ANNEXURE N: TECHNICAL STATEMENT of WORK

FOR ENGINEERING DESIGN AND DOCUMENT MANAGEMENT AND COLLABORATION SYSTEM (EDDMS)

RFP MWP1240CX

Context: The contents of this document constitutes the technical requirements related to a Request for Proposal (RFP).

Table of Contents

REFERENCES

Information from the following documents is incorporated in this document:

Referenced Document	Description
BRS	Group IT Business Requirement Specification (BRS) DEM-03388-X3T7_BRSF_Enterprise Engineering Management System
SEA SoAW	Statement of Architecture Work for Engineering Design and Document Management System
SEA LAD PAC	LAD PAC for Enterprise Design & Document Management System

Table 1: Reference Documents

ABBREVIATIONS AND TERMS

Abbreviation	Description
2D	Two Dimensional
3D	Three Dimensional
AC	Asset Creation
AEC	Architecture, Engineering & Construction
BIM	Building Information Management
BOM	Bill Of Material
BOQ	Bill Of Quantity
BS	British Standards
BRS	Business Requirements Specification
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CGM	Computer Graphics Metafile
C&I	Control & Instrumentation
CoE	Centre of Excellence
Collada	Collaborative Design Activity
COTS	Commercially off the Shelf
DFT	Delta File Transfer
DMS	Document Management System
DR	Disaster Recovery
DGN	Design File
DOC	Microsoft Word file
DWG	Drawing File
DXF	Drawing Exchange Format
EDMS	Engineering Document Management & Collaboration System
EDDMS	Engineering Design and Document Management and Collaboration System
Esri	Environmental Systems Research Institute

Abbreviation	Description
FEA	Finite Element Analysis
FBX	Film Box
GEO	Geographic
GIS	Geographic Information System
Group IT	Eskom Group Information Technology
H2S	Hydrogen Sulphide
HSP	Home Site Project
HV	High Voltage
IFC	Industry Foundation Class
IGES	Initial Graphics Exchange Specification
ISO	International Organisational Standardisation
IT	Information Technology
JPEG	Joint Photographic Experts Group
JTF	Jump To File
KML	Keyhole Markup Language
KMZ	Keyhole Mark-up Language Zipped
KPA	Key Performance Area
KPI	Key Performance Indicator
MAPI	Messaging Application Program Interface
Mb	Megabyte
MDL	Model Development Language
MS	Microsoft
NED	Network Engineering Design
NIS	Network Information System
OGC	Open Geospatial Consortium
PCMP	Project Complete Mapped File
PDF	Portable Document Format
P&ID	Piping and Instrumentation Diagram
PLS	Power Line Systems
PM	Project Management
PTM&C	Protection Telecommunication Metering and Control
Respondent	Entity responding to this RFP
RFP	Request for Proposal
ROI	Return On Investment
SANRAL	South African National Roads Agency
SANS	South African National Standards
SAP	System Application and Products System
SAT	Standard Acis Text
SCADA	Supervisory Control and Data Acquisition
SCCM	System Centre Configuration Manager
SCD	Substation Configuration Description

Abbreviation	Description
Service Provider	Entity that a contract is awarded to as an outcome of this RFP
SoAW	Statement of Architecture Work
STEP	Standard for The Exchange of Product
STL	Stereo Lithography
SWEO	Small World Electric Office
TIFF	Tagged Image File Format
TXT	Text file
U3D	Universal 3 Dimension
UI	User Interface
VBA	Visual Basic for Applications
VB	Visual Basic
VPN	Virtual Private Network
VRML	Virtual Reality Modelling Language
XLS	Microsoft Excel File Extension
XML	Extensible Mark-up Language

Table 2: Abbreviations and Terms

1. INTRODUCTION

The purpose of this document is to specify the requirements related to a Request for Proposal (RFP) for an "Engineering Design and Document Management and Collaboration System (EDDMS)" for use across Eskom's Generation, Transmission, and Distribution businesses.

The objective of the RFP is to identify EDDMS solutions and service providers that conform to Eskom's requirements. Subject to final investment and procurement approval, Eskom may award a contract to a selected Respondent.

This document contains Eskom's Scope pertaining to the product requirements, scope of supply / services, and procurement philosophy. It will be used as basis to compile the contractual scope in the event that a contract is awarded.

Submissions to Eskom need to follow a structured approach as described in the Invitation to Tender.

The document is divided into the following main sections:

- Introduction
- Product / Solution requirement
- Scope of Supply
- Scope of Services
- Information to be provided
- Appendix 1: Business Requirement Specification

2. BACKGROUND

Eskom Holdings is a vertically integrated operation that generates, transmits and distributes electricity. Eskom is a separately registered company, with ownership vesting in the South African government. More information about Eskom is available on www.eskom.co.za.

Eskom consists of the following Businesses:

- Distribution.
- Transmission.
- Generation.

The scope of this RFP includes:

- Engineering Design and Analysis products (AEC CAD and Specialised Engineering) used across all Eskom Businesses.
- EDMS used primarily by the Eskom Distribution and Transission Businesses.

EDDMS functionality is used across Eskom for various business needs:

- Electrical, mechanical and civil engineering plant / site construction projects.
- Plant / site operational maintenance.
- Production plant modifications.

Eskom currently operates 11 EDMS site instances related to this RFP. These sites are geographically dispersed, and each site consists of an in-house server, utilising

a MS SQL Server metadata database. Each site has its own unique EDMS project / folder structure and metadata configuration.

Existing EDDMS System information:

- EDMS sites: 11
- EDMS users: 2000 across 11 sites.
- AEC CAD users across all Eskom Businesses:
    - CAD view only: 500
    - Baseline CAD: 870.
- Specialised Engineering users:
    - Substation design: 50
    - Civil and road design: 40
    - Structural design: 15
    - A number of other applications
- CAD file detail:
    - Type: dgn (Bentley MicroStation)
    - Number of files: ±8 million across 11 sites.
    - Disk size: 20TB across 11 sites.
    - File size: average = 1MB; biggest in use: 3 GB

The existing EDDMS applications integrate to various third party applications within Eskom. In addition to this, there are also a number of customisations in existence, created by means of the methods supported (Bentley MDL, VBA, macros, etc.)

3. SOLUTION IMPLEMENTATION STRATEGY

Refer to Figure 1 for a high-level view of the implementation approach. Details are discussed in later sections of the document.

The solution option (SaaS vs Eskom-hosted) will determine details pertaining to the solution implementation and operation. This document will provide a generic implementation framework, while acknowledging that for a SaaS solution, detailed activities will differ from an Eskom-hosted solution.

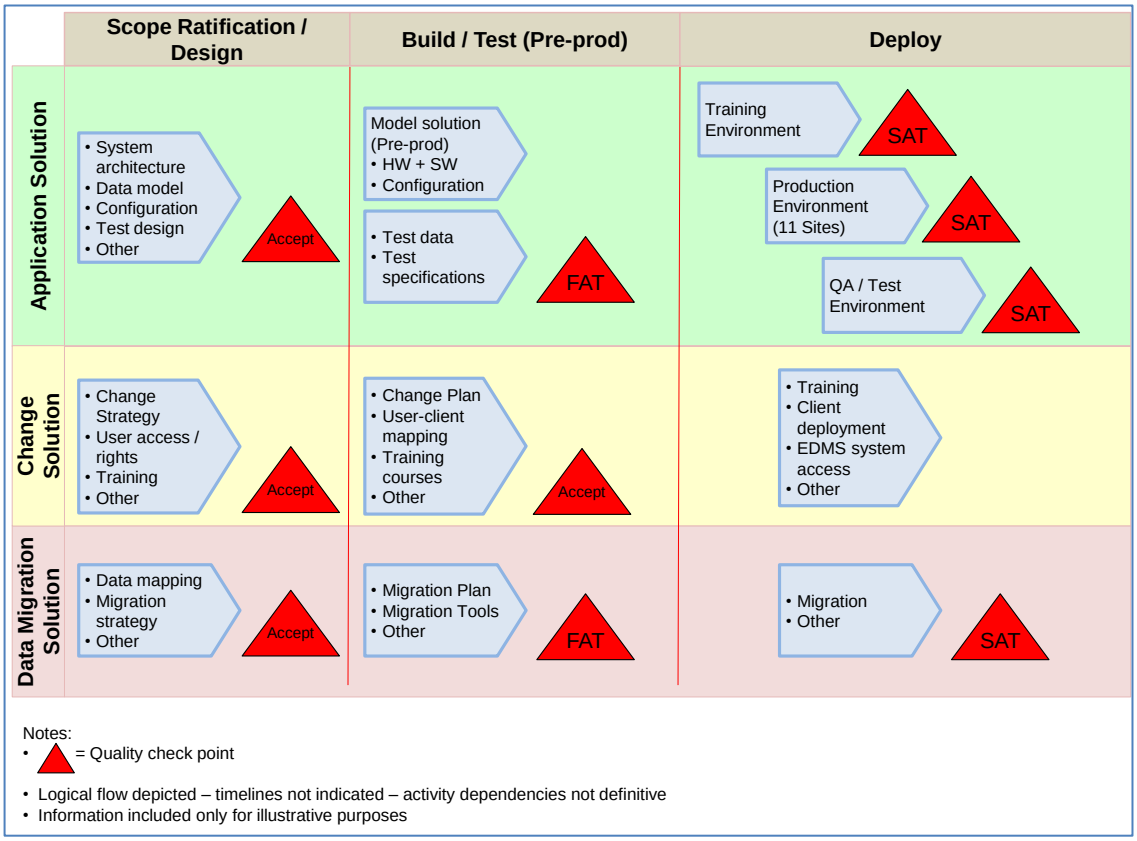


Figure 1: EDDMS: Project and Deployment Phasing Approach

The objective of the implementation approach is to deliver an operational and supported solution. The process involves:

Activity	Objective	Outcome
Buy	Eskom Tender for a EDDMS Solution	A potential contract established with a selected *Service Provider* for an EDDMS solution.
Scope Ratification	Eskom and the *Service Provider* confirm contract scope	A detailed description of: • The Service Provider's scope of work and supply. • Eskom deliverables and responsibilities.

Detail Design	The *Service Provider* compiles all detailed designs, Eskom reviews	• Detailed Designs.
Build / Test Pre-production Solution QA/Test environment	Design, Build and Test the *Service Provider's* EDDMS Solution	• A pre-production EDDMS solution.
Production Solution Deployment	Design, Build, Test and Deployment of all EDDMS platform environments.	• Production environment (11 sites). • QA/Test environment. • Training environment. • Back-up / recovery environment. • DR environment. • Maintenance and Support active.
Change Services		• Users trained. • Training material. • Training courses.
Data Migration Services	Migrate users and data from the existing Eskom systems to the new solution – for 11 sites	• The Production EDMS is the repository for all Eskom's data. • CAD files migrated.

Table 3: The Procurement Process

The implementation strategy will be adapted as required, based on the solution model selected (SaaS option, etc).

Refer to Section 7 for more detail.

There will be a transition period where the legacy architecture will be in operation alongside the new solution. The Service Provider will include this aspect in the detailed design under Change Management.

4. PROCUREMENT APPROACH (PROCESS) AND TIMELINES

Refer to the Invitation to Tender for information regarding, amongst others, contact persons, timeline and dates.

The RFP calls for a proposal for a compliant EDDMS solution, along with a roadmap to implement the EDDMS services / components. A potential contract will be awarded for the EDDMS services / components. Evaluation of proposals will consist of technical, financial, and commercial evaluations.

The following diagram provides an overview of the RFP process:

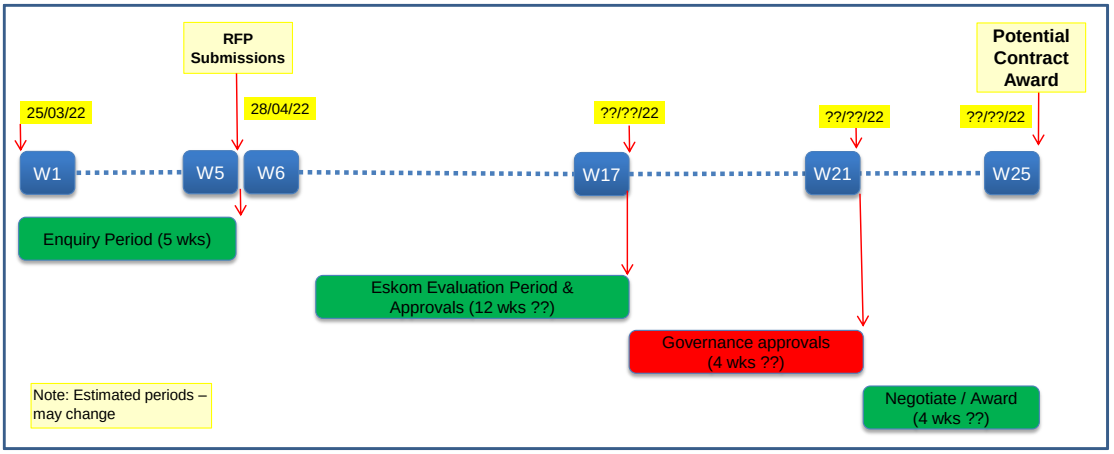


Figure 2: RFP Process

- Eskom Issues RFP

  The RFP associated with this Scope.

- Enquiry Period (Respondent Queries to Eskom)

  During this time, prospective Respondents may approach Eskom for any clarification required. Refer to the Invitation to Tender for information regarding the clarification closing date.

- RFP Closing Date - Submission of RFP

  Respondents will submit responses according to the requirements prescribed in the Invitation to Tender:

  - By the deadline indicated.
  - In the format prescribed.
  - Via the channel prescribed.

- Eskom evaluation:

  - Eskom Review and Clarification Request/s.

    Eskom will study the responses for a period and request further information / clarification from specific Respondents where necessary.

  - Respondent Presentation and System Demonstration

    Selected Respondents will be invited to do a presentation and system demonstration. This will form part of the technical evaluation.

  - Approvals by Eskom technical, financial and commercial governance structures.

- Governance approvals. This refers to internal Eskom governance approvals, e.g. Architectural approval, etc.

