned to the attribute to control whether it can be edited or deleted
- cc) IFC - Industry Foundation Class is a neutral and open specification file format. The data model facilitates interoperability between object based software platforms.

dd) Development and Transportation Industries

LandXML - LandXML is a specialized XML data file format containing civil engineering and survey measurement data commonly used in the Land

2.5.2 Responsibility

- a) A structured BIM approach to the production of all required design and as built data and information for these Works under the Contract, modelled on BS 1192 Collaborative production of architectural, engineering and construction information; Code of practice including BIM quality checklist;
- b) Evidence that an all discipline integration, coordination and resolution process has taken place in a collaborative 3D object orientated CDE, the outputs of which meet or better the Employer's Requirements;
- c) A uniform and interoperable software/hardware platform across the entire Work Package, in that any software used shall be consistent with the principles of the sharing of multi-disciplinary object data in a CDE; That data shall include geometry and object attributes;
- d) Compatibility between software and hardware platforms, including processes for any interfaces with other Work Packages, as to ensure seamless integration at all areas of overlap;
- e) An Engineering Content Management System (ECM) which shall be configured to the CDE workflows consistent with those set out in BS 1192 and integrate with Employers PMIS
- f) As-built drawings.
- g) The data sets shall include all plot composition files and associated references, all models and associated references, all associated object and attribute data in mandated format; All renditions of the above (PDFs) all as listed in the Master Document Index (MDI);
- h) A copy of the database from the ECM system and its files store;
- i) All data in a structured (Level/Layer/Filename) format should be consistent.
- j) AEC Uniclass.
- k) All As—Built data in a structured (format) consistent with the Construction Operations Building Information Exchange (COBie) format;
- l) Suitability trained personnel with the appropriate capabilities to execute the specific roles and responsibilities as outlined this BIM requirements , CAD and GIS manuals contains herein;

2.5.2 The Engineer's BIM Manager

- a) Defines the Program BIM requirement;
- b) Ensures the BIM process serves the engineering and business requirement during the design and build phase of the works;

- c) Ensures that data schema declared for the program serves the engineering requirements of the design and build phase of the Works;
- d) Ensures industry best practice is utilized for the BIM implementation and to facilitate the transition of design and as built data into operational data and information for ECC Dwarka.
- e) Ensures seamless integration with other adjoining/other relevant contract work packages.

2.5.3 The Contractor's BIM Manager

- a) Produces a general BIM implementation plan for their Specific Works package, together with the Contractor's Design Coordination Manager, containing:
 - i. Statements on how the work packages shall be zoned, the level of BIM resolution required in what zones, the number of specific discipline models that will be included what level of detail each of these models shall achieve for each stage for the design and build workflow.
 - ii. Statements on the level of program integration and construction sequencing with the BIM model.
 - iii. Statements on how the interface with other Works packages shall be achieved and managed.
- b) Ensures the Contractors BIM systems are providing the tools, process is centered on the delivery of structured, coordinated and accurate information.
- c) Ensure that all CAD, BIM data is compatible consistent and accurate and all BIM processes are compliant with BS 1192
- d) Ensures the Contractors BIM processes serves the engineering and business requirement of managing multi-discipline collaborative workflows, CAD QA, Clash resolution, program linkage and construction sequencing.
- e) Coordinates the project needs for IT solutions
- f) Coordinates the agreed project BEPs and updates to the BEPS
- g) Ensures compliance with those standards and methods.
- h) Shall be responsible for resolution of all interdisciplinary/other contract work packages and interface resolution.

2.5.4 The Contractor's Information Manager

- a) Provides the focal point for all file and document management issues in the project.
- b) Ensures that all information is compliant with standards and that each model or file has been signed off 'fit for purpose'.

2.5.5 Contractor's Lead Designer

- a) Manages the design, including information development and approvals.
- b) Confirms the design deliverables of the design team, establishes the zone strategy and ownership.
- c) Signs and approves the documentation for detail design coordination on and prior to passing to 'shared'. Ref BS 1192 workflow.

2.5.6 Contractor's CAD Manager

- a) Ensure that all CAD models and drawings are delivered to the ECC Dwarka use agreed IT solutions, and are according to the agreed project requirements.
- b) Ensure that all object attribute data is structured and is compliant with the project SMPs Ref B81192. This role should be responsible to the Contractor's BIM Manager.
- c) Completion of a table of names assigned to the roles described above and submits it to the client as a reference document.

2.6 Engineering Content Management (ECM) System

- 2.6.1 The Contractor shall produce ECM system information sufficiently detailed to produce traditional drawings or documents as views of multi—authored data.
- 2.6.2 The Contractor shall develop and utilize a suitable ECM system that allows for a suitable permissions matrix, workflow, referencing, version control, process and information hierarchy that is consistent with the principles of the CDE for all models and drawings.
- 2.6.3 The Contractor shall provide access to the ECM system for the Engineer.

3.0 BIM Modelling

3.1 Model file production principles

- 3.1.1 All model files shall be created at 1:1 scale.
- 3.1.2 All design and construction information shall be modelled as a single discipline model and coordinated in 3D in the composite model, using object based software, allowing for 2D drawings to be extracted as required.
- 3.1.3 All single discipline models shall be shared throughout the CDE. Clash detection and resolution process shall be run in this composite area. All 3D model data together with all 2D drawing extractions shall be spatially coordinated with the Geospatial System.
- 3.1.4 Model file composition.
- 3.1.5 Model files shall be generated using seed files, as prescribed in the Contractor's Work Package BEP.
- 3.1.6 All graphical elements shall be placed in the model View.

- 3.1.7 Model files shall have a title box placed in the sheet View.
- 3.1.8 Modelling shall be done to appropriate LOD (Level of Detailing) and LOI (Level of Information) to facilitate various outputs required out of BIM implementation exercise. For example; for coordinated Shop drawings (LOD 450 – LOD 500) etc. Please refer AIA (American Institute of Architects) and BIM Forum: Level of Specification document, version - 2016 for further details.

3.2 Coordinates

- 3.2.1 A common coordinate system for all BIM data and adopt it consistently for all Models.

3.3 Data Segregation (Zoning)

- 3.3.1 Each structure/Utility/Infrastructure shall be created in one file.
- 3.3.2 The BIM software in use will have a major impact on how the model is to be broken down, but in all cases sub-division is required to maintain workable files using appropriate hardware.

3.4 Planning the Work & Data Segregation:

- 3.4.1 The supply chain shall agree, adopt and maintain a BIM Strategy focusing on the following project-specific processes as a minimum:

- Model Management
- Zones and Areas
- Naming Conventions
- Publishing processes

- 3.4.2 Site Information: Minimum site information will as a digital default shall include:

- Site Name
- Site Status
- Land Area (Ha)
- Site Grouping
- Address including Postcode
- GIA of proposed asset(s)
- Site Cross Reference

- 3.4.3 Floor Data: All floor layouts will include the following minimum digital data set as a default

- Site Code
- Block No
- Floor Level
- Floor Code
- Floor Description
- GIA (m2)

3.4.4 Room Data: All rooms will include the following minimum digital data set as a default:

- Site Code
- Block No
- Floor Level
- Room Number
- Zone Name
- Room Description
- Room Area (m2)
- Space Utilization
- Functional Suitability
- Quality Room Height (m)
- Volume

3.4.5 Asset data will be provided for the client CAFM and AMS Systems as attributes of objects in the model with the following criteria:

Attribute Field	3D Model Generated Code.
GUIDE	
Building Name/Description	
Asset Template Name	
Asset Template Code	
Local Name/Description	Enter with a relevant name for the asset as it could be identified on site (e. g. West AHU No 1). This is the name defined in the design process.
Quantity	In the case of individual assets created this will be one.
	In the case of "grouped" assets it will be the count of the assets. e.g. Fire Extinguishers; Fire Hose Reels; Lighting; Emergency Lighting; FCUs; Eye Bolts. These are multi selected when defined in the Models.
Manufacturer	The manufacturers name.
Model	The model or reference of the asset.
Serial NO'	The asset serial number, this typically is added to the model late in the procurement and installation process and lends itself to being carried out via export, data entry and re-import. Where not applicable state N/A.
Floor/Level	The Level of the building or building zone.
Position	Detailed description of location.
Non-graphical attributes in an agreed digital format for:	Operating instructions
	Maintenance instructions
	Fault finding instructions
	Commissioning instructions
	Working life expectancy of the asset including cost, remaining life etc. on sub elements e. g. windows, doors, sanitary ware etc.,
	Commissioning dates and data
	Health and safety file
	Regular statutory tests
	Specification and cleaning regime — finishes and fittings, furniture and equipment
	Building level life cycle information Warranty information on sub elements (installed date, start and end dates)
	Schedule of information on maintainable assets (site, building, floor, department and room levels) for PPM Scheduling
	Schedule of information on maintainable systems e.g. security, access control etc., (site, building, floor, department and room levels) for PPM Scheduling
	Fuel supply and storage arrangements (site and building level)
	Power consumption information
Maintenance information on restricted access features e.g. high ledges, glazing etc.	

3.5 Model outputs

3.5.1 Within the CDE the central premise is that only approved data is shared. Each discipline WIP area can only reference data from the shared area. i.e. approved data. When this data comes together in the composite model it can be fully coordinated and composite renditions can be produced, for example in 3D pdf format.

3.6 Model Reviews

3.6.1 The Contractor shall ensure that the level of complexity and granularity for each discipline CAD/BIM model is appropriate for the stage of Works. Appropriate and required Level of detailing (LOD) and Level of Information (LOI).

3.6.2 The Contractor shall ensure that all disciplines integrate and coordinate their outputs in terms of both spatial and functional provision. This shall be demonstrated through the extensive use of coordinated design review sessions which shall include for the coming together of all relevant discipline models into a common master model (model composite) where engineering assurance and coordination checks shall take place.

3.7 Level of detail/Model Progression for the RIM Models

Project Stage	Model Description\ Details
Detail Design	<p>A more detailed version of the generalized building component or system with accurate dimensions, shape, location, orientation and quantity. Non- geometric information may be attached to the model elements.</p> <p>The Model Element is graphically represented within the Model as a design-specified system, object or assembly and associated components having accurate quantity, size, shape, location and orientation. Interfaces with other building elements and systems have been identified and coordinated; approximate allowances for spacing and clearances required for all specified supports; actual access/code clearance requirements modelled.</p>
Final Design	<p>Parameters required for procurement, including specification, materials and performance criteria are attached to the Model Element. Model elements are uniquely tagged.</p>
Pre- construction	<p>The Model Element is graphically represented within the Model as a design - specified system, object or assembly and associated components E. having accurate quantity, size, shape, location and orientation. Interfaces with other building elements and systems have been identified and , coordinated; approximate allowances for spacing and clearances required I' for all Specified supports; actual access/code clearance requirements modelled. Parameters required for procurement, including specification, materials and performance criteria are attached to the Model element. Model Elements are uniquely tagged.</p>

Construction	The Model Element is graphically represented within the Model as a specific system, object or assembly having accurate size, shape, location, quantity, and orientation suitable for construction, fabrication and installation. Required non-graphic detailing, fabrication, assembly, and installation information is attached to the Model Element.
As- Built	The Model Element is a field verified representation with actual installed and accurate size, shape, location, quantity, and orientation. Non-graphic information as installed and required for operation and maintenance is attached to the Model Elements.

3.7.1

<u>Analysis</u>	<u>Cost Estimation</u>	<u>Schedule</u>	<u>Coordination</u>
The Model Element may be analyzed for performance of selected systems by application of specific performance criteria assigned to the representative Model Element.	The Model Element maybe used to develop cost estimates suitable for procurement based on the specific data provided.	The Model Element may be used to show ordered, time-scaled appearance of detailed elements and systems.	The Model Element may be used to be used for specific coordination with other model . elements in terms of its size , location and clearance to other model elements including general operational issues

3.8 Component Grade

3.8.1 In order to produce information to the required scale, as with 2D CAD files, additional detail shall be created in separate model files. Where a Component is being used for multiple instances of the same object, the component shall (at the Contractor's discretion) be created in three 'grades': low, medium and high resolution. Modelling in this way allows easier component management and simple 'swapping' of the grades should additional, or less detail be required. It also ensures the most efficient use of PC processing power at any particular stage. The Contractors Work Package BIM strategy document shall address the naming conventions for components, component grades, types, parameters, materials, etc. and the quality assurance and filing of such elements. It shall give guidance on using downloaded content.

3.9 Existing Infrastructure data sets

3.9.1 Employer shall share available existing data sets and models for contractor as reference.

3.9.2 Contractor shall be liable for validating the models before utilizing/enhancing them further.

3.9.3 The existing infrastructure and systems shall be modelled in sufficient detail as to provide integration with the Works under the Contract.

3.9.5 Unresolved areas of non-coordination in structure/services/finishes/clashes shall be clearly highlighted on the drawings and the model at all times. Provenance of all referenced data sets shall be explicitly declared on all relevant models and subsequent drawings.

3.9.6 Any discrepancies with the data shall be reported back to the employer for their action.

3.10 4D&5D

3.10.1 The contractor shall take full advantage of the 3D object attributes available in the BIM environment to prove cost, constructional logic, fabrication and program as required by the employer.

3.11 Coordination and integration - drawing packages

3.11.1 Within the BIM environment each of the disciplines shall reference other models in a timely manner for coordination purposes. The head of each discipline group shall decide the extent and nature of supporting discipline data that shall be displayed in each of their own discipline drawing submissions. Clash detection software routine shall be run on the multi-discipline model and on combined master models and any clashes resolved. The reports of which will be submitted on request of the Engineer.

3.11.2 Specific drawing packages are required from each discipline. The drawings shall comprise of 2D extractions of the 3D design models from the CDE. These include, but not limited to the examples below.

A) Buildings

I. Architectural

II. Structural

III. Mechanical

IV. Electrical

V. Building Services

B) Combined Services Drawings (CSDs) on Structural/Civil/ Architectural backgrounds:

C) CSDs covering the main installations including closed circuit television (CCTV), power, fire systems, ventilation, lighting, and public address (PA), communications and signage. These shall be submitted in logical readable packages.

D) Plan and Profile drawing extractions of linear infrastructure

E) General Arrangement Drawings

3.11.3 All CAD drawings shall be comprised of 2D models extracted from the 3D master model. Any subsequent design scheme changes that are required to be fully coordinated shall be modelled in 3D and the drawing extraction re-run to produce revised plots.

3.11.4 All plot composition files shall be checked as prescribed by the workflow setup in the CDE before submission to the Engineer.

3.11.5 The contractor shall carry out transfer of digital model files in mutually agreed conditions with the employer as per the protect management requirement.

3.12 Deliverables

3.12.1 The number and extent of the design & build submissions shall be detailed by the Contractor in the MDI, which shall form part of the Contractor's BEP.

3.12.2 All native design/analysis models shall be listed and submitted in MDI

3.12.3 All CAD drawings submission shall have the original plot composition files containing all extractions.

3.12.4 All CAD drawings submissions shall have a simplified standalone 2D vector plot composition file.

3.12.5 All CAD drawings submissions shall have a corresponding PDF.

3.12.6 All CAD drawings submission shall have their provenance shown on the plot, i.e. the references, extractions, model revision used to generate plot.

3.12.7 All database and file store data from the Contractor's ECM system and all flat 2D drawings should be cut from the models.

3.12.8 BIM Deliverables:

- Site Model
- Massing Model
- Civil and Infrastructure models
- Architectural Model
 - o For regulatory submissions
 - o For coordination and / or clash detection analysis
 - o For Visualization
 - o For cost estimation
- Schedule (material, time etc.) and phasing program (in BIM or spreadsheet)
- Construction and fabrication models
- Shop drawings
- As-built model (in native proprietary or open formats and IFC)
- Data for facility management
- Simulation Models
- Other additional value added BIM services

3.12.9 To support the development of a Project Information Model (PIM) and Asset Information Model (AIM) at handover the information exchange formats will include the following information from the same data set in a commonly accessible electronic formats:

- 2D portable format document drawings (.dwg and .pdf) cut from the native Model(s)
- The native Model(s)
- The model(s) in IFC format
- Program files .mpp

- Text files (.doc and .pdi) for specification and all other tender docs

3.13 Master Document Index (drawing and model register)

3.13.1 The Contractor shall provide a MDI at the start of the Works that shall list all the ‘file identifiers’ for models and drawings that are needed, along with their delivery dates and intermediate milestones. The following document properties (metadata) shall be included:

- A. Company Code
- B. Project Code
- C. Design Stage
- D. Discipline Code
- E. Level
- F. Location
- G. Drawing Type
- H. Revision

3.13.2 All CAD models and drawings shall be compiled in a MDI (spreadsheet) by the Contractor prior to commencement of work. It shall list out all models and drawings to be submitted at each of the design stages.

3.13.3 The CAD MDI shall be used as the basis of and be maintained by means of the drawing register.

3.13.4 The contractor shall follow the drawing and document numbering system as per the Document management system details that will be provided by employer/ PMC to them.

4.0 Recommended Software Requirement

Discipline	Function	Software	Version	Operating System
Engineering/ Architectural Design Tools	3D BIM modelling for Buildings	Autodesk Revit	Latest	Windows 7 64 Bit recommended
Engineering/ Architectural Design Tools	Project review and coordination 4D construction/ 5D Schedule Simulation 3D BIM and GIS integration/coordination	Autodesk Navisworks Manage	Latest	
		Solibri	Latest	
		Autodesk Infracore	Latest	
		Bentley Microstation	Latest	
Publishing	Publish read only single file containing graphical and non-graphical attribute information for multi discipline BIM models	i-model Plug-in's For Revit For Adobe (Reader)	Latest	
Viewers/ Review	3D/2D Models, drawings and Maps	Revizto	Latest	
		Adobe Acrobat reader	Latest	
	3D/2D Models, drawings	Autodesk DWG True View	Latest	
		Bentley View	Latest	
Project Collaboration	Project Management	Proliance	Latest	
	Project Execution	Bentley Project Wise	Latest	

Schedule R - Guideline for Health, Safety and Environment Plan

(See Clause 3.1.7(l))

The Contractor shall prepare and submit a project specific Health, Safety and Environment plan based on the Guidelines for Health, Safety & Environment given below within 30 days of the date of Letter of Award.

1.0 Introduction

1.1 Purpose

The purpose of this Manual for Health, Safety & Environment is to establish uniform policies and procedures that will be used by Employer for implementation of technical and administrative tasks for construction contract in IICC Project at Dwarka. This manual is a guideline document for implementation of construction activities in the project. Construction Company working in IICC Dwarka project is responsible for implementing the manual in their respective projects.

This manual is not intended to be a step-by-step procedure for each activity. It is a document that outlines general activities, procedures, and requirements for the entire project throughout the construction phase of project. These procedures must always be read and implemented in conjunction with the related Contract Conditions.

1.2 Scope

This Manual for Health, Safety & Environment is prepared to uniformly direct and control activities during the construction of IICC Dwarka projects. The Contractors & Sub Contractors, their staff and Engineers working on IICC Dwarka projects are required to know specification requirements for their contracted work as issued by the Employer. This manual is designed to cover most issues involved in a large construction project. The size, scope, and technical complexity of the contract shall determine the relevant procedures specified in the manual.

2.0 Safety, Health & Environment (SH&E) Management Plan

2.1 Objective

Objective of this document is to define the principal requirements of the Employer on Safety, Health and Environment (SH&E) associated with the contractor / sub-contractor and any other agency to be practiced during mobilization, unloading, transportation, assembly/erection/construction, testing and commissioning of systems and all other allied works towards the execution of IICC Dwarka Phase - I. The objective of these guidelines is to ensure that adequate precautions are taken to avoid accidents, occupational health and harmful effects on the environment during any operation in IICC Dwarka project.

2.2 Application of this document

This document applies to all aspects of the contractor's scope of work, including all aspects conducted by sub-contractors and all other agencies. There shall be no activity associated to the contract carried out in under IICC Dwarka project, which is exempted from the purview of this document.

This document:

- Describes the SH&E interfaces between Employer and the Contractor.
- Details the processes by which the Contractor shall manage SH&E issues while carrying out the work under the contract.
- Describes by reference, the practices and procedures as given in the COMPANY Project Safety, Health & Environment manual for best SH&E performance.

These requirements shall be read in conjunction with Schedule-R, OHSAS 18001-1999, Occupational Health and Safety Management System and ISO 14001: 2004 Environmental Management Systems. The contractor shall define key terms used in these requirements related to OHSAS 18001 and ISO 14001 standards in their Project SH&E Manual.

2.3 ‘SH&E’ Targets and Goals

The SH&E targets, goals and aim for the Works are to achieve:

- Zero total recordable injuries.
- Zero reportable environmental incidents.
- All personnel inducted in accordance with the approved contractor SH&E plan.
- Total compliance of conducting inspections and audits as per approved SH&E plan.
- 100% incident recording and reporting.
- 100% adherence of usage of appropriate PPEs at work.
- Executing construction work with least disturbance to the environment, adjoining road users and traffic.

2.4 SH&E Compliance

2.4.1 Memorandum of Understanding (MOU)

A Memorandum of Understanding placed at **Appendix No.: 1** shall be signed before the award of contract by the contractor with regard to various provisions on Safety, Health and Environment to be practiced during the works carried out in IICC Dwarka.

2.4.2 Employer’s SH&E Policy and Management Systems

The construction works shall be undertaken in accordance with Employer’s SH&E Policy and Management Systems as amended from time to time provided in Project.

3.0 SH&E Manual

3.1.1 Indian statutory requirements

3.1.1 Primary statutory regulations

- Contractor shall develop thorough understanding about the required legal requirements and compliances on safety, health and environment in general and Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996, Central Rules 1998, Building and Other Construction Workers' Welfare Cess Act, 1996 and Central Rules, 1998 in particular, not only to satisfy the Inspectors' perspective but the use of legislation as the strong tool for effective SH&E management at construction worksites. Contractor is strongly advised to practice the principle of voluntary compliance.
- In order to facilitate the contractor for better understanding on the various provisions of the above Act and Rules, a tabulated information highlighting the Sections/Rules referring to the corresponding registration of contractors, maintenance of registers and records, hours of work and wages, welfare, medical facilities and safety requirements are given in the document. It is an indicative one and not a limiting list.
- In addition, the works shall be undertaken in accordance with all applicable legislation and Indian statutory requirements listed below and their latest amendment but not limiting to:
 - i. Indian Electricity Act 2003 and Rules 1956.
 - ii. Factories Act, 1948, Central Rules and Delhi NCR Factories Rules.
 - iii. Motor Vehicles Act as amended in 1994 and The Central Motor Vehicles Rules, 1989, and – Delhi State Motor Vehicles Rules as amended from time to time.
 - iv. The Petroleum Act, 1934 and Rules 1976.
 - v. Gas Cylinder Rules, 2003.
 - vi. Indian Explosives Act. 1884, along with the Explosives substance Act 1908 and the Explosives Rules 1983.
 - vii. The (Indian) Boilers Act, 1923.
 - viii. The Public Liability Insurance Act 1991 and Rules 1991.
 - ix. Minimum Wages Act, 1948 and Rules 1950.
 - x. Contract Labour Act (Regulation and Abolition), 1970 and Central Rules 1971.
 - xi. Delhi Building and Other Construction Workers Act
 - xii. Child Labour (Prohibitions & Regulations) Act, 1986 and Rules 1950.
 - xiii. Environment Protection Act, 1986 and Rules 1986.
 - xiv. Air (Prevention and control of Pollution) Act, 1981.

- xv. Water (Prevention and Control of Pollution) Act, 1974.
- xvi. The Noise Pollution (Regulation & Control) Rules, 2000.
- xvii. Notification on Control of Noise from Diesel Generator (DG) sets, 2002.
- xviii. Recycled Plastic Usage Rules, 1998.
- xviii. Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989.
- xix. The Hazardous Waste (Management & Handling) Rules, 1989.
- xx. Hazardous Waste Management Rules 1989 (as amended in 1999).
- xxi. Batteries (Management and Handling) Rules.

3.1.2 Workman Compensation Act, 1923 along with allied Rules

- The contractor shall ensure that all his employees / workmen are covered under ‘Workmen Compensation Act’ and shall pay compensation to his workmen as and when the eventuality for the same arises.
- Notwithstanding the above Act/Rules, there is nothing in those to exempt the contractor from the purview of any other Act or Rule in Republic of India for the safety of men and materials.
- If the requirements stated in this document are less stringent than or in conflict with the country’s applicable legislation, the latter shall apply.

3.2 International Standards, Guidelines & ISO Certifications

The works should be undertaken in accordance with the applicable international guidelines, standards and specifications on SH&E and every contract shall aim to achieve international certifications listed below during the currency of the contract:

- OHSAS 18001-1999: Occupational Health and Safety Management System.
- ISO 14001-2004: Environmental Management Systems.

The process of certification shall start immediately after the award of the work and complete within reasonable minimum time. Towards this, the contractor shall undertake the required steps for obtaining the certification on Occupational Health and Safety Management System and Environment Management System.

In case of contractors along with the joint venture partners, who possess a valid certification of either ISO 14001 or OHSAS 18001 or both shall include COMPANY contract in their immediate following surveillance audit which normally takes place once in 6 months from the date of certification and conduct the audit. The required documentation shall be undertaken with the help of the ISO consultant. If the same can be done in-house the same shall be demonstrated to the Employer. If any of the JV partners do not possess the ISO 14001 or OHSAS 18001 certification then the COMPANY contract shall obtain a fresh certification.

In case of failure on the part of the contractor, the Employer at the cost of the contractor shall do the same.

4.0 Risk Assessment and Method Statements

Risk Assessment shall be conducted by the contractor for all works to decide on priorities and to set objectives for eliminating hazards and reducing risks.

4.1 The Risk Assessment Process

The following elements shall be considered during the assessment process, but not limited to:

- i. hazard identification
- ii. persons at risk
- iii. evaluation of risk level
- iv. risk controls (existing and additional)
- v. record of risk assessment findings
- vi. monitoring and review

4.1.1 Hazard Identification

A critical observation/study of the structure/process/site under consideration by the risk assessment team is an essential part of hazard identification as is consultation with the relevant section of the workforce. It is important that unsafe conditions are not confused with hazards, during hazard identification.

4.1.2 Person(s) at Risk

On a construction/erecting/fabrication area, the persons at risk could be site operatives, surveyors, transport drivers, other visitors and the general public. The risk assessment must include any additional controls required due to the vulnerability of any of these groups, perhaps caused by inexperience or disability.

4.1.3 Evaluation of Risk Level

The purpose of the risk assessment, therefore, is to reduce the remaining risk after taking into consideration of risks already addressed. This is called the residual risk.

The goal of risk assessment is to reduce all residual risks to as low a level as reasonably practicable. In a relatively complex workplace, this shall take time so that a system of ranking risk is required – the higher the risk level the sooner it must be addressed and controlled. For most situations, a qualitative risk assessment shall be perfectly adequate. For all high risk activities a quantitative risk assessment shall be conducted to quantify the risk level in terms of the likelihood of an incident and its subsequent severity. Clearly the higher the likelihood and severity, the higher the risk will be. The likelihood depends on such factors as the control measures in place, the frequency the exposure to the hazard and the category of person exposed to the hazard. The severity will depend on the magnitude of the hazard (e.g. voltage, toxicity etc.).

4.1.4 Risk Control Measures

The next stage in the risk assessment is the control of the risk. Hierarchy of Risk Control

When assessing the adequacy of existing controls or introducing new controls, a hierarchy of risk controls should be considered. The principles are:

- i. avoiding risks
- ii. evaluating the risks which cannot be avoided
- iii. combating the risks at source
- iv. adapting the work to the individual, especially as regards the design of the workplace, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a predetermined work – rate and to reducing their effects on health
- v. adapting to technical progress
- vi. replacing the dangerous by the non-dangerous or the less dangerous
- vii. developing a coherent overall prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors relating to the working environment
- viii. giving collective protective measures priority over individual protective measures and
- ix. giving appropriate instruction to employees.

· In addition to the above the following principles shall also to be employed:

- i. eliminating
- ii. substitution
- iii. engineering controls (e.g. isolation, insulation and ventilation)
- iv. reduced or limited time exposure
- v. good housekeeping
- vi. safe systems of work
 - a) Method Statement
 - b) Permit to work
 - i. training and information
 - ii. personal protective equipment

- iii. welfare
- iv. monitoring and supervision
- v. reviews

Method Statement

- The method statement should take into account the conclusions of risk assessments made under the Management, Control of Substances Hazardous to Health and the Manual Handling Operations Regulations.
- As a mandatory rule, if potentially hazardous activities are to be undertaken then method statements should be prepared.
- Typical work which shall require method statements includes:
 - i. work at height
 - ii. work in deep excavation
 - iii. erection and dismantling of scaffolding, temporary support systems, form work and false work
 - iv. refurbishment work, which may affect the structural stability of such a structure
 - a) roof work
 - b) erection of structures
 - c) work on high voltage electrical equipment
 - d) entry into confined spaces
 - e) hot work
 - f) work involving highly flammable liquids

The extent and detail of a method statement shall depend upon the project components, size and / or complexity of the work, activity or task to be undertaken. A method statement should contain the following:

- i. management arrangements, including identified persons with authority
- ii. detailed sequence of work operations in a chronological order
- iii. drawings and / or technical information
- iv. Detailed information on plant, equipment, substances etc.

- v. inspection and monitoring controls
 - vi. risk assessments
 - vii. emergency procedures and systems
 - viii. arrangements for delivery, stacking, storing and movement of logistics on site
 - ix. details of site features, layout and access, which may affect the method of working
 - x. Procedures for changing or departing from the method statement.
- The method statement is a dynamic document and must be adhered to and kept up to date.

4.1.5 Record of Risk Assessment Findings

All risk assessment statements are to be recorded and maintained. The record should be accessible to auditors and employer's representative and a copy kept with the safety manual containing the safety policy and arrangements.

4.1.6 Monitoring and Review

Risk controls shall be reviewed periodically. Review and revision shall be necessary when conditions change as a result of the introduction of new machinery, processes or hazards. There could also be changes in the workforce, for example, the introduction of trainees. The risk assessment only needs to be revised if significant changes have taken place since the last assessment was done. An accident or incident or a series of minor ones provides a good reason for a review of the risk assessment. This is known as the post-accident risk assessment.

5.0 Contractor's SH&E Policy and Plan

The Contractor shall formulate a project specific SH&E policy and display it at conspicuous places at work sites in Hindi, English and a local language understood by the majority of construction workers. The general requirements for SH&E plan are:

The Contractor shall:

- a) Create and maintain a safe and health work environment
- b) Execute the works in a manner that complies with all the requirements of the Act and all the associated regulations, and in so doing, minimize the risk of incidents occurring; and
- c) Respond to the notices issued by the Employer's SH&E personnel

Within 4 weeks of the Letter of Award, the Contractor shall submit a detailed and comprehensive Contract specific SH&E Plan. The SH&E Plan shall include detailed policies, procedures and regulations which, when implemented, shall ensure compliance of the contract provisions. The SH&E Plan shall include the following but not be restricted to:

5.1 A statement of the Contractor's policy, organisation and arrangements for SH&E

- a. The name(s) and experience of person(s) within the Contractor's proposed management who shall be responsible for coordinating and monitoring the Contractor's SH&E performance;
- b. The number of SH&E staff who shall be employed on the Works, their responsibilities, authority and line of communication with the proposed Contractor's agent;
- c. A statement of the Contractor's policy and procedures for identifying and estimating hazards, and the measures for addressing the same;
- d. A list of SH&E hazards anticipated for this Contract and sufficient information to demonstrate the Contractor's proposals for achieving effective and efficient health and safety procedures;
- e. A description of the SH&E training courses and emergency drills which shall be provided by the Contractor, with an outline of the syllabus to be followed;
- f. Details of the safety equipment which shall be provided by the Contractor, including personal protective equipment;
- g. A statement of the Contractor's policy and procedures for ensuring that Contractor's Equipment used on the Project Site are maintained in a safe condition and are operated in a safe manner;
- h. A statement of the Contractor's policy and procedures for ensuring that sub-contractors comply with the Contractor's safety plan;
- i. A statement of the Contractor's disciplinary procedures with respect to SH&E related matters, and
- j. A statement of the Contractor's procedure for reporting and investigating accidents, dangerous occurrences or occupational illnesses

5.2 Supplements to the SH&E Plan

The Contractor shall, from time to time and as necessary, is required by the Employer to produce supplements to the SH&E Plan such that it is at all times a detailed, comprehensive and contemporaneous statement by the Contractor of his site safety, industrial health and environment obligations, responsibilities, policies and procedures relating to work on Site. Any and all submissions of supplements to the SH&E Plan shall be made to the Employer in accordance with the agreed procedures.

