**BEFORE THE NATIONAL GREEN TRIBUNAL**

**EASTERN ZONE, CHENNAI**

**Original Application No. 71of 2023 (EZ)**

**IN THE MATTER OF:**

**P.S. Saboo** **...Applicant**

**Verses**

**Union Territory of Andaman & Nicobar Island** **.... Respondent**

**INDEX**

| S.No. | Particulars | Page No. |
|---|---|---|
| 1. | AFFIDAVIT ON BEHALF OF THE MINISTRY OF ENVIRONMENT,FOREST AND CLIMATE CHANGE (RESPONDENT No. 2) | **01-07** |
| 2. | Report of the Joint Committee constituted in O.A. 357 of 2023NGT(SZ), in the matter of P.S. Saboo vs Union Territory of Andaman & Nicobar Islands, in Hon'ble, NGT, Principal Bench, New Delhi dated 29.05.2023. **Annexed as R1-1** | **08-128** |
| 3. | Gazetted Notification of Moefcc dated 20th April, 2022 **Annexed as R1-2** | **129-134** |

Place: Chennai

Dated: 12th November

P. DHANASEKARAN * NOTARY PUBLIC CHENNAI-06 G.O.MS.596/22 * GOVT. OF TAMIL NADU *

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL**
**EASTERN ZONE, KOLKATA**

**Original Application No. 71 of 2023 (EZ)**

**IN THE MATTER OF:**

P.S.Saboo

...Applicant

Versus

Union Territory of Andaman
& Nicobar Islands &
Ors.

...Respondent(s)

**AFFIDAVIT ON BEHALF OF THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE (RESPONDENT No. 2)**

**MOST RESPECFULLY SHOWETH:**

I, E. Arockia Lenin S/o Eamanuvel .J aged about 37 Years currently working as 'Scientist-D' in the Ministry of Environment, Forest and Climate Change (MoEF&CC), Regional Office, Chennai, do hereby solemnly affirm and state as under:-

P. DHANASEKARAN NOTARY PUBLIC CHENNAI-06 G.O.MS.596/22 GOVT. OF TAMIL NADU

Dr. E. Arockia Lenin
Scientist 'D'
Government of India
Regional Office, MoEF&CC
Shastri Bhawan, Haddows Road,
Nungambakkam, Chennai - 600 006

1. That I, in my official capacity of Scientist-D' in the Ministry Environment, Forest and Climate Change, Regional Office, Chennai i.e. Respondent No. 2 in the above mentioned matter, am conversant with the facts and circumstances of the case on the basis of official records, and as such authorized and competent to swear this affidavit.

2. That, the applicant by way of a letter petition dated 12.02.2023 in the present application has alleged that "*ecology and environmental equilibrium is being disturbed at South Andaman due to indiscriminate quarry operations, rebuilding and reconstruction work as well as new building comping up due to increase in population and demand of stone and stone products. Villages like Brookshabad, Prathopur and Brichgunj located on outskirts of capital Port Blair have become centres of island quarrying activities. Blasting, stone crushing, lorries ferrying stone products, skyline covered with dust, drying water reservoirs, withering trees and plants, depleting water table, chocked streams and nallahs are not only causing environmental damage but also causing respiratory diseases due to air pollution. Further, Andaman & Nicobar Islands fall in high seismic hazard zone.* "

Dr. E. Arockia Lenin
Scientist 'D'
Government of India
Regional Office, MoEF&CC
Shastri Bhawan, Haddows Road,
Nungambakkam, Chennai - 600 006

P. DHANASEKARAN
NOTARY PUBLIC
CHENNAI-06
G.O.MS.596/22
GOVT. OF TAMIL NADU

3. That the Hon'ble National Green Tribunal, Principal Bench, New Delhi vide its order dated 29.05.2023 has constituted a joint Committee comprising of State Pollution Control Board , Regional Officer, MoEF&CC, Kolkata and Andaman & Nicobar Coastal Zone Management Authority who shall visit the site, collect relevant information and submit a factual as well as action taken.

4. That in compliance of the aforesaid directions, the Ministry of Environment, Forests and Climate Change, Regional Office, Chennai had nominated Dr. E. Arockia Lenin, Scientist 'D' as their representative.

5. That the committee had carried out site visit of the quarry area located in the Brookshabad area, South Andaman district and stone crushing units located at Prothrapur, South Andaman district.

6. That the key observations and recommendations of the joint committee constituted by Hon'ble NGT are as follows :-

   i. *"The quarry sites are located beyond 500m from HTL as per the CRZ Notification 2011."*

   ii. *"During the site visit, no mining operations were observed in the quarry area. It is submitted that quarry operations are closed since 30.11.2022 (except 01 site which was closed on 06.02.2023). Tendering process for reallocation of the quarry is under process."*

R. DHANASEKARAN NOTARY PUBLIC CHENNAI-06 G.O.MS.596/22 GOVT. OF TAMIL NADU

**Dr. E. Arockia Lenin**
**Scientist 'D'**
**Government of India**
**Regional Office, MoEF&CC**
**Shastri Bhawan, Haddows Road,**
**Nungambakkam, Chennai - 600 006**

iii. *"The quarry has obtained environmental clearance from DEIAA vide Letter No. 156/ACS/Quarry/TS-II/2019/1258 dated 30-12-2021."*

iv. *"Although no violations were observed during the site visit, quarterly review of the quarry and stone crusher operators should be done. "*

v. *"Maintenance and upkeep of pollution containment measures: Although there were no violations observed, Sprinklers, dust collectors, wind breaking sheets, green belt etc. being significant in keeping air pollution around the quarry or stone crushing sites in check. Hence, their maintenance is equally important, which should form part of the quarterly report."*

vi. *"At present, the methodology for calculation of extracted material is based on volume of the truck or carrier. A robust scientific mechanism should be put in place to arrive at an accurate picture in terms of measurement of the material."*

vii. *"Although, quarry was not operational during the site visit, committee strongly emphasizes that Trucks carrying the material beyond the permissible limit, if any should be strictly fined and repeated violation should result into seizure of license. Proper covering of material loaded on trucks is essential to prevent dust/ particulate matter from spreading across the transit route."*

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G.O.MS.596/22
GOVT. OF TAMIL NADU

Dr. E. Arockia Lenin
Scientist 'D'
Government of India
Regional Office, MoEF&CC
Shastri Bhawan, Haddows Road,
Nungambakkam, Chennai - 600 006

A copy of the joint committee report is annexed herewith and marked as **Annexure-R2/1.**

7. It is submitted that the Ministry vide notification S.O. 1886 (E) dated 20.04.2022 has delegated the power to the State Level Environment Impact Assessment Authority (SEIAA) to grant Environmental Clearances to all minor mineral mining projects, irrespective of mine lease area. A copy of the Notification S.O. 1886 (E) dated 20.04.2022 is marked and annexed herein as **ANNEXURE R2/2.**

8. Further, quarry mining is regulated in terms of the Mines and Minerals (Development and Regulation Act), 1957 [MMDR Act] and the Mineral Concession Rule framed by the concerned State Governments. The State Government is empowered to formulate the rules for preventing illegal mining, transportation and storage of minerals (including sand) by exercising the powers conferred by section 23(C) of the Mines and Minerals (Development and Regulation) Act, 1957.

9. It is humbly submitted that, the State Pollution Control Board is the Nodal Authority in the State for dealing with cases related to pollution or environment management coming under the purview of the Water (Prevention and

DHANASEKARAN NOTARY PUBLIC CHENNAI-06 G.O.MS.596/22 GOVT. OF TAMIL NADU

Dr. E. Arockia Lenin
Scientist 'D'
Government of India
Regional Office, MoEF&CC
Shastri Bhawan, Haddows Road,
Nungambakkam, Chennai - 600 006

Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act 1986.

10. That in view of the aforementioned facts and circumstances, this Hon'ble Tribunal may kindly be pleased to pass appropriate order(s).

P. DHANASEKARAN
NOTARY PUBLIC
CHENNAI-06
G.O.MS.596/22
GOVT. OF TAMIL NADU

**DEPONENT**

Dr. E. Arockia Lenin
Scientist 'D'
Government of India
Regional Office, MoEF&CC
Shastri Bhawan, Haddows Road,
Nungambakkam, Chennai - 600 006

Before me
12/11/24.

P. DHANASEKARAN
ADVOCATE / NOTARY
No. 23, GEE GEE MINAR
COLLEGE ROAD, NUNGAMBAKKAM
CHENNAI - 600 006.

## VERIFICATION

Verified at Chennai on this 12th day of November , 2024 that the contents of this affidavit based on official record(s) maintained and information available in the office are true and correct, no part of it is false and nothing has been concealed there from.

**DEPONENT**

Dr. E. Arockia Lenin
Scientist 'D'
Government of India
Regional Office, MoEF&CC
Shastri Bhawan, Haddows Road,
Nungambakkam, Chennai - 600 006

Before me

12/11/24.

P. DHANASEKARAN
ADVOCATE / NOTARY
No. 23, GEE GEE MINAR,
COLLEGE ROAD, NUNGAMBAKKAM
CHENNAI - 600 006

P. DHANASEKARAN
NOTARY
PUBLIC
CHENNAI-06
G.O.MS.596/22
GOVT. OF TAMIL NADU

**Annexure-A**

**BEFORE THE NATIONAL GREEN TRIBUNAL**

**O.A NO. 357 OF 2023, PRINCIPAL BENCH, NEW DELHI**

**&O.A NO 71/2023/EZ EASTERN ZONE, KOLKATA**

**IN THE MATTER OF**

**P.S. Saboo**

.....Applicant(s)

Versus

**Union Territory of Andaman & Nicobar Islands**

.....Respondent(s)

**REPORT OF THE JOINT COMMITTEE CONSTITUTED IN O.A. 357 OF 2023 NGT(SZ)&O.A 71/2023/EZ IN THE MATTER OF P.S. SABOO VS UNION TERRITORY OF ANDAMAN & NICOBAR ISLANDS, IN COMPLIANCE OF HONBLE, NGT, PRINCIPAL BENCH ORDER DATED 29-05-2023 & EASTERN ZONE ORDER DATED 05-09-2023.**

**Place: Port Blair**

**Date: 17.09.2023**

**Report of the Joint Committee constituted in O.A. 357 of 2023NGT(SZ), in the matter of P.S. Saboo vs Union Territory of Andaman & Nicobar Islands, in Hon'ble, NGT, Principal Bench, New Delhi dated 29.05.2023.**

**1. Background:**

The Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi vide order dated 29.05.2023 constituted a Joint Committee comprising State PCB, Regional Officer, MoEF&CC, Kolkata and Andaman & Nicobar Coastal Zone Management Authority who shall visit the site, collect relevant information and submit a factual as well as action taken report, if any.

Further, vide Hon'ble NGT Eastern Zone order dated 05-09-2023 in O.A No. 71/2023 granted further two-weeks time for filing the Committee Report on affidavit.

**2. Constitution of the Joint Committee:**

In compliance with the directions of the Hon'ble NGT, the Joint Committee has been constituted comprising the following members based on the Officers deputed/ nominated from the Authorities concerned:

i. Shri. Ravi Horo, IFS, Conservator of Forest (Eco-Tourism, Biosphere Reserve, Coastal Zone), Andaman & Nicobar Coastal Zone Management Authority
ii. Shri. Abhishek Bhukal, DANICS, Member Secretary, A&N Pollution Control Committee
iii. Dr. E. Arockia Lenin, Scientist D, Regional Office, MoEF&CC, Chennai.

**3. Terms of Reference (TOR) to the Committee**

The Terms of reference (ToR) to the Joint Committee referred therein the Order dated 29.05.2023 of Hon'ble NGT in the above matter inter-alia includes the following:

*"to obtain a factual report for which purpose, we constitute a joint Committee comprising State PCB, Regional Officer, MoEF&CC, Kolkata and Andaman & Nicobar Coastal Zone Management Authority who shall visit the site, collect relevant information and submit a factual as well as action taken, if any, report within two months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/ OCR Support PDF."*

**Site visit of the Joint Committee**

In compliance to the Order dated 29.05.2023 of Hon'ble NGT in the above matter, a meeting of the Joint Committee was held on 31.08.2023 at the office of Member Secretary, A&N Pollution Control Committee. During the meeting, Member Secretary, A&N Pollution Control Committee deliberated upon the background of this case and discussed further course of action in compliance to the direction of Hon'ble NGT. Followed by the meeting, Joint Committee has carried out site visit of the quarry area located in the Brookshabad area, South Andaman district and stone crushing units located at Prothrapur, South Andaman district.

**Observations of Joint committee**

a) **Quarry:**

The Joint committee visited the quarry area located in the Brookshabad area of South Andaman. This quarry was started in the year 2020. The last Approval was issued by the office of Deputy Commissioner, South Andaman for quarrying activities at Brookshabad village in File No. 140/ACS/Quarry/SA/TS-1/2019 on 04.10.2021. The quarry sites are located beyond 500m from HTL as per the CRZ Notification 2011.

As per the quarry plan notified in A & N Gazette notification No. 280 dated 28-10-2019, extraction of up to 12000 cbm minor mineral was allowed from each site per annum. Further, the Study on Potentiality of Stone Availability in A&N Islands conducted by Department of Mining Engineering-IIT Kharagpur in the year 2021, the total stone resources available at Brookshabad (A and B Blocks) Port Blair is 3.12 million m3. Only 0.136460 million m3 of quarry materials have been extracted at Brookshabad for the year 2021-22, as per the report furnished by Assistant Commissioner (Settlement), which shows that the extracted quantum of quarry products is well within the limits set as per the quarry plan. The year wise production details obtained from office of Assistant Commissioner (Settlement) vide letter No. 133/ACS/QUARRY/TS-I/2019/1133 dated 08-08-2023 is given in **Annexure -I**.

During the site visit, no mining operations were observed in the quarry area. It is submitted that quarry operations are closed since 30.11.2022 (except 01 site which was closed on 06.02.2023). Tendering process for reallocation of the quarry is under process.

Length and width of quarries are not in uniform size, however, an area of 0.2050 ha (hectare) is earmarked for quarrying without use of explosive and an area of 0.2500 ha (hectare) is earmarked for quarrying with the use of explosive respectively in the last allotment.

**Requirement of Environmental Clearance:**

As per the MoEF&CC notification S.O. 3977(E)New Delhi, dated 14th August, 2018, the Schematic Presentation of Requirements on Environmental Clearance of Minor Minerals including cluster situation in Appendix-XI is reproduced as below,

| Area of Lease (Hectare) | Category of Project | Requirement of EIA / EMP/ DSR | Requirement of Public Hearing | Requirement of EC | Who can prepare EIA/ EMP | Who will apply for EC | Authority to appraise/ grant EC | Authority to monitor EC compliance |
|---|---|---|---|---|---|---|---|---|
| **EC Proposal of Sand Mining and other Minor Mineral Mining on the basis of individual mine lease** | | | | | | | | |
| 0 – 5ha | 'B2' | Form – 1M, PFR, DSR and Approved Mine Plan | No | Yes | Project Proponent | Project Proponent | DEAC/ DEIAA * Presently SEAC/SEIAA as per MoEF&CC OM dated 28-04-2023 | DEIAA SEIAA SPCB CPCB MoEF&CC Agency nominated by MoEF&CC |
| > 5 ha and < 25 ha | 'B2' | Form –I, PFR, DSR and Approved Mine Plan and EMP | No | Yes | Project Proponent | Project Proponent | SEAC / SEIAA | |
| 25ha and ≤ 100ha | 'B1' | Form –I, PFR, DSR and Approved Mine Plan and EIA and EMP | Yes | Yes | Project Proponent | Project Proponent | SEAC / SEIAA | |
| > 100 ha | 'A' | Form –I, PFR, DSR and Approved Mine Plan and EIA and EMP | Yes | Yes | Project Proponent | Project Proponent | EAC/ MoEFC | |

This quarry has obtained environmental clearance from DEIAA vide Letter No. 156/ACS/Quarry/TS-II/2019/1258 dated 30-12-2021. Copy enclosed as **Annexure-II**

**Response of the Joint Committee to the Issues raised in the Original Application**

ANPCC vide letter No. 7-68/PCC/NGT(O.A.No.357/2023)/2023/558 and 559 dated 11-09-2023 sought information from Deputy Commissioner (South Andaman) & Deputy Commissioner (North & Middle Andaman district) w.r.t Issues raised in Hon'ble NGT order dated 29-05-2023 and 05-09-2023. Based on the information received from Deputy Commissioners vide letter No.2-29/Earth/2023/1045 dated 18-09-2023 and letter No.4-350/Estt/DC(N&MA)/2023/1391 dated 15-09-2023, point-wise information is mentioned in tabular form below. Copies of letters are enclosed as **Annexure-III and Annexure IV.**

| S.No. | Issues raised in the Application | Response of the Joint Committee based on information received from line departments |
|---|---|---|
| | **Issue raised in Order dated 29-05-2023** | |
| 1. | Indiscriminate quarry operations, rebuilding and reconstruction work as well as new building coming up due to increase in population and demand of stone and stone products. | The quarry operations in the South Andaman District are regulated as per the notified quarry plan (enclosed in **Annexure I)** under A & N Islands Minor Mineral Rules, 2012.<br>After identification of suitable quarry blocks, a feasibility study was carried out by IIT Kharagpur. Based on the study the total availability of minerals assessed, it was decided to allow quarrying operations on the principles of sustainability and inter-generational equity. |
| 2. | Villages like Brookshabad, Prathopur and Brichgunj located on outskirts of capital Port Blair have become centres of island quarrying activities. | The quarry blocks are located in the Brookshabad village only and Prothrapur & Brichgunj villages are located in the vicinity of quarry blocks. Only the village of Brookshabad under Port Blair Tehsil is having its natural resources of stone and feasibility of stone mining. The sites selected for quarry operations were finalized as per the norms prescribed, CRZ notification 2011 and the feasibility study for potentiality on quarry blocks through an official detailed survey and mapping by IIT Kharagpur |
| 3. | Blasting, stone crushing, lorries ferrying stone products, skyline covered with dust, drying water reservoirs, withering trees and plants, depleting water table, chocked streams and nallahs are not only causing environmental damage but also causing respiratory diseases due to air pollution.. | The blasting operations, if any required, are permitted through official procedure and after verification of all requisite guidelines. These mandatory guidelines include frequent water spraying, protection of water bodies etc.<br>The PM 10 is complying with the standards as per the data collected by air quality monitoring stations at Brookshabad. **(Annexure V)** |
| | **Issues Raised in Order dated 05-09-2023** | |
| 4. | Earth cutting of hilly land and earth filing in natural drains and paddy land in and around Port Blair. | It is to report that permit for extraction of earth measuring 75,538 cbm was issued in and around Port Blair since 2021 to various individuals for agriculture improvement/developing of agriculture holding and permits were also issued to various Govt. departments for different projects viz. Construction of road etc.<br><br>It is pertinent to mention that such permits were given as per Rule 47 "Quarrying for domestic or agricultural purpose" of The A&N Islands Minor Minerals Rules, 2012. (enclosed in **Annexure IV)**<br>Earth Cutting permissions are issued after obtaining a duly recommended 18 points report from the concerned Tehsildar (Format is attached as **Annexure IV**). All the earth concerned cases after proper verification are placed before the competent authority/committee through the Deputy Commissioner (SA) (Copy of the Order No. 292 dated 03.02.2021 is enclosed as **Annexure IV)** |
| 5. | Hill cutting under Chouldari Panchayat. | Within the preceding biennium, the Andaman and Nicobar Administration duly issued a total of 25 |
| 6. | Earth cutting by land dealers in the | |

| | | |
|---|---|---|
| | Nayasher region in South Andaman. | permits (comprising a cumulative volume of 75.538 cubic meters) for the extraction of earth.<br>These permits were granted to various entities, including Panchayati Raj Institutions (PRIs), the Andaman Public Works Department (APWD), the National Highways and Infrastructure Development Corporation Limited (NHIDCL) as well as private tenants.<br>The intended purpose for these extractions encompassed developmental initiatives, agricultural enhancements, and the construction of road infrastructure among other endeavors. |
| 7. | Massive hill cutting in Manglutang, Humfrygunj, Wandoor and Guptapara | |
| 8. | Earth cutting and earth filling encroachments of natural drains leading from nearby Vasundhara Dam and almost all the natural nallah/drain paths leading from the dam up to sea have been encroached and levelled with the results that if there is continuous rain, the water overflowing from the dam will lead to massive flooding. | It has been reported by the Tehsildar that during the last two-year period, there have been no instances of earth filling occurring within the natural watercourses or drainage systems (nallah/drain) within the Chouldari, Manglutan, Wandoor, and Nayashahar villages. Moreover, no significant occurrences of earth sliding or flooding have been reported within the same villages during the same period.<br>It is also pertinent to mention that a total penalty of Rs. 45,95,480/- in 14 Nos. of cases so far was imposed upon various individuals in the year 2022-23, u/s 201(6) of A & N LR & LRR 1966 and Section 34 of A & N Islands Minor Minerals Rules, 2012 (enclosed in **Annexure IV**), for unauthorized dumping and extraction of earth. Report of revenue department is enclosed as **Annexure IV.** |
| 9. | Indiscriminate felling of mangrove trees at Mayabunder. | There have been no instances of indiscriminate felling of trees reported in Mayabunder. Electricity department submits that no new high tension lines have been drawn in the recent past. Some of the old RCC damaged poles have been replaced in Tugapur area". |
| 10. | Felling of Mangrove trees by the Electricity department for installation of electric pole | |
| 11. | Steps taken for protection of mangroves. | Regular patrolling are done by the frontline execution staff in creeks with mangroves using engine dinghies and foot patrolling is done in landward side by respective beat officer having jurisdiction to prevent damage to mangroves through anthropogenic causes.<br>Fisherman and general public are sensitized about the importance of mangrove ecosystem and the need of its protection.<br>Further, the mangroves which are degraded post Tsunami of 2004 are restored by taking up annual plantations.<br>In addition to the above, particularly the degraded mangroves near the human habitations, are restored by planting in gaps with fencing of plantations to ensure its restoration. |

**b) Stone Crushing Units:**

The Joint committee visited four crushing units randomly located in the Prothrapur, in South Andaman district. All the stone crushing units are operating in Andaman and Nicobar Islands after obtaining Consent to Operate from ANPCC. The list of crushing units operating in ANI is given in **Annexure -VI.** Compliance status w.r.t Consent to Operate issued by ANPCC are given in **Annexure VII**

**Recommendations of the Committee:**

- Although no violations were observed during the site visit, quarterly review of the quarry and stone crusher operators should be done. In case there is any finding where non compliance of regulations is observed, Environmental Compensation, based on methodology given by CPCB should be imposed. Repeated violations of the norms should result into blacklisting of the unit.
- Strengthening Monitoring mechanisms: Apart from submission of SPM test results in the quarterly reports submitted by the Stone crusher units, an independent air quality monitoring station should be installed in the vicinity of the quarry site for cross verification of results submitted in the quarterly reports.
- A system should be put in place in order to enable centralised monitoring of passage of materials from the quarry blocks. In this regard, e-way permit system could be explored for trucks/ carriers at entry/ exit points of the quarry. Also, trucks/ carriers should have mandatory enabled GPS.
- At present, the methodology for calculation of extracted material is based on volume of the truck or carrier. A robust scientific mechanism should be put in place to arrive at an accurate picture in terms of measurement of the material.
- Maintenance and upkeep of pollution containment measures: Although there were no violations observed, Sprinklers, dust collectors, wind breaking sheets, green belt etc. being significant in keeping air pollution around the quarry or stone crushing sites in check. Hence, their maintenance is equally important, which should form part of the quarterly report.
- Social Responsibility: It should be a mandated social responsibility of the units involved in quarry and stone crushing operations, to properly maintain adequate vegetation around the periphery to prevent the spread of dust/ particulate matter in the surrounding area.

- Measures to be undertaken during transportation: Although, quarry was not operational during the site visit, committee strongly emphasizes that Trucks carrying the material beyond the permissible limit, if any should be strictly fined and repeated violation should result into seizure of license. Proper covering of material loaded on trucks is essential to prevent dust/ particulate matter from spreading across the transit route.
- Safety measures for workers: Since, the quarry was not operational, it cannot be ascertained whether proper protective gears are being provided to the workers or not, however, it shall be the responsibility of the employer to provide its workers with industrial safety gears like helmet, face mask, eye safety gear etc. and provide them with accidental insurance cover. The operators should also maintain a risk assessment register and have an occupational safety policy in place.

Shri Ravi Horo, IFS
Conservator of Forest (Eco-Tourism,
Biosphere reserve, Coastal Zone)
Representative of ANCZMA

Dr. E Arockia Lenin,
Scientist 'D',
MoEF&CC RO-Chennai

Shri. Abhishek Bhukal, DANICS
Member Secretary ANPCC

Annexure-I



D No. 1198
R.Dated 09/08/23

**File No.133/ACS/QUARRY/TS-1/2019/ 1133**

सहायक आयुक्त ,बन्दोबस्तद्ध का कार्यालय

**OFFICE OF THE ASSISTANT COMMISSIONER(SETTLEMENT)**

दक्षिण अंडमान जिला/**SOUTH ANDAMAN DISTRICT**

पोर्ट ब्लेयर/**PORT BLAIR**

* * *

Dated the 8th Aug 2023.

To

**The Member Secretary,**
Pollution Control Committee,
Department of Science & Technology,
Dollygunj, Port Blair, A & N Islands.

Sub: Submission of information/documents NGT matter in Original Application No.357/2023- P.S.Saboo Versus(Applicant) Union Territory of Andaman & Nicobar Islands(Respondent) –reg.

Ref: -Letter No. 7-68/PCC/NGT(O.A.No.357/2023)/2023/338 dt: 12.07.2023

Sir,

I am directed to refer your letter on the subject cited above and to furnish herewith the information/documents available at this Office as desired from your end in a tabulated format for further course of action.

| Sl.No | Information/documents sought | Reply |
|---|---|---|
| 1. | Details of number of stone quarries and area allocated for operation at South Andaman District. | **Quarry sites- Brookshabad, Port Blair**<br>Year 2016-19 = 30 quarries<br>Area =6.96 hectares<br>Year 2020-21 = 22 quarries<br>Area= 4.96 hectares<br>Year 2021-22 = 16 quarries<br>Area=3.685 hectares<br>**Quarry sites-Hut Bay, Little Andaman**<br>Year 2016-19 = 02 quarries<br>Area = 0.605 hectares<br>Year 2020-21 = 02 quarries<br>Area= 0.41 hectares<br>Year 2021-22 = 01 quarries<br>Area=0.2050 hectares |
| 2. | Details of quantity of extraction of stone boulders and any other mineral from the stone quarries of South Andaman District in last 5 years. | Year 2016-19 =766857.0cbm<br>Year 2020-21 =200609.0cbm<br>Year 2021-22 =136460.0cbm<br>---<br>Total Qty.= 1103926.0 cbm |
| 3. | Copy of quarry plan, if any | Copy of Notified quarry plan of 2019 enclosed. |
| 4. | Copy of the study report on stone quarries, if any conducted through any research institutes or any agencies. | Copy of the Study on Potentiality of Stone availability in Andaman and Nicobar Islands by IIT, Kharagpur enclosed. |
| 5. | Compliance status with respect to implementation of the Andaman and Nicobar Islands Minor Mineral Rules-2007. | The Andaman and Nicobar Islands Minor Mineral Rules comes to force in the year-2012. The copy of the ANIMMR-2012 enclosed. |

Yours faithfully,

**Encl: As above.**

**Assistant Commissioner(Settlement)**

Copy also forwarded to PA to DC(SA) for kind information to the Deputy Commissioner, South Andaman please.

8/7/23



**Assistant Commissioner(Settlement)**

(216)

28/C

अण्डमान तथा निकोबार राजपत्र

Andaman And Nicobar Gazette

असाधारण

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उपायुक्त का कार्यालय

**OFFICE OF THE DEPUTY COMMISSIONER**

दक्षिण अण्डमान जिला

**SOUTH ANDAMAN DISTRICT**

## NOTIFICATION

Port Blair, dated the 28th October, 2019.

No. 277/2019/F.No.148/ACS/Quarry/TS-II/2019.— WHEREAS, in pursuance of Rule 15(1) of the Andaman and Nicobar Islands Minor Minerals Rules, 2012, a Committee was constituted vide Notification No.132/2015/F.No.34-738/2012-Rev(PF) dated 03rd August, 2015 for preparing Quarry Plan for the area(s) identified for quarrying under the provisions of the Rules.

AND, WHEREAS, the Committee after due examination, finalized a quarry plan at Brookshabad, Port Blair.

NOW, THEREFORE, in exercise of the power conferred under Rule 5 read with Rule 16 of the Andaman and Nicobar Islands Minor Minerals Rules, 2012, the Officer authorized by Lt. Governor to be competent to approve quarry plan i.e. the Deputy Commissioner (South Andaman), hereby approves the quarry plan containing the location, site plan, progressive and final closure plan, reclamation and restoration plan including specific guidelines for source-wise pollution control measures to be followed for quarry operations in South Andaman District as under:

## QUARRY PLAN

### A. BACKGROUND

The Andaman & Nicobar Islands Minor Mineral Rules, 2012 was notified on 20th September, 2012. In pursuance of Rule 6, contiguous areas for quarrying, having due regard to the restrictions mentioned in Rule 4, general topography and environmental aspects, was identified at Brookshabad village in Port Blair Tehsil.

An area of 2.50 hectares was identified at Brookshabad village for conduct of quarrying by use of explosives and another area of 2.46 hectares was also identified at Brookshabad village for conduct of quarrying without use of explosives.

The Hon'ble Lt. Governor, A & N Islands, in pursuance of Rule 15 and Section 5(b) of the Andaman and Nicobar Islands Minor Minerals Rules, 2012 read with Administration's Order No. 312, dated 30/01/2015 and in supersession of Administration's Notification No. 4-2/19-R/Quarry/PF-I dated 09/10/2012 notified the following Committee vide notification dated 03/08/2015 for South Andaman District for preparing quarry plan for the area(s) identified for quarrying under Rule 6 of the said rules :-

(215) 27/C



| | | |
|---|---|---|
| 1 | The Assistant Commissioner (HQ) | Chairman |
| 2 | Representatives of Health Department as nominated by Director, Health Services | Member |
| 3 | Representatives of APWD as nominated by Chief Engineer, APWD, Port Blair | Member |
| 4 | Representatives of Forest Department as nominated by PCCF | Member |
| 5 | The Assistant Commissioner (Settlement) | Convener |

The above Committee has been assigned the task of preparing quarry plan(s) for South Andaman District, which shall include for each identified area outer boundary, potential for extraction or crushing, progressive and final closure plan of quarry, plans for reclamation and restoration of land, measures for pollution control, responsibility of the quarry lease holder and any other matter that the Committee may decide. The plan shall also include the cost of preparation of such plan or plans to be apportioned amongst the lease holders of quarries established on such area in such a manner as the Committee may decide.

The Assistant Conservator of Forests was nominated as member of the Committee by PCCF, Senior Investigator was nominated by Director of Health Services as member of the Committee and Executive Engineer, SAD, APWD was nominated as member of the Committee by Chief Engineer, APWD.

The Committee held its meeting on 04/10/2019 at 04.00 PM, the Chairman informed about the urgency in preparing the quarry plan for the areas identified at Brookshabad village for quarrying and presented a draft quarry plan of the area before the Committee for its perusal.

The Committee after perusal of the draft quarry plan and after deliberations and after making such modifications as deemed fit has prepared and finalized the quarry plan.

**B. LOCATION**

(I) An area of 2.50 hectares was identified at Brookshabad village for conduct of quarrying by use of explosives.

- An area measuring 2.50 hectares has been identified out of the land bearing Sy. No. 1/P area 82.99 hectare situated at Brookshabad village recorded in favour of Govt. Revenue Department (the area is shown in the map at page **10** of the plan).
- The subject land is free from all encumbrances and the area includes the sites from where quarrying operations were being undertaken earlier.
- The details of area identified are as under:-

| Sl. No. | Name of Block | Sy. No. | Area in Hect. |
|---|---|---|---|
| 1. | B | 1 | 2.50 |
| | Total | | 2.50 |

- The selected area satisfies the restrictions mentioned in Rule 4 and is more than 500 meters from any Educational Institution, Health Institution or a residential area and is also more than 500 meters away from HTL.
- The outer boundary of the identified quarry area is as shown in the map at page **10** of the plan.

(II) An area of 2.46 hectares was identified at Brookshabad village for conduct of quarrying without use of explosives.

- An area measuring 2.46 hectares has been identified out of the land bearing Sy. No. 1/P area 82.99 hectare situated at Brookshabad village recorded in favour of Govt. Revenue Department (the area is shown in the map at page **10** of the plan).
- The subject land is free from all encumbrances and the area includes the sites from where quarrying operations were being undertaken earlier.

- The details of area identified are as under :-

| Sl. No. | Name of Block | Sy. No. | Area In Hect. |
|---|---|---|---|
| 1. | A | 1 | 2.46 |
| | **Total** | | **2.46** |

- The selected area satisfies the restrictions mentioned in Rule 4 and is more than 500 meters from any Educational Institution, Health Institution or a residential area and is also more than 500 meters away from HTL.
- The outer boundary of the identified quarry area is as shown in the map at page 10 of the plan.

## C. SITE PLAN

i. The selected quarrying area at Brookshabad is a more or less compact area.

ii. The HTL has been super imposed on the site plan with reference to the ICRZ Notification of 2011.

iii. The selected area has limited spatial extent, recognizable through topographic expressions, small hillocks, mounds, ridges over shorter intervals having narrow depressions etc.

iv. The extraction from this area would be of minor minerals only i.e. earth and stone boulders. Physical inspection has revealed that there are sufficient deposits of these minor minerals at the site.

v. Quarrying in this area is not exactly mining but is more like digging and leveling. This would ultimately result in getting flat land bounded by hillocks having a gradient of 45 degree angle. However, the rehabilitation of quarry site will be undertaken as per the prescribed norms.

vi. The Committee after considering all the above points, the occurrence of minor mineral, geographical condition and likely difficulties to be faced by the Regulatory Authorities in monitoring the environmental impact and implementation of necessary mitigation measures, is of the opinion to adopt cluster approach in the area and lease out mines having a area of 0.25 hectares each of 10 Quarry Blocks and 12 Quarry Blocks having an area of 0.2050 hectares each.

vii. The Administration vide letter No. 34-738/2012-Rev. (PF) dated 21st January, 2013 had recommended deletion of Corpus Fund, the Committee has also recommended its deletion.

viii. The selected quarry area was inspected and levels taken at different locations. Based on the levels taken, plots of size 0.25 hectares and 0.2050 hectares have been carved.

ix. 10 plots have been carved out in block B where explosives can be permitted for extraction of quarry material having the size of 0.25 hectares.

x. 12 plots have been carved out in block A where quarrying can be permitted without use of explosives having the size of 0.2050 hectares.

xi. The detail layout plan may be seen at page 10 of the plan.

## D. POTENTIAL FOR EXTRACTION OF MINOR MINERAL AND YEARLY EXTRACTION

- After taking levels and fixing benches within the blocks, the slope to be maintained at each plot has been arrived at in such a manner that at the end of quarrying from the area we have a gradient of 45 degree angle or a flat land which can be used for any other purposes. Details may be seen at page 10 of the plan.
- As stated earlier the Committee is satisfied that the quarry sites are having existence of minor mineral. However, Committee feels that it is for the prospective bidder to do the estimate prior to bidding and satisfy themselves with regard to quantity of minor minerals.
- In order to stagger the quarry operations over a period of time, the Committee decided to allow extraction of upto 12,000 cbm Minor Minerals from each site per annum

- 3 sites marked X, Y & Z (in the map at page 10 of the plan), which are depressions on accou of quarrying activities in the past, have been selected for dumping of quarry waste an overburden.

## E. PROGRESSIVE AND FINAL CLOSURE PLAN

- Considering the small size of quarry sites to be leased out, the Committee feels that progressiv closure plan would not be feasible however, avenue plantation is to be undertaken as an interi measure for protection of the environment.
- The Committee has decided to recommend guidelines for final closure of quarry. The following points are to be considered as a part of final closure of the quarry :

(a) Location of the Quarry.

(b) Topography of the Quarry.

(c) Reason for Closure or Reserves of Minor Minerals available for future in the quarry, if any.

(d) The reclamation and rehabilitation of the mined quarries indicating the method of reclamation/ restoration of land and quarries pits.

(e) Water quality and hydrology of the area indicating water bodies, surface run-off, vulnerability to erosion, sedimentation/ siltation, diversion of water course, contamination, quantity and quality change of water in water bodies. The corrective and protective measures are to be considered.

(f) Air quality indicating air quality status & corrective measure to prevent pollution.

(g) Waste Management indicating status, type, quality and quantity of over burden, earth/ top soil removed and prevention measure & disposal methods of the overburden in case not utilized for stabilization & for filling the pits. The protective measures to be taken for prevention of siltation, erosion and dust generation from these waste materials should also be addressed.

(h) Infrastructure- Emphasis on maintaining the existing roads, etc. and creation of toe/ retaining walls, check dams etc.

(i) Disposal or removal of Quarrying Machineries & construction like hutment/shed, if any.

(j) The Administration may include any activity as a part of closure of closure plan at any point of time.

(k) Statutory obligations like payment of wages/ Compensation for retrenchment of manpower/ labours under ID Act, and handling any other kind of repercussions shall be the sole responsibility of quarry lease holder.

(l) Disaster Management & Risk Assessment-Indicating the probable high risks like landslides, seismic activities, inundation of low areas in abandoned quarry and action plan to mitigate these risks.

(m) Monitoring and Evaluation of the activities of the closure plan.

- The above activities shall be undertaken jointly by the Department of Revenue, Forest, Andaman Public Works Department and the Pollution Control Committee of the UT.

## F. PLANS FOR RECLAMATION AND RESTORATION OF LAND

The following activities for reclamation and restoration of the land have to be jointly undertaken from the corpus created by concerned Departments such as Revenue, Forest, Andaman Public Works Department and the Pollution Control Committee of the Union Territory :

(a) Plantation activities to be taken up in strips (along the approach road) & Blocks (in the abandoned/closed quarries).
(b) Coastal/Littoral species of trees/plants will be selected for Strip Plantation along road and Hardy and fast growing tree species will be selected for block plantation.
(c) The Strip Plantation along the road will be taken up in 2-3 rows depending upon the availability of land along the road.

(d) The Strip Plantation on the sea ward side of the road will be raised in staggered/ quincial pattern with spacement of 3 mts x 3 mts. (row to row & plant to plant respectively).
(e) Casualty/ mortality filling of the plantations will be carriedout for minimum of three years starting from year of planting.
(f) Maintenance of the plantation will be done continuously for minimum of five years or more till the establishment of the plantations and activities like mulching, weeding, climber cutting and cleaning including the repair and maintenance of tree guards /fences will be taken up in each year.
(g) Cost estimation for each segment of Strip or Block plantation will be done by Forest department based on the Schedule of rates/ standard norms of the department considering the site conditions/ locality factors specially the soil and biotic factors of the area.

**G. MEASURES FOR POLLUTION CONTROL**

- During quarrying operations, the water should be sprayed at least once in a day over the roads at the quarry sites and nearby areas by the lease holders.
- Kachha road, used for transportation of murrum, from the quarry site shall be invariably sprayed by water during these operations. In order to minimize dust pollution, measures such as adoption of hoods at transfer points, vulcanizing of conveyer belt joints, under belt cleaning devices, and installation of dust suppressions and/or dust extraction system for conveyance shall be adopted.
- The kachha road leading to the quarry shall have avenue plantation to arrest the dust pollution.

**SPECIFIC GUIDELINES FOR SOURCE-WISE POLLUTION CONTROL MEASURES TO BE FOLLOWED FOR STONE QUARRIES BY THE LEASE HOLDER**

**AIR POLLUTION**

**DRILLING :**

1) Drilling machine shall be fitted with dust suppression, collection and disposal arrangement.
2) Deep wetting of drilling zones shall be done by water sprinkling before starting drilling.
3) During the drilling operations, the efforts shall be made to reduce dust generation by taking appropriate measures.

**BLASTING :**

1) Proper blasting whole geometry shall be designed.
2) Blast site shall be wetted before and after blasting operations are completed.
3) Only optimum quantity of permissible explosives shall be used so that the vibrations do not damage the structures/houses which may be close to human habitation.
4) Blasting shall be conducted only during favorable weather conditions and only during the day time and permissible hours.
5) The blasting operations shall be given publicity in the local area through all possible means and other available media so that local people become aware of the blasting activities being undertaken in the area.
6) The blasting to be undertaken by an authorized Shot Firer only.
7) The storage of the explosives and its transfer to and from the quarry area shall be strictly in accordance with the conditions listed in the permission granted by Competent Authority.

**HEAVY EARTH MOVING MACHINERY (HEMM):**

1) The operator/ transporter shall carryout regular maintenance of the machinery and vehicles.
2) The speed limit shall be adhered to.
3) Operator's cabin of the HEMMs should preferably be air conditioned at least air tight.
4) The smoke emission should conform to the standards notified in Motor Vehicle Act.
5) The trucks carrying the mined products shall be covered with tarpaulin so that there are no fugitive emissions during transportation.
6) The transportation should not be through the busy roads in the city/towns/villages, if by pass roads are available.

**HAUL ROADS :**

1) All the haul and service roads shall be mettled and well maintained.
2) Unmettled haul roads shall be free of ruts and pot holes.
3) All haul roads and surface roads shall be regularly sprayed with water.

4) Plantation alongside haul roads (avenue plantation) shall be carriedout done.

**OVERBURDEN :**

1) Plantation over and around over burden dumps shall be carriedout to ensure stability of slope: prevention of dust by wind action and soil erosion during the run off.
2) Wetting of surface of Overburden dump shall be regularly practiced.

**NOISE POLLUTION**

**BLASTING :**

1) Blast holes shall be judiciously charged.
2) No blasting shall be done when there is low cloud ceiling.
3) All other guidelines regarding blasting operations shall be strictly adhered to as per the directior of the competent authority.

**DRILLING:**

The workers shall be provided appropriate personal protective equipment viz. ear mufflers/ ear plug or noise proof cabins.

**HEAVY EARTH MOVING MACHINERY (HEMM):**

1) The engine exhausts of HEMM to be fitted with mufflers and cabins shall be noise proof.
2) HEMM shall be properly maintained.
3) Operators shall be provided with ear mufflers / ear plugs.
4) Imposition of speed restriction of HEMM near residential area shall be enforced.
5) The haulage path of the HEMM shall be re-routed so that it is away from the residential area.

**WATER POLLUTION SURFACE**

1) The project components should comply with all the standards given in the Water (Prevention and Control of Pollution) Act, 1974.

