ToR

For

Design, Development and Implementation of Online Project Management System (PMS)

For

Billing & Accounting

Contract Package No. KMC-SHARP/KCS/06/2025-26

Abbreviations & Definitions

ADB	Asian Development Bank
Authorized Signatory	The bidder's representative/officer vested (explicitly, implicitly, or through conduct) with the powers to commit the authorizing organization to a binding agreement. Also called signing officer/ authority having the Power of Attorney (PoA) from the competent authority of the respective Bidding firm.
Bid	"Bid" means the response to this document (later defined as RFP) presented in Financial Bid, which is supplied with necessary documents and forms, complete in all respect adhering to the instructions and spirit of this document.
Bidder	"Bidder" means any firm/agency/company/contractor/supplier/bidder/vendor responding to invitation for Bids and who is participating in the Bid.
CERT-In	Indian Computer Emergency Response Team
CMC	Contract Monitoring Committee.
CMMi	Capability Maturity Model Integration
CMU	Contract Management Unit
Contract	"The Contract" means a legally enforceable agreement entered between KMC-SHARP and the selected bidder(s) with mutual obligations.
Day	"Day" means a calendar day.
PM-DSC	Project Management and Design & Supervision Consultant
EMD	Earnest Money Deposit.
GoI	Government of India
GoWB	Government of West Bengal
Goods	"Goods" means a tangible physical product that can be contrasted with a service which is intangible i.e. all the products which the bidder is required to supply to Purchaser under the Contract.
KEIIP	Kolkata Environmental Improvement Investment Program
KMC	Kolkata Municipal Corporation
KMC-SHARP	Kolkata Municipal Corporation – Sustainability Hygiene and Resilience Project
LoI	Letter of Intent
NIT	Notice Inviting Tender
SAD	System Analysis and Design
SDD	Software Design and Development
SEI	Software Engineering Institute at Carnegie Mellon University (CMU)
SLA	Service Level Agreement is an agreement between two parties wherein one is KMC-SHARP and the other is the service provider. It is a service contract where the level of service is formally defined. In practice, the term SLA is sometimes used to refer to the contracted delivery time (of the service) or performance
SoW	Scope of Work
SRS	Software Requirement Specification
Successful Implementation	Successful Implementation includes: a) Security Audit b) Successful Implementation on Production Server after migration of actual and complete data c) Handover of actual running software source code complete in all respects including source code of Database PL/SQL and other supporting libraries.
URS	User Requirement Specification
UAT	User Acceptance Testing
UI	User Interface
PO	Purchase Order
MB	Measurement Book
AMC	Annual Maintenance Contract

Introduction

A new project is to be launched under Kolkata Municipal Corporation with code name as KMC-SHARP (Kolkata Municipal Corporation - Sustainability Hygiene and Resilience Project) to be funded by Asian Development Bank (ADB). The Project would improve the overall environmental condition and strengthen climate change and disaster resilience of the Kolkata city by establishing a smart, integrated effective, efficient and environmental solid waste management system and by increasing access to sewerage and drainage system in selected areas of KMC. By deploying the 3Rs more effectively, i.e. reduce, reuse and recycle, the project will help Kolkata chart a lower carbon and lower resource use sustainable path.

The new project shall consist of several works for betterment of living standards of the citizen of Kolkata. The project works shall be accomplished through various work packages with multiple project components.

Currently there is a Project Accounting System (PAS) running under the project named Kolkata Environmental Improvement Investment Program (KEIIP). This system is based on Oracle E-Business Suite (EBS) of applications consisting of the following 10 Oracle EBS standard programs.

1. Oracle Database Enterprise Edition
2. Oracle Real Application Cluster
3. Oracle Diagnostic Pack
4. Oracle Tuning Pack
5. Oracle Web Logic Suite
6. Oracle Internet Developer Suite
7. Oracle Financials
8. Oracle Purchasing
9. Oracle Discrete Manufacturing
10. Oracle Project Costing

In addition to the above standard programs, the existing system also has the following custom modules.

- Measurement Book (MB)
- ADB Claims Module

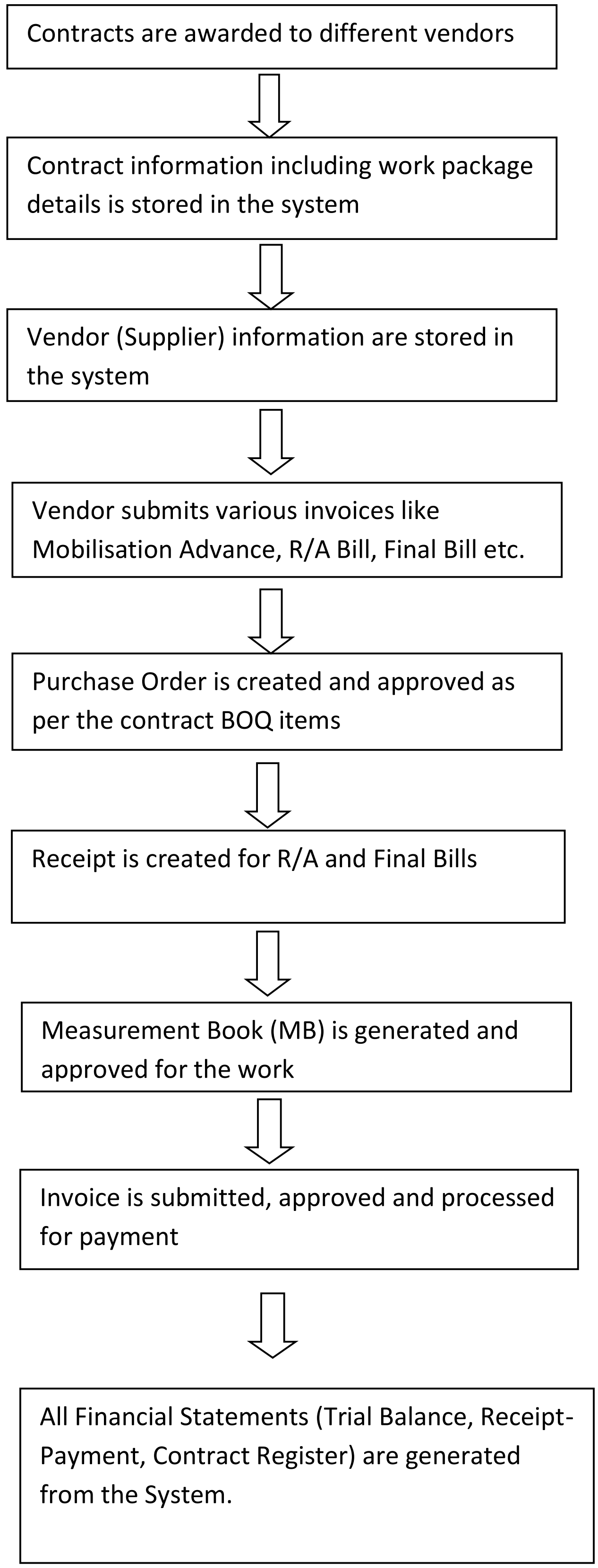
The existing system also has customized workflow for approval of Purchase Order, Measurement Book and Invoices as per the business logic implemented in the existing system.

The existing system is used to manage project activities involving creation and management of Project Components (Work Packages), Purchase Order (PO), Receipts, Measurement Book(MB), Invoices, Payments, Journals. The system also allows approval of PO, MB and Invoices following a predefined hierarchy of approvals.

The existing system enables users to generate various MIS reports as per requirements of various project units.

It is decided that the existing system is to be redesigned using Open Source Technology as mentioned in “Framework For Adoption of Open Source Software In e-Governance Systems” published by Government of India, Ministry of Communications and Information Technology in the month of April, 2015. The proposed system must have the compatibility to be hosted in cloud servers of renowned vendors as well as State Data Centre, Government of West Bengal. The compatibility of future integration with website of KMC-SHARP and GIS System has to be ensured by the successful bidder.

Broad Workflow of the existing Project Accounting System



Requirements and Specifications

1. **Objective**

   The purpose of this ToR is to identify competent and professional eligible Bidder(s) for Design, Development, Implementation of Online Project Management System (PMS) for Kolkata Municipal Corporation – Sustainability Hygiene and Resilience Project (KMC-SHARP) using Open Source Technology.

2. **Scope of Work**

   2.1 Background

   Project Authority, KMC-SHARP is looking for an online (web-enabled) integrated rules-based system for online centralized project management system tailored for evolving policy having transparent online project management, work package management, management of purchase orders and receipts, management of measurement books, management of invoices of various types, accounting of invoices and their payments, posting to General Ledger for generation of financial & accounting statements and comprehensive reporting to fulfill requirements of various project units of KMC-SHARP.

   The objectives for implementation of such a system are:

   a) Scalable, secure, robust and responsive online system for project management incorporating all the features and functionalities existing in the currently running Oracle ERP-based applications as well as the requirements of various project units of KMC-SHARP and flexible enough to integrate with new systems in future such as the one developed for e-KMC 2.0 with High Availability Architecture and Disaster Recovery mechanism in place.

   b) System that is flexible enough to adapt to evolving policy and administrative rules.

   c) Online entry and processing of various transactions for the entire life cycle period of KMC-SHARP and beyond.

   d) Flexible enough to cater the needs of various project units of KMC-SHARP

   e) Fulfill requirements for MIS reports for various project units as well as other departments of KMC.

   f) Minimize duplication, paperwork and unnecessary redundancy due to manual processing/manual transfer of data to enable KMC-SHARP officials to focus more on their core activities.

   g) Better management and retrieval mechanism.

   h) Securely store data in remote cloud for ease of retrieval and processing

   i) Should be able to be accessed from anywhere, not limited to the project office of KMC-SHARP through the Internet

   j) Being open source software, the source code would be in the sole custody of Project Authority, KMC-SHARP/KMC

   Through this Tender Document, KMC-SHARP is looking for an Online Project Management System (PMS) for Kolkata Municipal Corporation – Sustainability Hygiene and Resilience Project (KMC-SHARP) using Open Source Technology. The newly designed system shall be deployed by the bidder at Data Centre of Govt. of West Bengal (State Data Centre). In addition to above, the selected bidder will also carry out the migration of existing relevant data (master tables, List of Values (LOV) etc) from systems to be replaced to the proposed integrated System.

   The selected bidder will have the sole responsibility to deploy and maintain the system. The selected bidder should assess the capacity planning and assessment for the solution. The competent and professional organizations/firms having proven expertise in System Study, Design, Development, Implementation and Maintenance of Web enabled applications using latest stable Open Source technologies are requested to submit their bids against this Tender Document.

   2.2 Broad Scope of Work

If any services, functions or responsibilities not specifically described in the contract are an inherent, necessary or customary part of the services or are required for proper performance or provision of the services in accordance with the Broad Scope of Work or Indicative List of Required Features, they shall be deemed to be included within the scope of the work to be delivered for, as if such services, functions or responsibilities were specifically described in the scope of work without additional cost.

The System should be driven by an integrated suite of software modules with customization capabilities that supports the basic internal business processes of KMC-SHARP activities under scope of work and have a common open source database and Service Oriented Architecture wherever appropriate or required for integration with other systems.

The work includes:

1) Study, Requirement understanding and Analysis with respect to developing Online Integrated System for KMC-SHARP after undertaking the study of the existing systems:
   - Preliminary study for existing system of KEIIP
   - Requirement gathering through consultation with KMC-SHARP
   - Finalization of Software and Database configuration
   - Finalization of data migration and changeover strategy for smooth changeover.

2) Design, Development, Implementation and Maintenance of proposed online integrated system.

3) The system shall have options for multiple level of administrative control having varied rights for all the modules so that they are able to perform functions pertaining to their respective Centre/Domain as per their assigned rights.

4) System should be robust, responsive and support at least 100 concurrent users per instance and scalable as per need.

5) Bidder shall carry out the relevant Master Data migration /Porting of existing data into the new system. The format/schemas of existing data may be collected by the bidder on request.

6) Bidder shall get the system security audited at its own cost from CERT-In/CERT-In Empanelled vendors such as West Bengal Electronic Industry Development Corporation Limited(WEBEL), Standardization Testing and Quality Certification (STQC) Directorate, an attached office of Ministry of Electronics and Information Technology, Government of India etc. Final Production Run will be started only after safe-to-host certificate of the deployed project.

