

**APPLICATION FOR  
AMENDMENT IN TERMS OF REFERENCE  
OF  
SABARIMALA ROPEWAY PROJECT  
FROM HILL TOP NEAR KSEB SUBSTATION  
TO  
SANNIDHANAM BEHIND POLICE BARRACK**



**AT  
SABARIMALA**

**ELEVATION: UTP ELEVATION - 480 M ABOVE MSL.  
TECHNOLOGY: DETACHABLE GRIP MONOCABLE ROPEWAY SYSTEM  
(Category:A, Project falls under Periyar Wildlife Sanctuary)**

**Submitted to:**

Ministry of Environment, Forests & Climate Change  
Government of India

**Developed by:**

**M/s EIGHTEENTH STEP DAMODAR CABLE CAR PRIVATE LIMITED  
4D, E V Homes, Azad Road, Kaloor, Ernakulam**

**Environment Consultant:**

**M/s PERFECT ENVIRO SOLUTIONS PVT. LTD.**

***(NABET Registered wide list of accredited consultants organizations/ Rev 80/ September, 2019 at S. No-112)***

**5<sup>th</sup> Floor, NN Mall, Mangalam Place, Sector 3, Rohini, New Delhi**

**Phone No.: 011-49281360**

|                 |                             |                |
|-----------------|-----------------------------|----------------|
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## **SECTION-A : FORM-3**

**FORM-3**

**APPLICATION FOR AMENDMENT IN ENVIRONMENTAL CLEARANCE**

| <b>1.</b>              | <b>Details of Project</b>                                                                                                                                                                                                                                                                                                                                                                                        |                                                       |                                                                                                           |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------|--|------------------------|-------------------------|---------------------------|----------------------------|--------------------------|----------------|----------------|----------------|----------------|----------------|--|--|--|--|--|
|                        | a.                                                                                                                                                                                                                                                                                                                                                                                                               | Name of the project/s                                 | Sabarimala Temple Ropeway Project from Hill top near KSEB Substation to Sannidhanam behind Police Barrack |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | b.                                                                                                                                                                                                                                                                                                                                                                                                               | Name of the Company/Organization                      | M/s Eighteenth Step Damodar Cable Car Pvt. Ltd                                                            |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | c.                                                                                                                                                                                                                                                                                                                                                                                                               | Registered Address                                    | 4D, E V Homes, Azad Road, Kaloor, Ernakulum-682017                                                        |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | d.                                                                                                                                                                                                                                                                                                                                                                                                               | Legal Status of Company                               | Non-Government                                                                                            |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | e.                                                                                                                                                                                                                                                                                                                                                                                                               | Joint Venture (Yes/No)                                | No                                                                                                        |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        |                                                                                                                                                                                                                                                                                                                                                                                                                  | If Yes,                                               | Not Applicable                                                                                            |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        |                                                                                                                                                                                                                                                                                                                                                                                                                  | (i) No. of JV Partnerships (Multiple Entries Allowed) | Not Applicable                                                                                            |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | <table border="1"> <tr> <th>Name of the JV Partner</th> <th>Share of the JV Partner</th> <th>Address of the JV Partner</th> <th>Email ID of the JV Partner</th> <th>Mobile No. of JV Partner</th> </tr> <tr> <td>Not Applicable</td> <td>Not Applicable</td> <td>Not Applicable</td> <td>Not Applicable</td> <td>Not Applicable</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |                                                       |                                                                                                           |                          |  | Name of the JV Partner | Share of the JV Partner | Address of the JV Partner | Email ID of the JV Partner | Mobile No. of JV Partner | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |  |  |  |  |  |
| Name of the JV Partner | Share of the JV Partner                                                                                                                                                                                                                                                                                                                                                                                          | Address of the JV Partner                             | Email ID of the JV Partner                                                                                | Mobile No. of JV Partner |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
| Not Applicable         | Not Applicable                                                                                                                                                                                                                                                                                                                                                                                                   | Not Applicable                                        | Not Applicable                                                                                            | Not Applicable           |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                       |                                                                                                           |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
| <b>2.</b>              | <b>Address of the Correspondence</b>                                                                                                                                                                                                                                                                                                                                                                             |                                                       |                                                                                                           |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | a.                                                                                                                                                                                                                                                                                                                                                                                                               | Name of the Applicant                                 | Mr. Uma Nair                                                                                              |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | b.                                                                                                                                                                                                                                                                                                                                                                                                               | Designation                                           | Operation Officer                                                                                         |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | c.                                                                                                                                                                                                                                                                                                                                                                                                               | Address                                               | 4D, E V Homes, Azad Road, Kaloor, Ernakulam                                                               |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | d.                                                                                                                                                                                                                                                                                                                                                                                                               | Pin Code                                              | 682017                                                                                                    |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | e.                                                                                                                                                                                                                                                                                                                                                                                                               | E-Mail                                                | umagem@gmail.com                                                                                          |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | f.                                                                                                                                                                                                                                                                                                                                                                                                               | Telephone No.                                         | 0484-6060626                                                                                              |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
|                        | g.                                                                                                                                                                                                                                                                                                                                                                                                               | Fax No.                                               | -                                                                                                         |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |
| <b>3.</b>              | <b>Category of the Project/Activity as per Schedule of EIA Notification,2006</b>                                                                                                                                                                                                                                                                                                                                 |                                                       |                                                                                                           |                          |  |                        |                         |                           |                            |                          |                |                |                |                |                |  |  |  |  |  |



|           |                                      |                                                                                                                                                                                                                                                                                                                                              |                |
|-----------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|           | a.                                   | Project / Activity<br>[ 1 (a)(i) / 1 (a)(ii) I 1(b) / 1(c) / 1(d) / 1 (e) / 2(a) / 2(b) / 3(a) / 3(b) / 4(a) / 4(b)(i)/ 4(b)(ii) / 4(c) / 4(d) / 4(e) / 4(1) / 5(a) / 5(b) / 5(c) / 5(d) / 5(e) / 5(f) / 5(g) / 5(h) / 5(i) / 5(j)/ 6(a)/ 6(b)/ 7(a) ! 7(b)/ 7 (c) / 7 (d) / 7 (da) / 7 (e) / 7 (f) / 7 (g) / 7 (h) / 7 (i) / 8 (a) / 8 (b)] | 7 (g)          |
|           | b.                                   | Category (A/B1/B2)                                                                                                                                                                                                                                                                                                                           | Category A     |
|           |                                      | If B1 or B2,                                                                                                                                                                                                                                                                                                                                 | -              |
|           |                                      | Reason for application at Central Level / State level (in case of B1 and B2 projects)                                                                                                                                                                                                                                                        | -.             |
|           |                                      | If Others                                                                                                                                                                                                                                                                                                                                    | -              |
|           | c.                                   | Please Specify                                                                                                                                                                                                                                                                                                                               | -              |
| <b>4.</b> | <b>Location of the Project</b>       |                                                                                                                                                                                                                                                                                                                                              |                |
|           | a.                                   | Plot / Survey / Khasra No.                                                                                                                                                                                                                                                                                                                   | NA             |
|           | b.                                   | Village                                                                                                                                                                                                                                                                                                                                      | Perunad        |
|           | c.                                   | Tehsil                                                                                                                                                                                                                                                                                                                                       | Ranni          |
|           | d.                                   | District                                                                                                                                                                                                                                                                                                                                     | Pathanamthitta |
|           | e.                                   | State                                                                                                                                                                                                                                                                                                                                        | Kerala         |
|           | f.                                   | Pin Code                                                                                                                                                                                                                                                                                                                                     | 689662         |
|           | g.                                   | Bounded Latitudes (North)                                                                                                                                                                                                                                                                                                                    |                |
|           |                                      | From                                                                                                                                                                                                                                                                                                                                         | 9°24'53.52"N   |
|           |                                      | To                                                                                                                                                                                                                                                                                                                                           | 9°33'5.56"N    |
|           | h.                                   | Bounded Longitudes (East)                                                                                                                                                                                                                                                                                                                    |                |
|           |                                      | From                                                                                                                                                                                                                                                                                                                                         | 77° 3'54.80"E  |
|           |                                      | To                                                                                                                                                                                                                                                                                                                                           | 77° 4'43.49"E  |
|           | i.                                   | Survey of India Topo Sheet No.                                                                                                                                                                                                                                                                                                               | 58G/2          |
| <b>5.</b> | <b>Details of Terms of Reference</b> |                                                                                                                                                                                                                                                                                                                                              |                |
|           | a.                                   | Date of issue of ToR                                                                                                                                                                                                                                                                                                                         | 6.07.2017      |

| Product/Activity<br>(capacity/Area) | Quantity As per<br>approved ToR | Quantity<br>Proposed              | Unit          | Mode of<br>Transport/Transmi<br>ssion of Product |
|-------------------------------------|---------------------------------|-----------------------------------|---------------|--------------------------------------------------|
| Land Area                           | 3.838904                        | 4.94                              | Hectares      | NA                                               |
| Power<br>Requirement                | 0.095                           | 0.095                             | MW            | NA                                               |
| DG sets for Power<br>Backup         | 1x125 kVA (LTP)                 | 1x125 kVA (LTP)<br>1x25 kVA (UTP) | kVA           | NA                                               |
| Total Population                    | 800                             | 800- 1000                         | No.           | NA                                               |
| Total Water<br>Requirement          | 5                               | 13.3                              | KLD           | NA                                               |
| Wastewater<br>Generation            | 3                               | 9.2                               | KLD           | NA                                               |
| Total Solid Waste<br>Generation     | 23                              | 121                               | kg/day        | NA                                               |
| Cost of Project                     | 40                              | 80                                | Rs. in Crores | NA                                               |

- Mode of Transport/Transmission of Ropeway, combination of two or three Watt(MW), Hectares(ha), Kilo Litre per Day(KLD), Tons per Day, Kilometers(Km), Million Liters per Day(MLD), Product (Road. Rail, Conveyor Belt, Pipe Conveyor, Aria modes, Others)