5.3 Revision of SH&E Plan

If at any time the SH&E plan is, in the Employer's opinion, requires revision or modification to ensure the security of the Works and the safety of all workmen upon and visitors to the Site, the Employer may instruct the Contractor to revise the SH&E plan and the Contractor shall **within 7 days** submit the revised plan to the Employer for review and approval.

5.4 Omissions, Inconsistencies and Errors in the SH&E Plan

Any omissions, inconsistencies and errors in the SH&E Plan or the Employer's acceptance or rejection of the SH&E Plan and/or supplements thereto shall be without prejudice to the Contractor's obligations with respect to site safety, industrial health and environment and shall not excuse any failure by the contractor to adopt proper and recognized safety practices throughout the execution of the Work.

5.5 Adherence to SH&E Plan

The Contractor shall adhere to the SH&E Plan and shall ensure, as far as practically possible, that all sub-contractors of all tiers require that contracting parties each have a copy of the Site SH&E Plan and comply with its provisions.

5.6 Health and Safety in Contractor's Design Deliverables

When considering health and safety in designer's work, they shall be expected to do what is reasonable at the time the design is prepared. It may be possible for hazards, which cannot be addressed at the feasibility stage to be looked at during detailed design. In deciding what is reasonably practicable, the risk to health and safety produced by a feature of the design has to be weighed against the cost of excluding the feature. The overall design process does not need to be dominated by a concern to avoid all risks during the construction phase and maintenance. However, a judgment has to be made by weighing up one consideration against another so the cost is counted not just in financial terms, but also those of fitness for purpose, aesthetics, constructability or environmental impact. By applying these principles, it may be possible to make decisions at the design stage, which shall avoid or reduce risks during construction work. In many cases, the large number of design considerations shall allow a number of equally valid design solutions. What is important is the approach to the solutions of design problems. This should involve a proper exercise of judgment, which takes account of health and safety issues. The contractor shall appoint a Safety Consultant at the start of the contract and to implement the consultant's directions in respect of safety.

5.7 Hierarchy of Risk Control

Designers shall need, so far as reasonably practicable, to avoid or reduce risks by applying a series of steps known as the hierarchy of risk control or principles of prevention and protection. The steps to be adopted shall include the following:

- consider if the hazard can be prevented from arising so that the risk can be avoided (e.g., alter the design to avoid the risk);
- if this cannot be achieved, the risk should be combated at source (e.g., ensure the design details of items to be lifted include attachment points for lifting);
- failing this, priority should be given to measures to control the risk that shall protect all people;
- only as a last resort should measures to control risk by means of personal protection be assumed (e.g., use of safety harnesses).

In case of situations where the designers have carried out the design work and concluded that there are risks, which were not reasonably practicable to avoid, detailed information shall be given about the health and safety risks, which remain. This information needs to be included with the design to alert others to the risks, which they cannot reasonably be expected to know. This is essential for the parties who have to use the design information.

If the designers' basic design assumptions affect health or safety, or health and safety risks are not obvious from the standard design document, the designer shall provide additional information. The information shall include a broad indication of the assumptions about the precautions for dealing with the risks. The information shall need to be conveyed in a clear manner; it shall be included on drawings, in written specifications or outline method statements. The level of detail to be recorded shall be determined by the nature of the hazards involved and the associated level of risk.

5.8 Employer's approval

Every structure like scaffold, false work, etc. shall have its design calculations included in the method statements in addition to health and safety risks. Employers' designer or his approved proof check consultants as applicable as per the contract conditions shall approve all these designs.

Any non-standard structures like trestles made up of re-bars or structures which are very old, corroded, repaired for many times etc. for which no design calculations can be made accurately from any national standards, shall not be allowed to be used at sites even for short duration.

If any of the above mentioned clauses are not adhered penalty shall be imposed depending upon the gravity of the unsafe act and or condition.

6.0 Contractor SH&E Personnel and Responsibilities

6.1 Education and Experience

The Contractor shall appoint the required SH&E personnel as prescribed in General Instruction (enclosed at the end) based upon the statutory requirement and establishes the safety organisation based upon the contract value.

In order to effectively interact on labour welfare matters with the Employer and the statutory authorities enforcing the labour welfare legislations every contractor shall employ a duly qualified and experienced full time Labour Welfare Officer.

Conduct and competency

The conduct and functioning of the Contractor SH&E personnel shall be monitored by the Employer. Any default or deficiency shall attract penalty as per details given under penalty clause of this document.

The Contractor shall ensure that all personnel are competent to perform the job assigned to them. In the event that the Contractor is unable to demonstrate the competency of any person whose activities can directly impact on the Works' SH&E performance, the Employer shall remove that person from the site without any procedural formalities.

6.2 Approval from Employer

The name, address, educational qualification, work experience and health condition of each personnel deployed for SH&E jobs shall be submitted to the Employer in the format prescribed for the purpose for comments and approval well before the start of the work. Only on approval by the Employer these personnel are authorised to work. In case any of the SH&E personnel leaves the contractor the same shall be intimated to the Employer. The contractor shall recruit new personnel and fill up the vacancy.

6.3 Responsibility of SH&E personnel

For all works carried out by the contractor and his sub-contractors, the responsibility of ensuring the required SH&E manpower lies with the main contractor only. The minimum required manpower indicated by the Employer includes the sub-contractors' work also. It shall be the responsibility of the main contractor to provide required SH&E manpower for all the works executed by all contractors. Necessary conditions shall be included in all sub-contract documents executed by the main contractor.

The Contractor shall appoint in writing one health and safety representative for every 50 employees working on the site.

6.4 Employment status of SH&E personnel

No Contractor shall engage SH&E manpower from any outsourcing agencies in which case the effectiveness would be lost. All SH&E manpower shall be on the payroll of the main contractor only and not on the payroll of any subcontractor or outsourcing manpower agencies etc. This condition does not apply to positions like traffic marshals who are engaged almost on a daily requirement basis.

6.5 Reporting of SH&E personnel

All SH&E personnel shall report directly to the Project Manager. The Employer shall monitor adherence to this procedure at all times. In case of non-adherence penalty shall be levied as indicated in the penalty clause.

6.6 Inadequate SH&E personnel

In case if the Contractor fail to provide the minimum required manpower as illustrated in General Instruction or fail to fill up vacancies created within 14 days, the same shall be provided by the Employer at Contractor's cost. Any administrative expenses involved providing the same like paper advertisement or manpower consultant charges, etc. shall also be at the cost of contractor.

6.7 Prohibition of performance of other duties

No SH&E personnel shall be required or permitted to do any work which is unconnected to, inconsistent with or detrimental to the performance of the SH&E duties for respective category mentioned in General Information.

The Contractor shall provide all SH&E personnel with such facilities, equipment and information that are necessary to enable him to dispatch his duties effectively.

The minimum Employer's requirements of such facilities / equipment to be provided for SH&E personnel are given in the General Instruction.

7.0 Contractor SH&E Committee

7.1 SH&E Committees

All employees should be able to participate in the making and monitoring of arrangements for safety, industrial health and environment at their place of work. The establishment of site SH&E committees in which Contractors employees and Contractor and sub-contractor management are represented can increase the involvement and commitment of employees. Safety committee shall also include minimum one person from Employer's Engineer. The Contractor shall ensure the formation and monitor the functioning of Contractor SH&E committees.

7.2 Terms of Reference

The Terms of Reference for the committee shall be as follows;

- To establish company safety policy and practices
 - i. To monitor the adequacy of the Contractor's site SH&E plan and ensure its implementation.
 - ii. To review SH&E training.
 - iii. To review the contractor's monthly SH&E report.
 - iv. To identify probable causes of accident and unsafe practices in building or other construction work and to suggest remedial measures.
 - v. To stimulate interest of Employer and building workers in safety by organizing safety week, safety competition, talks and film-shows on safety, preparing posters or taking similar other measures as and when required or as necessary.
 - vi. To go round the construction site with a view to check unsafe practices and detect unsafe conditions and to recommend remedial measures for their rectifications including first-aid medical and welfare facilities.
 - vii. Committee team members should perform a site inspection before every committee meetings and to monitor SH&E inspection reports.
 - viii. 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.
 - ix. To suggest measures for improving welfare amenities in the construction site and other miscellaneous aspect of safety, health and welfare in building or other construction work.
 - x. To look into the health hazards associated with handling different types of explosives, chemicals and other construction materials and to suggest remedial measures including personal protective equipment.
- To review the last safety committee meeting minutes and to take action against persons/sub-contractors for non-compliance if any.

Within 14 days of award of contract, the SH&E committee shall be constituted and notification regarding the same shall be communicated to the members and employees as per the format provided during the kick-off meeting.

Site SH&E Committee meeting shall be conducted at least once in a month with the minimum members listed below:

Chairman	Project Manager
Secretary	SH&E Manager (In-charge)
Members	I. Construction Manager
	II. In charge of plant and machinery
	III. In charge of site electrics
	IV. Employer's Engineer representative
	V. Employer

7.3 Minimum time between two monthly SH&E Committee meetings

A minimum period of 21 calendar days shall be maintained between any two SH&E monthly committee meetings.

7.4 Agenda

The Secretary shall circulate the agenda of the meeting at least seven working days in advance of the scheduled date of the meeting to all members.

The agenda should broadly cover the following:

- Confirmation of minutes.
- Chairman's review/overview of site SH&E performance / condition.
- Previous month SH&E statistics.
- Incident and Accident Investigation / dangerous occurrence / near miss report.
- Site SH&E inspection.
- Sub-contractors' SH&E issues.
- Safety presentation by Secretary.
- Report from Employer.
- Any other business.

7.5 Minutes of the meeting

The Minutes of the meeting shall be prepared as per the format provided at the time of the kick – off meeting. The MoM shall be sent to all members **within 3 working** days preferably by mail followed by hardcopy. Safety Committee meeting minutes shall also be displayed in the notice board for wider publicity to all concerned.

7.6 Disciplinary Action

The chairman shall inform the members of any outstanding issues in the meeting and in case of repeated offence/ non-compliance by some members or other co/sub-contractors and propose suitable disciplinary action including provisions of monetary penalty as per the relevant contract clauses, the Employer shall ensure that the same is implemented.

8.0 ID Card and First Day at Work, SH&E Orientation Training

The Contractor shall ensure that all personnel working at the site receive an induction SH&E training explaining the nature of the work, the hazards that may be encountered during the site work and the particular hazards attached to their own function within the operation.

All personnel shall be issued a photo identity card of size 85mm x 55mm duly signed by the safety officer or any authorized representative of the contractor before they are engaged for any work.

9.0 SH&E Training

The attitude of people at all levels of the contractor is critical for SH&E performance. The Contractor shall keep his workforce motivated and focused on practicing the SH&E norms at all times.

The Contractor shall organise quality SH&E training to engage Managers, supervisors and other personnel in behavioral change and improve safety performance.

The Contractor shall analyse the training requirements for all the employees and initiate a training program to demonstrate that all persons employed, including subcontractors, are suitably qualified, competent and fit. This shall include:

- Detailed Job descriptions for all personnel, to include their specific SH&E responsibilities.
- Specification of qualifications, competency and training requirements for all personnel.
- Assessment and recording of training needs for all personnel, including subcontractors' employees in the workforce, vendor representatives and site visitors.
- A system for assessing new hirers' e.g. prior training and experience.
- A means of confirming that the system is effective.
- A matrix and schedule of training requirements, covering general, task– specific and SH&E-related training, showing the training frequency and interval between refresher courses.

- Timely, competent delivery of training courses.

The Contractor shall arrange behavioral-based training programmes for all the executives to identify recognise and eliminate unsafe act and unsafe conditions.

The refresher-training programme to all employees shall be conducted once in six months.

The employees completing the training program successfully shall be provided with a Safety Sticker. It is mandatory for all the employees to have Safety Sticker on their safety helmets. Any employee, who fails to abide by this, shall not be allowed to work on construction site.

The SH&E manager shall monitor it on daily basis and maintain a register of employees violating this rule.

Toolbox talks shall be conducted by Contractors safety officers to all workmen every day before the start of every working day.

On-the spot practical skill development training on height safety including scaffold safety, crane safety, welding safety, electrical safety, and traffic safety for marshals shall also be conducted to all foremen/ workmen who were associated to the concerned jobs.

Daily Safety Oath as given in the Project SH&E manual shall be taken by every employee including workman.

All vehicle drivers shall be instructed for defensive driving by the Contractors safety manager. Contractor shall provide training if required.

In case of failure on the part of the contractor to provide all the above-mentioned training programs to all employees in time, the same shall be provided by the Employer through accredited agencies if required by formulating a common scheme to all contractors. It is mandatory for the contractors to participate in the common scheme. Any administrative expenses and training fee towards the same shall be at the cost of the contractor.

10.0 SH&E Inspection

The contractor shall evolve and administer a system of conducting SH&E inspections and other risk management analysis on a periodical basis.

The purpose of SH&E inspection is to identify any variation in construction activities and operations, machineries, plant and equipment and processes against the SH&E Plan and its supplementary procedures and programs.

Following SH&E inspections program shall be adopted.

- Planned General Inspection.
- Routine Inspection.
- Specific Inspection.
- Other Inspection.

10.1 Planned General Inspection

- Planned general inspections are performed at predetermined intervals and it usually involves the representation from both Contractor and the Employer.
- Inspections that shall be classified under this inspection program are:
 - i. Monthly contractor's site safety committee Inspection.
 - ii. Weekly safety inspection by construction supervisors (Contractor and Sub-contractors).
 - iii. Daily safety inspection by contractor site SH&E team.

10.2 Routine Inspection

Routine inspections are often referring to the inspection of work site, equipment and temporary structures performed by site and equipment operators and temporary structure erectors.

Inspections that shall be classified under this inspection program are:

- i. Daily Inspection of site, plant and equipment (before the start of day)
 - ii. Weekly Inspection of scaffold
 - iii. Monthly Inspection of electrical hand tools by competent electrical supervisor
 - iv. Quarterly Inspection of temporary electrical systems by competent electrical supervisor
 - v. Half-yearly inspection of lifting machinery, lifting appliances and equipment etc. by competent person.
- The list mentioned above is not exhaustive. Contractor may add additional categories. Contractors' Site SH&E Manager shall ensure that a system of routine inspections are carried out periodically to all plants, equipment, powered tools and any other temporary structures that shall pose a hazard to operators and workmen.

10.3 Specific Inspection

- Specific inspections are performed on activities without a predetermined date. Competent supervisors usually perform inspections for ensuring an activity whether it is executed in accordance to a general set of rules; method statement submitted or developed procedures.
- The following are examples that shall be commonly performed as required on the construction site:
 - i. Inspection performed before and after the entry of person into a confined space.
 - ii. Inspection performed before starting earthwork by heavy equipment.
 - iii. Inspection performed before and after a welding and gas cutting operation.

- iv. Inspection of formwork before concreting by formwork erector.
 - v. Inspection of areas, material, scaffold, equipment and such immediately after any abnormal weathering experienced on site
- The list mentioned above is not exhaustive. The contractor shall ensure that a competent supervisor inspects all high-risk processes and activities.

10.4 Other Inspection

Other inspections include the following:

- i. Mandatory Inspections by Labour Department of Government.
- ii. Inspection by Employer
- iii. Inspection by Contractor's Top Management

10.4.1 The contractor shall prepare all required safety inspection checklist for all activity operations and equipment. Checklists shall be prepared based on the Indian standards, rules and regulations and Employer's requirements. The formats shall be included in the contractor's Project SH&E manual.

10.4.2 All inspection records and reports shall be properly kept and filed for audit purpose. Inspection reports of Planned General Inspection and Routine Inspection shall be used for discussion during Safety Committee Meetings.

11.0 SH&E Audit

11.1 General

11.1.1 Purpose and scope of SH&E audit

The purpose and scope of SH&E audit is to assess potential risk, liabilities and the degree of compliance of construction Safety, Health & Environmental plan and its supplementary procedures and programs against applicable and current SH&E legislation regulations and requirements of the employer. Project Manager holds the ultimate responsibility in ensuring implementation of SH&E audit program during the assembly/erection/construction work.

11.1.2 Types of Audits

The following two types of audits are to be conducted by contractor.

- Audit Rating Score (A R S)
- Electrical Safety Audit (E S A)

11.1.3 Audit Rating Score (A R S)

Audit Rating Score (ARS) shall be performed once in week. A team consisting of Project manager and Employer’s representative based on the pre-designed score-rating format indicated as per Annexure III which shall conduct it. This SH&E Audit Rating Score (ARS) report over a period of six months shall enable the Employer to evaluate the general compliance by the Contractor with the Conditions of Contract, the Schedule-R and the Contractor’s site specific SH&E Plan. Weekly, monthly, six Monthly Audits shall be conducted in accordance with Employer Guidelines. The Project Manager accompanied by the Employer’s representatives shall carry out the Audit. The Contractor’s senior manager and SH&E in-charge should also be invited to attend.

11.1.4 Timing

The Audit Rating Score (ARS) should be conducted at least 7 days prior to the scheduled date of Monthly SH&E Committee meeting of the particular month.

11.1.5 Evaluation

The numerical scoring has been weighed on a 1-10 scale. The audit team shall use their observations noted in evaluating the points to be awarded against each of the elements of the audited section. Wherever some topics and sub-topics are not applicable the score rating need not be given. The overall audit ratings shall be achieved by:

$$\text{Overall Audit rating} = \frac{\text{Actual Score Achieved}}{\text{Maximum Possible Score}} \times 100$$

The criteria of the required actions for the respective sections of the Audit shall be classified as given in Table 1 below:

Table 1: Audit Rating – Action to be taken

Sr.	Score	Description	Action
1	< 70%	Site is poorly managed from Safety perspectives	Needs definite improvement measures (deduction of 2% in the overall Bill)
2	> 70 to 80%	Just adequate management from safety perspectives	Definitely needs improvement (deduction of 1% from the overall bill)
3	> 80 to 90%	Good Management from Safety Aspects.	Scope of Further improvement (hold of .5% from the overall bill till the contractor achieves the higher rating)
4	> 90 to 100%	Excellent management from Safety aspects	Continue with Current Practices

11.1.6 Report

- A copy of each Audit Report shall be sent to Employer, Employer’s Engineer and to all subcontractors, with whom it shall then be discussed in detail at the Monthly SH&E Committee Meeting in order to ensure that any corrective actions are agreed upon.

11.1.7 Targets of SH&E Audit

- The contents and coverage of the external audit shall include the following items but not limited to:

- i. SH&E Organization Management.
- ii. Communication and Motivation.
- iii. Emergency preparedness.
- iv. Education and Training.
- v. Construction operational safety.
- vi. Electrical system safety.

- vii. Safety Appliances.

- viii. Fire prevention and control.

- ix. Housekeeping.

- x. Maintenance and Machinery safety.

- xi. First-aid and Medical Facilities.

- xii. Environmental Management.

11.1.8 Audit Preparation

- Audit team members are required to gather information by observations through interviews and by checks of hardware and documentation.
- Audit team shall prepare checklist to cover all parts based on SH&E legislations rules and regulations.
- Audit team members shall verify the facts and findings leading to the identified gaps and weakness.
- Audit leader has overall responsibility for reaching a conclusion.

11.1.9 Reporting

- Audit report shall be prepared and sent to the Employer and Employer's Engineer within 5 working days of conducting the audit by the contractor.

11.1.10 Report contents

- Executive summary - based on the finalized checklists as written the findings to the Employer by the audit team members, the audit leader shall compile a concise and accurate summary of observations and findings.
- Introduction - this shall contain basic information regarding the facilities or organization audited, the specific audit dates (inclusion of those for preparation and post-audit activities).

- Principal positive findings - this shall contain the summary of positive aspects as observed by the auditors. It shall also contain highlights of those issue, which may warrant dissemination as best practice regarding methodology used or achievement.
- Audit Findings - All audit findings as detailed in the audit checklists shall be grouped together as priority 1 and 2 as detailed below in a separate listing.
 - (a) Priority 1: Actions to rectify gaps or weakness should generally be implemented immediately, in no case beyond one-weeks' time, if risk potential is high or unacceptable.
 - (b) Priority 2: Actions should be generally implemented or rectified with a maximum of 1 - 2 weeks, if not rectified would create a likelihood of minor injury or business loss.

11.1.11 Conformity Report & Action by Employer

- The auditor shall inspect the site after 7days of conducting initial audit for checking the adequacy of implementation of items maintained under priority 1 by the contractor and shall submit a conformity / non-conformity report to the Employer with a copy to the contractor.
- The auditor shall again inspect after 14 days of conducting initial audit for checking the adequacy of implementation of items mentioned under priority 2 by the contractor and shall submit a conformity / non-conformity report to the Employer with a copy to the contractor.
- In case of non-conformity of items mentioned by auditor, the Employer shall take necessary steps including stoppage of work and or imposing any penalty for getting the item implemented.

12.0 SH&E Communication

12.1 Safety Communication

The Contractor shall take every effort to communicate the Safety, Occupational health and Environment management measures through posters campaigns / billboards / banners / glow signs being displayed around the work site as part of the effort to raise safety awareness amongst to the work force. Posters should be in Hindi, English and Local language deemed appropriate. Posters / billboards / banners/ glow signs should be changed at least once in a month to maintain the impact. The contractor shall also observe important days as listed.

12.1.1 SH&E Submittals to the Employer

- The contractor's SH&E management should send the following reports to the Employer periodically:
 - i. Daily Reporting of total no of workmen.
 - ii. Monthly SH&E Report.
 - iii. SH&E Committee Meeting Minutes.
 - iv. SH&E Inspection Reports.
 - v. SH&E Audit Reports.

12.1.2 Daily Reporting of total no of workmen

The Contractor shall report to the Employer the total no. of workmen engaged by all including any subcontractor **within 2 hours** of starting of any shift in any day. This reporting shall be the primary duty of the Chief SH&E Manager of the contractor and reporting shall be through tele-fax / email. The onus of checking the receipt of the same by the Employer lies with the contractor. If the information is not received or received more than 2 hrs after starting of the shift, penalty shall be levied as per relevant clause.

12.2 Monthly SH&E Report

The Contractor shall prepare a monthly SH&E report consisting of the following and submit 3 copies **within 7th of next month** to the Employer as specified in the Project SH&E manual.

- Monthly man-hour details as specified in the Project SH&E manual.
- Monthly accident / incident details as specified in the Project SH&E manual.
- SH&E committee details.
- Details of SH&E training conducted in the month.
- SH&E Inspection.
- SH&E Communication activities under taken in the month indicating the number of posters displayed and balance availability in stock.
- Toolbox talks details.
- Housekeeping.
- Health and Welfare activities.
- SH&E Activities Planned for next month.

12.3 Accident Reporting and Investigation

12.3.1 Reporting to Employer

- All accidents and dangerous occurrences shall immediately be informed verbally to the Employer. This shall enable the Employer to reach to the scene of accident / dangerous occurrences to monitor/assist any rescue work and/or start conducting the investigation process so that the evidences are not lost.
- Reports of all accidents and dangerous occurrences shall also be sent within 24 hours as per format provided in the Project SH&E manual.
- No accident / dangerous occurrence should be exempted from reporting to the Employer.
- Any wilful delay in verbal and written reporting to the Employer shall be penalised as per relevant clause.

12.3.2 Reporting to Government organisations

In addition to the above verbal and written reporting to the Employer, notice of any accident to a worker at the building or construction site that:

- causes loss of life; or
- disables a worker from working for a period of 48 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 72 hours in case of other accidents, to:
 - a) the Regional Labour Commissioner , wherein the contractor has registered the firm/work;
 - b) the officer-in-charge of the nearest police station;
 - c) the next of kin or other relative of the worker involved in the accident.

In case of an accident causing minor injury, first -aid shall be administered and the injured worker shall be immediately transferred to a hospital or other place for medical treatment.

12.3.3 Reporting of dangerous occurrences

The following classes of dangerous occurrences shall be reported to the Inspector having jurisdiction, whether or not any disablement or death caused to the worker, namely:

- a) collapse or failure of lifting appliances, or hoist, or conveyors, or similar equipment for handling of construction material or breakage or failure of rope, chain or loose gears; or overturning of cranes used in construction work;
- b) falling of objects from height;
- c) collapse or subsidence of soil, pipe lines, any wall, floor, gallery, roof or any other part of any structure, platform, staging, scaffolding or means of access including formwork;
- d) explosion of receiver or vessel used for storage of 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 any hazardous substance and damage to their container;
- g) collapse, toppling or collision of transport equipment;
- h) leakage or release of harmful toxic gases at the construction site;

- In case of failure of lifting appliance, loose gear, hoist or building and other construction work, machinery and transport equipment at a construction site, 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 Employer's representative;
- Every notice given for fatal accidents or dangerous occurrences shall be followed by a written report to the concerned Authorities.

12.4 Accident investigation

12.4.1 General

- Investigations should be conducted in an open and positive atmosphere that encourages the witnesses to talk freely. The primary objective is to ascertain the facts with a view to prevent future and possibly more serious occurrences.
- Accidents and Dangerous Occurrences which result in death, serious injury or serious damage must be investigated by the Contractor immediately to find out the cause of the accident/occurrence so that measures can be formulated to prevent any recurrence.
- Near misses and minor accidents should also be investigated by the Contractor as soon as possible as they are signals that there are inadequacies in the safety management system.

12.4.2 Procedure of incident investigation

- It is important after any accident or dangerous occurrence that information relating to the incident is gathered in an organised way. The following steps shall be followed;
 - a) take photographs and make sketches.
 - b) examine involved equipment, material and the environmental conditions.
 - c) interview the injured, eye-witnesses and other involved parties.
 - d) consult expert opinion where necessary.
 - e) identify the specific contractor or sub-contractor involved.
- Having gathered information, it is then necessary to make an analysis of incident
 - a) establish the chain of events leading to the accident or incident.
 - b) find out at what stage the accident took place.
 - c) consider all possible causes and the interaction of different factors that led up to the accident, and identify the most probable cause. The cause of an accident should never be classified as carelessness. The specific act or omission that caused the accident must be identified.

- The next stage is to proceed with the follow-up action report on the findings and conclusions formulate preventive measures to avoid recurrence publicize the findings and the remedial actions taken.

12.5 Employers' independent incident investigation

In case of fatal / dangerous occurrence the Employer can also conduct independent investigation. Contractor and his staff shall extend necessary co-operation and testify about the accident.

The Contractor shall take every effort to preserve the scene of accident till the Employer completes the investigation.

All persons summoned by the Employer in connection to witness recording shall obey the instructions without delay. Any willful suppression of information by any person shall be removed from the site immediately and / or punishable as per relevant penalty clause.

13.0 Emergency Response Plan

The Contractor shall prepare an Emergency Response Plan for all work sites as a part of the Contractor SH&E Plan. The plan shall integrate the emergency response plans of the Contractor and all other subcontractors. The Emergency Response Plan shall detail the Contractor's protocols and procedures, including detailed communications arrangements, for dealing with all emergencies that could affect the Site. This include where applicable, injury, sickness, evacuation, fire, chemical spillage, severe weather and rescue.

The Contractor shall ensure that an Emergency Response Plan is prepared to deal with emergencies arising out of:

- Fire and explosion.
- Collapse of lifting appliances and transport equipment.
- Collapse of building, sheds or structure etc.
- Gas leakage or spillage of dangerous goods or chemicals.
- Bomb threatening, criminal or terrorist attack.
- Earthquake, storms and other natural calamities.

Arrangements shall be made for emergency medical treatment and evacuation of the victim in the event of an accident or dangerous incident occurring, the chain of command and the responsible persons of the contractor with their telephone numbers and addresses for quick communication shall be adequately publicized and conspicuously displayed in the workplace.

Contractors shall require to tie-up with the hospitals and fire stations for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.

Contractor shall conduct an onsite emergency mock drill once in every month for all his workers and his subcontractor's workers.

It shall be the responsibility of the contractor to keep the Local Law & Order Authorities informed and seek urgent help, as the case may be, so as to mitigate the consequences of an emergency. Prompt communication to Employer, telephonically initially and followed by a written report, shall be made by the contractor.

14.0 Housekeeping

Housekeeping is the act of keeping the working environment cleared of all unnecessary waste, thereby providing a first-line of defence against accidents and injuries.

Contractor shall understand and accept that improper housekeeping is the primary hazard in any construction site and ensure that a high degree of housekeeping is always maintained. Indeed “Cleanliness is indeed next to Godliness”

Housekeeping is the responsibility of all site personnel, and line management commitment shall be demonstrated by the continued efforts of supervising staff towards this activity.

Adequate time shall be assigned to ensure that good housekeeping is maintained. This shall be carried out by team of housekeeping squad.

The contractor shall be responsible to provide segregated containers for disposal of debris at required places and regular cleaning of the same.

Full height fence, barriers, barricades etc. shall be erected around the site office establishments and construction worker housing in order to prevent the surrounding area from excavated soil, rubbish etc, which may cause inconvenience to and endanger the public. The barricade especially those exposed to public shall be aesthetically maintained by regular cleaning and painting as directed by the Employer. These shall be maintained in one line and level.

The structure dimension of the barricade, material and composition, its colour scheme, Employer’s logo and other details shall be in accordance with specifications laid down in tender document.

All stairways, passageways and gangways shall be maintained without any blockages or obstructions. All emergency exits passageways, exits fire doors, break-glass alarm points, firefighting equipment, first aid stations, and other emergency stations shall be kept clean, unobstructed and in good working order.

Lumber with protruding nails shall be either bent or removed and properly stacked. Un-packed wooden strips shall be safely stored and disposed.

All surplus earth and debris are removed/disposed off from the working areas to officially designated dumpsites. Trucks carrying sand, earth and any pulverized materials etc. in order to avoid dust or odour impact shall be covered while moving. The tyres of the trucks leaving the site shall be cleaned with water, wherever the possibility of spillage on carriageways meant for regular road traffic exists.

No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.

Proper and safe stacking of material are of paramount importance at yards, stores and such locations where material would be unloaded for future use. The storage area shall be well laid out with easy access and material stored / stacked in an orderly and safe manner.

Flammable chemicals / compressed gas cylinders shall be safely stored.

Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas shall be removed to the identified location(s).

All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from work place to the identified location(s). Empty cement bags, if any and other packaging material shall be properly stacked and removed. The Contractor shall ensure that all his sub-contractors maintain the site reasonably clean through provisions related to housekeeping.

15.0 Working at Height

15.1 Definitions

15.1.1 "access" and "egress" include ascent and descent.

15.1.2 "fragile surface" means a surface, which would be able to fail if any reasonably foreseeable loading were to be applied to it.

15.1.3 "line" includes rope, chain or webbing.

15.1.4 "personal fall protection" means:

- a fall prevention, work restraint, work positioning, fall arrest or rescue system, other than a system in which the only safeguards are collective safeguards; or
- rope access and positioning techniques.

15.1.5 "work at height" means:

- work in any place, including a place at or below ground level;
- obtaining access to or egress from such place while at work, except by a staircase in a permanent workplace;
- where, if protective measures were not taken, a person could fall a distance liable to cause personal injury.

15.1.6 "work equipment" means any machinery, appliance, apparatus, tool or installation for use at work (whether exclusively or not) and includes:

- a guard-rail, toe-board, barrier or similar collective means of protection;
- a working platform;
- a net, airbag or other collective safe guard for arresting falls;
- personal fall protection system;

- ladders.