7) The selected bidder would be required to provide Warranty, Maintenance, and Technical Support from the date of issue of completion certificate, and Annual maintenance of system with onsite technical support as and when required. Warranty and AMC include minor additional requirements/minor changes apart from regular maintenance. The free warranty period would be of ONE year after the successful implementation of the system on production server. The successful implementation of the system means:

   a) Sign off of UAT
   b) Security Audit
   c) Successful Implementation on Production Server
   d) Handover of actual running software source code complete in all respects including source code of database functions/procedures/packages and other supporting libraries

After expiry of warranty period, the bidder shall compulsorily offer Annual Maintenance Contract (AMC) after expiry of warranty period. However, Project Authority, KMC-SHARP may or may not award the AMC at its own sole discretion.

8) Identify the training requirements and train the concerned KMC-SHARP staff/officers for successful implementation and maintenance of the developed system. The Training shall include application, database and other related features. The training program will be broadly categorized as Functional Training for non-IT staff/officials and Technical Training for IT/Systems personnel. Exhaustive documentary hand-outs are to be provided to the incumbents of the training well in advance.

9) Preparation of User, Design & Technical manuals and other documents for the developed system in an easy to understand and user-friendly language with proper Diagrams, Screen-shots and charts wherever required. Recorded videos containing detailed explanation of functionalities and technical aspects on every module to be developed are also to be delivered to Project Authority,KMC-SHARP.

10) The design should organize business logic (with facility for authorized users to define, modify, add, and delete business rules from front end) and presentation logic separately while developing and implementing the proposed system, thus, restricting the database queries to be inserted inside the presentation and business logic; rather, it should be written in the Database only. Data fields' names should be self-explanatory. Source code should be well written and understandable with detailed legible comments for each function/module to be written. Model-View-Controller(MVC) / Model-View-Template(MVT) approach is always preferred to separate presentation from implementation of business logic.

11) The existing system running at the project office should be studied thoroughly and rigorously. The existing system is running on Oracle EBS Release 12i with Oracle Database 12c. The forms, reports and related database structures are to be studied properly and those are to be reproduced using Open Source Technology as stated earlier in this document. The custom forms and database structures are to be gone through and these are to be implemented in the proposed system. Approval of PO, MB and Invoices are to be carefully implemented in an easy-to-understand manner. Provision for setting up of approval path through front-end must be implemented.

12) Development of Mobile Compatible Responsive Application for uploading of images, geo-tagging and field level entries will need to be carried out by the selected bidder. Such an application will have the following minimum functionalities:
    - ✓ It will enable authorized users through proper authentication (Captcha, Password and OTP) to capture and post images, geo tagging and field level data to the Project Management System on real time basis using secured Application Programming Interface (API) calls
    - ✓ Data posted from mobile application will be securely stored in the database of Project Management System (PMS) and authorized users of PMS will be able to access such data in the System.
    - ✓ Selected Bidder will create reports in PMS regarding progress of works under various work packages using the data posted from Mobile Application

3. Indicative Scope of Work

The indicative scope of work regarding Design, Development, and Implementation of Online Project Management System (PMS) for Kolkata Municipal Corporation – Sustainability Hygiene and Resilience Project (KMC-SHARP) using Open Source Technology integrating information & activities of all project units specified as under:

Phase 1: Analysis

i. Finalizing the detailed list of activities, scope and duration of each of the activity and detailed project plan

ii. Detailed study of the existing systems which includes database, features and functionality, project creation and management, management of various work packages, management of suppliers, management of Purchase Orders (PO) and Receipts, management of electronics measurement book

(MB), approval path of PO,MB & invoices, management of invoices of various types(credit, debit, standard, tax, retention money, mobilization advance, return-to-vendor etc.) etc. to determine precise requirements of the new system.

- **iii.** Detailed discussions with concerned KMC-SHARP officials to understand the overall objectives of the assignment.
- **iv.** Finalization of Project Objectives/Requirements.
- **v.** Submission of detailed Project Proposal /Plan.
- **vi.** Signoff on detailed project plan, activities, timelines etc from KMC-SHARP.

Phase 2: Design

- **i.** Detailed Requirement gathering and analysis.
- **ii.** Study and analysis of existing system and include best practices in draft design.
- **iii.** “As-Is” and “To-Be” documents to be prepared based on the guidelines to be referred to in the documents already available with Systems Department of KEIIP and submitted with detailed scope of work consisting of the existing and proposed business logic with work flow diagrams
- **iv.** Carry out a System Study including SOPs, guidelines, programmes eligibility, existing systems to be replaced and with which to interact, etc. to prepare the Software Requirements Specification (SRS) and Functional Requirement Specification (FRS) document.
- **v.** Identification of technologies/platforms compatible with SDC Cloud (Government of W.B.).
- **vi.** Detailed High level and Low level application designs.
- **vii.** Information Integration and Consolidation.
- **viii.** Client Sign-off for Requirement Analysis.
- **ix.** Vendor shall develop appropriate screen layouts and templates for the user feedback.
- **x.** Approval of prototype (design interface) developed by vendor.
- **xi.** Coordination and collection of required data from KMC-SHARP/KEIIP.
- **xii.** Approval on the data gathered by the client department.
- **xiii.** Proper backup policy and Disaster Recovery Management
- **xiv.** Data migration strategy.
- **xv.** Compliance with website security and Auditing & Logging guidelines issued by NIC, CERT-IN and MeitY, GoI.

Phase 3: Development

- **i.** Coding / Temporary Demo server
- **ii.** Importing of data for testing
- **iii.** Application Development
- **iv.** Adherence to Web Application Audit/ Compliance and Approval / Security Features
- **v.** High availability architecture with following elements:
  - Load balancing and Redundancy.
  - Elimination of single points of failure.
  - Detection of failures as they occur.
- **vi.** Developed System Application should have multiple backend systems interfacing capabilities.
- **vii.** Rigorous testing of Developed system including Unit Testing, Integration Testing, System Testing, Functional Testing, Peak Load Testing, etc with reports
- **viii.** Testing of developed system based upon Compliance to applicable guidelines, Assess the user objective achievement, etc.
- **ix.** Completed system components for UAT
- **x.** Migration of existing data for UAT

- **xi.** UAT Sign-off by KMC-SHARP
- **xii.** Modification based upon user feedback
- **xiii.** Migration of master data to production environment
- **xiv.** Submission of technical and functional documents including source code walk-through in Microsoft Word and audio & video files.
- **xv.** Sign off on developed system by KMC-SHARP

Phase 4: Operation and Maintenance support

- **i.** Identify and execute training requirements for successful execution of integrated system
- **ii.** Creations of necessary documents and User Manuals both in Microsoft Word documents and audio & video files for training
- **iii.** Support in handover of system to KMC-SHARP
- **iv.** Support on Training / Demo as and when required
- **v.** Warranty Maintenance
- **vi.** Annual Maintenance of system
- **vii.** Designing interface/ mechanism compatible for access through Mobile phones(smart phones)

4. Indicative Deliverables

This section provides indicative deliverables; however actual deliverables will depend upon project specific requirements and will be finalized in consultation with KMC-SHARP.

- i. "As-Is" and "To-Be" documents (based on the existing documents available with the Systems Department, KEIIP)
- **ii.** FRS, SRS, High Level Design and Architecture Documents
- **iii.** Performance Test Reports
- **iv.** Security Test Reports
- **v.** UI Usability Report
- **vi.** User Manual and SOP
- **vii.** Technical and Design Manuals
- **viii.** Technical and Functional documents including source code walk-through in Microsoft Word and audio & video files.
- **ix.** Data Backup Process and Archival Process
- **x.** Requirement Traceability Matrix
- **xi.** Error-free Source Code of the actual running software complete in all respects along with source code of Database PL/SQL and other Libraries
- **xii.** Infrastructure design document
- **xiii.** Data Migration Utility with detailed documentation
- **xiv.** Data Model
- **xv.** Registration of domain
- **xvi.** Security Audit certificate (Safe to Host certificate) before hosting the services.

5. Indicative List of Required Features to be included in the System

The following is an indicative outline of required features. Tentative Module outline of the required features under scope of work is mentioned at the end of this ToR document. Detailed requirements will be finalized by the bidder in consultation with user departments of KMC-SHARP. The online integrated system catering to the needs of all KMC-SHARP project units should include the following:

a) Finalization of backup policy and Disaster Recovery Management.

b) Online Comprehensive Solution for Project Management System:

- **i.** Secure login-in for each user along with audit/log trail.
- **ii.** Two-step authentication (password authentication followed by One Time Password(OTP) is to be implemented in the proposed system
- iii. Authentication using password and short-lived secured token are also to be implemented.
- **iv.** The proposed system must allow single sign-on only.
- **v.** The proposed system must implement all the requirements given by various project units of KMC-SHARP. The requirements are to be found in this RFP document.
- **vi.** The existing features and functionalities, currently being used by various project units of KEIIP in the presently running System in Oracle EBS 12i platform are to be made available in the proposed system.
- **vii.** Every module to be developed in the proposed system shall have a dashboard showing progress of various transactions processed through the proposed system as per given criteria in graphical representation. Criteria for data retrieval would be provided by concerned officials of various project units at the time of development.
- **viii.** Mechanism for bulk upload of data from spreadsheets (excel) for Purchase Order, BOQs and Measurement Books are to be implemented.
- **ix.** Functionalities for uploading images taken at field of work (with latitude and longitude) and pdf documents and validating through digital signature certificates are also to be implemented
- **x.** One super user (or administrator) accounts having access to all modules and one administrator account for each of the modules having access to all screens and reports are to be created.
- **xi.** Super Administrator can create/edit/assign/delete rules, roles and users along with audit/log trail. The bidder shall initially configure the rules at the time of testing and implementation.
- **xii.** Super User and Module Administrator shall have access to creation of approval path of PO, MB and Invoices for respective module based on predefined rules.
- **xiii.** Database should be normalized, ensuring referential integrity and appropriate primary keys should be defined, and data field names should be self-explanatory.
- **xiv.** Feature of auto periodic backup of database.
- **xv.** Implementation of open source cloud containers to be used for deployment of the system in cloud servers
- **xvi.** Module wise access to be granted to specific user as per approval of the appropriate authority of KMC-SHARP.
- **xvii.** There should be a mechanism for Version Control and Bug Reporting & Tracking. Version control is to be implemented using open source Git software in the local server of KMC-SHARP. Development is to be carried out in the existing server of the project office using the installed Git. The successful bidder must ensure that the latest version of source code is available in the Git system installed in the existing server of the project office. Designated technical officials of KMC-SHARP shall have read access to the Git system.
- **xviii.** Mechanism to ensure through version control that any change in rules/procedure etc. does not make the data/information, etc. misleading, incompatible, or corrupt

xix. Design should support Extensive portal Analytics and Statistics to be provided. Traffic reports, visitor analysis, duration analysis, top landing pages and top exit pages, other statistical reports should be provided as per requirement of KMC-SHARP. Project status reports in the form of pie chart, bar chart etc. in addition to conventional pdf reports are to be facilitated in the new system.

c) System should be easy to navigate for prospective stakeholders & visitors of KMC-SHARP.

d) Proposed System should be accessible on all platforms and all major popular browsers (e.g. Internet Explorer, Mozilla Firefox, Google Chrome, Safari, Opera, etc). An user shall be able to query/register/make transactions from all popular browsers and mobile platforms.

e) Portability to any of the Mobile Platforms (ex. Smart phones & Tablets) and mobile browsers.

f) System must have at least the following security features:

- **a.** Vendor should also get the Security Audit certificate (Safe to Host certificate) from CERT-IN/ CERT-IN Empanelled agencies before hosting the services
- **b.** Free from OWASP Vulnerabilities (Open Web Application Security Project).
- **c.** Strong Password Policy.
- **d.** Storing of any kind of username and password in the encrypted form in the database
- **e.** Session Management
- **f.** Audit/Log Trail

g) Audit Trail should be maintained as per guidelines issued by Cert-IN throughout the system and database but should be kept separate as far as possible from main tables including:

- **i.** Login attempts with time, IP Address, etc.
- **ii.** Any change in data with time, IP Address etc.

h) System shall have feature to send the SMS notifications to stakeholders in the following cases and others as required:

- **i.** Verification SMS to users logging in to the new system
- **ii.** Verification SMS to users changing password in to the new system
- **iii.** Giving approval of PO, MB and Invoice.
- iv. At any other stage to be suggested by KMC-SHARP during development

i) The proposed System to be implemented using Open Source stable platform compatible with State Data Center Cloud (Government of West Bengal) and shall be hosted by the bidder on this cloud server keeping a centralized code repository and database with replication to ensure quick responses.

