

**C3: SCOPE OF SERVICES**

**C3.1 Employer's objectives**

This tender is for:

A Service Provider performing specialist Civil Engineering and Geo-Professional services for the project:

**DRMS PHASE IVA: EMERGENCY INVESTIGATIONS IN SUPPORT OF THE DOLOMITE RISK MANAGEMENT STRATEGY (DRMS) FOR THE NATIONAL DEPARTMENT OF PUBLIC WORKS.**

**C3.2 Description of the Services**

**C3.2.1 Services**

This contract is for the execution of a project with the title: **DRMS PHASE IVA: EMERGENCY INVESTIGATIONS IN SUPPORT OF THE DOLOMITE RISK MANAGEMENT STRATEGY (DRMS) FOR THE NATIONAL DEPARTMENT OF PUBLIC WORKS**, which comprises the primary and secondary objectives described hereunder.

The **primary objective** of this contract is to perform/execute, upon the WO instruction issued by the PM, any of the following work(s) and/or activities:

- i) Investigate Ground Hazard Incidents (GHI), some of which may be tagged as Emergency Event Incidents (EEI).
- ii) Perform various types/classes of Emergency Dolomite Stability Investigations (DSI's).
- iii) Undertake/execute specialist Dolomite Risk aversion/mitigation assignments
- iv) Provide professional and additional support services by assisting the Department's Dolomite Risk Manager (DRM), as, when and where required.

Any of the above items i) to iv) may occur at or apply to any of the Department's owned, leased or prospective, i.e. yet to be acquired, sites/properties, which is underlain by dolomite formation, anywhere in the Republic of South Africa.

Unstable ground conditions associated with dolomitic land typically result in the formation of sinkhole(s) or ground subsidence(s). For the purpose of this contract, when the aforementioned phenomena manifests/occur, such incidents are referred to as Ground Hazard Incident(s) (GHI). Such events are typically reported by the PM to the Service Provider, and once reported, a quick response time is required from the Service Provider, to first and foremost ensure the safety of people at the locality of the incident, and to secondly, recommend practical mitigating measures aimed at the prevention of damage to fixed assets such as buildings, facilities and water borne underground services/infrastructure. Whenever the PM refers to a reported GHI incident as an "EMERGENCY EVENT INCIDENT" (EEI), all actions following thereafter shall be performed on the basis of immediate attendance, where "TIME IS OF THE ESSENCE".

The **secondary objective** of this contract is to systematically record, both electronically and by hard copy, all gathered information, data and reports, to industry acceptable standards/norms, to enhance and further populate the Department's Dolomite GIS database.

**Important Note:**

The Department may in certain instances issue a WO instruction(s) to the Service Provider to perform/render services within the scope of this contract on a non-dolomite site/property at the tendered rates anywhere in the Republic of South Africa.

- i) Shallow Geotechnical Investigations
- ii) Exploration and drilling for underground water sources (including Geohydrological studies)
- iii) Additional assignment services as detailed in Clause C2.1.4.5 and

- iv) Any other service(s) as provided for in the priced activity schedules within the scope of the contract.

### **C3.2.2 PROJECT DESCRIPTION**

#### **C3.2.2.1 Scope**

In general, Services required are indicated as either **OUTCOME BASED SERVICES** or **TIME AND COST BASED FEES SERVICES**, which comprises Specified Outcomes, in accordance with specifications/ requirements set out in C3.

##### **C3.2.2.1 A) OUTCOMES BASED SERVICES:**

A1) The Department's PM may, at any time during this contract, instruct the Service Provider by WO to undertake unplanned Emergency Dolomite Stability Investigation(s) of any site/property owned or identified for lease or purchase by the Department, as and when the need is identified, all to specifications/requirements detailed in this contract.

A2) Dolomite Stability Investigation(s) and Water Auditing Initiative Services typically requires various activities and travelling to have the identified dolomite site(s)/property(ies) appropriately investigated, anywhere in the dolomite affected provinces of the Republic of South Africa, the size/extent of land and distance to such locality being unknown at the time of tender. Due to such unknown particulars pertaining to the yet-to-be-identified sites/properties, remuneration for required investigation and reporting Services, such as travelling costs, travelling time, disbursements, sundry costs, etc., are required to be tendered at all inclusive rates in C2.2.2 (Bill #1, Bill #2 and Bill #3) Services, in accordance with specified requirements/principles set out in C2.1, read in conjunction with C3.

A3) For the purpose of this contract, all work/activities required for Site-Specific Dolomite Stability Investigations shall be regarded to be foreseeable/predictable, as "run-of-the-mill" type work, which infers over-all responsibility upon the Service Provider to take control of and demand over planning/execution activities, by ultimately rendering Specified Outcomes, at all inclusive tendered rates.

**Important:** All Dolomite Stability Investigations shall be reviewed by a solicited and retained independent external experienced Senior Peer reviewer (Dolomite land), the costs of which shall be deemed all inclusive in the Service Provider's tendered rates in C 2.2.3 ( Bill#2, Bill#4 and Bill #5)

##### **C3.2.2.1 B) TIME AND COST BASED FEES SERVICES:**

B1) For the duration of this contract, the PM may at any time (24/7/365) instruct the Service Provider by WO to investigate and report on Ground Hazard Incidents (GHI) and Emergency Event Incidents (EEI). Such EEI's and/or GHI's instructed to be investigated, shall be performed upon receipt of a written Works Order (WO), which work/travelling costs will be remunerated at all inclusive tendered Time and Cost Based Fees rate(s). Due to such unknown particulars pertaining to the yet-to-be-identified sites/properties, remuneration for travelling costs, travelling time, disbursements, sundry expenses, etc., requires of the tendering Service Provider to tender all inclusive rates in C2.2.3 (Bill #3, Bill #4 and Bill #5) for such as required Services, which shall be performed in accordance with Specified Outcomes requirements/principles set out in C2.1 and read in conjunction with C3.

B2) Additional Time and Fees Based Cost Services may be instructed by the PM by WO to the Service Provider, the detail of which is described and measured separately.

**Important:** All types of Dolomite Stability Investigations shall be reviewed by a retained independent experienced Senior Peer reviewer (Dolomite land), the costs of which shall be deemed all inclusive in the Service Provider's tendered rates in C 2.2.3 ( Bill#2, Bill#4 and Bill #5)

**C3.2.2.1 C) GENERAL REQUIREMENTS IN RESPECT OF SPECIFIED OUTCOMES CONCERNING ANY TYPE/CLASS OF DOLOMITE STABILITY INVESTIGATION:**

**C1)** WO's issued by the PM to the Service Provider shall generally be performed as either Outcomes Based Services or Time and Cost Based Fees Services, the Specified Outcomes of which shall in principle conform to the basic requirements contained the Department's standard Dolomite reference manual titled: "PW 344 (LATEST VERSION): APPROPRIATE DEVELOPMENT OF INFRASTRUCTURE ON DOLOMITE: MANUAL FOR CONSULTANTS, a copy of which is available as referenced in ANNEXURE 1 (at the back of this tender document), which must be read in conjunction with SANS 1936 (2012) parts 1 to 4.

**C2)** The final "product" required to be prepared/submitted by the Service Provider, representing the Specified Outcome of instructed WO's, albeit performed under Outcomes Based Services or Time and Cost Based Fees Services, shall amongst others culminate in stand-alone formal tangible reports, to a standard acceptable to the PM. This includes, where required and/or instructed, an assessment of the Inherent Hazard Characterization of the investigated site/property, the Land Utilization report, the Dolomite Area Designation, the DSC or FDSI and the Dolomite the Risk Management Plan (DRMP).

In the case of work done when investigating EE's or GHI's, such reports must, in sufficient detail, describe and display by means of photographs and diagrams, all pertinent features/detail about the case investigated, complete with recommendations, cost estimate, actions required to be attended, etc.

**C3)** Tendering Service Providers shall take note of the fact that the Department currently utilizes the "ARC"-suite of GIS computer software programmes and it is a **compulsory** requirement of this contract that all information presented to the Department must be 100% compatible with the Department's currently utilized computer software programs

**C4) IMPORTANT: DOCUMENTATION PRECEDENCE:** Should there be any discrepancies between this Tender Document and the aforementioned DPW dolomite manual (PW 344 (LATEST VERSION)), the former shall take precedence. Should there be any deviations/discrepancies between the DPW dolomite manual (PW 344 (LATEST VERSION)) and SANS 1936, the latter takes precedence.

**C3.2.2.2 Location of the Project**

The location of this project is at any of the yet to be identified sites owned, leased or considered to be procured by the National Department of Public Works, in any of the dolomite affected provinces in the Republic of South Africa.

The dolomite affected provinces are Gauteng, Mpumalanga, Limpopo, North West, Northern Cape and a small fragment within the Free State.

Sites/properties/facilities due to be investigated/attended includes for a wide variety of different types/uses by different client Departments of the National Department of Public Works, such as, but not limited thereto, the South African Police Services (SAPS), the Department of Defence (DOD), the Department of Correctional Services (DCS), Border Control Centres (BCOCC), Department of Justice (DOJ), etc. .

A list of municipalities and magisterial districts, where dolomite feature, are identified and contained in PW 344 (LATEST VERSION).

**Important Note:**

The Department may in certain instances issue a WO instruction(s) to the Service Provider to perform/render services within the scope of this contract on a non-dolomite site/property at the tendered rates anywhere in the Republic of South Africa.

**C3.2.2.3 Project Cost Estimate**

The project cost estimate will not be disclosed.

**C3.2.2.4 Project Programme:**

**C3.2.2.4.1 Contract Period:**

The contract period is 3 (three) years, effective from the date of formal contract award.

**C3.2.2.4.2 Time of the Essence:**

It is a particular contract requirement that when a WO is issued to the Service Provider, that it be treated on the basis of "Time is of the Essence", whether the WO is about to be performed as Outcomes Based Services or Time and Cost Based Fees Services.

The Service Provider's performance (i.e. execution time(s)) under this contract, are required to be performed in "least time possible" to deliver upon project milestone events/dates. See Items C3.2.2.4.3 A), B), C) and D) hereunder, which must be read with C1.2.2, clause 3.15.

**C3.2.2.4.3 Project Milestone Target Dates:**

**A) General Requirements: Determination of "Generic" Program Target Dates for Pre-defined Milestone Activities:**

A1) The Service Provider and the PM shall engage, on a fair, reasonable and mutual consensus basis, within 10 working days of notification of contract award, come to an agreement about generic program milestone target dates for pre-defined milestone events/activities associated with the type/class and complexity of work required to be performed under this contract. See also C1.2.2, clause 3.15.

A2) Generic WO milestone target dates, such as are to be agreed upon by consensus between the PM and the Project Principal, shall become contractually binding & enforceable, with penalties to be applied for late completion of WO's, albeit for Outcomes Based Services or Time and Cost Based Fees Services. See C3.2.2.4.4 for details.

A3) WO's shall be performed by the persons listed as Key Persons and persons under their supervision and further executed as described in the Programme according to clause 3.15 of the Contract Data (C1.2.2) and the approved final PEP, in accordance with said clause.

A4) PEP's must be prepared and formally submitted by the Service Provider and such must give a clear indication of when and which Key Persons (listed in the schedule) are to be engaged/deployed against issued WO's involving either Outcomes Based Services or Time and Cost Based Fees Services as the basis for remuneration.

A5) The Service Provider's final approved PEP must provide a separate detailed generic methodology, complete with milestone events (critical path activities), should there be a valid and motivated reason for deviating from milestone event/dates specified for:

- a) GHI investigations
- b) EEI investigations
- c) Various types of Emergency Dolomite Stability Investigations
- d) Water Auditing Initiative investigations
- e) Additional Services
- f) Review of WO's by Independent Peer reviewer.

**B) Time and Cost Based Fees Services: Investigation of GHI's:**

B1) GHI's shall be attended by the Service Provider, upon having received an instruction from the PM (albeit verbal or in writing), by mobilizing and reaching the site of the incident within 72 (seventy two) hours.

B2) The Service Provider's designated Key Person shall attend to all necessary and required site related actions/activities/evacuation order etc., at the site of the WO instructed GHI.

B3) Reference shall be made to C2.1.2.21.4 and C3.3.2 (GHI Services enabling requirements) and C3.3.5 (GHI Services particular requirements), when instructed by the PM by WO to attend GHI events

B4) The Service Provider shall prepare/submit a GHI report to the PM, complete with a record of actions taken/instructed to safeguard the lives of people and/or protecting fixed assets. Such written report must reach the PM within 72 (seventy two) hours of the date of the WO instruction/notification.

B5) Late completion of any WO instructed GHI shall attract penalties per C3.2.2.4.4 A) – Case 1.

**C) Time and Cost Based Fees Services: Investigation of EEI's:**

C1) EEI's shall be attended by the Service Provider with due diligence and expedience upon having received an instruction from the PM (albeit verbal or in writing), by mobilizing and reaching the site of the incident within 24 (twenty four) hours.

C2) The Service Provider's designated Key Person shall attend to all necessary and required site related actions/ activities/evacuation order etc., at the site of the WO instructed EEI.

C3) The Service Provider shall prepare/submit an EEI report to the PM, complete with a record of actions taken/instructed to safeguard the lives of people and/or protecting fixed assets. Such written report must reach the PM within 72 (seventy two) hours of the date of the WO instruction/notification.

C4) Reference shall be made to C2.1.2.21.4 and C3.3.2 (EEI Services enabling requirements) and C3.3.5 (EEI services particular requirements) when instructed by the PM by WO to attend EEI events.

C5) Late completion of any WO instructed EEI shall attract penalties per C3.2.2.4.4 A) – Case 1.

**D) Outcome Based Services: Emergency Dolomite Site/Property Investigations:**

D1) The Service Provider shall attend WO instructions issued by the PM to perform Outcomes Based Services for Emergency Dolomite Stability Investigations in accordance with C3.3.2, C3.3.2.1, C3.3.2.2, C3.3.2.3, measured under Bill #2.1, #2.2 and #2.3 Services.

D2) The Service Provider shall attend to and render complete all activities, per each WO instructed, complete with sign off by the external Peer reviewer, within 7 (seven) to 10 (ten) weeks of the date of the formal instruction (depending on the size and scope of work described in the WO specific PEP).

D3) All requisite Specified Outcomes shall be submitted complete, within the time frame recorded, to reporting standards specified. See also requirements per C3.2.3.

D4) Failure to comply with the requirements/provisions (delayed or lateness) for Outcomes Based Services (Bill #2.1, Bill #2.2 or Bill #2.3 Services) shall attract penalties as detailed in C3.2.2.4.4 B) - CASE 2

**E) Outcomes Based Services: Water Auditing Initiative:**

E1) The Service Provider shall attend WO instructions issued by the PM to perform Outcomes Based Services by attending one or more identified WAI site/property.

E2) Reference shall be made to specifications/requirements in C 3.3.3, measured under Bill #3 Services.

E3) Water Auditing Properties (WAP) instructed by WO to be investigated/attended by the Service Provider, shall be performed as instructed by the PM.

E4) The Service Provider shall perform WO instructed Outcome Based Services with due diligence, according to agreed pre-determined Specified Outcomes, within time frame allowances mutually and formally agreed to in writing between the PM and the Project Principal. The Service Provider shall make available Key Persons relevant to the scope of the assignment, complete with requisite resources, to meet and deliver upon the Specified Outcome(s), which must be formalized/approved by the PM, within 5 (five) working days of referral.

E5) Failure by the Service Provider to timeously perform requisite activities (see C3.3.3.6) and render WAI Outcome Based Services, shall attract penalties detailed in C3.2.2.4.4 C), CASE 3.

F) Additional Time Based Fees Services:

F1) The Service Provider shall attend WO instructions issued by the PM which requires additional Time Based Services by Key Persons described in see C2.1.4.5, undertaken in accordance requirements specified in C3.2.3.9 B).

F2) The Service Provider shall diligently prepare and submit a WO specific PEP for such Time Based Fees Services, which must include program particulars and costing in accordance with rates tendered in Bill #5 Services.

F3) The additional Time Based Fees Service WO specific PEP shall be submitted by the Service Provider within 10 (ten) working days of the date of the WO instruction issued by the PM.

F4) Failure by the Service Provider to timeously perform and render Time Based Fees Services instructed by the PM shall attract penalties detailed in C3.2.2.4.4 C), CASE 3 such additional Services, in accordance with tendered rates in Bill#5. Said information shall be included in the PEP submitted by the Service Provider to the PM for consideration and approval. Lateness by the Service Provider in rendering such services shall attract as per C3.2.2.4.4 C) – CASE 3.

#### **C3.2.2.4.4 Penalties for Late Completion of Target Milestone Dates:**

Should any of the Specified Outcomes required from either Outcome Based Services or any Time Based Fees Services referred to in C3.2.2.4.3 be submitted late, the Department shall apply penalties for non-compliance as follows:

**A) CASE 1: Target Milestone Dates for Performing EEI's and GHI's:**

The Service Provider shall attend to WO instructed Emergency Event Incidents (EEI) and/or Ground Hazard Incidents (GHI) on dolomite land, anywhere in South Africa. See C3.2.2.4.3 B) and C)

The penalty applicable for not meeting Case 1: Target Milestone Dates for EEI and GHI events shall be R3000,00 per calendar day beyond the respective specified times (e.g. 24 hours for EEI's and 72 hours for GHI's).

Note 1: The PM is obliged to specify at the onset whether an instructed WO case shall be attended to as an EEI or a GHI. The Service Provider is required to diligently attend the WO specific incident.

Note 2: The date on which specified requirements are met, constitutes fulfilment of the Service Provider's obligations.

Note 3: It is an implied obligation under this contract for the Service Provider to facilitate and ensure that Bill #4 work is timely performed for WO's instructed to be undertaken by Key Persons (i.e. Bill #5 Time and Cost Based Fees Services). Failure to deliver Outcome Based Services within specified target milestone times, will attract CASE 3 penalties as per in C2.2.4.4 C), sub-item C2) hereunder.

**B) CASE 2: Target Milestone Dates for Performing Emergency Dolomite Stability site/property Investigations:**

Unsatisfactory and/or late submission of Emergency Dolomite Stability Investigation (DSI) report(s) (i.e. to Specified Outcomes requirements, complete with signoff by peer reviewer), beyond the Generic Time Frame period established and reflected upon in C3.2.2.4.3 D), unless circumstances differ substantially from a typical DSI, in which case the time frame period submitted/agreed upon between the PM and the Project Principal in a sub-level PEP shall apply. The penalty for late delivery shall be R1000,00 per working day, for any WO instructed Site/Property investigation.

**C) CASE 3: Target Milestone Dates for Performing WAI Services and/or Additional Time Based Fees Services:**

C1) Unsatisfactory reporting and/or late performance concerning WAI Services instructed by WO, with milestone target dates (formalized in negotiated consensus between PM and Project Principal), will attract penalties (which may be recurrent on a monthly basis), as readings must be taken and reported monthly. See C3.3.3.6 for penalty particulars.

C2) Unsatisfactory reporting and/or late performance of WO instructed Additional Time Based Fees Services (with the time frame formalized in negotiated consensus between PM and Project Principal per the approved relevant PEP), will attract a penalty of R2000,00 per working day, up to a maximum of R15,000 per instructed WO.

**D) Penalty rules:**

- i) Penalties become due as and when applicable, and shall be deducted from Certified interim Service Provider payment certificate accounts.
- ii) A penalty applied does attract VAT.
- iii) Applied penalties by the Department will be deemed to be final.

**Note:** Working days, in the determination of penalties referred to above, specifically exclude Saturdays, Sundays and Public holidays.

**C3.2.2.5. Information Available from the Department of Public Works:**

Various sample reports will be on display, at the compulsory tender clarification meeting, for study/review by Tendering Service Providers. These documents in principle set the minimum standard/format/content, to which WO Specified Outcomes, albeit Outcomes Based Services or Time and Cost Based Fees Services must be produced. See C5.3 for examples of Specified Outcomes.

The successful Service Provider will, upon award of the contract, be permitted restricted\*\* access to property specific records/reports of previously completed investigations/ assignments, such having been executed during previous DRMS phases I, II and IIIA contracts.

Discretion in the aforementioned access vests with the PM, namely to either avail or not to avail relevant available information from its GIS database to the Service Provider.

**Note\*\*:** Unrestricted access by the Service Provider to the Department's GIS database will under no circumstances be allowed, whether for viewing/copying/duplicating reasons.

**C3.2.2.6. Other Contracts and/or Disturbances on State Owned Dolomite Affected Properties/Sites:**

The Service Provider must acquaint himself with and plan for any and all site specific conditions before setting out to perform site related activity/works. The list of activities noted hereunder amongst others records some activities which may influence/jeopardize planned activities, albeit for sites scheduled for new investigation(s), follow-on investigation(s), Emergency Event(s) Incident (EEI) investigations or Ground Hazard Incident (GHI) investigations.

The Service Provider is alerted to the fact that no monetary claims will be entertained by the Department for whatever reason of delay/disruption, as it is required of the Service Provider to have made his own pro-active prior arrangements with official(s) in charge and/or responsible for management at the specific site or facility/property, which is due for investigation, covering amongst others the following:

- Security and/or accessibility problems/delays
- Standing time (which may be the result of or caused by unforeseen events/circumstances)
- Execution of other (contract) works on site, whether performed by the Department or "own works" initiated by the user-client
- Adverse weather conditions
- Site specific operational commitments (for example shooting/combating arrangements)
- Restrictive movement protocols (related to people/equipment), imposed by the relevant client user Department, such as at air fields
- Fruitless expense(s) incurred by the Service Provider, irrespective of cause/nature

### **C3.2.3 Compliance Requirements Performing WO Instructions:**

#### **C3.2.3.1 Emergency Dolomite Incident Investigations:**

##### **A) Generic Investigation and Reporting Requirements:**

A1) The following applies to all WO instructed Emergency Dolomite Incident Investigations, albeit for Outcomes Based Services (e.g. various types/class of Dolomite Stability Investigations) or Time and Cost Based Fees Services (e.g. GHI's or EEI's).

A2) The Service Provider shall render Specified Outcomes for various types of Emergency Dolomite Stability Investigation(s), requirements of which particular type/class shall be instructed by the PM in the relevant WO. The Specified Outcome shall culminate in the preparation and submission of standalone reports in accordance with specified requirements.

A3) Percussion boreholes shall be drilled and a driller's log prepared in accordance with SANS 633. Logging shall be carried out in accordance with SANS 633 by a competent person.

A4) Whenever the independent external senior Competent Person (Dolomite land) (i.e. the Peer Reviewer), recommends additional geophysical and/or exploratory percussion boreholes are required, on any site, such further work must be appropriately coordinated with other work of the Service Provider to minimize the impact of additional cost(s). Additional requirements of the peer reviewer must be reduced to writing and such must be formalized for the attention of the PM for consideration/approval. Upon approval, the PM will issue an additional WO instruction to the Service Provider. Such additional work instructed by the PM will be compensated at tendered all inclusive Time and Cost Based Fees Services rates.

**A5) Should the supervising on-site Geologist deem it appropriate and necessary to have additional borehole(s) drilled, while the drilling team is on a particular site, such drilling may be done on condition that such request be verbally motivated by the Project Principal to the PM (or his delegated representative), which verbal acceptance by the PM must be reduced to writing to reach the PM not later than 10 working days after the request was submitted/granted. Payment for such work will be permitted on the basis as an extension of on-site works, at all inclusive Time and Cost Based Fees Services Rates.**

A6) All dolomite exploratory boreholes drilled in execution of any written instructed WO, albeit for Outcomes Based Services or Time and Cost Based Fees Services, shall be attended to and backfilled for the full depth (bottom to top) depth of the borehole, to specified particular requirements/specifications contained in **ANNEXURE 2: ENGINEERING GEOLOGICAL SERVICE: EXPLORATORY GEOTECHNICAL DRILLING "PARTICULAR SPECIFICATION (PS): EXPLORATORY DRILLING FOR ENGINEERING GEOLOGICAL INVESTIGATION.**

Important: Specified requirements noted herein are deemed included in tendered rates for drilling of boreholes.



**B) Particular Reporting Requirements:**

B1) Tendering Service Providers will be afforded an opportunity, at the compulsory tender clarification meeting, to study sample documents/reports (i.e. work previously performed under the DRMS II, IIIB and IV contracts), depicting an **acceptable standard** to DPW with regards to quality, format, content and layout pertaining to Emergency Dolomite Stability Investigations performed at site(s)/property(ies) and/or Emergency Dolomite instability incidents investigated. Type reports/drawings/documentation shall be prepared for each WO, as required/applicable, including amongst others, at least the following aspects deemed relevant to the cause:

- Peer reviewed Dolomite Stability Investigation (DSI) report, complete with Dolomite Status Certificate (DSC), (when required);
- Dolomite Hazard Rating of the site/property investigated
- Determination of Dolomite Area Designation(s)
- Land Use Recommendations
- Detailed site layout (drawing)
- Dolomite Risk Management Plan (DRMP)
- Emergency Event Incident (EEI) report
- Dolomite Hazard Incident (GHI) report

B2) Examples of available best practice reports, depicting the norm of qualifying as an **acceptable standard** to the Department, are listed in Annexure C5.3. These are to be made available for review by prospective Tenderers' during the compulsory tender clarification meeting.

B3) First time sample document(s) (reports/drawings, etc.) must be submitted by the Service Provider to the PM, for comment/acceptance/approval, the outcome of which is intended to set and agree upon an acceptable standard for this contract (with reference to format/content /substance), to which further WO Specified Outcomes, as a minimum requirement, must comply.

B4) Sub-standard work will not be accepted by the Department. Such work will be rejected/returned and will not be certified for payment.

B5) The abovementioned requirement(s) does not alleviate the Service Provider from his/her professional liability for work submitted to the Department.

**C) Measurement and Payment:**

Tendered rates, to enable the Service Provider to meet and comply with Specified Outcomes requirements, both for Outcomes Based Services and Time and Cost Based Fees Services shall be deemed to be inclusive of meticulously attending to all specified requirements referenced in C3.2.3.1 A) and B) above and shall be deemed included in tendered Rates..

**C3.2.3.2 Service Provider to make Provision for own Reputable/Auditable Quality Assurance System/ Program:**

**A) Generic Quality Assurance Compliance Requirements:**

**A 1)** Tendering Service Providers are to price for an all-inclusive contract requirement, namely to allow and include for a two pronged approach to achieve Quality Control (QC) objectives.

**A 2)** The first QC objective/program is the establishment of a disciplined auditable system of "internal self-control", which purpose it shall be to track, via a formal paper trail, the Service Provider's own (internal) work(s)/activities. The QC objective intended shall at least resemble basic minimum requirements specified for a SABS ISO 9001 (SANS 9001) program.

**A 3)** The second QC objective/program requires of the Service Provider to source/engage/retain a suitably qualified seasoned and well experienced senior external independent Competent Person (Dolomite land), to conduct peer reviews on all WO's involving geological / geotechnical / geophysical and geo-hydrological input/outcomes, which must be attended to under this contract, albeit for work done on instructed Outcomes Based Services or Time and Cost Based Fees Services.

**A 4)** It is a particular and explicit requirement of this contract, that no Specified Outcome (read report(s)) shall be presented to the Department, which has not been peer reviewed and visibly signed off (to indicate compliance to this requirement) by the designated/appointed Peer Reviewer, complete with the date and his/her name legibly noted and signed off.

#### **C3.2.3.2 B1) Internal Quality Assurance Program**

**B1.1** The Service Provider shall be responsible to design and implement a reputable/auditable Quality Assurance system/program, which must amongst others, be the subject of internal specialist professional scrutiny, before presenting same to the Department for review/comment/acceptance.

Note 1: The abovementioned requirement does not replace the external peer review mechanism and it will be advantageous should the Tendering Service Provider already have SABS ISO 9001 (SANS 9001) accreditation. See also C2.1.2.21.2.

Note 2: Details about the Internal QA Program must be submitted with the final PEP to the PM for consideration/approval.

**B1.2** The Internal Quality Assurance Program shall have all information generated during the contract period, in whatever format, whether it be used for analysis and/or interpretation, laboratory testing and/or drilling result(s), site investigation(s) findings and/or judgement(s) to be made or based thereon, to be available for verification, if required, by an independent external auditable Quality Control Service Provider. The Internal Quality Assurance Program of the Service Provider shall clearly record the methodology and due processes followed.

**B1.3** It is a particular condition of this Contract that all interpreted, gathered and/or judgement related information, due for submission to the Department (in whatever format), shall be provided with a 95% statistical level of confidence.

#### **B1.4 Measurement and Payment for Internal QA program:**

Tendering Service Providers shall take note that **no separate payment item** applies to the above Internal Quality Assurance Program requirement and that rates tendered, albeit for Outcomes Based Services or Time and Cost Based Fees Services, shall be deemed inclusive in tendered rates to guarantee implementation and diligent upkeep of the quality assurance service(s) required for the contract duration. The Service Provider shall note that should signs of collapse of the Internal QA Program become evident (as assessed/judged by the PM), and/or non-performance by the Service Provider in delivering to the requirements specified above, a formal process of termination of the Contract may be considered. See C2.1.2.21 in general, C2.1.2.21.2 in particular, read with T2.1 clause 5.

#### **C3.2.3.2 B2) External Quality Assurance Program Requirements: Peer Review Function Performed by an Experienced Independent External Senior Competent Person (Dolomite land):**

**B2.1** Reference shall be made to T2.1, sub-item 5 and C2.1.2.21.2, the intent of which represents a **compulsory requirement of this contract**, for the particular attention of Prospective Tenderers, that comprehensive CV's of the proposed external senior Competent Person (Dolomite land) peer reviewers be included in the prelim PEP, as part of the Service Provider's Tender submission.

**B2.2** It is a compulsory requirement of this contract for the Service Provider to identify an appropriate external independent experienced Senior Competent Person (Dolomite land) to perform the work of specialist Peer reviewer, firstly to meet with the "general expectations" of the Service Provider and secondly, for such person being acceptable to the Department. This Peer reviewer must be a senior level industry recognized dolomite specialist, who must be a Competent Person (Dolomite land), with no less than 15 (fifteen) years extensive dolomite development experience, and must have been performing peer reviews, of a similar nature as is required by this contract, for no less than three consecutive years and/or at least five significant independent dolomite development projects.

**Important:** The name(s) and comprehensive CV's of at least 2 (two) competent and available Peer reviewers must be submitted with the prelim PEP to enable selection at a later stage, in collaboration with the Service Provider.

**B2.3** The Service Provider shall have all Specified Outcomes (read requisite reports) produced by and resulting from all WO's issued by the PM, albeit Outcomes Based Services or Time and Cost Based Fees Services, to be subjected to critical, holistic peer review(s), by the external experienced Senior Competent Person (Dolomite land), whose services must be retained by the Service Provider for the duration of this contract.

