



Ref: TSCCL/Projects/17 (PRAKASHAM PARK)/2018

Tender Document
for
“Retrofitting of Parks and Open Spaces including
Beautification, Landscape and Hardscape works
for Prakasham Park in Tirupati’s ABD Area
including O&M after DLP completion [from 3rd
year] under Smart City Mission”

Issued by:
Managing Director,
Tirupati Smart City Corporation
Limited, Tirupati,
Andhra Pradesh - 517501
Email: tsccltirupati@gmail.com

TIRUPATI SMART CITY CORPORATION LIMITED (TSCCL)

Ref: TSCCL/Projects/17(PRAKASHAM PARK)/2018

TENDER DOCUMENT

TSCCL desires to invite Tender for **Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati's ABD Area including O&M after DLP completion [from 3rd year] under Smart City Mission**. The detailed Tender including EMD, TOR, Eligibility criteria etc., can be downloaded from website of www.apecurement.gov.in from 25-06-2018 onwards.

The last date for online submission of bids is 20-07-2018 up to 16:00 hrs.

For more details contact:

Tirupati Smart City Corporation Limited.

E-mail: tsccltirupati@gmail.com

Cc: Rajendra.Raut@aecom.com

**Sd/-
Managing Director,
TSCCL**

DISCLAIMER

The information contained in this Tender document (the "Tender") or subsequently provided to Bidder(s), whether verbally or in documentary or any other form by or on behalf of the Employer or any of their employees or advisors, is provided to Bidder(s) on the terms and conditions set out in this Tender and such other terms and conditions subject to which such information is provided.

This Tender is not an agreement and is neither an offer nor invitation by the Employer to the prospective Bidders or any other person. The purpose of this Tender is to provide interested entities with information that may be useful to them in preparing their bids (the "Bid") including all the necessary submissions and the financial offers pursuant to this Tender. This Tender includes statements, which reflect various assumptions and assessments arrived at by the Employer in relation to the Project. Such assumptions, assessments and statements do not purport to contain all the information that each Bidder may require. This Tender may not be appropriate for all persons, and it is not possible for the Employer, its employees or advisors to consider the investment objectives, financial situation and particular needs of each party who reads or uses this Tender. The assumptions, assessments, statements and information contained in this Tender may not be complete, accurate, adequate or correct. Each Bidder should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this Tender and obtain independent advice from appropriate sources.

Information provided in this Tender to the Bidder(s) is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The Employer accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.

The Employer, its employees and advisors make no representation or warranty and shall have no liability to any person, including any Bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this Tender or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the Tender and any assessment, assumption, statement or information contained therein or deemed to form part of this Tender or arising in any way during the Bidding Process.

The Employer also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Bidder upon the statements contained in this Tender. The Employer may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumptions contained in this Tender. The issue of this Tender does not imply that the Employer is bound to select a Bidder or to appoint the Selected Bidder for the Project and the Employer reserves the right to reject all or any of the Bidders or Bids without assigning any reason whatsoever. The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by the Employer or any other costs incurred in connection with or relating to its Bid. All such costs and expenses will remain with the Bidder and the Employer shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation or submission of the Bid, regardless of the conduct or outcome of the Bidding Process.

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

Important Dates

S. No.	Activity	Timeline
1	Release of Tender	25-06-2018 from 10:00 Hrs
2	Last date of receipt of Pre-Bid queries of Tender by e-mail	04-07-2018 up to 16:00 Hrs
3	Posting of response to queries	06-07-2018 by 16:00 Hrs
4	Last date for online submission of Bids	20-07-2018 up to 16:00 Hrs
5	Date of opening of Bids	20-07-2018 at 17:00 Hrs

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

Table of Contents

Volume 1: Tender Procedures.....	10
Section I: Instruction to Tenderers.....	1
A. GENERAL.....	2
1. Introduction.....	2
2. Firms eligible to tender	6
3. Qualification data of the tenderers	8
4. One Tender per Tenderer.....	23
5. Cost of Tendering	23
6. Site Visit.....	23
B. Tender Document.....	24
7. Contents of tender document.....	24
8. Clarification on tender documents	24
9. Amendment to tender documents.....	24
C. PREPARATION OF TENDERS.....	25
10. Language of the Tender.....	25
11. Documents comprising of the tender	25
12. Bid Offer:.....	26
13. Validity of tenders:.....	27
14. Earnest Money Deposit (EMD).....	27
15. Signing of Tenders.....	29
D. SUBMISSION OF TENDERS.....	30
16. Submission of Tenders:	30
17. Deleted	31
18. Last date / time for submission of the tenders.....	31
19. Late tenders.....	32
20. Modification to the tender.....	32
E. TENDER OPENING AND EVALUATION.....	33
21. Tender opening.....	33
22. Clarification on the technical bid	33
23. Examination of technical bids and determination of responsiveness.....	34
24. Price bid opening.....	34
25. Evaluation and comparison of price bids	35
26. Discrepancy in tender percentage quoted.....	35
27. Process to be confidential	35
F. AWARD OF CONTRACT	37
28. Award Criteria.....	37
29. Notification of award and signing of agreement.....	37
30. Corrupt or fraudulent practices	38

DECLARATION	40
LETTER OF TENDER.....	41
BIDDER INFORMATION FORM.....	45
Section II: Bid Statement.....	47
Section III: Contract Forms.....	62
Volume 3: Conditions of Contract.....	87
A. GENERAL	88
B. TIME FOR COMPLETION.....	97
C. QUALITY CONTROL.....	102
D. COST CONTROL.....	104
E. FINISHING THE CONTRACT.....	112
F. SPECIAL CONDITIONS.....	114
Volume 4: Technical Specifications	141
Volume 5: Drawings	255
Volume 6: Bill of Quantities	296
SCHEDULE-A PART- I.....	297
Bill of Quantities (BoQ) – Preamble.....	297
Bill of Quantities (BoQ) Priced Bid.....	303
BILL OF QUANTITIES - PART-II.....	304
Reimbursable Items.....	304
Glossary.....	305

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

Volume 1: Tender Procedures

Section I: Instruction to Tenderers

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

SECTION I: INSTRUCTIONS TO TENDERERS

A. GENERAL

1. Introduction

- NAME OF WORK** : “Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati’s ABD Area including O&M after DLP completion [from 3rd year] under Smart City Mission”
- SCOPE OF WORK** : Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati’s ABD Area including O&M after DLP completion [from 3rd year] under Smart City Mission
- OFFICER INVITING TENDERS** : Managing Director, Tirupati Smart City Corporation Limited
Please refer Volume 2: Work Requirements / Scope of Work / Terms of Reference

Approximate Estimated Contract Value put to tender:

Rs. 8,14,46,568/-

Breakup of cost of major items covered in the ECV

(i)	Civil works
(ii)	Landscape & development works
(iii)	Supply and fixing of play equipment
(iv)	Electrical, plumbing and Irrigation works

- a) Period of completion : 9 months
- b) Defects Liability Period [DLP] : 2 Years
- c) SSR adopted: Common SSR for the year 2017-18
- d) Reimbursable Items
- i) GST Rs. 1,03,07,342/-
- ii) Seignorage charges Rs. 4,51,268 /-

The tenderer shall hand over the original BG for EMD to the Managing Director, TSCCL, Tirupati directly or through his agent or by registered Post or by courier service so as to reach before opening of the price bid and the receipt of the same within the stipulated time shall be the responsibility of the bidder. Department / TSCCL Authority will not take any responsibility for any delay or non-receipt.

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

The tenders will be opened by the Managing Director, TSCCL, Tirupati or his nominee at his office in the presence of tenderers or their authorized representatives, on the dates mentioned in Notice Inviting Tender (NIT). If the office happens to be closed on the dates, the opening of tenders gets automatically postponed to the next working date, the time being unaltered, unless extended by a notification published in Newspapers to all those who purchased the tender documents.

Tenders are invited on the e-procurement platform for the above -mentioned work from the Contractors / Contracting firms registered with Government of Andhra Pradesh. The details of Tender conditions and terms can be downloaded from the electronic procurement platform of Government of Andhra Pradesh i.e. www.apecurement.gov.in

- 1.1.** The intending bidders would be required to enroll themselves on the 'e' procurement market place at www.apecurement.gov.in.
- 1.2.** Contractors would be required to register on the e-procurement Market Place www.apecurement.gov.in and submit their bids on line. The Department / TSCCL Authority will not accept any bid submitted in the paper form
- 1.3.** The tenders should be in the prescribed form invited on e-procurement by the Tirupati Smart City Corporation Limited (As specified in NIT) that can be downloaded at free of cost from the website www.apecurement.gov.in.
- 1.4.** The dates stipulated in the tender notice are firm and under any circumstances they will not be relaxed unless officially extended.
- 1.5.** The successful (L1) tenderer shall furnish the original hard copies of all the documents/certificates/statements uploaded by him before concluding agreement.
- 1.6.** The successful tenderer is expected to complete the work within the time period specified in the NIT
- 1.7.** The Tenderers shall be required to furnish a declaration in on-line stating that the soft copies uploaded by them are genuine. Any incorrectness/deviation noticed will be viewed seriously and apart from canceling the work duly forfeiting the EMD, Criminal Action will be initiated including suspension of business.
- 1.8.** The tenderers who are desirous of participating in 'e' procurement shall submit their Technical bids, price bids etc., in the standard formats prescribed in the Tender documents displayed at 'e' market place. The tenderers should upload the scanned copies of all the relevant certificates, documents etc., in the 'e' market place in support of their Technical Bids. The bidders shall sign on all the statements, documents, certificates uploaded by him owning responsibility for their correctness/authenticity.

- 1.9.** The Corporation will not hold any risk and responsibility for the loss in transit during uploading of the scanned document, for the invisibility of the scanned document online, and any other problem(s) encountered by the Tenderers while submitting his bids online.
- 1.10.** The tenderers shall authenticate the bid with his digital certificate for submitting the bid electronically on e-Procurement platform and the bids not authenticated by digital certificate of the bidder will not be accepted on the e-Procurement platform
- 1.11.** The technical bid evaluation of the tenderers will be done on the certificates/documents uploaded through on-line only, towards qualification criteria furnished by them.
- 1.12.** The tenderer should furnish copy of Permanent Account Number (PAN) and copy of latest Income Tax returns submitted along with proof of receipt since last five years i.e., from 2012-13 to 2016-17.
- 1.13.** Copy of Valid GST Registration Certificate along with GSTIN obtained from Government of India.
- 1.14.** The tenderer should submit the particulars of information of litigation history.
- 1.15. ELIGIBILITY CRITERION:**
To qualify for consideration of award of the Contract each tender should fulfill the following criteria
- 1.15.1.** The tenderer should be a registered contractor having not less than Class – I Registration certificate as per G.O.Ms.No:94.
- 1.15.2.** Assessed available Bid Capacity as per formula (2AN-B) should be greater than the estimate contract value as specified in the tender document.
- 1.15.3.** The details and certificates are to be furnished as per the pro-forma available in the tender schedules.
- 1.15.4.** The bidder should have satisfactorily completed works of similar nature of works for Rs. 5,42,97,712/- as a prime contractor in the same name and style in any one financial year during the last Ten financial years (i.e. 1-4-2008 to 31-3-2018)
- 1.15.5.** The bidder should have executed the minimum quantities of items of work as given below in any one year during the last Ten years (i.e. 1-4-2008 to 31-3-2018). The bidder should enclose certificates issued by the Engineer-In-Charge of the State by the Central / State Government Departments undertaking and not below the rank of Executive Engineer or equivalent and counter signed by the officer of the rank of Superintending Engineer or equivalent.

- 1.15.6. The bidder in the same name and style should have successfully completed as specified in General Terms & Conditions of NIT.
- 1.15.7. The bidder should submit the particulars invariably in the format specified in the tender schedule along with necessary certificates, failing which his tender shall be treated as in-complete and summarily rejected.
- 1.15.8. The details and certificates are to be furnished as per the Proforma available in the tender schedules
- 1.15.9. Civil Contractors with appropriate registration i.e. as per G.O.Ms. No. 94, I & CAD Dept.(PW_COD) Dept., Dt.1.7.2003; Class-I in Civil Engineering with Govt. of A.P having required physical and financial eligibility can participate in tenders.
- 1.15.10. The tenderer should further demonstrate:
- 1.15.10.1. A declaration regarding (either owned or leased) key & critical equipment owned / leased shall be produced by the tenderer on a non-judicial stamp paper of Rs.100/-
- 1.15.10.2. Key personnel: The contractor should undertake on indemnity bond worth of Rs.100 stating that the following key personnel with adequate experience on their rolls
- 1.15.10.2.1. Two (02) Graduate Civil Engineer with minimum 3 years experience.
- 1.15.10.2.2. One (01) Diploma holder in Civil with minimum 3 years experience.
- 1.15.10.2.3. Liquid Assets / Credit facilities / Solvency Certificate from Nationalised Bank / Schedule of value not less than Rs. 2,71,48,856 issued after 01.04.2018 (Credit lines / letter of Credit Solvency Certificates from Banks etc. shall be submitted by the Tenderer).
- 1.15.10.2.4. EMD should be paid online for Rs.8,14,466/- (1% of AECV) issued by Nationalised Bank / scheduled bank should be paid via online payment gateway and bank guarantee in the shape of Bank guarantee in the standard format in favour of "Managing Director, Tirupati Smart City Corporation Limited, Tirupati" to be valid for 06 months from the date of NIT.
- 1.16.** The technical bid evaluation of the tenderers will be done on the certificates /documents uploaded through online only towards qualification criteria furnished by them.
- Note: 1) The qualification information shall be furnished as per the check list in tender document.

Note: 2) Qualification criteria detailed in tender document only shall be considered for submitting certificates.

- 1.17.** The Tenderer should submit signed undertaking of tender on line.
- 1.18.** The tenderer is subjected to be black listed and the EMD forfeited if he is found to have misled or furnished false information in the forms / statements / certificates submitted in proof of qualification requirements or record of performance such as abandoning of work, not properly completed in earlier contracts, inordinate delays in completion of the works, litigation history and / or financial failures and /or participated in the previous tendering for the same work and had quoted unreasonable high bid prices
- 1.19.** Even while execution of the work, if found that the contractor had produced false/fake certificates of experience he will be black listed and the contract will be terminated under clause 60 (a) of PS to APSS and his EMD will be forfeited.
- 1.20.** Any other condition regarding receipt of tenders in conventional method appearing in the tender documents may please be treated as not applicable.
- 1.21.** The tenderers are requested to upload the information in *.Zip format preferably.
- 1.22.** Any further information can be obtained from the Office of the Managing Director, Tirupati Smart City Corporation Limited, Tirupati during office hours.

Note: The certificates in support of Group of works, similar works must be in State/Central Government Departments or State/Central Government undertakings only issued by the concerned Executive Engineer and counter signed by the Superintending Engineer or equivalent authority. The sub-contractor's/GPA holders / Joint ventures experience shall not be taken into account in determining the tenderers compliance with qualifying criteria.

- 1.23.** If any of the certificates, documents, etc., furnished by the tenderer are found to be false / fabricated / bogus, the tenderer will be disqualified, blacklisted, action will be initiated as deemed fit and the EMD will be forfeited.
- 1.24.** The successful tenderer is expected to complete the work within the time specified in the Tender Notice

2. Firms eligible to tender

- 2.1.** The Firms who
 - i) Possess the valid registration in the class and category mentioned in the NIT and satisfy all the conditions therein.

- ii) are not blacklisted or debarred or suspended by the Government for whatever the reason, prohibiting them not to continue in the contracting business
- iii) have complied with the eligibility criteria specified in the NIT. are the eligible tenderers.

2.2. Firms ineligible to tender:

- i) A retired officer of the Government of Andhra Pradesh or Government of India executing works is disqualified from tendering for a period of Two (2) years from the date of retirement without the prior permission of the Government.
- ii) The tenderer who has employed any retired officer as mentioned above shall be considered as an ineligible tenderer.
- iii) The contractor himself or any of his employees is found to be Gazetted Officer who retired from Government service and had not obtained permission from the Government for accepting the contractor's employment within a period of Two (2) years from the date of his retirement.
- iv) The contractor or any of his employees is found at any time after award of contract, to be such a person who had not obtained the permission of the Government as aforesaid before submission of the tender or engagement in the contractor's service.
- v) Contractor shall not be eligible to tender for works in the division/circle where any of his near relatives are employed in the rank of Assistant Engineer or Assistant Executive Engineers and above on the Engineering side and Divisional Accounts Officer and above on the administrative side. The Contractor shall intimate the names of persons who are working with him in any capacity or are subsequently employed. He shall also furnish a list of Gazetted / Non-Gazetted, State Government employees related to him. Failure to furnish such information

tenderer is liable to be removed from the list of approved contractors and his contract is liable for cancellation.

Note: Near relatives include

1. Sons, step sons, daughters, and step daughters.
2. Son-in-law and daughter-in-law.
3. Brother-in-law and sister-in-law.
4. Brothers and Sisters.
5. Father and Mother.
6. Wife / Husband.
7. Father-in-law and Mother-in-law
8. Nephews, nieces, uncle and aunts
9. Cousins and
10. Any person residing with or dependent on the contractor.

3. Qualification data of the tenderers

3.1. The tenderer shall upload the following particulars in the formats enclosed, supported by documentary evidence as specified in the formats.

- a) Check slip to accompany the tender (in Annexure-I).
- b) Attested copies of documents relating to the Registration of the firm, Registration as Civil Contractor, Partnership deed, Articles of Association, GST Registration, copy of **PAN CARD** and copy of **LATEST INCOME TAX RETURNS FY 16-17** submitted along with proof of receipt.

Note: The Partnership firms, which are registered as contractors shall intimate the change in partnership deed, if any as per GO Ms No.58, I & CAD Department dated: 23/4/2002 within one month of such change. Failure to notify the change to the registration authority in time will entail the firms to forfeit their registration and their tender will be rejected. The intimation of change of partners if any and the acceptance by the registration authority may be enclosed.

- c) Value of all Civil Engineering works executed every year during the last Ten (10) financial years (i.e., from 2007-08 to 2016-17) in Statement -I
- d) Details of similar nature of building works completed in the name of the tenderer as Prime Contractor during the last Ten (10) financial years i.e., from

2007 - 2008 to 2016 - 2017 showing year wise break up of value of work executed in Statement -II

- e) Year wise specified quantities executed by the tenderer during the last Ten (10) financial years in Statement – III
- f) Details of the existing commitments i.e., works on hand and works for which tenders are submitted in Statement - IV
- g) Availability of Key & critical construction/quality control equipment in Statement - V
- h) availability of key personnel for administration/site management and execution viz., technical personnel required for the work (Statement - VI)
- i) information regarding any litigation, with Government during the last Ten (10) years in which the tenderer is involved in (Statement - VII)
- j) availability of working capital for the work [Liquid assets, credit facility and availability of other financial resources such as Solvency etc]
- k) The proposed methodology and program of construction, backed with equipment planning and deployment, duly supported with broad calculations, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.
- l) The Particulars of Quality Control testing lab owned, or ties up with established quality control testing laboratories.
- m) Tenders from Joint Ventures are acceptable unless specifically stated otherwise.
- n) Contractors against whom Vigilance / disciplinary / blacklisting cases are pending in the Corporation are not entitled to participate in the tender for the above work

3.2. QUALIFICATION CRITERIA FOR OPENING OF THE PRICE BID.

INDENT	
Indent Type	DOUBLE PACKET
Indent Notice No	TSCCL/PROJECTS/ 17 (PRAKASHAM PARK)/2018, Dated : 22-06-2018
Name of the Employer	Tirupati Smart City Corporation Limited (TSCCL)
Name of the Project	Smart City Mission
Type of the Work	Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati's ABD Area including O&M after DLF completion (from 3 rd year) under Smart City Mission.
Source of Funding	The TSCCL are empowered with grant of funds from Govt. of India and Government of Andhra Pradesh to be utilized for execution of this Project. All eligible payments under the contract(s) for the package for which this Invitation for Tender is issued shall be made by the TSCCL.
ADMINISTRATIVE SANCTION	
Particulars Ref. No	
Sanction Authority	Chairman / Managing Director / Board of Directors of Tirupati Smart City Corporation Limited.
Date	29-03-2018
Estimated Contract Value(INR)	Rs. 8,14,46,568/- (Rupees Eight Crore Fourteen Lakh Forty Six Thousand Five Hundred and Sixty Eight only)
TECHNICAL SANCTION	
Particulars Ref. No	R. No.: 47/2018-19, Dated: 21-05-2018
Sanction Authority	Engineer-In-Chief, PH & ME, Tadepalli, Guntur District.
Date	23-04-2018
Technical Approval date	21-05-2018
Year of SSR	2017-18
District	Chittoor
Mandal	Tirupati Urban
Assembly Constituency	Tirupati
Parliament constituency	Tirupati

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

NOTICE INVITING TENDER	
TENDER DETAILS	
Department Name	Tirupati Smart City Corporation Limited (TSCCL)
Circle / Division	Municipal Corporation, Tirupati
Name of Project	Smart City Mission
Name of Work	Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati's ABD Area including O&M after DLF completion (from 3 rd year) under Smart City Mission.
Estimated Contract Value (INR)	Rs. 8,14,46,568/- (Rupees Eight Crore Fourteen Lakh Forty Six Thousand Five Hundred and Sixty Eight only)
Period of Completion [in Months]	9 (Nine)
Form of Contract	LS
Tender/Bidding Type	Open
Bid Call (Nos)	2 nd Call
Type of quotation	(%) Percentage
Tender Category	Works
TRANSCATION FEE DETAILS	
Transaction Fee Payable to "APTS" payable at Hyderabad (As per G.O.Ms.No.4 dated 17-02-2015 IT & C Dept.)	
AMOUNT DETAILS	
Bid Processing Fee (INR)	Not Applicable
Bid Processing Fee Payable To	Not Applicable
Sales Tax (%)	Not Applicable
Sale Tax Payable To	Not Applicable

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Bid Security (INR)	Rs. 8,14,466/- [1% of the ECV / TCV]
Bid Security DD Drawn in favour of	It shall be drawn in favour of Managing Director, Tirupati Smart City Corporation Limited , payable at Tirupati (Andhra Pradesh-India).
Bid Security BG Drawn in Favour of	[Rs. 8,14,466/-] 1% of the ECV / TCV at the time of submission of Bids and in the form of Online payment Gateway only / Unconditional and irrecoverable Bank Guarantee issued by Nationalised Bank in the standard format as shown in the Tender schedule and it shall be drawn in favour of Managing Director, Tirupati Smart City Corporation Limited , payable at Tirupati (Andhra Pradesh-India).
TENDER DATES	
Document Downloading Start Date	25/06/2018, 10: 00 AM
Bid Document Downloading End Date	20/07/2018, 03: 00 PM
Last Date & Time for Receipt of Bids	20/07/2018, 04: 00 PM
Bid Validity Period	90 (Ninety) Days from the date of tender notice
Price Bid Opening Date (Financial Bid Stage)	23/07/2018, 04: 00 PM
OTHER DETAILS	
Officer Inviting Bids	Managing Director, Tirupati Smart City Corporation Limited (TSCCL), Tirupati.
Bid Opening Authority	Managing Director, Tirupati Smart City Corporation Limited (TSCCL), Tirupati.
Department Address for Submission of Documents	Attention: The Managing Director Tirupati Smart City Corporation Limited (TSCCL), Tirupati Municipal Corporation, 13-29-M9-1-00, Tilak Road, East Tirupati, Chittoor District, Andhra Pradesh. Pin Code : 517501. For online Submission : www.apecurement.gov.in The deadline for bid submission is : As stated in Important Dates

Contact Details	Municipal Engineer – II Tirupati Smart City Corporation Limited (TSCCL), Tirupati Municipal Corporation, 13-29-M9-1-00, Tilak Road, East Tirupati, Chittoor District, Andhra Pradesh. Pin Code : 517501. Phone: +919849906685			
E-mail	tsccltirupati@gmail.com			
Package No	N/A			
Bidder Nationality	National Competent Bidding (NCB)			
Language of the Tender	The language of the bid is: English All correspondence exchange shall be in English language . Language for translation of supporting documents and printed literature is English			
Currency Type	INR-Indian Rupee			
Default Currency	INR-Indian Rupee			
Bid Capacity	(2AN- B)> Estimate Contract Value (ECV)			
Consortium/Joint Venture	Applicable			
Withdraw Bid	Not Applicable			
Regret Bid	Not Applicable			
Eligibility and Qualification Criteria for considering of award of work				
Registration	Registered contractor having not less than Class – I and above as per G.O. Ms. No : 94, I & CAD (PW-COD) Dept., Dated: 01-07-2003 and amendments.			
Financial Requirement	Rs. 5,42,97,712/- (Rupees Five Crore Forty Two Lakh Ninety Seven Thousand Seven Hundred and Twelve only) in any one financial year during last Ten (10)financial years (i.e. 1-4-2008 to 31-3-2018) as per G.O. Ms. No. 372 MA&UD, Dated: 28-09-2012.			
Physical Requirement	Minimum Required quantity : In any one Financial Year during last Ten Financial Years (i.e. 1-4-2008 to 31-3-2018)			
Item		Quantity as per Estimate	Unit	Min. Required Quantity per annum
EPDM Flooring		2252	Sq.Mtrs.	1500
Hot Dip Galvanized Structural Steel Work		27072	Kgs	18048
Granite / Shahabad / Kota Stone Flooring		3198	Sq.Mtrs.,	2132

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Tree Plantations	252	Nos.	168
Shrubs Plantations	8508	Nos.	5672
Landscape / Softscape Bed Preparation (Planting Soil mix, top or sub soil)	6172	Cu.Mtrs.,	4115
Supply and fixing of pole lights or sports lights	134	Nos.	89

The bidder should enclose experience certificate issued by the Engineer-in-charge of the State/Central Government Departments not below the rank of Executive Engineer or equivalent authority and should have countersigned by the next higher authority.

Assessed available Bid Capacity as per formula (2AN-B) must be greater than the Estimate Contract Value.

A= Maximum value of similar nature of work executed in any one financial year during the last (10) Ten financial years as per G.O. Ms. No. : 28, I&CAD (PW-Reforms) Dept., Dt. 30.4.2012 (updated to current price level) taking into account the work executed for the mentioned period.

N= Number of years prescribed for completion of the work for which tenders are invited.

B= Updated value (at current price level) of all existing Commitments i.e., ongoing orders, orders likely to be awarded to be executed during the Period of completion of the similar nature of work completed for which Tenders are invited.
Annual turnover cost of completed works and balance works on hand etc., shall be updated by giving weightage of 10% per year to bring them to current price level.

**Liquid Assets /
Credit Facilities
Posses**

**Rs. 2,71,48,856/-
(Rupees Two Crore Seventy One Lakh Forty Eight Thousand Eight
Hundred and Fifty Six only)**

Critical Equipment Required

Equipment Required	Quantity Required
Excavator	1 No.s
Concrete Mixer	1 No.s
Pin Vibrator	1 No.s
Plate Vibrator	1 No.s
Water Tanker	1 No.s

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Availability of Key Personal	
Qualification	No. of Persons
Graduate Engineer (Civil)	2 No.s
Diploma Engineer (Civil)	1 No.s
Bid Submission	The bidder shall submit the bids as follow: Online submission : Scanned copy of the original
Power of Attorney (PoA)	The written confirmation of authorization to sign on behalf of the Bidder shall consist of Power of Attorney (PoA) on a Notarized Non Judicial paper of minimum value of Indian Rupees 100/- (Rupees One Hundred).
General Terms & Conditions/Eligibility	As per Tender Document
General Technical Terms and Conditions(Procedure)	As per Tender Document
Eligible Class of Contractors as per G.O. M's No.	G.O. Ms No 94, I&CAD (PWW) Department Dt 01-07-2003. And As Amended from Time to Time
<p><u>General Terms and Conditions :</u></p> <p>1. Bids are invited on the e-procurement for the above mentioned work from the Eligible registered contractors in any respective Departments of Government of Andhra Pradesh. The details of Tender conditions and terms can be down loaded from the electronic procurement platform of Government of Andhra Pradesh i.e www.eprocurement.gov.in</p> <p>Approximate estimated cost of work Rs. 8,14,46,568/- (Rupees Eight Crore Fourteen Lakh Forty Six Thousand Five Hundred and Sixty Eight only)</p> <p>2. Bidders would be required to register on the e-procurement market place www.eprocurement.gov.in and submit their bids on line. The department will not accept any bid submitted in the paper form.</p> <p>3. E.M.D to be paid by way of unconditional and irrevocable Bank Guarantee issued by any Nationalized Bank in the standard format as shown in the Tender Schedule drawn in favour of Managing Director, Tirupati Smart City Corporation Limited for Rs. 8,14,466/- (i.e. 1.00% of ECV) drawn in favour Managing Director, Tirupati Smart City Corporation Limited along with bids. The balance EMD @ 1.5% Contract value has to be paid at the time of concluding agreement. Scanned EMD should be uploaded with the bids and originals must be submitted to the Managing Director, Tirupati Smart City Corporation Limited, through Registered Post / Courier / Personally so as to reach before the date of opening of price bid. Failure to furnish the original BG before opening of price bid will entitle for rejection of bid and block listing.</p>	

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

4. The bidders can view/download the tender documents from the 'e' market place
(Note: - (i) The date stipulated above are firm and under no circumstances they will be relaxed unless otherwise extended by an official notification or happen to be Public Holiday). (ii) The Bank Guarantee submitted by the successful bidder at the time of tender with conditional obligations shall not accept and retained against EMD for performance at the time of conclusion of contract. (iii) Unconditional and irrevocable Bank Guarantee shall be obtained towards EMD for the entire specified amount at the time of concluding agreement)
5. The following orders are applicable as per G.O. Ms. No. 174 I & CAD (PW Reforms) Dept., Dt : 01-09-2008.
- i. Submission of original hard copies of the uploaded scan copies of online payment / BG towards EMD by participating bidders to the tender inviting authority before opening of the price bid is dispensed forthwith.
 - ii. All the bidders shall invariably upload the scanned copies of BG in the e-procurement system and this will be the primary requirement to consider the bid as responsive.
 - iii. The department will carry out the technical bid evaluation solely based on the uploaded certificates / documents, BG towards EMD in the e-procurement system and open the price bids of the responsive bidders.
 - iv. The Department will notify the successful bidder for submission of original hard copies of all uploaded documents, BG towards EMD prior to entering into agreement.
 - v. The successful bidder shall invariably furnish the original BG certificates / documents of the uploaded scanned copies to the tender Inviting Authority before entering into agreement either personally or through courier or post and the receipt of the same within the stipulated date shall be the responsibility of the successful bidder. The department will not take any responsibility for any delay in receipt/non-receipt of original BG towards EMD, certificates / Documents, from the successful bidder before the stipulated time. On receipt of the documents, the Department will ensure the genuineness of the BG towards EMD and all other certificates/documents uploaded by the bidder in e-procurement system in support of the qualification criteria before concluding the agreement.
 - vi. If any successful bidder fails to submit the original hard copies of the uploaded certificates / Documents, BG towards EMD within the stipulated time or if any variation is noticed between the uploaded documents and the hard copies submitted by the bidder, the successful bidder will be suspended from participating in the tender on e-procurement platform for a period of 3 (three) years. The e-procurement system would de-active the use ID of such defaulting successful bidder based on the trigger/recommendation by the Tender Inviting Authority in the system. Besides this, the department shall invoke all processes of law including criminal prosecution of such defaulting bidder as an act of extreme deterrence to avoid delay in the tender process for execution of all development schemes taken up by the Government. The information to this extent will be displayed in the e-procurement platform website.
6. The Tenderers shall be required to furnish a declaration in on-line stating that the soft copies uploaded by them are genuine. Any incorrectness/deviation noticed will be viewed seriously and apart from canceling the work duly forfeiting the EMD, Criminal Action will be initiated including suspension of business.

7. The bidders who are desirous of participating in 'e' procurement shall submit their Technical bids, price bids etc., in the standard formats prescribed in the Tender documents displayed at 'e' market place. The bidders should upload the scanned copies of all the relevant certificates, documents etc., in the 'e' market place in support of their Technical Bids. The bidders shall sign on all the statements, documents, certificates uploaded by him owning responsibility for their correctness/authenticity.
8. The technical bid evaluation of the tenderers will be done on the certificates / documents uploaded through on-line only, towards qualification criteria furnished by them.
9. Copy of Latest valid Income Tax Return along with proof of receipt and copy of PAN Card must be uploaded.
10. Copy of GST Registration Certificate along with GSTIN No. obtained from respective Department and latest Clearance Certificate must be uploaded.
11. Period of completion 9 Months + warranty as applicable.
12. The date stipulated in the NIT is fixed and under no circumstances they will be relaxed unless otherwise extended by an official notification or happen to be Public Holiday. Any other condition regarding receipt of tenders in conventional method appearing in the tender documents may please be treated as not applicable.
13. Each bidder should demonstrate the availability of key and critical equipment either owned or leased as shown in the NIT

Special Conditions:

1. The work should be got tested as per relevant IS Codes and Standards approved by the Department, Third Party Quality Control / CIPET before the total supplies are affected.
2. The Bidder has to furnish self-declaration of Latest Present and Permanent Postal Address along with Telephone Number, Mobile Number for Communication; Any Changes must be communicated to the Tender Inviting Authority failure to notify the changes prior one month the date of change of Address, the Available Address at Tender Inviting Authority will be deemed to fit for communication. It is the responsibility of the bidder; the Department will not take any responsibility for any delay, loss in communication of any Correspondence.
3. The Managing Director, Tirupati Smart City Corporation Limited reserved the right to reject any tender or drop the proposals for receiving the tenders without assigning any reason. The details of rules and regulations and other required information can be had at the above address during the office hours on all working days.
4. E.M.D. noted against the work i.e., at 1% of estimate contract value should be paid in the shape of BG /Online payment drawn in favour of Managing Director, Tirupati Smart City Corporation Limited. The balance E.M.D. at 1.5% of estimate contract value should be paid by D.D. for the amounts till the defect liability period is completed i.e., 2 years from the date of completion of work to be paid at the time of entering into agreement. The DD's taken earlier than the Tender Notice will not be valid.

5. Tenders with an excess of 5% of the estimate rates will be summarily rejected.
6. Tenders upto 25% less than the estimate may be accepted but for tenders less than 25% of the estimate, a Bank Guarantee or D.D. for the difference between the tender amount and 75% of the estimate value should be taken, so if the tenderer leaves the work in mid-way and the department is forced to call for the tender for the work.
7. Any Tender or all the tenders can be cancelled without assigning any reasons. Conditional tenders will not be considered.
8. For particulars please apply to the Municipal Engineer, Tirupati and clarification can be had till a day earlier to the opening date of tenders.
9. If the tender is made by an individual, it shall be signed with full name and his address shall be given if it is made by a firm. It shall be signed with the co-partnership name by a member of the firm who shall also sign his own name and address of each member of the firm shall be given. If the tender is made by corporation it shall be signed by the duly authorized officer who shall produce with his tender satisfactory evidence of his authorization. Such tendering corporation may be required before the contract executed to furnish evidence of the corporate existence In the case of Proprietary or partnership firm it will be necessary to produce the certificate before mentioned for the proprietor or proprietors and for each of the partners as the case may be.

Note :- The tenderers particular attention is drawn to the sections and clauses in the standard preliminary specification dealing with the following:

- a. Test inspection and rejection of defective materials of Supplies.
- b. Carriage
- c. Landscape - Horticulture works
- d. Hardscape
- e. Electrical Works.
- f. Construction plant.
- g. Water and Lighting.
- h. Cleaning during progress and for delivery
- i. Accidents
- j. Delays
- k. Particulars of payment.

The tenderer should closely pursue all the specifications Clause which govern the rates for which he is tendering. The Supplier has to fulfill all requirements in tender document.

Procedure for Submission of Bids: -

- a) Bidders need to contact, Managing Director, Tirupati Smart City Corporation Limited for information on e-procurement.
- b) Bidders need to register on the electronic procurement market place of Government of Andhra Pradesh i.e, www.eprocurement.gov.in. On registration on the e-procurement market place they will be provided with a user ID and password by the system using which they can submit their bids online.

c) While registering on the e-procurement market place, Bidders need to scan and upload the required documents only as per the Tenders requirement onto their profile.

d) Such uploaded documents pertaining Technical Bid need to be attached to the tender while submitting the bids on line. Steps for registering and submission of bids are described in details in the "Bidders Training Booklet" available with the Department as well as at the above web site.

e) The technical bid evaluation of the tenderers will be done on the certificates / documents uploaded through on-line only, towards qualification criteria furnished by them.

f) The successful (L1) bidder shall furnish the original hard copies of all the documents / certificates / statements uploaded by him before concluding Agreement.

Required Tender Document Details:

S.No.	Document Name	Document Type
1	Registration Certification	Mandatory
2	EMD	Mandatory
3	Transaction Fee Payable to APTS	Mandatory
4	PAN CARD	Mandatory
5	GST Registration Copy	Mandatory
6	Declaration as per proforma attached in Tender Documents	Mandatory
7	Annual Turnover Certificate certified by Chartered Accountant	Mandatory
8	Similar Work Experience Certificate for the work completed within the Block period	Mandatory
9	Certificate in support of Existing Commitments	Mandatory
10	Experience Certificate in support of quantities executed – within block period	Mandatory
11	Liquidated Assets / Solvency Certificate from authorized Bank	Mandatory
12	Scanned copy of declaration on Key Critical Equipment owned on Non-Judicial stamp paper of Rs. 100	Mandatory
13	Qualification Certificate of Key Personnel	Mandatory

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

14	MoU with a reputed supplier of EPDM	Mandatory
15	If any other documents as per Tender Document	Optional

NOTE: The bidders shall sign on all the statements, documents, certificates uploaded by him owning responsibility for their correctness/authenticity.

To qualify for opening the Price Bid each contractor / firm in their name and style should have, during the last Ten financial years (i.e. 1-4-2008 to 31-3-2018) (As specified in NIT) (financial years are those immediately preceding the financial year in which the tenders are invited).

- a) Satisfactorily completed as a PRIME CONTRACTOR, similar works of Rs.5,42,97,712/- [at current price level] in any one financial year (As specified in NIT)
- b) Executed in any one year the following minimum physical quantities (As specified in NIT).
- c) The bidder in the same name and style should have successfully completed as a prime contractor, (as same specified in NIT) during the last ten financial years (i.e. 1-4-2008 to 31-3-2018)
- d) Availability of the Key personnel
 - i. Graduate Engineer : 2 No.s
 - ii. Diploma Holders : 1 No.s
- e) Liquid assets and / or credit facilities of not less than Rs. 2,71,48,856/-. (Credit facility / letter of credits / Solvency certificates from Banks etc.,).

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Bid capacity.

The tenderer who meets the above qualification criteria and whose available bid capacity is more than the estimated contract value will be qualified for opening of Price bid. The available bid capacity will be calculated as under:

Available Bid capacity: **(2AN - B)**

Where,

A= Maximum value of civil engineering works executed in its name in any one financial year during the last five financial years (updated to current price level @ 10% per year) taking into account the works completed as well as works in progress.

N= Number of years prescribed for completion of the work for which tenders are invited [months/12].

B= Updated value (at current price level), of all existing commitments i.e., ongoing works, works likely to be awarded to be executed during the next **12 months** (Period of completion for which tenders are invited).

Annual turn-over, cost of completed works and balance works on hand etc., shall be updated by giving weightage of 10% per year to bring them to current price level.

No relaxation will be given to any of the qualification criteria.

Note: a) Sub-contractor's experience in his name will be taken in to account in determining the tenderer's compliance to the qualification criteria, if it is as per GO Ms No. 94, dated: 01/07/2003 / as per GO Ms No.8, dt. 8.1.2003.

b) The experience gained in a registered JV firm to the extent of the tenderer's share shall be considered if the tenderer happens to be the lead partner, for similar works criteria also.

3.3. Even though the tenderers meet the above qualifying criteria, they are liable to be disqualified/debarred/suspended/blacklisted if they have

- Furnished false/fabricated particulars in the forms, statements and/annexures submitted in proof of the qualification requirements and/or
- Not turned up for entering into agreement, when called upon.
- record of poor progress such as abandoning the work, not properly completing the contract, inordinate delays in completion, litigation history or financial failures etc. and/or

- participated in the previous bidding for the same work and had quoted unreasonably high tender percentage and
 - even while execution of the work, if found that the work was awarded to the Contractor based on false/fake certificates of experience, the Contractor will be blacklisted and work will be taken over invoking clause 60 (a) of PS to APSS.
- 3.4. Tenders up to 5% excess over the ECV will be considered as per the GO Ms. No: 243 & 244, dt. 08.03.2007 and the tenders with an excess of above 5% of the estimated contract value shall summarily be rejected.**
- 3.5.** Conditional tenders are not accepted. Submission of tender would be construed as acceptance to all the terms and conditions of the tender which include conditions of contract, drawings and accompanying specifications.
- 3.6.** The contract price is inclusive of all overhead charges and include the following elements:
- Site accommodation, setting up plant, access road, water supply, electricity and general site arrangements.
 - Office furniture, equipment and communications
 - Expenditure on:
 - Corporate office of contractor
 - site supervision
 - Documentation and “as built” drawings
 - Mobilisation/ de-mobilisation of resources
 - Labour camps with minimum amenities and transportation to work sites.
 - Light vehicles for site supervision including administrative and managerial requirements.
 - Laboratory equipment and quality control including field and laboratory testing.
 - Minor T & P and survey instruments and setting outworks, including verification of line, dimensions, trial pits and bore holes, where required.
 - Watch and ward
 - Traffic management during construction
 - Expenditure on safeguarding environment
 - Sundries
 - Financing Expenditure
 - Sales / Turnover tax
 - Work Insurance/ compensation
- 3.7.** Wherever the audit parties of A.G point out that the contractor is unintendedly benefitted, then the employer is empowered to recover the same amount from the Contractor and it is binding on the contractor.
- 3.8.** For tenders up to 25% less than the estimated contract value of work, no additional security deposit is required. But for tenders less than 25% of the estimated contract value of work, the difference between the tendered amount and 75% of the

estimated contract value, shall be paid by the successful tenderer at the time of concluding agreement as an additional security to fulfill the contract through a Bank Guarantee or Demand Draft on a Nationalised / Scheduled Commercial Bank in the prescribed format valid till completion of the work in all respects.

3.9.

- a) If the percentage quoted by a tenderer is found to be either abnormally high or within the permissible ceiling limits prescribed but under collusion or due to unethical practices adopted at the time of tendering process, such tenders shall be rejected.
- b) A tenderer submitting a tender which the tender accepting authority considers excessive and or indicative of insufficient knowledge of current prices or definite attempt of profiteering will render himself liable to be debarred permanently from tendering or for such period as the tender accepting authority may decide. The tenderer overall percentage should be based on the controlled prices for the materials, if any, fixed by the Government or the reasonable prices permissible for the tenderer to charge a private purchaser under the provisions of clause-6 of the hoarding and profiteering prevention ordinance of 1943 as amended from time to time and on similar principle in regard to labour supervision on the construction.

4. One Tender per Tenderer

- 4.1.** Each tenderer shall submit only one tender for the work. A tenderer who submits more than one tender will cause dis-qualification of all the tenders submitted by the tenderer.

5. Cost of Tendering

- 5.1.** The tenderer shall bear all costs associated with the preparation and submission of his tender and the tender inviting authority will in no case be responsible and liable for those costs.

6. Site Visit

- 6.1.** The tenderer, at the tenderer's own responsibility and risk is advised to visit and examine the site of work and its surroundings and obtain all information that may be necessary for preparing the tender for entering into a contract, for construction of the work. The costs of visiting the site shall be at the tenderer's own expense.

B. Tender Document

7. Contents of tender document

7.1. One set of tender document, comprises of the following:

Technical bid

- 1) Notice Inviting Tenders (NIT)
- 2) Instructions to tenderers
- 3) Forms of tender and qualification information
- 4) Conditions of contract
- 5) Specifications
- 6) Drawings
- 7) Forms of Securities i.e., EMD, Additional Security etc.

Price bid

Bill of Quantities and price bid

8. Clarification on tender documents

8.1. A prospective tenderer requiring any clarification on tender documents may contact the tender Inviting officer at the address indicated in the NIT. The tender inviting officer will also respond to any request for clarification, received through post.

9. Amendment to tender documents

- 9.1.** Before the last date for submission of tenders, the tender Inviting officer may modify any of the contents of the tender Notice, tender documents by issuing amendment/addendum.
- 9.2.** Any addendum/amendments issued by the tender inviting officer shall be part of the tender document and it shall either be communicated in writing to all the purchasers of the tender documents or notified in the News Papers in which NIT was published.
- 9.3.** To give prospective tenderers reasonable time to take an addendum into account in preparing their bids, the tender inviting officer may extend if necessary, the last date for submission of tenders.

C. PREPARATION OF TENDERS

10. Language of the Tender

10.1. All documents relating to the tender shall be in the **English** language only.

11. Documents comprising of the tender

11.1. The tender comprise the following.

- a) Technical Bid and drawings. [Both are available online at www.apecurement.gov.in].
- b) Qualification information and supporting documents [to be uploaded by the tenderer].
- c) Price bid containing bill of quantities (Schedule –A) and the Bid offer. [Both are available online at www.apecurement.gov.in].

11.2. The bidders who are desirous of participating in e-procurement shall submit their technical bids, price bids etc., in the standard proscribed in the tender documents displayed at e market place.

The bidders should upload the scanned copies of all the relevant certificates, documents etc., in the e market place in support of their technical bids. **The bidders shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/authenticity.**

After uploading the technical/price bid, the original DDs/BG are to be submitted by the bidder to the concerned **MD, TSCCL** so as to reach before opening of the price bid. Failure to furnish DDs/BG, entail rejection of the bid and forfeiture of the EMD. Similarly if any of the certificates, documents etc. furnished by the bidder are found to be false/fabricated/bogus, the bidder will be black listed and the EMD forfeited.

The technical bids will be opened on line by the concerned **MD, TSCCL** at the time and date as specified in the tender documents. All the statements, documents, certificates, DD/BG etc., uploaded by the tenderers will be down loaded for technical evaluation. The clarifications, particulars if any required from the bidders will be obtained or in the conventional method by addressing the bidders. The technical bids will be evaluated against the specified parameters/criteria, same as in the case of conventional tenders and the technically qualified bidders will be identified. The result of technical bid evaluation will be displayed on the e market place, which can be seen by all the bidders who participated in the tenders.

12. Bid Offer:

12.1. Bill of quantities called Schedule "A" and the bid offer accompanies the tender document as Volume - 6. It shall be explicitly understood that the tender inviting officer does not accept any responsibility for the correctness or completeness of this schedule 'A' and this schedule 'A' is liable to alterations by omissions, deductions or additions at the discretion of the **MD, TSCCL** or as set forth in the conditions of the contract. The Schedule "A" shall contain the items of work indicated as part - I and LS provisions as part-II. The percentage quoted by the contractor shall be applicable only to part -I. However, the provisions contained in the part -II will be operable basing on the conditions provided in the tender document. The tenderers will have to state clearly their willingness to execute the work at certain specific percentage of excess or less or at par of the ECV indicated in Part - I at the space provided therein in Schedule 'A'. The L.S amounts indicated in part - II are maximum reimbursable amounts. The tenderer should however quote his lump sum tender based on this schedule of quantities. He should quote his offer as an overall tender percentage. The overall tender percentage should be written both in words and figures.

The bid offers i.e., percentage shall be written both in figures and words legibly and free from errors, over writings or corrections of figures. Corrections where unavoidable should be made by crossing out, and rewriting duly signed with date.

12.2. The Schedule - A (or price bid) contains not only the quantities but also the rates worked out by the Department / TSCCL Authority and the amount for each item and total value of the estimated contract. The tenderer should workout his own rates keeping in view the work, site conditions and quote his overall tender percentage with which he intends to execute the work.

12.3. The bid offer shall be for the whole work and not for individual items/part of the work.

12.4. All duties, taxes, and other levies payable by the contractor as per State/Central Government rules, shall be included in the tender percentage quoted by the tenderer, however keeping in view the maximum reimbursable amounts specified in Part - II of price bid.

12.5. The tendered contract amount as computed based on overall tender percentage is subject to variation during the performance of the Contract in accordance with variation in quantities etc.

12.6. Charges payable to:

(a) Transaction Fee: It is mandatory for all the participating bidders to pay electronically the transaction fee to M/s Vupadi Technologies through "Payment Gateway Service on E-Procurement platform". The Electronic Payment Gateway accepts all Master and Visa cards issued by any bank and Direct Debit facility / Net Banking of ICICI Bank, HDFC to facilitate the transaction. As prevalent Government GST Norms + Bank Charges for Credit Card Transaction Amount payable to M/s. Vupadi Technologies (Vupadi) shall be applicable.

(b) Corpus fund charges towards 'e' procurement services at 0.0345% of estimated contract value with a cap of **Rs.10,000/-** for all works with estimated contract value up to Rs.50.00 Crores and **Rs. 25,000/-** for works with estimated contract value above Rs. 50.00 Crores from successful bidder payable in the shape of DD drawn in favour of Managing Director, APTS, Hyderabad payable at Hyderabad at the time of concluding agreement.

13. Validity of tenders:

13.1. Tenders shall remain valid for a period of not less than **90 days** from the last date of receipt of Tender specified in NIT.

13.2. During the above mentioned period no plea by the tenderer for any sort of modification of the tender based upon or arising out of any alleged misunderstanding of misconceptions or mistake or for any reason will be entertained.

13.3. In exceptional circumstances, prior to expiry of the original time limit, the tender inviting officer may request the bidders to extend the period of validity for a specified additional period. Such request to the tenderers shall be made in writing. A Tenderer may refuse the request without forfeiting his E.M.D. A tenderer agreeing to the request will not be permitted to modify his Tender, but will be required to extend the validity of his E.M.D for a period of the extension.

14. Earnest Money Deposit (EMD)

14.1. The Tenderer shall furnish, Earnest Money Deposit equivalent to 1% of ECV. The BG shall be from a Nationalized / Scheduled Commercial Bank valid for a period of 180 days. The BG is to be scanned and uploaded along with the Bid.

Note : If any tenderer fails to submit the hard copies of BG for EMD hard copies of uploaded documents within the stipulated time, the tenderer will be

suspended/disqualified from participating in the tenders on “e” procurement platform for a period of 12(Twelve) months from the date of bid submission. The suspension of tenderer shall be automatically enforced by the “e” procurement system

The balance EMD @ 1½% of ECV / TCV whichever is higher shall be paid at the time of concluding agreement by the successful tenderer. This EMD drawn in the favour of Managing Director, Tirupati Smart City Corporation Limited, Tirupati can be in the form of:

- a) Online payment on any Nationalized Bank / Scheduled Commercial bank.
- b) a bank guarantee from a Nationalized Bank / Scheduled Commercial Bank.

The bank guarantee submitted by the successful bidder at the time of tender with conditional obligations shall not be accepted and retained against EMD for performance at the time of conclusion of contract

Unconditional and irrevocable bank guarantee shall be paid towards EMD for the entire specified amount at the time of concluding agreement.

Bank Guarantees furnished towards EMD along with tender shall be valid for a period of six months from the date of tender notice.

