

1. EXECUTIVE SUMMARY:

M/s. Adani Vizhinjam Port Private Limited had made an application for Granite building stone quarrying located in Sy.133/4, 133/16, & 139/6 Aryanadu Village, Nedumangad Taluk, Thiruvananthapuram District, Kerala State over an extent of 1.9274 Ha.

Letter of intent for said granite quarry (M/s. Adani Vizhinjam Port Private Limited) is issued vide Letter No. 5350/M3/2019 dated 07.06.2019 of Directorate of Mining & Geology, Thiruvananthapuram District. A copy of the Letter is enclosed as **Annexure –1 (Mining Plan)**. The location Plan enclosed vide **Plate No – 1 (Mining Plan)**. The Topographical Contours Map Showing Reading of boundary pillars is enclosed vide **Plate No –3 (Mining Plan)**.

Quarrying / Mining Plan is approved by The Geologist, Dept. of Mining & Geology, Thiruvananthapuram District. Vide Letter No.360/DOT/ML/2019 dated:19.12.2019. A copy of approved letter is enclosed as Annexure-A

DETAILS OF THE SITE

1	Details of area (with location map)	:	Topographical Contours map Showing Reading of boundary pillars is enclosed vide Plate No –3 (Mining Plan).
2	District and State	:	Thiruvananthapuram, Kerala
3	Taluk / Mandal	:	Nedumangad
4	Village	:	Aryanadu
5	Khasara No. / Plot No. / Block / Licence No etc	:	Re-Sy Block. No: 47 Sy. No.: 133/4, 133/16, & 139/6
6	Mining lease Area (Hectares)	:	1.9274 Ha.
7	Whether the area is recorded to be in forest (please specify whether protected, reserved etc.,)	:	No
8	Ownership / Occupancy	:	Government land with NOC from district collector.
9	Existence of public road/railway line, if any, nearby and approximate distance Nearest Port / Airport	:	Nearest railhead – Thiruvananthapuram (29.5 Kms) Nearest airport – Trivandrum International airport. (32.2 Kms)
10	Topo sheet No.	:	C43X2 (58H/2)
10	Latitude (between) Longitude (between)	:	N-08°35'14.749" to N-08°35'20.030" E-77°05'58.877" to E-77°06'08.083"

Accessibility: This granite building stone quarry is located at 3.0 Kms from Aryanadu in Nedumangad Taluk. The quarry is at a distance of 28.2 Kms from Thiruvananthapuram town. It can be reached via Kattakada - Eanchapuri Road.

Topography: The lease is located on the slope of the area gently dipping towards SE. The highest elevation in this area is 135m above MSL and the lowest elevation is 80m above MSL. The general slope of the lease hold area is between 16° to 30° degree.

Brief Description of the Project:

Geology:

Regional Geology:

The district can broadly be divided into two geological divisions viz. (i) the eastern part represented by the Archaean crystalline rocks and (ii) western coastal fringe occupied by Tertiary and Quaternary sediments (Figure 1).

The Archaean crystalline rocks comprise Khondalite Group, Charnockite Group and Migmatite Group. Khondalite Group is composed of garnetiferous biotite-sillimanite gneiss, with occasional bands of calc-granulite and quartzite, and constitutes the major rock type. Charnockites are acidic to intermediate in composition. Irregular patches of khondalite, veins of pegmatite and quartz are seen within the charnockite. Pyroxene granulite occurs within the khondalite as thin discontinuous lenticular bands conformable to the foliation planes. Migmatites are evenly distributed in the central part of the district as narrow zones within garnetiferous sillimanite gneiss. All these rocks are intruded by a number of dolerite dykes, but their distribution is restricted to the midland region of the district. Thin and impersistent veins of pegmatite and quartz veins are very common, and many of the pegmatites have gained importance because of their gemstone (chrysoberyl) content. Sedimentary formation of Mio-Pliocene age (Warkalli beds) occurs as detached patches unconformably overlying the crystalline rocks, along the coastal tracts. Quaternary Formation includes pebble beds (with ferruginous sandstone and bands of clay), coastal sands and alluvium. The Tertiaries and the basement rocks of the midland are extensively lateritised.

Local Geology:

The granite building stones are has been exposed as outcrop, whereas part of area with lower elevation is covered by topsoil/overburden of about 0 to 0.5m thickness.

A geological plan showing the granites and soil cover and the geological plans and sections showing subsurface geology is prepared on 1:1000 scale and enclosed vide **Plate No 4**. (Mining Plan).

Table 01: Local Geology

Soil Cover	Average 0 to 0.5 m
Granite	80m (min. estimate)
Rock type	Charnockite

Table No: 1.1: The Geological Resources (A)

Section No	Area (m ²)	Influence (m)	Volume (m ³)	Tonnage (T) BD 2.5T/m ³	UNFC
A-A'	4864	59.5	289,408.00	723,520.00	332
B-B'	3136	60	188,173.20	470,433.00	332
C-C'	784	60	47,040.00	117,600.00	332
D-D'	662	65.5	43,361.00	108,402.50	332
Total			567,982.20	1,419,955.50	332

Table No.1.2. Granite Building Stone Blocked in benches (B).