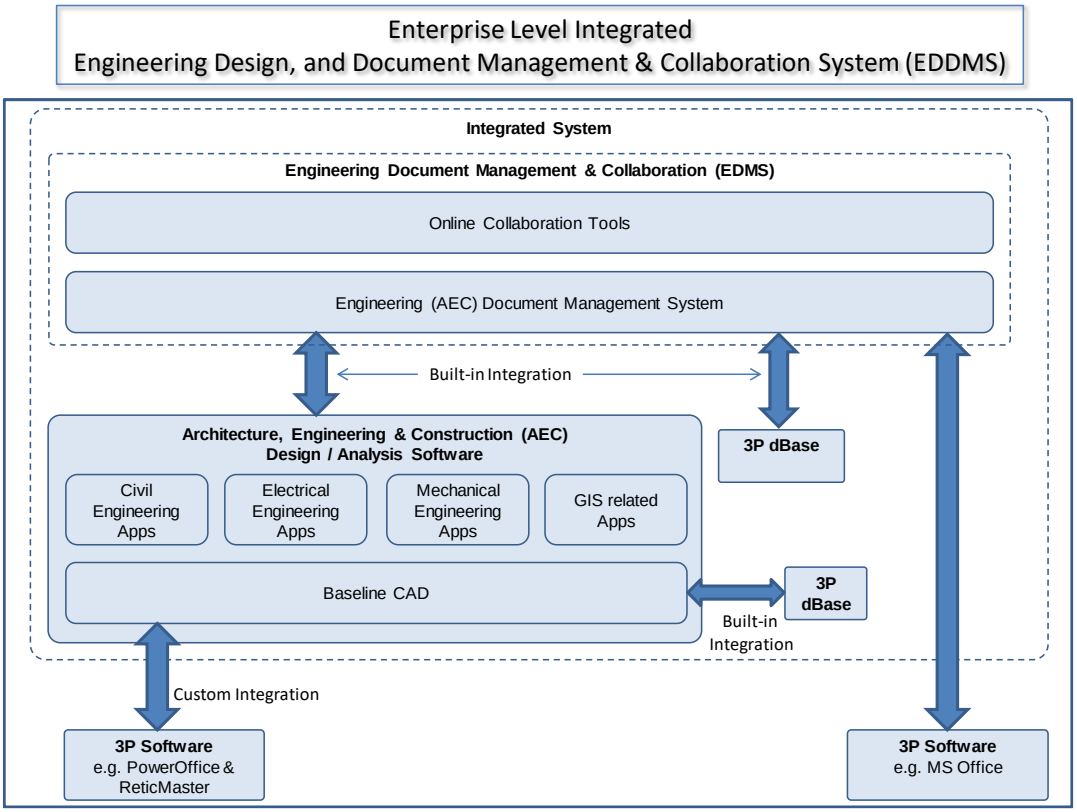
- Potential negotiation and contract award.

5. PRODUCT / SOLUTION REQUIREMENT

5.1 GENERAL

The requirement is for a Commercially-off-the-Shelf (COTS) integrated suite of enterprise-level system and applications, offering the following functions:

- Engineering Design and Analysis:
  - AEC – Baseline CAD.
  - AEC – Specialised Design / Analysis Apps.
- EDMS & Collaboration (including online services).



Notes: 3P = third party

Figure 3: System Diagram

5.2 DESIGN CONSIDERATIONS:

- The Engineering Design and Analysis products should be accessible to users working on their Windows based desktop/laptop computers. While web-based access will be beneficial, the requirement is that users should be able to operate in a stand-alone mode, not connected to a communication network. End users are located / working at the office and from remote locations. Eskom may also require external organizations to access the design documents for review and comment purposes.
- The Engineering Design and Analysis product file format/s should allow for storage in a native file format – i.e. it should not be incorporated in a database.
- EDMS system design should accommodate a large number of users dispersed over a large geographic area where network bandwidth and reliability may impact on performance. It should also provide for a very large number of CAD files. The benefits and risks of centralised vs decentralised components should be addressed in detail in the Proposal.
- The EDMS should provide for logical separation of data and administration related to the different Eskom Businesses. Each of the Eskom Businesses will be legally separated at some point in the near future.
- Even though the requirements call for an EDMS SaaS solution option with vendor based platform situated in South Africa (with a guarantee that Eskom operational data will not leave South Africa), it is a requirement that the initial solution should be hosted on a platform situated in Eskom owned data centres. Refer to Table 6 for a summary of EDMS options.
- Cloud Software-as-a-Service (SaaS) requirements / considerations:
  - Detailed discussion regarding cloud (SaaS) requirements will be conducted with successful Respondents. The following is some pertinent information:
    - Eskom data may not leave the borders of South Africa.
    - Data access:
      - All Eskom generated data remains the property of Eskom.
      - A copy of all Eskom data should reside within Eskom, on Eskom hardware, and readable by Eskom.
      - Data continuity: Eskom data must be available at all times

5.3 FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS

Refer to Appendix 1 for detailed requirements.

High level requirements:

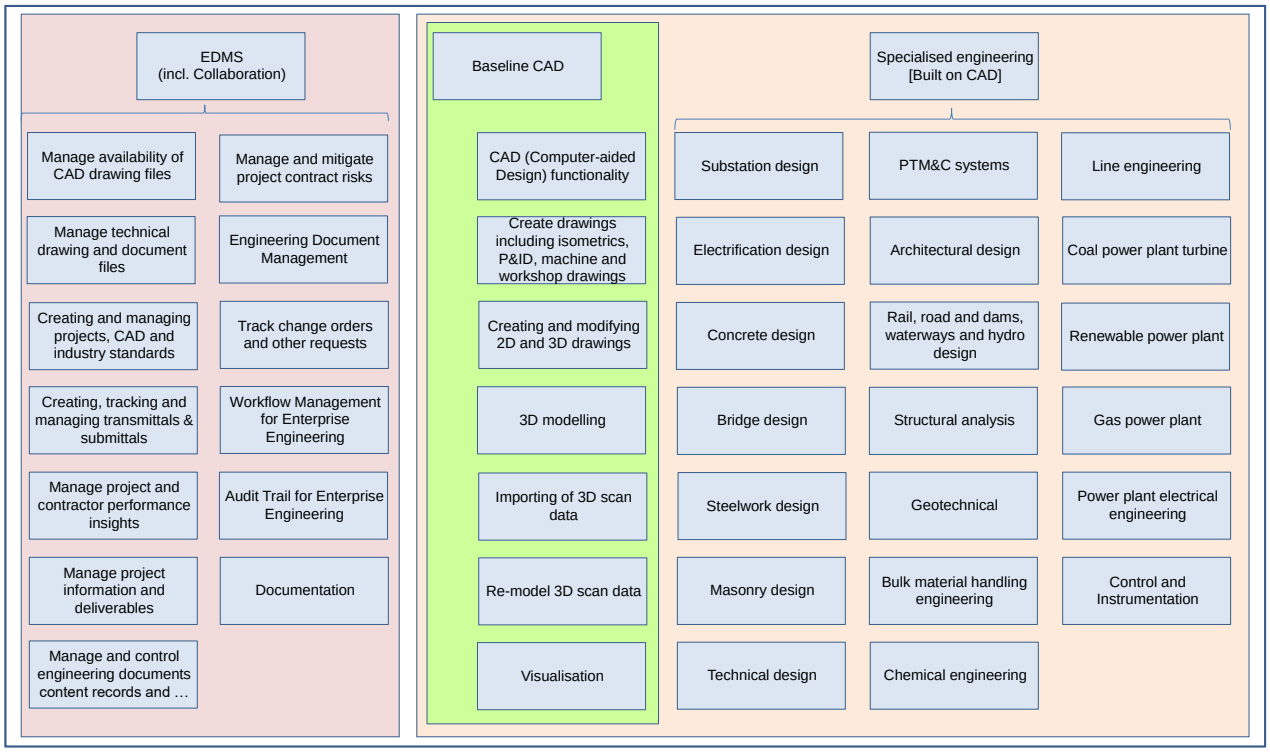


Figure 4: Functional Decomposition

Item	Category	Name	Description	Requirement Priority
1	Baseline CAD	CAD (Computer-aided Design) functionality	Standard and advanced system capability to provide engineers with all the necessary tools for CAD design	High
2	Baseline CAD	Create drawings including isometrics, P&ID, machine and workshop drawings	Full CAD capability for engineering and technical designs, for all engineering disciplines	High
3	Baseline CAD	Creating and modifying 2D and 3D drawings	The engineer requires the capability to access 2D and 3D drawings for the purpose of optimization and modification	Medium
4	Baseline CAD	3D Modelling	3D modelling is required so that all views are seen by the engineer to determine the best optimization where required	Medium
5	Baseline CAD	Importing of 3D scan data	The solution must be capable of accessing 3D scanned data from external systems and from multiple formats	

6	Baseline CAD	Re model 3D scan data	Remodelling of 3D scan data with specific focus on changes to the design	Medium
7	Baseline CAD	Visualisation	The engineer requires the capability to view the design taking a number of subsets into consideration. The visualization may be achieved in a standard or customized format.	Medium
8	Specialised Eng.	Architectural design	Engineers require the capability to design based on layouts of assets taking current and future landscapes into consideration.	Medium
9	Specialised Eng.	Bridge design	Create bridge modelling design, analyse bridge design, capture roadway geometry and topography, perform bridge clash detection, sequence construction and phasing.	High
10	Specialised Eng.	Bulk material handling engineering	Engineers require the capability to model bulk materials at Eskom sites	Medium
11	Specialised Eng.	Chemical engineering	Chemical engineering	Medium
12	Specialised Eng.	Coal power plant turbine	Condition monitoring diagnostics and collection of vibration signals for: a. Turbo machinery b. Hydro turbines and generators c. Wind turbines d. Reciprocating compressors e. Industrial gas turbines f. Aero derivative gas turbines g. Electric motors Design cadastral lines, roads and servitudes and use 2D and 3D tools.	High
13	Specialised Eng.	Concrete design	Design concrete member sections for flexure, axial, shear, torsion and deflection in accordance to South African National Standards (SANS) and Eurocode standards. Model reinforced concrete shapes such as concrete beams, columns, slabs, walls, spread footings, and continuous footings, all with parametric behaviour. Changes to the concrete shape cause the rebar to adjust automatically. Model complex reinforced concrete shapes, including curves, sloping, or non-orthogonal shapes.	High
14	Specialised Eng.	Control and Instrumentation	Management of all technical and engineering documents for the power plant	High

15	Specialised Eng.	Electrification design	The capability of planning for and designing an electrical network to meet the business and social targets of electrification.	Medium
16	Specialised Eng.	Gas power plant	Management of all technical and engineering documents for the power plant	High
17	Specialised Eng.	Geotechnical	Monitor rock performance and stability	Medium
18	Specialised Eng.	Line engineering	Perform engineering design for substations such as: a. Protection Schemes b. Metering c. Substation layouts d. Earthing and grounding layouts e. Architectural drawings for control rooms f. Create 2D drawings for construction and substation electrical layout g. Create schematic drawings for control purposes h. Create graphs and simulations i. Civil design j. Structural design k. Stormwater management/hydrologic analysis/hydraulic structure design l. Drainage design to support water based fire protection systems m. Access road design Access attributes and selects design overhead lines in different voltages including survey, tower spotting line design, route selection, land surveying using line lidar visual, substations and other infrastructure. Manage maps by merging, operate diagrams, check fault level of the infrastructure and integrate plans and designs of the maps. Supports the creation, maintenance, analysis and sharing of 2D and 3D geospatial information and create contours	High
19	Specialised Eng.	Masonry design	Perform masonry design; generate calculation reports and bill of quantities.	High
20	Specialised Eng.	Power plant electrical engineering	Management of all technical and engineering documents for the power plant	High
21	Specialised Eng.	PTM&C systems	To be confirmed	

22	Specialised Eng.	Rail, road and dams, waterways and hydro design	Analyse rail track regressions – convert surveys of track data into full alignments by using a regression analysis. Design and analyse rail and road corridors and place rail signals. Integrate imagery, point clouds and 3D meshes into design and construction models. Design rail track drainage systems, design track geometry, yard, and station and rail overhead line systems. Create horizontal and vertical alignments. Create road profiles and cross- sections. Design and analyse corridors. Model and analyse terrain, earthworks and complete water sanitary and sewer networks Water distribution modelling and analysis. Allocate and estimate sanitary loads by applying hydrographs, patterned loads, and unit loads using comprehensive and customizable engineering libraries..	High
23	Specialised Eng.	Renewable power plant	Management of all technical and engineering documents for the power plant	Medium
24	Specialised Eng.	Steelwork design	Produce drawings for all steel shapes, connections, and plate-work from the 3D model. Easily create comprehensive drawings including dimensions, notes, labels, and part lists. Any out-of-date drawings are automatically updated based on changes to the 3D model. Analyse custom sections, develop bill of materials/quantities and generate calculations reports, connection diagrams and engineering design sketches.	High
25	Specialised Eng.	Structural analysis	Capability to perform the following types of analysis in 2D and 3D: a. Linear Analysis b. P-Delta/ Second order analysis c. Non-linear analysis d. Buckling analysis e. Dynamic analysis (Modal, seismic, harmonic). f. Response spectra analysis g. Time history analysis h. Creep analysis i. Shrinkage analysis j. Fatigue analysis k. Pushover analysis	High

26	Specialised Eng.	Substation design	Capability to perform substation design to include the following: a. Protection Schemes b. Metering c. Substation layouts d. Earthing and grounding layouts e. Architectural drawings for control rooms f. Create 2D drawings for construction and substation electrical layout g. Create schematic drawings for control purposes h. Create graphs and simulations i. Civil design j. Structural design k. Stormwater management/hydrologic analysis/hydraulic structure design l. Drainage design to support water based fire protection systems m. Access road design.	High
27	Specialised Eng.	Technical design	Create drawings including isometrics, Piping and Instrumentation Diagram (P&ID), machine and workshop drawings. Import reference data such as existing drawings, scanned documents and 3D point cloud data and incorporate current existing drawing formats to utilize the current standard drawing templates for border sheets and title blocks.	High
28	EDMS	Creating and managing projects, CAD and industry standards	An engineer may create a project based on a specific operational need. The engineer needs to provide access to a team of engineers for design review purposes. The engineer manages access and ensures the design is aligned with industry standards and practices.	High
29	EDMS	Creating, tracking and managing transmittals and submittals	The engineer is required to obtain input and comment from colleagues in the department or other functional areas. The mechanism of a design review and the management of comments is done through transmittals (internal of the company and external specialists, which is controlled and managed by the project engineer.	High

30	EDMS	Documentation	An engineering document management solution provides the core capability to manage and control all forms and types of technical documentation on behalf of the organization. It is the basis for engineers, operational and maintenance staff to access plant assets based on its design base, and may be viewed electronically or printed in a controlled environment.	
31	EDMS	Engineering Document Management	An engineering document management solution provides the core capability to manage and control all forms and types of technical documentation on behalf of the organization. It is the basis for engineers, operational and maintenance staff to access plant assets based on its design base, and may be viewed electronically or printed in a controlled environment.	High
32	EDMS	Manage and control engineering documents content, records and compliance	The enterprise engineering solution shall provide a core capability to support engineers throughout the project and asset lifecycle. This includes all technical and functional information which will be the central repository for all assets including the integration of disciplines which ensures a fully functional system.	High
33	EDMS	Manage and mitigate project contract risks	The project engineer is required to record all project related risks and issues in a central repository to ensure the necessary mitigation strategies are implemented during and after the project. The project risks are accessible by all engineers and information related to the risk may be updated accordingly.	Medium
34	EDMS	Manage project and contractor performance insights	The project engineer need to keep a record of the contractor allocated tasks and respective performance indicators. In some cases, the project engineer needs to record specialist advice based on experience. The solution needs to accomodate the detailed advice for the project and shall be used for future purposes.	High