- 14.2.** The successful tenderer should however pay the E.M.D. at 2½% on Estimated Contract Value / Tender Contract Value whichever is higher plus additional EMD for tenders less than 15% of the Estimate Contract Value at the time of signing the agreement in the shape of crossed Demand Draft on any Nationalised Bank./Scheduled Bank or unconditional in the form given in “Formats of Securities” from any Nationalised Bank / Scheduled Bank.
- 14.3.** The earnest money deposit will be refunded to the unsuccessful tenderer by registered post/ in person at the expiry of the period of validity of tender or the entrustment of the work to the successful tenderer whichever is earlier
- 14.4.** The EMD of tenderers will be returned no sooner the tenders are finalized or end date of the tender validity period whichever is earlier.
- 14.5.** The 1% E.M.D paid by the successful tenderer before opening of the price bid through DD will be discharged if the tenderer furnishes bank guarantee for the full EMD of 2½% at the time of concluding agreement.
- 14.6.** The earnest money deposited by the successful tenderer will not carry any interest and it will be dealt with as provided in the conditions stipulated in the tender.
- 14.7.** The E.M.D given in the form of bank guarantee on a nationalized/scheduled commercial bank shall be valid for the duration of contract period plus defect

liability period of Two (02) years and in case any valid extension of contract period is granted, the validity of BG shall also be extended for the corresponding period. The bank guarantee on nationalized/scheduled commercial bank furnished by the tenderer towards additional security amount shall be valid till the work is completed in all respects.

14.8. The E.M.D. shall be forfeited.

- (a) if the tenderer withdraws the tender during the validity period of tender.
- (b) in the case of a successful tenderer, if he fails to sign the agreement for whatever the reason.

14.9. In consideration of the Managing Director / Superintending Engineer, Tirupati Smart City Corporation Limited / Chief Engineer/ Commissionerate of tenders undertaking to investigate and to take into account each tender and in consideration of the work thereby involved, all Earnest monies deposited by the tenderer will be forfeited to the Government in the event of such tenderer either modifying or withdrawing his tender at his instance within the said validity period of **90 days**.

15. Signing of Tenders

- 15.1.** If the tender is made by an individual, it shall be signed with his full name and his address shall be given. If it is made by a firm, it shall be signed with the co-partnership name by a member of the firm, who shall also sign his own name, and the name and address of each member of the firm shall be given, if the tender is made by a corporation it shall be signed by a duly authorized officer who shall produce with his tender satisfactory evidence of his authorization. Such tendering corporation may be required before the contract is executed, to furnish evidence of its corporate existence. Tenders signed on behalf of G.P.A holder will be rejected.
- 15.2.** The tender shall contain no alterations or additions, except those to comply with instructions issued by the tender inviting officer, or as necessary to correct errors made by the tenderer, in which case all such corrections shall be initialed by the person signing the tender.
- 15.3.** No alteration which is made by the tenderer in the contract form, the conditions of the contract, the drawings, specifications or statements / formats or quantities accompanying the same will be recognized, and, if any such alterations are made the tender will be void.

D. SUBMISSION OF TENDERS

16. Submission of Tenders:

- 16.1.** The Tenderers who are desirous of participating in 'e' procurement shall submit their Technical bids, price bids etc., in the Standard formats prescribed in the Tender documents, displayed at 'e' market place. The tenderers should upload the scanned copies in support of their Technical bids. The bidders shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness / authenticity. The Contractor must also upload certificates stating that the information furnished by him is genuine and he must also give self-declaration regarding value of ongoing works. The documents are to be uploaded in *.zip format only.
- 16.2.** The Corporation will not hold any risk and responsibility for the loss in transit during uploading of the scanned document, for the invisibility of the scanned document online, and any other problem(s) encountered by the Tenderers while submitting his bids online.
- 16.3.** Related certificates, documents etc., duly self-attested are to be scanned and uploaded on to the e-procurement platform at www.apecurement.gov.in in support of items mentioned in clause.
- 16.4.** Any other condition regarding receipt of tenders in conventional method appearing in Tender document may be treated as Non-applicable.
- 16.5.** The tenderer shall invariably ensure that the following documents are uploaded online. The technical bid evaluation of the tenderers will be done on the certificates/documents uploaded through online towards qualification criteria furnished by them.
- (a) Check slip showing the requisite particulars/certificates that are enclosed under Annexure – I Qualification Information.
 - (b) Copy of A.P. contractor's registration certificate under appropriate class with Government of Andhra Pradesh.
 - (c) Copy of permanent account number (PAN) card and copy of latest Income Tax returns submitted along with proof of receipt for 5 years i.e. from 2012-13 to 2016-17.
 - (d) Copy of Latest valid GST Registration certificate.
 - (e) The particulars of value of Civil Engineering works, executed in the last ten financial years in the tenderers name in Statement-I along with work done certificates in support of the figures.

- (f) The details of the contractor or his identified Sub-contractor with Class I Electrical certificate and license for executing Electrical Engg. Works duly supported with work done certificates, work wise
- (g) The details of works executed as Prime Contractor (in the same name) during the last ten financial years, showing year wise break up of value of work executed in Statement-II duly supported with work done certificates, work wise.
- (h) The physical quantities of specified works executed as Prime Contractor (in the same name) in the last ten financial years with year wise break up work wise in Statement-III duly supported with work done certificates.
- (i) The information on 'existing commitments' with supporting certificates in Statement-IV and self-declaration regarding ongoing works.
- (j) The availability of Key / critical construction / quality control equipment in Statement-V.
- (k) The availability of Key personnel in Statement-VI.
- (l) The information and litigation history in Statement-VII.
- (m) Proof of liquid assets / credit Facilities / Solvency certificate from Nationalised Banks / Schedule banks for the required amount.
- (n) Non-refundable Processing fee to be paid online for EMD.
- (o) Signed under taking of tender
- (p) Declaration statement.

Any other condition regarding receipt of tenders in conventional method appearing in Tender document may be treated as Non-applicable

NOTE: The bidders authorized person shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/authenticity.

17. Deleted

18. Last date / time for submission of the tenders.

- 18.1.** Tenders must be submitted not later than the date and time specified in NIT / Important Dates.
- 18.2.** No tender will be received physically at any office of **TSCCL**. They have quote their offer only on e-procurement platform at www.eprocurement.gov.in.
- 18.3.** The Managing Director, Tirupati Smart City Corporation Limited may extend the dates for issue and receipt of Tenders by issuing an amendment in which case all rights and obligations of the Managing Director, Tirupati Smart City Corporation Limited and the Tenderers will remain same as previously.

19. Late tenders

- 19.1.** Tenders are not accepted under any circumstances after the last date / time prescribed in NIT

20. Modification to the tender

- 20.1.** Tenderers can modify their Tender percentage online before the last date / time prescribed in NIT.
- 20.2.** No Tender shall be modified after the last date / time of submission of Tenders.
- 20.3.** In Modification Tenderer may offer, 'only discounts' to the percentage of the Tender percentage they quoted in the original Tender submitted prior to the last date and time specified for submission of Tenders.

Note: Any incorrectness / deviation noticed in the soft copies will be viewed seriously and apart from cancelling the tender duly forfeiting the EMD, criminal action will be initiated including suspension of business.

E. TENDER OPENING AND EVALUATION

21. Tender opening

21.1. The Technical bids will be opened online by the concerned Managing Director, Tirupati Smart City Corporation Limited, Tirupati at the time and date as specified in the tender documents. All the Statements, documents, certificates, Demand Draft / Bank Guarantee etc., uploaded by the bidders will be verified and downloaded, for technical evaluation. The clarifications, particulars, if any, required from the bidders, will be obtained either online or in the conventional method by addressing the bidders. The technical bids will be evaluated against the specified parameters / criteria same as in the case of conventional tenders and the technically qualified bidders will be identified. The result of Technical bids evaluation will be displayed on the 'e' market place, which can be seen by all the tenderers who participated in the Tenders.

The tenderers or their authorized representatives can be present at the time of opening of the tenders. Either the tenderer himself or one of his representatives with proper authorisation only will be allowed at the time of tender opening. If any of the tenderer is not present at the time of opening of tenders, the tender opening authority will, on opening the tender of the absentee tenderer, read out and record the deficiencies if any, which shall be binding on the tenderer.

21.1.1. The Technical bid will be opened and uploaded certificates will be verified. The details of the above shall invariably be read out and recorded. The Minutes of the Technical bid opening shall be recorded and signed by the Tender opening Authority as well as Tenderers OR their Authorized Representatives present.

22. Clarification on the technical bid

22.1.1. The tender opening authority may call upon any tenderer for clarification on the statements, documentary proof relating to the technical bid. The request for clarification and response thereto shall be in writing and it shall be only on the qualification information furnished by the tenderer. The clarification called for from the tenderers shall be furnished within the stipulated time, which shall not be more than a week.

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

- 22.1.2. The tenderer if so desirous, shall agree in writing to furnish the clarification called for within the stipulated time and, for disqualification and rejection of his tender in the event of failure to do so.

23. Examination of technical bids and determination of responsiveness

- 23.1.1. The Managing Director, Tirupati Smart City Corporation Limited will evaluate whether each tenderer is satisfying the eligibility criteria prescribed in the tender document and declares them as a qualified tenderer.
- 23.1.2. If the technical bid of a tenderer is not satisfying any of the eligibility criteria it will be rejected by the Managing Director, Tirupati Smart City Corporation Limited. However, the tender accepting authority detects any error in the evaluation of tenders by Managing Director, Tirupati Smart City Corporation Limited the tender accepting authority while returning the tenders may direct the Managing Director, Tirupati Smart City Corporation Limited as the case may be, to re-evaluate the tenders.
- 23.1.3. If any alteration is made by the tenderer in the tender documents, the conditions of the contract, the drawings, specifications or statements / formats or quantities the tender will be rejected.

24. Price bid opening

- 24.1. At the specified date and time, the price bids of all the technically qualified bidders will be opened online by the Managing Director, Tirupati Smart City Corporation Limited, Tirupati and the result will be displayed on the 'e' market place which can be seen by all the bidders who participated in the Tenders.
- 24.2. Only the price bids of qualified tenderers whose technical Bids are found satisfying the eligibility criteria shall be opened in the presence of the qualified tenderers or their authorized representatives present on the date and time fixed. The bid offers are read out and minutes recorded and the signatures of the tenderers present are taken in the minutes.
- 24.3. The price bid of the unqualified tenderers will not be opened and thereafter E.M.D will be returned to the tenderers.
- 24.4. Tenders shall be scrutinized in accordance with the conditions stipulated in the Tender document. In case of any discrepancy or non-adherence conditions the tender accepting authority shall communicate the same which will be binding both on the tender opening authority and the tenderer. In case of any ambiguity, the decision taken by the tender accepting authority on tenders shall be final.

25. Evaluation and comparison of price bids

- 25.1.** The **MD, TSCCL** will evaluate and compare the price bids of all the qualified tenderers.
- 25.2.** Negotiations at any level are strictly prohibited. However, good gesture rebate, if offered by the lowest tenderer prior to finalization of tenders may be accepted by the tender accepting authority.
- 25.3.** Selection of tenderer among the lowest and equally quoted tenderers will be in the following orders:
- a) The tenderer whose bid capacity is higher will be selected.
 - b) In case the bid capacity is also same the tenderer whose annual turnover is more will be preferred.
 - c) Even if the criteria incidentally become the same, the turnover on similar works and thereafter machinery available for the work and then the clean track record will be considered for selection.

26. Discrepancy in tender percentage quoted

- 26.1.** In case of any discrepancy between the overall tender percentage quoted in words and figures, the percentage quoted in words shall prevail. In case the tenderer has quoted overall tender percentage only in words and not in figures or vice versa, such tender shall be treated as incomplete and rejected.

27. Process to be confidential

- 27.1.** Information relating to the examination, clarification, evaluation and comparison of tenders and recommendations for the award of a contract shall not be disclosed to tenderers or any other persons not officially concerned with such process until the award to the successful tenderer has been announced by the tender accepting authority. Any effort by a tenderer to influence the processing of tenders or award decisions may result in the rejection of his tender.
- 27.2.** No Tenderer shall contact the **MD, TSCCL** or any authority concerned with finalization of tenders on any matter relating to its tender from the time of the tender opening to the time the contract is awarded. If the tenderer wishes to bring additional information to the notice of the **MD, TSCCL** it should do so in writing.
- 27.3.** Before recommending / accepting the tender, the tender recommending / accepting authority shall verify the correctness of certificates submitted to meet the eligibility criteria and specifically experience. The authenticated agreements of previous works executed by the lowest tenderer shall be called for.

27.4. Tenders will be finalised by the Executive Engineers / Superintending Engineers / Chief Engineers for the works costing upto Rs.2 Crores. The tenders for the works costing more than Rs.2 Crore will be referred to COT along with technical bid evaluation for consideration. The Commissionerate of tenders shall scrutinize the tenders submitted by Engineer-in-Chief / Chief Engineer / Project administrators in accordance with the conditions stipulated in the tender document and in case any discrepancy of non-adherence to the conditions, the same shall be communicated which will be binding both on the tender concluding authority and contractor. In case of any ambiguity the decision taken by the COT on tenders shall be final.

F. AWARD OF CONTRACT

28. Award Criteria

- 28.1.** The **MD, TSCCL** will award or recommend to the competent tender accepting authority for award of the contract to the tenderer who is found technically qualified as per the tender conditions and whose price bid is lowest.
- 28.2.** The tender accepting authority reserves the right to accept or reject any tender or all tenders and to cancel the tendering process, at any time prior to the award of contract, without thereby incurring any liability to the affected tenderer or tenderers or any obligation to inform the affected tenderer or tenderers of the reasons for such action.

29. Notification of award and signing of agreement

- 29.1.** The Tenderer whose Tender has been accepted will be notified of the award of the work by the **MD, TSCCL**, prior to expiration of the Tender validity period by registered letter. This letter (hereinafter and in the Conditions of Contract called "Letter of Acceptance") will indicate the sum that the Government will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Amount").
- 29.2.** When a tender is to be accepted the concerned tenderer shall attend the office of the **MD, TSCCL** concerned on the date fixed in the Letter of acceptance. Upon intimation being given by the **MD, TSCCL** of acceptance of his tender, the tenderers shall make payment of the balance E.M.D/security deposit wherever needed by way of Demand Draft with a validity period of Six (6) months or unconditional and irrevocable Bank Guarantee obtained from a Nationalized Bank with a validity period of (Period of Completion in months + 24 months), and sign an agreement in the form prescribed by the Department / TSCCL Authority for the due fulfillment of the contract. Failure to attend the **MD, TSCCL** 's office on the date fixed, in the written intimation, to enter into the required agreement shall entail forfeiture of the Earnest Money deposited. The written agreement to be entered into between the contractor and the **TSCCL** shall be the foundation of the rights and obligations of both the parties and the contract shall not be deemed to be complete until the agreement has first been signed by the contractor and then by the proper officer authorized to enter into contract on behalf of the **TSCCL**.
- 29.3.** The successful tenderer has to sign an agreement within a period of 7 days from the date of receipt of communication of acceptance of his tender. On failure to do so his

tender will be cancelled duly forfeiting the E.M.D., paid by him without issuing any further notice and action will be initiated for black listing the tenderer.

30. Corrupt or fraudulent practices

30.1. The Government/TSCCL require that the bidders/suppliers/contractors under Government financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Government/TSCCL

- (a) define for the purposes of the provision, the terms set forth below as follows:
 - (i) “corrupt practices” means the offering, giving, receiving or soliciting of anything of value to influence the action of a Government/TSCCL official in procurement process or in contract execution: and
 - (ii) “fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Government/TSCCL and includes collusive practice among Tenderers (prior to or after Tender submission) designed to establish in Tender prices at artificial non-competitive levels and to deprive the Government/TSCCL of the benefits of free and open competition.
- (b) Will reject a proposal for award if it determines that the tenderer recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.
- (c) Will blacklist / or debar a firm, either indefinitely or for a stated period of time, if at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing a Government/TSCCL contract.
- (d) Furthermore, tenderers shall be aware of the provisions stated in the general conditions of contract.
- (e) Rights of the Corporation:
 - 1. The management of the Corporation reserves the right to reject any or all of the tenders, without assigning any reason whatsoever.
 - 2. In the event of any dispute regarding any of the tender conditions, the decision of the management shall be final.

QUALIFICATION INFORMATION

Annexure -I

CHECKLIST TO ACOMPANY THE TENDER

Sl. No	Description	Remarks
1	2	3
1	Copy of Contractors valid registration under appropriate Class with Government of Andhra Pradesh	Yes/No
2	EMD certificate	Yes/No
3	Transaction fee certificate	Yes/No
4	Copy of PAN card along with a copy of latest Income Tax returns submitted along with proof of receipt	Yes/No
5	Copies of GST Registration certificate in the prescribed proforma	Yes/No
6	Details of civil engineering works executed during the last ten financial years on the tenderer's name in Statement - I with supporting certificates	Yes/No
7	Details of similar works (i.e., External Development and Landscape/ Park Development) completed as prime contractor (in the same name) during the last ten financial years in Statement - II with supporting certificates	Yes/No
8	Quantities of works executed in External Development and Landscape/ Park Development works as prime contractor (in the same name) during the last ten financial years in Statement - III with supporting certificates	Yes/No
9	Details of existing commitments i.e., works on hand and works for which tenders are submitted in Statement - IV with supporting certificates	Yes/No
10	Availability of critical equipment in Statement - V	Yes/No
11	Scanned copy of declaration on critical equipment on non-judicial stamp paper worth of Rs.100/-	Yes/No
12	Availability of key personnel in Statement - VI	Yes/No
13	Litigation history in Statement - VII	Yes/No
14	Proof of liquid assets in the shape of Solvency certificates etc., for the required amount	Yes/No
15	Declaration in on line stating that the soft copies uploaded by them are genuine	Yes/No
16	Any other certificates required as per NIT	Yes/No

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Notes:-

Notes:-

1. All the statements copies of the certificates, documents etc., shall be given page numbers on the right corner of each certificate, which will be indicated in column (4) against each item. The statements furnished shall be in the formats appended to the tender document.
2. The information shall be filled-in by the Tenderer in the checklist and statements I to VII, for the purposes of verification as well as evaluation of the tenderer's Compliance to the qualification criteria as provided in the Tender document.
3. The tenderers are requested to upload the specified documents as per NIT only to facilitate for easy evaluation of tender.
4. **The bidders shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/authenticity.**

DECLARATION

I/WE Have gone through carefully all the tender conditions and solemnly declare that I/we will abide by any penal action such as disqualification or black listing or determination of contract or any other action deemed fit, taken by, the Department / TSCCL Authority against us, if it is found that the statements, documents, certificates produced by us are false / fabricated.

I/WE hereby declare that, I/WE have not been blacklisted/debarred/Suspended / demoted in any Department / TSCCL Authority in Andhra Pradesh or in any State due to any reasons.

Signature of the Tenderer

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

LETTER OF TENDER

Date:

To
**The Managing Director,
TSCCL, Tirupati.**

Sir,

I/We do hereby tender and if this tender be accepted, under take to execute the following work viz “Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati’s ABD Area including O&M after DLP completion [from 3rd year] under Smart City Mission”.

as shown in the drawings and described in the specifications deposited in the office of the MD, TSCCL, TSCCL with such variations by way of alterations or additions to, and omissions from the said works and method of payment as provided for in the “conditions of the contract” for the sum of **ECV** or such other sum as may be arrived under the clause of the standard preliminary specifications relating to “Payment on lump-sum basis or by final measurement at unit rates”

I/WE have also quoted percentage excess or less on E.C.V., in Schedule ‘A’ (in words and figures) for which I/We agree to execute the work when the lumpsum payment under the terms of the agreement is varied by payment on measurement quantities.

I/WE agreed to keep the offer in this tender valid a period of **90 (Ninety) days** mentioned in the tender notice and not to modify the whole or any part of it for any reason within above period. If the tender is withdrawn by me/us for any reasons whatsoever, the earnest money paid by me/us will be forfeited to Government

I/WE hereby distinctly and expressly, declare and acknowledge that, before the submission of my/our tender I/We have carefully followed the instructions in the tender notice and have read the MoRT&H (4th revision) / A.P.S.S. and the preliminary specifications therein and the A.P.S.S. addenda volume and that I/We have made such examination of the contract documents and the plans, specifications and quantities and of the location where the said work is to be done, and such investigation of the work required to be done, and in regard to the material required to be furnished as to enable me/us to thoroughly understand the intention of same and the requirements, covenants, agreements, stipulations and restrictions contained in the contract, and in the said plans and specifications and distinctly agree that I/We will not hereafter make any claim or

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

demand upon the Government/TSCCL based upon or arising out of any alleged misunderstanding or misconception /or mistake on my/or our part of the said requirement, covenants, agreements, stipulations, restrictions and conditions.

I / WE enclosed to my/our application for tender schedule a crossed demand draft /Bank Guarantee No.....dated:.....) for Rs:
.....as earnest money not to bear interest.

I / WE shall not assign the contractor or sublet any portion of the same. In case if it becomes necessary such subletting with the permission of the Executive Engineer shall be limited to (1) Labour contract, (2) Material contract, (3) Transport contract and (4) Engaging specialists for special item of work enjoined in A.P.S.S.

IF MY / OUR tender is not accepted the sum shall be returned to me/us on application when intimation is sent to me/us of rejection or at the expiration of **90 (Ninety) days** from last date of receipt of this tender, whichever is earlier. If my/our tender is accepted the earnest money shall be retained by the Government/TSCCL as security for the due fulfillment of this contract. If upon written intimation to me/us by the **MD, TSCCL** /Superintending Engineer / Executive Engineer's Office, I/We fail to attend the said office on the date herein fixed or if upon intimation being given to me/us by the MD, TSCCL /Superintending Engineer/ Executive Engineer or acceptance of my/our tender, and if I/We fail to make the additional security deposit or to enter into the required agreement as defined in condition-3 of the tender notice, then I/We agree the forfeiture of the earnest money. Any notice required to be served on me/us here under shall be sufficiently served on me/us if delivered to me/us hereunder shall be sufficiently served on me/us if delivered to me/us personally or forwarded to me/us by post to (registered or ordinary) or left at my/our address given herein. Such notice shall if sent by post be deemed to have been served on me/us at the time when in due course of post it would be delivered at the address to which it is sent.

I/WE fully understand that the written agreement to be entered into between me/us and **TSCCL** shall be the foundation of the rights of the both the parties and the contract shall not be deemed to be complete until the agreement has first been signed by me/us and then by the proper officer authorized to enter into contract on behalf of Government/TSCCL.

I AM/WE ARE professionally qualified and my/our qualifications are given below:

Name	Qualified
------	-----------

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

I/WE will employ the following technical staff for supervising the work and will see that one of them is always at site during working hours, personally checking all items of works and pay extra attention to such works as required special attention (eg) Reinforced concrete work.

Name of members of technical staff proposed to be employed	Qualification.
---	----------------

I/WE declare that I/WE agree to recover the salaries of the technical staff actually engaged on the work by the Department / TSCCL Authority, from the work bills, if I/We fail to employ technical staff as per the tender condition.

TENDERERS / CONTRACTOR'S CERTIFICATE

- (1) I/WE hereby declare that I/We have perused in detail and examined closely the MoRT&H (4th Revision) and Andhra Pradesh Standard Specifications, all clauses of the preliminary specifications with all amendments and have either examined all the standards specifications or will examine all the standard specifications for items for which I/We tender, before I/We submit such tender and agree to be bound and comply with all such specifications for this agreement which I/We execute.
- (2) I/WE certify that I/We have inspected the site of the work before quoting my Percentage excess or less on ECV, I /We have satisfied about the quality, availability and transport facilities for coarse aggregate, sand and other materials.
- (3) I / WE am/are prepared to furnish detailed data in support of all my quoted rates, if and when called upon to do so without any reservations.
- (4) I / WE hereby declare that I / We will pay an Additional Security Deposit (ASD) in terms of condition 3.6 of instructions to tenderers.
- (5) I / WE hereby declare that I am / we are accepting to reject my tender in terms of condition 3.7 of instructions to tenderers.
- (6) I / WE hereby declare that I / We will not claim any price escalation.
- (7) I / WE hereby declare that I am / We are accepting for the defect liability period as 24 months instead of 6 months under clause 28 of APSS.
- (8) a) I / WE declare that I/WE will procure the required construction materials including earth and use for the work after approval of the Engineer-in-Charge. The

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

responsibility for arranging and obtaining the land for borrowing or exploitation in any other way shall rest with me/us for the materials for construction, I/WE shall ensure smooth and un-interrupted supply of materials.

- b) I / WE declare that the responsibility for arranging and obtaining the land for disposal of spoil/soil not useful for construction purposes shall rest with me/us.
 - c) I / WE declare that I / WE shall not claim any compensation or any payment for the land so arranged for disposal of soil and the land for borrow area. My/our quoted percentage excess or less ECV are inclusive of the land so arranged and I/We will hand over the land so arranged for disposal of soil to the Department / TSCCL Authority after completion of work.
 - d) I / WE declare that I / WE will not claim any extra amount towards any material used for the work other than the quoted works for respective schedule 'A' items.
- (9) I / WE declare that I / WE will execute the work as per the mile stone programme, and if I / WE fail to complete the work as per the mile stone programme I abide by the condition to recover liquidated damages as per the tender conditions.
- (10) I / WE declare that I / WE will abide for settlement of disputes as per the tender conditions.

DECLARATION OF THE TENDERER

- 1) I/WE have not been black listed in any Department / TSCCL Authority in Andhra Pradesh due to any reasons.
- 2) I/WE have not been demoted to the next lower category for not filing the tenders after buying the tender schedules in a whole year and my/our registration has not been cancelled for a similar default in two consecutive years.
- 3) I/WE agree to disqualify me/us for any wrong declaration in respect of the above and to summarily reject my/our tender.
- 4) I/WE have gone through carefully all the tender conditions and solemnly declare that I/WE will abide by any penal action such as disqualification or black listing or determination of contract or any other action deemed fit, taken by, the Department against us, if it is found that the statements, documents, certificates produced by us are false/fabricated.
- 5) I/WE hereby declare that, I/WE have not been blacklisted/ debarred/ Suspended/ demoted in any Department in Andhra Pradesh or in any State due to any reasons.

Address of the Tenderer:

Phone No.:

Fax No.:

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

CONTRACTOR

BIDDER INFORMATION FORM

Date: _____
Tender No. and Title: _____
Page _____ of _____ pages

Bidder's name

In case of Joint Venture (JV), name of each member:

Bidder's actual or intended country of registration:

[indicate country of Constitution]

Bidder's actual or intended year of incorporation:

Bidder's legal address [in country of registration]:

Bidder's authorized representative information

Name: _____

Address: _____

Telephone/Fax numbers: _____

E-mail address: _____

1. Attached are copies of original documents of

- ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above
- ☐ In case of JV, letter of intent to form JV or JV agreement
- ☐ In case of Government-owned enterprise or institution, documents establishing:
 - Legal and financial autonomy
 - Operation under commercial law
 - Establishing that the Bidder is not dependent agency of the Employer

2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Form of Bid-Securing Declaration

Date: *[insert date (as day, month and year)]*

Bid No.: *[insert number of bidding process]*

Alternative No.: *[insert identification No if this is a Bid for an alternative]*

To: *[insert complete name of Employer]*

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with the entity that invited Bids for the period of time of *[insert number of months or years]* starting on *[insert date]*, if we are in breach of our obligation(s) under the bid conditions, because we:

- (a) have withdrawn our Bid during the period of bid validity specified in the Letter of Bid; or
- (b) having been notified of the acceptance of our Bid by the Employer during the period of bid validity, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the ITT.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of our Bid.

Name of the Bidder* _____ *[insert complete name of person signing the Bid]*

Name of the person duly authorized to sign the Bid on behalf of the Bidder** *[insert complete name of person duly authorized to sign the Bid]*

Title of the person signing the Bid *[insert complete title of the person signing the Bid]*

Signature of the person named above _____ *[insert signature of person whose name and capacity are shown above]*

Date signed [insert date of signing] day of [insert month], [insert year]

*: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder

****:** Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid[*Note: In case of a Joint Venture, the Bid-Securing Declaration must be in the name of all members to the Joint Venture that submits the bid.*]

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Section II: Bid Statement

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 47

Section II – Bid Statement

Table of Forms

Bidder's Qualification.....	49
Statement I: Details of Civil Engineering Works Executed during the Last Ten (10) Financial Years on the Tenderer's Name	50
Statement II: Details of Similar Works (i.e., External Development and Landscape/ Park Development) Completed as Prime Contractor (In the Same Name) During the Last Ten (10) Financial Years.....	51
Signature of the Tenderer.....	52
Statement III.....	53
Quantities of works executed in External Development and Landscape/ Park Development works as prime contractor (in the same name) during the last ten financial years	53
Statement IV.....	55
Details of Existing Commitments i.e., Works on hand and works for which tenders are submitted.....	55
Statement - V.....	57
Availability of Critical Equipment.....	57
Statement - VI.....	59
Availability of Key Personnel.....	59
Statement - VII.....	61
Litigation History.....	61

Bidder's Qualification

To establish its qualifications to perform the contract, the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 49

Statement I: Details of Civil Engineering Works Executed during the Last Ten (10) Financial Years on the Tenderer's Name

Bidder's Name: _____

Date: _____

Joint Venture Member's Name: NA

Tender No. and Title: _____

Page _____ of _____ pages

Starting Year	Ending Year	Contract Identification	Role of Bidder
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	

Sl. No.	Financial Year	Value in Rs.
1.		
2.		

- a) Attach certificate(s) issued by the Executive Engineer concerned and counter signed by Superintending Engineer showing work wise / year wise value of work done in respect of all the works executed by the Tenderer during last ten years **OR**
- b) Certificate from Chartered Accountant supported with Annual Balance Sheet tallying with I.T. Clearance certificate.

Signature of the Tenderer

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Statement II: Details of Similar Works (i.e., External Development and Landscape/ Park Development) Completed as Prime Contractor (In the Same Name) During the Last Ten (10) Financial Years

Bidder's Name: _____

Date: _____

Joint Venture Member's Name: NA

Tender No. and Title: _____

Page _____ of _____ pages

Similar Contract No.	Information			
Contract Identification				
Award date				
Actual date of completion				
Stipulated date of Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount			INR*	
If member in a JV or sub-contractor, specify participation in total Contract amount			*	
Employer's Name:				
Address: Telephone/fax number E-mail:				

Details of similar works completed in the Name of the Tenderer during the last ten financial years.

Sl. No	Name of the work	Address of Agt. Concluding Authority	Agreement No. & dated.	Value of Contract
1	2	3	4	5

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 51

Stipulated period of completion	Actual date of completion	Value of work had done year wise during the last 'ten' years.					Total value of work done.
		1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year to 10 years	
6	7	9	10	11	12	13	14

Attach certificates issued by the Executive Engineer concerned and countersigned by the Superintending Engineer showing work wise / year wise value of work done and date of completion.

Signature of the Tenderer

Details of Similar Works (i.e., External Development and Landscape/ Park Development) Completed as Prime Contractor (In the Same Name) During the Last Ten (10) Financial Years (cont'd.....)

Similar Contract No.	Information
Description of the similarity	
1. Amount	
2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

Signature of the Tenderer

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 52

Statement III

Quantities of works executed in External Development and Landscape/ Park Development works as prime contractor (in the same name) during the last ten financial years

Bidder's Name: _____

Date: _____

Joint Venture Member's Name: NA

Sub-contractor's Name: _____

Tender No. and Title: _____

Page ____ of ____ pages

S.No.	List of Works	Information
1.	Hardscape <ul style="list-style-type: none">• Pathways/Pavement• Kerb• Play Court• Rain Water Harvesting	
2.	Soft scape <ul style="list-style-type: none">• Trees• Shrubs• Ground Cover• Trees transplant	
3.	Play/ Gym Equipment	
4.	Services <ul style="list-style-type: none">• Light pole• Signage	

Signature of the Tenderer

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 53

Physical quantities executed by the Tenderer in the last ten financial years. [work wise / year wise].

Sl. No.	Financial Year	Name of work	Agt.No	Quantities executed / Year wise.					Any other items.
				EWE	R.C.C.	Lining	B.M	M.S.S	
1	2	3	4	5	6	7	8	9	10
1									
2									
3									
4									
5									

Attach certificates in support of the above quantities issued by the Executive Engineer concerned and countersigned by the Superintending Engineer duly showing the quantities executed year wise.

Signature of the Tenderer

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 54

Statement IV

Details of Existing Commitments i.e., Works on hand and works for which tenders are submitted

Bidders and each partner to a JV should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Name of contract	Employer, contact address/tel/fax	Value of outstanding work (current INR equivalent)	Estimated completion date	Average monthly invoicing over last six months (INR/month)
1.				
2.				
3.				
4.				
5.				
etc.				

Details of works on hand and, yet to be completed as on the date of submission of the Tender and works for which Tenders has been submitted are to be furnished.

A) Existing Commitments on ongoing works:

SLNo	Name of work	Address of Agt. Concluding authority	Agt. No. & Date	Value of contract	Stipulated period of completion	Value of work done so far.	Balance Value of works to be completed	Anticipated date of completion	Updated value of balance work
1	2	3	4	5	6	7	8	9	10

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 55

Attach certificates issued by the Executive Engineer concerned and countersigned by Superintending Engineer, indicating the balance work to be done, and likely period of completion.

Signature of the Tenderer

B) Details of works for which Tenders are submitted [awarded / likely to be awarded]

Sl. No.	Name of work	Address of Agt. Concluding authority	Estimated value of work	Stipulated period of completion	Date on which tender was submitted	Present stage of Tender.
1	2	3	4	5	6	7

Signature of the Tenderer

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 56

Statement - V

Availability of Critical Equipment

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder. The Bidder shall provide all the information requested below, to the extent possible. Fields with asterisk (*) shall be used for evaluation.

Type of Equipment*		
Equipment Information	Name of manufacturer,	Model and power rating
	Capacity*	Year of manufacture*
Current Status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

The following information shall be provided only for equipment not owned by the Bidder.

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project	

Signature of the Tenderer

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 57

Availability of Critical Equipment

The tenderer should furnish the information required below, regarding the availability of the equipment, required for construction / quality control.

Sl. No.	Details of Equipment	Number required	Number		
			Owned	Leased	To be procured
1	2	3	4	5	6

Signature of the Tenderer

A declaration regarding the equipment owned shall be produced by the Tenderer on a non-judicial stamp paper of Rs..... as below;

DECLARATION

"I do hereby solemnly affirm and declare that I /we own the following equipment for using on the subject work and also declare that I / We will abide by any action such as disqualification or determination of Contract or blacklisting or any action deemed fit, if the department detects at any stage that I/we do not possess the equipment listed below.

Sl. No.	Details of each Equipment	Year of purchase	Regn. Number	Capacity	Any other data.	Is it in working condition
1	2	3	4	5	6	7

Signature of the Tenderer

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 58

Statement - VI

Availability of Key Personnel

Form – 1: Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements for each of the positions. The data on their experience should be supplied using the Form below for each candidate.

1.	Title of position
	Name
2.	Title of position
	Name
3.	Title of position
	Name
4.	Title of position
	Name
5.	Title of position
	Name
6.	Title of position
	Name
etc.	Title of position
	Name

Availability of Key Personnel

Qualification and experience of Key Personnel proposed to be deployed for execution of the Contract.

Sl. No	Name	Designation	Qualification	Total Experience	Working with the Tenderer since.
1	2	3	4	5	6

Signature of the Tenderer

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 59

Form – 2: Resume of Proposed Personnel

The Bidder shall provide all the information requested below. Fields with asterisk(*) shall be used for evaluation.

Position*		
Personnel information	Name*	Date of birth
	Professional qualifications	
Present employment	Name of Employer	
	Address of Employer	
	Telephone	Contact (manager / personnel officer)
	Fax	E-mail
	Job title	Years with present Employer

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

[illegible]

Signature of the Tenderer

TENDERER

Section II: Bid Statement

MANAGING DIRECTOR
TSCCL, TIRUPATI

Statement - VII

Litigation History

Bidder's Name: _____

Date: _____

Joint Venture Member's Name _____

Tender No. and Title: _____

Page _____ of _____ pages

Non-Performed Contracts			
<input type="checkbox"/> Contract non-performance did not occur since 1 st January [insert year]			
<input type="checkbox"/> Contract(s) not performed since 1 st January [insert year]			
Year	Non-performed portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and INR equivalent)
		Contract Identification: Name of Employer: Address of Employer: Reason(s) for non-performance:	
Pending Litigation			
<input type="checkbox"/> No pending litigation			
<input type="checkbox"/> Pending litigation			

Information on litigation history in which Tenderer is the Petitioner.

S. No	Case No. / Year	Court where filed.	Subject Matter / Prayer in the case.	Respondents i.e., SE / CE	Present Stage.
1	2	3	4	5	6

Signature of the Tenderer

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Section III: Contract Forms & Format of Securities

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Contract Agreement

THIS AGREEMENT made theday of,, between
[name of the Employer]. (hereinafter “the Employer”), of the one part, and
. *[name of the Contractor]*.(hereinafter “the Contractor”), of the other part:

WHEREAS the Employer desires that the Works known as*[name of the Contract]*.
.should be executed by the Contractor, and has accepted a Bid by the Contractor
for the execution and completion of these Works and the remedying of any defects
therein,

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.

- (i) the Letter of Acceptance
- (ii) the Letter of Bid
- (iii) the addenda Nos _____(if any)
- (iv) the Particular Conditions
- (v) the General Conditions of Contract, including appendix;
- (vi) the Specification
- (vii) the Drawings
- (viii) Bill of Quantities;¹and
- (ix) any other **listed in the Tender Document** as forming part of the Contract,

3. In consideration of the payments to be made by the Employer to the Contractor as specified in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

¹ In lump sum contracts, delete “Bill of Quantities” and replace with “Activity Schedule.”

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of [name of the borrowing country]. . . .on the day, month and year specified above.

Signed by: _____
for and on behalf of the Employer

Signed by: _____
for and on behalf the Contractor

in the
presence of: _____
Witness, Name, Signature,
Address, Date

in the
presence of: _____
Witness, Name, Signature,
Address, Date

Format of Securities

TENDERER

Section - III : Contract Forms & Format for Securities

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 65

PROFORMA

BANK GUARANTEE FOR EARNEST MONEY DEPOSIT

WHEREAS (Name of the Contractor) (here in after called “the Tenderer”) has submitted his tender response to NIT No..... dated:..... for the work “” (Name of work) (hereinafter called “the tender”).

KNOWN ALL MEN by these present that we (Name and Address of Bank) (hereinafter called “the Bank” are bound unto / (name of the designated PAO) in the sum of * for which payment will and truly to be made to the said Department, the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the Bank this day of200....

THE CONDITIONS of this obligation are:-

- (1) If after Tender opening the tenderer withdraws or modifies his Bid during the period of bid validity specified in the Form of Tender.
- (2) If the Tenderer having been notified of the acceptance of his bid by the Department during the period of validity.
 - (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to Tenderers, if required; or
 - (b) fails or refuses to furnish the balance EMD and additional performance Security in accordance with the instructions of Tenderers.

We undertake to pay to the Department up to the above amount upon receipt of his first written demand, without the Department having to substantiate his demand, provided that in his demand the Department will note the amount claimed by him is due to him owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

This Guarantee will remain in force up to and including the date**
after the dead line for submission of Tenders as such deadline is stated in the
Instructions to Tenders or as it may be extended by the Department, notice of
which extension(s) to the Bank is hereby waived. Any demand in respect of this
Guarantee should reach the Bank not later than the above date.

DATE.....

SIGNATURE OF THE BANK

WITNESS.....

SEAL.....

(Signature, Name and Address)

* The Tenderer should insert the amount of the EMD in words and figures denominated in
Indian Rupee. This figure should be the same as shown in the NIT.

** 6 months from the deadline date for submission of Tender [As specified in NIT].

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

PROFORMA

BANK GUARANTEE FOR BALANCE "E.M.D."

_____ (name & address of Department)

WHEREAS _____
_____ (name
and address of Contractor) (hereinafter called "the Contractor") has undertaken, in pursuance
of Contract No. _____ dated: _____ to execute the work of _____ [name of work];

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor
shall furnish you with a Bank Guarantee by a Schedule bank for the sum specified therein as
balance EMD / EMD for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you,
on behalf of the Contractor, up to a total of _____ [amount of guarantee]
_____ [in words], such sum being payable and we undertake to pay you,
upon your first written demand and without cavil or argument, any sum or sums within the
limits of _____ [amount of guarantee] as aforesaid without your needing to prove
or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor
before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the
Contract or of the Works to be performed thereunder or of any of the contract documents which
may be made between you and the Contractor shall in any way release us from any liability
under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid upto i.e., until 28 days from the date of
expiry of the Defects Liability period.

Signature & seal of the Guarantor _____

Name of Bank _____

Address _____

Date _____

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

PROFORMA
BANK GUARANTEE FOR ADDITIONAL FURTHER SECURITY

_____ (name and address of Department)

WHEREAS _____ (name and address of Contractor) (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. _____ dated: _____ to execute _____ [name of Contract and brief description of works] (hereinafter called "the Contractor");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a Schedule bank for the sum specified therein as Additional further security bank guarantee for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of Rs. _____ [amount of guarantee] _____ [in words], such sum being payable and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ [amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid upto and until 28 days from the date completion.

Signature & seal of the Guarantor _____

Name of Bank _____

Address _____

Date _____

TENDERER

PROFORMA
BANK GUARANTEE FOR MOBILISATION ADVANCE

To

(name & Address of Agreement Authority)

Sub:- _____(name of the work)

Gentlemen:

In accordance with the provisions of the Conditions of Contract, Mobilisation advance for the above-mentioned Contract, _____ [name and address of Contractor] (hereinafter called "the Contractor") shall deposit with _____ [name of Department] a bank guarantee to guarantee his proper and faithful performance under the said Contract for an amount of Rs. _____ [amount of guarantee]² _____ (in words).

We, the _____ [bank], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ [name of Department] on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, for the amount not exceeding _____ (amount of guarantee)³ _____ (in words).

We further agree that no change or addition to or other modification of the terms of the Contract or of works to be performed thereunder or of any of the Contractor documents which may be made between _____ [name of Department] and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until _____ [name of Department] receives full repayment of the same amount from the Contractor.

Yours truly,

Signature and seal: _____
Name of Bank/Financial Institution: _____
Address: _____
Date: _____

² An amount shall be inserted by the bank representing the amount of the Advance Payment, and denominated in Indian Rupees.

ANNEXURE – I (A).

FORM OF SOLVENCY CERTIFICATES BY MANDAL REVENUE OFFICER / TAHSILDAR

I, _____ Mandal Revenue Officer/ Tahsildar, of _____ do hereby certify, on being satisfied by the Examination of Revenue and other records and local enquiries that _____ *[here the name and address of the contractor should be mentioned]* is solvent to the extent of Rs. _____ [Rupees _____].

Date :

Place:

MANDAL REVENUE OFFICER / TAHSILDAR

SEAL OF THE OFFICE

ANNEXURE – I (B).

FORM OF SOLVENCY CERTIFICATE BY BANKS

I, _____ Managing Director / Manager / General Manager / Agent of _____ Bank Limited do hereby certify that a _____ *[here the Names and addresses of the contractor]* to be solvent to the extent of Rs. _____ [Rupees _____] as disclosed by the information and record which are available with the aforesaid bank.

For the _____ Bank

Date:

Place:

Signature of Bank Manager

[Authorised to Sign]

Volume 2 – Works Requirements / Scope of Works / Terms of Reference

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

Work Requirement / Scope of work / Terms of Reference

1.0 PROJECT DETAILS

1.1 BACKGROUND

With the India Smart Cities Challenge, the Government of India has taken the first step towards realizing its vision of building 100 smart cities across the nation. As part of the India Smart Cities Challenge under Ministry of Urban Development, Government of India, Tirupati is one of the cities that was selected in Round 2 and was ranked 4th amongst a nation-wide competition between 67 cities.

Under Indian Smart Cities Mission, the projects focus is on retrofitting a selected area within the city known as Area-Based Development (ABD). Additionally projects at PAN City level has also been taken up. The projects focus is multi-sectoral. The emphasis is on creating livable cities, Holistic development of the selected area such that it catalyzes the development of other areas and sets an example for other cities.

Tirupati is now working on an implementation plan to convert the Smart City Proposal (SCP) ideas into reality, beginning with retrofitting of the ABD that will catalyse future scalability to entire city and projects at PAN City. Tirupati Smart City ABD area is known as "Tirupati Town Center (TTC)

Tirupati is known as the spiritual center of Andhra Pradesh with about daily 75,000 pilgrims visit Tirumala for darshan of Lord Venkateshwara., besides other historical temples, and is referred to as the "Spiritual Capital of Andhra Pradesh". It was named the "Best Heritage City" for the year 2012-13 by Ministry of Tourism. Tirupati has strong cultural heritage and is a melting pot of various festivals, is considered the Medical Hub of Andhra Pradesh and is home to numerous hospitals.

Tirupati city is located in Chittoor district in the state of Andhra Pradesh. The Municipal Corporation Tirupati (MCT) spread is around 27.44 Sq Km and includes 50 Wards. According to 2011 census, the City's population is around 3,74,260. TTC (ABD) area is around 3.01 sq. Km with a population of around 1,12,000. The TTC area covers around 11% of MCT area and includes 30% of City's population.

The Smart City Plan for Tirupati revolves around the vision of creating - **"A 21st century pilgrimage city that promotes Arts, Innovation & Sustainable Growth"**.

Municipal Corporation Tirupati

Tirupathi Municipal Corporation is the 1st largest ULB in the Chittoor district. It is located 550 Km from Capital city and 71 Km from District Headquarters. It was established as 3rd grade Municipality in the year 01/04/1886 and upgraded as Municipal Corporation with w.e.f. 02/03/2007.

It is spread over an area of 27.44 Sq.Kms. With a population of 3,74,260 (2011 census). MCT is also the headquarters of Tirupati (urban) mandal, and of the Tirupati revenue division. It is the 9th most populous city in Andhra Pradesh and seventh most urban agglomerated city in the state, with a population of 459,985.

Tirupati Smart City Corporation Limited (TSCCL)

A Special Purpose Vehicle (SPV) was incorporated with the name “Tirupati Smart City Corporation Limited” (TSCCL) on 28th November 2016, to implement the projects proposed under the SCP.

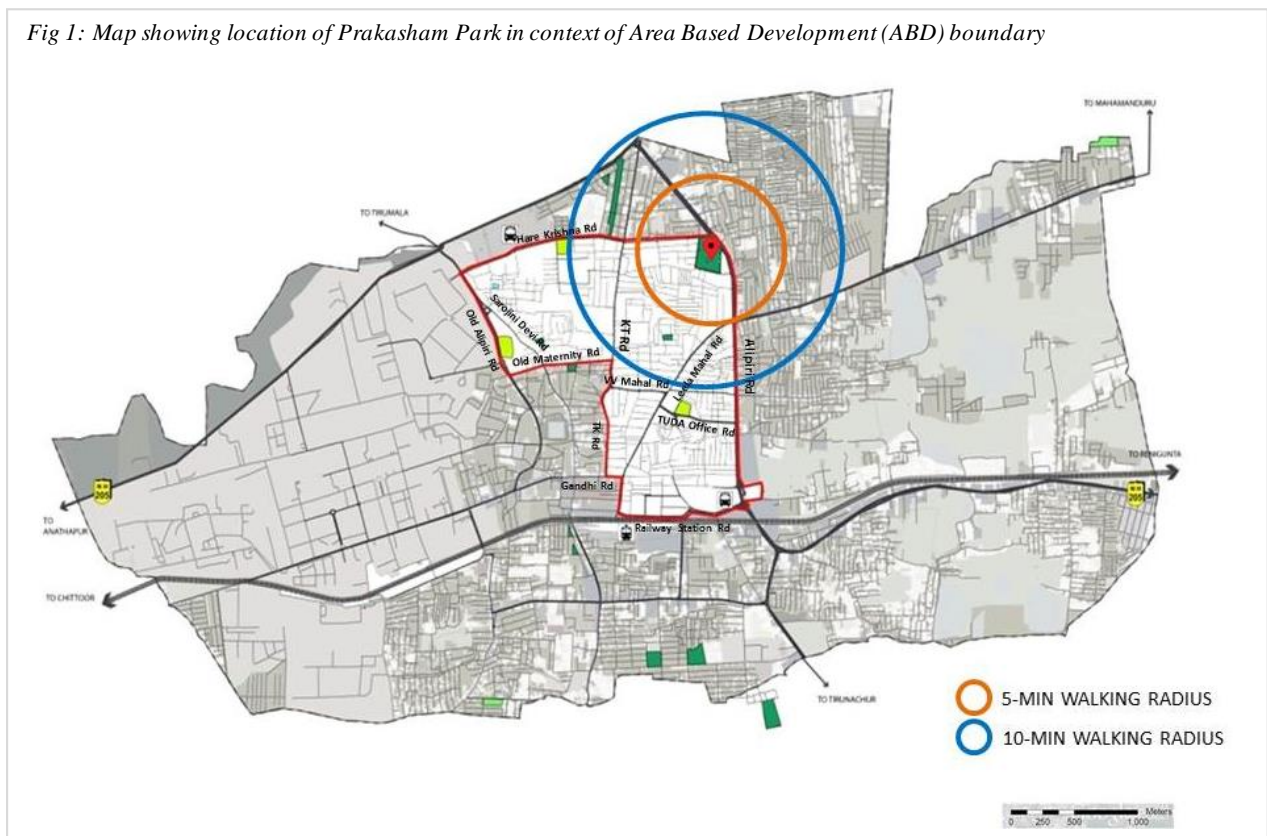
The Project

Aligning with the Smart City Vision, Tirupati will focus on Integration of existing open spaces with the city’s urban fabric by celebrating cultural, spiritual & social values. Additionally, this is a place making project for citizens and pilgrims alike. Tirupati smart city is focusing on health and well-being of its people (citizens and pilgrims alike), especially children, elderly and differently-abled and will improve its social infrastructure i.e. Parks & Open Green Space to cater to the health, spiritual and recreational needs of all strata of the society.

The Employer has taken up different projects for implementation. Retrofitting existing MCT parks and transforming them as “Functional and usable spaces” is one such project taken up for implementation.

The focus of this Tender is Prakasham Park, Khadi Colony. The location map is shown in figure 1, existing site conditions in figure 2 and 3

Fig 1: Map showing location of Prakasham Park in context of Area Based Development (ABD) boundary



PRAKASHAM PARK, KHADI COLONY 10.98 acres

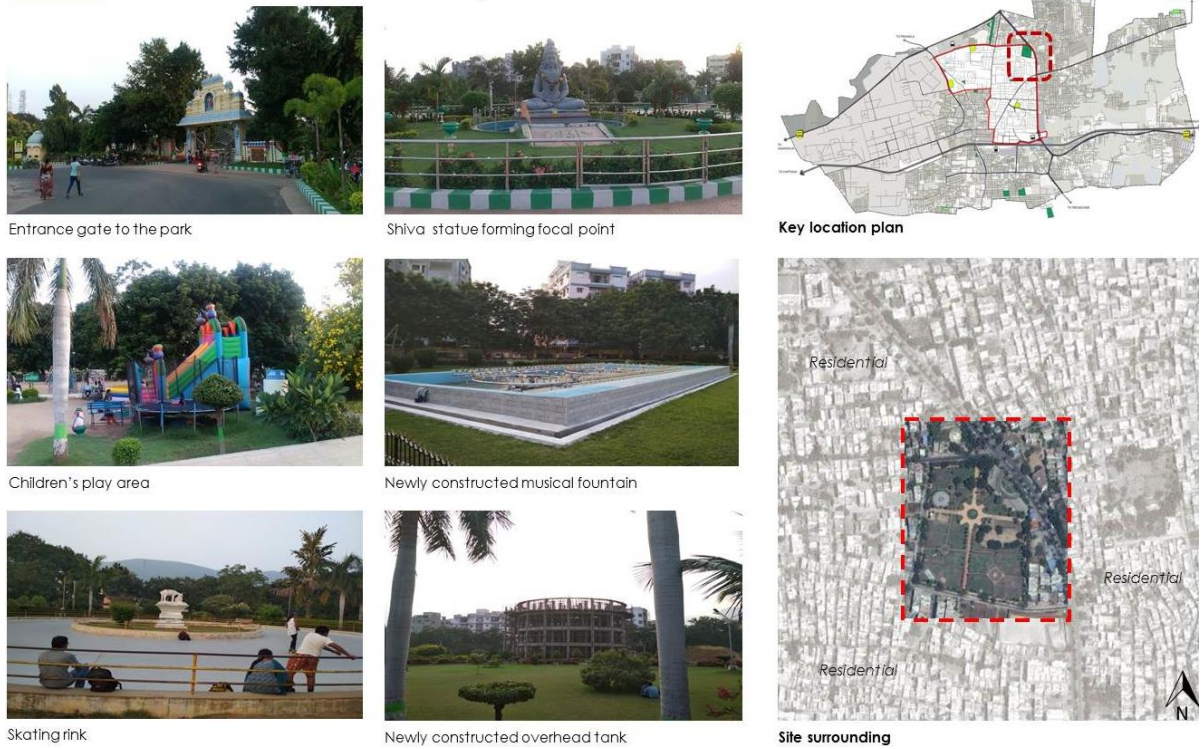


Fig 2: Existing conditions and site pictures

Shortcomings in the existing park becomes **OBJECTIVES** of intervention

- **Largest available park space** at city level so needs to cater to all age groups of society. Facilities and activities needs to be **designed for all age groups**.
- The network of secondary pathways currently **fragments the open spaces** with lack of defined activities around them. Pathways need to **connect spaces and activities**.
- The **sacred hills form a beautiful backdrop** to the park which can be further appreciated through realigning pathways focusing towards them.
- The **children's play area** is heavily used but with lack of age segregation. The space needs to be **reorganized** for different age brackets.
- The newly constructed water tank forms a grotesque **backdrop to the Shiva statue** which needs to be **re-enhanced** by providing green background.
- The **existing ball fountain** does not activate the space and the existing skating rink needs to be expanded. The **ball fountain forms focal point** for the proposed larger skating rink.
- The newly constructed **musical fountain** can be further activated by integrating it with the lawn and providing for vistas from which it can be viewed and enjoyed.
- Railings along pathways create physical and visual barriers which can be done away with.
- To develop a space accessible & enjoyed by people with **all abilities**.
- **Planting** to define space and produce **visual relief, shade and character to the park**.