Note: Features requirements indicated above are bare minimum. It does not limit Bidders to give better system.

6. **Schedule and time line for delivery of the project**

Project has to be completed within timelines. The maximum time for completion of project and various milestones is as under from the date of award of contract including testing and implementation of the proposed system:

Sl. No.	Milestone	Time Allowed
1	Analysis of the Project(As is) and approval of AS-IS study by Project Authority	21 days
2	Submission of Detailed Project Plan (to be)	14 days
3	Any suggestions for changes by KMC-SHARP	14 days
4	Resubmission after modifications suggested by KMC-SHARP	7 days
5	Sign Off and acceptance by KMC-SHARP	7 days
6	Detailed Requirement gathering and analysis including Study and analysis of existing system and include best practices in draft design, Carry out a System Study to prepare the As-IS, To-Be, SRS, including Detailed High level and Low level application designs, Information Integration and Consolidation and submission of SRS document	60 days
7	Client Sign-off for Requirement Analysis, preparation of data design and application architecture for the system, data migration strategy, development of appropriate screen layouts and forms for the users, approval of prototype (design interface) developed, coordination and collection of required data from KMC-SHARP (design should comply with system security guidelines issued by Cert-IN, NIC, MeitY, GoI)	30 days
8	Development of the system (including relevant Data Migration)	120 days
9	Hosting Staging Server, UAT, and Security Audit	30 days
10	Hosting on the Production Server (Cloud)	14 days
11	Training	Mutually decided

Post Go Live maintenance -2 Years

7. **Mid Term Review & Audit -** Midterm evaluation may be done to critically review the progress of the work and performance of the successful bidder. Project Authority, KMC-SHARP, at its discretion may also appoint third party for the same. The bidder will have to provide access to all information that may be required by KMC-SHARP/third party to successfully complete the review/audit.

8. **On-Premises Development –** The successful Bidder must develop the proposed Project Management System at KMC-SHARP office premises located at 5th Floor, Systems Department, Unnayan Bhawan, 206, A.J.C. Bose Road, Kolkata – 700017, West Bengal, India only. No other means of development shall be allowed by KMC-SHARP. Online

remote access to any hardware infrastructure of KMC-SHARP shall not be ~~entertained~~ permitted during development. The successful Bidder shall have access to the existing infrastructure of KMC-SHARP and development activities are to be carried out in the existing Servers of KMC-SHARP having the following technical specifications.

Specifications of the Servers (4 nos.): Intel, 2CPU, 8 cores with RHEL 7 OS
CPU: Intel(R) Xeon(R) CPU E5-2667 v4 @ 3.20GHz
SDD: 9.8TB
Memory: 64GB

However, the final system shall have to be deployed in State Data Center (SDC), GoWB after acceptance of the system in totality for Production Go-Live.

Specifications of Hardware Infrastructure for production deployment and Go-Live are to be provided by the successful bidder at the initial stage.

9. **Deployment of Sufficient Number of Technical Personnel for Development and Implementation -** The successful Bidder shall deploy sufficient technical and functional experts as stated hereunder at KMC-SHARP project office located at 206, A.J.C. Bose Road, Kolkata – 700017, West Bengal, India for the Design, Development, Implementation of Online Project Management System (PMS) for Kolkata Municipal Corporation – Sustainability Hygiene and Resilience Project (KMC-SHARP) using Open Source Technology. CVs of such experts to be deployed are to be submitted to KMC-SHARP along with the technical bid. The deployed personnel shall have to adhere to the working hours maintained in the project office of KMC-SHARP and may work extra hours if necessary to meet project deadline with prior approval of Project Director, KMC-SHARP. Record of attendance shall have to be maintained. The experts deployed by the successful bidder at the project office of KMC-SHARP shall have to work for the development and implementation of PMS only and shall not engage in project(s)/work(s) other than those related to KMC-SHARP.

   The deployed technical personnel should have minimum educational qualification of B.E./B.Tech./MCA from recognized university and should have minimum technical education qualification and experience as stated below in full stack software development and management using Open Source Technology, REST Framework and Open Source Database as mentioned in "Framework For Adoption of Open Source Software In e-Governance Systems" published by Government of India, Ministry of Communications and Information Technology in the month of April, 2015.

Sl. No.	Role	Min. Technical Education Qualification	Experience	Domain Skill
1	Project Manager	B.E./B.Tech in CSE/IT, MCA	Min. 10 years	Must have required experience to manage large Open Source Projects with good performance records

2	Back End Architect	B.E./B.Tech in CSE/IT.,MCA	Min. 8 years	Must have required experience to design database architecture using open source technology with good performance records
3	Business Analyst	B.E./B.Tech, MCA	Min. 5 years	Must be able to understand user requirements and must have required experience to get users requirements implemented in liaison with the development team quickly with good performance records and communication skills
4	Technical Lead	B.E./B.Tech. in CSE/IT, MCA	Min. 8 years	Must have required experience in completing the project within given time period
5	Full Stack Software Developer	B.E./B.Tech. in CSE/IT, MCA	Min. 5 years	Must have required experience to implement cloud-ready software with good communication skills
6	Software Tester	B.E./B.Tech. in CSE/IT ,MCA	Min. 2 years	Must have required experience in testing open source software to make it bug-free before formal go-live
7	Technical Support Executive Level 1	B.E./B.Tech., MCA	Min. 4 years	Must have skills as Full Stack Open Source Software Developer
8	Technical Support Executive Level 2	B.E./B.Tech., MCA	Min. 2 years	Must have skills as Full Stack Open Source Software Developer

Note: These are the bare minimum requirements of technical personnel to be deployed. However, the successful Bidder may deploy technical personnel as many as required to meet the deadline of the proposed project.

10. Qualification Criteria

The Bidder must furnish the following information along with self attested copies of supporting documents, failing which the proposal shall not be considered:

S. No.	Qualification Criteria	Supporting documents
1.	Covering Letter + Application Form	On Applicant's Letter head
2.	The Bidder should have been in existence for a period of at least 3 years as on 31-	Copy of the Certificate of Incorporation of the Company/Firm's

	03-2025 and must be one of: • A company incorporated in India under Indian Companies Act, 1956/2013; or • A partnership firm registered under The Partnership Act 1932/LLP Act, 2008; or • A society registered under Societies Act, 1860 / State Act. Consortium of companies/ firms is not allowed.	Registration Certificate.
3.	Bidder must possess and submit a valid: i. Permanent Account Number (PAN)of Bidder ii. Service Tax(GST) Registration Certificate	Valid copy of all the mentioned/required Certificates / Documents.
4.	The Applicant should have experience in at least one assignment of providing similar solution including Role based Application Module Wise Dashboards showing aggregated reports and customizable forms for any Government organization / PSU's during past three years ending 31-03-2025.	Copy of the relevant Work Order (any One) with Scope of Work/ Terms of Reference and Completion Certificates from Client.
5	Bidder should have been working on 'end-to-end' Customized Open Source Solution and ERP Projects in India from Requirement Gathering to User Training and Maintenance of Integrated Solutions during past three years ending 31-March-2025 with at least two of the projects of value not less than Rs. 1 crore each (excluding cost of hardware).	Reference, information and certificates from the respective clients certifying technical, delivery and execution capability of the bidder. The documentary evidence in form of work/contract and client report must be enclosed which should indicate the deliverables, commissioning/ completion certificates and the scope of relevant assignments.
6	The Bidder should be ISO 9001:2015 (For Quality Management System) certified company and shall possess CMMi Level 3 or higher (Software Development & Customization) certification.	Valid copy of mentioned/ required Certificate(s).
7	The Bidder should have on its payroll minimum 4 IT & 4 ERP Functional professionals for the proper execution of the contract. These professionals would be deployed for execution of the contract.	The bidder should submit an undertaking that it has minimum of 4 IT & 4 ERP functional professionals on its roll. The Bidder should also submit a list of the professionals who will be involved in this work stating clearly their roles in this work along with their CVs.
8	The Applicant should have an average annual turnover of at least Rs. 12 Crores (Rupees Twelve Crores Only) during the last three financial years (2022-23, 2023-24, and 2024-25).	Copies of audited balance sheets including profit & loss accounts/ annual reports of last three financial years (2022-23, 2023-24, and 2024-25) and CA Certificate.
S. No.	**Qualification Criteria**	**Supporting documents**
9	During each of the last three financial years ending 2024-25, the applicant must have been profit (net profit) making.	CA Certificate for the same for FY 2022-23, 2023-24, and 2024-25.
10	The bidder should not have been under sanction, cross-debarred, debarred in participating in any procurement activities in India by KMC or any State or Central Government or autonomous body/SPSUs/CPSUs/any other government	Undertaking to this effect shall be submitted by the applicant on its letter head and on Non-Judicial Stamp Paper.

	organization or its undertakings.	

11. **Database Design& Data Migration:** The successful Bidder will develop a new database for the proposed system using latest version of Open Source Database as mentioned in “Framework For Adoption of Open Source Software In e-Governance Systems” published by Government of India, Ministry of Communications and Information Technology in the month of April, 2015. The database will consist of multiple schemas containing tables and other PL/SQL codes. The names of the schema and tables as well as the PL/SQL codes must be self explanatory at par with the name of each module to be designed. The existing Oracle EBS application forms and the new requirements of various project units of KMC-SHARP are to be properly studied and the customized DFFs (Dynamic Flex Fields) and Lookups as well as their corresponding field names in existing Oracle database tables are also to be identified and documented in detail. Existing data (master and DFFs, LOVs, Lookups) from Oracle Database to the new Database to be developed using Open Source Database are to be migrated. Detailed database design report is to be prepared and submitted in detail to Project Authority, KMC-SHARP.
12. **Version Control System:** The successful bidder shall develop the proposed system using Open Source Technology as mentioned in “Framework For Adoption of Open Source Software In e-Governance Systems” published by Government of India, Ministry of Communications and Information Technology in the month of April, 2015. Latest version of any such open source IDE is to be used for development of the same. The entire project workspace containing source codes of UI, Middleware and API as well as Functions/Procedures of Open Source Database are to be properly maintained through Git to be installed in the existing server at the project office of KMC-SHARP. The successful Bidder has to ensure that no other version of the source code is to be maintained elsewhere and written declaration on this is to be submitted to Project Authority, KMC-SHARP by the competent authority of the Bidder. Read access to the Git instance is to be allowed to designated officers of KMC-SHARP.

13. **Standard of performance**
    a) The Bidder shall provide the services and carry out its other obligations under the agreement with due diligence, efficiency, economy, confidentiality, promptness and techniques.

    b) The Bidder shall adhere to professional, engineering and consulting standards recognized by international professional bodies while observing sound management, technical and engineering practices.

    c) It shall apply appropriate advanced technology (open source technology) and safe and effective methods during execution of this Project and shall always act in respect of any matter relating to this agreement, as faithful advisors to KMC-SHARP.

    d) The Bidder shall always support and safeguard the legitimate interests of KMC-SHARP, in any dealings with the third party.

    e) The Bidder shall abide by the provisions of the legislation(s), related to the Information Technology, prevalent in India.

    f) The Hardware, Software and other services provided under this contract shall conform to the standards laid down in the Scope of Work and Technical Specifications and Requirements. The security of the system should be foolproof and shall be treated “not foolproof” where unauthorized persons being able to access/infiltrate in to the system. The system may be the software or a process adopted by vendor.

g) The vendor shall be liable to KMC-SHARP for financial losses by way of some of system and process failure.