**H. RESPONSIBILITY OF QUARRY LEASE HOLDER**

Besides the responsibilities of the quarry lease holder as stated in the A & N Islands Minor Minerals Rules, 2012, the quarry lease holder shall also be responsible for complying with the various aspects as suggested in the various headings of the instant quarry plan and any further compliance required to be ensured (if any), conveyed by the Administration from time to time.

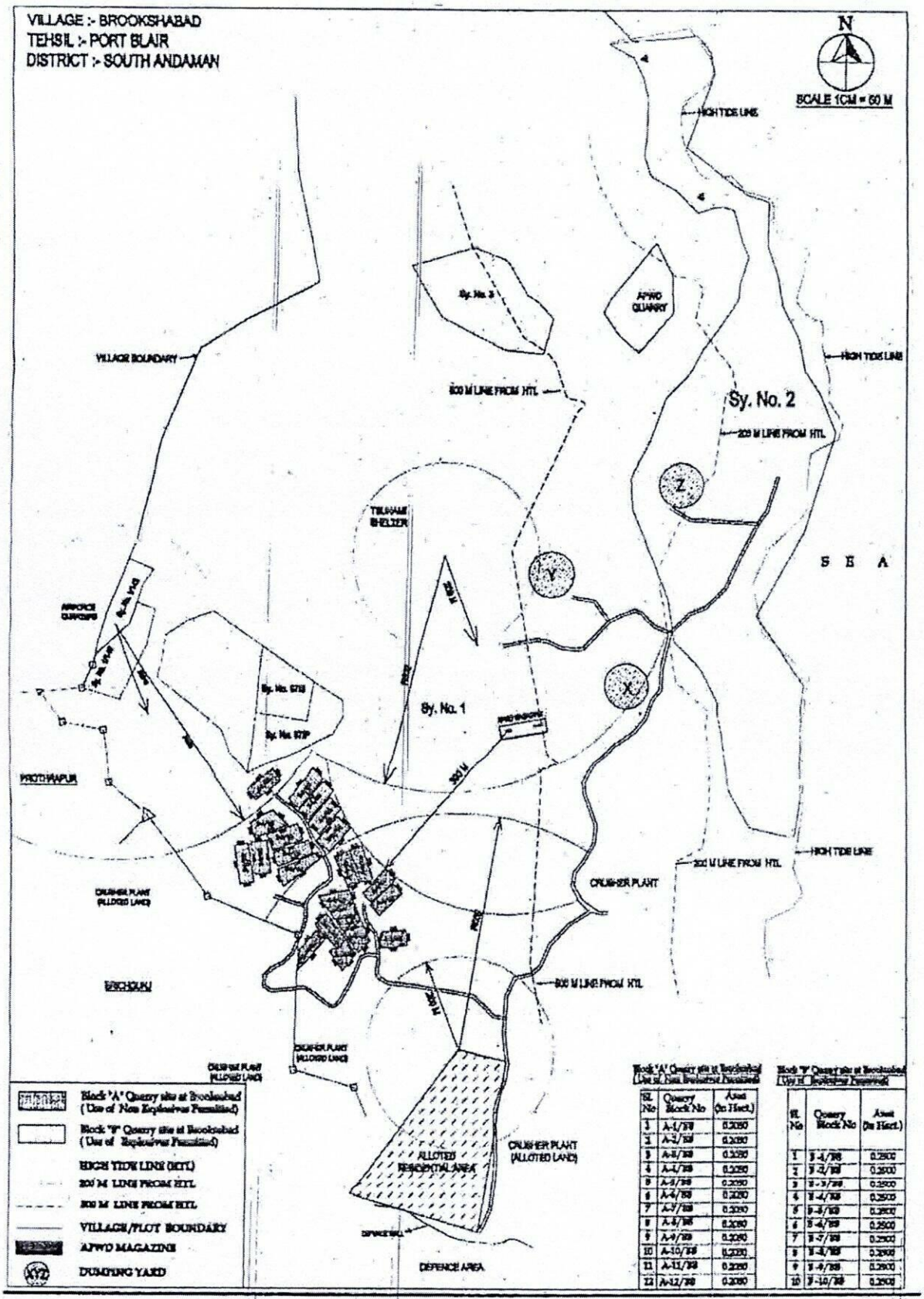
**I. OTHER RELEVANT MATTERS**

- Periodical health check-up of the workers and their family members engaged in the quarry, a dust prone unit and to keep vigilance on development of Silicosis or other respiratory illness.
- All quarry lease holders must keep necessary provision of "First Aid" at the work site.
- Make provision of fund for aid to the workers and their family in case of any accidental injury/death take place.

**J. PERIOD OF OPERATION OF QUARRY PLAN**

- The instant quarry plan shall come into force immediately after notification by the Deputy Commissioner (South Andaman).
- The plan shall remain in force till three years from the date of notification unless otherwise modified/recast on the basis of review conducted by the Committee after one year or on account of orders of a Competent Court/Administrator and in such event, the modified quarry plan shall have the same force and applicability for all concerned including the quarry lease holders.
- The instant quarry plan is within the ambit of provisions of Andaman and Nicobar Islands Minor Minerals Rules, 2012.

**Sd/-**
**(Abhishek Dev, IAS)**
Deputy Commissioner
(South Andaman District)
F. No. 148/ACS/Quarry/TS-II/2019

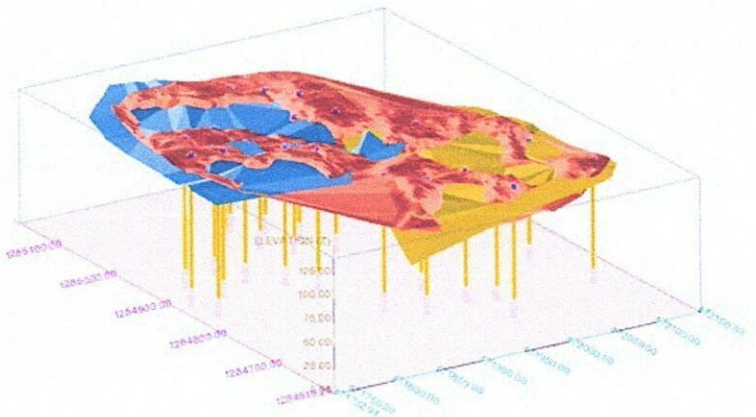



| Sl. No | Quarry Block No | Area (in Hect.) |
|---|---|---|
| 1 | A-1/20 | 0.2050 |
| 2 | A-2/20 | 0.2050 |
| 3 | A-3/20 | 0.2050 |
| 4 | A-4/20 | 0.2050 |
| 5 | A-5/20 | 0.2050 |
| 6 | A-6/20 | 0.2050 |
| 7 | A-7/20 | 0.2050 |
| 8 | A-8/20 | 0.2050 |
| 9 | A-9/20 | 0.2050 |
| 10 | A-10/20 | 0.2050 |
| 11 | A-11/20 | 0.2050 |
| 12 | A-12/20 | 0.2050 |

| Sl. No | Quarry Block No | Area (in Hect.) |
|---|---|---|
| 1 | B-1/20 | 0.2500 |
| 2 | B-2/20 | 0.2500 |
| 3 | B-3/20 | 0.2500 |
| 4 | B-4/20 | 0.2500 |
| 5 | B-5/20 | 0.2500 |
| 6 | B-6/20 | 0.2500 |
| 7 | B-7/20 | 0.2500 |
| 8 | B-8/20 | 0.2500 |
| 9 | B-9/20 | 0.2500 |
| 10 | B-10/20 | 0.2500 |

Project No: IIT/SRIC/MI/PANI/2019-2020/173

# STUDY ON POTENTIALITY OF STONE AVAILABILITY IN ANDAMAN AND NICOBAR ISLANDS



Sponsored by

**Andaman Public Works Department**

Consultant-in-charge

**Prof. Biswajit Samanta**

**Prof. Debashish Chakravarty**

**Prof. B. S. Sastry**

**Department of Mining Engineering**
**Indian Institute of Technology, Kharagpur**
**2021**

Project No: IIT/SRIC/MI/PANI/2019-2020/173

# STUDY ON POTENTIALITY OF STONE AVAILABILITY IN ANDAMAN AND NICOBAR ISLANDS

Submitted to

**Andaman Public Works Department**

Consultant-in-charge

**Prof. Biswajit Samanta**

**Prof. Debashish Chakravarty**

**Prof. B. S. Sastry**

**Department of Mining Engineering**
**Indian Institute of Technology, Kharagpur**

**2021**

## DISCLAIMER

It is appropriate to mention here that the report presents the estimated stone resources figure of stone quarry blocks in various parts of south and Middle-North Andaman district based on available information from the survey and drilling works conducted at the mine site by involved third party consultants. For improvement of the estimation, certain ancillary information are also gathered from the client. Some overburden depth taken from exposed rock surfaces are also used for resource estimation. The project team analyses the data and provides an estimate using a prevalent resource estimation technique. Any discrepancies, thus if occur, between actual and estimated figures can be attributed to the loss of information due to limited samples, sampling errors, survey errors and estimation method used. The above errors are quite natural in any resource estimation studies and the project team is no way responsible for such inherent discrepancies.

## EXECUTIVE SUMMARY

The Andaman and Nicobar Islands, located in the south-eastern part of the Indian mainland geographically, lies between latitude: 11.7401N and Longitude: 92.6586E. This Union Territory has more than 500 islands and islets. In 2015, Andaman administration carried out a scientific study for preparing district survey reports for the stone resources in North & Middle, and South district of Andaman under the notification of Ministry of Environment, Forest and Climate change. The primary purpose of this report was to assess the mineral resources potential for the Andaman region in order to systematic, sustainable and scientific development of quarries and extraction of earth and stone resources from these. Since then, mining was being carried out in some parts of Andaman districts in a scattered manner. However, for sustainable and environmental friendly mining and processing of stone materials Hon'ble National Green Tribunal (NGT) has recently issued a guideline for further mining and setting up of appropriate number of crusher units in the region based on stone resources potential in the region. In this connection, APWD authority has approached to IIT Kharagpur study team to conduct a scientific investigation for evaluating the stone potential in a few selected areas of South and Middle & North-Andaman districts. The identified areas include : (i) Brooksabad, Portblair, South-Andaman, (ii) Hut bay, South Andaman, (iii) Panchawati, Middle &North-Andaman, (iv) Harinagar, Middle& North-Andaman, (v) Shyamnagar, Middle & North-Andaman, and (vi) Madhupur, Middle &North-Andaman.

The present study pertains to the design of sampling scheme for data collection for surface elevation and soil/overburden depth mapping, and estimation of stone resources using these information. For the topographic survey, the works were allocated to third parties namely SM consultant and Subudhi consultant for South Andaman district, and for middle & north Andaman district respectively. For measuring the soil depth cover over stone surface, two schemes were recommended: (i) measurements of soil depth from the exposed rock surfaces. Since, mining was previously done in many of these quarry areas, the studied mining plots were exposed at certain location of the deposit that permits measuring of soil cover depth from exposed surfaces. In fact, majority of soil depth data collected belongs to this category,

(ii) measurements of soil depth using drilling from surface. These data were collected from the inner parts of mining areas where soil depth measurements could only be possible with drilling in soil (overburden). It is appropriate to mention here that drilling could only be done in the soil. No drilling was possible in stone stratum due to hardness of the constituents. However, since mining is proposed to be done up to a few meters above the MSL as per APWD authority, it is assumed that stone stratum is continued up to the mentioned reference depths.

A detailed statistical analyses were conducted with the surface elevation and top surface elevation data of stone quarry to understand the pattern of variation of surface topography and stone surface profile. The surface topography map and the stone surface profile map for each of the mining blocks were constructed using distance weight method of grid preparation with the help of SURPAC software. These two maps while integrated with projected bottom surface depth of stone quarry provided the estimate of stone volumes. For estimating the volumes of resources in individual plots in the block, the above surfaces were intersected with the plot coordinates. All together 22 quarry plots in South-Andaman and 26 quarry plots in middle and North-Andaman are estimated in this exercise. These include 11 plots in Brooksabad Block A, 11 plots in Brooksabad Block B, 2 plots in Hut Bay Block, 8 plots in Harinagar Block, 4 plots in Shyamnagar Block, 6 plots in Panchawati Block and 8 plots in Madhupur Block. Each plot is having an area of 0.25 hectares except two blocks in Brooksabad. As per our estimation, the total stone resources of the mining blocks are 1.25 Million $m^3$ (Brooksabad A), 1.87 Million $m^3$ (Brooksabad B), 2.78 Million $m^3$ (Harinagar), 1.11 Million $m^3$ (Shyamnagar),1.59 Million $m^3$ (Panchawati),1.82 Million $m^3$, (Madhupur)

## TABLE OF CONTENTS

# List of Figures

32.

# List of Tables

## 1.0 INTRODUCTION

The Andaman and Nicobar Islands, located in the south-eastern part of the Indian mainland geographically, float in isolation in the Bay of Bengal. It lies between latitude: 11.7401N and Longitude: 92.6586E. This Union Territory is a chain of more than 500 islands and islets. Most of these islands (about 550) are in the Andaman Group, 28 of which are inhabited. The smaller Nicobars, comprise some 22 main islands (10 inhabited). The Andaman and Nicobars are separated by the ten degree channel which is 150 Km wide and are southward extension of Arakan Yoma range (Myanmar).

In 2015, Ministry of Environment, Forest and Climate Change, Government of India issued a notification to the Andaman administration for preparing a district survey report for the occurrences in resources for each minor mineral. This aimed at systematic and scientific utilization of natural resources for benefiting the present and future generation in the region. With a systematic and scientific identification of areas of aggregates (stones) and its potential, the government would like to have a grasp on sustainable mining of the area.

Mining is being carried out in Andaman and Nicobar islands for quite some time. Particularly, stone mining is being done for the usages in various construction works in A& N Islands. However, Hon'ble National Green Tribunal (NGT) has recently issued a guideline for further mining based on availability of stone in the regions. This is with an aim of setting up an appropriate number of crusher units based on availability of stone resources for environmental protection of the regions. In this connection, APWD authority contacted IIT study team for a scientific study in order to estimate the stone potential in a few selected areas of South, and Middle & North-Andaman districts. The study team has gladly accepted their offer and wished to conduct a study for resources estimation of the stone in the following areas: (i) Brooksabad, Portblair, South-Andaman, (ii) Hut Bay, South Andaman, (iii) Panchawati, Middle & North-Andaman, (iv) Harinagar, Middle & North-Andaman, (v) Shyam nagar, Middle & North-Andaman, (vi) Madhupur, Middle & North-Andaman.

## 2.0 OBJECTIVES OF THE WORK

The objective of this study is to carry out a scientific investigation for the resources estimation of stone quarries in certain selected areas of Middle & North, and South Andaman districts. The study has the following specific objectives in mind.

- Design a framework of collecting topographical survey data over the study area.
- Delineating a sampling scheme for drilling in soil for collecting relevant overburden depth information for resource estimation.
- Analyzing the survey and soil (overburden) depth data in the lease hold areas of stone quarries and assessing the resource potentiality of individual quarry both block wise and individual plots wise.

## 3.0 SCOPE OF WORK

- Field visit- A two-member study team from IIT Kharagpur made a visit to the Andaman Nicobar Islands in the month of November to comprehend the different aspects pertaining to this study. Other purposes of this visit were also to physically understand the extent, geographical location, geometry and boundaries of the quarry site.
- Data collection- Certain Information and data in the forms of maps, soil depth information from existing exposed surface of the stone quarry, district survey reports of earlier studies were collected from the quarry sites.
- Topographic Survey- Based on site visit and first hand understanding of the topography of the area, the study team provided a guideline for topography survey of the stone quarries. Since, the place is far from IIT Kharagpur and the study team does not have enough resources to carry out the survey work, the job was allocated to the third parties namely SM consultants and Subudhi Consultants.
- Sampling design of drill hole and drill hole data collection- In most of the quarry sites, rock surfaces were exposed due to previous mining. This gave an

opportunity to measure soil cover/over burden depth along the exposed surface line. In other cases, the soil cover depth at different locations were measured using rock drill machine. Two different agencies SM consultant and Subudhi consultant in consultation with APWD authority were chosen and they were involved with the job of drilling operation.

- Analysis of sample data and resource estimation- A 3-D mine planning software namely SURFAC was used for surface topographic and overburden depth estimation and mapping. A detailed statistical analysis was also conducted on surface elevation and stone surface elevation data. Finally, resource estimation was done by preparing surface topography map, top and bottom stone surface maps using distance weighting method of grid construction and merging these maps.

## 4.0 STUDY OF BROOKSABAD (SOUTH ANDAMAN)

### 4.1 Description of the Study Area

Brooksabad is located at South Andaman district near the capital city Portblair. This one along with Hut Bay and Ramakrishnapur at Little Andaman Tehsil is identified as the main mining block at south Andaman region. Brooksabad mining quarry is allotted partly to the government agencies and partly leased out to private operators through auction. The mining is being done with or without explosive. A total of 12.39 hectares is identified for mining using explosives. The identified areas belong to Sy. No. 2/P having area of 26.77 hectares and Sy. No. 1/P having area of 82.99 hectares of Brookshabad village recorded in favour of Govt. Revenue Department. The subject land is free from all hindrances and the area includes the sites from where quarrying operation has been undertaken earlier. The whole area is divided into two parts namely Block A (8.25 hectares) and block B (4.14 hectares). The selected area is located more than 500 m away from any educational institutions, health Institutions or residential areas and is also more than 500 meters away from APWD explosive magazine. Another area of 11.63 hectares is also identified for quarrying without using explosives. These areas belonging to Sy. No. 2/P and Sy. No. 1/P are partitioned into

three different blocks. These are named as Block C (1.77 hectares), Block D (6.86 hectares) and Block E (3.0 hectares). The subject land is also free from all encumbrances and also includes the sites where quarrying operations have been conducted earlier. The selected land at the quarrying area is more or less compact. Out of 37 quarries being identified at South Andaman region, 33 quarries are located here. The selected area is limited in spatial extent, recognizable topographic expressions, small hillocks, mounds, ridges over shorter intervals having narrow depressions etc. Mainly of earth materials and stone boulders are being extracted from here. Quarrying in this area is more like of digging and leveling. This would ultimately result in getting flat land bounded by hillocks having a gradient of 45 degrees angle.

The selected quarry area was inspected by Andaman officials and marked into different plots by them. Total 22 plots were carved out in blocks A, B and C. Each plot is of size 0.25 hectares except for one plot of size 2.0 hectares reserved for APWD. In blocks D and E total 21 plots, each having the size of 0.25 hectares, and one plot, having a size of 2.00 hectares, are demarcated. The present study involves the resource estimation in Block A and Block B in this area. Figure 1 presents the identified plots, where the resource estimation job was undertaken.

**4.2 Geology and Geotectonics**

The Andaman and Nicobar Islands are the summits of northern part of a prominent submarine mountain range, probably co-related with the Indonesian arc, lying on the great tectonic suture zone and extending from the eastern Himalayas along the Myanmar border to Arakan. Sumatra and Lesser Sundas with southern continuation of the longitudinal ranges extending through the Bay of Bengal from Myanmar towards the south and southeast. The Northern most part of the islands is isolated from cape Nergrais in southern Myanmar by the North Preparis Channel and the southernmost part is separated from the Acheen head of western Sumatra by great Channel.

PORT BLAIR QUARRY DATA (PATCH-I)

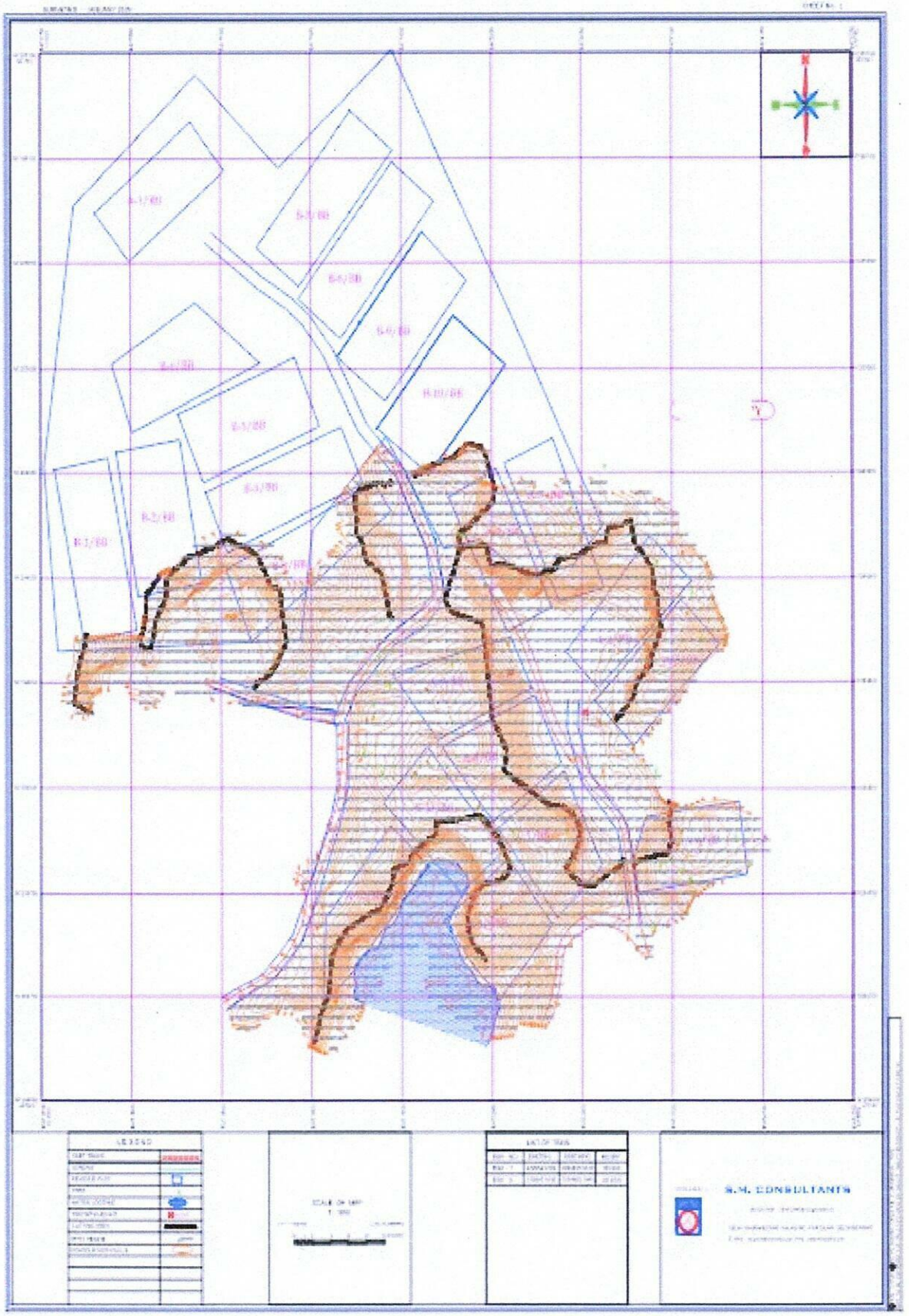



**Figure 1: Study area of Brooksabad**

There are two more Channels: (i) the Ten Degree Channel which separates Andaman Island from Nicobar Island and (ii) the Sombero Channel which isolates Great Nicobar from Car Nicobar and Nancowrie group. Geologically these islands belong to a geosynclinal basin. The rocks of this Island are highly folded due to frequent tectonic movements in the past. The geological formations represent a period of sedimentation from cretaceous to Sub-Recent period. The rocks are of two main types: (i) the Serpentine sequences and (ii) the Sedimentary Series. The Islands in the South Andaman district are composed mainly of thick Eocene sediments deposited on Pre-Tertiary sandstone, silt stone and shale with intrusions of basic and ultrabasic igneous rocks (Ophiolites). In the geologically younger Richie's archipelago, calcareous sand stones are more common. The available geological evidence leads to assume the possibility of a geological period when the Andaman and Nicobar Islands formed a range between Burma and Sumatra. The Andaman and Nicobar Islands with Preparis and Cocos formed a continuous hill connecting this with Burma (Myanmar) through Cape Negrais. The Tertiary sediments classified as the Mithakhari and Andaman Flysh Group comprises thinly bedded alternations of sandstones and siltstones, grit, conglomerate, limestones, shales, etc., are of Upper Cretaceous to Upper Eocene age. The Tertiary Group is overlain successively by the Archipelago Group, Nicobar Group and the Quaternary Holocene Group, intervening with unconformity. The generalized geological succession is given in Table. 1.

Marine inorganic sedimentary group of rocks comprising shale, sandstone, grit and conglomerate (Flysch and Mithakhari Groups) and organic sedimentary like Coralline atolls and limestone and extrusive and intrusive igneous rocks (volcanics and ultramafics) occupy the entire geographical area. Amongst these, the former (inorganic) Sedimentary group is most pervasive and occupy nearly 70% of the entire area of the islands while the igneous group covers nearly 15% while the rest 15% goes to the coralline and limestone formations. All these rock formations are brought under tectonism because of their alignment in a tectonically active zone, evident from the occurrence of shallow and deep focus earthquakes in the islands. The last earthquake and devastation by tsunami were also the effect of tectonic setting of this archipelago in a converging plate margin. Because of tectonism, the igneous and Sedimentary

groups of rocks are highly fractured and fissured. The fracturing in hard rock's form conduits for movement of ground water in the deeper horizon. The geology of the islands is highly varied and even changes within a small distance.

**Table 1 Generalized Geological sequence in South Andaman Islands**

| Age | Group | Formation |
|---|---|---|
| Recent to Sub Recent | Quaternary Holocene Group | Beach sand, Mangrove Clay, Alluvium, Coral Rags and Shell Limestone, loosely consolidated pebbles bed |
| Pleistocene to Late Pliocene | Unconformity | Shell limestone, Sandstone, Clay stone, etc. White clay stone, Melville Limestone |
| Miocene | Nicobar Group | |
| Oligocen to Palaeocene | Archipelago Group (Upper) | Thinly bedded alternations of Sandstones and siltstones, grit, conglomerate, Limestone, black Shales with olistiliths. |
| | Unconformity | |
| Late Cretaceous | Andaman Flysh, Mithakhari Group | Dyke swarms, acidic suite, Pillow lava with radiolarian chert and ultramafics suite. |
| | Unconformity | |
| | Ophiolites Group | |

### 4.3 Drilling and Topography Survey

For resource estimation, the basic data that are required include surface elevation, soil (overburden) cover depth, horizontal and vertical extents of the stone quarry. However, the baseline information, which were available from the studied sites, were not sufficient to estimate the resources with any acceptable accuracy. Hence, a detailed topographical survey and drilling works were carried out as a part of this investigation to generate adequate information. Since, IIT study team was not equipped with facilities, both the survey and drilling works were delegated to SM consultant, a local agency, in consultation with APWD authority. In this regard, a sampling scheme of data collection was suggested by IIT study team in discussion with the APWD authority. The SM consultant, in accordance with the above data collection scheme, carried out the survey and drilling operations. The topographical survey data were generated at 5 m grid intervals using TOTAL STATION. Table 2 presents a snapshot of topographical survey data generated in the process.

Along with topographical survey, the drilling at soil cover was done by SM consultant to measure the overburden height above the stone surface. The drilling was initiated at the surface, allowed to penetrate the soil cover and stopped when the stone surface was touched. The drilling length was then measured to determine the soil cover depth at that point. Drilling was not possible in the stone stratum because of hardness of the stone materials with respect to drilling machine used. The location of drilling was suggested by the IIT study team taking into accounts into a number of factors including the precision of estimate, the size of plot, time requirement of drilling. Figure 2 presents the spatial position of drill holes with respect to the studied plots. On an average, two drill holes are strategically placed in each studied plot. Table 3 presents a few example drill hole data generated in the area by the SM consultant.

**Table 2: A snapshot of topographic survey data in certain portion of Brooksabad**

| Coordinates of Quarry Area | | | | |
|---|---|---|---|---|
| Sl. No. | Easting | Northing | Height | Remarks |
| 1 | 471750 | 1284880 | 142.183 | |
| 2 | 471750 | 1284885 | 141.947 | |
| 3 | 471750 | 1284890 | 141.527 | |
| 4 | 471750 | 1284895 | 140.892 | |
| 5 | 471750 | 1284900 | 139.364 | |
| 6 | 471750 | 1284905 | 137.824 | |
| 7 | 471750 | 1284930 | 138.596 | |
| 8 | 471750 | 1284935 | 139.522 | |
| 9 | 471750 | 1284940 | 140.816 | |
| 10 | 471750 | 1284945 | 141.784 | |
| 11 | 471750 | 1284950 | 142.544 | |
| 12 | 471750 | 1284955 | 142.165 | |
| 13 | 471750 | 1284960 | 140.718 | |
| 14 | 471755 | 1284875 | 142.539 | |
| 15 | 471755 | 1284880 | 142.054 | |
| 16 | 471755 | 1284885 | 141.434 | |
| 17 | 471755 | 1284890 | 140.875 | |
| 18 | 471755 | 1284895 | 140.722 | |
| 19 | 471755 | 1284900 | 140.638 | |
| 20 | 471755 | 1284905 | 138.892 | |
| 21 | 471755 | 1284910 | 138.46 | |
| 22 | 471755 | 1284915 | 137.98 | |
| 23 | 471755 | 1284920 | 137.154 | |
| 24 | 471755 | 1284925 | 136.382 | |
| 25 | 471755 | 1284930 | 137.973 | |

**Table 3: Example set of drilling data generated in the studied area**

| BLASTING AREA(Block A) | | | | | | | |
|---|---|---|---|---|---|---|---|
| SL NO | BLOCK NO | BH NO | *EASTING IN M* | *NORTHING IN M* | *HEIGHT IN M* | *SOIL IN M* | REMARK |
| 1 | A3/BB | BH-3 | 472031.235 | 1284935.002 | 122.412 | 10.5 | Beyond the depth rock layer is start |
| 2 | A5/BB | BH-5 | 472116.677 | 1284865.650 | 108.919 | 7.5 | Beyond the depth rock layer is start |
| 3 | A6/BB | BH-6 | 472132.040 | 1284773.691 | 114.941 | 2.5 | Beyond the depth rock layer is start |
| 4 | A-7/BB | BH-7 | 472026.848 | 1284781.855 | 113.006 | 4.3 | Beyond the depth rock layer is start |
| 5 | A-8/BB | BH-8 | 472000.000 | 1284795.481 | 123.115 | 5.2 | Beyond the depth rock layer is start |
| 6 | A-9/BB | BH-10 | 471986.715 | 1284855.124 | 120.924 | 9.8 | Beyond the depth rock layer is start |

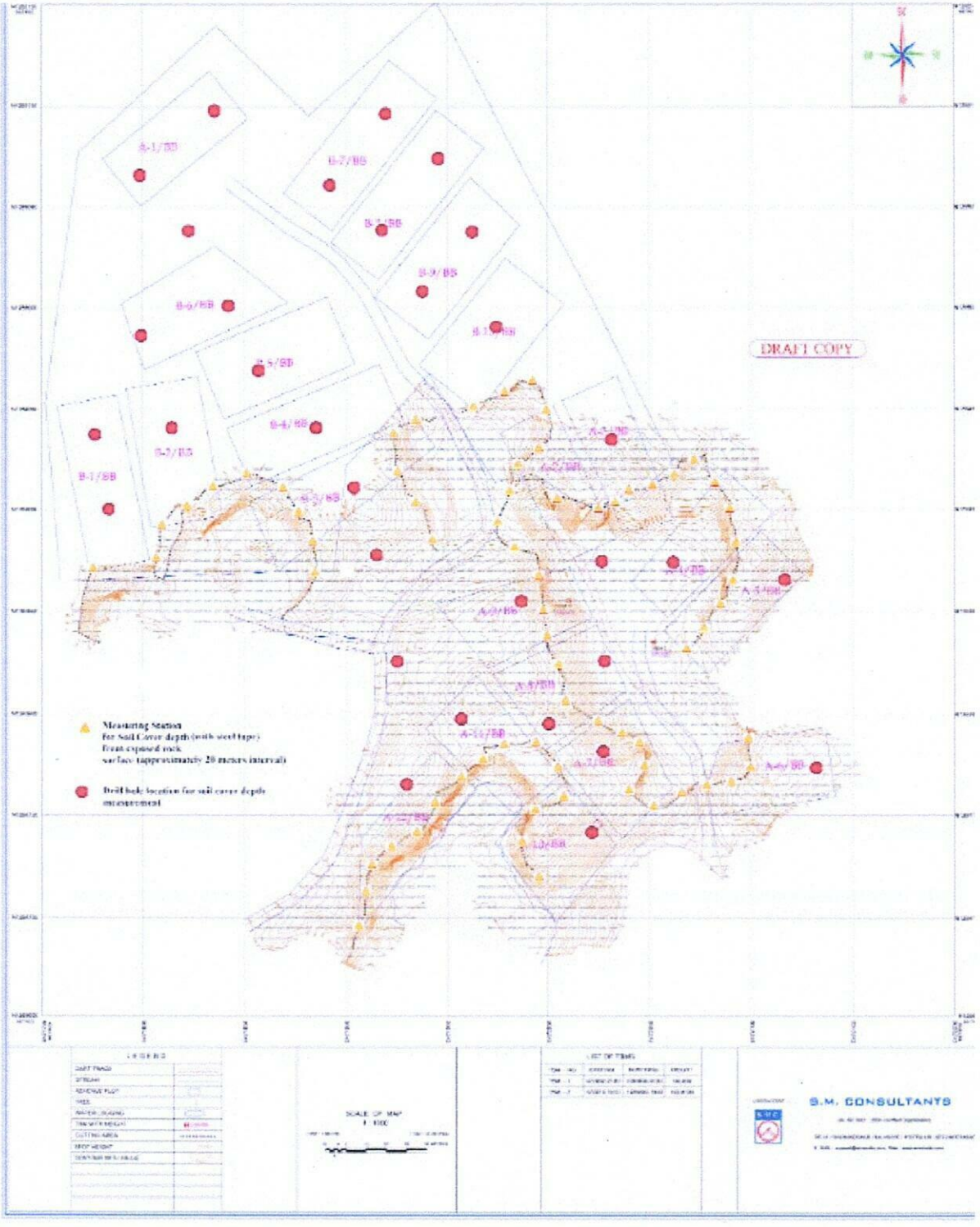
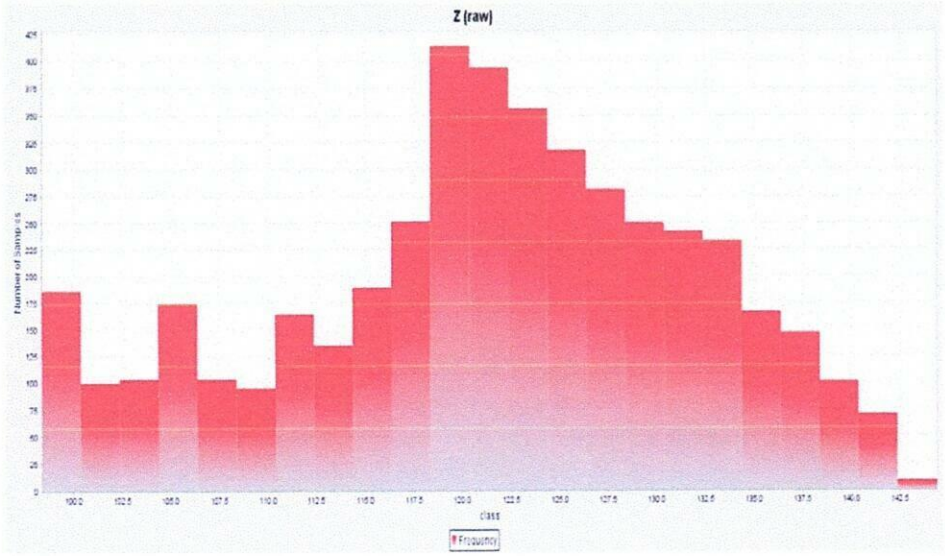



**Figure 2 : Spatial Location of Drill holes w.r.t study area**

### 4.4 Analysis of data and Resource estimation

A detailed statistical analysis was carried out for the topographical survey and drilling data to understand the surface topography and soil cover depth variations. The statistical analyses comprise of histogram plotting and generation of descriptive statistics. Figure 3 presents the summary statistics of surface elevation over entire area covering both Block A and Block B. The average surface elevation of the area is 121.38m above the bench mark datum point. It may also be noticed that the elevation level over the area varies from 98.39 m to 142.64m. This suggests that the surface topography is moderately undulating. The summary statistics of stone surface elevation, measured from drilling in soil and directly from exposed rock faces, are presented in Figure 4 separately for Block A and Block B. Altogether, 90 observations are available to find the soil cover depth over the area. The average stone surface elevation at Block A and Block B are found to be 112.91 m and 125.41 m respectively. Hence, it is noticeable that the average stone surface at Block B is at higher elevation than Block A.

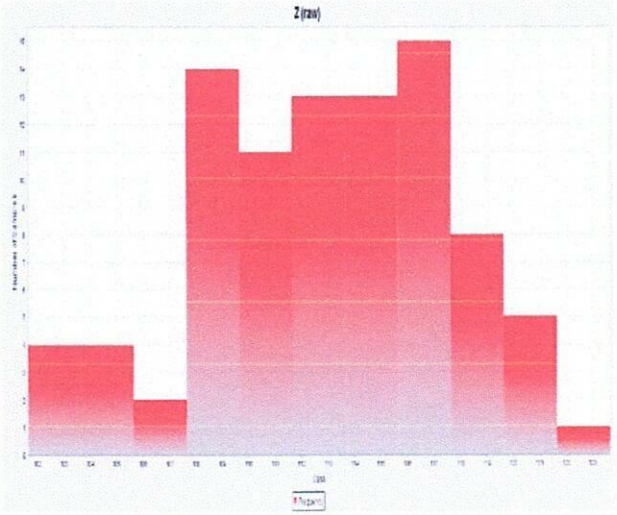



(a) Histogram plot of surface elevation at Brooksabad

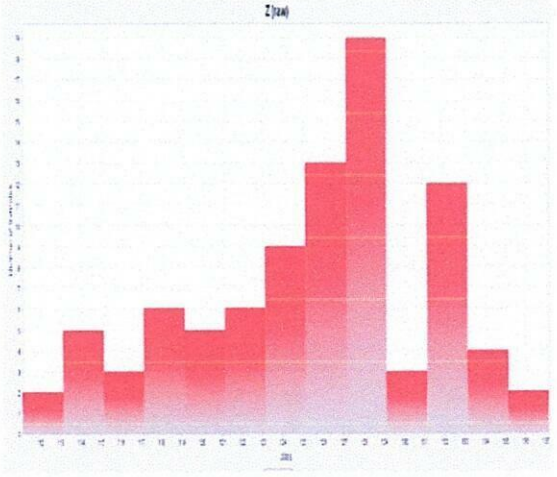
| File | Surface Survey Post.str |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 4480 |
| Minimum value | 98.393000 |
| Maximum value | 142.646000 |
| | Ungrouped Data |
| Mean | 121.384368 |
| Median | 122.060501 |
| Geometric Mean | 120.911710 |
| Variance | 111.865877 |
| Standard Deviation | 10.576667 |
| Coefficient of variation | 0.087134 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 111.865877 |
| Moment 3 About Arithmetic Mean | -365.080760 |
| Moment 4 About Arithmetic Mean | 30503.498848 |
| Skewness | -0.308562 |
| Kurtosis | 2.437555 |
| Natural Log Mean | 4.795061 |
| Log Variance | 0.007919 |
| 10.0 Percentile | 105.691000 |
| 20.0 Percentile | 112.051500 |
| 30.0 Percentile | 117.128500 |
| 40.0 Percentile | 119.893000 |
| 50.0 Percentile (median) | 122.060501 |
| 60.0 Percentile | 124.529000 |
| 70.0 Percentile | 127.348500 |
| 80.0 Percentile | 130.905000 |
| 90.0 Percentile | 134.842500 |
| 95.0 Percentile | 137.630500 |
| 97.5 Percentile | 139.647500 |
| Trimean | 122.142500 |
| Biweight | 121.939978 |
| MAD | 7.080022 |
| Alpha | -97.409070 |
| Sichel-t | 121.391322 |

(b) Descriptive statistics of surface elevation at Brooksabad

**Figure 3: Summary statistics of Brooksabad study area (a) histogram plot, and (b) descriptive statistics**



(a) Histogram of stone surface elevation at Brooksabad Block A



(b) Histogram of stone surface elevation at Brooksabad Block B

| File | Soil Survey Post Extended.str |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 90 |
| Minimum value | 101.647000 |
| Maximum value | 123.319000 |
| | Ungrouped Data |
| Mean | 112.915367 |
| Median | 113.343000 |
| Geometric Mean | 112.814333 |
| Variance | 22.543011 |
| Standard Deviation | 4.747948 |
| Coefficient of variation | 0.042049 |
| Moment 1 About Arithmetic | 0.000000 |
| Moment 2 About Arithmetic | 22.543011 |
| Moment 3 About Arithmetic | -39.009233 |
| Moment 4 About Arithmetic | 1314.557999 |
| Skewness | -0.364460 |
| Kurtosis | 2.586759 |
| Natural Log Mean | 4.725743 |
| Log Variance | 0.001802 |
| 10.0 Percentile | 106.713500 |
| 20.0 Percentile | 108.796500 |
| 30.0 Percentile | 110.245000 |
| 40.0 Percentile | 112.003000 |
| 50.0 Percentile (median) | 113.343000 |
| 60.0 Percentile | 114.719500 |
| 70.0 Percentile | 116.384000 |
| 80.0 Percentile | 117.106500 |
| 90.0 Percentile | 118.292500 |
| 95.0 Percentile | 119.845000 |
| 97.5 Percentile | 120.699000 |
| Trimean | 113.182000 |
| Biweight | 113.145614 |
| MAD | 3.713500 |
| Alpha | -100.630530 |
| Sichel-t | 112.914899 |

(c) Descriptive statistics of stone surface elevation at Brooksabad Block A

| File | Soil Survey Post Extended |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 89 |
| Minimum value | 111.143000 |
| Maximum value | 136.883000 |
| | Ungrouped Data |
| Mean | 125.415045 |
| Median | 126.520000 |
| Geometric Mean | 125.276891 |
| Variance | 34.033095 |
| Standard Deviation | 5.833789 |
| Coefficient of variation | 0.046516 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 34.033095 |
| Moment 3 About Arithmetic Mean | -100.874882 |
| Moment 4 About Arithmetic Mean | 3103.779838 |
| Skewness | -0.508079 |
| Kurtosis | 2.679711 |
| Natural Log Mean | 4.830526 |
| Log Variance | 0.002226 |
| 10.0 Percentile | 116.153500 |
| 20.0 Percentile | 119.910000 |
| 30.0 Percentile | 123.290000 |
| 40.0 Percentile | 125.357000 |
| 50.0 Percentile (median) | 126.520000 |
| 60.0 Percentile | 127.603500 |
| 70.0 Percentile | 128.447000 |
| 80.0 Percentile | 130.758500 |
| 90.0 Percentile | 131.991001 |
| 95.0 Percentile | 133.487000 |
| 97.5 Percentile | 135.898000 |
| Trimean | 125.846125 |
| Biweight | 126.129907 |
| MAD | 3.973000 |
| Alpha | -110.031570 |
| Sichel-t | 125.414814 |

(d) Descriptive statistics of stone surface elevation at Brooksabad

**Figure 4: Summary statistics of elevation data at Brooksabad A and B blocks: (a) histogram plot at A, (b) histogram plot at B, (c) descriptive statistics at A, and (d) descriptive statistics at B**

Figure 5 presents a surface topographic map prepared using grid interpolation of elevation data by distance weighting method. As it is expected, the surface looks quite undulating and has a natural gradient from Block B to Block A. It may also be noticed that surface looks very smooth and deep at certain locations. These regions basically fall in excavated part of the quarry. Figures 6 and 7 show the stone surface elevation maps prepared using grid interpolation by distance weighting method from soil cover depth data respectively for Block A and Block B. The stone surface (top) maps also indicate that stone stratum also has certain undulation in its structure.