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                    |                                                                  |                                                  |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------|------------------------------------------------------------------|--------------------------------------------------|
| 7. | Details of Configuration <i>(Multiple Entries Allowed)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        |                                    |                                                                  |                                                  |
|    | <b>Product/Activity (capacity/Area)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Quantity As per approved ToR</b>    | <b>Quantity Proposed</b>           | <b>Unit</b>                                                      | <b>Mode of Transport/Transmission of Product</b> |
|    | Land Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.838904                               | 4.94                               | Hectares                                                         | NA                                               |
|    | Power Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.095                                  | 0.095                              | MW                                                               | NA                                               |
|    | DG sets for Power Backup                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1x125 kVA (LTP)                        | 1x125 kVA (LTP)<br>1x25 kVA (UTP)  | kVA                                                              | NA                                               |
|    | Total Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 800                                    | 800 - 1000                         | No.                                                              | NA                                               |
|    | Total Water Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                                      | 13.3                               | KLD                                                              | NA                                               |
|    | Wastewater Generation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3                                      | 9.2                                | KLD                                                              | NA                                               |
|    | Total Solid Waste Generation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 23                                     | 121                                | kg/day                                                           | NA                                               |
|    | Cost of Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 40                                     | 40                                 | Rs. in Crores                                                    | NA                                               |
| 8. | <b>Reasons for the amendment in ToRs</b> – Due to a change in planning, following amendments have been proposed for the ropeway project- <ul style="list-style-type: none"><li>• Forest Area has been increased from 3,84 ha. to 4.94 ha for the project.</li><li>• Total Land area has been increased from 38389.04 m<sup>2</sup> to 49000 m<sup>2</sup>.</li><li>• Dormitory Units along with Kitchen has been proposed for visitors (for emergency purposes).</li><li>• Ambulance Car have been introduced for the project.</li><li>• The project has been planned to be “PLASTIC-FREE ZONE” for conservation of forest area and P river alongside Sabarimala temple.</li></ul> |                                        |                                    |                                                                  |                                                  |
| 9. | <b>Any Other Amendment required</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |                                    |                                                                  |                                                  |
|    | <b>Reference of Approved ToR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Description as per approved ToR</b> | <b>Description as per Proposal</b> | <b>Remarks</b>                                                   |                                                  |
|    | F.No. 10-17/2017-IA-III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Description details given in PFR       | Description details given in PFR   | Now, due to a change in planning, following amendments have been |                                                  |

|                                      |    |                                                            |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------|----|------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      |    |                                                            |                | <p>proposed for the ropeway project-</p> <ul style="list-style-type: none"> <li>• Forest Area has been increased from 3,84 ha. to 4.94 ha for the project.</li> <li>• Total Land area has been increased from 38389.04 m<sup>2</sup> to 49000 m<sup>2</sup>.</li> <li>• Dormitory Units along with Kitchen has been proposed for visitors (for emergency purposes).</li> <li>• Ambulance Car have been introduced for the project.</li> <li>• The project has been planned to be “PLASTIC-FREE ZONE” for conservation of forest area and Pamba river alongside Sabarimala temple.</li> </ul> |
| <b>10. Details of EIA Consultant</b> |    |                                                            |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                      | a. | Have you hired Consultant for preparing document (Yes/No)? | Yes            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                      |    | If No,                                                     | Not Applicable |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                      |    | (i) Reason for not engaging the Consultant                 | Not Applicable |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                      |    | If Yes,                                                    |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|            |                                 |                                                                                                                                                                     |                                                                   |
|------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
|            |                                 | (i) Accreditation No.                                                                                                                                               | Rev. 80/September, 2019 at S.No. 112                              |
|            |                                 | (ii) Name of the HA Consultant                                                                                                                                      | Perfact Enviro Solutions Pvt. Ltd.                                |
|            |                                 | (iii) Address                                                                                                                                                       | 5th Floor, NN Mall, Mangalam Palace, Sector-3 , Rohini, New Delhi |
|            |                                 | (iv) Mobile No.                                                                                                                                                     | 9818362330                                                        |
|            |                                 | (v) Landline No.                                                                                                                                                    | 01149281360                                                       |
|            |                                 | (vi) E-mail Id                                                                                                                                                      | info@perfactgroup.com                                             |
|            |                                 | (vii) Category of Accreditation<br>(Eligible for Category A / Eligible for Category B)                                                                              | A                                                                 |
|            |                                 | (viii) Sector of Accreditation                                                                                                                                      | Aerial Ropeways                                                   |
|            |                                 | (ix) Validity of Accreditation                                                                                                                                      | 21.11.2019                                                        |
|            |                                 | (x) Upload Certificate of Accreditation certified by QCI/NABET <i>(Upload pdf Only)</i>                                                                             | Enclosed                                                          |
| <b>13.</b> | <b>Documents to be attached</b> |                                                                                                                                                                     |                                                                   |
|            | a.                              | Upload Copy of revised Form-1                                                                                                                                       | Enclosed                                                          |
|            | b.                              | Upload revised pre-feasibility report                                                                                                                               | Enclosed                                                          |
|            | c.                              | Upload Cover Letter duly signed by the project proponent or authorized person<br><br>(Upload pdf only)                                                              | Enclosed                                                          |
|            | d.                              | Upload a copy of authorization duly signed by the project proponent in support of the person making this application on behalf of the User Agency (upload pdf only) | Enclosed                                                          |
|            | e.                              | Upload Additional File, if any<br>(Upload pdf only)                                                                                                                 |                                                                   |
| <b>14.</b> | <b>Undertaking</b>              |                                                                                                                                                                     |                                                                   |

|  |    |                                                                                                                                                                                                                                                                                                                                                                         |                                                    |
|--|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|  | a. | I hereby give undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information found to be false or misleading at any stage. The project will be rejected and clearance given, if any to the project will be revoked at our risk and cost. |                                                    |
|  | b. | Name                                                                                                                                                                                                                                                                                                                                                                    | Mr. Uma Nair                                       |
|  | c. | Designation                                                                                                                                                                                                                                                                                                                                                             | Operation Officer                                  |
|  | d. | Company                                                                                                                                                                                                                                                                                                                                                                 | M/s Eighteenth Step Damodar Cable Car Pvt. Ltd     |
|  | e. | Address                                                                                                                                                                                                                                                                                                                                                                 | 4D, E V Homes, Azad Road, Kaloor, Ernakulum-682017 |

## **SECTION-B : FORM-1**

**APPENDIX I**  
**(See paragraph – 8.9)**  
**FORM 1**

**I. Basic Information**

| S.No. | Item                                                                                                            | Details                                                                                                                                                                                                            |
|-------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | Name of the project/s                                                                                           | Sabarimala Temple Ropeway Project from Hill top near KSEB Substation to Sannidhanam behind Police Barrack                                                                                                          |
| 2.    | S. No. in the schedule                                                                                          | 7 (g)                                                                                                                                                                                                              |
| 3.    | Proposed capacity/ area/length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled. | Area of land- 4.94 ha<br>Alignment length – 2706.42 m<br>Capacity : 50 TPH                                                                                                                                         |
| 4.    | New/ Expansion/ Modernization                                                                                   | New                                                                                                                                                                                                                |
| 5.    | Existing Capacity/ Area etc.                                                                                    | Not Applicable                                                                                                                                                                                                     |
| 6.    | Category of Project i.e. 'A' or 'B'                                                                             | Category 'A'                                                                                                                                                                                                       |
| 7.    | Does it attract the general condition? If yes, please specify.                                                  | Yes.<br>Since the proposed project falls under Periyar Wildlife Sanctuary. The project attracts general conditions and falls under "Category A".                                                                   |
| 8.    | Does it attract the specific condition? If yes, please specify.                                                 | No                                                                                                                                                                                                                 |
| 9.    | Location                                                                                                        | Sabarimala                                                                                                                                                                                                         |
|       | Plot/ Survey/ Khasra No.                                                                                        | NA                                                                                                                                                                                                                 |
|       | Village                                                                                                         | Perunad                                                                                                                                                                                                            |
|       | Tehsil                                                                                                          | Ranni                                                                                                                                                                                                              |
|       | District                                                                                                        | Pathanamthitta                                                                                                                                                                                                     |
|       | State                                                                                                           | Kerala                                                                                                                                                                                                             |
| 10.   | Nearest railway station/ airport along with distance in kms.                                                    | <b>Nearest Railway Station:</b><br>Kadayanallur railway Station, 48.83 km SE<br><br><b>Nearest Airport:</b><br>Trivandrum International Airport, 104.22 km SSW<br><br><b>Nearest Highway:</b><br>SH-44 – 0.13 km E |
| 11.   | Nearest Town, city, District Headquarters along with distance in kms.                                           | Pamba, 0.36 km                                                                                                                                                                                                     |