14. Special Terms and Conditions

a) Bidders are neither allowed to join hands to participate in the tender nor allowed to submit multiple bids. In case of detection of such, their bid (s) is/are liable to be rejected. Bidding though consortium is not allowed.

b) The Project Director, KMC-SHARP reserves right to award the work/cancel the award without assigning any reason. In case of differences, if any, the decision of the Project Director, KMC-SHARP shall be final and binding. The work can be awarded to one or more agencies if need arises.

15. Deliverables from the Bidders

15.1 Design, Development, Implementation of Online Project Management System (PMS) for Kolkata Municipal Corporation – Sustainability Hygiene and Resilience Project (KMC-SHARP) using Open Source Technology

Project Authority, KMC-SHARP has envisaged the following activities that are required to be taken up by the Bidder to achieve the objectives:

i. To conduct the Existing System Study, User Requirement Study as per the User Requirements given at the end of this document , System Requirement Study as per the "Terms of Reference" and to finalize the requirements in consultation with KMC-SHARP.

ii. Develop "Visual Prototype" and Database Design and obtain approval from KMC-SHARP, Preparation and submission of As-Is, To-Be, SRS, FRS, SDD, etc.

iii. Development of Online Integrated System after getting the approval of prototype system incorporating the User Requirements of different project units of KMC-SHARP given at the end of this ToR.

iv. The successful bidder shall bear the cost of any tool/product/license etc to be used for development and implementation of the proposed project. KMC-SHARP shall not bear such cost under any circumstances.

v. **Testing**

The bidder shall thoroughly and rigorously test the system for load, quality and performance along with proper functioning at its site before deployment of the software on production environment and submit test reports to the buyer. User Acceptance Testing (UAT) instance is to be created after thorough testing performed by the Bidder for acceptance testing to be performed by stakeholders of KMC-SHARP. Any issues and requirements arising at the time of UAT are to be resolved by the bidder to make the UAT instance fully and finally accepted by KMC-SHARP before migrating to Production Instance for Go-Live without any additional cost involvement.

a) In addition to above, KMC-SHARP may hire services of third party to certify the system for load, quality and performance at its own cost to ensure proper functioning of the system. The suggestions given by the third party, if any would be mandatory for the bidder to implement and to incorporate and to execute the same from time to time.

b) Final approval/User Acceptance of the system shall be given by various project units of KMC-SHARP after the testing and successful implementation.

c) The system thus developed and tested shall be hosted and maintained at State Data Centre (Government of West Bengal) by the bidder

d) The bidder shall assess the cloud infrastructure required to host the application and database to State Data Center, Government of West Bengal and inform the same well in advance to the Project Authority before roll-out.

e) The bidder shall be required to provide performance tuning parameters/configuration of the Server/OS/Application Server software on which the system would be hosted for efficient working of the System.

vi. **Security Audit**

Vendor shall get the system security audited for "Safe to Host" certification from State Data Center Cloud (Government of West Bengal) before deploying the system in production environment. The requirements / compliance suggested during security audit are to be implemented without additional cost by the bidder.

vii. **Source Code, Proprietorship and Patent**

Vendor will provide the latest and complete source code of the actual running software which can be compiled and deployed by Systems Department of KMC-SHARP along with all the requisite software (Source Code, Libraries, IDEs etc.). Project Authority, KMC-SHARP will be the sole proprietor of the system developed and its Intellectual Property Rights, and any patents arising out the work shall be of KMC-SHARP, and vendor will have no claim on the same. The vendor shall not use the source of the proposed software for any kind of business or usage other than KMC-SHARP. **A Non-Disclosure Agreement (NDA) is to be signed between the bidder and Project Authority, KMC-SHARP on this after award of contract**. The source code shall remain in the Git system of development/staging server at the office of KMC-SHARP and the bidder shall ensure that no other version of the source code shall be maintained elsewhere. This assurance must be covered in the Non-Disclosure Agreement as stated earlier.

viii. **Deployment of System**

Deployment shall include implementation and maintenance of the developed system.

a) Bidders shall deploy the application in the UAT instance of SDC Cloud.

b) Bidder shall submit ideal minimum deployment requirements for the proposed system that will be sufficient for the smooth functioning of the system without compromising the performance including cloud infrastructure required.

c) These deployment requirements should consist of minimum required virtual hardware that KMC-SHARP needs to arrange for the successful installation and implementation of system.

d) Deployment of required system software and application including database for Production Rollout shall be done by the bidder on State Data Center Cloud (Government of West Bengal).

ix. **Preparation of Master Data**

The bidder shall be responsible for one time migration/porting of data (master, List of Values(LOV), Lookups, Dynamic Flex Fields (DFF)) from the old system (and at least three years data currently with KEIIP/KMC-SHARP) regarding various modules running in the existing ERP System after conversion as per the new design required for implementation of proposed system under the supervision of designated officers of KMC-SHARP.

x. **Hands on Training over the developed System**

a) The bidder shall provide hands on user training to KMC-SHARP staff for proper functioning, management of the system.

b) The training shall be conducted for at-least seven days at project office of KMC-SHARP. Training will consist of two parts, namely Technical and Functional. Technical training will be provided to the designated IT and Systems experts of KMC-SHARP and Functional training would be imparted to the designated officials of various project units of KMC-SHARP.

c) The Training Plan shall be mutually decided between KMC-SHARP and the Bidder.

d) Training shall be provided on the basis of hands-on Training to various stake holder project units of KMC-SHARP.

e) During training, user manuals, functional documents, technical documents (in the form of Microsoft Word documents, Audio & Video files) for the system shall be provided by the successful bidder.

f) No extra cost would be borne by KMC-SHARP on account of this.

15.2 Post Implementation Support/Warranty (Support after sign off of UAT and Production Go-Live)

The Bidder shall be responsible for installation, administration and maintenance of the system for the period of Warranty after successful implementation and porting of relevant data. The warranty period would be of ONE year after the successful implementation of the system on production server.

a. During the Warranty period, the bidder shall perform all the upgrade/new version/ modification/change/update free of cost.

b. During the Warranty period, the bidder shall provide all sorts of technical support to ensure smooth continuity of the business in the interest of KMC-SHARP.

c. The bidder shall compulsorily quote price for AMC after expiry of warranty period. However, KMC-SHARP may or may not award the AMC at its own sole discretion.

15.3 Requirements and Expected Features of Proposed Integrated System

a) **Browser Independent:** The system so designed and developed should be compatible with all popularly used browsers including mobile browsers.

b) **Software Platform**: The system should be developed using stable open source technology with Long Term Support. Source code should be well documented. KMC-SHARP shall have the right to approve the coding practices and may ask the firm, at any time, to change full or some part of the code according to the pattern suggested.

c) The system should have user friendly Graphical User Interface (GUI) and should enable role based access rights to each user. The interface needs to be developed for the users as per the FRS, URS and SRS approved by KMC-SHARP.

d) The system should be so designed and developed that it gives a feel of a portal with International Level Institute look, shall be User friendly, Easy to access or navigate, and should attract the prospective stakeholders.

e) The Page download/query response/document and image uploads/submissions should be quick and fast

f) The necessary set up and Licenses required for the Security set up should be mentioned in the SRS document prepared.

g) The MIS report - Drill down Reports, Matrix reports and other required reports to be developed for the System.

Note: Features discussed above are indicative. It does not limit Bidders to give more features as per best practices elsewhere.

Functionalities of Existing Project Accounting System at KEIIP

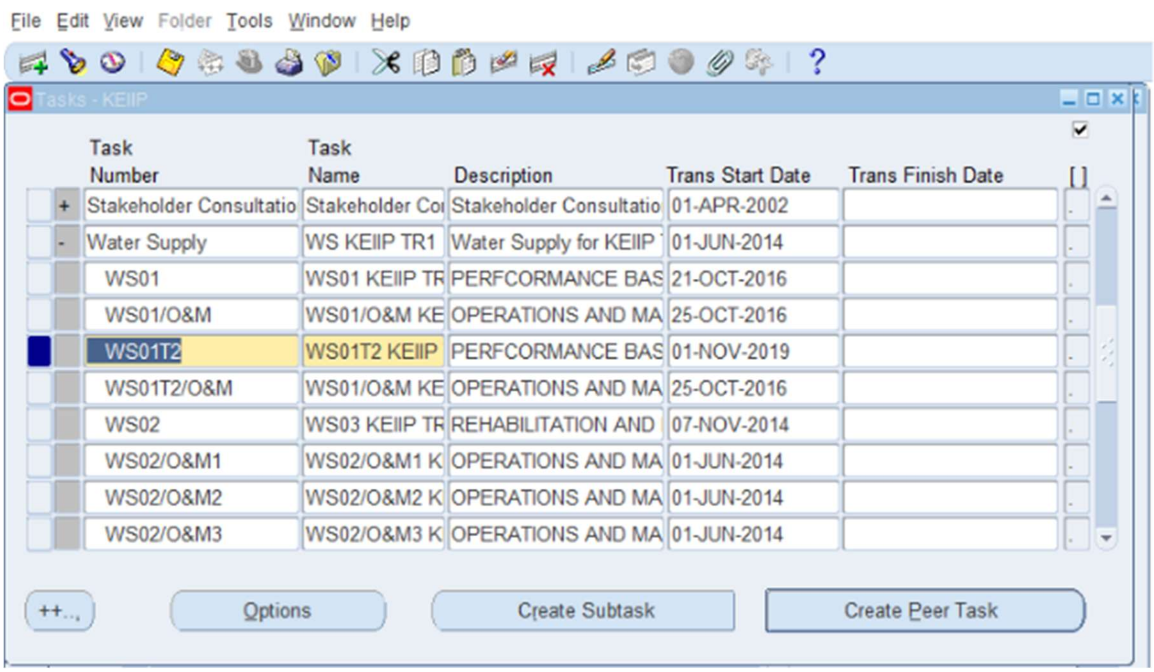
BROAD ACTIVITIES PERFORMED THROUGH KEIIP PROJECTACCOUNTING SYSTEM

1. CREATIONOFPROJECTSANDTASKS
2. CREATIONOFSUPPLIERS
3. CREATIONOFPURCHASEORDER
4. APPROVALOFPURCHASEORDER
5. REVISIONOFPURCHASEORDER
6. GENERATIONOFRECEIPTS
7. GENERATIONOFMEASUREMENTBOOKS
8. APPROVALOFMEASUREMENTBOOK
9. CREATIONOFINVOICES
10. APPROVALOFINVOICES
11. INVOICEPAYMENTS
12. POSTINGTOLEDGERS

13. GENERATIONOFREPORTS

1. CREATION OF PROJECTS AND TASKS

- ✔ Authorized Users set up a new Project
- ✔ A Project consists of multiple tasks and subtasks
- ✔ Parent Child Relationship exists between tasks and sub tasks in the System
- ✔ Whenever a new ADB contract is awarded, a task is created under appropriate parent task
- ✔ For example, WS-15 comes under parent task called “water supply”
- ✔ Every task is associated with start date and end date
- ✔ A task against which an end date has been entered, is not allowed to be selected for transactions after the end date
- ✔ Existing System allows modification of End Date