Fig 3: Map showing shortcomings and broad objectives for retrofitting Prakasham Park.

2.0 DESIGN INTENT

One can only live inside homes for so long. We need spaces out of our homes for social, cultural, spiritual or intellectual interactions, to play sports or to just breathe fresh air. With changes in lifestyles where internet, mobile phones offer all kinds of entertainment at a press of a button, it is becoming increasingly important to provide outdoor spaces that entice all age groups, especially children to step out. Parks & open spaces are no longer just a physical entity that fills left over spaces not fit for other uses. In this wave of urbanization in Indian cities & their suburbs - they have become an important ingredient to build healthy community. Parks function as lungs for any City, as well as spaces for passive & active recreation. Be it a space for spiritual gatherings, morning yoga classes, community activities, place to play kabaddi or badminton or soccer or cricket, or place to celebrate festivals, it all requires adequate space for all residents to assemble & congregate.

Retrofitting existing MCT parks and transforming them as “Functional and usable spaces” has been conceptualized by the Employer, to create 21st century health and wellness infrastructure for all strata of the society by focusing on:

- Enhancing the outdoor activity environment and activating spaces for the citizens and pilgrims
- Creating an identity for all parks in Tirupati
- Providing active outdoor spaces as spiritual extension of spaces and for sports and extra-curricular activities,
- Providing universal accessible design in all parks
- Increasing the green cover
- Nurturing interaction with nature
- Providing basic amenities in all parks
- Create opportunity for revenue generation through citizen-friendly activities/events

3.0 PROJECT OBJECTIVE AND EXPECTED OUTCOMES

The Employer has developed a CONCEPT DESIGN for Retrofitting parks within the ABD boundary of Tirupati Smart City. This entails comprehensive upgrading of the existing park facility which includes (but is not limited to) - **external development works for hardscape, softscape, site furniture, lighting, signage in the open areas & park, new play courts and refurbishment of existing playing fields, multi-play areas, kids play areas, barrier free access, walking/jogging paths, and drinking water facilities and toilet blocks.**

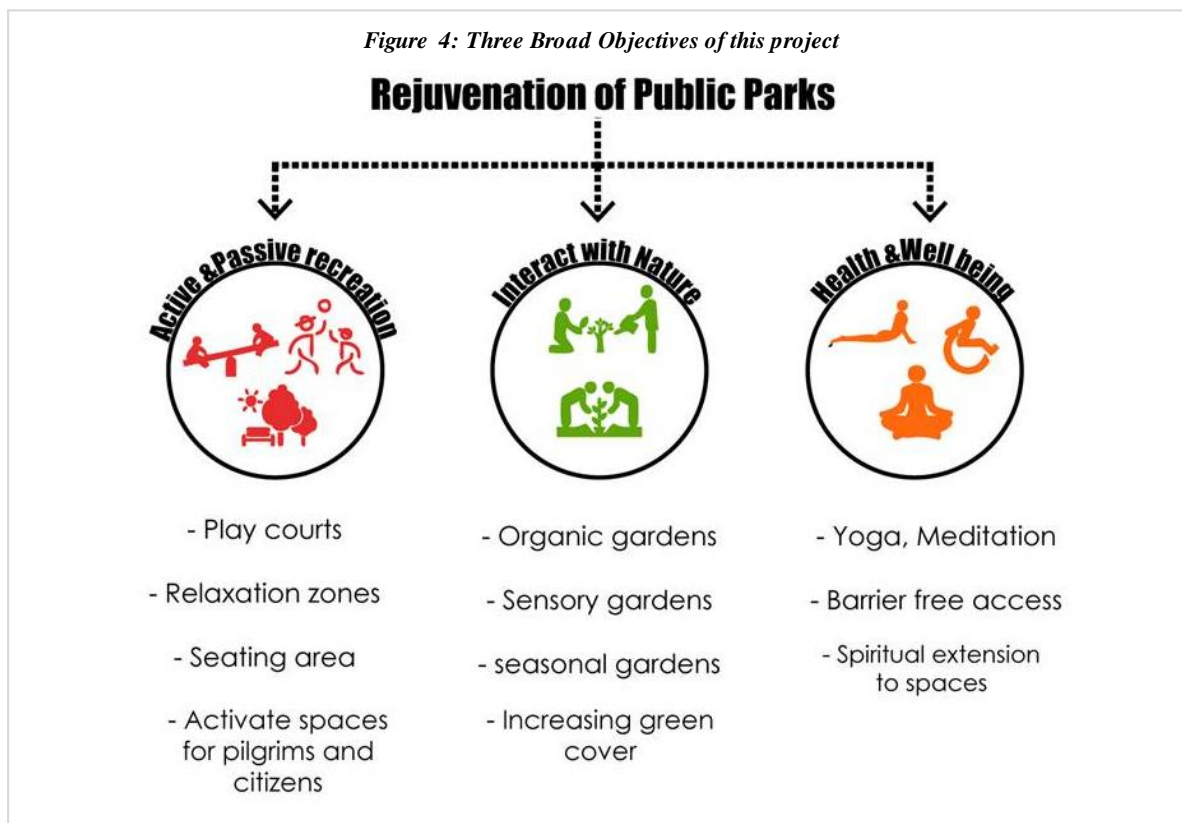
Retrofitting parks in the ABD area include **Three Broad** Objectives as show in figure 3. **The focus of this Tender is achieving “Objective A, B and C” listed below:**

A. Active & Passive Recreation

B. Interact with Nature

C. Health & Wellbeing

Figure 4: Three Broad Objectives of this project



The scope of this Tender/bid is to achieve objective A, B & C and has an expected outcome that is listed below. The Implementing Agency should ensure that the project implementation achieves all objectives and expected outcomes.

A. ACTIVE & PASSIVE RECREATION: Health benefits³ are proportional to the amount of activity; thus, every increase in activity adds some benefit and by providing adequate amount of accessible open green spaces, the opportunity for activity increases.

EXPECTED OUTCOME

- Greater opportunity for outdoor activities in all parks for all strata of society by providing Congregation area for social, spiritual, recreational & cultural interactions, Multiplay area, Kids play area, Sports play courts, Pathway/Jogging/Running track, Universally accessible areas, Performance/Gathering spaces.

B. INTERACT WITH NATURE: Contact with nature improves physical and psychological health; those in a greener environment people report fewer health. complaints, more often rate themselves as being in good health, and have better mental health⁴

EXPECTED OUTCOME

- Preservation of all existing trees and addition of new trees and landscaping elements
- Dedicated spaces for nature based learning, rain water harvesting, organic gardens
- Optimum use of under-utilized land within park premises by creation of functional spaces for various type of activities

C. HEALTH AND WELL BEING: Access to Parks increases frequency of exercise and reduces non communicable diseases like obesity⁵. Physical Activity makes people healthier⁶.

EXPECTED OUTCOME

- More outdoor activity areas for all, especially children to provide them opportunities for greater physical activity.
- Improved health and sanitation condition through clean drinking water and toilet facilities.
- Reduced paved areas in parks through addition of pervious surfaces and playgrounds/sport courts, thus reduction in urban heat island effect
- Universal accessible design through creation of ramps for access to parks
- Safe and secure parks premise through external lighting

4.0 SCOPE OF WORK

I. Scope of work to achieve the objectives is divided into 2 phases

1. Pre-Construction Phase
2. Construction Phase

1. PRE-CONSTRUCTION PHASE

- Contractors are requested to visit the site prior to filing/submission of the tender and undertake self-assessment of all the necessary works as per the specification and plans including all attributes/matters related for completion of this project.
- The Contractor is to seek clarification prior to the submission date (where necessary), to have clarity of all the activities required to be carried out for a successful and timely completion of this project and the works which shall be carried out by the successful contractor.

³ Physical activity and health, A report of the Surgeon General, CDC, U.S. Department of Health & Human Services. Accessed September 3, 2014 from <http://www.cdc.gov/nccdphp/sgr/pdf/execsumm.pdf>

⁴ The Health benefits of parks, How Parks Help Keep Americans and Their Communities Fit and Healthy
By Erica Gies, 2006, The Trust for Public Land

⁵ India is third most obese country in the world, India Today. Accessed September 3, 2015 from <http://indiatoday.intoday.in/story/obesity-india-weighs-third-on-obesity-scale/1/365876.html>

⁶ Physical activity and health, A report of the Surgeon General, CDC, U.S. Department of Health & Human Services. Accessed September 3, 2016 from <http://www.cdc.gov/nccdphp/sgr/pdf/execsumm.pdf>

- The works under Contract comprises the external development works for excavation and filling works, hardscape including various types of paving and cladding, softscape including garden and lawn planting, site furniture of a manufactured or natural product, lighting, play areas & bespoke play equipment in the open areas & parks, new play courts, drinking water facility and toilet block. Other works may include installation or restoration of existing water and electrical power utilities which are defined or implied in the plans and specifications.
- Statutory and other charges for getting various required approvals as required shall be in scope of Successful bidder.
- The contractor shall furnish all labour, material, tools and equipment necessary to complete the works as indicated on the drawings. Any item not specifically shown in the drawings or specified but normally required to conform to such intent, should be considered part of the work unless raised by the contractor prior to commencement of works. The contractor shall include and price for such item in the BOQ accordingly;
- All works indicated in the Drawings by notes are to be provided for, whether or not mentioned in this specification. Any item not specified nor specifically shown in the drawings, but are normally required to conform to such intent, are considered part of the work and deemed to be included in this contract and their execution shall be covered by the contract price, in the same manner as if they have been expressly shown on the drawings and described in the specifications.
- The works shall be completed within the scheduled time and shall be certified by the Employer upon Practical Completion;
- The landscape planting shall be provided in the areas shown in the Drawings with plants in a healthy and vigorous growing condition.
- The contractor shall submit for approval, his proposed Work Programme based on the criteria of the overall programme showing the intended sequences, stages and order of proceeding with the works together with the period of time he has estimated for each and every stage of the progress upon receipt of notification of award of project.;
- The successful bidder shall undertake confirmatory survey for accuracy and completeness of data. The drawings provided with this document are also available in Autocad (ACAD) and Bidders can collect the same, (if required) from the Employer, the Employer take no responsibility for accuracy where ACAD files are used for scaling and area calculations by the Contractor. It is in scope of successful Bidder to undertake all relevant Site surveys, obtaining all required approvals from the relevant authorities, Carry out Design and Drawings (wherever required) for the components of the work as per Employers requirement and submit the same to client for review and approval, Prepare and submit maintenance manual to client for approval at least 4 weeks before start of post construction maintenance period.

Key tasks/deliverables by the Contractor include:

- The contractor should submit a detailed timeline for scope of work to be carried out including details of the man power deployment for the projects prior to commencing the works for approval by the Employer.
- The Employer will supervise and monitor the progress of this phase and Contractor shall provide necessary coordination.
- Preparation and Submission of Complete Bill of Materials (BoM) along with detailed technical specifications, manufacturer's name along with supplier's details and delivery schedule at the sites. Shall also provide the codification for all the items delivered.

- Procurement programme indicating purchasing and dispatch of materials as per the implementation timelines.
- Preparation and submission of periodical progress report for all the stages on a weekly basis.
- Carrying of Field/Site Survey: The Contractor shall conduct site survey of the sites identified where the design is to be implemented; and prepare the survey reports highlighting the site feasibility, any site specific requirements / dependencies for successful implementation, prior to the procurement of materials or commencement of site works.

The Contractor must be aware of general and specific site conditions, topography and any existing landscape prior to commencement of any landscape works on site.

List of Relevant Documents to Be Referred;

This specification is to be read in conjunction with:

- **Concept:** Design Intent Drawing Package (Landscape works with allied services) included in Annexures or most up to date revision issued thereafter;
- **Bills of Quantities (BoQ):** Indicative BoQ, is included in Tender document.

Note: If work item is not detailed under Indian Standards, appointed contractor should refer to relevant international standard (BS or equivalent). This should be approved by Employer prior to commencing any works on site;

- Other documents – any documents not included above but relevant to the Bidding process. These should be provided/made available to contractor by the Employer, if applicable.

The list of drawings which includes:

Sr. No.	Drawing Number	Title
GENERAL 0000 SERIES		
1	TPT-ACM-LS-TEN-POS-001	COVER SHEET
2	TPT-ACM-LS-TEN-POS-002A	TITLE & DRAWING LIST
3	TPT-ACM-LS-TEN-POS-003	GENERAL NOTES
4	TPT-ACM-LS-TEN-POS-004	LEGENDS & ABBREVIATIONS
5	TPT-ACM-LS-TEN-POS-005	MATERIAL SCHEDULE
6	TPT-ACM-LS-TEN-POS-006	LIGHTING, FURNITURE, FIXTURE & SIGNAGE SCHEDULE
7	TPT-ACM-LS-TEN-POS-007	LIGHTING, FURNITURE, FIXTURE & SIGNAGE SCHEDULE
8	TPT-ACM-LS-TEN-POS-008	LIGHTING, FURNITURE, FIXTURE & SIGNAGE SCHEDULE
9	TPT-ACM-LS-TEN-POS-009	PLANTING SCHEDULE
PRAKASHAM PARK		
10	TPT-ACM-LS-TEN-POS-101	DEMOLITION PLAN

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

11	TPT-ACM-LS-TEN-POS-201	LEVEL & GRADING PLAN
12	TPT-ACM-LS-TEN-POS-301	GENERAL ARRANGEMENT & MATERIAL PLAN
13	TPT-ACM-LS-TEN-POS-401	LIGHTING, FURNITURE, FIXTURE & SIGNAGE PLAN
14	TPT-ACM-LS-TEN-POS-501	PLANTING PLAN - TREE
15	TPT-ACM-LS-TEN-POS-601	PLANTING PLAN - SHRUB & GROUND COVER
TYPICAL DETAILS		
16	TPT-ACM-LS-TEN-POS-1001	PAVING DETAILS - M1, M2, M3
17	TPT-ACM-LS-TEN-POS-1002	PAVING DETAILS - M4, M5, M6
18	TPT-ACM-LS-TEN-POS-1003	PAVING DETAILS - M7, M11
19	TPT-ACM-LS-TEN-POS-1101	EDGE DETAILS - E1, E2
20	TPT-ACM-LS-TEN-POS-1201	RAIN WATER PERCOLATION TRENCH & PITS
21	TPT-ACM-LS-TEN-POS-1301	WALL DETAILS - W1, W2
22	TPT-ACM-LS-TEN-POS-1401	STEP DETAILS - ST1
23	TPT-ACM-LS-TEN-POS-2001	FENCE DETAIL - F1
24	TPT-ACM-LS-TEN-POS-2002	SEAT - S1 & RAILING - R1 DETAILS
25	TPT-ACM-LS-TEN-POS-2003	GATE DETAIL - G1
26	TPT-ACM-LS-TEN-POS-2003A	GATE DETAIL - G2
27	TPT-ACM-LS-TEN-POS-2003B	GATE DETAIL - G3
28	TPT-ACM-LS-TEN-POS-2004	SIGNAGE DETAILS - ENTRY SIGNAGE SG1
29	TPT-ACM-LS-TEN-POS-2005	SIGNAGE DETAILS - SIGNAGE SG2 & PLACE MARKER SIGNAGE SG3

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

30	TPT-ACM-LS-TEN-POS-2006	LIGHT FIXING DETAILS
31	TPT-ACM-LS-TEN-POS-2101	PAVILION DETAIL - TYPE 1 & TYPE 2
32	TPT-ACM-LS-TEN-POS-2201	SOFTSCAPE DETAILS
33	TPT-ACM-LS-TEN-POS-2301	BOUNDARY WALL DETAILS
34	TPT-ACM-LS-TEN-POS-2401	RAMP DETAILS
35	TPT-ACM-LS-TEN-POS-2501	PAVING INTERFACE DETAIL
36	TPT-ACM-LS-TEN-POS-2601	EPDM MOUND DETAIL
37	TPT-ACM-LS-TEN-POS-2701	SWALE DETAIL

2. CONSTRUCTION PHASE

The on-site execution of the scope of work comprises the of full, final and entire installation and completion of built works and landscape works to the relevant applicable Indian Standards or a 'best practice standard such as BS' for such works. This standard applies to all elements as described in the section Landscape Works and is, (inclusive of hardscape, softscape, amenities, play areas and equipment, site furniture, exterior signage and lighting) and associated landscape services (levelling, drainage etc.) based on the design developed by the Employer and including handing, handing over of the same in full accordance with the Employer's requirements.

Key tasks include:

- The Contractor should submit a complete implementation timeline
- The Employer and/or Employer's representative will supervise and monitor the progress of the implementation of the work and solution.
 - Technical Specifications for Various Works to be followed in the project duration including O&M period, by the Selected Bidder.
- Material/Product samples:
 - All materials/samples to be submitted to the Employer for comments and approval prior to commencement of works; approved sample may be incorporated in the works
 - Type and number of samples as specified in relevant sections of this document.

- Sample panels:
 - Mock-ups - All sample panel/mock-up to be presented to the Employer for comments and approval prior to commencement of works;
 - Type and number of sample panels as specified in relevant sections of this document. Approved panels may be incorporated in the work.
- Operations & Maintenance Manual:
 - This should include schedule and instructions for all activities to be undertaken for operations and maintenance of established works.
- As-built drawings:
 - The Contractor shall prepare As-Built drawings and certify on these drawings that the drawings reflect the actual works installed.
 - Three sets of these drawings (A1 hardcopy, printed to scale and softcopy – AutoCAD and PDF on a CD) shall be submitted to the Employer post approval and record.
 - The Contractor shall ensure that this submission of As-Built drawings will not delay subsequent inspections and tests by the relevant authorities; otherwise he shall be fully responsible for any consequence due to his delay.
 - No separate payment will be made for the preparation of As-Built Drawings; Cost of preparation of As Built Drawing is deemed to be included in all other priced bill items.

The site-wide execution works within the site include the following but are not limited to;

LANDSCAPE WORKS

a) Landscape Zones/ Features:

1. Kids play area, Sports/ play courts,
2. Pathway/ Jogging/ Running track
3. Musical Fountain, renovation of surrounds
4. Universally accessible areas
5. Performance/ Gathering stage, Congregation area
6. Entrance plaza/ Entrance gateway
7. Skating Rink
8. Outdoor Gym

b) Site Furniture:

1. Play equipment - Standalone, Multi-play,
2. Outdoor Gym equipment
3. Bench
4. External Gates
5. Rubbish receptacles
6. Supply and installation of E-Toilets
7. Water ATM vending machine.
8. Seating Pavilion, granite clad masonry
9. Signages – Entry, Directional, Place Identification

c) Earthworks

1. Excavation and filling to achieve levels as detailed in the plans.
2. Excavation and filling works for site drainage.
3. Excavation and filling works for pathways and foundations
4. Excavation and filling for installation of utilities.

d) Hardscape – Materials:

1. Paver blocks
2. Granite Grey (Flamed/ Sandblasted), Granite Black paving stone
3. Granite Black (Flamed), cladding
4. EPDM (Rubberised flooring)
5. Granite Steppingstones, Flamed
6. Exposed aggregate concrete, Compacted clay/gravel for paths
7. KOTA Stone
8. Concrete kerb (various sizes)
9. Granite solid stone seat/benches

e) Site Utilities:

1. Lighting
2. Wall mounted area light
3. Pole light
4. Pavilion Lighting
5. Play Court Lighting

f) Water

1. Provision of water supply to R.O / Water kiosks from existing pump house.

g) Wall:

2. Solid boundary wall of masonry and cement render
3. GRC panel transparent Jali wall
4. Cement rendered masonry Ramp wall
5. Internal masonry wall, cement rendered

h) Access:

1. Gradual ramps
2. Steps

i) Softscape:

1. Planter beds
2. Shading trees, Hardy trees, Ornamental trees, Palm trees
3. Open play lawn area

j) Surface Treatments

1. EPDM, various depth and colours of rubberised surface
2. Textured Paint to various wall surfaces
3. Granite cladding

k) Drainage

1. Permeable surfaces (Grass)
2. Rainwater harvesting pits & trenches
3. Surface water drainage

Volume 3: Conditions of Contract

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

VOLUME 3: CONDITIONS OF CONTRACT

A. GENERAL

1. Interpretation:

- 1.1 In interpreting these Conditions of Contract, singular also means plural, male also means female, and vice-versa. Headings have no significance. Works have their normal meaning under the language of the contract unless specifically defined. The Engineers-in-charge will provide instructions clarifying queries about the conditions of Contract.
- 1.2 The documents forming the Contract shall be interpreted in the following order of priority:
- 1) Contract Agreement
 - 2) Letter of Acceptance, notice to proceed with the works
 - 3) Contractor's Tender (Technical bid)
 - 4) Conditions of contract (incl Special Conditions)
 - 5) Specifications
 - 6) Drawings
 - 7) Bill of quantities (Price-bid)
 - 8) Any other document listed as forming part of the Contract.

2. Engineer-in-Charge's Decisions:

- 2.1 Except where otherwise specifically stated, the Engineer-in-charge will decide the contractual matters between the Department / TSCCL Authority and the Contractor in the role representing the Department / TSCCL Authority.

3. Delegation:

- 3.1 The Engineer-in-charge may delegate any of his duties and responsibilities to other officers and may cancel any delegation by an official order issued.

4. Communications:

- 4.1 Communications between parties, which are referred to in the conditions, are effective only when in writing. A notice shall be effective only when it is delivered (in terms of Indian Contract Act)

5. Sub-contracting:

- 5.1 If the prime contractor desires to sub-let a part of the work, he should submit the same at the time of filing tenders itself or during execution, giving the name of the proposed Sub-contractor, along with details of his qualification and experience. The Tender Accepting Authority should verify the experience of the Sub-contractor and if the Sub-

contractor satisfies the qualification criteria in proportion to the value of work proposed to be sub-let, he may permit the same.

The total value of works to be awarded on sub-letting shall not exceed 50% of contract value. The extent of subletting shall be added to the experience of the sub-contractor and to that extent deducted from that of the main contractor.

6. Other Contractors:

- 6.1 The Contractor shall cooperate and share the Site with other contractors, Public authorities, utilities, and the Department / TSCCL Authority. The Contractor shall also provide facilities and services for them as directed by the Engineer-in-charge.

7. Personnel:

- 7.1 The Contractor shall employ the required Key Personnel named in the Schedule of Key Personnel to carry out the functions stated in the Schedule or other personnel approved by the Engineer-in-charge. The Engineer-in-charge will approve any proposed replacement of Key Personnel only if their qualifications, abilities, and relevant experience are substantially equal to or better than those of the personnel listed in the Schedule.

7.2 Schedule of Key Personnel:

The successful tenderer shall have to employ the following technical staff on full time basis to be available at site.

Cost of work (Technical sanction amount)	Qualification of Technical Staff
1	2
From Rs.50,000/- to Rs.1 Lakh	One I.T.I. candidate
Above Rs.1.00 lakh up to Rs.15.00 lakhs	One diploma holder
Above Rs.15.00 lakh up to Rs.50.00 lakhs	One Graduate Engineer
Above Rs.50.00 lakh upto Rs.100.00 lakhs	One Graduate Engineer and One Diploma holder
Rs.100.00 Lakhs to Rs.500.00 lakhs	Two Graduate Engineers
Rs.500.00 Lakhs to Rs.1000.00 lakhs	Two Graduate Engineers and One Diploma holder
Rs.1000.00 lakhs and above	Three Graduate Engineers and two Diploma holders
Rs.5000.00 lakhs and above	Six Graduate Engineers

- 7.3 Employment of technical personnel shall be with reference to the estimate cost of work put to tender.
- 7.4 The appointment of technical staff shall be on full time basis.
The Technical staff shall be available at work site for supervising the work including quality checking of all items from time to time. Failure to employ the required technical personnel [as per SSR 2017-2018] by the contractor, amounts will be recovered from the contractor over and above the provision made in part two of schedule-A from the contractors bills
- 7.5 The technical personnel should be on full time and available at site whenever required by Engineer in Charge to take instructions.
- 7.6 The names of the technical personnel to be employed by the contractor should be furnished in the statement enclosed separately.
- 7.7 In case the contractor is already having more than one work on hand and has undertaken more than one work at the same time, he should employ separate technical personnel on each work.
- 7.8 If the contractor fails to employ technical personnel the work will be suspended or Department / TSCCL Authority will engage technical personnel and recover the cost thereof from the contractor.
- 7.9 If the Engineer-in-charge asks the Contractor to remove a person who is a member of Contractor's staff or his work force stating the reasons the Contractor shall ensure that the person leaves the site forthwith and has no further connection with the work in the contract.
- 7.10 The Engineer-in-charge is the sole judge
- 7.10.1 to decide whether qualified technical staff is actually supervising the work
- 7.10.2 to decide the actual period of absence of such staff which requires the above recovery to be enforced and his decision is final and binding on the contractor.
- 7.11 The technical agents appointed by the contractor shall have to maintain properly all the records required by the Department / TSCCL Authority under safe custody at site, like checklists, calibration registers/records, Quality Test Registers, Test reports file, site order book, etc. and make signatures at appropriate places towards proof of verifications, conduction of tests, compliance to instructions etc.

8. Contractor's Risks:

- 8.1 All risks of loss of or damage to physical property and of personnel injury and death, which arise during and in consequence of the performance of the contract are the responsibility of the contractor.

9. Insurance:

- 9.1 Submission of insurance at the time of Concluding Agreement is dispensed forth with vide G.O.Ms.No.5 Finance (W&P) F7 Dept., Dt: 05-03-2014
- 9.2 The Contractor shall provide, in the name of the Department / TSCCL Authority, insurance cover for personal injury or death of persons employed for construction to the Managing Director at the time of concluding agreement of the work
- 9.3 The Contractor shall provide, in the joint names of the Department / TSCCL Authority and the contractor, insurance cover from the Start Date to the end of the Defects Liability Period i.e., 24 months after completion for the following events which are due to the Contractor's risks.
- a) loss of or damage to the Works, Plant and Materials;
 - b) loss of or damage to the Equipment;
 - c) loss of or damage of property in connection with the Contract; and
 - d) Personal injury or death of persons employed for construction.
- 9.4 Policies and certificates of insurance shall be delivered by the Contractor to the Engineer-in-charge at the time of concluding Agreement. All such insurance shall provide for compensation to be payable to rectify the loss or damage incurred.
- i) The contractor shall furnish insurance policy in force in accordance with proposal furnished in the Tender and approved by the Department / TSCCL Authority/TSCCL for concluding the agreement.
 - ii) The contractor shall also pay regularly the subsequent insurance premium and produce necessary receipt to the Engineer-in-Charge, well in advance.
 - iii) In case of failure to act in the above said manner the Department / TSCCL Authority/TSCCL will pay the premium and the same will be recovered from the Contractors payments.
- 9.5 Alterations to the terms of insurance shall not be made without the approval of the Engineer-in-Charge.

10. Site Inspections:

- 10.1 The contractor should inspect the site and also proposed quarries of choice for materials source of water and quote his percentage including quarrying, conveyance and all other charges etc.
- 10.2 The responsibility for arranging the land for borrow area rests with the Contractor and no separate payment will be made for procurement or otherwise. The contractor's quoted percentage will be inclusive of land cost.

11. Contractor to Construct the Works:

- 11.1 The Contractor shall construct and Commission the Work in accordance with the specifications and Drawings.

12. Diversion of streams / Vagus / Drains.

- 12.1 The contractor shall at all time carry out construction of cross drainage works in a manner creating least interference to the natural flow of water while consistent with the satisfactory execution of work. A temporary diversion shall be formed by the contractor at his cost where necessary. No extra payment shall be made for this work.
- 12.2 No separate payment for bailing out sub-soils, water drainage or locked up rain water for diversion, shoring, foundations, bailing of pumping water either from excavation of soils from foundations or such other incidental will be paid. The percentage to be quoted by the contractor are for the finished item of work in situ and including all the incidental charges. The borrow pits are also to be de-watered by the contractor himself at his expense, if that should be found necessary.
- 12.3 The work of diversion arrangements should be carefully planned and prepared by the contractor and forwarded to the **MD, TSCCL**, technically substantiating the proposals and approval of the **MD, TSCCL**, obtained for execution.
- 12.4 The contractor has to arrange for bailing out water, protection to the work in progress and the portion of works already completed and safety measures for men and materials and all necessary arrangements to complete the work.
- 12.5 All the arrangements so required should be carried out and maintained at the cost of the contractor and no separate or additional payment is admissible.

13. Power Supply.

- 13.1 The contractor shall make his own arrangements for obtaining power from the Electricity dept., at his own cost. The contractor will pay the bills of Electricity Department / TSCCL Authority for the cost of power consumed by him.

- 13.2 The contractor shall satisfy all the conditions and rules required as per Indian Electricity Act 1910 and under Rule-45(I) of the Indian Electricity Rules, 1956 as amended from time to time and other pertinent rules. The power shall be used for bonafide Department / TSCCL Authority work only.

14. Temporary Diversions (Works on Highways)

- 14.1 The contractor shall at all time carryout work on the highway in a manner creating least interference to the flow of traffic while consistent with the satisfactory execution of the same. For all works involving improvements to the existing highway, the contractor shall in accordance with the directions of the Engineer-in-charge provide and maintain during the execution of the work a passage for traffic, either along a part of the existing carriage way under improvement or along a temporary diversion constructed close to the highway.
- 14.2 If in the opinion of the Engineer-in-Charge, it is not possible to pass the traffic on part width of the carriageway for any reason, a temporary diversion close to the highway shall be constructed as directed. It shall be paved with the materials such as hard morrum, gravel and stone, metal to the specified thickness as directed by the Engineer-in-Charge. In all cases, the alignment, gradients and surface type of the diversion including its junctions, shall be approved by the Engineer-in-charge before the highway is closed to traffic.
- 14.3 The contractor shall take all necessary measures for the safety of traffic during construction and provide erect and maintain such barricades, including signs, markings, flags lights and information and protection of traffic approaching or passing through the section of the highway under improvement. Before taking up any construction, an agreed phased programme for the diversion of traffic on the highway shall be drawn up in consultation with the Engineer-in-charge.
- 14.4 The barricades erected on either side of the carriage way portion of the carriage way closed to traffic, shall be of strong design to resist violation and painted with alternative black and white stripe. Red lanterns or warnings lights of similar type shall be mounted on the barricades at night and kept lit throughout from sunset to sunrise.

15. Ramps:

Ramps required during execution may be formed wherever necessary and same are to be removed after completion of the work. No separate payment will be made for this purpose.

16. Monsoon Damages:

Damages due to rain or flood either in cutting or in banks shall have to be made good by the contractor till the work is handed over to the Department / TSCCL Authority. The responsibility of de-silting and making good the damages due to rain or flood rests with the contractor. No extra payment is payable for such operations and the contractor shall therefore, have to take all necessary precautions to protect the work done during the construction period.

17. The works to be completed by the intended completion date:

- 17.1 The contractor may commence execution of the works on the start date and shall carry out the works in accordance with the programme submitted by the contractor, as updated with the approval of the Engineer-in-Charge, and complete the work by the Intended completion date.

18. Safety:

- 18.1 The Contractor shall be responsible for the safety of all activities on the site.

19. Discoveries:

- 19.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site is the property of the Government / TSCCL Authority. The Contractor is to notify the Engineer-in-charge of such discoveries and carry out the Engineer-in-Charge's instructions for dealing with them.

20. Possession of the Site.

- 20.1 The Department / TSCCL Authority shall give possession of the site to the Contractor. If possession of a part site is given, the Department / TSCCL Authority will ensure that the part site so handed over is amenable to carry out the work at site by the Contractor.

21. Access to the Site:

- 21.1 The Contractor shall provide the Engineer-in-Charge and any person authorized by the Engineer-in-Charge, access to the site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

22. Instructions:

- 22.1 The Contractor shall carry out all instructions of the Engineer-in-charge and comply with all the applicable local laws where the Site is located.

23. Settlement of disputes:

- 23.1 If any dispute of difference of any kind whatsoever arises between the Department / TSCCL Authority and the Contractor in connection with, or arising out of the Contract, whether during the progress of the works or after their completion and whether before or after the termination, abandonment or breach of the Contract, it shall in the first place, be referred to and settled by the Engineer-in-charge who shall, within a period of 30 (Thirty) days after being requested by the Contractor to do so, give written notice of his decision to the Contractor. Upon receipt of the written notice of the decision of the Engineer-in-Charge the Contractor shall promptly proceed without delay to comply with such notice of decision.
- 23.2 If the Engineer-in-Charge fails to give notice of his decision in writing within a period of thirty days after being requested or if the Contractor is dissatisfied with the notice of the decision of the Engineer-in-Charge, the Contractor may within thirty days after receiving the notice of decision appeal to the Department / TSCCL Authority who shall offer an opportunity to the contractor to be heard and to offer evidence in support of his appeal, the Department / TSCCL Authority shall give notice of his decision within a period of thirty days after the Contractor has given the said evidence in support of his appeal, subject to arbitration, as hereinafter provided. Such decision of the Department / TSCCL Authority in respect of every matter so referred shall be final and binding upon the Contractor and shall forthwith be given effect to by the Contractor, who shall proceed with the execution of the works with all due diligence whether he requires arbitration as hereinafter provided, or not. If the Department / TSCCL Authority has given written notice of his decision to the Contractor and no claim to arbitration, has been communicated to him by the Contractor within a period of thirty days from receipt of such notice the said decision shall remain final and binding upon the Contractor. If the

Department / TSCCL Authority fail to give notice of his decision, as aforesaid within a period of thirty days after being requested as aforesaid, or if the Contractor be dissatisfied with any such decision, then and in any such case the contractor within thirty days after the expiration of the first named period of thirty days as the case may be, require that the matter or matters in dispute be referred to arbitration as detailed below:

SETTLEMENT OF CLAIMS:

Settlement of claims for Rs.50,000/- and below by Arbitration.

All disputes or difference arising of or relating to the Contract shall be referred to the adjudication as follows:

- a) Claims upto a value of Rupees 10,000/-.
 - Superintending Engineer, [of another circle in the same department as specified in the NIT].
- b) Claims above Rs.10,000/- and upto Rupees 50,000/-.
 - Another Chief Engineer, [of the same departments as specified in the NIT]

The arbitration shall be conducted in accordance with the provisions of Indian Arbitration and Conciliation Act 1996 or any statutory modification thereof.

The arbitrator shall state his reasons in passing the award.

Claims above Rs.50,000/-.

All claims of above Rs.50,000/- are to be settled by a Civil Court of competent jurisdiction by way of Civil suit and not by arbitration.

A reference for adjudication under this clause shall be made by the contractor within six months from the date of intimating the contractor of the preparation of final bill or his having accepted payment whichever is earlier.

B. TIME FOR COMPLETION

24. Program:

- 24.1 The total period of completion is (as specified in the NIT) Nine (9) months from the date of entering with agreement to proceed including rainy season. Keeping in view, the schedule for handing over of site given in condition 11.2 below, the work should be programmed such as to achieve the milestones as in “Rate of progress statement” enclosed.
- 24.2 The attention of the tenderer is directed to the contract requirement at the time of beginning of the work, the rate of progress and proportionate value of work done from time to time as will be indicated by the MD, TSCCL 's Certificate for the value of work done will be required. Date of commencement of their programme will be the date for concluding agreement but not the date of handing over site.
- 24.3 After signing the agreement, the contractor shall forthwith begin the work, shall regularly and continuously proceed with them.
- 24.4 Rate of progress:
- i) Work programme of achieving the milestones (Statement).
 - ii) Site schedule of programme of handing over site to the contractor. (Statement)
 - iii) The contractor shall achieve the financial progress, otherwise Liquidated Damages shall be levied as per the conditions of contract.

MILESTONE PROGRAMME TO BE DRAWN IN CONSULTATION WITH THE EXECUTING AGENCY AT THE TIME OF CONCLUDING THE AGREEMENT.

- 24.5 The contractor shall commence the works on site within the period specified under condition 24.1 to 24.3 above after the receipt by him of a written order to this effect from the MD, TSCCL and shall proceed with the same with due expedition and without delay, except as may be expressly sanctioned or ordered by the Managing Director, Tirupati Smart City Corporation Limited, Tirupati, or be wholly beyond the contractor's control.
- 24.6 Save in so far as the contractor may prescribe, the extent of portions of the site of which the contractor is to be given possession from time to time and the order in which such portions shall be made available to him and, Subject to any requirement in the contract as to the order in which the works shall be executed, the Executive Engineer will, with the MD, TSCCL 's written order to commence the works, give to the contractor

possession of so much of the site as may be required to enable the contractor to commence proceed with the execution of the works in accordance with the programme if any, and otherwise in accordance with such reasonable proposals of the contractor as he shall by written notice to the Managing Director, Tirupati Smart City Corporation Limited, Tirupati, make and will from time to time as the works proceed, give to the contractor possession of such further portions of the site as may be required to enable the contractor to proceed with the execution of the works with due dispatch in accordance with the said programme or proposals as the case maybe ; if the contractor suffers delay or incurs cost from failure on the part of the Managing Director, Tirupati Smart City Corporation Limited, Tirupati to give possession in accordance with the terms of this clause, the Managing Director, Tirupati Smart City Corporation Limited, Tirupati shall grant an extension of time for the completion of works.

24.7 The contractor shall bear all costs and charges for special or temporary way leases required by him in connection with access to the site. The contractor shall also provide at his own cost any additional accommodation outside the site required by him for the purposes of the work.

24.8 Subject to any requirement in the contract as to completion of any section of the works before completion of the whole of the works shall be completed in accordance with provisions of clauses in the Schedule within the time stated in the contract calculated from the last day of the period named in the statement to the tender as that within which the works are to be commenced or such extended time as may be allowed.

24.9 **Delays and extension of time:**

No claim for compensation on account of delays or hindrances to the work from any cause whatever shall lie, except as hereafter defined. Reasonable extension of time will be allowed by the officer competent to sanction the extension, for unavoidable delays, such as may result from causes, which in the opinion of the Managing Director, Tirupati Smart City Corporation Limited, Tirupati and are undoubtedly beyond the control of the contract. The Managing Director, Tirupati Smart City Corporation Limited, Tirupati shall assess the period of delay or hindrance caused by any written instructions issued by him, at twenty five percent in excess or the actual working period so lost.

In the event of the Executive Engineer failing to issue necessary instructions and thereby causing delay and hindrance to the contractor, the latter shall have the right to claim an assessment of such delay by the Managing Director, Tirupati Smart City Corporation Limited, Tirupati whose decision will be final and binding. The contractor shall lodge in

writing with the Executive Engineer a statement of claim for any delay or hindrance referred to above, within fourteen days from its commencement, otherwise no extension of time will be allowed.

Whenever authorized alterations or additions made during the progress of the work are of such a nature in the opinion of the Managing Director, Tirupati Smart City Corporation Limited, Tirupati as to justify an extension of time in consequence thereof. If there are valid reasons for extending the contract period, proposals for extension of time should be sent to the authority competent to accord administrative sanction, sufficiently in advance and in any case at least one month before the expiry of the contract period.

25. Construction Programme:

- 25.1 The Contractor shall furnish within one month of the order of the work a programme showing the sequence in which he proposed to carry out the work, monthly progress expected to be achieved, also indicating date of procurement of materials plant and machinery. The schedule should be such that it is practicable to achieve completion of the whole work within the time limit fixed and in keeping with the Mile stone programme specified and shall obtain the approval of the Engineer-in-charge. Further rate of the progress as in the program shall be kept up to date. In case it is subsequently found necessary to alter this program, the contractor shall submit sufficiently in advance the revised program incorporating necessary modifications and get the same approved by the Engineer - in - Charge. No revised program shall be operative without approval of Engineer - in - Charge.
- 25.2 The Managing Director, Tirupati Smart City Corporation Limited, Tirupati shall have all times the right, without any way violating this contract, or forming grounds for any claim, to alter the order of progress of the works or any part thereof and he contractor shall after receiving such directions proceed in the order directed. The contractor shall also report the progress to the Managing Director, Tirupati Smart City Corporation Limited, Tirupati within 7 days of the Executive Engineers direction to alter the order of progress of works.
- 25.3 The contractor shall give written notice to the Engineer-in-Charge whenever planning or progress of the works is likely to be delayed or disrupted unless any further drawings or order including a direction, instruction or approval is issued by the Engineer-in-Charge within a reasonable time. The notice shall include details of the drawing or order

required and of why and by when it is required and of any delay or disruption likely to be suffered if it is late.

26. Speed of Work

26.1 The Contractor shall at all times maintain the progress of work to conform to the latest operative progress schedule approved by the Engineer-in-Charge. The contractor should furnish progress report indicating the programme and progress once in a month. The Engineer-in-Charge may at any time in writing direct the contractor to slow down any part or whole of the work for any reason (which shall not be questioned) whatsoever, and the contractor shall comply with such orders of the Engineer-in-Charge. The compliance of such orders shall not entitle the contractor to any claim of compensation. Such orders of the Engineer-in-Charge for slowing down the work will however be duly taken into account while granting extension of time if asked by the contractor for which no extra payment will be entertained.

26.2 Delays in Commencement or progress or neglect of work and forfeiture of earnest money, Security deposit and withheld amounts:

If, at any time, the Engineer-in-Charge shall be of the opinion that the contractor is delaying commencement of the work or violating any of the provisions of the contractor is neglecting or delaying the progress of the work as defined by the tabular statement. "Rate of progress" in the "Articles of Agreement", he shall so advise the contractor in writing and at the same time demand compliance in accordance with conditions of Tender Notice. If the contractor neglects to comply with such demand within seven days after receipt of notice, it shall then or at any time thereafter, be lawful for the Engineer-in-Charge to take suitable action in accordance with Clause.60 of APSS.

27. Suspension of works by the Contractor.

27.1 If the Contractor shall suspend the works, or sublet the work without sanction of the Engineer-in-Charge, or in the opinion of the Engineer-in-Charge shall neglect or fail to proceed with due diligence in the performance of his part of the Contract as laid down in the Schedule rate of progress, or if he shall continue to default or repeat such default in the respects mentioned in clause.27 of the APSS, Engineer - in - Charge shall take action in accordance with Clause 61 of APSS.

27.2 If the Contractor stops work for 28 days and the Stoppage has not been authorised by the Engineer - in - Charge the Contract will be terminated under Clause 61 of APSS.

27.3 If the Contractor has delayed the completion of works the Contract will be terminated under Clause.61 of APSS.

28. Extension of the Intended Completion Date:

28.1 The Engineer - in - Charge shall extend or recommend for extension, in accordance with the Government / TSCCL Authority's orders in force, the Intended Completion Date if a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date.

28.2 The Engineer-in-Charge shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Engineer for a decision upon the effect of a Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

29. Delays Ordered by the Engineer-in-Charge:

29.1 The Engineer - in - Charge may instruct the Contractor to delay the start or progress of any activity within the Work.

30. Early Warning:

30.1 The contractor is to warn the Engineer - in - Charge at the earliest opportunity of specific likely future events or circumstances that may adversely affect the execution of works.

30.2 The Contractor shall cooperate with the Engineer - in - Charge in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Engineer - in - Charge.

31. Management Meetings:

31.1 The Engineer - in - Charge may require the Contractor to attend a management meeting. The business of a management meeting shall be to review the programme for remaining work and to deal with matters raised in accordance with the early warning procedure.

C. QUALITY CONTROL

32. Identifying Defects:

- 32.1 The Engineer-in-Charge/ Project Management Consultant engaged by the client shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Engineer-in-Charge may instruct the Contractor to verify the Defect and to uncover and test any work that the Engineer considers may be a Defect.

33. Tests:

- 33.1 If the Engineer-in-Charge instructs the contractor to carry out a test not specified in the specification to check whether any work has a defect and the contractor shall pay for the test and any samples.

34. Correction of Defects:

- 34.1 The Engineer - in - Charge shall give notice to the contractor of any defects before the end of the defects liability period, which begins on completion. The defects liability period shall be extended for as long as defects remain to be corrected by the contractor.
- 34.2 Every time notice of a defect is given, the contractor shall correct the notified defect within the length of time specified by the Engineer - in - Charge's notice.

35. Uncorrected defects

- 35.1 If the contractor has not corrected the defect within the time specified in the Engineer-in-Charge's notice, the Engineer-in-Charge will assess the cost of having the defect corrected and the contractor will pay this amount.
- 35.2 The Engineer - in - Charge shall introduce O.K cards and prescribe the formats thereof. O.K cards shall relate to all major components of the work. The contractor/his authorized representative shall be required to initiate and fill in and present the O.K card to the construction staff that would check the respective items and send to the quality control staff for final check and clearance/O.K. Any defects pointed out by the construction supervision staff or by the Quality Control staff shall promptly be attended to by the contractors and the fact of doing so be duly recorded on the back of O.K card.
- 35.3 The Engineer - in - Charge may also introduce check lists which shall be kept in Bound registers by the construction supervision staff. The contractor may be required to fill up

these lists in the first instance and shall be subsequently checked by the Construction / Quality Control engineers.

36. Quality Control:

In addition to the normal inspection by the regular staff in-charge of the construction of work, the work will also be inspected by the Executive Engineer /Superintending Engineer /Chief Engineer Quality control Circle or by the State or District level Vigilance Cell Unit and any other authorized external Agency if any sub-standard work or excess payments are noticed with reference to measurement books etc., during inspection, action will be taken based on their observations and these will be effected by the Engineer-in-Charge of the execution of the work.

For all works costing more than Rs.2.00 Crores the Contractor shall submit quality plan and also show proof of owning quality lab or tie-up with an established quality lab.

D. COST CONTROL

37. Bill of Quantities:

- 37.1 The Bill Quantities shall contain items for the construction work to be done by the Contractor.
- 37.2 The Contractor is paid for the quantity of the work done at the estimate rate in the Bill of Quantities for each item plus or minus Tender percentage.

38. Changes in the Quantities:

- 38.1 The contractor is bound to execute all supplemental works that are found essential, incidental and inevitable during execution of main work.
- 38.2 The payment of rates for such supplemental items of work will be regulated as under; Supplemental items directly deducible from similar items in the original agreement.
 - 38.2.1 The rates shall be derived by adding to or subtracting from the agreement rate of such similar item the cost of the difference in the quantity of materials labour between the new items and similar items in the agreement worked out with reference to the Standard Schedule of Rates adopted in the sanctioned estimate with which the tenders are accepted plus or minus over all tender percentage.
 - 38.2.2 (a) Similar items but the rates of which cannot be directly deduced from the original agreement.
 - (b) Purely new items which do not correspond to any item in the agreement.
 - 38.2.3 The rates of all such items shall be Estimated Rates plus or minus overall Tender premium.

39. Extra Items:

- 39.1 Extra items of work shall not vitiate the contract. The contractor shall be bound to execute extra items of work as directed by the Engineer - in - Charge. The rates for extra items shall be worked out by the Executive Engineer as per the conditions of the Contract and the same are binding on the Contractor.
- 39.2 The contractor shall before the 15th day of each month, submit in writing to the Executive Engineer a statement of extra items if any that they have executed during the preceding month failing which the contractor shall not be entitled to claim any.
- 39.3 Entrustment of additional items:
 - 39.3.1 Where ever additional items not contingent on the main work and outside the scope of original agreement are to be entrusted to the original contractor dispensing with bids

and if the value of such items exceeds the limits up to which the officer is empowered to entrust works initially to contractor without calling for tenders, approval of **next higher authority** shall be obtained. Entrustment of such items on nomination shall be at rates not exceeding the estimated rates.

39.3.2 Entrustment of the additional items contingent on the main work will be authorized by the officers up to the monetary limits up to which they themselves are competent to accept items in the original agreement so long as the total amounts up to which they are competent to accept in an original agreement rates for such items shall be worked out in accordance with the procedure (I) For all items of work in excess of the quantities shown in the Bill of Quantities of the Tenders, the rate payable for such items shall be estimate rates for the items (+) or (-) over all tender percentage accepted by the competent authority.

39.3.3 Entrustment of either the additional or supplemental items shall be subject to the provisions of the agreement entered into by a Competent Authority after the tender is accepted.. The Engineer – In - Chief is being authorized to approve the rate for the items / variation in quantity in the current agreement. The items shall not be ordered by an officer on his own responsibility if the revised estimate or deviation statement providing for the same requires the sanction of higher authority.

Note: It may be noted that the term Estimate Rate used above means the rate in the sanctioned estimate with which the tenders are accepted, or if no such rates is available in the estimate, the rate derived will be with reference to the Standard Schedule of Rates adopted in the sanctioned estimate with which tenders are accepted.

40. Cash flow forecasts:

40.1 When the program is updated, the contractor is to provide the Engineer -in-charge with an updated cash flow forecast.

41. Payment Certificates:

41.1 The Contractor shall submit to the Engineer - in - Charge monthly statements of the estimated value of the work completed less the cumulative amount certified previously.

41.2 The Engineer - in - Charge shall check the Contractor's monthly statement within 14 days.

41.3 The value of work executed shall be determined by the Engineer - in - Charge.

41.4 The value of work executed shall comprise the value of the quantities of the items in the Bill of Quantities completed.

41.5 The Engineer - in - Charge may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

42. Payments:

- 42.1 Payment for the work done by the contractor will be made for the finished work based on the measurements recorded in measurement books by any officer of the department not lower in rank than an Assistant Engineer and check measured by any officer not lower in rank than a Deputy Executive Engineer. The measurement shall be recorded at various stages of the work done and also after work is completed. The contractor shall be present at the time of recording of each set of measurement and their check measurement and accept them then and there so as to avoid disputes at a later stage. If the contractor is not available at the workspot at the time of recording measurements or check measurements the particulars of measurements shall be signed by the authorised agent of contractor based on which the contractor shall accept the set of measurements without any further dispute. If for any reason the contractor's authorised agent is also not available at site when the department / TSCCL Authority decides to suspend the work recording of measurements in the absence of the contractor or his authorised representative the department / TSCCL Authority shall not entertain any claim from the contractor for any loss incurred by him on this account. The Contractor shall however note that the Department/ TSCCL Authority cannot indefinitely wait for recording the measurement due to the absence of the Contractor and his authorised agent and check measure them even in the absence of the contractor.
- 42.2 The actual volume of stone and aggregates shall be computed after deducing the following percentages from the volume computed by stack measurements.