|     |                                                                                                                                                                                                                                                     |                                                                                                                                                                                          |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12. | Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)                                                                                                                   | Pathanamthitta Municipality, Pathanamthitta P.O                                                                                                                                          |
| 13. | Name of the applicant                                                                                                                                                                                                                               | M/s Eighteenth Step Damodar Cable Car Limited                                                                                                                                            |
| 14. | Registered Address                                                                                                                                                                                                                                  |                                                                                                                                                                                          |
| 15. | Address for correspondence:                                                                                                                                                                                                                         | 4D, E V Homes, Azad Road, Kaloor, Ernakulam                                                                                                                                              |
|     | Name                                                                                                                                                                                                                                                | Mr. Uma Nair                                                                                                                                                                             |
|     | Designation (Owner/Partner/CEO)                                                                                                                                                                                                                     | Operation Officer                                                                                                                                                                        |
|     | Address                                                                                                                                                                                                                                             | 4D, E V Homes, Azad Road, Kaloor, Ernakulam                                                                                                                                              |
|     | Pin Code                                                                                                                                                                                                                                            | 682017                                                                                                                                                                                   |
|     | E-mail                                                                                                                                                                                                                                              | umagem@gmail.com                                                                                                                                                                         |
|     | Telephone No.                                                                                                                                                                                                                                       | 0484-6060626                                                                                                                                                                             |
|     | Fax no.                                                                                                                                                                                                                                             | -                                                                                                                                                                                        |
| 16. | Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo sheet.                                                                                                                                             | Yes<br>Details of Alternative sites are given in Prefeasibility Report.                                                                                                                  |
| 17. | Interlinked Projects                                                                                                                                                                                                                                | No                                                                                                                                                                                       |
| 18. | Whether separate application of interlinked project has been submitted?                                                                                                                                                                             | Not Applicable                                                                                                                                                                           |
| 19. | If yes, date of submission                                                                                                                                                                                                                          | Not Applicable                                                                                                                                                                           |
| 20. | If no, reason                                                                                                                                                                                                                                       | Not Applicable                                                                                                                                                                           |
| 21. | Whether the proposal involves approval/clearance under: if yes, details of the same and their status to be given.<br>(a) The Forest (Conservation) Act, 1980?<br><br>(b) The Wildlife (Protection) Act, 1972?<br>(c) The C.R.Z. Notification, 1991? | 4.94 ha. has been diverted for the development of Sabarimala Temple Ropeway and 250 number of trees will be cut down. Supporting document has been annexed in Section-E.<br><br>No<br>No |
| 22. | Whether there is any Government Order/ Policy relevant/ relating to the site?                                                                                                                                                                       | No                                                                                                                                                                                       |
| 23. | Forest land involved (hectares)                                                                                                                                                                                                                     | 4.94 ha of area of forest land in Periyar Tiger Reserve for the development of Sabarimala Temple is diverted.                                                                            |

|     |                                                                                                                                                                                                                                                              |                                                     |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| 24. | Whether there is any litigation pending against the project and/ or land in which the project is proposed to be set up?<br>(a) Name of the Court<br>(b) Case No.<br>(c) Orders/ directions of the Court, if any and its relevance with the proposed project. | No litigation pending against the project proponent |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|

## II. Activity

### 1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

| S.No. | Information/Checklist confirmation                                                                                                                    | Yes/<br>No | Details thereof (with approximate quantities /rates, wherever possible) with source of information data                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1   | Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan) | Yes        | A total of 4.94 ha of land will be involved for ropeway project development. The alignment partly falls within a Forest land for development of terminal stations & line towers. About 49400 m <sup>2</sup> (4.94 ha) of area has been applied for forest diversion and approximately 250 number of trees will be cut down. This activity will be carried out as per the guidelines of the Forest (Conservation) Act, 1980.<br><br>Hence, the land use has already been changed from forest land to ropeway. |
| 1.2   | Clearance of existing land, vegetation and buildings?                                                                                                 | Yes        | The alignment partly falls within a Forest land for development of terminal stations & line towers. About 49400 m <sup>2</sup> (4.94 ha) of the area of forest land has already been diverted for the development of the project and approximately 250 number of trees will be cut down. This activity will be carried out as per the guidelines of the Forest (Conservation) Act, 1980.                                                                                                                     |

|      |                                                                                                           |     |                                                                                                                                                                                                                                                                                                                                                                  |
|------|-----------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.3  | Creation of new land uses?                                                                                | Yes | There will be no change in land use.<br><br>Forest land would be changed to Ropeway terminals & pillars.                                                                                                                                                                                                                                                         |
| 1.4  | Pre-construction investigations e.g. bore houses, soil testing?                                           | Yes | Geo-technical investigations and soil tests shall be carried out.                                                                                                                                                                                                                                                                                                |
| 1.5  | Construction works?                                                                                       | Yes | Terminal stations and line towers will be constructed. Terminal will have basic amenities like toilets, waiting areas, Restaurants, first aid rooms etc. The proposed ropeway shall be developed LTP & UTP. LTP starts from Hill top near KSEB Substation from UTP at Sannidhanam behind police barack. There will be a continuous ropeway line from LTP to UTP. |
| 1.6  | Demolition works?                                                                                         | No  | Not Applicable                                                                                                                                                                                                                                                                                                                                                   |
| 1.7  | Temporary sites used for construction works or housing of construction workers?                           | No  | Around 40 local workers will be engaged, who will be from nearby villages. No housing shall be provided.                                                                                                                                                                                                                                                         |
| 1.8  | Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations | Yes | Total of two terminals will be constructed.                                                                                                                                                                                                                                                                                                                      |
| 1.9  | Underground works including mining or tunneling?                                                          | No  | Not Applicable                                                                                                                                                                                                                                                                                                                                                   |
| 1.10 | Reclamation works?                                                                                        | No  | Not Applicable                                                                                                                                                                                                                                                                                                                                                   |
| 1.11 | Dredging?                                                                                                 | No  | Not Applicable                                                                                                                                                                                                                                                                                                                                                   |
| 1.12 | Offshore structures?                                                                                      | No  | Not Applicable                                                                                                                                                                                                                                                                                                                                                   |
| 1.13 | Production and manufacturing processes?                                                                   | No  | Not Applicable                                                                                                                                                                                                                                                                                                                                                   |
| 1.14 | Facilities for storage of goods or materials?                                                             | Yes | Temporary sheds will be used for storage of material during the construction of Ropeway                                                                                                                                                                                                                                                                          |
| 1.15 | Facilities for treatment or disposal of solid waste or liquid effluents?                                  | Yes | <b>During construction phase:</b><br><b>Solid Waste:</b><br>Approx. 6 kg/day wastes will be generated which will be sent to solid waste/landfill site.<br><b>Liquid Effluent:</b><br>Temporary toilets with septic tank and soak pits shall be provided for waste                                                                                                |

|      |                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|--------------------------------------------------------------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                                                                                      |    | <p>water disposal during construction phase.</p> <p><b>During operation phase:</b></p> <p><b>Solid Waste:</b><br/>Total 121 kg/day (18 TPA) of waste will be generated due to the proposed ropeway project. Out of which, 85 kg/day (13 TPA) biodegradable waste will be treated in 2 no. of Organic Waste Convertor proposed at each Terminal LTP &amp; UTP respectively and converted into compost.</p> <p>36 kg/day (5 TPA) of recyclable waste will be collected and given to approved recycler.</p> <p>No plastic waste will be generated as it will be Plastic-free zone.</p> <p><b>Liquid Effluent:</b><br/>From 800-1000 no. of population from the proposed ropeway project, total 9.2 KLD of waste water will be generated which will be treated in STP (10 KLD) at LTP and bio-toilets at UTP. 8.3 KLD of treated water will be reused in purposes like flushing, gardening and miscellaneous. It will be a Zero-liquid Discharge Project.</p> |
| 1.16 | Facilities for long term housing of operational workers?                                                                             | No | Not Applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1.17 | New road, rail or sea traffic during construction or operation?                                                                      | No | Not Applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1.18 | New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc? | No | <p>Already road exists near the site. Following transport infrastructure already exist:</p> <p><b>Nearest Railway Station:</b><br/>Kadayanallur railway Station, 48.83 km SE</p> <p><b>Nearest Airport:</b> Trivandrum International Airport, 104.22 km SSW</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

|      |                                                                                                              |     |                                                                                                                                                                                                                                                      |
|------|--------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                                                              |     | <b>Nearest Highway:</b> SH-44 – 0.13 km E                                                                                                                                                                                                            |
| 1.19 | Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements? | No  | The project is itself a creation of alternative mode of transportation.                                                                                                                                                                              |
| 1.20 | New or diverted transmission lines or pipelines?                                                             | No  | Not Applicable                                                                                                                                                                                                                                       |
| 1.21 | Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers? | No  | Not Applicable                                                                                                                                                                                                                                       |
| 1.22 | Stream crossings?                                                                                            | No  | Not Applicable                                                                                                                                                                                                                                       |
| 1.23 | Abstraction or transfers of water from ground or surface waters?                                             | Yes | Water will be sourced from Municipal Supply                                                                                                                                                                                                          |
| 1.24 | Changes in water bodies or the land surface affecting drainage or run-off?                                   | No  | Not Applicable                                                                                                                                                                                                                                       |
| 1.25 | Transport of personnel or materials for construction, operation or decommissioning?                          | Yes | Material will be transported to construction sites using local labour and mules. About 40 persons will be employed for the construction purposes.                                                                                                    |
| 1.26 | Long-term dismantling or decommissioning or restoration works?                                               | No  | Not Applicable                                                                                                                                                                                                                                       |
| 1.27 | Ongoing activity during decommissioning which could have an impact on the environment?                       | No  | Not Applicable                                                                                                                                                                                                                                       |
| 1.28 | Influx of people to an area in either temporarily or permanently?                                            | Yes | <p><b>During Construction phase:</b><br/>Maximum of 40 numbers of laborers will be deployed during peak construction phase.</p> <p><b>During operation phase</b><br/>50 staff will be envisaged as staff for the maintenance of proposed ropeway</p> |
| 1.29 | Introduction of alien species?                                                                               | No  | None                                                                                                                                                                                                                                                 |
| 1.30 | Loss of native species or genetic diversity?                                                                 | Yes | Total no. of 250 number of trees will be cut down for the proposed ropeway project.                                                                                                                                                                  |
| 1.31 | Any other actions?                                                                                           | No  | Not Applicable                                                                                                                                                                                                                                       |

**2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):**

Environment Consultant By: M/s Perfect Enviro Solutions Pvt. Ltd.