**B2.4** Should the Department at any time record any objection/reservation against the proposed Peer reviewer nominee (for example insufficient experience or inappropriate review progress), the Service Provider shall be notified and forthwith obliged to find an acceptable alternative to meet specified requirements, at no additional cost to the Contract. Notwithstanding the aforementioned, the Tendering Service Provider is advised that the Department retains the right, at any time during this Contract, to instruct the Service Provider to replace the independent Peer reviewer with another independent acceptable Peer reviewer, with such professional meeting the above specified requirements. The Service Provider shall forthwith (if required), render their full support and co-operation to enable/facilitate the successful completion this Contract, meeting specified peer review requirements.

**B2.5 Measurement and Payment for External Quality Assurance (Peer Review) Services:**

Tendering Service Providers shall take note that **no separate payment item** applies to the above external peer review function requirement and that rates tendered, albeit for Outcomes Based Services or Time and Cost Based Fees Services, shall be deemed inclusive in tendered rates to guarantee implementation and diligent upkeep of the peer reviewer service(s) required for the contract duration. See also C2.1.2.21.2

**C3.2.3.3 Generic Printing, Copying and Duplicating Requirements:**

**A) General**

A1) The Service Provider shall supply and deliver bound hard copy reports and digital electronic copies, to standard, type & format, and in quantities specified, for all WO's issued, albeit for Outcomes Based Services or Time and Cost Based Fees Services.

A2) All provisional reports completed for WO instructed Dolomite Stability Investigation(s) (of whatever type or origin), but not yet peer reviewed, shall be forwarded to the PM herein specified: Dolomite Stability Investigation reports must be systematically compiled, sequentially numbered, indexed, bound and delivered in 1 (one) hard copy colour format, plus (1) editable electronic formatted CD/DVD version (containing the complete contents of such provisional reports). Such reports shall typically include, amongst others, written text (comprising the body of written text in the report), layout drawings, maps, colour gravity survey maps, borehole log sheets, digital colour photographs (4,0Mb minimum resolution), and any other relevant supporting documentation, which in principle constitutes meeting Specified Outcomes, for each WO issued.

A3) Over and above the abovementioned, a further 3 (three) full colour hard copy sets and 2 (two) electronic titled/formatted versions (CD/DVD) of final reports must be prepared/delivered, upon completion of the peer review process, or whenever called upon for delivery of same. Referencing and numbering of reports must take into account the Department's unique numbering system requirements, by grouping/indexing such per property/site or ground movement incident(s) investigated, per client Department.

B) It is a particular requirement of this contract that all hard copy final reports, substantively containing Specified Outcomes requirements as per C3.3.2, C3.3.3, C3.3.4 and C3.3.5, be sequentially numbered on the cover page, per each WO, complete with a separate register of numbered copies, which should allow formal registry and issue of report copies to client Departments. All copies thus submitted shall have the words "RESTRICTED FOR USE OF THE DEPARTMENT OF PUBLIC WORKS", printed in BOLD LETTERS on the designed/approved (generic) cover page.

**C) Measurement and Payment**

C1) WO Services instructed by the PM to be performed on a Time and Cost Based Fees basis, do not include for printing, copying and duplicating requirements referred to above. Such expenses will be compensated at reimbursable rates. See C2.1.4.8, which will be payable under Bill #5, Bill item #5.4 a).

C2) Important: Services Performed as Outcome Based Services:

All printing, copying and duplicating requirements as specified hereinbefore, specifically for Outcome Based Services, namely Bill #2.1, Bill #2.2 and Bill #2.3 and Bill #3, shall be deemed included in tendered rates.

#### **C3.2.3.4 Site Layout Drawing(s) Required Separately**

A) All relevant site/property information, boundaries, coordinates (to WGS 84 reference system), outline(s) of existing buildings, borehole positions (GPS accuracy = 1,0m), and a general overview/description of the site (general site arrangement plan), inclusive of geological features, topography etc., per each site instructed by WO to be investigated, shall, in addition to the above printing/copying requirements, be prepared and submitted in single hard copy colour format, and an electronic version, to current best practice drawing standard(s). The size of such drawings shall be commensurate with the land extent (read hectares) of the site, to a scale of at least 1: 500. The Department requires formal delivery of such hard copy and e-copy, with the submission of specified reports, before full payment will be considered for any WO.

B) One fully indexed and referenced editable and one non-editable electronic copy (in CD/DVD format) of the above referenced Site Layouts shall be submitted for each site/property investigated.

C) **Measurement and Payment:**

Tendered rates shall be deemed to be inclusive in meeting all specified requirements of items C3.2.3.5 A) and B) above.

#### **C3.2.3.5 Use of Reasonable Skill, Care and Required Reference Resources:**

A) **General:**

A1) It is an implied term of this contract for the Service Provider to apply reasonable skill(s) and due diligence/care in discharging all duties/tasks/assignments instructed by WO, in a competent professional manner.

A2) Although the Service Provider's documents are scheduled to be reviewed by the Department, it shall in no way relieve the Service Provider of its professional responsibility for the proper and prompt execution of WO instructed work. The Department retains and reserves the right to have submitted reports/documentation reviewed by an external professional specialist entity. In the event of observed underperformance, default or negligence by the Service Provider during this contract, the Department acknowledges that there will be an obligation to serve notice on the Service Provider of such under-performance and/or shortcomings. Unless attended to expeditiously/diligently by the Service Provider, the Department retains the right to rectify such default at the Service Provider 's cost and the Department may claim compensation/damages and set such off against any amount(s) payable in terms of this contract.

**B) Specialist Geo-Professional Service Provider's Minimum Enabling Requirements, but not limited thereto, to Deliver upon Specified Outcomes Services and/or Time and Cost Based Fees Services:**

B1) Studying, assimilating and understanding the Department's currently used DRMS systems program, processes and procedures, all as described in the Department's Dolomite reference manual titled: "PW 344 (LATEST VERSION): APPROPRIATE DEVELOPMENT OF INFRASTRUCTURE ON DOLOMITE: MANUAL FOR CONSULTANTS, a copy of which is available as referenced in ANNEXURE 1 (at the back of this tender document).

**B2)** Source, obtain and study all relevant site/property ground water information/studies on dolomitic areas in South Africa, which should include extensive detailed knowledge about ground water compartments in Dolomite areas.

**B3)** Sourcing and verification of geodetic, cadastral and basic property information/data, for State owned properties, intended and due for investigation under this contract.

**B4)** The Service Provider will be allowed restricted access to selective reports/gathered data from the Department's GIS system, which will enable same to access/study/assess the desired standard of quality, norms and formatting of various specified reports, thereby permitting the Service Provider a thorough understanding of the Department's patented software programs used.

**B5)** Service Provider prepared/submitted Specified Outcomes, such as reports, maps drawings etc., must be fully compatible and integrated with the Department's currently used computing system(s) ("Arc"- software platform/ programmes) and methods utilized.

**B6)** The preparation and submission of a PEP for GHI's/EEI's will only be required should it be foreseen that it will deviate from the norm set and agreed upon between the Service Provider and the PM, as per C1.2 Clause 3.15. Should follow-on Services be required to be performed, such as planning, establishment, detailed gravity surveys, deep geological exploratory borehole drilling, near surface geotechnical sampling/investigations, reporting, etc., then a PEP must be compiled by the Service Provider and submitted to the PM for consideration and approval. Remuneration for the preparation of the said PEP will be at Time Based Fees Rates.

**B7)** Basic information which must be included in the relevant report(s), shall be a detailed description of the site/property, its current use, brief outline of buildings, services and its *status quo* condition, enlightening/detail photographs (as required) and other site specific geographical, geological and topographic features.

**B8)** The PM's WO's will generally, though briefly, define the scope of work for each identified site/property to be investigated, but such shall not limit or waiver the general contextual obligations of the Service Provider intended by this contract.

**B9)** The Service Provider shall have all WO's instructed to be performed under Bill #2 and Bill #5 Services (as may be relevant and appropriate) to be subject to the compulsory external peer review process(s), all as specified in C3.2.3.2. B2).

**B10)** The Service Provider shall be responsible to define a (Department) compatible country wide unique property/buildings referencing system, which must be formalized soon after award of this contract, and such must be compatible with the current reference system in use by the Department. Attendance to this requirement shall be deemed included in tendered Outcomes Based Services and Time and Cost Based Fees Services rates.

### **C) Measurement and Payment**

Rates tendered shall be deemed inclusive of the requirements of C3.2.3.5 A) and B) above.

#### **C3.2.3.6 Co-operation with other Services Providers:**

##### **A) Other Service Providers:**

The Services required under this contract will be under the control and management of the designated Departmental PM who, at the time of requesting the Service Provider to perform professional services, will be the person mentioned in T1.1.6. The Department reserves the right to replace the mentioned Departmental PM, with another member of its staff or any individual/firm from the private sector should it be deemed necessary, at any stage during execution of the Project.

##### **B) Other Role Players:**

Local, provincial and national authorities, statutory bodies, governmental Departments, Others, as may be required from time to time, including the client Department/end user(s).

**C) Measurement and Payment**

Rates tendered shall be deemed inclusive of the requirements of Items A) and B) above.

**C3.2.3.7 Compliance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) Additional Services (Other):**

**A) General:**

**A1)** It is a compulsory requirement of this contract, that in planning, executing and supervising work due to be performed (*inter alia* applicable to all WO's instructed), that such be done by strictly observing any and all applicable requirements/ regulations of the OHS Act (Act 85 of 1993), including relevant built environment regulations and codes of practice.

**A2)** Prospective Tenderer's and their respective yet-to-be employed sub-contractors are cautioned/alerted to the fact that works on dolomite land differ substantially from works on stable ground conditions, where no dolomite is present, particularly from a health and safety point of view. It requires team work between the Service Provider's own personnel, his assigned Safety Agent/Officer and his appointed sub-contractors. The collaborative identification of health and safety risks, together with recommendations on appropriate mitigation measures, the continuous monitoring of safety aspects on WO instructed sites/properties, are all regarded essential components that must be ensured/implemented as part of the Health and Safety Management Plan (HSMP) of the Service Provider.

**A3)** In addition to the above, the Service Provider shall be wholly responsible for ensuring compliance of his operation(s), equipment used, staff and persons deployed, whether it be under his direct or indirect control/supervision, albeit by invitation, instruction or otherwise, regardless of capacity, purpose and relationship of any such persons to the contract, to meet with all requirements and applicable regulations under the OH&SA, (Act 85 of 1993) and Section 5.5 of the Construction Regulations 2014, on behalf of the Department of Public Works.

**A4)** The Service Provider accepts full and complete responsibility (both contractually and/or in delict) regarding compliance with the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and Section 5.5 of the Construction Regulations 2014, for his acts and omissions as well as those of his employees and indemnifies the Department against any legal action in this regard.

**A5)** The Service Provider undertakes to ensure that the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and Section 5.5 of the Construction Regulations 2014, will similarly apply to his agreement with any sub-contractors, inclusive of indemnifying the Department against any legal action regarding the actions and/or omissions by them.

**A6)** The Service Provider shall prepare and submit a HSMP to the PM within one month after award of the contract. Should the PM record any reservations on the HSMP, such must be attended to and amended without delay. See also C2.1.2.21.1

**A7)** The designated and appointed Safety Agent/Officer shall timely record identified health and safety risk mitigation measures, provide appropriate guidance in connection with safe site investigation measures, processes and practices and to inspect the works on a basis set and agreed upon with the PM in writing. HSMP reports shall be submitted to PM at least on a quarterly basis.

**B) Measurement and Payment:**

Rates tendered by the Service Provider shall be deemed inclusive of the above requirement(s), as referenced in C3.2.3.7 A) above.

**C3.2.3.8 Final disposal of documents:**

A) Upon approval and finalisation of the final account pertaining to this contract, it is a particular security requirement/obligation placed on the Service Provider, to return to the Department, all WO Services documentation (albeit electronic or hard copies). The PM shall receive such documentation, with formal sign-off, for safeguarding/archiving.

B) Measurement and Payment:

Rates tendered by the Service Provider shall be deemed inclusive of specified requirement(s) noted in A) above.

### C3.2.3.9 Applicable Legislation and Standards

**A1)** This section applies to applicable national and provincial government legislation as well as that of any local authorities in whose area of jurisdiction the subject of the appointment falls and which has a bearing on the activities and facilities under this appointment.

**A2)** All the applicable legislation, which does not specifically allow discretion in respect of compliance by the State, shall be followed exactly as intended by such legislation regardless of any instructions, verbal or in writing, to the contrary. (Refer *inter alia* to Section 41 of the Occupational Health and Safety Act, 1993 (Act 85 of 1993)).

**A3)** Should any applicable legislation allow discretion in respect of compliance by the State, it shall be followed exactly as intended by the relevant legislation as if no discretion is allowed until such time as specific instructions in writing are issued to the appointed professional team by the PM.

**A4)** The Service Provider undertakes to ensure that his actions and outcome thereof including, but not limited to, the facilities to be attended by the Service Provider, shall be in accordance with all relevant legislation and upon delivery, will function as required by said relevant legislation. The Service Provider's actions and the outcome thereof shall in no way be detrimental to the health and safety of the occupants or persons present therein or in the vicinity thereof. Similarly it must not be detrimental to any aspects of the environment in its structure or operation if operated and utilized as specified in operation manual(s). The relevant legislation meant herein, as amended, consists of *inter alia* the following, but is not limited to:

- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965);
- Construction Industry Development Board Act, 2000 (Act 38 of 2000);
- Council for the Built Environment Act, 2000 (Act 43 of 2000);
- Electricity Act, 1987 (Act 41 of 1987);
- Engineering Profession Act, 2000 (Act 46 of 2000);
- Environmental Conservation Act, 1998 (Act 107 of 1998);
- Fire Brigade Services Act, 2000 (Act 14 of 2000);
- Local Government Municipal Systems Act, 2000 (Act 32 of 2000), municipal by-laws and any special requirements of the local service supply authority;
- National Building Regulations and Building Standards Act, 1977 (Act 103 of 1977);
- National Environmental Management Act, 1998 (Act 107 of 1998);
- National Heritage Resources Act, 1999 (Act 25 of 1999);
- National Water Act, 1998 (Act 36 of 1998);
- Occupational Health and Safety Act, 1993 (Act 85 of 1993);
- Telecommunications Act, 1996 (Act 103 of 1996);
- Water Services Act, 1997 (Act 108 of 1997) and general authorizations;
- the latest issue of SANS 10142: "Code of Practice for the Wiring of Premises";
- the Regulations of the local Gas Board, where applicable and
- all regulations promulgated under the above Acts.
- SANS 1936 Parts 1 to 4 (compulsory standards applicable to development on Dolomite Land.

This will be a continuous process throughout the appointment, which will manifest itself during the following phases:

- development of plans and documentation;



- supervision and oversight of all the Service Provider's appointed sub-contractors and/or persons under his control/appointment;
- ensuring compliance of the end product;
- compiling and issuing of Instruction/Operational Manuals indicating *inter alia* what the legal and safety requirements entail for the user(s)/operator(s) of the facilities;
- providing instruction to the intended users/operators.
- Develop and issue DRMP's as, where and when relevant/required

**A5)** The Service Provider accepts full and complete responsibility (both contractually and/or in delict) regarding compliance with the Occupational Health and Safety Act, 1993 (Act 85 of 1993) for his acts and omissions as well as those of his employees and indemnifies the Department against any legal action in this regard.

**A6)** The Service Provider undertakes to ensure that the requirements of the Occupational Health and Safety Act, 1993, read with Section 5.5 of the Construction Regulations 2014, will similarly apply to the agreement with any appointed sub-contractors of the Service Provider, inclusive of indemnifying the Department against any legal action regarding the actions and/or omissions by them.

**B) Measurement and Payment:**

Rates tendered by the Service Provider shall be deemed inclusive of requirements set out in C3.2.3.9 above.

**C3.2.3.10 Access to land/buildings/sites:**

Access to the land/buildings/sites shall be arranged/negotiated in consultation with the PM and the particular client facility/property manager, as and when required. See also C3.2.2.6.

**Measurement and Payment:**

Rates tendered shall be deemed inclusive of the above requirement(s).

**C3.2.3.11 Software Application(s) and Programming:**

The Service Provider must avail himself of software to be used in the preparation of project documentation for compatibility with the Department's currently used patented/registered software programmes in the "ARC"-suite. Specific requirements for layering and compatibility are specified in the DPW Dolomite Manual, with reference PW 344 (LATEST VERSION). See also C3.2.3.5 B5), and refer to "GIS" definition for clarity.

**Measurement and Payment:**

Rates tendered shall be deemed inclusive of the above requirement(s).

**C3.2.3.12 Security Clearance(s):**

It is an explicit condition of this agreement that partners, directors and/or the members of staff who will have an insight into the planning of projects requiring a security clearance, be kept to a minimum and that such persons will not object to being submitted to a security clearance, if the Department so requires.

If the latter is applicable, the necessary forms will accompany this tender or be provided to the Service Provider at any stage thereafter. These forms must be completed, if attached, and returned with the tender. It is important to furnish information which is complete in every respect.

In case the authority responsible for the clearance is, for security reasons, not satisfied with the classification obtained by any of the staff members of the Service Provider, it will be a further condition of this appointment that none of such staff members be involved with any aspect of the Project.



All documents pertaining to these projects must be stored in a safe place when not in use so as to ensure that the level of security of the projects is maintained.

**Measurement and Payment:**

Rates tendered shall be deemed inclusive of the above requirement(s)

**C3.2.3.13 Finger Prints (except Defence projects):**

Persons for which security clearance is required can obtain a finger print form SAP 91(a) from any Police station. The Service Provider must ensure that the police official responsible for taking the finger prints certifies the form since absence of the certification will result in the form being unacceptable

**Measurement and Payment:**

Rates tendered shall be deemed inclusive of the above requirement(s).

**C3.2.3.14 Condition to accept unregistered person with suitable built environment qualifications on secondment**

It is an express term of the contract that the Service Provider, after award of tender, accept unregistered, suitably qualified (built environment) person(s) in their office for the purpose of training and exposing the latter to the full extent of professional work, or as may be required according to specific circumstances, in order to gain experience which can be presented to the relevant council for consideration towards professional registration. The secondment of such unregistered person(s) will be negotiated with the Service Provider in terms of numbers, periods of secondment will be the subject of a separate Memorandum of Understanding with the service provider which will serve as an annexure hereto. Any secondment arrangements will cease upon professional registration of the seconded person(s) or as agreed on and so included in the aforementioned Memorandum of Understanding. The responsibility for salaries of seconded person(s) will remain with the employer, but responsibility for operational expenses, necessary for the execution of work, will vest with the Service Provider, all of which will be addressed in the Memorandum of Understanding.

**Note:** The unregistered person(s) will be contracted/employed by the Department of Public Works, and the required training and exposure is not limited to the scope of this contract.

### **C3.3 EXTENT OF SERVICES:**

#### **C3.3.1 BILL # 1: SPECIFIED OUTCOMES SERVICES: SPECIAL HIGH RISK INSURANCE REQUIREMENTS:**

##### **C3.3.1.1 Special High Risk Contract Insurance Requirements:**

###### **A) General:**

###### **A1) Cautionary Notice:**

Tendering Service Providers are forewarned that all sites/properties about to be attended/investigated under this contract shall be treated as HIGH RISK DOLOMITE LAND.

**A2)** High Risk Dolomite Land could subject investigative teams, staff and equipment to geological conditions of highly unstable subsurface conditions, which may result in catastrophic ground movement(s), evident by sinkhole(s) and/or subsidence(s).

**A3)** Resulting from and consequent to the above, the Service Provider shall procure, maintain and keep in force appropriate comprehensive insurance policies noted hereunder, which are necessary but not limited thereto, for the full duration of this Contract, albeit for WO's involving Outcomes Based Services or Time and Cost Based Fees Services.

**A4)** The Department's specific insurance indemnity requirements for this contract shall *inter alia* render the Department, the particular Client Department resident on the investigated WO site/property, the public at large, and any Government employee resident at or working on any of the designated site(s)/property(ies), harmless against any claim(s) of whatever cause/nature.

**A5)** The Service Provider shall, as a minimum requirement of this contract, arrange for appropriate comprehensive insurance cover against identified liabilities/risks listed hereunder, which may result from or be incidental to the Service Provider's works/activities on any of the WO instructed sites/property(ies).

###### **B) Procure Appropriate High Risk Insurance Cover:**

**B1)** It is the responsibility of the Service Provider to acquire appropriate insurance to cover for his own and his sub-contractors' risks/liabilities hereunder listed. Without limiting the Service Provider's obligations, the Service Provider shall, within 15 (fifteen) working days of the award of this Contract, but before commencement of any work performed and/or instructed under this contract, submit to the Department formal proof of such insurance policies being in force, if requested to do so.

**B2)** The minimum requirements for insurance cover for this contract shall include for but not be limited to the following:

- Damage to the Works
- Injury to persons or loss of or damage to properties
- Professional indemnity insurance cover
- Service Provider's Contractor's All Risks (CAR) insurance
- Public liability insurance
- Service Provider entity insurance (company and employees)

###### **C) Damage to the Works**

The Service Provider shall, for the full duration of the contract period, arrange for and bear the cost of appropriate insurance cover, to carry the full risk of all works/activities, such that it indemnifies and hold harmless the Department against any incident, which may result in damage to and/or destruction of built infrastructure consequent upon a catastrophic ground movement event as mentioned above. The Service Provider shall take such precautions and security/safety measures deemed necessary for the protection of the Works as it may deem necessary.

###### **D) Injury to Persons or Loss of or damage to Properties**

**D1)** The Service Provider shall be liable for and hereby indemnifies and holds harmless the Department against any liability, loss, claim or proceeding arising at any time during the Contract period, whether arising in common law or by statute, consequent upon personal injuries to or the death of any person whomsoever resulting from, arising out of or caused by a catastrophic ground instability event, which specifically relates to work performed under a formal WO instruction under this contract.

**D2)** The Service Provider shall be liable for and hereby indemnifies the Department against any and all liability, loss, claim or proceeding consequent upon loss of or damage to any moveable, or immovable or personal property or property contiguous to the WO site, whether belonging to or under the control of the Department or any other body or person whomsoever, arising out of or caused by a catastrophic ground movement, as mentioned above, which may occur during the Contract period.

**D3)** The Department shall be entitled to recover any and all losses and/or damages of whatever nature suffered or incurred consequent upon the Service Provider's default of his obligations as set out herein- before. Such losses or damages may be recovered from the Service Provider or by deducting the same from any amounts still due under this Contract or under any other contract presently or hereafter existing between the Department and the Service Provider and for this purpose all these contracts shall be considered one indivisible whole.

**E) Professional Indemnity Insurance Cover:**

It is a compulsory requirement of this Contract for the Service Provider to arrange and maintain, for the duration of this Contract, minimum professional insurance cover of R1,5 million, with the first amount payable not exceeding 5% of the value of indemnity, and/or personal liability – all as more comprehensively described in C1.2.3, clause 5.4.1: Data provided by the Service Provider and in respect of which the Service Provider must provide data as required.

**F) Service Provider's / Contractor's All Risks (CAR) Insurance:**

It is a compulsory requirement of this Contract for the Service Provider to arrange and maintain, for the duration of this Contract, sufficient Service Provider (and Sub-contractor's), Contractor's All Risks (CAR) insurance, for all WO works/activities undertaken by or about to be performed under this Contract.

**G) Public Liability Insurance:**

It is a compulsory requirement of this Contract for the Service Provider to arrange and maintain, for the duration of this Contract, adequate/appropriate cover for Public liability insurance cover (as amongst others affected by high risk dolomite land), for all works/activities contemplated to be executed under this contract on any WO instructed site/property.

**H) Service Provider Entity Insurance:**

The Service Provider shall be wholly responsible to arrange, maintain and pay for his own particular works/performance insurance requirements against any accident, loss of life, loss of property, incident, injury etc., for the duration of this contract, covering amongst others, the Service Provider's own interest and that of his employees, all his sub-contractors interests and their employees performing works/activities on any specified WO site, any all equipment/machinery used to perform requisite contract works, loss of production and/or any other eventuality, which may, or may not have been foreseen.

Note: The Service Provider's paid-up policy/insurance documentation shall at all times be available (especially prior to accessing any site/property) when called upon by either the PM and/or the User-Client's authorized representative(s)).

**I) Measurement and Payment for Insurance Requirements:**

Tendering Service Providers shall tender an all-inclusive lump sum price for Special High Risk Contract Insurance Requirements described in C3.3.1.3 above (read with C2.1.2.21.3). Said insurance shall cover and include for all WO instructed work undertaken or yet to be performed by the Service Provider, or his Sub-contractors, for Billed Services listed in C2.2.2 and C2.2.3.

The Tenderer's Financial Offer shall include for procuring, implementation and maintenance of all insurance requirements for the duration of the Contract. For pricing, reference is made to Bill #01, item #1.3. See example below:

**BILL ITEM #1.3: MEASUREMENT AND PAYMENT EXAMPLE:**

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE / UNIT	AMOUNT
#1.1	C2.1, C2.1.2, C2.1.2.21.3 C2.1.3.2 A) C3.2.3, C3.3.3.3	Special High Risk Contract Insurance requirements:	All-inclusive item	1	Lump Sum	R.....

**C3.3.2 PARTICULAR CONTRACT SERVICES REQUIREMENTS:**

**C3.3.2 A) General:**

A1) Tendering Service Providers shall tender all inclusive rates to perform Bill #1 to Bill #5 Services, to Specified Outcome(s), which requirements are given in detail either as Outcomes Based Services or Time and Cost Based Services. This, amongst others, requires of the Project Principal to make available dedicated time to obtain a desktop perspective of the Department's Dolomite Risk Management Strategy (DRMS) program, by amongst others assimilating relevant data/information pertaining to the Department's GIS database and the Department's Dolomite Manual with reference PW344/2017. Due allowance should be afforded to engage/consult the PM soon after contract award, to clarify and be briefed about any matter/issues of uncertainty.

A2) Bill #2 and Bill #5 Services infers a particular emergency obligation on the Service Provider, upon being issued with a WO by the PM, to verify/authenticate the targeted WO dolomite site/property<sup>2</sup> information (i.e. such as is unknown at the time of tender), which may be in any of the dolomite affected provinces in the Republic of South Africa.

A3) A general principle applicable to Bill #2 and Bill #5 Services is for the Service Provider to deliver/report upon Specified Outcomes Based requirements, which work/activities are typically performed at the physical WO instructed identified site/property.

A4) Bill #2, Bill #4 and Bill #5 Services generally constitutes two discrete pricing components. The first is for "**Site-Specific Activities**" and the second for "**Site-Variable Activities**", requirements of which are specified elsewhere, under either Outcomes Based Services or Time and Cost Based Fees Services.

A5) The Department's Dolomite Manual PW 344 (LATEST VERSION) and SANS 1936 (2010) Parts 1, 2 and 4, shall in general guide Dolomite Stability Investigations. In the event of ambiguity, the latter takes precedence.

A6) Bill #3 Services makes provision for the Department's Water Auditing Initiative (WAI).

**C3.3.2 B) Specialist Geo-Professional Service Providers Enabling Requirements (but not limited thereto) to Perform Bill #2 to Bill #5 Services:**

Reference shall be made to C2.1.2.21.4, which amongst other defines the Service Provider's minimum enabling requirements.

**C3.3.2 C) "Site-Specific Activities":**

C1). The term "Site-Specific Activities" is made up of, amongst others, various "known-to-the-Specialist-Service-Provider" generic activities, tasks, duties, requirements/obligations etc., which detailed elements/outputs form a particular implied term of this contract, which shall collectively be delivered upon when performing WO instructed Services, albeit Outcomes Based Services or or Time and Cost Based Fees Services. Since requirements for the "Site-Specific Component" of a scheduled geo-professional site/property investigation, are at best regarded to be within the Service Provider's own field of specialization, that there be no ambiguity in pricing tender Rates for such Services, that it includes everything, in the broadest possible intent/meaning of the term, to deliver and achieve the Specified Outcome required.

The Specified Outcomes defined under the description of the term "Site-Specific Component", is, as a consequence, deliverable (or output) driven, by performing Services to best practice standards in compliance with SANS 1936 (2012) parts 1 and 2. The Service Provider shall deliver Specified Outcome(s), within specified time frame allowance(s), as per each defined class/type of Outcomes Based Service(s) or Time and Cost Based Fees Services. Reference shall be made to

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<sup>2</sup>This information\* is obtainable from the Department of Land Affairs and/or the Deeds Office;

listed programmed milestones, as per the final approved PEP.

Services required shall be performed to achieve Specified Outcomes in C3, measured and payable per the relevant scheduled Bill items. This should include for, but not be limited thereto, hard copies of various type report(s), comprising the site specific Dolomite Status Certificate (DSC), the Inherent Hazard Classification, Land Use Zoning and the Dolomite Risk Management Plan (DRMP), complete with sign-off by the senior external independent experienced Competent Person (Dolomite land) peer review specialist.

**C2).** The absolute minimum number of boreholes to be drilled per site/property, for any DSI, shall never number less than 3 (three). Should the defined surface area of the site/property measure more than 1,0 ha, the number of boreholes shall be determined in accordance with specifications contained in SANS 1936 part 2: Clause 4.2.3 - Table 1, unless specifically instructed otherwise in writing, by the PM.

**C3).** The Service Provider shall thoroughly acquaint himself with the intent/meaning of the term "Site-Specific Activities", linked to each type/class of Service instructed, which infers everything needed to be done on the WO instructed site/property, to enable delivering precisely to specifications and in accordance with requirements of Specified Outcomes for Outcomes Based Service(s), as instructed by the PM.

**C4).** For clarification of intent, tendering Service Providers are cautioned to take note that the term "Site-Specific Activities (referred to above) and the term "Site-Variable Activities" (noted hereunder), are each described with the intent to leave no ambiguity as to what the specific activities, provisions and inclusions shall be associated with each. The term Site-Variable Activities basically covers all requirements/expenses associated with travelling arrangements of the Service Provider's sub-contracting entities, plus all equipment/staff, establishing and de-establishing from the WO instructed site/property to be investigated. The term "Site-Specific Activities" on the contrary, means all which is not covered by the former term, in order to have site works undertaken and to deliver upon particular Specified Outcomes (generally reports), prepared and submitted to specified standards/requirements, having duly attended a particular WO-specific instruction issued by the PM.

**C5).** All works/activities necessary and associated with the term "Site-Specific Activities" shall be deemed included in tendered rates. Tendering Service Providers shall take due cognizance of the abovementioned requirements when pricing all inclusive Rates for Site-Specific Activities.

**C6). Measurement and Payment: Site-Specific Activities:**

Measurement and payment for Site-Specific Activities shall incorporate and be read with C3.3.2 A) to C) above and tendered rates shall be deemed all-inclusive thereof.

Note: Examples of Measurement and Payment for Site-Specific Activities are separately given per each type/class of Service listed. See C3.3.2.1, C3.3.2.2, C3.3.2.3, C3.3.4 and C3.3.5.