15.1.7 “working platform”

- means any platform used as a place of work or as a means of access to or egress from a place of work;
- includes any scaffold, suspended scaffold, cradle, mobile platforms, trestle, gangway, gantry and stairway which is so used.

15.2 Organization and planning

The contractor shall ensure that work at height is:

- properly planned for any emergencies and rescue;
- appropriately supervised; and
- carried out in a manner, which is reasonably practicable safe.

The Contractor shall ensure that work at height is carried out only when the weather conditions do not jeopardize the health or safety of persons involved in the work.

15.3 Competence

- The Contractor shall ensure that no person engages in any activity, including organization, planning and supervision, in relation to work at height or work equipment for use in such work unless he is competent to do so or, if being trained, is being supervised by a competent person.

15.4 Avoidance of risks from work at height

The Contractor shall ensure that work is not carried out at height where it is reasonably practicable to carry out the work safely otherwise than at height.

15.4.1 Where work is carried out at height, the Contractor shall take suitable and sufficient measures as given below to prevent, so far as is reasonably practicable, any person falling a distance liable to cause personal injury. This ensuring that the work is carried out:

- from an existing place of work; or
- in the case of obtaining access or egress using an existing means complying to the requirements;
- where it is reasonably practicable to carry it out safely and under appropriate ergonomic conditions; and
- where it is not reasonably practicable for the work to be carried out, his providing sufficient work equipment for preventing, so far as is reasonably practicable, a fall occurring.

15.5 Selection of 'work equipment' for work at height

- The Contractor, in selecting work equipment for use in work at height, shall
 - a) give collective protection measures priority over personal protection measures; and
 - b) take account of
 - i. the working conditions and the risks to the safety of persons at the place where the work equipment is to be used;
 - ii. in the case of work equipment for access and egress, the distance to be negotiated;
 - iii. the distance and consequences of a potential fall;
 - iv. the duration and frequency of use;
 - v. the need for easy and timely evacuation and rescue in an emergency; and
 - vi. any additional risk posed by the use, installation or removal of that work equipment or by evacuation and rescue from it.
- The Contractor shall select work equipment for work at height which:
 - a) has characteristics including dimensions which:
 - i. are appropriate to the nature of the work to be performed including the foreseeable loadings; and
 - ii. allow passage without risk at that height, as well as underneath.
 - b) is in other respects the most suitable work equipment, having regard in particular to the purposes specified.

15.5 Fragile surfaces

15.6.1 The Contractor shall ensure that no person at work passes across or near, or working on, from or near, a fragile surface where it is reasonably practicable to carry out work safely and under appropriate ergonomic conditions without his doing so.

15.6.2 Where it is not reasonably practicable to carry out work safely and under appropriate ergonomic conditions without passing across or near, or working on, from or near, a fragile surface, every contractor shall:

ensure, so far as is reasonably practicable, that suitable and sufficient platforms, coverings, guard rails or similar means of support or protection are provided and used so that any foreseeable loading is supported by such supports or borne by such protection;

where a risk of a person at work falling remains despite the measures taken under the preceding provisions of this regulation, take suitable and sufficient measures to minimise the distances and consequences of his fall.

15.6.3 Where any person at work may pass across or near, or work on, from or near, a fragile surface, contractor shall ensure that:

- prominent warning notices are so far as is reasonably practicable affixed at the approach to the place where the fragile surface is situated; or
- where that is not reasonably practicable, such persons are made aware of it by other means.

15.6.3 Falling objects

15.7.1 The Contractor shall, where necessary to prevent injury to any person, take suitable and sufficient steps to prevent, so far as is reasonably practicable, the fall of any material or object.

15.7.2 Contractor shall take suitable and sufficient steps to prevent any person being struck by any falling material or object which is liable to cause personal injury.

15.7.3 The Contractor shall ensure that no material or object is thrown or tipped from height in circumstances where it is liable to cause injury to any person.

15.7.4 The Contractor shall ensure that materials and objects are stored in such a way as to prevent risk to any person arising from the collapse, overturning or unintended movement of such materials or objects.

15.8 Danger areas

15.8.1 Without prejudice to the preceding requirements of these Regulations, every contractor shall ensure that:

15.8.2 where a workplace contains an area in which, owing to the nature of the work, there is a risk of any person at work

15.8.3 falling a distance; or

15.8.4 being struck by a falling object.

- which is liable to cause personal injury, the workplace is so far as is reasonably practicable equipped with devices preventing unauthorised persons from entering such area; and
- such area is clearly indicated.

15.9 Inspection of work equipment

15.9.1 The Contractor shall ensure that, where the safety of work equipment depends on how it is installed or assembled, it is not used after installation or assembly in any position unless it has been inspected in that position.

15.9.2 The Contractor shall ensure that work equipment exposed to conditions causing deterioration which is liable to result in unsafe situations is inspected

- a) at suitable intervals; and

- b) each time that exceptional circumstances which are liable to jeopardise the safety of the work equipment have occurred, to ensure that health and safety conditions are maintained and that any deterioration can be detected and remedied in good time.

15.9.3 The Contractor shall ensure that a working platform

- a) used for construction work; and
- b) from which a person could fall 2 metres or more, is not used in any position unless it has been inspected in that position or, in the case of a mobile working platform, inspected on the site, within the previous 7 days.

15.9.4 The Contractor shall ensure that the reports of all inspections are properly maintained and shown to the Employer as and when required.

15.9.5 In this clause "inspection"

- a) means such visual or more rigorous inspection by a competent person as is appropriate for safety purposes;
- b) includes any testing appropriate for those purposes.

15.10 Inspection of places of work at height

The contractor shall so far as is reasonably practicable ensure that the surface and every parapet, permanent rail or other such fall protection measure of every place of work at height are checked on each occasion before the place is used.

15.11 Duties of persons at work

15.11.1 Any workmen employed by the Contractor shall report to the supervisor about any defect relating to work at height which he knows is likely to endanger the safety of himself or another person.

15.11.2 Every workmen shall use any work equipment or safety device provided to him for work at height by the contractor, in accordance with

- a) any training in the use of the work equipment or device concerned which have been received by him; and
- b) the instructions respecting that use which have been provided to him by the contractor as per the requirements of the Employer.

15.12 Requirements for existing places of work

15.12.1 Requirements for existing places of work and means of access or egress at height

Every existing place of work or means of access or egress at height shall

- i. be stable and of sufficient strength and rigidity for the purpose for which it is intended to be or is being used;

- ii. where applicable, rest on a stable, sufficiently strong surface;
- iii. be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used and to provide a safe working area having regard to the work to be carried out there;
- iv. possess suitable and sufficient means for preventing a fall;
- v. possess a surface which has no gap
 - 1. through which a person could fall;
 - 2. through which any material or object could fall and injure a person; or
 - 3. giving rise to other risk of injury to any person, unless measures have been taken to protect persons against such risk.
- vi. be so constructed and used, and maintained in such condition, as to prevent, so far as is reasonably practicable
 - 1. the risk of slipping or tripping; or
 - 2. any person being caught between it and any adjacent structure.
- vii. where it has moving parts, be prevented by appropriate devices from moving inadvertently during work at height.

15.12.2 Requirements for guardrails, toe-boards, barriers and similar collective means of protection

- Unless the context otherwise requires, any reference in this section to means of protection is to a guardrail, toe-board, barrier or similar collective means of protection.
- Means of protection shall
 - a) be of sufficient dimensions, of sufficient strength and rigidity for the purposes for which they are being used, and otherwise suitable;
 - b) be so placed, secured and used as to ensure, so far as is reasonably practicable, that they do not become accidentally displaced; and
 - c) be so placed as to prevent, so far as is practicable, the fall of any person, or of any material or object, from any place of work.
- In relation to work at height involved in construction work
 - a) the top guard-rail or other similar means of protection shall be at least 950 millimeters above the edge from which any person is liable to fall;
 - b) toe-boards shall be suitable and sufficient to prevent the fall of any person, or any material or object, from any place of work; and

- c) any intermediate guardrail or similar means of protection shall be positioned so that any gap between it and other means of protection does not exceed 470 millimeters. The positioning of the guardrail shall be maintained at all times
 - i. Any structure or part of a structure which supports means of protection or to which means of protection are attached shall be of sufficient strength and suitable for the purpose of such support or attachment.

15.12.3 Requirements for all Working Platforms

- Every working platforms requires a supporting structure for holding it
- Any surface upon which any supporting structure rests shall be stable, of sufficient strength and of suitable composition safely to support the supporting structure, the working platform and any loading intended to be placed on the working platform.
- Stability of supporting structure
 - i. Any supporting structure shall
 - a) be suitable and of sufficient strength and rigidity for the purpose for which it is being used;
 - b) in the case of a wheeled structure, be prevented by appropriate devices from moving inadvertently during work at height;
 - c) in other cases, be prevented from slipping by secure attachment to the bearing surface or to another structure, provision of an effective anti-slip device or by other means of equivalent effectiveness;
 - d) be stable while being erected, used and dismantled; and
 - e) when altered or modified, be so altered or modified as to ensure that it remains stable.
 - f) Have suitable base plates and properly footed thereby.
- Stability of working platforms
 - i. A working platform shall
 - a) be suitable and of sufficient strength and rigidity for the purpose or purposes for which it is intended to be used or is being used;
 - b) be so erected and used as to ensure that its components do not become accidentally displaced so as to endanger any person;
 - c) when altered or modified, be so altered or modified as to ensure that it remains stable; and
 - d) be dismantled in such a way as to prevent accidental displacement.
- Safety on working platforms

- i. A working platform shall
 - a) be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used and to provide a safe working area having regard to the work being carried out there;
 - b) possess a suitable surface and, in particular, be so constructed that the surface of the working platform has no gap;
 - c) through which a person could fall;
 - d) through which any material or object could fall and injure a person; or
 - e) giving rise to other risk of injury to any person, unless measures have been taken to protect persons against such risk; and
 - f) be so erected and used, and maintained in such condition, as to prevent, so far as is reasonably practicable
 - g) the risk of slipping or tripping; or any person being caught between the working platform and any adjacent structure.
- Loading
 - i. A working platform and any supporting structure shall not be loaded so as to give rise to a risk of collapse or to any deformation, which could affect its safe use.
- Additional requirements for scaffolding
 - i. Strength and stability calculations for scaffolding shall be carried out unless
 - a) a note of the calculations, covering the structural arrangements contemplated, is available; or
 - b) it is assembled in conformity with a generally recognised standard configuration.
- Depending on the complexity of the scaffolding selected, a competent person shall draw up an assembly, use and dismantling plan. This may be in the form of a standard plan, supplemented by items relating to specific details of the scaffolding in question.
- A copy of the plan, including any instructions it may contain, shall be kept available for the use of persons concerned in the assembly, use, dismantling or alteration of scaffolding until it has been dismantled.
- The dimensions form and layout of scaffolding decks shall be appropriate to the nature of the work to be performed and suitable for the loads to be carried and permit work and passage in safety.

- While a scaffold is not available for use, including during its assembly, dismantling or alteration, it shall be marked with general warning signs in accordance with and be suitably delineated by physical means preventing access to the danger zone.
- Scaffolding may be assembled, dismantled or significantly altered only under the supervision of a competent person and by persons who have received appropriate and specific training in the operations envisaged which addresses specific risks which the operations may entail and precautions to be taken, and more particularly in
 - i. understanding of the plan for the assembly, dismantling or alteration of the scaffolding concerned;
 - ii. safety during the assembly, dismantling or alteration of the scaffolding concerned;
 - iii. measures to prevent the risk of persons, materials or objects falling;
 - iv. safety measures in the event of changing weather conditions which could adversely affect the safety of the scaffolding concerned;
 - v. permissible loadings;
 - vi. any other risks which the assembly, dismantling or alteration of the scaffolding may entail.

15.13 Requirements for collective safeguards for arresting falls

- Collective safeguard are a safety net, airbag or other collective safeguard for arresting falls
- A safeguard shall be used only if
 - i. a risk assessment has demonstrated that the work activity can so far as is reasonably practicable be performed safely while using it and without affecting its effectiveness;
 - ii. the use of other, safer work equipment is not reasonably practicable; and
 - iii. a sufficient number of available persons have received adequate training specific to the safeguard, including rescue procedures.
- A safeguard shall be suitable and of sufficient strength to arrest safely the fall of any person who is liable to fall.
- A safeguard shall
 - i. in the case of a safeguard which is designed to be attached, be securely attached to all the required anchors, and the anchors and the means of attachment thereto shall be suitable and of sufficient strength and stability for the purpose of safely supporting the foreseeable loading in arresting any fall and during any subsequent rescue;
 - ii. in the case of an airbag, landing mat or similar safeguard, be stable; and
 - iii. in the case of a safeguard, which distorts in arresting a fall, afford sufficient clearance.

- Suitable and sufficient steps shall be taken to ensure, so far as practicable, that in the event of a fall by any person the safeguard does not itself cause injury to that person.

15.14 Requirements for personal fall protection systems

- A personal fall protection system shall be used only if
 - i. a risk assessment has demonstrated that the work can so far as is reasonably practicable be performed safely while using that system; and the use of other safer work equipment is not reasonably practicable; and
 - ii. the user and a sufficient number of available persons have received adequate training specific to the operations envisaged, including rescue procedures.
- A personal fall protection system shall
 - i. be suitable and of sufficient strength for the purposes for which it is being used having regard to the work being carried out and any foreseeable loading;
 - ii. where necessary, fit the user;
 - iii. be correctly fitted;
 - iv. be designed to minimise injury to the user and, where necessary, be adjusted to prevent the user falling or slipping from it, should a fall occur; and
 - v. be so designed, installed and used as to prevent unplanned or uncontrolled movement of the user.
- A personal fall protection system designed for use with an anchor shall be securely attached to at least one anchor, and each anchor and the means of attachment thereto shall be suitable and of sufficient strength and stability for the purpose of supporting any foreseeable loading.
- Suitable and sufficient steps shall be taken to prevent any person falling or slipping from a personal fall protection system.

15.15 Requirements for Ladders

- Every Contractor shall ensure that a ladder is used for work at height only if a risk assessment has demonstrated that the use of more suitable work equipment is not justified because of the low risk and
 - i. The short duration of use; or
 - ii. Existing features on site, which he cannot alter.
- Only approved metal ladders shall be allowed. Bamboo ladders are prohibited.
- Any surface upon which a ladder rests shall be stable, firm, of sufficient strength and of suitable composition safely to support the ladder so that its rungs or steps remain horizontal, and any loading intended to be placed on it.

- A ladder shall be so positioned as to ensure its stability during use
- A suspended ladder shall be attached in a secure manner and so that, with the exception of a flexible ladder, it cannot be displaced and swinging is prevented.
- A portable ladder shall be prevented from slipping during use by -
 - i. securing the stiles at or near their upper or lower ends;
 - ii. an effective anti-slip or other effective stability device; or
 - iii. any other arrangement of equivalent effectiveness.
- A ladder used for access shall be long enough to protrude sufficiently above the place of landing to which it provides access, unless other measures have been taken to ensure a firm handhold.
- No interlocking or extension ladder shall be used unless its sections are prevented from moving relative to each other while in use.
- A mobile ladder shall be prevented from moving before it is stepped on.
- Where a ladder or run of ladders raises a vertical distance of 9 metres or more above its base, there shall, where reasonably practicable, be provided at suitable intervals sufficient safe landing areas or rest platforms.
- Every ladder shall be inspected atleast every day before using
- Every ladder shall be used in such a way that
 - i. a secure handhold and secure support are always available to the user; and
 - ii. the user can maintain a safe handhold when carrying a load unless, in the case of a step ladder, the maintenance of a handhold is not practicable when a load is carried, and a risk assessment has demonstrated that the use of a stepladder is justified because of the low risk; and the short duration of use.

16.0 Slipping, Tripping, Cutting and Falling Hazards

- 16.1 Sharp projections or any protruding nails or similar objects shall be suitably guarded or shall even be avoided to make the place safe to work.
- 16.2 Contractor shall not allow workmen to work or use platforms, scaffolds/passageways or any walkways, which has water, or oil or similar substances spilt and has a slipping hazard, unless it is cleaned off or covered or sanded or saw dusted or make it safe with any suitable material.
- 16.3 When workers are exposed to areas where fall into water is possible, the contractor shall provide suitable and adequate equipment for saving the workers from drowning and rescuing from such hazard. If the Employer considers, the contractor shall provide well-equipped boat or launch, manned with trained personnel at the work place.

- 16.4 Open side or opening where worker, equipment, vehicle or lifting appliance may fall at a building or outside shall be guarded suitably except in places of free access by reasons of nature of work.
- 16.5 Suitable safety net shall be provided at places of material / man falling is possible in accordance with national standards.

17.0 Lifting Appliances

17.1 General

Lifting appliances means a crane, hoist machinery, derrick, winch, jack, hoist drum, slewing machinery, pulley blocks, hooks or other equipment used for lifting materials, objects or building workers and lifting gears means ropes, chain slings, shackles, hooks, lifting lugs, wire ropes, lifting eyebolts and eye nuts and other accessories of a lifting appliance.

17.2 Size and Characteristics of Machine

No machine shall be selected to do any lifting on a specific job until its size and characteristics are considered against:

- the weights, dimensions and lift radii of the heaviest and largest loads
- the maximum lift height, the maximum lift radius and the weight of the loads that must be handled at each
- the number and frequency of lifts to be made
- how long the crane will be required on site
- whether loads will have to be walked or carried
- whether loads will have to be suspended for lengthy periods
- the site conditions, including the ground where the machine shall be set up, access roads and ramps it must travel, space for erection and any obstacles that might impede access or operation

17.3 Identification System of Tools

- 17.3.1 The Contractor shall also maintain a register containing a system of identification of all tools and tackles, its date of purchase, safe working load, competent person date of examination etc.
- 17.3.2 All alarms and signals like reverse horn, automatic safe load indicators (SLI), boom angle indicators, boom extension indicators, over lift boom alarm, swing alarm, hydraulic safety valves, mechanical radius indicators, load moment indicators etc. shall be periodically examined and maintained always in working condition.

17.4 Qualification of Operator

- 17.4.1 The Contractor shall not employ any person to drive or operate any equipment like excavator, dozer, roller, dumper, crane or any other equipment whether driven by mechanical power or otherwise or to give signals to work as an operator of a rigger or derricks unless he:

- is above twenty-one years of age and possesses a valid heavy transport vehicle driving licence as per Motor Vehicle Act and Rules.
- is absolutely competent and reliable
- possesses the knowledge of the inherent risks involved in the operation of such equipment by undergoing a formal training at any institution of national importance acceptable to Employer

17.4.2 The operator cab shall possess good and safe:

- Structure, windows and windshield wipers
- Drivers chair and foot rest
- Control handles
- Cab instrumentation
- Telecommunication
- Cab out fitting

17.5 General requirements of appliances

17.5.1 The sweep area (work area) of the construction machinery shall be always free from obstructions.

17.5.2 All hydraulic piping and fittings shall be maintained leak proof.

18.0 Construction Machinery

18.1 General

Construction machineries may include excavators, dumpers and dump trucks, lift trucks, telescopic handlers, piling rigs, vibro hammers, welding equipments, mobile elevating work platforms, cranes, tipper lorries, lorry loaders, tankers, trailers, hydraulic and mechanical breakers etc. All the machinery shall be insured as per the relevant clauses.

18.2 Safe worthiness certificate

18.2.1 Every construction equipment shall be in sound mechanical working condition and certified by either competent person under Factories Act or manufacturers' warranty in case of brand new equipment or authorized persons / firms approved by Employer before induction to any site.

18.2.2 Every such certificate shall have the date of purchase, main overhauling undertaken in the past, any accident to the equipment, visual examination details, critical components safety check, list of safety devices and its working condition, manufacturer's maintenance checklist, past projects wherein the equipment were used etc. as its minimum content.

18.3 Reverse Horns

All Vehicles shall be fitted with audible reverse alarms and maintained in good working condition. Reversing shall be done only when there is adequate rear view visibility or under the directions of a banks man.

18.4 General Operating Procedures

- Drivers entering site shall be instructed to follow the safe system of work adopted on site. These shall be verbal instructions or, preferably, written instructions showing the relevant site rules, the site layout, delivery areas, speed limits, etc.
- No passengers shall be carried, unless specific seating has been provided in accordance with the manufacturer's recommendations.
- Working on gradients beyond any equipment's capability shall not be allowed.
- Prevention of dumper and dump truck accidents should be managed by providing wheel stops at a sufficient distance from the edges of excavations, spoil heaps, pits, etc.
- If a tractor dozer is employed on clearing scrub or felling trees, it shall be provided with adequate driver protection.
- In case of hydraulic breakers, hydraulic rams and hoses shall be in good working condition.
- Operators shall wear seat belts while operating the equipment at all times

18.5 Penalty

If any of the above clauses are not adhered, penalty shall be imposed as per relevant clause depending upon the gravity of the unsafe act and or condition.

19.0 Machine and General Area Guarding

The contractor shall ensure at the construction site all equipment, motors, chains and friction gearing, flywheels, shafting, dangerous and moving parts of machinery are securely fenced or legged. The fencing of dangerous part of machinery is not removed while such machinery is in motion or in use.

20.0 Manual Lifting and Carrying of Excessive Weight

- 20.1 The contractor shall ensure at his construction site of a building or other construction work that no building worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight as said below unless aided by another building worker or device. Maximum permissible lifting capacity for individuals is given in Table 2 below.

Table 2: Maximum Permissible Lifting capacity for individuals

Person	Maximum weight in kg.
Adult man	55
Adult woman	30

20.2 No building worker aided by other building worker shall lift or carry weight higher than or exceeding the sum of total of maximum limits set out for each building worker separately as mentioned in the table above.

21.0 Site Electricity

21.1 Competency of Electrical Personnel

21.1.1 The Contractor shall employ qualified and competent electrical personnel.

21.2 Assessment of Power

21.2.1 The Contractor shall assess the size and location of the electrical loads and the manner in which they vary with time during the currency of the contract.

21.2.2 The Contractor shall elaborate as to how the total supply is to be obtained / generated. The details of the source of electricity, earthing requirement, substation / panel boards, distribution system shall be prepared and necessary approval from Employer obtained before proceeding with the execution.

21.2.3 The Contractor shall take consideration, the requirements of the sub / petty contractors' electric power supply and arrive at the capacity of main source of power supply from nearby power substation or diesel generators as applicable.

21.3 Strength and capability of electrical equipment

No electrical equipment shall be put into use where its strength and capability may be exceeded in such a way as may give rise to danger.

21.4 Adverse or hazardous environments

21.4.1 Electrical equipment which may reasonably foreseeably be exposed to:

- mechanical damage;
- effects of the weather, natural hazards, temperature or pressure;
- effects of wet, dirty, dusty or corrosive conditions; or
- any flammable or explosive substance, including dusts, vapours or gases, shall be of such construction or as necessary protected as to prevent, so far as is reasonably practicable, danger arising from such exposure.

21.5 Electrical protection circuits

- 21.5.1 Precautions shall be taken, either by earthing or by other suitable means, to prevent danger arising when any conductor (other than a circuit conductor) which may reasonably foreseeable become charged as a result of either the use of a system, or a fault in a system, becomes so charged. A conductor shall be regarded as earthed when conductors of sufficient strength and current-carrying capability to discharge electrical energy to earth connect it to the general mass of earth.
- 21.5.2 If a circuit conductor is connected to earth or to any other reference point, nothing which might reasonably be expected to give rise to danger by breaking the electrical continuity or introducing high impedance shall be placed in that conductor unless suitable precautions are taken to prevent that danger.
- 21.5.3 Appropriate electrical protection shall be provided for all circuits, against over load, short circuit and earth fault current.
- 21.5.4 The contractor shall provide sufficient ELCBs (maintain sensitivity 30 mA) / RCCBs for all the equipment (including Potable equipment), electrical switchboards, distribution panels etc. to prevent electrical shocks to the workers.
- 21.5.5 All protection devices shall be capable of interrupting the circuit without damage to any equipment and circuits in case of any fault may occur.
- 21.5.6 Rating of fuses and circuit breakers used for the protection of circuits should be coordinate with equipment power ratings.
- 21.5.7 Protection against lightning shall be ensured to all equipment kept in open at sites.

21.6 Cables

- 21.6.1 Cables shall be selected after full consideration of the condition to which they shall be exposed and the duties for which they are required. Supply cable up to 3.3 kV shall be in accordance with BS 6346.
- 21.6.2 For supplies to mobile or transportable equipment where operating of the equipment subjects the cable to flexing, the cable shall conform to any of these codes BS 6007 / BS 6500 / BS 7375.
- 21.6.3 Flexible cords with a conductor cross sectional area smaller than 1.5 mm² shall not be used and insulated flexible cable shall conform to BS 6500 and BS 7375.
- 21.6.4 Where low voltage cables are to be used, reference shall be made to BS 7375. The following standards shall also be referred to particularly for underground cables BS 6346 and BS 6708
- 21.6.5 Cables buried directly in the ground shall be of a type incorporating armour or metal sheath or both. Such cables shall be marked by cable covers or a suitable marking tape and be buried at a sufficient depth to avoid their being damaged by any disturbance of the ground. Cable routes shall be marked on the plans kept in the site electrical register.
- 21.6.6 Cabling passing under the walk way and across way for transport and mobile equipment shall be laid in ducts at a minimum depth of 0.6 meters.

21.6.7 Cables that need to cross open areas, or where span of 3m or more are involved, a catenary wire on poles or other supports shall be provided for convenient means of suspension. Minimum height shall be 6 m above ground.

21.6.8 Cables carrying a voltage to earth in excess of 65V other than supply for welding process shall have metal armour or sheath, which has been effectively earthed and monitored by the contractor. In case of flexible and trailing cables such earthed metal sheath and/or armour should be in addition to the earth core in the cable and shall not be used as the protective conductor.

21.6.9 Armoured cables having an over-sheath of polyvinyl chloride (PVC) or oil resisting and flame retardant compound shall be used whenever there is a risk of mechanical damage occurring.

21.6.10 Cut or damaged cables shall not be used and shall be replaced immediately.

21.7 Plugs, socket-outlets and couplers

21.7.1 The Contractor shall ensure plugs, socket-outlets, and couplers available in the construction site as “splash proof” type. The minimum degree of Ingress Protection should be of IP44 in accordance with BS EN 60529.

21.7.2 Only plugs and fittings of the weatherproof type shall be used and they should be colour coded in accordance with the internationally recognized standards for example as detailed as follows:

111 lts: Yellow.

240 lts: Blue.

415 lts: Red.

21.8 Connections

21.8.1 Every joint and connection in a system shall be mechanically and electrically suitable for use to prevent danger. Proper cable connectors as per national/international standards shall only be used to connect cables.

21.8.2 No loose connections or tapped joints shall be allowed anywhere in the work site, office area, stores and other areas. Penalty as per relevant clause shall be put in case of observation of any tapped joints.

21.9 Portable and hand held equipment

The contractor shall ensure the use of double insulated or all-insulated portable electrical hand equipment may be used without earthing (i.e. two core cables), but they shall still be used only on **110V** because of the risk of damage to trailing leads.

21.10 Other equipment:

21.10.1 All equipment shall have the provision for major switch/cut-off switch in the equipment itself.

21.10.2 All non-current carrying metal parts of electrical equipment shall be earthed through insulated cable.

21.10.3 Isolate exposed high-voltage (over 415 Volts) equipment, such as transformer banks, open switches, and similar equipment with exposed energized parts and prevent unauthorised access.

21.11 Lighting

21.11.1 The Contractor shall provide sufficient site lighting, of the right type and at the right place for it to be properly effective. Lighting ought not to introduce the risk of electric shock. Therefore, 230V supplies should be used for those fittings, which are robustly installed, and well out of reach e.g. flood lighting or high-pressure discharge lamps.

21.11.2 The contractor shall ensure that luminaries should always be placed so that no person is required to work in their own shadow and so that the local light for one person is not a source of glare for the others. Strongly made clamps should be available for attaching luminaries to poles and other convenient supports.

21.11.3 Luminaries should be robust, resistant to corrosion and rain proof, especially at the point of the cable entry.

21.11.4 The correct type of lamp for each luminaire's should always be used and when lamps need to be replaced if shall be in accordance with the supply voltage.

21.11.5 Lamp holders not fitted with a lamp should be capped off.

22.0 Hand Tools and Power Tools

22.1 General

22.1.1 The Contractor is wholly responsible for the safe condition of tools and equipment used by his employees and that of his sub-contractors.

22.1.2 Use of short / damaged hand tools shall be prohibited and the contractor shall ensure all his hand tools used at his worksite are safe to work with or stored and shall also train his employees (including his sub-contractors) for proper use thereby.

22.1.3 All hand tools and power tools shall be duly inspected before use for safe operation.

22.1.4 All hand tools and power tools shall have sufficient grip and the design specification on par with national/international standards on anthropometrics.

22.2 Hand tools

22.2.1 Hand tools shall include saws, chisels, axes and hatches, hammers, hand planes, screw drivers, crow bars, and nail pullers.

22.2.2 The Contractor shall ensure that:

- For crosscutting of hardwood, saws with larger teeth points (no. of points per inch) shall be preferred to avoid the saw jumping out of the job.

- Mushroom headed chisels shall not be used in the worksite where the fragments of the head may cause injury.
- Unless hatchet has a striking face, it shall be used as a hammer.
- Only knives of retractable blades shall be used in the worksite.
- No screwdrivers shall be used for scraping, chiselling or punching holes.
- A pilot hole shall always be driven before driving a screw.
- Wherever necessary, usage of proper PPEs shall be used by his employees.

22.3 Power tools

22.3.1 Power tools include drills, planes, routers, saws, jackhammers, grinders, sprayers, chipping hammers, air nozzles and drills.

22.3.2 The Contractor shall ensure that:

Electric tools are properly grounded or / and double insulated.

GFCIs/ RCCBs shall be used with all portable electric tool operated especially outdoors or in wet condition.

Before making any adjustments or changing attachments, his workers shall disconnect the tool from the power source.

Tool is held firmly and the material is properly secured before turning on the tool.

All drills shall have suitable attachments respective of the operations and powerful for ease of operation.

When any work / operation need to be performed repeatedly or continuously, tools specifically designed for that work shall be used. The same is applicable to detachable tool bit also.

Size of the drill shall be determined by the maximum opening of the chuck n case of drill bit.

Attachments such as speed reducing screwdrivers and buffers shall be provided to prevent fatigue and undue muscle strain to his workers.

- Stock should be clamped or otherwise secured firmly to prevent it from moving.
- Workers shall never stand on the top of the ladder to drill holes in walls / ceilings, which can be hazardous, instead standing on the fourth or fifth rung shall be recommended.
- Electric plane shall not be operated with loose clothing or long scarf or open jacket.

- Safety guards used on right angle head or vertical portable grinders must cover a minimum of 180 degree of the wheel and the spindle / wheel specifications shall be checked.
- All power tools / hand tools shall have guards at their nip points.
- Low profile safety chain shall be used in case of wood working machines and the saw shall run at high rpm when cutting and also correct chain tension shall be ensured to avoid “kickback”.
- Leather aprons and gloves shall be used as an additional personal protection auxiliary to withstand kickback.
- Push sticks shall be provided and properly used to hold the job down on the table while the heels moves the stock forward and thus preventing kickbacks.
- Air pressure is set at a suitable level for air actuated tool or equipment being used. Before changing or adjusting pneumatic tools, air pressure shall be turned off.
- Only trained employees shall use explosive actuated tools and the tool shall also be unloaded when not in use.
- Usage of such explosive actuated tools shall be avoided in case of places where explosive/flammable vapours or gases may be present.
- Explosive actuated tools and their explosives shall be stored separately and be taken out and loaded only before the time of immediate use.
- Misfired cartridges of explosive actuated tools must be placed in a container of water and be removed safely from the project.
- No worker shall point any power operated / hand tool to any other person especially during loading / unloading.