35	EDMS	Manage project information and deliverables	The project or discipline engineer is required to set-up, manage and control all functional designs and ensure integration between discipline engineers. This document management solution will ensure that a fully integration solution is created, developed, managed and finalized for construction of plant modification.	High
36	EDMS	Manage technical drawing and document files	Engineers require the capability to access technical drawings from a single and central repository. This includes all design base documents, which are accessible to engineers based on their function and role.	High
37	EDMS	Track change orders and other requests	The management and control of change requests is an important functional capability for a project or design engineer. These changes need to be managed according to functional area and need to be managed according to date and time.	High
38	EDMS	Workflow Management for Enterprise Engineering	Workflow management ensures that technical tasks assigned to engineers are planned and co-ordinated to achieve project objectives. Depending on the type, size and complexity of the project, a workflow management capability will provide engineers to manage detailed engineering and reviews in a co-ordinated manner.	High
39	NF-EDMS	Access Control	Access control and rights environment that manage user roles	Medium
40	NF-EDMS	Activity log report	An activity log provides the status of tasks and alerts based on information produced by the system.	Medium
41	NF-EDMS	Archiving	Ability to store historic design base records for future plant modifications	High
42	NF-EDMS	Audit Trail for Enterprise Engineering	An audit trail provides the project engineer with a documented record of all technical tasks and assignments for the project lifecycle. It provides the designated accountabilities of each engineer for future audit reviews.	High

43	NF-EDMS	Audit trail report	Engineering managers need to have access to a report which generates information based on the data produced in the system	High
44	NF-EDMS	Dashboard reports	End users require access to dashboard functionality to monitor, control and track status of tasks and reports	Medium
45	NF-EDMS	Data migration	Data migration	High
46	NF-EDMS	Design completeness report	A report that indicates the completeness of designs so that managers can track and report on progress to project managers	Medium
47	NF-EDMS	Disaster Recovery		High
48	NF-EDMS	Information Security	Enforce Eskom's Information Security Policy which specifies the security protocols for Eskom employees and third party access. (Refer to Policy 32-85)	High
49	NF-EDMS	Manage availability of CAD drawing files	Engineers need to have access to design base drawings which are primarily in CAD format. Access to CAD files may be in different presentation layers.	High
50	NF-EDMS	Reporting	Reports should be developed on all major control areas of the EDDMS.	
51	NF-EDMS	Standard report set	Engineers require the capability to access all standard report functions based on the system data stored within the application	High
52	NF-EDMS	Training	The service provider will provide training.	

Table 4: Functional Decomposition

5.4 INTEGRATION

The EDDMS Eskom interfaces are illustrated in the diagram below (Reference: LAD PAC Fig 3):

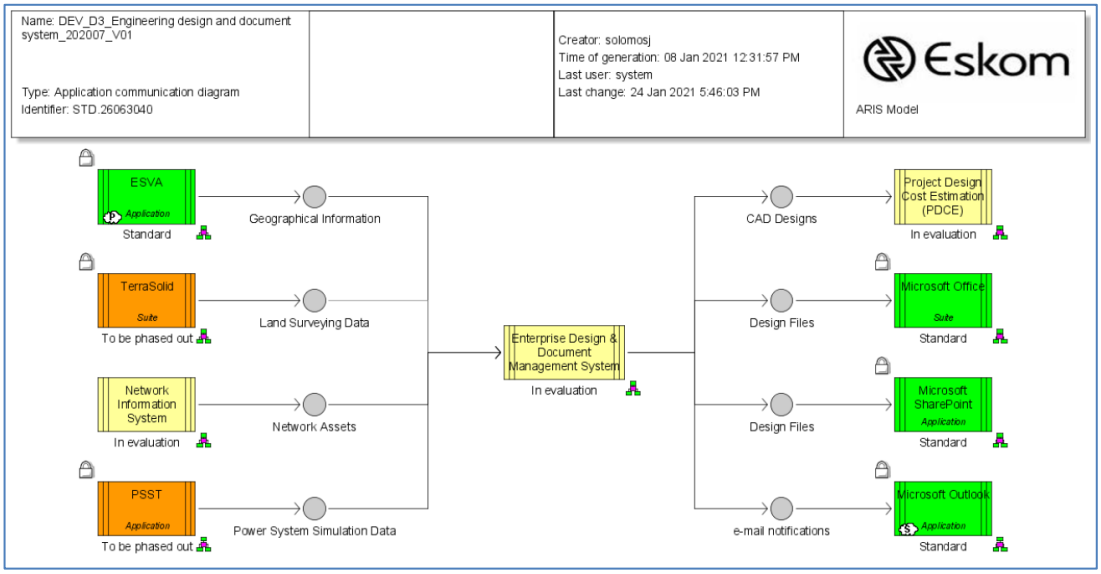


Figure 5: EDDMS interfaces

Interface Descriptions:

Name	Description
CAD Designs	Line design engineers are required to interact with the Design base engineering tool
Design Files	Engineers are required to export design related data and drawingss into SharePoint format
Geographical Information	Design engineers require access to GIS data to position electrical assets on a physical location. Therefore, the design tool requires to utilize geographic information accordingly.
Land Surveying Data	Engineers are required to access design base documentation from the CAD drawing tool
Network Assets	The design engineer is required to access network related assets from the existing network asset software tool. This interface will ensure that the correct assets and related technical information is available for design purposes
Power System Simulation Data	The power system simulation system requires access to a design data to perform design engineering functions
e-mail notifications	The design system is required to interact with Microsoft Outlook for e-mail notifications, when using transmittals and workflow functions

Table 5: Interface Descriptions

6. SCOPE OF SUPPLY

The requirement is for the following scope of supply:

6.1 ENGINEERING DESIGN / ANALYSIS AEC SOFTWARE AND LICENSING OPTIONS:

- Option 1 (required): Desktop based AEC products (Windows 10 OS).
- Option 2 (optional): SaaS based AEC products.

6.2 EDMS SOFTWARE AND LICENSING OPTIONS:

It is a requirement that a solution be offered that provides for a platform (server hardware and software) and primary data that resides on Eskom premises. A SaaS solution based on a platform external to Eskom is viewed as a potential future solution and should / may be offered as an option.

- The following EDMS environments shall be provided for:
    - Production environment/s for 11 sites
    - QA/Test environment
    - Training environment
    - Data back-up and recovery environment (for SaaS solutions)
    - Disaster Recovery (DR) environment, at least for Tx Business
- Option 1 (Optional): Eskom will provide the EDMS hardware platform specified by the Respondent. Eskom will also be responsible for the hardware platform maintenance.
- Option 2: EDMS Software as a Service (SaaS):
    - Option 2a: Service Provider hosted servers (hosted in South Africa).
    - Option 2b: On-premises (Service Provider owned) servers.
    - Option 2c: Hybrid.

    The SaaS model implies that the Service Provider will be responsible for platform software implementation, IT operation, and maintenance. Table 7 provides an overview of EDMS Solution Options and Accountabilities

Sizing parameters:

Existing EDDMS System information:

- EDMS sites: 11
- EDMS users: 2000 across 11 sites.
- AEC CAD users across all Eskom Groups:
    - CAD view only: 500
    - Baseline CAD: 870.

- Specialised Engineering users:
    - Substation design: 50
    - Civil and road design: 40
    - Structural design: 15
    - Various other applications
- CAD file detail:
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The existing EDDMS applications integrate to various third party applications within Eskom. In addition to this, there are also a number of customisations in existence, created by means of the methods supported (Bentley MDL, VBA, macros, etc.)

6.3 PRODUCT RELATED TRAINING MATERIAL AND COURSES

The requirement is for the following:

- End-user, system administration, user administration, and support training courses.
- Training material to enable Eskom to perform in-house end-user training, for future use.

7. SCOPE OF SERVICES

7.1 ROUTINE SERVICES

The requirement is for the following services:

- Maintenance and support, including, inter alia:
    - Access to the latest versions of the software and related documentation.
    - Software defects correction.
    - 24/7/365 application support.
- Access to online services:
    - Online training courses and associated training material.
    - Collaboration tools, e.g. Transmittals.
    - Software Administration (licensing portal) - user and license administration.

7.2 PROJECT MANAGEMENT SERVICES

Various Eskom organisational stakeholders will be involved in the project. In order to ensure an integrated approach, project management is required.

The *Respondent* shall provide a detailed proposal to perform all project management activities. Details of all project documentation to be generated by the *Service Provider* shall be submitted with the *Respondent's* proposal, including clear indication of items that will require Eskom approval.

Project management activities shall be performed by resource/s based in South Africa for the duration of the project.

7.3 DESIGN / IMPLEMENTATION / MIGRATION PROJECT SERVICES

The following table provides an overview of EDMS solution options and accountabilities (excluding EDMS client applications where relevant):

Aspect	Option 1	SaaS		
	Eskom owned / operated platform	Option 2a Public Cloud	Option 2b Private Cloud	Option 2c Hybrid
Platform Location				
- Baseline solution (QA/Training environment)	Eskom data center	Service Provider (Cloud platform - South Africa)	Eskom data center	Eskom data center + Service Provider
- Production solution				
- DR				
- Backup hardware/ software				
Ownership				
- Hardware	Eskom	Service Provider	Service Provider	Service Provider
- Application software				
- Database				
- DR				
- Backup hardware/ software				
Implement				
- Hardware (incl OS)	Eskom	Service Provider	Service Provider	Service Provider
- DBMS software				
- EDMS Software	Service Provider			
- Configure	Service Provider	Service Provider	Service Provider	Service Provider
- Integration				
- User migration	Service Provider	Service Provider	Service Provider	Service Provider
- Data migration - CAD				
- Data migration - EDMS				
IT Operation				
- Hardware	Eskom	Service Provider	Service Provider	Service Provider
- Application software	Eskom or Service Provider			
- Database	Eskom or Service Provider			
- Integration	Eskom or Service Provider			
Maintenance				
- Hardware platform	Eskom	Service Provider	Service Provider	Service Provider
- Database				
- Application software upgrades	Eskom and/or Service Provider			
- Application software bug fixing	Service Provider			
- Application Help desk	Eskom and/or Service Provider			

Table 6: EDMS Solution Options and Accountabilities

The Service Provider shall provide the appropriately skilled and experienced resources, with supporting methodology and tools to perform the following activities:

7.3.1 Scope Ratification

The objective of the scope ratification activity is for the *Service Provider* to document the detailed *Service Provider* related scope of supply and work/services, based on the framework contained in the contractual Scope and the *Service Provider's* response to this RFP.

The *Service Provider* shall provide a detailed description of:

- Service *Provider* scope of work / supply.
- Eskom scope of work / supply.
- All *Service Provider* deliverables and Eskom approval points.
- High level Architectural design:
  - System design.
  - Application architecture.
  - Application functionality description.
  - Non-functional characteristics, including sizing and performance parameters.
  - Data architecture, including data model description and data dictionary.
  - Application integration to the relevant third party applications.
  - Security architecture.
- Configuration information.
- Release and deployment scope and activities, including a transition plan.
- Other relevant information

The *Service Provider's* scope ratification document/s shall be subject to Eskom review and approval.

The *Respondent* shall provide a high level design, covering all BIDATIS (Business, Information, Data, Technology, Integration and Security Archhitecture) aspects as part of its proposal.

7.3.2 Detail Design

The *Service Provider* scope includes, amongst others:

- Detail design of all aspects of the system, including, amongst others:

  - Detail Architectural design:
    - System design.
    - Application architecture.
    - Application functionality description.
    - Non-functional characteristics, including sizing and performance parameters.
    - Data architecture, including data model description and data dictionary.
    - Integration design, utilising standard Out-Of-The-Box (OOTB) interfaces and services.
    - Technology architecture.
    - Security architecture.
    - Infrastructure requirements.

- Implementation specification, including per-site configuration details.
- Data migration design aspects:
  - Identification of all data to be migrated.
  - Mapping of legacy data formats to solution data formats.
  - Other.
- Change management design.
  - Training.
  - Client applications deployment.
  - User migration plan.
  - Data migration plan.
  - Other.
- Test cases.
- Other relevant information.
- Design of a disaster recovery solution, based on Eskom's standard titled "IT Continuity/DR Standard 32-385".
- Model the Application Solution architecture in Eskom's Aris based repository
- Prepare Eskom architectural governance documentation (Detailed Design) and participate in presentation to the governance body at a meeting in Johannesburg.

The Detail Design shall be subject to Eskom approval.

7.3.3 Pre-production Solution - QA/Test environment

The *Service Provider* scope includes, amongst others:

- All services required to provide a fully compliant pre-production EDDMS solution solution as the Eskom QA / Test environment, at an Eskom site (based on solution option):
  - Project management services.
  - Design.
  - All configuration activities required to prepare to deploy into production.
  - All integration activities required to prepare to deploy into production.
  - Build / Test.

7.3.4 Production Solution Deployment

The *Service Provider* scope includes, amongst others:

- All services required to Implement / Deploy / Configure - for 11 sites.
  - Project management services.
  - Design.
  - Implement / Deploy approved pre-production solution to 11 sites and all users.
  - Configure each site system to meet the site specific configurations, including, but not limited to:
    - Site role / object based access.
    - Site folder / project structure.
    - Site metadata.
    - Site workflows (where relevant).
    - Transmittals (where relevant).
    - Site CAD standards.
    - Other.
  - Site acceptance testing.
  - Other

7.3.5 Change Services

The *Service Provider* scope includes, amongst others:

- All services required to prepare users and sites for the new solution – for 11 sites, including, but not limited to:
  - Project management services.
  - Change planning and preparation.
  - Preparation of a training environment and data.
  - Access for users to the training environment.
  - Training material.
  - Training courses.
  - Training logistics.
  - Other.

7.3.6 Data Migration Services

The *Service Provider* scope includes, amongst others:

- All services required to migrate users and data from the existing Eskom systems to the new solution – for 11 sites, including, but not limited to:
  - Project management services.
  - Planning, staging, etc.
  - Site data files (drawings and documents).
  - Site role / object based access.
  - Site metadata.
  - Site workflows.
  - Site CAD standards.

- Other.

8. GENERAL REQUIREMENTS

8.1 CHANGE MANAGEMENT (SYSTEM / SOFTWARE)

Existing Eskom Group IT change management procedures and policies shall apply.

8.2 TESTING

The *Service Provider* shall prove conformance to quality assurance procedures related to the development and support of its products. In this regard, the *Service Provider* shall substantiate, in the form of auditable test results and references to installed systems, that all aspects of the proposed system have been thoroughly tested and operationally proven.

The objective of testing is to confirm that the solution conforms to all contractual requirements.

Solution testing will consist of:

- Factory Acceptance Testing (FAT).
- User acceptance testing:
  - Functional capabilities.
  - Non-functional aspects:
    - Performance.
    - Integration.
    - Data.
- Hand-over sign-off shall consist of a record of all deliverables and test results.
- DR testing will be performed by the *Service Provider* on the DR system.