**C3.3.2 D) "Site-Variable Activities"**

**D1).** The term "Site-Variable Activities" is associated with all travelling requirements/expenses of the Service Provider's Sub-contractors, to enable work to be performed at the locality of PM instructed WO site/property, for Bill #2, Bill #4 and Bill #5 Services. At the fundamental core of Site-Variable Activities are an all-inclusive tendered Rate for travelling towards and returning from a WO instructed site/property, which includes for travelling time/expenses of the designated supporting Sub-contracting entities personnel, equipment and machinery. To enable the Service Provider to produce Specified Outcomes in accordance with a WO instruction on a designated site/property, may require, amongst others, site inspections/arrangements for the contemplated work. These include, but are not limited to physically and materially investigating/exploring site conditions, borehole drilling works access/inspections, transportation of materials for testing/logging and evaluation etc., all of which components/elements contribute towards delivering upon Specified Outcomes.

**D2).** For the purpose of this contract, the Site-Variable Activities component includes, in the broadest possible meaning of the term, such items as can be related to travelling, which, amongst

others, deal with the travelling entities travelling time, travelling expenses/costs, inclusive of any and all subsistence and sundry disbursements expenses/costs deemed necessary/required, as from the date/time of departure from its Home Base to reach the WO specified site/property and the date/time of the return trip back to Home Base.

**D3).** The remuneration dispensation structure used for this contract is based on a combined, all-inclusive travelling distance rate, per kilometer, travelling undertaken by the different Services (production) entities. Such rates as are tendered must reflect the cumulative sum total of recoverable expense(s) of the various service rendering entities' distances travelled, based on a "once-off-only" site/property attendance investigation, irrespective of whether different Services entities/Key Persons are required to visit the site more than once. All work necessary and required to be performed/conducted on the specified WO site, must be attended/performed during such instructed/authorized trip(s), unless otherwise timeously/formally requested by the Service Provider, from the PM, who would not unreasonably withhold approval for such permission.

**D4).** At the time of Tender, travelling distance(s) of as yet un-identified sites/properties, are not known. Tendering Service Providers shall, as a result of such information lacking, tender all inclusive travelling rates. Tendered rates for Site-Variable Activities shall cover each travelling entities combined (all inclusive) total costs/expenses, based on similar principles described in C2.1.4.9, at a commensurate all inclusive tendered rate per kilometer travelled.

**D5). Price Adjustment to Tendered Rates:** Refer to C2.1.2.22

**D6). On-site Travelling:** On site travelling will not be compensated separately and tendered rates for Site-Variable activities are deemed included in tendered rates.

**D7). Measurement and Payment: Site-Variable Activities:**

Measurement and payment for Site-Variable Activities shall incorporate the above requirements and tendered Rates shall be deemed to be all-inclusive of meeting the requirements of C3.2.2 A) and C3.2.2 D1) to D4).

Note: Measurement example(s) applicable to Site-Specific Activities related to Bill #2.1, Bill #2.2, Bill #2.3, Bill #4 and Bill #5 are respectively detailed under the different Services required to be performed under this contract.

**C3.3.2.1 BILL #2.1: OUTCOME BASED SERVICES:**

**SPECIFIED OUTCOMES FOR EMERGENCY DOLOMITE INCIDENCE DETERMINATION WITHIN THE 4 (FOUR) KM BUFFER ZONE:**

SCOPE OF WORK: Bill Item #2.1 Service(s) applies to sites/properties where the incidence of dolomite presence shall be established. These sites/properties are generally located within a designated strip width, defined as the dolomite buffer zone.

**C3.3.2.1 A) General:**

A1) The PM will instruct the Service Provider by WO to determine whether a site/property is located on Dolomite. Typically, these instructions will be required to be performed within the 0,0 km to 4,0 km dolomite buffer zone, which is between 0,0 km to 4,0 km from the identified dolomite "boundary" (refer to the dolomitic map of SA), in any dolomite affected province, anywhere in the RSA.

A2) Tendering Service Providers shall tender all inclusive Bill Services rates, for all necessary tasks/duties/functions/activities required, to investigate (via WO) and deliver Specified Outcomes complete, for each site/property identified by the PM.

A3) Sites/properties instructed to be investigated may either be located on developed or undeveloped terrain. Developed sites are typically those where a property has been developed with infrastructure such as buildings, roads, wet services etc., the consequence of which may affect geological/geophysical investigation work(s). Undeveloped sites/properties typically represent a situation where no infrastructure development has taken place, generally referred to as a "green field" site, with virtually no obstruction(s) (except for fencing, trees, scrubs and other natural aspects/features), which may affect activities of the investigation team during their determination of whether the site is located on dolomite formation or not.

**C3.3.2.1 B) "Site-Specific Activities" for Exploratory Dolomite Incidence Investigations:**

B1) The Service Provider shall have the site geo-physically assessed by an experienced Competent Person (dolomite land), who must use his specialist knowledge/experience and skills to locate and set out 3 (three) only positions, where 100m deep boreholes are to be drilled on the WO specified site/property. The determination of where the boreholes are to be drilled will be irrespective of the property surface area to be investigated; such sites/properties will generally be between 1 ha and 2 ha in extent.

B2) The Competent Person (Dolomite land) shall, both for developed and undeveloped sites/properties, determine, locate and peg 3 (three) borehole positions, and accurately record same with a sub-meter accuracy GPS unit ( $\pm 1,0$  m). This information must be reflected on the drillers log sheet, the relevant site map/layout drawing, and the distance of the drilled boreholes in relation to the cadastral site boundary(ies) or the site/property coordinates.

B3) All exploratory drilling work required to be performed by the Service Providers sub-contractor drilling entity shall, amongst other, but not limited thereto, include for best practice specialized on-site dolomite exploratory drilling work(s), as directed by the Competent person (dolomite land). Upon completion of the driller's works/activities, backfilling of the borehole shall be competently done in accordance with the specified requirements contained in ANNEXURE 2: "ENGINEERING GEOLOGICAL SERVICE: EXPLORATORY GEOTECHNICAL DRILLING: PARTICULAR SPECIFICATION (PS): EXPLORATORY DRILLING FOR ENGINEERING GEOLOGICAL INVESTIGATION". The surrounding area close to and around drilled boreholes shall be cleared of excess drilling debris and the area must be generally tidied to resemble the condition it was found in before drilling commenced.

B4) As a general rule and principle, drilling shall be performed until such depth as where dolomite is struck, plus 6 m (if less than 100 m deep), or otherwise to a depth of 100m.



B5) For all Site-Specific Activities travelling by the drilling entity, its supporting functions/activities, Key Persons and geo-professionals, required to perform their work/activities on-site, should be priced under this item and such costs shall be deemed to be included in tendered rates.

**Important:** Tendering Service Providers shall make due allowance for and include such costs applicable to the "Site-Specific Activities" travelling (associated specifically with Bill #2.1 work), for any personnel/staff departing from and returning to the site, should requisite site work(s) not be completed on the same day(s) and/or should local stay-over(s) be required.

B6) Should any indications and/or positive elements or trace(s) of identifiable dolomite constituent materials be found/intercepted during on-site drilling activities, i.e. before the depth of 100 meter has been reached, in any of the three boreholes, then such "discovery" shall confirm the site as being a dolomite site, the consequence of which will reflect upon the need for a fully-fledged DSI (detailed elsewhere). The drilling rig and others involved may then de-establish, but not before site-finishing works have been attended to.

B7) It is a particular Specified Outcome(s) requirement for instructed WO's for Bill #2.1 Services, for the Service Provider to prepare and submit a formal "Close-Out" report for each site/property investigated, which must be formally signed off by the peer reviewer, before payment will be certified - see also C2.1.3.2 B). The Close-out report must clearly contain a statement that, amongst others, the site investigation has confirmed no evidence of dolomite. Said report shall contain a site specific comprehensive record of the boreholes drilled, log sheets, site information, coordinates of the position(s) where the boreholes were drilled, salient features of the site etc. It is a compulsory requirement of this contract for the Service Provider to issue a No-Dolomite Status Certificate (NDSC), indicating the dolomite status of the site/property, in terms of the Department's Dolomite Risk Management Strategy requirements.

B8) Ground water levels for each and every borehole drilled shall be recorded, no less than 48 hours after drilling a particular borehole, where after backfilling of the borehole shall commence in accordance with the specifications noted in C3.3.2.1 B3) above. Boreholes shall be backfilled for the full depth of the borehole (see B3) above), however, only to be done after the specified water level resting period (48 hours) has expired and the ground water level measured.  
**IMPORTANT:** The Service Provider is responsible to certify that the drilling entity has undertaken this work to his satisfaction.

B9) See C2.1.2.21.2 and C3.2.3.3 for Quality Assurance requirements.

B10) Dolomite Incidence reports shall be in accordance with standards commensurate with SANS 1936 Part 2, Clause 4, which reports must be peer reviewed.

#### **C3.3.2.1 C) Measurement and Payment for Bill #2.1 Services:**

C1) Investigation(s) to determine whether a site/property is underlain by dolomite, within the 0,0 km to 4,0 km dolomite buffer zone, shall be performed as described in item C3.3.2.1 A) & B) above:

C2) The method and certifiable portion payable towards realization of Specified Outcomes of Bill #2.1 Services, shall amongst others, be in accordance with requirements set out in C1) above.

C3) In addition to general instructions/information regarding Site-Specific work referred to in items C1) above, reference shall also be made to C3.3.2 C)

C4) See C3.3.2 D) above for requirements pertaining to Site-Variable activities related to travelling for all entities.

C5) See C2.1.3.2 B) for particulars regarding proportional remuneration schedule details.

C6) Payment for drilling under Bill #2.1 Services shall be for a depth of 100m for each of the three boreholes required to be drilled (whether drilling was performed to a lesser depth than 100m or not (i.e. if dolomite presence was confirmed before 100m depth).

C7) Payment certification will be permitted upon submission of the requisite Outcomes Based close-out report of the site/property investigated, containing all relevant information to certify a

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/UNIT	AMOUNT
#2.1	C2.1.2, C2.1.3, C2.1.3.1, C2.1.3.2 C2.3.1.2 A) & B) C3.2, C3.3, C3.3.2	<b>Emergency Feasibility-level Dolomite Stability Investigations (DSI) to determine Dolomite Incidence:</b>  Determination of the incidence of dolomite on any instructed site/property within the 4,0 km dolomite buffer zone, in any of the dolomite affected provinces in SA.  Feasibility-level DSI's shall be performed in accordance with amongst other SANS 1936, part 2, Clause 4.2, read with cited PRICING INSTRUCTIONS AND SPECIFICATIONS REFERENCE requirements, with 3 (three) boreholes per site. The requisite works/activities are as per Bill items listed hereunder:	-	-	-	-
#2.1a)	As above, C2.1.3.2 B), C3.2.3.1 & 2, C3.3.2.1	<b>Site-Specific Activity:</b> Undeveloped site: Land extent ≤ 2,0 ha; Complete site/property investigation, including close-out report and No Dolomite Status Certificate (NDSC) submitted to the PM;	Lump Sum/ Site	2	R.....	R.....
#2.1b)	As above, C2.1.2.21.2 C2.1.3.2 B), C3.2.3.3 C3.3.2.1 C)	<b>Site-Specific Activity:</b> Developed site: land extent ≤ 1,0 ha; Complete site investigation, including close-out report, with a No Dolomite Status Certificate (NDSC) submitted to PM;	Lump Sum/ Site	3	R.....	R.....
#2.1c)	As above, C.2.1.4.9 C3.3.2 C3.3.2 D) C3.3.2.1 A) & C)	<b>Site-Variable Activities:</b> Single item travelling expenses kilometer rate (cumulative summation) for Exploratory Drilling Service Entity, complete with its Operational and Supervisory personnel, inclusive of travelling distance, travelling and accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc., to reach, work at and return for each WO instructed site investigated:	km	3500	R.....	R.....

specific site investigated as "non-dolomitic", complete with the NDSC supplied.

C8) Price Adjustment to Tendered Rates. Refer to C2.1.2.22.

**BILL #2.1: MEASUREMENT AND PAYMENT EXAMPLE**

**C3.3.2.2 BILL #2.2: OUTCOME BASED SERVICES:**

**SPECIFIED OUTCOMES FOR EMERGENCY DESIGN LEVEL DOLOMITE STABILITY INVESTIGATIONS (DSI) ON DOLOMITE LAND.**

**SCOPE OF WORK:** Bill #2.2 Service(s) requires of the Service Provider to perform design level Emergency Dolomite Stability Investigations (DSI's) on sites/properties located on Dolomite land, in any dolomite affected province of South Africa. This Service includes for the physical condition assessment of the WO instructed land parcel by means of geophysical exploration techniques (typically gravity surveys – albeit normal or micro gravity surveys), specialist deep borehole drilling exploration work, ground water regime studies, etc., all of which is required to determine the Inherent Hazard Characterization (IHC) of the site/property, to pronounce upon the Dolomite Area Designation, the development of a Dolomite Risk Management Plan (DRMP), complete with recommendations about development potential/restrictions to direct/guide orderly sustainable future development.

**C3.3.2.2 A) General:**

A1) See C3.3.2 for general specifications/requirements.

A2) The PM may at any time instruct the Service Provider by WO to perform specialist Design Level DSI's on sites/properties identified to be located on dolomite formation.

A3) The Service Provider shall tender all inclusive rates to deliver upon Specified Outcome's, which must be performed in accordance with requirements referenced in C3.3.2.2 B) hereunder.

A4) Sites/properties instructed to be investigated may either be located on developed or undeveloped terrain. Developed sites are typically those where a property has been developed with infrastructure such as buildings, roads, wet services etc., and the consequence of which presence may affect geological/geophysical investigation work(s). Undeveloped sites/properties typically represent a situation where no infrastructure development has taken place, generally referred to as a "green field" site, with virtually no obstruction(s) (except for fencing, trees, scrubs and any natural aspects/features), which may affect activities of the investigation team, during their works/activities on a particular site.

A5) Emergency design level DSI reporting shall, as a minimum requirement, meet with specified requirements of SANS 1936 Part 2, Clause 4.

**C3.3.2.2 B) Specified Outcomes required for "Site-Specific" Dolomite Exploratory Activities:**

B1) The Service Provider shall have the site physically assessed by an experienced Competent Person (dolomite land), who must direct the specialist geophysicist in planning the requisite investigation work(s) deemed necessary.

B2) The Service Provider shall plan and perform a Design Level DSI in accordance with the basic requirements of the Department's Dolomite Manual: PW 344 (LATEST VERSION), read with the above referenced SANS 1936 specification.

Note: Tendering Service Providers are to note that sites/properties to be investigated are generally less than 1 (one) ha in extent.

B3) The Service Provider shall tender all inclusive lump sum rates for investigations on either developed or undeveloped sites/properties, all as detailed per relevant Activity Schedule items.

B4) Whenever an instructed site/property investigation measures smaller than 1,0 ha in extent, payment will be certified for a site size of 1,0 ha, thereby recognizing the Service Provider's all inclusive common cost items/elements necessary to undertake/complete such required work.

B5) No less than 3 (three) boreholes shall be drilled on any site/property measuring less than 1,0 ha, at positions determined from the results of the conducted gravity survey.

B6) The number of boreholes to be drilled on sites larger than 1 (one) ha, shall be determined from SANS 1936 (2012), Part 2, Clause 4.2.3, Table 1.

B7) Since the locality of sites/properties to be investigated are, at the time of tender, unknown, the Service Provider shall tender all inclusive Specified Outcomes Services rates for travelling, subsistence, disbursements, sundry expenses etc., as are deemed relevant and necessary/appropriate to the cause.

B8) The distance travelled by the Service Provider's drilling entity and/or any other authorized supporting functions, will be remunerated at all inclusive tendered Specified Outcomes Service rates, on the basis of the shortest distance from Pretoria (the Home Base), to the WO instructed site/property, as determined from any reputable computerized "route planner" program.

B9) For sites measuring larger than 1,0 ha in extent, extra over costs shall be tendered at Specified Outcomes Services rates and such rates must reflect upon the basic premise that all required physical items/equipment/staff/Key Persons etc., have already "established" on-site, to perform requisite work on the identified site/property. The latter statement should, as a result, require of the Service Provider to only tender Specified Outcomes Services rates for such additional time/work to be performed on-the-site (as site establishment has been accounted for elsewhere).

B10) Specialized drilling work shall, as a general principle, be performed until such depth\* as where dolomite is encountered, plus 6 m (only if the borehole drilling depth is less than 100 m deep), or otherwise to a depth of 100m. The Service Provider shall, as an integral part of this activity, be responsible to "locate" boreholes drilled with a sub-meter accuracy GPS unit. This information must be reflected on a General Arrangement drawing/map, complete with site boundaries and coordinates to WGS 84 reference.

Important note\*: For developed sites, the 100m criteria above will *per se* apply; for undeveloped sites, the 60m criteria applies.

B11) All exploratory drilling work required to be performed by the Service Providers sub-contractor drilling entity shall, amongst other, but not limited thereto, include for best practice specialized on-site dolomite exploratory drilling work(s), as directed by the Competent person (dolomite land). Upon completion of the driller's works/activities, backfilling of the borehole shall be competently (bottom to top) done in accordance with the specified requirements contained in ANNEXURE 2: "ENGINEERING GEOLOGICAL SERVICE: EXPLORATORY GEOTECHNICAL DRILLING: PARTICULAR SPECIFICATION (PS): EXPLORATORY DRILLING FOR ENGINEERING GEOLOGICAL INVESTIGATION". The surrounding area close to and around drilled boreholes shall be cleared of excess drilling debris and the area must be generally tidied to resemble the condition it was found in before drilling commenced.

B12) The Service Provider shall perform each WO instructed Emergency Design Level DSI, in accordance with and satisfying all requirements contained in the DPW Dolomite Manual PW 344 (LATEST VERSION), read with SANS 1936 Part 2, Clause 4. This includes amongst others, but not limited thereto, the following:

- Gravity survey to specification (30mx 30m grid);
- Specialized borehole drilling, logging, recording and mapping;
- Borehole backfilling (see ANNEXURE 2);
- Determine the Inherent Hazard Characterization (IHC) of the site/property (SANS 1936 (2012) Part 2, Clause 4.5.1;
- Provide recommendations on development potential of the site/property;
- DSI report, in accordance with requirements specified in SANS 1936 (2012) Part 2, Clause 4.3.3;
- Prepare and submit a separate site/property Dolomite Risk Management Plan (DRMP) in accordance with specified requirements of SANS 1936 (2012) Part 4, Clause 4.3;
- Issue Dolomite Status Certificate (DSC);
- Determine Dolomite Area Designation
- Peer review of all DSI documentation (referred to above);

B13) Attend to and make Site/property development recommendations which will guide orderly and sustainable future development.

B14) Each site/property investigated, must be formally signed off by the peer reviewer, before full payment will be certified by the PM - see also C2.1.2.21.2. For Bill Item #2.2 Services, it is a compulsory requirement for the Service Provider to issue a DSC, indicating the dolomite hazard rating and Dolomite Area Designation of the site/property in terms of SANS 1936-1 Table 1 and the Department's Dolomite Risk Management Strategy requirements.

B15) The format, contents and general standard of workmanship of the abovementioned reports/documents shall at least comply with the minimum requirements of the "sample documents", copies of which will be available and displayed at the compulsory tender clarification meeting.

B16) See C2.1.2.21.2 and C3.2.3.3 for Quality Assurance requirements.

**C3.3.2.2 C) Measurement and Payment for Bill #2.2 Services**

C1) The Service Provider shall perform Bill #2.2 Services at all inclusive Tendered Rates for Items C3.3.2.2 A) and B) above.

C2) The Service Provider shall attend to general requirements regarding Site-Specific work as per C3.3.2.2 B1) to B16 above; See also C3.3.2 items A) to C), as appropriate.

C3) See also C3.3.2 D) for general specifications applicable to Specified Outcomes Based Services applicable to Site-Variable Activities related to travelling.

C4) Full payment will apply for boreholes drilled to specified depths as required in SANS 1936 part 2. See also C2.1.3.2 C) for allowable proportional percentage interim payments.

C5) Final payment(s) against Bill #2.2 Services will not be considered until such time as requisite report(s) are submitted, complete with written sign-off by senior external Peer Reviewer.

C6) Price Adjustment to Tendered Rates. Refer to C2.1.2.22.

**BILL #2.2: MEASUREMENT AND PAYMENT EXAMPLE:**

ITEM REFERENCE	PRICING INSTRUCTIONS/ SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/ UNIT	AMOUNT
#2.2	C2.1.2, C2.1.3, C2.3.1.2 A) & C) C3.2, C3.3, C3.3.2	<b>EMERGENCY AND AD-HOC DESIGN LEVEL DOLOMITE STABILITY INVESTIGATIONS (DSI), INCLUDING INHERENT HAZARD CHARACTERIZATION (IHC), LAND UTILIZATION APPRAISAL, DOLOMITE AREA DESIGNATION AND DOLOMITE RISK MANAGEMENT PLANS (DRMP), FOR SITES/PROPERTIES LOCATED ON DOLOMITE FORMATION:</b> Emergency design level DSI's shall be performed in accordance with amongst other SANS 1936, part 2, Clause 4.3, read with cited PRICING INSTRUCTIONS AND SPECIFICATION reference requirements, with the minimum number of boreholes as per Clause 4.2.3, Table 1. The requisite works/activities are as per Bill items listed hereunder:	-	-	-	-
#2.2a)	As above, C3.3.2.2, C3.3.2.2 C)	<b>Site-Specific Activities:</b> Undeveloped site/property: Land extent ≤ 1,0 ha; Execute and deliver Specified Outcomes, incl. of peer reviews on all reports/ documents referenced above.	Lump sum/site	2	R.....	R.....

#2.2b)	As above	Extra over #2.2 a): up to 2,0 ha in extent:	Lump sum/site	1	R.....	R.....
#2.2c)	As above	Extra over #2.2 a): up to 3,0 ha in extent:	Lump sum/site	1	R.....	R.....
#2.2d)	As above	Extra over #2.2 a): up to 4,0 ha in extent:	Lump sum/site	2	R.....	R.....
#2.2e)	As above	Extra over #2.2 a): up to 5,0 ha in extent:	Lump sum/site	1	R.....	R.....
#2.2 f)	As above	<b>Site-Specific Activities:</b> ++Developed site: Land extent ≤ 1,0 ha; Execute and deliver Specified Outcomes, incl. of peer reviews on all reports/ documents referenced above.	Lump sum/site	2	R.....	R.....
#2.2 g)	As above	Extra over #2.2f): up to 2,0 ha in extent:	Lump sum/site	1	R.....	R.....
#2.2 h)	As above	Extra over #2.2f): up to 3,0 ha in extent:	Lump sum/site	1	R.....	R.....
#2.2 i)	As above, C3.3.2 D) C3.3.2.2 C)	<b>Site-Variable Activities:</b> Single item travelling expenses kilometer rate (cumulative summation) for Exploratory Drilling Service entity, complete with its operational and supervisory personnel, inclusive of travelling distance, travelling and accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc., to reach, work at and return for each WO instructed site investigated:	km	10 000	R.....	R.....

**NOTE 1:** Should additional boreholes be required to be drilled when the drilling entity is on site, remuneration will be in accordance with relevant items under Bill #4.3 Services

**NOTE 2:** ++Developed site means computed land surface area from cadastral boundaries of the site investigated.

**C3.3.2.3 BILL #2.3: OUTCOME BASED SERVICES:**

**SPECIFIED OUTCOMES FOR EMERGENCY FOOTPRINT DOLOMITE STABILITY INVESTIGATIONS (FDSI) ON DOLOMITE LAND:**

**SCOPE OF WORK:** Bill #2.3 Service(s) requires of the Service Provider to perform a "follow-on" emergency Footprint Dolomite Stability Investigation (FDSI), such typically undertaken after a Bill #2.2 Service had been undertaken and reported on. This Service includes amongst others for the execution of geophysical exploration work by specialist techniques (typically gravity surveys – albeit normal or micro gravity surveys), specialist deep borehole drilling exploration work on the footprint area(s) of planned buildings/structures, ground water regime studies, etc., all of which is required to confirm the Inherent Hazard Characterization (IHC) of the envisaged development site/property, pronounce upon the final determined Dolomite Area Designation. This Service includes for the review of and recommendations about building foundation options, interpreted with and taking into account the results of near surface geotechnical report information. The development of a Dolomite Risk Management Plan (DRMP) shall be an integral part of this Service.

**C3.3.2.3 A) General:**

A1) See C3.3.2 A) to D) for general information and certain particular requirements.

A2) Sites/properties instructed by the PM to be investigated by WO as Bill Item #2.3 Services, involves a detailed specialist dolomite study/investigation of an area of lesser magnitude, generally representing the cumulative planned building(s) footprint+++ area, upon which site/property a development project is intended for construction. This Service is typically executed as a follow-on study on sites/properties previously investigated as Bill Item #2.2 Services. All relevant/applicable DSI report(s), which are at the disposal of the Department, will be made be available to the Service Provider to assist in planning for such FDSI WO.

NOTE+++ : Development footprint area = area computed from building/ structure/facility footprint dimensions, plus 10m in any direction on plan.

A3) As and when the PM instructs the Service Provider by WO to perform additional micro-gravity surveys and/or extended exploratory drilling work, such must be performed at the subject site/property, to refine/enhance results from previous studies.

A4) Tendering Service Providers are to note that the relevant Activity Schedule items do not distinguish (this point is only valid and applicable to Bill Sub-Item #2.3 Services) between a Developed site/property or whether it is a green field site; The development footprint area(s) will generally be clear of obstructions for new buildings/facilities planned for the site in question.

**C3.3.2.3 B) Site-Specific Dolomite Related Exploratory Requirements for Footprint Dolomite Stability Investigations (FDSI):**

B1). The Service Provider is required to make a dedicated effort to obtain appropriate dolomite related property information and Design Level report(s) when planning for follow-up phase(s) 2 and 3 investigations.

B2). Planning for FDSI work shall be performed by an experienced Competent Person (Dolomite land), who should, in collaboration with the specialist geophysicist, determine such requirements as are regarded necessary.

B3). The Service Provider shall plan and have detailed Emergency FDSI work performed in compliance with the requirements of SANS 1936 (2012) Part 2, Clause 4.3.

B4). Tendering Service Providers are to note that the total extent of sites/properties designated to be investigated by WO instruction, are generally undeveloped and less than 1,0 ha in extent. Due allowance shall be made to include for all required common cost items/elements necessary to undertake/complete such required FDSI on-site works.

B5). The number of boreholes to be drilled shall be determined by the Competent Person (Dolomite land), taking cognizance of derived or deduced (new) input obtained from the specialist dolomite geo-physicist. The number of boreholes to be drilled during phase 2 and 3 investigation work shall be determined by Competent Person (Dolomite land). Should more than 5 (five) exploratory boreholes be required for any FDSI on a designated site/property, those that are in excess of the aforementioned number will be compensated at tendered Rates in Bill #4. Authorization by the PM (if required) needs to be obtained prior to undertaking such work, but definitely before site establishment.

B6). For sites/properties measuring in excess of 2500 m<sup>2</sup> land area, the extra over Bill #2.3 items shall be priced at tendered Rates, based upon the basic premise that the borehole drilling entity, its supporting materials/equipment, specialized equipment, Key Persons etc., have already established on the designated site/property and that such additional physical work necessary, shall be attended to as specified elsewhere.

B7). Where the total land surface area measures less than 2500m<sup>2</sup>, no less than 5 (five) exploratory boreholes shall be drilled per each WO instructed FDSI.

B8). The number of boreholes to be drilled for a WO instructed FDSI, for a site/property land surface area measuring more than 2500 m<sup>2</sup> but less than 5000 m<sup>2</sup>, shall be determined by the by the Competent Person (Dolomite land), supported by information obtained from the micro gravity survey conducted by the geo-physics. Should more 5 (five) boreholes be required to be drilled, the Service Provider shall motivate/submit such additional requirement to the PM for his approval prior to commencing drilling operations. Remuneration for drilling in excess of 5 (five) boreholes, will be remunerated at tendered Rates for Bill #4.3 Services, item C2.2.3.2. Tendering Service Providers shall take note that the locality of sites/properties, which are to be investigated are at the time of tender unknown. Reference shall be made to relevant Site-Variable Bill item(s) for travelling aspects and items pertaining thereto.

B9). For sites measuring larger than 0,5 ha in extent, rates shall be tendered for Bill #2.3 Service(s), upon the basic premise that all requisite physical items/equipment/ staff/Key Persons etc., have already been catered for in Bill items. Tendering Service Providers shall tender commensurate rates for such additional time/work/Services required to be performed on-the-site (as establishment has already been accounted for).

B10). Borehole drilling work shall as a general principle be performed until such depth as where dolomite is encountered, plus 6 m (if less than 60 m deep), or otherwise to a depth of 60m.

Note: Should the need arise and drilling needs to done to greater depth, then such must be referred to the PM to authorize. Remuneration will be at tendered fees for Bill #4.3 Services.

B11). The Service Provider shall, as an integral part of this activity, be responsible to "locate" boreholes drilled with a sub-meter accuracy GPS unit ( $\pm 1,0m$  accuracy). Said information must, amongst others, be reflected on the General Arrangement Plan of the site, complete with site boundaries and coordinates to WGS 84 reference system.

B12). Work required to be performed by the Service Provider's drilling entity shall amongst others, but not limited thereto, include for performing all necessary on-site exploratory drilling work/backfilling activities, in accordance with specified requirements contained in ANNEXURE 2: "ENGINEERING GEOLOGICAL SERVICE: EXPLORATORY GEOTECHNICAL DRILLING: PARTICULAR SPECIFICATION (PS): EXPLORATORY DRILLING FOR ENGINEERING GEOLOGICAL INVESTIGATION".

B13). The Service Provider shall prepare and submit a formal FDSI report in accordance with specified requirements of SANS 1936 (2012) Part 2, Clause 4.3.3.

B14). See C2.1.2.21.2 and C3.2.3.3 for Quality Assurance requirements.

B15). Each site/property investigated, must be formally checked/reviewed and signed off by the senior external competent person (Dolomite land) peer reviewer, before full payment will be permitted - see C2.1.2.21.2. Remuneration for the peer reviewer shall be as per Bill #6. See C.3.3.6.



B16). It is a compulsory requirement for the Service Provider performing Services as instructed by WO for Bill Item #2.3 Services, to issue a FDSC, indicating amongst others, the Inherent Hazard Characterization and the Dolomite Area Designation of the site/property in terms of SANS 1936-1 Table 1 and the Department's Dolomite Risk Management Strategy requirements.

B17). It is a compulsory requirement for the Service Provider performing Services as instructed by WO for Bill sub-items #2.3 services, to compile and submit a DRMP for site(s) investigated, for which compensation will not be made separately.

**Note:** The general format, contents and workmanship required for the abovementioned reports/DSC documentation, shall, as a minimum requirement, be comparable in standard to that of the sample documents, copies of which will be available and displayed during the compulsory tender clarification meeting to tendering Service Providers. See C5.3.

**C3.3.2.3 C) Measurement and Payment:**

The Service Provider shall perform Bill Item #2.3 Services at all inclusive tendered Rates as follows:

C1) Attend to the general requirements regarding Site-Specific work noted above as per C3.3.2.3 A1) to A4) and C3.3.2.3 B1) to B17) above; See also C3.3.2 items A) to C), as appropriate.

C2) See also C3.3.2 D) for general specifications applicable to Specified Outcomes Services applicable to Site-Variable activities related to travelling.