S. No	Standard size of aggregate and stone	Percentage reduction in volume computed by stack measurements to arrive at the volume to be paid for
1.	Stone	40
2.	40 mm and 25 mm	10
3.	20 mm, 12 mm, 10 mm & 6 mm	5
4.	Fine aggregate	Nil
5.	Gravel	20

[Note: The above Table may be modified depending on the type of work.]

42.3 Unless otherwise directed, measurements shall not be taken until sufficient materials for use on work have been collected and stacked. Immediately after measurement, the stack shall be marked by white wash or other means as directed by the Engineer-in-charge.

42.4 Payments and Certificates:

- 42.4.1 Payments shall be adjusted for recovery of advance payments, liquidated damages in terms of tender conditions and security deposit for the due fulfillment of the contract. Payment will be made to the Contractor under the certificate to be issued at reasonably frequent intervals by the Engineer - in - Charge, and intermediate payment will be the sum equal to 92½% of the value of work done as so certified and balance of 7½% will be withheld and retained as security for the due fulfillment of the contractor under the certificate to be issued by the Engineer-in-Charge. On completion of the entire works the contractor will receive the final payment of all the moneys due or payable to him under or by virtue of the contract except Earnest Money Deposit retained as security and a sum equal to 2½ percent of the total value of the work done. The amount withheld from the final bill will be retained under deposits and paid to the contractor together with the earnest money deposit retained as security after a period of 24 months as all defects shall have been made good according to the true intent and meaning thereof.
- 42.4.2 In case of over payments or wrong payment if any made to the contractor due to wrong interpretation of the provisions of the contract, APSS or Contract conditions etc., such unauthorised payment will be deducted in the subsequent bills or final bill for the work or from the bills under any other contracts with the Government / TSCCL Authority or at any time thereafter from the deposits available with the Government / TSCCL Authority.
- 42.4.3 Any recovery or recoveries advised by the Government Department / TSCCL Authority either state or central, due to non-fulfillment of any contract entered into with them by the contractor shall be recovered from any bill or deposits of the contractor.
- 42.4.4 No claim shall be entertained, if the same is not represented in writing to the Engineer-in-Charge within 15 days of its occurrence.
- 42.4.5 The contractor is not eligible for any compensation for inevitable delay in handing over the site or for any other reason. In such case, suitable extensions of time will be granted after considering the merits of the case.

42.5 Intermediate Payments:

- 42.5.1 For intermediate Stage of work, only part rates as fixed by the Engineer - in - Charge will be paid.
- 42.5.2 Part rates shall be worked out for the work done portion based on the actual operations involved keeping in view the value of the balance work to be done, to avoid unintended benefit to the Contractor in initial Stage.
- 42.5.3 Full rate shall be paid when the work is completed to the full profile as noted in the drawings.
- 42.5.4 For earthwork in cutting, 10% of the quantity will be withheld for intermediate payments and the same will be released after completing the work to the profiles as per drawings and disposal of the spoil material at the specified places and handing over the balance useful stone. For this purpose a length of 25 mts. will be taken as a Unit.
- 42.5.5 For earth work, embankment formation work, 10% of the quantity will be withheld for intermediate payments and the same will be released after completing the bund to the profiles as per drawings including trimming of side slopes and all other works contingent to the bund profile. For this purpose, 25 mts of length will be taken as a Unit.
- 42.5.6 For the structure works either with masonry or concrete where the height of structure is more than three meters, the quantities executed in the lower level will be withheld at the rate of one percent for every three meters height, if the balance height of the structure work is more than three meters in being over the executed level and the same will be released only after the entire work is completed as certified by the Engineer -in- Charge.
- 42.5.7 Where payment is intended for aggregates by Bill of Quantities item based on stock measurements, 10% of the quantity measured will be withheld. No payment or advance will be made for unfixed materials when the rates are for finished work in site.

43. Interest on Money due to the Contractor:

- 43.1 No omission by the Executive Engineer or the sub-divisional officer to pay the amount due upon certificates shall vitiate or make void the contract, nor shall the contractor be entitled to interest upon any guarantee fund or payments in arrear, nor upon any balance which may, on the final settlement of his accounts, found to be due to him.

44. Certificate of Completion of works:

44.1 Certificate of Completion of works:

44.1.1 When the whole of the work has been completed and has satisfactorily passed any final test that may be prescribed by the Contract, the Contractor may give a notice to that effect to the Engineer-in-Charge accompanied by an undertaking to carry out any rectification work during the period of maintenance, such notice and undertaking shall be in writing and shall be deemed to be request by the Contractor for the Engineer-in-Charge to issue a Certificate of completion in respect of the Works.

The Engineer-in-Charge shall, within twenty one days of the date of delivery of such notice either issue to the Contractor, a certificate of completion stating the date on which, in his opinion, the works were completed in accordance with the Contract or give instructions in writing to the Contractor specifying all the Works which, in the Engineer-in-Charge" opinion, required to be done by the Contractor before the issue of such Certificate. The Engineer-in-Charge shall also notify the Contractor of any defects in the Works affecting completion that may appear after such instructions and before completion of the Works specified there in. The Contractor shall be entitled to receive such Certificate of the Completion within twenty one days of completion to the satisfaction of the Engineer-in-Charge of the Works so specified and making good of any defects so notified.

44.1.2 Similarly, the Contractor may request and the Engineer-in-Charge shall issue a Certificate of Completion in respect of:

- a) Any section of the permanent works in respect of which a separate time for completion is provided in the Contract, and
- b) Any substantial part of the permanent works which has been both completed to the satisfaction of the Engineer-in-Charge and occupied or used by the Department / TSCCL Authority.

44.1.3 If any part of the Permanent Works shall have been completed and shall have satisfactorily passed any final test that may be prescribed by the Contract, the Engineer-in-Charge may issue such certificate, and the Contractor shall be deemed to have undertaken to complete any outstanding work in that part of the Works during the period of Maintenance.

45. Taxes

- 45.1 The percentage quoted by the contractor is inclusive of Goods and Service Tax (GST) and other taxes on all materials that the contractor will have to purchase for performance of this contract and also as per rules in force.
- 45.2 All Taxes such as GST, seigniorage, royalties, tools, control, etc., in respect of materials to be consumed on the work and also in the finished item of work etc., must be borne by the contractors.
- 45.3 As per section 194-C of income tax act 1961, deduction at the rate of 2.24% in respect of individual contractors and 2.30% in respect of firms on the gross amounts of payments will be made towards income tax. The tax will be recovered at the rates as per the income tax act during course of execution.

46. Price Adjustment:

- 46.1.1 Not Applicable.

47. Retention

- 47.1 The Department / TSCCL Authority shall retain from each payment due to the contractor @ the rate of 7.5% of bill amount until completion of the whole of the Works.
- 47.2 On completion of the whole of the Works half the total amount retained is re-paid to the Contractor and half when the Defects Liability Period has passed and the Engineer-in-Charge has certified that all the Defects notified by the Engineer-in-Charge to the Contractor before the end of this period have been corrected.
- 47.3 On completion of the whole works, the Contractor may substitute retention money with an “**on demand**” Bank Guarantee.

48. Liquidated Damages

- 48.1 If for any reason, which does not entitle the contractor to an extension of item, the rate of progress of works, or any section is at any time, in the opinion of the Managing Director, Tirupati Smart City Corporation Limited, Tirupati too slow to ensure completion by the prescribed time or extended time for completion Managing Director, Tirupati Smart City Corporation Limited, Tirupati shall so notify the contractor in writing and the contractor shall there upon take such steps as are necessary and the Managing Director, Tirupati Smart City Corporation Limited, Tirupati may approve to expedite progress so as to complete the works or such section by the prescribed time or

extended time. The contractor shall not be entitled to any additional payment for taking such steps. If as a result of any notice given by the Managing Director, Tirupati Smart City Corporation Limited, Tirupati under this clause the contractor shall seek the Managing Director, Tirupati Smart City Corporation Limited, Tirupati permission to do any work at night or on Sundays, if locally recognised as days or rest, or their locally recognised equivalent, such permission shall not be unreasonably refused.

- 48.2 If the contractor fails to complete whole of the works or any part thereof or section of the works within the stipulated periods of individual milestones (including any bonafide extensions allowed by the competent authority without levying liquidated damages), the Managing Director, Tirupati Smart City Corporation Limited, Tirupati may without prejudice to any other method of recovery will deduct one tenth of one percent of contract value per calendar day or part of the day for the period of delays subject to a maximum of 10% of the contract value not as a penalty from any monies in his hands due or which may become due to the contractor. The payment or deductions of such damages shall not relieve the contractor from his obligation to complete the works, or from any other of his obligations and liabilities under the contract.

- 48.3 The liquidated damages for the whole of the work:

Rs. 50.00 (amount per day) per 1 Lakh for unfinished value of work.

For milestone 1	2 nd Month	25% of the work should be completed. Otherwise the penalty of Rs.50/- per day per lakh on unfinished value of work.
For milestone 2	4 th Month	50% of the work should be completed. Otherwise the penalty of Rs.50/- per day per lakh on unfinished value of work.
For milestone 3	6 th Month	75% of the work should be completed. Otherwise the penalty of Rs.50/- per day per lakh on unfinished value of work.
For milestone 4	9 th Month	100% of the work should be completed. Otherwise the penalty of Rs.50/- per day per lakh on unfinished value of work.

The maximum amount of liquidated damages for the whole of the works is ten percent of final contract price.

49. Payment of Mobilization Advance

49.7.1 Not Applicable.

50 Securities:

50.7 The Earnest Money Deposit and Additional Security (for discount tender percentage beyond **25%**) shall be provided to the Department / TSCCL Authority not later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank acceptable to the Department / TSCCL Authority. The Earnest Money shall be valid until a date 28 days from the date of expiry of Defects Liability Period and the additional security shall be valid until a date 28 days from the date of issue of the certificate of completion.

51 Cost of Repairs:

51.7 Loss or damage to the works or materials to the works between the start date and the end of the defects correction periods shall be remedied by the contractor at the contractor's cost if the loss or damage arises from the contractor's acts or omissions.

E. FINISHING THE CONTRACT

52 Completion:

52.7 The Contractor shall request the Engineer-in-Charge to issue a Certificate of completion of the Works and the Engineer-in-Charge will do so upon deciding that the work is completed.

53 Taking Over:

53.7 The Department / TSCCL Authority shall takes over the Site and the Works within seven days of the Engineer-in-Charge issuing a certificate of Completion.

54 Final Account:

54.1 The Contractor shall supply to the Engineer-in-Charge a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Engineer-in-Charge shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Engineer-in-Charge shall issue within 56 days a schedule that states the scope of the corrections or additions that

are necessary. If the final Account is still unsatisfactory after it has been resubmitted, the Engineer-in-Charge shall decide on the amount payable to the Contractor and issue a payment certificate within 56 days of receiving the Contractor's revised account.

55 Termination:

55.1 The Department / TSCCL Authority may terminate the Contract if the contractor causes a fundamental breach of the Contract.

55.2 Fundamental breaches of Contract include, but shall not be limited to the following.

- a) The Contractor stops work for 28 days when no stoppage of work is shown on the current program and the stoppage has not been authorized by the Engineer-in-Charge.
- b) The Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation.
- c) The Engineer-in-Charge gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer-in-Charge and
- d) The Contractor does not maintain a security which is required and
- e) The Contractor has delayed the completion of works by the number of days for which the maximum amount of liquidated damages can be paid as defined.
- f) If the contractor, in the judgement of the Department / TSCCL Authority has engaged in corrupt or fraudulent practices in competing for or in the executing the contract.

For the purpose of this paragraph: "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution. "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Government and includes collusive practice among Tenderers (prior to or after Tender submission) designed to establish Tender prices at artificial non-competitive levels and to deprive the Government of the benefits of free and open competition.

55.3 Notwithstanding the above the Department / TSCCL Authority may terminate the contract for convenience.

55.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secured leave the Site as soon as reasonably possible.

56 Payment upon Termination:

56.1.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer-in-Charge shall issue a certificate for the value of the work done less advance payments received upon the date of the issue of the certificate, less other recoveries due in terms of the Contract, less taxes due to be deducted at source as per applicable law and less the percentage to apply to the work not completed. Additional Liquidated Damages shall not apply. If the total amount due to the Department / TSCCL Authority exceeds any payment due to the Contractor the difference shall be a debt payable to the Department / TSCCL Authority.

57 Property:

57.1.1 All materials on the Site, Plant, Equipment, Temporary Works and Works are deemed to be the property of the Department / TSCCL Authority if the Contract is terminated because of Contractor's default.

58 Release from Performance:

58.1.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of the Department / TSCCL Authority or the Contractor the Engineer-in-Charge shall certify that the contract has been frustrated. The Contractor shall make the site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all works carried out before receiving it and for any work carried out afterwards to which commitment was made.

F. SPECIAL CONDITIONS

59 Water Supply:

The Contractor has to make his own arrangements for water required for the work and to the colonies and work sites, which are to be established by the Contractor.

60 Electrical Power:

The Contractors will have to make their own arrangements for drawing electric power from the nearest power line after obtaining permission from the Andhra Pradesh State

Electricity Board at his own cost. In case of failure of electricity, the Contractor has to make alternative arrangements for supply of electricity by Diesel Generator sets of suitable capacity at place of work. If the supply is arranged by the Department / TSCCL Authority, necessary Tariff rates shall have to be paid based on the prevailing rates. The contractor will pay the bills of Electricity Board for the cost of power consumed by him. The contractor shall satisfy all the conditions and rules required as per Indian Electricity Act 1910 and under rule -45(I) of the Indian Electricity Rules, 1956 as amended from time to time and other pertinent rules.

The power shall be used for bonafide Departmental works only.

60.1 Electric Power for Domestic Supply:

- a) The contractor has to make his own arrangements for the supply of electric power for domestic purposes and the charges for this purpose have to be paid by him at the rates as fixed by the Andhra Pradesh State Electricity Board from time to time.
- b) The contractor will have to make his own arrangements to lay and maintain the necessary distribution lines and wiring for the camp at his own cost. The layout and the methods of laying the lines and wiring shall have the prior approval of the Engineer-in-Charge. All camp area shall be properly electrified. All lines, streets, approaches for the camp etc., shall be sufficiently lighted for the safety of staff and labour of the contractor, at the cost of the Contractor and it will be subject to the approval of the Engineer-in-Charge.

61 Land:

61.1 Land for Contractor's use:

The contractor will be permitted to use Government / TSCCL land for execution of work. The contractor shall have to make his own arrangements for acquiring and clearing the site, leveling, providing drainage and other facilities for labour staff colonies, site office, work-shop or stores and for related activities. The Contractor shall apply to the Department / TSCCL Authority within a reasonable time after the award of the contract and at least 30 days in advance of its use, the details of land required by him for the work at site and the land required for his camp and should any private land which has not been acquired, be required by the contractor for his use. The same may be acquired by the contractor at his own cost by private negotiations and no claim shall be admissible to him on this account.

The Engineer-in-Charge reserves the right to refuse permission for use of any government land for which no claim or compensation shall be admissible to the contractor. The contractor shall, however, not be required to pay cost or any rent for the Government land given to him.

61.2 Surrender of occupied land

- a) The Government land as here in before mentioned shall be surrendered to the Engineer-in-Charge within seven days, after issue of completion certificate. Also no land shall be held by the contractor longer than the Engineer-in-Charge shall deem necessary and the contractor shall on the receipt of due notice from the Engineer-in-Charge, vacate and surrender the land which the Engineer-in-Charge may certify as no longer required by the Contractor for the purpose of the work.
- b) The contractor shall make good to the satisfaction of the Engineer-in-Charge any damage to areas, which he has to return or to other property or land handed over to him for purpose of this work. Temporary structures may be erected by the contractor for storage sheds, offices, residences etc., for non-commercial use, with the permission of the Managing Director, Tirupati Smart City Corporation Limited, Tirupati on the land handed over to him at his own cost. At the completion of the work these structures shall be dismantled site cleared and handed over to the Managing Director, Tirupati Smart City Corporation Limited, Tirupati. The land required for providing amenities will be given free of cost from Government lands if available otherwise the contractor shall have to make his own arrangements.

61.3 Contractor not to dispose of Spoil etc.,

The contractor shall not dispose of or remove except for the purpose of fulfillment of this contract, sand, stone, clay ballast, earth, trees and shrubs or other materials obtained in the excavation made or lying on the site of the work, and all such materials and produce shall remain property of the Government.

The Department / TSCCL Authority may upon request from the contractor, or if so stipulated in the conditions of the contract allow the contractor to use any of the above materials for the works either free of cost or after payment as may be specifically mentioned or considered necessary during the execution of the work.

62 Roads:

In addition to existing public roads and roads Constructed by Government, if any, in work area all additional approach roads inside work area and camp required by the Contractor shall be constructed and maintained by him at his own cost. The layout design, construction and maintenance etc. of the roads shall be subject to the approval of the Engineer-in-Charge. The contractor shall permit the use of these roads by the Government free of charge.

It is possible that work at, or in the vicinity of the work site will be performed by the Government or by other contractors engaged in work for the Government during the contract period. The contractor shall without charge permit the government and such other contractor and other workmen to use the access facilities including roads and other facilities, constructed and acquired by the contractor for use in the performance of the works.

The contractor's heavy construction traffic or tracked equipment shall not traverse any public roads or bridges unless the contractor has made arrangement with the authority concerned. In case contractor's heavy construction traffic or tracked equipment is not allowed to traverse any public roads or bridges and the contractor is required to make some alternative arrangements, no claim on this account shall be entertained.

The contractor is cautioned to take necessary precautions in transportation of construction materials to avoid accidents.

63 Payment for Camp Construction

No payment will be made to the contractor for construction, operation and maintenance of camp and other camp facilities and the entire cost of such work shall be deemed to have been included in the tendered rate for the various items of work in the schedule of quantities and bids.

64 Explosive And Fuel Storage Tanks

No explosive shall be stored within 1/2 (half) KM of the limit of the camp sites. The storage of gasoline and other fuel oils or of Butane, Propane and other liquefied petroleum gases, shall conform to the regulations of Andhra Pradesh State Government and Government of India. The tanks, above ground and having capacity in excess of 2000 liters, shall not be located within the camp area, nor within 200m, of any building.

65 Labour:

The contractor shall, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

Labour importation and amenities to labour and contractor's staff shall be to the contractor's account. His quoted percentage shall include the expenditure towards importation of labour amenities to labour and staff; The contractor shall, if required by the Engineer-in-Charge, deliver to the Engineer-in-Charge a written in detail, in such form and at such intervals as the Engineer-in-Charge may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the contractor on the Site and such information respecting Contractor's Equipment as the Engineer-in-Charge may require.

65.1 Transportation of Labour:

- I. The contractor shall make his own arrangement for the daily transportation of the labour and staff from labour camps colonies to the work spot and no labour or staff of the contractor shall stay at the work spot. No extra payment will be made to the contractor for the above transportation of the labour and his quoted percentage to the work shall include the transportation charges of labour from colonies to work spot and back.
- II. The contractor will at all times duly observe the provisions of employment of children Act XXVI of 1938 and any enactment or modification of the same and will not employ or permit any person to do any work for the purpose under the provisions of this agreement in contravention of said Act. The contractor here by agrees to indemnify the Department / TSCCL Authority from and against all claims, penalties which may be suffered by the Department / TSCCL Authority or any person employed by the Department / TSCCL Authority by any default on the part of the contractor in the observance and performance of the provisions of the employment of children Act. XXVI of 1938 or any enactment or modification of the same.

As per Govt. memo No.721/Gr.(1)/81-35, dt:17.11.87. The contractor shall obtain the insurance at his own cost to cover the risk on the works to labour engaged by him during period of execution against fire and other usual risks and produce the same to the Executive Engineer concerned before commencement of work.

66 Safety Measures:

1. The contractor shall take necessary precautions for safety of the workers and preserving their health while working in such jobs, which require special protection and

precautions. The following are some of the measures listed but they are not exhaustive and contractor shall add to and augment these precautions on his own initiative where necessary and shall comply with directions issued by the Executive Engineer or on his behalf from time to time and at all times.

2. Providing protective foot wear to workers situations like mixing and placing of mortar or concrete sand in quarries and places where the work is done under much wet conditions.
3. Providing protective head wear to workers at places like underground excavations to protect them against rock falls.
4. Providing masks to workers at granulates or at other locations where too much fine dust is floating about and sprinkling water at frequent intervals by water hoses on all stone crushing area and storage bins abate to dust.
5. Getting the workers in such jobs periodically examined for chest trouble due to too much breathing in to fine dust. Taking such normal precautions like fencing and lightening in excavation of trenches, not allowing rolls and metal parts of useless timber spread around, making danger areas for blasting providing whistles etc.
6. Supply work men with proper belts, ropes etc., when working in precarious slopes etc.
7. Avoiding named electrical wire etc., as they would electrocute the works.
8. Taking necessary steps towards training the workers concerned on the machinery before they are allowed to handle them independently and taking all necessary precautions in around the areas where machines hoists and similar units are working.

67 Fair Wage Clause:

1. The contractor shall pay not less than fair wages to labours engaged by him on the work.
2. "Fair" wages means wages whether for time of piecework notified by the Government from time in the area in which the work is situated.
3. The contractor shall not with-standing the revisions of any contract to the contrary cause to be paid to the labour, in directly engaged on the work including any labour engaged by the sub-contractor in connection with the said work, as if the labours had been directly employed by him.
4. In respect of labour directly or indirectly employed in the works for the purpose of the contractors part of the agreement the contractor shall comply with the rules and regulations on the maintenance of suitable records prescribed for this purpose from

time to time by the Government. He shall maintain his accounts and vouchers on the payment of wages to the labourers to the satisfaction of the Executive Engineer.

5. The Managing Director, Tirupati Smart City Corporation Limited shall have the right to call for such record as required to satisfy himself on the payment of fair wages to the labours and shall have the right to deduct from the contract amount a suitable amount for making good the loss suffered by the worker or workers by reason of the "fair wages" clause to the workers.
6. The contractor shall be primarily liable for all payments to be made and for the observance of the regulations framed by the Government from time to time without prejudice to his right to claim indemnity from his sub-contractors.
7. As per contract labour (Regulation and abolition) Act. 1970 the contractor has to produce the license obtained from the licensing officers of the labour Department along with the tender or at the time of agreement.
8. Any violation of the conditions above shall be deemed to be a breach of his contract.
9. Equal wages are to be paid for both men and women if the nature of work is same and similar.
10. The contractor shall arrange for the recruitment of skilled and unskilled labour local and imported to the extent necessary to complete the work within the agreed period as directed by the Executive Engineer in writing.

68 Indemnity Bond:

NAME OF WORK : "Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati's ABD Area including O&M after DLP completion [from 3rd year] under Smart City Mission".

I _____ contractor S/o. _____ aged _____ Resident of _____ do hereby bind myself to pay all the claims may come (a) under Workmen's Compensation Act. 1933 with any statutory modification thereof and rules there under or otherwise for or in respect of any damage or compensation payable in connection with any accident or injury sustained (b) under Minimum wages Act 1948 (c) under payment of wages Act. 1936 (d) under the Contractor labour (Regulation and Abolition) Act. 1970 by workmen engaged for the performance of the business relating to the above contract i.e., failing such payment of claims of workmen engaged in the above work, I abide in accepting for the

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

recovery of such claims, effected from any of my assets with the Departments.

Signature of the tenderer

69 Compliance with Labour Regulations:

During continuance of the contract, the contractor and his sub-contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notifications that may be issued under any labour law in future either by the State or the Central Government or the local authority and also applicable labour regulations, health and sanitary arrangements for workmen, insurance and other benefits. Salient features of some of the major labour laws that are applicable to construction industry are given below. The contractor shall keep the Department indemnified in case any action is taken against Department by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments.

If the Department is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provision stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the contractor, the Engineer-in-charge /Department shall have the right to deduct any money due to the contractor including his amount of performance security. The Department /Engineer-in-Charge shall also have right to recover from the contractor any sum required or estimated to be required for making good the loss or damage suffered by the Department.

The employees of the Contractor and the Sub-contractor in no case shall be treated as the Department of the Department at any point of time.

70 Salient features of some major labour laws applicable to establishment engaged in buildings and other construction work:

- (a) Workmen compensation Act 1923: The Act provides for compensation in case if injury by accident arising out of and during the course of employment.
- (b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if any employee has completed 5 years service or more, or on death, the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments, employing 10 or more employees.
- (c) Employees P.F. and Miscellaneous provision Act 1952: The Act provides for monthly contributions by the Department plus workers @ 10% or 8.33%. The benefits payable under the Act are:
 - (i) Pension or family pension on retirement or death, as the case may be.
 - (ii) Deposit linked insurance on the death in harness of the worker.
 - (iii) Payment of P.F. accumulation on retirement/death etc.,
- (d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinements or miscarriage etc.
- (e) Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided by the Principal Department by Law. The Principal Department is required to take certificate of Registration and the contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Department if they employ 20 or more contract labour.
- (f) Minimum wages Act 1948: The Department is supposed to pay not less than the Minimum wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment construction of Buildings, Roads, Runways are scheduled employments.
- (g) Payment of wages Act 1936: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.
- (h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to Male or Female workers and for not making discrimination against Female employee in the matters of transfers, training and promotions etc.

- (i) Payment of Bonus Act 1965: The Act Is applicable to all establishments employing 20 or more employees. The Act provides for payment of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs. 3500/- per month or less. The bonus to be paid to employees getting Rs.2500/- per months or above and up to Rs.3500/- per month shall be worked out by taking wages as Rs.2500/- per monthly only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.
- (j) Industrial Disputes Act 1947: The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock- out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.
- (k) Industrial Employment (Standing Orders) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the State and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Department on matters provided in the Act and get the same certified by the designated Authority.
- (l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and Departments. The Trade Unions registered under the act have been given certain immunities from civil and criminal liabilities.
- (m) Child Labour (Prohibition & Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes, Employment Child Labour is prohibited in Building and Construction Industry.
- (n) Inter-State Migrant workmen's (Regulation of Employment & Conditions of service) Act 1979: The Act applicable to an establishment, which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another State). The inter State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home up to the establishment and back, etc.
- (o) The Building and Other Construction workers (regulation of Employment and conditions of service) Act 1996 and the Cess Act of 1996: All the establishments who

carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Department of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Department to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

- (p) **Factories Act 1948:** The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 person or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

71 Liabilities of the Contractor

71.1 Accident Relief and workmen compensation:

The contractor should make all necessary arrangements for the safety of workmen on the occurrence of the accident, which results in the injury or death of any of the workmen employed by the contractor, the contractor shall within 24 hours of the happenings of the accident and such accidents should intimate in writing to the concerned Asst. Engineer / Asst. Executive Engineer of the Department / TSCCL Authority the act of such accident. The contractor shall indemnify Government / TSCCL Authority against all loss or damage sustained by the Government / TSCCL Authority resulting directly or indirectly from his failure to give intimation in the manner aforesaid including the penalties or fines if any payable by Govt. as a consequence of Govt. failure to give notice under workmen's compensation Act or otherwise conform to the provisions of the said Act. In regard to such accident. In the event of an accident in respect of which compensation may become payable under the workmen's compensation Act VIII 23 whether by the contractor, by the Government it shall be lawful for the Executive Engineer to retain such sum of money which may in the opinion of the Executive Engineer be sufficient to meet such liability. The opinion of the Executive Engineer shall be final in regard to all matters arising under this clause.

71.1 The contractor shall at all times indemnify the Govt. of A.P. against all claims which may be made under the workmen's compensation act or any statutory modification thereafter or rules there under or otherwise consequent of any damage or compensation payable in consequent of any accident or injuries sustained or death of any workmen engaged in the performance of the business relating to the contractor.

72 Contractor's Staff, Representatives and Labour:

- (a) The contractor shall, at all times, maintain on the works, staff of qualified Engineers, and Supervisors of sufficient experience of similar other jobs to assure that the quality of work turned out shall be as intended in the specifications. The contractor shall also maintain at the works, a Work Manager or sufficient status, experience and office and duly authorise him to deal with all aspects of the day-today work. All communications to any commitments by the Work Manager shall be considered as binding on the Contractor.
- (b) The Contractor shall at all times submit details of skilled and unskilled labour and equipment employed to the Engineer-in-Charge in prescribed proforma as he may require to assess and ensure the proper progress of work.
- (c) If the contractor does not employ the technical person agreed to on the work a fine of Rs.25,000/- will be imposed. If he does not employ for 30 days, thereafter it becomes a fundamental breach of contract.

73 Accommodation and food:

The contractor should arrange accommodation he needs, at his own cost. The contractor shall make his own arrangements for supply of food grains, fuel and other provision to his staff and labourers including controlled commodities.

74 Relationship:

Contractor shall have to furnish information along with tender, about the relationship he is having with any officer of the Department, Government of Andhra Pradesh / TSCCL Authority of the rank Assistant Engineer and above engaged in the work and any officer of the rank of Assistant Secretary and above of the Department of Government of Andhra Pradesh / TSCCL Authority.

75 Protection of adjoining premises:

The contractor shall protect adjoining sites against structural, decorative and other damages that could be caused by the execution of these works and make good at his cost any such damages.

76 Work during night or on Sundays and holidays:

The works can be allowed to be carried out during night, Sundays or authorised holidays in order to enable him to meet the schedule targets and the work shall require almost round the clock working keeping in view:

- (i) The provisions of relevant labour laws being adhered to:
- (ii) Adequate lighting, supervision and safety measures are established to the satisfaction of the Engineer-in-Charge and
- (iii) The construction programme given by the Contractor and agreed upon by the Engineer-in-Charge envisages such night working or working during Sundays or authorised holidays.

77 Layout of materials stacks:

The contractor shall deposit materials for the purpose of the work on such parts only of the ground as may be approved by the Engineer-in-Charge before starting work. A detailed survey, clearly indicating position and areas where materials shall be stacked and sheds built is to be conducted by the contractor at his own cost and only after obtaining necessary approval of the plan for use of sites by the Engineer-in-Charge, the Contractor can use the sites accordingly.

78 Use of blasting materials:

Procurement of blasting materials and its storage is the responsibility of the contractor. The contractor shall engage licensed blaster for blasting operation. The contractor is to act in accordance with Indian Explosive Act and other rules prevailing, during the execution of work. It is the responsibility of the contractor to see, that works by other agencies in the vicinity are not hampered, in such cases if any claim is made by other agencies that should be borne by the contractor. Carriage of blasting materials, from the magazine to the work site, is the responsibility of the contractor.

79 Equipment:

79.1 The contractor shall have sufficient equipment and labour and shall work such hours and shifts as may be necessary to maintain the progress on the work as per the approval

progress schedule. The working and shifts hours shall comply with the Govt. Regulations in force.

79.2 It is to expressly and clearly understood that contractor shall make his own arrangements to equip himself with all machinery and special tools and plant for the speedy and proper execution of the work and the Department / TSCCL Authority does not undertake responsibility towards their supply.

79.3 The Department / TSCCL Authority shall supply such of the machinery that may be available on hire basis but their supply cannot be demanded as matter of right and no delay in progress can be attributed to such non-supply of the plant by the Department / TSCCL Authority and the Department / TSCCL Authority cannot be made liable for any damage to the contractor. The Contractor shall be responsible for safe custody of the Departmental / TSCCL Authority machinery supplied to him (which will be delivered to contractor at the machinery yard at site of work) and he has to make good all damages and losses if any other than fire, wear and tear to bring it to the conditions that existed at the time of issue to the contractor before handing over the same to the Department / TSCCL Authority. The hire charges for the machinery handed over to the contractor will be recovered at the rate prevalent at the time of supply. The contractor will have to execute supplemental agreement with Executive Engineer at the time of supply of the machinery.

79.4 The acceptance of Departmental / TSCCL Authority machinery on hire is optional to the contractor.

80 Steel/Plywood forms:

Steel/ Plywood forms should be used for all items involving and use of centering and shuttering shall be single plane without any dents and undulations.

81 Inconvenience to public:

The contractor shall not deposit materials at any site, which will cause inconvenience to public. The Engineer-in-Charge may direct the contractor to remove such materials or may undertake the job at the cost of the contractor.

82 Conflict of interest:

Any bribe, commission, gift or advantage given, promised or offered by on behalf of contractor or his partner, agent or servant or any one on his behalf to any officer, servant, representatives, agents of Engineer-in-Charge, or any persons on their behalf, in

relation to the obtaining or to execution of this, or any other contract with Engineer-in-Charge shall in addition to any criminal liability, which it may occur, subject to the cancellation of this or all other contracts and also to payment of any loss or damage resulting from any such cancellation. Engineer-in-Charge shall then be entitled to deduct the amount, so payable from any money, otherwise due to the contractor under this or any other contract.

83 Contract documents and materials to be treated as confidential:

All documents, correspondences, decisions and orders, concerning the contract shall be considered as confidential and/or restricted in nature by the contractor and he shall not divulge or allow access to them by any unauthorised person.

84 General obligations of Contractor:

84.1 The contractor shall, subject to the provision of the contract and with due care and diligence, execute and maintain the works in accordance with specifications and drawings.

84.2 The contractor shall promptly inform the Department / TSCCL Authority and the Engineer-in-Charge of any error, omission, fault and such defect in the design of or specifications for the works which are discovered when reviewing the contract documents or in the process of execution of the works.

84.3 If Contractor believes that a decision taken by the Engineer-in-Charge was either outside the authority given to the Engineer-in-Charge by the Contract or that the decision was wrongly taken, the decision shall be referred to the technical expert within 14 days of the notification of the Engineer-in-Charge's decisions.

84.4 Pending finalisation of disputes, the contractor shall proceed with execution of work with all due diligence.

85 Security measures:

- a) Security requirements for the work shall be in accordance with the Government's general requirements including provisions of this clause and the Contractor shall conform to such requirements and shall be held responsible for the actions of all his staff, employees and the staff and employees of his sub-contractors.
- b) All contractors' employees, representatives and sub-contractor's employees shall wear identifications badges provided by the contractor. Badges shall identify the contractor,

showing and employee's number and shall be worn at all times while at the site. Individual labour will not be required to wear identification badges.

- c) All vehicles used by the contractor shall be clearly marked with contractor's name.
- d) The contractor shall be responsible for the security of the works for the duration of the contract and shall provide and maintain continuously adequate security personnel to fulfill these obligations. The requirements of security measures shall include, but not limited to maintenance of order on the site, provision of all lighting, fencing, guard flagmen and all other measures necessary for the protection of the works within the colonies, camps and elsewhere on the site, all materials delivered to the site, all persons employed in connection with the works continuously throughout working and non-working period including nights, Sundays and holidays for duration of the contract.
- e) Other contractors working on the site concurrently with the contractor will provide security for their own plant and materials. However, their security provisions shall in no way relieve the contractor of his responsibilities in this respect
- f) Separate payment will not be made for provision of security services.

86 Firefighting measures:

- a) The contractor shall provide and maintain adequate firefighting equipment and take adequate fire precaution measures for the safety of all personnel and temporary and permanent works and shall take action to prevent damage to destruction by fire of trees shrubs and grasses.
- b) Separate payment will not be made for the provision of fire prevention measures.

87 Sanitation:

The contractor shall implement the sanitary and watch and ward rules and regulations for all forces employed under this contract and if the Contractor fails to enforce these rules, the Engineer-in-Charge may enforce them at the expenses of the Contractor.

88 Training of personnel:

The contractor, shall, if and as directed by the Engineer-in-Charge provide free of any charge adequate facilities, for vocational training of Government Officers, students, Engineers, supervisors, foremen, skilled workmen etc. not exceeding six in number at any one time on the contractor's work. Their salaries, allowances etc. will be borne by

the Government and the training schemes will be drawn up by the Engineer-in-Charge in consultation with the contractor.

89 Ecological balance:

- a) The contractor shall maintain ecological balance by preventing de-forestation, water pollution and defacing of natural landscape. The contractor shall so conduct his construction operation as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. In respect of the ecological balance, Contractor shall observe the following instructions.
 - i) Where unnecessary destruction, scarring, damage or defacing may occur, as result of the operation, the same shall be repaired replanted or otherwise corrected at the contractor's expense. The contractor shall adopt precautions when using explosives, which will prevent scattering of rocks or other debris outside the work area. All work area including borrow areas shall be smoothened and graded in a manner to conform to the natural appearances of the landscape as directed by the Engineer-in-Charge.
 - ii) All trees and shrubbery which are not specifically required to be cleared or removed for construction purposes shall be preserved and shall be protected from any damage that may be caused by the contractor's construction operation and equipment. The removal of trees and shrubs will be permitted only after prior approval by the Engineer-in-Charge. Special care shall be exercised where trees or shrubs are exposed to injuries by construction equipment, blasting, excavating, dumping, chemical damage or other operation and the contractor shall adequately protect such trees by use of protective barriers or other methods approval by the Engineer-in-Charge. Trees shall not be used for anchorages. The contractor shall be responsible for injuries to trees and shrubs caused by his operations. The term "injury" shall include, without limitation bruising, scarring, tearing and breaking of roots, trunks or branches. All injured trees and shrubs be restored as nearly as practicable without delay to their original condition at the contractor's expense.
 - iii) The contractor's construction activities shall be performed by methods that will present entrance or accidental spillage of solid matter contaminants, debris and other objectionable pollutants and wastage into river. Such pollutant and waste include earth and earth products, garbage, cement concrete, sewage effluent,

industrial wastes, radio-active substances, mercury, oil and other petroleum products, aggregate processing, mineral salts and thermal pollution. Pollutants and wastes shall be disposed off in a manner and at sites approved by the Engineer-in-Charge.

- iv) In conduct of construction activities and operation of equipments the contractor shall utilise such practicable methods and devices as are reasonably available to control, prevent and otherwise minimise the air pollution. The excessive omission of dust in to the atmosphere will not be permitted during the manufacture, handling and storage of concrete aggregates and the contractor shall use such methods and equipment as a necessary for collection and disposal or prevention of dust during these operation. The contractor's methods of storing and handling cement shall also include means of eliminating atmospheric discharges of dust, equipment and vehicles that give objectionable omission of exhaust gases shall not be operated. Burning of materials resulting from clearing of trees, bushes, combustible construction materials and rubbish may be permitted only when atmospheric conditions for burning are considered favourable.
- b) Separate payment will not be made for complying with the provisions of this clause and all cost shall be deemed to have been included in the unit rates and prices included in the contract if any provision is not complied with within a reasonable time even after issue of a notice in this respect, the necessary operations would be carried out by the Engineer-in-Charge at the cost of the Contractor, Orders of the Engineer-in-Charge in this respect would be final and binding on the contractor.

90 Preservation of existing Vegetation:

- a) The contractor will preserve and protect all existing vegetation such as trees, on or adjacent to the site which do not unreasonably interfere with the construction as may be determined by the Engineer-in-Charge. The contractor will be held responsible for all unauthorized cutting or damage of trees, including damage due to careless operation of equipment, stockpiling of materials or trecking of grass areas by equipment. Care shall be taken by the Contractor in felling trees authorised for removal to avoid any unnecessary damages to vegetation and tress that are to remain in place and to structures under construction or in existence and to workmen.

- b) All the produce from such cutting of trees by the contractor shall remain the property of Government and shall be properly stacked at site, approved by the Engineer-in-Charge. No payment whatsoever, shall be made for such cutting and its stacking by the Contractor. If any produce from such cutting is not handed over to the Government by the contractor, he shall be charged for the same at the rates to be decided by the Engineer-in-Charge. The recovery of this amount shall be made in full from the intermediate bill that follows.
- c) The contractor shall also make arrangements of fuel deposits for supply of required fuel for the labourer to be employed for cooking purpose at his own cost in order to prevent destruction of vegetation growth in the surrounding area of the work site.

91 Possession prior to Completion:

The Engineer-in-charge shall have the right to take possession of or use any completed part of work or works or any part thereof under construction either temporarily or permanently. Such possession or use shall not be deemed as an acceptance of any work either completed or not completed in accordance with the contract with in the interest of Clause 28 of APSS except where expressly otherwise specified by the Engineer-in-charge.

Payment upon Termination:

If the contract is terminated because of a fundamental breach of contract by the contractor, the Engineer-in-Charge shall issue a certificate for the value of the work done less advance payment received upon the date of the issue of the certificate and less the percentage to apply to the work not completed as indicated in the contract data. Additional liquidated damages shall not apply. If the total amount due to the Department / TSCCL Authority exceeds any payment due to the contractor the difference shall be a debt payable to the Department / TSCCL Authority. In case of default for payment within 28 days from the date of issue of notice to the above effect, the contractor shall be liable to pay interest at 12% per annum for the period of delay.

92 Access to the contractor's books:

Whenever it is considered necessary by the Engineer-in-Charge to ascertain the actual cost of execution of any particular extra item of work or supply of the plant or material on which advance is to be made or of extra items or claims, he shall direct the contractor to produce the relevant documents such as payrolls, records of personnel, invoices of materials and any or all data relevant to the item or necessary to determine its cost etc.

and the contractor shall when so required furnish all information pertaining to the aforesaid items in the mode and manner that may be specified by the Engineer-in-Charge.

93 Drawing to be kept at site:

One copy of the drawings furnished to the contractor shall be kept by the contractor on the site and the same shall at all reasonable time be available for inspection and use by the Engineer-in-Charge and the Engineer-in-Charge's representative and by any other persons authorised by the Engineer-in-Charge in writing.

94 B.I.S. [I.S.I.] books, MoRT&H / APSS to be kept at site:

A complete set of Indian Standard specification, MoRT&H Specification (4th revision referred to in "Technical Specifications" and A.P.S.S. shall be kept at site for reference.

95 Site Order Book:

An order book shall be kept at the site of the work. As far as possible, all orders regarding the work are to be entered in this book. All entries shall be signed and dated by the Department Officer / TSCCL Authority in direct charge of the work and by the contractor or by his representative. In important cases, the Managing Director, Tirupati Smart City Corporation Limited, Tirupati will countersign the entries, which have been made. The order book shall not be removed from the work, except with the written permission of the Executive Engineer.

96 Variations by way of modification, omissions or additions:

For all modifications, omissions from or additions to the drawings and specifications, the Managing Director, Tirupati Smart City Corporation Limited, Tirupati will issue revised plans, or written instructions, or both and no modification, omission or addition shall be made unless so authorised and directed by the Managing Director, Tirupati Smart City Corporation Limited, Tirupati in writing.

The Managing Director, Tirupati Smart City Corporation Limited, Tirupati shall have the privilege of ordering modifications, omission or additions at any time before the completion of the work and such orders shall not operate to annul those portions of the specifications with which said changes do not conflict.

Engineer-in-Charge's Decision: It shall be accepted as in separable part of the contract that in matters regarding materials, workmanship, removal of improper work, interpretation of the contract drawings and contract specification, mode of the procedure and the carrying out of the work, the decision of the Engineer-in-Charge, which shall be given in writing shall be binding on the contractor.

97 Care and diversion of River/Stream:

The contractor shall submit details regarding the diversion and care of river or stream during construction of the work along with a separate print-out of the time table showing earliest and latest start and finish dates of various activities. He should submit a detailed layout plan with drawings for the diversion and care of river during construction of work. The above arrangements shall be at contractor's cost.

98 Income tax;

- a) During the currency of the contract deduction of income tax shall be made from the gross value of each bill of the contract, the contract value of which is in excess of Rs.10,000/- for deduction of tax procedure stipulated under section 194-C(4) of Income Tax Act, 1961 and applicable as per the prevailing Government Orders & Circulars on total value of the contract
- b) Income Tax clearance certificate should be furnished before the payment of final bill.
- c) The contractor's staff, personnel and labour will be liable to pay personnel income taxes in respect of their salaries and wages as are chargeable under the laws and regulations for the time being in force, and the contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such laws and regulations.

99 Seigniorage charges: Go. Ms No.100, I & C(M1) Dept., Dt.31.10.2015 and as amended from time to time

The Seigniorage charges will be recovered from the contractors bills as per rules or as per the rates fixed by the Mines & Geology Department from time to time as on Date of recording measurements in measurement books whichever is higher for the materials consumed theoretically on the work only.

- 100.1 The rates are liable to be revised and amended from time to time by the State Government by notification in the Andhra Pradesh Gazetted, If the revised seigniorage

fee is more than the above mentioned, the recovery from the contractor's bill is as per revised rates.

- 100.2 An amount of 0.10% of the gross bills will be deducted from contractors as their contribution to the National Academy of Construction (NAC), Hyderabad and 0.15% towards Chief Ministers Relief fund as per G.O.Ms.No.159 T(R&B) R.III Dept., dt.30.10.2004.
- 100.3 The percentage quoted by the Contractor is exclusive of Seigniorage charges on all materials that the contractor will have to purchase for performance of this contract.
- 100.4 Seigniorage component loaded in Part-B of the estimate shall be added in each bill of the Contractor and recovered.

101 Goods and Services Tax (GST):

- 101.1 **Tax during the currency of the contract, deduction according to which tax has to be deducted.**
- 101.2 The tax to be deducted at source as per GST 2017 applicable as per the prevailing Government Orders & Circulars on total value of the contract.
- 101.3 The percentage quoted by the contractor is inclusive of Goods Service Tax (GST) and other taxes on all materials that the contractor will have to purchase for performance of this contract.
- 101.4 GST component as per applicable of the estimate shall be added in each bill of the Contractor and recovered

102 Labour CESS: As per the Building and other Construction Workers Welfare CESS Act, 1996, Section 3 of CESS Act, read with rule 4(3) of the cases rules and in accordance with S.O.No.2899, dt.28-03-1996 of Government of India, 1% CESS will be deducted from the bills paid for works from the contractor. The deducted amount will be remitted by way of challan to be payable in any branches of Andhra Bank to the savings Bank Account No. 805015 of the labour Commissioner office Extension counter (code No. 9039) as per the procedure prescribed under G.O.Ms.No.42 of LET&F Department, dt.30 -04-2007.

103 Supply of construction materials:

- i) The contractor has to make his own arrangements for procurements, supply and use of construction materials.
- ii) All materials so procured should confirm to the relevant specifications indicated in the bidding documents.

- iii) The contractor shall follow all regulations of the Department / TSCCL Authority/Government of India in respect of import licenses etc., of the procurement of the materials is through imports and he shall be responsible for the payment of applicable duties and taxes, port clearances, inland transportation etc.
- iv) The contractor shall make his own arrangements for adequate storage of the materials.
 - a. The contractor shall purchase Bitumen / Emulsion only from the reputed firm i.e., HPCL, BPCL and IOCL.
 - b. The contractors shall produce original bills towards purchase of bitumen / emulsion while submitting the bills for payment.

Executive Engineer Concerned should endorse the name of work on the bills / vouchers / invoices for which the bitumen / emulsion is utilized to avoid reuse of bills on other works.

The contractors shall order and procure the bitumen / emulsion work wise so that the contractor obtain invoice / bills work wise and submit the same to the Executive Engineer concerned while preparing the bills.

The contractor shall procure required quality control equipment, which is required for day-to-day laboratory tests and also to procure any other equipment, which is essential during the work period.

FOOT NOTE ON SPECIAL CONDITIONS

1. Each allottee of the house knows his/her particular allotted houses. As such the allottee will be participating in the day to day construction. In addition to the Department officers / TSCCL Authority, External quality control personnel will be inspecting the site. The successful tenderer should not feel as a hindrance but should cooperate for the participation and suggestions given by the allottees and quality control authorities. The Department / TSCCL Authority will pay to the amount to the work done bills as on when the funds available in the corporation. The interest the pending bills not paid to the contractor.
2. The deposit amount will be returned to the unqualified unsuccessful tenderers only after 3 months from the date of opening of tenders of finalization of the tender whichever is earlier.
3. All test charges as directed by the Department / TSCCL Authority from time to time should be born by the contractor.

4. Water suitable for construction should be procured by the contractor and Department / TSCCL Authority will not show the source and will not entertain any expenditure for getting suitable water.
5. The contractor shall make his own arrangements for obtaining temporary power supply from APSEB.
6. Any suspected right formation by the contractors altogether be discourage and if found all the tenders will be cancelled duly forfeiting the amounts deposited.
7. All certificates ((including (2 AN-B)) if found false, the deposited amount by the contractor will be forfeited in addition to recommend for black listing.
8. **The successful tenderer should conclude the Agreement within seven days of time from the date of receipt of letter of acceptance (LOA) from the MD, TSCCL, TSCCL duly filling the formalities like Bank Guarantee etc., on failure to do so his tender will be cancelled duly forfeiting the EMD paid by him without assigning any further notice.**
9. **The date of agreement will be taken as handing over of site and commencement of the scheme for all purposes.**
10. If the contractor fails to complete whole of the works or any part thereof or section of the works within the stipulated periods, the MD, TSCCL may be out prejudice to any other method of recovery will deduct 1.10 of 1% of contract value per calendar day or part of the day for the period of delays subject to a maximum of 10% of the contract value.
11. The contractor is bound to execute all supplemental items that are found essential, incidental, contingent to work and inevitable during the execution of work either in connection with civil or amenities without any financial and quantitative limitations of the Department / TSCCL Authority insists during the agreement period. He should not claim any extra over the supplemental rate as derived from the agreement conditions/APSS.
12. The successful tenderer is bound to Execute 50% of the houses in excess at agreement rates and specifications as in Schedule-A without any escalation in rates. Necessary EOT will be granted without imposing any liquidated damages within the specified time.
13. A minimum quantity of 380 Kgs. of cement per one cubic meter shall be used for VRCC M30 Grade design Mix.
14. All the items mentioned in the Schedule-A include all leads and lifts and depositing the earth as directed by the Department / TSCCL Authority, shoring shuttering, bailing out

water and cost & conveyance of all materials at site of work scaffolding steel centering, machine mixing, laying, vibration with Pin/Pan Vibrator, curing, tamping ramming etc., with all incidental re-handing operations etc., complete required for finished item of works. All RCC items should be finished neatly, if needed at the contractors cost.

15. All rates quoted should include water leads if any contractor should make his own arrangement for obtaining water at site, Department / TSCCL Authority will not pay charges extra towards water leads and will not undertake to indicate source.
16. Water used for mixing Mortar or Concrete and for curing shall be clean and free from injurious amounts of deleterious materials such as oils, acids, alkalis, salts, site an organic matter etc., and materials which may cause discoloration as per APSS No 129
17. FOUNDATIONS & BASEMENT FILLINGS: The rate should include earthing, unloading, conveyance, spreading, watering, tamping etc., all operations complete. Clay and expansive type of soils shall not be used for filing purpose.
18. All the brick work should be with Fal-G bricks of size as required and of crushing strength not less than 50 Kgs./sq/cm.
19. All special specifications as directed by the Commissioner, TSCCL concerned and as per drawing supplied form time to time during the execution of work.
20. The fixtures and furniture's to be provided for the Doors & Windows by the contractors as per ISI standards.
21. All stones used shall be cleaned and are of uniform Colours, texture, strong hard and durable as indicated in clause 107.1 table 107.A and nominal sizes and corresponding grading for single sized and graded aggregated in clause 108 (1 – 1) table 108 – A and Table 108 – B of A.P.S.S.
22. The site should be cleared and leveled up to the extent of the plot of the building before the excavation is started and also when building is completed, no extra payment will be made for such leveling of site and rate of excavation of foundation should be quoted taking this contingency into account in case of sloped grounds.
23. Dead mortar shall be removed every day after day's work.
24. For reinforced cement mortar, pre-case jallies items the rate is inclusive of steel and cement etc., complete and no separate issue of steel and cement will be made towards these items.
25. Final payment shall be made on checking of surfaces and slopes etc., complete by the authority of Department / TSCCL Authority.