| S.No. | Information/checklist confirmation                                                            | Yes/ No | Details thereof (with approximate quantities /rates, wherever possible) with source of information data                                                                                                                                                                                                                                                                                                                           |
|-------|-----------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1   | Land especially undeveloped or agricultural land (ha)                                         | Yes     | A total of 49400 m <sup>2</sup> (4.94 ha) of land will be involved for ropeway project development. The alignment partly falls within a Forest land for development of terminal stations & line towers. About 49400 m <sup>2</sup> (4.94 ha) of the area of forest land has already been diverted and approximately 250 number of trees will be cut down.                                                                         |
| 2.2   | Water (expected source & competing users) unit: KLD                                           | Yes     | <b>During construction phase:</b> The water required during peak stage of construction will be about 2 KLD. The water will be provided by Tanker supply.<br><br><b>During Operation phase:</b> The total water requirement for the project will be 13.3. KLD. Out of which, 5 KLD fresh water requirement will be met by Municipal Supply. Rest of the water requirement will be met by reusing treated water generated from STP. |
| 2.3   | Minerals (MT)                                                                                 | No      | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2.4   | Construction material – stone, aggregates, sand / soil (expected source – MT)                 | Yes     | Construction material will be bought from the nearby areas and towns.                                                                                                                                                                                                                                                                                                                                                             |
| 2.5   | Forests and timber (source – MT)                                                              | No      | Not Applicable                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2.6   | Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW) | Yes     | <b>Power source:</b> Kerala State Electricity Board Limited.<br><b>Power Load Requirement :</b> 95 kW.<br><b>Power Backup:</b><br>DG set of capacity 1x 125 kVA at LTP and 1x 25 kVA at UTP and for backup power supply.                                                                                                                                                                                                          |
| 2.7   | Any other natural resources (use appropriate standard units)                                  | No      | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                    |

**3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.**

| S.No. | Information/Checklist confirmation                                                                                                             | Yes/ No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data                                                                                                       |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1   | Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies) | Yes     | No Storage of hazardous substances (as per MSIHC rules) will be done however, used oil from DG sets will be generated. Proper management of used oil shall be taken care of. Details are given in Section-C. |
| 3.2   | Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)                                               | No      | Suitable drainage and waste management measures will be adopted in both the construction and operational phase which will restrict stagnation of water or accumulation of                                    |

|     |                                                                                                                      |     |                                                                                                                                                                                                                                   |
|-----|----------------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                      |     | water. This will effectively restrict the reproduction and growth of disease vectors.                                                                                                                                             |
| 3.3 | Affect the welfare of people e.g. by changing living conditions?                                                     | Yes | Due to upcoming of Ropeway, employment opportunities will increase, resulting increase in earning of people. Therefore, the living conditions will improve in the area. Old and Handicap persons will be able to visit the place. |
| 3.4 | Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc., | No  | No vulnerable people exists at the site                                                                                                                                                                                           |
| 3.5 | Any other causes                                                                                                     | No  | Not applicable                                                                                                                                                                                                                    |

#### 4. Production of solid wastes during construction or operation or decommissioning (MT/month)

| S. No. | Information/Checklist confirmation                         | Yes /No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------|------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1    | Spoil, overburden or mine wastes.                          | No      | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4.2    | Municipal waste (domestic and or commercial wastes)        | Yes     | <p><b>During Construction Phase,</b><br/>Approx. 40 local workers will be preferably employed, no labour camp will be setup at the site. Approx. 6 kg/day wastes will be generated which will be sent to solid waste/landfill site.</p> <p><b>During Operation Phase,</b><br/>Total 121 kg/day (18 TPA) of waste will be generated due to the proposed ropeway project. Out of which, 85 kg/day (13 TPA) biodegradable waste will be treated in 2 no. of Organic Waste Converter proposed at each Terminal LTP &amp; UTP respectively and converted into compost. 36 kg/day (5 TPA) of recyclable Waste will be collected and given to approved recycler. No plastic waste will be generated as it will be Plastic-free zone.</p> |
| 4.3    | Hazardous wastes (as per Hazardous Waste Management Rules) | Yes     | Used oil and Waste lubricants will be the Hazardous waste in the project which will be disposed off as per Hazardous waste Management, Handling & Trans boundary) Movement Rules, 2016.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4.4    | Other industrial process wastes                            | No      | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4.5    | Surplus product                                            | No      | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|      |                                                       |     |                                                                                                                                                                                                                                |
|------|-------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.6  | Sewage sludge or other sludge from effluent treatment | Yes | No STP is proposed in the area, the wastewater generated from the site is very less in quantity. The wastewater generated shall be treated in Bio-Toilets provided at LTP & UTP and then shall be disposed off into soak pits. |
| 4.7  | Construction or demolition wastes                     | Yes | Waste generated due to construction for the project will be re-used completely for backfilling and landscaping.                                                                                                                |
| 4.8  | Redundant machinery or equipment                      | No  | Not applicable                                                                                                                                                                                                                 |
| 4.9  | Contaminated soils or other materials                 | No  | Not applicable                                                                                                                                                                                                                 |
| 4.10 | Agricultural wastes                                   | No  | Not applicable                                                                                                                                                                                                                 |
| 4.11 | Other solid wastes                                    | No  | Not applicable                                                                                                                                                                                                                 |

**5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)**

| S.No. | Information/Checklist confirmation                                                           | Yes/ No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data                                                                                                                                                                     |
|-------|----------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5.1   | Emissions from combustion of fossil fuels from stationary or mobile sources.                 | Yes     | Emissions will be from DG Sets of capacity 1x 125 kVA at LTP and 1x 25 kVA at UTP . DG sets will run in case of power failure. To avoid the emissions, adequate stack height will be provided for DG Sets. The DG sets will run only in case electricity is not available. |
| 5.2   | Emissions from production processes                                                          | No      | Not applicable                                                                                                                                                                                                                                                             |
| 5.3   | Emissions from materials handling including storage or transport                             | No      | Not applicable                                                                                                                                                                                                                                                             |
| 5.4   | Emissions from construction activities including plant and equipment                         | Yes     | Dust emissions will be generated during construction activities. Water sprinkling will be carried out at construction sites.                                                                                                                                               |
| 5.5   | Dust or odours from handling of materials including construction materials, sewage and waste | No      | Not applicable                                                                                                                                                                                                                                                             |
| 5.6   | Emissions from incineration of waste.                                                        | No      | Not applicable                                                                                                                                                                                                                                                             |
| 5.7   | Emissions from burning of waste in open air (e.g. slash materials, construction debris).     | No      | Not applicable                                                                                                                                                                                                                                                             |
| 5.8   | Emissions from any other sources.                                                            | No      | Not applicable                                                                                                                                                                                                                                                             |



### 6. Generation of Noise and Vibration, and Emissions of Light and Heat:

| S. No. | Information/Checklist confirmation                                    | Yes/ No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data                                                                                                      |
|--------|-----------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.1    | From operation of equipment e.g. engines, ventilation plant, crushers | Yes     | Noise will be generated at the time of construction activities during excavation and drilling for foundation of pillars. Noise barrier shall be installed to prevent dispersion of the noise. DG set shall be bought acoustically enclosed. |
| 6.2    | From industrial or similar processes                                  | No      | Not applicable                                                                                                                                                                                                                              |
| 6.3    | From construction or demolition                                       | Yes     | Temporary increase of noise level will be there during construction phase                                                                                                                                                                   |
| 6.4    | From blasting or piling                                               | No      | Not applicable                                                                                                                                                                                                                              |
| 6.5    | From construction or operational traffic                              | No      | Not applicable                                                                                                                                                                                                                              |
| 6.6    | From lighting or cooling systems                                      | No      | Not applicable                                                                                                                                                                                                                              |
| 6.7    | From any other sources                                                | No      | Not applicable                                                                                                                                                                                                                              |

### 7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

| S. No. | Information/Checklist confirmation                                                                      | Yes/ No | Details thereof (with approximate quantities/rates, wherever possible) with source of information data                                                                                                                                                                              |
|--------|---------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.1    | From handling, storage, use or spillage of hazardous materials                                          | No      | Not applicable                                                                                                                                                                                                                                                                      |
| 7.2    | From discharge of sewage or other effluents to water or the land (expected mode and place of discharge) | Yes     | There shall be a provision of 50 staff during the operation of the ropeway. There shall be provision STP at LTP and Bio-Toilets at UTP for the staff. The treated water generated from STP will be reused within the project for purposes like flushing, gardening & miscellaneous. |
| 7.3    | By deposition of pollutants emitted to air into the land or into water                                  | Yes     | The only source of emission in air will be DG Sets of capacity 1x 125 kVA at LTP and 1x 25 kVA at UTP . DG sets will run in case of a power failure. Adequate Stack height for DG Sets shall be provided.                                                                           |
| 7.4    | From any other sources                                                                                  | No      | Not applicable                                                                                                                                                                                                                                                                      |
| 7.5    | Is there a risk of long term buildup of pollutants in the environment from these sources?               | No      | Not applicable                                                                                                                                                                                                                                                                      |

**8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment.**

| <b>S. No.</b> | <b>Information/Checklist confirmation</b>                                                                                               | <b>Yes/ No</b> | <b>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</b>                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8.1           | From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances                                 | No             | Not applicable                                                                                                                                                                                                            |
| 8.2           | From any other causes                                                                                                                   | Yes            | Adequate safety measures shall be followed as per IS specification such as door locks, rescue equipment. Appropriate rescue equipment shall be provided to facilitate rescue operation of passengers from Cabins of line. |
| 8.3           | Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)? | No             | The project falls in Seismic Zone III. Proper precautions shall be undertaken during designing of foundations of Pillars and LTP & UTP.                                                                                   |

**9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality.**

| <b>S. No.</b> | <b>Information/Checklist confirmation</b>                                                                                                                                                                                                                                                                                                                                                                          | <b>Yes/ No</b> | <b>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</b>                                                                                                                                     |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9.1           | <p>Lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:</p> <ul style="list-style-type: none"> <li>Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.)</li> <li>Housing development</li> <li>Extractive industries</li> <li>Supply industries</li> <li>Other</li> </ul> | No             | <p>The following structures will be developed as supporting infrastructure within the premises:</p> <p>There shall be provision of STP at LTP &amp; Bio-toilets UTP for the proposed project.</p> <p>None</p> <p>None</p> <p>None</p> <p>None</p> |

|     |                                                                                                     |     |                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----|-----------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9.2 | Lead to after-use of the site, which could have an impact on the environment                        | Yes | There would be a social upliftment of the area due to increased tourism from the proposed project, positive impact due to efficient and cost-effective alternate means of transportation system due to proposed Ropeway. Ropeway system would also lead to Reduced pollution, Traffic de-congestion. There will be more infrastructure development nearby due to better means of transportation. |
| 9.3 | Set a precedent for later developments                                                              | No  | This rope-way will lay precedent for alternatives mode of transportation as proposed ropeway system would also lead to reduced pollution, Traffic de-congestion. There will be more infrastructure development nearby.                                                                                                                                                                           |
| 9.4 | Have cumulative effects due to proximity to other existing or planned projects with similar effects | No  | Not Applicable                                                                                                                                                                                                                                                                                                                                                                                   |