The *Service Provider* shall compile a Test Plan, outlining all formal testing. The Test Plan shall conform to Eskom's TCoE standard. The relevant test specifications shall be produced by the *Service Provider* and approved by Eskom. Test cases and test results shall be provided to Eskom in a suitable format for importing into Eskom's test solution, HPQC. The results of all tests shall be documented by the *Service Provider* and signed by both the *Service Provider* and Eskom.

Comprehensive testing of all deliverables remains the responsibility of the *Service Provider*, and witnessing or participation in any tests by Eskom shall not relieve the *Service Provider* of any accountability.

8.3 TRAINING REQUIREMENTS

End-user, system administration, user administration, and support training courses are required.

Full details of all training courses proposed shall be provided, including course descriptions, course prerequisites, course schedules, training equipment required, venues, maximum number of candidates per course and course cost. Training courses shall be presented in South Africa. All travel and subsistence cost for candidates will be for the account of Eskom.

The *Service Provider* shall also offer suitable end-user training material to enable Eskom to perform in-house end-user training for future reference.

Training logistics shall be managed through Eskom Academy of Learning.

8.4 USER DOCUMENTATION

The *Respondent* shall submit, for evaluation purposes, an electronic copy of standard product and user documentation offered, as part of their proposal.

A short description, as well as tables of content for documentation to be developed shall be provided.

The *Service Provider* shall provide one electronic copy of all product and user documentation.

8.5 MAINTENANCE AND SUPPORT

The software scope shall include all *Service Provider* EDDMS software, as well as any software forming part of the solution, e.g. integration and interfacing software, etc.

Any proposed maintenance and support agreement shall ensure that the systems stay current with the *Service Provider*'s latest developments.

The *Respondent* shall describe in detail its approach to:

- Software version and functional upgrades over the full maintenance period.
- Software change management and its impact on system performance and availability.
- Third party software or solution components.

The proposal shall also address:

- Membership of *Service Provider's* product user group with access to all facilities pertaining thereto shall be included.
- Human support i.t.o. all aspects of the use of the software as may be required telephonically, on site or via remote access, at any time, and with due notice (to be specified by the Respondent).
- The *Respondent* shall propose a mechanism for fault/incident/problem reporting, investigation, and fixing faults, as well as for ensuring that all environments (production, DR and QA/Test, etc.) remain synchronised with regards to software fixes and updates. *Service Provider* response times shall be indicated.

8.6 QUALITY REQUIREMENTS

The quality requirements stated in the Invitation to Tender shall be applicable to any contract awarded as a consequence of this Invitation.

8.7 ESKOM'S RESPONSIBILITIES

Based on the information provided in the Invitation to Tender, the *Respondent's* proposal shall include a complete list of Eskom*'s* responsibilities i.e. all items/venues/services/ information/approvals/activities to be provided and performed by Eskom.

8.8 ACCESS TO ESKOM SITES

The *Service Provider* shall request access to Eskom's site, from the Project Manager, at least two weeks prior to access being required. Access to site shall be granted at any time during the Working Day of any Working Week. Access to site may be granted at other times, on request, at the Project Manager's sole discretion.

Requests for access to site shall stipulate:

- The work to be carried out.
- The duration for which access is required.
- The persons who shall require access.
- Special requirements related to infrastructure, e.g. office space where *Service Provider* resources will spend extended periods on a site.

All persons requiring access to site shall provide proof of identification and be required to obtain (and retain with them at all times) a permit for the site that is to be visited.

9. INFORMATION TO BE PROVIDED BY THE RESPONDENT

9.1 RELEVANT TO THE SCOPE

9.1.1 Product / Solution Requirement

State clearly whether you have the ability to meet each of the requirements stated in Sections 3.5, 3.6, and 3.7 (including Appendix 1), and describe how you will meet each of the requirements, referencing each item.

9.1.2 Licensing Models

The Respondent is requested to provide details regarding the different licensing models. Describe the product license model/s, detailing various options e.g. perpetual licenses, subscription licensing, enterprise licensing, Software as a Service (SaaS) etc.

9.1.3 Service Level Agreement requirements

The Respondent is requested to:

- Provide their maintenance and support agreement model in order to determine the level of end-user and product support.
- Provide details of support infrastructure and personnel, both locally and abroad.
- Provide Service Level Agreement details.
- At least the following information should be provided:

    - Description of services.

- Incident priority categories.
- Incident Response and Resolution Targets.
- Incident management process.

9.1.4 Training material and courses

The Respondent is requested to provide details of all training courses and end-user training material proposed, including course descriptions, course prerequisites, course schedules, training equipment required, venues, maximum number of candidates per course and course cost.

9.2 ADDITIONAL TECHNICAL INFORMATION REQUIRED

Where information required is duplicated between various tender documents, the Respondent may address it once, and provide a reference to where it is addressed in other instances.

The Respondent is requested to provide a detailed response to the questions posed in the Invitation to Tender - Annexure L, with specific reference to "Master Evaluation Criteria".
Note that Sections 2.1 and 2.2 of the "Master Evaluation Criteria" contain references to the BRS and are summaries of specific BRS sections. A detailed response to the BRS in Appendix 1 of this document is also required.

9.3 EVALUATION SOFTWARE AND FUNCTIONAL DEMONSTRATION

The Respondent is requested to provide Eskom with a trial version of its software for testing and evaluation purposes. The trial period is required for a minimum of six months access from the time of the closing date of the RFP.

The Respondent is requested to provide Eskom with an online demonstration of its software. The detail regarding the demonstration will be communicated to the Respondent. The period of availability of the demonstration is 3 months from the time of the closing date of the RFP.

9.4 CLARIFICATION OF RESPONSE

Eskom may, for a period stated in the Invitation to Tender, request clarifications regarding Respondent responses.

9.5 COSTING AND TIMELINES

The Respondent is requested to provide costing for the scope of supply / services described in Section 3.6 and 3.7 above:

9.5.1 Engineering (Desktop) Applications Offering

The Respondent is requested to provide:

- Itemised perpetual license cost for each available product. List prices should be reflected, with detailed breakdown of all possible discounts.
- Annual budgetary cost and payment plan associated with the various subscription license models, based on the following illustrative user numbers:

	Number of Users
CAD view only	500
Baseline CAD	870
Substation Design	50
Civil Design	40
Structural Design	15
GIS related	30

Note: Above numbers are based on individual users, and not concurrent usage.

Table 7: Engineering Application User Numbers

Provide a breakdown reflecting:

- Desktop Application licensing. List all available products.
- Maintenance and support.
- Provide an annual breakdown.
- State all assumptions and discount factors.
- Identify any key variables/factors/unknowns that make estimating a particular cost difficult.

Various scenarios (based on license model), with associated costing for each scenario, should be submitted.

9.5.2 EDMS Offering

The Respondent is requested to provide:

- Annual cost and payment plan associated with the various EDMS subscription licensing models, based on the following illustrative user numbers:

	Year 1-5
EDMS Sites	11
EDMS Users	2000

It is estimated that around 400 users are “view only” users, i.e. they don’t create or edit drawings or documents.

Table 8: EDMS Application User Numbers

Provide a breakdown reflecting:

- Server licensing.
- Client licensing.
- Maintenance and support.
- Provide an annual breakdown.
- State all assumptions and discount factors.
- Identify any key variables/factors/unknowns that make stating a particular cost difficult.

Various scenarios (based on license model), with associated costing for each scenario, should be submitted, including, but not limited to:

- Option 1: Eskom will provide the EDMS hardware platform specified by the Respondent.
- Option 2: EDMS Software as a Service (SaaS):
  - Option 2a: Service Provider hosted servers (hosted in South Africa).
  - Option 2b: on-premises (Eskom owned) servers.
  - Option 2c: Hybrid.

9.5.3 Training material and courses

9.5.4 Routine Services

The Respondent is requested to provide costing for the following services:

- Maintenance and support related to all deployed environments and DR/Backup platform/s.
- Access to online services.

9.5.5 Design / Implementation / Migration Project Services

The Respondent is requested to provide costing for the following services:

- **Project Management Services**

- **Design / Implementation / Migration Project Services**

  - Scope Ratification.
  - Detail Design.
  - Deployment:
    - Pre-production Solution - QA/Test environment.
    - Production Solution.
    - Training environment.
    - Disaster Recovery.
    - Backup solution.
  - Change Services.
  - Data Migration Services

Various options (based on license model), with associated costing for each option, should be submitted.

9.5.6 Timelines

The *Project* shall be executed according to a defined project schedule made up of a number of agreed activities.

The *Service Provider* shall obtain Eskom approval for each agreed deliverable before continuing with subsequent activities.

The *Respondent* shall submit a detailed programme proposal (project schedule) in response to this RFP, based on the framework in Figure 1. The project schedule shall clearly address each activity and indicate dependencies between activities. Clear timelines and dates should be provided for each activity.

9.6 SERVICE PROVIDER / VENDOR REFERENCES

The Respondent is requested to provide at least four references, locally and globally (if applicable) of where supply / services described above have been provided by the Respondent in an Enterprise environment similar to Eskom.

The following information is required:

- Customer details, including contact persons (contact names, positions, telephone numbers);
- Brief description of scope and extent of supply / services.
- Cloud migration details.

Further, the Respondent is requested to submit details regarding its EDDMS project implementation and data migration experience.

9.7 SERVICE PROVIDER ACCREDITATION

The following information is required:

- If not a Vendor, the Respondent is required to provide proof of accreditation as a Vendor Partner and to describe which products and services are included in the Respondent's portfolio.
- Is your company currently able to provide all of the services, inclusive of the provision of licenses, maintenance and support services to achieve Eskom's stated business requirements ?
- Are you in a position to enter into Enterprise contracts on behalf of a Vendor ?

APPENDIX 1: BUSINESS REQUIREMENT SPECIFICATION

1. USE CASE DIAGRAM

The diagram below depicts an overview of the use cases for the Engineering Design and Document Management and Collaboration System (EDDMS)

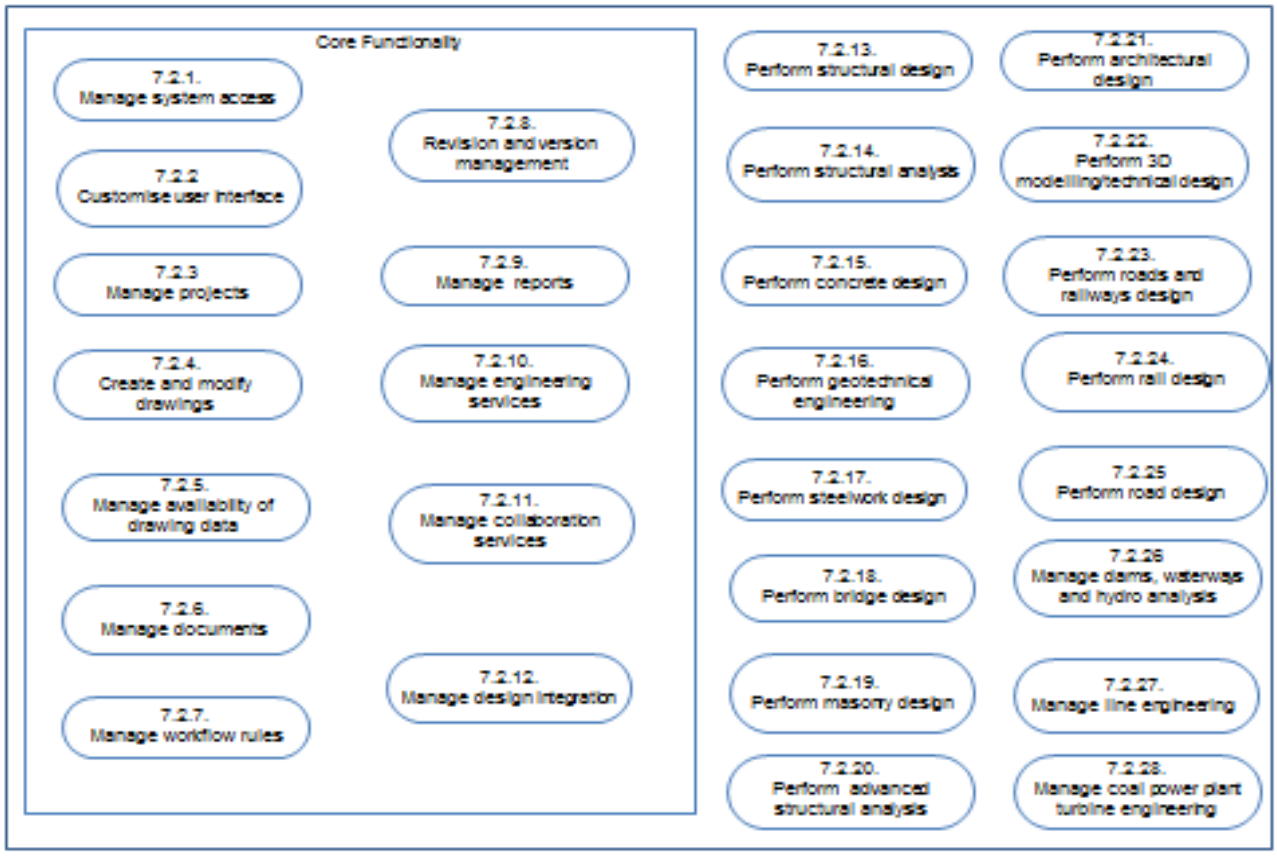

Figure 6: Overview of EDDMS Use Cases

HIGH-LEVEL USE CASE DESCRIPTIONS

BRS Nr	Functional grouping	Functionality
7.2.1.	Manage System Access	***Description of use case:*** Specify the security protocols for Eskom employees and third party access. Control and authenticate system access. Register end user and configure access profile on approved request received. System to be configurable to allow groups to have full rights (add/edit/view) to their data whilst providing other users with limited/ view only access. System to support a web interface for remote users to access the system. Enforce password management by mandatory password changes every 30 days.
7.2.2.	Customise user interface	***Description of use case:*** Customise the look and feel of the application as per end user preference. Save user preferred views as a template and enabled for use by different end users i.e. personal view vs public view.