26. Contractor shall maintain a Register indicating results of Quality Control tests including cement, steel water, Fine aggregated and Coarse Aggregate. The test charges born by the contractors.
27. PLASTERING: In case of discontinuity in back ground (i.e., at the junction of brick masonry portion and RCC Portion. The two portions shall be separated by a neat cut or groove in plastering when it is green at all such junction portion. The rate for internal and external plastering shall be inclusive of making a neat cut groove. No separate rate will be paid for making neat cut or groove except the agreement rate for external or internal plastering vide A.P.D.S.S. specification No. 901.3.5
28. The contractor should bring his own concrete mixtures, Plate Vibrator, Pin Vibrator.
29. Seigniorage charges will be deducted from the work bills as per G.O.Ms. No. 217 Industries & Commerce (M-1) Department dt 29.9.2004 and Memo NO. 1398/TAR/2004 dt 4.10.2004 Deputy Director of Mines and Geology and applicable as per the prevailing Government Orders & Circulars.
30. Test charges of Fal-G brick, Sand, Motor, Concrete, Cement & Steel and any material supplied by the contractor and finished work done by the contractor should be borne by the contractor only.
31. No charges towards re handling of excavated soil will be payable. All excavated materials will have to be deposited at places shown by the Engineer.
32. GST will be recovered from the bills as per existing GST rules.
33. The rates of above items should be inclusive of all taxes and Seigniorage charges.
34. It is to be expressly understood that the measured work is to be taken net (not withstanding any custom or practice to the contrary) according to the actual quantities placed and finished according to the drawings or may be ordered from time to time by the Deputy Executive Engineer and the cost calculated by measurement or weight at the respective prices without any additional charge for any necessary or contingent works connected therewith.
35. All items of work will have to be executed as per standard specifications laid down in APSS and the special specifications and general features of design attached herewith. The quoted offer shall include all operations described in the said specifications and general features and shall be inclusive of all charges such as leads, lifts, classification, incidental charges, all taxes, royalties, hire and operational charges of all T & P security measures etc., complete.
36. Vernacular signature should be translated into English.

37. Additions and alternations in schedules or conditions will disqualify the tender.
38. Steel/Plywood centering should be used for all members involving the user of centering.
39. The tenderer should inspect the site & checkup the possible water sources for carrying out work throughout the year, monsoons, or non-monsoon seasons irrespective of the quantum of rainfall and quote their offer accordingly. No subsequent claims for extra water leads will be entertained under any circumstances.
40. The contractor will not be entitled to claim any interest on arrears which he may be get on the final settlement of accounts.
41. The contractor shall make his own arrangements for the acquisition of stone and other quarries etc., at his own cost.
42. An amount of 0.10% of the gross bills will be deducted from contractors as their contribution to the **National Academy of Construction (NAC)**, Hyderabad and 0.15% towards Chief Ministers Relief fund as per G.O.Ms.No.159 T(R&B) R.III Dept., dt.30.10.2004
43. All RCC items of works should carry out as per the specifications of IS 456 – 1978 & 2000 and BIS 1983 and other relevant IS codes as amended upto date.

Volume 4: Technical Specifications

Parks and Open Spaces

Specification document for Landscape Parks

TABLE OF CONTENTS

Volume 4: Technical Specifications	141
1. General Landscape Requirement	147
1.1 Project Details:	147
1.1.1 General Description	147
1.1.2 Purpose of Specification	147
1.1.3 Scope of Specification	147
1.1.4 List of relevant drawings and document	148
1.1.5 Terminologies	149
1.2 Site Management:	149
1.2.1 General Description	149
1.2.2 Site Management Plan	150
1.3 Health and Safety:	150
1.3.1 General Description	150
1.3.2 Health and Safety Plan	151
1.3.3 Environmental Management	151
1.3.4 Moisture	152
1.3.5 Preservation of Existing Features, Vegetation & Services	152
1.3.6 Guidelines for Trees to be removed	153
1.3.7 Guidelines for Trees to be retained	153
1.3.8 Guidelines for Existing Services	153
1.3.9 Protection of Existing Property	154
2. Specific Landscape Requirement	155
2.1 Scope of Work:	155
2.1.1 Site Preparation	155
2.1.2 Site Survey	155
2.1.3 Site Investigation	155
2.2 Demolition & Site Clearance:	157
3. Earthworks	159
3.1 General items:	159
3.1.1 Preservation of Existing top soil	159
3.1.2 Excavation	160
3.1.3 Filling	162
3.2 Anti-Termite Treatment:	165
3.2.1 Chemicals	165
3.2.2 Application	165
4. Hardscape Specification	167
4.1 Brickwork/ masonry work:	167
4.2 Stone work:	168
4.3 Concrete work:	170
4.4 Mortar:	173
4.5 Cement Plastering:	175
4.6 Wood work:	176
4.7 Bamboo work	178
4.8 Steel Supply and Installation:	181
4.9 Stainless Steel Works:	185
4.9.1 Material	185
5. Landscape Elements Specifications	187
5.1 Kerbs and Edges:	187
5.1.1 Relevant Drawing and Documents	187
5.1.2 General quality	187
5.1.3 Material Samples Required	187

5.1.4	Delivery, Storage, and Handling.....	187
5.2	Natural Precast Concrete Flushed Kerb:	188
5.3	Brick Kerb:	188
5.4	Concrete Kerbs:	189
5.5	Paving:	190
5.5.1	Scope.....	190
5.5.2	Relevant Drawing and Documents.....	190
5.5.3	Quality Assurance.....	190
5.5.4	Delivery, Storage, and Handling.....	191
6.	Paving Types.....	192
6.1	Concrete Pavers –paving type:	192
6.2	EPDM Flooring –Paving type:	192
6.3	Brushed Concrete Finish –paving type:	193
6.4	Steel Trowel Concrete Finish –paving type:	193
6.5	Wood Float Concrete Finish –paving type:	194
6.6	Broom finish on Concrete:	194
6.7	Exposed Aggregate Concrete Finish – paving type:	195
6.8	Morrum or Earth Path	196
6.8.1	Aggregate for Concrete	196
6.9	Pedestrian Ramps:	196
6.9.1	Civil Material.....	197
6.10	Steps:	197
7.	Pergolas, Stage or Pavilion.....	199
7.1	Civil Material:	199
7.2	Miscellaneous items used in execution of Paving:	199
7.3	Execution of Pavement Work:	200
7.4	Laying Concrete:	200
7.5	Laying Natural Stone/ Tile Paving:	200
7.6	Wall Coping and Cladding:	201
7.6.1	Scope.....	201
7.6.2	Relevant Drawing and Documents	201
7.6.3	Quality assurance.....	201
7.6.4	Delivery, Storage, and Handling.....	202
8.	Wall Types.....	203
8.1	Brick Wall:	203
8.1.1	Technical Specifications.....	203
8.2	Brick Wall with GI Fencing:	203
9.	Landscape Elements, Site Furniture/ Equipment.....	205
9.1	Relevant Drawing and Documents:	205
9.1.1	Quality Assurance.....	205
9.1.2	Delivery, Storage, and Handling.....	206
9.2	Landscape Elements:	206
9.2.1	Seating: Types.....	206
9.2.2	Pergola structure.....	206
9.2.3	Handrail.....	206
9.2.4	Gate	207
9.3	Play Equipment:	207
9.3.1	Relevant Drawing and Documents	207
9.3.2	Quality Assurance.....	207
9.4	Lighting:	210
9.4.1	Scope of Work.....	210
9.4.2	Objectives.....	210
9.5	Softscape works:	211
9.5.1	Scope of Work.....	211

9.5.2	Objectives.....	211
1.	Topsoil:.....	211
2.	Site Topsoil Preparation:.....	213
3.	Grass Surfaces Turf:.....	214
4.	Grass Surfaces Direct Seeding:.....	215
9.6	Plants:.....	215
9.6.1	Placing plants	216
9.6.2	Transplanting trees	217
9.6.3	Delivery storage and handling.....	218
12.	Area Filling, Embankment and Land Development.....	250
14.	Measurement for Payment.....	251
15.	QUALITY CONTROL LAB- TEST PARTICULARS.....	251
17.	TESTING CHARGES.....	253

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

1. General Landscape Requirement

1.1 Project Details:

1.1.1 General Description

Proposed landscape design focusses on landscape interventions which encourage more of physical activities for all age groups along with passive spaces for cultural and social diversity.

Interventions such as paving material, seating, street furniture play equipment and planting palette are basic components

1.1.2 Purpose of Specification

The hardscape and softscape specification defines the requirements and gives guidance for implementation and maintenance of the hard and soft landscape works.

1.1.3 Scope of Specification

The specification describes the general requirements for landscape elements in the landscape works. The works under this section include but are not limited to the following:

EARTHWORKS

Ground works general, protection of existing trees, site clearance, excavation, placing, ground shaping, grading and compacting earth fill, installation of geotextile and earth reinforcement. Earthworks exclude slope protection, compaction and reinforcement;

CIVIL WORKS (MASONRY WORKS –BRICK & STONE; CONCRETE WORK)

The general requirements for brick and stone masonry to Engineer's concrete structure for external wall surfaces, also all allied works including all materials, labour, curing, scaffolding, tools etc. ;

WOOD & BAMBOO WORK

Section includes relevant information related to material availability, treatment & preservation, application in different landscape elements with respect to technical information and relevant drawings and documents;

METAL WORK

The general requirements of metal work for different landscape structures and furniture in coordination with structural consultant;

KERBS AND EDGES

Section includes application of work for kerbs, edges etc, as well as all allied works;

PAVING

Section includes application of work for surface finishes to walkways, paths etc as well as all allied works;

WALL FINISH

The general requirements for stone masonry and wall cladding to Engineer's concrete structure for external wall surfaces, also all allied works including all materials, labour, curing, scaffolding, tools etc;

LANDSCAPE SOFTSCAPE WORKS

All planting and grassing works associated or implied within the landscape plan or the specifications.

LANDSCAPE FEATURES & SITE FURNITURE

All landscape features as per landscape package .

PAINTING

All paints and coating on floors, walls, landscape structures and all allied works;

1.1.4 List of relevant drawings and document

This specification to be read in conjunction with:

- Landscape Drawing Package;
- Bills of Quantities;
- Relevant Indian Standards as listed in Annexure;
Note: If work item is not included in Indian Standards, appointed contractor should refer to relevant international standard (BS or equivalent). This should be approved by Client's representative prior to commencing any works on site;
- Other documents – any documents not included above but relevant to the tender process. These should be provided /made available to Contractor by the Client/Client's representative if applicable.

1.1.5 Terminologies

In the Specification and other Documents forming part of the Contract, the following expressions and words shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them:

"Approved" or "approval"	means approved by or approval of, the Client's Representative
"Submitted" or "submit"	means submitted to or submit to the Client's Representative in writing prior to commencing works
"Accepted" or acceptance"	means accepted by or acceptance of, the Client's Representative
"As shown on Drawings"	means all works required to conform with the intent shown on the landscape drawings whether or not specifically described in these documents/drawings but are necessary for the full and satisfactory completion of the Contract Works
"As required"	means as required to satisfactory standard match the description in the Specification and other Documents forming part of the Contract

1.2 Site Management:

1.2.1 General Description

- Prior to site handover to the Landscape Contractor, Landscape Contractor should prepare and get written approvals of Site Management Plan.
- After the handover of the site to the Landscape Contractor, site preparation measures have to be taken up before the commencement of work.

1.2.2 Site Management Plan

- Plan to be prepared by Contractor and approved by the Client/Client's representative prior to handover of the site.
- Plan should be followed during Construction
- Plan should comply with all relevant statutory regulations as well as Health and safety requirements (as per "*Section 1.6.3. Health and Safety*", of this Specification)
- Plan should include and detail the following items;
- Detailed information on site preparation measures to be taken up before commencement of works as well as during the works and maintenance period;
- Clear site arrangement layout for temporary structures, storage, water, electricity supply, vehicular circulation and parking areas etc.
- Method statements on how site management will be carried out;
- Details of management structure and responsibilities, with clearly stated points of contact;
- Communication procedure within site team;
- Procedures for informing other contractors and employees of site management issues;
- Procedures for communications between the project team, other contractors and site operatives;
- Procedures for keeping the records of site queries, obtained approvals, tests, any documentation that affects the site works etc.
- Storage of the materials and equipment on site;
- Any additional information required by statutory regulations.

1.3 Health and Safety:

1.3.1 General Description

The safe completion of the works is a primary aim of the contract. All works should be executed in compliance with all applicable statutory requirements. Below listed are general requirements and items, contractor should take care of and provide in respect to Health and Safety on site.

- a) Contractor and Consultants should always liaise with Client's nominated Health and Safety Representative during all phases of the project delivery including pre-construction, construction and post construction/maintenance stage of work.
- b) Client's Health and Safety Representative responsibilities should include the following;
 - Advise and assist the Client, Contractor and Consultants involved in project with their Health and Safety obligations and duties,
 - Notify details of the project to respective Health and Safety authorities or statutory/ reporting authorities,
 - facilitate good communication between the client, designers and contractors with respect to Health and Safety matters,
 - Prepare/update the health and safety file on a weekly basis.

1.3.2 Health and Safety Plan

- a) Health and Safety Plan to be submitted by the Contractor to the Client/Client's representative for written approval prior to commencement of works;
- b) Following items should be included as part of the plan:
 - Method statements on how risks from hazards identified prior to construction and in response to other information and how hazards identified by the Contractor will be mitigated,
 - Details of management structure and responsibilities, with clearly stated point of contact in case of emergency along with other phone numbers of responsible staff,
 - Arrangements for issuing health and safety directions,
 - Selection procedures for ensuring competency of other contractors,
 - Procedures for informing other contractors and employees of health and safety hazards, includes preparation and initiation of toolbox meetings on a weekly basis
 - Procedures for communications between the project team, other contractors and site operatives,
 - Arrangements for coordination and cooperation between contractors,
 - Procedures for carrying out risk assessments and for managing and controlling the risks,
 - Emergency procedures including those for fire prevention and escape,
 - Arrangements for ensuring that all accidents, illness and dangerous occurrences are recorded,
 - Arrangements for welfare facilities,
 - Procedures for ensuring that all persons on site have all the required safety gear and have received relevant health and safety information and training,
 - Arrangements for ensuring that all visitors to site receive the required safety gear and training prior to entering the site,
 - Arrangements for consulting with and taking views of people on site,
 - Arrangements for preparing site rules and drawing them to the attention of the those affected and ensuring their compliance,
 - Monitoring procedures to ensure compliance with site rules, health and safety standards and statutory requirements.
- c) In addition, all statutory health and safety requirements should be included as part of the Health and Safety Plan.

1.3.3 Environmental Management

- a) Noise control
 - Comply with local regulations and initiate measure to minimise the noise level where possible.
- b) Pollution
 - Protect the site, the Works and the general environment including the atmosphere, land, streams and waterways against pollution. If pollution occurs inform the Site Management Team immediately, an authorised representative of the Client/Contractor is to inform the appropriate

authorities and provide relevant information Including mitigation measures.

- c) Nuisance
 - Prevent nuisance from smoke, dust, rubbish, vermin and other causes. Prevent hazardous build-up on site, in excavations and to surrounding areas and roads,
- d) No dumping of material in the surrounding areas is permitted.
- e) Asbestos containing materials
 - Report immediately any suspected materials discovered during execution of the Works. Agree methods for safe removal or encapsulation.
- f) Fire prevention
 - Prevent personal injury or death, and damage to the Works or other property from fire. Comply with local statutory fire regulations.
- g) Burning on site
 - Burning on site **NOT** permitted.

1.3.4 Moisture

- a) Prevent the site works and materials from wetness and dampness where this may cause damage to the works.
- b) Contaminated materials
 - Where instructed to remove material affected by contamination from the site in an approved manner and complying with all statutory/ legislative requirements, minimize the risk of infecting other parts of the site.
- c) Waste
 - Waste includes rubbish, debris, spoil, containers and surplus material. Keep site and works clean and tidy,
- d) Remove waste frequently and dispose offsite in a manner approved by Waste Regulation Authority and as per Waste Management Plan.

1.3.5 Preservation of Existing Features, Vegetation & Services

- a) All existing features identified by client's representative as to be retained should be dealt with in accordance with the below listed procedures.
- b) Existing features include hard landscape structures and fixtures as well as trees and other feature soft landscape elements.
- c) Hard landscape elements which have been identified as important element by the client shall be protected from all on going site works.
- d) No structural elements should be removed / relocated without written permission of Client's representative.
- e) All protected elements should be clearly identified and labelled, site team should be aware of all the items to be protected. A Site Protection is to be prepared by the Contractor prior to works commencing identifying all elements to be retained on site.
- f) No existing trees should be cut/pruned without written permission of Client representative/PM;
- g) All soft landscape works shall be carried out in coordination with experienced horticulturalist;

1.3.6 Guidelines for Trees to be removed

- a) Any existing trees identified as “to be removed” or any dead trees:
- Contractor shall engage a suitably experienced arborist to undertake any tree works. Trees should be for removal or cut and fell, as close to the ground as possible;
 - Trunks to be cut to convenient lengths for removal or integration with the landscape works;
 - Root stumps to be removed to a minimum depth of 800mm below ground level, with lateral branches over 100mm in diameter removed from the site;
 - Any debris or material that comes from the above works shall be utilised in accordance with Waste Management Plan.

1.3.7 Guidelines for Trees to be retained

- a) All retained trees should be clearly identified “TO BE RETAINED” and information signs should be displayed on site in prominent positions at each entrance and noted on the Site Protection plan noted in Item 1.8 (e);
- b) All retained trees shall be marked by visible, durable tags, lettered to tree number or symbol (if any) on the drawings and these numbers should be clearly identified on the Site Protection Plan prepared by the Contractor and approved by the Clients Representative.
- c) Trees should be fenced off the works area if possible, in all cases tree trunk and roots should be protected from site works;
- d) Protected area should be in a shape of a circle around each tree to the extent of the canopy dripline or to a radius of 3m, measured from tree trunk for trees under 5 mts in height.
- e) Do not store any materials or allow site equipment or vehicles to pass under or near the trees to avoid soil compaction Prevent damage to tree bark; do not attach any items to trees.
- f) Do not add or remove topsoil within the drip line of trees, do not fill against tree trunks even temporarily;
- g) Open excavation under tree canopy should be carried for as short period as possible. If exposing roots unnecessarily, temporarily line excavation with polyethylene sheet to reduce evaporation;
- h) Use only hand methods to locate, expose, and cleanly remove the soil around roots on the line of excavation. Root systems should be preserved intact.
- i) When it is necessary to cut the roots bigger than 25mm diameter, make sure the cutting does not disturb remaining root system. Cut should be smooth with no ragged edges. Clean cut surface should be immediately treated with bituminous fungicidal sealant.

1.3.8 Guidelines for Existing Services

- a) Special precautions shall be taken by the Contractor to avoid damage to existing sewerage pipes, storm water drains, and pipes, storm water grids, and inlets, manholes, valve casings, water pipes and taps, fire hydrants, irrigation pipes and equipment, cables, completed landscaping works, telephone and light poles, vegetation and other services.

- b) Where manholes, valve castings and other services have to be adjusted to fit in with the construction work or for any other reason, the Client's Representative shall be notified with 14 days' notice prior to works being carried out, so that the necessary arrangements can be made. Manholes, valve casings, meter casings, fire hydrants etc., shall always be easy to reach and visible post completion of the works.

1.3.9 Protection of Existing Property

- a) The Contractor shall take all necessary precautions against damage that might occur to any person, animal, building, structure, services, vegetation, vehicles etc.
- b) Enough warning signs, railings, lighting etc. shall be placed around excavations, obstacles, and heaps.
- c) Foot bridges, shall be placed over trenches, where necessary for the convenience of the public.
- d) Construction activity is to be limited to pre-designated areas and with the prior approval of the client's representative.

2. Specific Landscape Requirement

2.1 Scope of Work:

- a) The work in this contract covers the supply and installation of all materials and labour to complete the landscape works identified in the tender package. Any item not specifically shown in the drawings or specified, but normally required to conform to such intent should be considered part of the work. Contractor shall include and price for such item in the BOQ accordingly;
- b) All works indicated in the Drawings by notes will be provided, whether or not mentioned in this specification. Any item not specified nor specifically shown in the drawings, but are normally required to conform to such intent, are considered part of the work and deemed to be included in this contract and their execution shall be covered by the contract price, in the same manner as if they have been expressly shown on the drawings and described in the specifications.
- c) The works shall be completed within the scheduled time and shall be certified by the Client's Representative in consultation with the Landscape Architect upon practical completion;
- d) The Contractor shall submit for approval, his proposed Work Programme based on the criteria of the overall programme showing the intended sequences, stages and order of proceeding with the works together with the period of time he has estimated for each and every stage of the progress.
- e) The Contractor shall complete the works within or by the date of completion as set forth in the Contract. The Contractor shall undertake all responsibility for rectification of defects of the landscape for a period of twelve (12) months from the issuance of Practical Completion Certificate.

2.1.1 Site Preparation

- a) Prior to the start of any construction works on site contractor should make sure that the below listed items have been executed.

2.1.2 Site Survey

- a) General:
 - Prior to commencing the works, the Contractor shall carry out own survey and inform the Client's Representative/Landscape Architect of any discrepancies with the Construction Drawings.
 - Site survey shall be carried out by skilled and experienced team for the type of work.
 - If any unforeseen/unrecorded hazards or items have been discovered Contractor shall give notice to the PMC/Client's Representative. No works shall be carried out until the issue has been resolved.

2.1.3 Site Investigation

- a) General:
 - Contractor shall be solely responsible for obtaining all the information on the nature of the site and sub-surface soil conditions for the purpose of

preparing an in-depth response to the tender and the subsequent execution of the contract.

- Site investigation shall provide data to allow Contractor to proceed with works.
- Extent of the investigation shall be determined by the PMC/Client's Representative and the Contractor.
- Site investigation shall include:
 - Establish records of mean water table;
 - Identify all previous known uses of the site;
 - Identify site features to be preserved;
 - Identify areas of limited access, incomplete work by others or any other issues which may hamper the execution of the works;
 - Locate and identify all known land and water contaminants;
 - Locate and identify soil types to a depth of 4.0m below existing ground level;
 - Recommendations for further investigations.

b) Public and Safety:

- During any temporary works during the investigation, area investigated shall be secured and public access shall be limited;
- Erect temporary fences, footpaths, warning lights etc. prior to starting the investigation.
- Area of any investigation shall be kept clean and protected from ground and surface waters.

c) Field Test General:

- Each test shall be recorded and following data shall be provided:
- Project name and reference;
- Date and time of test;
- Weather conditions;
- Soil types and description;
- Location and detail of the sample;
- Site photograph
- If any feature should be encountered, provide description and depth of:
 - Changes in soil strata,
 - Drains,
 - Foundations/structures;
 - Hard strata;
 - Services

d) Field Test – Soils:

- Soil test shall be carried out in accordance with relevant Indian standards;
- Tests shall be carried out at every test pit;
- Method of testing to be proposed by contractor and approved by the Clients Representative prior to works taking place.
- Test shall provide the information on the following:
- Permeability; Geophysical conditions;

- Any special site features, as advised by the Clients Representative should be undertaken in an approved manner, by the Contractor.
- e) Samples:
- When taking samples make sure the following:
 - Method should be undertaken in an approved manner and in conformance with testing procedures. It should include information on: depth, frequency and locations.
 - Samples should be collected and stored in a manner that prevents exposure to direct heat and sunlight, extreme temperatures with labelling identifying the date, time location and testing organisation;
 - Samples should not be contaminated;
 - Ensure samples are a typical representation of the zone from which they were taken;
 - Retain samples in a sealed location for 28 days post submission of the final report.
- f) Site Test – water:
- Tests should identify ground water levels and pressures.
 - Method to be undertaken in an approved manner, and in conformance with testing procedures by the contractor.
- g) Laboratory tests:
- Mechanical and Chemical properties shall be tested;
 - Method of testing should be undertaken in an approved manner, by the contractor and at the contractor's expense. Records are to be kept of all Testing in a ledger noting time, date and type of test with results and samples kept in a secure, lockable location in the site office.
- h) Final Report:
- Final site investigation report should include:
 - All identified land and water contaminants within the site;
 - Identify all previously known uses of the site;
 - Locate and identify soil types to a depth of the 4.0m below existing ground level
 - Mean water table;
 - Recommendations for further investigation as required;
 - Site Features to be included:
 - All above and below ground features;
 - All underground services and above ground utilities;
 - Topography

2.2 Demolition & Site Clearance:

- a) General
- Contractor to survey and agree with the Client representative/PMC the extent of demolition and proposed methodology for removal of elements which have been identified on the Demolition Plan or drawings.
 - Extent of works should be within site boundary, otherwise notify and agree with Client representative/PMC;

- Contractor to submit details of the demolition works prior to proceeding.
The document should include:
 - Location and types of structures, site and surrounding area,
 - Extent;
 - method;
 - premises which may be affected;
 - Health and safety procedures for protecting public and site workers;
 - Proposed programme of workplace
 - Any special requirements.
- b) Services affected by Demolition:
- Contractor shall give notice at least 24 hours prior so that the Client's representative may inspect existing services which might be affected by demolition work. Information on below and above ground services to be removed by the Contractor must be identified at least 14 days prior to the works being undertaken, including arrangements for disconnection/removal approved by the Clients Representative;
- c) Material arising:
- All components and materials arising from the demolition works shall be utilised as per Waste Management Plan procedures.
- d) Site Clearance general guidelines:
- Contractor will be responsible for clearing all planting areas of existing vegetation not specified to remain and all other debris and foreign materials considered a hindrance to the planting operation and/or unsightly in appearance.
 - Contractor will be responsible for cleaning the planting areas after completion of civil and other works in that area, and preparing so as to be suitable for planting by the horticulturalist.
 - Carefully remove items indicated to be salvaged and store on the site where indicated. Except for stripped Subsoil or other materials indicated to remain on Client's property, cleared materials shall become the Contractor's property and shall be removed from the project site in an approved manner, on a periodic basis and on completion of site works.
 - Contractor will take care and maintain previously established grades and swales.

3. Earthworks

Prior to the start of any construction works on site contractor should make sure that the below listed items have been executed.

3.1 General items:

a) General notes:

- The section refers to excavation grading and filling of soil across the site as part of the works.

b) Setting Out:

- Before start of excavation works the Contractor shall carry out preliminary setting out of key items pertaining to the construction and excavation works;
- Contractor will be fully responsible for establishing and locating at site all grid lines, base lines, levels and limits for project.
- Qualified surveyor should be engaged to prepare the above works;
- All setting out information established by Contractor on site should conform accurately with information in the Drawings
- Client's Representative shall approve all setting out and locations prior to any excavation works;
- Prior to start of further works, Contractor should do a Quality check and any errors/non-compliance with Drawings should be highlighted to the Client's Representative. Any works done which cause obstruction to future works, without approval from the Client's Representative, shall be demolished and reconstructed at the expense of the Contractor;
- The Contractor shall follow the datum identified in the plans and approved by the Client's representative or as set out by the Main Civil Works Contractor if applicable. Contractor shall be responsible for providing, maintaining and safeguarding the position and levels of all survey pillars/pegs and benchmarks existing on site or added;
- Contractor shall maintain sufficient number of pillars/pegs for checking/monitoring of the works for the entire duration of the project.
- Contractor should undertake weekly inspections of pegs, set-out points or other datum references used to proceed with the works.

3.1.1 Preservation of Existing top soil

a) Stripping top soil:

- For the extent/depth of the topsoil refer to site investigation report;
- Before beginning general excavation or filling, Contractor shall strip topsoil from areas where there will be regrading, paving/roads and other areas shown on drawings.
- Topsoil shall be removed to an average depth of 300mm or as indicated in the specifications and/ or supporting information provided to the Contractor., If the depth of topsoil is difficult to determine, Contractor shall give notice to PM/Client's Representative for guidance.

- Stockpiled topsoil to be reused immediately after excavation works are completed or removed from site post approval of the Clients representative;
- b) **Location of stockpile:**
 - To be agreed - topsoil shall be stored in an area of the site where it should not interfere with other site operations it should be undisturbed during the ongoing construction process And all deleterious material including weeds removed prior to placement in its final location.
 - The area that is to be used for storing the topsoil shall be cleared of vegetation and any waste arising from the development e.g. building rubble and fill materials.
- c) **Protection :**
 - Contractor to make sure the following treatment has been applied to remove topsoil;
 - Topsoil not to be mixed with subsoil, stone, hardcore, rubbish or material from demolition, other soil or materials containing aggressive weeds or non-soil forming materials, oil, fuel cement or other substances harmful to plant growth;
 - Do not place any other material on top of storage heaps.
 - Do not allow construction plant to pass over storage heaps.
 - Prevent compaction and contamination, by fencing and covering as appropriate.

3.1.2 Excavation

- a) **General :**
 - All excavation works shall be in accordance with relevant Indian standards, equivalent international standards or accepted best practise in construction;
 - Any features like: pavement wearing surface, concrete paths, kerbs, channels or alike, should be cut by concrete saw to give clean break line along the edge of excavation.
 - If excavating next to existing features (existing boundary wall, signage, existing structures, pillars, ramps, services, trees etc.) Contractor to ensure all health and safety procedures are strictly followed to avoid disturbance of foundations, tree roots etc.
 - All excavation shall be carried out by mechanical equipment, unless specified otherwise by Client representative. Contractor can suggest alternative methodology for Client's Representative approval. However any consequent loss or damage will be under Contractor's liability.
- b) **Extent:**
 - Excavate over the site to a depth that will give correct levels and profiles as the basis for construction, paving, filling and other relevant works. Make allowance for compaction and settlement.
 - Excavate for footings, pits and alike, to the required size and depths. Confirm the bedding capacity is as specified.

c) Accuracy and Permissible Deviation:

- All excavation works shall be taken up to such widths, lengths, depths and profiles as are shown on the drawings or such other lines and grades as specified by Client's Representative.
- All excavation shall be done to minimum dimensions as required for safety, quality and efficiency.
- Any deviation from formation levels beneath mass concrete foundations, ground bearing slabs, embankments and cuttings, external walls etc. shall be consulted with Engineer.
- General permissible deviation from linear dimension to be ± 25 mm.

d) Excavation to existing foundations and structures:

- Prior to commencing any excavation, excavate trial pits adjacent to existing foundations to determine extent and formation level
- Consult with site engineer on approved formation level in the new excavation for the safety of the structure;
- Backfill material to excavation to be determine by structural engineer;
- Provide support to adjacent structures if necessary, sufficient to prevent damage arising from works;
- Supports should be lateral (shoring) and vertical (piling or underpinning);
- If permanent support required give notice to PM/Client's Representative.
- Where excavation encroaches below a line drawn at 45 angle from the nearest formation level of another higher excavation, the lower excavation, all work within it and backfilling thereto must be completed before higher excavation is made.

e) Dewatering/ Drainage:

- All excavations should be kept free of water.
- Grading works surrounding the excavation should be designed so as to exclude rain/surface water draining into excavated areas.
- Any water in the excavated areas should be pumped out by Contractor, this should be continued until area is clear of water and up till foundation work is completed and backfilled.
- Do not disturb excavated faces or stability of adjacent ground or structures during pumping.
- Pumped water should be discharged in an appropriate manner and in accordance with relevant Environmental/ statutory controls without flooding adjacent property outside the site. Sumps made for dewatering shall be clear of excavations and fill on completion.

f) Inspection:

- Contractor to give 5 days' notice to the Clients representative for inspections of formations for foundations and filling formations, service trenches, roads and paving.
- Seal the approved formation with blinding concrete within 4 hours of inspection.

3.1.3 Filling

a) Fill Material – General:

- Fill material specification should be according to relevant Indian standards or under the guidance of technical expert.
- Submit full details of proposed fill materials, including:
 - Type and source of imported fill;
 - Proposals for processing and reuse of material excavated on site;
 - Test reports as required;
- Submit the above at least 21 days before starting filling.
- Site rock may be used if of a suitable size, not exceeding 300mm and of a suitable material. Contractor is to verify that the excavated rock is of a type suitable for the proposed works and provide supporting evidence to the Clients representative.

b) Fill Material Properties and types of Fill material:

- Any fill material used for filling should be free of hazardous, aggressive or unstable content.
- Within the top 1000mm of any area to receive topsoil, do not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structures or instability in the filling;

Sulphur content: Do not use filling with sulphur content exceeding 0.5% within 500mm of cement bound elements (for example concrete structures or masonry), unless such elements are protected by impermeable membranes or by other suitable approved means.

c) Sources:

- Where directed, re-use material recovered from excavations on the site. Dry out recovered material as necessary prior to use.

d) Fill types recommendations:

- Earth berms and General fill: Well-graded material, maximum particle size 75 mm, plasticity index $\leq 55\%$.
- Select fill: Granular material complying with the following properties:
 - Particle size: 75 mm maximum.
 - Proportion passing 0.075 mm sieve: 25% maximum.
 - Plasticity index: $\geq 2\%$, $\leq 15\%$.
 - Soaked CBR: Not less than 15.
- Maximum depth of fill to be compacted not too exceeds 300mm at any one time.

e) Fill:

- Well graded material with maximum plasticity index 35% and maximum particle size determined by location and layer thickness, but not exceeding two-thirds of the uncompact layer thickness.

- Fill sub grade: Use class 3 materials or select fill.

f) Testing of suitability of Fill Materials:

- If required, the Client's Representative may request for a laboratory test of the proposed fill material prior to placement of any material.
- Samples should be submitted to accredited laboratory by Contractor.
- Report to be submitted by Contractor to Structural engineer.

g) Preparation of Filling:

- General: Remove loose material, debris, rubbish, standing water and organic matter.

h) Benching:

- If filling is to be placed against a ground surface that has slopes of more than 1:4, bench into the natural surface for at least 1 m at every 1 m change of level to form a key for the filling. Location of benches to be confirmed by the Site Engineer prior to works commencing.

i) Underground slabs:

- For under filling pavements and other load bearing elements that will support slabs, pavements and other load-bearing elements, compact the stripped surface as for filling. If necessary, loosen the material to a depth of 200 mm and adjust the moisture content to an approved level.

j) Under earth mounds:

- Cultivate the ground by ripping to a depth of 200 mm before mound formation.

k) Rock:

- Remove any single, loose or unstable blocks of rock prior to placement of fill.

l) Placing fill:

- Place fill material in layers, so that only one type of material occurs in each layer.
- Each layer to be min 150mm, max 300mm thick
- Site grading shall be carried out as indicated in the drawings and as directed by the Employer's Representative.
- Adjacent structures, membranes and buried services:
- Do not overload, destabilise or damage.
- Submit proposals for temporary support necessary to ensure stability during filling. Remove support progressively as backfilling proceeds.
- Allow 14 days (minimum) before backfilling against in situ concrete structures.
- Compaction
 - Compact fill as soon as possible after placing.

- After compaction surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like.
- Defective areas: where compaction cannot be achieved, remove existing material from site and place new material for compaction to full thickness of layer using new material. Layers of fill not too exceed 250mm unless approved by the Site Engineer or Clients representative.
- To ensure that the fill has been compacted as specified, the Contractor, at his cost, shall carry out field and laboratory tests. Field compaction test shall be carried out at different stages of filling and also after the fill to the entire height have been completed. This shall hold good for embankments as well. Reports to be provided to Client's representative and Landscape Architect.
- The fill shall continue to be carried out to such dimensions and levels as indicated on the drawings after the stipulated compaction. The fill will be considered as incomplete if the desired compaction has not been obtained.
- The Contractor shall protect the earth fill from being washed away by rain damaged in any other way. Should any slip occur, the contractor shall remove the affected material and make good the slip page site. The Contractor shall remove the affected material and make good the slip at his cost.

m) Reuse of material for fill:

- As specified in 2.3.4(e), the rock as obtained from excavation may be used for filling and levelling to indicate grades without further breaking.
- In such an event, filling shall be done in layers not exceeding 250 mm approximately.
- After rock filling to the approximate level indicated above, has been carried out, void in rocks shall be filled with finer materials such as earth, broken stone etc and the area flooded so that the finer materials fill up the voids. Care shall be taken to ensure that the finer fill material does not get washed out.
- Over the layer so filled, a 100 mm thick mixed layer of broken material and earth shall be laid and consolidation carried out by a 12 tonne roller. No less than twelve passes of the roller shall be accepted before subsequent similar operations are taken up.
- To ensure that the fill has been compacted as specified, the Contractor at his own expense shall carry out field and laboratory tests to validate standards of compaction achieved. Field compaction test shall be carried out at different stages of filling and also after the fill to the entire height have been completed.

n) Tolerance of cut & fill:

- Unless otherwise specified, no portion of the earth cutting shall vary from the specified or proposed level by an amount exceeding 150mm. The tolerance of the fill level or those on slope shall not be more than 25mm from the proposed level. The same tolerance shall be applicable to the limits and lines of cut and fill. All levels are those applicable at the end of the Defects Liability Period. The Contractor should therefore make the necessary allowance for shrinkages, consolidation, settlement and any other losses and to include all expenses for this in his quoted rates.

- Notwithstanding the above, all cut or fill area shall be such that there is no stagnation of water. Should there be any local depressions, the Contractor shall be required to re-grade or fill up the depressions as necessary. The Contractor shall be responsible for making good all settlements or erosion in the filling and cut area whenever the defects occur or as directed by the Client's -Representative up to the end of the maintenance period.

3.2 **Anti-Termite Treatment:**

- This section covers the general requirements for Anti-Termite Treatment measures, chemical treatment of soils for the protection of features & buildings attack of subterranean termites, Chemicals to be used with their minimum rates of application and procedure to be followed for treatment of Foundation.

3.2.1 **Chemicals**

- The chemical used for soil treatment shall be any one of the following:

Chemical	Relevant Indian Standard	Concentration by weight_ %
<i>Chlorpyriphos emulsifiable concentrate</i>	IS: 8944-1978	1.0
<i>Heptachlor emulsifiable concentrate</i>	IS: 6439-1972	0.5
<i>Chlordane emulsifiable concentrate</i>	IS: 2682-1966	1.0

3.2.2 **Application**

- The method of application and the stages it will be applied shall be submitted for approval and this shall conform to relevant Indian standard or international equivalent.
- All works related to application of the Chemicals shall strictly follow Health and Safety procedures as mentioned in section 1.6.3. Health and Safety Plan.
- Workers shall be properly protected during application and shall wear the necessary clothes, masks, goggles and other gear to avoid direct contact and inhalation of chemicals ;
- No work shall be carried out under unsuitable weather conditions, these include:
 - Rain or when the soil is wet due to rain or sub-soil water;
 - Strong winds;
 - Heat waves;
- Chemicals shall be brought to the site of work in sealed original containers. The materials shall be brought in at a time, in adequate quantity to suffice for the work. The material shall be kept in cool and locked stores. The empties shall not be removed from the work site till the relevant item of work has been completed and permission granted by the Client/ Employer's Representative.

- Chemicals available in concentrated forms with concentration indicated on the sealed containers shall only be used. Chemicals shall be diluted with water in the desired quantity before use, using graduated containers to achieve the desired percentage of concentration.
- Hand operated pressure pump with graduated containers shall be used to ensure uniform spraying and to facilitate proper penetration of the chemical. Continuous check shall be kept to ensure that the specified quantity of chemicals is used for the required area during the operation.
- Soil treatment shall start when the foundation trenches and pits are ready to receive mass concrete in foundations. Laying of mass concrete will start when the chemical emulsion has been absorbed by the soil and the surface is quite dry. The above mentioned also applies in the case of treatment to the filled earth surface within the plinth before laying the sub grade for the floor. The treated soil barriers shall not be disturbed after they are formed. If by chance, treated soil barriers are disturbed, immediate steps shall be taken to restore the continuity and completeness of the barrier system.
- Empty chemical containers are to be punctured so as to prevent re-use and disposed of in an approved manner.

4. Hardscape Specification

This section covers the general specifications of basic materials which are part of landscape civil work which includes Brickwork, Stone masonry, Concrete work; wood work, bamboo work, steel work and related treatment procedures.

All materials and workmanship shall comply with the relevant Indian Standards and Codes or latest CPWD specifications, 2009.

4.1 Brickwork/ masonry work:

- a) **Brickwork classification:** Class 1 for exposed brick work; Class 2 for compound wall with plastering
- b) **Strength:** For class 1 - average compressive strength should not be less than 10.7 N/mm² For Class 2 - 7.5 which means average compressive strength should not be less than 7.5 N/mm² and not more than 10 N/mm² .
- c) **Manufacturer:** from Suppliers Schedule provided or equivalent approved.
 - Quality: Well burnt F.P.S. bricks
 - Special shapes: The bricks shall have smooth rectangular faces with sharp corner and shall be uniform in colour and emit clear ringing sound when struck
 - Size: (229 x 110 x 70) mm – nominal size.
- d) **Mortar:** The mortar for the brick work shall be as specified, and conform to accepted standards. Lime shall not be used where reinforcement is provided in brick work because it will allow corrosion of metal. More details are given in section 2.5.4.
- e) **Sampling of brick samples:**
 - Samples of bricks shall be subjected to the following tests:
 - Dimensional tolerance.
 - Water absorption.
 - Efflorescence.
 - Compressive strength.
- f) **Soaking of Bricks:**
 - Bricks shall be soaked in water before use, for a period allowing for the water to just penetrate the whole depth of the bricks based on prior field tests undertaken and verified on site.
 - Alternatively bricks may be adequately soaked in stacks by profusely spraying with clean water at regular intervals for a period not less than six hours.
 - The bricks required for masonry work using mud mortar shall not be soaked.
 - When the bricks are soaked they shall be removed from the tank sufficiently early so that at the time of laying they are skin-dry.
- g) **Laying:**
 - Bricks shall be laid in English bond unless otherwise specified.
 - For brick work in half brick wall, bricks shall be laid in stretcher bond.
 - All loose materials, dirt and set lumps of mortar which may be lying over the surface on which brick work is to be freshly started, shall be removed with a wire brush and surface wetted.

Bricks shall be laid on a full bed of mortar to the nominated line and length and to the vertical

h) **Joints:**

- The thickness of all types of joints including brick wall joints and cross joints shall be not more than 10mm. Specified thickness of joints shall be of 1 cm. Deviation from the specified thickness of all joints shall not exceed one-fifth of specified thickness.
- Flushed joint. Plumb at every fifth cross joint.

i) **Curing:** 7 days.

j) **Brick Quality:**

Class 1 Bricks:

- Plain surface, sharp edges and size with tolerance in dimensions + -3%
- Uniform red or brownish coloured.
- High crushing strength, not less than 10.7 N/mm²
- Machine moulded
- Efflorescence- NIL
- Water absorption less than 15%.
- Application: used for the exterior wall brick works, short columns and arches.

Class 2 Bricks:

- Slightly uneven faces and edges with tolerance in dimensions + -8%
- Uniform colored but may be slightly over burnt.
- High crushing strength, not less than 7 N/mm²
- Hand moulded
- Efflorescence- Little
- Water absorption less than 20%.
- Application: used for internal walls and compound walls.

Class 3 Bricks:

- May be distorted with blunt edges.
- Over burnt or under burnt and non uniform color.
- High crushing strength, not less than 3.5N/mm²
- Hand moulded
- Efflorescence- Accepted
- Water absorption less than 25%.
- Application: flooring, paving, small brick foundations and brick bat lime concrete(B.B.L.C.).

4.2 Stone work:

Stone type:

- Granite or other nominated stone material;

Source:

- shall be obtained from the quarries, approved by the Client's representative.

Sampling:

- To match approved material sample produced by contractor which should be approved by Client's representative and Landscape Architect.
- Stone shall be hard, sound, durable and free from weathering decay and defects like cavities, cracks, flaws, sand holes, injurious veins, patches of loose or soft materials and other similar defects that may adversely affect its strength and appearance.

Sizes of stone:

- the length of stones for stone masonry shall not exceed three times the height and the breadth on base.
- Shall not be greater than three-fourth of the thickness of wall, or not less than 150 mm.
- The height of stone for rubble masonry should not be less than 200mm.

Dressing:

- Each stone shall be hammer dressed on the face, the sides and the beds. Hammer dressing shall enable the stones to be laid close to neighbouring stones such that the bushing in the face shall not project more than 40 mm on the exposed face.

Thickness of joints: The joint thickness shall not exceed 30 mm at any point on the face.

Mortar: As section 2.5.4.

Laying:

- The stone shall be lightly wetted before laying. They shall then be fixed with mortar in position without the use of chips or underpinning of any sort.
- The walls shall be carried up truly plumb. All courses shall be laid truly horizontal and all vertical joints truly vertical. The stone shall break joints on the face for at least half the height of the course, unless otherwise shown in the drawings. The stone shall be laid in regular courses not less than 200mm height and all the stones shall be of the same height unless otherwise specified. No stone shall be less in length than one and a half times its height unless otherwise specified.

Joints:

- The joints shall be done with cement mortar 1: 3 (1 cement: 3 coarse sand). All joints shall be full of mortar. Special care shall be taken to see that the groundings for veneer work are full of mortar.
- The thickness of joints shall be as indicated within the specifications or drawings but should not exceed 25mm. For a close butt jointed facing the thickness shall not exceed 5 mm.
- The face joints shall be uniform throughout.

4.3 Concrete work:

a) Procurement:

- Concrete work shall be done with Design Mix Concrete or Ready Mixed Concrete from reputed and approved suppliers approved by contractor and Engineer in charge.
- The Design Mix Concrete will be designed based on the principles given in Indian standards. The contractor shall request suitable design mixes for each class of concrete from the mix providers, such that the concrete ingredients and proportions will result in a concrete mix meeting specified requirements. In case of admixtures and or white cement, the mix shall be designed with these ingredients considered. The specification mentioned herein below shall be followed for Design Mix Concrete.

b) Ingredients:

- All ingredients selected should be as per relevant Indian Standards and CPWD specifications, 2009.
- Including Coarse and Fine Aggregate Water – It shall conform to requirements laid down as per standards.
- Cement – Cement arranged by the contractor will be slag or Portland Pozzolana Cement (PPC). Cement of grade lower than that used for mix design shall not be allowed to be used in the work. The Indian standards for PPC Cement are as follows and is highly recommended.
- IS 1489 (Part 1) 1991, Portland Pozzolana Cement – specification (fly ash based).
- IS 1489 (Part 2) 1991, Portland Pozzolana Cement – specification (Calcined clay based)
- IS 3812 1981 – specification for flyash as pozzolana and admixture IS 1344 1981
- Admixtures – Wherever required, admixtures of approved quality shall only be mixed with concrete as specified. The admixtures with the approval of Client's representative shall conform to relevant Indian Standards.
- Grade of Concrete – The Characteristic compressive strength of various grades of concrete shall be min M20 Grade in the case of plain concrete and M30 in case of reinforced concrete or as otherwise specified..
- Special attention shall be given to the design of the mix to prevent concrete being manufactured with the following: slag, broken brick, soft lime stone, soft sandstone, or other porous or weak aggregates. Concrete prepared with any of these materials shall not be used.
- In reinforced concrete structures, care shall be taken to protect the reinforcement from exposure to saline atmosphere during storage, fabrication and use. It may be achieved by treating the surface of reinforcement with cement wash or by suitable methods. Any scaling or surface rust is to be removed with a wire brush prior to placement of reinforcing.

c) Laying concrete:

- Surfaces on which concrete is to be placed should be free from debris and standing water.
- Pre-moist the base material prior to placing concrete.

- Timing: Place as soon as practicable after mixing and while sufficiently plastic for full compaction. After discharge from the mixer do not add water or re-temper. Temperature of concrete at point of delivery:
- In hot weather (maximum): 30°C.
- In cold weather (minimum): 5°C.
- Do not use frozen materials.
- Do not place concrete against frozen or frost covered surfaces.
- Do not place concrete when air temperature is below 3°C on a falling thermometer. Do not resume placing until rising air temperature has reached 3°C.
- Placing in final position:
- Place in one continuous operation up to construction joints.
- Do not place concrete simultaneously on both sides of movement joints.
- Spreading: Spread and strike off with surcharge sufficient to obtain required compacted thickness.
- Joints: Cracking of concrete takes place when curing takes place and secondly when concrete shrinks with change in temperature. There are four different types of joints which are introduced depending on structural requirement of the concrete slab.
- Contraction joints – are intended to create weakened planes in the concrete and regulate the location where cracks, resulting from dimensional changes, will occur.
- Isolation or expansion joints – separate or isolate slabs from other parts of the structure, such as walls, footings, columns, driveways and patios from sidewalks, stairs, light poles, other point of restraint.
- Construction joints – are surfaces where two successive placements of concrete meet. The location of construction joint should be planned and approved by the Site Engineer prior to concrete placement.
- Guidelines for executing joints:
- Refer relevant I.S standards and structural consultant guidelines before executing joints in concrete slabs.
- The maximum joint spacing should be 24 to 36 times the thickness of the slab as basic thumb rule. Consult structural consultant for technical details.
- For contraction joints, the joint groove should have minimum depth of 10mm or $\frac{1}{4}$ the thickness of the slab as basic thumb rule.
- Tooled joints must be run early in the finishing process and rerun later to ensure groove bond has not occurred.
- Early-entry-dry-cut joints are generally run 1 to 4 hours after completion of finishing of concrete setting.
- Conventional saw-cut joints should be run within 4 to 12 hours after the concrete has been finished.
- Use pre-moulded joint filler such as compressible foam strips for isolation joints to separate slabs from building wall or footings. At least 50mm of sand over the top of a footing will also prevent bond to the footing.
- If the slab contains wire mesh as reinforcement, cut out alternate wires, or preferably discontinue the mesh, across contraction joints.
- Construction joints, use Connolly joints <https://www.connollykeyjoint.com/> or similar approved at all joints keying the two edges of the slab together.

d) Compaction of Concrete:

Concrete shall be compacted during placing so that:

- A monolithic mass is created between the ends of the member, planned joints or both;
- The formwork is completely filled to the intended level;
- The entrapped air is expelled;
- All reinforcement, tendons, ducts, anchorages and embedments are completely surrounded;
- The specified finish to the formed surfaces of the member is provided;
- The required properties of the concrete can be achieved.
- Vibrate or using other approved means to consolidate concrete mix against forms.

e) Compaction Methodology:

- Hand compaction: this method is used for non-structural items. Workability should be decided to minimize the chances of honey combing. Rodding and Tamping are two common methods which can be used for pathways and paved areas.
- Mechanical Compaction: Vibration is imparted to the concrete by mechanical means. It causes temporary liquefaction so that air bubbles come on the top and expelled ultimately.
- Concreting shall be carried out in one continuous operation between the expansion joints and construction joints without any break at the dummy joints.
- Concrete shall be deposited on the base as near the joints as possible without touching them. It shall then be shoveled against the sides, maintaining equal pressure and deposited approx. 50 mm higher than the depth of the joints, care being taken that it is worked well around the joints. The concrete shall not be dumped from the bucket directly upon or against the joints.

f) Finishing of Concrete:

- During compaction, any low or high spots shall be made up by adding or removing concrete.
- After longitudinal floating has been completed but while concrete is still plastic, the slab surface shall be tested for trueness with a 3 m straight edge.
- Any depressions or high spots showing departure from the true surface shall be immediately rectified. High spots shall be cut down and refinished. Depressions shall be enlarged to about 8-10 cm and filled up with fresh concrete, compacted and finished. A deviation of less than 3mm ± is acceptable

g) Aggregate for Concrete:

- Limitations on contaminants: Free from absorbent particles which may cause 'popouts', and other particles such as coal and iron sulfide which may be unsightly or cause unacceptable staining
- Supply: From a single source and maintained throughout the contract.
- Colour: consistent.
- Aggregates should be single sized aggregate, 10 – 12mm in diameter, coarse/ rounded edge.
- Sample should be submitted and approved prior to placement.