Section No	Area (m ²)	Influence (m)	Volume (m ³)	Tonnage (T) BD 2.5T/m ³	UNFC
A-A'	707	59.5	42,066.50	105,166.25	122
B-B'	570	60	34,200.00	85,500.00	122
C-C'	110	60	6,600.00	16,500.00	122
D-D'	201	65.5	13,165.50	32,913.75	122
Total			96,032.00	240,080.00	122

Table No.1.3. Granite Building Stone Blocked in buffer zone (C).

Section No	Area (m ²)	Influence (m)	Volume (m ³)	Tonnage (T) BD 2.5T/m ³	UNFC
A-A'	2952	52	153,504.00	383,760.00	122
B-B'	1578	60	94,680.00	236,700.00	122
C-C'	182	60	10,920.00	27,300.00	122
D-D'	213	58	12,354.00	30,885.00	122
Total			271,458.00	678,645.00	122

Table No.1.3. Granite Building Stone Old Excavate quantity (D).

Section No	Area (m ²)	Influence (m)	Volume (m ³)	Tonnage (T) BD 2.5T/m ³	UNFC
A-A'	42	24	1,008.00	2,520.00	122
B-B'	0	0	-	-	122
C-C'	0	0	-	-	122
D-D'	0	0	-	-	122
Total			1,008.00	2,520.00	122

Table. 1.4. Granite Building Stone Mineable Reserves (E).

Section No	Area (m ²)	Influence (m)	Volume (m ³)	Tonnage (T) BD 2.5T/m ³	UNFC
A-A'	2084	52	108,368.00	270,920.00	122
B-B'	1125	60	67,500.00	168,750.00	122
C-C'	150	60	9,000.00	22,500.00	122
D-D'	252	58	14,616.00	36,540.00	122
Total			199,484.00	498,710.00	122

Table No.1.5

Brief Summary of Reserves (in Tonnes)	
Total Geological reserve (A)	14,19,955.50
Granite Building Stone Blocked in benches (B)	2,40,080.00
Granite Building Stone Blocked in buffer zone (C)	6,78,645.00
Granite Building Stone Old Excavate quantity (D)	2,520.00
Mineable reserves (E) E= A-(B+C+D)	4,98,710.00

Mining:

The Mining is proposed to be operated by developing benches of 6m height and 6m ultimate width by Opencast Semi-Mechanized Mining Method. The mechanized operation of mining includes excavators, tippers, rock breakers, Jack hammer drilling and blasting. the maximum production of 1,99,900.00 Tonnes per annum of Granite Building Stone. This Pre-Feasibility Report is submitted for obtaining Environment Clearance as required under EIA notification-2006/15th January 2016 and for a max production capacity 1,99,900.00 Tonnes Per Annum, over an extent of 1.9274 Ha. (4.7626 Acres) located in Re-Survey Block. No.47, Re-Survey Nos. 133/4, 133/16, & 139/6(Government Land) of, Aryanadu Village, Nedumangad Taluk, Thiruvananthapuram District, Kerala State in favor of “Granite Building Stone Quarry of M/s. Adani Vizhinjam Port Private Limited”

Table No. 1.3 Year-wise calculations of granite building stone production

Year Wise	Section No	Bench Level	Area (m ²)	Influence (m)	Volume (m ³)	Tonnage (T) BD 2.5T/m ³
I-Year	A-A'	132	10	52	520.00	1,300.00
		126	113	52	5,876.00	14,690.00
		120	218	52	11,336.00	28,340.00
		114	294	52	15,288.00	38,220.00
		108	277	52	14,404.00	36,010.00
		102	298	52	15,496.00	38,740.00
	B-B'	120	38	60	2,280.00	5,700.00
		114	73	60	4,380.00	10,950.00

		108	108	60	6,480.00	16,200.00
	C-C'	114	5	60	300.00	750.00
		108	60	60	3,600.00	9,000.00
TOTAL					79,960.00	199,900.00
II-Year	A-A'	96	286	52	14,872.00	37,180.00
		90	310	52	16,120.00	40,300.00
	B-B'	102	166	60	9,960.00	24,900.00
		96	208	60	12,480.00	31,200.00
		90	238	60	14,280.00	35,700.00
	C-C'	102	85	60	5,100.00	12,750.00
	D-D'	96	4	58	232.00	580.00
		90	56	58	3,248.00	8,120.00
TOTAL					76,292.00	190,730.00
III-Year	A-A'	84	224	52	11,648.00	29,120.00
	B-B'	84	171	60	10,260.00	25,650.00
TOTAL					21,908.00	54,770.00
IV-Year	B-B'	78	54	52	2,808.00	7,020.00
	D-D'	84	126	58	7,308.00	18,270.00
TOTAL					10,116.00	25,290.00
V-Year	B-B'	78	98	60	5,880.00	14,700.00
TOTAL					5,880.00	14,700.00
Production for 5 year					194,156.00	485,390.00