22.4 Welding, Gouging and Cutting

- 22.4.1 Gas cylinders in use shall be kept upright on a custom-built stand or trolley fitted with a bracket to accommodate the hoses and equipment or otherwise secured. The metal cap shall be kept in place to protect the valve when the cylinder is not connected for use.
- 22.4.2 Hose clamp or clip shall be used to connect hoses firmly in both sides of cylinders and torches.
- 22.4.3 All gas cylinders shall be fixed with pressure regulator and dial gauges
- 22.4.4 Non-return valve and Flashback arrester shall be fixed at both end of cylinder and torch.
- 22.4.5 Domestic LPG cylinders shall not be used for Gas welding and Cutting purpose.
- 22.4.6 DCP or CO2 type Fire Extinguisher not less than 5 kg shall be fixed at or near to welding process zone in an easily accessible location. Fire Extinguisher should confirm to IS 2190: 1992.
- 22.4.7 Use firewatchers if there is a possibility of ignition unobserved by the operator (e.g. on the other side of bulkheads).

- 22.4.8 Oxygen cylinders and flammable gas cylinders shall be stored separately, at least 6.6 meters (20 feet) apart or separated by a fire proof, 1.6 meters (5 feet) high partition. Flammable substances shall not be stored within 50 feet of cylinder storage areas.
- 22.4.9 Transformer used for electrical arc welding shall be fixed with Ammeter and Voltmeter and also fixed with separate main power switch.
- 22.4.10 Welding grounds and returns should be securely attached to the work by cable lugs, by clamps in the case of stranded conductors, or by bolts for strip conductors. The ground cable shall not be attached to equipment or existing installations or apparatus.
- 22.4.11 Use a low voltage open circuit relay device if welding with alternating current in constricted or damp places.
- 22.4.12 Take precautions against the risk of increased fume hazards when welding with chrome containing fluxed consumables or high current metal inert gas (MIG) or tungsten inert gas (TIG) processes.
- 22.4.13 Avoid being in contact with water or wet floors when welding. Use duckboards or rubber protection.
- 22.4.14 All electrical installations shall meet the IS: 5571: 1997 and NFPA 70 for gas cylinder storage area and other hazardous areas.
- 22.4.15 The current for Electric arc welding shall not exceed 300 A on a hand welding operation.

25.0 Dangerous and Harmful Environment

No worker shall be allowed into any confined space or trench or excavation wherein there is given off any dust, fumes / vapours or other impurities which is likely to be injurious or offensive, explosive or poisonous or noxious or gaseous material or other harmful articles unless steps are carried out by the contractor and certified by the responsible person to be safe.

26.0 Fire Prevention, Protection and Fighting System

26.1 General

The Contractor shall ensure that construction site is provided with fire extinguishing equipment sufficient to extinguish any probable fire at construction site.

- 26.1.1 Recharging of fire extinguishers and their proper maintenance should be ensured and as a minimum should meet Indian National Standards
- 26.1.2 All drivers of vehicles, foreman, supervisors and managers shall be trained on operating the fire extinguishers and firefighting equipment.
- 26.1.3 All lifting appliances' driver cabin should be provided with a suitable portable fire extinguisher.
- 26.1.4 Combustible scrap and other construction debris should be disposed off site on a regular basis. The disposal shall be carried after getting approval from local authorities.

26.1.5 Every fire, including those extinguished by contractor personnel, shall be reported to the Employer representatives.

26.1.6 Emergency plans and Fire Evacuation plans shall be prepared and issued. Mock drills should be held at least once every 3 months, to ensure the effectiveness of the arrangements and as a part of the programme, the Telephone Number of the local fire brigade should be prominently displayed near each telephone on site.

27.0 Corrosive Substances

Corrosive substances including alkalis and acids shall be stored and used by a person dealing with such substances at a building / construction site in a manner that it does not endanger the building worker and suitable PPE shall be provided by the contractor to the worker during such handling and work. In case of spillage of such substances on building worker, the contractor shall take immediate remedial measures.

28.0 Traffic Management

28.1 General

The basic objective of the following guidelines is to lay down procedures to be adopted by contractor to ensure the safe and efficient movement of traffic and also to ensure the safety of workmen at construction sites. The guiding principles to be adopted for safety in construction zone are to:

- Warn the road user clearly and sufficiently in advance.
- Provide safe and clearly marked lanes for guiding road users.
- Provide safe and clearly marked buffer and work zones
- Provide adequate measures that control driver behaviour through construction zones.
- Provide additional support in the form of a flag man at all times, to assist the operator of the equipment or a heavy transport vehicle

28.2 Warning signs

Warning signs shall be displayed in the area wherever required such as deep excavation, work at height or any other area pointed out by Employer's Engineer / Employer. Materials hanging over / protruded from the chassis / body of any vehicle especially during material handling shall be indicated by red indicator (red light/flag) to indicate the caution to the road users.

28.3 Delineators

The delineators are the elements of a total system of traffic control and have two distinct purposes:

- i. To delineate and guide the driver to and along a safe path
- ii. As a taper to move traffic from one lane to another.

28.3.1 These channelizing devices such as cones, traffic cylinders, tapes and drums shall be placed in or adjacent to the roadway to control the flow of traffic. These should normally be retro-reflectors complying with IRC: 79 - Recommended Practice for Road Delineators.

28.3.2 Traffic cones and cylinders

- Traffic cones of 500mm, 750mm and 1000mm high and 300mm to 500mm in diameter or in square shape at base and are often made of plastic or rubber and normally have retro-reflectorized red and white band shall be used wherever required.
- Damaged cones shall be replaced immediately

28.3.3 Drums

- Drums about 800mm to 1000mm high and 300mm in diameter can be used either as channelizing or warning devices. These are highly visible, give the appearance of being formidable objects and therefore command the respect of drivers.
- Damaged drums shall be replaced immediately

28.3.4 The contractor shall ensure that all his construction vehicles plying on public roads (like dump trucks, trailers, etc.) have proper license to ply on public roads from the State Transport Authority. Drivers holding proper valid license as per the requirements of Motor Vehicles Act shall drive these vehicles.

28.3.5 The contractor shall not undertake loading and unloading at carriageways obstructing the free flow of vehicular traffic and encroachment of existing roads by the contractor applying the excuse of work execution.

28.3.6 Tow away vehicle

The contractor shall make arrangements keeping tow away van / manpower to tow away any breakdown vehicle in the traffic flow without losing any time at his cost.

29.0 Personal Protective Equipment (PPE)

29.1 The contractor shall provide required PPEs to workmen to protect against safety and or health hazards. Primarily PPEs are required for the following protection:

- Head Protection (Safety helmets)
- Foot Protection (Safety footwear, Gumboot, etc.)
- Body Protection (High visibility clothing (waistcoat/jacket), Apron, etc.)
- Personal fall protection (Full body harness, Rope-gap fall arrester, etc.)
- Eye Protection (Goggles, Welders glasses, etc.)
- Hand Protection (Gloves, Finger coats, etc.)

- Respiratory Protection. (Nose mask, SCBAs, etc.)
 - Hearing Protection (Ear plugs, Ear muffs, etc.)
- 29.2 The PPEs and safety appliances provided by the contractor shall be of the standard as prescribed by Bureau of Indian Standards (BIS). If materials conforming to BIS standards are not available, the contractor as approved by the Employer shall procure PPE and safety appliances.
- 29.3 All construction workers should be provided with high visibility jackets with reflective tapes confirming to the requirement specified under BS EN 471: 1994 as most of viaduct /tunnelling and station works are executed either above or under right-of-way. The visibility of workmen at all times shall be increased so as to protect them from speeding vehicular traffic.
- 29.4 The Contractor shall provide safety helmet, safety shoe and high visibility clothing for all employees of Employer’s Engineer & Contractor’s workmen, traffic marshal and other employees who are engaged for any work under this contract as per the requirement.
- 29.5 Colour coding for helmets: Contractors shall follow the colour code for safety helmets as described in the Table 3 below:

Table 3: Safety Colour Code

Safety Helmet Colour Code (Every Helmet should have the LOGO* affixed / painted)	Person to use
White	Company staff
White	All Designers, Architect, Consultants, etc.
White	Main Contractors (Engineers / Supervisors)
Blue	All Sub-contractors (Engineers / Supervisors)
Red	Electricians (Both Contractor and Sub- contractor)
Green	Safety Professionals (Both Contractor and Sub-Contractor)
Orange	Security Guards / Traffic marshals
Yellow	All workmen
White (with “VISITOR” sticker)	Visitors

The contractor company’s respective logo

- Logo shall have its outer dimension 2”X 2” and shall be conspicuous.
- Logo shall be either painted or affixed.

In addition to the above any other PPE required for any specific jobs like, welding and cutting, working at height etc. shall also be provided to all workmen and also ensure that all workmen use the PPEs properly while on the job.

- 29.6 The contractor shall not pay any cash amount in lieu of PPE to the workers/sub-contractors and expect them to buy and use during work.

- 29.7 The contractor shall at all-time maintain a minimum of 10% spare PPEs and safety appliances and properly record and show to the Employer during the inspections. Failing to do so shall invite appropriate penalty as per the provisions of the contract.
- 29.8 It is always the duty of the contractor to provide required PPEs for all visitors. Towards this required quantity of PPEs shall always be kept at the security post.

30.0 Visitors to Site

- 30.1 No visitor is allowed to enter the site without the permission of the Employer. All authorised visitors should report at the site office. Contractor shall provide visitor's helmet (White helmet with visitor sticker) and other PPEs like Safety Shoe, reflective jacket, respiratory protection etc. as per requirement of the site.
- 30.2 All Visitors shall be accompanied at all times by a responsible member of the site personnel.
- 30.3 The Contractor shall be fully responsible for all visitors' safety and health within the site.

31.0 Occupational Health and Welfare

31.1 Medical Facilities

- 31.1.1 The contractor shall arrange a medical examination of all his employees including his sub-contractor employees employed as drivers, operators of lifting appliances and transport equipment before employing, after illness or injury, if it appears that the illness or injury might have affected his fitness and, thereafter, once in every two years up to the age of 40 and once in a year, thereafter.
- 31.1.2 The Contractor shall maintain the confidential records of medical examination or the physician authorized by the Employer.
- 31.1.3 No building or other construction worker is charged for the medical examination and the cost of such examination is borne by contractor employing such building worker.
- 31.1.4 If the contractor fails to get the medical examination conducted as mentioned above, the Employer shall have the right to get the same conducted by through an agency with intimation to the contractor and deduct the cost and overhead charges.
- 31.1.5 The Contractor shall make it mandatory for all the workmen groups to resort to stressing exercises every morning for twenty minutes before the start of work. The Contractor shall appoint competent person as a leader who will ensure daily exercising of all workmen.

31.2 Ambulance van and room

The Contractor shall ensure at a construction site of a building or other construction work that an ambulance van and room are provided at such construction site or an arrangement is made with a nearby hospital for providing such ambulance van for transportation of serious cases of accident or sickness of workers to hospital promptly and such ambulance van and room are maintained in good condition and is equipped with standard facilities.

31.3 First-aid boxes

31.3.1 The Contractor shall ensure one well maintained First-aid box for every 100 workers on the construction site. Every First-aid box shall be distinctly marked “First-aid” and be equipped with all items required for first aid treatment.

31.3.2 HIV/ AIDS prevention and control

The Contractor shall adopt the Policies on “HIV / AIDS Prevention and Control for Workmen Engaged.

31.4 Prevention of mosquito breeding

31.4.1 Measures shall be taken to prevent mosquito breeding at site. The measures to be taken shall include:

- a. Empty cans, oil drums, packing and other receptacles, which may retain water shall be deposited at a central collection point and shall be removed from the site regularly.
- b. Still waters shall be treated at least once every week with oil in order to prevent mosquito breeding.
- c. Contractor’s equipment and other items on the site, which may retain water, shall be stored, covered or treated in such a manner that water could not be retained.
- d. Water storage tanks shall be provided.

31.4.2 Posters in Hindi, English & local language, which draw attention to the dangers of permitting mosquito breeding, shall be displayed prominently on the site.

31.4.3 The Contractor at periodic interval and upon the request of the Employer shall arrange to prevent mosquito breeding by fumigation / spraying of insecticides. Most effective insecticides shall include SOLFAC WP 10 or Baytex, The Ideal Larvicide etc.

31.5 Alcohol and drugs

31.5.1 The Contractor shall ensure at all times that no employee is working under the influence of alcohol / drugs which are punishable under Govt. regulations.

31.5.2 Smoking at public worksites by any employee is also prohibited as per Govt. regulations.

31.6 Noise

31.6.1 The Contractor shall, at his own expense, take all appropriate measures to ensure that work carried out by the Contractor and by his sub-Contractors, whether on or off the Site, shall not cause any unnecessary or excessive noise which may disturb the occupants of any nearby dwellings, schools, hospitals, or premises with similar sensitivity to noise.

31.6.2 The Contractor shall ensure that noise generated by work carried out by the Contractor and his sub-Contractors during daytime and night time shall not exceed the maximum permissible noise limits,

whether continuously or intermittently, as stipulated by MoEF conditions. In the event of a breach of this requirement, the Contractor shall immediately re-deploy or adjust the relevant equipment or take other appropriate measures to reduce the noise levels and thereafter maintain them at levels which do not exceed the said limits.

31.7 Occupational Noise

- 31.7.1 Protection against the effects of occupational noise exposure should be provided when the sound level exceeds the threshold values.
- 31.7.2 When employees are subjected to sound levels exceeding those listed in the Table, feasible administrative or engineering controls should be utilized as given in this document.
- 31.7.2 If such controls fail to reduce sound levels personal protective equipment shall be provided.

31.8 Vibration Level

- 31.8.1 In locations where the alignment is close to historical / heritage structures, the contractor shall prepare a monitoring scheme prior to construction at such locations. The scheme shall include:
- 31.8.2 Monitoring requirements for vibrations at regular intervals throughout the construction period.
- 31.8.3 Pre-construction structural integrity inspections of historic and sensitive structures in project activity.
- 31.8.4 Information dissemination about the construction method, probable effects, quality control measures and precautions to be used.

32.0 Environmental Management

32.1 Air Quality

- 32.1.1 The Contractor shall take all necessary precautions to minimise fugitive dust emissions from operations involving excavation, grading, and clearing of land and disposal of waste. He shall not allow emissions of fugitive dust from any transport, handling, construction or storage activity to remain visible in atmosphere beyond the property line of emission source for any prolonged period of time without notification to the Employer.
- 32.1.2 The Contractor shall use construction equipment designed and equipped to minimise or control air pollution. He shall maintain evidence of such design and equipment and make these available for inspection by Employer.
- 32.1.3 If after commencement of construction activity, Employer believes that the Contractor's equipment or methods of working are causing unacceptable air pollution impacts then these shall be inspected and remedial proposals shall be drawn up by the Contractor, submitted for review to the Employer and implemented.
- 32.1.4 In developing these remedial measures, the Contractor shall inspect and review all dust sources that may be contributing to air pollution. Remedial measures include use of additional / alternative equipment by the Contractor or maintenance / modification of existing equipment of the Contractor.

- 32.1.5 The Contractor shall establish and maintain records of routine maintenance program for internal combustion engine powered vehicles and equipment used on this project. He shall keep records available for inspection by Employer.
- 32.1.6 The Contractor shall cover loads of dust generating materials like debris and soil being transported from construction sites. All trucks carrying loose material should be covered and loaded with sufficient free - board to avoid spills through the tailboard or sideboards.
- 32.1.7 The Contractor shall promptly transport all excavation disposal materials of whatever kind so as not to delay work on the project. Stockpiling of materials shall only be allowed at sites designated by the Employer. The Contractor shall place excavation materials in the dumping/disposal areas designated in the plans as given in the specifications.
- 32.1.8 The temporary dumping areas shall be maintained by the Contractor at all times until the excavated soil is re-utilised for backfilling or as directed by Employer. Dust control activities shall continue even during any work stoppage.
- 32.1.9 The Contractor shall water down construction sites as required to suppress dust, during handling of excavation soil or debris or during demolition. The Contractor shall make water sprinklers, water supply and water delivering equipment available at any time that it is required for dust control use. Dust screens shall be used, as feasible when additional dust control measures are needed especially where the work is near sensitive receptors.
- 32.1.10 The Contractor shall submit to the Employer an Air Monitoring and Control Plan (AMCP) as per contract specific Environment Management Plan to guide construction activity in so far as it relates to monitoring, controlling and mitigating air pollution.

32.2 Water Quality

- 32.2.1 The Contractor must comply with the requirements of the Central Ground Water Board for discharge of water arising from dewatering. Any water obtained from dewatering systems installed in the works must be either re-used for construction purposes and this water may subsequently be discharged to the drainage system or, if not re-used, recharged to the ground water at suitable aquifer levels. The Contractor shall not be permitted to directly discharge, to the drainage system, unused ground water obtaining from the excavation without obtaining approval of Employer or the Agency controlling the system.
- 32.2.2 The Contractor shall ensure that earth, bentonite, chemicals and concrete agitator washings etc. are not deposited in the watercourses but are suitably collected and residue disposed off in a manner approved by local authorities.
- 32.2.3 All water and waste products (surface runoff and wastewater) arising on the site shall be collected and removed from the site via a suitable and properly designed temporary drainage system and disposed off at a location and in a manner that shall cause neither pollution nor nuisance.
- 32.2.4 The Contractor shall discharge wastewater arising out of site office, canteen or toilet facilities constructed by him into sewers through a wastewater drainage system to be constructed by the Contractor for proper discharge, after obtaining prior approval of Employer / Employer's authorized representative controlling the system.

- 32.2.5 The bentonite mixing, treatment and handling system shall be established by the contractor giving due regard to its environmental impacts. The disposal of redundant bentonite shall be carefully considered whether in bulk or liquid form. The disposal location shall be advised and agreed with the relevant authorities.
- 32.2.6 The Contractor shall take measures to prevent discharge of oil and grease during spillage from reaching drainage system or any water body. Oil removal /interceptors shall be provided to treat oil waste from workshop areas etc.
- 32.2.7 The Contractor shall apply to the appropriate authority for installing bore wells for water supply at site.

33.0 Solid Waste Management

During construction, two types of solid waste are expected to be generated – construction & demolition (C&D) waste and municipal waste generated from the labour colonies. - C & D Waste Management Rules, 2016.

The Contractor responsible for the construction activities shall be responsible for sound handling and management of the C&D and municipal waste at the construction site. It is suggested that the civil contractor adopts the concept of 3 Rs – Reduce, Reuse, Recycle. The contractor shall submit a C&D waste management plan which includes plans for waste reduction, C&D storage, collection and transportation and disposal.

The following management measures are suggested which shall be implemented by the civil contractor at construction sites:

33.1 Construction Waste Management

33.1.1 Storage at Construction Site

- a. Dumping of C&D waste in non-designated sites shall be strictly prohibited.
- b. All construction/demolition waste will be stored within the site itself. Metal mesh screen or GI screens will be provided so that the waste does not get scattered.
- c. C&D waste shall be stored separately and not allowed to get mixed with other waste (e.g., municipal / biomedical / e-waste / hazardous etc.).
- d. Civil contractors to ensure appropriate handling, storage, collection, re-use and clearing of the wasted construction material. The non-utilizable and utilizable C&D waste generated at site will be stored in a segregated manner at the construction site. Reusable items will be used during construction activities; levelling, making roads etc.
- e. The civil contractors to ensure that appropriate numbers of skip containers or trolleys are provided on construction site, which can be removed with skip lifters as the case may be.
- f. The storage bins/ designated area shall be in accordance with the quantum and nature of the C&D waste.
- g. Rain protection (shed and at the floor) to be provided for the storage of construction materials.

- h. Clearly label the containers, preferably with waterproof signage, detailing which material can be disposed of in each one.
- i. In case of road construction, empty containers of paint, prime coat, tack coat (considered as hazardous waste) shall be stored at a designated place / or a skip and sent to an authorized hazardous waste handler. All the records of the sale of items to authorized hazardous waste vendors will be preserved 7 years after completion and final payment of the contract.

33.1.2 Collection/ transportation and Disposal of C&D waste

- a. Collection of the un-utilizable C&D waste within the construction site will be done mechanically (JCBs, LHD (load, haul, dump) etc.) with minimum human intervention.
- b. The skips will be emptied at regular intervals by the using hook loader trucks. The contractor will transport the waste to a designated area/ location/ facility as directed by Employer.

33.2 Municipal Waste Management

The contractor will be responsible for managing the municipal waste arising out of labour camps. This will primarily comprise of kitchen and general domestic waste (glass, paper, metal, inerts etc.) and sewage from toilets. The contractor will be responsible for segregated storage, collection, transportation, processing and disposal of such waste. Following measures shall be adopted by the contractor for appropriate waste handling:

- a) Civil contractor shall provide colour-coded twin bins which will be placed outside each of the accommodation units provided to the labour, for disposal of wet kitchen waste and dry recyclables. Such bins will be distributed free of cost to the labours by the contractor.
- b) The civil contractor shall install organic waste composter/ convertor (OWC) machine of required capacity to treat all the kitchen waste (wet organic waste).
- c) The recyclables like paper, plastic, metal are to be stored separately and sold to a recycler.
- d) The Contractor will also distribute a twin bin (120 X2 litre capacity) to the nearby dhabhas/ petty shops occurring within 500 metres radius of the construction site, where the labours visit often for food/ tea/ snacks/ cigarette/ bidi during the day. They would also be responsible for Waste generated in these shops and their disposal as provisioned and on the basis of their own internal arrangement.

33.3 Definitions:

- "Construction and demolition waste" means the waste comprising of building materials, debris and rubble resulting from construction, re-modelling, repair and demolition of any civil structure;
- "Disposal" means the final and safe disposal of solid waste on land to prevent contamination of ground water, surface water, ambient air and attraction of animals or birds;
- "Dry waste" means waste other than food waste and inert and includes recyclable waste, non-recyclable waste, combustible waste and sanitary waste;

- “Handling” includes all activities relating to sorting, segregation, material recovery, secondary storage, shredding, baling, crushing, loading, unloading, transportation, processing and disposal of solid wastes;
- “Bio-degradable waste” means any organic material that can be degraded by micro- organisms into simpler stable compounds;
- “Non - biodegradable waste” means any waste that cannot be degraded by micro-organisms into simpler stable compounds;
- "Recycling" means the process of transforming segregated solid waste into a new product or raw material for producing new products;
- "Segregation" means sorting and separate storage of various components of solid waste namely biodegradable wastes or wet waste, non-biodegradable wastes or dry waste including recyclable waste, combustible waste sanitary waste and non - recyclable waste, domestic hazardous wastes, e-waste and construction and demolition wastes;
- "Transportation" means conveyance of solid waste, either treated, partly treated or untreated from a location to another location in an environmentally sound manner through specially designed and covered transport system so as to prevent the foul odour, littering and unsightly conditions;

34.0 Hazardous Waste Management

- a) If encountered or generated as a result of Contractor’s activity, then waste classified as hazardous under the “Hazardous Wastes (Management & Handling) Rules, 1989, amendments 2000, 2003” shall be disposed off in a manner in compliance with the procedure given in the rules under the aforesaid act.
- b) Chemicals classified as hazardous chemicals under “Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 of Environment (Protection) Act, 1986 shall be disposed off in a manner in compliance with the procedure given in the rules under the aforesaid act.
- c) The contractor shall identify the nature and quantity of hazardous waste generated as a result of his activities and shall file a ‘Request for Authorisation’ with Delhi State Pollution Control Board along with a map showing the location of storage area.
- d) Outside the storage area, the contractor shall place a ‘display board’, which shall display quantity and nature of hazardous waste, on date. Hazardous Waste needs to be stored in a secure place.
- e) It shall be the responsibility of the contractor to ensure that hazardous wastes are stored, based on the composition, in a manner suitable for handling, storage and transport. The labelling and packaging is required to be easily visible and be able to withstand physical conditions and climatic factors.
- f) The contractor shall approach only Authorised Recyclers of Hazardous Waste for disposal of Hazardous Waste, under intimation to the Employer.

- g) Submittal of all environment related documents and records pertaining to monitoring and trend analysis on key parameters such as but not limited to consumption/efficient use of resources such as energy, water, material such as cement, fly ash, iron and steel, recycle/reuse of waste etc that shall have demonstrated continual improvement in the implementation of Environmental management System. Failure to do so the employer shall impose appropriate penalty as indicated under penalty clause.

35.0 Energy Management

35.1 The contractor shall use and maintain equipment so as to conserve energy and shall be able to produce demonstrable evidence of the same upon Employer's request.

35.2 Measures to conserve energy include but not limited to the following:

- Use of energy efficient motors and pumps
- Use of energy efficient lighting, which uses energy efficient luminaries
- Adequate and uniform illumination level at construction sites suitable for the task
- Proper size and length of cables and wires to match the rating of equipment
- Use of energy efficient air conditioners

35.3 The contractor shall design site offices maximum daylight and minimum heat gain. The rooms shall be well insulated to enhance the efficiency of air conditioners and the use of solar films on windows may be used where feasible.

36.0 Radiation

- a) The use of radioactive substances and radiating apparatus shall comply with the Govt. regulatory requirements and all subsidiary legislation.
- b) An operation involving ionising radiation shall only be carried out after having been reviewed without objection by the Employer's representative and shall be carried out in accordance with a method statement.
- c) Each area containing irradiated apparatus shall have warning notices and barriers, as required by the Regulations, conspicuously posted at or near the area.
- d) Radioactive substances shall be stored, used or disposed shall be strictly in accordance with the Govt. Enactments.
- e) The contractor shall ensure that all site personnel and members of the public are not exposed to radiation.

37.0 Charges to be recovered from Contractor for Unsafe Act or Condition

37.1 The Employer aims to build an image of one of the best safety conscious practice in IICC Dwarka construction and operation. An unsafe act or conduct on the construction site may result into an illness, injury, property damage or worst, loss of life. The Contractor is expected to take safety very seriously and shall keep the construction site safe at all times. The Employer shall practice a zero tolerance towards unsafe behavior by any parties on the construction site. The Employer shall recover the cost of damages from the contractors for every reportable incident (fatality / injury).

37.2 Table 4 below indicates the Safety, Health and Environment violation (unsafe act / unsafe condition) and charges to be recovered from contractors.

Table 4: SH&E Violation Charges

Sr.	Topic	Unsafe Act/ Unsafe Condition	Deductible Amount
1	SH & E Plan	a) Not as per Employers' content and coverage. b) delay in Submission c) copies not provided to all required supervisors / engineers.	Rs. 50,000 per single violation, compounded to a maximum of Rs. 2,00,000/- at any single instance.
2	SH & E Organisation	a) Not complying with the minimum manpower requirements as per the bid documents. b) Not filling up the vacancies created due to SH&E personnel leaving the contractor within 14 days.	Both a) & b) Rs. 50,000 per month
3	SH & E Committee	a) Failed to formulate or conduct SH & E Committee meeting for any month. b) Failed to conduct Site inspection before conducting SH&E Committee meeting. c) Failed to send SH & E Committee meeting minutes or Agenda to the Employer in time.	a) Rs. 50,000/- for each violation Both b) & c) Rs. 25, 000/- for 1 st violation and Rs. 50,000/- for subsequent violations.
4	SH & E Training	Not complying to the requirements as mentioned in conditions of Contract on SH & E and project SH & E manual with regard to: a) Induction training not given b) Supervisor / engineer/ manager training not conducted. c) Refresher training not conducted. d) Tool box talk not conducted.	a) to d) – Rs. 10,000/- for each violation.

Sr.	Topic	Unsafe Act/ Unsafe Condition	Deductible Amount
5	SH & E Inspection	Not complying to the requirements as mentioned in the Conditions of Contract on SH & E and project SH & E manual.	Rs. 50, 000/- for 1 st violation and Rs. 1,00,000/- for every subsequent violations
6	SH & E awareness days	SH & E days not observed.	Rs. 10,000/- for each violation
7	Injury and Incidence reporting	a) Fatal Accidents b) injury Accident c) Abnormal delay in reporting accidents or willful suppression of information about any accidents/ dangerous occurrence.	a) Rs. 5,00,000/- for 1 st fatality and Rs. 10,00,000/- for every subsequent fatality. b) Rs, 1,00,000/- for 1 st grievously injured person and Rs. 2,00,000 for every subsequent grievously injured person (Grievous injury as defined in the Workmen Compensation Act). c) Rs. 25,000 for each violation
8	Housekeeping	a) Housekeeping of construction worker housing, site office establishments etc. b) Surroundings areas of drinking water tanks / taps not hygienically cleaned / maintained. c) Office, Stores, toilet/ urinals not properly cleaned and maintained. d) Required dustbins at appropriate places not provide / not cleaned. e) Openings unprotected f) Vehicles/ equipments parked/ placed on roads obstructing free flow of traffic.	Rs. 10,000 per single violation Compounded to a maximum of Rs. 50,000 at any next single instance.
9		a) Not using or anchoring Safety Belt. b) Not using Safety net. c) Absence of Life Line or Anchorage point to anchor safety belt	Rs. 10,000 per single violation Compounded to a maximum of Rs. 50,000 at any next single instance.
10		Not using proper PPE by any person at site.	Rs. 100/- per incident.

37.3 Without limiting to the unsafe acts and or conditions mentioned above, the Employer shall have the right to deduct charges for any other unsafe act and or condition depending upon the gravity of the situation on a case-to-case basis. The charges shall be in comparison with that of the similar offence.

38.0 Disciplinary Policy Procedures

All employees are expected to comply with jobsite rules and regulations, and to follow established operating procedures set forth by this company. Violations shall not be tolerated and Project Manager shall be held accountable for the conduct of their employees.

Project Managers are required to take action when a violation is observed. Immediate action to control or eliminate a hazard is required.

In the event a violation is observed, the following procedures have been established to place an employee on notice.

Notice*	Action
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* Within any consecutive 12 month period.

- 38.1 First Offense: A written warning addressed to the employee and a copy placed in the employee's file referencing the violation and warning, including date and time. If the issue is still not corrected within the 24 hours after the issuance of the penalty, the Employer reserves the right to cite the employee for second offense.
- 38.2 Second Offense: A written warning addressed to the employee with reference to the violation including date and time of the occurrence. A copy of this warning shall be given to the employee, and another copy shall be placed in the employee's file. This warning shall be followed by a meeting with the employee, SH&E Manager, foreman and/or project manager to determine whether the employee shall be suspended without pay or terminated depending upon the nature of the violation. If the issue is not solved after the second citation, the Employer reserves the right to terminate the violator and/or Safety Office responsible for the correction.
- 38.3 Third Offense shall result in termination and permanent removal from the site. In addition to the termination, Employer or Employer's Engineer shall maintain proper documentation such that any Contractor/s do not employ the same employee for any of the IICC Dwarka project.

39.0 Stoppage of Work

- 39.1 The Employer shall have the right to stop the work at his sole discretion, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and / or property, and / or equipment. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury / accident.
- 39.2 The Contractor shall not proceed with the work until he has complied with each direction to the satisfaction of Employer
- 39.3 The Contractor shall not be entitled for any damages / compensation for stoppage of work, due to safety reasons and the period of such stoppage of work shall not be taken as an extension of time for Completion of the Facilities and shall not be the ground for waiver of levy of liquidated damages.

40.0 Awards

- The following categories shall be considered for awards by the Employer based on the performance of contractor:
 - i. For every safe million man hour working without any reportable incidents
 - ii. Zero fatality contract
 - iii. 100% adherence to voluntary reporting of all accidents throughout the currency of contract
 - iv. Safest project team of the year.
 - v. Best SH&E team of the year.
 - vi. Safest Contractor of the year.
- The Contractor shall also declare the awards at least on quarterly basis for the individual workmen as well as teams for the safe execution of project in order to provide the motivation to all the workmen groups / teams.

41.0 Days to be observed for creating SH&E Awareness

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

41.0 Minimum requirements of SH&E Communication Posters / Signages / Video

The contractor, as per the categories provisioned in Clause 42, shall prepare a SH&E Communication Plan as a part of site specific SH&E Plan and shall include the following minimum requirement of Posters / Signages / Video as applicable. In case readymade posters are available in any of the category from National Safety Council, Loss Prevention Association of India or any other safety related organisations they may procure the same and display it. In case the same is not available then the contractors' shall make necessary arrangements to get the posters designed and printed on their own.