BRS Nr	Functional grouping	Functionality
7.2.3.	Manage projects	***Description of use case:*** Create and maintain new project folders with supporting documentation. Configure project standard template folder. Each project shall only be created once the standard project template has been configured to cater for all disciplines.
7.2.4.	Create and modify drawings	***Description of use case:*** Create and modify 2D and 3D drawings. Import and remodel 2D and 3D scanned data. Convert images, share and distribute drawings by sending links of various files by email.
7.2.5.	Manage availability of drawing data	***Description of use case:*** Manage availability of drawing data by enabling multiple end users to access, edit, view, and store various data files and formats. Keep audit trail on any changes of drawing data and records as well as activity logs on the number of times a document is being accessed.
7.2.6.	Manage documents	***Description of use case:*** Register a new document. Compile, approve, save all related project documents. Keep all documents in a centralised database to prevent loss of data due to multiple data sources. Handle varying document sizes as configuration sizes are dependent on the tools being used.
7.2.7.	Manage workflow rules	***Description of use case:*** Capability to do custom workflow (workflow following any order and defined workflow). Capability for the system to allow required work flow to be configured and used as per related processes. This should include document management, engineering change management and stakeholder requirements management.
7.2.8.	Revision and version management	***Description of use case:*** Manage project documentation and information by applying check-out, check-in controls and revision/ version management on the relevant documents. Save document with new version/revision (latest version/revision of the document will become editable and previous version will stay readable). Notify document check-out/in status.
7.2.9.	Manage reports	***Description of use case:*** Create, customise and configure various reports as per end user requirements/needs. Publish, generate and save reports. Keep an audit trail on any changes of drawing data and records of the reports.
7.2.10.	Manage engineering services	***Description of use case:*** Access, view, share and save engineering application files. View engineering models and mark PDF's. Receive, send and manage transmittals and submittals. Report, manage and resolve engineering challenges. Collect, manage, view and approve engineering field data. Access and gain insight on past, current and future engineering performance
7.2.11.	Manage collaboration services	***Description of use case:*** Review and approve workflows. Check in/out design integration content. Collect data from engineering fields.
7.2.12.	Manage design integration	***Description of use case:*** Implement project delivery workflows. Integrate engineering applications. Automate title block generation. Manage dependencies, references drafting, modelling project and industry standards and work spaces.
7.2.13.	Perform structural design	Implement building information management (BIM) capability for building maintenance. Perform asset reliability management.

BRS Nr	Functional grouping	Functionality
7.2.14.	Perform structural analysis	***Description of use case:*** Perform 2D and 3D analysis. Create and analyse element types such as beam elements, plate, shell and membrane elements, composite and contact elements etc. Create and analyse material types such concrete, steel, timber aluminium and customised materials. Generate wind loading and automesh.
7.2.15.	Perform concrete design	***Description of use case:*** Design concrete member sections for flexure, axial, shear, torsion and deflection in accordance to South African National Standards (SANS) and Eurocode standards. Model reinforced concrete shapes such as concrete beams, columns, slabs, walls, spread footings, and continuous footings, all with parametric behaviour. Changes to the concrete shape cause the rebar to adjust automatically. Model complex reinforced concrete shapes, including curves, sloping, or non-orthogonal shapes.
7.2.16.	Perform geotechnical engineering	***Description of use case:*** Monitor rock performance and stability.
7.2.17.	Perform steel work design	***Description of use case:*** Produce drawings for all steel shapes, connections, and plate-work from the 3D model. Easily create comprehensive drawings including dimensions, notes, labels, and part lists. Any out-of-date drawings are automatically updated based on changes to the 3D model. Analyse custom sections, develop bill of materials/quantities and generate calculations reports, connection diagrams and engineering design sketches.
7.2.18.	Perform bridge design	***Description of use case:*** Create bridge modelling design, analyse bridge design, capture roadway geometry and topography, perform bridge clash detection, sequence construction and phasing.
7.2.19.	Perform masonry design	***Description of use case:*** Perform masonry design; generate calculation reports and bill of quantities.
7.2.20.	Perform advanced structural analysis	***Description of use case:*** Analyse effect of temperature loads, transfer heat between temperature conditions. Accurately determine the thermally induced stresses due to increase temperature conditions in bodies that are fully or partially restrained.
7.2.21.	Perform architectural design	***Description of use case:*** Adjust measurements and heights of floor slab, walls, windows, doors and roof tools. Generate schedules of doors and windows used in the drawing, generate schedules of floor areas, room numbers etc. and generate fenestration calculations.
7.2.22.	Perform 3D modelling/ technical design	***Description of use case:*** Create drawings including isometrics, Piping and Instrumentation Diagram (P&ID), machine and workshop drawings. Import reference data such as existing drawings, scanned documents and 3D point cloud data and incorporate current existing drawing formats to utilize the current standard drawing templates for border sheets and title blocks.
7.2.23.	Perform roads and railways design	***Description of use case:*** Design application for surveying, drainage and subsurface utilities.

BRS Nr	Functional grouping	Functionality
7.2.24.	Perform rail design	***Description of use case:*** Analyse rail track regressions – convert surveys of track data into full alignments by using a regression analysis. Design and analyse rail and road corridors and place rail signals. Integrate imagery, point clouds and 3D meshes into design and construction models. Design rail track drainage systems, design track geometry, yard, and station and rail overhead line systems.
7.2.25.	Perform road design	***Description of use case:*** Create horizontal and vertical alignments. Create road profiles and cross- sections. Design and analyse corridors. Model and analyse terrain, earthworks and complete water sanitary and sewer networks.
7.2.26.	Manage dams, waterways and hydro analysis	***Description of use case:*** Water distribution modelling and analysis. Allocate and estimate sanitary loads by applying hydrographs, patterned loads, and unit loads using comprehensive and customizable engineering libraries. Assessing consumption, flow monitoring, land use, or census data in GIS to automatically estimate and import sanitary loads into sewer models. Allocate and estimate storm water loads by loading models with wet weather runoff flows derived from precipitation using the built-in rainfall distributions or user-defined rainfall events. Analyse hydraulics and combined sewer overflows, hydrogen sulphide formation by identifying risk of damage from hydrogen sulphide (H2S) formation, which can lead to potential collapses if not addressed. Produce average concentration runs, display result maps of the network, and compare H2S formation according to various conditions such as temperature. Design and analyse low impact development controls, pond dams, sanitary sewer, and storm water system and simulate water quality by simulating the generation, inflow, and transportation and treatment of any number of user-defined pollutants, such as total suspended solids or heavy metals. Analyse flood inundation areas and flood hazard by easily calculating the extent of flooded areas and estimate the flood hazard based on water column heights and peak flow velocities.
7.2.27.	Manage line engineering	***Description of use case:*** Perform engineering design for substations such as: a. Protection Schemes b. Metering c. Substation layouts d. Earthing and grounding layouts e. Architectural drawings for control rooms f. Create 2D drawings for construction and substation electrical layout g. Create schematic drawings for control purposes h. Create graphs and simulations i. Civil design j. Structural design k. Stormwater management/hydrologic analysis/hydraulic structure design l. Drainage design to support water based fire protection systems m. Access road design Access attributes and selects design overhead lines in different voltages including survey, tower spotting line design, route selection, land surveying using line lidar visual, substations and other infrastructure. Manage maps by merging, operate diagrams, check fault level of the infrastructure and integrate plans and designs of the maps. Supports the creation, maintenance, analysis and sharing of 2D and 3D geospatial information and create contours

BRS Nr	Functional grouping	Functionality
7.2.28.	Manage coal power plant turbine engineering	***Description of use case:*** Condition monitoring diagnostics and collection of vibration signals for: a. Turbo machinery b. Hydro turbines and generators c. Wind turbines d. Reciprocating compressors e. Industrial gas turbines f. Aero derivative gas turbines g. Electric motors Design cadastral lines, roads and servitudes and use 2D and 3D tools.
7.2.29.	Migration management	***Description of use case:*** Provide migration toolset to import data from the current system to the new system. Capability for the audit trail for migration, errors, exception report and for fixing. Capability to allow the form rebuild for all current workflow.

Table 9: BRS Use Cases

2. DETAILED REQUIREMENTS

The Respondent is requested to provide the following statement of compliance related to each requirement stated below:

- Complies (no configuration required);
- Complies – requires configuration;
- Does not comply;
- Requirement is not clear (make and state your own assumptions).
- Repetition: where requirements are repeated – state this and refer to relevant first response.

Respondents are requested to provide detailed information to support their statement of compliance. Provide a reference in the "Reference to detailed information" column.

Notes:

- The information below is a record of requirements collated by various stakeholder groups. Some requirements are therefore repeated.
- Requirements are mostly grouped logically, but there are some instances where specific requirements belong to a different logical grouping.

2.1 BASELINE CAD

2.1.1 Create and modify drawings

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
Example	Example		X				Example - Main Presentation - Section 7.2.3
BRS4-D1	Capability to create 2D and 3D drawings.						
BRS4-D2	The solution should be able to do the following: o Search documents on metadata fields and index stored text data. o Utilize the existing metadata and not require re-work.						[EDMS requirement] [Migration requirement]
BRS4-D3	CAD drawings to have the following functionality: a) 2D line drawing b) 3D modelling c) Create 2D drawing from 3D mode d) CAD drone to reference background data such as raster e) Create contour lines from points, lidar, terrain etc f) Create/develop BOQ's or other specified material quantities from drawings.						

BRS4-D4	Capability to modify 2D and 3D drawings ○ Ability to incorporate current existing drawing formats to utilize the current standard drawing templates for border sheets and title blocks. ○ Ability to do design history tracking.						
BRS4-D5	Capability to import 2D and 3D scan data ○ Ability to import reference data such as existing drawings, scanned documents and 3Dpoint cloud data. ○ View and manipulate point-cloud data.						
BRS4-D6	Capability to remodel 2D and 3D scan data ○ Ability to do parametric 2D & 3D modelling driven by constraints formulas and spreadsheets (dimension driven design).						
BRS4-D7	Capability to create hyperlinks.						
BRS4-D8	Ability to arrange design, convert images, share and distribute drawings by sending links of various files by email						
BRS4-D9	Ability to bring in referenced views of 3D models into a 2D drawing/sheet.						
BRS4-D10	Ability to bring in reference data such as existing drawings, scanned documents and 3Dpoint cloud data						
BRS4-D11	Ability to generate Parts/Materials list table to insert on drawings or export to excel						
BRS4-D12	Ability to do design history tracking and version						
BRS4-D13	Ability to create catalogue cells e.g. South African National Standards (SANS) pipe fittings, structural members from spreadsheets.						
BRS4-D14	Capability to allow users create pre-defined macros.						
BRS4-D15	Ability to integrate seamlessly with Eskom's standard GIS systems and related infrastructure.						
BRS4-D16	Ability to do Finite Element Analysis (FEA) within the CAD model or provide capability to integrate to the existing one within the business.						
BRS4-D17	Ability for the system to automatically generate ISO expiration alerts.						
BRS4-D18	Ability to work with different file formats e.g. Reni diagrams.						File compatibility Reni is Eskom specific
BRS4-D19	Ability to produce high graphical definition a drawing using multiple documents sets that is consistently applied across the project.						[EDMS requirement]
BRS4-D20	Get a live view of the project status in sheet orientation. As the design changes, so will the sheets.						
BRS4-D21	Capability to edit directly in the design model and the application should update the sheets.						

BRS4-D22	Capability to auto populate cabling diagrams from key circuit diagrams (Control Plant Drawings).						
BRS4-D23	Ability to provide drawings which are compatible to the existing CAD system to allow users to view and edit the drawings. Should be fully integrated between the CAD system and the document management system.						

2.1.2 Baseline CAD - Perform 3D modelling / Technical Design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS23--W1	Capability to create and modify 2D and 3D drawings.						
BRS23—W2	Capability to import 3D scans data.						
BRS23—W3	Capability to remodel 3D scans data.						
BRS23—W4	Capability to create drawings including isometrics, Piping and Instrumentation Diagram (P&ID), machine and workshop drawings.						
BRS23—W5	Capability to modify element attributes including but not limited to: a. Line weights b. Colour c. Line style d. Transparency						
BRS23—W6	Capability to generate parts/materials list table to insert on drawings or export to excel.						
BRS23—W7	Capability to create property tags and populated business data.						
BRS23—W8	Capability to create catalogue cells e.g.; SANS pipe fittings, structural members from spreadsheets.						
BRS23—W9	Capability to do clash detection of hard objects, maintenance and clearance volumes.						
BRS23—W10	Capability to script macros to automate repetitive tasks.						
BRS23—W11	Capability to use geographic co-ordinate projection systems and synchronise with 3D representation of the earth based satellite imagery system.						
BRS23—W12	Capability to perform terrain modelling.						
BRS23—W13	Capability to have interoperability and be flexible to interface with other systems.						
BRS23—W14	Capability handle large 3D models with may consist of elements, surfaces, solids, smart solids, meshes, point clouds, raster's.						
BRS23—W15	Capability to perform 3D modelling and produce drawings to the level of detail design.						

BRS23—W16	Capability to integrate with Building Information Management (BIM).						
BRS23—W17	Capability to perform Finite Element Analysis (FEA) within the CAD model.						
BRS23—W18	Capability to direct free form modelling.						
BRS23—W19	Capability to convert images and pdf files to DGN and DWG and managing raster to vector.						
BRS23—W20	Capability for CAD work to be done in an integrated environment and to collaborate from different Eskom sites.						
BRS23—W21	Capability to have point cloud feature recondition (piping and structure).						
BRS23—W22	Capability to access and view Reni diagrams.						
BRS23—W23	Capability to view and edit single line diagrams and network diagrams.						
BRS23—W24	Capability to import 3D model into structural analysis software.						
BRS23—W25	Capability to perform 3D modelling and technical design.						
BRS23—W26	Capability to perform arrangement design.						
BRS23—W27	Capability to perform draughting 2D engineering drawings.						
BRS23—W28	Capability to generate process flow diagram.						

2.2 EDMS

2.2.1 Manage System Access

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS1-A1	Register a user.						
BRS1-A2	Configure user access profile • System administrator • Business administrator • Document controller • Project end users o Read only access o Edit user access o Draftsperson [Edit user + CAD access] o Web view access						
BRS1-A3	Inform user about access granted.						
BRS1-A4	Capability to activate /de-activate user account.						
BRS1-A5	Run and or print end user access reports.						
BRS1-A6	Access geometry requiring object enablers.						

2.2.2 Customise user interface

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS2-B1	Capability to create folders.						
BRS5-B2	Capability to customise pane view as per user preference.						
BRS2-B3	Save customised pane view to become part of selection list of views.						
BRS2-B4	Add shortcut to change view.						
BRS2-B5	Access view toolbar and allow user to select different view.						
BRS2-B6	Enable/ Disable document previous revision views.						

BRS2-B7	Enable/ Disable document attributes views: Ability to select document attributes such as: a.Unique ID b. Item no c. Legacy Filename d. Document title e. Document description f. Grid g. Substation name h. Bay i. Revision number j. Date						
BRS2-B8	View folder structure on different hierarchical levels across all business divisions in SAP. a. High level folders per Division b. Design base folders c. Installed plant as build lines folder overview which contains sub-folders for the various lines installed d. Substation folder overview e. Work in progress project folder f. Archived projects g. Project template overview contains standardised folders that can be copied when a new project is created. These folders are: ↳ Cross functional documents ↳ HV plant engineering ↳ Integration. ↳ Lines engineering ↳ Protection Telecommunication Metering & Control(PTM&C) ↳ Substation engineering ↳ Reference folders ↳ Power plant engineering ↳ Renewable power plant ↳ Perform geo- technical engineering ↳ Chemical engineering ↳ structures and buildings ↳ Roads and railways ↳ Dams waterways & hydro ↳ Coal power plant turbine and boiler ↳ Temporary space-unallocated folders.						
BRS2-B9	Capability to allow users to create folders according to their specific needs.						
BRS2-B10	Capability to integrate with current enterprise systems.						
BRS2-B11	Capability to aggregate, assemble and reference data of multiple types and formats.						
BRS2-B12	Import, open and reference Industry Foundation Class (IFC) files.						