Table No. 1.4 Year-wise generation of topsoil / waste

Year	Section No	Area (m ²)	Influence (m)	Volume (m ³)	Tonnage (T) BD 1.6T/m ³
I-Year	A-A'	55	52	2,860.00	4,576.00
	B-B'	23	60	1,380.00	2,208.00
	C-C'	15	60	900.00	1,440.00
Total				5,140.00	8,224.00
II-Year	B-B'	17	60	1,020.00	1,632.00
	C-C'	8	60	480.00	768.00
	D-D'	12	58	696.00	1,113.60
Total				2,196.00	3,513.60
IV-Year	D-D'	5	58	290.00	464.00
Total				290.00	464.00
GRAND TOTAL				7,626.00	12,201.60

The Production & Development Plan is enclosed vide **Plate No. 5A to 5E** (Mining Plan).

2. INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION:

I. Identification of project and project proponent. In case of Mining project, a copy of mining lease/ letter of intent should be given.

Building Stone Quarry is located in the Re-Survey Block. No.47, Re-Survey Nos. 133/4, 133/16, & 139/6(Government Land) of, Aryanadu Village, Nedumangad Taluk, Thiruvananthapuram District, Kerala State over an extent of 1.9274 Ha. Letter of Intent (LOI) for said Granite Building Stone quarry of M/s. Adani Vizhinjam Port Private Limited is issued vide Letter No. 5350/M3/2019 dated 07.06.2019 from Directorate of Mining & Geology, Thiruvananthapuram District. A copy of the Letter is enclosed as Annexure –1 (Mining Plan). The location Plan is enclosed vide **Plate No – 1** (Mining Plan). The Topographical Contours Map Showing Reading of boundary pillars is enclosed vide **Plate No – 3** (Mining Plan).

Name & address of lease holder : **Shri. Rajesh Kumar Jha,**
Managing Director & CEO,
M/s. Adani Vizhinjam Port Private Limited,
2nd Floor, Vipanchika Tower, Thycaud,
Thiruvananthapuram – 695014
Ph No: +91 9099005722

II. Brief description of nature of the project

The “Granite Building Stone Quarry of M/s. Adani Vizhinjam Port Private limited” over an extent of 1.9274 Ha, is a granite building stone mining project. The granite building stone is the basic rock in this area to be excavated by quarrying.

This Granite Building Stone quarry is proposed to be operated by Opencast Semi-Mechanized Quarrying Method. The mechanized operation of quarry shall use excavators, tippers, rock breakers, Jack hammer drilling and blasting. In addition to that jack hammers shall be used for hump breaking. The maximum production capacity proposed in this area is 1,99,900.00 Tonnes Per Annum building stone of size 10 mm to 2.4 cubic meter.

The quarrying operation shall provide 41 direct and twice the number of indirect employments to local people.

III. Need for the project and its importance to the country and or region.

The basic objective of the project is to have effective utilization of granite stone for break water construction work in Vizhinjam Port project and other Government infrastructure project.

Mainly infrastructure projects – like roads, highways, railways, bridges, buildings, township, Port Development, etc., have raised the demand of building material. Building stone quarry not only provides the building material but also employment and economic growth of the region that

ultimately enhance the socio-economic status of the people of the region and the state. The mining activities shall provide socio-economic benefits to the local population with direct & indirect employment opportunities. The project also contributes to the regional and financial benefits in the form of Royalty, Cess, Taxes, Seigniorage fee, DMF etc.

IV. Demand-Supply Gap.

Granite Building stone is an important component of the construction activities for infrastructure development. The demand for granite building stone is increasing along with the increase in infrastructure and construction activities in Kerala. This quarry can produce maximum of 1,99,900.00 tonnes of building stone annually and the demand of building stone by various industries can be partly fulfilled by this project. Since there is a huge requirement of granite building stone for the development of Vizhinjam Port Project, the production from proposed mining lease will partially meet the requirements of Port development works.

V. Imports Vs Indigenous production

The requirements of granite building stone in infrastructure industry is huge whereas the prices of granite are relatively low. The import or export of the same is not feasible due to heavy transportation cost. The granite building stone of size 10 mm to 2.4 cubic meter would be transported directly for breakwater construction.

VI. Export possibility.

This Mine has been granted by Government of Kerala for development of breakwater at Vizhinjam port and Other Government infrastructure projects (If needed) hence export is not envisaged for this project.

VII. Domestic/Export markets.

The blasted rock of 10mm to 2.4 cubic meter shall be loaded to the tippers by excavator and transported to the Vizhinjam port area for breakwater construction. The remaining material would be dispatched to various locations for Government local infrastructure development.