### III. Environmental Sensitivity

| S. No. | Areas                                                                                                                                                      | Name/<br>Identity                                                                                                                                                                 | Aerial distance (within 15 km.) from Proposed project location boundary                                   |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 1      | Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value            | Periyar Wild Life Sanctuary and Tiger reserve                                                                                                                                     | Area comes under the century                                                                              |
| 2      | Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests | <b>Water Bodies</b><br>Pamba Aar River<br>Kakkal Aar<br>Anathode Dam<br>Pamba Dam<br>Mullaperiyar Reservoir<br><br><b>Forest</b><br>Periyar Wild Life Sanctuary and Tiger reserve | 0.21 km NE<br>3.42 km SE<br>12.15 km SE<br>10.19 km SE<br>10.41 km NE<br><br>Area comes under the century |
| 3      | Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration              | Periyar Wild Life Sanctuary and Tiger reserve                                                                                                                                     | Area comes under the century                                                                              |
| 4      | Inland, coastal, marine or underground waters.                                                                                                             | None                                                                                                                                                                              | None                                                                                                      |

|    |                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                             |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | State, National boundaries                                                                                                                                    | Tamil Nadu                                                                                                                                                                                                                                                                                                                                                                                        | 20.69 km NE                                                                                                                                                                                 |
| 6  | Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas                                                              | <b>Roads:</b><br>SH- 44<br>NH 183 A<br><br><b>Railway Station:</b><br>Kadayanallur Rly Station<br><br><b>Airport:</b><br>Trivandrum International Airport                                                                                                                                                                                                                                         | 0.13 km E<br>7.30 km E<br><br>48.83 km SE<br><br>104.22 km SSW                                                                                                                              |
| 7  | Defense installations                                                                                                                                         | None                                                                                                                                                                                                                                                                                                                                                                                              | None                                                                                                                                                                                        |
| 8  | Densely populated or built-up area                                                                                                                            | Sabrimala                                                                                                                                                                                                                                                                                                                                                                                         | UTP of the project is situated in Sabrimala                                                                                                                                                 |
| 9  | Areas occupied by sensitive man-made land uses ( <i>hospitals, school, places of worship, community facilities</i> )                                          | <b>Hospital</b><br>Govt Hospital hospital<br>Government Hospital<br>Amrita Hospital<br>Govt Hospital Pampa<br><br><b>Post Office</b><br>Gavi Post Office<br><br><b>Place of Worship</b><br>Sabrimala Sannidhanam<br>Sree Dharma Saastha Temple<br>Muthappan Palli Church<br><br><b>School</b><br>Govt H.S.S. Kissumam School<br><br><b>Bank</b><br>Dhanlaxmi Bank<br>State Bank of Travancore ATM | 0.19 km E (UTP)<br>0.44 km SE (UTP)<br>0.33 km SE (LTP)<br>0.31 km NE (LTP)<br><br>8.90 km E<br><br>0.20 km NE<br>0.29 km SEE<br>3.16 km SW<br><br>9.91 km W<br><br>0.25 km E<br>0.39 km NE |
| 10 | Areas containing important, high quality or scarce resources (Ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals) | None                                                                                                                                                                                                                                                                                                                                                                                              | None                                                                                                                                                                                        |
| 11 | Areas already subjected to pollution or environmental damage. ( <i>Those where existing legal environmental standards are exceeded</i> )                      | None                                                                                                                                                                                                                                                                                                                                                                                              | None                                                                                                                                                                                        |

|    |                                                                                                                                                                                                                             |  |                                                     |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------|
| 12 | <p>Areas susceptible to natural hazard which could cause the project to present environmental problems</p> <p><i>(Earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)</i></p> |  | <p>The project area falls in seismic zone –III.</p> |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------|

## **SECTION-C: BRIEF SUMMARY**

## **BRIEF SUMMARY**

The proposed Sabarimala Ropeway Project will be developed between Hilltop near KSEB Substation Pamba (LTP) and Sannidhanam Temple (UPT), Kerala. The High-Power Committee (HPC) for the implementation of the Sabarimala Master Plan has proposed a Ropeway project in between Pamba and Sannidhanam (uphill). The proposed Ropeway will reduce travel time for passengers and will also be helpful in the transportation of goods. As per the Concessionaire Agreement between M/s Damodar Ropeways & Infra Ltd. and M/s Eighteenth Step Projects Private Ltd. accordingly, an SPV has been formed named M/s Eighteenth Step Damodar Cable Car Pvt. Ltd which will be held responsible for the development of the proposed Ropeway project.

The proposed system to be installed at Sabarimala will be the Detachable Grip Monocable Ropeway System. The Project is a 2706.42 m long ropeway, covering an area of 48094.640 m<sup>2</sup> (including two Terminal Stations, towers, ropeway corridor, open & covered storage area, Godown, Machine Room, Dormitory and Kitchen areas). There will be a continuous ropeway line from Lower Terminal Point to Upper Terminal Point.

The project is an Aerial Ropeway falls under item 7 (g) of the EIA notification, 2006 and is a designated Project as per Schedule and falls under category A, as it attracts the general condition. The selected alignment falls in some parts of Periyar Wildlife Sanctuary. The project was granted Terms of Reference vide letter no. F.No. 10-17/2017-IA-III dated 6.07.2017 for the development of a ropeway admeasuring area of 38389.04 m<sup>2</sup>.

Now, due to a change in planning, the following amendments have been proposed for the ropeway project-

- Forest Area has been increased from 3,84 ha. to 4.94 ha for the project.
- Total Land area has been increased from 38389.04 m<sup>2</sup> to 49400 m<sup>2</sup>.
- Dormitory Units along with Kitchen have been proposed for visitors (for emergency purposes).
- Ambulance cars have been introduced for the project.
- The project has been planned to be “PLASTIC-FREE ZONE” for conservation of forest area and Pamba river alongside Sabarimala temple.

Hence, we are applying to the Amendment in Terms of Reference of the same.

The Revised Latitude & longitude of the site are given below:

| Station | Latitude      | Longitude    | Elevation (m) |
|---------|---------------|--------------|---------------|
| LTP     | 77° 3'54.80"E | 9°24'53.52"N | 190           |
| UTP     | 77° 4'43.49"E | 9°33'5.56"N  | 906           |

To meet the terrain, length and capacity requirement a Detachable Monocable system is appropriate in this Alignment. A maximum of 40 numbers of labor will be deployed during the peak construction phase. Ropeway will be used for material handling (carrying capacity of 50 TPH) and shifting persons in emergency situations and ambulance services. During the regular operation of Ropeway, Staff for operation & maintenance to be deployed at the project will be about 50 numbers. Approx. 800 - 1000 visitors (including dormitory and ropeway complex) are expected in a day and there shall be a provision of 50 staff during the operation of the ropeway.

Power Load Requirement will be 95 kW. DG sets of capacity 1 x 125 kVA at LTP and 1 x 25 kVA at UTP is proposed for backup power supply. These D.G. Sets will be provided with proper stack height as per the CPCB norms.

Approx. 800 - 1000 visitors (including dormitory and ropeway complex) are expected in a day and there shall be a provision of 50 staff during the operation of the ropeway. There will be provision of toilets at LTP and UTP for the visitors & staff. Bio-toilets will also be provided at LTP and UTP. The total water requirement has been estimated at 13.3 KLD. 5 KLD of freshwater requirement will be met by Municipal Supply. The rest of the water requirement will be met by reusing treated water generated from the Sewage Treatment Plant of capacity 10 KLD.

Water will be used mainly for flushing & hand-washing, kitchen, drinking, Gardening & misc. purposes. 9.2 KLD of wastewater will be generated which will be treated in STP of capacity 10 KLD located at LTP and bio-toilets located at UTP. The water storage tank will be at LTP and UTP. For drinking water, a water cooler/water Dispenser shall be provided at both LTP & UTP.



A total of 121 kg/day (18 TPA) of waste will be generated due to the proposed ropeway project. Out of which, 85 kg/day (13 TPA) biodegradable waste will be treated in 2 no. of Organic Waste Converter proposed at each Terminal LTP & UTP respectively and converted into compost. 36 kg/day (5 TPA) of recyclable Waste will be collected and given to approved recycler. No plastic waste will be generated as it will be the Plastic-free zone.

There will be no displacement or immigration of the human population due to the proposed project. Risk assessment shall be done and proper safety and security measures shall be undertaken. Proper prevention and timely maintenance of ropes, machines etc will be scheduled to prevent any accident. The maintenance team will be trained to handle any type of contingency in time of emergency. All safety guidelines shall be adhered to and followed during construction and operation phases. First aid facilities will be provided at the site.

## **SECTION D- PRE-FEASIBILITY REPORT**

### **Project Description:**

The proposed Sabarimala Ropeway Project will be developed between Hilltop near KSEB Substation Pamba (LTP) and Sannidhanam Temple (UPT), Kerala. The High-Power Committee (HPC) for the implementation of the Sabarimala Master Plan has proposed a Ropeway project in between Pamba and Sannidhanam (uphill). The proposed Ropeway will reduce travel time for passengers and will also be helpful in the transportation of goods. As per the Concessionaire Agreement between M/s Damodar Ropeways & Infra Ltd. and M/s Eighteenth Step Projects Private Ltd. accordingly, an SPV has been formed named M/s Eighteenth Step Damodar Cable Car Pvt. Ltd which will be held responsible for the development of the proposed Ropeway project.