2.2.3 Manage projects

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS3-C1	Capability to configure project standard template folder.						
BRS3-C2	Ability for the user to copy/paste existing standard project template folder for re-use.						
BRS3-C3	Capability to rename project and change project attributes.						
BRS3-C4	Capability to update and upload project folder with supporting documentation.						
BRS3-C5	Ability to allow versions of documents updated or uploaded.						
BRS3-C6	Search and view project documentation use an external viewer/portal such as CAD tools.						
BRS3-C7	Capability to archive project folder.						
BRS3-C8	The solution should have an embedded help function enabling first line support to end users.						
BRS3-C9	Capability to build asset life cycle.						
BRS3-C10	Capability to build project life cycle.						

2.2.4 Manage availability of drawing data

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS5-E1	Capability to search documents on metadata fields and index stored text data.						
BRS5-E2	Provide full search on attributes/metadata such as: a. Drawing number b. Description/Title c. Third party/contractor drawing number d. Contractor name e .Discipline e.g. civil, electrical f. Date archived g. Date modified h. Power Station name						
BRS5-E3	Bulk uploading of files by: a. drag and drop using selected allocated multiple files. b. Import multiple data files.						
BRS5-E4	User must be able to import and export documents to external files such as:						

	a. Design Files (DGN) b. Drawing Files(DWG) c. Drawing Exchange Format (DXF), d. Portable Document Format(PDF) e. Microsoft Excel File Extension(XLS) f. Microsoft Word file extension(DOC) g. Text (TXT) file h. Home Site Project(HSP) file i. Computer Aided Manufacturing (CAM) file j. Keyhole Markup Language(KML) and Keyhole Markup language Zipped(KMZ) k. Shapefile:*.shp l. Extensible Markup Language file(XML) m. Project Complete Management(PCMP) file n. Substation Configuration Description(SCD) o. Microsoft PowerPoint file Extension (PPT) p. Joint Photographic Experts Group (JPEG) 2000 q. Tagged Image File Format(TIFF) r. Universal3Dimension(U3D) s. Industry Foundation Class(IFC) t. Rhino 3DM u. Stereo Llithography (STL) v. Virtual Reality Modelling Language(VRML) world w. SketchUP Mechanical CAD file formats such as: x. Jump To File(JTF) open CAD file y. Initial Graphics Exchange Specification (IGES) z. Parasolid aa. ACIS bb. Standard ACIS Text(SAT) cc. Computer Graphics Metafile(CGM) dd. Standard for The Exchange of Product Data (STEP) Visualisation file formats such as: ee. 3DS ff. Wavefront 3D object file gg. Collaborative Design Activity (Collada) hh. Filmbox (FBX) Geospatial file formats such as: ii. Earth satellite imagery system KML jj. Environmental Systems Research Institute (Esri) files and geospatial PDF						
BRS5-E5	Capability to keep records of data fields linked to a document and drawing file.						
BRS5-E6	Ability to check-in and out of a document by editing, access audit trail records.						

BRS5-E7	Capability to allow switching between automatic and manual saving and set interval of automatic saving.						
BRS5-E8	Ability to recover saved drawings.						
BRS5-E9	Provide full automated audit trail traceability and able to view changes.						
BRS5-E10	Capability to apply standard or customised document protection rules.						
BRS5-E11	Capability to provide drawings status management as follows: A .Active drawings b. Archived drawings c. Saved drawings d. Check in/check out of drawings.						
BRS5-E12	Ensure digital security by: a. Controlling digital rights to view, edit, print and copy files and documents content b. Establishing pre-defined expiration dates for design files c. Confirming status and approvals using digital signatures.						
BRS5-E13	Provide viewing office documents without native application such as web browser.						
BRS5-E14	Enable remote printing and plotting.						
BRS5-E15	Enable automatic handling of reference files.						
BRS5-E16	Enable document linking by auto populating cabling diagram and control plant.						
BRS5-E17	Enable activity log by viewing the number of times the document is accessed.						
BRS5-E18	Provide web browser viewing and redlining functionality.						
BRS5-E19	Support simple and user friendly batch plot/prints including PDFs.						
BRS5-E20	Enable notifications and Messaging Application Program Interface (MAPI) compliance.						
BRS5-E21	Enable document viewing, publishing and linking.						
BRS5-E22	Ability to save and scan files to folders.						
BRS5-E23	Capability to add drawings that were modified offline.						
BRS5-E24	[Left blank intentionally]						
BRS5-E25	Capability for the user to be able to share and distribute CAD engineering drawings with the same reference.						
BRS5-E26	Capability to add and view new CAD drawings.						
BRS5-E27	User to be able to open multiple drawing files.						
BRS5-E28	User to have the ability to draw status report of drawings.						

2.2.5 Manage documents

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS6-F1	User to be able to: a. Create a new document number b. Register a new document number c. Compile the document d. Review the document e. Approve the document f. Publish the document g. Withdraw/archive/supersede document h. Search documents based on any metadata field or combination thereof.						
BRS6-F2	Ability to view, search, import and export documents.						
BRS6-F3	Capability for the system to handle varying document sizes as configuration sizes are dependent on the tools being used.						
BRS6-F4	Capability for the system to allow user defined numbering conventions to be implemented (this is to cater for different conventions used by different CoE).						
BRS6-F5	System to allow various documents and data types to be checked in into the system.						
BRS6-F6	Ability to keep all documents in a centralised database for all divisions to prevent loss of data due to multiple data sources which are not fully backed up.						
BRS6-F7	Ability to track changes on the document and other requests.						
BRS6-F8	System to allow documents to be searched based on any metadata field or combination thereof.						
BRS6-F9	Capability to modify document templates.						
BRS6-F10	Capability to access documents and folders available on the web browser.						
BRS6-F11	Capability to access documents, folders, workflow and control functions allowed per user role.						
BRS6-F12	Capability to have access to a group of documentation files linked to a specified folder e.g. a. Plant breakdown structure or project departments will have access control per folder and work flow.						
BRS6-F13	Capability to track documents as per the project number.						
BRS6-F14	Capability to create, track and manage transmittals and submittals.						
BRS6-F15	Capability to automatic archiving of previous documents and configurable by the administrator and end user.						

BRS6-F16	Ability to provide a full system audit trail to record actions of check in, check out documents and notifications. The following information logs to be kept: a. User details b. Date and time c. Action performed						
BRS6-F17	Maintain an error log for all system errors and retain these logs for at least 3 months.						
BRS6-F18	Provide compatibility to edit existing documents as currently supported by the CAD system.						
BRS6-F19	Capability for automatic file locking on check-out.						
BRS6-F20	Capability to manage records.						
BRS6-F21	Capability to perform digital asset management.						
BRS6-F22	Capability to perform digital rights management.						

2.2.6 Manage workflow rules

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS7- G1	Ability to create the work flow.						
BRS7-G2	Ability to manage the workflows.						
BRS7-G3	Capability to do parallel workflow activities.						
BRS7-G4	Manage project work flow and transmittals o Document controller configure/ issuing transmittal o End user receive transmittal notification by an e-mail o Acknowledge transmittal Respond and comment on transmittal.						
BRS7-G5	Capability to do custom workflow (Workflow following any order and defined workflow). Capability for the system to allow required work flow to be configured and used as per related processes. This should include document management, engineering change management and stakeholder requirements management.						
BRS7-G6	Capability to categorise workflows into collections and including a search bar to quickly locate them by name.						
BRS7-G7	Ability to assign people to specific activities.						
BRS7-G8	Ability to send notifications via email or push notifications to remind of upcoming approvals.						

BRS7-G9	Track details, history and audit trails activity regarding specific tasks.						
BRS7-G10	Ability to re-assign/redirect the workflow activity.						
BRS7-G11	Modified documents need to be checked in by the user in order for the most recent changes to be made available to all users and allow other users to make changes, if required.						
BRS7-G12	Capability to review and approve workflows.						
BRS7-G13	Capability to implement project delivery workflows.						
BRS7-G14	Provide authorization workflow management as per delegation of authority.						

2.2.7 Revision and version management

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS8-H1	Search and open existing document identified for editing.						
BRS8-H2	Capability to check out the document.						
BRS8-H3	Capability to apply changes to the document.						
BRS8-H4	Capability to save the document with the new version number adding comments to the changes applied and check-in the document.						
BRS8-H5	Delete active version and select any versions.						
BRS8-H6	Notification messaging with an e – mail for functions such as: a. New revision b. Workflow state changes						
BRS8-H7	Ability to check the document back into the server and allow other users to open the document for editing.						
BRS8-H8	The system to send an email notification to: a. Remind the user to check in the document, after a specified period of time, usually about a week; b. Notify the responsible party that the document has not been checked in, after the maximum time period has expired. In most cases escalation should happen if the document has been checked out for over a week, however in the case of working directories the time period will be daily; c. All affected users when a new / updated configuration is loaded onto the system; and d. Inform all people involved in a project, when there is an update in						

	any of the related project documents.						
BRS8-H9	Protect drawings to prevent two changes to happen on the same version.						

2.2.8 Manage reports

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS9-I1	Capability to create standard reports.						
BRS9-I2	The solution should allow users to customise or configure reports as per user defined needs.						
BRS9-I3	Ability to publish publicly /privately web based reports on the system and local PC.						
BRS9-I4	Generate standard reports on pre-defined frequencies.						
BRS9-I5	Download and save reports on local PC.						
BRS9-I6	The following reports are required: a. Weekly reports, indicating all the documents that are checked out, how long it has been checked out, name of the person who has check out the document by and any comments added. b. A dashboard overview of all documents flagged as being edited; along with its high-level status. i.e. within allocated time / overdue / escalated. c. A dashboard overview of all documents that are flagged as being checked out for edited, versus the allocated user. d. A design base completeness report, which indicates what documents are missing, per as-built folder, against a predefined required documents checklist.						

2.2.9 Manage engineering services

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS10-J1	Capability to share and save files.						
BRS10-J2	Capability to access, view, share and save engineering application files.						
BRS10-J3	Ability to view engineering models and mark PDF's.						
BRS10-J4	Capability to receive, send and manage transmittals and submittals.						
BRS10-J5	Capability to report, manage and resolve engineering challenges.						
BRS10-J6	Capability to collect, manages, view and approve engineering field data.						
BRS10-J7	Capability to access and gain insight on past, current and future engineering performance.						

2.2.10 Manage collaboration services

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS11-K1	Capability to access or and read-only to design integration content.						
BRS11-K2	Capability to check in/out with design integration content.						
BRS11-K3	Capability to collect data from engineering fields.						
BRS11-K4	Capability to collect data from engineering fields.						

2.2.11 Manage design integration

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS12-L1	Capability to integrate engineering applications.						
BRS12-L2	Capability to automate title block generation.						
BRS12-L3	Capability to manage dependencies and references.						

BRS12-L4	Capability to manage drafting, modelling project and industry standards.						
BRS12-L5	Capability to manage workspaces						
BRS12-L6	Capability to create and manage specifications.						
BRS12-L7	Capability to leverage delta file transfer and caching.						

2.3 SPECIALISED ENGINEERING DESIGN

2.3.1 Perform structural design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS13-M1	Capability to implement building information management (BIM) capability for building maintenance.						
BRS13-M2	Capability to perform asset reliability management						

2.3.2 Perform structural analysis

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS14-N1	Capability to perform the following types of analysis in 2D and 3D: a. Linear Analysis b. P-Delta/ Second order analysis c. Non-linear analysis d. Buckling analysis e. Dynamic analysis (Modal, seismic, harmonic). f. Response spectra analysis g. Time history analysis h. Creep analysis i. Shrinkage analysis j. Fatigue analysis k. Pushover analysis						
BRS14-N2	Ability to create and analyse the following element types: a. Beam elements (Straight, and curved and tapered) b. Plate, shell and membrane elements c. Plane stress and plane strain elements d. Solid and tetrahedral elements e. Contact elements f. Composite elements g. Cable elements h. Library of standard sections profiles in SA						
BRS14-N3	Capability to create and analyse the following material types: a. Concrete b. Steel c. Timber d. Aluminium e. Customised materials						

BRS14-N4	Capability for interactive model generation.						
BRS14-N5	Capability to generate automesh.						
BRS14-N6	Capability to select profiles from the South African section profile database.						
BRS14-N7	Capability to custom section input.						
BRS14-N8	Capability to analyse a general section property.						
BRS14-N9	Capability to generate wind loading.						
BRS14-N10	Capability to automatically generate design envelopes (Bending, Shear, Torsion).						
BRS14-N11	Capability to import architectural drawing/models to develop 3D structural models for analysis and later be used for relevant designs.						
BRS14-N12	Capability to export design loads/stresses to design modules.						
BRS14-N13	Capability to assigned spring supports and prescribed displacements.						
BRS14-N14	Capability to release nodes in any degree of freedom and to vary stiffness at nodes.						
BRS14-N15	Capability to analyse the structure in accordance with SANS and Eurocode loading codes for seismic and wind actions to structure.						
BRS14-N16	Capability for a CAD integrated modelling environment that provides bidirectional, direct and associative interfaces which allow the user to alter the design parameters or dimensioning without needing to reapply loads, supports or re-specify boundary conditions.						
BRS14-N17	Capability to allow the user to modify dimensions of a structure, without requiring remodelling the structure. a. The user can use native CAD geometry directly, without requiring translation of intermediate geometry formats. b. The model is not built up from elementary nodal level by the user, but instead the program uses a 3D CAD model to generate elements as required.						

2.3.3 Perform advanced structural analysis

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information

BRS21-U1	The advanced structural analysis software/program further has the following functionality: a. Ability to analyse effect of temperature loads, b. Ability to transfer heat between elements exposed to different temperature conditions. c. Ability to accurately determine the thermally induced stresses due to increase temperature conditions in bodies that are fully or partially restrained.						
BRS21-U2	Capability to perform load analysis of loose or partially connected bodies contained in a structure subjected to non-linear and non-static loads, a. For example seismic load analysis of water or solids containing structure, such as load imposed onto structure from coal in a silo during a seismic event.						
BRS21-U3	Capability to exercise parameter and dimensioning control a. The user can create attributes and parameters with the CAD system that is directly used to generate the FEA model, meshing or analysis. i.e. the user can create a parameter for the diameter of a cylinder. If this diameter is revised, the user can then update this parameter, whereby the FEA model is automatically updated accordingly and all relationships to the cylinder is maintained/not broken.						
BRS21-U4	Capability to perform automatic merging of nodes when meshing complex shapes that meet/coincide, where no intervention is required from the user to align nodes between the converging shapes.						
BRS21-U5	Capability to generate boundary conditions between structures' surfaces that are disjointed and that may collide, slide, slip or press against each other, with frictional forces accounted for and where the one body can impose a load onto and deform the adjacent body. Examples include modelling of friction grip bolted connections, pretensioning, slide bearings and contact modelling.						
BRS21-U6	Capability to model loads as functional loads.						

BRS21-U7	Capability to analyse machine block foundation for dynamic loading, including rotating and reciprocating machines and soil spring options.						
BRS21-U8	Capability to perform in-depth analysis review using dynamic graphs and detailed formulae in reports.						