VIII. Employment Generation (Direct and Indirect) due to the project.

As per the requirement of Mines Act, Mines manager, Mines Foreman, Mine mates, Blaster, shall be appointed to supervise the quarrying operations. The list of the staff and workmen those shall be employed in the quarry is given below

Sl. No	Particulars	No's
1	First class mine manager	1
2	Asst Mine Manager	1
3	Mine foremen	1
4	Mine Mate cum Blaster	2
5	Mechanical Engineer	1
6	Highly Skilled (Operator, Driver etc.)	5

7	Skilled (Supervisor, Accountant, Clerk etc.)	5
8	Semi-skilled (Helpers, spotters etc.)	5
9	Un-skilled (general purpose)	20
	Total	41

NOTE: About twice the number of indirect employments would be generated from this project.

3. **PROJECT DESCRIPTION**

(i) Type of project including interlinked and interdependent projects, if any.

The building stone shall be produced by drilling and blasting, the blasted material shall be loaded using excavators and transported to the Vizhinjam Port Project for break water construction purpose.

(ii) Location (map showing general location, specific location, and project boundary & project site layout) with Co-ordinates.

The Granite Building Stone Quarry of M/s. Adani Vizhinjam Port Private Limited over an area of 1.9274 Ha, is located in Re-Survey Block. No.47, Re-Survey Nos. 133/4, 133/16, & 139/6(Government Land) of Aryanadu Village, Nedumangad Taluk, Thiruvananthapuram District, Kerala State. The corner points in latitude & longitude of the area is given below.

B.P.No.	Latitude	Longitude
1	N-08°35'18.095"	E-77°05'59.260"
2	N-08°35'17.418"	E-77°05'59.184"
3	N-08°35'15.887"	E-77°05'58.877"
4	N-08°35'15.566"	E-77°06'01.109"
5	N-08°35'15.240"	E-77°06'02.289"
6	N-08°35'15.961"	E-77°06'03.733"
7	N-08°35'15.919"	E-77°06'04.744"
8	N-08°35'15.484"	E-77°06'05.440"
9	N-08°35'14.749"	E-77°06'05.934"
10	N-08°35'15.084"	E-77°06'08.083"
11	N-08°35'17.788"	E-77°06'04.867"
12	N-08°35'17.084"	E-77°06'04.269"
13	N-08°35'16.964"	E-77°06'03.554"
14	N-08°35'17.821"	E-77°06'03.267"
15	N-08°35'18.624"	E-77°06'02.221"
16	N-08°35'20.030"	E-77°06'01.948"
17	N-08°35'19.594"	E-77°06'00.243"
18	N-08°35'18.703"	E-77°06'00.557"

Surface cum Geological Plan & Sections Showing the project boundary & project site layout with Co-ordinates is enclosed as **Plate No-3 & 4** (Mining Plan).

(iii) Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.

This is site specific project. Quarrying activities are carried out based on local geology and availability of the granite building stone at the specific site.

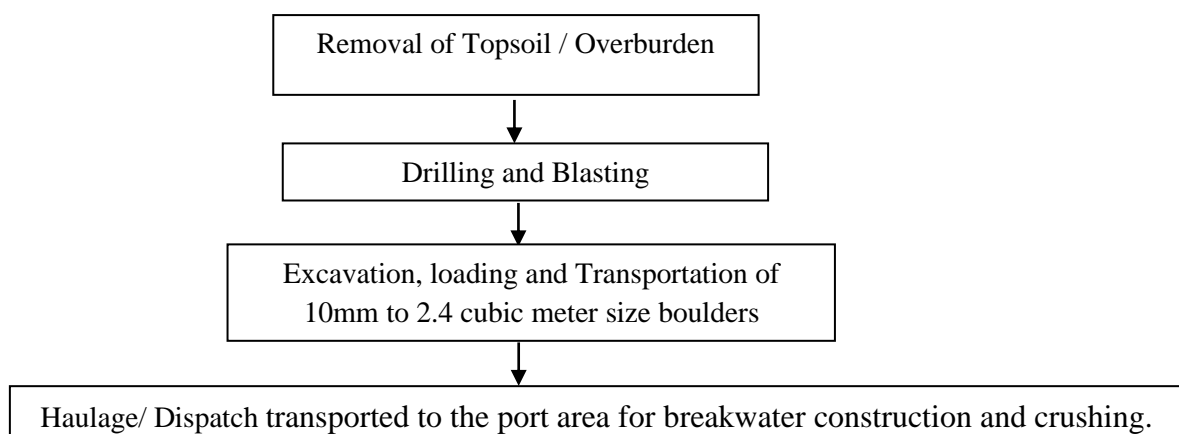
(iv) Size or magnitude of operation.

Small scale operation within an area of 1.9274 Ha, Maximum Production planned 1,99,900.00 Tonnes Per Annum (TPA) of granite building stone.

(v) Project description with process details (a schematic diagram/ flow chart showing the project layout, components of the project etc. should be given).