The proposed system to be installed at Sabarimala will be the Detachable Grip Monocable Ropeway System. The Project is a 2706.42 m long ropeway, covering an area of 48094.640 m<sup>2</sup> (including two Terminal Stations, towers, ropeway corridor, open & covered storage area, Godown, Machine Room, Dormitory and Kitchen areas). There will be a continuous ropeway line from Lower Terminal Point to Upper Terminal Point.

The project is an Aerial Ropeway falls under item 7 (g) of the EIA notification, 2006 and is a designated Project as per Schedule and falls under category A, as it attracts the general condition. The selected alignment falls in some part of Periyar Wildlife Sanctuary. The project was granted Terms of Reference vide letter no. F.No. 10-17/2017-IA-III dated 6.07.2017 for the development of a ropeway admeasuring area of 38389.04 m<sup>2</sup>.

Now, due to a change in planning, following amendments have been proposed for the ropeway project-

- Forest Area has been increased from 3,84 ha. to 4.94 ha for the project.
- Total Land area has been increased from 38389.04 m<sup>2</sup> to 49000 m<sup>2</sup>.
- Dormitory Units along with Kitchen has been proposed for visitors (for emergency purposes).
- Ambulance Car have been introduced for the project.
- The project has been planned to be “PLASTIC-FREE ZONE” for conservation of forest area and Pamba river alongside Sabarimala temple.

Hence, we are applying to Amendment in Terms of Reference of the same.

## **Type of Project**

The project being an Aerial Ropeway falls under the Item 7 (g) as per EIA Notification, 2006 and is a designated Project as per Schedule and falls under category A, as it attracts the general condition. The selected alignment falls in some part of Periyar Wildlife Sanctuary.

## **Project Proponent**

M/s Eighteenth Step Damodar Cable Car Private Limited is a Private company by shares registered on 01 June 2015. It is classified as Non-govt company and is registered at Registrar of Companies, Ernakulam to create safe, reliable, efficient and environmentally sound infrastructure.

## **Description of Project Site:**

The sabarimala temple is situated in the midst of dense forests in the Periyar Wildlife Sanctuary in Ranni Taluk of Pathanamthitta, district of Kerala. Sabarimala is located deep in the western ghat hill ranges about 70 km East of Pathanamthitta, the district headquarters and 185 km north of Thiruvananthapuram, the state capital. The most famous temple of Lord Ayyappa is located in the Western Ghat mountain ranges of Pathanamthitta District, Perunad gram panchayat in Kerala visited by a large number of people from all over the country and abroad, however, mostly from the four southern states of India.

Sabarimala is a Hindu pilgrimage center. It is the largest annual pilgrimage in the world with an estimated 50 million devotees visiting every year. Sabarimala is believed to be the place where the Hindu God Ayyappan meditated after killing the powerful demoness Mahishi. Ayyappan's temple is situated here amidst 18 hills. The temple is situated on a hilltop at an altitude of 499 m above mean sea level, and is surrounded by mountains and dense forests. The temple is open for worship only during the days of Manadalapooja (approximately 15 November to 14 January), Makaravilakku (14 January- Makkar Sankranti) and Maha Vishuva Sankranti (14 April), and the first five days of each Malayalam month.

- **Lower Terminal Point:** It starts from Hill top near KSEB Substation.
- **Upper Terminal Point:** It is situated at Sannidhanam behind Police Barrack

**Need/Justification of the Project:**

Since the upper temple land is Sabarimala is not connected by motorable road, pilgrims and other people walk up the steep mountain through about 4 km trekking path from Pampa, another holy place on the sides of Pampa river. Such trekking path is also considered a divine penance. Materials are transported through the trekking paths on shoulders or through tractors. Since tractors pass through pilgrim paths, this also is a safety concern.

Goods which are regularly transported include:

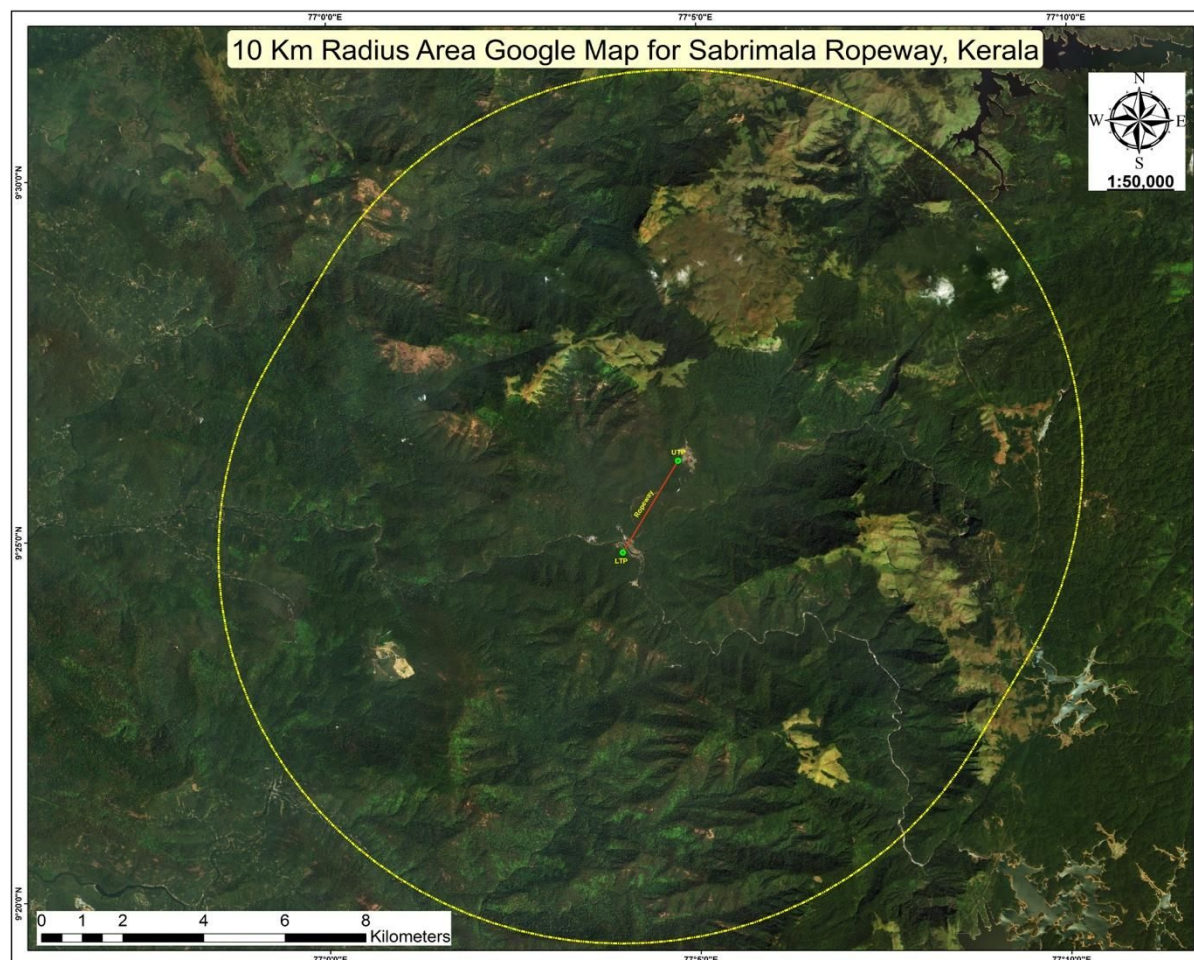
1. Materials required for activities in connection with the temple-flowers & other articles and materials required for making prasadam (rice, jaggery etc)
2. Materials required for the traders operating from upper hill temple area-like food articles required for the many restaurants, general merchandise which the pilgrims buy for Pooja related activities.
3. Construction materials-like cement, steel etc.

Thus, the Sabarimala master plan proposed an alternative method for transportation of goods to the mountain temple through ropeway. The High-Power Committee (HPC) for the implementation of Sabarimala Master Plan has proposed a Ropeway project in between Pamba and Sannidhanam (uphill). The proposed Ropeway will reduce travel time for passengers and will also be helpful in transportation of goods.

### Location of the Project Alignment:

The proposed ropeway shall be developed from Hill top near KSEB Substation (LTP) to Sannidhanam behind Police Barack (UTP)

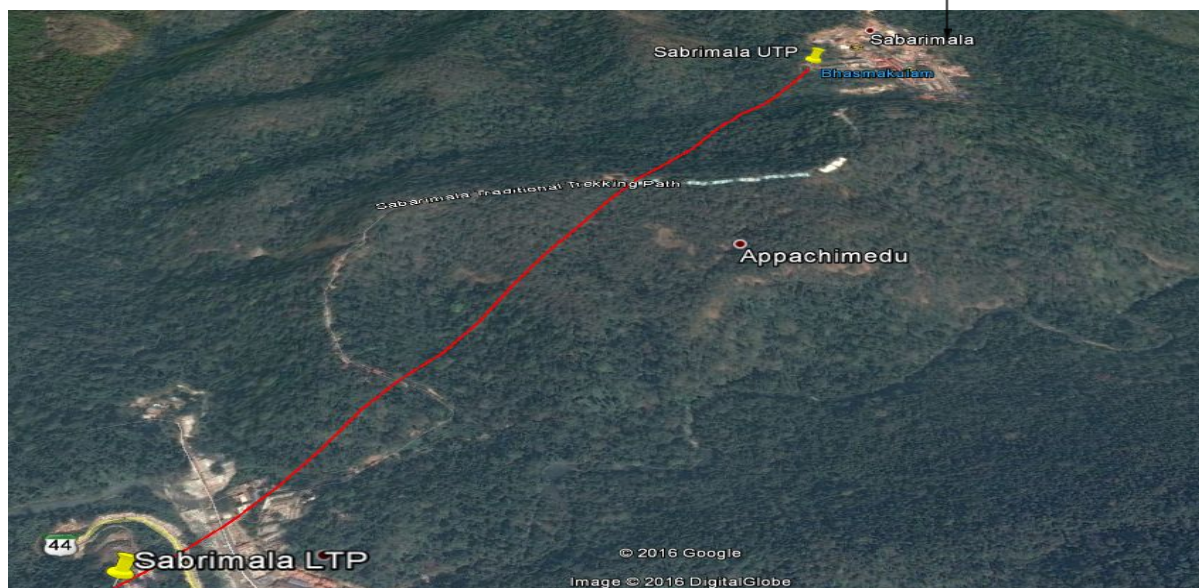
The location map of the Project alignment is shown below:



The Latitude & longitude of the site are given below:

| Station | Latitude      | Longitude    |
|---------|---------------|--------------|
| LTP     | 77° 3'54.80"E | 9°24'53.52"N |
| UTP     | 77° 4'43.49"E | 9°33'5.56"N  |





**Connectivity (distances from Lift Area):**

Nearest Railway Station : Kadayanallur Railway Station-48.83 km SE  
 Nearest Airport : Trivandrum International Airport - 104.22 km SSW  
 Nearest Highway : SH- 44- 0.13 km E

**Area Requirement:**

The area required for the construction of the terminal stations and line towers would be about 48094.640 m<sup>2</sup>.