File Edit View Folder Tools Window Help

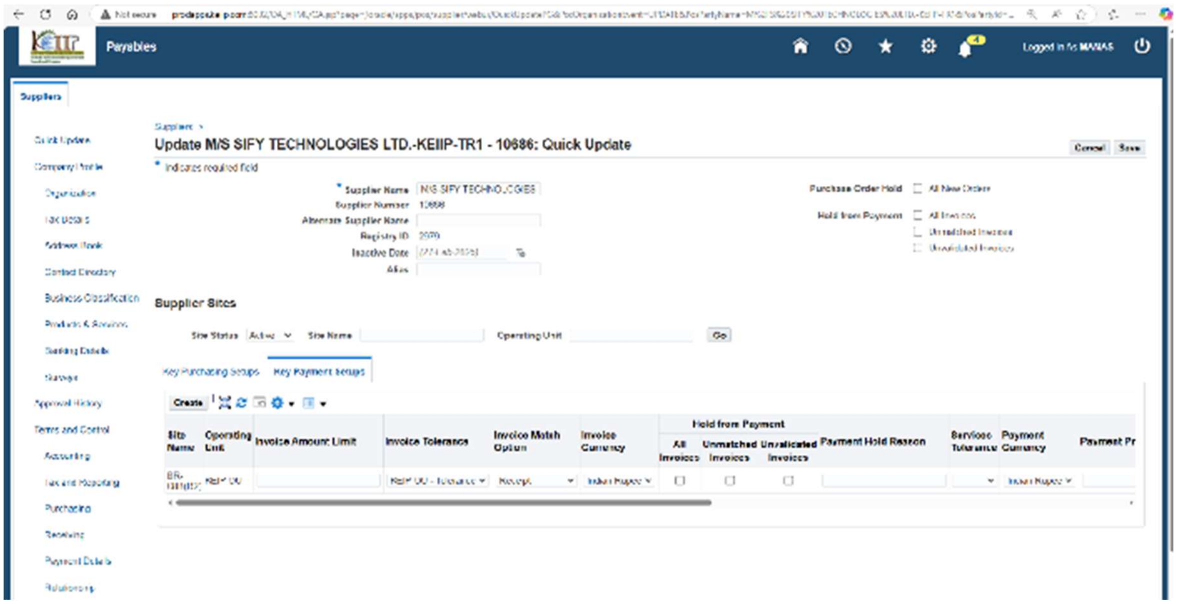
Tasks - KEIIP

Task Number	Task Name	Description	Trans Start Date	Trans Finish Date
+ Stakeholder Consultatio	Stakeholder Co	Stakeholder Consultatio	01-APR-2002	
- Water Supply	WS KEIIP TR1	Water Supply for KEIIP	01-JUN-2014	
WS01	WS01 KEIIP TR	PERFCORMANCE BAS	21-OCT-2016	
WS01/O&M	WS01/O&M KE	OPERATIONS AND MA	25-OCT-2016	
WS01T2	WS01T2 KEIIP	PERFCORMANCE BAS	01-NOV-2019	
WS01T2/O&M	WS01/O&M KE	OPERATIONS AND MA	25-OCT-2016	
WS02	WS03 KEIIP TR	REHABILITATION AND	07-NOV-2014	
WS02/O&M1	WS02/O&M1 K	OPERATIONS AND MA	01-JUN-2014	
WS02/O&M2	WS02/O&M2 K	OPERATIONS AND MA	01-JUN-2014	
WS02/O&M3	WS02/O&M3 K	OPERATIONS AND MA	01-JUN-2014	

++... Options Create Subtask Create Peer Task

2. CREATION OF SUPPLIERS

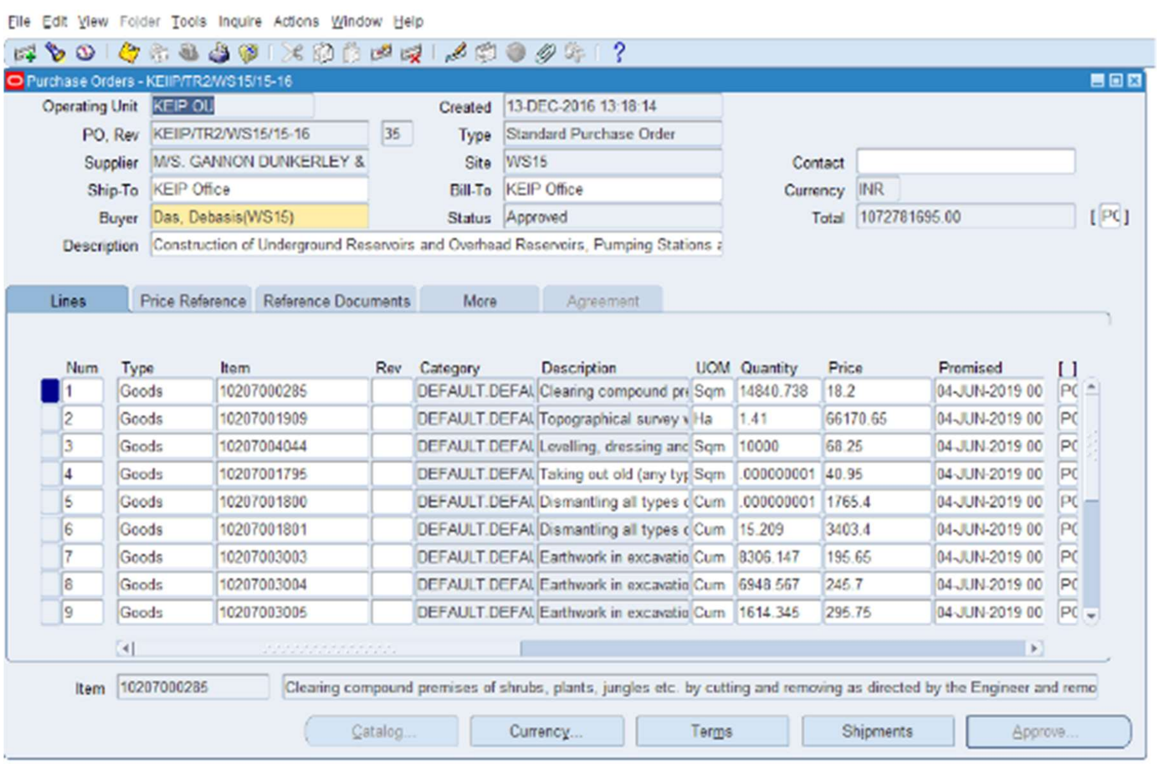
- ✔ Every Supplier is registered in the System. Detailed information of the supplier like Supplier Name, Address, Contact Details, Site Information, Accounting Information etc are recorded in the System
- ✔ Every supplier is assigned to one or multiple sites, each uniquely identified by ADB package number
- ✔ Presently we have to maintain Project Tasks and Supplier Sites separately, although both being the same ADB Contract Package Number, which makes repetition of same information at multiple places
- ✔ Accounting details like Assigning Chart of Account(COA) Codes for Prepayment, Liability and Bills Payable against various sites are recorded
- ✔ Options exist to select the supplier for purchasing or billing or both
- ✔ Banking Information of the suppliers are also captured



3. CREATION OF PURCHASE ORDER (PO)

- A Purchase Order (is created by Design and Supervision Consultant (of KEIIP for various Work Contract Packages Presently there is no provision for uploading original Bill of Quantity BoQ of the selected bidder in the System
- Purchase Order is created after a Contract Agreement is signed between selected bidder and KEIIP/KMC following norms of ADB and KEIIP/KMC
- Presently Variation in Percentage with respect to Initial BOQ Amount is not displayed in PO Header
- PO Header consists of information such as PO Number (ADB Contract Package Number in full), PO Date, PO Amount (Sum of PO Line Amounts), PO Status (New/Submitted/Approved), PO Description, Name of Supplier, Supplier Site (ADB Contract Package Number in short)
- Provision for entering additional information of the Contract such as Date of Commencement, Date of Completion, Notice to Proceed Letter No, Letter of Acceptance Letter No, Letter of Acceptance Letter Date, Mayor In Council Agenda, Mayor In Council Agenda Date, Municipal Corporation Agenda No, Municipal Corporation Item No, Municipal Corporation Agenda Date, Loan No, Original Contract Value and Contract Revised Valuealso exists in the System.
- PO Lines consists of multiple line items, each of which in turn consists of the following
    - Line Number
    - Line Type (Goods/
    - Item No

- ❖ Revision No
- ❖ Item Category (DEFAULT DEFAULT)
- ❖ Description
- ❖ Unit of Measurement (
- ❖ Quantity
- ❖ Price
- ❖ Promised Date
- ❖ Need By Date
- ❖ Amount
- ❖ Charge Account
- ❖ BOQ Item No
- ❖ BOQ Revision No



4. APPROVAL OF PURCHASE ORDER (PO)

- ➢ Purchase Order is approved following a predefined approval path of hierarchy
- ➢ It is usually approved from Construction Supervisor of DSC followed by Construction Manager (Assistant Engineer (Executive Engineer(CMU), Dy Chief Engineer(CMU) and finally Director General(DG), Project, KEIIP

- Approval Management Engine (of Oracle EBS is presently used for creation and modification of approval path for various ADB Contract Work Packages
- Provision for rejection of a PO also exists in the System
- PO can not be used for receiving if it is in 'New'/'In Process'/'Rejected' status It can only be used for receiving if it is in Approved status
- Each approver can check the approval message in the work list of the user after logging in to the System using credentials
- User can see the details of PO Headers and Line Items after clicking on the approval message from the Work List
- Approver can enter remarks at the time of approving or rejecting the PO from the Work List

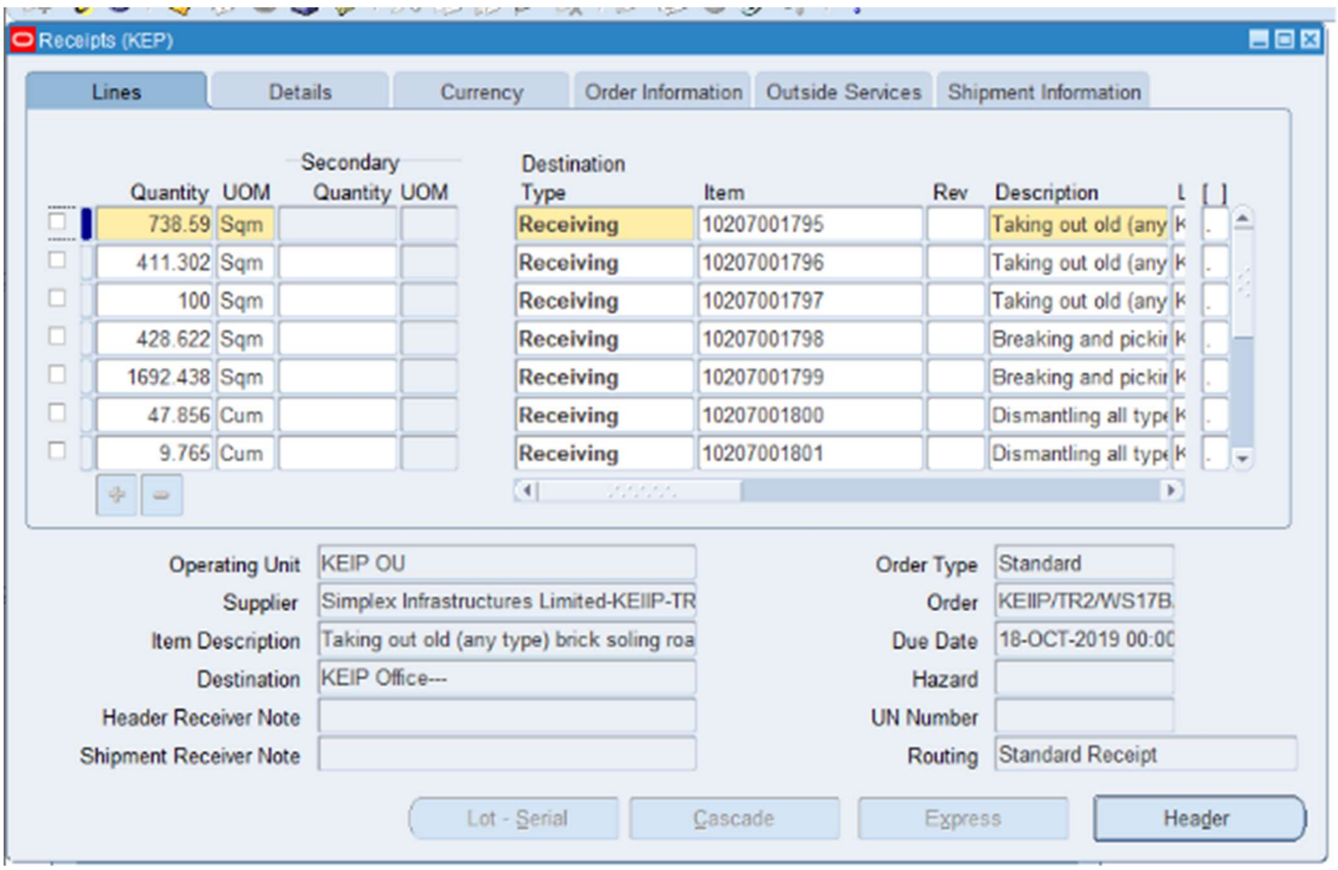
5. REVISION OF PURCHASE ORDER (PO)

a. An approved PO can be revised (called Variation) when quantities of one or multiple existing and approved line items change OR new line item(s) is/are added to the existing PO, resulting in changes/variations of the PO Amount (
b. Item rates of existing line items are not allowed for changes
c. Quantities can not be changed to less than received in the PO Line Items
d. No Line Item is allowed to be deleted in the System once the PO is approved
e. Every variation gives rise to a new version number incremented by one than the previous one
f. Detailed information of every version of PO is preserved in the existing System
g. Presently, the restriction of percentage of variation to be allowed in PO is missing
h. Every revision needs approval of all the users as per the pre-defined approval path of hierarchy