C3) See C2.1.3.2 C) for particulars regarding proportional remuneration applicable to Specified Outcomes Based Services for Site-Variable Activities (travelling related).

C4) Full payment will apply for boreholes drilled to specified depths. Refer to C2.1.3.2 D) for permissible interim percentage stage payments.

C5) Final payment(s) against Bill #2.3 Services will not be considered until such time as requisite report(s) are submitted, complete with written sign-off by senior external Peer Reviewer.

C6) Price Adjustment to Tendered Rates. Refer to C2.1.2.22.

**BILL #2.3: MEASUREMENT AND PAYMENT EXAMPLE:**

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/UNIT	AMOUNT
#2.3	C2.1.2, C2.1.3, C2.1.3.2 A) & D) C3.2.1, C3.2.2, C3.2, C3.3 C3.3.2	<b>EMERGENCY FOOTPRINT DOLOMITE STABILITY INVESTIGATIONS (FDSI), CONFIRMATION OF INHERENT HAZARD CLASS (IHC), DOLOMITE AREA DESIGNATION AND PREPARATION OF FORMAL DOLOMITE RISK MANAGEMENT PLANS (DRMP):</b> FDSI's shall be performed in accordance with amongst other SANS 1936, part 2, Clause 4.3, read with cited PRICING INSTRUCTIONS AND SPECIFICATION REFERENCE requirements, with the minimum number of boreholes as per Clause 4.2.3, Table 1. The requisite works/activities are as per scheduled Bill items listed hereunder:	-	-	-	-
#2.3a)	As above, C3.3.2.3 C)	<b>Site Specific Activities:</b> Construction Area measuring a development footprint** area in extent up to 2500 m <sup>2</sup> :	Lump sum/site	2	R.....	R.....
#2.3b)	As above	Extra over footprint*** area in #2.3a), up to max. of 5000 m <sup>2</sup> :	Lump sum/site	1	R.....	R.....

#2.3c)	As above	Extra over footprint*** area in #2.3a), up to max. of 1,0 ha:	Lump sum/site	1	R.....	R.....
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ITEM REFERENCE	PRICING INSTRUCTIONS/ SPECIFICATIONS/ REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/UNIT	AMOUNT
#2.3d)	As above, C3.3.2 D), C3.3.2.3 C)	<b>Site-Variable Activities:</b> Single item travelling expenses kilometer rate (cumulative summation) for Exploratory Drilling Service Entity, complete with its Operational and Supervisory personnel, inclusive of travelling distance, travelling and accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc., to reach, work at and return for each WO instructed site investigated:	km	1500	R.....	R.....

**NOTE 1:** Should additional boreholes be instructed to be drilled when the drilling entity is on site, remuneration will be in accordance with Bill #4.3 Services

**NOTE 2\*\*\*:** Development footprint area = area computed from building/ structure/facility dimensions, plus 10m in any direction, on plan.

**C3.3.3 BILL #3: OUTCOME BASED SERVICES:**

**SPECIFIED OUTCOMES FOR THE WATER AUDITING INITIATIVE (WAI):**

**C3.3.3.1 Scope Of Work:**

A). General

A1). The Department identified the Water Auditing Initiative (WAI) as one of the prime elements of determining distress/malfunctioning in water networks, which has the potential of serving the purpose of an early warning pointer in identifying dolomite risk location(s) in water system networks. This will also have the added benefit of saving fruitless utility expenditure on water losses associated with dolomitic sites, owned by the Department.

A2). Due to the complexity/variety of different sites/property types and uses, such sites as are deemed relevant to the WAI study variables, are identified by name/unique reference, its particular use/(s), the number of persons populating the site/use in relation to the number/locality of auditable water meters per site. Layout drawings of each of the identified sites/properties, complete with referenced information noted hereinbefore, are to be obtained/ prepared.

A3). The auditing data and the site-specific demand analysis must provide data and information to such level to reflect upon Specified Outcomes expectations, which substance is summarized hereunder (but not limited thereto):

- The Service Provider shall prepare a detailed sub-level PEP for a comprehensive Water Auditing Initiative (WAI), which must describe the scope and programmatic and systematic detail of the Specified Outcome. This sub-level PEP must be submitted to the PM for consideration/comment/approval, within 2 (two) weeks after contract award.
- Calculation of estimated water demand per Water Auditing Property (WAP), per Water Auditing Zone(s) (WAZ), utilizing appropriate design parameters from relevant codes of practice, which must include for setting/assigning different functional zones within said larger WAP, with the aim of providing scientific proof/validation of results against actual metered water readings.
- Preparation and submission of water supply services layout drawings, per each of the identified WAP's WAZ sub-sites/facilities, complete with cadastral boundaries, locality and accurate coordinates of fit for purpose water meter logging devices. All relevant design parameters/data must be presented in tabulated format on (supporting) water services drawings, per each land parcel representing a WAP.
- The WAI scientific study must utilize statistical analysis methods in support of the proof of success/failure, as appropriate, of Bill #3 Services.
- This assignment must be treated with meticulous scientific/statistical accuracy and must reflect same in the final Outcome (read report).
- The expected Outcome Based result of Bill #3 Services shall be to receive/analyse information about the pilot Water Auditing Initiative for listed WAP's WAZ's, which aim it is to pro-actively detect water leaks and to timeously react appropriate to the cause, with the additional secondary benefit of significantly curbing water system losses. The latter must be quantified in monetary terms as part of Specified Outcomes required.
- The final close-out report must reflect upon all aspects of the study, good or bad, complete with successes and/or failures.
- The Service Provider shall prepare a dedicated PEP, which must amongst others deliberate upon fulfilling requirements for computing statistical analysis on the WAI programme as a whole, the final outcome of which must reflect upon recommendations for and formulate conclusions about the success/ess and cost saving(s) achieved, with the latter aspect reflecting upon water utility wastage costs.

**C3.3.3.2 Particular Outcomes Based Requirements:**

A1). The primary focus and purpose of Bill #3 Services is to evaluate factors and determine variables resulting from ageing water pipe systems deemed to be beyond their serviceable lifespan, which are located at various rated inherent dolomite hazard zones, within specified

WAP's. The final close-out report must reflect upon a scientific/statistical analysis of the findings/determinations derived from research/analysis undertaken.

A2). The Service Provider must amongst others structure Bill #3 Services such that it gives expression to and supports the following basic requirements:

- Undertake punctual monthly recording(s) of pre-determined WAP's collective metered water use, inclusive of reading/recording various WAZ meters on such WAP's, to enable the development of a statistical water use model.
- Perform appropriate design(s) and relevant calculations to determine predicted water use, on a monthly theoretical basis, comprising the various elements/components of different water use(s) within specified WAZ's on each WAP.
- Perform scientific/statistical analysis of designed water demand versus actual metered use. Variation in occupation numbers applicable to different water users/uses, within WAZ's, must form an integral part of these (monthly) projections/determinations.
- Identify, predict, and regularly report on locality of potential water leakages and its estimated quantum. This aspect includes for "as-the-need-arises" written responses by the Service Provider to the PM, to invoke appropriate actions to initiate necessary preventative interventions by others.
- Assessment of and accounting for water system losses, within each specified WAP's WAZ's.
- Investigation of and reporting about potential water abuse by client users, where and whenever observed.
- Reconcile actual metered water use, per each specified WAP, with tabulated site specific records of actual monthly payments to Water Utility Service Providers.
- Identify/determine the potential risk of distressed water networks in relation to dolomite risks for each identified WAP.
- Prioritise upgrading of water services networks, based on risk versus accounted for and/or un-accounted water losses.
- Develop statistical models for and predictions about water consumption for different development types and related occupation levels instructed WAP's.
- The Service Provider shall report its findings/results at quarterly progress meetings about the above aspects, as appropriate. Minutes of such meetings shall be compiled by the Service Provider and presented for consideration and sign-off within two weeks after the meeting by the PM.

**BRIEF OUTLINE OF PHASING SPECIFIC OUTCOMES:**

PHASE	PRIMARY DUTIES:
1	Initiation phase: Specified WAP's desktop study
2	Production Phase:
2A	Record WAP's actual metered water use: Immediate commencement and thereafter a continuous monthly punctual duty.
2B	Compilation of working drawings, comprising buildings, facilities & water services network layouts, for all specified WAP's.
2C	Determination of theoretical design water demand in accordance with standard South African practice (CSIR's RED Book), for different water uses within all specified WAP's, including defining various development "types" (including seasonal effects), with agreement about and sign-off by the client user, the PM and the Service Provider.
2D	Setting/defining basic design parameters. This includes for formal sign-off by PM.
2E	Water network hydraulic analysis (using existing as built drawings) with recognized computer aided Civil engineering design package, representing the theoretical projection of water demand for the various areas/classes of water consumption at all WAP's. This must include for various levels of occupational use within WAZ's.

2F	Statistical comparison of measured consumption versus theoretical water demand, inclusive of dealing with monetary evaluation/comparison aspect(s)
2G	Determine and report results on water usage reduction after upgrading pressurized water networks, which have been installed in accordance with PW 344 (LATEST VERSION) standards.
2H	Metering statistics and statistical anomalies analysis
2J	Prioritization of water services upgrading projects
3	Close-out stage: Reports, conclusions and recommendations

**C3.3.3.3 WORK BREAKDOWN STRUCTURE:**

The primary identified Services required for the Water Auditing Initiative (WAI) are outlined in the Work Breakdown Structure (WBS) table hereunder.

Item	Verifiable Specified Outcome Milestone Event per each WAZ property:
a)	Monthly Water Audit: Readings taken at identified WAZ property: Note: Interim payments shall be made at quarterly intervals over the contract period
b)	Water demand (consumption) analysis versus theoretical
c)	Site water use assessment and analysis:
d)	Water distribution network analysis:
e)	Statistical anomalies/reporting
	Total:

Note: Interim payment percentages are referenced in C2.1.3.2 E).

**C3.3.3.4 Specified Outcomes Required for Specified Water Auditing Properties (WAP's):**

A1). Bill #3 Services typically applies as follows:

WAP Property Description	WAP Developed Buildings Footprint area* (ha)	WAP number of buildings (no)
DOD: SAAF: Swartkops Special Forces (MASOP*)	50	1000

**Note:** Developed Footprint Buildings Area\* means, within the context of Bill #4, the parcel of land served by potable and/or irrigated water services, under pressure, within the identified WAP, which dimensions measures across the length and breadth of the developed footprint of such property, enveloping infrastructure developments such as buildings/facilities/structures, plus 20m in any direction, however always within the cadastral boundaries of a particular identified property.

A2). Water meter readings shall be taken on a fixed date on a monthly basis. The shortest distance travelling route shall be pre-planned/configured, with the aid of a route planner program, to capture all 7 (seven) WAZ properties water readings, if practical, on one specific day of the month.

A3). The "developed footprint" area of a property generally measures less than the (property) land parcel extent.

A4). The land parcel extent of identified WAP's noted above, covers "*developed footprint*" areas, which includes for institutional, commercial, residential, roads, recreational (sport fields) and other constructed development(s) & facilities, but specifically excludes non-used and non-developed areas, such as uncultivated grasslands next to airport runways.

A5). For small sites less than 1 (one) ha, the full property land parcel extent (measured in ha) applies for measurement and payment purposes.

A6). All work performed under Bill #3 Services shall be subject to peer reviews, complete with sign-off by the Project Principal, on each of the above listed WAP's.

**C3.3.3.5 Bill #3 Services: Milestone Dates**

A) Bill #3 Service's milestone dates shall be detailed in the Service Provider's WAI PEP. See guideline schedule of milestone dates in the table hereunder.

B) Should mutual consensus not be reached between the PM and the Service Provider in agreeing milestone dates, such dates shall be negotiated in good faith by the PM and the Project Principal.

C) The final PEP must be formally approved by the PM, which contents will comprise an integral contractual element of Bill #3 Services.

DESCRIPTION OF MILESTONE	TARGET DATE
Submission of Sub-level PEP for consideration & comment by the PM	Within 2 (two) weeks of contract award
Design Level (see C3.3.3.3 b) above): Initiation Phase: Desktop study of WAP's	Within 6 (six) weeks of contract award
Phase 2A: Water audit measurement commencement:	Within 6 (six) weeks of contract award
Phase 2B: Prepare and submit working drawings of all WAZ's in relation to WAP's, reflecting upon site layout and water services routes under pressure	Within 12 weeks of contract award.
Phases 2C, 2D and 2E: Finalize all designs for water demand and update working drawings with relevant information	Within 20 (twenty) weeks of contract award
Phases 2F, 2G and 2H: Regular and on-going reporting	Quarterly reporting
Phase 2J: Recommendations and prioritization:	Quarterly reporting
Phase 3: Final close-out report:	Three months before tender expiry

**C3.3.3.6 Penalties for Late Completion:**

**A1) Formalizing Milestone Dates:**

The Service Provider and the PM shall engage, on a fair, reasonable and mutual consensus basis, within 10 (ten) working days after submission of the WAI PEP (two weeks after contract award), to formalize/fix milestone activities/dates.

**A2)** Upon final approval of the sub-level PEP by the PM, the Service Provider shall strictly adhere to and timeously submit Specified Outcomes on milestone dates contained therein.

**A3) Penalty Application:**

Late submission of Specified Outcomes on milestone dates will attract the application of penalties as specified hereunder:

Unsatisfactory and/or late delivery of any Specified Outcome on milestone dates contained in the approved final WAI PEP, shall attract a Penalty as listed in C3.2.2.4.3 E), up to a maximum penalty of R 10 000,00, per milestone event.

**C3.3.3.7 Travelling Requirements/Arrangements:**

A1). The Service Provider shall prepare and submit a proposed travelling schedule visiting all WAP's on a monthly basis, for consideration/approval to the PM, which must account for an effective, least kilometre distance travelled, "Round-Robin-Trip" basis.

**A2). Travelling time**

Fees for travelling time are as set out in Table 8 in the "Rates for Reimbursable Expenses".

Fees are payable for travelling time at the tariff, as set out in C2.1.3.5 Time charges for work done under a value based fee. Travelling time will be fully reimbursed.

**A3). Travelling costs**

Fees for travelling costs are as set out in Table 3 in the "Rates for Reimbursable Expenses".

Travelling costs will be refunded for the full distance covered per return trip measured from the office of the Service Provider appointed.

Compensation for the use of private motor transport will be in accordance with the Government tariff for the relevant engine swept volume, up to a maximum of 3000 cubic centimetres, prescribed from time to time and as set out in Table 3 in the "Rates for Reimbursable Expenses".

**A4). Hired vehicles**

In cases where use is made of hired vehicles, the most economical sized vehicle available is to be used but compensation shall nevertheless be restricted to the cost of a hired car not exceeding a capacity of 1300 cc. Where use of a special vehicle is essential (e.g. four track or minibus to accommodate more people), prior approval in writing must be obtained from the departmental project manager.

**A5). Subsistence allowance**

The subsistence allowances are as set out in Tables 4 and 5 in the "Rates for Reimbursable Expenses".

Only actual costs are payable in respect of absence from office of less than 24 hours.

Should the daily tariff as set out in Table 4 be inadequate, substantiated actual costs plus a special daily allowance as shown in Table 5 for incidental expenses, may be claimed. It must be noted that claims may only be according to Table 4 or Table 5. Accommodation should be limited to the equivalent of a three star hotel and no alcoholic beverages or entertainment costs may be claimed for.

**Measurement and Payment for Bill #3 Services:**

A1) The Service Provider shall tender all inclusive rates to meet and deliver upon Specified Outcomes referenced in items C3.3.3.1 to C3.3.3.7 above.

A2) The method and certifiable interim payment proportion towards Specified Outcomes elements, contained in the Work Breakdown Structure (WBS) of Bill #3 Services, must be tendered as a Lump Sum per each WAP. See C2.1.3.2 E).

A3) The WAP/WAZ Developed Building Footprint Area\*, measured in hectares (ha), as quantified in the relevant column of Bill #3 items, is shown as provisional quantities. Variances in quantum, either upwards or downwards, shall be quantified/remunerated according to tendered all inclusive Rates, against item "#WAZ.add Land"

A4) The WAZ Number of Buildings (no) represents an estimated count of buildings/structures counted on a specified site/property. Only buildings with a footprint area measuring in excess of 200m<sup>2</sup> shall be counted in this determination. A count of buildings/structures, either upwards or downwards, shall be the basis of remuneration at all inclusive tendered Rates.

**BILL #3: MEASUREMENT AND PAYMENT EXAMPLE**

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	WAZ DEVELOPED FOOTPRINT AREA (ha)	WAZ NUMBER OF BUILDINGS (no.)	RATE/IDENTIFIED SITE	AMOUNT
#3	C3.3.3	Site Description:	-	-	-	-
#3WAZ.01	C3.3.3.8	DOD: Swartkop Park: Special Forces (MASOP*)	50	1000	Lump sum	R .....
#3WAZ.add. Land	C3.3.3.8	WAZ Land Parcel Variance(s)	per 1,0 ha (+ or -)	-	R .....	R .....
#3WAZ.add. Buildings	C3.3.3.8	WAZ Additional Buildings/Structures	-	per group of 10 (+ or -)	R .....	R .....
#3.	Item	Travelling Component:	-	Distance	Rate/km	
#3WAZ.Trav	C3.3.3.7	All inclusive rate for travelling to reach and return from identified 7 (seven) WAZ Properties: Note 1: Shortest distance travelling route shall be configured to capture all 7 WAZ properties listed above, inclusive of time, travelling costs and all sundry expenses  Note*: Provisional re-measurable travel distance to sites authorized by the PM (per instructed WO):		7,000*km	R .....	R .....

**Note:** All work performed under Bill #3 Services shall be subject to Project Principal's oversight and review, complete with sign-off for each of the WO instructed WAP's.



**C3.3.4 BILL #4 SERVICES: TIME AND COST BASED FEES SERVICES:**

**SPECIFIED OUTCOMES FOR ADDITIONAL EXPLORATORY SERVICES IN SUPPORT OF DOLOMITE RISK MITIGATION INTERVENTIONS:**

**C3.3.4 General:**

A1) The PM may instruct WO's for any additional required work, such as gravity surveys, micro gravity surveys, test pitting by TLB, DPSH testing, additional drilling and Laboratory tests to be performed under Bill #4 Services.

A2) The Service Provider must at all times have on call, at short notice, emanating from EEI or GHI WO instructions issued by the PM, access to and be able to provide such Specialist Services as described herein. Such called for Services should be available on a 7/24/365 basis, whenever instructed by the PM, typically via cell phone communication, with subsequent confirmation with a formal WO by the PM.

A3) Due to the random, unpredictable extent and unknown locality of ground instability events/incidents, which may occur at any time during the contract period, the PM will, after review and discussion with the Service Provider Project Principal, of a particular incident, promptly issue instructions (albeit formal or informal), about the most appropriate means/method/type and speed with which an investigation incident requires to be conducted. As a consequence, as and when the PM instructs such work by WO to the Service Provider, the dedicated time of the Project Principal must, without delay, be availed to coordinate the necessary actions/activities, to attend to and facilitate the physical Site-specific investigation/ drilling/testing/exploration means required.

A4) Bill #4 Services allows for and requires specific support functions/facilities/equipment (with supporting staff), which are required to be available, on short notice, to perform the actual site investigation work required. Such work/activities will be instructed via WO, by the PM, which may include (but not be limited thereto), gravity surveys, exploratory borehole drilling, TLB work, DPSH and geotechnical laboratory testing, which would support and enable the Service Provider professional(s) and external peer reviewer, to derive/deduct conclusions and make recommendations about the safety of people and the preservation (read safety) of fixed assets.

A5) Tendering Service Providers are to note that the time of Key Persons required to provide support Services activities for WO's implicating Bill #04 Services, are dealt with and accounted for separately, under Time Based Fees for Bill #5 Services.

A6) Site-Specific Services required to be performed by the Tendering Service Provider sub-contractor's (Bill #4 Services), shall be tendered for on an all-inclusive basis for travelling and sundry expenses, to enable same to reach/return and perform work to render Specified Outcomes for a particular issued WO.

A6) See C2.1.4.9 and C3.3.2 D) for principles applicable to Site-Variable Activities (travelling aspects) applicable to Bill #4 Services.

**C3.3.4.1 BILL #4.1: SPECIFIED OUTCOMES: ADDITIONAL EMERGENCY GRAVITY SURVEYS:**

**C3.3.4.1 A) General:**

A1) Additional emergency Gravity Survey Services investigations shall conform to and be reported about as per specified best practice standards/requirements, which shall meet with the minimum requirements specified in SANS 1936 (2012) Part 2, Clause 4.2.2: Geophysical survey.

A2) All Gravity survey work shall be performed with appropriate best practice fit for purpose specialized equipment. The Geophysicist shall utilize a grid spacing of 30m x 30m, and gravity surveys should generally reach beyond physical site boundaries, all as deemed relevant/appropriate to the cause.

A3) Upon preparing and rendering Gravity Services, Specified Outcomes shall be formally recorded and handed over in a format acceptable to the Service Provider geo-professional(s). The aforementioned information shall also be put in possession of the PM, in hard copy and e-format, before payment will be considered for such Services rendered.

A4) See C3.3.4.2 A) for special circumstances involving additional micro gravity surveys wherein the Service Provider may perform work without a written WO instruction of the PM. The Service Provider shall however, in circumstances referred to hereinbefore, record such work subsequent to performing additional micro gravity work, complete with substantiated motivation, soon after execution of such Services.

**C3.3.4.1 B) Site-Specific Activities:**

B1) Whenever the PM instructs by WO additional emergency gravity survey work to be performed, tendered Rates shall make provision for all costs associated with executing the additional gravity survey work, per site/property, per station, inclusive of the interpretation thereof and capturing same in an acceptable hard copy and electronic format, which must be compatible with the Department's and the Tendering Service Provider's criteria/requirements.

B2) The Service Provider shall take note that the criteria applicable to B1) above, applies to all information exchange requirements, such as the electronic database, maps, reports, etc., which must be in a format acceptable to the Service Provider's requirements. Printing, duplicating, e-copy requirements etc., for reproducing the aforementioned, shall be as per C3.2.3.3, and all such expenses/costs/disbursements shall be deemed included in the rate tendered per station.

B3) Reference shall be made to C2.1.4 regarding tendered Time and Cost Based Fees Services for Key Personnel (excl. professional time of the Geo-physicist and his/her support staff performing work associated with additional gravity survey work, which time cost and expenses are deemed included in tendered Rates as stated in B1) and B2) above).

**C3.3.4.1 C) Site-Variable Activities:**

C1) The "Site-Variable" Activities associated with Bill #4.1 Services, has at its core a travelling substance, which is deemed necessary by the gravity surveying entity, to produce Specified Outcomes.

C2) The Site-Variable component includes, in the broadest possible meaning of the term, all such costs/expenses related items, associated with the travelling action/activity of the Gravity Surveyor entity and his support staff, which should include for, amongst others (but not limited thereto), travelling time, travelling costs/expenses, subsistence costs, sundry disbursement costs, accommodation costs, toll fees, etc., as from the time of departure from the sub-contracting gravity surveying entities' work place, to reach the specified Site/property, and the subsequent return trip back to same. Details of planned travelling by the sub-contracting gravity surveying entity shall be reflected upon in the Service Provider's PEP for each instructed WO. See 3.3.2 D).

C3) The Department shall remunerate the gravity surveying entity for work required on a "once-off-only" site visit basis (travelling distance measured in km for a return trip), and all work necessary to be performed/concluded on the specified WO site, must be attended to during such authorized

trip, unless otherwise agreed to and timeously/formally requested by the Service Provider and thereafter formally authorized in writing by the PM. The Gravity surveying entities' staff shall physically attend to the instructed WO Site/property, during which it shall inspect, conduct and conclude all work/activities necessary to finalize required/specified site specific work.

C4) Travelling will be remunerated at an all-inclusive kilometer Rate, for the return trip distance travelled, for each instructed WO where emergency gravity survey work is required. Since distance(s) and destination detail(s) shall be regarded as unknown at tender stage (by virtue of the unknown locality/distance to reach and return from the specified Site/property), the Service Provider shall tender all inclusive travelling Rates for Specified Outcomes required, for additional emergency gravity survey services per Bill #4.1, based on the principles described in C2.1.4.9, at a commensurate unit rate per kilometre travelled.

C5) Price Adjustment to Tendered Rates. Refer to C2.1.2.22.

#### C3.3.4.1 D) Measurement and Payment

D1) All Site-Specific requirements (see C3.3.4.1 A) and C3.3.4.1 B) above) associated with additional emergency gravity survey work, shall be priced at all inclusive tendered Rates. Payment against this item will be based on the number of gravity stations (30mx30m) set out and utilised, for either developed or un-developed sites, to render results acceptable to the Tendering Service Provider for interpretation, and if required, to receive further instructions.

D2) Compensation will be against a standard grid pattern of 30mx30m. Payment will be per station, as instructed by in writing by the Service Provider, which must be authorized by the PM upon receipt of the WO specific PEP. Results, maps, e-format information, exchange interface requirements etc., shall be to the specified criteria recorded above, a copy of which must be delivered to the PM (to signify receipt/acceptance), before payment will be certified by the PM. All data must be compatible with the Department's currently used GIS database system.

D3) Site-Variable travelling requirements shall be tendered at all inclusive travelled kilometre Rates, to specifications referenced in C3.3.4.1 C) above.

**BILL #4.1: MEASUREMENT AND PAYMENT EXAMPLE:**

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/UNIT	AMOUNT
#4.1	C2.1.2, C2.1.3, C2.1.4, C3.2, C3.3.4, C3.3.4.1	<b>Bill #4.1 Services*:</b> <b>Additional Emergency Gravity surveys:</b> General requirements/allowances:				
#4.1a)	As above, C3.4.4, C3.3.4.1 A) & B) C3.3.4.1 D)	<b>Site-Specific Activities:</b> Execution of on-site additional emergency gravity survey work (30mx30m grid) at developed sites/ properties, in accordance with cited specifications and Specified Outcomes:	Station	1000	R .....	R.....
#4.1b)	As above	Execution of on-site additional gravity survey work (30mx30m grid) at un-developed sites/ properties, in accordance with cited specifications and Specified Outcomes:	Station	1200	R.....	R.....
#4.1 c)	C3.3.2 D) C3.3.4, C3.3.4.1 A), C) & D),	<b>Site-Variable Activities:</b> All inclusive Site-Variable kilometer rate for Gravity survey entity travelling, incl. travelling time of Geo-professional(s), disbursements, subsistence etc., inclusive of support personnel, (if required), per each WO instructed site investigation.	km	4000	R.....	R.....

**\*IMPORTANT NOTE:** Bill items #4.1a), b) and c) above will be the subject of a CASE 3 penalty, which will be applied when the designated sub-contracting entity takes more the 72 (seventy two) hours to reach and perform GHI or EEI instructed Bill #4 investigation Services. Reference is made to C3.2.2.4.4 C).

**C3.3.4.2 BILL #4.2: SPECIFIED OUTCOMES: ADDITIONAL EMERGENCY MICRO GRAVITY SURVEYS:**

C3.3.4.2 A) General:

A 1) The Service Provider shall tender all inclusive Specified Outcomes Services rates for additional emergency on-site micro gravity survey work based on a 10mx10m grid pattern. Such work would typically be required in areas which are densely developed or where circumstances of merit dictate. The Service Provider and/or the specialist geophysicist will be required to motivate to PM in writing the need for additional micro gravity survey work, if this is recommended for any particular Site/property. The Department will only certify payment for micro gravity survey work when a formal WO has been issued by the PM.

A 2) In cases where the Gravity survey entity has already established on a particular Site/property being gravity surveyed (i.e. 30mx30m grid pattern), and it becomes convincingly clear that a specific portion of land will imminently require micro gravity survey work, then such may be executed without prior written permission of the PM, however, on the proviso that the survey area in question measures less than 1000 m<sup>2</sup>, and that remuneration will be at tendered rate(s) for stations about to be set up. When the area proposed to be micro gravity surveyed measures in excess of 1000 m<sup>2</sup>, a WO instruction from of the PM must be obtained prior to executing such work.

A 3) Additional emergency micro gravity survey Services investigations shall conform to and be reported about as per specified best practice standards/requirements, which shall meet with the minimum requirements specified in SANS 1936 (2012) Part 2, Clause 4.2.2: Geophysical survey.

A 4) Upon preparing and rendering emergency Micro-Gravity survey Services, Specified Outcomes shall apply and such shall be formally recorded and handed over in a format acceptable to the Service Provider's geo-professionals. The aforementioned information shall also be submitted to the PM, in hard copy and e-format, before payment will be processed for such work.

**C3.3.4.2 B) Site-Specific Activities applicable to Emergency Micro-Gravity Survey Services:**

B 1) Whenever the PM instructs additional emergency Micro-Gravity survey Services by WO, the Rate tendered per station shall make provision for all Site-Specific costs associated with executing the additional emergency Micro-Gravity survey Services on the Site/property identified, including the interpretation thereof and capturing same in a format compatible with the Department's and the Service Provider's criteria/requirements.

B 2) The Service Provider shall take note that item B1) above applies to all information exchange requirements such as the electronic database, maps, reports, etc., which must be in a format acceptable to the Service Provider professional(s) and the Department. Printing, duplicating, e-copy requirements etc., shall be as per C3.2.3.3, and all such expenses shall be deemed to be included in the tendered Rate per station.

B 3) Reference shall be made to C2.1.4 regarding tendered Time and Cost Based Fees Services by Key Personnel (excl. professional time of the Geo-physicist and his/her support staff, which are required to perform such additional micro-gravity survey Services, which time/cost/expenses are deemed included in tendered Rates in C3.3.4.2 B1) and B2) above).

B 4) Specified Outcomes, such as maps, e-format information exchange interface requirements etc., shall be to the specified criteria/format required by the Service Provider Competent Person (Dolomite land), a copy of which must be delivered to the Department (thereby signifying formal receipt/acceptance), before payment will be certified by the PM.

B 5) All data and drawing(s) prepared/submitted by the Micro-Gravity services entity shall be in a format compatible with the Department's currently used GIS database system.

**C3.3.4.2 C) Site-Variable Activities applicable to Emergency Micro-Gravity Survey Services:**

C1) The scheduled "Site-Variable Activities" associated with Bill #4.2 Services, have at its core a travelling substance, which would be required from the Micro-Gravity surveyor entity, to produce WO instructed emergency Micro-Gravity survey Services Specified Outcomes:

C2) Site-Variable component includes, in the broadest possible meaning of the term, all such costs/expenses related items, associated with the travelling action/activity of the Micro-Gravity surveyor entity and his support staff, which should include for, amongst others (but not limited thereto), travelling time, travelling costs/expenses, subsistence costs, sundry disbursement costs, accommodation costs, toll fees, etc., as from the time of departure from the sub-contracting Micro-Gravity surveying entities' work place, to reach the specified Site/property, and the subsequent return trip back to same. Details of planned travelling by the sub-contracting micro-gravity surveying entity shall be reflected upon in the Service Provider's PEP for each instructed WO. See 3.3.2 D).