- Surface should undergo steel floating process to get IPS (Indian Patent Stone Flooring) Finish using steel trowel. Application of retardant and removal of retardant as per vendor and Engineer's specification.
- Adjacent work: Use preventative measures such as hessian matting or polyethylene sheets etc to prevent contamination of adjoining surfaces. Form neat junctions and prevent damage. Keep clean all channels, kerbs, inspection covers, to be installed and kept clean during the installation process.

4.4 Mortar:

(a) Desirable properties of mortars for use in masonry are:

- Workability
- Water retentivity
- Rate of stiffening
- Strength
- Resistance to rain penetration
- Durability

(a) Standards: All materials and workmanship shall comply with the relevant Indian Standards and Codes or latest CPWD specifications.

(b) Contractor to follow Health and Safety procedures set in Section 1.6.3. on Health and Safety Plan.

h) Material specifications Water

- Water used for mixing and curing shall be clean and free from injurious quantities of alkalies, acids, oils, salts, sugar, organic materials, vegetable growth or other substance that may be deleterious to bricks, stone, concrete or steel. Potable water is generally considered satisfactory for mixing.
- The Ph value of water shall be not less than 6.
- The physical and chemical properties of ground water shall be tested along with soil investigation and if the water is not found conforming to the requirements as mentioned in IS codes, the contractor has to arrange good quality water for construction indicating the source and providing a certification certificate stating the same.
- Water found satisfactory for mixing is also suitable for curing.
- Sea water shall not be used for mixing or curing.
- Water from each source shall be tested before the commencement of the work and thereafter once in every three months till the completion of the work. In case of ground water, testing shall also be done for different points of drawdown. Water from each source shall be got tested during the dry season before monsoon and again after monsoon.

i) Cement

- The cement used shall be grade as mentioned in Indian Standards and the type selected should be appropriate for the intended use.

- Portland cement is a hydraulic binder and a finely ground inorganic material. When mixed with water, it forms a paste which sets and hardens by means of hydraulic reactions.

Blended cements:

- Blended cements or composite cements are those cements in which a mineral additive has been added to Portland cement. Blended cement is a hydraulic cementitious product, similar to ordinary Portland cement, but due to the addition of blending material it has certain improved properties compared to OPC.
- **Portland pozzolana cement (PPC)** is manufactured either by grinding intimately together portland cement clinker, gypsum and a pozzolana such as flyash, or by intimately and uniformly blending portland cement and fine pozzolana. The BIS has differentiated PPC based on the pozzolana added to the mix. As per updated IS standards, the proportion of flyash as a pozzolana used can vary between 15 and 35 percent by weight of cement, as stipulated by IS 1489:(Part I) 1991. The physical requirements of OPC and PPC are similar.
- Increased impermeability, lower heat of hydration, lower plastic shrinkage, reduced alkali aggregate expansion, and improved resistance to aggressive chemical agents and corrosion are some of the major benefits to be derived from the use of PPC.
- The use of PPC is, thus desirable for enhancing durability in different construction jobs, especially for structures subjected to aggressive environments. The Indian standards for PPC Cement are as noted in 2.5.3
- The Indian standards for PPC Cement are as noted in 2.5.3

Preparation of Mortar

- This shall be prepared by mixing cement and sand with or without the addition of pozzolana in 1:4 proportions as per relevant Indian standards.
- Proportioning: Proportioning on weight basis shall be preferred taking into account specific gravity of sand and moisture content. Boxes of suitable size shall be prepared to facilitate proportioning on weight basis. Cement bag weighting 50 kg shall be taken as 0.035 cubic metre. Other ingredients in specified proportion shall be measured using boxes of size 40 x 35 x 25 cm. Sand shall be measured on the basis of its dry volume in the case of volumetric proportioning.
- Mixing: The mixing of mortar shall be done in mechanical mixers operated manually or by power as decided by Engineer-in-Charge

j) Sand:

- Type and grading of sand to be used shall be specified. It shall be coarse sand, fine sand. Use of sea sand shall not be allowed

Coarse sand:

- Type shall be either river sand or pit sand or a combination of the two.

Fine sand:

- Shall be either river sand or pit sand or a combination of the two as approved by the Site Engineer.
- Sand must be checked for organic impurities such as decayed vegetation humps, coal dust etc.

4.5 Cement Plastering:**Objectives:**

- Cement Plaster mortar type and quality to Engineer's specification and to comply with relevant Indian standards and regulations. Plastering of the surface to be performed to Engineer's specification or have a deviation of less than ± 5 mm at both vertical and horizontal angles.

Samples:

- Contractor to submit samples of cement, coarse and fine aggregate. For external work and under coat work, the fine aggregate shall conform to grading IV. For finishing coat work the fine aggregate conforming to grading zone V shall be used. Sand: To be fine, sharp, well-graded sand with a low clay content and free from efflorescing salts.

Preparation of surface:

- The existing joints shall be raked out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scraping. The surface shall then be thoroughly washed with water, cleaned and kept moist before plastering is commenced.

a) Cement Mortar:

- The mortar shall be prepared using The mix and type of fine aggregate specified in the description of the item shall be used for the respective coats.

b) Thickness:

- The finished product shall be 12mm, 15mm and 20mm or as specified in the item.

c) Application:

- Plastering shall be started from the top and worked down towards the floor. To ensure even thickness and a true surface, solid plaster about 15 × 15 cm shall be first applied, horizontally and vertically, at not more than 2 metres intervals over the entire surface to serve as gauges.

d) Curing

- The plaster shall be kept moist for a period of at least 7 days post installation. During this period, it shall be suitably protected from all damages and hot

winds, at the contractor's expense by such means as the Engineer-in-Charge may approve.

e) **Finish**

- The plaster shall be finished to a true and plumb surface and to the proper degree of smoothness as required. The work shall be tested frequently with a true straight edge not less than 2.5 m long and with plumb bobs. The finished surface to have a deviation of less than ± 5 mm at both vertical and horizontal angles.

4.6 Wood work:

a) **Standards:** All materials and workmanship shall comply with the relevant Indian Standards and Codes or latest CPWD specifications.

b) **Timber procurement:**

- Timber (including timber for wood based products): Obtained from well managed forests/ plantations in accordance with:
- The laws governing forest management in the producer country or countries.
- International agreements such as the F.S.C or Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either: Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied, or Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood based products.

c) **Seasoning of Timber:**

- The process of drying timber under controlled conditions is called seasoning of timber.
- Timber shall be either air seasoned or kiln seasoned and in both cases moisture content of the seasoned timber should be achieved as per relevant Indian Standards.
- Air seasoned timber shall be used.
- Kiln seasoning of timber, where specified, shall be done as per IS standards in a plant approved by Engineer in-Charge.

d) **Preservation of Timber:**

- Preservative treatment does not improve basic properties of timber but gives varying degree of protection against deterioration due to attacks by fungi, termites, borers and marine organisms.
- Preservative treatment, where specified, shall be done using Oil type, Organic solvent type or Water-soluble type preservative as specified or recommended for the type of timber and its application.. Oil type preservatives shall be used if the timber is not required to be polished or painted. Before preservative treatment, the timber shall be sawn and seasoned.
- All surfaces exposed after treatment, except due to planing, shall be thoroughly brushed with the preservation before jointing.
- Preservative treatment of timber shall be done as per relevant Indian Standards in a plant approved by the Engineer-in-Charge.

e) **Material:**

Timber:

- Timber panels shall be preferably made of timber of larger width. The minimum width and thickness of a panel shall be 150 mm and 15 mm respectively. When made from more than one piece, the pieces shall be joined with a continuous tongue and groove joint, glued together and reinforced with metal dowels.
- The grains of timber panels shall run along the longer dimensions of the panels.

Application:

f) **For Form work:**

- The work shall be carried out as per detailed drawings and as directed by the Engineer-in-Charge, only specified timber shall be used.
- Sawing shall be true straight and square, and in the direction of the grains.
- The scantlings shall be accurately planed smooth to the full dimensions and rebate roundings and mouldings shown in the drawings, before the same are framed.
- Patching or plugging of any kind shall not be permitted.
- A tolerance of \pm mm shall be allowed in the finished cross sectional dimension.

g) **Timber Panels:**

- Timber panels shall be preferably made of timber of large width; the minimum width and thickness of the panel shall be 100 mm, and 15 mm respectively. When made from more than one piece, the pieces shall be jointed with a continuous tongued and grooved joint, glued together and reinforced with headless nails at regular intervals not exceeding 100 mm. Depth and thickness of such joint shall be equal to one-third of thickness of panel. The panels shall be designed such that no single panel exceeds 0.5 square metre in area. The grains of timber panels shall run along the longer dimensions of the panels. All panels shall be of the same species of timber unless otherwise specified.

For Fitting

- Fitting shall be of stainless steel. These shall be well made, reasonably smooth, and free from sharp edges and corners, flaws and other defects. Screw holes shall be counter sunk to suit the head of specified wood screws. Screws to be recessed to allow filling with an approved putty or other fixative.

h) **Timber Decking:**

Seasoning and Preservation

- All timber used for decking and paving shall be thoroughly seasoned in accordance with relevant Indian Standards as mentioned in point (c). After seasoning the timber shall be treated with preservative in accordance with relevant Indian Standards as mentioned in point (d).
- Seasoning and preservative treatment shall be paid for separately unless otherwise specifically included in the description of the item of flooring.

Boards/ Planking

- It shall be of the class of timber and thickness as specified in the description of the item. The timber shall be as specified in section 2.5.6. Only selected boards of uniform width shall be used. Unless otherwise specified or shown in the drawings.
- The minimum length of boards shall be such that the boards shall rest at least on three supports, except where otherwise required by the pattern specified in the drawings or as directed by the Engineer-in-Charge.
- The boards shall be planed true on the outside face only unless otherwise specified in the description of the item.
- Butt joint should be provided where it lies over a vertical beam.
- Screws shall be of the slotted counter sunk head type, of length not less than the thickness of planks plus 25 mm, subject to a minimum of 40 mm, and of designation No. 9 conforming to Indian Standards.

Fixing

- Prior to fixing the planks to the joist a waterproof membrane such as malthoid or other approved flexible flashing. Flashing to be securely fastened to the joist to prevent slippage during installation of the planks.
- The joists on which the planks shall be fixed, shall be checked and corrected to levels. The end boards shall be accurately fixed with the sides parallel and close to the walls. Each adjoining board shall be carefully jointed with a maximum opening of 6mm and shall be securely held in position and screwed.
- Pre- drill holes for end screws with a minimum of 15mm material extending past the drill hole.
- For fixing the boards to the joists, two screws shall be used at each end of the boards and one screw at each of the intermediate joists in a zig zag manner. The screws shall be countersunk and screw holes filled with approved stopping.
- The flooring shall be truly level and plane. The joints shall be truly parallel and or perpendicular to the walls, unless otherwise specified.
- The floor shall be sanded in both directions post installation to remove minor defects and made perfectly even, true and smooth.

4.7 Bamboo work

a) Some relevant standards for Bamboo based applications are as follows:

- IS: 6874-1973: Method of tests for round bamboos
To evaluate physical (moisture content, specific gravity, and shrinkage) and mechanical (static bending, and compression parallel to grain) properties of whole bamboo culms.
- IS: 8242-1976: Methods of tests for split bamboos
To evaluate physical (moisture content, and specific gravity) and mechanical (static bending, and compression parallel to grain) properties of split bamboo.
- IS: 10145-1982: Specification for bamboo supports for camouflaging equipment
Requirements relating to materials, types, dimensions, workmanship and finish, permissible defects and preservation of bamboo supports for camouflaging equipment.

- IS: 7344-1974: Specification for bamboo tent poles
Covers wall, standing, and ridge poles.
- IS: 9096-1979: Code of practice for preservation of bamboos for structural purposes
Types of preservatives and methods of treatment of bamboos used for structural purposes like posts, scaffolding, house building and wall trusses. The preservatives recommended are Coal Tar Creosote, Copper Zinc Naphthenates and Abietates, Boric Acid and Borax, Copper-Chrome-Arsenic (CCA) Composition, Acid-Curpric-Chromate Composition, Copper-Chrome-Boric Composition
- IS 1902: 1993: Preservation of bamboo and cane for non-structural purposes- Code of practice (First Revision)
Types of preservatives and methods of treatment of bamboos and canes used indoors and outdoors for non-structural purposes. The preservatives recommended are Coal Tar Creosote, Copper and Zinc Naphthenates and Abietates, Boric Acid and Borax, Copper-Chrome-Arsenic (CCA) Composition, Acid-Copper-Chrome (ACC) Composition, Copper-Chrome-Boron (CCB) Composition, Boronated Copper Chrome Arsenic.
 - **Referred Standards**
- Specification for creosote and anthracene oil for use as wood preservatives (second revision) IS 218: 1983.
- Code of practice for treatment of timber (third revision) IS 401: 1982.
- Code of practice for preservation of bamboos for structural purposes IS 9096: 1979.

b) Bamboo treatment or Preservation:

- Brushing or Dipping techniques is commonly used for bamboo treatment.
- For non-structural members, Boric acid and Borex to be used in 1;1.5 proportion. For structural members (Poles, beams) for treatment Boric acid, copper sulphate, Sodium or Potassium dichromate to be used in proportion of 1.5:3 – 4.

c) Bamboo Selection:

Bamboo has been categorized into structural Group A & B & Group C.

Structural Group A and Group B Species

Special Grade:	70mm < diameter < 100m
Grade I	50mm < diameter ≤ 70m
Grade II	30mm < diameter ≤ 50m
Grade III	Diameter ≤ 30m

Structural Group C

Special grade I	80mm < diameter ≤ 100m
II	60mm < diameter ≤ 80m
III	Diameter ≤ 60m

Bamboo should be selected on the basis of its characteristics importance for structural utilization. Such as;

- Diameter and length of culms
- Taper of culms
- Straightness of culms
- Inter-nodal length
- Wall thickness
- Density and strength
- Durability and seasoning.

d) Bamboo Specification:

- Main structural elements (column and roof members) should be 70 – 100mm in diameter at thin end.
- Unsupported height of the post shall not be more than 3.0m.
- Taper: shall not be > 5.8 mm/m may be length in any grade.
- Curvature : max. curvature shall not be >75mm in length of 6m of any grades.
- Wall thickness of bamboo should be 10 – 12mm.
- Distance between nodes (intermodal length) should not exceed 300 – 600mm.
- Bambusa bamboos (height 15 – 30m; Diameter – 150mm; Internodes – 200 to 400mm; Thickness – thick walled) are the best suited species for construction.

e) Construction Process:

- Practice of putting bamboo post directly in the ground shall not be permitted. Bamboo post shall be fixed in to the foundation pile or plinth.
- Tar or Creosote treatment at the bottom of the post is required that needs to be embedded in the foundation pile or plinth.
- Minimum 300mm deep and 100mm dia hole shall be made in the foundation pile.

f) Joinery/ Connections of bamboo:

- Lashing or Friction-tight Rope Connection – is used for joining two or more poles together with a tying material.
- Dowel or Plug-in/Bolt Connections – Is a pin (wood or bamboo with fibres in longitudinal directions) of 10mm
- Clove Hitch or Positive fitting connections – Clove Hitch lashing is used for joining two or more poles together with atypical material.
- Interlocking connections – There are two different types of woodcore connections.
- A piece of wood can be used and glue can be employed to stick it to the inner surface of the bamboo. Any normal glue provides a capacity far larger than that of bamboo in the tangential direction. Two slots are needed in the bamboo cane to control cracking during the insertion of the wood cylinder.
- Metal anchor technique is another technique to build interlocking connection.
- The steel plate C is introduced in the slot of the wood cylinder and glued to it with a mixture of epoxy resin and portland cement. The plate is projected, so that its outer extreme can be adapted for different applications. Metal anchor technique is the post commonly and popular system being used.

4.8 Steel Supply and Installation:

- a) **Supply of Material:** General requirements relating to supply of structural steel shall conform to IS standards.
- b) **Grades:** There are nine grades of steel as given in Indian Standards. While placing the order the steel should be designated by description in the specifications and be fit for purpose and identified by 'Designation'.
- c) **Manufacture:**
- The whole work shall be representative of the highest class of workmanship. The greatest accuracy shall be observed in the design, manufacture and erection of every part of the work to ensure that all parts will fit accurately together on erection.
 - The processes used in the steel making and further hot rolling into steel plates, strips, sections, flats, bars, etc., are left to the discretion of the manufacturer/supplier and it should meet relevant Indian or International standards and product requirement.
- d) **Fabrication:**
- Fabrication shall generally be done as specified in Indian standards. In major works or where so specified, shop drawings giving complete information for the fabrication of the component parts of the structure including the location, type, size, length and details of all members, shall be prepared in advance of the actual fabrication and approved by the Engineer-in-charge.
 - Accuracy shall be observed in the fabrication of various members, so that these can be assembled without being unduly packed, strained or forced into position and when built up, shall be true and free from twist, kinks, buckles or open joints.
 - All the steel sections used in the fabrication must have mill test certificate clearly indicating the specification to which the steel conforms and whether steel is killed and normalized.
 - Use of steel of any quality other than those mentioned above would require the prior approval of the Structural Engineer.
- e) **Processes which are involved in Fabrication of MS components are given below:**

Surface Cleaning

- All finished materials shall be well and cleanly rolled to the dimensions, sections and masses specified. The finished material shall be reasonably free from surface flaws; laminations; rough/ jagged and imperfect edges and all other harmful defects prior to fabrication or painting.
- There are three different types of methods involved in surface cleaning. Such as, Hand preparation using wire brush, blast cleaning & Flame cleaning depending on the proposed application, specific requirement and skills.

Cutting and Machinery

- Following surface preparation, cutting to length is always the first process to be carried out, and this is done by any of the following methods:
- Shearing and cropping
- Cold Sawing

Punching and Drilling

Wooden or metal sheet templates shall be made to correspond to each member and position of rivet/ bolt holes shall be marked accurately on them and holes drilled. The templates shall then be laid on the steel members, and holes for riveting and bolting marked on them. The ends of the steel members shall also be marked for cutting as per required dimensions. The base of steel columns and the positions of anchor bolts shall be carefully set out at the required location and approved by the Site Engineer.

Straightening Bending and Rolling

- Rolled steel may get distorted after rolling due to cooling process. Further during transportation and handling operations, materials may bend or may even undergo distortion. Therefore before attempting further fabrication the material should be straightened. In current practice, either rolls or gag presses are used to straighten structural shapes.
- All steel materials, plates, bars and structural members shall have straight edges, flat surfaces and be free from twist. If necessary, they shall be cold straightened or flattened by pressure before being worked or assembled unless, they are required to be of curvilinear form. Pressure applied for straightening or flattening shall be such as it would not injure the material and adjacent surfaces or edges shall be in close contact or at uniform distance throughout.

Fitting and Reaming

- Before final assembly, the component parts of a member are fitted-up temporarily with bolts or small amount of welds.
- In bolted work, especially when done manually, some holes in the connecting material may not always be in perfect alignment and small amount of reaming may be required to permit insertion of fasteners.

Connections or Fastening Method

- The strength of the entire structure depends upon the proper use of fastening methods. There are two methods of fastening approved namely bolting and welding.
- Welding is the most common method of shop fabrication of steel structures. In addition to being simple to fabricate, welded connection considerably reduce the size of the joint and the additional fixtures and plates.

Specifications for welding:

- Welding shall be carried out by qualified welding personnel in accordance with the relevant Indian standards and code of practice.
- The work shall be positioned for downward welding wherever possible.
- The sequence of welding shall be such as will avoid undue distortion and minimize residual shrinkage stresses. Recommendation of IS 9595 shall be followed.
- The welds shall be free from cracks, discontinuity in welding and other defects such as (i) under-size (ii) over-size, (iii) under-cutting and (iv) over-cutting in the case of fillet welds and defects (ii), (iii) & (iv) in the case of butt welds.
- As far as possible every effort shall be made to limit the welding that must be done post galvanising and after the structure is erected.
- All welds shall be cleaned of slag and other deposits after completion. Till the work is inspected and approved painting shall not be done.
- All operation connected with welding and cutting equipment shall conform to the safety requirements given in IS 818 for safety requirements and Health provision in Electric and gas welding and cutting operations.

Specifications for bolted connections:

- The Contractor shall carry out all field connection work as per the shop drawings prepared. All bolts, nuts, washers, rivets, electrodes required for the installation are the responsibility of the Contractor who shall supply all approved field connections.
- Bolts and nuts shall be galvanised conforming to the requirement given in the following Indian specifications.
- In case of bolted connections, taper washers or flat washers or spring washers shall be used with bolts as necessary.
- The length of the bolt shall be such that at least one thread of the bolt projects beyond the nut.
- In all cases where bearing is critical, the unthreaded portion of bolt shall bear on the members assembled.
- A washer of adequate thickness may be provided to exclude the threads from the bearing thickness, if a longer grip bolt has to be used for this purpose.
- All connections and splices shall be designed for full strength of members or loads.
- Column splices shall be designed for the full tensile strength of the minimum cross section at the splice.
- Splicing shall be avoided at critical locations and be done only after the approval of Engineer-in-charge as per the splice drawing submitted by Contractor and approved by Engineer-in-charge.
- All members likely to collect rain water shall have drain holes provided.
- Where holes are drilled in the member post galvanising, two coats of a cold galvanic paint are to be applied prior to the installation of any connecting bolt.

Surface Finishing

- Structural members whose ends must transmit loads by bearing against one another are usually finished to a smooth even surface. Finishing is performed by sawing, milling or other suitable means.

Surface Treatment

- Materials and products, including fixings, concealed and structural components, shall be corrosion resistant or protective coated to prevent corrosion in a marine environment.
- Structural steelwork is protected against corrosion by galvanization in the shop or at site. process can be decided as per site requirement and in consultation with the Site Engineer.
- Approved method of applying metal coating to steel surfaces is Hot-Dip Galvanising.
- In Hot Dip Galvanising, the cleaned and fluxed steel is dipped in molten zinc at a temperature of about 450°C. The steel reacts with molten zinc to form a series of zinc or iron alloys on its surface. As the steel workpiece is removed, a layer of relatively pure zinc is deposited on top of the alloy layers.
- Structural Steelwork exposed to weather, embedded into concrete or masonry, or in contact with chemically treated timber shall be hot dip galvanized based on Indian or International standards and codes given for proper workmanship.
- For most applications galvanised steel does not require painting.

Erection

- The Contractor shall provide at his/her own cost all tools, machinery, equipment and erection material necessary for the expeditious execution of the work and shall erect the structural steel and iron work, in every respect as covered by the contract and in accordance with the drawings and specifications.
- The contractor however shall be fully responsible for the work being carried out in a safe and proper manner without unduly stressing the various members and proper equipment such as derricks, lifting tackles, winches, ropes etc. shall be used.
- The work of erection may be done in suitable units as may be directed by the Engineer-in-charge.
- Steel members shall be hoisted and erected in position carefully, without any damage to itself, other structures and equipment and injury to workmen.
- The method of hoisting and erection proposed to be adopted by the contractor shall be approved from the Site Engineer in advance
- Fabricated members shall be lifted at such points so as to avoid deformation or excessive stress in members. The structure or part of it placed in position shall be secured against over-turning or collapse by suitable means and in accordance with the Health and Safety obligations.
- Where necessary mechanical appliances such as lifting tackle winch etc. shall be used. It should be inspected for safety prior to use.
- During execution, the steel members shall be securely bolted or otherwise fastened when necessary, temporarily braced to provide for all loads

including those due to erection equipment and the operation to be carried out safely by qualified staff structure during erection. The steel members shall be placed in proper position as per approved drawing, final riveting or permanent bolting shall be done only after proper alignment has been checked and confirmed by the Site Engineer.

- Columns and stanchions shall be erected vertical and true with the necessary cross bracing to support the member etc. and the base shall be properly fixed with the foundation concrete by means of anchor bolts etc. as per drawing.
- Anchor bolts to be placed in the concrete foundation should be held in position with a wooden template during placement of concrete around the bolts/ligatures.
- At the time of concreting anchor bolt locations shall be provided with suitable timber mould or pipe sleeve to allow for adjustment which shall be removed after initial setting of concrete. The spaces left around anchor bolts shall be linked to a stopping channel in the concrete leading to the side of the pedestal and on the underside of the base plate to allow the spaces being grouted up after the base plate is fixed in the position along with the column footing. Grouting shall be of cement mortar 1:3 (1 cement: 3 coarse sand) or as specified.

Bedding of Column, Stanchions etc.

- Bedding/ grouting shall not be carried out until the steel work has been finally levelled, plumbed and connected together. The stanchion shall be supported on plastic wedges and adjusted to make the column plumb. For multi-storeyed buildings, the bedding shall not be done until sufficient number of bottom lengths of stanchions have been properly lined, levelled and plumbed and sufficient floor beams are fixed in position. The base plates shall be wedged clear of the bases by plastic wedges and adjusted where necessary to plumb the columns. The gaps under the base plate may be made up to 25 mm which shall be pressure grouted with cement grouts.

f) Completion Process

Cleaning

- General: Leave the works in a clean, tidy condition.
- Remove surface rust where noted and re-apply the appropriate paint or sealing product.
- Surfaces: Clean immediately before handover.

Fixings

- All components: Tighten.
- Timing: Before handover.

4.9 Stainless Steel Works:

4.9.1 Material

- a) **Supply of Material:** General requirements relating to supply of structural stainless steel shall conform to IS standards.
- b) **Grades:** The grade of stainless steel should conform to the description given in Indian Standards for use in external/ marine environment. While placing the order

the stainless steel should be designated by description in the specifications and be fit for purpose and identified by 'Designation'.

- c) **Steel type:** Type 316 Stainless Steel
- d) **Characteristics:** Type 316 stainless steel has better corrosion resistance to most chemicals, salts and acids and is more resistant to marine atmosphere because of an addition of 2.0 to 3.0% molybdenum. This addition improves the corrosion resistance of austenitic steels and imparts hot strength characteristics.
- e) Type 316 stainless steel is high creep strength at elevated temperatures.
- f) **Fabrication:** Roll formed, spun, deep drawn, hot and cold forged or bent and folded with a strong force, owing to the material's high strength and work hardening rate as per IS standards.
- g) **Dimensions:**
 - Stainless tube is available in many sizes, refer to drawings for relevant dimensions required for the project work.
 - Freedom from Defects: Stainless steel sheets and tube shall be free from harmful defects, such as scale, rust, blister, laminations, cracked edges and seams.
 - Physical and Chemical properties: Stainless steel sheets and tube should undergo some check analysis and tensile test to achieve standards as mentioned in IS standard code.
- h) **Tolerances**
 - The tolerances for stainless steel tube such as material with a wall thickness of 4-6mm shall be in the range of .75mm to 1.00mm
- i) **Application**
 - 316 Stainless Steel is specified for use with high purity products where product contamination must be held to a minimum. Typical applications are, Chemical Processing, Pharmaceutical and Textile Finishing Equipment and Marine Exterior Trim and as external hand-railing.

5. Landscape Elements Specifications

5.1 Kerbs and Edges:

- a) To be read with Preliminaries/ General Conditions and Engineer's details and specifications.
- b) All materials and workmanship shall comply with the relevant Indian Standards and Codes or CPWD specifications.
- c) Contractor to follow Health & Safety procedures set in Health & Safety Plan (as per section 1.6.3.) at any time during the works.

5.1.1 Relevant Drawing and Documents

The section to be read in conjunction with relevant drawings:

- a) Contractor is responsible to have most recent Drawings in his possession (e.g. relevant structural details) and discard superseded drawings upon revision. A drawing register is to be kept in the site office noting current plans current plans changes to plans during the work programme.

5.1.2 General quality

- a) The quality of materials method and control of manufacture and transportation of all concrete work in respect of mix, where reinforced or otherwise, shall conform to the applicable portions of these specifications.
- b) The Engineer-in-charge shall have the right to inspect the sources of materials, the layout and operation of procurement and storage of materials, the concrete batching and mixing equipment's and the quality control system. Such an inspection shall be arranged by the contractor and the Engineer-in-charge's approval shall be obtained prior to starting the work.

5.1.3 Material Samples Required

The ingredients to be used in the manufacture of standard concrete shall consist solely of a standard type Portland cement, clean sand, natural coarse aggregate, clean water and admixtures if specially called for as per drawings or schedule of quantities.

5.1.4 Delivery, Storage, and Handling

- Kerbstone units to be delivered on site, in suitable packaging free from cracks, chippings or discolorations of the material.
- Store materials on elevated platforms, under cover, and in a dry location. Do not use materials that have become damp.
- Store all accessories, including metal items, to prevent corrosion, discolouration and accumulation of dirt and oil.
- All materials shall be stored in a secured location and in accordance with Health and Safety Plan (as per "1.6.3. General Requirements, Section on Health and Safety").

- Contractor to be responsible for the safekeeping of all materials delivered to site and replacement at own cost as required.

5.2 Natural Precast Concrete Flushed Kerb:

- Manufacturer:** from Suppliers Schedule provided or equivalent approved.
- Application: For all typical edges with adjacent surfaces noted as flush with kerb detail;
- Concrete type: Manufactured by using M-30 grade of concrete using vibro-compaction process using jointless moulds.
- Size (width x length x height): Refer the Relevant Drawings & Schedule
- Special shapes: Refer the Relevant Drawings & Schedule
- Finish: Smooth
- Plan dimension deviation class: $\pm 2\text{mm}$.
- Diagonal deviation class: $\pm 2\text{mm}$.
- Thickness deviation class: $\pm 2\text{mm}$.
- Colour:** Refer the Relevant Drawings & Schedule.
- Bedding:** approved Kerbstone is to be laid onto a concrete base/ footing. The base should typically be as per structure consultant advice. It should compose of compacted semi-dry concrete (typically in 1:2:4 cement: sand: aggregate) mix. A minimum of one-third of the unit must be fully bedded into the mortar mix.
- Joints:** 5mm wide joint, Mortar colour to match edge colour.
 - Sealant movement joints: Refer to relevant Indian standards and updated CPWD specification.
 - Fixing of the kerb and any structural related details to Engineer's specification.
 - Contractor to reject any kerb units that do not comply with the above requirements and those that are chipped or damaged. Client's Representative to reserve right to reject products that do not comply to specifications.

5.3 Brick Kerb:

- Manufacturer:** Machine moulded from Suppliers Schedule provided or equivalent approved.
- Brick type: Class 1 Bricks; Average compressive strength should not be less than 10.7 N/mm²
- Water absorption less than 15%.
- Size (length x width x height): Refer the Relevant Drawings & Schedule
- Special shapes: Refer the Relevant Drawings & Schedule
- Finish: Smooth.
- Plan dimension deviation class: $\pm 2\text{mm}$.
- Diagonal deviation class: $\pm 2\text{mm}$.
- Thickness deviation class: $\pm 2\text{mm}$.
- Colour: Refer the Relevant Drawings & Schedule

k) **Bedding:** approved Kerbstone is to be laid onto a concrete base/ footing. The base should typically be as per structure consultant advice. It should compose of compacted semi-dry concrete (typically in 1:2:4 cement: sand: aggregate) mix. A minimum of one-third of the unit must be fully bedded into the mortar mix.

- Sub base layer: well compacted Granular subbase. Refer to structural details.
- Joints: 5mm wide joint, Mortar colour to match edge colour.
- Sealant movement joints: Refer to relevant Indian standards or CPWD specifications,
- Fixing of the kerb and any structural related details to Engineer's specification.
- Contractor to reject any kerb units that do not comply with the above requirements. Client's Representative to reserve right to reject products that do not comply with specifications.

5.4 Concrete Kerbs:

a) **Excavation:** the depth of the excavation depends on height of the kerbstone. Which way it will be laid and height of upstand is intended.

- Do not install in adverse weather conditions. Adequately protect foundations, bedding and haunching against extreme temperatures and rapid drying by wind and sun. Avoid excessive supply of concrete to prevent the start of curing process occurring prior to final working of concrete.
- Concrete used for foundations or haunching should comply with Indian standards and relevant Designated mix: Not less than GEN - 0 or Standard mix ST1, Workability: Very low.
- All cuts need to be machine cut. Cutting to be neat and accurate, without spalling. Form neat junctions. Minimum cut as specified on Drawings. If minimum cut not possible use oversized unit to be installed;
- Use special corner and radii units at bends, corners and junctions as per location on drawings.
- Units to be positioned true and levelled along top and front faces, in a mortar bed on accurately cast foundations; responding to site levels provided by the Landscape Architects.
- Ends of units buttered with bedding mortar as laying proceeds. Joints completely filled, 5mm wide mortar joint and surplus mortar removed immediately.
- After bedding has set, secure units with a continuous haunching of concrete to both sides of the kerb where applicable; Refer point no. 3.6. (g),(h), (i) for Deviation in finish kerb levels.

5.5 Paving:

5.5.1 Scope

- a) This section of the Specification covers the general requirements for concrete paving, natural stone paving, bituminous surfaces, tactile paving and allied works including all materials, labour, curing, scaffolding, tools etc.
- b) Contractor is to make allowance for the placement of conduit or pipework of a sufficiently large enough diameter to allow the installation of utilities such as irrigation line, electrical cabling at a future date.
- c) The contractor is to install all drainage pits and connecting pipework prior to commencing the placement of concrete pavement.
- d) All items and works related to the section shall be compliant with relevant Indian standards or equivalent standards;
- e) Contractor to follow Health & Safety procedures set in Health & Safety Plan (as per section 1.6.3.) at any time during the works.

5.5.2 Relevant Drawing and Documents

- a) All sections of this document to be read in conjunction with the relevant drawings & schedules provided as part of the landscape package:
- b) Contractor is responsible to have most recent Drawings in his possession (e.g. relevant structural details) and discard superseded drawings upon revision. A drawing register is to be kept in the site office noting current plans current plans changes to plans during the work programme.

5.5.3 Quality Assurance

- All paving materials to be obtained from single source, and supplied preferably, in one lot to keep variations to the minimum. Material to be as per approved Supplier's list or approved alternate – submitted by Contractor and approved by Client's Representative;
- The Contractor shall sort the paving material according to shade, texture and size of grains etc. to keep variation(s) in material and colour in the finished product to provide a random effect on the finished colour
- Any paving material with variation in the colour, shade, texture and size of grains etc., not acceptable to the Engineer-in-Charge, shall not be used in the work and shall be removed and replaced by the Contractor.
- Source Limitations for Other Materials: Obtain sample for each type of cementitious material, mortar, and other material from single source or producer for each aggregate;
- Use manufacturer's standard test methods to determine whether mortar and grout materials will obtain optimum adhesion with, and will be non-staining to, installed paving stones and other materials constituting stone paver installation.

- Pre-installation Inspection: Conduct inspection at Project site with Client's Representative as per approved Works Programme.

Mock-ups

- Construct Mock-ups to set quality standards for materials and execution as coordinated and approved by Client's Representative.
- Construct Mock-ups for each type of paving, each Mock-up shall be to scale, and surface areas as dimensioned as stipulated in the Drawings'. Notes for each Mock-up to be provided.
- Contractor to submit the drawing showing layout, location and dimensions for 'on-site' Mock-up area, for Client's Representative's approval prior to construction of Mock-up.
- Mock-up should include kerbs, recessed manhole covers, paving transitions, interface with lighting and any additional feature as required;
- Approval of mock-ups should include quality of finish, materials, mortars & P.C.C. and workmanship;
- Approval of mock-ups is also for other material and construction qualities that the Client's Representative specifically approves in writing. Approval of mock-ups does not constitute approval of deviations from the Contract Documents unless Client's Representative specifically approves such deviations in writing.
- If any major item has been rejected, mock-up panel shall be removed or corrected and presented again for approval.
- If minor items have been rejected, notes shall be taken by the Contractor and followed during the construction programme in respect to mentioned items. A copy of the notes is to be provided to the Site Engineer for review of adherence during the construction works.

5.5.4 Delivery, Storage, and Handling

- Paving units to be delivered on site in suitable packaging free from cracks, chippings or discolorations of the material.
- Store materials on elevated platforms, under cover, and in a dry location. Do not use materials that have become damp.
- Store all accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.
- All materials shall be stored in a secured location and in accordance with Health and Safety Plan (as per "1.6.3. General Requirements, Section on Health and Safety").

6. Paving Types

6.1 Concrete Pavers –paving type:

- a) Refer the Relevant Drawings & Schedule
- Granular sub-base: Thickness and specifications as per structural consultant
 - Sand bed: 50mm thk; specifications as per structural consultant compacted to remain true to level.
 - Paving type – Pre-cast Concrete pavers; 80mm thick and suitable for vehicular traffic or equivalent). Refer the Relevant Drawings & Schedule
- k) **Manufacturer:** from Suppliers Schedule provided or equivalent approved. Manufacturer to produce schedule of materials. Refer to Basis of the Design
- Size – Refer the Relevant Drawings & Schedule
 - Shape – irregular or partly rounded
 - Colour- Grey
 - Finish – Sand blasted
 - Plan dimension deviation class: ± 2 mm.
 - Diagonal deviation class: ± 2 mm.
 - Thickness deviation class: ± 2 mm.
- l) **Joints:** 5mm joint filled with self-binding polymeric sand (as recommended by manufacturer). Flush finish. All joints to align as shown in drawings Contractor to provide samples for approval.

6.2 EPDM Flooring –Paving type:

Refer the Relevant Drawings & Schedule

- a) **Manufacturer:** Virgin EPDM or SBR rubber granules and accessory materials such as binders and solvents shall be as produced and/or supplied by vendor or equal approved by the client. Manufacturer to produce schedule of materials. Refer to Basis of the Design.
- b) **Materials:**
- Granules - Pure vulcanized EPDM rubber chips ranging in size from 0.5-1.5mm minimum dimension (as per vendor and standards) to 1-4mm maximum dimension (as per vendor and standards).
 - EPDM rubber shall be UV stable.
 - Wetpour product on a concrete base (to be provided by the Contractor), shaped to provide positive fall to the edges defined in the plans.
 - Colour: Multiple, Refer the Relevant Drawings & Schedule
 - Binder- Resin (Chemical Family: Aromatic (as per vendor and standards) or Aliphatic (as per vendor and standards) Isocyanate as specified by client).
 - Binder shall be 100% urethane and contain no TDI. Accelerators may be used with aliphatic binders when job site temperature requires it. (Aliphatic binders should be considered on indoor applications where there is UV exposure or where light coloured rubber granules are used.)
 - Primer – Aromatic or Aliphatic resin thinned with solvent.
- c) **Base Preparation & Laying**
- Slab thickness and galvanized reinforcement mesh sizes and specifications (as per relevant Indian standards & structural consultant).

- Maintain a slope of no less than 2% to for surface run-off and to make it water permeable surface,
- First layer application should be determined by the current Sports Authority of India Standards handbook for rubberised flooring for play areas. Thickness of the rubber safety surface can range from 30mm to 100mm (SBR rubber) meeting standards for safety surfacing.
- Second layer to be applied at a minimum thickness of 5-8mm, using E.P.D.M. rubber granules ranging from 2.5mm to 3.5mm in size.
- Polyurethane binder shall be mixed throughout the entire material.
- Bevel is installed at the perimeter of the installation running from the thickness of the surface down to the base. The outside line of the bevel must be clear and follow the designed edge of the installation.
- Finished product: Shall meet or exceed current standards and specification.
- Testing: The system should be tested to the following standard.
- Hardness: as per standards, best practice International standards or relevant Indian codes of practice.
- Water Absorption: as per standards, best practice International standards or relevant Indian codes of practice.
- Ultraviolet Resistance: as per standards, best practice International standards or relevant Indian codes of practice.
- Fungal Resistance: as per standards, best practice International standards or relevant Indian codes of practice.
- Spread Of Flame Resistance: as per standards, best practice International standards or relevant Indian codes of practice.
- Accelerated: weathering no change after 2000 hours
- Freeze /Thaw: no change after 30 days at minus 50 in 24 hour period

6.3 Brushed Concrete Finish –paving type:

Refer the Relevant Drawings & 2.5.3 in the specifications.

- Supplier: Concrete supply should be finalized and approved by Client's representative prior to commencement of works. Concrete batching plant to provide batching details for records.
- Concrete type and quality to Engineer's specification and to comply with relevant Indian standards and regulations; reinforced as per structural consultant guidance. Refer section 2.5.3 for more details on concrete work.
- M25 grade of concrete in 1:1.5:3 ratio or as specified as per standards.
- Slab thickness and galvanized reinforcement mesh, sizes and specifications (as per relevant Indian standards & structural consultant).
- Slump of concrete should be maximum 110mm or as per structural consultant advice.
- Slab length should not be larger than 6.0m.
- Joints: expansion joints at 6.0m c/c; construction joints @3.0m c/c.

6.4 Steel Trowel Concrete Finish –paving type:

- Hard (Steel) trowelling is a process by which a finisher uses a steel trowel to densify the surface of the concrete. This finish is optional and produces a hard, smooth surface.

- After the concrete has been placed and compacted, finishing of the surface is undertaken. The initial stage in achieving any finish is to screed the surface to the required level/profile and flatness. A bullfloat is then typically used to close and fill any holes in the surface and eliminate lines from the screeding operation, leaving the surface relatively smooth. Also, hand floating the edges, corners and around penetrations may be carried out to level off screed marks and to consolidate loose material. The concrete is then left until all the bleedwater has evaporated. The final stage of finishing generally involves trowelling the surface
- Workmanship: skilled labour working under supervision of contractor following all standards and specifications

6.5 Wood Float Concrete Finish –paving type:

- Refer the Relevant Drawings & 2.5.3 in the specifications.
- Wooden Hand floats are held flat on the surface and moved in a sweeping arc to embed the aggregate, compact the concrete, and remove minor imperfections and cracks. Wooden floats require skilled operators and timing is important. If used too early, they stick, dig in, and can tear the surface. Used too late, they roll the coarser particles of fine aggregate out of the surface.
- The concrete is then left until all the bleedwater has evaporated. The final stage of finishing generally involves trowelling the surface.
- Finish surface when using a wooden float differs from that of a steel or magnesium float as it has a rougher texture to the finish. Suitable for external paths as non-skid surface.
- Workmanship: skilled labour working under supervision of contractor following all standards and specifications

6.6 Broom finish on Concrete:

Surface Finish:

- Brooms of varying degrees of stiffness can produce finishes that are both functional and attractive. Polypropylene and horsehair bristles will produce light textures, poly fibre bristles are used for medium and coarse textures, while special long soft plastic bristles are used for texturing over long distances to reduce the risk of mortar being dragged across the surface or clogging the bristles. As for wood float finishes, the surface should be adequately compacted by steel trowelling and the broom used only to provide texture by scoring the surface. Although typically used to provide a straight pattern, curved lines, wavy finishes and sawtooth patterns are also possible. Finishes such as checkerboard are achieved by brooming at 90° to adjacent panels. Intricate textures or graphic brushing to incorporate borders or variegated textures are best achieved using small brushes. Achieving broomed finishes that include border tessellation are specialist applications and should be undertaken only by experienced contractors. These may require hand brooming with specific brushes to achieve the desired texture. The timing of brooming, angle at which the broom is held and pressure applied will all affect the appearance, and should therefore be consistent. An

extension handle is usually fitted so that the broom can be pulled right across the surface in one motion. After each traverse of the concrete, the broom head should be tapped or cleaned to prevent an accumulation of mortar in the bristles. Surfaces to be broomed should be uniform in order to achieve consistent finishes. Where parts of the surface are shaded during finishing, brooming of these moister sections may cause 'balling' of loose matrix material which will crust or wear away under traffic loads. Where a broomed texture is used and traffic is heavier than domestic or light commercial traffic, the texture should be deeper. Lightly broomed textures look attractive when first done but wear quickly in industrial situations, whereas a medium or coarse broom texture should provide a good, skid-resistance surface over the design life of the floor or pavement

- To improve slip and skid resistance for applications such as driveway and sidewalk construction, the surface should be broomed at 90° to the intended direction of the traffic.
- Workmanship: skilled labour working under supervision of contractor following all standards and specifications.

6.7 Exposed Aggregate Concrete Finish – paving type:

- Exposed-aggregate finishes by definition, have the aggregates (the stones and/or sands) within the concrete which would normally be concealed by a thin surface layer of cement mortar, exposed at the surface. There are a number of techniques for producing exposed-aggregate finishes including water washing, abrasive blasting, acid etching and honing; each creating a different and distinctive appearance.
- Concrete mixes are often 'modified' for exposed aggregate finishes by increasing the proportion and the size of aggregates which are to be featured. Because the predominant colour comes from the aggregates, these types of finishes tend to conceal staining of the surface and generally do not require a surface sealer to be applied.
- The cement mortar can also be coloured, usually to complement the colour of the selected aggregates. Sample panels are recommended to assess techniques, surface finish, distribution of stones and, if applicable, consistency of colour. These finishes should be done under the supervision of a paviour experienced in these techniques.
- Aggregates can range from 3- and 6-mm 'pebbles' to large stones placed into the surface of the concrete: often referred to as 'plumbs'
- For water-washed finishes, the size of the aggregate should be appropriate for the application. For barefoot use, 3- and 6-mm pebbles are ideal with 10 mm about the maximum size recommended
- A number of methods are available to expose the aggregates including removal of the cement mortar from the surface layer by water washing (most common), abrasive/water blasting, acid etching, and removal of the surface layer of concrete by honing. Work should be done under the supervision of experienced contractors. Test panels are recommended to assess techniques, surface finish, distribution of aggregates and, if applicable, consistency of colour. Slab length should not be larger than 6.0m in any direction.

- Joints: expansion joints at 6.0m c/c; construction joints @3.0m c/c.

6.8 Morrum or Earth Path

a) Scope of work

- Morrum is available in 4-5 types with different colours ranging from browns, yellows to grey. The type of morrum depends on the grain size, liquid limit, plastic limit, moisture density relations based on these parameters, it can be used for walling, building, pavement or base of construction works. It is generally a impervious material.
- The type of morrum to be used, shall be identified by the Contractor and approved by the Site Engineer prior to commencing works. It should preferably be a local material

a) Base Preparation & Laying

- Morrum shall be laid for paths in thicknesses not exceeding 150mm. It should be raked to a generally flat surface prior to compaction. Allowance is to be made for compaction when finishing against retaining edges or kerbs with a deviation of less than 5mm in the finish to the adjacent surface.
- Grading of the path shall consider drainage of the surface and potential for scouring of the morrum surface by watershed from adjoining surfaces.
- Compaction of the material should be via a mechanical compactor/ vibrating plate of a minimum 50 kg weight. A minimum of 4 passes shall take place to achieve acceptable compaction with water added as required to close out cracking/ fracturing of the surface.

6.8.1 Aggregate for Concrete

- Limitations on contaminants: Free from absorbent particles which may cause 'popouts', and other particles such as coal and iron sulfide which may be unsightly or cause unacceptable staining
- Supply: From a single source and maintained throughout the contract.
- Colour: consistent.
- Aggregates should be single sized aggregate, 10 – 12mm in diameter unless otherwise specified, coarse/ rounded edge.
- Sample should be submitted and approved prior to placement.
- Surface should undergo steel floating process to get IPS (Indian Patent Stone Flooring) Finish using steel trowel. Application of retardant and removal of retardant as per vendor and Engineer's specification. Exposure of aggregate should be 5mm maximum.

6.9 Pedestrian Ramps:

Refer the Relevant Drawings & Schedule

All ramps must comply with the relevant I.S (Indian Standard) as per C.P.W.D

6.9.1 Civil Material

- a) **Granular sub-base:** Thickness and specifications as per structural consultant
- Brick tow wall: 230mm thk, Class – ‘1’ -Brickwork; Exposed; (Refer section for Brick work for sizes and other details; refer drawing for quantities and details).
 - Footing for brickwork – In 100mm thk. PCC. (For ratio and details refer section for Concrete work construction and structural consultant).
 - Ramp Surface: Where concrete pavement is specified, the type, thickness and quality to match the Engineer’s specification and to comply with relevant Indian standards and regulations; reinforced as per structural consultant guidance. Refer section for more details on concrete work.
 - Concrete slab: Slab thickness as per structural advice; concrete base using appropriately sized reinforcement mesh; (sizes and specifications as per relevant Indian standards & structural consultant advice).
 - Surface finish: Brushed concrete finish Refer section on Brushed Concrete finish details and specifications).

Miscellaneous items:

- **Railing.** Refer the Relevant Drawings & Schedule and section for detail specifications).

6.10 Steps:

- a) Refer the Relevant Drawings & Schedule for further information.

Civil Material:

b) **Technical Specification**

- **Size:** Refer the Relevant Drawings & Schedule

c) **Material:**

- **Granular sub-base:** Thickness and specifications as per structural consultant
- **Brickwork: Class – ‘1’ -Brickwork;** Exposed; Refer to applicable section on Brick work for sizes and other details; refer drawing for quantities and details.
- **Footing for brickwork –** In 100mm thk. PCC. For ratio and details refer applicable section for Concrete work construction and structural consultant).
- **Concrete -** type and quality to Engineer’s specification and to comply with relevant Indian standards and regulations; reinforced as per structural consultant guidance. Refer applicable section for more details on concrete work.
- **Thickness:** concrete thickness as per structural advice; (sizes and specifications as per relevant Indian standards & structural consultant advice).

d) **Surface:**

- **Surface Finish:** Steel Grey Granite paving stone @ 600mm x 300mm x 20mm thickness
- **Brushed Concrete finish.** Refer applicable section on Brushed Concrete finish details and specifications.
- **Colour:** Refer the Relevant Drawings & Schedule

e) **Special requirement:**

- **Nosing:** Bull nose; 10mm in radius/ Refer the Relevant Drawings & Schedule
- **Step Tread Grooves** parallel to face; set of four (5X5)mm groove placed 50mm from face of riser as slip resistant measurement of pedestrian surface as per IS standards.

7. Pergolas, Stage or Pavilion

- a) Refer the Relevant Drawings & Schedule

7.1 Civil Material:

b) **Technical Specification**

- **Size:** Refer the Relevant Drawings & Schedule

c) **Material**

- Granular sub-base: Thickness and specifications as per structural consultant.
- Brickwork: Class – '1' -Brickwork; Exposed; (Refer section 2.5.1 for Brick work for sizes and other details; refer drawing for quantities and details).
- Footing for brickwork – In 100mm thk. PCC. (For ratio and details refer section 2.5.3 for Concrete work construction and structural consultant).

d) **Concrete slab**

- Concrete type and quality to Engineer's specification and to comply with relevant Indian standards and regulations; reinforced as per structural consultant guidance. Refer section 2.5.3 for more details on concrete work.
- Thickness: concrete thickness as per structural advice; (sizes and specifications as per relevant Indian standards & structural consultant advice).
- Surface Finish: Brushed Concrete finish. (Refer section 3.3.3 on Brushed Concrete finish details and specifications).
- Colour: Natural.

7.2 Miscellaneous items used in execution of Paving:

a) **Mortar**

- Refer section 2.5.4 for details being used in Paving and wall construction.

b) **Tooled coloured joints in mortar bedded units**

- Joints: Completely filled with bedding mortar as work proceeds. Tooled to neat flush profile.
- Joint width: 5 to 7mm.
- Pointing: 1:3 cement: sand mortar with pigment, colour to match stone colour. Refer to 2.5.4.
- Depth: 10mm.

c) **Cementitious bases and sub-bases**

- General: Protect from moisture loss by covering with sand or polyethylene sheet, if not covered by another pavement course within 2 hours of completion.

d) Sealant movement joints in mortar bedded units

- Spacing: 9.0m or as per structural consultant or relevant Indian standards; aligned with paving pattern to minimize cutting at construction joints.
- Extent of joints: Through edge units, haunching and foundation.
- Joint filler: Compressible cellular rubber or plastics compatible with specified sealant. Build in as work proceeds.
- Joint width: 10mm.
- Barrier (joint breaker): As recommended by sealant manufacturer. Position filler and barrier accurately to fully support sealant at recommended distance from exposed faces of units.
- Sealant: Submit proposals.
- Colour: Colour to match adjacent paving. Contractor to source up to 3 samples of suitable colours and submit for approval from client representative and Client.