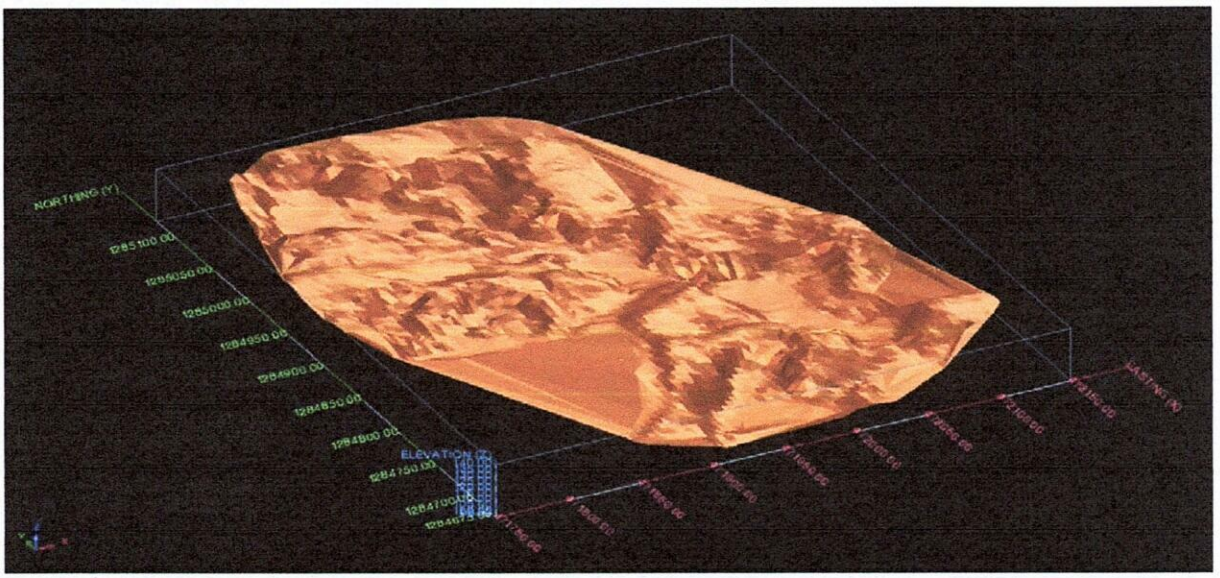



**Figure 5: Surface Topographical variation over Block A and Block B**

A merged map of surface elevation and stone surface elevation was also constructed to have a visual portrait of soil cover and stone stratum variation. This is presented in Figure 8. The area between these two surfaces, in fact, represents the soil cover/overburden volume which has to be excavated before quarrying the stone. The volume below the stone surface identifies the stone volume. It is worth to mention that no data related to stone stratum structure was available to the study team. However, mining in this area is proposed to be done up to a 55m RL as indicated by APWD authority. Indeed, in each mining area, APWD has suggested the depth up to which resources would be estimated. Therefore, it is assumed that stone stratum is continued up to the mentioned depth. Table 4 presents the co-ordinates of the various plots of Block A and Block B.

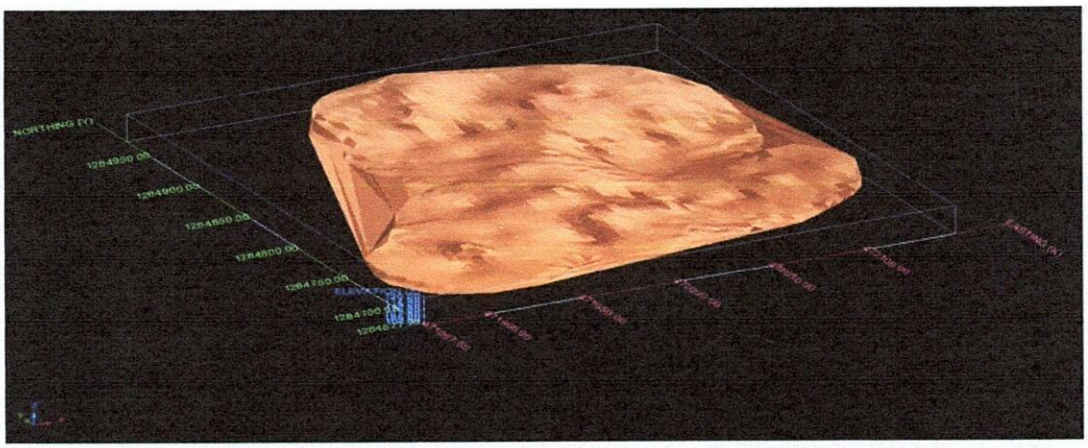


Figure 6: Stone surface profile over Block A

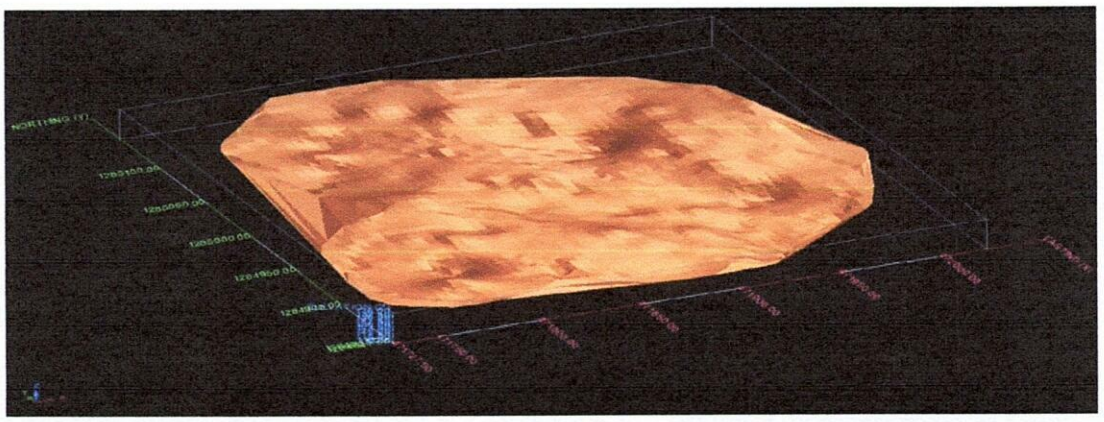


Figure 7: Stone surface profile over Block B

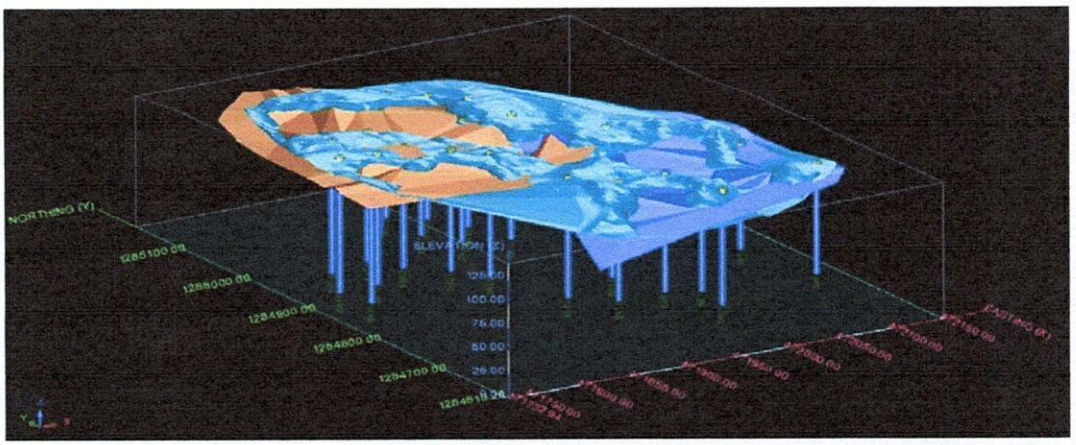
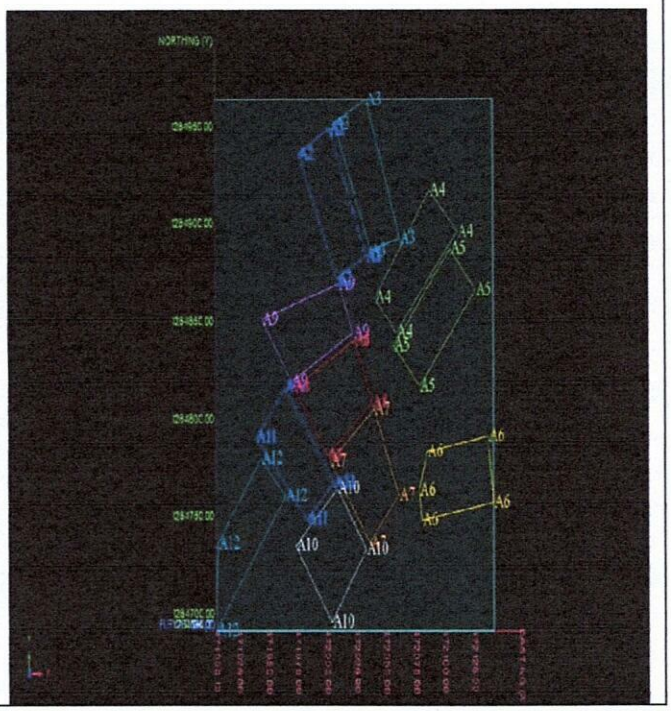


Figure 8: Superimposition of surface grid and stone surface grid along with drill location (Blue colour Stone surface at A, golden stone surface at B, Cyan color topography grid along with drill location.

Table 4: Spatial coordinate of various identified plots in Block A

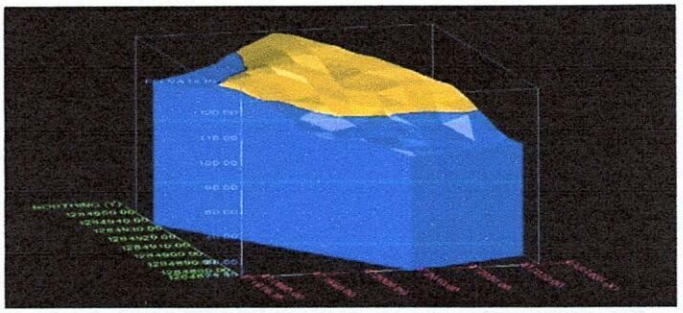
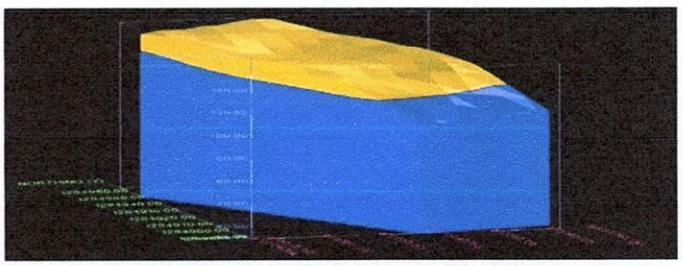
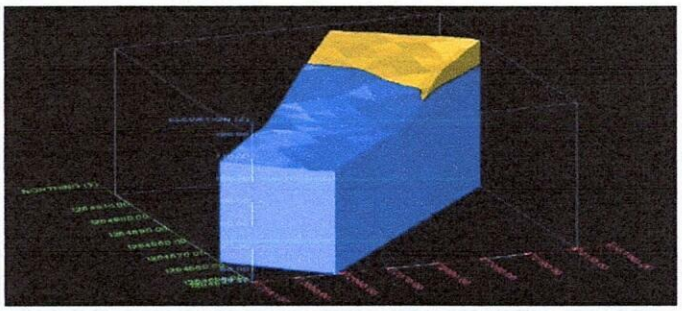
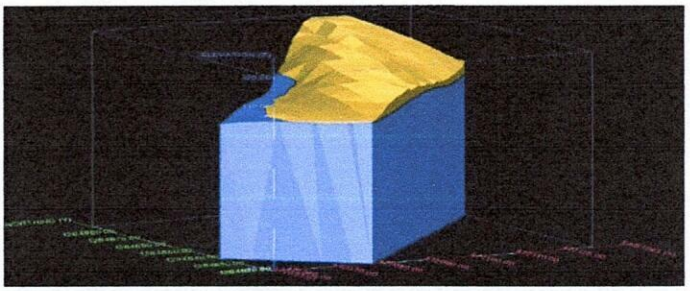
| Block | Min X | Max X | Min Y | Max Y | Min Z | Max Z |
|---|---|---|---|---|---|---|
| A2 | 471976.2 | 472033.2 | 1284874 | 1284952 | 55 | 125.3 |
| A3 | 472006.9 | 472062.2 | 1284889 | 1284967 | 55 | 128.0 |
| A4 | 472041.1 | 472110.9 | 1284847 | 1284920 | 55 | 121.6 |
| A5 | 472057.1 | 472126.3 | 1284820 | 1284890 | 55 | 120.9 |
| A6 | 472078.3 | 472141.1 | 1284750 | 1284794 | 55 | 117.7 |
| A7 | 472002.9 | 472061 | 1284739 | 1284808 | 55 | 125.7 |
| A8 | 471972.5 | 472038.5 | 1284784 | 1284844 | 55 | 123.6 |
| A9 | 471944.9 | 472022.3 | 1284822 | 1284872 | 55 | 125.0 |
| A10 | 471973.4 | 472033.2 | 1284698 | 1284767 | 55 | 128.0 |
| A11 | 471939.7 | 472005.8 | 1284751 | 1284819 | 55 | 127.5 |
| A12 | 471906.1 | 471964.6 | 1284694 | 1284782 | 55 | 133.6 |

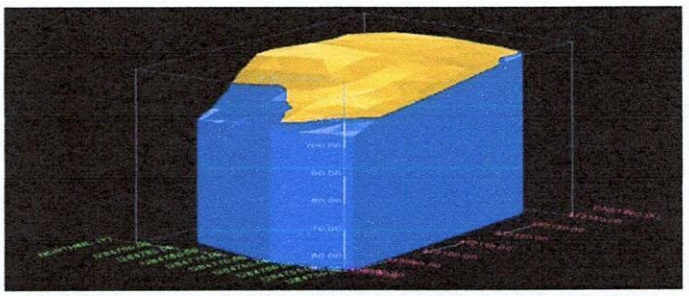
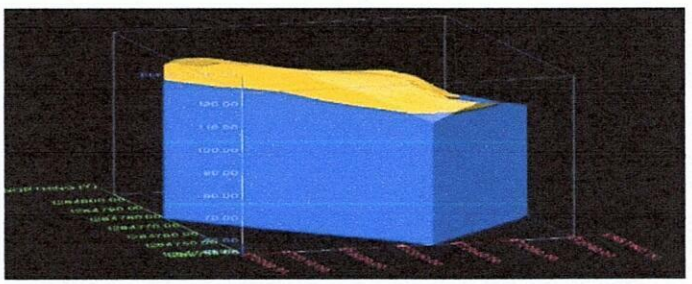
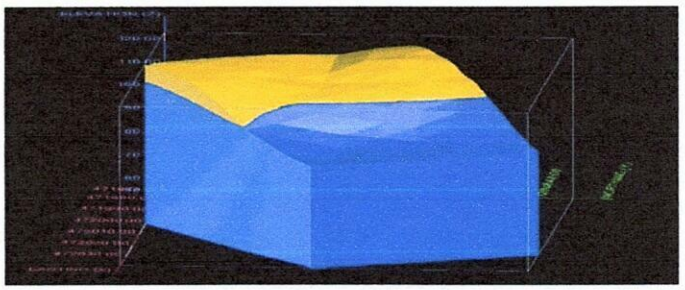
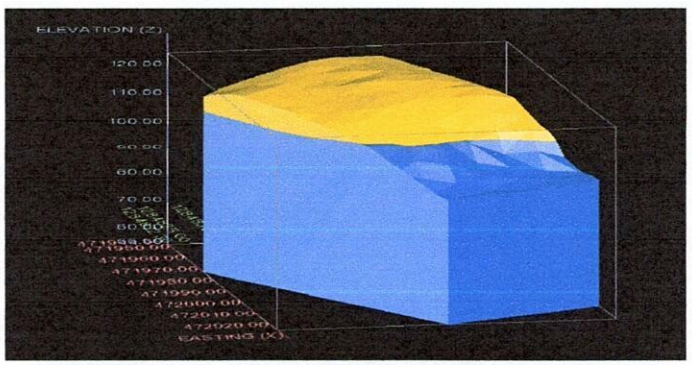


For calculating soil/overburden and stone volumes, individual plots were intersected with the surface topography grid and stone surface grid. The intersected volume bounded by the particular plot surface and those of surface topography and stone surface grids provided the estimate of soil (overburden) volume. On the other hand, the intersected volume between stone surface grid and suggested bottom surface grid yielded the stone volume. Table 5 presents the estimated volumes of various plots in Block A. In the table, each plot volume is pictorially shown to have a comprehensive view of size and shape of each plot. Total volume of the block and estimated volumes of individual plots are summarized in Table 6. For the Block B, Table 7 presents the spatial coordinates of individual plots. The estimated resources of the individual plots of Block B are presented in Table 8 and summarized in Table 9.

51

**Table 5: Estimated stone resources for various plots of Brooksabad Block A**

| Block | Stone+Soil Volume $m^3$ | Stone Volume $m^3$ (shown in blue) | Soil Volume $m^3$ (shown in yellow) | Pictorial representation of the plots (yellow and blue colors represent soil and stone volume respectively) |
|---|---|---|---|---|
| A2 | 119676 | 113468 | 6208 |  |
| A3 | 134646 | 119213 | 15433 |  |
| A4 | 106244 | 102950 | 3294 |  |
| A5 | 110550 | 100764 | 9786 |  |

| | | | | |
|---|---|---|---|---|
| A6 | 117535 | 111189 | 6346 |  |
| A7 | 120010 | 109938 | 10072 |  |
| A8 | 118436 | 112817 | 5619 |  |
| A9 | 128718 | 113514 | 15204 |   |

53

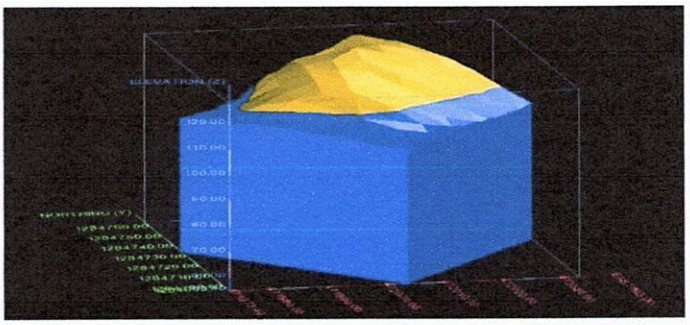
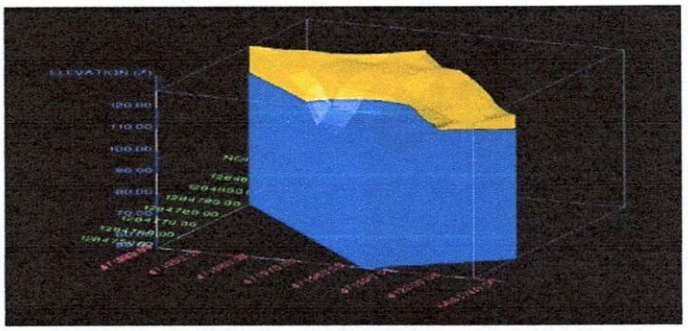
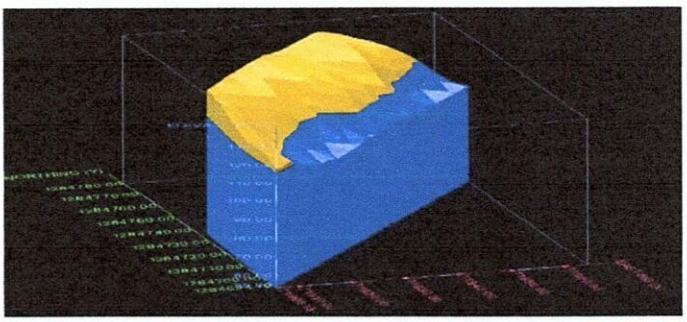
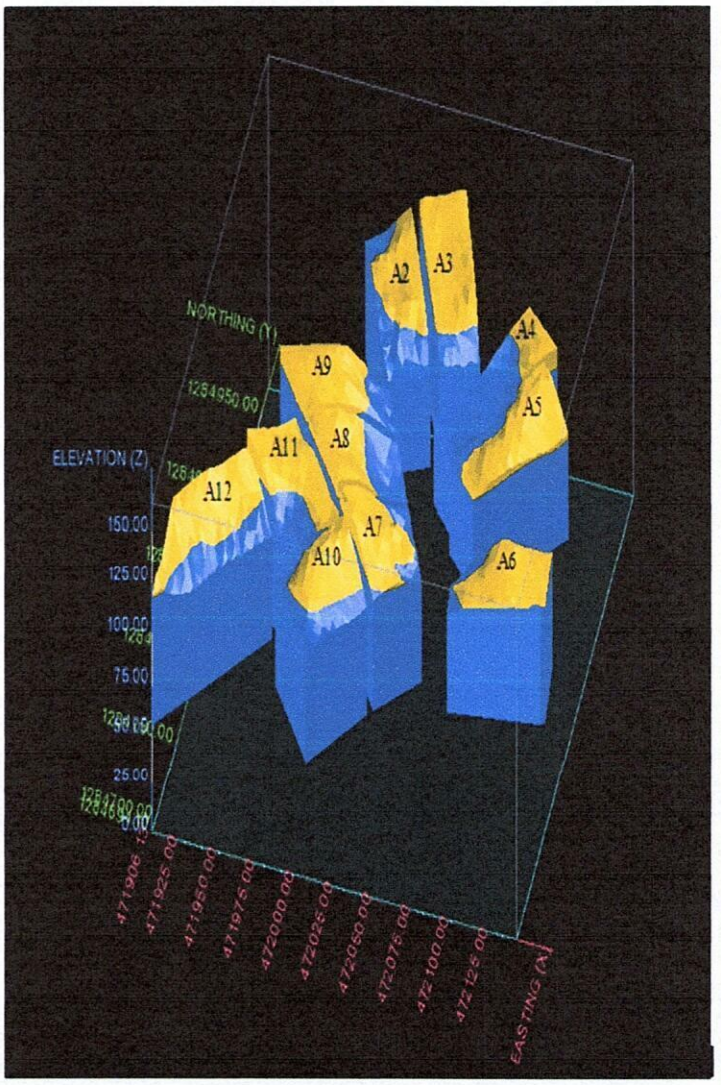
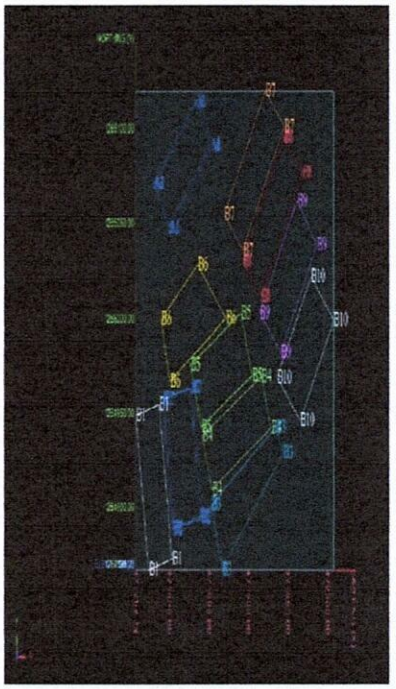
| | | | | |
|---|---|---|---|---|
| A10 | 127105 | 119653 | 7452 |  |
| A11 | 130111 | 121976 | 8135 |  |
| A12 | 137130 | 124973 | 12157 |  |

**Table 6: Summarized results of estimated stone resources in Brooksabad Block A**

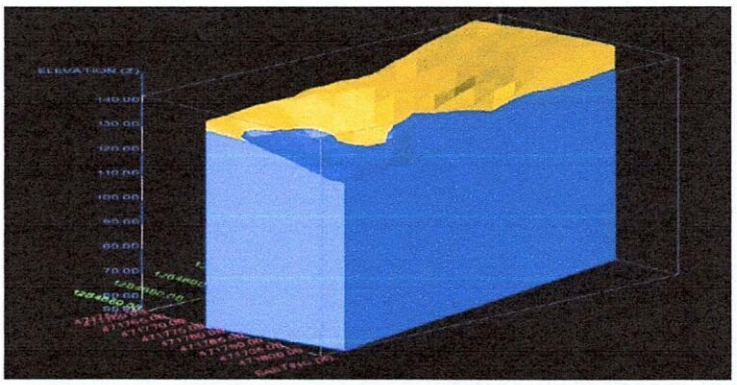
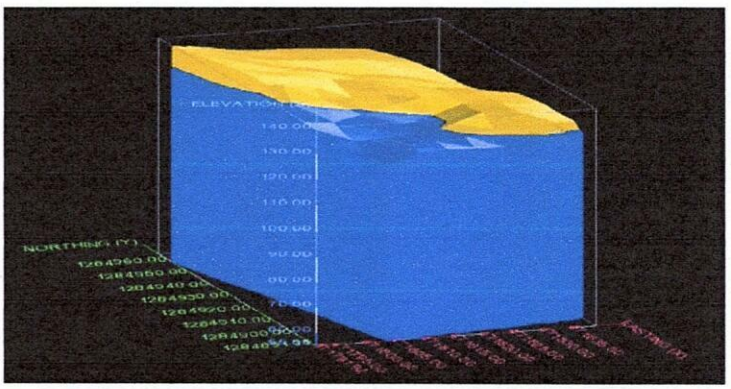
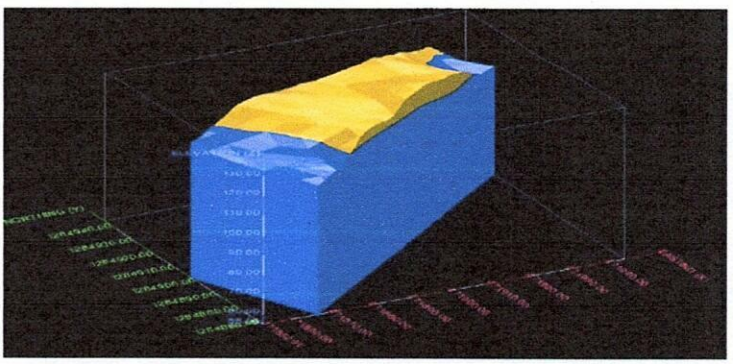
| Block | Stone+ Soil Volume $m^3$ | Stone Volume (shown in Blue) $m^3$ | Soil Volume (shown in Yellow) $m^3$ | Pictorial representation of the plots (yellow and blue colours represent soil and stone volume respectively) |
|---|---|---|---|---|
| A2 | 119676 | 113468 | 6208 |  |
| A3 | 134646 | 119213 | 15433 | |
| A4 | 106244 | 102950 | 3294 | |
| A5 | 110550 | 100764 | 9786 | |
| A6 | 117535 | 111189 | 6346 | |
| A7 | 120010 | 109938 | 10072 | |
| A8 | 118436 | 112817 | 5619 | |
| A9 | 128718 | 113514 | 15204 | |
| A10 | 127105 | 119653 | 7452 | |
| A11 | 130111 | 121976 | 8135 | |
| A12 | 137130 | 124973 | 12157 | |
| Total | 1350161 | 1250455 | 99706 | |

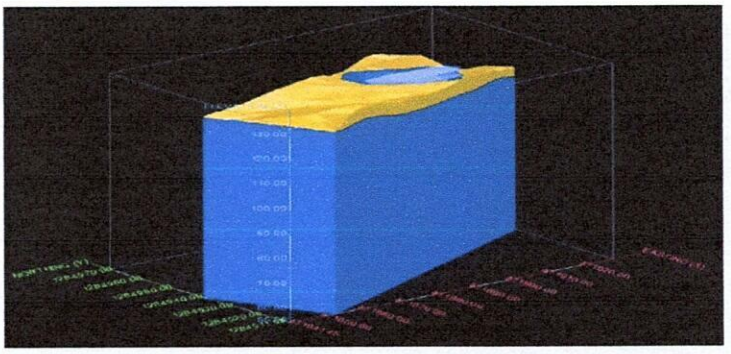
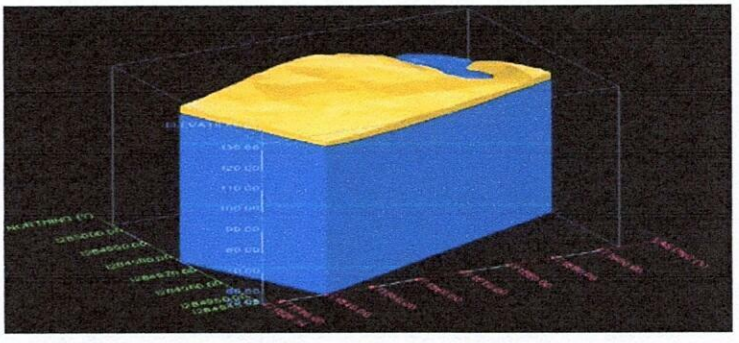
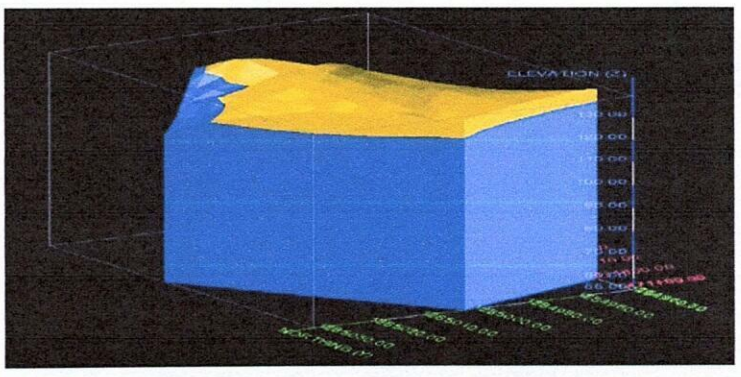
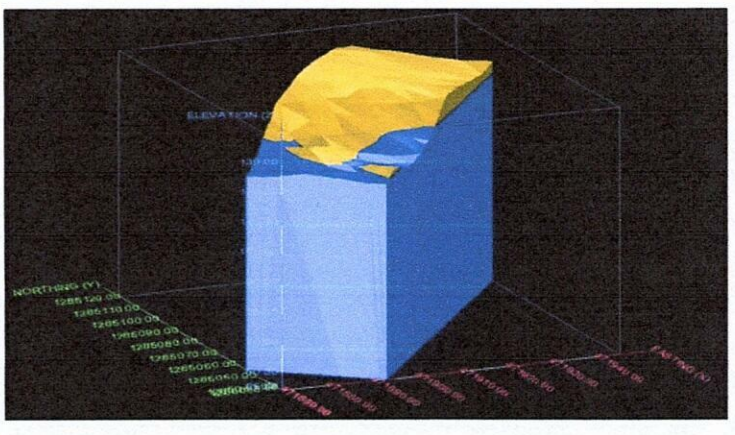
**able 7:Spatial Coordinates of various plots in Brooksabad B**

| Block | Min X | Max X | Min Y | Max Y | Min Z | Max Z | |
|---|---|---|---|---|---|---|---|
| B1 | 471757.7 | 471803.3 | 1284870 | 1284957 | 55 | 142.5 |  |
| B2 | 471791.9 | 471839.3 | 1284891 | 1284966 | 55 | 140.4 | |
| B3 | 471852.9 | 471944.3 | 1284870 | 1284945 | 55 | 132.8 | |
| B4 | 471841.5 | 471928.7 | 1284912 | 1284972 | 55 | 133.3 | |
| B5 | 471826.3 | 471904.7 | 1284946 | 1285006 | 55 | 133.1 | |
| B6 | 471789.5 | 471871.6 | 1284970 | 1285031 | 55 | 138.8 | |
| B7 | 471869.8 | 471945.3 | 1285039 | 1285123 | 55 | 137.6 | |
| B8 | 471892.9 | 471968.4 | 1285014 | 1285098 | 55 | 132.5 | |
| B9 | 471914.6 | 471986.2 | 1284985 | 1285065 | 55 | 135.4 | |
| B10 | 471936.6 | 472007.8 | 1284949 | 1285025 | 55 | 133.7 | |
| A1 | 471780.2 | 471852.1 | 1285051 | 1285117 | 55 | 137.6 | |

56

**Table 8: Estimated stone resources for various plots of Brooksabad Block B**

| Block | Stone+Soil Volume $m^3$ | Stone Volume $m^3$ | Soil Volume $m^3$ | Pictorial representation of the plots (yellow and blue colour represent soil and stone volume respectively) |
|---|---|---|---|---|
| B1 | 195151 | 186525 | 8626 |  |
| B2 | 194945 | 185434 | 9511 |  |
| B3 | 175837 | 165729 | 10108 |  |

| | | | | |
|---|---|---|---|---|
| B4 | 172395 | 166285 | 6110 |  |
| B5 | 179374 | 169323 | 10051 |  |
| B6 | 195685 | 180625 | 15060 |  |
| B7 | 186897 | 174312 | 12585 |  |

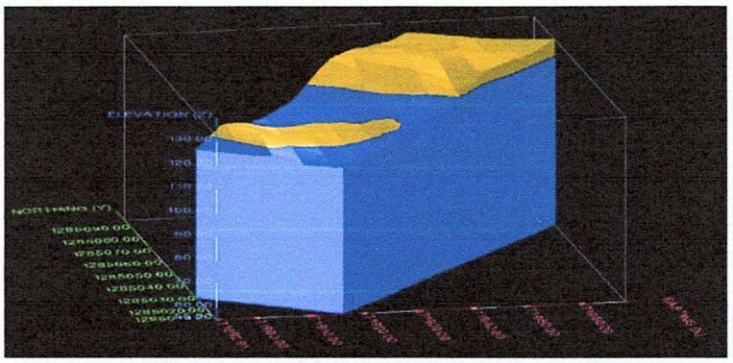
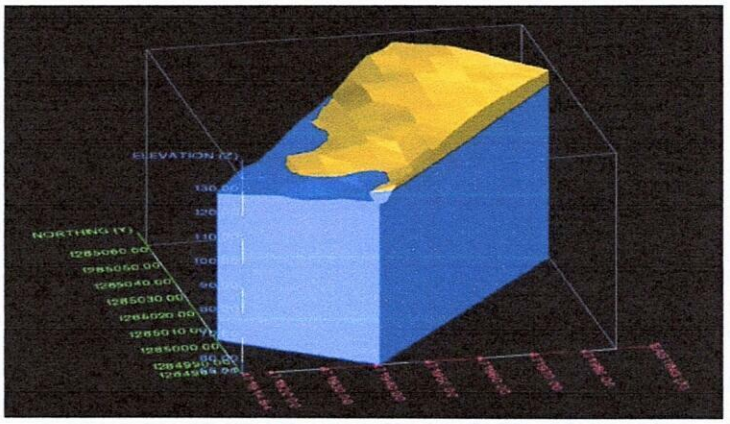
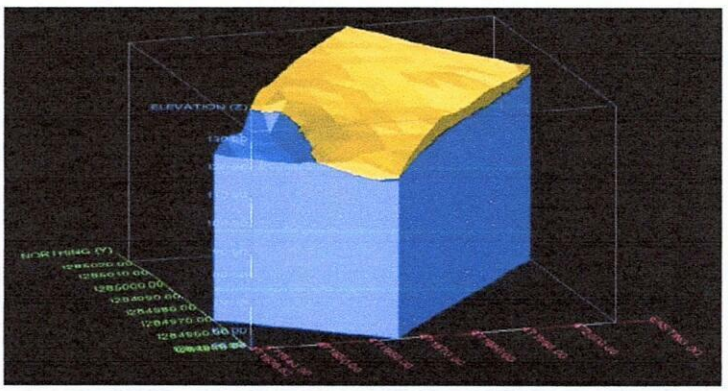
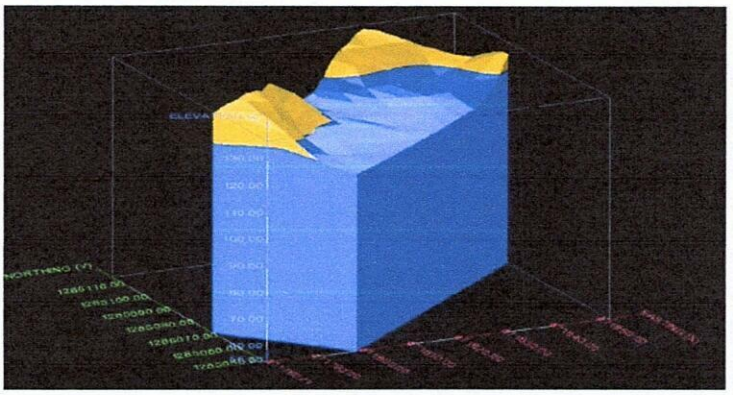
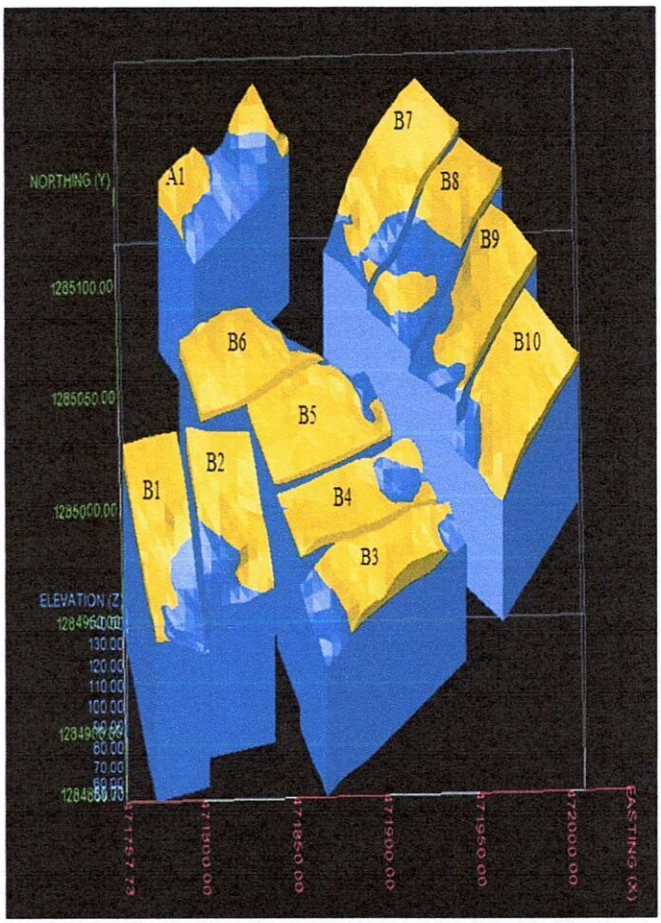
| | | | | |
|---|---|---|---|---|
| B8 | 173369 | 167835 | 5534 |  |
| B9 | 185057 | 174129 | 10928 |  |
| B10 | 179176 | 165066 | 14110 |  |
| A1 | 143145 | 140439 | 2706 |  |

**Table 9:Summarized results of Estimated resources of stone volume at Brooksabad Block B**

| Block | Stone+Soil Volume $m^3$ | Stone Volume $m^3$ (shown in Blue) | Soil Volume $m^3$ (shown in Yellow) | Pictorial representation of the Block |
|---|---|---|---|---|
| B1 | 195151 | 186525 | 8626 |  |
| B2 | 194945 | 185434 | 9511 | |
| B3 | 175837 | 165729 | 10108 | |
| B4 | 172395 | 166285 | 6110 | |
| B5 | 179374 | 169323 | 10051 | |
| B6 | 195685 | 180625 | 15060 | |
| B7 | 186897 | 174312 | 12585 | |
| B8 | 173369 | 167835 | 5534 | |
| B9 | 185057 | 174129 | 10928 | |
| B10 | 179176 | 165066 | 14110 | |
| A1 | 143145 | 140439 | 2706 | |
| Total | 1981031 | 1875702 | 105329 | |

60

# 5.0 STUDY OF MIDDLE AND NORTH ANDAMAN

Altogether, in North & Middle Andaman Islands, there were 26 quarries (plots) identified. These are scatted in four different parts of the district. These areas belong to Harinagar (Mayabunder Tehsil), Shyamnagar (Diglipur Tehsil), Panchawati (Rangat Tehsil) and Madhupur (Diglipur Tehsil) villages. The selected areas have limited spatial extent, recognizable topographic expressions, small hillocks, mounds, ridges over shorter intervals having narrow depressions etc. Mainly earth and stone boulders are being extracted from these areas. Some parts of these quarries were already excavated. Quarrying of these areas is not exactly mining but is more of like digging and levelling. This would ultimately result in getting flat land bounded by hillocks having a gradient of 45 degree angle The selected quarry areas were demarcated by Govt. officials and labeled off at different locations. Based on these levels, different plots each of size 0.25 hectares were carved out. These quarries are allotted partly to the government agencies. The quarry plan for the above quarries were approved by the competent authority. The APWD authority wants that IIT study team carry out the resource estimation for individual plots in these areas. Since, no baseline data were available, topographic survey and drilling works for generating data were allocated to Subudhi Consultants, a local agency in the area.