All the above are to be detailed in the Site SH&E Plan and get an approval from the Employer before displaying the posters.

Formation of Site SH&E Committee

Contract No _____

Contractor Name _____

Contract Title _____

CIRCULAR

Committee

The following SH&E Committee is constituted with immediate effect:

Chairman:

Members:

1)

2)

3)

4)

5)

Secretary:

Periodicity

The committee shall meet at least once in a month on the day (specify date)

Agenda

Secretary shall circulate agenda of the meeting at least two days in advance of the schedule date of the meeting.

Circulation

Minutes of the meeting shall be recorded in the standard format and circulated to the following under the signature of the secretary

- | | |
|-------------|----------------------------|
| 1. Chairman | 3. COMPANY Representatives |
| 2. Members | 4. Others concerned |

MINUTES OF SAFETY MEETING

Contract No.:

Contractor Name

Contract Title

Meeting No.

Date of Meeting

Location of meeting

MEMBERS PRESENT	INVITEES	MEMBERS ABSENT
-----------------	----------	-------------------

Report sent to:

No of copies

Department

Prepared By:

Location:

Date:

Annexure I: MOU between Employer & Contractor for safe execution of contract work

This Memorandum of Understanding is made and executed by and between Employer or their authorized representative(s), hereinafter referred to as “EMPLOYER” (which expression shall wherever the context so requires or admits be deemed to mean and include its successors in business and assigns) of the one party

AND

M/s _____

having its registered office at

_____ hereinafter referred to as the “CONTRACTOR” (which expression shall wherever the context so requires or admits be deemed to mean and include its successors in business and assigns) of the other party

WITNESSETH THAT

WHEREAS the EMPLOYER gives highest importance to the occupational safety, health and environment during execution of work, seeks cooperation from the CONTRACTOR in this endeavour.

Thus, this Memorandum of Understanding is for promoting the safety, health and environment aspects required to be followed at workplace/site and shall be applicable to any site job to be done by the CONTRACTOR

AND

WHEREAS the CONTRACTOR has read all the terms and conditions of the EMPLOYER and whereas the CONTRACTOR has studied the following documents:

Tender Documents, including RFQ cum RFP, EPC Agreement , Schedules, Drawings.

Building and Other Construction Workers (Regulations of Employment and Conditions of Service) Act 1996, Central Rules 1998, Building and Other Construction Workers Welfare Cess Act 1996 and Rules 1998 and

Indian Electricity Act 2003 and Rules 1956.

Corresponding International / Bureau of Indian Standard Codes.

The amendments to any of the above rules and any other rules & regulations or procedures, circulars, notices & advices laid down by the EMPLOYER from time to time.

Now it is hereby AGREED AND DECLARED by and between the EMPLOYER and the CONTRACTOR as follows:

Clause – I The CONTRACTOR shall abide by the terms and conditions stipulated in Schdule-S.

Clause - II The CONTRACTOR shall undertake full responsibility for safe execution of job at work place/site and safety of his personnel and adjoining road users during work.

Clause - III Without giving any prior notice, the EMPLOYER shall from time to time be entitled to add/or amend any or all terms and conditions with a view to improving safety and occupational health of personnel and safety of work, with immediate effect and the same shall be binding on the CONTRACTOR. The contractor agrees to implement all such amendments, which shall be laid down by the EMPLOYER.

Clause - IV Besides following the guidelines, safety rules and regulations, safety codes given in various safety procedures / documents mentioned above, the CONTRACTOR shall also prepare detailed method statement which includes job safety analysis wherever there are complicated and hazardous/high risk working involved and get it approved from Employer before execution of work.

Clause - V Any negligence or violation in implementing any of the provision of the conditions of contract on Schedule-S shall be viewed seriously and the contractor is liable to compensate the employer for the loss of reputation. The cost of damage shall be fixed on case-to-case basis.

In witness thereof the Parties hereto by representatives duly authorised have executed this Memorandum of Understanding on _____ day of _____ 20____.

Signed on

Signed on

For and on behalf of Employer

For and on behalf of (Contractor)

Signature: Signature:

Name:

Name:

Title:

Title:

Annexure- II SAFETY, HEALTH & ENVIRONMENT SCORECARD – WEEKLY

	Issuer	Acronym	Sr. No	Rev.	Pg. No
REPORT SUMMARY (Period – From—to --- To)					
CLIENT : DMICDC			Project Name : IICC DWARKA		
PMC:			Location : Sector 25, DWARKA		
EPC CONTRACTOR :			Date of observation		
Report Number			Distribution; All		
Scorecard Details	Percentage Score (1-10)	Wtd. score	Remarks		
Section 1: Jobsite General	10%		Clause 15.1.3		
Section 2: Housekeeping and Sanitation	5%				
Section 3: Fire Prevention	6%				
Section 4: Electrical	8%				
Section 5: Personal Protective Equipment (PPE's)	8%				
Section 6: Hand Tools and Power Tools	4%				
Section 7: Ladders	3%				
Section 8: Scaffolds	5%				
Section 9: Motor Vehicle and Heavy Equipment Section 10: Hoist	4%				
Section 10: Hoist and Cranes	5%				
Section 11: Excavation	4%				
Section 12: Welding, Cutting & Other Hot Works	7%				
Section 13: Height Work	9%				
Section 14: Handling and Storage of Materials	3%				
Section 15: Barricades	7%				
Section 16: Emergency Planning	8%				
Section 17: Environmental cleanup	4%				
Consolidated Site Safety Score (all sections)	100%				
SCORE INTERPRETATION:					
9-10 : Excellent management from Safety aspects – Continue with Current Practices					
8-9 : Good Management from safety aspects –scope of Further improvements					
7-8 : Just adequate management from safety aspects – definitely needs improvement					
<7: Site is poorly managed from Safety perspective – Needs definite improvement measures.					
Prepared by SHE Team – AECOM & EPC Contractor			Reviewed by :		

		Issuer	Acronym	Sr. No	Rev.	Pg. No
IICC DWARKA SHE SCORE (Period – From—to --- To)						
REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
Section 1: Jobsite General		10%				
1.1	Display of Posters and safety signs/warnings	1.0%				
1.2	First aid kit available and adequately stocked	1.0%				
1.3	Proper safety induction & job related safety training completed & recorded?	1.0%				
1.4	Emergency telephone numbers posted?	0.5%				
1.5	Overhead protection at tower periphery?	1.5%				
1.6	Unauthorized entry through other points restricted by hard barricading or sheeting	0.5%				
1.7	Adequate lighting in the access, egress and work area?	1.0%				
1.8	All accidents and injuries are being appropriately recorded in the accident reporting form?	0.5%				
1.9	Minutes of jobsite safety meetings recorded are kept for review?	1.00%				
1.10	The principal contractor has a written safety program that is site specific where necessary?	0.5%				
1.11	Pedestrian and traffic routes identified?	0.5%				
1.12	Tool-box talks conducted and documented?	0.5%				
1.13	Task related Work Permits in place?	0.5%				

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IICC DWARKA SHE SCORE (Period – From—to --- To)						
REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
Weighted Score for Section 1						
Section 2: Housekeeping and Sanitation		5%				
2.1	Functional Male and Female Toilet provided with proper signage's?	1.00%				
2.2	Adequate supply of fresh drinking water at jobsites?	1.00%				
2.3	Personal garbage and lunch sacks are removed from the site or properly disposed of on a daily basis so as to not attract rodents, pests or insects?	0.50%				
2.4	Passageways and walkways clearly indicated and free from obstructions?	1.00%				
2.5	Emergency eye washer and body shower available?	0.25%				
2.6	Wall openings and floor holes /opening/shaft/voids are sign posted, covered, guarded & adequate safety nets provided at the jobsite?	1.00%				
2.7	Nails are removed from scrap lumber and other unused materials?	0.25%				
Weighted Score for Section 2						
Section 3: Fire Prevention		6%				
3.1	Adequate number and type of fire extinguisher(s) available and labeled with periodic inspection record?	0.75%				
3.2	All workers know the location of the fire extinguisher and know how to operate it?	1.50%				
3.3	Firefighting equipment is accessible and maintained at all times in good condition?	1.00%				

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REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
3.4	Smoking is prohibited in all areas except where designated	1.00%				
3.5	Flammable and combustible liquids are marked and properly stored appropriate containers?	1.75%				
Weighted Score for Section 3						

Section 4: Electrical		8%			
4.1	All equipment is either grounded or double-insulated?	1.50%			
4.2	Electrical equipment connected with ELCB/RCCB and periodic testing done?	0.75%			
4.3	Fuses provided of appropriate rating?	1.00%			
4.4	All terminal boxes equipped with required covers?	0.75%			
4.5	Electrical dangers posted and barricaded?	1.50%			
4.6	Proper type of fire extinguisher(s) provided?	1.00%			
4.7	Cable dressing carrying out in a appropriate manner to prevent Trip/Fall hazard at the worksite?	0.75%			
4.8	Industrial Plugs being used of approved type for site use?	0.75%			
Weighted Score for Section 4					
Section 5: Personal Protective Equipment (PPE's)		8%			

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REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
5.1	Hazard evaluation accomplished and certified?	1.00%				
5.2	Employer issued PPEs including hard hats, safety shoes, goggles, gloves, jackets, safety harness of national standards?	3.00%				
5.3	Is PPE being provided used by workers and staff?	2.00%				
5.4	Employees trained in the use of PPE?	2.00%				
Weighted Score for Section 5						
Section 6: Hand Tools and Power Tools		4%				
6.1	Proper tools in working condition are used for the job?	1.00%				
6.2	All safety guards and devices are in place while the tools or machinery is in use?	1.00%				
6.3	Inspections and proper maintenance accomplished prior to use?	1.00%				
6.4	All power disconnected while power tools are not in use?	1.00%				
Weighted Score for Section 6						
Section 7: Ladders		3%				
7.1	Sufficient numbers of ladders are available at site?	0.50%				
7.2	Ladders inspected and in good condition?	0.50%				
7.3	Ladders used properly for type of exposure?	0.40%				
7.4	Ladders secured to prevent slipping, sliding, or falling?	0.30%				
7.5	Proper maintenance and storage	0.45%				

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REPORT SUMMARY		IICC DWARKA				
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Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
7.6	Are aluminum ladders of sufficient strength for the task at contractor's cost? Are the records available?	0.15%				
7.7	Do side rails extend 36" above top of landing?	0.40%				
7.8	All ladders are free of grease, oil, paint, or other slipping hazards?	0.30%				
Weighted Score for Section 7						
Section 8: Scaffolds		5%				
8.1	Erection properly supervised as per provisions of IS codes?	0.50%				
8.2	All structural members free from defects and meet safety factor?	0.50%				
8.3	Safe/unsafe tags/ Tickets clearly visible?	0.50%				
8.4	Are scaffolds erected on solid footing and all connections secure?	0.50%				
8.5	Are working areas free of dirt, debris, grease, etc.?	0.40%				
8.6	Are guard rails, intermediate rails, and toe boards in place?	0.30%				
8.7	Are workers protected from falling objects?	1.00%				
8.8	Is scaffold plumb and square, with cross-bracing and secured to structure?	0.50%				
8.9	The working surface of the scaffold is fully planked and rigidly clamped or tied with metal wire?	0.30%				
8.10	Proper access provided to reach working platform?	0.50%				
Weighted Score for Section 8						

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REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
Section 9: Motor Vehicle and Heavy Equipment		4%				
9.1	Regular inspection and maintenance	1.00%				
9.2	Brakes, lights, warning devices operative?	0.75%				
9.3	Backup alarms working and audible?	0.50%				
9.4	Legally certified and experienced operators?	1.00%				
9.5	Unauthorized persons not to be carried on vehicles	0.75%				
Weighted Score for Section 9						
Section 10: Hoist and Cranes		5%				
10.1	Employees kept clear from suspended loads?	0.50%				
10.2	Are daily inspections completed by operators?	0.70%				
10.3	Proper loading for capacity at lifting radius and SWL followed?	1.40%				
10.4	Equipment properly lubricated and maintained?	0.35%				
10.5	Passageways and walkways clear?	0.25%				
10.6	Signalmen where needed?	0.25%				
10.7	Alarms working and audible?	0.25%				
10.8	Legally certified and experienced operators?	1.00%				

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IICC DWARKA SHE SCORE (Period – From—to --- To)						
REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
10.9	Slings color coded and dated for inspection?	0.30%				
Weighted Score for Section 10						
Section 11: Excavation		4%				
11.1	The underground utilities have been located and marked?	0.50%				
11.2	Trenches 5' or more in depth are shored, or have sides sloped?	0.50%				
11.3	Operation supervised by competent person?	0.50%				
11.4	Ladders used in excavated areas are properly secured?	0.50%				
11.5	Are roads and sidewalks supported and protected?	1.00%				
11.6	Heavy loads kept at safe distance from excavated pit?	0.50%				
11.7	Are equipment ramps adequate?	0.50%				
Weighted Score for Section 11						
Section 12: Welding, Cutting & Other Hot Works		7%				
12.1	Are operators trained and qualified?	0.60%				
12.2	Are oxygen and acetylene stored separately and properly?	0.60%				
12.3	Fire extinguisher located near operations?	0.60%				

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REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
12.4	Fire blanket use or available?	0.40%				
12.5	Flashback arresters and NRV placed on hoses (O2 and fuel gas)? Bottle cages to be upright.	0.75%				
12.6	Gas lines and power cables protected and in good condition?	0.25%				
12.7	Area inspected for fire hazards?	0.80%				
12.8	Is job specific PPE being used?	1.00%				
12.9	"Hot work" permit completed and posted in areas requiring such permit?	1.50%				
12.10	Oxygen and acetylene kept in trolleys at work place and chained?	0.50%				
Weighted Score for Section 12						
Section 13: Height Work		9%				
13.1	All persons working at elevation are trained and equipped with safety helmet, safety shoes and full body safety harness firmly anchored?	1.50%				
13.2	Is the area cordoned off using a safety tape and caution sign board?	1.00%				
13.3	Height work" permit completed and posted in areas requiring such permit?	1.75%				
13.4	Employees working down below other employees or hazards are protected (hard hats, canopies, toe board, etc.)?	0.75%				

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REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
13.5	None of the persons working at elevation is suffering from ailments like low / high blood pressure, vertigo and epilepsy.	1.00%				
13.6	All persons working at elevation are instructed to immediately stop the work in case of high velocity winds / lightning / heavy rains / flammable or toxic fumes / gases observed during the operation?	1.00%				
13.7	Scaffolding / ladder used are in good condition and safe for use?	1.00%				
13.8	Contractor supervisor is present at the job site till the time the job is completed?	1.00%				
Weighted Score for Section 13						
Section 14: Handling and Storage of Materials		3%				
14.1	Materials properly stored or stacked?	0.85%				
14.2	Are shelves, racks, and overhead storage load rated?	0.45%				
14.3	Passageways and walkways clearly indicated and free from obstructions?	0.35%				
14.4	Is PPE being used?	0.85%				
14.5	Sufficient employees to do the job and properly trained for doing the work?	0.25%				
14.6	Stacking heights appropriate for type of material being stored? Bund boards to be used where necessary	0.25%				
Weighted Score for Section 14						
Section 15: Barricades		7%				
15.1	Excavated area and main holes barricaded?	1.50%				

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REPORT SUMMARY		IICC DWARKA				
PROJECT LOCATION		Sector 25, DWARKA				
Date of Observation						
Observation carried out by						
Report Number						
	Description		Score (1-10)	Wtd score	Action Plan	
15.2	Roadways and sidewalks protected?	1.50%				
15.3	Barricades or covers installed (shafts, floor openings, wall openings, stairways, trenches, outriggers, etc.)?	4.00%				
Weighted Score for Section 15						
Section 16: Emergency Planning		8%				
16.1	Proper emergency evacuation plan is available on the site and workers are aware of the same?	2%				
16.2	Mock drills conducted and appropriate records maintained	2%				
16.3	Emergency vehicle/ambulance stationed at site?	2%				
16.4	Proper escape routes signs are posted & are free of obstructions?	2%				
Weighted Score for Section 16						
Section 17: Environmental cleanup		4%				
17.1	Proper dumping/recycling of concrete debris /waste oil?	2.00%				
17.2	Dust control measures adequate?	1.00%				
17.3	Noise control measures?	1.00%				
Weighted Score for Section 17						
Consolidated Site Safety score (all section)		10				

Annexure-III - Labour Safety Rules & Provisions

- 1.0 Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds and hand holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than VA to 1 (1/4 horizontal and 1 vertical).
- 2.0 Scaffolding or staging more than 3.6m (12 feet) above the ground or floor, swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3 feet) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
- 3.0 Working platforms, gangways, and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6m (12 feet) above ground level or floor level, they should be closely boarded, should have adequate width & should be suitable fastened as described in (2.0) above.
- 4.0 Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 90 cm (3 feet).
- 5.0 Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30 feet) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11.5") for ladder up to and including 3m (10 feet) in length. For longer ladders this width should be increased at least 1/4" for each additional 30 cm (1 ft.) of length. Uniform step spacing shall not exceed 30 cm (12"). Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of the work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident, and shall be bound to bear the expenses of defense of every suit, action or other proceeding at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may, with the consent of the Contractor, be paid to compensate any claim by any such person.

6.0 EXCAVATION AND TRENCHING

All trenches, 1.2mts.(four feet) or more in depth, shall at all times be supplied with at least one ladder for each 30m.(100 feet) in length or fraction thereof, ladder shall be extended from bottom of the trench to at least 90cm (3feet) above the surface of the ground. The side of the trenches, which are 1.5 m. (5feet) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger or sides to collapsing. The excavated materials shall not be placed within 1.5m (5 feet) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

- 7.0 Demolition - Before any demolition work is commenced and also during the progress of the work following precautions shall be observed:

- 7.1 All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- 7.2 No electric cable or apparatus which is likely to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.
- 7.3 All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be overloaded with debris or materials as to render it unsafe.
- 8.0 All necessary personal safety equipments as considered adequate by the Employer/ Employer's Engineer should be kept available for the use of persons employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate step to ensure proper use of equipment by those concerned. The following safety equipment shall be invariably provided.
 - 8.1 Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
 - 8.2 Those engaged in white washing and mixing or stacking of cement bags or any materials which are injurious to the eye shall be provided with protective goggles.
 - 8.3 Those engaged in welding works shall be provided with welders protective eye shields.
 - 8.4 Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe interval.
 - 8.5 When workers are employed for works in sewers and manholes, which are in active use, the Contractors shall ensure that the manhole covers are opened and ventilated at-least for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident the public. In addition, the contractor shall ensure that the following safety measures are adhered to:
 - a. Entry for workers into the sewer line shall not be allowed except under supervision of the JE or any other higher officer.
 - b. At least 5 to 6 manholes upstream and downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manholes for working inside.
 - c. Before entry, presence of Toxic gases should be tested by inserting wet lead acetate paper which changes color in the presence of such gases and gives indication of their presence.
 - d. Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.
 - e. Safety belt with rope should be provided to the workers. While working inside the manholes such rope should be handled by two men standing outside to enable him to be pulled out during emergency.
 - f. The area should be barricaded or cordoned off by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.
 - g. No smoking or open flames shall be allowed near the blocked manhole being cleaned.

- h. The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.
 - i. Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Employer/ Employer's Engineer may decide the time up to which a worker may be allowed to work continuously inside the manhole.
 - j. Gas masks with Oxygen Cylinder should be kept at site for use in emergency.
 - k. Air-blowers should be used for flow of fresh air through the manholes. Whenever called for, portable air-blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non sparking gas engines also could be used but they should be placed at-least 2 metres away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.
 - l. The workers engaged for cleaning the manholes / sewers should be properly trained before allowing to work in the manhole.
 - m. The workers shall be provided with Gumboots or non-sparking shoes, bump helmets and gloves non sparking tools, safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.
 - n. Workmen descending a manhole shall try each ladder step or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.
 - o. If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him. or rushed to the nearest hospital for proper and through medical care before discharge, at the risk and cost of the Contractor.
 - p. The extent to which these precautions are to be taken depend on individual situation but the decision of the Employer/ Employer's Engineer regarding the steps to be taken in this regard in an individual case will be final.
- 8.6 The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form wherever men above the age of 18 are employed on the work of lead painting the following precautions should be taken.
- 8.6.1 No paint containing lead or lead products shall be used except in the form of paste or readymade paint.
 - 8.6.2 Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scrapped.
 - 8.6.3 Overalls shall be supplied by the Contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.
- 8.6.4.1a) White lead, sulphate or lead work products containing those pigments shall not be used in painting operation except in the form of paste or of paints ready for use.
- b) Measures shall be taken whenever required in order to prevent danger arising from the application of paint in the form of spray.
 - c) Measures shall be taken, whenever practicable to prevent danger arising out of dust caused by dry

rubbing down and scrapping.

8.6.4.2a) adequate facilities shall be provided to enable working painter to wash during and on cessation of work.

b) Suitable arrangements shall be made to prevent clothing put off during working hours being spoiled by painting materials. Else, the contractor shall hold a regular medical examination/ tests of all workers / staff so as to assure their health, safety and fitness for work.

8.6.4.3 a) Cases of lead poisoning and of suspected lead poisoning shall be notified and shall be subsequently verified by a medical man appointed by the competent authorities of DMICDC.

b)The DMICDC may require when necessary a medical examination of workers.

c) Instructions with regard to the special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

9.0 When the work is done near any place where there is risk of drowning, all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions should be made for prompt first aid treatment for all injuries likely to be sustained during the course of the work.

10.0 Use of hoisting machines and tackle including their attachment encourage and supports shall conform to the following standard of conditions.

10.1 a) these shall be of good mechanical construction, sound material and adequate strength and free from patent, defects and shall be kept in good working order, b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

10.2 Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffolding, winch or giving signals to operator.

10.3 In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this clause shall be loaded beyond the safe working load except for the purpose of testing.

10.4 In case of DMICDC machines, the safe working load shall be notified by the Employer/ Employer's Engineer. As regards Contractor's machines the Contractor shall notify the safe working load of the machine to the Employer/ Employer's Engineer whenever he brings any machinery to site of work and get verified by the Employer/ Employer's Engineer.

10.5 Motors gearing, transmission electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguard. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energized, insulating mats, wearing apparel, such as gloves sleeves and boots as may be

- necessary be provided. The worker should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.
- 10.6 All scaffold, ladders, and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.
- 10.7 These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place of work spot. The person responsible for compliance of the safety codes shall be named therein by the contractor.
- 10.8 To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the Contractor shall be open to inspection by DMICDC Official or their representatives.
- 10.9 Notwithstanding the above Clauses from (i) to (xiv) there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS

1.0 APPLICATION

These rules shall apply to all building and construction works in which 20 (twenty) or more workers are ordinarily employed or are proposed to be employed in any day during the period during which the contractor work is in progress.

2.0 DEFINITION

Work place means a place where twenty or more workers are ordinarily employed or are proposed to be employed in connection with construction work on any day during the period during which the contract work is in progress.

3.0 FIRST-AID FACILITIES

3.1 At every work place first aid facilities shall be provided and maintained, so as to be easily accessible during working hours, First-Aid boxes at the rate of not less than one box per 150 contract labour or part thereof ordinarily employed.

3.2 The First-Aid boxes shall be distinctly marked with a red cross on white background and shall contain the following equipments:

3.2.1 For work places in which number of contract labour employed does not exceed 50, Each First-Aid box shall contain the following equipments:

- i. Small sterilized dressings.
- ii. Medium size sterilized dressings.
- iii. Large size sterilized dressings.
- iv. Large sterilized burn dressings.
- v. 1 (30 ml) bottle containing a two percent alcoholic solution of iodine.
- vi. 1 (30 ml) bottle containing salvolatile having the dose and mode of administration indicated on the label.
- vii. 1 snakebite lancet.
- viii. 1 (30 gms) bottle of potassium permanganate crystals.
- ix. 1 pair of scissors.
- x. 1 copy of the First-Aid leaf-let issued by the Director General, Factory Advise Service & Labour Institute, Government of India.
- xi. 1 bottle containing 100 tablets (each of 5 grams) of aspirin.
- xii. Ointment for burns.
- xiii. A bottle of suitable surgical antiseptic solution.

3.2.2 For work places in which the number of contract labour exceed 50. Each First-Aid box shall contain the following equipments:

- i) 12 small sterilized dressings.
- ii) 6 medium size sterilized dressings.
- iii) 6 large size sterilized dressings.
- iv) 6 large size sterilized burn dressings.
- v) 6 (15 gms) packet sterilized cotton wool.

- vi) 1 (60 ml.) bottle containing a two percent iodine alcoholic solution.
 - vii) 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
 - viii) 1 - roll of adhesive plaster.
 - ix) 1 snake - bite lancet.
 - x) 1 (30 gms.) Bottle of potassium permanganate crystals.
 - xi) 1 pair of scissors.
 - xii) 1 copy of the First-Aid leaf-let issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
 - xiii) A bottle containing 100 tablets (each of 5 grams) of aspirin.
 - xiv) Ointment for burns.
 - xv) A bottle of suitable surgical antiseptic solution.
- 3.3 Adequate arrangements shall be made for immediate recoument of the equipment when necessary.
- 3.4 Nothing except the prescribed contents shall be kept in the First Aid box.
- 3.5 The First Aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.
- 3.6 A person in charge of the First-Aid box shall be a person trained in First-Aid treatment in work places where the number of labour employed is 150 or more.
- 3.7 In work places where the number of labour employed is 500 or more and hospital facilities are not available within easy distance of the works, first-Aid Posts shall be established and run by a trained Compounder. The Compounder shall be on duty and shall be available at all hours when the workers are at work.
- 3.8 Where work places are situated in places, which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or persons suddenly taken ill to the nearest hospital.
- 4.0 DRINKING WATER**
- 4.1 In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.
- 4.2 Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.
- 4.3 Every water supply of storage shall be at a distance of not less than 50 feet from any latrines drain or other source of pollution, Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap-door which shall be dust and water-proof.
- 4.4 A reliable pump shall be fitted to each covered well, trap-door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5.0 WASHING FACILITIES

- 5.1 In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of labour employed herein.
- 5.2 Separate and adequate screening facilities shall be provided for the use of male and female workers.
- 5.3 Such facilities shall be conveniently accessible and shall be kept clean and hygienic condition.

6.0 LATRINES AND URINALS

6.1 Latrines shall be provided in every work place on the following scale, namely:

- a) Where females are employed there shall be at least one latrine for every 25 females.
- b) Where males are employed, there shall be at least one latrine for every 25 males.

Provided that where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females, as the case may be, upto the first 100, and one for every 50 thereafter.

- 6.2 Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
- 6.3 Construction of Latrines: The inside walls shall be constructed of masonry or some suitable heat resisting non-absorbent materials and shall be cement washed inside and outside at least once a year. Latrine shall not be a standard lower than bore-hole system.
- 6.4 (a)Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men only" or "For Women only" as the case may be.

(b)The notice shall also bear the figure of man or of a woman, as the case may be.
- 6.5 There shall be at least one urinal for male workers upto 50 and one for female workers upto 50 employed at a time. Provided that where the number of male or female workmen, as the case may be, exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females upto the first 500 and one for every 100 or part thereof, thereafter.
- 6.6 a) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.

b) Latrines and urinals other than those connected with a flush sewerage system shall comply with the requirements of the Public Health Authorities.
- 6.7 Water shall be provided by means of a tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

6.8 Disposal of Excreta

Unless otherwise arranged for by the local sanitary authority arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator.

Alternatively excreta may be disposed off by putting a layer of night soil at the bottom of a pucca tank prepared for the purpose and covering it with a 15 cm layer of waste or for refuse and then covering it with a layer of earth for fortnight (when it will turn into manure).

- 6.9 The Contractor shall, at his own expense, carry out all instruction issued to him by the Employer/ Employer's Engineer to effect proper disposal of night soil and other conservancy work in respect of the Contractor's workmen or employees on the site. The Contractor shall be responsible for payment of any charges which may be levied by Municipal or Cantonment Authority for execution of such work on his behalf.

7.0 PROVISION OF SHELTER DURING REST

At every place, there shall be provided, free of cost, four suitable sheds, two for males and the other two for rest separately for the use of man and women labour. The height of each shelter shall not be less than 3 meters from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sqm. per head.

Provided that the Employer/ Employer's Engineers may permit, subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8.0 CRECHES

- 8.1 A every work place, at which 20 or more women workers are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under the age of six years. One room shall be used as a play room for the children and the other as their bedrooms.

The rooms shall be constructed on standard not lower than the following:

- i) Thatched roof
- ii) Mud floor and walls.
- iii) Planks spread over the mud floor and covered with matting

- 8.2 The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.
- 8.3 The Contractor shall supply adequate number of toys and games in the playroom and sufficient number of cots and beddings in the bed-room
- 8.4 The Contractor shall provide one Ayaa to look after the children in the creche when the number of women workers does not exceed 50; and two when, the number of women workers exceed 50.
- 8.5 The use of the rooms/earmarked as creches shall be restricted to children, their attendant and mother of the children.

9.0 CANTEENS

- 9.1 In every work place where the work regarding the employment of contract labour is likely to continue for six months and wherein contract labour numbering one hundred or more are ordinarily employed, an adequate canteen shall be provided by the Contractor for the use of such labour.
- 9.2 The canteen shall be maintained by the Contractor in an efficient manner.

- 9.3 The canteen shall consist of at least a dining hall, kitchen, and storeroom, pantry and washing places separately for workers and utensils.
- 9.4 The canteen shall be sufficiently lighted at all times when any person has access to it.
- 9.5 The floor shall be made of smooth and impervious material and inside walls shall be lime washed or colour washed at least once in each year.
- Provided that the inside walls of the kitchen shall be lime-washed every four months.
- 9.6 The premises of the canteen shall be maintained in a clean and sanitary condition.
- 9.7 Waste Water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.
- 9.8 Suitable arrangements shall be made for the collection and disposal of garbage as per the municipal guidelines so that the labour camp and the site / work places are neat tidy to avoid any epidemic like Dengue, Chikungunya, Malaria, Cholera, Typhoid etc.
- 9.9 The dining hall shall accommodate at a time 30 persons of the labour working at time.
- 9.10 The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chair shall not be less than one square metre per dinner to be accommodated.
- 9.11 a) A portion of the dining hall, and service counter shall be partitioned off and reserved for women workers in proportion to their number.
b) Washing places for women shall be separate and screened to secure privacy.
- 9.12 Sufficient tables, stool, chairs or benches shall be available for the number of dinners to be accommodated.
- 9.13.1 a) There shall be provided and maintained sufficient utensils, crockery, furniture and any other equipment necessary for the efficient running of the canteen.
b) The furniture, utensils and other equipment shall be maintained in a clean and hygienic condition.
- 9.13.2 a) Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.
b) A service counter, if provided, shall have top of smooth and impervious material.
c) Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.
- 9.14 The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the labour.
- 9.15 The charge for food stuffs, beverages and any other items served in the canteen shall be based on 'No profit' 'No loss' and shall be conspicuously displayed in the canteen.
- 9.16 In arriving at price of food stuffs, and other articles served in the canteen, the following items shall not be taken into consideration as expenditure, namely:

- a) The rent of land building;
- b) The depreciation and maintenance charges for the building and equipment provided for the canteen;
- c) The cost of purchase, repair and replacement of equipment including furniture, crockery, cutlery and utensils;
- d) The water charges and other charges incurred for lighting and ventilation;
- e) The interest and amounts spent on the provision and maintenance and equipment provided for in the canteen;

9.17 The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

10.0 ANTI MALARIAL / Dengue or any other Mosquito borne Diseases PRECAUTIONS

The Contractor shall at his own expense, conform to all anti-malarial instructions given to him by the Employer/ Employer's Engineer including the filling up of any borrows pits which may have been dug by him.

11.0 AMENDMENTS

DMICDC may from time to time, add to or amend these rules and issue such directions as it may consider necessary for the purpose of removing any difficulty which may arise in the administration hereof.