The quarrying of granite building stone is proposed by opencast semi-mechanized quarrying method and the sequence of quarrying shall be as given under,

- After exposing the granites, drilling of small diameter holes 33mm & Large diameter of 115mm, shall be done by Wagon Drill and Jack Hammer Drill.
- The blasting shall be carried out by latest technique of Non-Electrical (NONEL) blasting technology with millisecond delay detonators with proper burden & spacing.
- The Rock breakers shall be used to break the oversize boulders left after blasting.
- No secondary blasting like plaster shooting, pop blasting shall be undertaken at any time in the quarry.
- The blasted material and the broken material by rock breakers shall be loaded to the tippers by excavator and transported to the desired destination.



Summary of the production and development is given in the table below

Year	Production (T)	Topsoil (T)	Total handling (T)	Ratio
I-Year	1,99,900.00	8,224.00	2,08,124.00	1:0.04
II-Year	1,90,730.00	3,513.60	1,94,243.60	1:0.02
III-Year	54,770.00	0	54,770.00	1:0.0
IV-Year	25,290.00	464.00	25,754.00	1:0.02
V-Year	14,700.00	0	14,700.00	1:0.0
Total	4,85,390.00	12,201.60	4,97,591.60	1:0.03

At conceptual stage there shall be single pit in this area with 11 benches of 6m height and 6m width. The pit dimensions at conceptual stage shall have 267m in length & 129m in width and it shall be developed up to 72m above MSL level. The overall pit slope shall be maintained at less than 45⁰.

The top benches shall be rehabilitated with simple vegetation by spreading the excess topsoil. The bottom benches at the conceptual stage shall be converted into rainwater storage pond. The pit shall be properly fenced with single opening for drawing the water. The Conceptual Plan & Sections are enclosed as **Plate No. 7** (Mining Plan).

Totally 12,201.60 Tonnes topsoil shall be recovered and 4,85,390.00 Tonnes granite building stone shall be generated in the first five years of the plan period. The topsoil shall be stacked at the safety barrier area and shall be used for Afforestation/Green belt development.

The Geological resources of granite building stone in this area are **14,19,955.50 Tonnes** and mineral reserves are **4,98,710.00 Tonnes**. In the five years of plan period totally **4,85,390.00 Tonnes** granite building stone/ aggregate shall be quarried. The balance mineral reserves of **13,320.00 Tonnes** will be mined subsequently. Thus, the life of the mine is about **6 years**.

(vi) Raw material required along with estimated quantity, likely source, marketing area of final products, mode of transports of raw Material and finished product.

No raw materials are required for producing granite building stone, the final products shall be transported by 10 tonnes tippers to desired destination.

(vii) Resource optimization/ recycling and reuse envisaged in the project, if any, should be briefly outlined

There shall not be any waste generation in the quarry process as all the topsoil generated will be utilized for Green belt development.

(viii) Availability of water its source, Energy/ power requirement and source should be given.

Around 16 KLD of water is required for dust suppression, afforestation and domestic use, which shall be drawn from nearby old abandoned quarries / Rainwater harvesting ponds.

Packed drinking water shall be provided for drinking purposes.

Requirement of water

Purpose	Qty Required m ³ /day
Drinking water & Domestic	2
Afforestation	6*
Dust suppression	8*
Total	16

* The water for Plantation and dust suppression will not be required for 4-5 months in a year during monsoon and wet/ rainy days.

All Excavators, Tippers, Compressors and all other equipment's are self-primed by diesel engines.

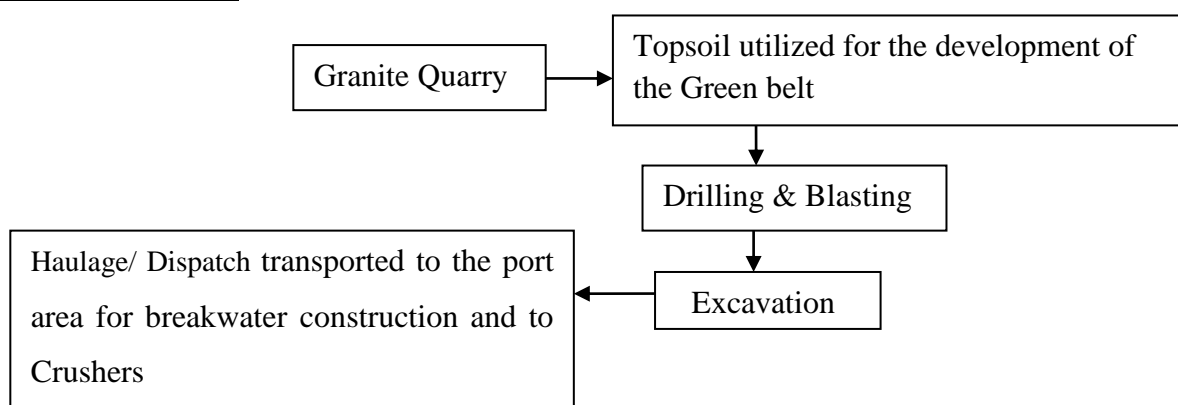
No external power is required for the project.