7.3 Execution of Pavement Work:

7.4 Laying Concrete:

- a) Refer to applicable Section for Concrete work details.

7.5 Laying Natural Stone/ Tile Paving:

- Do not install paving units in adverse weather conditions. Adequately protect foundations, bedding and haunching against extreme temperatures and rapid drying by wind and sun, heavy rainfall.
- Sub base and bedding to be laid to Engineer's specification.
- Bedding to be firm and properly compacted before proceeding with paving and it should meet minimum Indian standards for compaction.
- Cutting to be neat and accurate, without spalling to form neat junctions with edging and adjoining finishes. Minimum cut as specified on Drawings. If minimum cut not possible use oversized unit;
- Levels and lines of finished surface should be smooth and even with falls to prevent ponding.
- When laying pavers on the slope, lay paving units from the bottom of slope, upwards.
- Paving should appear even and regular with even joint widths and free of mortar and sand stains.
- Deviation in finish paving levels should be no more than $\pm 2\text{mm}$. Allowed deviation in height of finished paving above features (gullies/drainage channels/kerbs) to be no more than $\pm 3\text{mm}$, sudden irregularities are not permitted. Variation in levels between adjacent block/pavers sets to be no more than $\pm 2\text{mm}$.
- Paving to be kept clean at all times. All deleterious materials to be removed immediately.
- Do not overload previously laid paving with stacks of materials. Avoid damage to unit corners, surfaces etc.

- After laying do not allow for any pedestrian traffic for 24h, vehicular traffic for 28days

7.6 Wall Coping and Cladding:

7.6.1 Scope

- This section of the Specification covers the general requirements for masonry works, natural stone cladding, paints, mosaic tiling and allied works including all materials, labour, curing, scaffolding, tools etc to the external surface of stand-alone walls and buildings.
- All items and works related to the section shall be compliant with relevant Indian standards or CPWD specifications, 2009 for all items and related work.
- Contractor to follow Health & Safety procedures set in Health & Safety Plan (as per section 1.6.3.) at any time during the works.

7.6.2 Relevant Drawing and Documents

- a) The section to be read in conjunction with the Relevant Drawings & Schedule
 - Contractor is responsible to have most recent Drawings in his possession (e.g. relevant structural details) and discard superseded drawings upon revision. A drawing register is to be kept in the site office noting current plans current plans changes to plans during the work programme

7.6.3 Quality assurance

- b) **Installer Qualifications: Registered Contractor;** suitably experienced staff are to be engaged to install. Contractor to provide references as to the competency of the staff engaged in applying the finishes.
- c) All cladding materials to be obtained from single source and supplied preferably, in one lot to keep variations to the minimum, as per approved Supplier's list – submitted by Contractor and approved by Client's Representative.
- d) Any cladding material with variation in the colour, shade, texture and size of grains etc., not acceptable to the Engineer-in-Charge, shall not be used in the work and shall be removed and replaced by the Contractor at his cost.
- e) Source Limitations for Other Materials: Obtain each type of cementitious material, mortar, grouts and other material from single source or producer for each aggregate.
- f) Use relevant Indian standard test methods to determine whether mortar and grout materials will obtain optimum adhesion with, and will be non-staining to, installed cladding and other materials constituting cladding installation.
- g) Pre-installation Inspection: Conduct inspection at Project site with Client's Representative as per approved Works Programme to determine suitability of the site for proposed works.
- h) Mockups: to set quality standards for materials and execution as coordinated and approved by Client's Representative. Refer to 3.1.1 for detailed information.

7.6.4 Delivery, Storage, and Handling

- a) refer to 3.1.11 for further information.

8. Wall Types

8.1 Brick Wall:

- a) Refer the Relevant Drawings & Schedule

8.1.1 Technical Specifications

- a) Wall Size: Refer the Relevant Drawings & Schedule
- Refer to applicable section. on Brick work construction.
 - Manufacturer: Machine moulded from Suppliers Schedule provided or equivalent approved.
 - Brick type: Class 1 Bricks; Average compressive strength should not be less than 10.7 N/mm²
 - Water absorption less than 15%.
 - Size (length x width x height): Refer the Relevant Drawings & Schedule
 - Finish: Refer the Relevant Drawings & Schedule
 - Plan dimension deviation class: ± 2 mm.
 - Diagonal deviation class: ± 2 mm.
 - Thickness deviation class: ± 2 mm.
 - Colour: Refer the Relevant Drawings & Schedule. To match approved samples
- b) Wall Base Finish:
- Surface finish: Acrylic emulsion exterior paints(Refer CPWD specifications and relevant Indian standards for execution guidelines along with manufacturer's recommendation)
 - Colour: Refer to applicable sections and drawings (As per manufacturer).
 - Finish: Smooth (As per manufacturer). 20mm thk. Cement Plaster; Deviation: ± 2 mm (Refer section 2.5.5 on Cement Plaster)
- c) Coping- Refer the Relevant Drawings & Schedule.

8.2 Brick Wall with GI Fencing:

General: Refer the Relevant Drawings & Schedule.

b) Technical Specifications:

- a) Wall Dimension: Refer the Relevant Drawings & Schedule.
- **Fence** Pre-fabricated Hot Dipped Galvanised mild steel or otherwise noted Framework of primary and secondary members.
Structural members (Vertical and Horizontal members) -Hollow box sections of varying sizes as per drawing should be in Mild steel and Hot Dipped Galvanized. (For standards, Fabrication and Surface treatment of Steel refer to applicable section; consult structural consultant for technical advice)
 - For Brick wall specifications refer to applicable section for Brick wall; Refer applicable section for Brick work construction.

b) **Wall Base Finish:** Refer the relevant drawings & schedule.

- 20mm thk. Cement Plaster; Deviation: ± 2 mm (Refer to applicable section on Cement Plaster)
- Surface finish: Acrylic emulsion exterior paints (Refer CPWD specifications and relevant Indian standards for execution guidelines along with manufacturer's recommendation)
- Colour: As noted in the details and drawings (Application as per manufacture details). Refer the relevant drawings & schedule
- Finish: Smooth (As per manufacturer). Refer the relevant drawings & schedule
-

c) **Coping-** Refer the relevant drawings & schedule.

- **Railing/ Fencing Finish** - Hot dipped galvanized fencing. (Refer to applicable section for Steel works).
- **Fixing Detail** - Contractor to provide fixing details after approval by structural consultant engaged at his own cost for technical advice.

9. Landscape Elements, Site Furniture/ Equipment

General: This section needs to be read with Preliminaries/General Conditions and Engineer's details and specifications provided in different sections of the document.

Contractor to provide fixing details after approval by structural consultant engaged at his own cost for technical advice.

9.1 Relevant Drawing and Documents:

- a) The section to be read in conjunction with the Drawing package provided in the tender package:
 - Contractor is responsible to have most recent Drawings in his possession (e.g. relevant structural details) and discard superceded drawings upon revision. A drawing register is to be kept in the site office noting current plans current plans changes to plans during the work programme

9.1.1 Quality Assurance

- b) Specialist landscape element, Site/ Street furniture supplier to complete and develop landscape elements provided in drawing schedule and submit shop drawings and material schedules for approval by client representative. Contractor to submit proposed guarantee period.
- c) Contractor to ensure all materials, methodologies and mixes are suitable to the local climate conditions.
- d) The supplier/subcontractor must complete the design and detailing and submit detailed design including shop drawings and calculations to the Landscape Architect/Client's representative for comment before production. The Client's representative and Client are to approve prior to manufacture.
- e) The works shall comply with the most recently published Indian Standard for Construction or equivalent approved standard. Contractors who do not have a copy of these standard specifications may obtain a copy from BIS Bureau of Indian Standards (www.bis.org). The supplier/subcontractor's attention is directed to the fact that high standards of work are required.
- f) The supplier/subcontractor must carry out all fixing, reinforcement and foundation details.
- g) **Environment:** The supplier/subcontractor must select materials and carry out workmanship that is resistant to affects by local climatic and environmental conditions and provide a minimum life-span of 20 years for all permanent furniture. All materials and finishes are to be agreed and must not become excessively hot to touch during typical daytime conditions.
- h) **Material samples:** The supplier/subcontractor must prepare samples of all other surface finishes prior to manufacture. Obtain approval of appearance, and finishes prior to manufacture.

- i) The Contractor shall appoint a specialist or suitably qualified personnel to install furniture pieces to the specified location. The Contractor is to provide details of their proposed sub-consultant for the installation of furniture to the Client's representative for approval prior to appointment.

9.1.2 Delivery, Storage, and Handling

- a) Refer to previous description of the conditions for delivery, storage and handling of all landscape elements.
- b) Fixtures to be delivered on site in suitable packaging free from cracks, chippings or discolorations of the material.
- c) All materials shall be stored in a secured locked location and in accordance with Health and Safety Plan.

9.2 Landscape Elements:

9.2.1 Seating: Types

- a) Refer Drawing no. Refer the relevant drawings & schedule for Seating Details.
- b) **Technical Specification:** Size: Refer the relevant drawings & schedule

9.2.2 Pergola structure

- a) Refer Relevant Drawings & Schedule for Pergola Details.

9.2.3 Handrail

- a) Refer the relevant drawings & schedule for Handrail Details.
- b) **Technical Specification**
 - Material – Stainless Steel / Refer the relevant drawings & schedules.
 - Finish – Non – directional SS brushed finish / Refer the relevant drawings & schedule
 - Fixing and connections: Under supervision of structural consultant. Finish and colour to match adjacent material.
 - Installation:
 - Contractor to provide fixing details after approval by structural consultant engaged at his own cost for technical advice.

9.2.4 Gate

1. General: Refer Relevant Drawings & Schedule for

a) Technical Specification

- **Overall size**

Refer the relevant drawings & schedule Structural members (Hollow box sections & Flat plate for gate framework and vertical bars) of varying sizes given as per drawing should be in Mild steel, fabricated and Hot Dipped Galvanized (For standards, Fabrication and Surface treatment of Steel refer to applicable section;

- Contractor to provide fixing details after approval by structural consultant engaged at his own cost for technical advice.

Fixing and Connection

- Holdfast, Hinges, screws, bolts, nuts (details as per drawing and detail).
- Accessories:
- Latch Lock as per detail.

9.3 Play Equipment:

General: This section needs to be read with Preliminaries/ General Conditions and Manufacturer's details and specification. Refer to applicable sections and materials schedule for further details.

9.3.1 Relevant Drawing and Documents

- The section to be read in conjunction with Manufacturer Drawings and details.
- Refer International Standards for Playground equipment for parks and open space – specifications for reference and details.
- Length of the warranties for each part making up the piece of the equipment, availability of each part making up the piece of equipment if replacement is required.
- Level of service provided by the vendor.

9.3.2 Quality Assurance

a) Specialist play equipment supplier to complete and develop selected design and submit shop drawings and material schedules for approval by client representative. Components and performance to be designed to a life span of 20 years. Contractor to submit proposed guarantee period.

- Contractor to ensure all materials and installation methodologies are suitable to the climatic conditions.
 - The supplier/subcontractor must complete the design and detailing of foundations and any other supporting information outside of the remit of the Play Equipment vendor and submit detailed design including shop drawings and calculations to the Landscape Architect/Client's representative for
-

comment before final production. The Site Engineer and Client are to approve prior to ordering the equipment.

- The works shall comply with the most recently published Indian Standard for Construction or equivalent approved International standards. Contractors who do not have a copy of these standard specifications may obtain a copy from BIS Bureau of Indian Standards (www.bis.org). The supplier/subcontractor's attention is directed to the fact that high standards of work are required.
- Supplier should follow Health and Safety norms as mentioned in section 1.6.3 as per updated Indian Standard for Construction or equivalent approved International standards guidelines for Playground surface and play equipment.
- Equipment should also undergo Safety test to check Finger, Hand, Limb and head traps.
- The equipment shall be subjected to load test (prescribed in Indian standards).
- The Contractor shall appoint a specialist to install play equipment to the specified location. The Contractor is to provide details of their proposed sub-consultant for the installation of play equipment to the Project Manager for approval prior to appointment.
- The supplier/subcontractor must carry out all fixing, reinforcement and foundation details.

2.

1. Support:

- Foundations for the equipment should be prepared in accordance with the manufacturer's recommendation and structural confirmation.
- Particular attention is necessary during preparation of foundations to ensure that final erection, especially where steel tube supports will be embedded in concrete, can be carried out to the correct levels as per Indian Standard for Construction or equivalent approved International standards specifications.
- Manufacturer should pay attention in the selection of appropriate size and strength of chains to safeguard the safety of the users which allows the movement backwards and forwards.

2. Fastenings/ Connections:

- All fastening and connections will be as per manufactures' specification along with relevant Indian Standard for Construction or equivalent approved International standards specifications.
- Fastenings used in any accessible part of the equipment shall be of round headed type or hexagon type with chamfered corners unless countersunk or counter bored to eliminate sharp protrusions.
- Accessible nuts shall have the projecting screw thread cut off and the remainder peened so that no sharp edges remain. Nuts, bolts and screws should be secured against loosening. S-hooks, if used shall be pinched and closed as tightly as possible.
- All connection points of stainless steel members should be treated with picking process. All edges should be grinded to achieve smooth surface.

3. Profile and exposed Surface:

- Components parts shall not have any rough or sharp edges or projections in any position that present a hazard to the child.

4. Finish

- Play equipment workmanship and finish shall conform to the requirement prescribed in Indian and International standards.
- The surfaces of all parts, not naturally resistant to corrosion or deterioration shall be protected by surface coating or impregnation as per International standards and Health and safety norms.
- For example, by sealing hollow sections to prevent the ingress of water or making provision for water to drain away; by designing joints and connections so that they are ventilated, self-draining or sealed to prevent ingress of water by capillary action.

5. Surfacing Materials for Play Equipment:

- Surface material of the play equipment should be as per relevant Indian standards or approved International Standards
- It is strongly recommended that impact absorbing surfaces be provided in at least the operating area around the equipment, particularly those items from which falls are possible.
- Where Sand is used as a softfall, the minimum depth shall be 400mm, the material should be turned over twice a year to prevent compaction and reduction of the softfall characteristics.
- Manufacturers will be able to provide recommendations for the minimum surface areas needing protection.

6. Installation of Play equipment

3.

- The manufacturer shall supply installation instructions which shall include sizes and other details for foundations, erection sequence, tightening for all bolts and similar items and checklist against which correct assembly and operation can be assessed.
- The Contractor shall appoint a specialist to install play equipment to the specified location. The Contractor is to provide details of their proposed sub-consultant for the installation of play equipment to the Project Manager for approval prior to appointment.

7. Packing and Marking

- The equipment shall be packed for delivery as agreed to between the purchaser and the supplier
- Marking shall be durably marked with the following particulars in a visible location when erected on site:
 - Indication of the source of manufacture
 - Month and year of manufacture
 - Batch and serial number
- **BIS** (Bureau of Indian Standards) certification marking is important to be provided on play equipment as per BIS Act, 1986. As a licence for working of play equipment.

9.4 Lighting:

General: This section needs to be read with Preliminaries/ General Conditions and Manufacturer's details and specification. Refer to relevant sections and materials schedule for further details.

9.4.1 Scope of Work

The works to be executed under this specification consists of the design of lighting in Parks and Open Space as depicted in the plans. Should the Contractor wish to submit designs with alternative specifications, they should clearly demonstrate that the design will satisfy acceptable industry standards under the following criteria;

- Technical Standards – compliance with Indian standards or accepted International standards and industry guidelines.
- Safety – compliance with relevant Indian Standards and standards indicated in the preceding document.
- Environmental compatibility.
- Amenity
- Accessibility and convenience.

9.4.2 Objectives

- To achieve lighting parameters that provide a safe night time environment for the community, Safety and security is about good lighting and not more lighting!. The lighting should cater for all perceived activities within the Streetscape, Parks or Open Space.
- Appropriate lighting will allow for higher visibility of pedestrians and encourage people to walk, cycle and use public transport.
- Lighting fixtures should be sourced from a reputable supplier, be vandal resistant, low maintenance, low replacement cost and energy efficient.
- Lights can either be Metered lighting or Off-Grid lighting. The luminaires can either be powered by;
- a dedicated solar (P.V Panel) system, alternatively a stand-alone in-situ light, pole and battery system can be installed. Care should be taken to avoid overshadowing of the P.V panel by trees or buildings that would reduce the efficiency of the light.
- or connection to an existing power supply that satisfies the demand loading of the lighting in cable size, cable run and potential voltage drop.
- Design process for the lighting of public spaces.
 - location and need/purpose of lighting
 - category of lighting
 - type of light (luminaire should be a white light), pole and bracket
 - the method of lighting control (if required)
 - the requirement to be monitored thru a commend & control centre.
- Minimum energy efficiency standards for all new lighting infrastructure. This is identified using a luminaire efficacy of no less than 60 lumens per watt. , typically a LED light of 18 watts.

9.5 Softscape works:

- b) This section covers the general specifications of basic softscape works which are part of landscape civil work which includes (trees, shrubs and groundcovers) vegetative materials work and related treatment procedures.
- c) All materials and workmanship shall comply with the relevant Indian Standards and Codes or latest CPWD specifications, 2009

9.5.1 **Scope of Work**

- a) The works to be executed under this specification consists of the design of the planting response to the design prepared in the drawing package and related documents. The works are for the supply and installation in Streetscape, Parks and Open Space as depicted in the plans. Should the Contractor wish to submit designs with alternative specifications, they should clearly demonstrate that the design will satisfy acceptable industry standards under the following criteria;
- b) **Technical Standards** – compliance with Indian standards or accepted International standards
- c) Responsibilities Requirement: The contractor is responsible for all unknowns and/or varying site conditions, including utilities, subsoil conditions and regulatory authority permits. Regulatory approvals: Obtain permits or approvals from the regulatory authority as required for the completion of the project, including for the following: -
- d) Use of pesticides/herbicides. Liaise with the relevant authority to determine approval conditions and requirements, and address these to obtain approval, as required.

9.5.2 **Objectives**

- a) Design and install landscaping works to improve the visual appeal of the development and provide a comfortable outdoor living environment for the residents, including the provision of softscape and hardscape elements.
- b) Site modification associated with landscaping works, including clearing, tree protection and earthworks (including mounds and batters).
- c) Stormwater management measures associated with landscaping works, including subsoil drainage.

1. Topsoil:

- a) Topsoil material Source: If the suitable topsoil cannot be provided from material recovered from the site, provide imported topsoil.
- b) **Soil composition:** for Fill and imported topsoil properties: Provide fill/soil free of the following: - Clay material. - Refuse or materials toxic to humans, animals or plants. - Stumps, roots or stones larger than 50 mm. Topsoil composition: Provide soil with the following properties: - Minimum 3% (by mass) organic content. - pH value: 5.5 to 7.5. - Maximum 0.06% (by mass) soluble salt content.

c) **Topsoil particle size:** table (% passing by mass) Sieve aperture (mm) Soil textures Fine Medium Coarse 2.36 100 100 100 1.18 90 – 100 95 – 100 95 – 100 0.60 75 – 100 75 – 100 70 – 90 0.30 57 – 90 55 – 85 30 – 46 0.15 45 – 70 38 – 55 10 – 22 0.075 35 – 55 25 – 35 5 – 10 0.002 2 – 15 2 – 8 Topsoil nutrient level table

d) **Nutrient Unit** Sufficiency range

Nitrate-N (NO₃) mg/kg > 25 Phosphate-P (PO₄) – P tolerant mg/kg 43 - 63

1) Phosphate-P (PO₄) – P sensitive mg/kg < 28

2) Phosphate-P (PO₄) – P very sensitive mg/kg < 6

3) Potassium (K) mg/kg 178 - 388

4) Sulphate-S (SO₄) mg/kg 39 - 68

5) Calcium (Ca) mg/kg 1200 - 2400

6) Magnesium (Mg) mg/kg 134 - 289

7) Iron (Fe) mg/kg 279 - 552

8) Manganese (Mn) mg/kg 18 - 44

9) Zinc (Zn) mg/kg 2.6 - 5.1

10) Copper (Cu) mg/kg 4.5 - 6.3

11) Boron (B) mg/kg 1.4 - 2.7

12) Method References pH in H₂O (1:5), pH in CaCl₂ (1:5) and Electrical Conductivity (EC) by Rayment & Higginson (1992) method 4A2, 4B2, 3A1 Soluble Nitrate-N by APHA 4500 Soluble Chloride by Rayment & Higginson (1992) modified method 5A2 Extractable P by Mehlich 3 – ICP Exchangeable cations – Ca, Mg, K, Na by Mehlich 3 – ICP Extractable S by Mehlich 3 – ICP Extractable trace elements (Fe, Mn, Zn, Cu, B) by Mehlich 3 – ICP

e) **Topsoil: Site preparation.**

Embankments

- Maximum gradient: 1:4. Grade embankments to an even slope. Embankment stabilisation General: Where necessary to prevent erosion or soil movement, stabilise embankments.

Stabilisation:

- Method: Either matting (generally: Biodegradable fibre reinforced with lightweight polymer mesh) overlay or mulching.

Planting:

- after matting is installed. Peg the matting into 300 x 300 mm anchor trenches at top and bottom, backfill the trenches with soil and compact. Matting pegs: U-shape galvanized steel, at 1000 x 1000 mm intervals generally, 250 mm at overlaps.

SUBSOIL – INSTALLATION:

- Planting beds Excavated to bring the subsoil to at least 300 mm below finished design levels. Shape the subsoil to fall to subsoil drains where required. Break up the subsoil to a further depth of 100 mm.

Unexcavated Sites:

- Remove weeds, roots, builder's rubbish and other debris. Bring the planting bed to 75 mm below finished design levels.

Cultivation Minimum depth:

- 100 mm. Services and roots: Do not disturb services or tree roots. If required cultivate these areas by hand. Cultivation: Mix in materials required to be incorporated into the subsoil. Cultivate manually within 300 mm of paths or structures. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to design levels after cultivation

Additives General:

- Apply additives after cultivation and incorporate into the upper 100 mm layer of the subsoil. Gypsum: Incorporate at the rate of 0.25 kg/m². Organic soil improver: Add to each new planting area.

2. Site Topsoil Preparation:

Screeding:

- A suitable screen capable of handling the volumes required by the project, must be employed prior to placing topsoil, to remove deleterious material from the soil mix. Sieves capable of grading from 20 mm to 15 mm.

Waste:

- Remove from site all clay lumps, balled compacted particles greater than 20 mm, stones and trash foreign to the normal composition of soil.

Contamination:

- If diesel oil, cement or other phytotoxic material has been spilt on the site topsoil, excavate the contaminated soil and dispose of it off the site.

Admixtures:

- During the screening, for turf areas add the following: - 15% by weight coarse sand minimum particle size 0.2 mm. Additives program: 8 weeks before stolonizing or turfing.

Placement:

- Spread the topsoil on the prepared subsoil and grade evenly, making the necessary allowances to permit the following: - Required finished levels and contours may be achieved after light compaction. - Grassed areas may be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.

Spreading:

- On steep batters, make sure there is no danger of batter disturbance during placement of topsoil. Compact lightly to prevent erosion in the event of rain..

Finishing:

- Feather/ blend edges into adjoining undisturbed ground.

Topsoil depths:

- Spread topsoil to the following typical depths: -
 - Excavated planting areas If using organic mulch: 225 mm.. If using gravel mulch: 250 mm.

- Irrigated grassed areas generally heavy use (e.g. playing fields, playgrounds, and public parks): 200 mm.
- Non-irrigated grass areas: 100 mm.
- Earth mounds.
- Mass planted surfaces: 300 mm.
- Grassed surfaces: 100 mm.
- Top dressing: 10 mm.

3. Grass Surfaces Turf:

Turf:

- Cultivated turf of even thickness, free from weeds and other foreign matter, supplied by a specialist grower of cultivated turf.

Quality:

- Turf to be of an even thickness, free from weeds, pests, disease and other foreign matter. Turf properties: Consisting of 25 mm deep dense, well-rooted, vigorous grass growth in min 25 mm deep topsoil. –

Species:

- A hard wearing variety having low watering and maintenance requirements as per specifications.

TURFING REQUIREMENTS:

- Keep planting area free of rubbish, rubble stones and roots.
- **Watering:** Keep soil moist to 100 mm deep before planting.
- **Planting area preparation:** as follows: - Rotary hoe: To a minimum depth of 150 mm. Lightly roll post cultivation to form an even, levelled surface without wheel ruts.
- **Supply:** Deliver the turf within 24 hours of cutting, and lay within 36 hours of cutting. Prevent turf from drying out between cutting and laying. If not laid within 36 hours of cutting, roll turf out on a flat surface with the grass up, and water as required to maintain a good condition.
- **Placement:** Lay the turf in stretcher bond pattern with the joints staggered and close butted. Make sure the turf is uniform in colour and thickness. Place the rolls parallel, with the long sides of level areas, and along contours on slopes. Close butt the end joints. Finish with an even surface.
- **Tamping:** Lightly tamp to an even, levelled and consistent surface immediately after **laying**. Use only a light roller.
- **Stabilising:** on steep slopes: Peg the turf (on steep slopes) to prevent downslope movement. Remove the pegs when the turf is established.
- **Watering:** Water immediately after laying until the topsoil is moistened to its full depth. Maintain moisture to this depth.

- **Establishment:** Maintain turfed areas until there is a dense continuous sward of healthy grass over the whole turfed area, evenly green and of a consistent height.
- **Failed turf:** Contractor to lift failed turf and replace with new turf at his own cost.
- **Levels:** If levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.
- **Mowing:** Mow to maintain the grass height within the required range. Do not remove more than one third of the grass height at any one time. Carry out the last mowing within 7 days before the end of the planting establishment period. Remove grass clippings from the site after each mowing.
- **Top dressing:** After the first mowing, remove cuttings and lightly top dress to a depth of 10 mm correct any unevenness in the turf surface during this process.
- **Fertilising Requirement:** Mix the fertiliser thoroughly into the topsoil before placing the turf with a slow release fertiliser applied to the manufacturer's recommendations. Apply lawn fertiliser at the completion of the first and last mowing, and at other times as required to maintain healthy grass cover.

4. Grass Surfaces Direct Seeding:

- **Preparation:** Refer to specifications for preparation of site.
- **Quantity:** Contractor to provide sufficient quantities of the approved grass seeding mix to the site, with allowance for loss thru birds or other animals

9.6 Plants:

- **REQUIREMENTS** Plant properties Supply trees with the following properties: - Nursery grown. True to species, variety, cultivar, stem form and other features required in the Plants list/schedule. - Free from injury. - Self-supporting. - With caliper at any given point on the stem greater than the caliper at any higher point on the stem.
- **Supply and delivery:** Supply plants from an accredited nursery and deliver to site with a label displaying the botanical name.
- **Health:** Fully branched. Foliage size, texture and colour at time of delivery consistent with that of healthy specimens for the nominated species.
- **Vigour:** Extension growth consistent with that exhibited in vigorous specimens of the species nominated.
- **Container Grown Stock:** Remove plants without damaging or disturbing the roots. - Root bound plants: Do not use. - Variation from the plan: Do not provide plants which vary from the Landscaping plan in species or size without approval from the principal. - Planting areas

9.6.1 Placing plants

- **Method:** Excavate a hole twice the diameter of the rootball and at least 100 mm deeper than the rootball. Break up the base of the hole to a further depth of 100 mm, and loosen compacted sides of the hole to prevent confinement of root growth.
 - **Depression around roots:** Provide 80 cm diameter depression around the plant. Make sure roots are covered and protected with soil. Top of rootball: Finish 100 to 200 mm below soil level.
 - **Locations General:** If it appears necessary to vary plant locations and spacings to avoid service lines, or to cover the area uniformly, or for other reasons, Contractor to give notice to the Site Engineer and Clients Representative prior to continuing.
 - **Planting conditions Weather:** Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.
 - **Watering Timing:** Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.
 - **Placing:** Remove the plant from the container with minimum disturbance to the rootball. Prune roots so that all circling roots are severed or aligned radially into the surrounding soil. Make sure the rootball is moist.
 - **Planting:** Place plant in its final position, in the centre of the hole, with the topsoil levelled with the finished surface of the surrounding soil. Compact lightly to minimise subsidence without compacting the backfill. Avoid mixing mulch with topsoil.
 - **Backfilling Requirement:** Backfill with a topsoil mixture. Lightly tamp and water to eliminate air pockets. Make sure the plant stem remains the same height above ground as it was in the container.
 - **Watering basins for plants:** Except in irrigated grassed areas and normally moist areas, construct a watering basin around the base of each individual plant, consisting of a raised ring of soil capable of holding at least 10 L.
 - **Fertilising:** Fertilise all new planting areas with an organic fertilizer or other approved alternative.
 - **Damage:** Free from damage from restricted habit due to growth in nursery rows and defects such as knots, sun scalds, abrasions and disfigurement.
 - **Stress:** Free from stress resulting from inadequate watering, excessive shade or excessive sunlight experienced at any time during their development.
 - **Site environment:** Grown and hardened off to suit anticipated site conditions at the time of delivery.
 - **Root development:** Healthy root systems developed by transplanting or root pruning and grown in their final containers for the following periods: -
-

Plants < 25 L size: More than 6 weeks. –

Plants > 25 L size: More than 12 weeks.

- **Pests and disease:** Free from attack by pests or disease, eggs or larvae. Native species with a history of attack by native pests: Restrict plant supply to those with evidence of previous attack to less than 15% of the foliage and ensure absence of actively feeding insects.
- **Labelling General:** Clearly label individual plants and batches. Label type: Waterproof tag able to withstand transit without erasure or misplacement. Label information: Include the following: - Common name and botanical (full scientific) name. - Include for hybrids, variety or cultivar.
- **Root system Requirement:** Supply plant material with a root system proportioned in relation to the size of the plant material. - Conducive to successful transplantation. - Free of any indication of having been restricted or damaged.
- **Root inspection:** Do not provide root bound stock. Shrubs and ground cover Pot size: Minimum 175 or 200 mm or to the Landscaping plan. Trees planted on site Minimum size: 45 litre bag.

9.6.2 Transplanting trees

- **General Conditions:** Select a time for transplanting appropriate to the season, time of actual operation, rootball diameter and depth, lifting methods and weather conditions.
- **Preparation Watering:** Establish a temporary trickle irrigation system, or manually water the intended trees for a period of two weeks before ball excavation work.
- **Fertilising:** Apply one application of liquid fertiliser mix to the foliage and root as appropriate to the species. Apply sufficient liquid fertiliser mix to allow the spray to drip from foliage and soak into the rootball. Do not spray the fertiliser mix on excessively hot, dry or windy days.
- **Rootball:** Minimise the cutting of roots. Use only sharp tools, water blasting or water cutting. Initial cut: Conform to the following: - Manually or using chain trenching machine. Replace trees where rootballs have been excavated by backhoe or an excavator. - Cut 250 mm beyond the required finished rootball dimensions of each side to allow damaged roots to be trimmed back to final dimensions and sealed. Hand trimming: To 100 mm less than the required finished rootball dimension. Cut back all roots greater than 25 mm diameter.
- **Rootball cutting:** Contractor to excavate trench symmetrical about the trunk and in proportion to the overall size of the tree, except where the limitations of individual tree planter openings require specific tailoring of the rootball dimension. - Cut the rootball to a size which maximises the rootball for each specimen.

- **Backfilling Trench:** Backfill and lightly compact with clean sand, free of any foreign matter, pathogens or any substances which may be deleterious to future root growth. Apply root inducing formulation to the manufacturer's recommended concentration,
- **STAKES AND TIES:** Provide for all new trees and shrubs. Material: Hardwood or bamboo, straight, free from knots or twists, pointed at one end. Installation: Drive stakes into the ground at least one third of their length, avoiding damage to the root system. Position stake on the prevailing wind side of the plant.
- **Stake sizes:** - For plants ≥ 2.5 m high: Three 50 x 50 x 2400 mm stakes per plant. - For plants 1 to 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant. - For plants < 1 m high: One 38 x 38 x 1200 mm stake per plant.

9.6.3 Delivery storage and handling

- Deliveries: Make arrangements for a controlled site delivery point to receive and unload materials, including planting. On-site storage facilities: Arrange for suitable storage with the necessary irrigation requirements to maintain plant condition

TECHNICAL SPECIFICATIONS

[TO BE INCORPORATED AS PER REQUIREMENT OF THE WORK PUT TO TENDER DULY QUOTING THE RELEVANT SPECIFICATION NUMBER OF APSS./ BSI Code No. , MoRT&H, etc. STANDARD SPECIFICATION NO.]

PREAMBLE

SITE INFORMATION

The information given hereunder and provided elsewhere in these documents is given in good faith by the Employer but the Contractor shall satisfy himself regarding all aspects of site conditions and no claim will be entertained on the plea that the information supplied by the Employer is erroneous or insufficient.

GENERAL REQUIREMENTS

The Technical Specifications in accordance with which the entire work described hereinafter shall be constructed and completed by the Contractor shall comprise of the following:

PART-I: General Technical Specifications

The General Technical Specifications shall be the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOURTH REVISION, AUGUST 2001 issued by the Ministry of Road Transport and Highways (MORTH) formerly the Ministry of Surface Transport and published by the Indian Roads Congress.

PART-II: Supplementary Technical Specifications

The Supplementary Technical Specifications shall comprise of various Amendments/Modifications/ Additions to the "General Technical Specifications" referred to in PART - I above and Additional Specifications for particular item of works not already covered in PART-I.

A particular clause or a part thereof in "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (FOURTH REVISION, AUGUST 2001 and incorporated in PART-II, referred to above, such Amendment/Modification/Addition supersedes the relevant Clause or part of the Clause.

The Additional Specifications shall comprise of specifications for particular item of works not already covered in PART-I.

When an Amended/Modified/Added Clause supersedes a Clause or part thereof in the said Specifications, then any reference to the superseded Clause shall be deemed to refer to the Amended/Modified/Added Clause or part thereof.

In so far as Amended/Modified/Added Clause may come in conflict or be inconsistent with any of the provisions of the said Specifications under reference, the Amended/Modified/ Added Clause shall always prevail.

Additional Specifications

In the absence of any definite provisions on any particular issue in the aforesaid Specifications, reference may be made to the latest codes and specifications of IRC and BIS in that order. Where even these are silent, the construction and completion of the works shall conform to sound engineering practice as approved by the Engineer and in case of any dispute arising out of the interpretation of the above, the decision of the Engineer shall be final and binding on the Contractor.

AMENDMENTS/MODIFICATIONS/ADDITIONS TO EXISTING CLAUSES OF GENERAL TECHNICAL SPECIFICATIONS

Clause 103 DEFINITIONS

The following abbreviations shall be added in this Clause: TSCCL : Tirupati Municipal Corporation.

Clause 108.4 Delete first two sentences.

Clause 109.9 Delete 2nd and 3rd sentence and add the following “setting out of the road alignment and measurement of angles shall be done by using total station”.

Clause 110 Encumbrances in Construction Area, including Trees and Utilities

Replace whole of this clause with the following:

Clause 110.1 The contractor shall be responsible to coordinate with service provider / concerned authorities for cutting of trees, shifting of utilities and removal of encroachments etc. and making the site unencumbered from the project construction area required for completion of work. This will include initial and frequent follow-up meetings / actions / discussions with each involved service provider / concerned authorities. The contractor will not be entitled for any additional compensation for delay in cutting of trees, shifting of utilities and removal of encroachments by the service provider / concerned authorities. Payment for cutting of trees and shifting of utilities as required by the concerned Department / TSCCL Authority shall be made by the Employer.

Clause 110.2 Drawings scheduling the affected encumbrances such as trees and services like water pipes, oil pipelines, cables, gas/oil pipes, electricity lines, accessories,

telephone poles and OFC cables etc. shall be verified by the willing bidder in the office of the Employer. Copy of the drawings, however, will be issued to successful bidder under clause 107 of specification, for verification by him for accuracy, necessary co-ordination and work.

Clause 110.3 The Employer will make payments to the respective service provider / authorities for cutting of trees and shifting of utilities, wherever required. The contractor will obtain necessary approval from such Authorities after payments by the Employer and also in cases where payments are not required to be made for such shifting. The Employer will also write to all concerned Department / TSCCL Authority / service provider organization for expediting and facilitating cutting of trees, utilities shifting and removal of encroachment etc.

Clause 110.4 Any services affected by the Works must be temporarily supported by the Contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of the Works. It shall be deemed to be part of the Contract and no extra payment shall be made for the same.

Clause 110.5 The Contractor may be required to carry out certain works for and on behalf of the various bodies and he shall also provide, with the prior approval of the Engineer, such assistance to the various bodies as may be authorized by the Engineer.

Clause 111 Precautions for Safeguarding the Environment

This whole clause shall be substituted by following:

Clause 111.1 General

The contractor shall take all precautions for safeguarding the environment during the course of the construction of works. He shall abide by all rules, regulations and laws in force governing pollution and environmental protection that are applicable to the area where the works are situated.

NOISE :

The Contractor shall mitigate against any sustained increase in base line ambient sound levels at sensitive receptors during construction of work.

All construction operations shall be performed in a manner to minimize noise and vibration. The parameters for noise are detailed below.

- 70 dB (decibel) (A) for day and night;
- 50 dB (decibel) (A) for day and 45 dB (A) for night for residential and silence zone areas.

If the noise level are found to be above these standards and it is determined by the Engineer that these levels are due to the equipment's or plants being deployed by the contractor, he shall undertake, at his own cost measures as approved by the Engineer, to bring these levels down to the specified levels. Contractor shall ensure:

-Stationery equipment will be placed at least 115m away from inhabitant areas & 200m from sensitive areas to minimum noise impacts.

Construction activities generally prohibited between 10 p.m. to 6 a.m. near habitation. Provision of using ear plugs, helmets by workers exposing high noise levels. Erecting sign boards at sensitive and residential locations prohibiting use of air horns. Labour shall be warned against the hunting of wild life, if any. No archaeological site shall be disturbed.

Clause 111.2 Borrow Pits for Embankment Construction

Borrow pits shall not be dug within the right-of-way of the road. Contractor will ensure that proper excavation techniques are used to improve stability and safety of the borrow area. The excavation shall be carried out in such a way that the area does not inundate during monsoons generate cesspools of water for breeding site. The area after excavation shall be properly landscaped. The stipulations in Clause – 305.2.2 shall govern.

Clause 111.3 Quarry Operations

The contractor shall obtain material from licensed quarries only after the consent of the forest Department or other concerned authorities. The quarry operation shall be undertaken within the purview of the rules and regulations in force. Contractor shall ensure scheduling the movement of transport carrying material to and from site during non-peak hours. The trucks carrying dusty material fly ash shall be covered with tarpaulin and provided with adequate free board to prevent spillage. End boards shall be provided in loaders to prevent spillage. Stockpiling of material shall be properly planned so as to ensure that no traffic jam takes place on the highway.

Clause 111.4 Control of Soil Erosion & Sedimentation

The contractor shall carry out the works in such a manner that soil erosion is fully controlled. The stipulations in Clause – 306 shall govern.

Clause 111.5 Precautions against Dust

The contractor shall take all reasonable steps to minimize dust nuisance during the construction of the works. All existing highway and roads used by vehicles of the contractor or any of his sub-contractor or suppliers of materials or plant, and similarly any new roads which are part of the works and which are being used by traffic, shall be kept clean and clear of all dust/mud or other extraneous material dropped by the said vehicles or their tyres. Similarly, all dust or mud or other extraneous material from the works spreading on these highways shall be immediately cleared by the contractor. Clearances shall be effected immediately by manual sweeping and removal of debris, or, if so directed by the Engineer, by mechanical sweeping and clearing equipment, and all dust, mud and other debris shall be removed entirely from the road surface. Additionally, the road surface shall be hosed or watered using suitable equipment to avoid dust pollution. Special care shall be taken to combat dust problem originating from use of fly ash.

Clause 111.6 Pollution from Hot Mix Plant, Batching Plant & Other Construction Machinery

The Contractor shall ensure the use of relatively new, well maintained hot mix plant (batching plant) so that emission conforms to the CPCB norms and be fitted with dust extraction unit avoid prolonged engine powered equipment idleness. Asphalt mixing sites shall be located more than 500m from any community or residence. The hot mix plant shall be founded on compacted/paved surface so that the spills do not affect the aquifer. Proper sizing and maintenance of mufflers, engine intake, silencers and engine enclosures shall be carried out. The contractor shall take every precaution to reduce the levels of noise, vibration, dust and emission from his plant. The contractor shall be fully responsible for any claims for damages caused to the owner of property, fields and residence in the vicinity.

All vehicles, equipments and machinery need for construction will be regularly maintained to ensure that pollution emission levels conform to CPCB norms. All vehicles should be fitted with silencer and dust removal device.

Construction vehicles, machinery & equipment will move or be stationed in the designated area to avoid Compaction of soil ensuring the perseverance of the top soil for agriculture.

Clause 111.7 Road Safety

The contractor shall provide adequate circuit for traffic flow around construction areas, control speed of construction vehicles through road safety and training of drivers, provide adequate signage, barriers and flag persons for traffic control. If there are traffic jams during construction, measures shall be taken to relieve the congestion with the assistance of traffic police. Safety of workers undertaking various operations during construction will be ensured by providing helmets, masks, safety goggles etc.

Clause 111.8 Sanitation & Waste Disposal in Construction Camp

Contractor shall ensure that construction camps are located at a distance of minimum 200m from water sources. Special attention shall be paid to the sanitary conditions of the camps. The contractor shall ensure that sufficient measures are taken i.e. provision of garbage tanks and sanitation facility. Waste in septic tanks shall be cleaned periodically. Garbage shall be collected in four soakage pits at each construction site and disposed of daily. Contractor shall provide adequate measures for the health care of workers and arrange their regular medical check-up to ensure that they do not suffer from communicable disease. At every work place, good & sufficient potable water supply will be maintained to avoid waterborne/water related diseases.

If any pits are dug at construction/camp site which are not filled and may turn into mosquito breeding sites during monsoons, either these shall be filled up properly so that no water gets accumulated or sprayed frequently with pesticides to prevent mosquito breeding. Prior permission of the Engineer and regulatory authority shall have to be taken by the contractor for discharging or disposing of any material arising from the execution of workers.

Clause 111.9 Substance Hazardous to Health

The contractor shall not use or generate any material in the work, which are hazardous to the health of persons, animals or vegetation. Where it is necessary to use some substance, which can cause injury to the health of the workers, the contractor shall provide suitable clothing or appliances to his workers, viz. car plugs, helmets or dust masks.

Clause 111.10 Any structural damage caused to the existing roads/structures by his construction equipment shall be made good without any extra cost.

Clause 111.11 Use of Nuclear Gauges

Nuclear gauges shall be used only where permitted by the Engineer. The contractor shall provide the Engineer with a copy of the regulations governing the safe use of nuclear gauges he intends to employ and shall abide by such regulations.

Clause 111.12 Environmental Monitoring

In order to carry out periodic checks environmental monitoring will be carried out by the Engineer as per schedule and if any parameter is found above the acceptable standards, mitigation measures/control measures as decided by the Engineer shall be complied with by the contractor.

Clause 111.13 Protection of Existing Trees

Many of the existing trees within the right of way will be cut for construction of roadway by Forest Department or any other agency (Refer clause 110 also). The contractor shall take all necessary measures to ensure safety and protection of the remaining trees from any action whatsoever relating to his construction operations in the adjoining areas

Adequate supply of fuel (Kerosene, LPG) shall be provided to the construction laborers to avoid felling of trees for cooking and other household activities.

Clause 111.14 Disposal of Materials Outside Work Site

Notwithstanding other relevant provision in the contract, the excess material generated by dismantling, excavation, waste material and lubricants, used oil,

gasoline and other such substance etc., shall be removed from site, outside the right of way at regular intervals and site shall be kept clean from all such disposable materials, grease, cotton and other wastes. Construction material will be disposed off in shallow soakage wells constructed in each construction site. Such intervals shall not exceed one month under any circumstances. The selection of the disposal site shall be the responsibility of the contractor and he shall ensure that the selected site does not result in any claim for damages to the employer or violation of any existing laws.

Clause.111.15 Compliance with the foregoing will not relieve the contractor of any responsibility for complying with the requirement of any highway authority in respect of the roads used by him.

Clause 112.1 General

Delete the last sentence and add the following: “Two weeks before undertaking work which would involve any obstruction whatsoever to traffic the Contractor shall submit, for the Engineer's approval, a Traffic Control Plan.

The plan shall include:

- i. Typical drawings for temporary diversions in accordance with Sub-Clause 112.3
- ii. Typical details of arrangements for construction under traffic including details of traffic arrangements proposed to be in place after the cessation of work each day.

Special consideration shall be given in the preparation of the Traffic Control Plan to the safety of pedestrians and workers and delineation of the roadway at night. Temporary diversions will be constructed only with the approval of the Engineer and will generally only be constructed at bridge sites where new bridges are to be located on the existing road alignment. Road works shall generally be constructed under traffic.”

Clause 121 FIELD LABORATORY**Clause 121.2 Description**

Add the following at the end of this Clause: Within 14 (fourteen) days of the Start Date, the Contractor shall prepare detailed working drawing of the laboratory building and make/supplier of the equipment to the Engineer for his approval. The field laboratory to be provided under the Contract shall be handed over to the Engineer in finished and fully equipped condition not later than 2 months after the receipt of Notice to Proceed or 2 months from the date when the land for the construction of field laboratory is provided, whichever is later, and such building shall be to the entire satisfaction of the Engineer. The laboratory and its associated work including its administration shall be to the complete satisfaction of the Engineer throughout the project period till such time all the take over certificates are issued. The contractor must satisfy the engineer in any non-compliance whatsoever. During the period specified, the laboratory tests shall be performed in another laboratory proposed by the Contractor and approved by the Engineer."

Clause 121.3 Laboratory Equipment

This Clause shall read as under:

"The following items of laboratory equipment shall be provided in the field laboratory."

A :General	
(i) Balance	
(a) 7 kg to 10 kg capacity semi-self indication Type- Accuracy 1 gm Electronic	2 Nos
(b) 500 gm capacity semi-self- indicating Electronic Type- Accuracy 0.01 gm.	2 Nos.
(c) Pan balance 5 kg capacity Accuracy 0.5 gm.	3 Nos.
(d) Platform Scale - 300 kg capacity	1 No.
(e) Chemical Balance 100 gm. capacity - accuracy 0.001	1 No.
(ii) Ovens-Electrically operated, thermostatically controlled	
(a) From 100°C to 220°C Sensitivity 1°C	1 No.
(iii) Sieves: as per I.S. 460-1962	
(a) I.S. Sieves 450 mm internal dia of sieve sets as per ISI of required sieve sizes complete with lid and pan	2 Sets
(b) I.S. sieve 200 mm internal dia (brass frame and steel or brass wire cloth	2 Sets

mesh) consisting of sieve sets of required sieve sizes complete with lid and pan	
(iv) Sieve shaker capable of taking 200 mm and 450 mm dia sieves electrically operated with time switch assembly (As per IS)	1 No
(v) 200 tonnes compression testing machine	1 No.
(vi) Stop watches 1/5 sec. Accuracy	2 Nos.
(vii) Glassware comprising of Beakers, Pipettes, dishes, measuring cylinders (100 to 1000 cc capacity) glass rods and funnels, glass thermometers range 0°C to 100°C and metallic thermometers range upto 300°C	1 Doz each
(viii) Hot plates 200 mm dia (1500 watt)	2 Nos.
(ix) Enamel trays:	
(a) 600 mm x 450 mm x 50 mm	6 Nos.
(b) 450 mm x 300 mm x 40 mm	6 Nos.
(c) 300 mm x 250 mm x 40 mm	6 Nos.
(d) Circular plates of 250 mm dia	6 Nos
(x) Water Testing kit	1 No.
B : For Soils	
(i) Water still	1 No.
(ii) Liquid limit device with and A.S.T.M grooving tools as per ISI-2720	2 Nos.
(iii) Sampling pipettes fitted with pressure and suction inlets, 10 capacity	1 set
(iv) Compaction apparatus (Proctor) as per ISI 2720 (Part 8) complete with collar, base plate and hammer	2 Nos.
(v) Modified AASHTO Compaction apparatus as per I.S. 2720 (Part 7) 1974 or Heavy Compaction Apparatus as per IS complete with collar, base plate hammer	2 Nos.
(vi) Sand pouring cylinder with conical funnel and tap and complete as per I.S. 2720 (Part 28) 1974 including modified equipment.	6 Nos.
(vii) Sampling tins with lids 100 mm dia x 75 mm ht 1/2 kg capacity and miscellaneous items like moisture, tins with lid (50 grams) etc.	24 Nos.
(viii) Lab C.B.R. testing equipment for conducting CBR testing, load frame with 5 Tonne capacity, electrically operated with speed control as per I.S. 2720 (Part 16), and consisting of following:	1 set
(a) CBR moulds 150 mm dia - 175 mm ht. complete with collar, base plate etc.	8

(b) Tripod stands for holding dial gauge holder	12
(c) CBR plunger with settlement dial gauge holder	2
(d) Surcharge weight 147 mm dia 2.5 kg. wt with central hole	12
(e) Spacers disc 148 mm dia. 47.7 mm ht. with handle	3
(f) Perforated plate (Brass)	12
(g) Soaking tank for accommodating 6 CBR moulds	
(h) Proving rings of 1000 kg, 2500 kg and 5000 kg capacity	1 each
(i) Dial gauges, 25 mm travel - 0.01 mm/division	10
(ix) Standard Penetration test equipment	1 No.
(x) Nuclear Moisture Density meter or equivalent	1 No.
(xi) Rapid moisture meter complete with chemicals	2 Nos.
(xii) Unconfined Compression Test Apparatus	1 Set
C : For Cement, Cement Concrete and Materials	
(i) Water still	1 No.
(ii) Vicat needle apparatus for setting time with plungers, as per I.S. 269-1967	1 No.
(iii) Moulds	
a) 150 mm x 300 mm ht cylinder with capping component	As reqd.
b) Cubicals 150mm, 100 mm (each size)	As reqd
(iv) Concrete permeability apparatus	1 No.
(v) High frequency mortar cube vibrator for cement testing	1 No.
(vi) Concrete mixer power driven, 1 cu ft capacity	1 No.
(vii) Variable frequency and amplitude vibrating table size 1 metre x 1 metre, as per the relevant British Standard	1 No.
(viii) Flakiness index test apparatus	1 No.
(ix) Aggregate impact test apparatus as per IS 2386 (Part 4) 1963.	1 No.
(x) Los Angeles abrasion apparatus as per IS. 2386 (Part 4) 1963	1 No.
(xi) Flow table as per IS 712-1973	1 No.
(xii) Equipment for slump test	4 Nos.
(xiii) Equipment for determination of specific gravity for fine and coarse aggregate as per IS: 2386 (Part 3) 1963.	4 Nos.
(xiv) Compression and flexural strength testing machine of 200 T capacity with additional dial for flexural testing	1 No.
(xv) Core cutting machine with 10 cm dia diamond cutting edge	2 Nos.

(xvi) Needle vibrator	4 Nos.
(xvii) Air entrainment meter	1 No.
(xviii) 0.5 Cft, 1 Cft cylinder for checking bulk density of aggregate with tamping rod	As reqd
Soundness testing apparatus for cement	1 set
E : For Control of Profile and Surface Evenness	
(i) Total Station	1 No.
(ii) Precision automatic level with micrometer attachment	2 sets
(iii) Distomat or equivalent	1 set
(iv) Theodolite - Electronically operated with computerised output attachment.	1 set
(v) Precision staff	3 sets
(vi) 3 metre straight edge and measuring wedge	3 sets
(vii) Camber templates 2 lane	
(a) Crown type cross-section	1 set
(b) Straight run cross-section	2 sets
(viii) Steel tape	
(a) 5 m long	2 sets
(b) 10 m long	2 sets
(c) 20 m long	2 sets
(d) 30 m long	2 sets
(e) 50 m long	2 sets
F : Any other items as may be required for carrying out the testing for the works.	