Annexure-IV- CONTRACTOR'S LABOUR REGULATIONS

1.0 SHORT TITLE

2.0 These regulations may be called the Contractor "Labour Regulations".

3.0 Definitions

"Workman" means any person employed by the Employer or its Contractor directly or indirectly through a sub-contractor, with or without the knowledge, of the Employer to do any skilled, semi-skilled, un-skilled, manual, supervisory, technical or clerical work for hire or reward, whether, the terms of employment are expressed or implied but does not include any person-

a) Who is employed mainly in a managerial or administrative; or	
b) Who being employed in a supervisory capacity draws wages exceeding c) Rupees Two thousand Five hundred per person or exercises either by the nature of the duties attached to the office or by reason of powers vested to him, functions mainly of managerial nature. Who is an out worker, that is to say, a person to whom any articles or materials are given out by or on behalf of the principal employer to be made up cleaned, washed, altered, ornamental finished, repaired, adopted or otherwise processed for sale for the purpose of the trade or business of the principal employer and the process is to be carried out either in the home of the out worker or in some other premises, not being premises under the control and management of the principal employer.	

2.2 "Fair Wages" means wages whether for time or piece work fixed and notified

2.3 under the provisions of the minimum Wages Act from time to time.

2.4 "Contractor" shall include every person who undertake to produce a given result other than a mere supply of goods or articles of manufacture through labour or who supplies labour for any work and includes a sub-contractor.

"Wages" shall have the same meaning as defined in the Payment of Wages Act.

2.4.1 Normally working hours of an adult employee should not exceed 9 hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.

- 2.4.2 When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week he shall be paid overtime for the extra hours put in by him at double the ordinary rate of wages.
- 2.4.3.1 Every worker shall be given a weekly holiday on a Sunday, in accordance with the provisions of the Minimum Wages (Central) Rules 1960 as amended from time to time, irrespective of whether such worker is governed by the Minimum Wages Act or not.
- 2.4.3.2 Whether the Minimum Wages prescribed by the Government under the Minimum Wages Act are not inclusive of the wages for the weekly day of rest, the worker shall be entitled to rest day wages at the rate applicable to the next preceding day, provided he has worked under the same contractor for a continuous period of not less than 6 days.
- 2.4.3.3 Where a contractor is permitted by the Employer/ Employer's Engineer to allow a worker to work on a normal weekly holiday, he shall grant a substitute holiday to him for the whole day on one of the five days immediately before or after the normal weekly holidays and pay wages to such worker for the work performed on the normal weekly holiday at overtime rate.

3.0 DISPLAY OF NOTICE REGARDING-WAGES, ETC.

The contractor shall before he commences his work on contract, display and correctly maintain and continue to display and correctly maintain in a clean and legible condition in conspicuous places on the work, notices in English and in the local Indian languages spoken by the majority of the workers, giving the minimum rates of wages fixed under the Minimum Wages Act, the actual wages being paid, the hours of work for which such wages are earned, wage period, dates of payment of wages and other relevant information as per Appendix 'A'.

4.0 PAYMENT OF WAGES

- 4.1 The contractor shall fix wage periods in respect of which wages shall be payable.
- 4.2 No wage period shall exceed one month.
- 4.3 The wages of every person employed as labour in an establishment or by a contractor where less than one thousand, such persons are employed shall be paid before the expiry of the seventh day and in other cases before the expiry of tenth day after the last day of the wage period in respect of which the wages are payable.
- 4.4 Where the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.
- 4.5 All payments of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.
- 4.6 Wages due to every worker shall be paid to him direct or to other person authorized by him in this behalf.
- 4.7 All wages shall be paid in current coin or currency or in both.

- 4.8 Wages shall be paid without any deductions of any kind except those specified by the Central Government by general or special order in this behalf or permissible under the Payment of Wages Act 1956.
- 4.9 A notice showing the wage period and the place and time of disbursement of wages shall be displayed at the place of work and a copy sent by the contractor to the Employer/ Employer's Engineer under acknowledgment.
- 4.10 It shall be the duty of the contractor to ensure the disbursement of wages in the presence of the Engineer or any other authorized representatives of the Employer/ Employer's Engineer who will be required to be present at the place and time of disbursement of wages by the contractor to workmen.
- 4.11 The contractor shall obtain from the Engineer or any other authorized representative of the Employer/ Employer's Engineer as the case may be, a certificate under his signature at the end of the entries in the "Register of Wages" or the "Wage-cum-Muster Roll" as the case may be in the following form:

"Certified that the amount shown in column No. 14(net Amount paid) has been paid to the workmen concerned in my presence onat ..".

5.0 FINES AND DEDUCTIONS, WHICH MAY BE MADE FROM WAGES

- 5.1 The wages of a worker shall be paid to him without any deduction of any kind except the following -

a)	Fines
b)	Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.
c)	Deduction for damage to or loss of goods expressly entrusted to the employed persons for custody, or from loss of money or any other deduction which he is required to account where such damage or loss is directly attributable to his neglect or default.
d)	Deduction for recovery of advances or for adjustment of over payment of wages, advances granted shall be entered in a register.
e)	Any other deduction, which the Central Government may from time to time allow.

- 5.2 No fines should be imposed on any worker save in respect of such acts and omissions on his part as have been approved by the Chief Labour Commissioner.

NOTE: An approved list of Acts and Omissions for which fines can be imposed is enclosed at Appendix-I.

- 5.3 No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.
- 5.4 The total amount of fine which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a Rupee of the total wages, payable to him in respect of that wage period.

5.5 No fine imposed on any worker shall be recovered from him in installment, or after the expiry of sixty days from the date on which it was imposed.

5.6 Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

6.0 LABOUR RECORDS

6.1 The contractor shall maintain a "Register of persons employed" on work on contract in form XIII of the CL (R&A) Central Rules 1971.

6.2 The contractor shall maintain a "Muster Roll" register in respect of all workmen employed by him on the work under contract in from XVI of the CL (R&A) Rules 1971.

6.3 The contractor shall maintain a "Wage Register" in respect of all workmen employed by him on the work in form.

6.4 Register of accidents - The contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:

- a) Full particulars of the labourers who met with accident.
- b) Rate of wages
- c) Sex
- d) Age
- e) Nature of accident and cause of accident.
- f) Time and date of accident.
- g) Date and time when he/she admitted in Hospital
- h) Date of discharge from the Hospital
- i) Period of treatment and result of treatment
- j) Percentage of loss of earning capacity and disability as assessed by Medical Officer.
- k) Claim required to be paid under Workmen's Compensation Act.
- l) Date of payment of compensation.
- m) Amount paid with details of the person to whom the same was paid.
- n) Authority by whom the compensation was assessed.
- o) Remarks.

6.5 Register of Fines - The contractor shall maintain a "Register of Fines"

The contractor shall display in a good condition and in a conspicuous place of work the approved list of Acts and Omission for which fines can be imposed .

6.6 Register of Deductions - The contractor shall maintain a "Register of Deductions" for damage or loss in form.

6.7 Register of Advances - The contractor shall maintain a "Register of Advances"

6.8 Register of Overtime - The contractor shall maintain a "Register of Overtime"

7.0 ATTENDANCE CARD-CUM WAGE SLIP:

7.1 The contractor shall issue an attendance card-cum-wage slip to each workman employed.

7.2 The card shall be valid for each wage period.

7.3 The contractor shall mark the attendance of each workman on the card twice each day, once at the commencement of the day and again after the rest interval, before he actually starts work.

7.4 The card shall remain in possession of the worker during the wage period under reference.

7.5 The contractor shall complete the wage slip portion on the reverse of the card at least a day prior to the disbursement of wages in respect of the wage period under reference.

7.6 The contractor shall obtain the signature or thump impression of the worker on the wage slip at the time of disbursement of wages and retain the card with himself.

8.0 EMPLOYMENT CARD

The contractor shall issue an Employment Card in form to each worker within three days of the employment of the worker

9.0 SERVICE CERTIFICATE

On termination of employment for any reason whatsoever the contractor shall issue to the workman whose services have been terminated, a service certificate.

10.0 PRESERVATION OF LABOUR RECORDS

All records required to be maintained under Regulations Nos. 6 and 7 shall be preserved in original for a period of three years from the date of last entries made in them and shall be made available for inspection by the Employer/ Employer's Engineer, Labour Officer.

11.0 POWER OF LABOUR OFFICERS TO MAKE INVESTIGATIONS INQUIRY

The Labour Officer or any other person authorized by DMICDC on its behalf shall have power to make inquires with a view to ascertaining and enforcing due and proper observance of the Fair Wage Clauses and the Provisions of Regulations. He shall investigate into any complaint regarding the default made by the contractor or sub-contractor in regard to such provision.

12.0 INSPECTION OF BOOK AND SLIPS

The contractor shall allow inspection of all the prescribed labour records to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labour officer or any other person, authorized by the Central Government on his behalf.

13.0 SUBMISSION OF RETURNS

The contractor shall submit periodical returns as may be specified from time to time.

14.0 AMENDMENTS

The Employer may from to time, add or amend the regulations and on any question as to the application, interpretation or effect of these regulations the decision of the Zonal Chief concerned shall be final.

Annexure-V- UNDERTAKING FOR NON-ENGAGEMENT OF CHILD LABOUR –

Name of Work:

Bidding Doc. No.:

I/ We hereby declare that:

- a) We are committed to elimination of child labour in all its forms.
- b) “Neither we nor any of our nominated sub-contractor(s) will engage Child Labour in any of our work(s) in terms of the provisions of The Child Labour (Prohibition and Regulation) Act, 1986 and other applicable laws.
- c) We as well as our nominated sub-contractor(s) undertake to fully comply with provisions of The Child Labour (Prohibition and Regulation) Act, 1986 and other applicable labour laws, in case the work is awarded to us.
- d) It is understood that if I/We, either before award or during execution of Contract, commit a transgression through a violation of Article b /c above or in any other form, such as to put my/our reliability or credibility in question, the Owner is entitled to disqualify us from the Tender process or terminate the Contract, if already executed or exclude me / us from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Owner. Such exclusion may be for a period of 1 year to 3 years as per the procedure prescribed in the guidelines for holiday listing of the Owner.
- e) I/We accept and undertake to respect and uphold the Owner's absolute right to resort to and impose such exclusion.

Place:

Signature of Bidder:

Date

Schedule S - Project Management Requirements

(See Clause 3.1.7 (m))

PROJECT PLANNING, SCHEDULING, MONITORING & CONTROL SYSTEM FOR EPC CONTRACT

Abbreviations:

EPC	-	Engineering, Procurement and Construction
PMC	-	Program / Project Management Consultant
MR	-	Material Requisition
AFC	-	Approved for Construction
WBS	-	Work Breakdown Structure
UOM	-	Unit of measurement
PR	-	Purchase Requisition
PO	-	Purchase Order

CONTENTS

<u>Clause</u>	<u>Title</u>	_____
1.0	<u>INTRODUCTION</u>	
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3.0	<u>ABBREVIATIONS</u>	
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9.0	<u>PROGRESS REPORTING</u>	
10.0	<u>BULK MATERIAL CONTROL</u>	
11.0	<u>PLANNING PACKAGE</u>	
12.0	<u>CONTROL ROOM DISPLAY</u>	
13.0	<u>SOFTWARE PACKAGES</u>	

ATTACHMENT

I	PROJECT SCHEDULE HIERARCHY (1 Sheet)
II	WORK BREAK DOWN STRUCTURE (1 Sheet)
III	MONTHLY PROGRESS REPORT (37 Sheets)
IV	FLOW OF DOCUMENTS (3 Sheets)

1.0 INTRODUCTION

To ensure timely completion, the Engineering, Procurement & Construction (EPC) Contractor shall establish and maintain an effective Planning, Scheduling, Monitoring & Control system, including mobilization of required number of professionally qualified and experienced Planning Engineers for design office and construction site. The system shall be capable of accurate and timely prediction of trend, evolution of adequate preventive actions for likely slippages, and formulation of suitable recovery schedule for delays, if any, that have occurred.

Schedules, reports and documents to be prepared and submitted by the EPC contractor for review of Client / Program / Project Management Consultant (PMC) at various stages and details of meetings to be held are described here under item 8.0 (Review Meetings).

2.0 DEFINITIONS

Work Breakdown Structure (WBS)

Work Breakdown Structure is a diagram that depicts various units in a project and each unit is detailed with work items / equipment and major workloads.

Design Office

Where Residual Basic Engineering, Detailed engineering, procurement activities for the contract are performed by EPC contractor.

Functions, Units, Disciplines

Function means basic components of the projects e.g. Residual Basic Engineering, Detailed engineering, ordering, manufacturing, delivery, construction and commissioning. Each function is carried out for various units viz. Convention Center, Exhibition Center 1, 2, 3, Infrastructure etc. and it is further divided into various disciplines i.e. architecture, civil, structure, mechanical (HVAC), mechanical (plumbing / piping), electrical, instrumentation / ict etc.

3.0 ABBREVIATIONS

EPC -	Engineering, Procurement and Construction
PMC -	Program/Project Management Consultant
MR -	Material Requisition
AFC -	Approved for Construction
WBS -	Work Breakdown Structure
UOM -	Unit of measurement
PR -	Purchase Requisition
PO -	Purchase Order

4.0 DOCUMENTS ALONG WITH BID

The EPC bidder shall submit following documents along with the bid:

- a) Proposed Overall Project Schedule in network form showing all the details unit wise in Primavera P6 (Latest Version) in pdf. Write up on Project Planning, Scheduling, Monitoring & Control system (proposed). Progress Measurement Methodology with details such as weightages, milestones etc.
- b) Organizational set up for Planning, Scheduling, Monitoring & Control at EPC Contractor's Design Office and Site Office. Function wise Resource Deployment Schedule (HO & Site manpower and construction equipment).

- c) Project Approach & execution methodology. Softwares to be used for planning and material control.
- d) Certificates of ISO 9001, ISO 18001 & ISO 14001 or its international equivalent to be.

5.0 AFTER AWARD OF WORK

5.1 90 DAYS FRONT END SCHEDULE

The EPC Contractor shall prepare and submit a detailed 90 days front-end schedule within one week of award. Pending finalization of Overall Schedule, this schedule shall be the basis of monitoring of front-end (initial) activities. The schedule shall cover all activities to be carried out during initial 90 days period of the contract. The schedule shall be reviewed in the kick-off meeting.

5.2 KICK OFF MEETING

A Kick off Meeting shall be organized **within one week of award** of contract. The meeting shall be attended by Client's and PMC's representatives. During the meeting, the following with respect to Planning, Scheduling, Monitoring & Control system shall be discussed and finalized:

1. **Project Management Plan** and Procedure for Project Planning, Scheduling, Monitoring & Control system including all reporting formats.
2. **Work Breakdown Structure (WBS)** for Project Schedules, organization and level of detailing for Overall Project Schedule and Functional Schedules.
3. **Overall Project Schedule**, Planning deliverables required for Project Monitoring & Control.
4. List of unit wise milestones to be included in the network, in addition to milestones specified in the Contract, if any (the number of milestones shall be at least 2 to 3 per unit per month).
5. List of engineering deliverables with indicative schedule for submission.
6. **Organizational set up** (including Organization Chart) for the project including that at EPC Contractor's Design Office and Site Office.
7. **Project Execution Methodology** and **Procurement Plan** including procedure for Bulk Material Control.
8. **Progress Measurement Methodology** and Unit, Function, Discipline, and Deliverable wise weightage breakdown.
9. **Resource Deployment Schedules** - Function wise, Unit wise and Discipline wise for HO & Site manpower & construction equipment including Resource Analysis (Standard Unit Man-hours). List of critical equipment and materials for the fortnightly expediting report.
10. **Cost Loading Schedules** - Function wise, Unit wise, Discipline wise including Charts (Curves).

11. Cut off dates, distribution list with number of copies and Project calendar indicating submission of various planning documents and revisions.
12. Risk Management Plan covering – risk identification, qualitative & quantitative risk analysis, risk response, risk monitoring and control.
13. Any other document as required.

5.3 PROGRESS MEASUREMENT SYSTEM / METHODOLOGY

The EPC Contractor shall submit during Kick Off Meeting, the detailed system / methodology of progress measurement of Residual Basic Engineering, Detailed Engineering, Ordering, Manufacturing, Delivery, Sub-contracting, Construction and Commissioning for review by Employer/ Employer's Engineer. EPC Contractor shall also furnish the methodology of progress measurement for sub-contracted packages and integration of the same with the overall progress.

During the Kick Off meeting, Employer/ Employer's Engineer shall finalize weighted values to be used for the following:-

- a) Unit wise within the contract, as applicable.
- b) Function wise (for Residual Basic Engineering, Detailed Engineering etc.) within each unit.
- c) Milestone weightage (for Residual Basic Engineering, Detailed Engineering etc.) for each type of deliverable.

“Effort based weighted values” for the deliverable under Residual Basic Engineering, Detailed Engineering, Construction, Pre-commissioning, Commissioning, As-built Documentation, Training etc. and **“Cost based weighted values”** for the deliverables under Ordering, Tendering, Sub-contracting, Manufacturing, Delivery etc., along with the basis of their derivation, shall be submitted by EPC Contractor for review by Employer/ Employer's Engineer, and the comments if any shall be incorporated by EPC Contractor and resubmitted for approval.

Function level weightage shall be divided to discipline level and then to deliverable level / milestone level.

Progress figures at Unit / Function / Discipline level shall be summarized from deliverable level and indicated in the functional schedules.

5.4 EPC RISK MANAGEMENT

- Based on the Client/PMC Risk Management Plan develop a systematic risk management plan/strategy to be applied to this EPC Package and its component projects that clearly identifies potential risks to the Programme. The EPC risk management plan needs to be comprehensive to cover all potential risks faced by this EPC Package throughout the duration of the Services, identify probabilities of risk occurrence and allocate weighting systems to monitor risk. The risk management plan needs to include early warning systems and trend analyses and other methodologies that assist in early discovery of risk items
- Track that significant risks are systematically identified, recorded, evaluated, actively managed and regularly re-evaluated and communicated across the EPC Package
- Identify, communication and manage inter-package or external risks

- Identify and manage internal package related risks
- Propose mitigation measures ranging from adjustments to the proposed alignment, changes, recovery plans and any other action used to mitigate certain risks
- Conduct risk assessment workshops on a regular basis with Client/PMC, PMs, suppliers, contractors and other stakeholders

6.0 PROJECT SCHEDULES

Following schedules shall be prepared and submitted by EPC contractor to Employer/ Employer's Engineer for approval. A hierarchy of all schedules to be generated by EPC Contractor is shown in Attachment – I.

6.1 OVERALL PROJECT SCHEDULE NETWORK (Summarized & Detailed)

The EPC Contractor shall submit within four weeks of award, a network based, using Primavera P6 (latest version) detailed overall project schedule (unit wise) on time scale, for all units in the contract and all functions of the work describing the project workload (refer Attachment - II). The schedule shall highlight interface activities in the scope of Employer/ Employer's Engineer and clearly reflect strategies and philosophy of execution. Major milestones for each unit shall be depicted at the beginning of the network. Milestones shall be chosen in such a way that minimum 1 milestone to maximum 5 milestones are scheduled every month (average 2 to 3 milestones per month). The project schedule shall be developed for contractual duration and or target duration decided with Employer/ Employer's Engineer. Grace period, if any as per contract shall not be considered for schedule. The schedule shall be reviewed by Employer/ Employer's Engineer and the comments if any shall be incorporated and the schedule shall be issued for implementation within one week from the receipt of comments. This schedule once approved by Employer/ Employer's Engineer shall form the Baseline Schedule and should not be revised without the prior written permission of Employer/ Employer's Engineer.

Overall Project Schedule Network (Summarized) will be derived from Overall Project Schedule Network (Detailed) and will include all major / critical activities & summarized activities at macro-level.

Overall Project Schedule Network (Detailed) shall be used for trend / detailed analysis whereas Overall Project Schedule Network (Summarized) will be used to project status at a glance to higher management along with the Monthly Progress Report.

The Overall Project Schedule Network (Detailed) shall be updated on monthly basis and submitted along with Monthly Progress Report indicating/comparing with Baseline Schedule.

6.2 FUNCTIONAL SCHEDULES

The EPC Contractor shall prepare resource based detailed Unit wise functional schedules (Deliverable and Milestone Level Schedule) for all functions in network form, using Primavera P6 (latest version) in line with overall project schedule for monitoring and control. EPC Contractor shall submit the same within four weeks of award for review along with construction schedule, which shall also be submitted within four weeks of award. Functional Schedule activities to be fully loaded with quantum of work, resources (manpower, material, machinery/equipment) and costs. Unit wise "S" curves for schedule progress of all units, functions & disciplines shall also be submitted along with the functional schedules.

The schedule shall be reviewed by Employer/ Employer's Engineer and comments, if any, shall be incorporated and issued for implementation within one week from receipt of comments. The Schedule "S" curves shall remain firm during the execution of the project.

EPC Contractor shall also ensure preparation, submission and updating of all functional schedules as described herein for all sub contracted packages.

This schedule shall cover the full scope of Contractor's work. In this schedule the works to be broken down to a level where each of the activity is a progress measurable element and that activity durations to be reasonable (typically no more than 6 days duration except for project management tasks, procurement activities for long lead items or any other activity that obviously needs to be of longer duration).

6.2.1 Residual Basic Engineering Schedule

The EPC Contractor shall submit a Unit wise schedule consisting of all Residual Basic Engineering drawing/document and applicable milestones (refer sample format page 14 of Attachment - III).

6.2.2 Detailed Engineering Schedule

The EPC Contractor shall submit a Unit wise schedule of all engineering deliverable/documents such as AFC drawings, Isometrics, Specifications, Material Requisition, Purchase Requisition, Design calculations, BIM Model etc. as per page 14 of Attachment - III.

6.2.3 Ordering Schedule

The EPC contractor shall submit a Unit wise schedule for all ordering activities as per pages 17 &18 of Attachment - III. This shall include all MRs listed in Engineering Schedule.

6.2.4 Manufacturing / Delivery Schedule

The EPC contractor shall submit a Unit wise schedule for all Manufacturing & Delivery activities as per page 22 of Attachment - III. These shall include all MRs listed in the Ordering Schedule. After placement of order for MR, PO wise detail under respective MR shall be listed. The progress at Function/Unit level shall be summarized considering weighted values of MR/PO level for tagged items and bulk material to report overall Manufacturing and Delivery progress.

EPC Contractor shall also submit along with Weekly Progress Report, status of drawings and documents for all vendors on whom orders have been placed, as per page 16 of Attachment - III. In addition to the above, for critical items as mutually agreed between EPC Contractor and Employer/ Employer's Engineer, EPC Contractor shall ensure that vendors prepare and update logical networks for Manufacturing & Delivery and submit the same on weekly / monthly basis to Employer/ Employer's Engineer.

6.2.5 Sub-contracting Schedule

The contractor shall submit a Unit wise schedule for all Sub-contracting activities as per page 23 of Attachment - III. This shall include all tenders envisaged for the Project.

6.2.6 CONSTRUCTION SCHEDULE

The EPC Contractor shall prepare and submit a **detailed network of quantitative Construction Schedule** unit wise for Employer/ Employer's Engineer review.

The EPC Contractor shall submit resources (manpower and machinery) deployment schedule. The schedule shall have interface with Engineering, Ordering and Manufacturing & Delivery activities and also interface required from Employer/ Employer's Engineer. The EPC Contractor shall also define construction quantity for each activity. EPC Contractor shall finalize discipline wise Construction Progress Curves and quantum schedule.

This schedule shall cover the full scope of Contractor's work. In this schedule the works to be broken down to a level where each of the activity is a progress measurable element and that activity durations should be reasonable (typically no more than 6 days duration except for project management tasks, or any other activity that obviously needs to be of longer duration).

6.3 OVERALL PROGRESS CURVES

The EPC Contractor shall prepare unit wise and Overall Progress curves showing cumulative schedule progress taking into consideration Progress curves for Residual Basic Engineering, Detailed Engineering, Ordering, Manufacturing & delivery, Sub-contracting and Construction & Commissioning Progress Curves. The overall Progress curves shall be updated immediately after finalization of construction schedule. The overall Progress curves shall be submitted for Employer/ Employer's Engineer review, with necessary back ups and shall form part of monthly progress report.

6.4 OTHER SCHEDULES

The control philosophy for construction activities involves monitoring at the unit/discipline/subcontract/area level from the initial stages of construction and supplementing it with monitoring at the system / loop level as construction advances towards mechanical / substantial completion, pre-commissioning, commissioning stages. To meet this objective, the following schedules/deliverables shall be prepared by EPC Contractor.

6.4.1 SUB CONTRACTOR SCHEDULE

EPC Contractor shall ensure preparation of detailed schedules for all works in the scope of each subcontract awarded by them within two weeks of award of sub- contract, for monitoring of construction progress. These schedules shall have quantity/work load details of all work items and Progress curve for each of the sub contracts. The EPC Contractor shall ensure updating of the same on fortnightly basis. Employer/ Employer's Engineer reserve the right to check these schedules at any time.

6.4.2 MONTHLY PROGRAM

EPC Contractor shall prepare monthly quantitative programs in line with functional schedules for all the functions. These programs shall be made keeping in view the cumulative targets as set in the schedules backlog and work front available in terms of vendor inputs, drawings, materials and access as applicable. The programs for construction shall be accompanied by list of resources (Manpower & machinery) planned to be deployed to achieve the programs. Current hold ups (Drawing, Materials, etc. if any) required to be resolved for the execution of the programs made, shall be indicated with proposed action plan for resolution.

In case of construction, monthly program shall be finalized in consultation with Employer/ Employer's Engineer's site representative and submitted within **two calendar days of monthly progress report cut-off date**. Monthly programs other than Construction shall be submitted to Employer/ Employer's Engineer within three calendar days of monthly progress report cut - off date. In all matters concerning the extent of targets set out in monthly program, the decision of Employer/ Employer's Engineer shall be final and binding.

The monthly programs shall be further broken down into weekly programs and indicated in weekly reports for closer monitoring of progress.

6.4.3 LOOP WISE PIPING COMPLETION SCHEDULE FOR MEP WORKS

EPC Contractor shall prepare micro-level schedule for completion of piping activities and submit to Employer/ Employer's Engineer for review at least **two months before the start of hydro-testing** as scheduled in Unit wise Construction schedules. The schedules shall cover unit wise / system wise / loop wise, the following activities remaining as of the date of preparation:

- a) Status of balance piping materials (Details of items, quantities, vendors, POs and expected date of receipt at site to be indicated)
- b) Status of balance equipment and in-line instrument items (Details of tags, vendors and POs and expected receipt to be indicated)
- c) Welding (inch dia.) workload separately for shop fabrication and field welding.
- d) Erection and supporting (inch meter)
- e) Radiography (number of joints)
- f) Stress relieving (number of joints)
- g) Hydro-testing (inch meter)

6.4.4 SYSTEM WISE COMPLETION SCHEDULE FOR MEP WORKS

After preparation of loop wise micro -level schedule for completion of piping activities, EPC Contractor shall prepare Unit wise / System wise micro -level schedule for completion of remaining activities. The schedules shall be submitted by EPC Contractor to Employer/ Employer's Engineer for review, 6 weeks before scheduled system completion as per Unit wise Construction Schedules. The schedules shall cover discipline wise remaining activities as mentioned below

- a) Balance civil and structural work item wise
- b) Balance Mechanical erection work tag wise
- c) Alignment of Rotating Equipment
- d) Balance Electrical work
- e) Balance Instrumentation works including loop checking
- f) Schedule for issue of prescribed formats for handing over of system such as

Format I	:	Information regarding system completion
Format II	:	Checklist
		Ready for pre-commissioning / Mechanical completion
Format III	:	certificate
Format IV	:	Ready for commissioning certificate
Format V	:	Completion of commissioning certificate

The description of the system and loop numbering mentioned in the schedules at 6.4.3 & 6.4.4 above shall be as agreed with Employer/ Employer's Engineer (Construction / Commissioning group). The schedule shall be resource based and shall indicate total and remaining workload for each activity.

6.4.5 PRE-COMMISSIONING / COMMISSIONING SCHEDULE FOR MEP WORKS

EPC Contractor shall prepare unit wise / system wise pre-commissioning / commissioning micro-level schedule. These schedules shall be submitted by EPC Contractor to Employer/ Employer's Engineer for review two months before the Mechanical Completion / Substantial Completion milestone or one month before starting pre-commissioning activities, whichever is earlier.

The schedules shall be developed after considering the pre-commissioning / commissioning priorities & interface requirements and identify requirement of licensor's/ vendor's representatives stay at site. The description of system / sub system mentioned in the schedule shall be as agreed with Employer/ Employer's Engineer (Construction / Commissioning groups).

6.5 RECOVERY SCHEDULE

The EPC Contractor shall generate and submit recovery schedule for completion of all balance activities without change in contractual completion time & cost with detailed resource reinforcement as and when asked by Employer/ Employer's Engineer. The recovery schedules shall be submitted to Employer/ Employer's Engineer for review. Accordingly the Progress curves for recovery schedules shall be made and shown along with the original / baseline schedules and actual Progress curves.

During updation of overall project schedule, the recovery schedules shall be shown in linked bar chart form along with the original / baseline schedule.

7.0 UPDATING OF PROJECT SCHEDULES

The various schedules as described herein shall be updated for submission to Employer/ Employer's Engineer. Updating of the schedule is to determine the project trend, with the objective of taking preventive / corrective action. The reflection of delayed / anticipated completion by way of current trend does not in any manner absolve the EPC Contractor of his contractual obligations as per the contract.

7.1 OVERALL PROJECT SCHEDULE

7.1.1 Overall Project Schedule Network (Detailed)

The schedule shall be updated on monthly basis and submitted in linked bar chart form in soft form (native format). The updating shall be compared with the original / baseline schedule.

While updating, the following shall be considered:

- Actual date of start and completion for the activities and actual work progress/balance work.
- Duration of activities not yet started shall remain the same as per the original / baseline schedule.
- Anticipated dates of activities in progress including that for drawing/material availability.
- Change in philosophy / execution strategy to be with prior approval from Employer/Employer's Engineer.
- Addition/deletion of any activity if required or any change in job logic/dependencies/relationships and/or activity duration and/or resource planning to be with prior approval from Employer/Employer's Engineer.

7.1.2 Overall Project Schedule Network (Summarized)

The schedule shall be as derived from the updated Overall Project Schedule Network (detailed) as above on monthly basis and submitted in linked bar chart form with monthly progress report. The updating shall be compared with the original/baseline schedule. Format for updated schedule will be as per Attachment-III page 31 of 37.

7.2 FUNCTIONAL SCHEDULES

The updated functional schedule trend and original/baseline schedule shall be shown together and submitted to Employer/ Employer's Engineer on monthly basis, as part of Monthly Progress Report.

While updating, the following aspects shall be considered:

- Actual date of start and completion for the activities and actual work progress/balance work.
- Duration of activities not yet started shall remain the same as per the original / baseline schedule.
- Anticipated dates of activities in progress including that for drawing/material availability.
- Contractual completion date for sub-contractors and vendor delivery not reflected earlier.
- Interfaces of one agency with other agencies and various statutory reviews / approval.
- Interfaces between unit & offsite / utilities i.e. permanent power & water, waste disposal etc.
- Change in execution logic / philosophy and engagement of number of agencies / sub-contractors to be with prior approval from Employer/Employer's Engineer.
- Addition/deletion of any activity if required or any change in job logic/dependencies/relationships and/or activity duration and/or resource planning to be with prior approval from Employer/Employer's Engineer.

7.3 OTHER SCHEDULES

The following schedules shall be updated on a weekly basis and submitted to Employer/ Employer's Engineer before the weekly review meeting at site in linked bar chart format. The updated schedule trend shall be compared with original / baseline schedule.