(ix) Quantity of wastes to be generated (liquid and solid) and scheme for their Management/ disposal.

There shall not be any waste generation (liquid & Solid) during production of the Granite building stones. Only the topsoil shall be utilized for the development of the green belt in the 7.5 meters safety zone.

(x) Schematic representations of the feasibility drawing which give information of the project

Quarrying Operations



4. **SITE ANALYSIS:**

(i) **Connectivity.**

This granite building stone quarry is located at 3.0 Kms from Aryanadu in Nedumangad Taluk. The quarry is at a distance of 28.2 Kms from Thiruvananthapuram town. It can be reached via Kattakkada - Eanchapuri Road.

(ii) **Landform, Land use and Land ownership.**

Since the proposed area is Government land, NOC from District Collector is enclosed as **Annexure-8** (Mining plan).

Present land use, land use at the end of progressive stage and the ultimate land use pattern.

Particulars	Land use pattern at present stage (Ha)	Land use pattern (end of progressive stage) (Ha)	Land use pattern at Conceptual stage (Ha)
Vegetated Area	0.9940	-	-
Rock Outcrop	0.9100	-	-
Area for mining / mining activities	0.0234	1.3607	1.3607
Area for Roads	-	-	-
Area for Safety Barrier / Green belt	-	0.5667	0.5667
Total	1.9274	1.9274	1.9274
Area for dump	-	-	-
Unused area	1.9040	-	-
Total Lease area	1.9274	1.9274	1.9274

(iii) **Topography (along with map).**

The lease is located on the slope of the area gently dipping towards SE. The highest elevation in this area is 135m above MSL and the lowest elevation is 80m above MSL. The Surface cum Geological Plan & Sections of the Quarry Lease is enclosed vide **Plate No.3 & 4** (Mining Plan).

(iv) Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, eco sensitive area, water bodies (distance from the HFL of the river). CRZ. In case of notified industrial area, a copy the Gazette notification should be given.

The proposed “Granite Building Stone Quarry of M/s. Adani Vizhinjam Port Private Limited” is located on the slope of the hill gently dipping towards SE slopes. It is not a forest land and there is no human habitation. Partially the area covered with rock formations over which thin vegetation exists. There is no forest land, no area under CRZ, No water bodies, and no Sanctuary in the core zone.

(v) Existing Infrastructure(Aerial Distance):

- Hospital : Govt Hospital, Aryanad, (1.70 Kms)
- School : N.S.S.U.P School, Mannoorkara (0.80 Km)
- Church : St. Thomas Church, Kokkottela (0.38 Kms)
- Mosque : Al Ihsun Masjid, Mannoorkara (1.04 Kms)
- Temple : Kuttukuzhi Thampuram Temple, Kuttichal (0.67 Kms)
- Anganwadi : Cheriaryanad (2.48 Kms)
- National Highway : Trivandrum – Nagercoil Highway (NH-66, 18.24 kms)
- State Highway : Nedumangad Highway (SH-3, 1.33 kms)

(vi) Soil Classification:

There is a soil cover of 0 to 0.5m thickness on the granite in the quarry lease area. The soil is Lateritic soil, reddish in color and clay with loamy nature.

(vii) Climatic data from Secondary Sources:

<i>Temperature</i>	<i>The annual variation of mean air temperature at Thiruvananthapuram district is from 21°C to 34°C.</i>
<i>Relative Humidity</i>	<i>The humidity is high and rises about 90% during the monsoon season.</i>
<i>Rainfall</i>	<i>The average annual rainfall of the district is 2035mm. It is significant that the district gets benefits of both monsoon – southwest monsoon and northeast monsoon.</i>

Source: District survey Report, Thiruvananthapuram.

(viii) Social Infrastructure available (Aerial Distance):

- Hospital : Govt Hospital, Aryanad, (1.70 Kms)
- School : N.S.S.U.P School, Mannoorkara (0.80 Km)
- Church : St. Thomas Church, Kokkottela (0.38 Kms)
- Mosque : Al Ihsun Masjid, Mannoorkara (1.04 Kms)
- Temple : Kuttukuzhi Thampuram Temple, Kuttichal (0.67 Kms)
- Anganwadi : Cheriaryanad (2.43 Kms)
- Police station : Aryanadu, (1.69 Kms)
- Fire Brigade : Mylakkara, (7.65 Kms)

5. PLANNING BRIEF:

i. Planning concept (type of industries, facilities, transportation etc) Town and Country planning/ Development authority Classification:

This is a granite Building stone mining project. It is proposed to produce maximum 1,99,900.00 tonnes building stones per annum. The mined material will be transported by tippers of 10 tonnes

capacity to Vizhinjam Port Project. Effective Environment Management will be carried out to control the pollution of Air, Water, Noise and Ground vibration.