## 5.1 Resource Estimation at Harinagar

A total of 2.00 hectares was identified at Harinagar village for quarrying without blasting. The subject land is free from all encumbrances. The selected area is located more than 500 meters from any educational Institutions, health Institutions or residential areas. The proposed quarry area contains 8 different plots each having 0.25hectare size of land. These plots are identified as A, B, C, D, E, F, G &H. Figure 9 presents a surface plan of the area. Before the resource estimation, topography survey, and soil depth measurements using drilling and from exposed faces were performed. Tables 10 and 11 show the instances of topographic survey records at certain locations of the area by Subudhi Consultants using TOTAL STATION, and soil cover measurements using drilling respectively.

61

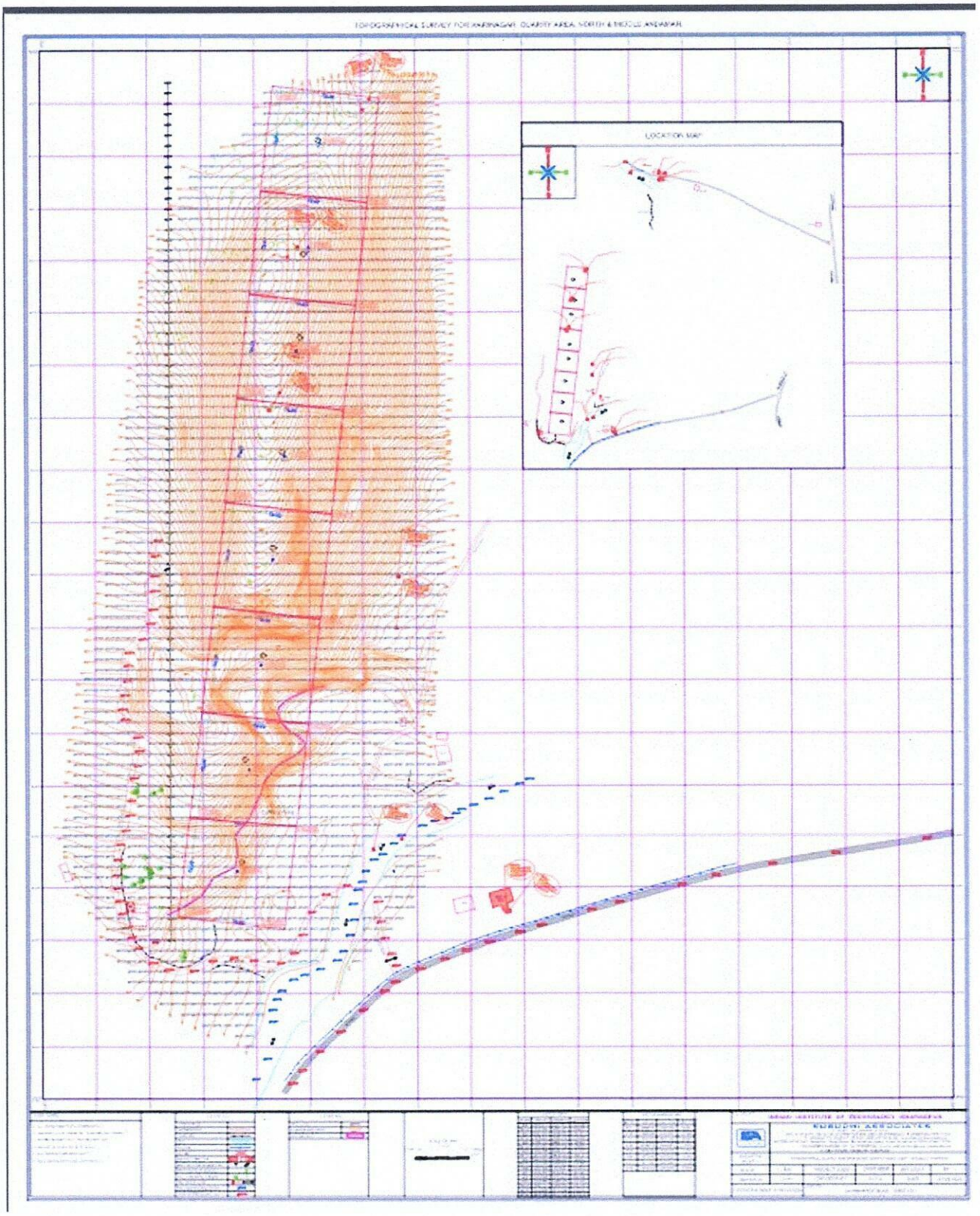



**Figure 9: Study area at Harinagar village with identified plots**

**Table 10: A snapshot of topographic survey records in a portion of the area generated by Subudhi consultants**

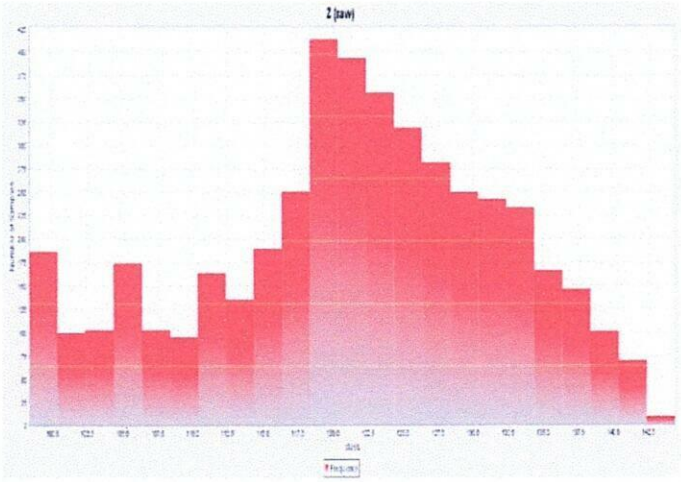
| HARI NAGAR QUARRY | | | | |
|---|---|---|---|---|
| Chainage | Offset | X(Easting) | Y(Northing) | Z(Elevation) |
| 0 | 50 | 19785 | 29375 | 97.844098 |
| 0 | 55 | 19790 | 29375 | 97.966695 |
| 5 | 0 | 19735 | 29380 | 105.760574 |
| 5 | 5 | 19740 | 29380 | 103.921348 |
| 5 | 10 | 19745 | 29380 | 102.264171 |
| 5 | 15 | 19750 | 29380 | 101.031929 |
| 5 | 20 | 19755 | 29380 | 101.376092 |
| 5 | 25 | 19760 | 29380 | 101.022891 |
| 5 | 30 | 19765 | 29380 | 99.507154 |
| 5 | 35 | 19770 | 29380 | 98.730845 |
| 5 | 40 | 19775 | 29380 | 98.15406 |
| 5 | 45 | 19780 | 29380 | 97.589403 |
| 5 | 50 | 19785 | 29380 | 97.793336 |
| 5 | 55 | 19790 | 29380 | 97.827 |
| 10 | 0 | 19735 | 29385 | 107.117842 |
| 10 | 5 | 19740 | 29385 | 104.392196 |
| 10 | 10 | 19745 | 29385 | 102.640307 |
| 10 | 15 | 19750 | 29385 | 101.761241 |
| 10 | 20 | 19755 | 29385 | 102.359148 |
| 10 | 25 | 19760 | 29385 | 101.678223 |

**Table 11: : A few examples of drill hole data generated by Subudhi consultants**

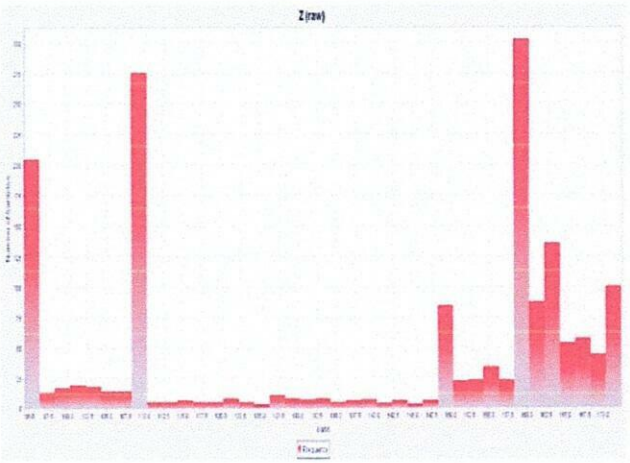
| BLOCK - A | | | | |
|---|---|---|---|---|
| NO. | X | Y | z | Termination Depth in (m) |
| 1 | 19804.607 | 29755.887 | 175.564 | 16.00 |
| BLOCK - B | | | | |
| NO. | X | Y | z | Termination Depth in (m) |
| 2 | 19799.679 | 29706.086 | 185.616 | 14.00 |
| BLOCK - C | | | | |
| NO. | X | Y | z | Termination Depth in (m) |
| 3 | 19794.405 | 29656.442 | 180.427 | 17.00 |
| BLOCK - D | | | | |
| NO. | X | Y | z | Termination Depth in (m) |
| 4 | 19788.741 | 29606.853 | 172.601 | 13.00 |
| BLOCK - E | | | | |
| NO. | X | Y | z | Termination Depth in (m) |
| 5 | 19784.639 | 29556.776 | 162.759 | 13..00 |
| BLOCK - F | | | | |
| NO. | X | Y | z | Termination Depth in (m) |
| 6 | 19775.851 | 29507.142 | 124.333 | 15.00 |

Figure 10 shows the summary statistics of surface elevation and stone surface elevation at Harinagar study area. Total 1028 TOTAL STATION's observations were used to generate the surface elevation statistics. On the other hand, 1660 soil depth observations including measurements from drilling and exposed rock faces were available for this purpose. On an average, the surface topography is at 150.69 m above the bench mark datum. Moreover, the topography level varies from 96.58 m to 192.36 m. The mean stone surface elevation is at 138.89 m RL indicating an average soil cover depth of 12.0 m. Figures 11 and 12 display surface topography map and stone surface map respectively. Figure 13 presents the merged map of the above two elevation maps laid out with drill holes. It can be seen that surface topography is steeply dipping towards east to west. Table 12 shows the coordinates of the eight plots in Harinagar area. The merged map was interested with the identified plots to calculate the stone and soil volumes as in earlier case.

Table 13 presents the estimated volumes of various plots in the area. Total volume and individual plots' volume are summarized in Table 14




(a) Histogram plot of surface elevation data




(b) Histogram plot of stone surface elevation data

| File | Surface Harinagar.str |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 1028 |
| Minimum value | 96.589000 |
| Maximum value | 191.326000 |
| | Ungrouped Data |
| Mean | 150.695499 |
| Median | 162.114000 |
| Geometric Mean | 147.507520 |
| Variance | 877.689662 |
| Standard Deviation | 29.625828 |
| Coefficient of variation | 0.196594 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 877.689662 |
| Moment 3 About Arithmetic Mean | -12712.870998 |
| Moment 4 About Arithmetic Mean | 1367146.404770 |
| Skewness | -0.488914 |
| Kurtosis | 1.774733 |
| Natural Log Mean | 4.993879 |
| Log Variance | 0.045016 |
| 10.0 Percentile | 103.898000 |
| 20.0 Percentile | 117.146000 |
| 30.0 Percentile | 130.654500 |
| 40.0 Percentile | 146.478000 |
| 50.0 Percentile (median) | 162.114000 |
| 60.0 Percentile | 169.913500 |
| 70.0 Percentile | 174.291000 |
| 80.0 Percentile | 177.317000 |
| 90.0 Percentile | 182.342000 |
| 95.0 Percentile | 186.554500 |
| 97.5 Percentile | 188.676000 |
| Trimean | 155.940625 |
| Biweight | 153.376650 |

(c) Descriptive statistics of surface elevation data

| Fil | tr |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 1660 |
| Minimum value | 94.350000 |
| Maximum value | 171.620000 |
| | Ungrouped Data |
| Mean | 138.898392 |
| Median | 154.885000 |
| Geometric Mean | 135.797548 |
| Variance | 792.832933 |
| Standard Deviation | 28.157289 |
| Coefficient of variation | 0.202719 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 792.832933 |
| Moment 3 About Arithmetic Mean | -10226.020070 |
| Moment 4 About Arithmetic Mean | 930911.143366 |
| Skewness | -0.458072 |
| Kurtosis | 1.480965 |
| Natural Log Mean | 4.911165 |
| Log Variance | 0.047268 |
| 10.0 Percentile | 94.350000 |
| 20.0 Percentile | 109.330000 |
| 30.0 Percentile | 109.940000 |
| 40.0 Percentile | 138.545000 |
| 50.0 Percentile (median) | 154.885000 |
| 60.0 Percentile | 159.560000 |
| 70.0 Percentile | 159.875000 |
| 80.0 Percentile | 163.430000 |
| 90.0 Percentile | 167.575000 |
| 95.0 Percentile | 171.060000 |
| 97.5 Percentile | 171.620000 |
| Trimean | 145.275000 |
| Biweight | 141.847881 |
| MAD | 23.392119 |
| Alpha | -93.406500 |
| Sichel-t | 139.043195 |

(d) Descriptive statistics of stone surface elevation data

**Figure 10: Summary statistics of surface and stone surface elevation data: (a) histogram of surface elevation, (b) histogram of stone surface elevation, (c) descriptive statistics of surface elevation, and (d) descriptive statistics of stone surface elevation**

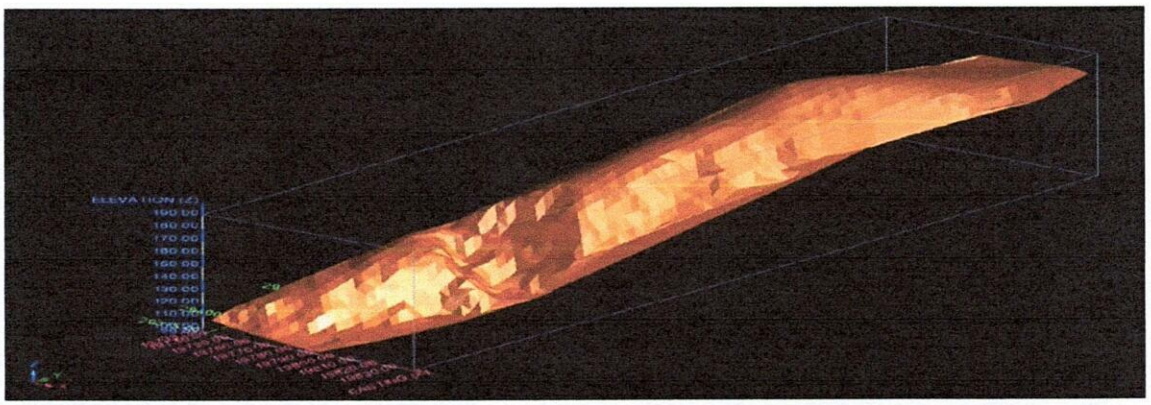


**Figure 11: Surface elevation model over the Harinagar area**

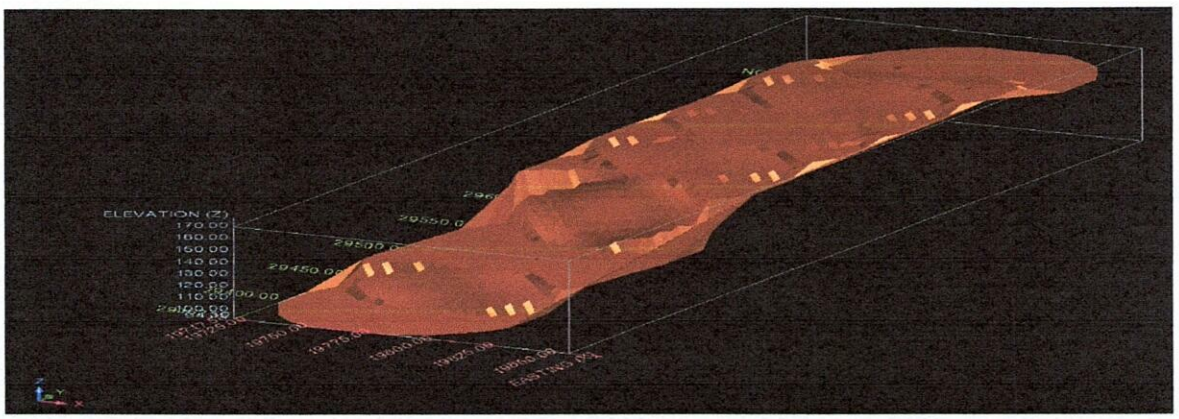



**Figure 12: Stone surface (top) level of harinagar area**

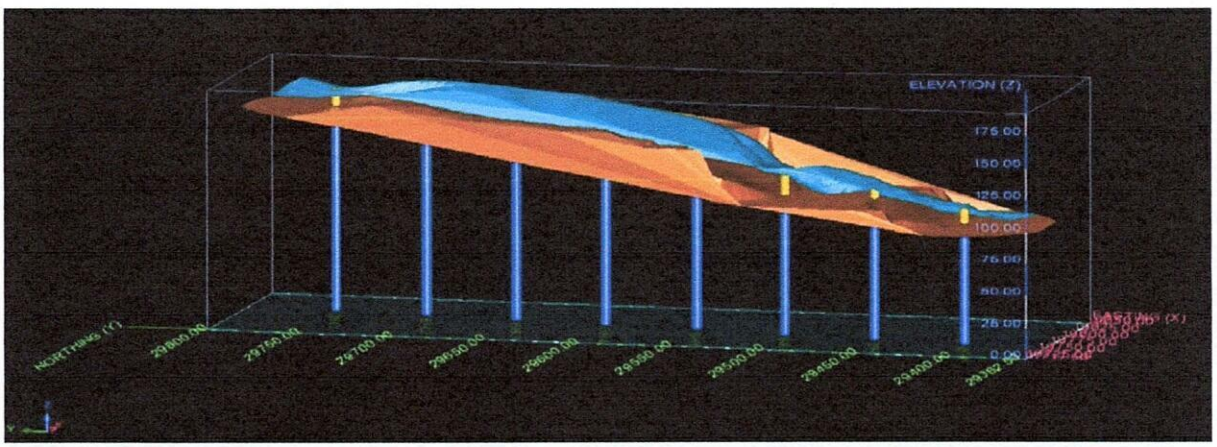
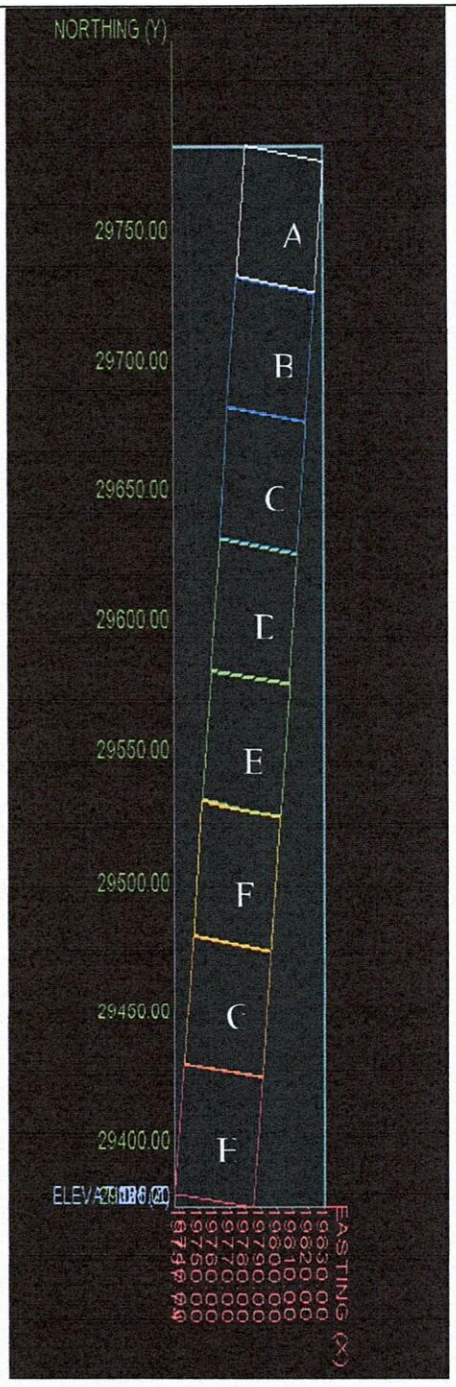



**Figure 13: Superimposition of surface elevation (cyan colour) and stone surface (golden colour) elevation. Blue color of drill hole indicates non-drilling portion of stone volume and yellow colour indicates drill hole penetration in soil.**

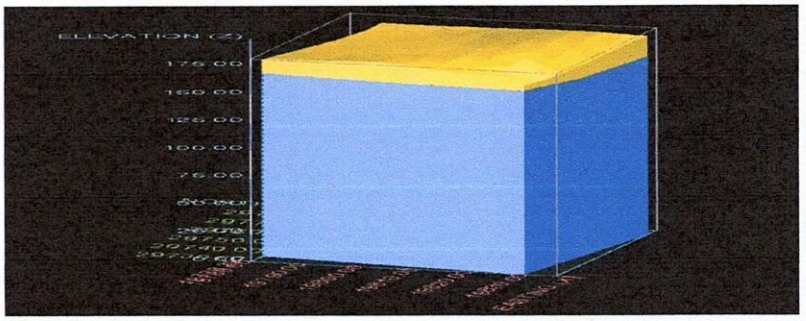
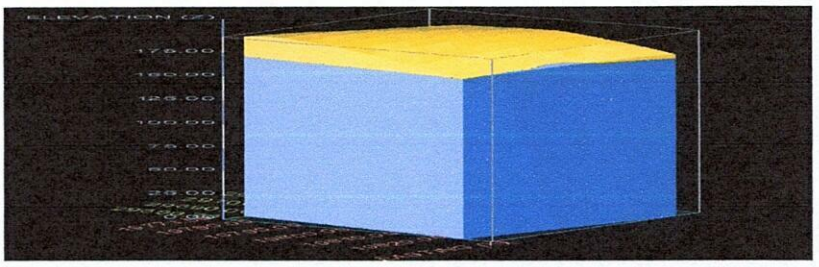
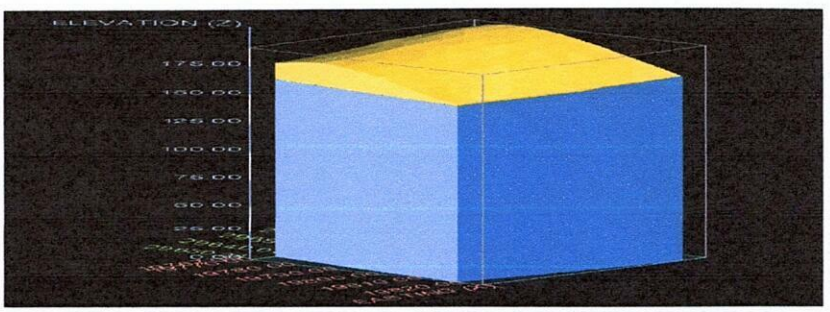
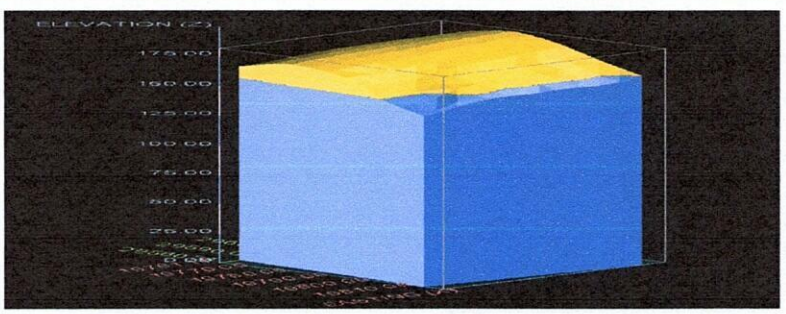
**Table 12: Spatial coordinates of eight different plots in Harinagar block**

| Block | Min X | Max X | Min Y | Max Y | Min Z | Max Z |
|---|---|---|---|---|---|---|
| A | 19778.39 | 19833.43 | 29730.6 | 29785 | 0 | 181.558 |
| B | 19771.56 | 19827.37 | 29680.78 | 29736.36 | 0 | 191.326 |
| C | 19767 | 19822 | 29630.24 | 29686.24 | 0 | 191.215 |
| D | 19761.11 | 19816.11 | 29580.34 | 29635.34 | 0 | 181.524 |
| E | 19755.59 | 19811.59 | 29529.42 | 29584.42 | 0 | 172.599 |
| F | 19750.08 | 19805.08 | 29478.73 | 29534.73 | 0 | 155.89 |
| G | 19743.88 | 19798.88 | 29429.12 | 29484.12 | 0 | 138.761 |
| H | 19737.74 | 19793.74 | 29378.7 | 29433.7 | 0 | 122.95 |



61

**Table 13: Estimated resources of stone volume in individual plots in Harinagar block (up to zero m RL)**

| Block | Stone+Soil Volume $m^3$ | Stone Volume $m^3$ | Soil Volume $m^3$ | Pictorial representation of the plots (yellow and blue colour represent soil and stone volume respectively) |
|---|---|---|---|---|
| A | 435334 | 398182 | 37152 |  |
| B | 452932 | 421398 | 31534 |  |
| C | 449790 | 411567 | 38223 |  |
| D | 422016 | 393925 | 28091 |  |

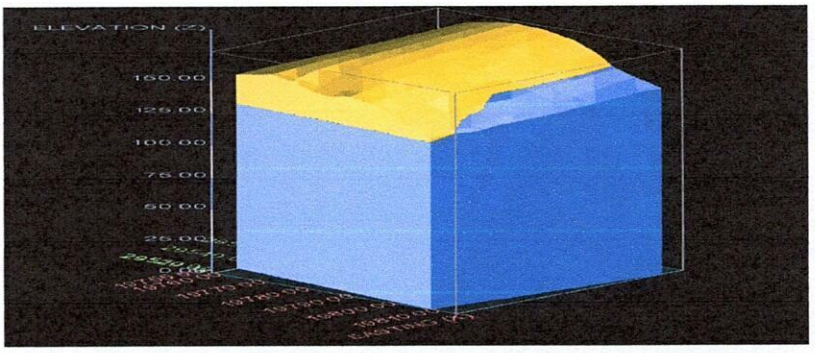
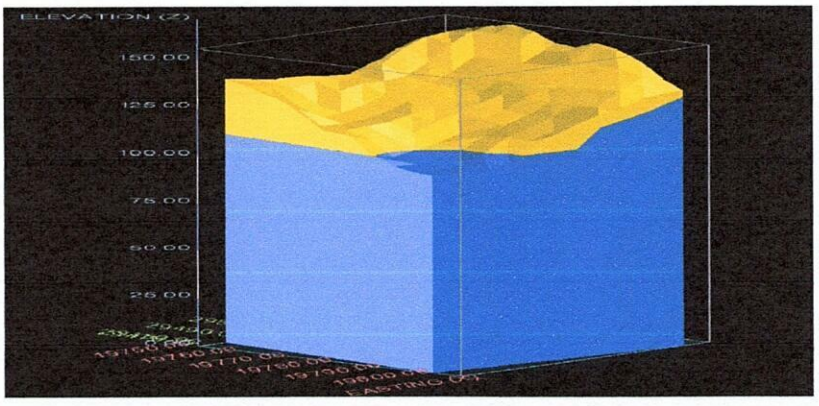
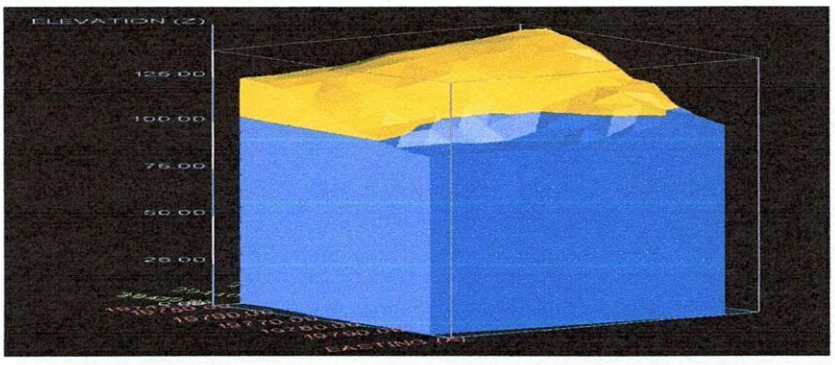
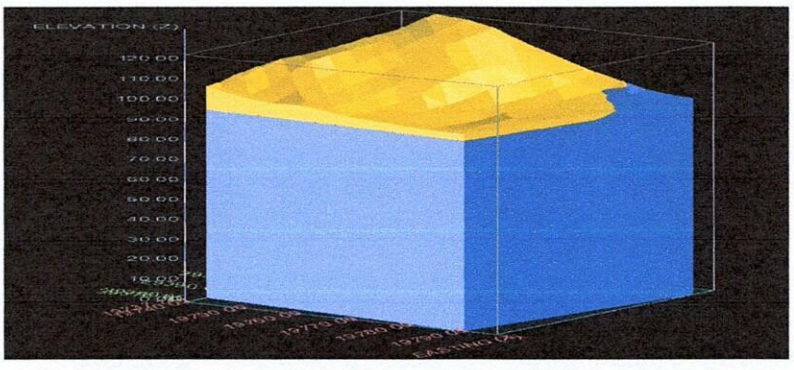
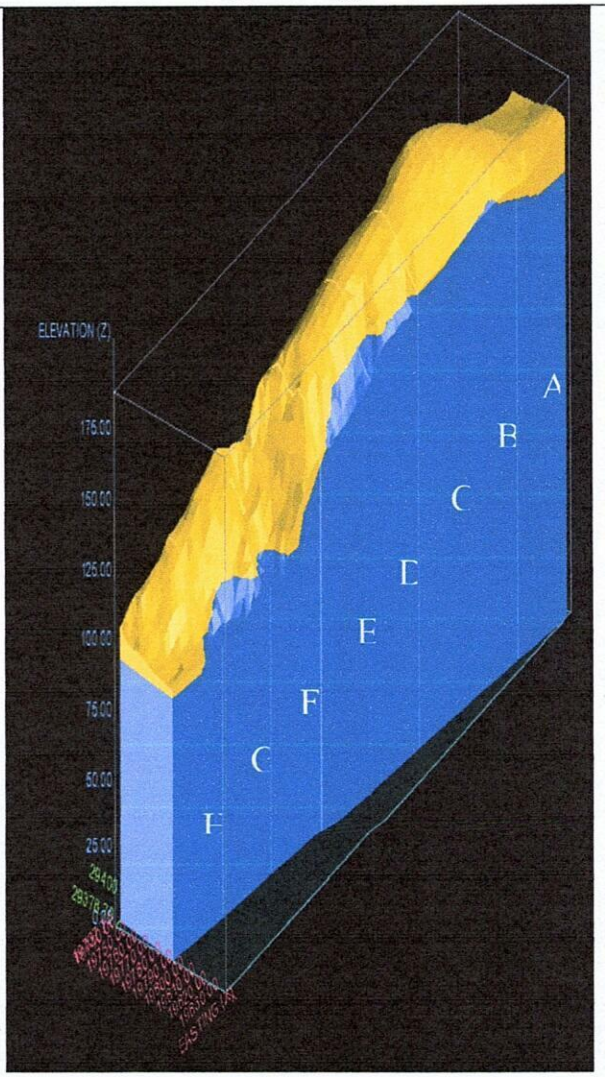
| | | | | |
|---|---|---|---|---|
| E | 395407 | 365988 | 29419 |  |
| F | 320337 | 283823 | 36514 |  |
| G | 292131 | 264509 | 27622 |  |
| H | 264656 | 241400 | 23256 |  |

**Table 14: Summarized results of Estimated resources of stone volume in Harinagar block**

| Block | Stone+Soil Volume $m^3$ | Stone Volume $m^3$ | Soil Volume $m^3$ | Pictorial representation of the plots (yellow and blue colours represent soil and stone volume respectively) |
|---|---|---|---|---|
| A | 422834 | 385682 | 37152 |   |
| B | 440432 | 408898 | 31534 | |
| C | 437290 | 399067 | 38223 | |
| D | 409516 | 381425 | 28091 | |
| E | 382907 | 353488 | 29419 | |
| F | 307837 | 271323 | 36514 | |
| G | 279631 | 252009 | 27622 | |
| H | 252156 | 228900 | 23256 | |
| Total | 3032603 | 2780792 | 251811 | |

## 5.2 Resource Estimation at Shyamnagar

An area of 1.00 hectare of Govt. land bearing Survey No.102/1/P and identified as hilly land at the village Shyamnagar was selected as the mining site for quarry operation. The mining in this site is being done without blasting. The above quarry consists of four blocks with each block having an area of 0.25 ha. The surface plan for the site is shown in Figure 14 with the plots. marked as – A, B,C and D. The quarry for the site was approved by competent authority. The land is free from all encumbrances and situated more than 500 meters away from any educational institutions, health Institutions or residential areas.

Resource estimation was done using topography survey and stone surface data generated by Subudhi consultants. Tables 15 and 16 show an instance of topographic survey records and soil cover depth measurements at certain locations using drilling respectively.

Figure 15 shows the summary statistics of surface elevation and stone surface elevation at Shyamnagar study area. Total 506 topographical survey records were available to generate the surface elevation statistics. Whereas, 1753 soil cover depth observations including measurements from drilling and exposed faces were used to generate stone surface (top) statistics. It can be noticed that the average surface topography level is at 121.11 m above the bench mark point and varies from 104.09 m to 145.06 m. The mean stone surface elevation is at 112.06 m RL indicating an average soil cover depth of 9.0 m. Figures 16 and 17 display a surface topography map and stone surface map respectively. Figure 18 presents the merged map of the area laid out with drill holes. It can be seen that surface topography is gently sloping.in the area. Table 17 shows the coordinates of the four different plots in the area. Table 18 presents the estimated volumes of various plots in the area. Total volume and individual plot volumes are summarized in Table 19.

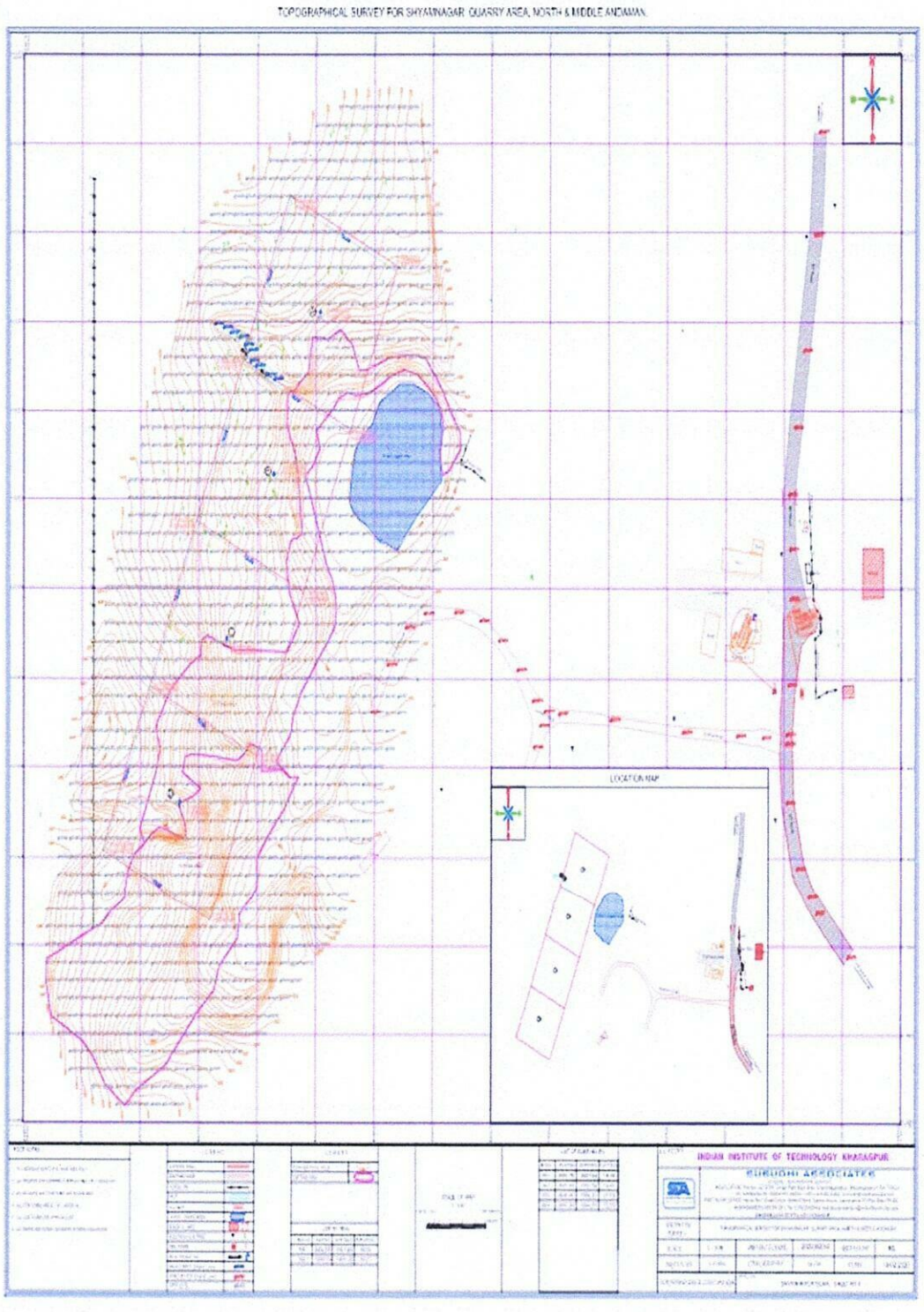


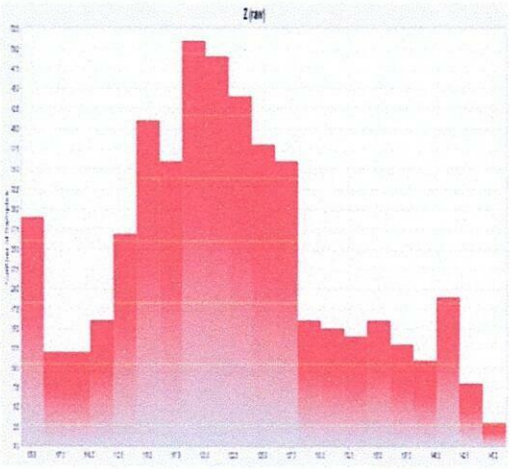

**Figure 14: Study area at Shyamnagar village with identified plots**

**Table 15: A snapshot of topographic survey records in a portion of the Syamnagar area generated by Subudhi consultants**

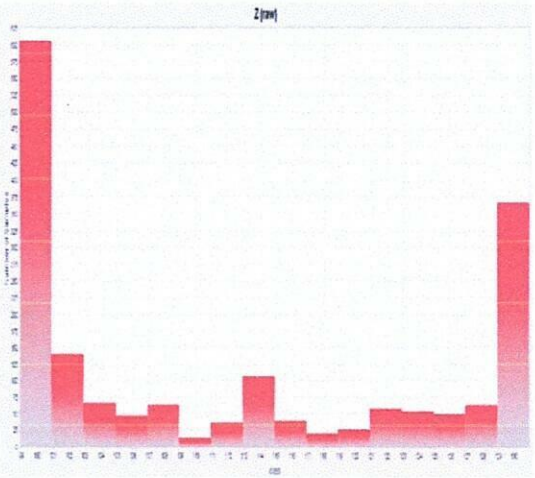
| LEVEL BOOK (SHYAM NAGAR QUARRY) | | | | |
|---|---|---|---|---|
| Chainage | Offset | X(Easting) | Y(Northing) | Z(Elevation) |
| 0 | 45 | 99750.000 | 119905.000 | 119.363 |
| 0 | 50 | 99755.000 | 119905.000 | 117.136 |
| 5 | 35 | 99740.000 | 119910.000 | 129.092 |
| 5 | 40 | 99745.000 | 119910.000 | 126.961 |
| 5 | 45 | 99750.000 | 119910.000 | 124.089 |
| 5 | 50 | 99755.000 | 119910.000 | 119.948 |
| 5 | 55 | 99760.000 | 119910.000 | 117.243 |
| 10 | 20 | 99725.000 | 119915.000 | 136.766 |
| 10 | 25 | 99730.000 | 119915.000 | 134.149 |
| 10 | 30 | 99735.000 | 119915.000 | 131.972 |
| 10 | 35 | 99740.000 | 119915.000 | 128.528 |
| 10 | 40 | 99745.000 | 119915.000 | 126.817 |
| 10 | 45 | 99750.000 | 119915.000 | 125.244 |
| 10 | 50 | 99755.000 | 119915.000 | 122.802 |
| 10 | 55 | 99760.000 | 119915.000 | 116.406 |
| 15 | 10 | 99715.000 | 119920.000 | 141.286 |
| 15 | 15 | 99720.000 | 119920.000 | 140.411 |
| 15 | 20 | 99725.000 | 119920.000 | 135.884 |
| 15 | 25 | 99730.000 | 119920.000 | 133.946 |

**Table 16: A few examples of drill hole data generated by Subudhi consultants in shyamnagar block**

| BORE HOLE CO-ODINATES | | | | |
|---|---|---|---|---|
| BLOCK - A | | | | Termination depth |
| NO. | X | Y | Z | |
| 1 | 99801.758 | 120077.606 | 117.919 | 19 |
| BLOCK - B | | | | |
| NO. | X | Y | | |
| 2 | 99781.802 | 120031.768 | 114.959 | 14 |
| BLOCK - C | | | | |
| NO. | X | Y | | |
| 3 | 99761.843 | 119985.932 | 121.83 | 8.5 |
| BLOCK - D | | | | |
| NO. | X | Y | | |
| 4 | 99741.884 | 119940.101 | 136.787 | 6 |



(b) Histogram plot of surface elevation data



(a) Histogram plot of stone surface elevation data

| File | Shyam Nagar/surface Shyamnagar.str |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 506 |
| Minimum value | 104.099000 |
| Maximum value | 145.069000 |
| | Ungrouped Data |
| Mean | 122.119247 |
| Median | 121.166500 |
| Geometric Mean | 121.747262 |
| Variance | 91.788414 |
| Standard Deviation | 9.580627 |
| Coefficient of variation | 0.078453 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 91.788414 |
| Moment 3 About Arithmetic Mean | 278.871124 |
| Moment 4 About Arithmetic Mean | 22289.619006 |
| Skewness | 0.317119 |
| Kurtosis | 2.645617 |
| Natural Log Mean | 4.801947 |
| Log Variance | 0.006081 |
| 10.0 Percentile | 109.971000 |
| 20.0 Percentile | 114.424000 |
| 30.0 Percentile | 117.127500 |
| 40.0 Percentile | 119.074000 |
| 50.0 Percentile (median) | 121.166500 |
| 60.0 Percentile | 123.629500 |
| 70.0 Percentile | 126.001000 |
| 80.0 Percentile | 129.438500 |
| 90.0 Percentile | 136.612000 |
| 95.0 Percentile | 140.542000 |
| 97.5 Percentile | 141.893000 |
| Trimean | 121.305250 |
| Biweight | 121.444616 |
| MAD | 5.859500 |
| Alpha | -80.479419 |
| Sichel-t | 122.117287 |