2.3.4 Perform concrete design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS15-O1	Capability to perform the concrete member design of beams, slabs, columns, foundations, retaining walls and pile caps.						
BRS15-O2	Capability to perform crack width (bending and thermal) design.						
BRS15-O3	Capability to perform punching shear design.						
BRS15-O4	Capability to perform pre-stressed member design.						
BRS15-O5	Capability to perform a custom section design.						
	Capability to design concrete member sections for flexure, axial, shear, torsion and deflection in accordance to SANS and Eurocode standards.						
BRS15-O6	Capability to model reinforced concrete shapes such as concrete beams, columns, slabs, walls, spread footings, and continuous footings, all with parametric behaviour. Changes to the concrete shape cause the rebar to adjust automatically.						
BRS15-O7	Capability to model complex reinforced concrete shapes, including curves, sloping, or non-orthogonal shapes.						
BRS15-O8	Capability to generate calculation reports.						
BRS15-O9	Capability to generate engineering sketches.						
BRS15-O10	Develop bending schedules.						
BRS15-O11	Capability to generate Bill of Materials, which includes quantities, cut lengths, member profiles.						
BRS15-O12	Capability to interface with analysis model.						

BRS15-O13	Capability to produce rebar placing drawings, including sections, plans, details, bar bending schedules, material take-offs and beam/column/footing schedules, all based on the 3D model.						

2.3.5 Perform geotechnical engineering

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS16-P1	Capability to monitor rock performance and stability.						

2.3.6 Perform steelwork design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS17-Q1	Capability to perform steelwork design.						
BRS18-R1	Capability to perform the following design checks: a. Cross and longitudinal bending b. Shear c. Axial force d. Torsion e. Combined bending, shear, axial force and torsion f. Interaction check for different conditions.						
BRS18-R2	Capability to analyse members exposed to elevated temperatures.						
BRS18-R3	Capability to analyse deflection.						
BRS18-R4	Capability to perform crane gantry girder analysis and design.						
BRS18-R5	Capability to design in accordance with: a. SANS 10162-1 and 2, b. Eurocodes 1, 2 and 3 c. British Standard						
BRS18-R6	Capability to perform connection design, which includes the following as minimum: a. Using member forces extracted from the analytical model b. Allow for custom loading c. Base plate design						

	d. Beam column connections (pinned and fixed) design e. Fin plate design f. End plate (pinned and fixed) design g. Haunch connection design h. Bracing connections design i. Welding design j. Beam /Column splice connections design k. Gusset plates design l. Double angle web cleats design						
BRS18-R7	Capability to develop bill of materials/bill of quantities.						
BRS18-R8	Capability to analyse custom sections.						
BRS18-R9	Generate calculation reports, including connection diagrams.						
BRS18-R10	Generate engineering design sketches.						
BRS18-R11	Capability to interface with analysis model.						
BRS18-R12	Capability to create layouts/ legend showing allocated connection and member names/ groups.						
BRS18-R13	Capability to produce drawings for all steel shapes, connections, and plate-work from the 3D model. Easily create comprehensive drawings including dimensions, notes, labels, and part lists. Any out-of-date drawings are automatically updated based on changes to the 3D model.						

2.3.7 Perform bridge design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS19-S1	Capability to perform bridge modelling.						
BRS19-S2	Capability to do analysis for bridge design.						
BRS19-S3	Capability to capture roadway geometry and topography.						
BRS19-S4	Capability to design and analyse concrete and steel bridges.						
BRS19-S5	Capability to generate detail reports.						
BRS19-S6	Capability to create 3D and 2D drawings for sections, elevations plans.						

BRS19-S7	Capability to develop detail rebar schedules, quantities and drawings using the ability to integrate with structures software.						
BRS19-S8	Capability to perform bridge clash detection.						
BRS19-S9	Capability to perform sequence construction and phasing.						

2.3.8 Perform masonry design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS20-T1	Capability to perform masonry design.						
BRS20-T2	Capability to generate calculation reports.						
BRS20-T3	Capability to generate design sketches.						
BRS20-T4	Capability to generate Bill of Quantities.						
BRS20-T5	Capability to design of the following for all loading types incl. live, dead, seismic, wind, explosion/ blast forces: a. Stiffened and unstiffened single-leaf and cavity walls; b. Variable support conditions, including partially fixed; c. Switch between design codes (SANS, Eurocodes and British Standards) to compare results; d. Concentrated vertical load analysis and design; e. Add lateral line loads at any point on the wall; f. Load bearing and infill wall panels; g. Opening span direction options; h. Piers in tension or compression; i. In-plane loads for shear walls; j. Include multiple wind posts; k. Masonry walls and columns.						

2.3.9 Perform architectural design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS22-V1	Capability to have a built in 3D rendering option and have an ability to be export or plugin to other 3D rendering programs						
BRS22-V2	Capability to have tools (floor slab tool, wall tool, windows and doors tool, roof tool) these tools should allow the user to adjust measurements (heights, widths etc.) without having to draw every single line of each component in a model space.						
BRS22-V3	Capability for all tools to be able to show different finishes for walls, windows, doors, floors and roofs, these are important for the concept phase where 3D modelling is done, it becomes easier for every discipline to see what exactly a building being presented by an Architect is going to look like.						
BRS22-V4	Capability to generate schedules of doors and windows used in the drawing.						
BRS22-V5	Capability to generate schedules of floor areas, room numbers etc.						
BRS22-V6	Capability to generate fenestration calculations.						

2.3.10 Perform roads and railways design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS24-X1	Capability for user to design application for surveying, drainage, subsurface and utilities.						

2.3.11 Perform rail design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS25-Y1	Capability to analyse rail track regressions – convert surveys of track data into full alignments by using a regression analysis.						
BRS25-Y2	Capability for automated rail drawing.						
BRS25-Y3	Capability to automate rail drawing production, including profiles and cross sections.						
BRS25-Y4	Capability for design and analyse rail and road corridors.						
BRS25-Y5	Capability to design and place rail signals.						
BRS25-Y6	Capability for design modelling – ability to easily integrate imagery, point clouds and 3D meshes into design and construction models.						
BRS25-Y7	Capability to design rail track drainage systems and geometry.						
BRS25-Y8	Capability to design yard, station, and siding.						
BRS25-Y9	Capability to design rail overhead line systems.						
BRS25-Y10	Capability to reuse common design layouts.						

2.3.12 Perform road design

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS26-Z1	Capability to create horizontal and vertical alignments.						
BRS26-Z2	Capability to create profiles and cross-sections.						
BRS26-Z3	Capability to design and analyse corridors.						
BRS26-Z4	Capability to design in context – by easily integrating traditional survey, imagery, point clouds, and 3D reality meshes into design and construction models.						
BRS26-Z5	Capability to model and analyse terrain.						

BRS26-Z6	Capability to model, analyse and design complete storm water and sanitary sewer networks.						
BRS26-Z7	Capability to model earthworks.						
BRS26-Z8	Capability to reuse common design layouts.						
BRS26-Z9	Capability to perform road way design.						

2.3.13 Manage dams, waterways and hydro analysis

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS27-AA1	Capability to perform water distribution modelling and analysis.						
BRS27-AA2	Capability to allocate and estimate sanitary loads by**:** a. Applying hydrographs, patterned loads, and unit loads using comprehensive and customizable engineering libraries. b. Assessing consumption, flow monitoring, land use, or census data in GIS to automatically estimate and import sanitary loads into sewer models.						
BRS27-AA3	Capability to allocate and estimate storm water loads by: a. Loading models with wet weather runoff flows derived from precipitation using the built-in rainfall distributions or user-defined rainfall events. b. Computing appropriate runoff methods.						
BRS27-AA4	Analyse hydraulics and combined sewer overflows: Multiple solvers analysing: Saint Venant equations, convex/gradually varied flow solver (steady-state analysis for extreme flow conditions and extended period simulations), and rational/gradually varied flow solver.						

BRS27-AA5	Capability to analyse Hydrogen Sulphide Formation a. Identify at risk of damage networks from hydrogen sulphide (H2S) formation, which can lead to potential collapses if not addressed. b. Produce average concentration runs, display result maps of the network, and compare H2S formation according to various conditions such as temperature.						
BRS27-AA6	Capability to analyse inlet capacities by: a. Calculating the proportion of storm water runoff that will enter an inlet versus the proportion that will be carried downstream in a gutter or pond on the road surface. b. Accurately confirming that the spread of flow in a gutter doesn't exceed design requirements.						
BRS27-AA7	Capability to build and manage hydraulic models by: Leveraging and importing many well-known external data formats, this maximizes ROI (Return on Investment) on geospatial and engineering data and automates input data generation.						
BRS27-AA8	Capability to design and analyse culverts by: Selecting from a library of standard culvert shapes, materials, and entrance conditions, then compute culvert headwater and tailwater elevations using calculation methodologies outlined in South African National Roads Agency(SANRAL) drainage manual and other appropriate literature						
BRS27-AA9	Capability to design and analyse low impact development controls by: Modelling the effect that low impact development controls have in retaining runoff before it enters the storm water system.						
BRS27-AA10	Capability to design and analyse pond dams, inlets and outlets by: Setting the maximum outflow rate, estimate storage, and check the outlet design and final design						

BRS27-AA11	Capability to design sanitary sewers by: a. Minimizing capital investments by entering design restrictions: velocities, slopes, cover depths, and pipe and manhole matching offsets. b. Recommending the most cost-effective pipe sizes and inverts elevations, avoiding unnecessary pipe trench excavation, while meeting design restrictions.						
BRS27-AA12	Capability to design storm water system by: Minimizing capital investments by entering design restrictions: velocities, slopes, cover depths, and pipe and inlet matching offsets. The software product recommends the most cost-effective pipe sizes and invert elevations, avoiding unnecessary pipe trench excavation, while meeting design restrictions.						
BRS27-AA13	Capability to simulate water quality by**:** Simulating the generation, inflow, and transportation and treatment of any number of user-defined pollutants, such as total suspended solids or heavy metals.						
BRS27-AA14	Capability to design and analyse culverts by: Selecting from a library of standard culvert shapes, materials, and entrance conditions, then compute culvert headwater and tailwater elevations using calculation methodologies outlined in SANRAL Drainage Manual and other appropriate literature.						
BRS27-AA15	Capability to interpret and present modelling results by: Viewing detailed tables, reports, rating curves, and more, that show results of the hydraulic calculations performed.						
BRS27-AA16	Capability to add real-world digital context and visualization by: a. Assessing flood risks for urban, riverine, and coastal systems with real-world digital context in the form of a 3D reality mesh from Context Capture. b. Bring simulations to life by generating realistic						

	visualizations of flood events helping stakeholders understand the risks and impacts of flooding events and potential mitigation actions.						
BRS27-AA17	Capability to analyse flood inundation areas and flood hazard by: Easily calculating the extent of flooded areas and estimate the flood hazard based on water column heights and peak flow velocities						
BRS27-AA18	Capability to produce visually appealing animations by: Exploring and present model results using a wide range of integrated visualization capabilities, including the option to make smooth, continuous animations of the obtained results.						
BRS27-AA19	Capability to set up scenario management by: Creating new scenarios and make comparisons among different alternatives which allows rapidly find the best solution for flood risk mitigation.						
BRS27-AA20	Capability to simulate river flows by: a. Calculating river flow using kinematic, dynamic, and diffusion wave approaches. b. Simulating the exchange of water between the river flow and (sub) surface flow based on hydraulic gradients and contains capabilities to estimate the drainage network from topographic maps and to interpolate cross sections in space.						
BRS27-AA21	Capability to simulate surface runoff by: a. Multiple methods to route surface runoff, including kinematic, dynamic, and diffusion wave approaches, using a fully distributed 2D grid with an optional 1D grid. Water from surface runoff can infiltrate, enter into a river, or evaporate. b. Containing capabilities to prepare spatial data required to calculate surface runoff. For example, the application estimates manning's coefficients from land use maps.						

BRS27-AA22	Capability to simulate urban/rural floods by: Simulating flooding in urban/rural areas by integrating capabilities, fully evaluate the flow of water in the piped subsurface network, river and coastal systems, the surface flow, and the exchange of water between all those systems.						
BRS27-AA23	Capability to work in a visual rich environment by: Integrating GIS engine that allows: open, edit, and visualize all kinds of data files that the model needs. Layers can be styled in multiple ways.						
BRS27-AA24	Capability to analyse transients by: Controlling transients by performing a transient analysis to locate trouble spots and determine appropriate surge control strategies. Precise transient simulation to decrease the risk of approximating the behaviour of protective devices and rotating equipment (pumps and turbines).						
BRS27-AA25	Capability to analyse pipe and valve criticality by: Finding the weak links in water distribution systems and assess the adequacy of isolation valves. Evaluate the ability to isolate portions of the system and serve customers using different valve locations. Automatically generate network segments once the isolation valve data is supplied.						
BRS27-AA26	Capability to assess fire flow capacity by: Using a water distribution hydraulic model to access and identify where fire protection is inadequate. Design improvements such as the sizing and location of pipes, pumps, and tanks in order to meet fire-flow and protection requirements.						

BRS27-AA27	Capability to design water distribution systems by: Using a hydraulic model results to help optimize the design of complex water distribution systems and utilize built-in scenario management features to keep track of design alternatives. Optimize the design.						
BRS27-AA28	Capability to develop flushing plans by: Optimizing flushing programs with multiple conventional and unidirectional flushing events in a single run.						
BRS27-AA29	Capability to increase velocity in mains to flush out solids and stale water, with the primary indicator of the success of flushing being the maximum velocity achieved in any pipe during the flushing operation.						
BRS27-AA30	Capability to identify water loss by: Conserving water and increase revenues by reducing water loss. Leverage flow and pressure data to find locations for detailed sonic leak detection.						
BRS27-AA31	Capability to study the amount by which one can expect to reduce leakage by reducing pressure and see the impact on customer service.						
BRS27-AA32	Capability to manage energy use by: Modelling pumps accurately using hydraulic modelling, including complex pump combinations and variable speed pumps, to understand the impact that different pump operational strategies have on energy usage.						
BRS27-AA33	Capability to minimize energy related to pumping costs while maximizing system performance.						
BRS27-AA34	Capability to prioritize pipe renewal by: Identifying the pipes that should be considered for replacement or repair. Pipe links are ranked based on several aspects, including property- and performance-based criteria. Benefits that result include improved asset planning, increased distribution capacity, and maximum returns on capital expenditures.						