The Mining Plan for the operations in the quarry lease area is approved by the District Geologist, Department of Mining and Geology, Thiruvananthapuram District, Kerala, vide Letter No. 360/DOT/ML/2019, dated: 19.12.2019.

ii. Population Projection:

There will not be any increase in population due to the project. The manpower required for the project will be employed from the local areas. Hence not much influx of population from outside is anticipated.

iii. Land use planning (breakup along with green belt etc):

Particulars	Land use pattern at present stage (Ha)	Land use pattern (end of progressive stage) (Ha)	Land use pattern at Conceptual stage (Ha)
Vegetated Area	0.9940	-	-
Rock Outcrop	0.9100	-	-
Area for mining / mining activities	0.0234	1.3607	1.3607
Area for Roads	-	-	-
Area for Safety Barrier / Green belt	-	0.5667	0.5667
Total	1.9274	1.9274	1.9274
Area for dump	-	-	-
Unused area	1.9040	-	-
Total Lease area	1.9274	1.9274	1.9274

iv. Assessment of Infrastructure demand (physical & social):

All the manpower for the project shall be employed from the local area. Thus, there shall not be influx of people into the region; therefore, no increase in the population is envisaged during the period of the operations.

The operations are also small scale. Hence, infrastructure demand both in the form of physical and social infrastructure, in terms of physical infrastructure will not be very demanding.

However, the project would raise the economic status of the people in the region thus the social infrastructure like education, health and hygiene, etc. would be quite demanding. The company thus commits to support the local community in the field of Health & Hygiene, Basic education, Education of girl child, Sports, renewable energy etc. thereby strengthening the social infrastructure of the region, and to the development of Vizhinjam Port project.

6. PROPOSED INFRASTRUCTURE

(i) Industrial Area (Processing Area):

No Crushing or screening or processing is planned within the quarry lease area. The entire product from the mine will be transported to the Vizhinjam Port Project. Existing road shall be strengthened & made use for the transportation. As the mining equipment are all diesel powered there is no need for external power. The infrastructure facilities like site services, First Aid room, Rest shelter, and other statutory facilities, etc., shall be in the close proximity of the quarry lease area.

The manpower requirement shall be employed from local area, no additional infrastructure is required.

(ii) Residential Area (Non-Processing Area):

No additional residential area is required as the manpower for this project shall be employed from the nearby villages.

(iii) Green Belt:

0.5667 Ha area earmarked for safety barrier shall be developed as green belt by planting minimum but not limiting to 800 no's of local species. Till conceptual stage totally 0.5667 Ha area shall be covered under green belt. Apart from this Afforestation shall be done on the haulage road by planting 1200 saplings.

(iv) Social Infrastructure:

The project shall generate 41 direct and twice the number of indirect employments to the local people. Hence, the activity will contribute to the improvement of income status of the local people. The quarry project will also improve infrastructure facilities, eventually leading to the overall development of the area, resulting in the improvement of standard of life of local population.

The Project proponent undertakes to spend Rs. 2.00 Lakhs per Annum, to take up CER works in the surrounding villages which includes Infrastructure creation for Rainwater harvesting system, renewable energy & plantation in community areas, Skill development programs, & other specific need base etc.

(v) Connectivity (Traffic and Transportation Road/ Rail/ Metro/ Water ways etc)

This granite building stone quarry is located at 3.0 Kms from Aryanadu in Nedumangad Taluk. The quarry is at a distance of 28.2 Kms from Thiruvananthapuram town. It can be reached via Kattakkada - Eanchapuri Road.

(vi) Drinking water Management (Source & Supply of Water):

Drinking water shall be made available at all the times to the mine workers. Packed drinking water shall be provided at mine site for drinking purpose.

(vii) Sewerage system:

Not applicable, as no human settlement is proposed in the lease area.

(viii) Industrial Waste Management:

No industrial waste is going to generate at this quarry.

(ix) Solid waste Management:

It is expected to recover 12,201.60 tonnes topsoil during quarrying this area. This topsoil shall be stacked separately in the pre-determined location as shown in the Production and Development plan and used in afforestation / Green belt / Safety barrier all along the periphery of the quarry lease area.

No other waste is envisaged from the operations.

(x) Power Requirement & Supply / Source:

As all the machinery are self-primed by diesel engines, no external power is required.

7. REHABILITATION AND RESETTLEMENT (R*R) PLAN

(i) Policy to be adopted (Central/ State) in respect of the project affected persons including home owners, land owners and land less laborers (a brief outline to be given):

Not applicable since there is no rehabilitation and resettlement involved in this project.

8. PROJECT SCHEDULE & COST ESTIMATES

i. Likely date of start of construction and likely date of completion (Time schedule for the project to be given):

The Quarry will be commenced immediately after getting the statutory approvals from Government authorities. Total cost of the project is about Rs. 600 lakhs.

ii. Estimated project cost along with analysis in terms of Economic viability of the project.