(d) Descriptive statistics of surface elevation data

| File | Shyam Nagar/soil Bottom Survey |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 1753 |
| Minimum value | 98.919000 |
| Maximum value | 130.787000 |
| | Ungrouped Data |
| Mean | 112.060757 |
| Median | 107.312000 |
| Geometric Mean | 111.336082 |
| Variance | 166.227264 |
| Standard Deviation | 12.892915 |
| Coefficient of variation | 0.115053 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 166.227264 |
| Moment 3 About Arithmetic Mean | 804.924318 |
| Moment 4 About Arithmetic Mean | 40049.488878 |
| Skewness | 0.375579 |
| Kurtosis | 1.449414 |
| Natural Log Mean | 4.712553 |
| Log Variance | 0.012841 |
| 10.0 Percentile | 98.919000 |
| 20.0 Percentile | 99.081000 |
| 30.0 Percentile | 99.837500 |
| 40.0 Percentile | 101.935000 |
| 50.0 Percentile (median) | 107.312000 |
| 60.0 Percentile | 114.106500 |
| 70.0 Percentile | 123.124000 |
| 80.0 Percentile | 129.403500 |
| 90.0 Percentile | 130.787000 |
| 95.0 Percentile | 130.787000 |
| 97.5 Percentile | 130.787000 |
| Trimean | 110.148500 |
| Biweight | 111.329838 |
| MAD | 12.210838 |
| Alpha | -94.248370 |
| Sichel-t | 112.052812 |

(c) Descriptive statistics of stone surface elevation data

**Figure 15: Summary statistics of surface and stone surface elevation data: (a) histogram of surface elevation, (b) histogram of stone surface elevation, (c) descriptive statistics of surface elevation, and (d) descriptive statistics of stone surface elevation**

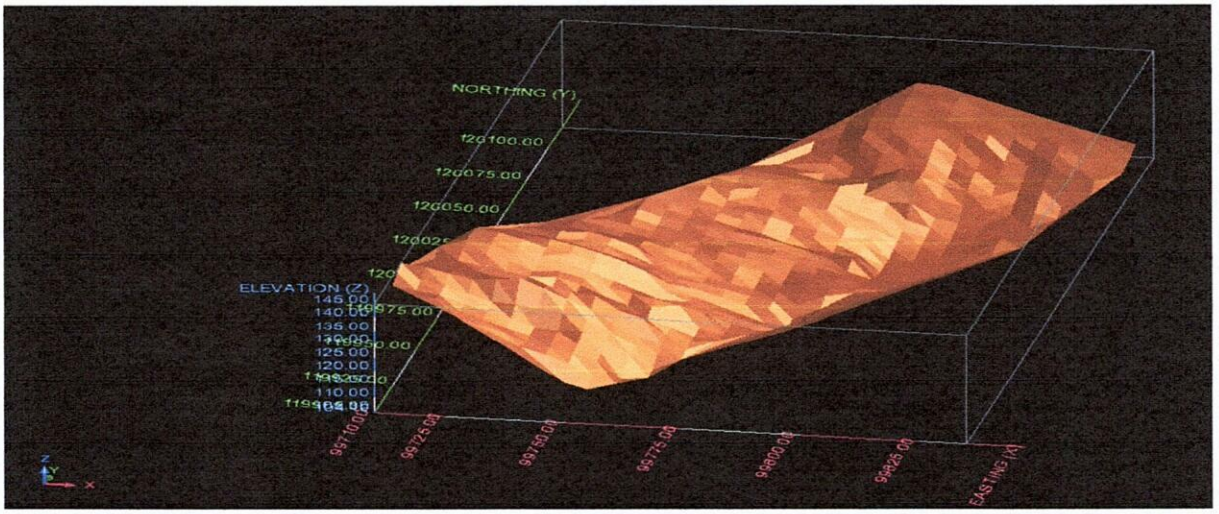



**Figure 16: Surface elevation model over the Shyamnagar area**

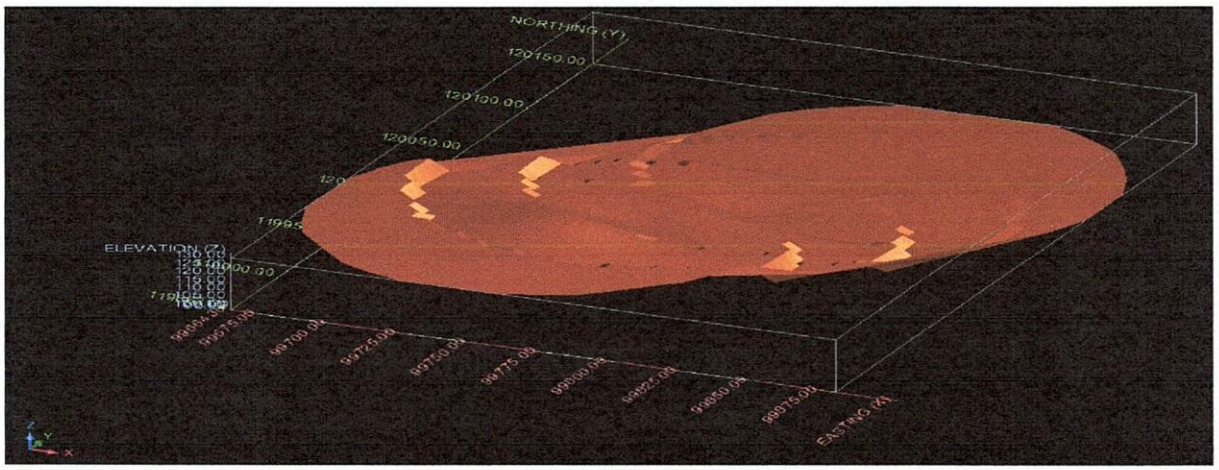



**Figure 17: Stone surface (top) level of Shyamnagar area**

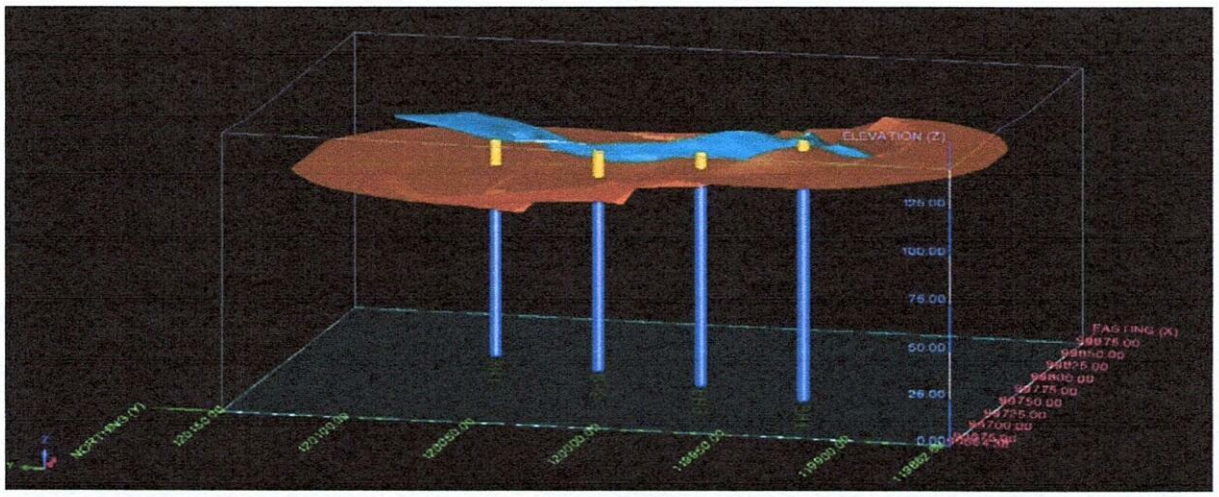



**Figure 18: Superimposition of surface elevation (cyan colour) and stone surface (golden colour) elevation. Blue color of drill hole indicates non-drilling portion of stone volume and yellow colour indicates drill hole penetration in soil.**

**Table 17: Spatial coordinates of four different plots in Shyamnagar block**

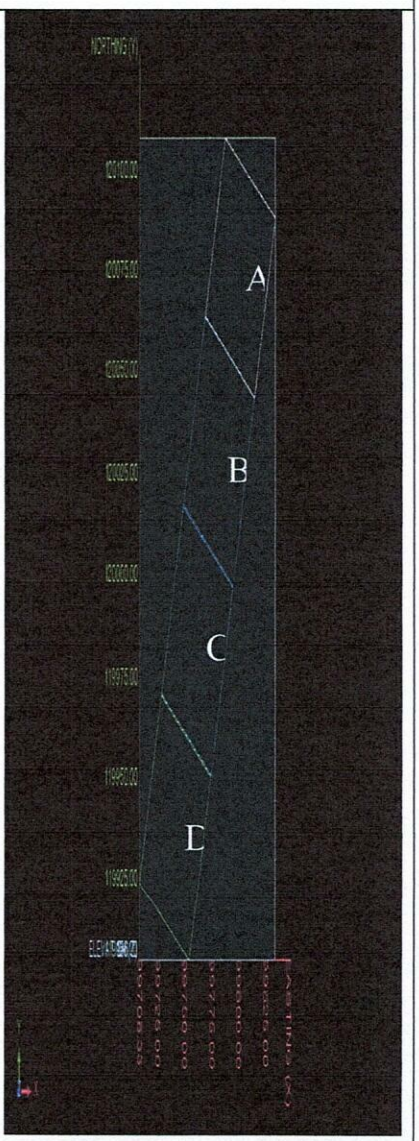
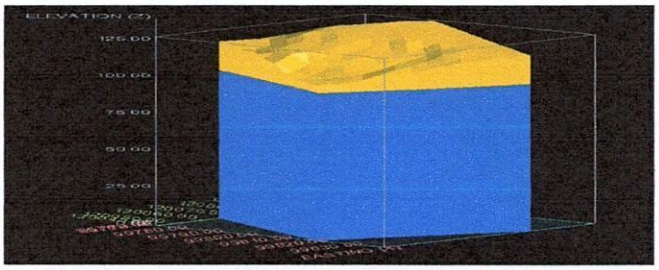
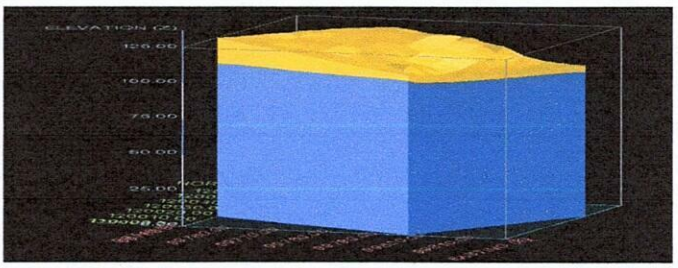
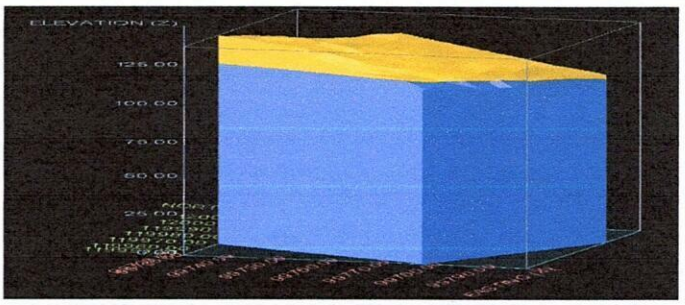
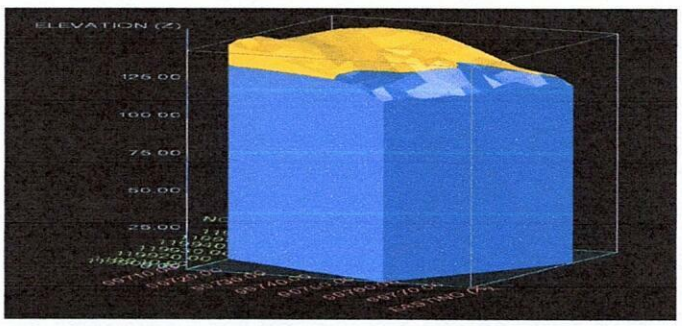
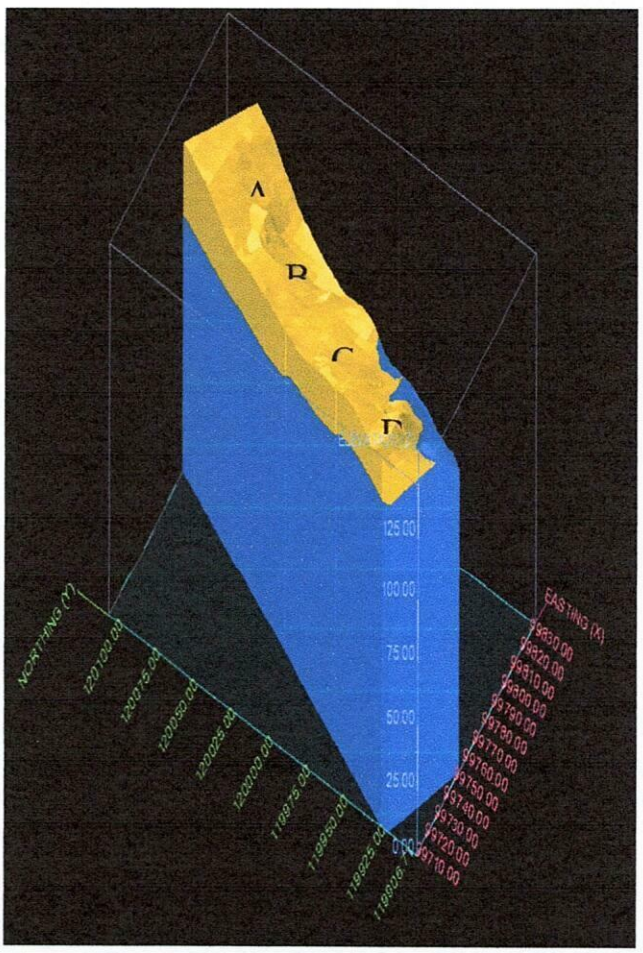
| Block | Min X | Max X | Min Y | Max Y | Min Z | Max Z | |
|---|---|---|---|---|---|---|---|
| A | 99769.023 | 99834.429 | 120045.863 | 120111.956 | 0 | 127.866 |  |
| B | 99748.882 | 99814.882 | 119999.764 | 120065.764 | 0 | 125.65 | |
| C | 99728.606 | 99794.606 | 119953.212 | 120019.212 | 0 | 138.413 | |
| D | 99710 | 99774.328 | 119906.713 | 119972.713 | 0 | 144.684 | |

**Table 18: Estimated resources of stone volume in individual plots in Shyamnagar block (upto zero m RL)**

| Block | Stone+Soil Volume $m^3$ | Stone Volume $m^3$ (shown in Blue) | Soil Volume $m^3$ (shown in Yellow) | Pictorial representation of the Block |
|---|---|---|---|---|
| A | 299173 | 249333 | 49840 |  |
| B | 287821 | 257416 | 30405 |  |
| (C | 307771 | 286322 | 21449 |  |
| D | 332497 | 318787 | 13710 |  |

77

**Table 19: Summarized results of Estimated resources of stone volume in Shyamnagar block**

| Block | Stone+Soil Volume | Stone Volume (shown in Blue) | Soil Volume (shown in Yellow) | Pictorial representation of the Block |
|---|---|---|---|---|
| A | 286673 | 236833 | 49840 |  |
| B | 275321 | 244916 | 30405 | |
| C | 295271 | 273822 | 21449 | |
| D | 319997 | 306287 | 13710 | |
| Total | 1227262 | 1111858 | 115404 | |

78

### 5.3 Resource Estimation at Panchawati

An area of 1.50 ha of Govt. land bearing Survey No.49/P was identified at Panchawati village for stone mining. The above quarry consists of six plots with each plot having an area of 0.25 ha. These plots are designated as A, B, C, D, E and F. The surface map for the above area is shown in Figure 19. The subject land is free from all encumbrances. The selected area satisfies the locational restrictions of more than 500 meters away from any educational institutions, health institutions or residential areas.

Resource estimation was done using topography survey data and soil depth data measured by Subudhi consultants. Tables 20 and 21 show instances of topographic survey records in the area, and soil cover depth measurements using drilling respectively.

Figure 20 presents the summary statistics of surface elevation and stone surface elevation at this study area. Total 797 topographical survey records were available to generate the surface elevation data statistics. Whereas, 2490 soil cover depth observations were used to generate stone surface statistics. Mean surface topography is at an elevation of 118.36 m above the bench mark point and varies from 97.43 m to 163.46 m indicating large variation in topographical landscape. The mean stone surface elevation is at 106.0 m RL suggesting an average soil cover depth of around 12.0 m. Figures 21 and 22 display surface topography map and top stone surface map respectively. Figure 23 presents the merged map of above two elevation maps laid out with the drill holes. It can be seen that surface topography is more or less flat but highly undulating. Table 22 shows the spatial coordinates of individual plots in the quarry area. Table 23 presents the estimated volumes of stone resources in the individual plots. Total resources volumes and individual plot volumes are presented in a concise format in Table 24.

79

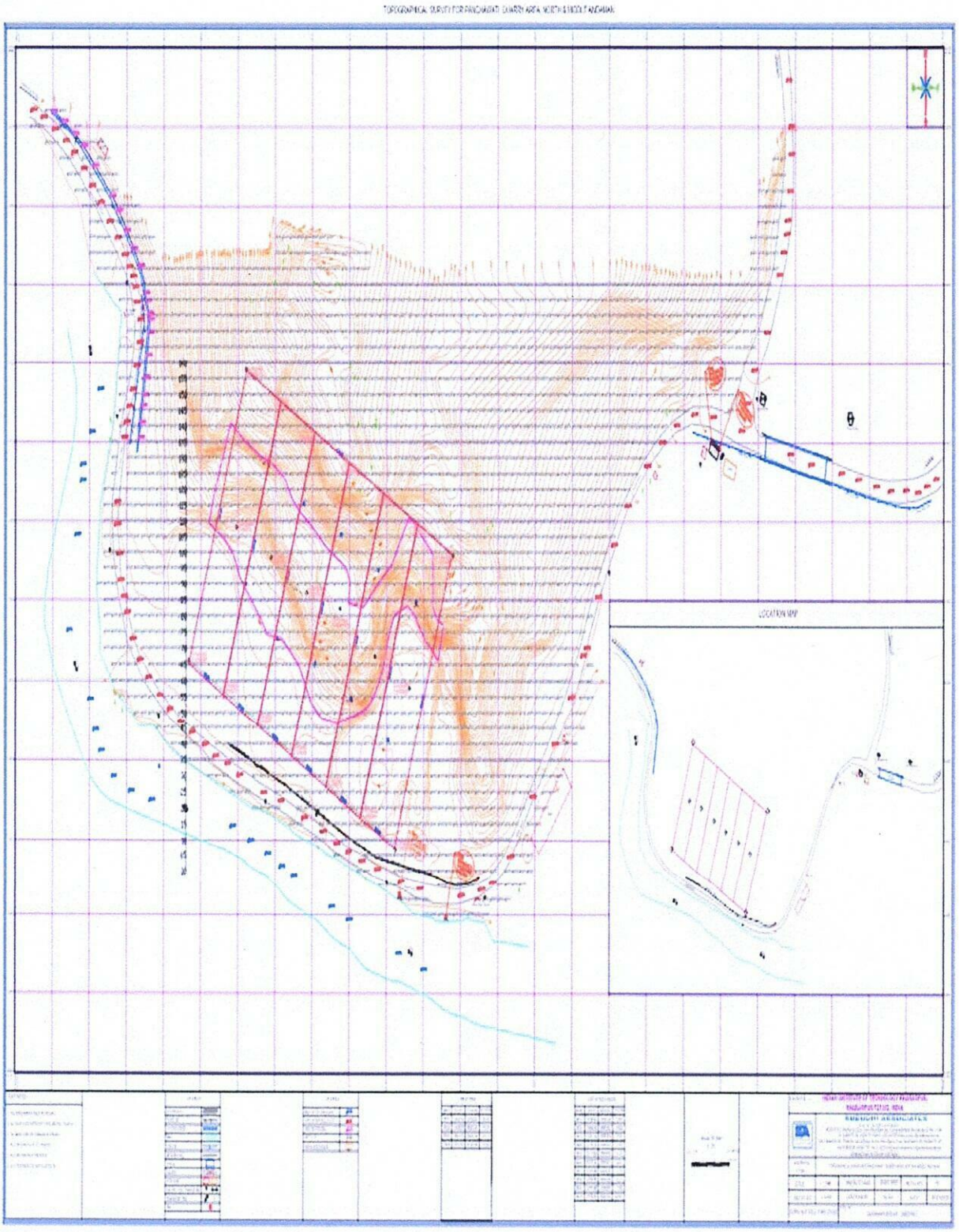



**Figure 19: Study area at Panchawati with identified plots**

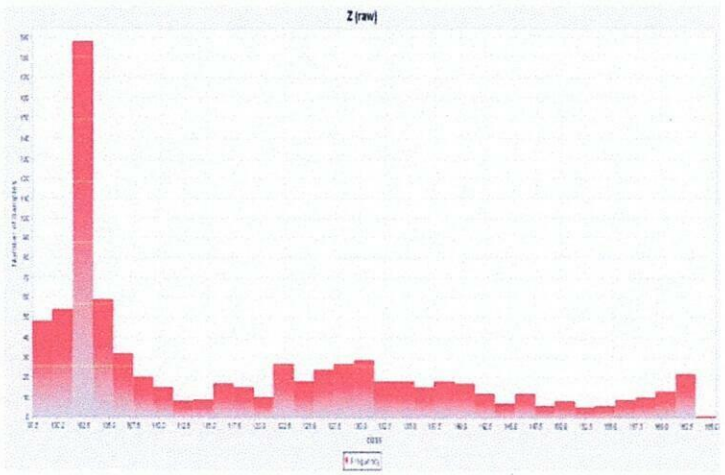
80

**Table 20: A snapshot of topographic survey records in a portion of the Panchawati generated by Subudhi consultants**

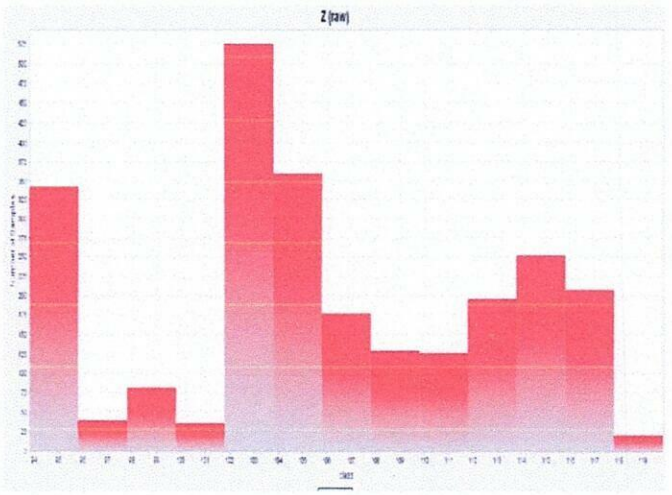
| LEVEL BOOK<br>PANCHAWATI QUARRY | | | | |
|---|---|---|---|---|
| Chainage | Offset | X(Easting) | Y(Northing) | Z(Elevation) |
| 0 | 140 | 39780 | 49865 | 102.238 |
| 5 | 120 | 39760 | 49870 | 102.028 |
| 5 | 125 | 39765 | 49870 | 102.399 |
| 5 | 130 | 39770 | 49870 | 102.448 |
| 5 | 135 | 39775 | 49870 | 102.613 |
| 5 | 140 | 39780 | 49870 | 102.664 |
| 10 | 105 | 39745 | 49875 | 101.589 |
| 10 | 110 | 39750 | 49875 | 101.815 |
| 10 | 115 | 39755 | 49875 | 102.229 |
| 10 | 120 | 39760 | 49875 | 102.310 |
| 10 | 125 | 39765 | 49875 | 102.380 |
| 10 | 130 | 39770 | 49875 | 102.452 |
| 10 | 135 | 39775 | 49875 | 102.237 |
| 10 | 140 | 39780 | 49875 | 102.353 |
| 10 | 145 | 39785 | 49875 | 102.262 |
| 15 | 95 | 39735 | 49880 | 101.691 |
| 15 | 100 | 39740 | 49880 | 102.014 |
| 15 | 105 | 39745 | 49880 | 102.106 |
| 15 | 110 | 39750 | 49880 | 102.238 |
| 15 | 115 | 39755 | 49880 | 102.177 |
| 15 | 120 | 39760 | 49880 | 100.720 |
| 15 | 125 | 39765 | 49880 | 100.292 |
| 15 | 130 | 39770 | 49880 | 99.896 |

**Table 21: : A few examples of drill hole data generated by Subudhi consultants in Panchawati block**

| BLOCK - A | | | | |
|---|---|---|---|---|
| NO. | X | Y | Z | TERMINATION DEPTH |
| 1 | 39669.437 | 49973.147 | 110.984 | 7.5m |
| BLOCK - B | | | | |
| NO. | X | Y | Z | |
| 2 | 39695.953 | 49962.264 | 112.978 | 8.0m |
| BLOCK - C | | | | |
| NO. | X | Y | Z | |
| 3 | 39719.604 | 49952.119 | 123.806 | 10.0m |
| BLOCK - D | | | | |
| NO. | X | Y | Z | |
| 4 | 39742.616 | 49942.513 | 128.294 | 12.0m |
| BLOCK - E | | | | |
| NO. | X | Y | Z | |
| 5 | 39765.704 | 49932.777 | 123.453 | 5.5m |
| BLOCK - F | | | | |
| NO. | X | Y | Z | |
| 6 | 39788.693 | 49923.129 | 100.026 | 6.0m |
| | | | | |




(b) Histogram plot of surface elevation data




(a) Histogram plot of stone surface elevation data

| File | Panchwati/surface Panchwati.str |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 797 |
| Minimum value | 97.439000 |
| Maximum value | 163.467000 |
| | Ungrouped Data |
| Mean | 118.364755 |
| Median | 109.112000 |
| Geometric Mean | 116.946819 |
| Variance | 360.048739 |
| Standard Deviation | 18.974950 |
| Coefficient of variation | 0.160309 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 360.048739 |
| Moment 3 About Arithmetic Mean | 5673.052901 |
| Moment 4 About Arithmetic Mean | 323913.836250 |
| Skewness | 0.830376 |
| Kurtosis | 2.498659 |
| Natural Log Mean | 4.761719 |
| Log Variance | 0.023361 |
| 10.0 Percentile | 100.062000 |
| 20.0 Percentile | 102.294500 |
| 30.0 Percentile | 102.788500 |
| 40.0 Percentile | 104.148500 |
| 50.0 Percentile (median) | 109.112000 |
| 60.0 Percentile | 121.623001 |
| 70.0 Percentile | 128.649500 |
| 80.0 Percentile | 135.664000 |
| 90.0 Percentile | 147.555000 |
| 95.0 Percentile | 158.356000 |
| 97.5 Percentile | 161.851500 |
| Trimean | 113.011000 |
| Biweight | 115.199958 |
| MAD | 12.953958 |
| Alpha | -97.275537 |
| Sichel-t | 118.319065 |

(c) Descriptive statistics of surface elevation data

| File | Panchwati/soil Bottom Final1.str |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 2490 |
| Minimum value | 93.800000 |
| Maximum value | 117.950000 |
| | Ungrouped Data |
| Mean | 106.009687 |
| Median | 104.980000 |
| Geometric Mean | 105.780002 |
| Variance | 48.180088 |
| Standard Deviation | 6.941188 |
| Coefficient of variation | 0.065477 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 48.180088 |
| Moment 3 About Arithmetic Mean | -54.263210 |
| Moment 4 About Arithmetic Mean | 4992.893964 |
| Skewness | -0.162257 |
| Kurtosis | 2.150885 |
| Natural Log Mean | 4.661361 |
| Log Variance | 0.004366 |
| 10.0 Percentile | 94.030000 |
| 20.0 Percentile | 101.665000 |
| 30.0 Percentile | 103.480000 |
| 40.0 Percentile | 103.750000 |
| 50.0 Percentile (median) | 104.980000 |
| 60.0 Percentile | 106.970000 |
| 70.0 Percentile | 110.910000 |
| 80.0 Percentile | 113.690000 |
| 90.0 Percentile | 115.670000 |
| 95.0 Percentile | 116.240000 |
| 97.5 Percentile | 117.080000 |
| Trimean | 106.452500 |
| Biweight | 105.874926 |
| MAD | 4.924926 |
| Alpha | -92.862000 |
| Sichel-t | 106.011059 |

(d) Descriptive statistics of stone surface elevation data

**Figure 20: Summary statistics of surface and stone surface elevation data: (a) histogram of surface elevation, (b) histogram of stone surface elevation, (c) descriptive statistics of surface elevation, and (d) descriptive statistics of stone surface elevation**

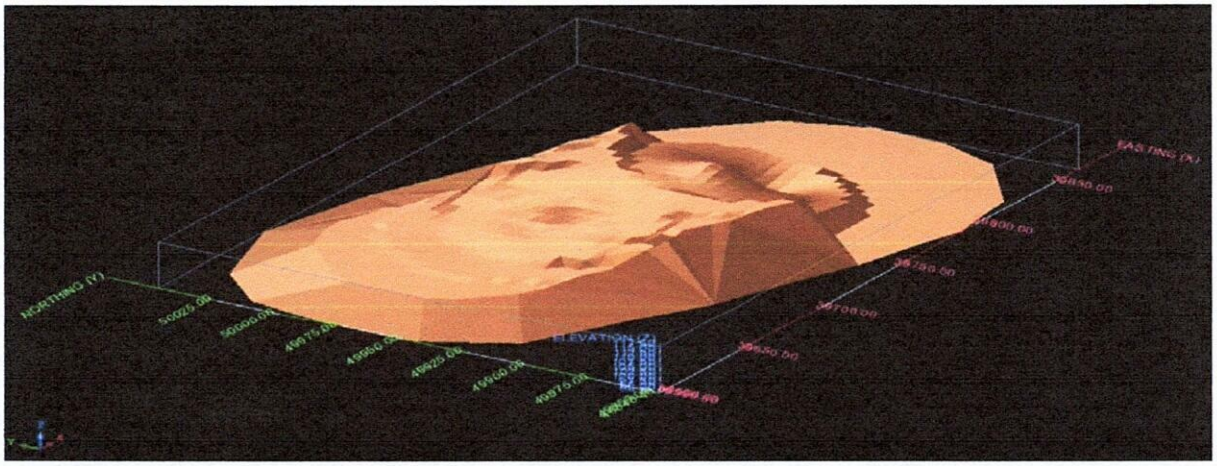


**Figure 21: Surface elevation model over the Panchawati area**

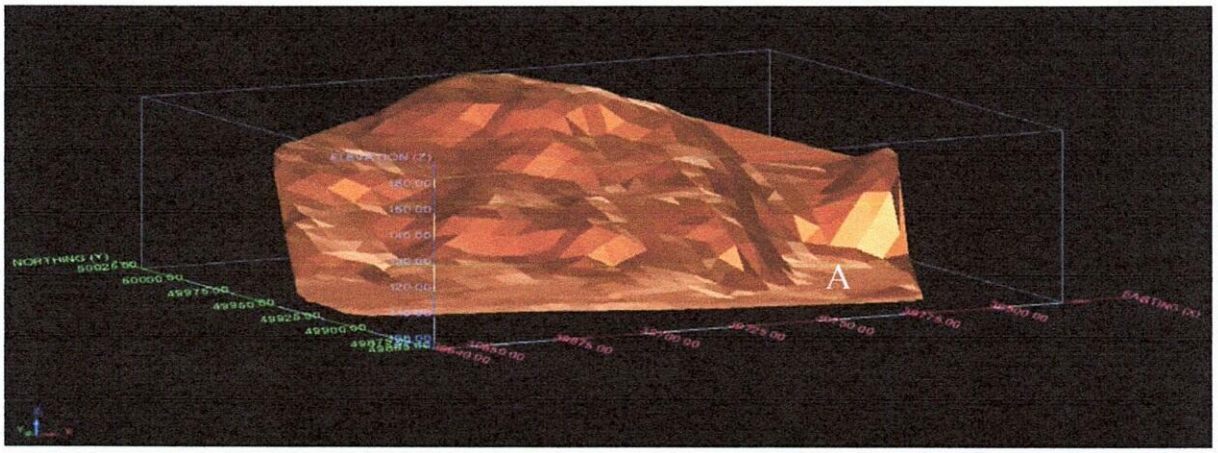



**Figure 22: Stone surface (top) level of Panchawati area**

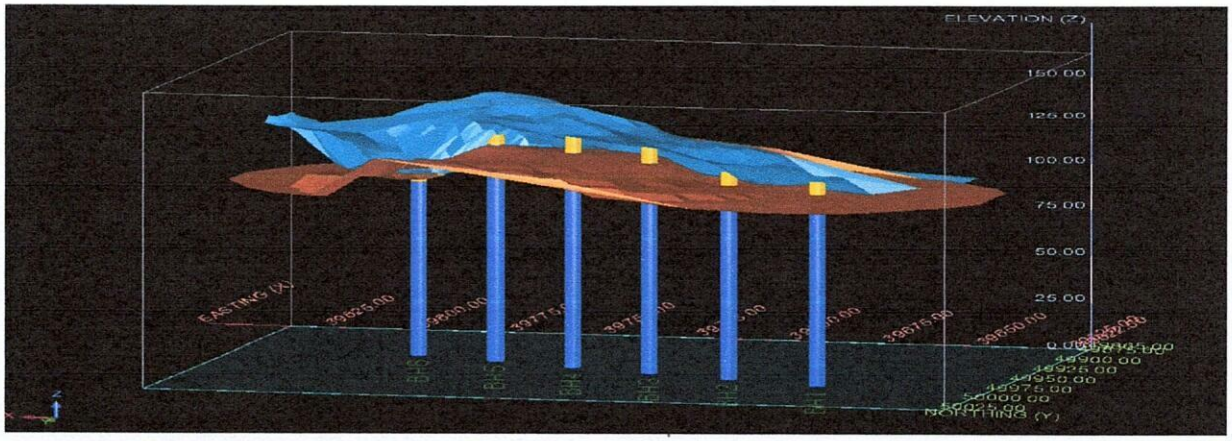
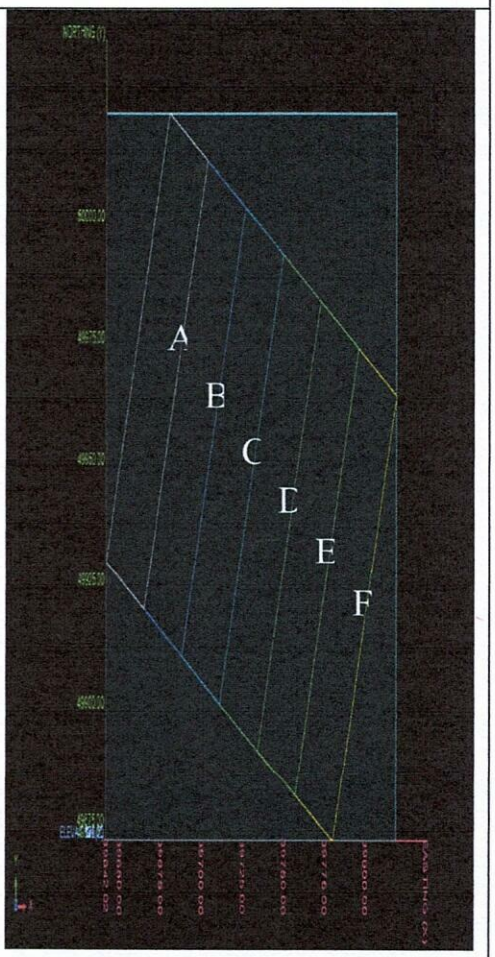



**Figure 23: Superimposition of surface elevation (cyan colour) and stone surface (golden colour) elevation. Blue color of drill hole indicates non-drilling portion of stone volume and yellow colour indicates drill hole penetration in soil.**

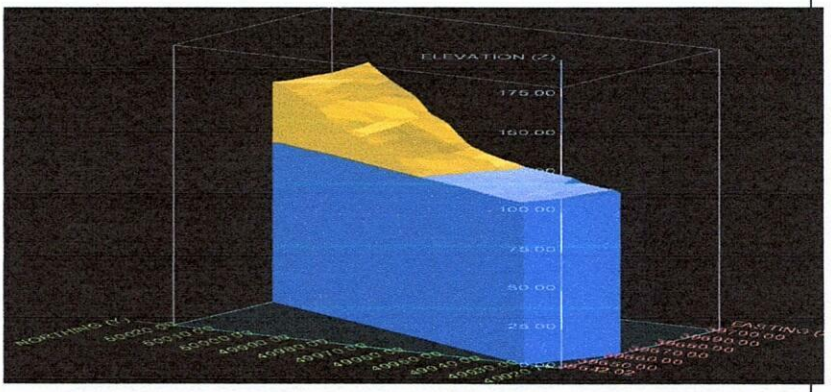
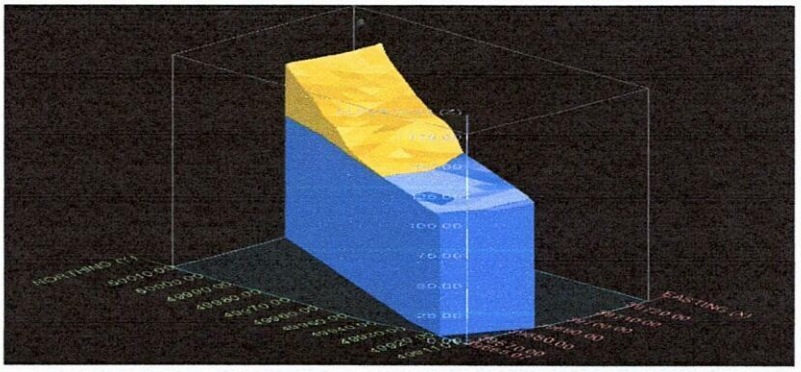
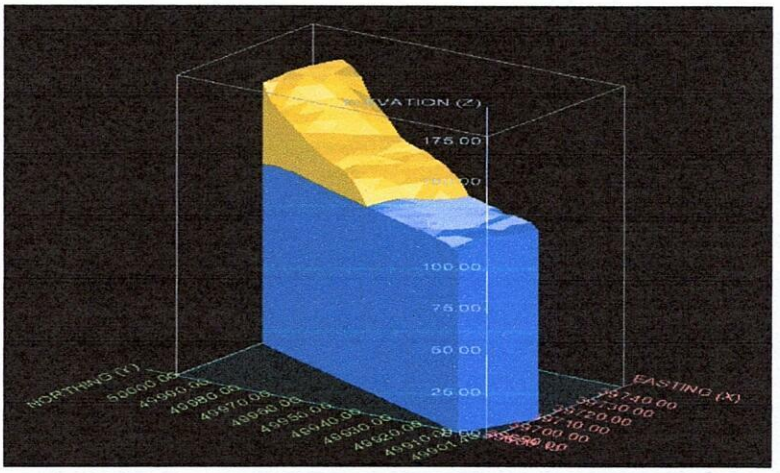
83

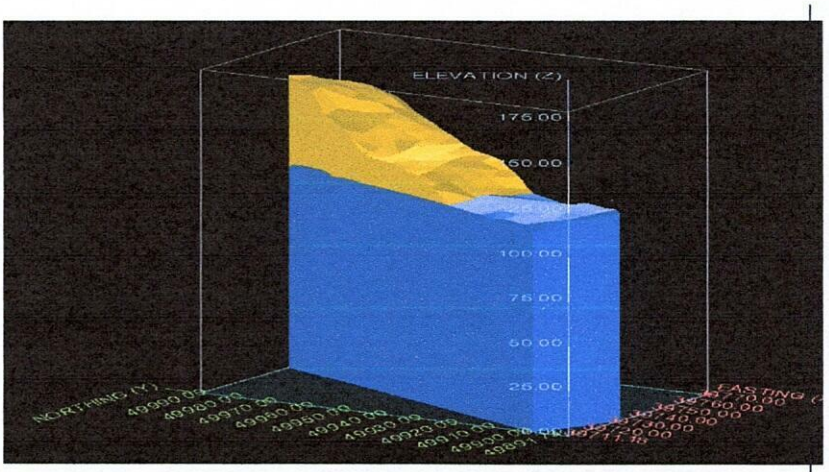
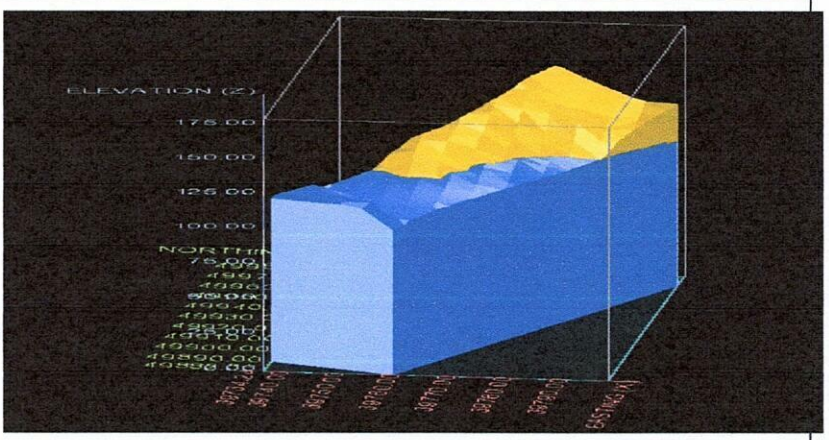
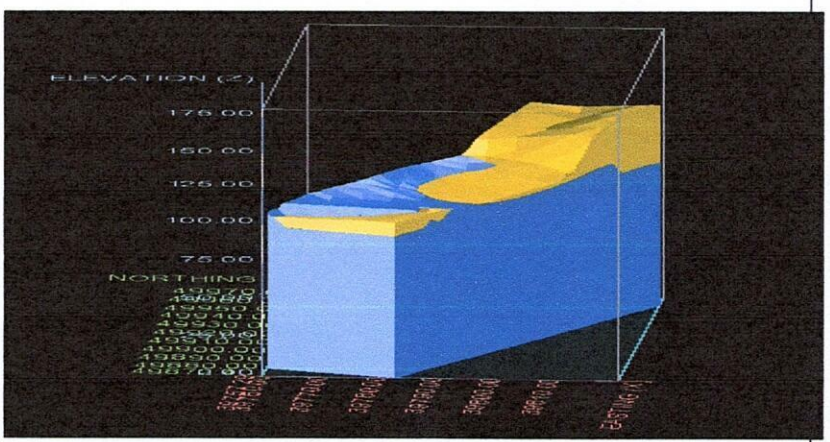
**Table 22: Spatial coordinates of four different plots in Panchawati block**

| Block | Min X | Max X | Min Y | Max Y | Min Z | Max Z | |
|---|---|---|---|---|---|---|---|
| A | 39642.02 | 39703.74 | 49920.74 | 50022.63 | 0 | 147.3 |  |
| B | 39665.07 | 39726.8 | 49911.07 | 50012.96 | 0 | 156.3 | |
| C | 39688.13 | 39749.85 | 49901.4 | 50003.29 | 0 | 162.3 | |
| D | 39711.18 | 39772.91 | 49891.73 | 49993.62 | 0 | 162.3 | |
| E | 39734.24 | 39795.96 | 49882.06 | 49983.95 | 0 | 149.7 | |
| F | 39757.29 | 39819.02 | 49872.4 | 49974.28 | 0 | 139. | |

84

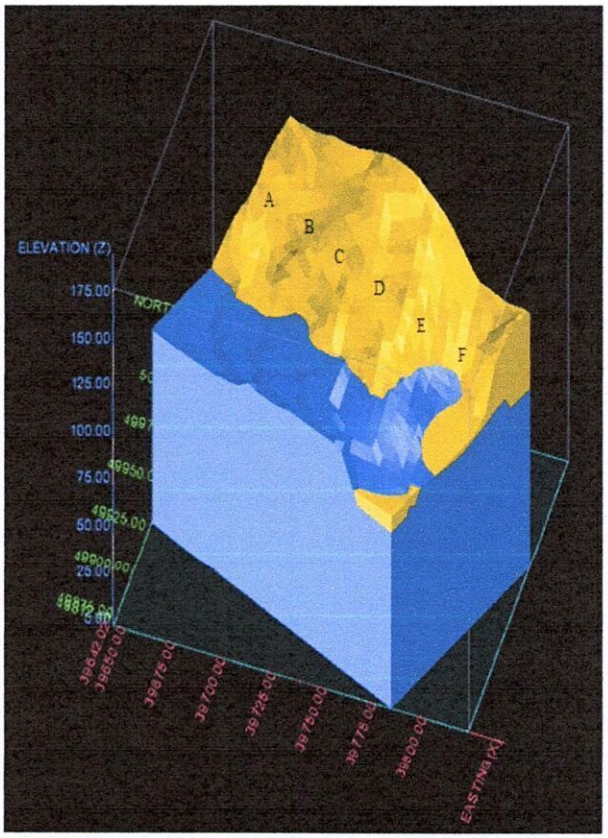
**Table 23: Estimated resources of stone volume in individual plots in Panchawati block (upto zero m RL)**

| Block | Stone+Soil Volume | Stone Volume (shown in Blue) | Soil Volume (shown in Yellow) | Pictorial representation of the Block |
|---|---|---|---|---|
| A | 286948 | 258641 | 28307 |  |
| B | 292710 | 263785 | 28925 |  |
| C | 307125 | 273678 | 33447 |  |

| | | | | |
|---|---|---|---|---|
| D | 311858 | 280088 | 31770 |   |
| E | 289751 | 270640 | 19111 |   |
| F | 268221 | 247757 | 20464 |   |

86

**Table 24: Summarized results of Estimated resources of stone volume in Panchawati block**

| Block | Stone+Soil Volume | Stone Volume (shown in Blue) | Soil Volume (shown in Yellow) | Pictorial representation of the Block |
|---|---|---|---|---|
| A | 274448 | 246141 | 28307 |  |
| B | 280210 | 251285 | 28925 | |
| C | 294625 | 261178 | 33447 | |
| D | 299358 | 267588 | 31770 | |
| E | 277251 | 258140 | 19111 | |
| F | 255721 | 235257 | 20464 | |
| Total | 1756613 | 1594589 | 162024 | |

87

### 5.4 Resource Estimation at Madhupu

In Madhupur village, an area of 2.0 hectares Govt. land bearing Survey No.49/P is identified for stone mining. The above quarry consists of eight different plots with each plot covering an area of 0.25 ha. These plots are identified as- A, B, C, D, E, F, G and H. The mining of the above quarry was approved by competent authority. The quarrying of the area is proposed to be done without use of explosive. The surface map of the above quarry area is shown in Figure 25. The subject land is free from all encumbrances. The selected area satisfies the locational restrictions of more than 500 meters from any educational institutions, health institutions or residential areas.