6. GENERATION OF RECEIPTS

a. Receipts are generated from approved PO after submission of Bills by the supplier in hard copy format
b. Receipt contains Receipt Lines
c. Each Receipt Line contains the following information against each received PO item
   i. Receipt Quantity
   ii. Unit of Measurement
   iii. Destination Type (Receiving)
   iv. Item Code
   v. Item Description
   vi. Location
   vii. Category
   viii. PO Number
   ix. PO Line Number
   x. Project
   xi. Task
   xii. Charge Account (COA)
   xiii. Name of Supplier
d. It is possible to return quantities against a received item from a receipt. Receiving Return has the following fields:
   i. Quantity to be returned
   ii. Unit of Measurement (allowed to be changed in the existing system)
   iii. Destination Type (

iv. Return to (value is ‘ when selected)
v. Supplier Name (gets auto selected when Supplier is selected from previous field)
vi. RMA number (
vii. Item Code
viii. Parent Quantity
ix. Transaction Type (value is ‘
x. Rev (revision number)
xi. Item Description
xii. Create Debit Memo (Check Box, when selected, a demit memo invoice is generated by system)



7. GENERATION & APPROVAL OF MEASUREMENT BOOKS

a. Measurement Book(MB) is a customized application integrated with existing System at KEIIP

b. It is created only after receiving (i e after receipt has been generated) from an approved PO

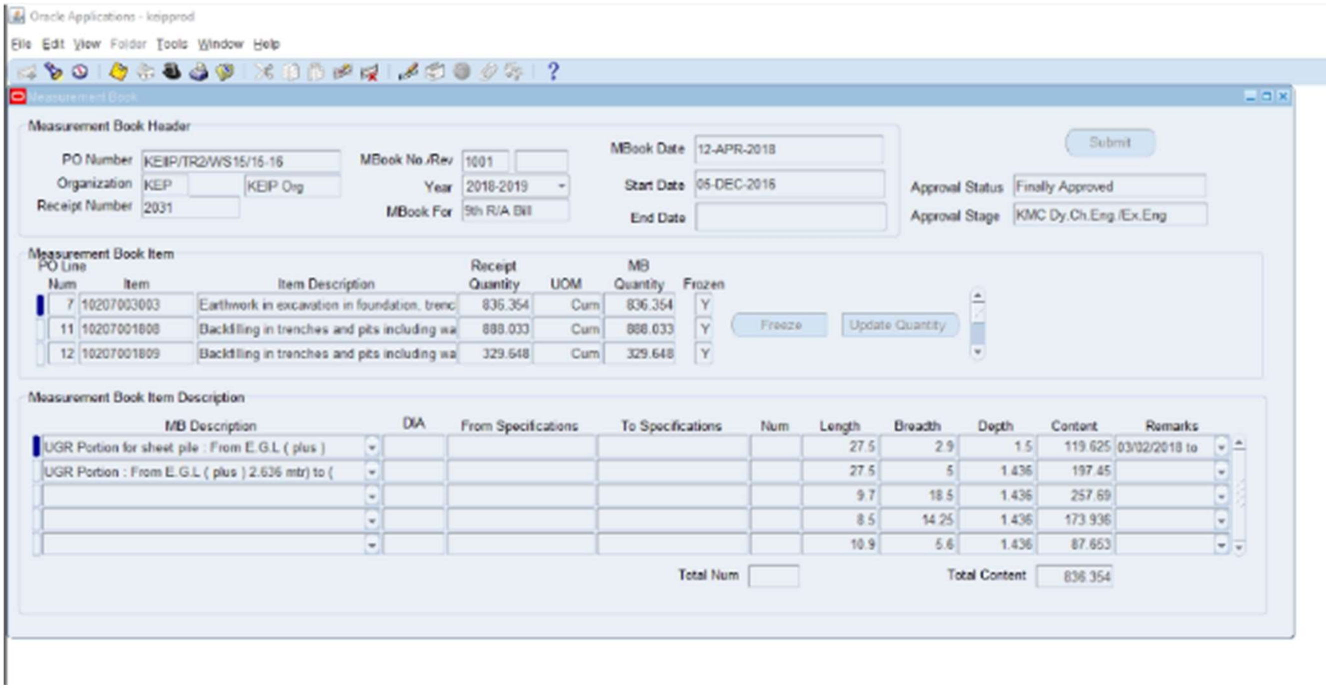
c. DSC uploads the MB details from MS Excel files using the tool called WEB ADI integrated with Oracle EBS

d. After uploading measurement details, the MB is in DRAFT stage it is frozen for finalization

e. After freezing, MB is sent for approval using predefined approval path of hierarchy

f. Presently, MB is finally approved by Executive Engineer of CMU, KEIIP

g. MB has three parts: MB Header, MB Item(Receipt Item) and MB Lines (Item measurement details against selected Receipt Item). Measurement Book Header has the following fields:
   i. PO Number
   ii. MBOOK No. / Revision
   iii. Organization Code and Name
   iv. Receipt No.
   v. Mbook For (R/A Bill Type like 1 st RA, 2 nd RA etc. is entered)
   vi. Mbook Date
   vii. Start Date (Measurement Start Date)
   viii. End Date (Measurement End Date)
   ix. Approval Status
   x. Approval Stage (Designation of Approving Authority)
   xi. Submit Button
h. MB Item has the following fields
   i. PO Line Number
   ii. Item Code
   iii. Item Description
   iv. Receipt Quantity
   v. UOM
   vi. MB Quantity
   vii. Frozen Status
   viii. Freeze Button
   ix. Update Quantity Button
i. MB Item Description has the following fields:
   i. MB Description
   ii. Dia
   iii. From Specification
   iv. To Specification
   v. Num
   vi. Length
   vii. Breadth
   viii. Depth
   ix. Content 3 digit rounded off)
   x. Remarks
j. Finally, two fields namely Total Num (summation of number fields) and Total Content (summation of contents against each PO Line Item is displayed



8. <u>CREATION OF INVOICES</u>

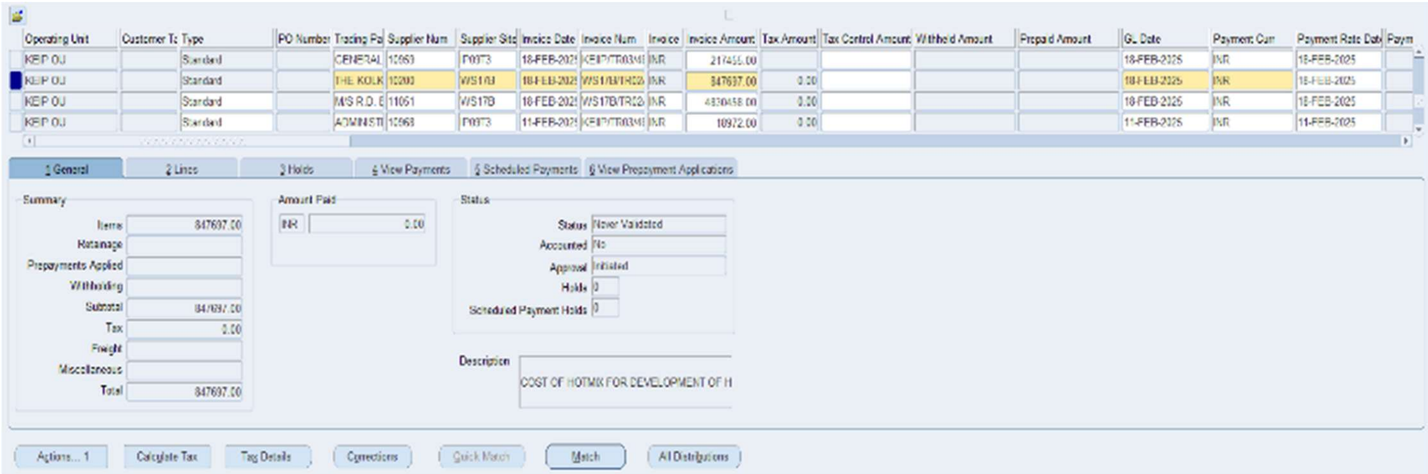
a. After approval of MB, Invoice is created from invoice creation screen Invoices are of the following types:

   i. Credit
   ii. Debit
   iii. Prepayment
   iv. Standard

b. Following invoices are entered into the system:

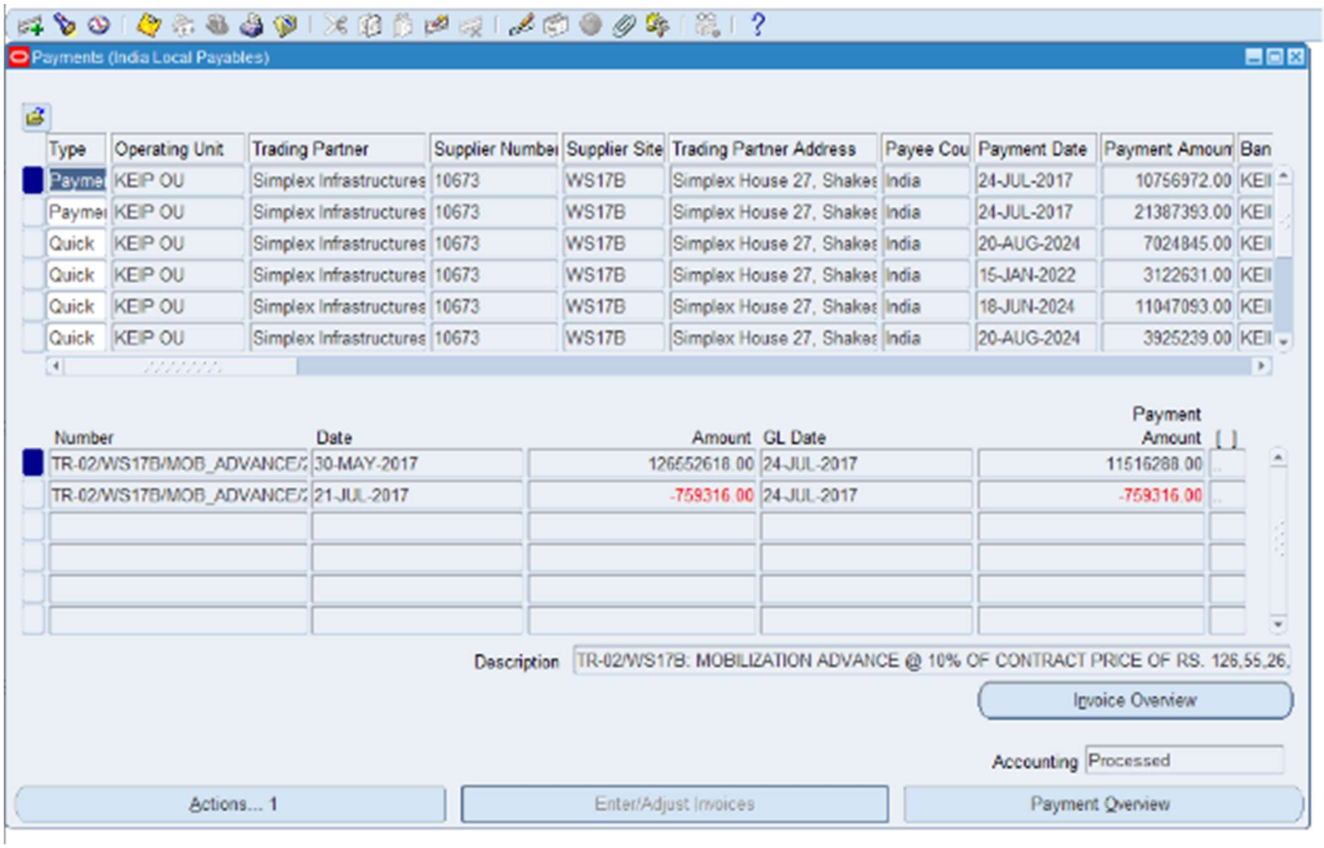
   - ✔ R/A Bills (1 st R/A, 2 nd R/A, etc) which are of standard types
   - ✔ Retention Money
   - ✔ Escalation Invoice
   - ✔ Tax Invoice (TDS, CGST, SGST, LWC, TDS u/s 194C,
   - ✔ Establishment Bills including Car Hiring Charges
   - ✔ Mobilization Advance
   - ✔ Advance Adjustment Invoices
   - ✔ System Generated Invoices for Return to Supplier Transactions
   - ✔ Deductions against non continuation of CAR policy
   - ✔ Withheld Release
   - ✔ Liquidity Damage
   - ✔ Consultancy Fees

c. Invoices (like Work Package Standard R/A bills) created from receipts are matched against receipts and receipt lines are populated in the distribution lines of invoice