C3) The Department shall remunerate the Micro-Gravity surveying entity for Services on a "once-off-only" site visit basis (return trip travelling distance measured in km), and all work necessary to be performed/concluded on the specified WO site, must be attended to during such authorized trip, unless otherwise agreed to and timeously/formally requested by the Service Provider, and thereafter formally authorized in writing by the PM. The Micro Gravity surveying entities' staff shall physically attend the identified WO site/property, during which it shall inspect, conduct and conclude all work/activities necessary to finalize/conclude required/specified site specific work.

C4) Travelling will be remunerated at an all-inclusive kilometer Rate, for the return trip distance travelled, for each instructed WO where emergency Micro-Gravity survey work is required. Since distance(s) and destination detail(s) shall be regarded as unknown at tender stage (by virtue of the unknown locality/distance to reach and return from the specified site/property), the Service Provider shall tender all inclusive travelling Rates for Specified Outcomes required, for additional emergency Micro-Gravity survey services per Bill #4.2, based on the principles described in C2.1.4.9, at a commensurate unit rate per kilometre travelled.

C5) Price Adjustment to Tendered Rates. Refer to C2.1.2.22.

**C3.3.4.2 D) Measurement and Payment:**

D1) Remuneration for Services rendered will be compensated at all inclusive tendered Rates for a grid pattern of 10mx10m, to requirements specified above.

D2) Attendance to and delivering upon specific requirements as per Items C3.3.4.2 A) to C3.3.4.2 C) above, shall be deemed included in tendered Rates.

D3) Payment will be per station, as per the written instructed requirements of the Service Provider's Competent Person (dolomite land).

..... continued on next page

**Bill #4.2: MEASUREMENT AND PAYMENT EXAMPLE:**

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/UNIT	AMOUNT
#4.2	C2.1.2, C2.1.3, C2.1.4, C3.2, C3.3.4 C3.3.4.2	<b>Bill #4.2 Services*:</b> <b>Additional Emergency Micro Gravity Surveys:</b> General requirements/allowances:				
#4.2a)	As above, C3.3.4.2 A) & B) C3.3.4.2 D)	<b>Site-Specific Activities:</b> Execution of on-site additional micro gravity survey work (10mx10m grid), in densely populated developed areas, in accordance with cited specifications and Specified Outcomes:	stations	1600	R.....	R.....
#4.2b)	As above, C2.1.4.9 C3.3.2 D), C3.3.4.2 A), C) & D)	<b>Site-Variable Requirements:</b> All inclusive Site-Variable kilometer rate for Micro-gravity service entity travelling, including travelling time of Geo-professional(s), disbursements, subsistence etc., inclusive of support personnel, (if required), per each WO instructed site investigation.	km	4000	R.....	R.....

**IMPORTANT NOTE:** Bill items #4.2a) and 4.2 b) above will be the subject of a CASE 3 penalty, which will be applied when the designated sub-contracting entity takes more the 72 (seventy two) hours to reach and perform GHI or EEI instructed Bill #4 investigation Services. Reference is made to C3.2.2.4.4 C).

**C3.3.4.3 BILL #4.3: SPECIFIED OUTCOMES: ADDITIONAL EMERGENCY GEOLOGICAL EXPLORATION SERVICES BY MEANS OF BOREHOLE DRILLING, LOGGING, TESTING ETC.:**

**C3.3.4.3 A) General:**

A1) Whenever the PM instructs the Service Provider by WO to perform emergency Dolomite Stability Investigations (DSI) or GHI/EEI Services, albeit for Outcomes Based work or Time and Cost Based Fees Services, the Service Provider shall facilitate and undertake exploratory specialist drilling Services, as and where required. Since the locality of such events/incidents are unknown at tender stage, the location may be anywhere in the Dolomite affected provinces of South Africa.

A2) Generally GHI and EEI Services are WO instructed by the PM, which event(s) are typically reported to the PM by DPW property user entities, the public at large or any other DPW appointed consultant or contractor.

A3) Should the reported ground instability event, or structural (building) distress, warrant further detailed specialist studies/investigations, the PM shall, in collaboration/consultation with the Service Provider, instruct by means of a WO, drilling of additional emergency exploratory boreholes.

**C3.3.4.3 B) Site-Specific Activities Applicable to Emergency Drilling of Additional Exploratory Borehole(s):**

B1) The Service Provider shall assign competent Key Person(s) (time inputs based upon Time and Cost Based Fees Services as per relevant Bill #5 items), to facilitate, arrange, and coordinate the drilling of exploratory emergency boreholes on any DPW site underlain by dolomite. Such work shall only be attended to upon receipt of a formal WO issued by the PM.

B2) Should the Competent Person (Dolomite land) require additional emergency Gravity survey, (or Micro-gravity survey) work to be performed, i.e. before exploratory borehole drilling commences, then such instructions, read with WO Specified Outcome requirements, will form the basis of setting the scope of work for follow-on site investigation work.

B3) Subsequent to and resulting from the Service Provider's Competent Person's (Dolomite land) inspection of the WO instructed site/property, borehole setting out shall be undertaken to Outcome Based requirements. The Service Provider shall accordingly accurately peg out the determined positions of such as required exploratory boreholes on site, to enable the Service Provider drilling entity to perform its work, well before the drilling equipment establishment takes place on site. GPS coordinates of borehole positions must be accurately recorded and locality positioned on relevant reference maps/drawings.

B4) The Service Provider's sub-contracting drilling entity shall be under direct instruction, control and supervision of the assigned Key Person, who shall duly issue instructions for work which may be related to emergency work (i.e. GHI or EEI cases), or *ad-hoc* investigation substance.

B5) All drilling work shall be performed under the direct supervision of a qualified experienced drilling foreman until the Key Person (Geologist) has released the driller from his responsibility. Recording and logging of boreholes must be to best practice industry standards. Borehole logging and recording of relevant data/information shall be the responsibility of the Service Provider's Key Person (Geologist).

B6) The Competent Person (Dolomite land) and/or the designated Key Person (Geologist) must ensure that all drilling work is carried out to the current best practice standards specified in SANS 633 (also referenced in SANS 1936), and that recording be made in accordance with the specification for geotechnical logging of soil profiles and rotary percussion boreholes for engineering purposes in Southern Africa. The drilling foreman shall, under the supervision of the Service Provider's Key Person (Geologist), perform such drilling works as directed. The designated Key Person (Geologist) shall supervise all drilling work full time on site and shall



render interim verbal report(s) (frequency as deemed appropriate/relevant), on drilling conditions/progress to the Competent Person (Dolomite land), for each borehole drilled. All

Borehole(s) drilled should intercept at least 6m dolomite bedrock before drilling may be ceased, unless otherwise instructed by the designated responsible Key Person. Each WO instructed borehole must be uniquely/sequentially numbered and compensation will only be considered if properly referenced/numbered/logged to the aforementioned requirements.

B7) Backfilling of all boreholes drilled and measured for payment under Bill #4.3 Services, shall be backfilled strictly in accordance with specified requirements set out in ANNEXURE 2 (attached hereto), clauses PS1 to PS 14.

IMPORTANT NOTE: Each borehole shall be backfilled for the full drilled depth (i.e. from the bottom to the top), under the explicit supervision of the designated Key Person.

B8) The Service Provider will be required to submit a detailed PEP, upon having received a PM instructed WO to have additional emergency exploratory boreholes drilled, which must contain a detailed breakdown of all work/activities required to be performed by assigned/designated Key Persons, for activities such as managing, coordinating, setting out, travelling (site-variable activity), logging, supervision of borehole backfill operations, dipping ground water level (after 48 hours), compilation of report(s) relevant to the cause, etc., all of which are to be compensated at Bill #5 Time and Cost Based Fees tendered Rates.

#### C3.3.4.3 C) Site-Variable Activities:

C1) The scheduled "Site-Variable" Activities associated with Bill #4.3 Services, has at its core a travelling substance applicable to the exploratory drilling entity, to produce Specified Outcomes.

C2) The Site-Variable Activity includes, in the broadest possible meaning of the term, all such items that can be related to the exploratory drilling entities' forward and return travelling arrangements/actions, which includes amongst others, staff travelling costs, overhead costs, diverse travelling expenses, toll fees, kilometers travelled, subsistence expenses, sundry disbursements etc., from the time of departure from the drilling entities' Home Base (or otherwise pre-authorized work place), to reach and return from the WO instructed site/property. Details of the sub-contracting drilling entities' planned travelling distance must be reflected upon in the Service Provider's PEP for each instructed WO.

C3) The drilling entities travelling distance will be remunerated at all inclusive travelling distance rate, for each WO issued by the PM, for the requisite investigation at an identified Site/property. Since distance(s) and destination detail(s) may be regarded as unknown(s) at tender stage (by virtue of the unknown locality/distance to reach and return from the specified site/property), the drilling entity shall tender all inclusive rates for travelling when attending to Specified Outcomes against this item, covering all expenses/costs as referenced in this section. See also C2.1.4.9, which further clarifies inclusions of the term "All-Inclusive".

C4) Additional Geological Exploration Services performed by WO (Bill #4 Services), as instructed by the PM to the Service Provider, shall be arranged, coordinated and managed by the Service Provider's Project Principal. All Time and Cost Based Fees Services required/rendered, involving Key Persons as may be relevant to the cause will be compensated at tendered Rates, the short descriptions of which are referenced in Bill #4.1 to Bill #4.4 Services.

C5) Time and costs of designated Key Persons envisaged to be deployed for WO instructed additional exploratory drilling work shall be reflected upon in the Service Provider's PEP, which must be submitted for approval to the PM. Upon formal approval of the PEP by the PM, remuneration will be at Bill #5 tendered Rates for Time and Cost Based Services attended to by the Service Provider's designated Key Persons. This includes amongst others for travelling, setting out, reporting to best practice standards, etc.

#### C3.3.4.3 D) Measurement and Payment:

D1) The Service Provider shall perform/deliver upon Specified Outcomes Services, at all inclusive tendered Rates, in accordance with specified requirements per C3.3.4.3 A) to C3.3.4.3 C) above.

D2) In addition to general instructions/information referred to in Site-Variable Services, per C3.3.4.3 C) above, reference shall also be made to C3.3.2 D).

D3) Price Adjustment to Tendered Rates. Refer to C2.1.2.22.

**BILL #4.3: MEASUREMENT AND PAYMENT EXAMPLE:**

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/UNIT	AMOUNT
#4.3	C2.1.2, C2.1.3, C2.1.4, C3.2.2, C3.2.3, C3.3.4 C3.3.4.3	<b>Bill #4.3 Services*: Additional Emergency Geological Exploration work by means of Borehole drilling/ logging/ testing &amp; backfilling:</b>				
#4.3a)	As in #4.3 above, C3.3.4.3 A) & B) C3.3.4.3 D)	<b>Site-Specific requirements*:</b> On-the-site establishment and de-establishment from any WO instructed site, including setting up on any number of boreholes on the same site.	site	15	R .....	R .....
#4.3b)	As in #4.3 above, C3.3.4.3 A) & B) C3.3.4.3 D)	Drill through any material up to a maximum depth of 30 m, measured from ground surface, complete with backfilling of borehole	m	2500	R.....	R .....
#4.3c)	As in #4.3 above, C3.3.4.3 A) & B) C3.3.4.3 D)	Drill deeper through any material from a depth of 30m up to 60 m (measured from ground surface), complete with backfilling of borehole	m	1500	R.....	R .....
#4.3d)	As in #4.3 above, C3.3.4.3 A) & B) C3.3.4.3 D)	Drill deeper through any material from a depth of 60m up to 100 m (measured from ground surface), complete with backfilling of borehole	m	500	R.....	R .....
#4.3e)	As in #4.3 above, C3.3.4.3 A) & B) C3.3.4.3 D)	Install borehole casing if required; only by authorization of the Geologist or the Competent Person (dolomite land).	m	200	R.....	R .....
#4.3f)	As in #4.3 above, C3.3.4.3 C) C3.3.2 D)	<b>Site-Variable Activities*:</b> Single item travelling expenses kilometer rate (cumulative summation) for emergency additional Exploratory Drilling Service Entity, complete with its Operational and Supervisory personnel, inclusive of travelling distance, travelling and accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc., to reach, work at and return for each WO instructed site investigated:	km	7000	R.....	R .....

**IMPORTANT NOTE:** Bill items #4.3a) to #4.3e) above will be the subject of a CASE 3 penalty, which will be applied when the designated sub-contracting entity takes more the 72 (seventy two) hours to reach and perform GHI or EEI instructed Bill #4 investigation Services. Reference is made to C3.2.2.4.4 C).

**C3.3.4.4 BILL #4.4: ADDITIONAL GEOLOGICAL EXPLORATION WORK BY MEANS OF TEST PITTING WITH TLB, DPSH AND LABORATORY TESTING:**

C3.3.4.4 A) General;

A1) Whenever required, albeit for Additional Services and/or any Ground instability event(s)/incidence(s), the PM will instruct the Service Provider by WO to undertake exploratory geological exploration work by means of test pitting by TLB, perform DPSH and/or geotechnical laboratory testing, at the locality required/instructed.

A2) Typically Ground Hazard Incident (GHI) and Emergency Event Incident (EEI) cases are reported by means of notification from the Service Provider himself, DPW facility user(s), the public at large and/or other Consultant or Contracting entities working for the Department.

A3) Should the reported incident warrant further detailed specialist investigations, the PM shall in consultation with the Service Provider, instruct by WO additional geological exploration work, which could require test pitting with a TLB, DPSH testing and or recovery of soil samples and subsequent laboratory geotechnical testing. Since the locality of such event(s)/incident(s) are unknown at tender stage, the location may be anywhere in the dolomite affected provinces of South Africa.

C3.3.4.4 B) Site-Specific Activities Applicable to Additional Geological Exploration Work by Means of Test Pitting with a TLB, Perform DPSH Investigation(s) and Laboratory Testing:

B1) The Service Provider shall arrange, facilitate, coordinate and deploy relevant Key Persons (time inputs based upon Time and Cost Based Fees Services as per relevant items of Bill #5 Services), to coordinate all activities leading towards the performing additional geological exploration work by means of test pitting with a TLB, DPSH investigation and Laboratory Testing, on any site in South Africa underlain by dolomite. Such work shall only be attended to upon receipt of a formal WO issued by the PM.

B2) Should the Competent Person (Dolomite land) possibly require additional geological exploration work by means of test pitting with TLB, DPSH investigation and or laboratory testing work to be performed, then such instructions, and the Outcome Based Services required, will form the basis of setting the scope of work for further site investigation activities.

B3) Subsequent to and resulting from the Service Provider's Competent Person's (Dolomite land) inspection of the subject site, the Service Provider shall peg out the exact positions of work(s) required, to enable the Service Provider sub-contracting entities to perform its work, in accordance with instructions issued by the Key Person (dolomite land). If required/instructed, GPS coordinates of such testing positions must be accurately recorded and locality positioned on relevant maps/drawings.

B4) The Service Provider subcontracting entity shall render Bill #4.4 Services as instructed by WO, which Services shall be performed under the direct instruction, control and supervision of the designated Key Person, for work which may be of an *ad-hoc* or emergency substance (i.e. GHI or EEI cases).

B5) Time and costs of designated Key Person(s), envisaged to be deployed for WO instructed additional Services for undertaking test pitting with a TLB, DPSH investigation and or Laboratory testing, shall be reflected upon in the Service Provider's PEP, which must be submitted for approval to the PM. Upon formal approval of the PEP by the PM, remuneration will be at Bill #5 tendered Rates for Time and Cost Based Fees Services due to be attended to by the Service Provider's designated Key Person(s). This includes amongst others for travelling, setting out, reporting to best practice standards, etc.

C3.3.4.4 C) Site-Variable Activities:

C1) The scheduled "Site-Variable" Activities associated with Bill #4.4 Services, has at its core a travelling substance, which the Service Provider and his respective Sub-contracting entities will be

instructed to undertake, in performing additional geological exploration work by means of test pitting with a TLB, DPSH investigations and geotechnical laboratory testing services, to produce Specified Outcomes.

C2) Site-Variable Activities includes, in the broadest possible meaning of the term, all such items that can be related to the travelling arrangements/actions of the various sub-contracting Service Provider's instructed WO scope of work, which amongst others includes for staff travelling costs, overhead costs, diverse travelling expenses, toll fees, kilometers' travelled, subsistence expenses, sundry disbursements etc., from the time of departure from the assigned sub-contracting entities' Home Base (or otherwise pre-authorized work place), to reach, establish/de-establish and subsequently return from the WO instructed site/property. Details of the assigned sub-contracting entities' planned travelling distance must be reflected upon in the Service Provider's PEP for each instructed WO, which must be approved by the PM before commencement/execution of work.

C3) The Sub-contracting entities' travelling distance will be remunerated at an all-inclusive kilometer travelling distance Rate, when attending additional geological exploration Services instructed to be performed by WO, which may require either test pitting with a TLB, DPSH investigation work and/or Laboratory Testing at the designated site/property. Since travelling distance(s) and destination detail(s) may be regarded as unknown at tender stage (by virtue of the unknown locality/distance to reach and return from the specified site/property), the Tendering Service Provider shall tender all inclusive kilometer Rates for travelling when attending to Specified Outcomes requirements against this item, covering all expenses/costs. See also C2.1.4.9.3, which clarifies inclusions of the term "all inclusive"

C4) Additional Geological Exploration Services performed by WO instruction (Bill Items #4.4 Services), as instructed by the PM to the Service Provider, shall be arranged, coordinated and managed by the Service Provider's Project Principal. All time related costs and expenses pertaining to the afore, involving designated Key Persons as may be required, will be compensated at tendered Time and Cost Based Fees Rates, the essence of which are described/referenced in Bill #5 Services.

#### **C3.3.4.4 D) Measurement and Payment**

D1) The Service Provider shall perform and deliver upon Specified Outcomes Services, at all inclusive tendered rates, in accordance with specified requirements per C3.3.4.4 A) to C3.3.4.4 C) above.

D2) In addition to general specifications about Site-Specific Activities, reference shall also be made to C3.3.2 C), as appropriate/applicable.

D3) Price Adjustment to Tendered Rates. Refer to C2.1.2.22.

**BILL #4.4: MEASUREMENT AND PAYMENT EXAMPLE:**

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/UNIT	AMOUNT
#4.4	C2.1.2, C2.1.3, C2.1.4, C3.2.2, C3.2.3, C3.3.4	<b>Bill Item #4.4 Services: Additional Emergency Geological Exploration work by means of test pitting with TLB, DPSH and laboratory testing;</b>				
#4.4a)	C3.3.3.4 A) & B)	<b>Site-Specific requirements:</b> On-the-site establishment of TLB to and de-establishment from any WO instructed site.	Site	15	R.....	R.....
#4.4b)	As above	<b>Site Specific Activity:</b> Excavation of test pits to refusal or maximum reach of TLB and backfilling after completion of soil profiling and sampling.	Day	25	R.....	R.....
#4.4c)	As above	<b>Site Specific Activity:</b> Onsite recovery and submission of soil samples to SANAS accredited soil testing facility to perform the following tests: (v) Foundation indicator (grading to 0,002mm and Atterberg Limits). (vi) Modified AASHTO maximum dry density and optimum moisture content (vii) CBR (Mod. AASHTO, NRB and Proctor compactive efforts) (viii) Oedometer  Note: Travelling related activities for the above actions/activities are recoverable under Bill item #5.2 a) b) or c), as relevant/appropriate to the cause	No	55	R.....	R.....
			No	30	R.....	R.....
			No	30	R.....	R.....
			No	10	R.....	R.....
#4.4d)	As above	<b>Site Specific Activity:</b> Establishment of DPSH equipment to and from WO instructed site, perform DPSH tests to refusal depth and record test data	Day	15	R.....	R.....
#4.4e)	As above, C3.3.2 D) C3.3.4.4 C) C3.3.4.4 D)	<b>Site-Variable Activities:</b> (i) Single item travelling expenses kilometre rate (cumulative summation) for TLB Service Provider, complete with operator and fuel supply, including travelling distance, accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc. to reach, work at and return for each WO instructed site investigated.  (ii) Single item travelling expenses kilometre rate (cumulative summation) for DPSH Service Provider, complete with operational and supervisory personnel, inclusive of travelling distance, accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc. to reach, work at and return for each WO instructed site investigated.	km	1500	R.....	R.....
			km	4000	R.....	R.....

**\*IMPORTANT NOTE:** Bill items #4.3a) to #4.3e) above will be the subject of a CASE 3 penalty, which will be applied when the designated sub-contracting entity takes more the 72 (seventy two) hours to reach and perform GHI or EEI instructed Bill #4 investigation Services. Reference is made to C3.2.2.4.4 C).

**C3.3.4.5 BILL #4.5: EMERGENCY EXPLORATORY GEOHYDROLOGICAL SERVICES FOR AUGMENTATION OF WATER SUPPLY:**

**C3.3.4.5 A) General**

A1) Whenever required, the PM will instruct the Service Provider by WO to undertake emergency exploratory geohydrological services for the augmentation of water supply at the locality required/instructed.

A2) Typically cases of insufficient water supply at DPW facilities are reported by means of notification from DPW facility user(s).

A3) Should the reported water supply insufficiency warrant detailed specialist investigation, the PM shall in consultation with the Service Provider, instruct by WO exploratory geohydrological investigation for the augmentation of the water supply. Since the locality of such cases are unknown at tender stage, the location may be anywhere in water scares areas associated with dolomite affected provinces of South Africa.

**C3.3.4.5 B) Site-Specific Activities Applicable to Emergency Exploratory Geohydrological Services for augmentation of water supply:**

B1) The Service Provider shall arrange, facilitate, co-ordinate and deploy relevant Key Person(s) (time inputs based upon Time and Cost Based Fees Services as per relevant items of Bill #5 Services), to co-ordinate all activities leading towards the performing of exploratory geohydrological services for the augmentation of water supply on the required site in South Africa. Such work shall only be attended to upon receipt of a formal WO issued by the PM.

B2) Should the PM require exploratory geohydrological services for the augmentation of water supply to be performed, then such instructions, and the Outcome Based Services required, will form the basis of setting the scope of work for such geohydrological services.

B3) The exploratory geohydrological services include the following aspects:

- Geophysical surveys, including magnetic, electro-magnetic, electric resistivity and gravity surveys;
- Percussion borehole drilling of 215mm diameter, with steel slotted/perforated casing, including gravel pack, solid steel casing with proper sanitary seal, standpipe and lockable steel cap.
- Pumping tests consisting of stepped and constant drawdown and recovery tests;
- Water quality tests to determine drinking water quality.

B4) All geophysical survey work shall be performed with appropriate best practice fit for purpose specialized equipment. The geophysicist shall perform magnetic/electro-magnetic (horizontal and vertical loop)/electric resistivity/gravity (30m x 30m) surveys all as deemed relevant/appropriate to the cause and submit a complete interpretive geophysical survey report with site layout drawings, survey traverses and proposed drill site locations indicated and properly motivated. Upon preparing and rendering such geophysical surveys, Specified Outcomes shall be formally recorded and handed over in a format acceptable to the Service Provider's Key Person (geologist). The aforementioned data shall also be put in possession of the PM in hard copy and digital format, before payment will be considered for such services rendered. Gravity surveys shall be performed according to C3.3.4.1 and billed under Bill #4.1.

B5) Subsequent to the completion of the geophysical surveys, the Service Provider's Key Person (geologist) shall evaluate the geophysical results, determine the most appropriate borehole position(s) and set out the required borehole position(s) on site to enable the Service Provider drilling entity to perform the drilling. GPS co-ordinates of borehole positions shall be accurately recorded and the borehole localities positioned on relevant map(s)/drawing(s). The Service Provider's subcontracting drilling entity shall work under direct instruction, control and supervision of the assigned Key Person (geologist), who shall duly issue instructions for

performing water boreholes. All drilling work shall be performed under the direct supervision of a qualified and experienced drilling foreman until the Key Person (geologist) has released the driller from his responsibilities. Recording and logging of the borehole profiles shall be the responsibility of the Service Provider's Key Person (geologist) and he/she shall ensure that the drilling work is carried out to the current best practice standards. All unsuccessful holes shall be backfilled strictly in accordance with the specified requirements set out in ANNEXURE 2 (attached hereto), Clauses PS1 to PS14. Each such borehole shall be backfilled for the full drilled depth (i.e. from the bottom to the top) under the explicit supervision of the designated Key Person (geologist) and sealed with a concrete capping.

On completion of the drilling of successful boreholes, the driller shall develop the holes to flush the hole clean for a duration of at least one hour and determine the blow yield. All successful holes shall be equipped with steel slotted/perforated casing, complete with a gravel pack, steel solid casing with sanitary seal and lockable steel cap.

B6) Pumping tests shall be performed in every successful water borehole by an approved, experienced and registered technician under supervision of the Service Provider's Key Person (geologist). A stepped discharge test and a constant discharge test (over 48 hours or 72 hours as specified), including recovery test by water level recovery measurements shall be performed in every successful water borehole according to the requirements of SANS 10299-A:2003. All required readings and data shall be properly recorded and submitted to the Key Person (geologist) in hard copy and digital format.

B7) Water samples shall be taken during the pumping tests from each successful borehole in approved water containers as specified and submitted to a SANAS accredited testing facility for drinking water standard analysis in accordance with SANS 241:2015.

B8) A pumping test analysis report on the analysis of the pumping test results shall be compiled by an approved groundwater test data analyst (geohydrologist). The report shall include interpretation of the pumping test data, determination of sustainable yields, duty cycles and installation guidelines for each tested borehole, including comparison of water quality test results with SANS 241 standards for drinking water. The report shall be submitted to the Service Provider in hard copy and digital format.

B9) Time and costs of designated Key Persons, envisaged to be deployed for WO instructed additional Services for undertaken exploratory geohydrological services for the augmentation of water supply, shall be reflected upon in the Service Provider's PEP, which must be submitted for approval to the PM. Upon formal approval of the PEP by the PM, remuneration will be at Bill #5 tendered Rates for Time and Cost Based Fees Services due to be attended to by the Service Provider's designated key Person(s). This includes amongst others for travelling, setting out, reporting to best practice standards, etc.

#### **C3.3.4.5 C) Site-Variable Activities**

C1) The scheduled "Site-Variable" Activities associated with Bill #4.5 Services, have at its core a travelling substance, which the Service Provider and his respective Subcontracting entities will be instructed to undertake, in performing exploratory geohydrological services for the augmentation of water supply, to produce Specified Outcomes.

C2) Site-Variable Activities include, in the broadest possible meaning of the term, all such items that can be related to the travelling arrangements/actions of the various subcontracting Service Provider's instructed WO scope of work, which amongst others, include for staff travelling costs, overhead costs, diverse travelling expenses, toll fees, kilometres travelled, subsistence expenses, sundry disbursements, etc., from the time of departure from the assigned sub-contracting entities' Home Base (or otherwise pre-authorized work place), to reach, establish/de-establish and subsequently return from the WO instructed Site/property. Details of the assigned subcontracting entities' planned travelling distance must be reflected upon in the Service Provider's PEP for each instructed WO, which must be approved by the PM before commencement/execution of work.





		<p><b>General requirements/allowances</b></p> <p><b>Establishment</b> (i) On-the-site establishment and disestablishment of all equipment and personnel, including setting up on any number of boreholes on the same site.</p> <p>Drilling 215mm diameter (ii) Drill through any material up to a maximum depth of 60m measured from ground surface.</p> <p>(iii) Drill deeper through any material from a depth of 60m to 120m (measured from the ground surface).</p> <p>(iv) Install steel slotted/perforated casing, complete with gravel pack into successful holes.</p> <p>(v) Install steel solid casing, complete with proper sanitary seal into successful holes.</p> <p>(iv) On completion of drilling of successful holes, develop the holes to flush the hole clean for a duration of at least 1hr and determine the blow yield.</p> <p>(vii) Backfill unsuccessful holes and seal with concrete cap.</p> <p>(viii) Fit successful holes with a steel standpipe and lockable cap.</p>	Site	1		
			m	720		
			m	360		
			m	90		
			m	450		
			No	6		
			No	6		
			No	6		
#4.5c)	As above	<p><b>Pumping Tests:</b></p> <p><b>Establishment</b> (i) On-the-site establishment and disestablishment of all equipment and personnel.</p> <p><b>Stepped discharge test</b> (ii) Perform the stepped drawdown test in accordance with SANS 10299-4: 2003</p> <p>(iii) Constant discharge test: 48 hours Perform the constant discharge test for 48 hours in accordance with SANS 10299-4:2003.</p> <p>(vi) Constant discharge Test: 72 hours Perform the constant discharge test for 72 hours in accordance with SANS 10299-400:2003.</p> <p>(vii) Recovery Test Perform water level recovery measurements in accordance with SANS 10299-4- 2003</p>	Sum	6		
			No	6		
			No	6		
			No	6		
			hr.	144		
#4.5d)	As above	<p><b>Water Quality Tests:</b> Take water samples from boreholes in approved water containers, transport and submit water samples to SANAS accredited laboratory for drinking water standard analysis in accordance with SANS 241:2015.</p>	No	6		
#4.5e)	As above	<p><b>Pumping Test Analysis Report:</b> Complete report on the pumping test analysis by an approved groundwater test data analyst to interpret the pumping test data, determine sustainable yields, duty cycles and installation guidelines for each tested borehole, including comparison of water quality test results with SANS 241 standards for drinking water.</p>	Site	1		
#4.5f)	As above	<p><b>Site-Variable Activities</b></p> <p>(i) All inclusive single item travelling expenses kilometer rate for geophysical survey entity for Geohydrology Services, complete with operational and supervisory personnel, inclusive</p>	km	1600		

	of travelling distance, accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc. to reach, work at and return to base for each WO instructed site investigated.			
	(ii) All inclusive single item travelling expenses kilometer rate for water borehole drilling entity, complete with operational and supervisory personnel, inclusive of travelling distance, accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc. to reach, work at and return to base for each WO instructed site investigated.	km	1600	
	(iii) All inclusive single item travelling expenses kilometer rate for pumptesting entity for Geohydrology Services, complete with operational and supervisory personnel, inclusive of travelling distance, accommodation expenses, travelling time, disbursements, subsistence expenses, toll fees, etc. to reach, work at and return to base for each WO instructed site investigated.	km	1600	

**IMPORTANT NOTE:** Bill items #4.5a) to #4.5f) above will be the subject of a CASE 3 penalty, which will be applied when the designated sub-contracting entity takes more than 72 (seventy two) hours to reach and perform GHI or EEI instructed Bill #4 investigation Services. Reference is made to C3.2.2.4.4C).