Resource estimation was done using topography survey data, drilling data in soil and measurements of soil cover thickness at exposed faces. Tables 25 and 26 show an instance of topographic survey measurement records in the area, and soil cover depth measurements using drilling respectively. Figure 25 presents the summary statistics of surface elevation and stone surface elevation at this study area. Total 1330 topographical survey measurements were available to generate the surface elevation data statistics. Whereas, 3181 soil cover depth observations which included drilling and exposed rock face measurements were used to generate stone surface statistics. The surface topography is at an average elevation of 112.38 m above the bench mark point. The surface elevation level varies from 102.11 m to 132.64 m indicating large variation in topographical landscape. The mean stone surface elevation is at 91.9 m RL suggesting an average soil cover depth of around 11.0 m. Figures 26 and 27 display surface topography map and top stone surface map respectively. Figure 27 presents the merged map of the above two elevation maps laid out with the drill holes. It can be seen that surface topography is relatively deep and smooth in the middle portion of the studied area. This is due to the presence of excavated mined out region in the area. Table 27 shows the spatial coordinates of individual plots in the quarry area. Table 28 presents the estimated volumes of stone resources of the individual plots in the quarry. These resource volumes along with total volume are presented in a concise format in Table 29.

88

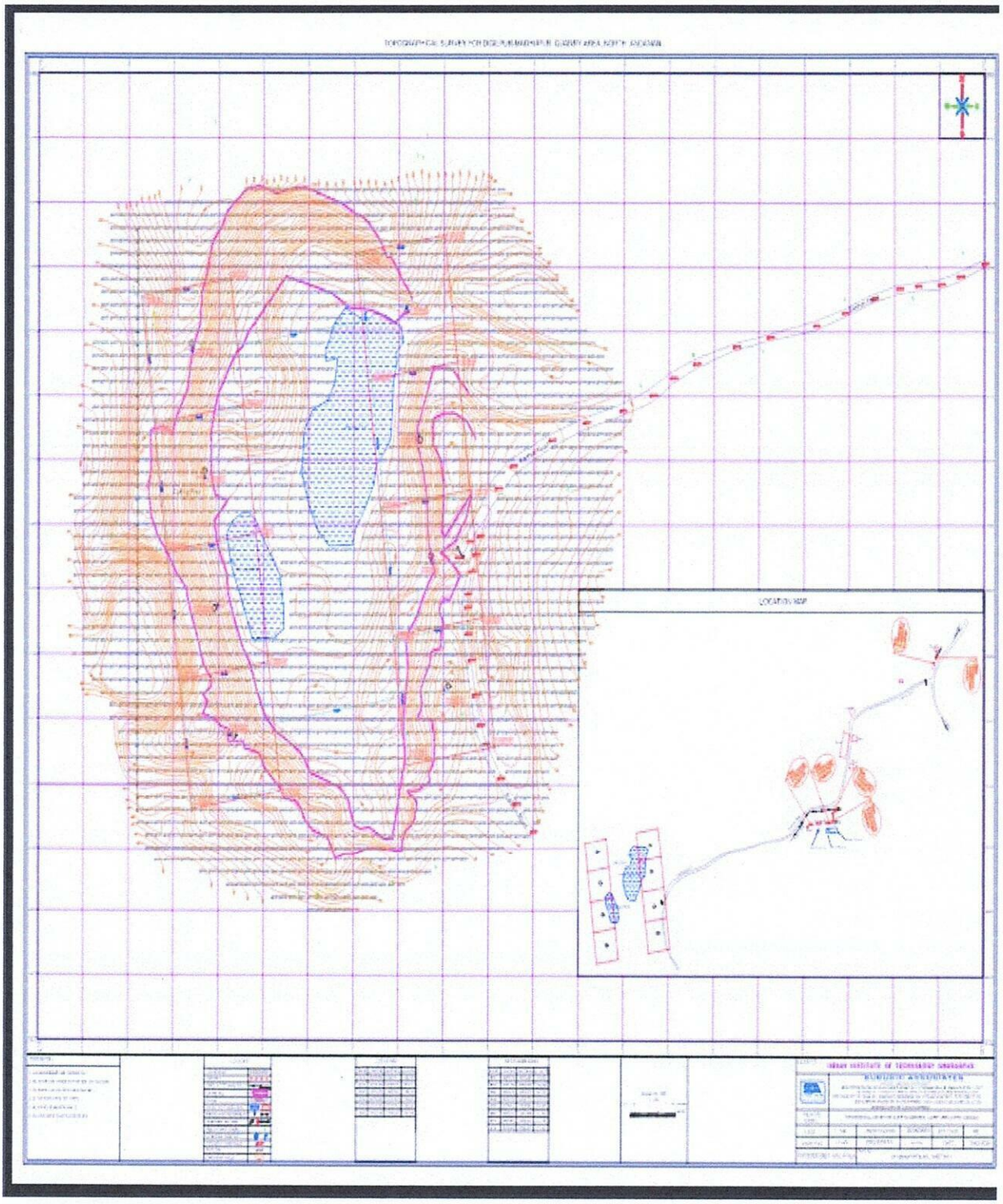



**Figure 24: Study area at Madhupur with identified plots**

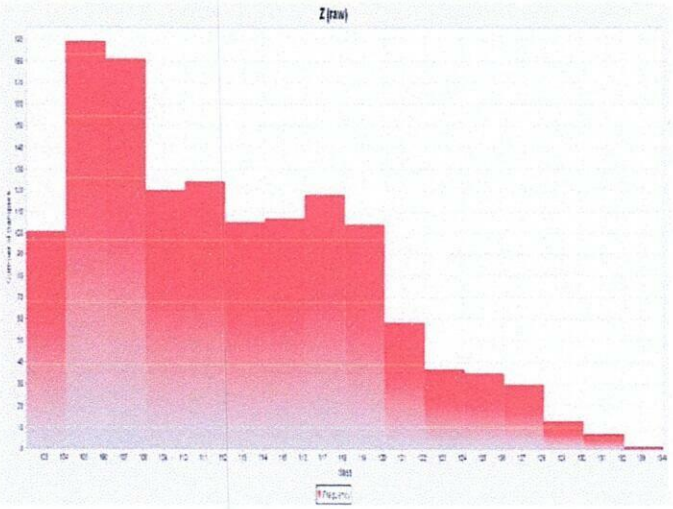
**Table 25: A snapshot of topographic survey records in a portion of the Madhupur generated by Subudhi consultants**

| LEVEL BOOK (MADHUPUR QUARRY) | | | | |
|---|---|---|---|---|
| Chainage | Offset | X(Easting) | Y(Northing) | Z(Elevation) |
| 0 | 25 | 49230.000 | 59540.000 | 108.861 |
| 0 | 30 | 49235.000 | 59540.000 | 109.921 |
| 0 | 35 | 49240.000 | 59540.000 | 111.719 |
| 0 | 40 | 49245.000 | 59540.000 | 113.521 |
| 0 | 45 | 49250.000 | 59540.000 | 114.725 |
| 0 | 50 | 49255.000 | 59540.000 | 116.380 |
| 0 | 55 | 49260.000 | 59540.000 | 116.489 |
| 5 | 25 | 49230.000 | 59545.000 | 110.047 |
| 5 | 30 | 49235.000 | 59545.000 | 110.134 |
| 5 | 35 | 49240.000 | 59545.000 | 112.442 |
| 5 | 40 | 49245.000 | 59545.000 | 115.844 |
| 5 | 45 | 49250.000 | 59545.000 | 117.603 |
| 5 | 50 | 49255.000 | 59545.000 | 116.721 |
| 5 | 55 | 49260.000 | 59545.000 | 116.656 |
| 5 | 60 | 49265.000 | 59545.000 | 118.203 |
| 5 | 65 | 49270.000 | 59545.000 | 120.462 |
| 5 | 70 | 49275.000 | 59545.000 | 121.316 |
| 5 | 75 | 49280.000 | 59545.000 | 120.925 |
| 5 | 80 | 49285.000 | 59545.000 | 121.068 |

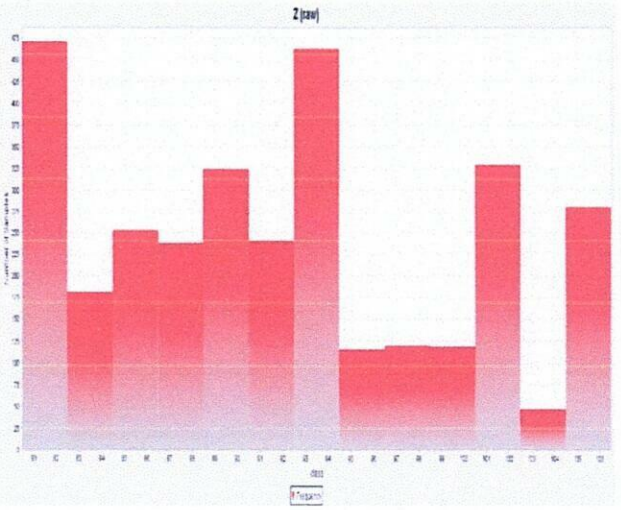
**Table 26: A few examples of drill hole data generated by Subudhi consultants in Madhupur block**

| SL.No | Block | Co-Ordinates | | R.L | Termination depth of Bore log (M) |
|---|---|---|---|---|---|
| 1 | A | X | Y | Z | |
| | | 49355.000 | 59735.000 | 104.572 | 23.5 |
| BLOCK - B | | | | | |
| 2 | B | X | Y | Z | |
| | | 49361.167 | 59684.870 | 112.235 | 27.5 |
| BLOCK - C | | | | | |
| 3 | C | X | Y | Z | |
| | | 49368.279 | 59635.169 | 113.411 | 24.5 |
| BLOCK - D | | | | | |
| 4 | D | X | Y | Z | |
| | | 49375.261 | 59585.912 | 122.321 | 29 |
| BLOCK - E | | | | | |
| 5 | E | X | Y | Z | |
| | | 49236.904 | 59719.648 | 126.652 | 20.5 |
| BLOCK - F | | | | | |
| 6 | F | X | Y | Z | |
| | | 49239.961 | 59669.922 | 112.491 | 32 |

90



(a) Histogram plot of surface elevation



(b) Histogram plot of stone surface elevation data

| File | Madhupur/surface Madhupur.str |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 1330 |
| Minimum value | 102.112000 |
| Maximum value | 132.640000 |
| | Ungrouped Data |
| Mean | 112.380822 |
| Median | 111.451500 |
| Geometric Mean | 112.183587 |
| Variance | 45.244481 |
| Standard Deviation | 6.726402 |
| Coefficient of variation | 0.059854 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 45.244481 |
| Moment 3 About Arithmetic Mean | 179.742383 |
| Moment 4 About Arithmetic Mean | 5164.673095 |
| Skewness | 0.590612 |
| Kurtosis | 2.522967 |
| Natural Log Mean | 4.720137 |
| Log Variance | 0.003480 |
| 10.0 Percentile | 104.432500 |
| 20.0 Percentile | 105.959000 |
| 30.0 Percentile | 107.291000 |
| 40.0 Percentile | 108.883000 |
| 50.0 Percentile (median) | 111.451500 |
| 60.0 Percentile | 113.735000 |
| 70.0 Percentile | 116.215500 |
| 80.0 Percentile | 118.429000 |
| 90.0 Percentile | 121.771500 |
| 95.0 Percentile | 125.194000 |
| 97.5 Percentile | 127.134000 |
| Trimean | 111.680000 |
| Biweight | 111.890600 |
| MAD | 5.319900 |
| Alpha | -89.507822 |
| Sichel-t | 112.378826 |

(c) Descriptive statistics of surface elevation data

| File | Madhupur/soil Bottom Madhupur.str |
|---|---|
| String range | All |
| Variable | Z |
| Number of samples | 3181 |
| Minimum value | 80.491000 |
| Maximum value | 106.152000 |
| | Ungrouped Data |
| Mean | 91.927945 |
| Median | 91.525000 |
| Geometric Mean | 91.606824 |
| Variance | 59.751195 |
| Standard Deviation | 7.729890 |
| Coefficient of variation | 0.084086 |
| Moment 1 About Arithmetic Mean | 0.000000 |
| Moment 2 About Arithmetic Mean | 59.751195 |
| Moment 3 About Arithmetic Mean | 140.753885 |
| Moment 4 About Arithmetic Mean | 7232.245956 |
| Skewness | 0.304748 |
| Kurtosis | 2.025723 |
| Natural Log Mean | 4.517506 |
| Log Variance | 0.006966 |
| 10.0 Percentile | 81.335000 |
| 20.0 Percentile | 84.381500 |
| 30.0 Percentile | 86.884000 |
| 40.0 Percentile | 88.922500 |
| 50.0 Percentile (median) | 91.525000 |
| 60.0 Percentile | 93.321000 |
| 70.0 Percentile | 95.437500 |
| 80.0 Percentile | 100.895500 |
| 90.0 Percentile | 103.003000 |
| 95.0 Percentile | 106.152000 |
| 97.5 Percentile | 106.152000 |
| Trimean | 91.631375 |
| Biweight | 91.681243 |
| MAD | 6.485000 |
| Alpha | -0.716910 |
| Sichel-t | 91.926361 |

(d) Descriptive statistics of stone surface elevation data

**Figure 25: Summary statistics of surface and stone surface elevation data: (a) histogram of surface elevation, (b) histogram of stone surface elevation, (c) descriptive statistics of surface elevation, and (d) descriptive statistics of stone surface elevation**

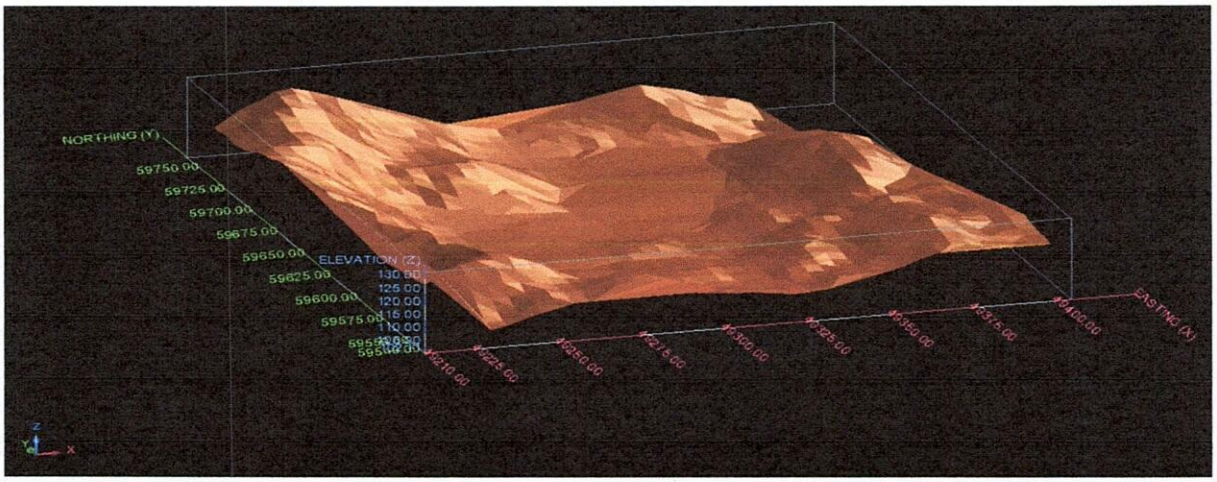



**Figure 26: Surface elevation model over the Madhupur area**

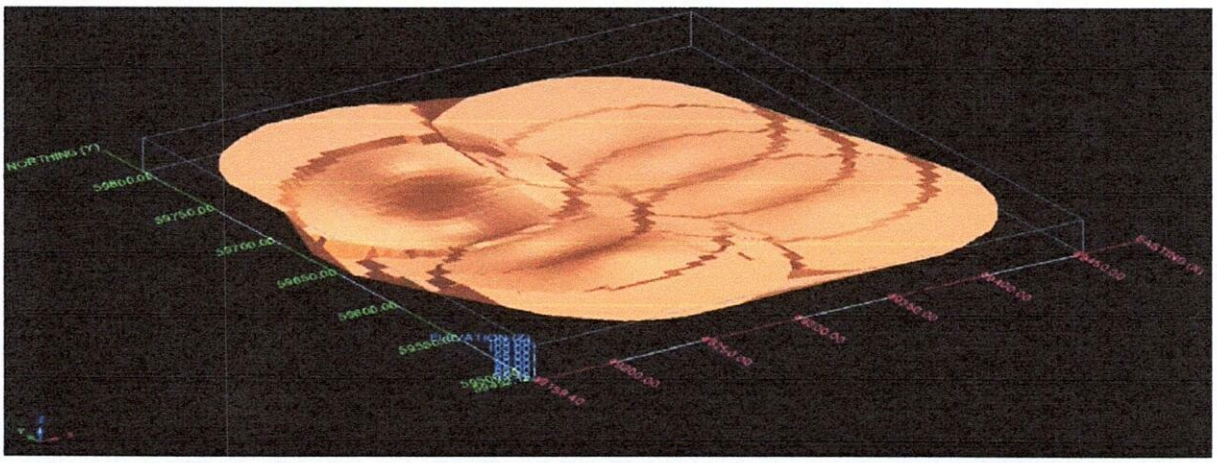



**Figure 27: : Stone surface (top) level of Madhupur area**

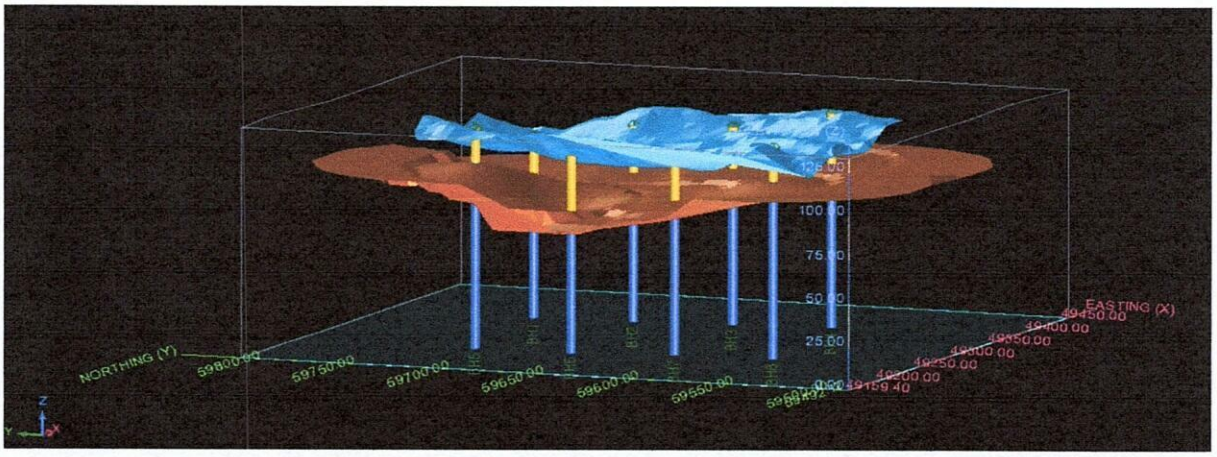
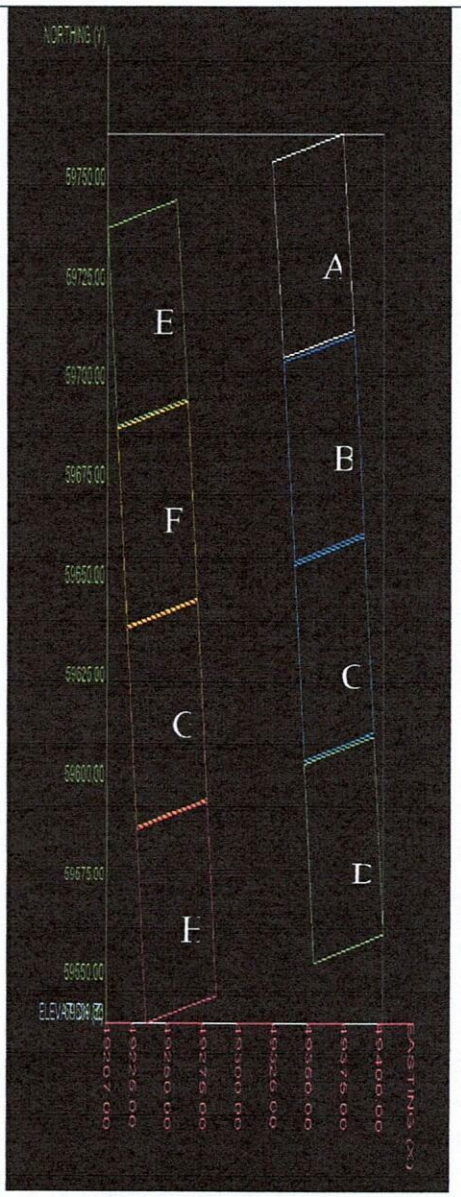


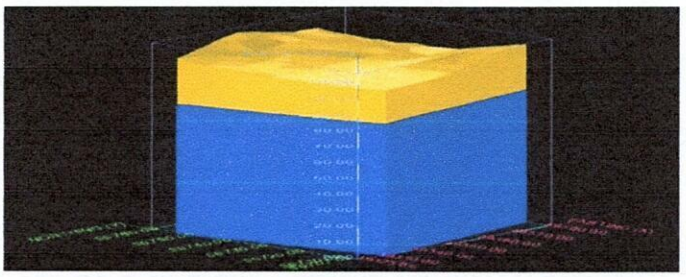
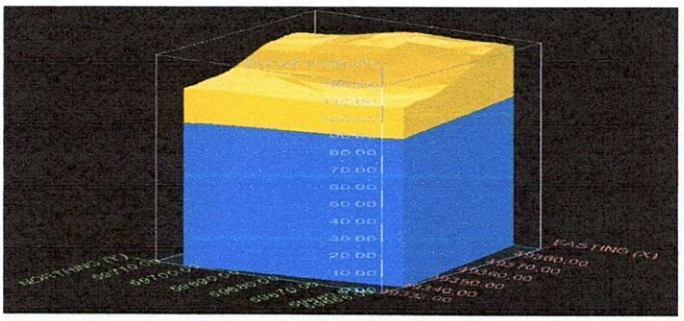
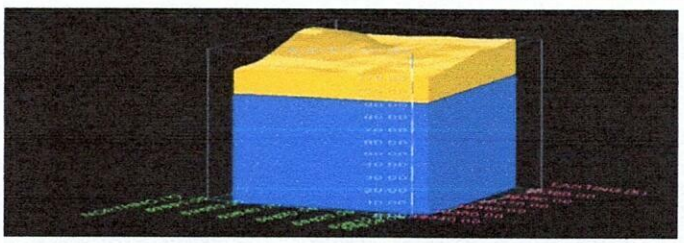
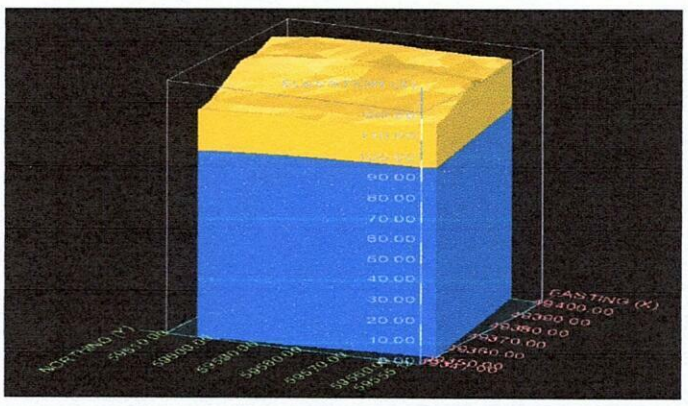

**Figure 28: Superimposition of surface elevation (cyan colour) and stone surface (golden colour) elevation. Blue color of drill hole indicates non-drilling portion of stone volume and yellow colour indicates drill hole penetration in soil.**

**Table 27: : Spatial coordinates of four different plots in Madhupur block**

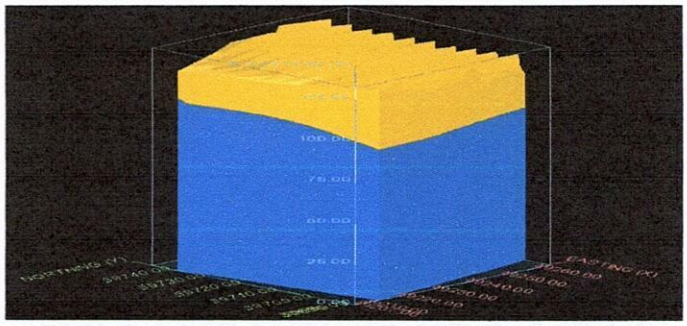
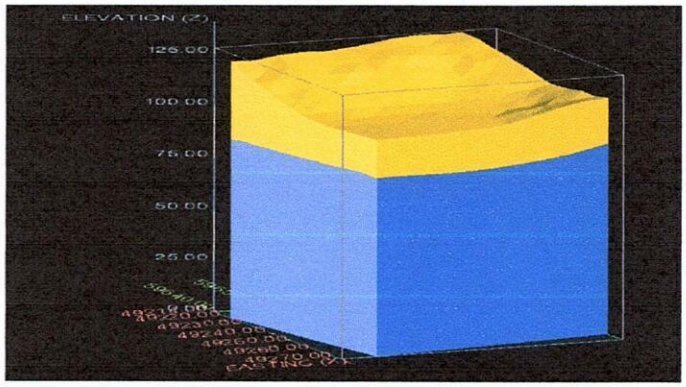
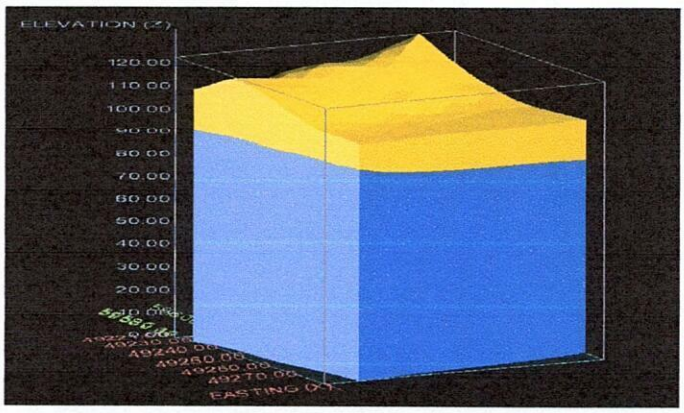
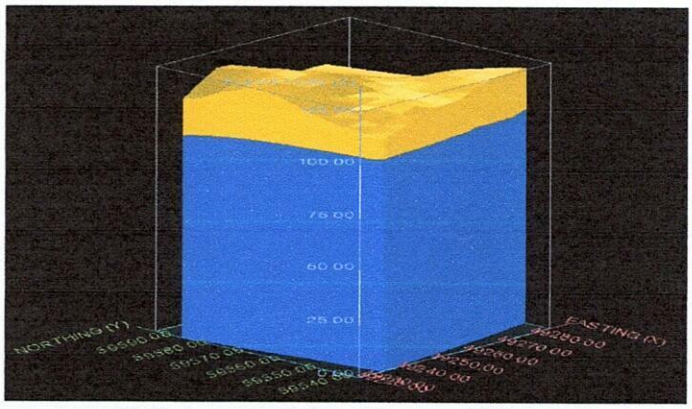
| Block | Min X | Max X | Min Y | Max Y | Min Z | Max Z | |
|---|---|---|---|---|---|---|---|
| A | 49323.65 | 49381.63 | 59707.05 | 59763.19 | 0 | 116.9 |  |
| B | 49332 | 49389 | 59656 | 59713 | 0 | 120.7 | |
| C | 49340 | 49396 | 59606.06 | 59662.06 | 0 | 119.8 | |
| D | 49347 | 49403 | 59555.12 | 59612.12 | 0 | 123.1 | |
| E | 49207 | 49264 | 59689.73 | 59746.73 | 0 | 131.9 | |
| F | 49214 | 49271 | 59640 | 59696 | 0 | 127.6 | |
| G | 49221 | 49278 | 59589.43 | 59646.43 | 0 | 124.1 | |
| H | 49228 | 49285 | 59540 | 59595.86 | 0 | 125.4 | |

93

**Table 28: Estimated resources of stone volume in individual plots in Madhupur block (upto Zero m RL)**

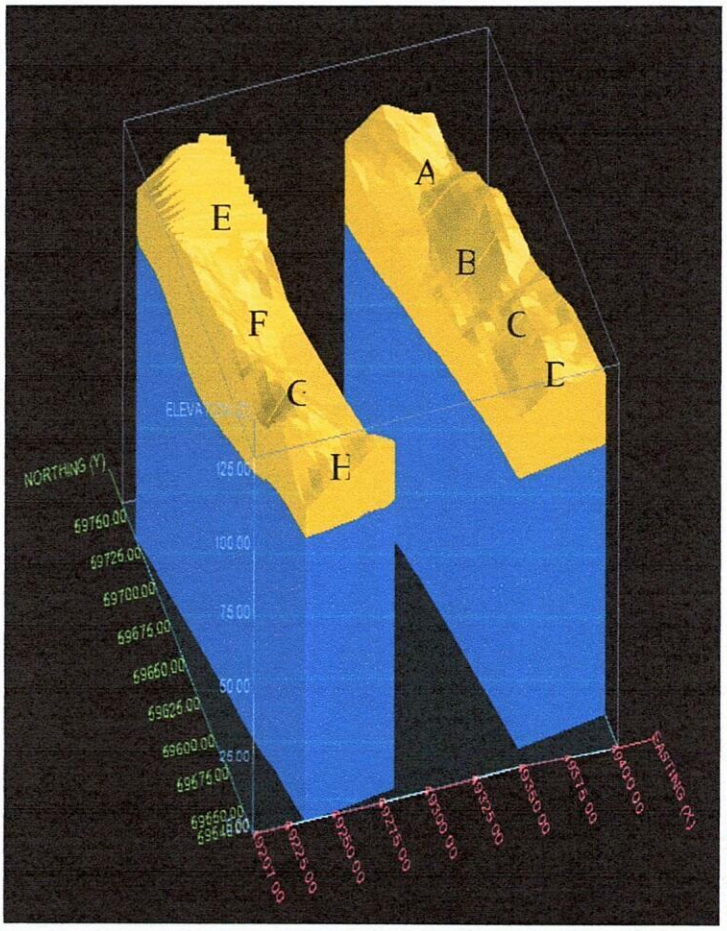
| Block | Stone+Soil Volume | Stone Volume (shown in Blue) | Soil Volume (shown in Yellow) | Pictorial representation of the Block |
|---|---|---|---|---|
| A | 267205 | 205265 | 61940 |  |
| B | 279461 | 214461 | 65000 |  |
| C | 276061 | 218012 | 58049 |  |
| D | 292548 | 231626 | 60922 |  |

94

| | | | | |
|---|---|---|---|---|
| E | 306183 | 257434 | 48749 |  |
| F | 282770 | 211764 | 71006 |   |
| G | 284557 | 228733 | 55824 |   |
| H | 292285 | 249281 | 43004 |   |

95

**Table 29: Summarized results of Estimated resources of stone volume in Madhupur block**

| Block | Stone+Soil Volume | Stone Volume (shown in Blue) | Soil Volume (shown in Yellow) | Pictorial representation of the Block |
|---|---|---|---|---|
| A | 254705 | 192765 | 61940 |  |
| B | 266961 | 201961 | 65000 | |
| C | 263561 | 205512 | 58049 | |
| D | 280048 | 219126 | 60922 | |
| E | 293683 | 255934 | 48749 | |
| F | 270270 | 199264 | 71006 | |
| G | 272057 | 216233 | 55824 | |
| H | 279785 | 236781 | 43004 | |
| Total | 2281070 | 1816576 | 464494 | |

29/c

## 6.0 SUMMARY AND CONCLUSIONS

- Altogether 24 plots in South Andaman and 26 plots in Middle & North Andaman spanning over 7 different blocks in various parts of Andaman Islands are estimated for determining stone resources potential. Each plot is having an area of 0.25 hectare except one having an area of 2.0 hectare in Brooksabad Block A.
- No baseline data were available to carry out this investigation at the beginning. Hence, surface elevation and soil/ overburden depth data were generated as a part of this study. The SM consultants and Subudhi consultants were assigned to carry out topographical survey and soil survey works for South Andaman and Middle & North Andaman districts respectively.
- As a whole, surface elevation measurements using TOTAL STATION, soil/overburden depth cover measurements from drilling and exposed rock faces were used for resource estimation. No drilling could be done at the stone stratum due to hardness of the materials with respect to drill machine used.
- Surface elevation map and stone surface elevation map were prepared using topography and soil depth data by distance weighting method of interpolation at a closer grid. An established 3-D mine planning software namely SURPAC, containing resource estimation module, was extensively used for this purpose. The resource estimation was done by merging the surface elevation map, stone top surface elevation map and stone bottom surface map and intersecting with the quarry plots
- Estimated stone volumes for different mining blocks of the districts are found to be 1.25 Million $m^3$ (Brooksabad A), 1.87 Million $m^3$ (Brooksabad B), 2.78 Million $m^3$ (Harinagar), 1.11 Million $m^3$ (Shyamnagar), 1.59 Million $m^3$ (Panchawati), and 1.82 Million $m^3$ (Madhupur)

अण्डमान तथा निकोबार राजपत्र

**Andaman And Nicobar Gazette**

असाधारण

EXTRAORDINARY

प्राधिकार से प्रकाशित

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No. 214, Port Blair, Thursday, September 20, 2012

# ANDAMAN AND NICOBAR ADMINISTRATION
## SECRETARIAT
## NOTIFICATION

Port Blair, dated the 20th September, 2012

No. 207/2012/F. No. 4-2/19-R/Qarry/PF-I.—In exercise of the powers conferred under Section 15 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957), read with Govt. of India, Ministry of Home Affairs, Notification No. U-11030/5/2012-UTL dated 17.09.2012, the Lieutenant Governor (Administrator), Andaman & Nicobar Islands hereby makes the following rules, namely :-

### CHAPTER-I

### PRELIMINARY

**1. Short title and commencement :-** (i) These rules may be called the Andaman & Nicobar Islands Minor Minerals Rules, 2012.

(ii) They shall come into force from the date of their publication in the Official Gazette.

**2. Application :** - These rules shall apply to entire territory of Andaman & Nicobar Islands.

**3. Definition :-** (1) *In these rules, unless the context otherwise requires :-*

(i) **"Act"** means the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957);

(ii) **"Assessee"** means a person holding a quarry lease and includes any other person who has excavated, removed or processed or is excavating, removing or processing minor minerals or minerals;

(iii) ***"Assessment Year"*** *means the period beginning from the first day of July and ending on the thirtieth day of June of the following year or part thereof;*

(iv) **"Authorised Officer"** means the Authorities appointed under the provisions of Andaman & Nicobar Islands Land Revenue & Land Reforms Regulations, 1966;

(v) ***"Catchment area"*** *means the total notified area draining into a given waterway or water body;*

(vi) ***"Cluster of mining"*** *means a group of quarry lease holders each having area less than one hectare, and mining together within a minimum area of two hectares;*

***Explanation :-*** An individual quarry lease granted over an area of more than one hectare shall not be considered for computation of minimum two hectares area for the purpose of these rules;

(vii) *"Competent Authority" means the Deputy Commissioner of the District or any other authority authorized by the Lt. Governor to implement the provisions of these rules;*

(viii) *"Crushing" means processing of quarry products;*

(ix) "Excavation" means digging or collecting of minor minerals from any land;

(x) "Form" means form appended to these rules;

(xi) *"Lieutenant Governor"* means the Lieutenant Governor of Andaman and Nicobar Islands;

(xii) "Pollution Control Committee" means the Pollution Control Committee of Andaman and Nicobar Administration;

(xiii) *"Quarry" means each plot available for quarrying lease;*

(xiv) *"Quarrying" means extraction of minor minerals from the Quarry;*

(xv) "Quarry Lease" means a lease for quarrying granted under these rules wherein a lessee is allowed to win minerals and required to pay fixed rent, dead rent, royalty, fee, fines or any other charges as prescribed under these rules;

(xvi) "Quarry Plan" means a comprehensive mining plan for systematic and scientific development of the quarry lease for undertaking quarrying operation and for the purposes of these rules the quarry plan in respect of any minor minerals shall be deemed to be the mining plan;

(xvii) "Rent" means charge levied for the use of land during subsistence of the quarrying as may be prescribed by the Lieutenant Governor from time to time;

(xviii) "Revisional Authority" means the Lieutenant Governor;

(xix) "Water Body" means any significant accumulation of water, usually covering the earth.

(2) Words and expressions used but not defined in these rules shall have the meaning respectively assigned to them in the Mines and Minerals (Development and Regulation) Act, 1957, and Mineral Conservation and Development Rules, 1988 made by the Central Government under Section 18 of the Act and the Mines Act, 1952.

## CHAPTER-II

## GENERAL RESTRICTION ON QUARRYING OPERATIONS

4. **Quarrying to be under quarry lease** :- (1) No person shall undertake any quarrying in respect of any minor mineral in any land except under or in accordance with the terms and conditions of a quarrying lease granted under these rules.

(2) No quarrying shall be allowed :-

(a) within a distance of five hundred metres from any educational institution, health institution or a residential area consisting of atleast fifteen houses of recorded tenants spread over an area of five thousand square metres, in the case where explosive is used for blasting;

(b) within two hundred metres from from any educational institution, health institution or a residential area consisting of atleast fifteen houses of recorded tenants spread over an area of five thousand square metres, in other cases;

(c) within two hundred metres of any water body;

(d) within notified catchment area;

(e) in a depression;

(f) below mean sea level.

5. **Criteria to be considered by Competent Authority for grant or renewal of quarry lease:-**

No quarry lease shall be granted or renewed by the Competent Authority unless he satisfied that,—

(a) there is evidence to show that the area for which the lease is applied has existence of minor minerals; and

(2) there is a quarry plan duly approved by the Lieutenant Governor or any Officer authorized by the Lieutenant Governor for this purpose in respect of such deposits for the development of minor mineral deposits in the area concerned.

## CHAPTER-III

## QUARRY LEASES

6. **Identification of areas for quarrying :-** The Competent Authority shall, with the approval of the Lieutenant Governor, identify contiguous areas for quarrying having due regard to the restrictions mentioned in Rule 4, general topography and environmental aspects.