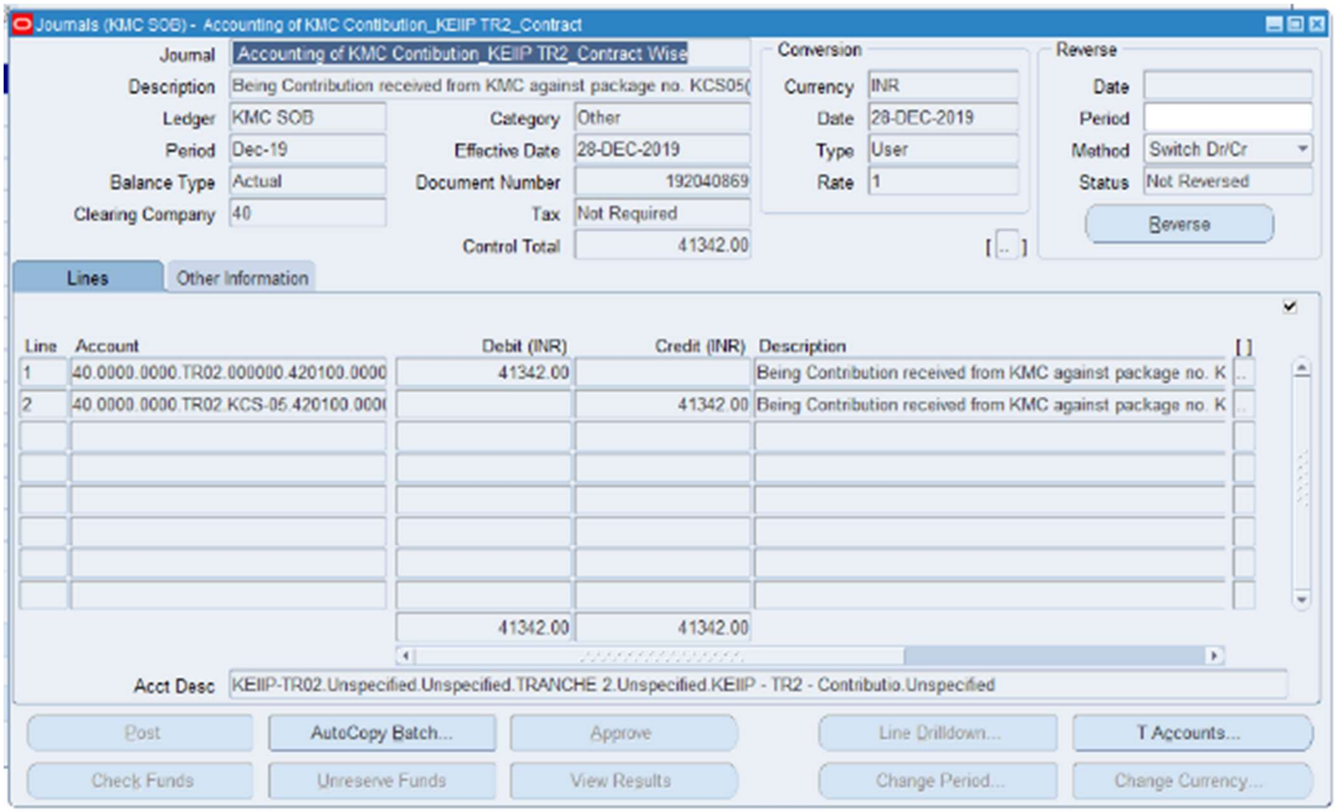
9. **<u>APPROVAL OF INVOICES</u>**
    - ✔ Invoices are sent for approval using predefined approval path of hierarchy in the System
    - ✔ Invoices are either initiated by DSC (for Work Packages) or Establishment (for Establishment expenses) for approval
    - ✔ Invoices initiated by DSC are routed through CMU before coming to the approval under Finance Department
    - ✔ Final R/A bills for the ADB Contract Work Package having contract price greater than or equal to 5 Crore are approved by JMC(Finance)

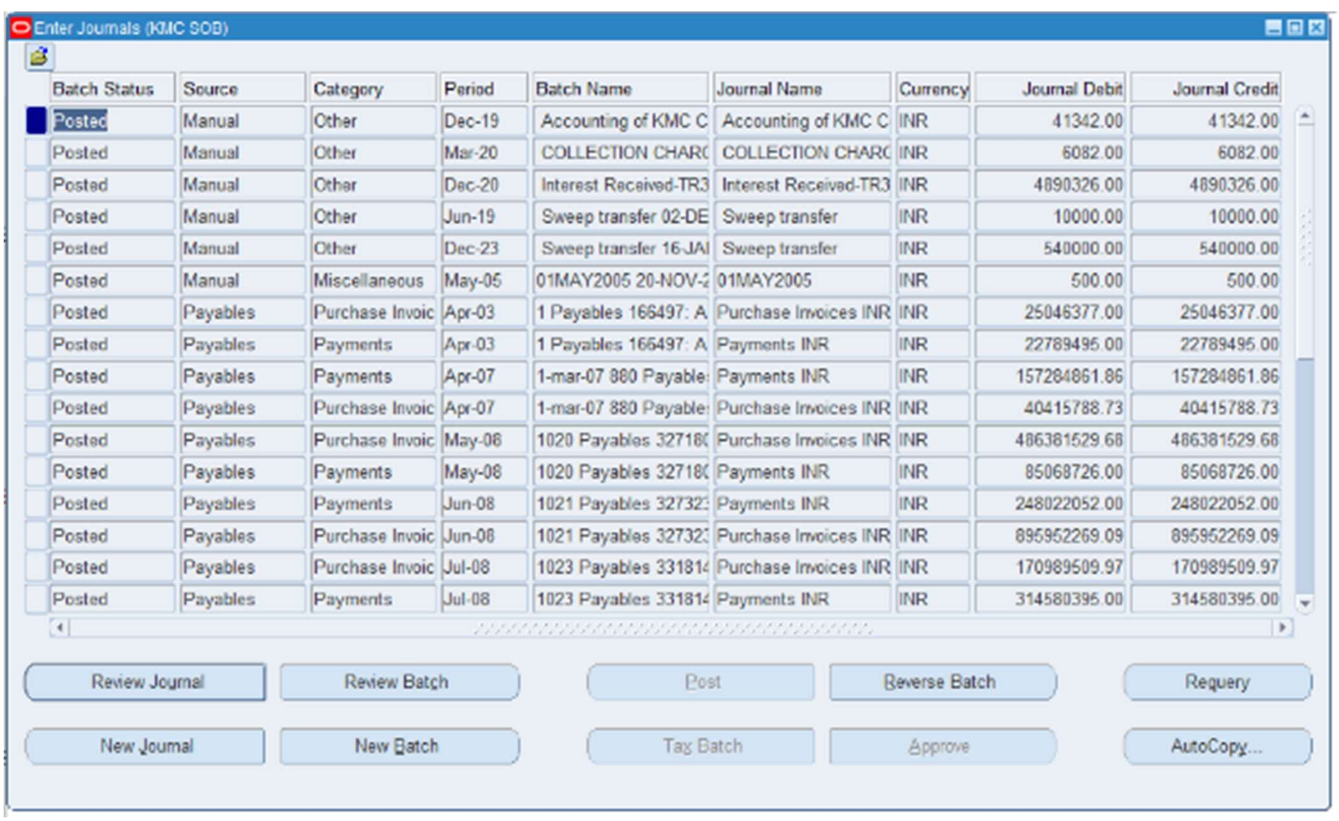
10. **<u>PAYMENT OF INVOICES</u>**
    - ✔ Invoices are accounted and posted to journal by designated officials of Finance Department, KMC
    - ✔ Payment entry is made against each approved and accounted invoice in the System
    - ✔ Payments are then approved, accounted and posted to journal in the System
    - ✔ Payments methods currently followed at KEIIP are through check or bank transfer (RTGS/NEFT)



11. POSTING TO GENERAL LEDGER

a. Journals are created and approved in the System
b. Invoices are finally posted to General Ledger (GL) individually or through Journal Batch




Enter Journals (KMC SOB)

Batch Status	Source	Category	Period	Batch Name	Journal Name	Currency	Journal Debit	Journal Credit
Posted	Manual	Other	Dec-19	Accounting of KMC C	Accounting of KMC C	INR	41342.00	41342.00
Posted	Manual	Other	Mar-20	COLLECTION CHAR(	COLLECTION CHAR(	INR	6082.00	6082.00
Posted	Manual	Other	Dec-20	Interest Received-TR3	Interest Received-TR3	INR	4890326.00	4890326.00
Posted	Manual	Other	Jun-19	Sweep transfer 02-DE	Sweep transfer	INR	10000.00	10000.00
Posted	Manual	Other	Dec-23	Sweep transfer 16-JAI	Sweep transfer	INR	540000.00	540000.00
Posted	Manual	Miscellaneous	May-05	01MAY2005 20-NOV-2	01MAY2005	INR	500.00	500.00
Posted	Payables	Purchase Invoic	Apr-03	1 Payables 166497: A	Purchase Invoices INR	INR	25046377.00	25046377.00
Posted	Payables	Payments	Apr-03	1 Payables 166497: A	Payments INR	INR	22789495.00	22789495.00
Posted	Payables	Payments	Apr-07	1-mar-07 880 Payable:	Payments INR	INR	157284861.86	157284861.86
Posted	Payables	Purchase Invoic	Apr-07	1-mar-07 880 Payable:	Purchase Invoices INR	INR	40415788.73	40415788.73
Posted	Payables	Purchase Invoic	May-08	1020 Payables 32718(	Purchase Invoices INR	INR	486381529.68	486381529.68
Posted	Payables	Payments	May-08	1020 Payables 32718(	Payments INR	INR	85068726.00	85068726.00
Posted	Payables	Payments	Jun-08	1021 Payables 32732:	Payments INR	INR	248022052.00	248022052.00
Posted	Payables	Purchase Invoic	Jun-08	1021 Payables 32732:	Purchase Invoices INR	INR	895952269.09	895952269.09
Posted	Payables	Purchase Invoic	Jul-08	1023 Payables 331814	Purchase Invoices INR	INR	170989509.97	170989509.97
Posted	Payables	Payments	Jul-08	1023 Payables 331814	Payments INR	INR	314580395.00	314580395.00

12. REPORTS

a. Current System has many standard reports shipped with the Oracle EBS product in pdf format only
b. However, for departmental uses, custom reports are also used rigorously
c. Following are various custom reports currently available in the System:
    - Measurement Book Report
    - Contractor’s Work Done Report
    - Contractor’s Bill Last Page Report
    - Receipt & Payment Report
    - Contract Register Report
d. Presently advanced reporting dashboard like Pie Chart, Bar Chart etc are missing in the System

User Requirements from Project Units of KMC-SHARP

1. **Requirements from Establishment of KEIIP/KMC-SHARP**
   1) The current functionalities for insertion of a new bill into the system under the assigned package need to be incorporated.
   2) Approval based bill management system which is currently available.
   3) Reassignment of bills from current user to another user (if required by higher official due to long absence of current user) needs to incorporate.
   4) Real time bill status dashboard to KMC higher authorities.
   5) Date wise bill generation/ bill approval status report required.
   6) Date wise supplier report.
   7) Budgetary Dashboard to Higher Authorities.
   8) Different MIS Report for Higher Authorities.