**C3.3.5 BILL #5: TIME AND COST BASED FEES SERVICES:**

**SPECIFIED OUTCOMES FOR ADDITIONAL SERVICES BY KEY PERSONS:**

**Brief Service Description:**

**ATTENDANCE TO GROUND HAZARD INCIDENCES (GHI), EMERGENCY EVENT INCIDENTS (EEI) AND ADDITIONAL ASSIGNMENTS:**

**C3.3.5.1 A) General Requirements:**

A1) The PM may, at any time during this contract, instruct the Service Provider to make available additional Time and Cost Based Fees Services in terms of human and other resources required/necessary, to perform Additional Services, generally performed by designated/identified Key Persons. Such as instructed Additional Services shall amongst others include for providing, managing, facilitating, coordinating and mobilizing requisite support Services for and on behalf of the Department, which Services includes amongst other for additional gravity survey services, borehole drilling, geotechnical investigations and/or managing Services requiring specialist dolomite risk mitigation inspections, near surface investigation work, safety interventions, etc.. Such as required additional Time and Cost Based Fees Services shall be performed under WO instruction issued by the PM, and may be required locally (i.e. at or close to the Service Provider's offices) or otherwise anywhere in the dolomite affected provinces of the Republic of South Africa.

A2) The main sphere/field wherein, and the classes/types about which Additional Services will be instructed, are itemized under C2.2.3, Bill #4 and Bill #5 Services. Typically such required Additional Services will be in support of and involve dedicated attendance, upon the issue of a WO instruction by the PM, to investigate a GHI, EEI or perform Additional Services.

A3) PM instructed WO's will require of the Service Provider to render Additional Services to attend to specific events and/or certain specialist assignments, such as dolomite training workshops, planning & cost estimates of identified aspects for dolomite projects, the identification/prioritization of new dolomite projects and monitoring of dolomite related incidents. See also C2.1.4.5

A3) When instructed, the Service Provider shall diligently arrange for and attend GHI and EEI events by his designated/assigned Key Person(s). These incidents shall be methodically organized and urgently attended, complete with actions taken/recorded, both in terms of time/date of receiving the instruction to proceed, and when (date/time) the instructed GHI or EEI inspection were attended at the incident site scene.

A4) All EEI and GHI cases attended by the Service Provider shall culminate in written reports, which must be submitted in hard copy format to the PM, no later than 5 (five) working days after the date of notification of the event. The record of and details about such cases shall conform to a uniform generic reporting format/standard, the contents of which must be substantive and comprehensive to the incident/event. The following items shall, as a minimum requirement, but not limited thereto, be covered in such report(s):

- Brief description of the incident (i.e. GHI or EEI);
- Colour photographs (no less than 10 (ten));
- Accurate description of the locality of the incident plus reference to the unique GIS building/item reference, shown on a locality map; The latter is obtainable from the PM.
- Record of and reference to WO instruction(s) issued, the name(s) and contact number(s) of the person in command/control at the incident site, complete with date(s)/time(s), etc.;
- Which additional attendant Services will be required, and within what time restraints/limits such Services must be provided.
- Site conditions, public response, general observations, record of discussion(s), etc.;
- If it was deemed appropriate and necessary for a building or area to be evacuated, a copy of the written evacuation order, co-signed by the recipient responsible site person, complete with details of the instructing person's name and contact details;
- Recommendation(s) appropriate to the cause;

Note: The Service Provider's first incident report will be evaluated by the PM, with comments for correction/adaptation given, after which future incident reporting will have to be in conformance thereto.

A5) Reference shall be made to allowed/permitted Project Milestone Target Dates (see C3.2.2.4.3) and applicable penalties (see C3.2.2.4.4), when performing WO's related to GHI and EEI investigations and Additional Services.

A6) The Service Provider will be expected throughout this contract to give preference to the execution of WO's issued by the PM, on the basis that "Time is of the Essence".

A7) WO's shall be performed by the person(s) listed as Key Person(s) and persons under their supervision and further executed as described in the Programme according to clause 3.15 of the Contract Data (C1.2.2) and the approved final PEP, in accordance with said clause.

A9) Whenever required and/or instructed, PEP's shall be duly prepared, referenced and formally submitted to the PM for consideration and approval. Said PEP must give a clear indication of where, when and which Key Persons (listed in the schedule) are to be assigned to undertake the necessary tasks/duties involving in particular, Time and Cost Based Fees Services.

**C3.3.5.1 B) Specific Requirements Applicable to GHI, EEI and Additional Assignments:**

B1) The Service Provider shall in this contract required to be pro-active, vigilant and energetic in detecting and/or responding to call(s) reporting any dolomite related GHI or EEI case. The Generic "route" which has been found to be practically applicable to either GHI or EEI event notification's, is described hereunder:

B2) Whenever a dolomite ground/structure instability incident event is reported to the PM, either by the client user Department, the Service Provider or any other external party, the PM decides whether the case at hand should be treated/classed as an EEI or not. If the incident is not regarded an EEI event, the status of the incident will by default be classed as a GHI.

B3) Should the PM verbally instruct the Service Provider to attend to a reported ground instability event, such as an EEI case, it requires prompt and immediate attendance by the Service Provider's designated Key Person(s) within 24 hours. This verbal instruction will subsequently be followed up by a formal WO instruction issued by the PM.

B4) The Service Provider must immediately respond/attend to the EEI at the subject site/property, which may be anywhere in the dolomite affected provinces of the Republic of South Africa.

B5). The Service Provider shall with due care and caution diligently assesses the EEI (or GHI) on the subject site, by investigating/analysing possible causes, establishing the possibility of water leaks, assessing possible risks, etc., which may influence the immediate surrounds of the incident. First and foremost is ensuring the safety of people and then the prevention of damage to fixed (buildings or structures) assets. The Service Provider shall issue written instructions (appropriate to the cause) to the client user's responsible person at the incident site, immediately after discussion(s) with the PM. See also B6) hereunder.

B6) The Service Provider shall contact/liaise with the PM as soon as it is practically possible after arrival/assessment on the Site/property. Should the PM not be readily available on call, the Service Provider shall issue immediate instruction(s), which could include anyone of the following, but not limited thereto: issue an evacuation order, provide/place safety tape, arrange for closing off wet services valve(s), etc.

Note: On-site instructions for EEI cases are typically given verbally "on-the-spot", (depending on the assessed urgency). This must be supported (at the event site) by a written record of salient aspects/instructions that must be observed and attended to by the responsible person of the Client user occupying the site/property. Said record must be signed (as proof) by the responsible person at the site of the incident.

B7) The Service Provider shall take best quality digital (min. 4 Megabyte resolution) photographs, at the scene of the incident (generally no less than 10 photos). See C3.3.5.1 A4).

B8) The Service Provider's designated Key Person may not depart from the site of the EEI event to return to his Home base, until such time as it has been determined that all imminent (dolomite) safety risks have been attended, at least in the immediate short term, by having duly instructed those affected by the incident as described in B5) and B6) above.

B9) The Service Provider shall prepare/submit a detailed written EEI report within 72 hours after the incident was first reported. See also A4) above, indicating basic minimum requirements for such written report(s).

B10) The Service Provider shall consult the PM and in doing so recommend an appropriate way forward (as part of the EEI report) required by the PM.

B11) Should additional Services, such as geophysical and/or drilling work, be required as part the Service Provider's assessment/evaluation (emanating from and/or dealing with a specific EEI or GHI), the Service Provider shall be obliged to immediately engage the PM and come to agreement as to what actions are to follow. This may require the Service Provider to immediately manage activate/coordinate work/activities deemed necessary, per scheduled items listed in C2.2.3.1, C2.2.3.2 and C2.2.3.3, under Bill #4.1 to Bill #4.4 Services.

B12) See C2.1.2.21.4 for Specialist Geo-Professional Service Provider's minimum enabling requirements (but not limited thereto) to perform Bill #5 Services:

B12) Whenever the PM instructs Additional Time and Cost Based Fees work by WO to the Service Provider, it is a particular requirement for the Service Provider to timeously prepare/submit a PEP relevant to the cause to the PM for consideration/approval, unless instructed to otherwise.

#### C3.3.5.1 C) Additional Services Instructed by WO

C1) In the event of the Service Provider being instructed by the PM by WO to perform Additional Time and Cost Based Fees Services, the Service Provider shall prepare a detailed PEP for such assignment, following a formal briefing meeting with the PM, within 10 (ten) working days after the date of the briefing meeting. The PEP must render a full description of the Scope of Work intended, appropriately linked to programme target milestone dates, complete with an exposition of how the Service Provider:

- i). understands the detailed requirements of the assignment,
- ii). envisages the means and methods of executing both professional and physical work activities,
- iii). when and for what activity which listed Key Person(s) will be assigned to the work in execution thereof, and
- iv). a detailed cost breakdown, indicating amongst other Key Person's time(s), applicable rates
- v). a detailed cost estimate for Additional Services covered by scheduled Bill items #4.1 to #4.4 (if required).

C2) The Service Provider shall perform WO's for Additional Services (see C2.1.4.5) in accordance with the requirements/details of the approved PEP, as instructed (in writing) by the PM. The information relevant to the WO approved PEP shall form the basis of management of such assignment. Time and Cost Based Fees shall apply as per tendered Rates. The programme contained in the PEP will become the "programme" as meant in clause 3.15 of the Conditions of Contract, for each such WO assignment. The cost breakdown contained in the PEP shall not be exceeded without timeous prior approval of the PM. Should unavoidable and unforeseen circumstance/conditions change during execution of a WO (i.e. since the briefing), the Service Provider and the PM shall formally engage in an attempt to negotiate/resolve/determine an amicable way forward. Should the Parties fail to reach mutual consent/agreement, the matter will be dealt with in terms of the Conditions of Contract.

C3.3.5.1 D) Time and Cost Based Fees Services: Site-Variable Activities:

D1) The scheduled "Site-Variable" Activities associated with C2.2.3.4, Bill #5 Services, has at its core a travelling substance of Key Persons, when attending WO's instructed by the PM, for Time and Cost Based Fees Services. Typically, a single person (Key Person) would attend to travelling/attending such site/property related work/assignment.

D2) In the context of Bill #5 Time and Cost Based Fees Services, tendering Service Provider's shall tender for Site-Variable Activities (e.g. travelling) for the designated Key Person(s), based on the following principles:

- i). Travelling time and travelling costs shall be tendered on a consolidated combined all inclusive tendered rate per km, based on one Key Person travelling.
- ii). Reasonable disbursement(s) and subsistence costs for trips in excess of 8 (eight) hours away from Home Base, will be compensated as an extra over to item D2) i) above.  
Note: Allowable trip recoverable costs shall be remunerated, plus a fixed mark-up percentage, as recorded elsewhere in Bill #5 Services.
- iii). All sundry disbursements such as toll fees, meals, refreshments etc., for trips less than 8 (eight) hours away from Home Base, must be priced inclusive of tendered Time and Cost Based Fees Rates.
- iv). Travelled distance will be remunerated on the basis of travelling commencing from the Service Provider's Home Base, to reach and return from the specified site/property, site travelling kilometres included.
- v). Travelling distance will be remunerated at all inclusive travelled distance tendered fees Rate(s), for each WO instructed Service for investigation/attendance, near or far. Since distance(s) and destination detail(s) are unknown at tender stage (by virtue of the unknown locality/distance to reach and return from the specified site/property), the Rates tendered shall be all inclusive as per requirements noted above.
- vi). Price Adjustment to Tendered Rates. Refer to C2.1.2.22.

C3.3.5.1 E) Measurement and Payment for Time and Cost Based Fees Services Instructed by WO:

D1) Time Based Fees for Key Persons (hourly rates), as itemized per Bill #5 Services, shall be compensated upon meeting requirements specified under C3.3.5.1 A) to C) above, taking due cognisance, as appropriate, of D3) to D5) hereunder. In principle, tendered Rates shall be deemed to be all inclusive.

D2) Travelling costs (e.g. Site-Variable Activities as per C3.3.5.1 D2 above) for designated identified Key Persons, shall be remunerated as set out in Table 3 in the "Rates for Reimbursable Expenses".

D3) The Service Provider shall tender all inclusive Time and Cost Based Fees Rates for Key Persons listed in C2.2.3.4, Bill #5 Services, Bill items #5.1a) to #5.1f). See also specific inclusions/requirements listed under C2.1.4 in general and C2.1.4.5 in particular.

D4) See C3.2.3.3 for generic (minimum) printing, copying, and duplicating requirements, the cost of which must be attended to as per requirements of C2.1.4.8 and separately remunerated under Bill #5 Services, item #5.4a).

D5) When the PM specifically instructs the Service Provider by WO, recoverable Time and Cost Based Fees Services (e.g. authorized subsistence recoverable costs), such will be compensated under Bill #5, item #5.3a). Remuneration will be certified for substantiated reasonable cost invoice(s) upon receipt of original invoices/proof of expenses, plus a mark-up (maximum allowed 7,5%) for attendance to same under Bill #5, Bill item #5.3b) See also specific requirements detailed in C2.1.4.10.

**BILL ITEM #5: MEASUREMENT EXAMPLE:**

**C2.2.3: ACTIVITY SCHEDULE FOR TIME AND COST BASED FEES SERVICES: BILL #4 AND BILL #5**

ADDITIONAL EMERGENCY AND AD-HOC GEO-PROFESSIONAL AND GEO-PHYSICAL DOLOMITE INVESTIGATION SERVICES, INCLUSIVE OF TIME BASED SERVICES FOR KEY PERSONS AND PEER REVIEWS:

**C2.2.3.5: ADDITIONAL TIME AND COST BASED FEES SERVICES FOR KEY PERSONS ATTENDING TO EMERGENCY EVENT INCIDENTS (EEI), DOLOMITE HAZARD INCIDENTS (DHI) AND ANY ADDITIONAL WO ASSIGNMENTS, SUBSISTENCE AND SUNDRY ALLOWANCES:**

**BILL #5:**

ITEM REFERENCE	PRICING INSTRUCTIONS/SPECIFICATIONS REFERENCE	CATEGORY	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE/UNIT	AMOUNT
#5.1	C2.1.2, C2.1.3, C2.1.4, C3.3.2, C3.3.4.1, C3.3.4.2, C3.3.4.3, C3.3.3.4, C3.3.5, C3.3.5.1		<b>Bill #5.1</b> <b>Emergency Time and Cost Based Fees Services performed by Key Persons:</b> (hourly basis): Time and Cost Based Fees Services performed by the Service Provider upon the issue of a WO by the PM(refer to clause 4.4 (2) of 2016 NDPW - Scope of Engineering Services and Tariff of fees): <b>Note:</b> Bill #5.Services only applies to the investigation of and reporting about dolomite related GHI, EEI cases and Additional Services				
#5.1a)	As above, C3.3.5.1 A),	B	g)Project Principal (as defined in this contract)	hr.	1000	R.....	R.....
#5.1b)	B), C3.3.5.1 C), C3.3.5.1 E)	C	h)Competent Person (civil engineering)	hr.	800	R.....	R.....
#5.1c)		C	i) Competent Person (dolomite land)	hr.	2000	R.....	R.....
#5.1d)		C	j) Competent Person (structural engineering)	hr.	300	R.....	R.....
#5.1e)		C	k)Registered Geologist (Pr. Sci.)	hr.	2000	R.....	R.....
#5.1f)		D	l) Civil Engineering Field Technician (Pr. Techni.)	hr.	1000	R.....	R.....
<b>Sub-total c/o to next page</b>						<b>C/0</b>	<b>R.....</b>

..... continued on next page

#5.3	C2.1.4	<b>Provisional Cost Sum :</b>				
#5.3a)	C2.1.2.20 C3.3.5.1E)	Provisional Cost Sum for authorized subsistence recoverable costs:	PC Sum	-	-	R 30,000.00
#5.3b)	C2.1.2.20	Mark-up on above item #5.3a) (max 7.5%)	Percent	..... %	-	R.....
#5.4	C2.1.4	<b>Provisional Cost Sum :</b>				
#5.4a)	C2.1.4.8	Provisional Cost Sum for Authorized recoverable charges for printing & sundry items): Note: Gazetted rates apply, with zero mark-up	PC Sum	-	-	R 40,000.00
#5.5	C2.1.4.	<b>Provisional Cost Sum :</b>				
#5.5a)	C2.1.2.20 C2.1.4.5 C3.3.5.1E)	Dolomite monitoring and risk related mitigation requirements (such as externally acquired equipment, systems, materials etc.), excl. Key Persons input (e.g. time, or travelling), obtained on quotation basis.	PC Sum	-	-	R 400,000.00
#5.5b)	C2.1.2.20	Profit on above item #5.5a) (max 7.5%)	Percent	..... %	-	R.....

### C3.4 Submission of Accrual Reports

The Service Provider shall submit accrual reports to the client representative at the end of March and September each year for the duration of the Service Contract period from the date of appointment up to and including project closeout. This is to ensure that PMTE complies with the accounting framework GRAP, which requires that PMTE disclose all its accruals as at the end of each reporting date.



## C4: SITE INFORMATION

### C4 Site Information:

For the explicit purpose of this contract, all Sites/properties implicated by virtue of it being identified or un-identified at the time of tender, are to be considered being located on **high risk dolomite land**. **IMPORTANT**: This statement reflects upon insurance requirements applicable to this contract.

Site information related to this contract reflects upon a large number of State Owned Sites/properties, located on dolomite formation and/or intended to be purchased/leased by the National Department of Public Works, anywhere in South Africa.

See C3.2.2.5 for information about and status of available sample documents.

### **SAMPLE DOCUMENTS:**

**Important Notice**: The reports listed hereunder shall be on display to Tendering Service Provider's during the compulsory tender clarification meeting. These documents are not included as part of Tender documentation. The *locus standi* of these listed documents are that it be regarded an integral part of this Contract's tender documentation, and that it serves the purpose of setting an acceptable minimum standard to meet with the Department's requirements.

**C5: ANNEXURES:**

## **C5.1 ANNEXURES**

### **ANNEXURE 1:**

#### **PW 344 (LATEST VERSION): APPROPRIATE DEVELOPMENT OF INFRASTRUCTURE ON DOLOMITE: MANUAL FOR CONSULTANTS**

- **VOLUME 1: STANDARD SPECIFICATIONS APPLICABLE TO DOLOMITE STABILITY INVESTIGATIONS (DSI) AND THE PLANNING, ENGINEERING REQUIREMENTS AND MANAGEMENT OF DEVELOPMENT ON DOLOMITE LAND.**
- **VOLUME 2: ANNEXURES: STANDARD SPECIFICATIONS APPLICABLE TO DOLOMITE STABILITY INVESTIGATIONS (DSI) AND THE PLANNING, ENGINEERING REQUIREMENTS AND MANAGEMENT OF DEVELOPMENT ON DOLOMITE LAND.**
- **VOLUME 3: TYPICAL ENGINEERING DETAILS: STANDARD SPECIFICATIONS APPLICABLE TO DOLOMITE STABILITY INVESTIGATIONS (DSI) AND THE PLANNING, ENGINEERING REQUIREMENTS AND MANAGEMENT OF DEVELOPMENT ON DOLOMITE LAND.**

Volumes 1,2 and 3 are available from the Department of Public Works website and/or a Dropbox link as respectively referenced hereunder.

<http://www.publicworks.gov.za/consultantguidelines.html> , see item 4, Civil Engineering.

**ANNEXURE 2:**

**ENGINEERING GEOLOGICAL SERVICE: EXPLORATORY  
GEOTECHNICAL DRILLING "PARTICULAR SPECIFICATION (PS):  
EXPLORATORY DRILLING FOR ENGINEERING GEOLOGICAL  
INVESTIGATION.**

## **ENGINEERING GEOLOGICAL SERVICE: EXPLORATORY GEOTECHNICAL DRILLING**

### **PARTICULAR SPECIFICATION (PS): EXPLORATORY DRILLING FOR ENGINEERING GEOLOGICAL INVESTIGATION**

#### **GENERAL:**

This section deals with the requirements of drilling of exploratory percussion boreholes for an Engineering Geological investigation.

**Important note:** Competency of drilling Service Provider:

The drilling Service Provider must be experienced in dolomite environment with a minimum drilling experience of 10 000 m drilled on dolomite stability investigations.

#### **PS 1 DRILLING OPERATION SUPERVISION**

The Service Provider shall take total responsibility for the reliability and correctness of the driller's requisite information/results.

Note: Stringent precautionary measures and direct supervision shall be instituted to conform to the aforementioned stipulated requirement.

#### **PS 2 EQUIPMENT (minimum requirements)**

Drilling equipment shall comprise of the following mobile unit(s):

Compressor unit with measured and calibrated constant air delivery rating at 750 cfm and 16 bar minimum.

Pneumatic percussion drilling rig with 165 mm nominal diameter button bit capable of drilling in all soil types up to 100 m deep and at any inclination up to 30 degrees to the vertical.

The Service Provider shall submit a Safety Certificate issued by the manufacturer or SABS/ISO accredited firm for the complete unit and air compressor unit separately.

#### **PS 3 ALTERNATIVE EQUIPMENT**

Tenderers may submit details of alternative similar available equipment. Full particulars shall however be submitted with the tender submission.

#### **PS 4 SERVICE PROVIDER'S SUPERINTENDENCE**

No work shall be executed unless supervised by an approved experienced Representative of the Service Provider whom shall be made known, in writing, to the Engineer/Geologist for his approval, prior to commencement of any drilling work. Any faulty work executed in the absence of the Service Providers approved representative shall be re-done at the Service Provider's expense.

#### **PS 5 SETTING OUT OF THE WORKS AND ACCESS TO BOREHOLE POSITIONS**

The Engineer/Geologist shall set out and furnish the Service Provider with drilling positions.

The cost of obtaining access to and from borehole positions, on any site listed in C2.2.2.2, shall be for the Service Provider's account and such shall be deemed included in tendered rates.

#### **PS 6 LOCATION, PROTECTION AND DAMAGES TO EXISTING SERVICES**

The Engineer/Geologist shall furnish the Service Provider with the position of all known sub-surface services. The drilling Service Provider shall excavate up to a depth of 1,5 metre to expose such services if deemed necessary by the Engineer/Geologist. Repair of damages to under/above ground services shall be for the

account of the drilling Service Provider once the position of such service was established/made known to the Service Provider or indicated by the Engineer/Geologist. All damages to any service shall be reported to the Engineer/Geologist within 1(one) hour of occurrence. The drilling Service Provider shall submit a full damage report in writing within 24 hours of the occurrence.

## **PS 7 SETTING UP**

Setting up shall include setting up the drill vertically or at any inclination, and the movement of the complete drilling rig between boreholes as per drilling sequence or as directed by Engineer/Geologist.

## **PS 8 PERCUSSION DRILLING (165 mm Button bit)**

### **PS 8.1 Depth of drilling**

Drilling shall be to the depth as indicated by the Engineer/Geologist, who will supervise/direct drilling work. Should the following conditions be encountered, the following principles apply:

1. Drilling into rock for more than 6 metre; stop at 6 metre and call for further instructions
2. Drilling through cavities or highly compressible material.
3. Encountering of water, abnormally wet soil, abnormal odours or other forms of contamination.

### **PS 8.2 Drilling classifications**

For the purpose of this contract, exploratory drilling shall be to any depth, in any material, up to a maximum depth of 100 meters, which includes for drilling through cavities, voids and/or unstable ground conditions:

The applicable rate for boreholes drilled shall cover all costs for the supply and maintenance of equipment, expendable materials as required for drilling exploratory boreholes, recovery of samples at 1 metre intervals as well as recording drilling time for each borehole, the addition of material to enhance sample recovery, completion of the driller's field report, delivery of samples to the approved/accredited laboratory directed by the Engineer/Geologist, and backfilling of the borehole (including water to wet backfilling material).

### **PS 8.3 Drilling at inclination**

The inclination of boreholes to be noted in degrees, measured for deviation from the vertical and indication of the direction of propagation. Drilling at any inclination shall be rated as an extra over cost to the cost per meter drilled irrespective of depth or type of material. No additional payment shall however be allowed for setting up.

### **PS 8.4 Driller's field report**

The compilation of field report shall be deemed inclusive of the drilling rate.

### **PS 8.5 Sample recovery/delivery and testing**

Samples shall be recovered of each metre drilled and placed in sequential order at a suitable location near the borehole and left undisturbed until inspected by the Engineer/Geologist. The Driller shall recover two 300 ml uncontaminated samples, sealed in plastic bags (clearly marked - hole no and recovery depth) directly after drilling of each metre and place it in sequential order in a plastic "sausage" in order to provide two sample sets. The recovery, compilation and delivery of samples shall be deemed inclusive of the drilling rate.

The Cost of testing recovered samples at an accredited laboratory, as directed by the Engineer/Geologist, shall deemed included in the rates tendered.

### **PS 8.6 Water/Foam/Drilling mud used**

The depth range of water used to enhance sample recovery shall be clearly indicated on Driller's field report. Drilling rates shall cover application of water/foam/mud.

## **PS 9 CASING**

### **PS 9.1 Temporary casing**

Temporary steel casing of 150 mm nominal diameter and wall thickness of (x t= ??) shall only be installed when instructed by the Engineer/Geologist. The rate for this work shall cover insertion and recovery of casing. Casing lost (due to non-recoverability) shall not be payable under this contract and shall be allowed for by the Service Provider

### **PS 9.2 Permanent casing**

Permanent steel casing of 150 mm nominal diameter is to be installed only if instructed by the Engineer/Geologist. The annulus between the casing and the borehole walls should be grouted, with backfilled with soilcrete (10% Cement) and a 500 mm diameter (150 mm thick) concrete (19mm/20Mpa) collar shall be provided at ground level. Borehole to be sealed with an approved painted (red oxide) metal cap (detail to be supplied by the Engineer). The rate for this work shall cover cost of casing, insertion, backfilling, grouting of annulus, concrete collar (neatly finished/shuttered) and fitted/welded cap.

### **PS 10 WATER LEVELS AFTER 24 HOURS**

Boreholes are to be left open until the Engineer/Geologist issue instructions for backfilling. A suitable approved protective cover shall be provided to prevent debris or water to enter the borehole. Water levels will be taken/recorded by the Engineer, 24 hours after completion of drilling.

### **PS 11 BACKFILLING OF BOREHOLE**

Boreholes are to be backfilled with stabilised grouting (to the brim), with materials recovered from drilling, suitably wetted to form a flowing slurry, all to the requirements of the Engineer/Geologist.

### **PS 12 STABILISED GROUTING OF BOREHOLE**

All boreholes are to be backfilled using a 1:8 cement: sand mix with just sufficient water to allow mixture to flow, all to the requirements of the supervising Geologist/Engineer. The cost of backfilling boreholes shall be deemed included in the rates.

### **PS 13 SEAL AND MARKING OF BOREHOLES**

The drilling Service Provider shall provide a 400x400 x 150 mm 15 MPa wood floated concrete cap with 100 mm concrete thickness down the hole. The concrete cap is to be installed 300 mm below ground surface. A steel rod, 10 mm in diameter and 200 mm in length (Engineer to provide detail drawing) is to be placed centrally and horizontally within the cap. The soil is to be reinstated and compacted over the concrete cap when it has cured. The backfilling shall be slightly proud of the natural ground level to prevent ponding of storm water in the vicinity of the borehole. The borehole number, drilling date and direction of inclination shall be engraved/marked (letter size no less than 50 mm) in the wet concrete, all to the requirements of the Engineer/Geologist.

### **PS 14 STOPPING OF WORK DUE TO INCLEMENT WEATHER**

The Engineer/Geologist reserves the right to stop drilling operations temporarily if weather conditions, to his discretion, may interfere with the desired drilling results. No standing time shall be paid for such instructed stoppages and the rates tendered shall be deemed inclusive of such eventualities. The Drilling Service Provider shall formally record these events in writing and have same signed off within 48 hours of the stoppage event.

**C5.1 ANNEXURES (cont.)**

**ANNEXURES A, B, C AND D:  
FUNCTIONALITY QUESTIONNAIRES:**



**ANNEXURE A:**

**RECORD OF TENDERER'S CURRENT AND PAST EXPERIENCE IN PERFORMING \*COMPARABLE SPECIALIST ADVISORY PROJECT SERVICES FOR INFRASTRUCTURE DEVELOPMENTS ON PROBLEMATIC SOILS, AMONGST OTHER PERFORMING DOLOMITE STABILITY INVESTIGATIONS, GEOTECHNICAL ENGINEERING SERVICES, PREPARATION OF DOLOMITE RISK MANAGEMENT PLANS (DRMP) DURING THE PAST 5 (FIVE) OR MORE YEARS**

*Note: The term \*comparable in the context of this tender means similar work performed by tenderers having been appointed to execute assignments/duties relevant and appropriate to the scope of works applicable to this tender.*

**Important: This page must be submitted with the Tenderer's tender submission.**

<b>Project title</b>	CIVIL ENGINEERING AND GEO-PROFESSIONAL SERVICES: DRMS: PHASE 5: EMERGENCY AND AD-HOC PROPERTY INVESTIGATIONS IN SUPPORT OF THE DOLOMITE RISK MANAGEMENT STRATEGY FOR THE PROPERTIES OF THE NATIONAL DEPARTMENT OF PUBLIC WORKS.	
<b>Tender no:</b>	H21/017 AI	<b>Reference no:</b>

<b>PROJECT TITLE; YEAR OF APPOINTMENT</b>	<b>PROJECT CLIENT &amp; CONTACT PARTICULARS</b>	<b>DETAILS OF *COMPARABLE SPECIALIST ADVISORY PROJECT SERVICES / EXPERIENCE</b>	<b>CONTRACT VALUE</b>
.....	.....		
.....	.....		
.....	.....		
.....	.....		

NB: Attach additional sheets if more space is required.

**Signature of Tenderer** \_\_\_\_\_

**ANNEXURE B :**  
TENDERERS ARE REQUIRED TO PREPARE AND SUBMIT \*\*REQUISITE DOCUMENTATION FOR EACH LISTED PROFESSIONAL KEY PERSON COMPRISING OF HIS CURRICULUM VITAE (DETAILING AMONGST OTHER EXPERIENCE IN THE TYPE/CLASS OF WORK REQUIRED FOR THIS PROJECT), COMPLETE WITH CERTIFIED COPIES OF PROFESSIONAL REGISTRATION/S AND QUALIFICATIONS.

Project title	SPECIALIST CIVIL ENGINEERING AND GEO-PROFESSIONAL SERVICES: DRMS: PHASE 4A: EMERGENCY AND AD-HOC PROPERTY INVESTIGATIONS IN SUPPORT OF THE DOLOMITE RISK MANAGEMENT STRATEGY FOR THE PROPERTIES OF THE NATIONAL DEPARTMENT OF PUBLIC WORKS
Tender no:	H21/017 A1

**IMPORTANT:**

- i) The Project Principal may not perform more than 2 (two) Key Person's specific jobs / functions.
- ii) Tenderers are required to complete and submit **ANNEXURE B** with their tender submission, complete with \*\*requisite documentation.

