**GUIDE LINE OF DETAIL ASSESSMENT FOR CONSTRUCTION MATERIAL DEPOSIT.**

1. Carrying out topographical survey on 1:1000 to 1:5000 scales by professional Surveyor.
2. During survey work, Field geologist should be continuously attached to show geological point on the ground.
3. The geologist will note down the attitude of the rocks (Litho structural) and description of each out crop are being simultaneously picked up by Surveyor.
4. In areas, where there are no exposures, the concerned geologist will have to determine the type of the soil cover, such as its thickness, material type, slope angle, direction and type of vegetation.
5. In order to establish the depth to the bed rock pitting should be carried out.
6. Accordingly the detail topographical map should indicate the exact position of insitu rocks, soil cover and location of any drainage system and other features.
7. A series of cross sections should be drawn from the map in the direction normal to the regional strike of rock formation.
8. The thickness of the over burden material will be calculated from cross section.
9. Joint sets with spacing should be properly noted down.
10. Collection of representative rock samples for determination of unconfined compressive strength (UCS), aggregate impact value (AIV), ten percent fine, slake durability test, abrasion test, porosity, water absorption, unit weight, Brazilian test (As per the specification required for construction industry and hydropower project).
11. Three different maps should be attached by professional geologist.
12. Locality index map.
13. Detail geological map.
14. Geological cross section (depending upon the size of the areas).

 12. Time and duration for carrying out topographical and geological mapping of

 Construction material deposits should judiciously be decided based upon the

 total acreage of the area to be covered.

13. The submission of geology report of any construction deposit should be

 completed within 1 or 2 months.

 **GUIDE LINE FOR GEOLOGICAL MAPPING (TOPO SHEET**

**WISE /EXPEDITION) ON 1:50,000 SCALES.**

1. Desk top study (Aerial photograph, Topo-map and previous report) of the area may be carried out by which can work out the plan of the areas. The concerned geologist should read critically all reports that pertain to the area, as well as books or papers that present basic ideas and methods pertinent to the project.
2. Determination of location of the area in the map by applying the following methods.
3. Hand held(single frequency) GPS/Altimeter
4. Intersecting point taken back bearing from two or three known point (Geomorphic features).
5. Junction point of two Perennial streams/rivers.
6. Based on the accessibility of the area, traverse line should be fixed at least at the spacing of 500m apart in the direction normal to the regional strike of rock formation.
7. Use enlarge map(1:25000 scales) as an working sheet in the field and collect maximum authentic structural data of the different rock types and plot it in the map along with location. Maintain one fair map (1:50,000 scales) and transfer the collected geological data in the evening.
8. From every litho-unit collect at least one or two samples. Rock specimen must be marked with a number matching as per the notes.
9. Collect oriented samples for thin section studies.
10. During the course of regional mapping, if encountered with traces of some important mineralization pin point it in the map and give more stress in the area by collecting geo-data, samples and if time permits carry out tape and compass survey on large scales.. The field geologist should maintain the dairy and record the following as illustrated below:-
11. Name of unit and/or bed rock name.
12. Specific locality or area to which description applies.
13. Thickness and overall structure or shape of unit in this area.
14. Gross characteristics of area underlain by unit (topography expression, color and type of soil, vegetation, nature of outcrops)
15. Characteristic structure of unit.
16. Range of thicknesses average thickness of beds or layered structures.
17. Shapes of beds or other structures (tabular, lenticular, lineate, etc.)
18. Primary features within the beds or other structures (grading , laminations, cross- bedding, channeling, distorted flow banding, inclusions, etc)
19. Characteristic secondary structures, especially cleavage and prominent weathering effects.

 9. Fossils (especially if a litho logic characteristic of unit).

 a. Distribution of fossils.

 b. Special characteristics of fossiliferous rocks.

 c. Position and condition of fossils (growth position, fragmental, rounded,

 Pitted or fluted by solution, external or internal molds, etc).

 10. Description of rocks, with most variety described first.

1. Color, fresh and weathered (of wet or dry rock?).
2. Induration (of weathered or completely fresh rock?).
3. Grain sizes (range of sizes and principal or medium size).
4. Degree of sorting or equigranularity.
5. Shapes of grains.
6. Orientations of fabric of grains, especially in relation to rock structures.
7. Nature and amount of cement, matrix, or groundmass, if any.
8. Nature and amount of pores (porosity), and any indications of permeability (is this of truly fresh rock?).
9. Constitution of grains (mineral, lithic, fossils, glass) and their approximate percent volume.
10. Naming of the rocks.