Clause 121.4 Ownership

This Clause shall read as under:

The field laboratory building shall be and remain the property of the contractor. It shall be dismantled at his own cost to the satisfaction of Engineer within two months of issuance of taking over certificate. However, the equipment provided for tests shall be the property of the contractor, which will be removed by him at his own cost after issuance of taking over certificate.”

Clause 121.5 Maintenance

This Clause shall read as under:

“The Contractor shall arrange to maintain the field laboratory including sample store yards in a satisfactory manner until the issue of Taking over Certificate for the complete work. Maintenance includes all activities described in Clause 120.4 and maintenance of equipment and running of the same including chemicals and consumables.”

Clause 121.7 This clause shall be read as under:

“The cost of provision of field laboratory including supply of laboratory equipment and also provision of adequate number of qualified personnel, erection, maintenance and running of laboratory including all consumable like chemicals and reagents shall be deemed to have been included in the contract price.

Clause 201 CLEARING AND GRUBBING

Clause 201.1 Scope

Delete the last sentence and replace with as under:

“Clearing and grubbing shall be performed less than one month in advance of earthwork operations and in accordance with the requirements of these specifications. If any vegetation grows after clearing and grubbing and before earthwork, the Contractor shall repeat the work to the satisfaction of the Engineer without any extra cost”. Areas requiring clearing and grubbing shall be determined by the Engineer.

Clause 304 EXCAVATIONS FOR STRUCTURES

Clause 304.3.4 Preparation of Foundation

In para 2 and 3 of clause 304.3.4 substitute 'concrete M-15' in place of '1:3:6 nominal mix'.

Clause 305.2.2.2 Borrow Materials

Replace the Para 1 of this Clause by the following:

"No borrow area shall be made available by the Employer for this work. The arrangement for the source of supply of the material for embankment and sub-grade as well as compliance to the different environmental requirements in respect of excavation and borrow areas as stipulated, from time to time, by the Ministry of Environmental and Forest, Government of India and the local bodies, as applicable shall be the sole responsibility of the Contractor."

Replace the Para 8 of this Clause given below Table 300-2 by the following:

"The contractor shall at least 7 working days before commencement of Compaction submit the following to the Engineer for approval:

- i) The Values of maximum dry density and optimum moisture content obtained in accordance with IS:2720 (Part 8) for each fill material he intends to use.
- ii) The graphs showing values of density plotted against moisture content from which each of the values in (i) above of the maximum dry density and optimum moisture content were determined.
- iii) The dry density-moisture content-CBR relationship for each of the fill materials he intends to use in the sub-grade'.

Clause 305.3 Construction Operations

Clause 305.3.4 Compacting Ground Supporting Embankment/Sub-grade

Replace the Para 1 of this clause by the following:-

Where necessary, the original ground shall be scarified to a depth of 250mm levelled, mixed with water and then compacted by rolling to facilitate placement of 1st layer embankment and its Compaction in accordance with the requirement as given in table 300.2.

Add the following sentence at the end of para 2.

"Where necessary to facilitate Compaction of the sub-grade to 97% relative Compaction as stated above, a further depth of maximum of 250mm thickness shall be loosened, watered and compacted in accordance with Clause 305.3.5 and 305.3.6 to not less than 95% of maximum dry density, determined in accordance with IS: 2720 (Part 8)."

Clause 306.4 Measurement for Payment

Substitute Clause 306.4 as follows:

"All temporary sedimentation and pollution control works shall be deemed as incidental to the earthwork and other items of work and as such no separate payment shall be made for the same."

Clause 401.2 Materials

Clause 401.2.1 Para 1 of this clause shall read as under:

"The material to be used for the work shall be natural sand, moorum, gravel, crushed stone, crushed laterite stone or combination thereof depending upon the grading required. The material shall be free from organic or other deleterious constituents and conform to Grading given in Table 400-2

Clause 401.3 The clause shall read as follows:

"It shall be ensured prior to actual execution that the material to be used in the sub-base has a minimum field CBR value of 30% when compacted and finished.

When directed by Engineer, this shall be verified by performing CBR tests in the laboratory. The CBR tests shall be conducted on specimen when compacted to 98% of the maximum dry density as per IS: 2720 (Part 8) and soaked for 4 days in water."

Clause 504.2.2 Coarse Aggregates

- i) Delete the words from 2nd line of 1st para "crushed gravel or other hard material retained on the 2.36 mm sieve".
- ii) Delete the entire para 3 of Clause 504.2.2
- iii) From the table 500.3 delete at the bottom of the table asterisk "Aggregate may satisfy requirements of either of these two tests" and modify as under:
"Aggregate should satisfy both the tests value of Los Angeles Abrasion Value and Aggregate Impact Value."

Clause 504. 8 Rate

Add at the end of para "The rate shall include the provision of bitumen, at 3.25 per cent by weight of the total mixture.

Clause 901 GENERAL

Clause 901.1 This clause shall read as under:

"All materials to be used, all methods adopted and all works performed shall be strictly in accordance with the requirements of these Specifications. The Contractor shall set up a field laboratory at locations approved by the Engineer and equip the same with adequate equipment and personnel in order to carry out all required tests and Quality Control work as per Specifications and/or as per Clause 121 and/or as directed by the Engineer. The list of laboratory equipment and the facilities to be provided shall be as per Clause 121 and shall be got approved from the Engineer in advance.

Clause 901.5 This Clause shall read as under:

"The Contractor shall provide necessary co-operation and assistance in obtaining the samples for tests and carrying out the field tests as required by the 'Engineer' from time to time. This may include provision of laboratory, equipment, transport, consumables, personnels, including labour, attendants, assistance in packing and

dispatching and any other assistance considered necessary in connection with the tests."

Clause 903 QUALITY CONTROL TESTS DURING CONSTRUCTION

Clause 1006 CEMENT

The first para of this Clause shall read as under:

"Cement to be used in the works, shall be any of the following with the prior approval of the 'Engineer':

- a) Ordinary Portland Cement 33 grade conforming to IS: 269.
- b) Ordinary Portland Cement 43 grade, conforming to IS: 8112.
- c) Ordinary Portland cement 53 grade, conforming to IS: 12269.

Delete para 4 and 5 from Clause 1006."

Clause 1007 COARSE AGGREGATES

- (i) Delete from the first sentence "crushed gravel..... inert material" appearing in 4th and 5th line.

- (ii) Add the following at the end of the Clause:

"Primary and secondary stone crusher should be employed for getting proper size and grading of coarse aggregates." Proper stone crusher like impact crusher shall be chosen so that the production of the flaky materials can be controlled.

Clause 1010 WATER

In para (c) the permissible limit for Chlorides (C1) shall be read as "250 mg/lit for structures having length more than or equal to 30 m," instead of "500 mg/lit."

Clause 1014 STORAGE OF MATERIALS

Clause 1014.3 Aggregates

The following shall be added to this Clause:

"Aggregates shall be stored or stockpiled in such a manner that segregation of fine and coarse sizes will be avoided and also that the various sizes will not become intermixed before proportioning. They shall be stored, stockpiled and handled in such a manner that will prevent contamination by foreign materials."

Clause 1502 MATERIALS

This Clause shall read as under:

"All materials shall comply with the requirements of IRC-87.

Material and components used for formwork shall be examined for damage or excessive deterioration before use/reuse and shall be used if found suitable after necessary repair. Only steel formwork shall be used. The steel used for forms shall be of such thickness that the forms remain true to shape. All bolts should be countersunk. The use of approved internal steel ties or plastic spacers shall be permitted. Structural steel tubes used as support for forms shall have a minimum wall thickness of 4 mm."

Clause 1503 DESIGN OF FORMWORK

Clause 1503.2 The following shall be added to this Clause

"For distribution of load and load transfer to the ground through staging, an appropriately designed base plate must be provided which shall rest on firm sub-stratum".

Clause 1509 RE-USE OF FORMWORK

This Clause shall read as under:

"After forms are stripped, all materials to be reused shall be thoroughly cleaned. Holes bored through sheathing for form ties shall be plugged by driving in common corks or foamed plastics. Patching plaster may also be used to fill small holes. After cleaning and before refixing, each formwork shall be got approved from the Engineer.

Formwork and staging shall be so used so as to maintain quality of the exposed surface. However, if in the opinion of the Engineer, any particular panel/member has become unsatisfactory for use at any stage, the same will be rejected.

All bent steel props shall be straightened before reuse. The maximum deviation from straightness is 1/600 of length. The maximum permissible axial loads in used props shall be suitably reduced depending upon their condition.

Clause 1513 RATE

Add the following at the end of the first para:

"The unit rate shall also include all costs for preparation of erection scheme, designs of falsework and formwork and their approval."

Clause 1704 PROPORTIONING OF CONCRETE

Add the following at the end of this Clause.

"In proportioning concrete, the quantity of both cement and aggregate shall be determined by weight. Where the weight of cement is determined by accepting the manufacturer's weight per bag, a reasonable number of bags shall be weighed separately to check the net weight. Where cement is weighed from bulk stock at site and not by bag, it shall be weighed separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipments shall be maintained in a clean, and serviceable condition. Their accuracy shall be periodically checked".

"It is most important to keep the specified water- cement ratio constant and at its correct value. To this end, moisture content in both fine and coarse aggregates shall be determined as frequently as possible, frequency for a given job being determined by the Engineer according to the weather conditions. The amount of mixing water shall then be adjusted to compensate for variations in the moisture content. For the determination of moisture content in the aggregates, IS: 2386 (Part III) shall be referred to. Suitable adjustments shall also be made in the weight of aggregates to allow for the variation in weight of aggregates due to variation in their moisture content".

Clause 1704.4 Additional Requirement

In para (a) substitute "0.06%" for "0.1%", "0.06%" for "0.2%"; and: 0.1%" for "0.3% for the three items respectively.

Clause 1705 ADMIXTURES

This Clause shall read as under:

"Duly tested admixtures/additives conforming to IS: 6925 and IS: 9103 (without replacement of cement) may be used subject to satisfactory proven use, with the approval of the Engineer. Admixtures generating Hydrogen or Nitrogen and

containing chlorides, nitrates, sulphides, sulphates and any other material liable to affect the steel or concrete shall not be permitted"

"The general requirements, physical and chemical requirements shall be as per Clause 1012."

Clause 1706 Size of Coarse Aggregate

Table 1700-7 in this clause shall read as under:

		Maximum Nominal size of coarse Aggregate (mm)
Components		
i)	Solid type piers & abutments	40
ii)	RCC work in slabs, Kerb, approach slab, piers And abutments, pier/abutment caps, piles	20
iii)	RCC work in handrails	12.5
iv)	Any other work as specified or as directed by the Engineer	

Clause 1707 EQUIPMENT

Para 1 of this Clause shall read as under:

"Unless specified otherwise, equipment for production, transportation and Compaction of concrete shall be as under": a) For production of concrete.

- i) Batching and mixing of the concrete shall be done in a concrete batching and mixing plant fully automatic with a minimum capacity of 15 cum. per hour. The plant shall be approved by the Engineer".
- ii) In special cases, for culverts, the Engineer may allow mixing of concrete by a diesel or electrically operated mechanical mixer with integrated weigh batching facility having a capacity of 500 litres and automatic water measuring system."

Para 3 of this clause shall read as under:

Measurement of cement ± 3 percent of quantity of cement in each batch

Measurement of water	± 3 percent of quantity of water in each batch
Measurement of aggregate	± 3 percent of quantity of aggregate in each
Measurement of admixture	± 3 percent of quantity of admixture in each batch.

Clause 1709 Transporting, Placing and Compaction of Concrete Add the following paragraph at the end of 2nd para of clause 1709.

For placing Concrete with Pumps: Pipe Lines from the pump to the placing area should be laid out with a minimum of bends. For large concrete placements standby pumps shall be available. Suitable valves (air release valves, shutoff valves etc.) shall be provided as per site needs. The pumping of concrete shall be preceded by a priming mix to lubricate the pump and pipeline. A rich mix of creamy consistency shall be required for lubricating the pipelines. Continuous pumping shall be done to the extent possible. After concrete has been placed the lines and all related equipment shall be cleaned immediately. A plug sponge ball shall be inserted in the end near the pump and shall be forced through the line by either water or air pressure. Pipes for pumping should not be made from materials which can harm concrete; aluminum alloy pipelines shall not be used.

Clause 1713 PROTECTION AND CURING

Clause 1713.1 Water Curing

Add the following at the end of para I.

"Wherever possible, use of water sprinklers or perforated pipes should be encouraged for curing of concrete. Such arrangement must be maintained for a minimum period of 14 days after concreting."

"Approved concrete curing compounds should be preferred where water curing cannot be done reliably" subject to the approval of the Engineer.

Clause 2009 MEASUREMENTS FOR PAYMENT

Add the following after para 2.

"Paper bearings shall be measured in square meters".

Clause 2504 Pitching/Revetment on Slopes

The heading of this clause shall read as under:

- a) Pitching/Revetment on slopes and filter media.

TECHNICAL SPECIFICATIONS

1.0 Materials, Workmanship, period and certificate of maintenance and defect liability Quality

All the materials and workmanship shall be of the respective kinds described in the contract and in accordance with Executive Engineer instruction and shall be subjected from time to time to such tests as the Executive Engineer may direct at the place of manufacture or fabrication or on the site or at such other place or places as may be specified in the contract or at all or any of such places. The contractor shall provide such assistance, Instruments, Machines, Labour and materials as are normally required for examining, measuring and testing the work and the quality weight or quantity of any materials used and shall supply samples of materials before in corporation in the works for testing as may be selected and required by the Executive Engineer.

2.0 Tests, Inspection of defective materials

The contractor shall without extra cost provide samples and co-operate in the testing of materials. The Executive Engineer /Deputy Executive Engineer shall have access at all times to the places of storage and where materials are being manufactured and proceeded for use in the works under contract to determine whether their manufacture and process are proceeding in accordance with the drawings and specifications. The Executive Engineer / Deputy Executive Engineer shall during the progress of the works have power to orders in writing from time to time in respect of the following.

- a) The removal from the site, within such time or times as may be specified in the order, of any materials which in opinion of the Deputy Executive Engineer are not in accordance with contract.
- b) The subscription of proper and suitable materials and
- c) The removal and proper re-execution, notwithstanding of any work which in respect materials or workmanship is not in the opinion of the Executive Engineer, in accordance with contract.

The Contractor shall carry out such order at no extra cost to the Executive Engineer. In case of default on the part of the contractor in carrying out such order, the Executive Engineer shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental there to shall be recoverable from the contractor by Executive Engineer or may be deducted by the Executive Engineer from any monies due to or which may become due to the contractor.

In lieu of removing the work or materials not in accordance with the contract, the Executive Engineer / Deputy Executive Engineer may order such work or materials to remain and in that case such may be paid at the reduced rates as may be decided by Executive Engineer. However any action by the Executive Engineer / Deputy Executive Engineer under this para shall not in any way absolve the contractor from his responsibility and liabilities as per conditions of contract.

3.0 Cement

The contractor has to make his own arrangements for the procurement of cement of required to be specifications required for works subject to the following.

- a) The contractor shall procure OPC cement required for the works, only from reputed cement factories (Main Producers) acceptable to the Executive Engineer. The contractor shall be required to furnish to the Executive Engineer bill of payments and test certificates issued by the manufacturers to authenticate procurement of quality cement from the approved cement factory. One copy of gate pass shall be handed over to Executive Engineer. The contractor shall make own arrangement for adequate storage of cement.
- b) The contractor shall procure cement in standard packing (50kg per bag) from the authorized manufacturers. The contractor shall make necessary arrangement at his own cost to the satisfaction of Executive Engineer / Deputy Executive Engineers for actual weighment of random sample from the available stock and shall confirm with the specification laid down by the Bureau of Indian Standards or other standard institutions as the case may be. Cement shall be got tested for all the tests as directed by the Executive Engineer at least once in a month in advance before the use of cement bags brought and kept at site go down. Cement bags required for testing shall be supplied by the contractor free of cost.
- c) The contractor should store the cement of 60 days requirement at least one month in advance to ensure the quality of cement so brought to site and shall not remove the same without the written permission of the Executive Engineer Dy. Executive Engineer.

- d) The contractor will have to construct sheds for storing his cement at appropriate locations at the work site. The Executive Engineer / Deputy Executive Engineer or his representatives shall have free access to such stores at all times.
- e) The contractor shall further at all times satisfy the Executive Engineer /Deputy Executive Engineer on demand by production of records and books or by submission of returns and other proofs as directed that the cement is being used as tested and approved by Executive Engineer for the purpose and the contractor shall at all times keep his records up to date to enable the Executive Engineer /Deputy Executive Engineer to apply such checks as he may desire.
- f) Cement which has been unduly long in storage with the contractor or alternatively has deteriorated due to inadequate storage and thus become unfit for use on the work shall be rejected by the Department / TSCCL Authority and no claims will be entertained. The contractor shall forthwith remove from the work area any cement the Executive Engineer /Deputy Executive Engineer may disallow for use on work and replace it by cement complying with the relevant Indian Standards.

4.0 Steel

The contractors shall procure mild steel (MS) bars and HYSD, Fe-415 reinforcement bars, High yield strength deformed bars (HYSD bars), rods and structural steel etc., required for the works, only from the main or secondary producers manufacturing steel to the prescribed specifications of Bureau of Indian Standard or equivalent certifications marks and acceptable to the MD, TSCCL. Necessary test certificates are to be produced to the Engineer - in - Charge before use on works. The Original bills of procurement should be submitted to the MD, TSCCL, Greater Tirupati Municipal Corporation for making payments of the item.

The Diameter and Weight of Steel should be as follows:

S.No	Diameter of rod	Sectional weight in KG / RM both for Plain and HYSD steel
1	6 MM	0.22
2	8 MM	0.39
3	10 MM	0.62
4	12 MM	0.89
5	14 MM	1.21

6	16 MM	1.38
7	18 MM	2.00
8	20 MM	2.47
9	22 MM	2.98
10	25 MM	3.85
11	28 MM	4.83
12	32 MM	6.31
13	33 MM	6.71
14	36 MM	7.99
15	34 MM	9.86
16	36 MM	10.88

Note: If any rods other than those diameters specified above are procured the weights shall be as per Standard Steel tables.

5. The work to be carried out as per following specification materials to be procured

Sl No.	Short Title	I.S .Number
I CEMENT:		
1.	43 Grade ordinary port land cement	8112-1989
2.	Methods of physical tests for hydraulic cement	4031 (part 1 to 15)1988
II AGGREGATES:		
1.	Aggregates (coarse and fine) from natural source for concrete.	383-1970
2.	Specification for sand for masonry:	2116- 1980
3.	Method of tests for aggregates for concrete:	2386(part 1 to part Iv)1963
III BUILDING STONES:		
1.	Method of Tests for determination of strength Properties of natural building stones	1121 (part1 to IV) 1974
	Part-1 : Compressive strength	
	Part-II: Transverse strength	
	Part-III: Tensile strength	
	Part-IV: Shear strength	
2.	Quarrying stones for construction purpose	

	Recommended practice	83831-1977
3.	Measurement of buildings and civil Engineering works	1200-(part-IV)1976
4.	Stone Masonry: specifications for dressing Natural building stones	1129-1972(part-IV)
5.	Drilling and permeability tests	5529-(part-iii)-1973
6.	Code of practice for permeability tests (during and after construction)	11216-1985.
IV	STEEL:	
1.	Code of practice for bending and fixing of bars Concrete reinforcement	2502-1963
2.	Specifications for High Strength Deformed steel bars and wires for concrete reinforcement	1781-1985
3.	Recommendation for detailing of reinforcement In reinforced cement concrete works	5525-1969
4.	Mild steel and medium tensile steel bars for concrete reinforcement	432 (part-VIII)-1982
5.	Measurement of building and Civil Engineering Works(part-VII steel works and iron work)	1200(part-VIII)1993.
V	MASONRY:	
1.	Code of practice for construction of stone masonry Rubble stone masonry	1597(part-1)-1992
2.	Measurement of building and Civil Engineering works plastering and pointing	1200(part-XII)-1976
VI	CONCRETE:	
1.	Measurement of building and civil Engineering works method of concrete works	1200(part-ii)-1974
2.	Concrete works: code of practice for plain and reinforced concrete	456-2000
3.	Precast concrete coping blocks	5751-1984
4.	Method of Testing for strength of concrete	516-1959
5.	Specification for –Admixtures for concrete	9103-1979
6.	Method of sampling and analysis of concrete	1791-1963

- | | |
|--|-----------|
| 7. Concrete mixer – batch type | 1791-1963 |
| 8. Concrete vibrators- immersible type | 2505-1980 |

VII EARTH WORK:

- | | |
|---|----------------------|
| 1. Measurement of building and Civil Engineers
works method for earth work | 1200(part-1)-1974 |
| 2. Safety code for filling and other deep foundations | 5121-1969 |
| 3. Safety code for excavation works | 3701-1966 |
| 4. Code of practice for earth work on canals | 4701-1982 |
| 5. Method of testing for soils determinations of
water content | 2720(part11)1973 |
| 6. Determination of water content dry density
relation using light compaction | 2720(part-VIII)-1980 |
| 7. Determination of dry density of soils in place
by sand replacement method (first revision) | 2720(partXXvii)-1974 |
| 8. Determination of Dry density of soils in – situ
by the core cutting method (first revision) | 270(part-xx1x)-1975 |

VIII. OTHER SUBJECTS:

- | | |
|--|--------------------|
| 1. Safety code for scaffolds | 3698(part-1)-1968 |
| 2. Safety code for ladders | 3696(part-ii)-1966 |
| 3. Recommendation of stacking and storage of
construction materials at site | 4082-1977 |

IX. I.S. 383 / 1970 TABLE - 1**25.1****COARSE AGGREGATE**

I.S. Sieve Designation	Percent passing for Single – Sized Aggregate of Metal Size							Percent passing for graded - Aggregate of Nominal Size		
	63 mm	40 mm	20 mm	16 mm	12.50 mm	10 mm	40 mm	20 mm	16 mm	12.50 mm
80 mm	100	--	--	--	--	--	100	--	--	--
63 mm	85-100	100	--	--	--	--	--	--	--	--
40 mm	0-30	85-100	100	--	--	--	95-100	100	--	--
20 mm	0-5	0-20	85-100	100	--	--	30-70	95-100	100	100
16 mm	--	--	--	85-100	100	--	--	--	90-100	--
12.5 mm	--	--	--	--	85-100	100	--	--	--	90-100
10 mm	0-5	0-5	0-20	0-30	0-45	85-100	10-35	25-55	30-70	40-85
4.75 mm	--	--	0-5	0-50	0-10	0-20	0-5	0-10	0-10	0-10
2.36 mm	--	--	--	--	--	0-5	--	--	--	--

TABLE - II**X. FINE AGGREGATE**

I.S sieve Designation	Grading Zone - I	Grading Zone - II	Grading Zone - III	Grading Zone - IV
10 mm	100	100	100	100
4.75 mm	90-100	90-100	90-100	95-100
2.36 mm	60-95	75-100	85-100	95-100
1.18 mm	13-70	55-90	75-100	90-10
600.00 microns	15-34	35-59	60-79	80-100
300.00 microns	5-20	8-30	12-40	15-50
150.00 microns	0-100	0-10	0-10	0-15

TABLE - III**XI. ALL - IN AGGREGATE GRADING**

I.S sieve Designation		40 mm Nominal		20 mm Nominal
80 mm		100		--
40.00 mm		95-100		95-100
20.00 mm		45-75		30-50
4.75 mm		24-75		10-35
600.00 microns		8-30		0-6
150.00 microns		0-60		--

XII For Vibrated Reinforced Concrete items (V.R.C.C.)**TABLE - IV****CHARACTERISTIC STRENGTH OF CUBE AT THE AGE OF 28 DAYS OF CURING**

M-25	25 N/ mm ²	=	250 kgs/cm ²
M-20	20 N/ mm ²	=	200 kgs/cm ²
M-15	15 N/ mm ²	=	150 kgs/cm ²

6.0 Conditions of Roof, Slabs and stripping of time

The R.C.C. Slab laid should be leakproof. After observing for one rainy season, if the roof or floor is found to be perfectly leak proof and no moisture or dampness is seen underneath at ceiling of the slab, the contractor can ask for refund of E.M.D. or F.S.D. from the Corporation. If there are any defects noticed after laying of roof, they must be attended to by the contractor at his own cost. Further the contractor must arrange to get the structure treated as per clause 21 of ISI code No.456/2000 at his own cost on the instructions of the Department.

When R.C.C. Slab is laid the following tests may be carried out by the contractor at his own cost to prove that the slab is impervious.

- (a)** After the centering is removed and curing period is over the slab shall be put to test by pouring water 15 CMs depth and watched carefully for a period not less than a week.

- (b) If leakage is observed immediate action should taken to rectify it by the contractor at his own cost and again tested to see that there are no leakages.
- (c) The Officer observing the leakage test shall issue a certificate to this effect before final bill is made.
- (d) The variation thickness of R.C.C. roof slab due to varying spans or special covering materials should not effect the general roof bed which should be uniform unless otherwise shown to drawings or instructed.
- (e) For roof slab to be laid, MS hooks have to be provided as directed by the Department / TSCCL Authority for fixing fans and lights. G.I./PVC Pipes of 12 mm/20 mm diameter has to be provided in the masonry walls or concrete at the specified places as directed by the Department / TSCCL Authority for making electrical wiring. No payment will be made to the contractor for these sundry items of work.
- (f) For roof slabs, water has to be stagnated for 15 Cm depth for one week to test the leakages if any, if there are any leakages the contractor has to rectify the same as directed by the Department / TSCCL Authority at the cost of the contractor. No payment will be made to the contractor on this account either for testing or for rectification's thus stagnated.

7.1 Forms shall not be struck until the concrete has reached a strength at least twice the stress to which the concrete may be subjected at the time of removal of form of work. The strength referred to shall be that of concrete using the same cement and aggregates, with the same proportions and cured under conditions of temperature and moisture similar to those existing on the work. Where possible, the form work shall be left longer as it would assist the curing.

Note:-1. In normal circumstances and where ordinary Portland cement is used, formwork may generally be removed after the expiry of the following periods.

- | | | |
|----|--|---|
| a) | Walls, Columns and
Vertical faces of all structural members | 16 to 24 hours as
may be decided by the
Engineer – in – Charge. |
| b) | Slabs (Props left under) | 3 days |
| c) | Beam Soffits (Props left under) | 7 days |
| d) | Removal of props under slabs | |
| | i) Spanning up to 4.5 mts | 7 days |
| | ii) Spanning over 4.5 mts | 14 days |
| e) | Removal of props under Beams and Arches : | |

- | | | |
|-----|-----------------------|---------|
| i) | Spanning up to 6 mts. | 14 days |
| ii) | Spanning over 6 mts. | 21 days |

For other cements, the stripping time recommended for ordinary Portland cement may be suitable modified.

Note 2:- The number of props left under, their sizes and description shall be such as to be able to safely carry the full dead load of the slab, beam or arch as the case may be together with any live load likely to occur during of further construction.

8.0 All cement concrete shall be machined mixed and machine vibrated.

8.1. The proportions of cement concrete specified in the above schedule are nominal and are indication of approximate proportion of cement, fine aggregate and coarse aggregate which may have to be altered suitably at site to obtain desired strength and workability. However, the quantity of cement shall not be less than specified below.

Design Mix	M-20 Grade	350kg /Cum
Nominal Mix		Cement in Bags of 50 kgs. Per on Cum (net) of cement concrete
a.	1:1.5:3 8.84 bags of 50 kgs
b.	1:2:4 6.62 bags of 50 kgs
c.	1:2.5:5 5.30 bags of 50 kgs
d.	1:3:6 4.42 bags of 50 kgs
e.	1:4:8 3.31 bags of 50 kgs
f.	1:5:10 2.65 bags of 50 kgs
g.	1:6:12 2.21 bags of 50 kgs
h.	1:8:16 1.66 bags of 50 kgs

8.2 Theoretical requirement of cement for

a. C.R.S. Masonry in C.M. (1:6).....	1.54 bags per Cum
b. C.R.S. Masonry in C.M. (1:8).....	1.15 bags per Cum
c. Brick Masonry in C.M (1:4)	1.44 bags per Cum
d. Brick Masonry in C.M. (1:6)	0.96 bags per Cum
e. Brick Masonry in C.M. (1:8)	0.72 bags per Cum
f. 12 mm plastering in CM (1:5).....	1.02 bags per 10 Sqm
g. 12 mm plastering in CM (1:6).....	0.82 bags per 10 Sqm
h. 20 mm plastering in CM(1:6).....	1.15 bags per 10 Sqm
i. 12 mm plastering in CM (1:4).....	1.08 bags per 10 Sqm
j. 12 mm plastering in CM(1:6).....	0.72 bags per 10 Sqm

9. Dewatering

Bailing or pumping out water shall be done as and when necessary to keep the excavation pit free from sub-soil or surface water including rain etc. i.e., water from any source. While execution of works, if so encountered, the contractor shall provide for the purpose of excavation under water all the necessary dewatering equipments like well points, pumps (including stand byes), pipes, conduits, etc. and make necessary arrangement of proper drainage of the pumped water from the well points and its easy disposal without affecting the site and the adjoining areas.

The Contractor shall take any permission required for such disposal of water to other areas, from the respective authorities. The Contractor shall engage the dewatering equipments in such a way that the excavated pit should always remain dry while the excavation and concrete work for columns and walls up to ground floor level are carried out. The dewatering process shall be carried out during inspection and measurements, when concrete and masonry works are in progress and till the works come above the natural water level and till the Engineer considers that the concrete work, motor is sufficiently set and or other work in the area is completed including backfilling on sides foundation including ramming, compaction by 15 cm layers is completed to satisfaction and approval of Engineer and as directed by the Engineer, at no extra cost to the Employer. Dewatering by pumps as required at site shall be included in the rate wherever specified in the item(s) of excavation.

9.1 Stacking and Disposal of Excavated Material

All materials excavated will remain the property of the Board and rate or excavation includes sorting out of useful materials and stacking them on site as directed. Materials suitable and useful for backfilling, plinth filling area development, embankment or other use shall be stacked in convenient places but in such a way as not to obstruct free movement of men, animals and vehicles or encroach on the area required for constructional purpose.

10. Earthwork in Filling and Site Clearing.

The areas where excavation and filling is to be carried out shall be excavated upto the level as shown in the drawing. All old foundations boulders etc. encountered during excavation shall be removed as directed by the Engineer.

11. Plinth Filling with Sand/Moorum/Crushed Stone Aggregate

11.1 Sand

Sand shall be clean and free from dust, organic and foreign matter and corresponding to grading Zone V or IV, meeting the approval of the Engineer.

11.2 Moorum

Moorum shall be approved quality and shall be brought from approved source or obtained after excavation.

11.3 Filling with Sand/Moorum

Sand/moorum filling shall be done in a manner similar to earth filling in plinth as specified in (Xii) except that flooding with water shall do consolidation. The surface of the consolidated sand, moorums shall be dressed to required level or slope. Concreting of floor shall not be started till the Engineer has inspected and approved of the sand/moorum filling. No excavation of foundation shall be filled in or covered up until all measurements of excavations; masonry, concrete and other works ground level are taken up jointly.

12. Area Filling, Embankment and Land Development

These items of works when directed shall be done with available earth form area arranged or specified by the Engineer or carried earth arranged by contractor from his own sources and approved by Engineer and laid in layer not exceeding 150 mm in loose thickness.

Successive layers shall not be placed until the layer under construction becomes thoroughly compacted up to required density. Power Rollers shall do the degree of compaction or mechanical tampers where heavy equipments is inaccessible.

13. Surplus Excavated Materials

The contractor from the site shall remove all excavated materials certified as surplus and not useful in an approved manner as per direction of the Engineer.

The contractor shall under take the items of removal of surplus excavated materials only when specific instruction in this regard including the quantity to be removed, has been obtained from the Engineer.

14. Measurement for Payment

Assist Engineer/AEE shall measure quantity of work required and check measured by Dy. Engineer for payment in related items in the schedule either by tape-measurement or by cross-section derived from initial and final levels as directed. In case of earth filling from area, provided by owner the borrow pit measurement shall be made for payment. Earth arranged by contractor from his own sources shall be measured for payment in Stacks after deduction of the volume of voids or as directed by Engineer.

Layout / Setting out of works, clearing sites, removal of tree, bushes, vegetation etc., conducting tests shall not be separately measured and paid for and will deem to be included in the related completed items in the schedule.

15. QUALITY CONTROL LAB- TEST PARTICULARS

The materials like coarse aggregate Fine aggregate, R.C.C./ C.C Steel, Bricks, Stone blocks, fly ash Bricks / Blocks, Wood, Tiles etc. will be tested in the Engineering College Laboratory as noted below:

16. BUILDING WORKS

1. For reinforced Cement Concrete / Plain Cement Concrete: Compressive Strength

Quantity of Concrete in the work	No. Of Samples Each Sample Consists of 3 cubes
1-5	1
6-15	2
16-30	3
31-50	4
51 and above	5

2.For Bricks / FAL-G Bricks: Dimensions / Compressive strength / Absorption of water/Efflorescence

Lot size	No. Of Samples Each Sample Consists of 3 specimens
2,001-10,000	5
10,000-35,000	10
35,001-50,000	15

3. For Stone Blocks / FAL-G Blocks: Compressive Strength

Quantity	No. Of Samples Each Sample Consists of 3 Stone Blocks / FAL- Blocks
For every 1000 Nos. of stone Blocks / FAL- G Blocks Masonry	1

4. Steel: Diameter

Quantity	No. Of Samples Each Sample Consists of 3 pieces of one meter length
For every consignment not exceeding 10 M. T for each Diameter	1

5.Cement: Normal Consistency / Compressive strength @ 3days & 7 days and 28 days Ordinary Portland cement of 43/53 Grade confirming to relevant I.S. Codes

Quantity	No. of Samples
For every 20 M.T. of procurement	One sealed Bag

6.Wood: Water Absorption / Compressive strength

Quantity	No. of Samples Each Sample Consists of 3 pieces of required size
For every consignment	1

7. Tiles: Water Absorption / Compressive strength

Lot size	No. Of Samples Each sample consists of 3 tiles
Up to 1,000	5
1,000 to 1,000	10
5,001- 10,000	15

8. Concrete Mix Design

Stage of construction	No. Of Samples
Before commencement of RCC work. Note: In case of change of source of material. Cement Brand / Grade additional lost test has to be done as per the direction of Engineer In charge.	1

9. Coarse Aggregate: Sieve Analysis / Bulk Density / Flakiness and Elongation

For every 10 cum of R.C.C. work – or part there of 1 No.

10. Fine Aggregate Sieve Analysis / Bulking of sand / silt content

For every 10 cum of R.C.C. work – or part thereof - 1 No.

- Note:
1. The required quantity of test cubes / Bricks / Stone blocks / Fly ash Blocks / Coarse Aggregate / Fine Aggregate are to be supplied by the contractor at free of cost.
 2. The contractor should make necessary arrangements and hand over the samples to the Engineering College laboratory as directed by the Department / TSCCL Authority by the Department / TSCCL Authority officers
 3. The test results should satisfy as per relevant I.S. Codes.

17. TESTING CHARGES

S.No	Material	Tests conducted	
1	Cement	Normal consistency & Compressive strength (6 cubes will be cast and tested for 3 days & 7 days strength)	
2	Steel	Diameter & Weight	
2.	Concrete	Compressive Strength	
4	Bricks/ Stone blocks / Flyash G Blocks	Dimensions, Compressive strength, Water Absorption	
5	Concrete	Mix Design	
6	Coarse Aggregate	Sieve Analysis	
		Bulk Density	

		Flakiness & Elongation	
7	Fine Aggregate	Sieve Analysis	
		Bulking of sand	
		Silt Content	
8	Wood	Water Absorption	
		Compressive Strength	

Note: The Charges towards tests conducted have to be borne by the contractor

Volume 5: Drawings

TENDERER

Volume 5: Drawings

MANAGING DIRECTOR
TSCCL, TIRUPATI

Page 255

DRAWINGS

DRAWINGS:

- 1.1 The plans enclosed with the tender are liable to be altered during execution of work as per necessity of site conditions. The premium quoted by the contractor for various items shall hold good for execution of work even with altered plans.
- 1.2 One set of drawings, on the basis of which actual execution of the work is to proceed shall be furnished free of cost to the contractor by the Executive Engineer progressively according to the work program submitted by the contractor and accepted by the Executive Engineer. Drawings for any particular activity shall be issued to the contractor at least 30 days in advance of the scheduled date of the start of the activity. However, no extra claims by the contractor toward any delay in issue of drawing or issue of any revision / change to the drawings issued earlier shall be admissible. The Chief Engineer shall intimate the contractor 7 days in advance regarding any delay to issue of drawings, for any particular stage of works. If work gets affected due to delay to issue of drawings, for any particular stage of work the contractor shall be granted extension of time in terms of condition of tender notice.
- 1.3 Signed drawings above shall not be deemed to be an order for work unless they entered in the agreement or schedule of drawings under proper alterations of the contractor and Executive Engineer or unless they have been sent of the contractor by the Executive Engineer with a covering letter confirming that the drawing in and authority for work in contract.

1.0 DISCREPANCIES:

- 2.1 In case of discrepancies between documents the following order of procedure shall apply:-
 - 2.1.1 Between the written description of written dimensions in the drawings and the corresponding one in the specifications, the latter shall apply.
 - 2.1.2 Figured dimensions shall supersede scaled dimensions. The drawings on a larger scale shall take precedence over those on a smaller scale.
 - 2.1.3 Drawings issued as construction drawings from time to time shall supersede tender drawings and also the correspondence drawings previously issued.

Note: The contractor should not execute any component of work without obtaining the working drawings. Any work done without drawings shall be at the contractors responsibility only. Acceptance for such work will be at the discretion of the Executive Engineer.

2.0 SECRECY CLAUSE

The drawings and specifications made available to the tenderer shall exclusively be used on the work and they are retained from passing on each plan to any unauthorised hand either in parts or in full under the provisions of Section-3 and 5 of the official secrets Act 1923. Any violation in this regard will entail suitable action under appropriate clause or official secret Act 1923.

Volume 6: Bill of Quantities

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

SCHEDULE-A PART- I

Bill of Quantities (BoQ) – Preamble

NAME OF WORK:-“ Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati’s ABD Area including O&M after DLP completion [from 3rd year] under Smart City Mission”

1. The Bill of Quantities shall be read in conjunction with the instructions to Tenderers, General and Special conditions of Contract Technical Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional and are given to provide common basis for tendering. The quantities here given are those upon which the lump sum tender cost of the work is based but they are subject to alterations, omissions, deductions or additions as provided for in the conditions of this contract and do not necessarily show the actual quantities of work to be done. The basis of payment will be actual quantities of work ordered and carried out as measured by the Contractor and verified by the Engineer and valued at the estimate rate plus or minus tender percentage quoted in the Bill of Quantities where applicable, and otherwise at such rates and prices as the Engineer-in-Charge may fix within the terms of Contract.
3. The estimate rates in the Bill of Quantities shall, except in so far as it is otherwise provided under the Contract include cost of all constructional material, labour, machinery, transportation, erection, maintenance, profit, taxes and duties together with all general risks, liabilities and obligations set out or implied in the Contract.
4. The plans enclosed with the tender are liable to be altered during execution of work as per necessity of site conditions. The Tender percentage quoted by the tenderer shall hold good for execution of work even with altered plans.
5. The whole cost of complying with the provisions of the Contract shall be included in the estimated rates for items provided in the Bill of Quantities and where no items are provided in the Bill of Quantities, their cost shall be deemed to be distributed among the estimate rates entered for the related items of work.
6. General directions and descriptions of work and materials are not necessarily repeated nor summarised in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering estimate rate against each item in the Bill of Quantities.
7. The method of measurements of completed work for payment shall be in accordance with the relevant B.I.S. Codes, A. P. S. Specifications & MoRT&H (4th Revision)

8. All items of work are to be executed as per the drawings / specifications supplied with the contract documents. If there is any contradiction between the drawings and the text of the specifications, the later shall prevail.
9. The Tenderer should inspect and select the quarries of his choice before he quotes the tender percentage in the Schedule of Bill of Quantities and satisfy himself about the availability of required quantum of materials.
10. Diversion drains should be excavated before completion of the embankments and the useful soils should be used in the nearby embankments.
11. The actual mix proportion by weight to be adopted during execution will be got designed in the laboratories to suit the grade of concrete and mortar to be used. It will be the responsibility of the contractor to manufacture concrete and mortar of required strength.
12. The quantum of measurement for all items of earthwork involving conveyance manually or by machinery shall be as assessed by level measurement. The measurements for the embankment will be for the consolidated banks only.
13. Wherever bailing out of water is involved either for excavation or for foundations or for constructions, the percentage quoted shall take into account the dewatering charges necessary. No separate payment will be made for dewatering.
14. Wherever embankment work is involved, useful soils approved by the Engineer-in-Charge from the cutting reaches and diversion drains shall be taken and used for forming nearby embankments soils used for constructions will be at free of cost.
15. The quoted tender percentage shall also include the work of any kind necessary for the due and satisfactory construction, completion and maintenance of the works according to the drawings and these specifications and further drawings and orders that may be issued by the Engineer-in-Charge from time to time. The quoted tender percentage shall include compliance by the Contractor with all the general conditions of contract, whether specifically mentioned or not in the various clauses of these specifications, all materials, machinery, plant, equipment, tools, fuel, water, strutting, timbering, transport, offices, stores, workshop staff, labour and the provision of proper and sufficient protective works, diversions, temporary fencing and lighting. It shall also include safety of workers, first aid equipments suitable accommodation for the staff and workmen, with adequate sanitary arrangements, the effecting and maintenance of all insurances, the payment of all wages, salaries, fees, royalties / Taxes, duties or other charges arising out of the execution of works and the regular clearance of rubbish, reinstatement and

clearing-up of the site as may be required on completion of works safety of the public and protection of the works and adjoining land. The work of Building in quality control / assurance shall be deemed to be covered in the quoted percentage.

16. The Contractor shall ensure that, the quoted tender percentage shall cover all stages of work such as setting out, selection of materials, selection of construction methods, selection of equipment and plant, deployment of personnel and supervisory staff, quality control testing etc. The work quality assurance shall be deemed to be covered in the tender percentage.
17.
 - a) The special attention of the tenderer is drawn to the conditions in the tender notices wherein reference has been made to the MoRT&H (4th revision) & Andhra Pradesh Standard Specifications [APSS] and the Standard preliminary specifications containing therein. These preliminary specifications shall apply to the agreement to be entered into between the contractor and the Government of Andhra Pradesh and shall form an in-separable condition of the contract along with the estimate. All these documents taken together shall be deemed to form one contract and shall be complimentary to another.
 - b) The tenderer shall examine, closely the A.P.S.S / MoRT&H and also the standard preliminary specifications contained therein and sign the Chief Engineer's office copy of the APSS / MoRT&H and its addenda volume in token of such study before submitting his overall tender percentage which shall be for finished work in-situ. He shall also carefully study the drawings and additional specifications and all the documents, which form part of the agreement to be entered into by the successful tenderer. The APSS / MoRT&H and other documents connected with contract such as estimate plans, specifications, can be seen on all working days in the office of the Chief Engineer, TSCCL.
18. The tenderers attention is directed to requirements for materials under the clause 'materials and workmanship' in the preliminary specifications of APSS & MoRT&H (4th revision). Materials conforming to the Bureau of Indian Standards specifications, APSS and MoRT&H (4th revision) etc., shall be used on the work and the tenderers shall quote his overall tender percentage accordingly.
19. The tenderer has to do his own testing of materials and satisfy himself that they conform to the specifications of respective I.S.I. Codes before tendering.
20. The contractor shall himself procure the required construction materials of approved quality including the earth for formation of embankment and water from quarries /

sources of his choice. All such quarries / sources of materials required for the work shall be got approved by the Engineer-in-Charge in writing well before their use of the work.

21. The contractor shall himself procure the steel, cement, Bitumen, Blasting materials, sand, metal, soils, etc., and such other materials required for the work well in advance. The contractor has to bear the cost of materials for conveyance. The Department / TSCCL Authority will not take any responsibility for fluctuations in market in cost of the materials, transportation and for loss of materials etc.
22. Inspection of site and quarries by the tenderer: Every tenderer is expected before quoting his overall tender percentage, to inspect the site of proposed work. He should also inspect the quarries and satisfy himself about the quality, and availability of materials. The best class of materials to be obtained from quarries, or other sources shall be used on the work. In every case the materials must comply with the relevant standard specifications. Samples of materials as called for in the standard specifications or in this tender notice, or as required by the Executive Engineer, in any case, shall be submitted for the Executive Engineer's approval before the supply to site of work is begun.
23. The tenderer's particular attention is drawn to the sections and clauses in the A.P. standard specification dealing with
 - a) Test, inspection and rejection of defective materials and work.
 - b) Carriage
 - c) Construction plant
 - d) Water and lighting
 - e) Cleaning up during the progress and for delivery.
 - f) Accidents
 - g) Delays
 - h) Particulars of payments.

The contractor should closely peruse all the specification clauses, which govern the overall tender percentage he is tendering.

24. The defect liability period of contract in terms of GO Ms No: 8, T(R&B) Department dated: 8.1.2003 is twenty four months.
25. The estimate rates for items shown in the Schedule "A" include all construction materials. No escalation in rates will be paid unless specified in the tender document. The tenderer has to quote an overall tender percentage considering all the aspects of the

- tender to complete the finished item of work as per the APSS / MoRT&H / B.I.S. specifications, the special specifications appended, Drawings etc.
26. If there is any contradiction between APSS / MoRT&H and B.I.S. specifications, listed and detailed technical specifications, the latter shall prevail.
27. In case of a job for which specifications are not available with the Schedule or in APSS / MoRT&H or B.I.S. code and are required to be prescribed, such work shall be carried out in accordance with the written instructions of the Engineer-in-charge.
28. The contractor should use the excavated useful soils and stone for construction purpose. Soils used for construction either for homogeneous section in hearting or in casing zone based on the suitability will be at free of cost and the cost of stone used for construction purpose will be recovered from the contractors bill.
- The contractor should quote his tender percentage keeping in view of the above aspects.
29. Additions and alternations by the Tenderer in the Schedule of quantities will disqualify the tender.
30. In the case of discrepancies between the written description of the item in the Schedule "A" and the detailed description in the specification of the same item, the latter shall be adopted.
31. The Unit rates noted below are those governing payment of extras or deductions for omissions according to the conditions or the contract as set-forth in the preliminary specifications of the A.P. standard specifications and other conditions of specification of this contract.
32. It is to be expressly understood that the measured work is to be taken according to the actual quantities when in place and finished according to the drawings or as may be ordered from time to time by the Executive Engineer and the cost calculated by measurement or weight at their respective rates without any additional charge for any necessary or contingent works connected herewith. The Percentage Excess or less on ECV quoted are for works in situ and complete in every respect.
33. For all items of work in excess of the quantities indicated the rates payable for such excess quantities will be tendered rates i.e., estimate rates plus or minus tender percentage.
34. For all items of work, intermediate payment will be made provisionally as per relevant clause. Full-accepted agreement rates will be paid only after all the items of works are completed.

35. The contractor is bound to execute all supplemental works that are found essential incidental and inevitable during execution of main work.
36. The payment of rates for supplement items of work will be regulated as under.
Supplemental items directly deductible from similar items in the original agreement.
The rates shall be derived by adding to or subtracting from the agreement rate of such similar item the cost of the difference in the quantity of materials labour between the new items and similar items in the agreement worked out with reference to the schedule of rates adopted in the sanctioned estimate with which the tenders are compared.
- a) Similar items but the rates of which cannot be directly deducted from the original agreement.
 - b) Purely new items which do not correspond to any item in the agreement.
The rate of all such items shall be estimated rates plus or minus overall tender percentage.
37. ENTRUSTMENT OF ADDITIONAL ITEMS.
- a) Where ever additional items not contingent on the main work and outside the scope of original agreement are to be entrusted to the original contractor dispensing with tenders and if the value of such items exceeds the limits up to which the officer is empowered to entrust works initially to contractor without calling for tenders approval of next higher authority shall be obtained. Entrustment of all such items on nomination shall be rates not exceeding the estimate rates.
 - b) Entrustment of supplement items contingent on the main work will be authorised by the officers up to the monetary limits up to which they themselves are competent to accept items in the original agreement so long as the total amounts up to which they are competent to accept in an original agreement rates for such items shall be worked in accordance with the procedure prescribed in GO Ms.No.1493 PWD, dated:25.10.1971 and as amended in Govt. Memo number 544 cod 72-22 dt:6.7.1973.
 - c) Entrustment of either the additional supplemental items shall be further subject to the provisions under para 176(b) of APWD Code Viz., the items shall not be ordered by an officer on his own responsibility if the revised estimate or deviation statement providing for the same requires the sanction of higher authority.

Note: It may be noted that the term estimate rate used above means the rate in the sanctioned estimate with which the tender's compared or if no such rate is available in the estimate

the rate derived will be with reference to the schedule of rates adopted in the sanctioned estimate with which tenders are compared.

SCHEDULE-A

Bill of Quantities (BoQ) Price Bid

[Part-I]

NAME OF WORK: "Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati's ABD Area including O&M after DLP completion [from 3rd year] under Smart City Mission"

Sl.No	Approximate quantity In figures/ words	Description of work	Specification No / CPHEEO / APSS / BIS / MoRT&H	Unit In figures / words	Estimate Rate In figures / words	Amount in Rs.
		SEPARATE SHEETS ENCLOSED				

TENDERER

MANAGING DIRECTOR
TSCCL, TIRUPATI

NAME OF WORK: "Retrofitting of Parks and Open Spaces including Beautification, Landscape and Hardscape works for Prakasham Park in Tirupati's ABD Area including O&M after DLP completion [from 3rd year] under Smart City Mission"

BILL OF QUANTITIES - PART-II

Reimbursable Items

i)	GST	Rs. XX,XX,XXX/-
ii)	Seignorage charges	Rs. XX,XXX/-

- 1) The Contractor has to procure O.P. Cement, 43 grade of ISI specification of 8112/1986 and should produce the original bill.
- 2) The contractor has to procure steel confirming to IS1786.
- 3) Technical Agent (Person) should be engaged by the contractor in at his own cost as per eligibility.
- 4) Amount in Part -II will be Reimbursed to the Contactor as per the actual bills produced.
- 5) Payment will be made after completion of work whenever funds are available in TSCCL.
- 6) Rates adopted in the schedule "A" are after deduction of sand cost as per govt. free sand policy.

Glossary

ABD	Area Based Development
NIT	Notice Inviting Tender
ITT	Instruction to Tenderers
BOQ	Bill of Quantities
CV/CV	Curriculum Vitae
EMD	Earnest Money Deposit
AECV	Approximate Estimated Contract Value
ECV	Estimated Contract Value
TCV	Tender Contact Value
GCC	General Conditions of Contract
GoAP	Government of Andhra Pradesh
GoI	Government of India
JV	Joint Venture
MD	Managing Director
MCT / TMC	Municipal Corporation Tirupati
PBG	Performance Bank Guarantee
BG	Bank Guarantee
L1	Lowest Tenderer
NCB	National Competent Bidding
ECV	Estimate Contract Value
FDR	Fixed Deposit Receipt
GST	Goods and Service Tax
INR	Indian Rupee
SCP	Smart City Proposal
SPV	Special Purpose Vehicle
TOR	Terms of Reference
TSCCL	Tirupati Smart City Corporation Limited
TTC	Tirupati Town Center