**KEY PERSONNEL:**

NAME OF KEY PERSON &	KEY PERSON'S POSITION	DETAILS OF RELEVANT EXPERIENCE	CV & CERTIFIED COPIES OF PROFESSIONAL REGISTRATION & QUALIFICATIONS ATTACHED
	**Project Principal:	Attach details of relevant experience with CV & certified copies of professional registration & qualifications	<input type="checkbox"/> Yes <input type="checkbox"/> No
	**Competent Person (Civil Engineering)	Attach details of relevant experience with CV & certified copies of professional registration & qualifications	<input type="checkbox"/> Yes <input type="checkbox"/> No
	**Competent Person (Dolomite land) Engineering Geologist or Civil Engineer	Attach details of relevant experience with CV & certified copies of professional registration & qualifications	<input type="checkbox"/> Yes <input type="checkbox"/> No
	**Competent Person (Structural Engineering)	Attach details of relevant experience with CV & certified copies of professional registration & qualifications	<input type="checkbox"/> Yes <input type="checkbox"/> No
	**Civil Engineering Technician	Attach details of relevant experience with CV & certified copies of professional registration & qualifications	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Geologist	Attach details of relevant experience with CV & certified copies of professional registration & qualifications	<input type="checkbox"/> Yes <input type="checkbox"/> No

**NB:** Attach additional sheets if more space is required.

Signature of Tenderer \_\_\_\_\_

**ANNEXURE C: DOLOMITE LAND: CASE STUDY**

Tenderers are required to prepare in writing a systematic account of dealing with a sinkhole event that has just been reported to the DPW Dolomite Risk Manager (DRM), who in turn instructs the "successful" tenderer to duly attend to the incident, such being categorized by the PM as an Emergency Event Incident (EEI). Said systematic account or methodology should describe such actions/activities deemed necessary, from the date/time of receiving the instruction up to the recommendation(s) stage, whether to retain, repair or demolish the affected structure.

Details about the reported EEI are as follows:

- a) The sinkhole size measures about 2m dia. x 3m deep, which incident occurred on a property with a Hazard rating = 6(7)/1, with utility wet services installed before 1980.
- b) The sinkhole was noted and reported by an employee who observed the sinkhole, such having occurred right next to a three storey office block.

Tenderers are required to give an account in dealing with the above incident hereunder (**ANNEXURE C**) with their tender submission, describing in detail their methodology in dealing with the EEI, comprising each of the three main components of response, hereunder:

**Important: This page must be submitted with the Tenderer's tender submission.**

<b>Project title</b>	<b>SPECIALIST CIVIL ENGINEERING AND GEO-PROFESSIONAL SERVICES: DRMS: PHASE 5: EMERGENCY AND AD-HOC PROPERTY INVESTIGATIONS IN SUPPORT OF THE DOLOMITE RISK MANAGEMENT STRATEGY FOR THE PROPERTIES OF THE NATIONAL DEPARTMENT OF PUBLIC WORKS.</b>
<b>Tender no:</b>	H21/017 AI

i) attending to the incident upon arrival on site		
ii) options and criteria to be considered for investigative methods and means,		
iii) relevant and appropriate considerations should rehabilitation of the sinkhole be regarded feasible.		

NB: Attach additional sheets if more space is required.

**Signature of Tenderer** \_\_\_\_\_

**ANNEXURE D: DOLOMITE RISK MANAGEMENT STRATEGY (DRMS)  
DOLOMITE RISK MANAGEMENT PLAN: (DRMP)**

Tenderers are required to prepare and submit details of the basic elements that should be covered when preparing a DRMS/DRMP for a dolomite property located on a site with a Dolomite Area Designation = D4, which is occupied by a Government Department.

Details of the site:

- The target site's buildings were developed prior to 1965.
- The site had one large sinkhole (10m dia and 20m deep) some 20 m from the building footprint, which was rehabilitated in 2013. The cause was identified to have been inappropriate storm water control.
- Wet and dry civil engineering services were replaced/upgraded in accordance with SANS 1936-3, under the same contract.

Tenderers are required to complete and submit their DRMP/DRMS in writing hereunder (ANNEXURE D).

**Important: This page must be submitted with the Tenderer's tender submission.**

<b>Project title</b>	<b>SPECIALIST CIVIL ENGINEERING AND GEO-PROFESSIONAL SERVICES: DRMS: PHASE 5: EMERGENCY AND AD-HOC PROPERTY INVESTIGATIONS IN SUPPORT OF THE DOLOMITE RISK MANAGEMENT STRATEGY FOR THE PROPERTIES OF THE NATIONAL DEPARTMENT OF PUBLIC WORKS.</b>
<b>Tender no:</b>	H21/017 AI

**PROPOSED DRMP/DRMS:**

NB: Attach additional sheets if more space is required.

**Signature of Tenderer** \_\_\_\_\_

**ANNEXURE E:**

The tendering Service Provider shall, as a **compulsory requirement** to this Tender, provide full particulars and a comprehensive Curriculum Vitae of the external independent Senior Competent Person (Dolomite land), who shall be retained to perform all required peer review activities necessitated by this Contract. Said detail(s) and commitment must be submitted with the tenderer's **RETURNABLE DOCUMENTS**. [See also T2.1 (5)], which information must be appended to this Tender document, as ANNEXURE E.

**Important: This page must be submitted with the Tenderer's tender submission.**

<b>Project title</b>	<b>SPECIALIST CIVIL ENGINEERING AND GEO-PROFESSIONAL SERVICES: DRMS: PHASE 5: EMERGENCY AND AD-HOC PROPERTY INVESTIGATIONS IN SUPPORT OF THE DOLOMITE RISK MANAGEMENT STRATEGY FOR THE PROPERTIES OF THE NATIONAL DEPARTMENT OF PUBLIC WORKS.</b>
<b>Tender no:</b>	<b>H21/017 AJ</b>

**TENDERING SERVICE PROVIDERS SHALL ATTACH REQUISITE DOCUMENTATION TO THIS PAGE.**

NB: Attach additional sheets if more space is required.

**Signature of Tenderer** \_\_\_\_\_

# Appendix A

**PROFESSIONAL FEES IN RESPECT OF AN ENGINEER'S APPOINTMENT (ALL DISCIPLINES)**

**National Department of Public Works & Infrastructure  
Scope of Engineering Services and Tariff of Fees  
for Persons Registered in terms of the  
Engineering Profession Act, 2000 (Act No. 46 of 2000)**

**1 April 2016**

**2016 NDPWI - Scope of Engineering Services and Tariff of Fees**

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**National Department of Public Works & Infrastructure  
Scope of Engineering Services and Tariff of Fees  
for Persons Registered in terms of the  
Engineering Profession Act, 2000,  
(Act No.46 of 2000)**

**The commencement date of this document**

**shall be**

**1 April 2016**

# 2016 National Department of Public Works & Infrastructure: Scope of Engineering Services and Tariff of Fees for Registered Professionals

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## 1. PREAMBLE

This document is based on the "Guideline Scope of Services and Tariff of Fees for Persons Registered in terms of the Engineering Profession Act, 2000, (Act No.46 of 2000)" determined by the Engineering Council of South Africa under Section 34(2) of the Engineering Profession Act, 2000 (Act No. 46 of 2000) and published under Government Gazette No 34875 Board Notice 206 of 20 December 2011 (ECSA Guideline Fee Scales).

Changes have been made to the ECSA Guideline Fee Scales to reflect the specific requirements of the National Department of Public Works & Infrastructure for professional engineering appointments/contracts. The **services** to be provided by the **consulting engineer** and the corresponding remuneration have been set out herein for projects implemented by or on behalf of the National Department of Public Works & Infrastructure and were determined with consideration of the factors put forward in the ECSA Guideline Fee Scales.

The Scope of Services and Tariff of Fees described herein are generally applicable and are referred to in the **agreement**. Specific requirements with regards to the Scope of Services and the Tariff of Fees shall be set out in the **agreement** and should any requirement of the **agreement** be in conflict with the requirement of this document, the requirement of the Agreement shall prevail.

Any amount mentioned in or fee calculated in terms of this document is exclusive of Value Added Tax.

This document allows for four different methods of remuneration namely:

- (1) Fees for Normal Services (percentage fee based on the cost of works),
- (2) Fees for Additional Services (fees for services additional to those provided for in the Normal Services),
- (3) Time based fees and
- (4) Expenses and costs.

Words or expressions in bold font are defined in clause 2.2.

## 2. GENERAL PROVISIONS

### 2.1 Generality of Terms

In this document, except where the context otherwise requires or indicates:

- (1) the masculine includes the feminine,
- (2) the singular includes the plural, and
- (3) any reference to a natural person includes a juristic person.

### 2.2 Definitions

In this Schedule, any word or expression defined in **the Act** has that meaning, unless the context otherwise indicates:

- (1) **Agreement** means the Letter of Appointment/Acceptance or the Professional Services Contract.
- (2) **Client** means any juristic person or organ of the State engaging a **consulting engineer** for services on a **project**.
- (3) **Construction monitoring** means the process of administering the construction contract and over-seeing and/or inspecting the works, to the extent of the **consulting engineer's** engagement, for the purpose of verification that the works are being completed in accordance with the requirements of the contract that the designs are being correctly interpreted and that appropriate construction techniques are being utilized. **Construction monitoring**, to whatever extent, shall not diminish the **contractor's** responsibility for executing and completing the works in accordance with his contract.
- (4) **Consulting engineer** for purposes of these rules only, means any professional registered in terms of **the Act**, or a juristic person who employs such professional, engaged by a **client** on a **project**.
- (5) **Contractor** means any person or a juristic person under contract to a **client** to perform the **works** or part of it on a **project**, including a subcontractor under contract to such **contractor**.

- (6) **Cost of the works** means the total amount, exclusive of value added tax, certified or which would normally be certifiable for payment to **contractor(s)** (irrespective of who actually carries out the works) in respect of the **works** designed, specified or administered by the **consulting engineer**, before deduction of liquidated damages or penalties, including –
- a *pro rata* portion of all preliminary and general items applicable to the **works** and
  - the costs of new materials, goods or equipment, or a fair evaluation, of such material, goods or equipment as if new whether supplied new or otherwise by, or to, the **client** and including the cost or a fair evaluation of the cost of installation. The sourcing, inspection and testing of such will comprise additional **services** by the **consulting engineer**.
- (7) **Electronic Engineering Services** means **services** related to the provision of electronic systems and detailing the terminations, signals and interconnections of electronic components as distinct from conventional electrical HV, MV and LV systems and related reticulation.
- (8) **Engineering Project** means a project of which the scope comprises mainly engineering work of one discipline only and all financial and administrative matters are dealt with by the **consulting engineer** or where the **consulting engineer** will act as **principal agent** where other disciplines are also involved.
- (9) **Multi-disciplinary Project** means a project comprising building work, together with its associated engineering work, where the engineer is subject to the authority of another professional acting as the Principal Agent while financial and administrative matters are dealt with by another professional.
- (10) **Normal services** means the **services** set out in clause 3.2.
- (11) **Principal Agent** means the Professional Service Provider appointed as such.
- (12) **Project** means any total scheme envisaged by a **client**, including all the **works** and **services** concerned.
- (13) **Services** means the services contemplated in clause 3 on a **project** for which a **consulting engineer** is engaged.
- (14) **Stage** means a stage of **normal services** set out in clause 3.2.
- (15) **The Act** means the Engineering Profession Act, 2000 (Act No. 46 of 2000).
- (16) **Total annual cost of employment** means the total annual cost of employment as defined in clause 4.4(4).
- (17) **Works** means the activities on a **project** for which **contractor(s)** are under contract to the **client** to perform or are intended to be performed, including the supply of goods and equipment.

## 2.3 Short Title

This document is called the "2016 NDPWI – Scope of Engineering Services and Tariff of Fees".

## 3. SCOPE OF SERVICES

### 3.1 Planning, Studies, Investigations and Assessments Reports

These services, as indicated below, relate to carrying out studies and investigations as well as the preparation and submission of reports embodying preliminary proposals or initial feasibility studies and will normally be remunerated on a time and cost basis.

- (1) Consultation with the **client** or **client's** authorized representative.
- (2) Inspection of the site of the **project**.
- (3) Preliminary investigation, route location, planning and a level of design appropriate to allow decisions on feasibility.
- (4) Consultation with authorities having rights or powers of sanction as well as consultation with the public and stakeholder groups.
- (5) Advice to the **client** as to regulatory and statutory requirements, including environmental management and the need for surveys, analyses, tests and site or other investigations, as well as approvals, where such are required for the completion of the report, and arranging for these to be carried out at the **client's** expense.
- (6) Searching for, obtaining, investigating and collating available data, drawings and plans relating to the **works**.
- (7) Investigating financial and economic implications relating to the proposals, feasibility studies and/or option analysis and recommendations.

- (8) Clause 3.1(7) does not normally apply to civil and structural **services** on **multi-disciplinary projects**, except as far as the interpretation of cost figures for civil and structural **services** are concerned.

**Deliverables:**

- Submission of a report for consideration by the **client**, including all or any of the above, with emphasis on the following:
  - Collation of information.
  - Reports on technical and financial feasibility and related implications.
  - List of consents and approvals.
  - Schedule of required surveys, tests, analyses, site and other investigations.
  - Comparison of **project** options, including life cycle costing and recommendations where required.

### 3.2 Normal Services

These services are applicable to projects where the nature, form and function of the facility has been defined through previous investigations and reports and the engineering services are required to take the **project** through to successful completion of construction.

#### 3.2.1 Stage 1 – Inception

(Defined as: Establish **client** requirements and preferences, assess user needs and options, appointment of necessary consultants, and establish the **project** brief including **project** objectives, priorities, constraints, assumptions aspirations and strategies.)

- (1) Assist in developing a clear **project** brief.
- (2) Attend **project** initiation meetings.
- (3) Advise on procurement policy for the **project**.
- (4) Advise on the rights, constraints, consents and approvals.
- (5) Define the scope of **services** and scope of work required.
- (6) Conclude the terms of the **agreement** with the **client**.
- (7) Inspect the site and advise on the necessary surveys, analyses, tests and site or other investigations where such information will be required for **Stage 2** including the availability and location of infrastructure and services.
- (8) Determine the availability of data, drawings and plans relating to the **project**.
- (9) Advise on criteria that could influence the **project** life cycle cost significantly.
- (10) Provide necessary information within the agreed scope of the **project** to other consultants involved.

**Deliverables:**

- Submission of a report for consideration by the **client**, including all or any of the above, with emphasis on the following:
  - Agreed scope of **services** and scope of work.
  - Signed **agreement**.
  - Report on **project**, site and functional requirements.
  - Schedule of required surveys, tests, analyses, site and other investigations.
  - Schedule of consents and approvals.

#### 3.2.2 Stage 2 – Preliminary Design: Concept and Viability

(Defined as: Prepare and finalise the **project** concept in accordance with the brief, including project scope, scale, character, form and function, plus preliminary programme and viability study/assessment of the **project**.)

Following the **client's** instructions to proceed with the development of preliminary proposals or the basic planning of the **project**, comprising all or any of the following:

- (1) Agree documentation programme with principal consultant and other consultants involved.
- (2) Attend design and consultants' meetings.
- (3) Establish the concept design criteria.
- (4) Prepare initial concept design and related documentation.
- (5) Advice to the **client** as to the regulatory and statutory requirements, including environmental management and the need for any further surveys, analyses, tests and site or other investigations, as well as approvals, which may be required and arranging for these to be carried out at the **client's** expense. This advice is to be presented by the **consulting engineer** based on the interpretation of the results of these tests and investigations including geotechnical and/or foundation investigations, in a report containing recommendations to be applied to and incorporated in designs. The **consulting engineer** will also take the environmental management plan into account for the full life cycle of the **project**.
- (6) Preparation and submission to the **client** of any preliminary plans, drawings and estimates required for seeking the approval of statutory authorities and the **client**.
- (7) Refine and assess the concept design to ensure conformance with all regulatory requirements and consents.
- (8) Establish access, utilities, services and connections required for the design of the **project**.
- (9) Coordinate design interfaces with other consultants involved.
- (10) Prepare process designs (where required), preliminary designs including preliminary drawings and plans, and related documentation for approval by authorities and **client**, including costing of the aforementioned.
- (11) Provide cost estimates and life cycle costs including financial implications and preliminary programmes.
- (12) Liaise, co-operate and provide necessary information to the **client**, principal consultant and other consultants involved.

**Deliverables:**

- Submission of a report for consideration by the **client**, including all or any of the above, with emphasis on the following:
  - Concept design report.
  - Schedule of required surveys, tests and other investigations and related reports.
  - Process design report.
  - Preliminary design report.
  - Cost estimates, concept and viability reports which include all or any of the above.

### 3.2.3 Stage 3 – Detail Design

(Defined as: Finalise the design, outline specifications, cost plan, financial viability and programme for the **project**.)

- (1) Review documentation programme with principal consultant and other consultants involved.
- (2) Attend design and consultants' meetings.
- (3) Incorporate **client's** and authorities' detailed requirements into the design.
- (4) Incorporate other consultant's designs and requirements into the design.
- (5) Prepare design development drawings including draft technical details and specifications.
- (6) Prepare detail designs, and design drawings including draft technical details and specifications:
  - In the case of reinforced concrete **works**, drawings must include bending schedules.
  - In the case of structural steel **works**, drawings and details provided by the **consulting engineer** must include full information, dimensions and specifications on all sections, connections, plates, fasteners, bolts and welding, to such an extent that no further designs by **contractor(s)** or other parties are required. The **consulting engineer** need not provide shop drawings for the manufacture of the structural steel **works**.
- (7) Review and evaluate design, specifications and estimates of the **cost of works** in order to finalise the detail design **stage**.

- (8) Advice to the **client** on any alternative designs and tenders, but excluding detailed inspection, reviewing and checking of alternative designs and drawings not prepared by the **consulting engineer** and submitted by any **contractor** or potential **contractor**.
- (9) Liaise, co-operate and provide necessary information to the principal consultant and other consultants involved.
- (10) Submit the necessary design documentation to local and other authorities for approval and obtain said approval or alternatively for record purposes where approval is not required by Building Regulations.
- (11) Accommodate services design.

**Deliverables:**

- Submission of a report for consideration by the **client**, including all or any of the above, with emphasis on the following:
  - Detail design drawings.
  - Outline specifications.
  - Local and other authority submission drawings, reports and approvals.
  - Detailed estimates of construction costs.

### 3.2.4 Stage 4 – Documentation and Procurement

(Defined as: Prepare procurement and construction documentation, confirm and implement the procurement strategies and procedures for effective and timeous procurement of necessary resources for execution of the **project**.)

- (1) Attend design and consultants' meetings.
- (2) Prepare and finalise specifications, schedule of quantities and preambles for the **works**.
- (3) Submission of detailed estimates, capital and life cycle costs, financial implications and programmes for implementation of the **works**.
- (4) Reaffirm detailed cost estimates and adjust designs and documents if necessary to remain within approved budget.
- (5) Prepare and finalise the procurement strategy for **contractor(s)** or assist the principal consultant where relevant.
- (6) Prepare documentation for **contractor** procurement.
- (7) Assist in calling for tenders/bids and/or negotiation of prices and/or assist the principal consultant where relevant.
- (8) Liaise, co-operate and provide necessary information to the principal consultant and the other consultants as required.
- (9) Assist in the evaluation of tenders/bids.
- (10) Assist with the preparation of contract documentation for signature.
- (11) Assess samples and products for compliance and design intent.
- (12) Advice to the **client** on any alternative designs and tenders, but excluding detailed inspection, reviewing and checking of alternative designs and drawings not prepared by the **consulting engineer** and submitted by any **contractor** or potential **contractor**.
- (13) Placing orders for the **works** on behalf of the **client**.

**Deliverables:**

- Submission of a report for consideration by the **client**, including all or any of the above, with emphasis on the following:
  - Finalised Specifications.
  - Service co-ordination.
  - Detail design drawings.
  - Tender/bid documentation.
  - Tender/bid evaluation and report.
  - Tender/bid recommendation.
  - Priced contract documentation.

### 3.2.5 Stage 5 – Contract Administration and Inspection

(Defined as: Manage, administer and monitor the construction contracts and processes including preparation and coordination of procedures and documentation to facilitate practical completion of the works.)

- (1) Attend site handover.
- (2) Issue construction documentation in accordance with the documentation schedule including, in the case of structural engineering, reinforcing bending schedules and detailing and specifications of structural steel sections and connections.
- (3) Execute the contract administration in terms of the contract between the **client** and the **contractor**.
- (4) Prepare schedules of predicted cash flow.
- (5) Prepare pro-active estimates of proposed variations for **client** decision making.
- (6) Preparation of and issuing variation orders on behalf of and after consultation with the **client**.
- (7) Attend regular site, technical and progress meetings.
- (8) Inspect **works** for conformity to contract documentation.
- (9) Adjudicate and resolve financial claims by **contractor(s)**.
- (10) Assist in the resolution of contractual claims by the **contractor**.
- (11) Assist the **client** in the resolution of disputes or differences that may arise between the **client** and the **contractor**, except mediation, arbitration and/or litigation.
- (12) Establish and maintain a financial control system.
- (13) Clarify details and descriptions during construction as required.
- (14) Assist and/or prepare valuations for payment certificates to be issued by the **principal agent**.
- (15) Witness and review of all tests and mock ups carried out both on and off site.
- (16) Check and approve **contractor** drawings for design intent.
- (17) Update and issue drawings and drawings register.
- (18) Issue contract instructions as and when required.
- (19) Agreeing and verifying final quantities during construction with the **contractor**.
- (20) Review and comment on operation and maintenance manuals, guarantee certificates and warranties.
- (21) Inspect the **works** and issue practical completion certificates and defects lists.
- (22) Arranging for the delivery of all test certificates, including the Electrical Certificate of Compliance, statutory and other approvals, as built drawings and operating manuals.
- (23) Advice to the **client** on any further alternative designs, but excluding detailed inspection, reviewing and checking of alternative designs and drawings not prepared by the **consulting engineer** and submitted by any **contractor**.

#### Deliverables:

- Submission of a report for consideration by the **client**, including all or any of the above, with emphasis on the following:
  - Schedules of predicted cash flow.
  - Construction documentation.
  - Register of drawings issued.
  - Estimates for proposed variations.
  - Contract instructions.
  - Financial control reports.
  - Valuations for payment certificates.
  - Progressive and draft final account(s).
  - Practical completion and defects list.
  - Electrical Certificate of Compliance.

Where a quantity surveyor is included in the project team in Multi-Disciplinary works, items 4, 5, 9 and 12 will not be required from the engineer.

### 3.2.6 Stage 6 – Close-Out

(Defined as: Fulfil and complete the **project** close-out including necessary documentation to facilitate effective completion, handover and operation of the **project**).

- (1) Inspect and verify the rectification of defects.
- (2) Prepare comments for relevant payment valuations and completion certificates.
- (3) Prepare and/or procure operations and maintenance manuals, guarantees and warranties.
- (4) Prepare and/or procure as-built drawings and documentation.
- (5) Agreeing final quantities with **contractor(s)**, compiling final accounts and issuing final payment certificates.

**Deliverables:**

- Valuations for payment certificates.
- Works and final completion lists.
- Operations and maintenance manuals, guarantees and warranties.
- As-built drawings and documentation.
- Final accounts.

### 3.2.7 Targeted (Preferential) Procurement

Should the **client** during any **stage** of the **project**, require the **consulting engineer** to perform work or **services** pertaining to targeted procurement, such work and or **services** could entail, but are not limited to, any or all of the following:

- (1) incorporation of any targeted (preferential) participation goals;
- (2) the measuring of key participation indicators;
- (3) the selection, appointment and administration of participation and;
- (4) auditing compliance to the above by any **contractor s** and/or professional consultant.

### 3.3 Additional Services

The following **services** are additional to the **normal services** provided by the **consulting engineer**, unless specifically agreed otherwise between the **consulting engineer** and the **client**. The **agreement** on the scope of **services** and remuneration shall be in writing and should, if at all possible, be concluded before such **services** are rendered.

#### 3.3.1 Additional Services pertaining to all Stages of the Project

- (1) Enquiries not directly concerned with the **works** and its subsequent utilisation.
- (2) Valuation for purchase, sale or leasing of plant, equipment, material, systems, land or buildings or arranging for such valuation.
- (3) Making arrangements for way leaves, servitudes or expropriations.
- (4) Negotiating and arranging for the provision or diversion of services not forming part of the **works**.
- (5) Additional work in obtaining the formal approval of the appropriate Government Departments or Public Authorities, including the making of such revisions as may be required as a result of decisions of such Departments or Authorities arising out of changes in policy, undue delay, or other causes beyond the **consulting engineer's** control.
- (6) Topographical and environmental surveys, analyses, tests and site or foundation or other investigations, model tests, laboratory tests and analyses carried out or procured on behalf of the **client**.
- (7) Setting out or staking out the **works** and indicating any boundary beacons and other reference marks.
- (8) Preparation of drawings for manufacture and installation or detailed checking of such for erection or installation fit.
- (9) Detailed inspection, reviewing and checking of designs and drawings not prepared by the **consulting engineer** and submitted by any **contractor** or potential **contractor** as alternative to those embodied in tender or similar documents prepared by the **consulting engineer**.
- (10) Preparing and setting out particulars and calculations in a special form required by any relevant authority.
- (11) Abnormal additional **services** by or costs to the **consulting engineer** due to the failure of a **contractor** or others to perform their required duties adequately and on time.

- (12) Executing or arranging for the periodic monitoring and adjustment of the **works**, after final handover and completion of construction and commissioning, in order to optimise or maintain proper functioning of any process or system.
- (13) Investigating or reporting on tariffs or charges leviable by or to the **client**.
- (14) Advance ordering or reservation of materials and obtaining licenses and permit.
- (15) Additional **services**, duties and/or work resulting from project scope changes, alterations and/or instructions by the **client**, or his duly authorized agents, requiring the **consulting engineer** to advice upon, review, adapt and/or alter his completed designs and/or any other documentation and/or change the scope of his **services** and/or duties. Such additional **services** are subject to **agreement** in writing between the **consulting engineer** and the **client** prior to the execution thereof.
- (16) Exceptional arrangements, communication, facilitation and agreements with any stakeholders other than the **client** and **contractor(s)** appointed for the **works** on which the **consulting engineer** provides **services**.
- (17) Any other additional **services**, of whatever nature, specifically agreed to in writing between the **consulting engineer** and the **client** prior to the execution thereof.

### 3.3.2 Construction Monitoring

- (1) If the **construction monitoring**, as set out in clause 3.2.5(3), is deemed to be insufficient by the **consulting engineer**, the **consulting engineer** may, with prior written approval having been obtained from the **client**, appoint or make available additional staff for such **construction monitoring** as are necessary to undertake additional **construction monitoring** on site to the extent specifically defined and agreed with the **client**. The functions in respect of additional **construction monitoring** are to be limited to detailed inspections and exclude those mentioned under clause 3.2.5.

Applications for additional staff must be made on the department's prescribed format, together with which the **consulting engineer** must submit a proper motivation, containing *inter alia*, a schedule indicating the envisaged time to be spent on additional **construction monitoring** as applied for, as well as the envisaged time to be spent on normal **construction monitoring** as set out in clause 3.2.5(3).

- (2) Alternatively, the **client** may appoint or make available staff, as intended in clause 3.3.2(1), subject to approval by the **consulting engineer**.
- (3) Staff, as intended in clauses 3.3.2(1) and 3.3.2(2), shall report to and take instructions from the **consulting engineer** or an authorized representative of the **consulting engineer** only and shall be deemed to be in the employ of the **consulting engineer**.
- (4) Should any change regarding the persons utilized for additional on-site monitoring or their remuneration or duration of services be necessary, the utilization of such persons and/or their remuneration must be agreed to in writing with the **client** prior to the implementation thereof.
- (5) If, for any reason, no additional staff or inadequate staff for **construction monitoring** is appointed, the **consulting engineers** shall provide additional **services**, including additional site visits, as required and agreed to in writing with the **client** prior to commencement thereof.
- (6) Where provided for in the **agreement**, the duties of the **consulting engineer** for the following defined levels of **construction monitoring**, respectively, are as follows:

(a) **Level 1:**

The **construction monitoring** staff shall:-

- (i) Maintain a part-time presence on site as agreed with the **client** to review random samples and review important completed work prior to enclosure or on completion as appropriate.
- (ii) Where the **consulting engineer** is the sole consultant or **principal agent**, carry out such administration of the **project** as is necessary on behalf of the **client**.
- (iii) Where the **principal agent**, other than the **consulting engineer**, has been appointed for the **project**, provide such information as to enable the **principal agent** to fulfil his responsibilities.
- (iv) Be available to provide the **contractor** with technical interpretation of the plans and specifications.



(b) **Level 2:**

The **construction monitoring staff** shall:-

- (i) Maintain a full time presence on site to constantly review –
  - (a) Work procedures
  - (b) Construction materialsfor compliance with the requirements of the plans and specifications and review completed work prior to enclosure or on completion as appropriate.
- (ii) Where the **consulting engineer** is the sole consultant or **principal agent**, carry out such administration of the **project** as is necessary on behalf of the **client**.
- (iii) Where the **principal agent**, other than the **consulting engineer** has been appointed for the **project**, provide such information as to enable the **principal agent** to fulfil his responsibilities.
- (iv) Be available to provide the **contractor** with technical interpretation of the plans and specifications.

### 3.3.3 Occupational Health and Safety Act, 1993 (Act No.85 of 1993)

Should the **client** require the **consulting engineer** to undertake duties falling under the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the Construction Regulations in terms thereof, on behalf of the **client**, the additional **services** may include the following:

- (1) The **consulting engineer** must arrange, formally and in writing, for the **contractor** to provide documentary evidence of compliance with all the requirements of the Occupational Health and Safety Act, 1993 (Act No.85 of 1993).
- (2) The **consulting engineer** must execute the duties of the **client**, as his appointed agent, as contemplated in the Construction Regulations to the Occupational Health and Safety Act, 1993 (Act No.85 of 1993).

### 3.3.4 Quality Assurance System

Where the **client** requires that a quality management system or quality assurance services, over and above **construction monitoring services**, be applied to the **project**, these are in addition to **normal services** provided by the **consulting engineer** and to be specifically defined and separately agreed in writing prior to commencement thereof.

### 3.3.5 Lead Consulting Engineer

Should the **client** require the **consulting engineer** to assume the leadership of a joint venture, consortium or team of consulting engineers, of the same discipline, prescribed or requested by the **client**, the additional **services** may include the following:

- (1) Responsibility for the overall administration of all sections of the **services**, including those portions of the **services**, which fall within the ambit of the other consulting engineers.
- (2) Responsibility for the overall co-ordination, programming of design and financial control of all the **works** included in the **services**.
- (3) Processing certificates or recommendations for payment of **contractor(s)**.

### 3.3.6 Principal Agent of the Client

When a **consulting engineer** is, in addition to his normal functions as **consulting engineer**, appointed as the **principal agent** of the **client** on a project, the **consulting engineer** will also be responsible for the following:

- (1) Leadership of the professional team.
- (2) Submission of preliminary and developed proposals in the form of consolidated reports, drawings and specifications together with estimates of time required and **cost of the works**.
- (3) The overall administration of all sections of the **project** including those, which fall within the ambit of the other professional members in the team.

- (4) The overall coordination, programming of design and financial control of the **project**.
- (5) Resolving differences that may arise between the **client** and the **contractor(s)**, excluding mediation, arbitration or litigation.
- (6) Approval of certificates for payment to **contractor(s)** issued by the other professional members in the team before their presentation to the **client** for settlement.
- (7) Making arrangements to provide the **client**, on completion of the **works**, with such record drawings as may be required for a proper record of the **works** as constructed and such manuals as may be required for the operation and maintenance of the relevant parts of the **works**.
- (8) Approval of the final contract account and provision of a close out report for the **project**.
- (9) Manage targeted procurement **services** as indicated in clause 3.2.7.