BRS27-AA35	Capability to simulate networks in real time by: Connecting calibrated hydraulic models to Supervisory Control and Data Acquisition (SCADA) systems so that the initial boundary conditions for the model are automatically updated with the latest real-time data.						
BRS27-AA36	Capability to use the real-time model to keep an eye on the system and help ensure it is operating effectively.						
BRS27-AA37	Capability to create project deliverables by: a. Generating consistent, high-quality deliverables such as paper plots, reports, 2D/3D PDFs, i-models, and 3D physical models. b. Creating annotation, display styles, and reports directly from the embedded properties of objects to ensure that they will always remain in sync with the design model during work-in-progress.						
BRS27-AA38	Capability to design in context by: a. Clearly understanding existing conditions and accelerates design modelling workflows with the ability to easily integrate imagery, point clouds, and 3D reality meshes into design and construction models. b. Integrate geospatial information to ensure that models are precisely geospatially located.						
BRS27-AA39	Capability to design with 3D parametric modelling by: a. Developing complex design models with a wide range of design modelling tools, including surface, mesh, feature, and solid modelling. b. Building parametric functional components with predefined variations to easily find and manage many similar components. c. Using drawing extraction tools which automatically immerse drawings within models for improved clarity and streamlined documentation workflows.						

BRS27-AA40	Capability to enforce standards by: a. Ensuring the proper application of organizational and project-specific standards and content. b. Applying templates to control geometry and data standards such as styles for dimensions, text, lines, detail symbols, and more. Once designs are complete, use automated tools to check drawings for standards compliance. Discover how one can manage design changes and drawing standards, and control and protect files.						
BRS27-AA41	Capability to lay out and annotate drawings by a. Creating precise drawings using a comprehensive set of drafting tools to rapidly progress designs from concept to completion. b. Using persistent constraints to maintain design intent and speed drafting and annotation workflows with intelligent, interactive snapping and dynamic data entry.						
BRS27-AA42	Capability to produce animations and renderings a. Secure stakeholder confidence by producing realistic movies and simulations from design, construction, and operational models. Choose from key frame and time-based animation. b. Get results faster, using live on-screen animation previews and distributed network processing. Create lifelike visualizations and access online and delivered libraries of physically correct materials, lighting, and rich photorealistic content.						
BRS27-AA43	Capability to visualize and analyse designs: a. Understand designs more clearly by analysing and performing data visualizations on models based on their geometry or underlying attributes. b. Perform analysis of real-world solar exposure and shading.						

	c. Apply real-time display styles to visualize models based on each object's height, slope, aspect angle, and other embedded properties. d. Visualize reality meshes based on associated spatial and attribute data.						
BRS27-AA44	Capability to work collaboratively on designs by: a. Viewing and working with design information from others in real time using live referencing of 2D and 3D DGN, DWG, and large image files, refreshed on demand. b. Creating and exchanging digital mark-ups of designs. c. Tracking and easily understand changes made to design files, even at the component-level, throughout their lifecycle. d. Improve enterprise-wide collaboration through integration.						
BRS27-AA45	Capability to work in a personalized environment a. Confidently work in the right context for each project with the required settings and standards automatically applied. Instantly get help and achieve mastery with access to a comprehensive library of learning content. b. Personalize and group tools and tasks and reduce keystrokes with customizable menus.						
BRS27-AA46	Capability to access manufactured components by: a. Accessing cloud services enabling faster access and more consistent use of manufactured components and organization or project-specific content and standards. b. Use the parametric components in specific applications and industries across multidiscipline project teams, while supporting knowledge sharing between personnel and enabling the persistence of component information across the asset lifecycle.						

BRS27-AA47	Capability to automate the production of high-quality drawings, including multidiscipline documentation sets, which are consistent across the entire project.						
BRS27-AA48	Capability to conceptualize and detail site designs by: a. Creating, revising, and optimizing multiple design scenarios for commercial, industrial projects. b. Conceptualize and detail design features using auto-drawing capabilities and interactive 3D modelling.						
BRS27-AA49	Capability to integrate multidiscipline models in site designs by: Ensuring models represent all project information by incorporating site designs, drainage, driveways, buildings, and other site features. Import models to readily view the model holistically in the proposed environment.						
BRS27-AA50	Capability to model, analyse, and design complete storm water and sanitary sewer networks by: a. Creating, manipulating, designing, and analysing storm water and sewer networks that are fully integrated with civil infrastructure project. b. Manipulating networks in plan or profile views, displaying not only the drainage model but also other utilities.						
BRS27-AA51	Capability to optimize earthwork by: Employing a highly advanced optimization engine for earthwork allowing designers to quickly and easily explore alternatives. Solver to run thousands of iterations based on designer-defined constraints for each site layout to find the best cost of construction. Differing design scenarios can be evaluated, design changes can be implemented, and critical grading elements such as walls and berms can be dynamically evaluated for cost.						
BRS27-AA52	Capability to optimize site layout by a. Simplifying site layouts with designer-defined parametric drawing capabilities of parking lots,						

	buildings, drives, and walkways. Intelligent site layout offers iterative and dynamic interaction of key design components across the project, dramatically speeding up the design process and allowing designers to focus on engineering and efficiency. b. Design changes, whether exploring alternatives or addressing client feedback, are fast and easy due to the dynamic interaction of elements. c. Re-position buildings, modify parking areas, and add drives and walks all while evaluating the results and responding to project stakeholder feedback.						
BRS27-AA53	Capability to perform design-time analysis by: Ensuring visibility into overall project performance with design-time analytics to achieve optimized design outcomes for a wide variety of analysis such as drainage, terrain, safety, grading, site visibility, and more.						
BRS27-AA54	Capability to reuse common design layouts by: Using civil cells to ensure standards are implemented, increase design quality, and eliminate the need to repeatedly design common configurations. If a user can design it, then a civil cell can handle it. There is no limit to the simplicity or complexity of a civil cell.						
BRS27-AA55	Capability to support BIM workflows by: Exporting digital deliverables, including Industry Foundation Class (IFC), to support industry BIM workflows. Use Asset Manager to include component attribution for a more efficient, data-rich BIM deliverable. Advance your BIM workflows in a digital twin authoring environment while supporting the creation of all traditional and digital design deliverables.						

BRS27-AA56	Capability to visualise designs by: a. Experiencing designs in real time with constraint-driven templates, a context sensitive intuitive interface, and dynamic 3D modelling. b. Visualizing the design at any time and on demand within the modelling workflow. No translations, software, or special workflow process is needed.						

2.3.14 Manage line engineering

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS28-BB1	Capability to evaluate, isolate portions of the system and serve customers using different valve locations. Automatically generate network segments once the isolation valve data is supplied.						
BRS28-BB2	Capability to manipulate networks in plan or profile views, displaying not only the drainage model but also other utilities.						
BRS28-BB3	Capability to perform engineering design for substations such as: a. Protection Schemes b. Metering c. Substation layouts d. Earthing and grounding layouts e. Architectural drawings for control rooms f. Create 2D drawings for construction and substation electrical layout g. Create schematic drawings for control purposes h. Create graphs and simulations i. Civil design j. Structural design k. Stormwater management/hydrologic analysis/hydraulic structure design l. Drainage design to support water based fire protection systems m. Access road design.						

BRS28-BB4	Capability for user to be able to access attributes and selects design, complex overhead lines in different voltages including: a. Survey b. Tower spotting- line design- c. Route selection d. Substations and other infrastructure						
BRS28-BB5	Capability to design land surveying using line lidar visual.						
BRS28-BB6	Capability to create 3D substation models and 2D drawings: a. Design substation physical layout b. Design substation protection and control c. Estimate substation materials d. Generate substation construction deliverables.						
BRS28-BB7	Capability to design structures and export PLS CAD files						
BRS28-BB8	Capability to design of access roads in and around substations/sites.						
BRS28-BB9	Capability to exchange intelligent CAD information by exporting and importing attribute data shape files.						
BRS28-BB10	Capability for Geographic Information System (GIS) interoperability (ability of computer system or software to exchange and make use of information)- creation and analysis of 2D and 3D models.						
BRS28-BB11	Capability to allow user to be able to perform the following: a. Specification of plant equipment b. Design of safety and working clearances c. Design of foundation, structures and busbars d. Design of lightning shielding systems. e. Design of utilities for the substation. f. Design of cabling systems.						
BRS28-BB12	Capability for the user to mark and count occupied stands for electrification projects.						
BRS28-BB13	Capability to export data to a geospatial software application displays a virtual globe which offers the ability to analyse and capture geographical data to see if stands are aligned.						
BRS28-BB14	Capability for control diagram and plant protection schematics, power plant substation, electrical, mechanical, architectural and civil design.						
BRS28-BB15	Capability to view all multiple files from other package version files						
BRS28-BB16	Capability for terrain modelling and raster files.						

BRS28-BB17	Capability to design cadastral lines, roads and servitudes.						
BRS28-BB18	Capability to manage maps by: a. Merging maps b. Integrating plans and designs c. Operate diagrams d. Check fault level of the infrastructure.						
BRS28-BB19	Capability to support the creation, maintenance, analysis and sharing of 2D and 3D geospatial information and create contours.						

2.3.15 Manage coal power plant turbine engineering

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS29-CC1	Capability for condition monitoring diagnostics and collection of vibration signals for: a. Turbo machinery b. Hydro turbines and generators c. Wind turbines d. Reciprocating compressors e. Industrial gas turbines f. Aero derivative gas turbines g. Electric motors.						
BRS29-CC2	Capability to use 2D and 3D tools.						
BRS29-CC3	Capability for Standard for the Exchange of Product (STP) files compatibility. It is a usable interfacing file type used between different programs.						
BRS29-CC4	Control and Instrumentation(C&I) design database for creating models that links, panel arrangement drawings, cross-reference drawings, automated diagram.						

2.4 MIGRATION

BRS Number	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
BRS30-DD1	Provide migration toolset to import data from the current system to the new system.						
BRS30-DD2	Capability for the audit trail for migration, errors, exception report and for fixing.						
BRS30-DD3	Capability to allow the form rebuild for all current workflow.						

2.5 INFORMATION / DATA REQUIREMENTS

2.5.1 Define the following information:

Classification of data / information	Data / Information type	Confidentiality of information (refer to previous page for quick reference)	Confidentiality level of information (refer to previous page for quick reference)	Availability of data	Migration of data
Operational, governance and legislative requirements	↳ Structural data ↳ Process mechanical & piping ↳ Instrumentation data ↳ Electrical data ↳ Building data ↳ Drafting and deliverables ↳ Construction and commissioning data ↳ Visualisation data ↳ Project collaboration & document management data ↳ Asset management & performance data ↳ Site and structure design data ↳ Data analysis	Controlled disclosure	High	24/7/365	Data Migration is required for all EDDMS suite applications All data required to migrate from the current Eskom configuration to the cloud based version

2.6 REPORTING REQUIREMENTS [BRS §8]

2.6.1 High level reporting requirements [BRS §8.1]

High level reporting requirements in number form.

	Report Name	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
RR1	Standard report set	Weekly report reports indicating: a. all the documents that are checked out b. how long the document has been checked out c. name of the person checked out the document and any comments added.						
RR2	Dashboard reports	Overview report of all documents flagged as being edited, along with its high level status i.e. within allocated time/overdue/escalated. Overview of all documents that are flagged checked out for editing versus documents allocated per user.						
RR3	Design completeness report	Design completeness report which indicates what documents are missing per as built folder against a predefined document check list.						
RR4	Audit trail report	Audit trail report on any changes to drawing data and records						
RR5	Activity log report	To report on the number of times a document is accessed and what changes were effected						

2.7 SYSTEM REQUIREMENTS [BRS §7.4]

Requirement Name	Functionality	Complies	Complies – with configuration	Does not comply	Not clear	Repetition	Reference to Respondent's detailed information
Assets	Capability to have 11 DMS servers to be decentralised country wide at remote sites with their own database instances and files. There are +- 2TB of files per site (+-20TB). Estimated 8,000 000 dgn CAD files (proprietary format). Capability for the database data and files to be in a controlled secured environment which keeps records of the physical files with versions, attached metadata, workflows, audit trail and access rights. Capability for the data assets to be transferrable without losing any part of the data. Capability to support +- 2000 active users in Eskom using the current CAD systems.						
CAD	CAD common capability and compatibility with DMS, Cloud and Web services. Capability to be compatible to: • reference files, • workspace files, • access rights • and • CAD software platform dgn v8i and • i-model file formats. Capability to keep files in a native format which is in .dgn v8i format. Capability to publish .dgn v8i files to i-model file format for cloud & web services. Capability to publish all other files to pdf format for web view users.						

	Capability to interface with databases.						
Specialised integrated CAD applications	Capability to integrate with third party applications from various integrated vendors such as: • Power System Simulation Tool- Engineering design lines • Project Design Costing Tool- • NIS- GIS • uCheetah- Engineering design lines • Terra Solid- Civil extension functionality						
Customised integrated added CAD applications and work space files	Capability to interface directly with the following customised integrated added software which requires the same functionality when replacing the existing system: • MS Access databases (mdb) including XLS & text files • Custom Macros(+- 100 programs) • CAD software platform Visual Basic for Applications(VBA) (+- 20 programs) • CAD software platform Model Development Language(MDL) programs(+-20 programs) • Cell libraries(+-500 lib's) Capability to convert the following custom workspace files to be compatible : +- 1500 font libraries +- 1500 seed files +- 1500 line styles +-1500 colour tables +- 1500 pen tables +- 1500 print/plot drivers						
DMS system integrated with CAD	Capability to integrate with CAD reference files vector (dgn) & raster (tif, ecw, etc). Capability to be compatible with the current suite of engineering project collaboration software designed for the architecture engineering, construction industries:						

	Metadata functionality Version history functionality Audit trail and history functionality Numbering system functionality which has customised specialised data per site Workflow status functionality which has customised specialised data per site. Require the following mandatory technology functionality: Delta file transfer (DFT) with SQL encryption and compression. Database indexing contents of DMS which access the native CAD vector data text information inside. AD security setup Spatial data integration						
Cloud and Web services	Capability for control over design, deliverables and the users working on the design. Common capability and shared service across desktop, mobile, server and cloud. Capability to access personal learning material, paths and history. Capability to receive, notifications and product related news. Capability for project centric analysis and dashboards. Capability for personal sharing using i-model file format. Capability to manage user rights, document rights, version controls, audit history records and metadata. Capability to work offline without internet connection.(software is localised, therefore create or check-out files beforehand and when online, check-in the files).						

	Capability for the project information to be stored using encrypted data sent and stored in the Eskom approved cloud platform.						
Data migration	Capability for the current +-8 million files in native format .dgn v8i files to be compatible to the CAD software platform. Require the reference links of the current CAD software .dgn v8i master files including nesting referencing. Capability for data migration of the following information: • Metadata • Version history system information • Audit trail history • Numbering system • Workflow and status information. Estimated timeframe of the system setup and configurations. Estimated timeframe of data migrations which include: • Data mapping • Data cleaning • Data transfer migration • Data verification • User Acceptance Testing(AUT)						
Infrastructure	The DMS system should be hosted close at each site using file or caching servers for maximum speed performance but should also be available centralised (Cloud and Web services) for other regions. Each remote site should have database instances preferably MS Sql Server. CAD and specialised extension software should be packaged using Microsoft (MS) System Centre Configuration Manager (SCCM).						

System performance	System performance variables such as file size, network performance.						
Geospatial content	Capability to support GIS principles such as Open Geospatial Consortium (OGC), exchange and use of GIS metadata.						