2. **Requirements from Project Accounting Unit(PAU) of KEIIP/KMC-SHARP**

2.1 Primary Requirements

1) Approval based Bill /Invoice management system to be developed. Approval path and logic may be shared later.
2) **BRS System Integration:** The system should integrate with the BRS (Budgeting, Reporting and Monitoring System) for software-based functionalities.
3) **Bank Guarantee Management:** The system should include a module for bank guarantee entry, update, pop up notification through SMS and register, maintenance.
4) **Statutory Reports:** The system should generate approval-based statutory reports and calculation
sheets linked with the main invoice.
5) **Project Status Reports:** The system should generate project status reports (physical and financial) categorized by contractor and package.
6) **Master Sheet Management:** The system should handle package and contractor-wise master sheets.
7) **Bank Dump:** System should generate the Bank Dump asper requirement.
8) **Stock Register:** The system should include a software-based stock register for stationery and materials.
9) **Statutory Document Checklist:** The system should provide a checklist for the validity of all statutory documents for both package and miscellaneous bills.
10) **Trial Balance:** System generated Trial Balance is required.
11) **Receipt and Payment System:** The system should manage and generate receipts and payments Account.
12) **Subcontractor Management:** The system should include a module for subcontractor details and registration.
13) **Car & Fuel Register, Salary & Encashment Register:** The system should maintain electronic registers for car and fuel, salary, and encashment.
14) **Account Confirmation:** The system should allow for account confirmation within the software.
15) **Dashboard Progress Report:** The system should provide a dashboard for financial reports.
16) **Contract Register:** The system should include a contract register.
17) **ADB Claim Module:** The system should include a module for managing ADB claims.
18) **Ledger Management:** The system should provide ledgers for insurance, fixed assets, vendors, contracts, subcontractors.
19) **Cheque Printing:** The system should allow for cheque printing within the software.

20) **Billing and Payment Abstraction:** The system should generate billing and payment abstracts similar to ADB's LFIS.
21) **RTGS /NEFT Forms and Payment Details:** The system should generate RTGS /NEFT forms, payment details, and payment note sheets.
22) **Integrated Financial Modules:** The system should integrate GL (General Ledger), payment, billing, claim, and report modules.
23) **Payment Reports:** The system should Generate downloadable payment reports categorized by vendor, bank, type, and period with full descriptions.
24) System generated statutory tax deduction should be available.

2.2 Additional Requirements

1) **Contract Register:** The system should maintain a contract register with details including:
    a. Every variation of contract value for each package.
    b. Work package-wise invoice details, payment details, advance deductions (mobilization &material), adjustments, retention money deductions.
    c. Submission of claims to ADB, disbursement details, contribution details from sources (ADB, GoWB,KMC), and utilization details.
    d. Mobilization advance deduction from the next bill(percentage and amount pre-defined by authorized users).
2) **DDO Allocation:** A unique DDO (Drawing and Disbursement Officer) code should be allocated to DG(P) and AOs (Accounts Officers) for each work package before submitting bills to PAU (Project Administration Unit). PAU should receive all bills electronically with a system-generated acknowledgment.
3) **Measurement Book Reference:** Each bill should include the measurement book number and measurement date for all items in a receipt.
4) **Advance Register:** The system should maintain an advance register (report) for mobilization, EMI
    (Equal Monthly Installment), and material advances, allowing users to view advance payments at a glance. The system should allow amortization of mobilization advance from the next RA (Running Account) bill, with pre-defined percentages and amounts.
5) **Retention Money Report:** The system should generate a retention money outstanding summary report.
6) Contribution Register: The system should display a contribution register (sources and utilization)report for ADB, GoWB, and KMC.
7) **Insurance and Bank Guarantee Register:** The system should include a register for insurance and bank guarantee details (Workmen Compensation Policy &Contractor's All Risk Policy). It should restrict accounting for invoices when these policies or guarantees expire for a particular package.
8) **ADB Claim Register:** The system should include an ADB claim register and a register for tracking received claims with corresponding bills.
9) **ACA Claim Register:** The system should include an ACA claim register and generate project reports like monthly and quarterly ACA reports and bimonthly DEA reports.
10) **TDS Register and Certificate:** The system should generate TDS (Tax Deducted at Source) register and TDS certificates for suppliers.
11) **Customized Ledger:** The system should display customized ledgers by package in report format.
12) Invoice Generation Restriction: The system should not allow invoice generation after a tranche and its related ADB loan are closed.
13) **File Tracking:** The system should track the movement of files, including establishment works of KEIIP.
14) **MIS Reports:** The system should include MIS reports for easy access to relevant information.

3. Other Requirements:

3.1 Admin & Login Application

The Administration System plans to computerize the activities of the System managers and application administrators.

KEIIP/KMC application (Henceforth will be referred as KEIIP application) can be accessed from different location, by different person of different hierarchy. Hierarchy of organization prevents some users to access all the functionality provided by KEIIP application. Apart from that KEIIP application will not allow any unauthorized user to access the system.

Administration application provides central authentication and authorization control facility.

The system provides the following features:

a) Create a User
b) Disable a User
c) Enable a User
d) Create Module-Office association.
e) Delete Module-Office association
f) Module-Role-Screen association
g) Module-Role-Screen dissociation
h) Associate a User with Module-Office-Role Combination (Role end date should be less than equal to employee retirement date)
i) Dissociate a User from Module-Office-Role Combination

3.2 File Tracking system

The File Tracking System computerizes the activities of File Transfer process among all the sections of KEIIP related to the Files, Letters, Bills, Notice, and Circular etc. It should also keep track of the external physical files, Letters, Bills, Notice, Circular etc received or sent to/from outside sources.

The File Tracking System computerizes the file dispatch and file receiving sections of all the section of KEIIP. This system can be used in all the sections while sending and receiving files.

The system provides the following features:

a) Generation of a unique file number on receiving a file.
b) Attaching scanned documents (if require) with the file.
c) Forwarding a file to different sections of KEIIP or other external Departments of KMC or any other source.
d) Upon Receiving a file and download the attached scanned copy.

3.3 Provision for Uploading Files (images/pdfs) at various stages

The proposed system is to be made highly interactive and document-oriented. At various stages, the system shall allow departmental users to upload relevant documents and pictures and it will also allow to download / view those uploaded pictures and documents.

Following are the stages of uploading files:

- ✔ At the time of creation of projects and work packages
- ✔ At the time of generation of Purchase Order (PO)
- ✔ At the time of creation of Measurement Books (MB)
- ✔ At the time of generation of Invoices
- ✔ At the time of entering information in various other forms like Policies, Performance Bank Guarantee (PBG), ADB Claims, CAR policies etc.

Following are the various stages of viewing uploaded files:

- ✔ At the time of granting approvals of PO,MB and Invoices
- ✔ At the time of viewing relevant documents from respective forms

The system should have provision to digitally sign such documents at the time of uploading.

The concerned authorized project engineer(s) working at the field of work will be able to upload relevant images regarding progress of work in the proposed system and such images should be uploaded along with latitude and longitude of the place where the image will be captured. For this purpose, a **mobile application** is to be developed. The user working at the project site will be able to upload project progress images using his/her credential on real time basis using the application.

4. Requirements from Contract Management Unit (CMU)

4.1 The system should uniquely identify each transaction for its tranche and its related ADB loan indicator. The user should be able to segregate the transactional data tranche wise. The system should implement this using the Chart of Account.

4.2 The flexibility should remain to allow users to work in more than one tranche at a time whenever it is required to do so.

4.3 The proposed system would be developed considering complete workflow based system including Work Estimate Approval, Work Proposal Approval, Approval of Purchase Order, Approval of Measurement Books and Approval of Invoices. There should be a provision to allow users to set vacation rules in the system. The users should be able to approve, forward, reject, or reassign notifications in the customized system.

4.4 DSC will prepare the Purchase Order for each contract with the supplier and items selected from Master Database. The PO will be approved using a predefined hierarchy (by CMU) to be decided at the time of development.

4.5 DSC will generate receipt from the Purchase Order prior to the generation of Measurement Book. The system should restrict receiving less than or equal to the maximum available quantity defined in the purchase order. Once the purchase order is approved, it will not be allowed to be modified unless it is revised as per the approval of the authority. History of such revision needs to be ensured in the proposed system decided at the time of development.

4.6 The Measurement Book will be generated by DSC and it will be approved following a hierarchy (within CMU) to be distribution lines of the system generated invoice also.

4.7 The measurement book should contain the measurement date which should appear later in the distribution lines of the system generated invoice.

4.8 Creation of bills from the system generated receipt should be automatically such that no user intervention is required.

4.9 Generation of Measurement Books needs to be very much faster than the present practice.

4.10 The system should maintain moderate level of security in its performance and internal operations Regular daily backup and recovery of data need to be ensured

4.11 MIS Reports should be available to allow users to get relevant information from the system quickly as and when required. The existing Reports are to be re-developed in the proposed new system.

4.12 A mechanism is to be explored to enable engineers to check the measurement taken at the site of work and certify the same using digital signature in the proposed system. The system generated measurement book would be digitally verified and certified and this would be treated as a legally valid measurement books.

4.13 A detailed summary of all debit memos with respect to relevant R/A bill of any particular contract package should be maintained in the system.

4.14 The quantity debited through Memo, in any R/A bill of particular contract package should be reflected in “since previous quantity” and “this bill quantity” of that R/A bill.

4.15 History of previously approved Purchase Order, variation, MB and invoice, done by the CMU engineers, are required to be shown in the system.

4.16 In the Measurement Book, pipe lengths are entered mentioning upstream and downstream manhole identity numbers for any particular stretch. In the system, there should be provision for prevention of repetition of measurements in the successive R/A bills. As an example, if 1600 mm dia pipe length is entered, mentioning stretch between MH no. 'X' and MH no. 'Y' or vice versa in a particular R/A bill, system should prevent repetition of any measurement for the aforesaid stretch for aforesaid pipe dia, unless previous measurement is debited.

4.17 Similarly, repeated entry of construction of manhole/catch pit holding same identity number in the MB of successive R/A bills for a particular BoQ item should be prevented in the system.

4.18 In case of approval of excess quantity of BoQ items, the amount related to the quantities of the BoQ items where variation occurs, should be reflected in the system for which the approval is given by the CMU engineers.

5. Requirements As Per Project Administrative Manual (PAM) of KMC-SHARP

i. There will be provision to monitor ADB Loan Disbursement Details through appropriate screens and reports. The proposed system will be flexible enough to get integrated with other external applications through API calls.

ii. The proposed system shall also be able to transfer data with the Asset Management System to be developed for KMC.

iii. Accounting policies (Accrual Based Accounting) are to be adopted as per approval of Council of KMC. Sufficient reporting templates are to be made available regarding accounting in the new system.

iv. Quarterly Financial Reports are to be generated from the System. Formats and Templates of such reports will be provided in due course of time.

v. Internal Audit reports are to be generated from the System. Formats and Templates of such reports will be provided at the time of development.

vi. Annual Audited Project Financial Statements (APFS) and Annual Entity Financial Statements are to be generated from the system. Input and Format of these reports are to be provided at the time of development.

vii. Statement of Expenditure (SOE) is to be generated from the System as per ADB's norms and guidelines.

viii. ADB Claims management facility is to be incorporated and implemented in the proposed system.

ix. Following Reports are to be created in the proposed system. Formats of these reports are to be developed as per the Project Administrative Manual (PAM) available at the office of Project Director, KMC-SHARP.

a. Statement of Receipts and Payments
b. Statement of Expenditure by category and financier
c. Statement of Disbursement
d. Details of Disbursement
e. Reconciliation Statement
f. Chart of Accounts Mapping Table
g. Status of past External/internal audit observations (resolved/ pending)
h. Status of FM action plan (complied/ongoing)
i. Status of FM-related actions agreed during ADB review missions (if any)
j. Environmental Monitoring Report is to be generated as per the format given in the PAM.

x. Grievance Redress Mechanism is to be implemented in the System. Detailed logic of such implementation is to be provided at the time of development.

<u>Note:</u> All Functionalities available in the existing running system must be retained in the new system too.