7. **Grant of quarry leases :-** All areas identified for quarrying shall be allotted to the successful bidder by open option:

Provided that a Government Department undertaking quarrying operation under as own direct supervision shall be exempted from bidding process.

8. **Bidding process for quarry leases :-** (1) The Competent Authority shall publish notice fixing the date of auction.

(2) There shall be atleast thirty clear days between the date of publication of the notice and the date fixed for auction.

(3) The notice of auction shall also indicate the minimum reserve price for each quarry below which bids will not be accepted.

9. **Terms and conditions for granting quarry leases :-**

(a) only one quarry lease shall be permitted to a successful bidder in a District : Provided that no such restriction shall apply in the case of Government Departments;

(b) successful bidder shall have to execute a quarry lease deed within the period specified in the award letter;

(c) no sub-lease of the quarry shall be permitted.

10. **Quarry lease deeds :-** The following conditions shall be followed, namely :-

(a) the lease deed shall include the quarry plan of the quarry lease alongwith a site map;

(b) no quarry lease holder is entitled to raise any dispute with reference to survey and demarcation of the quarry permitted out to him after execution of the quarry lease deed;

11. **Period for which leases may be granted or renewed :-**

(1) A quarry lease for a minor mineral shall be granted for a period of not more than three years.

(2) The date of commencement of the period of lease granted under these rules shall be the date on which the lease deed is executed.

(3) The lease shall expire on the date specified in the lease deed unless it is renewed for a period of not more than six months on such terms and conditions as may be specified therein.

12. **Minimum and Maximum area of the quarry lease :-**

The minimum area that can be granted under a quarry lease shall be one hectare and the maximum area that can be granted under a quarry lease shall be two hectares :

Provided that the Lieutenant Governor, for reasons to be recorded in writing may, in respect of any area and any minor mineral, relax the said minimum or maximum area.

13. **Responsibility of the holder of quarry lease :-** Every lease holder including its Owner, Manager or Supervisor shall—

(a) ensure that the protective measures contained in the quarry closure plan including reclamation and rehabilitation work shall be carriedout in accordance with the approved quarry closure plan or with such modifications as approved by the Lieutenant Governor or the authority authorized for such purposes under these rules;

(b) submit to the Competent Authority, a yearly report before the 1st June of every year setting forth the extent of protective and rehabilitative works carriedout as envisaged in the approved quarry closure plan, and if there is any deviation, reasons thereof ;

(c) carryout the quarry operations in such a manner as to ensure systematic development and conservation of minor minerals deposits and take all possible precautions for the protection of environment and control of pollution while conducting quarrying of minor mineral in the area for which lease is granted ;

(d) control air pollution including dust, exhaust emissions or fumes during quarry operations for minor mineral and related activities and maintain permissible limits specified under any environmental laws for the time being in force;

(e) take all possible precautions to prevent or reduce to a minimum the discharge of toxic and objectionable liquid effluents from minor mineral quarry, workshop or processing plant into surface of ground water bodies and usable lands and such effluents shall conform to the standards laid down in by the Government ;

(f) control noise pollution arising out of quarrying or any processing operations for minor mineral at the source so as to keep it within the permissible limit.

## CHAPTER-IV

## QUARRYING OPERATIONS

**14. Quarrying operations to be in accordance with quarry plan :-** (1) Every lease holder shall carryout quarrying operations for minor minerals in accordance with the quarry plan.

(2) If the quarrying operations are not carriedout in accordance with the quarry plan as referred to under Sub-Rule (1), the competent authority may order suspension of all or any of the quarry operations and permit continuance of only such operations as may be necessary to restore the conditions in the quarry as envisaged under the said quarrying plan.

**15. Quarry plan to be prepared :-** (1) The Lieutenant Governor shall notify a Committee for each District, which shall be responsible for preparing quarry plans for the area identified under Rule 6 through a competent agency and the cost of preparation of such plan or plans shall be apportioned amongst the lease holders of quarries established on such area in such manner as the Committee may decide.

(2) The quarry plan shall be include for each identified area outer boundary, potential for extraction or crushing progressive and final closure plan of quarry, plans for reclamation and restoration of land, measures for pollution control, responsibility of the quarry lease holder and any other matter that the Committee may decide.

**16. Approval and Notification of Quarry Plan :-** On approval of the quarry plan by the Lieutenant Governor or any Officer authorized for this purpose, with or without modifications, it shall be duly notified.

**17. Mine Closure Plan :-** Every quarry shall have quarry Closure Plan as a component of quarry plan, which shall be of two types:- (i) a progressive quarry closure plan; and (ii) a final quarry closure plan.

**18. Cluster Mining :-** (1) Where more than one quarry lease with an area less than one hectare has been granted, all those quarry leases shall be allowed to operate only as a cluster, and in such clusters the provisions of quarrying of minor minerals shall be complied within a systematic and scientific manner in terms of quarrying plan individually by each quarry lease holder.

(2) The programme of restoration and reclamation of the mined out area and rehabilitation must be made jointly in phased manner in the abandoned areas in the entire cluster of the minor minerals as specified by the Competent Authority.

**19. Removal and utilization of top soil :-** (1) Every holder of a quarry lease shall, wherever top soil exists and is to be excavated for quarry operations, remove it separately.

(2) The top soil so removed shall be utilized for restoration or rehabilitation of the land which is no longer required for prospecting or mining operations or for stabilizing or landscaping the external dumps.

(3) When the top soil cannot be utilized concurrently, it shall be stored separately for future use.

**20. Storage of overburden, waste rock etc. :-** Every holder of a quarry lease shall—

(a) take steps so that the overburden, waste rock, rejects and fines generated during quarrying operations shall be stored in separate dumps;

(b) properly secure the dumps so as to prevent escape of materials therefrom in harmful quantities which may in turn cause degradation of environment or cause floods;

(c) select the site for dumps as far as possible on impervious ground to ensure minimum leaching effects due to precipitations;

(d) wherever possible, back-fill the waste rock, overburden etc., into the quarry excavation with a view to restoring the land to its original use as far as possible;

(e) in case the back-filling of waste rock in the area excavated during quarry operations is not feasible, suitably terrace and stabilize the waste dumps though vegetations or otherwise.

## CHAPTER-V

## ENVIRONMENT

**21. Reclamation and rehabilitation of lands :-** Every holder of quarry lease shall undertake the phased restoration, reclamation and rehabilitation of lands affected by quarry operations and shall complete this work before the conclusion of such operations and the abandonment of prospect or quarry.

**22. Precaution against ground vibrations :-** Whenever any damage to public buildings or monuments is apprehended due to their proximity to the quarry lease, scientific investigations shall be carriedout by the holder of quarry lease, so as to keep the ground vibrations caused by blasting operations within safe limits.

**23. Precaution against air pollution :-** Air pollution due to fines, dust, smoke or gaseous emissions during quarrying and related activities shall be controlled and kept within permissible limits as specified under various environmental laws of the country including the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) and the Environment (Protection) Act, 1986 (29 of 1986) by the holder of quarry lease.

**24. Discharge of toxic liquid :-** Every holder of quarry lease shall take all possible precautions to prevent or reduce the discharge of toxic effluents and objectionable liquid effluents from quarry, quarry workshop, into surface water bodies, ground water aquifer and useable lands, to a minimum and such effluents shall be suitably treated, if required, to conform to the standards laid down in this regard by the Government.

**25. Precaution against noise :-** Noise arising out of quarrying shall be abated or controlled by the holder of prospecting licence or a quarry lease at the source so as to keep it within the permissible limit.

**26. Permissible limits and standards :-** The standards and permissible limits of all pollutants, toxic effluents and noise referred to in rules 23, 24 and 25 shall be in terms of standards notified by the Government from time to time.

**27. Restoration of flora :-** Every holder of the lease shall –

(a) carryout operations in such manner as to cause least damage to the flora of the area held under quarry lease and the nearby areas;

(b) take immediate measures for planting in the same area or any other area selected by the Competent Authority not less than twice the number of trees destroyed by reason of quarrying operations and look after them during the subsistence of the lease after which these trees shall be handed over to any other authority as may be nominated by the Lieutenant Governor and restore to the extent possible, other flora destroyed by quarrying operations.

## CHAPTER-VI

## TRANSIT OF MINOR MINERALS

28. **Display of quarry lease:** - Every lease holder shall display the details of quarry lease granted to him on a board in a prominent place within the quarry lease site.

29. **Maintenance of records and production of the same for inspection :** - A lease holder shall maintain a record in Form-1 and such records shall be opened to inspection by the Competent Authority or by any other person so authorized in his behalf by the Competent Authority.

30. **Furnishing of statement of accounts by a lease holder :** - Every quarry lease holder within fifteen days of the last date of each month shall submit to the Competent Authority a return of the total sales affected by him during such month in Form - 2.

31. **Intimation of landing of minor minerals in Andaman & Nicobar Islands :-** Where a person brings minor minerals into the Union Territory of Andaman & Nicobar Islands from any other place, he shall intimate to the Competent Authority on arrival of such minor minerals, in Form-3 alongwith copy of the bill of lading and wharfage.

32. **Cash Memorandum:** - (1) Every person, while selling minor minerals shall give to the purchaser a Cash Memorandum prepared in duplicate and every purchaser, owner, driver, and the person in-charge of any vessel or vehicle or other conveyances shall produce the Cash Memorandum at the time of inspection and verification as required by the Competent Authority or by any other person authorised by the Competent Authority in this behalf.

(2) Any consignment of minor mineral without a valid Cash Memorandum including the receptacle, carts, vehicles or other conveyances used for carrying such mineral, shall be liable for seizure by the Competent Authority or such authorised person.

(3) The date and time on each Cash Memorandum issued shall be entered in words and figures by the seller at the time of despatch of the consignment.

(4) The Cash Memorandum shall indicate the registration number of the holder of the quarry lease or the importer of minor mineral from whom the mineral has been purchased or sourced.

33. **Transit Pass:** - (1) Every quarry lease holder, before transporting minor minerals to crushing site and every importer of minor mineral before transporting minor minerals shall obtain Transit Pass in triplicate from the Competent Authority.

(2) A copy of the Transit Pass shall be required to be produced by every purchaser, owner, driver, and the person in-charge of any vessel or vehicle or other conveyances at the time of inspection and verification as required by the Competent Authority or by any other person authorised by the Competent Authority in this behalf.

(3) Any consignment of minor mineral without a valid Transit Pass including the receptacle, carts, vehicles or other conveyances used for carrying such mineral, shall be liable for seizure by the Competent Authority or such authorized person.

(4) The date and time on each Transit Pass issued shall be entered in words and figures by the quarry lease holder and the importer of minor minerals at time of dispatch of the minor minerals in a separate register to be maintained by such lease holder or importer.

(5) The Transit Pass shall indicate the registration number of the holder of the quarry lease or the importer of minor mineral from whom the mineral has been purchased or sourced.

34. **Checking of unauthorized transaction or transit of minor minerals :-** Any person who possesses any minor mineral for processing, consumption or for sale has sold any minor mineral shall, if so required, produce sufficient proof including Cash Memorandum or copy of Transit Pass to the Competent Authority or to any other person authorized in this behalf by the Competent Authority to the effect that the minor mineral had been purchased from any duly authorized quarry lease holder or importer of minor mineral as the case may be, failing which the Competent Authority or such authorized person may seize the minor mineral and realize an amount not exceeding a sum calculated at double the market value of such mineral thereof .

## CHAPTER-VII

## REGISTRATION, RETURNS AND NOTICES

35. **Registration and monthly and annual returns :-** (1) The owner, agent or manager of every quarry lease and every importer of minor mineral shall register himself with the Competent Authority and the registration number so allotted by the Competent Authority shall be mentioned in all reporting and correspondence connected therewith.

(2) For the purpose of registration under Sub-Rule (1) the owner, agent or manager of quarry lease shall obtain registration within one month from the execution of the lease deed and every importer of minor mineral shall obtain registration before arrival of the mineral into the territory of Andaman and Nicobar Islands.

(3) The owner, agent or manager of every quarry lease, shall submit to the Competent Authority returns in respect of each quarry lease, in the following manner, namely :-

(a) a quarterly return which shall be submitted before the 15th of every month for the preceding month in Form – 4; and

(b) a annual return which shall be submitted before the first day of July each year for the preceding financial year in Form – 5 :

Provided that in the case of abandonment of a quarry the annual return shall be submitted within ninety days from the date of abandonment.

(4) If it is found that the owner, agent or manager of quarry has submitted incomplete or wrong or false information in quarterly or annual returns or fails to submit any of the return within the date specified, then the Competent Authority, may,—

(a) order suspension of all quarrying operations in the quarry and may revoke the order of suspension only after ensuring proper compliance;

(b) take action to initiate prosecution under these rules;

(c) recommend termination of the quarry lease, in case such suppression or misrepresentation of information indicates abetment or connivance of illegal quarrying.

(5) If more than one mineral is produced from the same quarry return shall be submitted in specified forms for each mineral separately.

(6) In case of temporary discontinuance of quarrying operations or suspension of quarrying operations, the owner, agent or manager of quarry, shall submit return in the specified form furnishing relevant particulars, inclusive of "Nil" information.

36. **Abandonment or surrender of quarries site :-** (1) The lease holder of every quarry shall not abandon or surrender quarry site or a part of such quarry site during the subsistence of the lease except with prior permission in writing of the Competent Authority.

(2) Notice for abandonment or surrender of quarry site or a part thereof shall be given in Form – 6 and shall be accompanied by plans and sections on a scale of not less than 1cm = 10 metres showing accurately the work done in such quarry site upto the date of submission of the notice.

(3) The Competent Authority may, by an order in writing, prohibit abandonment or refuse surrender or allow the abandonment or surrender of quarry site or a part thereof with such conditions as he may specify.

(4) Where an abandonment of a quarry lease site or part thereof takes place as a result of the occurrence of a natural calamity beyond the control of the lease holder or the lease is terminated in compliance of any order or directions issued by any Statutory Authority established under any law for the time being in force or any Tribunal or a Court, an intimation shall be sent to the Competent Authority within a period of twenty-four hours of such abandonment or termination and within a period of fifteen days of such abandonment or termination in other circumstances, in the manner provided in Sub-Rule (2).

37. **Intimation of re-opening of a quarry site :-** The holder of every quarry lease site shall send to the Competent Authority an Intimation in Form-7 for re-opening of such quarry lease after discontinuance so as to reach within seven days from the date of such re-opening.

## CHAPTER-VIII

## POWER TO INVESTIGATE AND ISSUE DIRECTIONS

38. **Power to investigate and report :-** (1) An authorized officer or any other officer authorized by the Lieutenant Governor may enter and inspect a quarry, and examine or direct the examination of any mineral deposit in any area under quarry lease and take samples therefrom at any time for the purposes of these rules.

(2) Subject to the provisions of these rules, the Authorized Officer and Competent Authority shall have the powers to authorize investigation and institute prosecution against any person for offences under the Act or these rules in respect of minor minerals in the following cases, namely :-

(a) quarrying operations for any mineral without a quarry lease;

(b) undertaking of any quarrying operations outside the area granted under quarry lease;

(c) transactions relating to possession of mineral stock of unknown origin, or such mineral which cannot be satisfactorily accounted for ;

(d) transportation, storage, trade or export of illegally raised mineral without lawful authority;

(e) any other matter pertaining to illegal quarrying referred to the Andaman and Nicobar Government by the Central Government.

39. **Prohibition of deployment in certain cases :-** If any quarry, in the opinion of the Competent Authority possess a grave and immediate threat to the conservation of mineral resources or to the environment, the Competent Authority may, by an order in writing to the holder of quarry lease holder, require such lease holder to take such measures as may be specified in the order and may prohibit, until the requirements as specified in the order are complied with to the satisfaction of such officer, the deployment of any person other than those required for compliance with the requirement of the order or operation of any quarrying operations.

## CHAPTER-IX

## ROYALTIES AND DEAD RENT

40. **Royalty payable in respect of minerals :-** (1) The holder of a quarry lease, whether granted before or after the commencement of these rules shall, notwithstanding anything in the instrument of lease or in any other law for the time being in force, pay royalty in respect of any mineral removed or consumed by him or by his agent, manager, employee or contractor from the leased area to the Andaman and Nicobar Administration.

(2) The Lieutenant Governor may, by Notification, declare the rate at which royalty shall be payable in respect of minor minerals in the territory of Andaman and Nicobar Islands.

41. **Dead rent payable by lessee :-** (1) The holder of a quarry lease, whether granted before or after the commencement of these rules, shall, notwithstanding anything contained in the instrument of lease or in any other law for the time being in force, pay every year, dead rent for all the areas included in the quarry lease to the Administration of Andaman and Nicobar Islands.

(2) Where the holder of such quarry lease becomes liable under Sub-Rule (1) of Rule 40 to pay royalty for any mineral removed or consumed by him or by his agent, manager, employee or contractor from the leased area, he shall be liable to pay either such royalty or the dead rent in respect of that area, whichever is higher.

(3) The Lieutenant Governor may, by Notification, declare the rate at which dead rent shall be payable in respect of minor minerals :

Provided that in respect of such portion of a lease in which both major and minor minerals occur, higher of the two dead rents shall be payable.

(4) In order to encourage mining of small deposits in cluster, dead rent for the area shall be determined with regard to the actual mineralized area under quarrying operations.

## CHAPTER X

## REVISION

42. **Revision :-** (1) Any person aggrieved by any order made by the Competent Authority or Authorized Officer, as the case may be, under these rules, may, within two months from the date of communication of the order to him, prefer a revision application to the Lieutenant Governor who shall be the Revisional Authority in such matter.

(2) In every application under Sub-Rule (1) against order of the Competent Authority to grant a quarry lease, any person to whom a quarry lease was granted in respect of the same area or for a part thereof, shall be impleaded as party.

(3) Every revision petition, under Rule (1) shall be accompanied by a fee of Rs. _____ to be specified herein.

(4) Alongwith the revision petition under Sub-Rule (1) the applicant shall submit as many copies thereof as there are parties impleaded under Sub-Rule (2).

(5) On receipt of the revision petition and the copies thereof the Revisional Authority, shall send a copy of the revision petition to the Competent Authority or the Authorized Officer whose orders are being challenged, and to each of the parties impleaded under Sub-Rule (2) specifying a date on or before which he may make his representation, if any, against the revision petition.

43. **Stay Orders :-** Pending the final disposal of revision application, the Revisional Authority, may, for sufficient cause, stay the execution of the order against which revision has been made.

44. **Final Order:-** (1) Where a revision application is made under Rule (1) of Rule 42, the Revisional Authority, may confirm, modify or set aside the order or pass such other order in relation thereto as it may deem just and proper.

(2) The order passed by the Revisional Authority shall be final and binding on the parties.

45. **Opportunity of being heard :-** No order under this Chapter shall be passed against any person interested, unless he has been given a reasonable opportunity of being heard.

## CHAPTER-XI

## MISCELLANEOUS

46. **Cancellation of a lease : -** (1) If a lease holder fails to comply with any of the conditions of the quarry lease or any of the provisions of the Act, rules applicable on quarrying operations or any directions issued by the Competent Authority or an Authorized Officer in this regard, or if the quarry area is urgently required for any public purpose, the Competent Authority may by an order in writing cancel the lease issued under these rules.

(2) In the event of cancellation of the lease under Sub-Rule (1) the stock of minor mineral with the lease holder shall be seized and put to auction by the Competent Authority or any Authorized Officer and the proceeds of such action credited to Government account.

(3) A lease holder whose lease has been cancelled under these rules not be eligible for grant of a lease or participate in the bidding process for a period of five years from the date of cancellation of such lease and other penal provisions in the Act, as applicable, would also be simultaneously instituted by the Competent Authority or any Authorized Officer.

(4) Before issue of any final orders of cancellation of a quarry lease under Sub-Rule (1), the Competent Authority shall give an opportunity of being heard and record reasons in writing and communicate to the quarry lease holder.

47. **Quarrying for domestic or agricultural purposes : -** (1) In cases of improvement of land for construction of residential building, creation of playground for public purpose, construction of canals, wells, roads or for agricultural and such other purposes where extraction of minor mineral is inevitable, the Competent Authority may grant permit in Form-8, on such terms and conditions, as it may specify, other than those specified in these rules on the basis of an application by interested party alongwith a sworn Affidavit to the effect that such excavation will not pose any danger to life and property of any person in the vicinity :

Provided that a Transit Pass shall be issued for transport of such minor mineral by the Authorized Officer on application by the interested party.

(2) A person permitted to extract minor mineral under Sub-Rule (1) shall be exempted from obtaining quarrying lease.

(3) Removal of minor mineral by any person, firm, association or company for the purposes as mentioned in Sub-Rule (1) without a valid permit shall amount to an offence under the provision of the Act and these rules.

(4) Royalty for the mineral extracted shall be paid at the rates fixed for the said mineral in the Union Territory.

48. **Revenue Recovery : -** All sums due to the Government under or by virtue of these rules may be recovered under the provisions of the Andaman and Nicobar Islands Land Revenue and Land Reforms Regulations, 1966 and the rules framed thereunder as though such sums are arrears of land revenue.

Sd./-
**(Lt. General (Retd.) Bhopinder Singh)**
Lieutenant Governor,
Andaman & Nicobar Islands.

By order and in the name of the Administrator, Andaman & Nicobar Islands.

Sd./-
**(Abdul Hamid)**
Assistant Secretary (Revenue)
A & N Administration

MGPPB—214/Gazette/2012—75 Copies. SB.

**Annexure-II**

**CONFIDENTIAL**

**F. No. 156/ACS/Quarry/TS-II/2019/1257**
**OFFICE OF THE SUB- DIVISIONAL MAGISTRATE**
**SOUTH ANDAMAN DISTRICT**
**PORT BLAIR**
***
**Port Blair, dated the 30th November, 2021.**

**To,**

**The Assistant Commissioner (Settlement),**
**South Andaman,**
**Port Blair.**

**Sub:- Forwarding of detailed report of DEIAA Committee for Environmental Clearance for Quarry/ Mining Operations at Brookshabad village, Port Blair Tehsil South Andaman District - reg.**

I am to forward herewith the detailed report of the DEIAA Committee in connection with the Environmental Clearance for Quarry/ Mining Operations at Brookshabad village, Port Blair Tehsil, South Andaman District.

Encl:- as above.

30/11/21
**Assistant Commissioner (SA)/SDM**
**Member Secretary, DEIAA**

**Copy to:-**

1. PA to DC (SA) for kind information of the Deputy Commissioner (SA).

30/11/21
**Assistant Commissioner (SA)/SDM**
**Member Secretary, DEIAA**

**F. No. 156/ACS/Quarry/TS-II/2019/ 1258**
**OFFICE OF THE SUB- DIVISIONAL MAGISTRATE**
**SOUTH ANDAMAN DISTRICT**
**PORT BLAIR**
*******

**Port Blair, dated the 30th November, 2021.**

**To,**

**The Assistant Commissioner (Settlement),**
**South Andaman,**
**Port Blair.**

**Sub:- Environmental Clearance for Quarry/ Mining Operations at Brookshabad village, South Andaman District, Port Blair Tehsil- reg.**

**Non- Explosive Quarry Blocks:-**

| Name of the mining lease site | Location | Size of mining lease | Capacity of mining lease | Period of mining lease | Expected cost of project |
|---|---|---|---|---|---|
| A-1/BB | 11°37'18.95"N (Latitude) 92°44'40.61"E (Longitude) | 0.2050 hectares | 12,000 cbm | 01 Year | 15.6 lakhs |
| A-2/BB | 11°37'17.82"N (Latitude) 92°44'39.69"E (Longitude) | 0.2050 hectares | 12,000 cbm | 01 Year | 15.6 lakhs |
| A-3/BB | 11°37'24.01"N (Latitude) 92°44'38.83"E (Longitude) | 0.2050 hectares | 12,000 cbm | 01 Year | 15.6 lakhs |
| A-4/BB | 11°37'25.03"N (Latitude) 92°44'37.57"E (Longitude) | 0.2050 hectares | 12,000 cbm | 01 Year | 15.6 lakhs |
| A-5/BB | 11°37'25.86"N (Latitude) 92°44'36.14"E (Longitude) | 0.2050 hectares | 12,000 cbm | 01 Year | 15.6 lakhs |
| A-6/BB | 11°37'21.76"N (Latitude) 92°44'34.02"E (Longitude) | 0.2050 hectares | 12,000 cbm | 01 Year | 15.6 lakhs |
| A-7/BB | 11°37'22.83"N (Latitude) 92°44'33.09"E (Longitude) | 0.2050 hectares | 12,000 cbm | 01 Year | 15.6 lakhs |

**Explosive Quarry Blocks**

| | | | | | |
|---|---|---|---|---|---|
| B-2/BB | 11°37'23.09"N (Latitude) 92°44'26.91"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |
| B-3/BB | 11°37'23.93"N (Latitude) 92°44'32.40"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |
| B-4/BB | 11°37'24.76"N (Latitude) 92°44'31.68"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |
| B-5/BB | 11°37'25.77"N (Latitude) 92°44'31.03"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |
| B-6/BB | 11°37'25.99"N (Latitude) 92°44'28.52"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |
| B-7/BB | 11°37'29.36"N (Latitude) 92°44'31.67"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |
| B-8/BB | 11°37'28.38"N (Latitude) 92°44'32.91"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |
| B-9/BB | 11°37'26.99"N (Latitude) 92°44'33.26"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |
| B-10/BB | 11°37'26.16"N (Latitude) 92°44'34.80"E (Longitude) | 0.2500 hectares | 12,000 cbm | 01 Year | 28.33 lakhs |

This has reference to your letter no. 836/DEAC/TS/2019/1123 dated 30th November, 2021 seeking Environmental Clearance under the Environmental Impact Assessment Notification, S.O. 141 (E) dated 15.01.2016. The proposal has been appraised as per prescribed procedure in the light of provisions under

the Environment Impact Assessment Notifications, S.O. 141 (E) dated 15.01.2016 on the basis of the mandatory documents enclosed with the application viz. the Form 1 M, District Survey Report, pre- feasibility report.

It is inter alia noted that the proposal involves quarrying/ mining operations at Brookshabad village, Port Blair, South Andaman District. The plot area of the proposed activity is 3.6850 hectare. It is proposed to conduct quarrying activity in 16 blocks among which 09 Blocks with the Explosives and 07 Blocks without the use of explosives As per the Appraisal Committee Report the size of explosive blocks is of 0.25 hectares each and non- explosive is 0.2050 hectares. The proposed site is more than 500 mtrs away from the High Tide Line. The project will be conducted in Government Revenue Land and there is no forest land involved. The area identified for the project does not required any of the following approval or clearance i.e. the Forest Conservation Act 1980, the Wild Protection Act 1972 and the provisions of the Coastal Regulation Zone 2011. The total project cost is estimated at Rs 254.97 lakhs for Explosive Blocks and Rs 109.20 lakhs for non- explosive blocks.

The total period for which quarrying operation will be done, as per the mining plan is for 01 year only, from the date of mining lease with the successful bidders.

The Expert Appraisal Committee, after due consideration of the relevant documents submitted by the project proponent and additional clarifications furnished in response to its observations have recommended for the grant of Environmental Clearance for the project. Accordingly, the committee hereby accords necessary Environment Clearance for the above project as per the provisions of Environment Impact Assessment Notification, S.O. 141 (E) dated 15.01.2016 and its subsequent amendments, subject to strict compliance of the terms and conditions as follows:

**SPECIFIC CONDITIONS:-**

i) Necessary permission shall be obtained for drawing of ground water from competent authority

ii) Air pollution

**Drilling**

- Drilling machine shall be fitted with dust suppression, collection and disposal arrangement.
- Deep wetting of drilling zones shall be done by water sprinkling before starting drilling.
- During the drilling operations, the efforts shall be made to reduce dust

**Blasting**

- Proper blasting geometry shall be designed.
- Blast site shall be wetted before and after operations are completed.
- Only optimum quantity of permissible explosives shall be used so that the vibrations do not damage the structures/ houses which may be close to human habitation.
- Blasting shall be conducted only during favourable weather conditions and only during the day time and permissible hours.
- The blasting operations shall be given publicity in the local area through all possible means and other available media so that local people become aware of the blasting activities being undertaken in the area.
- The blasting to be undertaken by an authorized shot firer only.
- The storage of the explosives and its transfer to and from the quarry area shall be strictly in accordance with the conditions listed in the permission granted by competent authority.

**Heavy Earth Moving Machinery (HEMM)**

- The operators/ transporter shall carry out regular maintenance of the machinery and vehicles.
- The speed limit shall be adhered to
- Operator's cabin of the HEMMs should preferably by air conditioned at least air tight.
- The smoke emission should conform to the standards notified in Motor Vehicle Act.
- The trucks carrying the mined products shall be covered with tarpaulin so that there are no fugitive emissions during transportation.
- The transportation should not be through the busy rods in the city/ towns/ villages, if by pass roads area available.

**Haul Roads**

- All the haul and service roads shall be metalled and well maintained
- Un- metalled haul roads shall be free of ruts and pot holes.
- All haul roads and surface roads shall be regularly sprayed with water.
- Plantation alongside haul roads (avenue plantation) shall be carried out.

**Overburden**

- Plantation over and around over burden dumps shall be carried out to ensure stability of slope, prevention of dust by wind action and soil erosion during the run off.
- Wetting of surface of overburden dump shall be regularly practised.

iii) Noise Pollution

**Blasting**

- Blast holes shall be judiciously charged.
- No blasting shall be done when there is low cloud ceiling.
- All other guidelines regarding blasting operations shall be strictly adhered to as per the directions of the Competent Authority.

**Drilling**

The workers shall be provided appropriate personal protective equipment viz. ear mufflers/ ear plugs or noise proof cabins.

**Heavy Earth Moving Machinery (HEMM)**

- The engine exhausts of HEMM to be fitted with mufflers and cabins shall be noise proof.
- HEMM shall be properly maintained.
- Operators shall be provided with ear mufflers/ ear plugs.
- Imposition of speed restriction of HEMM near residential area shall be enforced.
- The haulage path of the HEMM shall be re- routed so that it is away from the residential area.

**iv) Water pollution surface**

- The project components should comply with all the standards given in the water (Prevention and control of pollution Act 1974.

**A.K. Paul, DFO (SA)**
**(Member)**

**Dr. C. Sivaperuman**
**(Member)**

30/11/21

**Sub- Divisional Magistrate (SA)**
**(Member Secretary)**

**Deputy Commissioner (SA)**
**(Chairman)**

MOST URGENT
NGT COURT MATTER

File No.4-350/Estt/DC(N&MA)/2023/1391

**OFFICE OF THE DEPUTY COMMISSIONER**
**NORTH & MIDDLE ANDAMAN**
**MAYABUNDER**

**Annexure-III**

Dated the 15th Sept., 2023.

To

The Member Secretary(ANPCC)
Pollution Control Committee
Department of Science & Technology
Dolly Gunj, Port Blair.

**Sub: Sending of comments regarding NGT Court matter of Shri P.S. Saboo (Applicant) - Versus – Union Territory of Andaman & Nicobar Islands (Respondent) – reg.**

Sir,

Kindly refer your letter no.7-68/PCC/NGT(O.A No.157/2021)/2021 dated 08.09.2023 on the subject cited above and furnishing herewith the requisite information on the various issues related to impact of Environment as raised by the **Petitioner Shri P.S. Saboo**, Branch President, All India Crime Reforms Organisation, A & N Islands, Port Blair pertains to this jurisdiction are collected from the concerned Departments(Copies attached) duly complied and reproduced below in point wise as requested therein.

**Issues raised in order dated 5.9.2023.**

**Point no.1** : This issue as raised is not relevant in N & M Andaman District.
**Point no.2** : This issue as raised is not relevant in N & M Andaman District.

**Issues raised in order dated 29.5.2023.**

**Point no.1** : It is to inform that there has been no instance of indiscriminate felling of trees ever reported in Mayabunder.

**Point no.2** : "The power supply is maintained by the Electricity Department since 1975 onwards and their all High tension transmission line is more than 40 years old and in the recent past, they have not drawn any kind of New High tension line. Some of the old R.C.C. damaged poles have been replaced in Tugapur area."

That the Electricity Department has not felled any kind of Mangrove tree for installation of electric pole.

**Point no.3** : Mangroves in Mayabunder Division are distributed across all the three territorial ranges. Regular patrolling are done by the frontline executive staff in creeks with mangroves using engine dinghies and foot patrolling is done in landward side by respective beat officer having jurisdiction to prevent damage to mangroves through anthropogenic causes. Fishermen and general public are sensitized about the importance of mangrove ecosystem and the need of its protection. Further, the mangroves which are degraded post Tsunami of 2004 are restored by taking up annual plantations. In addition to the above, particularly the degraded mangroves near the human habitations are restored by planting in gaps with fencing of plantations to ensure its restoration.

This is for your kind information and necessary action please.

Yours faithfully

15/9/23

Assistant Commissioner(HQ)



Copy to the PA to the Deputy Commissioner(N&MA) for kind information of Deputy

**Annexure-IV**



Dir
Barathak

विज्ञान तथा प्रौद्योगिकी
Science & Technology,
D No. 1588
R.Date/ प्राप्ति दिनांक 19/9/23

**F. No. 2-29/Earth/2023/ 1045**
**OFFICE OF THE ASSISTANT COMMISSIONER**
**SOUTH ANDAMAN**

Dated the 18th Sept, 2023

To

Member Secretary (ANPCC)
Department of Science and Technology
Dollygunj, Port Blair

This is with reference to your letter no. 7-68/PCC/NGT (O.A No. 357/2023)/2023, dated 08.09.2023, regarding furnishing comments on following points specifically mentioned in the order dated 29.05.2023 and 05.09.2023, by the Hon'ble NGT Court.

**Issues raised in order dated 29.05.2023**

The requisite point wise reply is submitted as under:-

**Reply on Point No. 1:-** The quarry operations in the South Andaman district are regulated under A & N Islands Minor Mineral Rules, 2012,. To facilitate developmental works such as Infrastructure development for eg. building of roads, bridges, Govt buildings as well as private establishment and houses etc., the District Administration has identified suitable quarrying areas based on extensive study conducted by various govt. agencies.
After identification of suitable quarry blocks, a feasibility study was carried out by IIT Kharagpur. Based on the study the total availability of minerals assessed. And it was decided to allow quarrying operations on the principles of sustainability and inter-generational equity.

**Reply on Point No. 2:-** The villages of Brookshabad, Brichgunj and Prothrapur comprised of hilly terrains wherein there is a availability of quarry material. Hence, the quarry blocks located in the Brookshabad village only and Prothrapur & Brichgunj villages are located in the vicinity of quarry blocks.
Only the village of Brookshabad under Port Blair Tehsil is having its natural resources of stone and feasibility of stone mining. The sites selected for quarry operations were finalized as per the norms prescribed and the feasibility study for potentiality on quarry blocks through an official detailed survey and mapping by the IIT Kharagpur.

**Reply on Point No. 3:-** The blasting operations, if any required, are permitted through official procedure and after verification of all requisite guidelines. The quarry plans which are a mandatory for all the quarry operators. These mandatory guidelines include frequent water spraying, protection of water bodies etc. These guidelines will be followed by the quarry lease operators who will be getting the lease agreements in due course of time. As on date, the quarry operations are not in functional awaiting the finalization of e-tender process.

**Querries raised in order dated 29.05.2023**

The requisite point wise reply is submitted as under:-

**Reply on Point No. 1:-** It is to report that permit for extraction of earth measuring 75,538 Cbm is issued in an around Port Blair to various individuals for agriculture improvement/developing of agriculture holding and permits were also issued to various Govt departments for different projects viz. Construction of road etc.
It is pertinent to mention that The A&N Islands Minor Minerals Rules, 2012 under Rule 47 provided that *"Quarrying for domestic or agricultural purpose:- (1) In case of improvement of land for construction of residential building, creation of playground for public purpose, construction of canals, wells roads or for agricultural and such other purposes where extraction of minor mineral is inevitable, the Competent Authority may grant permit in Form-8, on such terms*

Cont. P. 2/-

*and conditions, as it may specify, other than those specified in these rules on the basis of an application by interested party alongwith a sworn affidavit to the effect that such excavation will not pose any danger to life and property of any person in the vicinity".*
Copy of under Rule 47 of the A&N Islands Minor Minerals Rules, 2012 is enclosed as **Annexure 'A'.**

Earth Cutting permissions are issued after obtaining a duly recommended 18 points report from the concerned Tehsildar (Format is attached as **Annexure 'B'**). All the earth cutting cases after proper verification are placed before the competent authority/committee through the Deputy Commissioner (SA) (Copy of the Order no. 292 dated 03.02.2023 regarding the committee constituted to recommend the earth cutting permission is enclosed as **Annexure 'C'**) and after obtaining the recommendations of the committee, the earth cutting permissions in Form 8 is issued to the concerned stake holder.

**Reply on Point No. 2, 3 & 5:-** The Revenue Field Staff of Chouldari, Manglutan, Wandoor, and Nayashahar villages under the jurisdiction of Ferrargunj Tehsil hereby affirm that, within the preceding biennium, the Andaman and Nicobar Administration duly issued a total of 25 permits (comprising a cumulative volume of 75,538 cubic meters) for the extraction of earth. These permits were granted to various entities, including Panchayati Raj Institutions (PRIs), the Andaman Public Works Department (APWD), the National Highways and Infrastructure Development Corporation Limited (NHDCL), as well as private tenants. The intended purposes for these extractions encompassed developmental initiatives, agricultural enhancements, and the construction of road infrastructure, among other endeavours.

**Reply on Point No. 4:-** It has been reported by the Tehsildar that during the last two-year period, there have been no instances of earth filling occurring within the natural watercourses or drainage systems (nallah/drain) within the Chouldari, Manglutan, Wandoor, and Nayashahar villages. Moreover, no significant occurrences of earth sliding or flooding have been reported within the same villages during the same period. Further reported that if any person carried out illegal earth cutting noticed, the Revenue Department take strict action against him under Section 201 (6) of A&N LR & LRR 1966 and under Section 34 of A & N Islands Minor Minerals Rules, 2012.
Copy of under Section 201 (6) of A&N Islands Land Revenue and Land Reforms Regulation 1966 is enclosed as **Annexure 'D'** and copy of under Rule 34 of the A&N Islands Minor Minerals Rules, 2012 is enclosed as **Annexure 'E'** and report of revenue field is enclosed as **Annexure 'F'**.

It is also pertinent to mention that a total penalty of Rs. 4595480/- in 14 nos. of cases so far imposed upon various individuals, u/s 201 (6) of A&N LR & LRR 1966, for unauthorised dumping and extraction of earth

18/9

Assistant Commissioner
South Andaman

15/9

**Copy to:-**

1. PA to DC (S/A) for kind information of the Deputy Commissioner (S/A).

18/9

Assistant Commissioner
South Andaman

115

## CHAPTER-XI

## MISCELLANEOUS

46. **Cancellation of a lease : -** (1) If a lease holder fails to comply with any of the conditions of the quarry lease or any of the provisions of the Act, rules applicable on quarrying operations or any directions issued by the Competent Authority or an Authorized Officer in this regard, or if the quarry area is urgently required for any public purpose, the Competent Authority may by an order in writing cancel the lease issued under these rules.

(2) In the event of cancellation of the lease under Sub-Rule (1) the stock of minor mineral with the lease holder shall be seized and put to auction by the Competent Authority or any Authorized Officer and the proceeds of such action credited to Government account.

(3) A lease holder whose lease has been cancelled under these rules not be eligible for grant of a lease or participate in the bidding process for a period of five years from the date of cancellation of such lease and other penal provisions in the Act, as applicable, would also be simultaneously instituted by the Competent Authority or any Authorized Officer.

(4) Before issue of any final orders of cancellation of a quarry lease under Sub-Rule (1), the Competent Authority shall give an opportunity of being heard and record reasons in writing and communicate to the quarry lease holder.

47. **Quarrying for domestic or agricultural purposes : -** (1) In cases of improvement of land for construction of residential building, creation of playground for public purpose, construction of canals, wells, roads or for agricultural and such other purposes where extraction of minor mineral is inevitable, the Competent Authority may grant permit in Form-8, on such terms and conditions, as it may specify, other than those specified in these rules on the basis of an application by interested party alongwith a sworn Affidavit to the effect that such excavation will not pose any danger to life and property of any person in the vicinity :

Provided that a Transit Pass shall be issued for transport of such minor mineral by the Authorized Officer on application by the interested party.

(2) A person permitted to extract minor mineral under Sub-Rule (1) shall be exempted from obtaining quarrying lease.

(3) Removal of minor mineral by any person, firm, association or company for the purposes as mentioned in Sub-Rule (1) without a valid permit shall amount to an offence under the provision of the Act and these rules.

(4) Royalty for the mineral extracted shall be paid at the rates fixed for the said mineral in the Union Territory.

48. **Revenue Recovery : -** All sums due to the Government under or by virtue of these rules may be recovered under the provisions of the Andaman and Nicobar Islands Land Revenue and Land Reforms Regulations, 1966 and the rules framed thereunder as though such sums are arrears of land revenue.

Sd./-
**(Lt. General (Retd.) Bhopinder Singh)**
Lieutenant Governor,
Andaman & Nicobar Islands.

By order and in the name of the Administrator, Andaman & Nicobar Islands.

Sd./-
**(Abdul Hamid)**
Assistant Secretary (Revenue)
A & N Administration

ANNEX-13

**18 points** in the following check list duly filled alongwith the NOCs as per the rule 47 of A & N Islands, Minor Mineral Rules 2012.

| Sl. No. | Information required | Report from Tehsildar |
|---|---|---|
| 1. | Name of the applicant seeking permission for development/improvement of land namely private tenant as well as Govt. Departments. | |
| 2. | Name of the village, Sy.No. and area for which development/improvement sought. | |
| 3. | Total quantity of excess earth to be transported. | |
| 4. | Whether the development/improvement done on Private or Govt. land. | |
| 5. | Name of the village, Sy. No. and area of dumping site. | |
| 6. | Whether the development/Improvement of land diminishes the value of the both the holdings(improvement site & dumping site) | |
| 7. | Whether the Tehsildar, Revenue Inspector/Patwari inspected the site from where the development/improvement/earth to be transported. | |
| 8. | Date of inspection of the site by the field staff. | |
| 9. | Whether any obstruction to natural course of perennial water source will cause on improvement/development. | |
| 10. | On development/improvement from road side the extraction should be up to the road level and not below the ground level. Whether removal of earth will cause lowering of road area. | |
| 11. | Whether the development/improvement of land is posing any danger to the life & property in the vicinity or not (improvement site & dumping site). | |
| 12. | Mention the distance of earth collection and to the place of shifting.(in Km) | |
| 13. | Whether the dumping site proposed by the applicant is submerged land. | |
| 14. | Whether the applicant has filed an affidavit to this effect that such excavation will not pose any danger to life & property in the vicinity or not. If no, obtain the same. | |
| 15. | In case of agriculture land, field reports for such application for earth cutting on the agricultural land should clearly indicate the purpose of development, ascertained by field enquiry and duly certified by the Tehsildar concerned in case of deviation noticed in respect of likely purpose of excavation for any purpose other than development from Agricultural purpose the same may be informed. | |
| 16. | Which purpose ? if any specific reason; | |
| 17. | What is the factual position/practice? | |
| 18. | Whether the development/improvement of land sought by the applicant is recommended, justification for recommending the case. | |

ANNEXURE – C



अण्डमान तथा निकोबार प्रशासन
**ANDAMAN AND NICOBAR ADMINISTRATION**
सचिवालय **SECRETARIAT**
****

*Port Blair, dated* 3rd Feb, 2023

Order No. 292

A Committee consisting of the following officers is hereby constituted to recommend the earth cutting permissions after examining the applications on merit and on case to case basis:

1. Secretary (Rev) : Chairman
2. Representative of PCCF : Member
3. Secretary (Agri) : Member
4. Deputy Commissioner concerned : Member
5. Town and Country Planner : Member
6. Assistant secretary (Rev) : Convenor

- The Committee may seek detailed project report or any other report while examining the application.
- Chairman of the Committee may seek advice from any expert or invite him in the meeting for evaluation of the application.
- After the recommendation of the Committee, the earth cutting permissions will be processed and issued by the Deputy Commissioner concerned.