- Loop wise piping completion schedule for MEP works
- System wise completion schedule for MEP works
- Pre-commissioning / commissioning schedule for MEP works

8.0 REVIEW MEETINGS

The EPC Contractor shall present project status, project highlights & risk status/register and action plan as applicable at various review meetings as described below. The presentation materials shall be submitted by EPC contractor to Employer/ Employer's Engineer at least two days before the date of the meeting for management level review meetings and Monthly/Fortnightly review meetings.

8.1 Management Level Review Meeting

Level of participation : Senior management of Employer/ Employer's Engineer and EPC contractor

Agenda, frequency and venue : To be decided by Employer/ Employer's Engineer

8.2 Monthly / Fortnightly Review Meeting

Level of participation (PMC) and EPC Contractor : Employer (Client), Employer Engineer

Agenda:

- 1) Status against various commitments made during the previous review meetings
- 2) Monthly program w.r.t. Progress Status / Statistics
- 3) Project Completion Outlook
- 4) Areas of concern with action plan
- 5) Recovery schedule.
- 6) Updated Risk Register covering – risk identification, qualitative & quantitative risk analysis, risk response, risk monitoring and control.

Venue and timing of the meeting shall be decided by Employer/ Employer's Engineer. Frequency of Meeting (Monthly or Fortnightly) shall also be decided by Employer/ Employer's Engineer, based on criticality of the project status.

8.3 Weekly Review Meeting

8.3.1 For EPC Design Office activities

Level of participation: Client, PMC & EPC Contractor

- Agenda:
- 1) Weekly program w.r.t. progress status / Statistics for Residual Basic Engineering, Detailed Engineering, Ordering, Manufacturing & Delivery and Sub-contracting.
 - 2) Action taken for slippages.
 - 3) Program for next week
 - 4) Status of various resources deployed Vs planned
 - 5) Updated Risk Register

8.3.2 For Site Activities

Level of participation: Client, PMC & EPC Contractor

- Agenda:
- 1) Work front availability
 - 2) Weekly program v/s Achievement
 - 3) Resource mobilization
 - 4) Reasons for shortfall
 - 5) Recovery Schedule
 - 6) Progress statistics
 - 7) Program for next week.
 - 8) Status of resources deployed v/s planned.
 - 9) Updated Risk Register
 - 10) Hindrance register

Venue and timing of Weekly Review Meetings for shall be decided by Employer/ Employer's Engineer.

9.0 PROGRESS REPORTING

The EPC Contractor shall submit the following reports on regular basis for Employer/ Employer's Engineer's information/ review.

9.1 Monthly Progress Report

The report shall be submitted on monthly basis within 5 calendar days from cut -off date covering overall scenario of the project. A copy of the specified formats for the report is enclosed as Attachment – III.

9.2 Weekly Progress Report (Overall)

This report shall be prepared by EPC Contractor and issued on weekly basis to Employer/ Employer's Engineer with in three days of the cutoff date. The report shall include the following:

- Executive Summary
- Project highlights with dates of achievements.
- Project exception (work programmed but not achieved with reasons for non-achievement) and work programmed for next week
- Critical areas
- Action taken / to be taken for slippages
- Progress statistics
- Activities planned for next week
- Status of Outstanding Documents from Employer/ Employer's Engineer/PEAC

This shall cover both for EPC Contractor's Design Office activities and construction activities at site.

9.3 Weekly Progress Report (Construction)

This report shall be prepared by EPC Contractor and submitted on weekly basis within 2 calendar days from cutoff date. The report shall cover following items:

- Progress statistics
- Work item wise quantity completed against program for the week including reasons for shortfall
- Program for next week
- Front available
- Constraints, if any.
- Resources deployed against planned with reasons for shortfall in resource deployment
- List of equipment / materials received at site during the week

9.4 Daily Progress Report (Construction)

EPC Contractor shall submit (daily before noon), for status of previous working day a daily report including the following

- f* Program v/s Progress for the day
- f* Program for next day
- f* Important achievements for the day
- f* Materials / Equipment receipt for the day.
- f* Man power / Machinery deployment report - Required v/s Deployed.

9.5 Expediting Report

EPC Contractor shall submit fortnightly expediting report(s) based on his representative's visit to vendor's work for orders where delivery of materials is critical to project completion. A list of such critical items / vendors shall be specified by Employer/ Employer's Engineer during the kick off meeting or at a later date.

In addition to the above, Employer/ Employer's Engineer may request expediting report based on visit of EPC Contractor's representatives in case of orders which though not critical at the time of order placement become subsequently critical during project execution due to any reason.

10.0 BULK MATERIAL CONTROL

The Contractor shall follow an integrated material control system for the project. The system shall be such that material identification in the design office, procurement and allocation, are all channelized and controlled in an orderly manner. The Contractor shall follow material identification like unit wise / system wise / area wise / zone wise / Line wise (for MEP works), and shall give construction orientation to material control. The Contractor, right from the beginning, at the design stage, shall start identifying materials system wise or area wise as indicated above. The material control system shall be based upon tracking of material requisitioning, placement of purchase order, manufacturing at vendor's shop up to receipt at site for making the material available for performing planned and sequential construction work.

Through periodic reviews, the Contractor shall have a system of generating Hold up reports well in advance to identify exception on material availability and to track such material by the expeditors through a systematic follow up procedure from the vendors.

The contractor shall make a presentation on the bulk material control system proposed to be implemented by them for the project during the kick-off meeting.

Contractor shall submit the following reports on monthly basis for each unit as well as summary level.

- Bulk Material Status Report
- Material hold up/shortage report.

11.0 PLANNING PACKAGE

Details of time of submission, frequency of submission and tentative number of copies required for all documents to be submitted by the contractor are tabulated in attachment IV.

Once the majority of the schedules are finalized, the EPC contractor shall compile the same and submit in the form of a Planning Package. (Not later than 4 weeks of award of the job). The Planning Package shall consist of the following:

- Introduction & Approach to Implementation
- Organization Chart (Design Office / Site)
- Project WBS / Work load (Quantum of Work)
- Overall Project Schedule Network (Summarized)
- Overall Project schedule Network (Detailed)
- Functional schedules
- 90 days front end schedule (to be submitted in one week during Kick-off Meeting)
- List of Milestones
- Progress measurement System (Methodology)

- Progress 'S' curves with backup calculation sheet
- Sample reporting formats
- Manpower and Machinery deployment schedule with Resource Analysis
- Risk Register
- Lessons Learned

Contractor shall submit reports, updated schedules, programs etc. as described herein till the completion of all work in the scope of the contract. No chapter/annexure of any report shall be deleted without prior written approval of Employer/ Employer's Engineer.

12.0 CONTROL ROOM DISPLAY

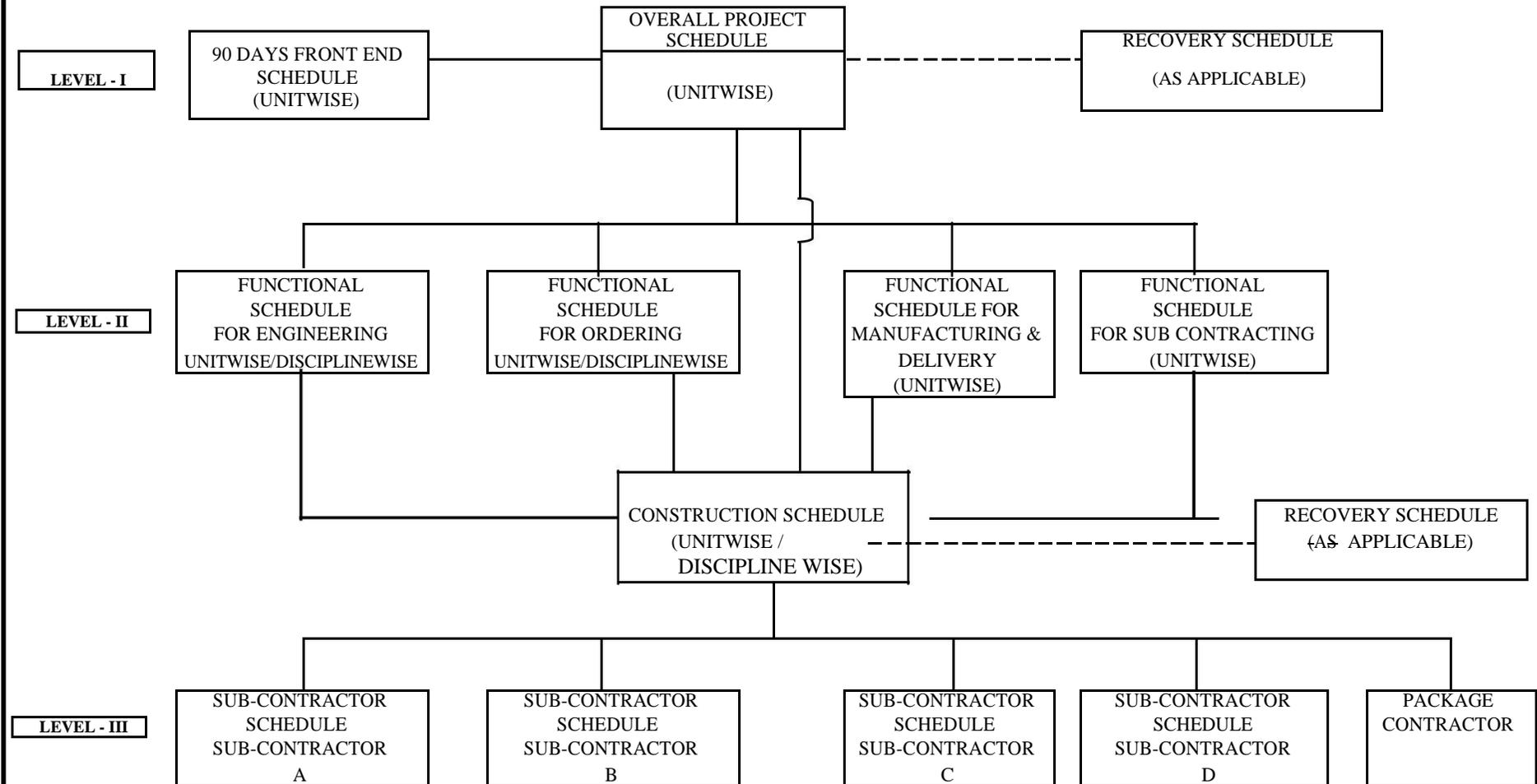
EPC Contractor shall have conference room at site to display charts featuring salient static information of the project, schedules, status of progress, resource deployment, rainfall record, block flow diagram, plot plan, work break down structure etc. The status shall be updated at least on weekly basis. The objectives of the control room are to provide information at a glance to project personnel including the management of Employer/ Employer's Engineer.

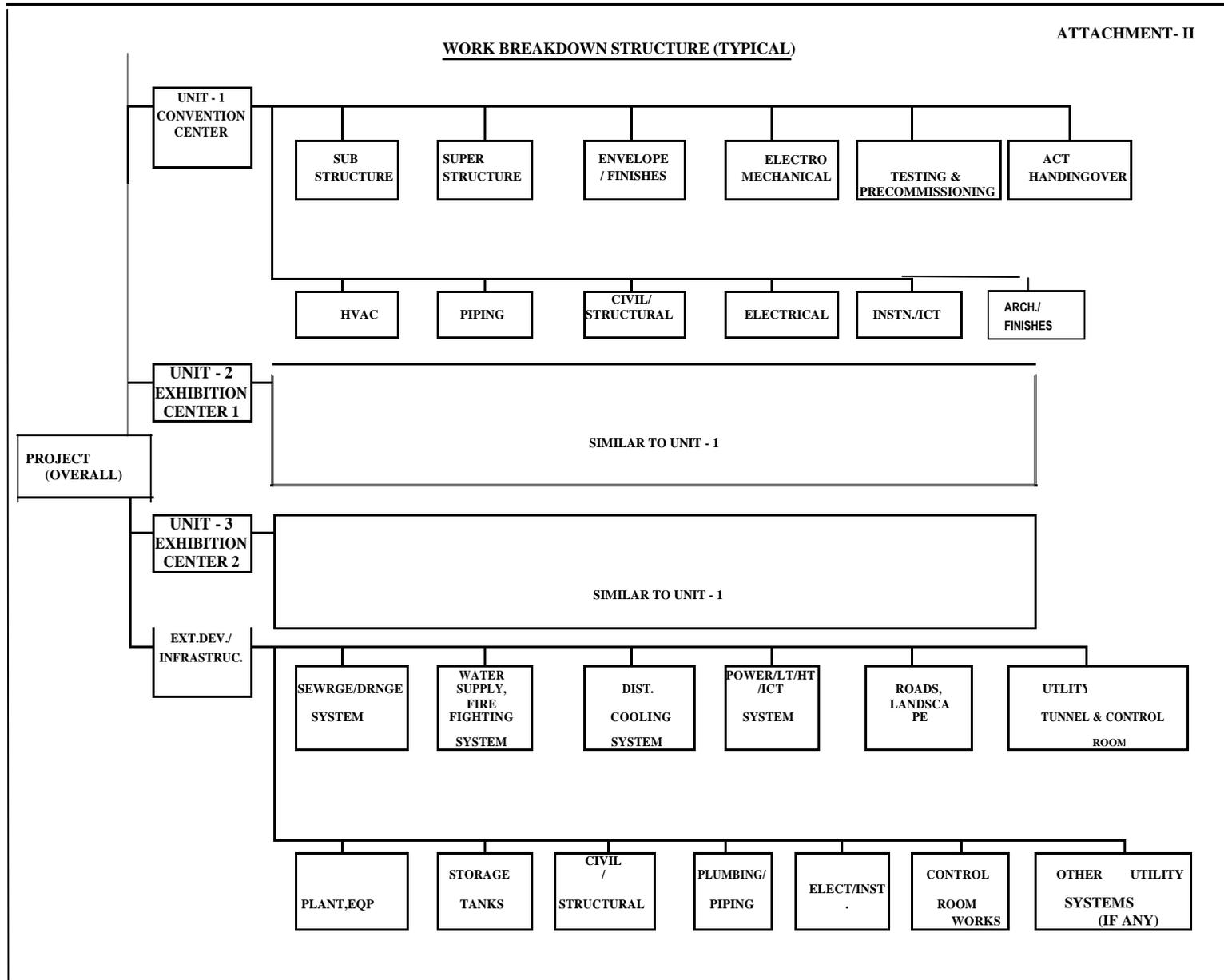
13.0 SOFTWARE PACKAGES

For schedule preparation and updating, the EPC contractor shall use internationally acclaimed network analysis package such as Primavera Project Planner (P6 Latest Version), compatible with that being used by Employer/ Employer's Engineer and submit the backup of the schedules (native format) along with the hard copy whenever submission of the schedules are called for. The electronic files for other deliverables shall be compatible with Microsoft Office.

PROJECT SCHEDULE HIERARCHY

(TO BE GENERATED BY EPC CONTRACTOR)





ATTACHMENT - III

CLIENT – DELHI MUMBAI INDUSTRIAL CORRIDOR DEVELOPMENT CORPORATION (DMICDC)
PROJECT LOCATION – DWARKA, NEW DELHI

P R O J E C T – India International Convention & Expo Centre
UNIT (CONVENTION CENTER)

PMC:-

MONTHLY PROGRESS REPORT

PROGRESS REPORT NO. _____
UPTO ____ (DAY) ____ (MONTH) ____ (YEAR)
(REPORTING CUT-OFF DATE)

PREPARED BY :

EPC CONTRACTOR

PAGE 1 OF 38

	INFORMATION/ACTION			
DATE	ISSUED FOR	PREPARED BY	REVIEWED BY	APPVD BY

DOCUMENT NO _____

**NAME OF EPC CONTRACT
CONTRACTOR**

**MONTH & YEAR
CLIENT: DMICDC
PMC: AECOM**

PROJECT

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III OTHER REPORTS

- OTHER REPORTS SUCH AS
- QUALITY REPORT
 - HEALTH, SAFETY AND ENVIRONMENT REPORT
 - COST REPORTS/ CASH FLOW
 - RISK REGISTER
 - LESSONS LEARNED

**NAME OF EPC CONTRACT
CONTRACTOR**

**MONTH & YEAR
CLIENT: DMICDC
PMC: AECOM**

PROJECT

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I - INTRODUCTION

CLIENT : **DMICDC**
PROJECT LOCATION : **DWARKA, NEW DELHI**
PMC : **AECOM**
DESIGN CAPACITY :

UNIT **CAPACITY** **LICENSOR**

CONTRACT VALUE : _____ Rs.(IN CRORES)

SCOPE OF WORK :

PROJECT TARGET DATES (UNIT WISE)

EFFECTIVE START DATE :

TARGET COMPLETION DATE :

CONTRACTUAL COMPLETION DATE :

CONTRACTUAL COMMISSIONING DATE :

(If Applicable)

ANT. MECH. / SUBST. COMPLETION DATEE :

ANTICIPATED COMMISSIONING DATE :

(If Applicable)

PROJECT DURATION : _____ MONTHS

TIME ELAPSED : _____ MONTHS

**NAME OF EPC CONTRACT
CONTRACTOR**

**MONTH & YEAR
CLIENT: DMICDC
PMC: AECOM**

PROJECT

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II - EXECUTIVE SUMMARY

EXECUTIVE SUMMARY SHALL SERVE AS SYNOPSIS OF THE PROJECT. IT NEEDS TO FOCUS ON THE FOLLOWING:

- **OVERALL SCHEDULE AND ACTUAL PROGRESS TO BE SPECIFIED (CUMULATIVE AND DURING THE MONTH)**
- **LIMIT IT TO ONE PAGE AS FAR AS POSSIBLE.**
- **MAJOR MILESTONES ACHIEVED DURING THE MONTH.**
- **CONTINGENCY / CRASH ACTION PLAN FOR MOST CRITICAL AREAS, IF ANY, BEING FORMULATED / IMPLEMENTED.**
- **SIGNAL FOR THE AREAS LIKELY TO BECOME CRITICAL.**
- **ANY OTHER ISSUE NOT LISTED ABOVE.**

**NAME OF EPC CONTRACT
CONTRACTOR**

**MONTH & YEAR
CLIENT: DMICDC
PMC: AECOM**

PROJECT

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III - DETAILED STATUS
(UNIT WISE / DISCIPLINE WISE)

- A. RESIDUAL BASIC ENGINEERING**
- ACTIVITIES COMPLETED DURING THE MONTH
- ACTIVITIES PLANNED FOR THE NEXT MONTH
- B. DETAILED ENGINEERING**
- ACTIVITIES COMPLETED DURING THE MONTH
- ACTIVITIES PLANNED FOR THE NEXT MONTH
- C. PROCUREMENT**
i) ORDERING
- ACTIVITIES COMPLETED DURING THE MONTH
- ACTIVITIES PLANNED FOR THE NEXT MONTH
- ii) MANUFACTURING/DELIVERY**
- ACTIVITIES COMPLETED DURING THE MONTH
- ACTIVITIES PLANNED FOR THE NEXT MONTH
- D. SUB-CONTRACTING**
- ACTIVITIES COMPLETED DURING THE MONTH
- ACTIVITIES PLANNED FOR THE NEXT MONTH
- E. CONSTRUCTION, PRE-COMMISSIONING, COMMISSIONING, HANDOVER**
- ACTIVITIES COMPLETED DURING THE MONTH
- ACTIVITIES PLANNED FOR THE NEXT MONTH
- F. PACKAGE SUB-CONTRACTOR STATUS**
PACKAGE SUB-CONTRACTOR WISE STATUS TO BE GIVEN
FUNCTION WISE AS APPLICABLE)
- i) ENGINEERING**
ii) ORDERING
iii) MANUFACTURING & DELIVERY
iv) CONSTRUCTION
- ACTIVITIES COMPLETED DURING THE MONTH
- ACTIVITIES PLANNED FOR THE NEXT MONTH

NAME OF EPC CONTRACT
 CONTRACTOR
 PROJECT

MONTH & YEAR
 CLIENT: DMICDC
 PMC: AECOM
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IV - AREAS OF CONCERN WITH ACTION PLAN
(UNIT WISE / DISCIPLINE WISE)

SR. NO.	AREAS OF CONCERN	CONSTRAINTS	IMPACT ON SCHEDULE (CALENDAR DAYS)	ACTION PLAN	ACTION BY	TARGET DATE

SAMPLE

NOTE

1. THIS SHALL CONTAIN ONLY CRITICAL ITEMS/ISSUES WHICH ARE DIRECTLY AFFECTING THE PROJECT SCHEDULE, OTHER ITEMS CAN BE PLACED IN PROBLEMS & HOLD UPS CHAPTER.
2. TARGET DATES SHALL BE FURNISHED WITH ACTION PLAN.

NAME OF EPC CONTRACT CONTRACTOR PROJECT	MONTH & YEAR	
	CLIENT: DMICDC PMC: AECOM PAGE 7 OF 38	

V – PROGRESS STATISTICS

A. OVERALL PROJECT PROGRESS

DESCRIPTION	WTD % AGE		DURING THE MONTH				CUMULATIVE			
	COMPLEX		SCHEDULE		ACTUAL		SCHEDULE		ACTUAL	
			% Progress	Wtd % Prog	% Progress	Wtd % Prog	% Progress	Wtd % Prog	% Progress	Wtd % Prog
RESIDUAL BASIC ENGINEERING										
DETAILED ENGINEERING										
ORDERING										
MANUFACTURING/DELIVERY										
SUB-CONTRACTING										
CONSTRUCTION										
COMMISSIONING										
OVERALL PROGRESS - PHYSICAL	Σ B = 100%									

B. PROCESS UNIT (UNIT WISE)

B.1 UNIT NAME – CONVENTION CENTER

DESCRIPTION	WTD % AGE		DURING THE MONTH				CUMULATIVE			
	Complex	Unit	SCHEDULE		ACTUAL		SCHEDULE		ACTUAL	
			% Progress	Wtd % Prog	% Progress	Wtd % Prog	% Progress	Wtd % Prog	% Progress	Wtd % Prog
RESIDUAL BASIC ENGINEERING										
DETAILED ENGINEERING										
ORDERING										
MANUFACTURING/DELIVERY										
SUB-CONTRACTING										
CONSTRUCTION										
COMMISSIONING										
PHYSICAL PROGRESS UNIT B1	B1%	100								

B.2. UNIT NAME – EXHIBITION CENTER – 01

B.3. UNIT NAME – EXHIBITION CENTER – 02

B.4. UNIT NAME – EXHIBITION CENTER – 03

B.5. UNIT NAME – TRUNK INFRASTRUCTURE

DESCRIPTION	WTD % AGE		DURING THE MONTH				CUMULATIVE			
	Complex	Unit	SCHEDULE		ACTUAL		SCHEDULE		ACTUAL	
			% Progress	Wtd % Prog	% Progress	Wtd % Prog	% Progress	Wtd % Prog	% Progress	Wtd % Prog
RESIDUAL BASIC ENGINEERING										
DETAILED ENGINEERING										
ORDERING										
MANUFACTURING/DELIVERY										
SUB-CONTRACTING										
CONSTRUCTION										
COMMISSIONING										
PHYSICAL PROGRESS UNIT B5	B5 %	100								

NAME OF EPC CONTRACT CONTRACTOR PROJECT	MONTH & YEAR
	CLIENT: DMICDC
	PMC: AECOM PAGE 8 OF 38

C SUB CONTRACTED PACKAGES (PROCESS UNIT, UTILITIES & OFFSITES)										
C.1 PACKAGE 1 –										
DESCRIPTION	WTD % AGE		DURING THE MONTH				CUMULATIVE			
	Complex	Unit	SCHEDULE		ACTUAL		SCHEDULE		ACTUAL	
			% Progress	Wtd % Prog	% Progress	Wtd % Prog	% Progress	Wtd % Prog	% Progress	Wtd % Prog
RESIDUAL BASIC ENGINEERING										
DETAILED ENGINEERING										
ORDERING										
MANUFACTURING & DELIVERY										
SUB-CONTRACTING										
CONSTRUCTION										
COMMISSIONING										
PHYSICAL PROGRESS UNIT C1	C1	100%								

C.2 PACKAGE - 2

C.3 PACKAGE -3

D. MAJOR REASONS FOR SHORTFALL

NOTE:

- 1. WHEREIN THE GAP BETWEEN SCHEDULE & ACTUAL %AGE PROGRESS IS MORE THAN 5 %, EXPLANATION FOR THE BACK LOG/GAP REQUIRED TO BE FURNISHED IN THIS SHEET.**
- 2. ALL COMPONENTS OF THE PROJECT IN EPC CONTRACTOR'S SCOPE AS PER THE CONTRACT, SHOULD BE REPORTED IN THE PROGRESS STATISTICS.**
- 3. UNIT WISE ALL SUBCONTRACTED PACKAGES TO BE REPORTED UNDER SUBHEADING "SUB CONTRACTED PACKAGE".**
- 4. CONSTRUCTION INCLUDES %AGE PROGRESS OF SUB-CONTRACTED PACKAGES IF ANY IN THE RESPECTIVE UNIT / OFFSITES & UTILITIES AS DETAILED IN THE ANNEXURE TO CONSTRUCTION PROGRESS.**

NAME OF EPC CONTRACT
CONTRACTOR
PROJECT

MONTH & YEAR
 CLIENT: DMICDC
 PMC: AECOM
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VII - PROBLEMS / HOLD-UPS
(UNIT WISE / DISCIPLINE WISE)

SR. NO.	PROBLEM / HOLD-UPS	ACTION PLAN	ACTION BY	TARGET DATE
1				
2				
3				
4				
5				

SAMPLE

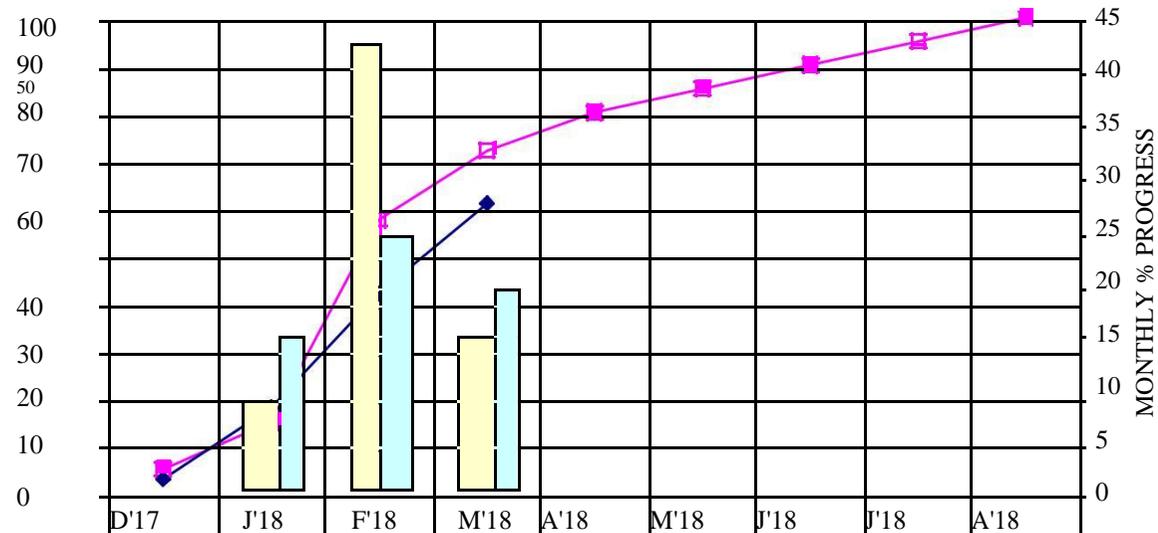
NOTE : ONLY POINTS WHICH AFFECT THE PROGRESS BUT MAY NOT HAVE THE IMPACT ON THE PROJECT SCHEDULE SHALL BE LISTED HERE.

NAME OF EPC CONTRACT
CONTRACTOR
PROJECT

MONTH & YEAR
CLIENT: DMICDC
P MC: AECOM
PAGE 11 OF 38

ANNEXURE - I (A)

PROJECT - (Name of contract)
FUNCTION / PHYSICAL



SCH DURING THE MONTH	0	10	42.5	14.5					
ACT. DURING THE MONTH	0	15	24	19					
CUMM. SCH	5	15	57.5	72	80	85	90	95	100
CUMM. ACT	3	18	42	61					

NOTE : 1. UNIT WISE SEPARATE CURVE FOR EACH FUNCTION AND CURVES FOR PHYSICAL PROGRESS
 2. OVERALL (AT CONTRACT LEVEL) SEPARATELY FOR EACH FUNCTION AND CURVES FOR PHYSICAL PROGRESS

NAME OF EPC CONTRACT		MONTH & YEAR	
CONTRACTOR		CLIENT: DMICDC	
PROJECT		PMC: AECOM	
		PAGE 12 OF 38	
ANNEXURE - II (A)			
CHRONOLOGICAL ACHIEVEMENTS			
S. NO.	DESCRIPTION OF KEY MILESTONES	SCH. DATE	ACTUAL DATE OF OCCURRENCE
1.	GENERAL		
2.	UNIT WISE (AS APPLICABLE)		
2.1	RESIDUAL BASIC ENGINEERING		
2.2	DETAILED ENGINEERING		
2.3	ORDERING		
2.4	MANUFACTURING & DELIVERY		
2.5	SUB-CONTRACTING		
2.6	CONSTRUCTION		
2.7	SUB-CONTRACTED PACKAGES		
2.8	PRECOMMISSIONING		
2.9	COMMISSIONING		
NOTE : MECHANICAL COMPLETION, SUBSTANTIAL COMPLETION AND COMMISSIONING DATES SHALL ALSO BE RECORDED.			

SAMPLE

NAME OF EPC CONTRACT CONTRACTOR							MONTH & YEAR CLIENT: DMICDC PMC: AECOM Page 13 of 38 ANNEXURE: II (B.1)					
PROJECT							SUMMARY STATUS OF ENGINEERING DRAWINGS (SUMMARY LEVEL & UNIT WISE SEPARATELY)					
DISCIPLINE	TOTAL DRAWING NOS.	DRAWINGS RELEASED (NOS.)				REVIEW STATUS (NOS.)			SUBMISSION PROGRAM		REMARKS	
		DURING THE MONTH		CUMULATIVE		TOTAL DRAWING FOR REVIEW	CODE 1	CODE 2	CODE 3	FOR NEXT MONTH		
		SCH.	ACT.	SCH.	ACT.					FRESH		CODE3
ARCHITECTURAL												
GENERAL CIVIL												
STRUCTURAL												
PIPING (GAD's)												
ISO's												
ELECTRICAL												
INSTRUMENTATION / ICT												
TOTAL												

SAMPLE

NAME OF EPC CONTRACT CONTRACTOR PROJECT <hr style="border-top: 1px dashed black;"/>	MONTH & YEAR CLIENT: DMICDC PMC: AECOM Page 14 of 38
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DRAWINGS / DOCUMENTS RELEASE SCHEDULE / CONTROL INDEX (DCI)

(UNITWISE / DISCIPLINEWISE)

ANNEXURE – II (B.2)
STATUS AS OF : DD/MM/YYYY

DRG. NO.	REV. NO.	CAT.	DRAWING / DOCUMENT TITLE	USE CODE	WTD. VALUE	MILESTONES					% PROG.	WTD. PROG.	REV. CODE	REMARKS
						DRAFT COMPL	CHECK COMPL.	IST SUBM	REVIEW					
									CODE 2	CODE 1				
*	*	*	*	*										
DISCIPLINE :						SCH.								
						A/F								
						SCH.								
						A/F								
						SCH.								
						A/F								
						SCH.								
						A/F								

LEGEND

CATEGORY (CAT.): I: INFORMATION R: REVIEW A: APPROVAL
S: STUDY A: STATUTORY / CLIENT REVIEW

USE CODE:- P: PURCHASE C: CONSTRUCTION
T: TENDERING L: CALCULATION

NOTE: 1. INDICATE A/F (ACTUAL / FORECAST) AS APPLICABLE WITH THE DATES.
2. * PERCENTAGE FOR AGREED MILESTONES AS PER PROGRESS MEASUREMENT METHODOLOGY.
3. THIS INCLUDES RESIDUAL BASIC ENGINEERING AND DETAILED ENGINEERING DELIVERABLES.