 11. Nature of Contacts.

1. Sharp or gradational, with descriptions and dimensions of gradations.
2. All evidence regarding possible unconformable relations.
3. Criterion or criteria used in tracing contact in field.

 12. Set the base camp at the point from where the team can march to the

 advance camp and for other convenience too.

 **GUIDE LINE OF MINERAL INVESTIGATION/EXPLORATION**

**A.STAGE-1**

1. Carry out thorough literature studies as a desk top study, before attempting to go to the field.
2. Verify the type of deposit. Make geological traverses; identify the type of deposit in the field megascopically. Prepare field map by plotting the available mineral occurrence in the topo sheet prepared at1:25000 scale.
3. Collect grab samples and analyze for the required radicals. The number of samples will depend on the size of the mineralized band.
4. Determine the thickness and strike extent of the band and see whether a detailed surface geological study is warranted or not.
5. Submit a brief interim report, with the following contents.
6. Executive summary.
7. Introduction
	1. General
	2. Acknowledgement.
	3. Scope of work.
	4. Location.
	5. Communication/Accessibility.
	6. Climate.
	7. Flora and Fauna.
	8. Habitation
	9. Geomorphology.
	10. Seismicity.
	11. Previous work
8. Geology
	1. Regional Geology
	2. Regional structure
	3. Geology of the deposit areas
	4. Tentative reserve of the deposit.
	5. Conclusion and Recommendation, with justification to proceed with the next phase of investigation work or to abandon the areas.

 **B. Stage –II**

 Based on the positive findings of the stage I work, the Stage –II work to

 be carried out. The Guide line is detailed below:-

1. Determination of the extent of the mineralized bands.
2. Dig trenches for verifying the strike extension of the mineralized bands
3. Cut groove lines across the entire mineralized bands and collect meter age groove samples in order to determine the grade persistency.
4. The groove sampling should be carried out at a predetermined distance of about 100m along the strike of the non-metallic bands, in order to determine the grade persistency along the strike.
5. Pitting may be required to confirm the continuity of the mineralized bands.
6. Prepare topographic map on 1:1000/2000 scales to plot the details of geology. A series of cross section will be required at this stage.
7. Topographical surveying.
8. Clearing of forest and bushes along the line of sight while surveying.
9. Benchmark shall be the triangulation point and Co-relate with at least two other triangulation points if possible.
10. Polygon tachometry for close traverse to be carried out with all three co-ordinates with reference to the Bench marks.
11. The contour interval should be at 5m contour intervals in 1:1000/2000 scales.
12. The topographical map should have the detail surface features such as drainage, escarpment, slides, footpath, dwellings, vegetation etc. apart from the detail geology in it.
13. The trench/groove log and the analysis result should be submitted as annexure.
14. Detailed surface geological report should be submitted with the following contents.
	1. General
	2. Scope of work.
	3. Location.
	4. Communication/accessibility.
	5. Climate.
	6. Flora and Fauna.
	7. Habitation
	8. Geomorphology.
	9. Regional Geology.
	10. Detail geology of the deposit areas.
	11. Description of the deposit.
	12. Analytical report of surface groove samples.
	13. Quality and quantity of the deposit.

 **C.** Conclusion and Recommendation, with justification to proceed or

 Abandon with detail phase of investigation involving drilling.

 **D. Stage-III**

 Based on the recommendation of Stage –II work, the stage-III

 Work to be conducted, the guide line is detailed below:-

1. To carry out Peg geology/ profiling on the ground maintaining the spacing.
2. Depending upon the nature of the deposit, proposed series of borehole point along and across the regional strike of the bed.
3. To provide the borehole plan to the drilling section.
4. Core logging and Core sampling should be carried out.
5. The summarized litho log of drill cores and the analysis result should be submitted as annexure.
6. Preparation of sub-surface geological map with the help of Borehole data or stratum contour.
7. Preparation of Transverse section along section /Profile line and graphic litho log of Boreholes.
8. Submission of Detail Geological report.