The detailed area summary is given below:

| Area required for                 | Details as per TOR Letter dated 6.07.2017 | Details as per Amendment in TOR |
|-----------------------------------|-------------------------------------------|---------------------------------|
| <b>LOWER TERMINAL POINT (LTP)</b> |                                           |                                 |
| Lower Terminal Station            | 600                                       | 600                             |
| Open & Covered Storage Area       | 1400                                      | 7157                            |
| Godown                            | 0                                         | 1621.423                        |
| Machine Room                      | 0                                         | 259.848                         |
| Dormitory                         | 0                                         | 309.829                         |
| Kitchen                           | 0                                         | 52.025                          |
| Total Area                        |                                           | 10000.000                       |
| <b>UPPER TERMINAL POINT (UTP)</b> |                                           |                                 |
| Upper Terminal Station            | 360                                       | 360                             |
| Open & Covered Storage Area       | 525                                       | 3022.434                        |
| Godown                            | 0                                         | 1472.501                        |
| Machine Room                      | 0                                         | 477.796                         |
| Dormitory                         | 0                                         | 332.869                         |
| Total Area                        |                                           | 5665.6                          |
| Area for towers                   | 684 (19 towers)                           | 684 (19 towers)                 |
| Ropeway Corridor                  | 32429.04                                  | 33734.4                         |
| Total Area of Land                | 38389.04                                  | 49400.0                         |



## PROJECT DETAILS

| Particulars      | Unit | Details as per TOR Letter dated 6.07.2017 | Details as per Amendment in TOR |
|------------------|------|-------------------------------------------|---------------------------------|
| Length           | m    | 2706.42                                   | 2706.42                         |
| Level Difference | m    | 244.30                                    | 244.30                          |
| Number of Towers | No.  | 19                                        | 19                              |

## TECHNICAL DESCRIPTION OF ROPEWAY

| Particulars            | Details as per TOR Letter dated 6.07.2017 | Details as per Amendment in TOR                       |
|------------------------|-------------------------------------------|-------------------------------------------------------|
| System                 | Monocable Detachable Ropeway              | Monocable Detachable Ropeway                          |
| Hourly Capacity        | 50 TPH                                    | 50 TPH                                                |
| Haulage Rope Diameter  | 34 mm                                     | 34 mm                                                 |
| Trip Time              | 20 min                                    | 20 min                                                |
| Drive Speed            | 3.0 m/s                                   | 3.0 m/s                                               |
| Type of Carriers       | - Long Tray<br>- Semi enclosed box        | - Long Tray<br>- Semi enclosed box<br>- Ambulance Car |
| Maximum Single Payload | 500 kg                                    | 500 kg                                                |
| Power Supply           | 415 Volts, 3 Phase                        | 415 Volts, 3 Phase                                    |

## SERVICE DETAILS

| Particulars             | Unit | Details as per TOR Letter dated 6.07.2017 | Details as per Amendment in TOR |
|-------------------------|------|-------------------------------------------|---------------------------------|
| Power Requirement       | kW   | 95                                        | 95                              |
| DG Sets (Back-up Power) | kVA  | 1 x 125 (LTP)                             | 1 x 125 (LTP)<br>1 x 25 (UTP)   |
| Visitors                | No.  | 750                                       | 800 - 1000                      |

|                              |         |                  |                 |
|------------------------------|---------|------------------|-----------------|
| Staff                        | No.     | 50               | 50              |
| Total Population             | No.     | 800              | 800-1000        |
| Total water requirement      | KLD     | 5                | 13.3            |
| Total waste water generation | KLD     | 3                | 9.2             |
| Total Solid Waste Generation | kg/ day | 23<br>(8.39 TPA) | 121<br>(18 TPA) |

### Alternative routes assessed

Four alternative routes were assessed, which are as discussed below:-

- 1) **Alternate-1:** Between southern corner of Car/Bus parking area and adjacent to Existing 66 kV substation at Pamba and behind the Police barrack at Mallikapuram.
- 2) **Alternate-2:** Between Southern corner of Car/ Bus parking area and adjacent to existing 66 kV Sub Station at Pamba and at the place of existing godown for proposed prasadam plant on the southern corner of Sannidhanam.
- 3) **Alternate-3:** Between area near-junction of traditional path and jeepable road and at the place of existing godown for proposed prasadam plant on the southern corner of Sannidhanam.
- 4) **Alternate-4:** Between an area adjacent to the Devaswom Board Guest House and at the place of existing go down proposed prasadam plant.

Ultimately Alternate-1 has been finalized by TDB

| Station | Latitude       | Longitude     |
|---------|----------------|---------------|
| LTP     | 77° 03'58.07"E | 9°24'54.95"N  |
| UTP     | 77° 04'45.41"E | 9° 26'12.32"N |

### Characteristics of Selected Alignment:

**Alternate-1:** This alignment has all merits edging out the other alternatives.

**LTP:** The Lower Terminal point (LTP) selected is at the southern west corner of Car/Bus parking area and adjacent to existing 66 KV substation at Pamba. This area is approachable by road and is hardly 500 m from Devaswom office complex and 400m from Bridge. The advantage of this area may be understood that without entering into the sabarimala complex,

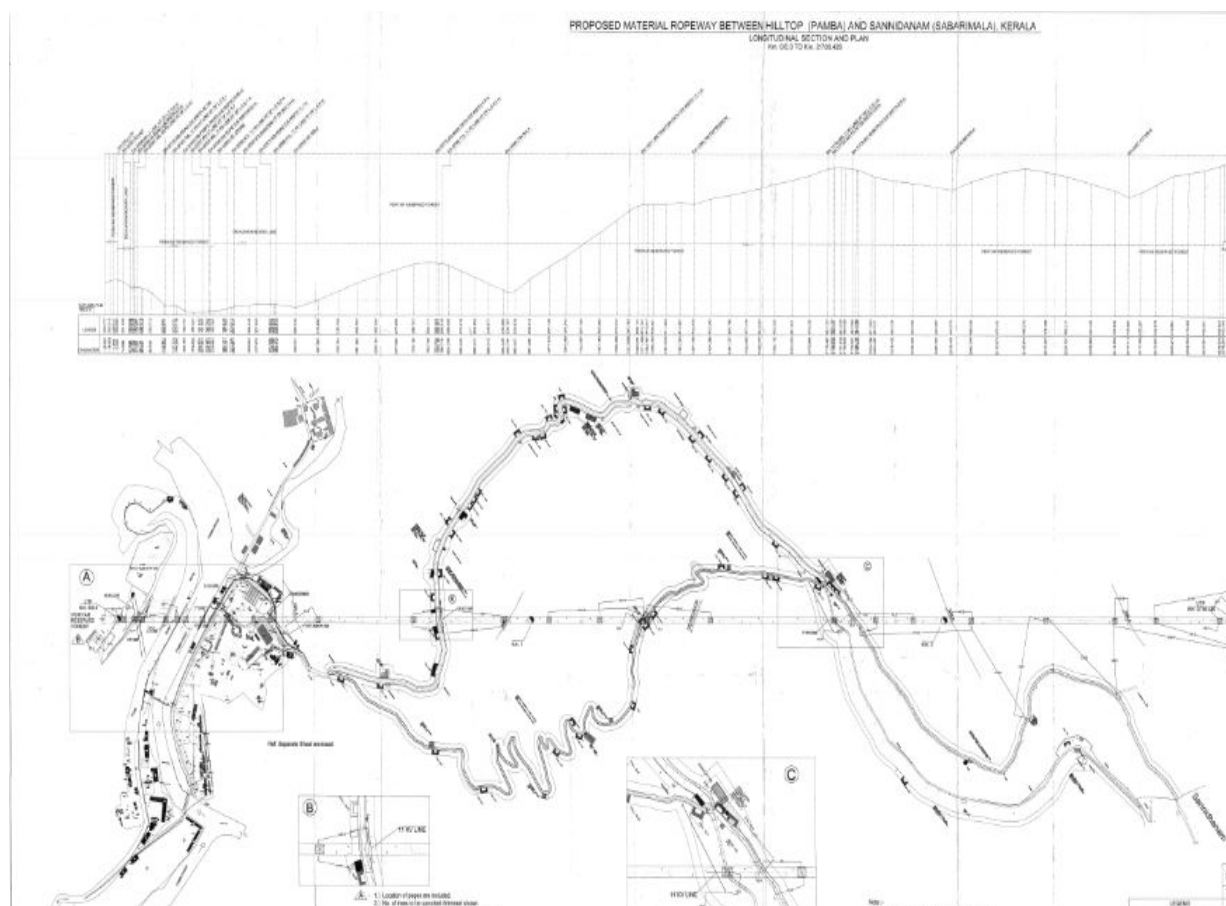
one can access this area directly and during rainy season. The area falls under the jurisdiction of Sabarimala Temple authority.