NAME OF EPC CONTRACT :
CONTRACTOR :
PROJECT :

MONTH & YEAR
CLIENT: DMICDC
PMC: AECOM
PAGE : 15 OF 38

MCI: MATERIAL CONTROL INDEX (UNIT WISE / DISCIPLINE WISE)											ANNEXURE : II (B.3)	
											STATUS AS ON: DD/MM/YY	
S. NO	DRAWING/DOCUMENT NUMBER	DRAWING / DOCUMENT DESCRIPTION	CATERGORY (A/R/T)	WTD. VALUE		ISSUE OF MR	PREPARE TBA	PREP OF PR	APPROVAL OF PR / 1ST REVIEW OF VENDOR DRGS	APPROVAL OF VENDOR DRGS/DOCS	WEIGHTED PROGRESS	REMARKS / REASONS FOR DELAY
						20%	30%	10%	10%	30%		
<DISCIPLINE>												
1					SCH							PLEASE REFER ANNEXURE II (C)
					ACT/FORECAST							
2					SCH							
					ACT/FORECAST							
3					SCH							
					ACT/FORECAST							
4					SCH							
					ACT/FORECAST							
5					SCH							
					ACT/FORECAST							
6					SCH							
					ACT/FORECAST							
7					SCH							
					ACT/FORECAST							
8					SCH							
					ACT/FORECAST							
9					SCH							
					ACT/FORECAST							
10					SCH							
					ACT/FORECAST							
11					SCH							
					ACT/FORECAST							
12					SCH							
					ACT/FORECAST							
13					SCH							
					ACT/FORECAST							
14					SCH							
					ACT/FORECAST							
15					SCH							
					ACT/FORECAST							
		TOTAL			SCH						%	
					ACT/FORECAST						%	

LEGEND: CATEGORY (CAT.) :

I : INFORMATION R : REVIEW A : APPROVAL

S : STUDY A : STATUTORY / CLIENT REVIEW

P : PURCHASE C : CONSTRUCTION

T : TENDERING L : CALCULATION

USE CODE :-

NOTE :

1. INDICATE A/F (ACTUAL / FORECAST) AS APPLICABLE WITH THE DATES.

2. * PERCENTAGE FOR AGREED MILESTONES AS PER PROGRESS MEASUREMENT METHODOLOGY.

3. THIS INCLUDES RESIDUAL BASIC ENGINEERINGG AND DETAILED ENGINEERING DELIVERABLES.

**NAME OF EPC CONTRACT
CONTRACTOR**

PROJECT

UNIT NAME / SUMMARY LEVEL

**MONTH & YEAR
CLIENT: DMICDC
PMC: AECOM
Page 17 of 38**

ANNEXURE: II (D.1)

**ORDERING STATUS (SUMMARY)
LOCAL (INDIAN) & FOREIGN PROCUREMENT SEPARATELY**

CATEGORY	TOTAL MRs	MR ISSUED		ISSUE ENQUIRY		BIDS DUE		FOI / TOI		PO ISSUED	
		SCH.	ACT.	SCH.	ACT.	SCH.	ACT.	SCH.	ACT.	SCH.	ACT.
EQUIPMENT											
PLANTS											
INSTRUMENT											
TOTAL											
BULK											
TOTAL											

SAMPLE

- NOTE :**
- 1. NUMBER OF MRs SHALL BE PROVIDED FOR EACH MILESTONE AGAINST EACH EQUIPMENT CATEGORY SUCH AS D.G. SET, CHILLERS, COMPRESSORS, PUMPS, STP ETC. AND BULK MATERIAL.**
 - 2. SEPARATE STATUS FOR EACH UNIT AND AT PROJECT SUMMARY LEVEL.**

<p>NAME OF EPC CONTRACT YEAR CONTRACTOR DMICDC</p> <p>PROJECT</p>	<p>MONTH & CLIENT: PMC: AECOM Page 18 of 38</p>
<p>ORDERING STATUS (DETAILED) (DISCIPLINEWISE FOR EACH UNIT)</p>	
<p>UNIT (D.2)</p>	<p>ANNEXURE: II</p>

M R. NO	DESC RIPTI ON ITEM NO.	WTD. VAL.	C A T	SCH.	MR RELS DATE	ISSUE ENQ.	RECV BIDS	TBA ISSUED	FOI/ TOI ISSUE	PO ISSUE	L/C OPEN	% PROG	VENDO R/ LOCATI ON	PO NO./ DATE	PR REVIE W	REV. CODE 2	REV. CODE 1	CDD	REMAR KS
				SCH.															
				A/F															
				SCH.															
				A/F															
				SCH.															
				A/F															
				SCH.															
				A/F															

SAMPLE

- NOTE :**
1. INDICATE A/F (ACTUAL/FORECAST) AS APPLICABLE WITH THE DATES
 2. CONTRACTUAL DELIVERY DATE (CDD) IS TO BE QUALIFIED IN REMARKS COLUMN (i.e. EX WORKS, FOT, FOB, AT SITE ETC.)
 3. CATEGORY (CAT): I – INFORMATION, R – REVIEW, S – STUDY, A - APPROVAL

NAME OF EPC CONTRACT								MONTH & YEAR						
CONTRACTOR								CLIENT:						
PROJECT								PMC: AECOM						
								PAGE: 19 OF 38						
UNIT / SUMMARY *		EQUIPMENT DELIVERY STATUS						ANNEXURE: II(E.1)						
		(SUMMARY)												
EQUIPMENT DESCRIPTION	TOTAL NOS	QUANTITY ORDERED (NOS.)		DESPATCHED (NOS.)	RECEIVED AT SITE (NO.)		QTY IN TRANSIT (NOS.)	DELIVERY FORECAST AT SITE FOR BAL. EQPT. CALENDAR MONTHS ----->						
		SCH.	ACT.		SCH.	ACT		1	2	3	4	5	6	
DG SET														
CHILLERS														
STP														
DISTRICT COOLING														
AIR COOLERS														
PUMPS														
COMPRESSORS														
FANS														
MISC. (MAJOR CRITICAL ITEMS)														
TOTAL														
NOTE	1. STATUS FOR INDIGENOUS AND IMPORTED EQUIPMENT SHALL BE FURNISHED SEPARATELY 2. * SEPARATE STATUS FOR EACH UNIT AND AT SUMMARY LEVEL.													

SAMPLE

NAME OF EPC CONTRACT CONTRACTOR													MONTH & YEAR CLIENT: DMICDC PMC: AECOM Page: 20 of 38			
PROJECT																
UNIT / SUMMARY *													ANNEXURE: II(E.2)			
EQUIPMENT RECEIPT AND ERECTION STATUS (DETAILED) (UNIT WISE/DISCIPLINE WISE))																
PO NO.	EQPT TAG NO.	EQUIPMENT DESCRIPTION	ERECTION WT. (MT)	VENDOR NAME LOCATION, COUNTRY	REQD. AT SITE (SCH.)	C.D.D	DESPATCHED ON	RECEIVED AT SITE	SITE ASSEMBLY (IF ANY)	FDN READY DATE	STRL. READY DATE	ERECTION DATE	HYDROTESTING DATE (IF ANY)	PAINTING (IF ANY)	INSULATION (IF ANY)	FIRE PROOFING (IF ANY)
		DG SET														
		a)														
		b)														
		CHILLERS														
		STP														
		DISTRICT COOLING														
		AIR COOLERS														
		PUMPS														
		COMPRESSORS														
		FANS/BLOWERS														
		OTHER ITEMS														
		ELECTRICAL EQUIPMENTS														

NOTE : 1. ALL EQUIPMENT TO BE COVERED. TAGGED ITEMS WITH MULTIPLE SUFFIXES TO BE MENTIONED SEPARATELY. e.g. 701-E-03 701-E-04 701-E-05
 2. * SEPARATE STATUS FOR UNIT AND AT SUMMARY LEVEL.

NAME OF EPC CONTRACT YEAR CONTRACTOR DMICDC AECOM PROJECT UNIT ANNEXURE: II (E.3)	MONTH & CLIENT: PMC: Page 21 of 38
UNIT NAME / SUMMARY LEVEL *	
BULK MATERIAL STATUS (SUMMARY) (LOCAL (INDIA) AND FOREIGN PROCUREMENT SEPARATELY) STATUS AS OF _____	

Sr. No.	ITEM WISE DESCRIPTION	UOM	TOTAL REQUIREMENT	QUANTITY			FORECAST FOR BALANCE DELIVERY					STATUS / PROBLEMS
				ORDERED	RELEASED	RECEIVED AT SITE	1	2	3	4	5	
1	STRUCTUTAL STEEL	Ton										
2	PIPES	M.										
3	FITTINGS	No.										
4	FLANGES & VALVES	No.										
5	ELECTRICAL ITEMS											
6	(ALL) INSTRUMENT ATION / ICT ITEMS											

SAMPLE

NOTE :
 1. SEPARATE STATUS FOR EACH UNIT AND AT SUMMARY LEVEL.
 2. STATUS TO BE GIVEN SEPARATELY FOR LOCAL (INDIAN) AND IMPORTED PURCHASE.

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PROJECT

MANUFACTURING / DELIVERY STATUS

(UNIT WISE / DISCIPLINE WISE/ TAG WISE)

(LOCAL (INDIAN) AND FOREIGN PROCUREMENT SEPARATELY)

ANNEXURE - II(E.4)

STATUS AS OF : DD/MM/YYYY

TAG NO./ ITEM	DESCRIPTION OF ITEM	WTD VAL	PO NO. & DATE	VENDOR/ LOCATION/ COUNTRY	INSPN CAT	ORDER QTY	RELS QTY.	RECD QTY		VENDOR	RAW	RAW	MFG	MFG	FINAL	CDD	FOB/EX	ARRIVAL	ARRIVAL	SITE	%	REMARKS
										DRG REV.	MATL. S/O	MATL RECPT	START	FINISH	INSPN		WORKS DELIVERY	INDIAN PORT	AT SITE	REQD DATE	PROG	
										*	*	*	*	*	*		*	*	*			
									SCH.													
									A/F													
									SCH.													
									A/F													
									SCH.													
									A/F													
									SCH.													
									A/F													
									SCH.													
									A/F													

SAMPLE

LEGEND

INSPN. CAT. - INSPECTION CATEGORY ; - AS DESCRIBED IN INSPECTION METHODOLOGY.

* - AGREED MILESTONE PERCENTAGE

A/F :- ACTUAL / FORECAST

NOTE : 1 INDICATE A/F AS APPLICABLE WITH THE DATES (A/F :- ACTUAL / FORECAST)

2 BULK ITEMS LIST SHOULD INCLUDE STRUCTURAL STEEL, PIPING, ELECTRICAL AND INSTRUMENTATION / ICT ITEMS.

3 IN CASE OF IMPORTED SHIPMENT NAME OF THE VESSEL AND PORT OF BOARDING TO BE INDICATED.

4 CONTRACTUAL DELIVERY DATE (CDD) IS TO BE QUALIFIED IN REMARKS COLUMN (i.e. EX WORKS, FOT, FOB, AT SITE (AS APPLICABLE) ETC.)

**NAME OF EPC CONTRACT
CONTRACTOR**

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PROJECT

SUB-CONTRACTING STATUS

**ANNEXURE - II(F)
STATUS AS OF : DD/MM/YYYY**

UNIT :

DESCRIPTION OF WORK	WTD VALUE		ISSUE OF TENDER SPECS	PREPARATION OF TENDER DOCUMENT	TENDER ON SALE	RECEIPT OF BIDS	AWARD OF WORK	%AGE PROGRESS	NAME OF AGENCY	DURATION OF CONTRACT	CONTRACTUAL COMPLETION DATE	INTERMEDIATE CONTRACTUAL MILESTONES (IF ANY)	REMARKS
			*	*	*	*	*						
		SCH.											
		A/F											
		SCH.											
		A/F											
		SCH.											
		A/F											
		SCH.											
		A/F											
		SCH.											
		A/F											
		SCH.											
		A/F											

SAMPLE

* - AGREED MILESTONE PERCENTAGE

A/F :- ACTUAL/FORECAST

NOTE : 1. INDICATE A/F AS APPLICABLE WITH THE DATES.

NAME OF EPC CONTRACT CONTRACTOR							MONTH & YEAR CLIENT: DMICDC PMC: AECOM PAGE: 24 OF 38					
PROJECT							ANNEXURE : II(G.1)					
UNIT _____							UNIT WISE STATUS OF CONSTRUCTION QUANTITIES RELEASED (DISCIPLINE WISE FOR EACH UNIT)					
S. NO.	DISCIPLINE & MAJOR WORK ITEM	UOM	LIKELY QTY	CUM RELEASED QTY	BALANCE QTY TO BE RELEASED	PROGRAM FOR BALANCE						QTY UNDER HOLD AND REASON FOR THE SAME
						MONTHS						
						1 ST	2ND	3RD	4TH	5TH	6TH	
SAMPLE												
UOM : UNIT OF MEASUREMENT.												

NAME OF EPC CONTRACT CONTRACTOR PROJECT UNIT	MONTH & YEAR CLIENT: DMICDC PMC: AECOM Page 25 of 38
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QUANTITATIVE MONTHLY CONSTRUCTION PROGRESS STATUS
(UNIT WISE / DISCIPLINE WISE)

ANNEXURE: II (G.2)

WORK ITEM DESCRIPTION	UNIT OF MEASUREMENT	TOTAL QUANTITY						PROGRAM FOR NEXT MONTH
		CUMULATIVE			DURING THE MONTH			
		WORKLOAD	FRONT	COMPLETED	PROGRAM	COMPLETED	BACKLOG	
EXCAVATION	CM							
BACKFILLING	CM							
RCC WORKS	CM							
BRICK WORK	CM							
A/G PPG – FAB	ID							
A/G PPG – ERN	IM							
CABLING	LM							
INSTRUMENTATION								
LOOP CHECKING	NOS							

SAMPLE

PERCENTAGE PROGRAMMED DURING THE MONTH :
 PERCENTAGE ACHIEVED DURING THE MONTH :
 PERCENTAGE PROGRAMMED FOR NEXT MONTH :

CUM. PERCENTAGE PROGRESS SCHEDULE :
 FRONT :
 ACTUAL:

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UNIT : _____

ANNEXURE : II (J)

SYSTEM HANDING OVER STATUS (UNIT WISE) FOR MEP

S.NO.	SYSTEM DESCRIPTION		FORMAT I ISSUE DATE	FORMAT II ISSUE DATE	FORMAT III ISSUE DATE	FORMAT IV ISSUE DATE	FORMAT V ISSUE DATE
A.	SYSTEM I	TARGET DATE					
		ACTUAL DATE					
B.	SYSTEM II	TARGET DATE					
		ACTUAL DATE					
C.	SYSTEM III	TARGET DATE					
		ACTUAL DATE					
		TARGET DATE					
		ACTUAL DATE					
		TARGET DATE					
		ACTUAL DATE					
	GRAND TOTAL	TARGET (NOS.)					
		ACTUAL (NOS.)					

SAMPLE

LEGEND :

FORMAT I : INFORMATION REGARDING SYSTEM COMPLETION

FORMAT II : CHECKLIST

FORMAT III : READY FOR PRE-COMMISSIONING \ MECH COMPLETION CERTIFICATE

FORMAT IV : READY FOR COMMISSIONING CERTIFICATE

FORMAT V : COMPLETION OF COMMISSIONING CERTIFICATE

NOTE :

1. TO BE FURNISHED SEPARATELY FOR EACH UNIT
2. REPORTING SHALL START AFTER PREPARATION OF SYSTEM WISE COMPLETION SCHEDULE

NAME OF EPC CONTRACT :

CONTRACTOR :

PROJECT :

MONTH & YEAR

CLIENT: DMICDC

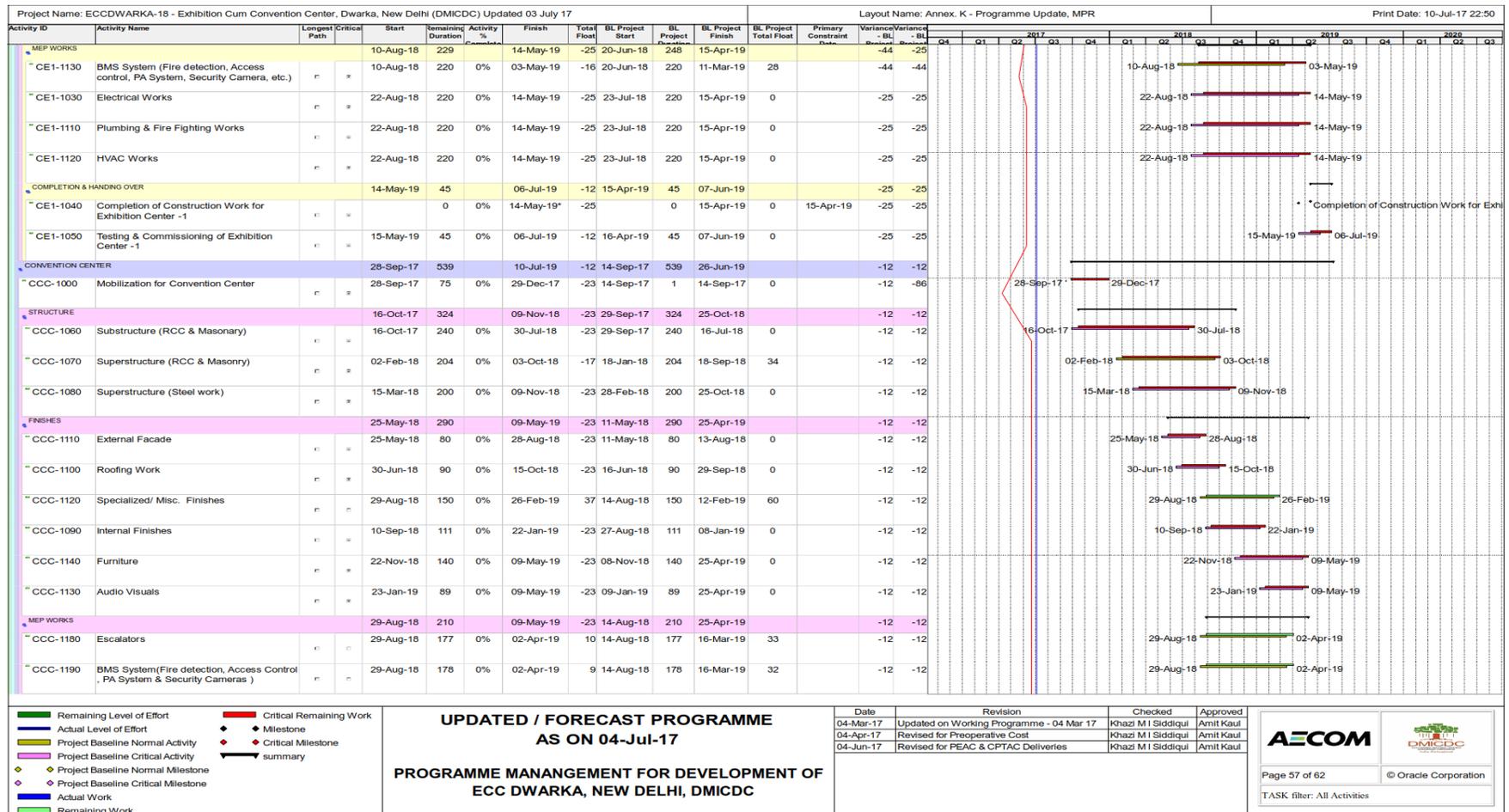
PMC: AECOM

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UPDATED PROJECT SCHEDULE

ANNEXURE: II (L)

STATUS AS ON: DD/MM/YY



<p>NAME OF EPC CONTRACT CONTRACTOR</p> <p>PROJECT</p>	<p>MONTH & YEAR CLIENT: DMICDC PMC: AECOM Page 32 of 38</p> <p>ANNEXURE: II (M)</p>
<p>STATUTORY APPROVAL STATUS (APPROVALS TO BE LISTED UNDER THE HEADS OF (A) FOR DESIGN / DRAWINGS AND (B) FOR INSTALLATION)</p>	

Sr. No.	APPROVALS	@@ STATUS	APPROVAL DATE		REMARKS
			REQUIRED BY	RECEIVED ON	
1	NOC FROM DELHI TRAFFIC POLICE				
2	MUNICIPAL CORPORATION FOR VARIOUS BUILDINGS				
3	CIVIL AVATION FROM AAI				
4	DEPARTMENT OF MINES FOR EXCAVATION				
5	NOC FROM MUNICIPAL CORP. FOR ALL FACILITIES				
6					
7					
8					
9					
10					
11	ANY OTHER STATUTORY & GOVT. APPROVALS				

SAMPLE

NOTE: PROBLEMS IF ANY, HOLDING APPROVAL SHALL BE HIGHLIGHTED IN THE STATUS COLUMN

**NAME OF EPC CONTRACT
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ANNEXURE - II(N)

INVOICING STATUS

Sr. No.	INVOICE		RECEIPT		DEDUCTIONS		OTHER DEDUCTIONS	TOTAL DEDUCTIONS	REASONS FOR OTHER DEDUCTIONS /
	NUMBER & DATE	VALUE	NET AMOUNT	DATE	INCOME TAX				REMARKS
					AMOUNT	CERT. RECD.			
	TOTAL	0	0	0	0	0	0	0	

NAME OF EPC CONTRACT
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ANNEXURE - II(O)

STATUS OF WAIVERS / DEVIATIONS

SR. NO	WAIVER / DEVIATION PERMIT NO. / LETTER REF NO.	DATE	SUBJECT	REMARKS	STATUS
A	SUBMITTED IN FORMAT				
B	DEVIATION PROPOSED				

**NAME OF EPC CONTRACT
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PROJECT

DELAY ANALYSIS

ANNEXURE : II(P-i)

Sr. NO	DISCIPLINE	WTD VALUE %	DURING THE		CUMULATIVE		DEVIATION	REMARKS
			MONTH %		PROGRESS %			
			SCH	ACT	SCH	ACT		
1	GENERAL							
2	GENERAL CIVIL							
3	ARCHITECTURE							
4	STRUCTURAL							
5	STEEL WORKS							
6	PIPING							
7	ROT.EQUIPMENT/PUMP							
8	MECH.EQUIPMENT							
9	ELECTRICAL							
10	INSTRUMENTATION / ICT							
	TOTAL	100.0						

**CONTRACTOR
PROJECT**

**CLIENT: DMICDC
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ANNEXURE - II(P-ii)**

DELAY ANALYSIS

SR. NO	DISCIPLINE	CUMULATIVE		DEVIATION	ACTIVITY/ ITEM	DRG NO. / MR NO.	REMARKS
		PROGRESS %					
		SCH	ACT				
1	GENERAL						
2	GEN. CIVIL						
3	ARCHITECTURE						
4	STRUCTURAL						
5	PIPING						
6	ROTATING EQPT/PUMP						
7	MECHANICAL						
8	ELECTRICAL						
9	INSTRUMENTATION / ICT						

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ANNEXURE - II(Q)**

RISK REGISTER ECC Dwarka

Data Date: 01-Jan-18

Risk ID	Activity ID	Risk Description	Threat / Opportunity	Effect	Mitigation	Action By	Schedule				Cost				EMV	PRIORITY						
							Effect	Probability (P)		Impact (I)		Score (S) = P * I	Effect	Probability (P)			Impact (I)		Score (S) = P * I			
								Y/N	V/L/M/H	1/2/3/4/5	V/L/M/H			1/2/3/4/5			V/L/M/H	1/2/3/4/5		V/L/M/H	1/2/3/4/5	As per Matrix
1	T02-1410, AT3-2050	Delay in Preparation of GFC Drawing for client approval	T	Delay in Start of Construction and rising overhead	Timely completion of Detailed Design & Engineering by providing sufficient manpower	Design Team/PEAC	Y	H	4	VH	5	H	20	Y	H	4	VH	5	H	20	1,20,04,50,000	1
2	T02-1430, AT3-2070	Delay in obtaining Statutory Approval for Start of Construction	T	Delay in Start of Construction and rising overhead	Effective Coordination between PMC/Client & Stakeholder	Design Team/ DDA	Y	H	4	VH	5	H	20	Y	H	4	VH	5	H	20	13,00,20,000	2
4	T03-1410, T03-1420	Delay in Mobilization of Piling Rigs	T	Slow speed of Piling works resulting into delay	Procurement / P&E team should mobilize the equipment as per baseline programme	Procurement / P & E Department	Y	H	4	H	4	H	16	Y	L	2	M	3	M	6	2,04,00,000	3
3	GY1-2910, GY1-2960	Delay in Mobilization of Cranes	T	Slow speed of Construction resulting into delay	Procurement / P&E team should mobilize the equipment as per baseline programme	Procurement / P & E Department	Y	H	4	H	4	H	16	Y	L	2	M	3	M	6	1,30,00,000	4
5	T03-1250, T03-1400, T03-1410	Delay in Mobilization of Excavators	T	Slow speed of Excavation resulting into delay	Procurement / P&E team should mobilize the equipment as per baseline programme	Procurement / P & E Department	Y	H	4	H	4	H	16	Y	L	2	M	3	M	6	1,00,56,000	5
6	GY1-2940, GY1-3000	Delay in procurement of Batching Plant	T	Delay in Start of RCC Works	Procurement / P&E team should mobilize the equipment as per baseline programme	Procurement / P & E Department	Y	M	3	H	4	H	12	Y	M	3	M	3	M	9	1,23,40,000	6
7	GY1-2960, GY1-4000	Delay in Construction of Site office	T	Unsatisfied staff morale resulting into delays	Site office construction to start as per baseline programme	DMICDC / PEAC / CPTAC	Y	H	4	L	2	M	8	N								7

**NAME OF EPC CONTRACT
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ANNEXURE: II (R)

PROJECT PHOTOGRAPHY & VIDEOGRAPHY

NOTE:

- a. To Document site conditions prior to start of construction, monthly and within one month of completion.
- b. Quality of photograph/videography to be of highest quality but not less than 13MP, 256-bit color
- c. Minimum of 20 digital photographs each week from a minimum of ten views from points located by the Employer/Employer's Engineer
- d. Time lapse video from points located by the Employer/Employer's Engineer
- e. Submit a view location sketch indicating points of view. The photographs/Videos should cover key project activities e.g. Manufacturing of Critical Equipment, Fabrication Works, Transportation of Items, Construction/Erection of Main Areas / Equipment, Access Road.
- f. Submit digital photographs / Videos, each set on a separate CD-R, cumulative of all photos to-date with each MPR as indicated in Attachment IV - Flow of Documents from EPC Contractor.
- g. Photographs for each month shall be in a separate monthly directory and each file shall be named to indicate its location on the view location sketch. The view location sketch & date and time shall also be provided on the CD as digital file.
- h. All photographic & video requirements as per NGT, EC & IGBC Guidelines.

FLOW OF DOCUMENTS FROM EPC CONTRACTOR

- Note :**
1. Documents to be submitted by the bidder along with Bid are listed in clause 4.0
 2. EPC Contractor shall submit electronic file along with hard copy wherever “*” is marked below
 3. Number of copies to be submitted by EPC Contractor for each document indicated below are indicative and shall be modified as per project requirement by Project Manager before including in the bid document.

S.NO.	DESCRIPTION OF DOCUMENT	FREQUENCY / TIME OF RECEIPT	NO. OF COPIES					DOCUMENT CATEGORY
			CLIENT (HO)	CLIENT (SITE)	PMC (HO)	PMC (SITE)	PMC (EPC DESIGN OFFICE)	
1.	90 Days Front End schedule	Within one week of award	2	2	4*	2*	2*	Review
2a.	Procedure for Planning Scheduling and Monitoring along with sample formats.	During kick off Meeting (To be held within one week of award)	2	2	2	2	2	Approval
2b.	Progress Measurement Methodology							Approval
3a.	Overall Project Schedule (Unit wise) – Detailed & Summarized	Within four weeks of award. Monthly summarized schedule to be submitted with monthly progress report. Detailed schedule to be submitted separately on Monthly basis.	2	2	4*	2*	2*	Approval
3b.	Updating of overall Project schedules (Unit wise)							Information
4a.	Unit wise Functional Schedules in resource based bar chart with “S” curves - Residual Basic Engineering Schedules - Detailed Engineering Schedules - Ordering Schedules - Manufacturing & Delivery Schedule - Sub-contracting Schedule	Within 4 weeks of award Schedules of different disciplines to be submitted as separate documents	2	2	4*	2*	2*	Approval

FLOW OF DOCUMENTS FROM EPC CONTRACTOR

S. NO	DESCRIPTION OF DOCUMENT	FREQUENCY / TIME OF RECEIPT	NO. OF COPIES					DOCUMENT CATEGORY
			CLIENT (HO)	CLIENT (SITE)	PMC (HO)	PMC (SITE)	PMC (EPC DESIGN OFFICE)	
4b.	Updating of Functional Schedule and "S" Curve	Monthly	2	2	2*	2*	2*	Information
5a.	Construction Network (Unit wise) with contract level, unit level and discipline "S" curves.	Within four weeks of award	2	2	2*	2*	2*	Approval
5b.	Updating of Construction Network and "S" curves (Unit wise)	Monthly	2	2	2*	2*	1	Information
6a.	Loop wise piping completion schedule for MEP works	Two months before start of hydro - testing as scheduled in unit wise construction network	1	1	2*	2*	2*	Review
6b.	Updating of loop wise piping completion schedule for MEP works	Weekly, to be submitted before review meeting	1	1	2*	2*	1	Information
7a.	System wise completion schedule for MEP works	Six weeks before scheduled completion as per unit wise construction network	1	1	2*	2*	2*	Review
7b.	Updating of system wise completion schedule for MEP works	Weekly, to be submitted before review meeting	1	1	2*	2*	1	Information
8a.	Pre-commissioning / commissioning schedule For MEP works	Two months before scheduled mechanical completion or one month before starting of Pre-commissioning activities as per unit wise construction, whichever is earlier.	1	1	2*	2*	2*	Review
8b.	Updating of Pre-commissioning / commissioning schedule for MEP works	Weekly, to be submitted before review meeting	1	1	1	2*	1	Information
9.	Recovery Schedules For Overall Project Schedule For Construction Network Updating	As desired by Employer/ Employer's Engineer	2	2	2*	2*	2	Review
			2	2	2*	2*	2	Review
		As per 3b, 4b & 5b.	2	2	2*	2*	2	Review

FLOW OF DOCUMENTS FROM EPC CONTRACTOR

S. NO.	DESCRIPTION OF DOCUMENT	FREQUENCY / TIME OF RECEIPT	NO. OF COPIES					DOCUMENT CATEGORY
			CLIENT (HO)	CLIENT (SITE)	PMC (HO)	PMC (SITE)	PMC (EPC DESIGN OFFICE)	
10a.	Sub-contractor schedules with "S" curves including all Sub-Contractor Packages like DG Station, STP etc.,	To be made within two weeks of award of Sub-Contract To be submitted when called for by the Employer/PMC	As called for					Information
10b.	Updating of Sub-contractor schedules with "S" Curves	Fortnightly						Information
11.	Monthly Program Design Office Activities Construction Activities	Within three calendar days of monthly progress report cutoff date Within two calendar days of monthly progress report cutoff date	As desired		2	2	2	Review
					2	2	2	Review
12.	Monthly Progress Report	Monthly, within 5 calendar days from cutoff date	2	2	2* Files as mentioned above	2* Files as mentioned above	2* Files as mentioned above	Information
13.	Weekly Progress Report (Over all)	Weekly / within 3 calendar days of cutoff date.	2	2	2	2	2	Information
14.	Weekly Progress Report (Construction)	Weekly / within 2 calendar days of cutoff date.	2	2	2	2	2	Information
15.	Daily Progress Report (Site)	Daily / before noon of next day	1	2	2	2	1	Information
16.	Expediting Report	Fortnightly	2	2	2	2	2	Information
17.	Planning Package	Within 4 weeks of award.	2	2	2	2	2	Information

Note: All the above deliverables shall also be furnished in soft form (native format) along with hard copies