Considering the present domestic market conditions of the products, the appx. Cost of the project estimated is around Rs. 600 lakhs. The summary of the assets is given below. Mining machinery will be hired through contractors.

Table No. 8.1: Capital Cost of the Project

SI No.	DESCRIPTION	Capital investment Cost in lakh Rs.
1	Excavator, Rock breaker, Wagon drill (Estimated equipment cost)	140.00
	Water Tanker, Jeep,	40.00
	Tippers	70.00
2	Strengthening of Roads	15.00
3	Cost for Infrastructure like Site office, Temporary sheds, Rest shelters etc.,	50.00
4	Cost for Environment Protection	80.00
5	Cost for construction of Garland drains, SST, RWHP, Gully checks/Silt traps, etc	50.00
6	D.G. Set	10.00
7	Mine Development	20.00
8	Land Expenses (476.06 Cents x 20,000 rupees/Cent) + Misc	100.00
9	Miscellaneous	25.00
Total		600.00

Table No. 8.2: Land cost details for each Survey Number

Survey .No.	Extent in Hectares	Fair Value(Rupees)
133/4	1.1394	65,17,800
133/6	0.0435	2,14,800
139/6	0.5645	27,88,600
Total	1.9274	95,21,200
Documentation charges & Misc. Expenses		4,78,800
Overall Land Expenses		1,00,00,000

Table No. 8.3: Operating Cost of the Project

Sl.No.	Details	Cost
1	The estimated capital cost of the project	Rs.600.00 lakhs
2	Estimated expenses per Tonne	Rs.115.00
3	Royalty & Others related Cost per Tonne	Rs.90.00
5	Selling price per Tonne (Pit Head)	Rs.250.00

Therefore, the proposed project is financially viable. However, increase in prices of building stone in domestic market is further expected.

9. ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

This project will be one of the major economic activities resulting in provide livelihood and have positive impact on socio-economic life of people living in nearby villages thereby contributing to the overall up gradation of living standards. The project also generates revenues to the state and central governments, by way of royalties, GST and other taxes, Cess, DMF, Seigniorage fee, etc, The mining operations shall be providing employment to approximately 41 persons directly and twice the number of indirect employments will be created.

- Skill development, Support for use of renewable energy etc. programs shall be implemented on account of the facilities being planned as part of the CER works by the company.
- Plantation in community areas and avenue planation will be part of CER activities.
- Support facilities for construction of roof/rainwater harvesting system.
- The mined-out pit at the end of the mining operations will be developed into a pond for Pisciculture that could provide livelihood for a few villages. The water could be used for agriculture & various other purposes.

Summary of CER Annual Commitments

CER/ Recurring								
Sl. No	Activity	Head as per OM No: 22-65/2017-AI.III, Dated: 01/05/2018	1st year Rs in Lakhs	2nd year Rs in Lakhs	3rd year Rs in Lakhs	4th year Rs in Lakhs	5th year Rs in Lakhs	Total Rs in Lakhs (5years)
1.	Providing skill development programs like Computer operating, tailoring, Welding & Mechanic training, etc. to local people for both men and women which in turn increases the skill level of the local youth and women.	Skill Development	0.50	0.50	0.50	0.50	0.50	2.50
2.	Solar rechargeable streetlights will be installed at appropriate location in Mailamoodu and surrounding villages.	Solar power	0.50	0.50	0.50	0.50	0.50	2.50
3.	Construction of Rainwater Harvesting systems for recharge of domestic well in mailamoodu and nearby villages.	Rainwater Harvesting	0.50	0.50	0.50	0.50	0.50	2.50
4.	Avenue plantation will be carried in roadsides and Community areas of Mailamoodu and surrounding villages	Avenue planation and plantation in community areas.	0.25	0.25	0.25	0.25	0.25	1.25
5.	Development of need based Infrastructures, Educational, Health facilities, and other CER project works in the local area in consultation with local Self-Government (LSG's).	On specific need base.	0.25	0.25	0.25	0.25	0.25	1.25
TOTAL			2.00	2.00	2.00	2.00	2.00	10.00

❖ All the CER works shall be undertaken based on the recommendation of the Local Self Government (LSG's).

Conclusion:

This new project will specifically meet the Granite Building Stone requirements for the development of Vizhinjam Port project in Thiruvananthapuram District.

The project would also significantly contribute to the state and central exchequer by way of royalty, taxes, Seigniorage fee, etc. The contribution to the District Mineral Fund (DMF) will also positively contribute to the development of the Thiruvananthapuram District.

It can be summarized that the development of Granite Building Stone mining project of 'M/s. Adani Vizhinjam Port Private Limited' shall have a positive impact on the socio-economic and the environment of the area and lead to overall Sustainable Development of the region.

Date: 02.01.2020

Place: Thiruvananthapuram

(Signature of Project Proponent

Along with name and address)



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