### 3.3.7 Mediation, Arbitration and Litigation proceedings and similar Services

Where the **client** requires the **consulting engineer** to, on his behalf, perform the **services** listed hereunder or similar work, the extent thereof and remuneration therefore is subject to agreement between the **client** and the **consulting engineer**:

- (1) Dealing with matters of law, obtaining parliamentary or other statutory approval, licenses or permits.
- (2) Assisting with or participating in contemplated or actual mediation, arbitration or litigation proceedings.
- (3) Officiating at or attending courts and commissions of enquiry, select committees and similar bodies convened by statute, regulation or decree.

## 4. TARIFF OF FEES

### 4.1 Application of Tariff of Fees

- (1) The tariff of fees contained in this Schedule applies in respect of the **services** set out in clause 3 "Scope of Services".
- (2) The **client** shall remunerate the **consulting engineer**, for the **services** rendered, on the basis of clauses 4.2 and 4.5. In cases where the **client** and **consulting engineer** have agreed that clauses 4.2 and 4.3 are not applicable, payment should be on the basis of clause 4.4 or as agreed according to clause 4.1(4).
- (3) The **client** shall reimburse the **consulting engineer** for all expenses and costs incurred in terms of clause 4.5 in performing his **services**, irrespective of whether fees are charged in terms of clauses 4.2 and 4.3 or clause 4.4 as well as for all costs incurred on behalf, and with the approval of the **client**.
- (4) While the tariff of fees contained in this document can be applied to many projects the factors that influence the fees to be paid for **services** are complex and depend on a number of contributing factors. These contributing factors that should be taken into account may include, inter alia, all or any of the following:
  - (a) **Project complexity:** Projects may range from relatively simple projects where it is based on well established, common practices to more complex projects where it calls for the application of new, unusual or untried practices.
  - (b) **Cost of the works:** This may range from a situation where the **cost of the works** is abnormally high relative to the **services** being rendered to a project where the **cost of the works** is abnormally low relative to the **services** required from the **consulting engineer**.
  - (c) **Time duration:** This may involve projects where the **works** are executed over appreciably shorter or longer periods than would normally be expected for any of the **stages** defined in 3 "Scope of Services".
  - (d) **Level of responsibility, liability and risk:** These may range from relatively low levels of responsibility and/or risks to projects with unusually high responsibilities and/or risks that are expected to be carried by the **consulting engineer**.

- (e) **Level of expertise, qualifications, skills and experience:** Some works do not require a high degree of expertise while other works may require more specialized expertise or substantial skills and experience that cost more to develop and retain.
  - (f) **Level of technology** required and changes in technology that may influence the costs of the **services** provided.
  - (g) Whether aspects related to labour intensive works need to be considered in the design.
- (5) Combinations of one or more of the above factors may require an adjustment of the tariffs to fairly compensate the **consulting engineer** and this adjustment should be negotiated in good faith by both parties.
- (6) Agreement on any adjustment of or special fees should be reached at the time of the engagement of the **consulting engineer** or as soon after circumstances warrant such as practically possible, but in all cases prior to the **consulting engineer** rendering **services** which may be affected.
- (7) Where the **normal services** relate to more than one of the disciplines of consulting engineering contemplated in clauses 4.2.1 to 4.2.7 namely civil, structural, mechanical, electrical and **electronic engineering services**, a separate fee for **services** in each discipline should be calculated in accordance with the relevant clause. Where a **consulting engineer** is appointed for either or both electronic and electrical services, his payment shall be according to the electrical fee scales based on the combined value of these **services**.
- (8) Where at the instance and with the consent of the **client** the **works** are undertaken on separate non-contiguous sites, continuity is interrupted or are unusually fragmented or are constructed as separately documented phases or sections, the fee for **normal services** is:
- (a) The sum of the fees calculated separately for each site, contract, phase or section as if they were separate works; or
  - (b) A fee agreed to between the **client** and the **consulting engineer** and which fee lies between the fee calculated on the total **cost of the works** and the sum of the fees contemplated in clause 4.1(8)(a) above.
- (9) For the calculation of fees, "duplication of works" is defined as the re-use of designs, drawings and details done by a consultant to duplicate a complete unit (e.g. a building or bridge).
- (10) The following fees may be claimed after each **stage** of **services** or monthly or as agreed between the **consulting engineer** and the **client**:
- (a) Percentage fees determined on the basis of the **cost of the works** prevailing at the time of the fee calculation and *pro rata* to the completed **services**, or a portion of the total fee based on completion of the **stages** along the lines indicated in 4.2.8.
  - (b) Time based fees applicable when the **services** were rendered.
- (11) Disbursements as set out in clause 4.1(3) may be claimed monthly.

## 4.2 Fees for Normal Services

### 4.2.1 Civil and Structural Engineering Services pertaining to Engineering Projects

- (1) The basic fee for **normal services** in the disciplines of civil and structural engineering, pertaining to **engineering projects**, is determined from the table below. The fee is the sum of the primary fee and the secondary fee applicable to the specific **cost of the works** in respect of which the **services** were rendered on the **project**.

Cost of the Works		Basis of Fee Calculation	
Where the costs of the works:		Primary Fee	Secondary fee
Exceeds	But does not exceed		
R 0	R 598,000	R 0	A Lump Sum or on Time Basis
R 598,000	R 1,419,000	R 74,800	12,5% on the balance over R 598 000
R 1,419,000	R 6,985,000	R 177,400	10,0% on the balance over R 1 419 000
R 6,985,000	R 14,248,000	R 734,000	9,0% on the balance over R 6,985,000
R 14,248,000	R 35,480,000	R 1,387,600	8,0% on the balance over R 14,248,000
R 35,480,000	R 70,961,000	R 3,086,200	6,0% on the balance over R 35,480,000
R 70,961,000	R 427,427,000	R 5,215,100	5,5% on the balance over R 70,961,000
R 427,427,000		R 24,820,700	5,0% on the balance over R 427,427,000

- (2) The following additional fee shall be applicable to the value of the reinforced concrete and structural steel portions of the **works**, inclusive of the costs of concrete, reinforcing, formwork, structural steel work and any *pro rata* preliminary and general amounts. Where structures of identical design are repeated on the same **project**, the combined costs shall be cumulated for the determination of the cost of the reinforced concrete and structural steel works.

Cost of the Works		Basis of Fee Calculation	
Where the costs of the works:		Primary Fee	Secondary fee
Exceeds	But does not exceed		
R 0	R 598,000	R 0	A Lump Sum or on Time Basis
R 598,000	R 1,419,000	R 29,900	5,0% on the balance over R 598,000
R 1,419,000	R 6,985,000	R 71,000	4,5% on the balance over R 1,419,000
R 6,985,000	R 14,248,000	R 321,400	4,0% on the balance over R 6,985,000
R 14,248,000	R 35,480,000	R 611,900	3,0% on the balance over R 14,248,000
R 35,480,000	R 70,961,000	R 1,248,900	2,0% on the balance over R 35,480,000
R 70,961,000	R 427,427,000	R 1,958,500	1,5% on the balance over R 70,961,000
R 427,427,000		R 7,305,500	1,5% on the balance over R 427,427,000

- (3) To calculate the fee for railway track work in terms of this item, 50 per cent of the cost of the permanent way materials is excluded from the **cost of the works**, but the full cost of ballast and equipment specially designed by the **consultant** is included in the **cost of the works**.
- (4) For **normal services** relating to a description of the **works** mentioned in the first column of the following table, the proportion of the basic fee relating to the specific item calculated in terms of clause 4.2.1(1) and 4.2.1(2) is multiplied by the category factor mentioned against that description in the second column of the table. In case more than one of the descriptions below applies, the effective factor will be the product of the factors involved, except for the fee for targeted procurement.
- (5) These factors do not apply when fees are a lump sum or on a time basis.

- (6) In the case of road works, where the road traverses both rural and urban areas, an adjustment *pro rata* to the length of road in rural and urban area should be made.
- (7) In the case of road rehabilitation a combination of factors applies depending on the situation of the road (rural or urban) and the category factor for alterations to existing works.

Description of the Works	Factor by which basic fee is multiplied
Rural roads (single carriageways), excluding bridges	0,85
Rural freeways and dual carriageways, excluding bridges	0,95
Freeways and dual carriageways through existing peri-urban areas, excluding bridges	1,00
Single Carriageways through existing urban areas	1,00
Freeways and dual carriageways through existing urban areas	1,25
Gravel roads:     Primary roads	1,25
Secondary roads	1,00
Informal roads	0,75
Water and waste water treatment works	1,25
Services (Excluding roads for existing informal settlements including roads and to reduced standards or supplies)	1,25
Water and sanitation in rural areas	1,35
Alterations to existing works (Only applicable to the fees on the portion or section of works affected)	1,25
Mass concrete foundations, brickwork and cladding designed and detailed by the <b>consulting engineer</b> (Only applicable to the design portion of the fees on such works)	0,33
Duplication of works (Only applicable to the design portion of the fees on duplicated works)	0,25
Targeted procurement (Additional fee based on the basic fees before the application of any of the other factors. Only applicable where specifically appointed for service)	0,07

#### 4.2.2 Civil Engineering Services pertaining to Multi-disciplinary Projects

- (1) The basic fee for **normal services** in the discipline of civil engineering, pertaining to **multi-disciplinary projects**, is determined from the table below. The fee is the sum of the primary fee and the secondary fee applicable to the specific **cost of the works** in respect of which the **services** were rendered on the project.

Cost of the Works		Basis of Fee Calculation	
Where the costs of the works:		Primary Fee	Secondary fee
Exceeds	But does not exceed		
R 0	R 598,000	R 0	A Lump Sum or on Time Basis
R 598,000	R 1,419,000	R 74,800	12,5% on the balance over R 598,000
R 1,419,000	R 6,985,000	R 177,400	10,0% on the balance over R 1,419,000
R 6,985,000	R 14,248,000	R 734,000	9,0% on the balance over R 6,985,000
R 14,248,000	R 35,480,000	R 1,387,600	8,0% on the balance over R 14,248,000
R 35,480,000	R 70,961,000	R 3,086,200	7,0% on the balance over R 35,480,000
R 70,961,000	R 427,427,000	R 5,569,900	7,0% on the balance over R 70,961,000
R 427,427,000		R 30,522,500	7,0% on the balance over R 427,427,000

- (2) For **normal services** relating to a description of the **works** mentioned in the first column of the following table, the proportion of the basic fee relating to the specific item calculated in terms of clause 4.2.2(1) is multiplied by the category factor mentioned against that description in the second column of the table. In case more than one of the descriptions below applies, the effective factor will be the product of the factors involved.

These factors do not apply when fees are a lump sum or on a time basis.

Description of the Works	Factor by which basic fee is multiplied
Alterations to existing works (Only applicable to the fees on the portion or section of works affected)	1,25
Internal water and drainage for buildings upon specific agreement with the client to render such services	1,25
Duplication of works (Only applicable to the design portion of the fees on duplicated works)	0,25

### 4.2.3 Structural Engineering Services pertaining to Multi-disciplinary Projects

- (1) The basic fee for **normal services** in the discipline of structural engineering, pertaining to **multi-disciplinary projects**, is determined from the table below. The fee is the sum of the primary fee and the secondary fee applicable to the specific **cost of the works** in respect of which the **services** were rendered on the project.

Cost of the Works		Basis of Fee Calculation	
Where the costs of the works:		Primary Fee	Secondary fee
Exceeds	But does not exceed		
R 0	R 598,000	R 0	A Lump Sum or on Time Basis
R 598,000	R 1,419,000	R 74,800	12,5% on the balance over R 598,000
R 1,419,000	R 6,985,000	R 177,400	10,0% on the balance over R 1,419,000
R 6,985,000	R 14,248,000	R 734,000	9,0% on the balance over R 6,985,000
R 14,248,000	R 35,480,000	R 1,387,600	8,0% on the balance over R 14,248,000
R 35,480,000	R 70,961,000	R 3,086,000	7,0% on the balance over R 35,480,000
R 70,961,000	R 427,427,000	R 5,570,000	7,0% on the balance over R 70,961,000
R 427,427,000		R 30,523,000	7,0% on the balance over R 427,427,000

- (2) For **normal services** relating to a description of the **works** mentioned in the first column of the following table, the proportion of the basic fee relating to the specific item calculated in terms of clause 4.2.3(1) is multiplied by the category factor mentioned against that description in the second column of the table. In case more than one of the descriptions below applies, the effective factor will be the product of the factors involved.

These factors do not apply when fees are a lump sum or on a time basis.

Description of the Works	Factor by which basic fee is multiplied
Alterations to existing works (Only applicable to the fees on the portion or section of works affected)	1,25
Mass concrete foundations and brickwork designed and cladding designed and detailed by the <b>consulting engineer</b> (Only applicable to the design portion of the fees on such works)	0,33
Duplication of works (Only applicable to the design portion of the fees on duplicated works)	0,25

#### 4.2.4 Mechanical Engineering Services pertaining to Engineering Projects

- (1) The basic fee for **normal services** in the discipline of mechanical engineering, pertaining to **engineering projects**, is determined from the table below. The fee is the sum of the primary fee and the secondary fee applicable to the specific **cost of the works** in respect of which the **services** were rendered on the **project**.

Cost of the Works		Basis of Fee Calculation	
Where the costs of the works:		Primary Fee	Secondary fee
Exceeds	But does not exceed		
R 0	R 598,000	R0	A Lump Sum or on Time Basis
R 598,000	R 1,419,000	R74,800	12,5% on the balance over R 571 000
R 1,419,000	R 6,985,000	R177,400	10,0% on the balance over R 1 353 000
R 6,985,000	R 14,248,000	R734,000	8,0% on the balance over R 6 659 000
R 14,248,000	R 35,480,000	R1,315,000	7,0% on the balance over R 13 582 000
R 35,480,000	R 70,961,000	R2,801,300	6,0% on the balance over R 33 824 000
R 70,961,000	R 427,427,000	R4,930,100	5.5% on the balance over R 67 648 000
R 427,427,000		R24,535,700	5.5% on the balance over R 407 474 000

- (2) For **normal services** relating to a description of the **works** mentioned in the first column of the following table, the proportion of the basic fee relating to the specific item calculated in terms of clause 4.2.4(1) is multiplied by the category factor mentioned against that description in the second column of the table. In case more than one of the descriptions below applies, the effective factor will be the product of the factors involved, except for the fee for targeted procurement.

These factors do not apply when fees are a lump sum or on a time basis.

Description of the Works	Factor by which basic fee is multiplied
Alterations to existing <b>works</b> (Only applicable to the fees on the portion or section of <b>works</b> affected)	1,25
Duplication of <b>works</b> (Only applicable to the design portion of the fees on duplicated <b>works</b> )	0,25
Targeted procurement (Additional fee based on the basic fees before the application of any of the other factors. Only applicable where specifically appointed for service)	0,07



#### 4.2.5 Mechanical Engineering services pertaining to Multi-disciplinary Projects

- (1) The basic fee for **normal services** in the discipline of mechanical engineering or wet services, pertaining to **multi-disciplinary projects**, is determined from the table below. The fee is the sum of the primary fee and the secondary fee applicable to the specific **cost of the works** in respect of which the **services** were rendered on the **project**.

Cost of the Works		Basis of Fee Calculation	
Where the costs of the works:		Primary Fee	Secondary fee
Exceeds	But does not exceed		
R 0	R 598,000	R0	A Lump Sum or on Time Basis
R 598,000	R 1,419,000	R89,700	15,0% on the balance over R 571 000
R 1,419,000	R 6,985,000	R212,900	12,5% on the balance over R 1 353 000
R 6,985,000	R 14,248,000	R908,600	10,5% on the balance over R 6 659 000
R 14,248,000	R 35,480,000	R1,671,200	9,5% on the balance over R 13 582 000
R 35,480,000	R 70,961,000	R3,688,300	9,0% on the balance over R 33 824 000
R 70,961,000	R 427,427,000	R6,881,500	8,5% on the balance over R 67 648 000
R 427,427,000		R37,181,200	8,5% on the balance over R 407 474 000

- (2) For **normal services** relating to a description of the **works** mentioned in the first column of the following table, the proportion of the basic fee relating to the specific item calculated in terms of clause 4.2.5(1) is multiplied by the category factor mentioned against that description in the second column of the table. In case more than one of the descriptions below applies, the effective factor will be the product of the factors involved, except for the fee for targeted procurement.

These factors do not apply when fees are a lump sum or on a time basis.

Description of the Works	Factor by which basic fee is multiplied
Multi-tenant installations: <i>The Multi-tenant factor only becomes applicable if substantial fragmentation of services, which would otherwise not be divided, occurs as a result of the multi-tenant application. Normal multi-zoning, even if applied in multi-tenant accommodation, does not qualify for the application of the Multi-tenant factor.</i>	1,25
Alterations to existing works (Only applicable to the fees on the portion or section of works affected)	1,25
Duplication of works (Only applicable to the design portion of the fees on duplicated works)	0,25
For projects where the <b>cost of the works</b> exceeds R 572,000 and where bills of quantities are not required from the <b>consulting engineer</b> and all financial, tender and contractual matters are dealt with by the Quantity Surveyor or other parties	0,75
Targeted procurement (Additional fee based on the basic fees before the application of any of the other factors. Only applicable where specifically appointed for service)	0,07

#### 4.2.6 Electrical and Electronic Engineering Services pertaining to Engineering Projects

- (1) The basic fee for **normal services** in the discipline of electrical and electronic engineering, pertaining to **engineering projects**, is determined from the table below. The fee is the sum of the primary fee and the secondary fee applicable to the specific **cost of the works** in respect of which the services were rendered on the **project**.

Cost of the Works		Basis of Fee Calculation	
Where the costs of the works:		Primary Fee	Secondary fee
Exceeds	But does not exceed		
R 0	R 598,000	R0	A Lump Sum or on Time Basis
R 598,000	R 1,419,000	R74,800	12,5% on the balance over R 571 000
R 1,419,000	R 6,985,000	R177,400	10,0% on the balance over R 1 353 000
R 6,985,000	R 14,248,000	R734,000	8,0% on the balance over R 6 659 000
R 14,248,000	R 35,480,000	R1,315,000	7,0% on the balance over R 13 582 000
R 35,480,000	R 70,961,000	R2,801,300	6,0% on the balance over R 33 824 000
R 70,961,000	R 427,427,000	R4,930,100	5,5% on the balance over R 67 648 000
R 427,427,000		R24,535,700	5,5% on the balance over R 407 474 000

- (2) For **normal services** relating to a description of the **works** mentioned in the first column of the following table, the proportion of the basic fee relating to the specific item calculated in terms of clause 4.2.6(1) is multiplied by the category factor mentioned against that description in the second column of the table. In case more than one of the descriptions below applies, the effective factor will be the product of the factors involved, except for the fee for targeted procurement.

These factors do not apply when fees are a lump sum or on a time basis.

Description of the Works	Factor by which basic fee is multiplied
<b>Alterations to existing works</b> (Only applicable to the fees on the portion or section of works affected)	1,25
<b>Duplication of works</b> (Only applicable to the design portion of the fees on duplicated works)	0,25
<b>Targeted procurement</b> (Additional fee based on the basic fees before the application of any of the other factors. Only applicable where specifically appointed for service)	0,07

#### 4.2.7 Electrical and Electronic Engineering services pertaining to Multi-disciplinary Projects

- (1) The basic fee for **normal services** in the discipline of electrical and electronic engineering, pertaining to **multi-disciplinary projects**, is determined from the table below. The fee is the sum of the primary fee and the secondary fee applicable to the specific **cost of the works** in respect of which the **services** were rendered on the **project**.

Cost of the Works		Basis of Fee Calculation	
Where the costs of the works:		Primary Fee	Secondary fee
Exceeds	But does not exceed		
R 0	R 598,000	R0	A Lump Sum or on Time Basis
R 598,000	R 1,419,000	R89,700	15,0% on the balance over R 571 000
R 1,419,000	R 6,985,000	R212,900	12,5% on the balance over R 1 353 000
R 6,985,000	R 14,248,000	R908,600	10,5% on the balance over R 6 659 000
R 14,248,000	R 35,480,000	R1,671,200	9,5% on the balance over R 13 582 000
R 35,480,000	R 70,961,000	R3,688,300	9,0% on the balance over R 33 824 000
R 70,961,000	R 427,427,000	R6,881,500	8,5% on the balance over R 67 648 000
R 427,427,000		R37,181,200	8,5% on the balance over R 407 474 000

- (2) For **normal services** relating to a description of the **works** mentioned in the first column of the following table, the proportion of the basic fee relating to the specific item calculated in terms of clause 4.2.7(1) is multiplied by the category factor mentioned against that description in the second column of the table. In case more than one of the descriptions below applies, the effective factor will be the product of the factors involved, except for the fee for targeted procurement.

These factors do not apply when fees are a lump sum or on a time basis.

Description of the Works	Factor by which basic fee is multiplied
Multi-tenant installations: <i>The Multi-tenant factor only becomes applicable if substantial fragmentation of services, which would otherwise not be divided, occurs as a result of the multi-tenant application. Normal multi-zoning, even if applied in multi-tenant accommodation, does not qualify for the application of the Multi-tenant factor.</i>	1,25
<b>Alterations to existing works</b> (Only applicable to the fees on the portion or section of works affected)	1,25
<b>Duplication of works</b> (Only applicable to the design portion of the fees on duplicated works)	0,25
For <b>projects</b> where the <b>cost of the works</b> exceeds R 572,000 and where bills of quantities are not required from the <b>consulting engineer</b> and all financial, tender and contractual matters are dealt with by the Quantity Surveyor or other parties.	0,75
<b>Targeted procurement</b> (Additional fee based on the basic fees before the application of any of the other factors. Only applicable where specifically appointed for service)	0,07

#### 4.2.8 Services provided partially or in Stages

- (1) The following table shall be used for proportioning the basic fee for **normal services** over the various **stages** of the **services**.

Stage of Services	Percentage points for each stage
<b>Civil: Engineering Projects:</b> <ul style="list-style-type: none"> <li>• Inception</li> <li>• Preliminary Design: Concept and Viability</li> <li>• Detail Design</li> <li>• Documentation and Procurement</li> <li>• Contract Administration and Inspection</li> <li>• Close-Out</li> </ul>	5 20 30 15 25 5
<b>Structural: Engineering Projects:</b> <ul style="list-style-type: none"> <li>• Inception</li> <li>• Preliminary Design: Concept and Viability</li> <li>• Detail Design</li> <li>• Documentation and Procurement</li> <li>• Contract Administration and Inspection</li> <li>• Close-Out</li> </ul>	5 20 30 15 25 5
<b>Civil: Multi-disciplinary Projects:</b> <ul style="list-style-type: none"> <li>• Inception</li> <li>• Preliminary Design: Concept and Viability</li> <li>• Detail Design</li> <li>• Documentation and Procurement</li> <li>• Contract Administration and Inspection</li> <li>• Close-Out</li> </ul>	5 20 30 15 25 5
<b>Structural: Multi-disciplinary Projects:</b> <ul style="list-style-type: none"> <li>• Inception</li> <li>• Preliminary Design: Concept and Viability</li> <li>• Detail Design</li> <li>• Documentation and Procurement</li> <li>• Contract Administration and Inspection</li> <li>• Close-Out</li> </ul>	5 20 30 15 25 5
<b>Mechanical, electrical and electronic projects:</b> <ul style="list-style-type: none"> <li>• Inception</li> <li>• Preliminary Design: Concept and Viability</li> <li>• Detail Design</li> <li>• Documentation and Procurement</li> <li>• Contract Administration and Inspection</li> <li>• Close-Out</li> </ul>	5 20 30 15 25 5

- (2) Where not all the **stages** of the **normal services** are provided by the **consulting engineer**, the fee is, subject to clause 4.1(7), calculated as a percentage of the total fee calculated in terms of this clause, which percentage is the sum of the percentage points appropriate to each **stage** as set out in the above table against those **stages** of the **services** provided by the **consulting engineer**.

## 4.2.9 Cancellation or Abandonment

Should instructions having been given by the **client** to the **consulting engineer** to proceed with any of the **stages of services** set out in clause 4.2.8(1) and the whole or part of the **works** is cancelled or abandoned or postponed for a period of more than six months, the **consulting engineer** shall be remunerated for **services** performed, plus a surcharge equal to such losses (excluding future profits) and expenses as may have been caused by such termination of the **agreement** as can be substantiated by the **consulting engineer**.

## 4.3 Fees for Additional Services

- (1) Subject to clauses 4.2.8(2), 4.3(2), 4.3(3), 4.3(4), 4.3(5), 4.3(6) and 4.3(7), the fees for additional **services**, contemplated in clause 2.2, are agreed to between the **client** and the **consulting engineer** as set out in clause 4.1.
- (2) For additional **services** as a result of the resumption of such **services** or the alteration or modification of designs on the instructions of the **client**, the **consulting engineer** is entitled to time based fees and actual costs incurred.
- (3) For the provision of a **construction monitoring service**, as contemplated in clause 3.3.2, the **consulting engineer** is entitled to recover from the **client** the fees as agreed between the **consulting engineer** and the **client**:
  - (a) for part time **construction monitoring** staff costs, the amount payable to such staff shall be at the hourly rates contemplated in clause 4.4(3);
  - (b) for full time **construction monitoring** service the fee shall be based on the **total annual cost of employment** plus a surcharge of twelve percentage points (12%);
  - (c) a maximum of 50 hours may be applied for part time **construction monitoring** per month. Time spent on site in excess hereof will be without further remuneration; and
  - (d) distances for travelling applied for may not be exceeded without prior written approval of the departmental project manager. Remuneration of travelling will be calculated according to actual distances per month at the applicable rate of the time of travel.
- (4) For all other costs, as set out in clause 4.5, the actual expenses incurred.
- (5) For duties under the Occupational Health and Safety Act, 1993 (Act No.85 of 1993), as contemplated in clause 3.3.3, the **consulting engineer** shall, if so appointed by the **client**, be remunerated on a time and cost basis as agreed with the **client**.
- (6) For assuming the leadership of a joint venture, a consortium or team of consulting engineers, as contemplated in clause 3.3.5, the fee for the lead **consulting engineer** shall be ten percentage points (10%), which is not an additional fee but is that portion of the fee for **services** rendered by the team, which shall be allocated to the lead **consulting engineer**. The apportionment of the fee to **services** is as stated in clause 4.2.8(1).
- (7) For **services** as **principal agent** of the **client**, as contemplated in clause 3.3.6, the **consulting engineer** is entitled to an additional fee calculated at one percentage point (1%) of the total **cost of the works** comprising the **project**. The **consulting engineer** is not entitled to any fees for **principal agent** if he is not explicitly appointed as such.

## 4.4 Time Based Fees

- (1)
  - (a) Time based fees are all-inclusive fees, including allowances for overhead charges incurred by the **consulting engineer** as part of normal business operations, including the cost of management, as well as payments to administrative, clerical and secretarial staff used to support professional and technical staff in general and not on a specific project only.
  - (b) Time based fees are calculated by multiplying the hourly rate contemplated in clause 4.4(3), which is applicable to the **consulting engineer** for professional and any other technical staff employed by the **consulting engineer**, with the actual time spent by such staff in rendering the **services** required by the **client**.
  - (c) Professional and technical staff include all staff performing work directly related to the execution of the **services** the **consulting engineer** is engaged for by the **client** and excludes all administrative, clerical and secretarial staff used to support professional and technical staff in general and not on a specific project only, but includes the typing of letters, minutes, reports and documents for **projects**.

- (2) To determine the time based fee rates the professional and technical staff concerned is divided into:-
- (a) **Category A**, in respect of a private consulting practice in engineering, shall mean a top practitioner whose expertise and relevant experience is nationally or internationally recognized and who provides advice at a level of specialization where such advice is recognized as that of an expert.
  - (b) **Category B**, in respect of a private consulting practice in engineering, shall mean a partner, a sole proprietor, a director, or a member who, jointly or severally with other partners, co-directors or co-members, bears the risks of the business or takes full responsibility for the projects and related liabilities of such practice and where his/her level of expertise and relevant experience is commensurate with the position performs work of a conceptual nature in engineering design and development, provides strategic guidance in planning and executing a project and/or carries responsibility for quality management pertaining to a project.
  - (c) **Category C**, in respect of a private consulting practice in engineering, shall mean all salaried professional staff with adequate expertise and relevant experience performing work of an engineering nature and who carry the direct technical responsibility for one or more specific activities related to a project. A person referred to in Category B may also fall in this category if such person performs work of an engineering nature at this level.
  - (d) **Category D**, in respect of a private consulting practice in engineering, shall mean all other salaried technical staff with adequate expertise and relevant experience performing work of an engineering nature with direction and control provided by any person contemplated in categories A, B or C.
- (3) The scale of fees on a time basis, on which Value Added Tax is excluded, shall be at the following rates per hour, rounded off to the nearest rand:
- (a) for a person in *category A* and *B*: 18.75 cents for each R100 of the total annual remuneration package (lowest notch) attached to a Director's grading (level 13) in the Public Service;
  - (b) for a person in *category C*: 17,5 cents for each R100 of the total annual remuneration package (lowest notch) attached to a Deputy Director's grading (level 12) in the Public Service;
  - (c) for a person in *category D*: 16,5 cents for each R100 of his/her **total annual cost of employment**; provided that this hourly rate shall not exceed 16,5 cents for each R100 of the total annual remuneration package (lowest notch) attached to an Assistant Director's grading (level 11) in the Public Service.

Hourly rates calculated in terms of (a), (b) and (c) above shall be deemed to include overheads and charges in respect of time expended by clerical personnel, which shall, therefore, not be chargeable separately.

Unless otherwise specifically agreed in writing, remuneration for the time expended by *Category B persons* in terms of (a) above on a project shall be limited to 5 per cent of the total time expended on the **project**. Any time expended by principals in excess of the 5 per cent limit shall be remunerated at the rates determined in (b) or (c) above.

Notwithstanding the above, where work is of such a nature that personnel as described in paragraph (c) above are capable of performing such work, it shall be remunerated at that level and not at the rates described in paragraphs (a) and (b) above, irrespective of who in fact executed the work.

The salaries referred to in (a) to (c) above can change from time to time, which will, therefore, change the rates applicable. These rates will, however, only be adjusted on the first day of each calendar year irrespective of any changes in salary ranges during the relevant year. The rate as set out in Table 8 of the "Rates for Reimbursable Expenses", as amended from time to time may be used as bases for relevant claims.

- (4) For the purposes of clause 4.4(3)(c), the **total annual cost of employment** (gross annual remuneration) of a person contemplated in clause 4.4(2) means the total amount borne by an employer in respect of the employment of such a person per year, calculated at the amounts applicable to such a person at the time of appointment of the person.

#### **4.5 Expenses and Costs**

All expenses and costs shall be claimed for in accordance with the provisions of the **agreement** subject to the submission of substantiating documentation.