This issues with the approval of the Chief Secretary.

Assistant Secretary (Rev)
F.No. 34/1031/2023-Rev

**OFFICE ORDER BOOK**

Copy to:-

1. The Principal Chief Conservator of Forest, Port Blair.
2. The Secretary (Agri), A&N Administration, Port Blair.
3. The Deputy Commissioner, N&MA district, Mayabunder.
4. The Deputy Commissioner, South Andaman district, Port Blair.
5. The Deputy Commissioner, Nicobar district, Car Nicobar.
6. The Chief Engineer, APWD, Port Blair.
7. The Town & Country Planner, Port Blair.
8. PS to CS for kind information of Chief Secretary.
9. PS to Secretary (Rev) for kind information of Secretary (Rev).
10. Spare copy.

Assistant Secretary (Rev)

ANEX-D

ANNEX-D



(a) free grazing of the cattle used for agriculture;

(b) removal, free of charge, by residents of the village for their *bona fide* domestic consumption of –

(i) forest produce;

(ii) minor minerals;

(c) concessions to be granted to the village craftsmen for the removal of forest produce or minor minerals for the purpose of rheir craft.;

Deputy Commissioner to set apart unoccupied land for certain purposes

198. (1) Subject to such rules as may be made under this Regulation, the Deputy Commissioner may set apart unoccupied land for the following purposes, namely :-

(a) for timber or fuel reserve;
(b) for paster or fodder reserve;
(c) for burial ground and cremation ground;
(d) for keeping cattle;
(e) for encamping ground;
(f) for threshing floor;
(g) for bazaar;
(h) for skinning ground;
(i) for manure pits;
(j) for any public purpose such as schools, playgrounds, parks, roads lanes and draines;
(k) for any other purposes which may be prescribed.

(2) Lands set apart specially for any purpose mentioned in sub-section (1) shall not otherwise be diverted for any other purpose without the previous sanction of the Deputy Commissioner.

(3) Notwithstanding anything contained in this section, if the Deputy Commissioner is satisfied that any unoccupied land set apart for any of the suitable for such purposes mentioned in sub-section (1) is not immediately required or suitable for such purpose, he may allot such land to such person, for such periods and purposes and on such terms and conditions, as may be prescribed.

(4) Where any land is allotted under sub-section (3), nothing in Chapter XIII shall apply to the allottee of such land.

Prohibiting of cutting of certain trees

199. If the Chief Commissioner is of opinion that the cutting of any trees in any unoccupied land is detrimental to public interest or that it is necessary to prohibit or regulate the cutting of any trees in such land for preventing soil erosion he may, by general or special order, prohibit or regulate the cutting of such trees.

Abadi

200. Where the area reserved for abadi is, in the opinion of the Deputy Commissioner, insufficient, be may reserve such further area for abadi from the unoccupied land in the village as he may think fit.

Government's title to minerals

201. (1) The Government reserves the right, in respect of every land to and over the foreshore, quarries, mines, stone, slate, chalk clay, precious stones, gold washing, coal and other minerals and mineral oils and also to all stream water courses and public thoroughfares within or traversing the said lands or any part thereof, unless any or all of them are expressly specified for alienation in any instrument made by the Government.

(2) The right to all mines and quarries includes the right of access to land for the purpose of mining and quarrying and the right to occupy such other land as may be necessary for purposes subsidiary thereto,

including the erection of offices, workmen's dwellings, machinery, the stacking of minerals and deposit of refuse, the construction of roads or tram-lines and any other purposes which the Government may declare to be subsidiary to mining and quarrying.

* (2) (a) "The Government may assign to any person, its right over any minerals, mines or quarries and the Chief Commissioner may with the previous approval of the Government assign to any person the right of the Government over minor minerals.

*Explanation-* In this sub-section, the expression "minor minerals" has the same meaning assigned to it in clause (e) of section 3 of the Mines and Minerals (Regulation and Development) Act, 1957."

** (3) If the Government or the Chief Commissioner has assigned to any person its right over any minerals, mines or quarries, and if for the proper enjoyment of such right it is necessary that all or any of the power specified in sub-section (2) should be exercised, the Deputy Commissioner may, by order in writing and subject to such conditions and reservations as he may specify, authorise the person to whom such right has been assigned to exercise such powers:

1 of 1894

** (4) If, in the exercise of any right over any land under this section, the rights of any person are infringed by the occupation or disturbance of such land, the Government or the Chief Commissioner or the assignee shall pay to such person compensation for such infringement and the amount of such compensation shall be calculated by the Sub-Divisional Officer, or if is award is not accepted, by the civil court, as nearly as may be in accordance with the provisions of the Land Acquisition Act, 1894

** (5) If an assignee fails to pay compensation as provided in sub-section (4), the Deputy Commissioner may recover such compensation from him on behalf of the persons entitled to it, as if it were an arrear of land revenue

** (6) If any person who without lawful authority extracts or removes minerals from any mine or quarry, the right to which vests in the Government and has not been assigned to him by, the Government or the Chief Commissioner, such person shall, without prejudice to any other action that may be taken against him, be liable on the Exceeding a sum calculated at double the market value of the minerals so extracted or removed:

Provided that if the sum so calculated is less than one thousand rupees, the penalty may be such larger sum not exceeding one thousand rupees as the Deputy Commissioner may impose.

** (7) Without prejudice to the provisions of sub-section (6). the Deputy Commissioner may seize and confiscate any mineral extracted or removed from any mine or quarry the right to which vests in, the Government and has not been assigned by, the Government or the Chief Commissioner.

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* Sub-section 2(a) inserted vide Notification No. 128/F.No. 52-3/76-J.I dated 24-7-76.

** Sub-section 3, 4, 5, 6 and 7 of section 201 of Principal Regulation are amended vide Notification No. 128/F.No. 52 3/76 JIdt. 24-7-76.

...has been purchased or sourced.

33. **Transit Pass:** - (1) Every quarry lease holder, before transporting minor minerals to crushing site and every importer of minor mineral before transporting minor minerals shall obtain Transit Pass in triplicate from the Competent Authority.

(2) A copy of the Transit Pass shall be required to be produced by every purchaser, owner, driver, and the person in-charge of any vessel or vehicle or other conveyances at the time of inspection and verification as required by the Competent Authority or by any other person authorised by the Competent Authority in this behalf.

(3) Any consignment of minor mineral without a valid Transit Pass including the receptacle, carts, vehicles or other conveyances used for carrying such mineral, shall be liable for seizure by the Competent Authority or such authorized person.

(4) The date and time on each Transit Pass issued shall be entered in words and figures by the quarry lease holder and the importer of minor minerals at time of dispatch of the minor minerals in a separate register to be maintained by such lease holder or importer.

(5) The Transit Pass shall indicate the registration number of the holder of the quarry lease or the importer of minor mineral from whom the mineral has been purchased or sourced.

34. **Checking of unauthorized transaction or transit of minor minerals :-** Any person who possesses any minor mineral for processing, consumption or for sale has sold any minor mineral shall, if so required, produce sufficient proof including Cash Memorandum or copy of Transit Pass to the Competent Authority or to any other person authorized in this behalf by the Competent Authority to the effect that the minor mineral had been purchased from any duly authorized quarry lease holder or importer of minor mineral as the case may be, failing which the Competent Authority or such authorized person may seize the minor mineral and realize an amount not exceeding a sum calculated at double the market value of such mineral thereof .

120

ANEX - 'F'

It is to report that permit for extraction of earth nearly 15,538 Cbm is issued in the following villages of Kharlikhai, Nayashahar, Manglutan and Wandoor

2) Number of permit issued: 25

3) The permit issued taken into consideration is ~~two~~ w.e.f 2021

4) No report of any commr is received in the matter of blockage of any nallah due to earth cutting or sliding for the last two years. The matter was also got demarcated by the Revenue Surveyor for any such blockage over govt nallah or as such in the said villages in question

5) The permit were issued to the Govt agencies / Private agencies / PRIs for / as requested under the provision of mines and mineral act of Andaman and Nicobar Islands.

6) Flooding of these areas as ~~seen~~ brought forward is a natural phenomena of low lying areas during the Monsoon when it coincides with high tide and release of water from Dhanikhari Dam when it crosses the dangerous levels were informed to the General Public and Panchayat Raj Institutions.

(7) No Major sliding reported in last two years.

**Annexure-V**

| AMBIENT AIR MONITORING REPORT AT BROOKSHABAD, | | | | | |
|---|---|---|---|---|---|
| DATE | DAY | PM10 (in µg/m3) Annual standard: 60 24 hourly standard: 100 | | | AVERAGE |
| | | 6AM-2 PM | 2PM-10PM | 10PM-06AM | |
| **JUNE, 2023** | | | | | |
| 21 06 2023 | Wednesday | 25.58 | 21.27 | 22.56 | 23.14 |
| 24 06 2023 | Saturday | 23.44 | 16.54 | 21.55 | 20.51 |
| 28 06 2023 | Wednesday | 40.78 | 31.77 | 13.88 | 28.81 |
| **JULY, 2023** | | | | | |
| 01 07 2023 | Saturday | 19.43 | 12.58 | 15.4 | 15.80 |
| 05 07 2023 | Wednesday | 17.54 | 19.55 | 20.4 | 19.16 |
| 08 07 2023 | Saturday | 19.47 | 18.7 | 18.09 | 18.75 |
| 12 07 2023 | Wednesday | 22.74 | 17.58 | 15.74 | 18.69 |
| 15 07 2023 | Saturday | 23.4 | 26.01 | 19.44 | 22.95 |
| 19 07 2023 | Wednesday | 17.79 | 18.47 | 17.22 | 17.83 |
| 22 07 2023 | Saturday | 20.19 | 20.77 | 19.17 | 20.04 |
| 26/0/2023 | Wednesday | 19.88 | 20.98 | 17.54 | 19.47 |
| 29 07 2023 | Saturday | 16.54 | 18.27 | 20.01 | 18.27 |
| **AUGUST,2023** | | | | | |
| 02 08 2023 | Wednesday | 17.19 | 14.48 | 16.34 | 16.00 |
| 05 08 2023 | Saturday | 15.1 | 20.01 | 14.55 | 16.55 |
| 09 08 2023 | Wednesday | 18.64 | 19 | 20.47 | 19.37 |
| 12 08 2023 | Saturday | 21.84 | 18.77 | 20 | 20.20 |
| 16 08 2023 | Wednesday | 19.33 | 22.01 | 20.44 | 20.59 |
| 19 08 2023 | Saturday | 20.88 | 19.61 | 12.84 | 17.78 |
| 23 08 2023 | Wednesday | 19.13 | 17.97 | 20.04 | 19.05 |
| 26 08 2023 | Saturday | 12.48 | 16.13 | 16.67 | 15.09 |
| 30 08 2023 | Wednesday | 16.91 | 15.44 | 20.8 | 17.72 |

**Annexure-VI**

## List of Stone Crusher Units operating at South Andaman District

| S.No | Name of the SCU | Area |
|---|---|---|
| | **Port Blair Tehsil** | |
| 1. | M/s. RDS Project Limited, Sy. No. 66. | Brookshabad |
| 2. | Shri. Shyam Lal, Sy. No. 1/24 Area: 0.20 Hects | Brookshabad |
| 3. | Shri. M. Arumugham, Sy. No. 18, Area: 500.00 Sq. Mtrs | Brookshabad |
| 4. | Shri. Naresh Ram, Survey No. 1/10, Area; 0.05 Hects, | Brichgunj |
| 5. | M/s Anthony Muthu, Sy. No. 26/1, 0.06 hects | Brookshabad |
| 6. | Shri. R. Periya Swamy, Sy. No. 203/103, Area: 500 Sqm. | Teylerabad |
| 7. | Shri. M. Subramaniam, Sy. No. 255/P/1, Area: 1000 Sqm | New Bimblitan |
| 8. | Shri. K. Muthuswamy, Sy. No. 98, Area: 500 Sqm. | Teylerabad |
| 9. | Shri. K. Chellappan, Sy. No. 98, Area: 0.05 Hects | Teylerabad |
| 10. | Shri. Bishan Lall, Sy. No. 427/3, Area: 300 Sqm. | Sippighat |
| 11. | Shri. Nirmal Kumar Halder, Sy. No. 102/1/2, Area: 300 Sqm. | Chouldari |
| 12. | Shri. N.Kannappan, Sy. No. 168/2, Area 0.40 Hects. | Calicut, |
| 13. | Shri. K. P Prema Kumari, Sy. No: 33/5, Area: 600 Sqmt. | Teylerabad |
| 14. | M/s AGP Contractions Pvt. Ltd., Sy. No.1/97, Area: 0.2 Hects | Brookshabad |
| 15. | Shri. B. Malleswaran, Sy. 16, Area: 1000 Sq. Mtrs | Brookshabad |
| 16. | Smti. Saroja, Sy. No. 60/3, Area: 0.10 Hects | Brookshabad |
| 17. | Shri. Asai Thambi, Sy. No. 66/2, Area: 1.10 Hects | Brookshabad |
| 18. | M/s Sumangalam Metallic Pvt. Ltd., Sy. No. 26/1, area: 2000 Sqm, | Brookshabad |
| 19. | Smti. A Suchitra, Sy. No. 66/1/P, Area: 500 Sqm, | Brookshabad |
| 20. | N. Guruswamy, Sy. No. 269/1/B, Area: 1000 Sq. Mtrs. | Prothrapur |
| 21. | Smti. V. Amuda, Sy. No. 269/H/2, Area: 0.05 Hects. | Prothrapur |
| 22. | Smt. Uma Devi, Sy. No. 269/1/H/2, Area: 500 Sqm. | Prothrapur |
| 23. | Shri. K.R Lakshmanan, Sy. No. 203/164/2, Area: 0.05 Hects, | Teylerabad |
| 24. | M/s Dweep Builder, Prop Shri. Muthuramalingam. Sy No. 98, Area: 500 Sqm | Teylerabad |
| 25. | Smti. Kaleshwari, Sy. No. 255/P(1), Area: 0.05 Hects | Bimblion |
| 26. | Shri. P.Surya Rao, Sy. No. 259/8, 500Sqm | Prothrapur |
| 27. | M/s A. Manikam and Sons, Sy. No 269/P, Area; 0.05 Hects | Prothrapur |
| 28. | M/s P.R Enterprises, Shri. P. Govindan, Survey No. 19/P, 20/P and 21/P | Brookshabad |
| 29. | Smti. Malar Vizhi, Sy. No. 209/1 & 209/2, Area: 1.65 Hects | Teylerabad |
| 30. | Shri. N. Kuppuswamy Sy. No. 2/6, Area: 0.03 Hects | Bimblion |
| 31. | Shri. R. Chidambraram Sy. No. 54, Area: 0.05 Hects | Bimblion |
| 32. | Shri. Saranjat Saluja & Manveer Singh Saluja, Sy. No. 51/98/21, Area: 0.106 Hect | Brookshabad |
| 33. | Shri. R. Sethupathi, Sy No. 21, area: 0.2678, | Brookshabad |
| 34. | Shri. S. Subramanian Sy. No. 66/3, Area: 0.10 ha | Brookshabad |
| 35. | Shri. Ramesh Stone Products, Survey No. 17, Area; 1300 Sqm, | Brookshabad |
| 36. | Smti. Visalakshi, Sy. No. 16, Area: 1400 Sqm | Brookshabad |
| 37. | M/s Ascon Engineering. Prop: Shri. A. Srinivas, Survey No. 264/2, Area: 2000 Sqm., | Brichgunj |
| 38. | Shri. K.Sundramurthy, Survey No. 203/164/2 area: 0.0375 Hects, | Teylerabad |
| 39. | Shri. S. Muthuswamy, Sy. No. 184, Area: 500 Sqm | Kamaraj Nagar, Calicut village |
| 40. | Shri. A. Ramar, Sy. No. 14/P, Area: 0.1300 Hect | Brookshabad |
| 41. | Smti. P Revathi,Sy. No. 1/105, Area: 0.06 Hect | Brookshabad |

| | | |
|---|---|---|
| 42. | Shri. K Radha, Sy. No. 16/P, Area: 0.1000 Hect. | Brookshabad |
| 43. | Ummer, Survey No. 430, Area: 0.25 Hect. | Sippighat |
| | **Ferrargunj Tehsil** | |
| 44. | Shri. V.M Kunjamoo, Sy. No. 114/2, Area: 0.20 Hects. | Namunaghar |

## List of SCUs operating at North & Middle Andaman District

| S.No | Name of the SCU | Area |
|---|---|---|
| | **Rangat Tehsil** | |
| 1 | Smti. D. Kalyani, Sy. No. 218/1/P & 218/2 , Area: 0.05 Hects | Janakpur |
| 2 | Smti. Laxmi, Sy. No. 220/1, Area: 0.03 Hects, | Janakpur |
| 3 | Shri. Sunil Kr. Mazumder, Sy. No. 187/2, Area: 0.05 Hects | Janakpur |
| 4 | Shri. Biswajit Nandi, Sy. No. 19/P, Area; 0.05Hects | Bharatpur Village |
| 5 | Shri. Kandaswamy,(on behalf of EE, APWD, MB) at Survey N. 49/18, area:1.00 Hects | Phanchawati |
| 6 | Shri. Shyamal Halder & Shri. G.Krishna, Sy. No.215, area: 0.05 Hec | Rangat |
| 7 | Shri. Bhoominathan, Sy. No. 49/3/P Area: 0.05 Hects | Janakpur |
| 8 | Shr. K. Babu, Sy No. 216/P, Area:0.40 Hects | Janakpur |
| 9 | Shri. Pran Krishna Biswas, Sy. No. 221/3/P, Area 1.00 Hects | Janakpur |
| 10 | Shri. Tapan Paul, Sy. No. 222/P, Area: 0.50 Hects | Janakpur |
| 11 | Smti. R. Sumathy, Sy. No. 222/3/P, Area: 0.09 Hects. | Janakpur |
| 12 | Shri. Jayakumar, Sy. No. 504/9, area: 0.10 Hects | Nimbutala |
| 13 | Shri Manibhusan Majhi, Sy No. 94, Area: 0.03 Hects | Amkunj |
| 14 | Shri. V. M Kunjamoo, Sy. No. 49/7/2, Area: 0.05 Hects | Panchawati |
| 15 | Shri. T. K Paul, Sy. No. 231/3, Area: 0.05 Hects | Padmanabhapuram |
| 16 | Shri. Kanailal Das, Sy. No. 9/2 Area: 0.05 Hects | Dharmapur |
| 17 | M/s Neha Builder(Old name Shri Arshad Waseem) Sy. No. 7/1, Area: 0.10 ha | Thiruvanchikulam |
| 18 | Shri Kamal Kumar Das Sy. No. 9/2, Area-0.05 hr | Dharmapur |
| 19 | Shri Robin Ray Sy. No. 219/6, Area-0.05 hr | Janakpur |
| | **Mayabunder Tehsil** | |
| 1 | Shri. P. Velavan, Sy. No. 21/19/4, Area: 0.10 Hects. | Karmatang |
| 2 | Shri. V. Durai Raj, Sy. No. 14/6/2, 14/6/P Area: 0.10 Hects., | Karmatang |
| 3 | Shri. M. Sethuraja, Sy. No. 73/2, Area: 500 Sqm, | Jaipur village, Harinagar |
| 4 | Shri Sanjib Kumar Halder, Sy. No. 5/11/P & 5/11/P, area: 0.02 & 0.03 Hects | Harinagar |
| 5 | Shri Hiranmoy Roy, Sy. No. 5/3/1, area: 0.05Hects | Harinagar, Billiground |
| | **Diglipur Tehsil** | |
| 1 | Shri. Milan Roy, Sy. No. 66, Area: 0.05 Hects. | Madhupur |
| 2 | Shri. Naresh Halder, Sy. No. 66/2P & 193/P, Area: 0.0299& 0.0201. | Madhupur |
| 3 | Shri. Jyotirmoy Biswas Sy. No. 321/P, Area; 0.05 Hects. | Laxmipur |
| 4 | Shri. Goutam Biswas, Sy. No. 321/P, Area; 0.05 Hects. | Laxmipur |
| 5 | Shri. Shyamal Debnath, Sy. No. 218/1/1, Area: 10.05 Hects | Madhupur |
| 6 | Shri. Sushil Mondal Sy. No. 72/2, Area: 0.05 Hects., | Madhupur |
| 7 | Shri. K. Ahmed, Sy. No 758/1/(P), Area 0.05 Hect, | Nabagram |
| 8 | Shri. Binod Hawlader, Sy. No. 60/2, Area: 0.10 Hects. | Madhupur |
| 9 | Shri. R. Rajasekhar, Sy. No. 70/p, Area: 0.10 Hects., | Madhupur |

| | | |
|---|---|---|
| 10 | M/s Balajee Stone Products, Pankaj Kumar Rungta, Sy. No. 673/P & 722/P, Area: 0.05 Hects | Madhupur |
| 11 | Shri. Uttam Kr Saha, Sy. No. 116/2/P, Area 0.05Hects., | Shyamnagar |
| 12 | Shri. Ujjal Saha, Sy.No. 240/1/1/P, Area; 0.10 Hects, | Subhasgram |
| 13 | Shri. V. Durai Raj, Sy. No. 690/2, Area: 0.10 ha, | Nabagram |
| 14 | M/s Balajee Stone Products, Pankaj Kumar Rungta, Sy. No. 673/P & 722/P, Area: 0.05 Hects | Nabagram |
| 15 | Shri. P.R Singaram, Sy. No. 218/1/4 area: 0.05 Hects | Madhupur |
| 16 | Shri. Uttam Kr Saha, Sy. No. 678/1(P), Area 0.05 Hects. | Nabagram |
| 17 | Shri. Uttam Kumar Saha, Sy. No. 209(P), Area: 0.05 ha | Madhupur |
| 18 | Shri Manoranjan Halder, Sy No. 217/2, Area: 0.05 Hects | Madhupur |
| 19 | Shri. Harihar Ch. Das, Sy. No. 218/1/2/P, Area 0.05 ha | Madhupur |

**Annexure VII**

Compliance status w.r.t Consent for Operate issued by ANPCC at South Andaman District

| S. No | Conditions & restrictions imposed by NGT | Status of the compliance imposed by NGT |
|---|---|---|
| 1 | The CTE/CTO issued by ANPCC may contain information regarding No. of Crushers installed along with their capacity, type and quantum of products generated from the units | *Yes, Andaman & Nicobar Pollution Control Committee (ANPCC) issues consent with the capacity, type and quantum of products generated from the unit.* |
| 4 | Proper land usage pattern regarding storage of raw materials and finished products to be prepared and submitted to competent authority for approval | *Before issue of consent ANPCC obtains land status and recommendations from District Administration, which includes layout map on land usage pattern.* |
| 6. | Proper boundary wall for the crushing unit to be constructed and maintained. | *All the crusher units have constructed the compound wall to stop the spread of dust particles generated from the unit, except 04 Nos of units are not maintained.* |
| 7. | Dust suppression systems viz., water sprinkler and dry fog system to be installed and maintained at transfer points of belt conveyors/drums, Adequate green belt development along the periphery to be developed | *Dust suppression systems viz., water sprinkler are installed by all the stone crusher units at transfer points of belt and along the periphery to suppress the dust generated from the unit. Except at 02 Nos. of SCU, where water sprinters are installed but found non- operation due to non-maintenance of sprinklers.* |
| 8 | Proper personal protective equipment's (PPE) to be provided at all workers | *Proper personal protective equipment's like helmet, head ears, gloves and shoes are provided to workers by all the stone crusher unit, except 03 Nos.* |
| 9 | Permission for withdrawal of Ground Water from Competent Authority to be obtained and records regarding water withdrawal be maintained. | *Except one unit namely Smti. Saroja, Sy. No. 60/3, Area: 0.10 Hects Brookshabad is using borewell without obtaining the permission, No other units are using ground water.* |
| 10 | Proper display board containing all the details of the unit viz. Name of the Unit, CTO validity, Env. Parameters etc. to be installed and maintained at the main entrance of the unit. | *All the crusher units have installed Proper display boards containing the details of the unit viz. Name of the Unit, CTO validity, Env. Parameters etc. are installed and maintained at the main entrance of the unit except 02 Nos.* |
| 11 | The adjacent land of the crusher unit being utilized for storage Raw & finished products, which might not belongs to the said under the land records, to be verified by concerned departments for the encroachment. Proper demarcation between land of the unit and adjacent land to be maintained. | *All the crusher units have installed compound wall along the periphery which demarcate the adjacent land.* |
| 12 | Inside the unit premises, water sprinklers should be mounted to road side to minimize the fugitive emission due to plying vehicles. Regular water sprinklers to be carried out on the approach road, which connecting to the unit. | *Yes, all the Crusher units have installed the water sprinklers inside the campus and along with road side to contain the dust emitted from the Crusher unit and plying vehicles. Except at 04 Nos. of SCU, where water sprinters are installed but found non- operation due to non maintenance of sprinklers.* |

| | | |
|---|---|---|
| 13 | The conveyor belts to be installed with proper cover / shed on it to minimize the fugitive emission during material handling and transportation. | *Yes, the norms are being maintained for suppression of fugitive emission during material handling and transportation. During inspection it is found that 02 No. of SCUs have not maintained the cover over conveyor belt.* |
| 14 | The stone dust (Sand) to be stored under shed or covered with tarpaulin cover to minimize the fugitive emissions during summer and high wind conditions. | *Yes, the norms are being maintained by all the crusher units except 03 units.* |

रजिस्ट्री सं. डी.एल.- 33004/99 REGD. No. D. L.-33004/99

भारत का राजपत्र
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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

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## पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

## अधिसूचना

नई दिल्ली, 20 अप्रैल, 2022

**का.आ. 1886(अ).**—केंद्रीय सरकार पर्यावरण और वन विभाग के पूर्ववर्ती मंत्रालय में पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा (3) की उप-धारा (1) और उप-धारा (2) के खंड (v) के अधीन प्रदत्त शक्तियों का प्रयोग करते हुए, पर्यावरण समाघात निर्धारण अधिसूचना, 2006 (जिसे इसमें इसके पश्चात ईआईए अधिसूचना, 2006 कहा गया है), परियोजनाओं की कतिपय प्रवर्ग के लिए पूर्व पर्यावरणीय मंजूरी आज्ञापक बनाने के लिए, संख्या का.आ.1533(अ), तारीख 14 सितंबर, 2006 द्वारा प्रकाशित की है।

और राज्य पर्यावरण समाघात निर्धारण प्राधिकरण (एसईआईएए) का गठन प्रवर्ग ख के अधीन सभी प्रस्तावों के लिए पर्यावरण मंजूरी (ईसी) पर विचार और अनुदान के लिए प्रत्यायोजित शक्तियों का प्रयोग करने हेतु राज्य स्तर पर ईआईए अधिसूचना, 2006 के कार्यान्वयन के लिए पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 3 की उप-धारा (3) के अधीन किया गया है;

और राज्य पर्यावरण समाघात निर्धारण प्राधिकरण ने पर्यावरण मंजूरी मूल्यांकन प्रक्रिया में पिछले पंद्रह वर्षों में पर्याप्त अनुभव प्राप्त किया है और राज्य स्तर पर पर्यावरण मंजूरी प्रस्तावों के कुशल और पारदर्शी निपटान के लिए परिवेश पोर्टल के माध्यम से पूरी तरह से ऑनलाइन कर दिया गया है;

और केंद्रीय सरकार राज्य स्तर पर मंजूरी की प्रसुविधा के लिए पर्यावरण मंजूरी प्रक्रिया को और विकेंद्रीकृत करना आवश्यक समझती है;

और आज की तारीख में, सुरक्षा भागीदारी के महत्वपूर्ण तत्वों के साथ राष्ट्रीय रक्षा और सामरिक महत्व से संबंधित प्रवर्ग ख की परियोजनाओं का राज्य स्तर पर भी मूल्यांकन किया जा रहा है, जिसे केंद्रीय सरकार राष्ट्रीय सुरक्षा चिंताओं को ध्यान में रखते हुए केंद्रीय रूप से मूल्यांकन करना आवश्यक समझती है;

अतः अब, केंद्रीय सरकार, पर्यावरण (संरक्षण) नियम, 1986 के नियम 5 के उप-नियम (4) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए उक्त नियमों के नियम 5 के उप-नियम (3) के खंड (क) के अधीन नोटिस की अपेक्षा को समाप्त करने के पश्चात, लोकहित में भारत सरकार की तत्कालीन पर्यावरण एवं वन मंत्रालय की अधिसूचना संख्यांक का.आ. 1533(अ), तारीख 14 सितम्बर, 2006,की अधिसूचना में निम्नलिखित और संशोधन करती है अर्थात्:-

उक्त अधिसूचना में-

(1) पैरा 4 में, उप-पैरा (iii क) के स्थान पर, निम्नलिखित रखा जाएगा, अर्थात्: -

*(iii क) राष्ट्रीय रक्षा या सामरिक या सुरक्षा महत्व से संबंधित हैं या जिन्हें केंद्रीय सरकार द्वारा संकटकाल जैसे महामारी, प्राकृतिक आपदाओं जैसी अत्यावश्यकताओं के कारण ऐसी प्रवर्ग 'ख' परियोजनाओं को अधिसूचित किया गया है या राष्ट्रीय कार्यक्रमों या स्कीमों या मिशन या ऐसी परियोजनाओं के अधीन पर्यावरण के अनुकूल क्रियाकलापों का संवर्धन करने के लिए जो इस अधिसूचना में यथा अधिकथित समय-सीमा से अधिक विलंबित हैं और समय-समय पर इस संबंध में यथा-अधिकथित मानदंडों को पूरा करती हैं, उन्हें केंद्रीय स्तर पर प्रवर्ग 'ख' परियोजनाओं के रूप में विचार किया जाएगा;*

(2) अनुसूची में, -

(i) मद 1(क) के सामने,-

(क) स्तंभ (3) में, -

(क) गैर-कोयला खनन पट्टे के संबंध में "> 100 हेक्टेयर खनन पट्टा क्षेत्र" के स्थान पर, निम्नलिखित रखा जाएगा, अर्थात्: -

"कोयले के अलावा अन्य प्रमुख खनिज खनन पट्टे के संबंध में >250 हेक्टेयर खनन पट्टा क्षेत्र";

(ख) ">150 हेक्टेयर" प्रतीक, अंक और अक्षर के स्थान पर, "> 500 हेक्टेयर" प्रतीक, आंकड़े और अक्षर रखे जाएंगे;

(ख) स्तंभ (4) में, -

(क) गैर-कोयला खनन के संबंध में <100 हेक्टेयर खनन पट्टा क्षेत्र के स्थान पर,

पट्टा", निम्नलिखित रखा जाएगा, अर्थात्: -

*"लघु खनिज खनन पट्टों के संबंध में सभी खनन पट्टा क्षेत्र और कोयले के अलावा अन्य प्रमुख खनिज खनन पट्टे के संबंध में <250 हेक्टेयर खनन पट्टा क्षेत्र";*

(ख) "<150 हेक्टेयर" के प्रतीकों, अंकों और अक्षरों के स्थान पर "<500 हेक्टेयर" के प्रतीक, अंक और अक्षर रखे जाएंगे;

(ii) मद 1(ग) के सामने, -

(क) स्तंभ (3) में, -

(क) क्रम संख्या (i) में, "> 50 मेगावाट, प्रतीकों, अंकों और अक्षरों के स्थान पर "> 100 मेगावाट "प्रतीक, आंकड़े और अक्षर रखे जाएंगे;

(ख) क्रम संख्या (ii) और उससे संबंधित प्रविष्टियों का लोप किया जाएगा;

(ख) स्तंभ (4) में, -

(क) क्रम संख्या (i) में, "<50 मेगावाट' प्रतीक, अंक और अक्षर के स्थान पर, "<100 मेगावाट' प्रतीक, आंकड़े और अक्षर रखे जाएंगे;

(ख) क्रम संख्या (ii) में, -

(I) "और <50,000 हेक्टेयर" शब्द, प्रतीक और अंक का लोप किया जाएगा;

(II) बिंदु (ग) में सारणी में, "से <50,000" शब्द, प्रतीक और अंक का लोप किया जाएगा; ।

(ग) स्तंभ (5) में, क्रम संख्या (ii) के पश्चात, निम्नलिखित क्रम संख्या अंत:स्थापित किया जाएगा, अर्थात् :-

*"(iii) अंतर-राज्यीय मुद्दों से संबंधित सिंचाई परियोजनाओं का मूल्यांकन केंद्रीय स्तर पर श्रेणी में परिवर्तन के बिना किया जाएगा।";*

(iii) मद 1(घ) के सामने,-

(क) स्तंभ (3) में, "> 50 मेगावाट" प्रतीकों, अंकों और अक्षरों के स्थान पर, "> 100 मेगावाट" प्रतीकों, अंकों और अक्षरों को रखा जाएगा;

(ख) स्तंभ (4) में, "<50 मेगावाट' प्रतीक, अंक और अक्षर के स्थान पर, "<100 मेगावाट" प्रतीक, आंकड़े और अक्षर रखे जाएंगे;

(iv) मद 2(क) के सामने, -

(क) स्तंभ (3) में, ">1" प्रतीकों और अंक के स्थान पर, ">2.5 "प्रतीकों और अंक को रखा जाएगा;

(ख) स्तंभ (4) में, "<1" प्रतीकों और अंक के स्थान पर, "< 2.5" प्रतीक और अंक रखे जाएंगे;

(ग) स्तंभ (5) में,विद्यमान पैरा के पश्चात, निम्नलिखित पैरा अंत:स्थापित किया जाएगा, अर्थात्: -

*"खनन पट्टा क्षेत्र के भीतर स्थित धुलाई मशीनों के साथ एकीकृत कोयला खनन परियोजनाओं को कोयला खनन परियोजनाओं के लिए विद्यमान सीमा के अनुसार केंद्रीय स्तर या राज्य स्तर पर, यथास्थिति, विचार किया जाना जारी रहेगा।";*

(v) मद 2 (ख) के सामने, -

(क) स्तंभ (3) में,विद्यमान प्रविष्टियों का लोप किया जाएगा;

(ख) स्तंभ (4) में, "<0.5 मिलियन टीपीए का उत्पादन" प्रतीक, अंक, शब्द और अक्षर के स्थान पर, "सभी खनिज परिष्करण परियोजना, परिष्करण की प्रक्रिया पर ध्यान दिए बिना" शब्द रखे जाएंगे;

(ग) स्तंभ (5) में,विद्यमान पैरा के पश्चात, निम्नलिखित पैरा रखा जाएगा,

अर्थात्: -

"भीतर स्थित लाभकारी संयंत्रों के साथ एकीकृत खनन परियोजनाएं खनन पट्टा क्षेत्र पर केन्द्रीय स्तर पर विचार किया जाता रहेगा या यथास्थिति, राज्य स्तर, खनन परियोजनाओं के लिए विद्यमान सीमा के अनुसार।";

(vi) मद 7 (क) के सामने,-

(क) स्तंभ (3) में, "सभी परियोजनाओं" शब्दों के स्थान पर "सभी नई परियोजनाएं" शब्द रखे जाएंगे;

(ख) स्तंभ (4) में, निम्नलिखित अंत:स्थापित किया जाएगा, अर्थात्: -

"सभी विस्तार परियोजनाएं, जिनमें हवाई पट्टियां भी सम्मिलित हैं, जो वाणिज्यिक उपयोग के लिए हैं।"

[फा. सं. आईए 3-22/10/2022-आईए. III]

डॉ. सुजीत कुमार बाजपेयी, संयुक्त सचिव

**टिप्पण :** मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग II, खंड III, उप-खंड (ii), संख्या का.आ. 1533(अ), तारीख 14 सितंबर, 2006 द्वारा प्रकाशित की गई थी और अधिसूचना संख्या का.आ. 1807(अ), तारीख 12 अप्रैल, 2022 द्वारा अंतिम संशोधन किया गया था ।

**MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE**

**NOTIFICATION**

New Delhi, the 20th April, 2022

**S.O. 1886(E).**—WHEREAS, the Central Government in the erstwhile Ministry of Environment and Forests, in exercise of its powers under sub-section (1) and clause (v) of sub-section (2) of section (3) of the Environment (Protection) Act, 1986 has published the Environment Impact Assessment Notification, 2006 (hereinafter referred to as the EIA Notification, 2006), vide number S.O.1533 (E), dated the 14th September, 2006 for mandating prior environmental clearance for certain category of projects;

And whereas, the State Environment Impact Assessment Authorities (SEIAAs) have been constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 for implementation of the EIA Notification, 2006 at State level for exercising delegated powers to consider and grant Environmental Clearance (EC) for all proposals under Category B;

And whereas, the SEIAAs have gained substantial experience over the past fifteen years in the EC appraisal process and the process at the State level has also been made completely online through the PARIVESH portal for efficient and transparent disposal of EC proposals;

And whereas, the Central Government deems it necessary to further decentralise the EC process for facilitating clearances at State level;

And whereas, as on date, category 'B' projects, relating to national defence and strategic importance with significant element of security involvement are also being appraised at the State level which, the Central Government deems it necessary to be appraised centrally taking into account national security concerns;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986),read with sub-rule(4) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government, after having dispensed with the requirement of notice under clause (a) of sub-rule (3) of rule 5 of the said rules, in public interest, hereby makes the following further amendments in the notification of the Government of India, in the erstwhile Ministry of Environment and Forests, number S.O. 1533 (E), dated the 14th September, 2006, namely:-

In the said notification,-

(1) in paragraph 4, for sub-paragraph (iii a), the following shall be substituted, namely:-

*(iii a) Such Category 'B' projects, relating to the National defence or strategic or security importance or those as notified by the Central Government on account of exigencies such as pandemics, natural disasters or to promote environmentally friendly activities under National Programmes or Schemes or Missions or such projects which are inordinately delayed beyond the stipulated timeline as laid down in this notification and also meet the criteria as laid down in this regard from time to time, shall be considered at the Central level as Category 'B' projects;*

(2) in the Schedule,–

(i) against item 1(a),–

(a) in column (3),–

(A) for ">100 ha. of mining lease area in respect of non-coal mining lease", the following shall be substituted, namely:–

">250 ha mining lease area in respect of major mineral mining lease other than coal";

(B) for the symbol, figures and letters "> 150 ha", the symbol, figures and letters "> 500 ha" shall be substituted;

(b) in column (4),–

(A) for "≤ 100 ha of mining lease area in respect of non-coal mine lease", the following shall be substituted, namely:–

"All mining lease area in respect of minor mineral mining leases and ≤ 250 ha mining lease area in respect of major mineral mining lease other than coal";

(B) for the symbols, figures and letters "≤ 150 ha", the symbols, figures and letters "≤ 500 ha" shall be substituted;

(ii) against item 1(c),–

(a) in column (3),–

(A) in serial number (i), for the symbols, figures and letters "≥ 50 MW", the symbols, figures and letters "≥100 MW" shall be substituted;

(B) serial number (ii) and the entries relating thereto shall be omitted;

(b) in column (4),–

(A) in serial number (i), for the symbol, figures and letters "< 50 MW", the symbol, figures and letters "< 100 MW" shall be substituted;

(B) in serial number (ii),–

(I) the word, symbol and figures "and < 50,000 ha." shall be omitted;

(II) in point (c) in the table, the word, symbol and figures "to < 50,000" shall be omitted;

(c) in column (5), after serial number (ii), the following serial number shall be inserted, namely:–

"(iii) Irrigation projects involving Inter-State issues shall be appraised at Central level without change in category.";

(iii) against item 1(d),–

(a) in column (3), for the symbols, figures and letters "≥ 50 MW", the symbols, figures and letters "≥100 MW" shall be substituted;

(b) in column (4), for the symbol, figures and letters "< 50 MW", the symbol, figures and letters "< 100 MW" shall be substituted;

(iv) against item 2(a),–

(a) in column (3), for the symbols and figure "≥1", the symbols and figures "≥ 2.5" shall be substituted;

(b) in column (4), for the symbols and figure "<1", the symbols and figures "< 2.5" shall be substituted;

(c) in column (5), after the existing paragraph, the following paragraph shall be inserted, namely:–

"Integrated coal mining projects with washeries located within mining lease area shall continue to be considered at Central level or State level, as the case may be, as per the extant threshold for coal mining projects.";

(v) against item 2 (b),–

(a) in column (3), the existing entries shall be omitted;

(b) in column (4), for the symbol, figures, words and letters "< 0.5 million TPA throughput", the words "All mineral beneficiation projects irrespective of the procedure for beneficiation" shall be substituted;

(c) in column (5), after the existing paragraph, the following paragraph shall be inserted, namely:–

"Integrated mining projects with beneficiation plants located within mining lease area shall continue to be considered at Central level or State level, as the case may be, as per the extant threshold for mining projects.";

(vi) against item 7 (a),–

(a) in column (3), for the words "All projects", the words "All new projects" shall be substituted;

(b) in column (4), the following shall be inserted, namely:–

"All expansions projects, including airstrips, which are for commercial use.".

[F. No. IA3-22/10/2022-IA.III]

Dr. SUJIT KUMAR BAJPAYEE, Jt. Secy.

**Note :** The principal notification was published in the Gazette of India, Extraordinary, Part II, Section III, sub-section (ii), vide, number S.O. 1533(E), dated the 14th September, 2006 and was last amended, vide, the notification number S.O. 1807(E), dated the 12th April, 2022.

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