The altitude of LTP is 255.694 m above MSL.

**UTP:** The Upper Terminal Point (UTP) is on the west of Sabarimala complex behind the Police Barrack at Mallikapuram and on a sufficiently available flat land. Almost no tree cutting is involved for making a station. From this area, material can be easily transported to the main temple complex through tractors. This area is falling under the jurisdiction of the temple authority.

The altitude of UTP is 499.96 above MSL.

The proposed ropeway alignment will cross Main pathways crossing, road crossing, crossing of Stairs, some small buildings and some number of tree to be cut/trimmed with the permission of forest department and safety distance will be maintained .



### Ropeway System Technology

Aerial Ropeway is a System in which men or material are either suspended from rope in cabins, chairs, buckets or Tram Cars and are hauled by rope from one place to another.

Ropeway Systems have been successfully employed for several years in material transport and for transport of passengers in hills, mountains and remote areas. Application of ropeways in urban transport is a cost effective, pollution free and environment friendly solution especially for towns located around hilly terrain.

### Advantages

The main advantages of application of ropeway in transportation are low land requirement, low power requirement and its capacity to negotiate steep gradient without any pollution.

Ropeway will provide visitors with an opportunity to have a bird's eye view of the area and also to take a glimpse of the beauty of the surrounding area, Lake etc.. Thus ropeway will not only attract the visitors but will also provide an easy mode of transportation, create more time for the visitors to enjoy the beauty of nature.

There are various types of ropeways which are described below.

#### **A. CONTINUOUSLY CIRCULATING MONOCABLE ROPEWAY**

A Monocable Ropeway System comprises basically an endless rope which acts both as the carrying as well as the haulage rope to which a number of carriages are attached at regular intervals. The carriages circulate around the closed system by continuous carrying-cum-haulage rope. The carriages can be in the form of chairs or gondolas / cabins (enclosed carriers). Usually the carrying capacity of each carrier varies from 2 to 8 passengers.

Monocable can be either fixed grip or detachable grip. Again fixed grip ones can be either normal fixed grip with chairs, cabins suspended at regular intervals along the line or pulsed, in which case a group of cabins are placed at regular intervals.

Monocable Ropeway Systems are deployed on a terrain which has a gentle slope or convex shape of the profile. The terrain has to be accessible by foot and pathways along the route of the ropeway system. All trees and obstructions below the ropeway alignment have to be cleared for maintaining suitable ground clearance. The height of the ropeway is also limited to enable accessibility to the system for rescue, in case of any unprecedented hazard.

##### **Advantages**

- Continuous transportation system for passengers
- Adjustment of speed and number of carriers according to actual requirement.
- Flexibility of the system, i.e. system can start with a low transport capacity with low initial investment and expansion of capacity as the demand grows by increase of speed / additional carriers or a combination of both.
- Boarding and debarking operation with carriers stopped or moving at a very slow speed is possible.
- Simplicity of operation and maintenance especially for fixed grip Monocable Ropeways.
- Less requirement of space for terminal stations in case of fixed grip system.

##### **Constraints**

- Low ground clearance necessitates a large number of trestles which in turn involves removal of obstructions / cutting of trees on the route.
- ☐ Maintenance of large number of carriers and towers and line trestle equipment.
- ☐ System is more sensitive to high winds.

- ☐ Spans between the towers are limited.
- ☐ Due to limitation of height of carriers from ground, in monocable system it is not possible to cross valleys.

## **B. CONTINUOUSLY CIRCULATING BICABLE ROPEWAY**

This Ropeway System basically consists of two stationary carrying track ropes and a single endless haulage rope.

The track rope supports the carriers and the hauling rope hauls the carriers. At terminal stations, carriers move from track ropes to station rails and passengers board / de-board from carriers.

Bicable system like Monocable system be either of fixed or detachable grip type.

### **Advantages**

1. Theoretically there is no limit to the maximum slope, which cannot be climbed nor is there any limitation in ground clearance from underneath the carrier.
2. Higher capacity of transportation
  - Heavier unit load can be carried.
  - Larger spans between trestles possible.
  - Less maintenance of line trestle equipment.

### **Constraints**

- System Cost higher
- Rope replacement cost more.

## **C. JIGBACK SYSTEM**

### **i) BICABLE JIGBACK**

Such a system has two carrying ropes and one haulage rope with large cabins attached in either direction, attachment being made on diametrically opposite side of the haulage rope. The cabins are always fixed to the haulage rope.

While one cabin starts moving from one terminal station to the other terminal station, the other cabin simultaneously starts from the opposite terminal station. Once they reach the opposite terminals, de-boarding & boarding takes place. Then the movement of the ropeway is reversed giving the Jig Back effect.

## ii) **MONOCABLE JIGBACK**

In this system one endless hauling rope supports and hauls two cabins, one in forward direction and the other in reverse direction between the terminal stations. The cabins are fixed to the rope. Once the cabins reach the terminal stations the movement of the ropeway is reversed. Monocable uses cabins of comparatively lower passenger carrying capacity.

### Advantages

- Reduced terminal space requirement
- Cost effective
- Simplicity of operation and maintenance

### Constraints

- i) Low transportation capacity

## **Proposed Ropeway System Technology**

**Monocable Detachable system:** The proposed system to be installed is Continuous Detachable Monocable system. The system is designed to transport passenger's upside and downside at a constant speed which can be selected by the operator(s) within the minimum and maximum range. The detachable system features friction sheaves at the incoming and outgoing sides of the stations. These sheaves transmit the speed of the rope via double V-belts to the conveyors which transport the carriers through the stations.

## **Design Parameters:**

- a) **Climatic features:** For the design of structures, a temperature variation from (+) 0 deg. C to (+45) deg. C has been considered.
- b) **Humidity:** Variation in humidity level from 30% to 95% has been considered for the system design.
- c) **Wind Pressure:** Wind pressure shall be as per the relevant Indian Standard i.e. installation should not be in operation above 50 kmph winds.
- d) **Seismic Factors:** The ropeway system works are located in Zone III as per IS 1893 2002. However, based on site condition it is recommended that all the structure shall be designed as per the provisions of the IS Codes.

## TECHNICAL DATA

The proposed Detachable Monocable gondola will conform to the following basic performance data: -

| Particulars                                     | Details as per TOR Letter dated 6.09.2017 | Details as per Amendment in TOR                          |
|-------------------------------------------------|-------------------------------------------|----------------------------------------------------------|
| <b>System</b>                                   | Monocable Detachable                      | Monocable Detachable                                     |
| <b>Horizontal Distance</b>                      | 2706.42 m                                 | 2706.42 m                                                |
| <b>Level Difference (between LTP &amp; UTP)</b> | 244 m                                     | 244 m                                                    |
| <b>Alignment</b>                                | Straight                                  | Straight                                                 |
| <b>Speed</b>                                    | 0 to 3.0 m/sec                            | 0 to 3.0 m/sec                                           |
| <b>Trip Time</b>                                | 20 min                                    | 20 min                                                   |
| <b>Capacity</b>                                 | 50 TPH                                    | 50 TPH                                                   |
| <b>Type of carriers</b>                         | a) Long Tray<br>b) Semi enclosed box      | c) Long Tray<br>d) Semi enclosed box<br>e) Ambulance Car |
| <b>Maximum single pay load</b>                  | 500 kg                                    | 500 kg                                                   |
| <b>Drive Power</b>                              | 100 HP                                    | 100 HP                                                   |
| <b>Power Supply</b>                             | 415 Volts, 3 Phase                        | 415 Volts, 3 Phase                                       |
| <b>No. of Towers</b>                            | 19                                        | 19                                                       |
| <b>Rope</b>                                     | 34 mm dia                                 | 34 mm dia                                                |
| <b>Drive Location</b>                           | LTP                                       | LTP                                                      |

## ROPEWAY EQUIPMENT

### Drive Station

- Steel structure for launching and conveying system
- Upper machinery frame
- Torsion shaft
- Gearbox
- Double grooved bull wheel, split design
- Main AC drive
- Main electric cabinets and controls
- Frequency converter
- Emergency drive unit
- Service and emergency brakes
- Access platforms and handrails
- Launching/conveying system
- Opening and closing lines
- Anchoring system for the overhead control cable.

### Return Tension Station



### **Complete return station, consisting of:**

- Support steel structure for launching and conveying system
- Machinery frame
- Bull wheel, split design
- Access platforms and handrails
- Emergency drive unit
- Launching/conveying system
- Main electrical cabinets and controls
- Hydraulic tensioning system with two hydraulic cylinders
- Anchoring system for the overhead control cable.

### **Specifications & Guidelines**

The specifications and guidelines are provided for the various project components (Ropeway System, associated infrastructure) including, but not limited to the following major provisions:

The Concessionaire shall consider Specifications provided by Bureau of Indian Standards and other applicable statutory code of practices like Indian Electricity Act, National Building Code, Municipal Building Bylaws of Kerala, etc. for design, construction, operation and applicable maintenance of the project facilities. The Concessionaire shall adhere to the provisions of any Act for passenger ropeway that is applicable for enacted in future in the state of Kerala. In case of ropeway Cabins and its associated part to be mandatorily procured imported, suitable international standards with justification may be followed.

### **Maintenance Schedule:**

Detailed operation and maintenance instruction manuals covering all aspects of maintenance of the Ropeway System would form an integral part of system documentation.

The essential aspects of maintenance are, however, briefly listed below:

- Preventive maintenance including inspection and attention to buckets, hangers and grips etc.
- Periodic lubrication at the stations.
- Regular cleaning at stations to ensure a clean and dust free atmosphere.
- Periodic inspection, checking and replacement of hauling rope especially the spliced zones.

- Inspection, checking, lubrication and replacement if and when required of line components such as line sheaves.
- Tightening of all station tower bolts periodically.
- Checking of prime mover such as motors, gearbox, couplings etc.
- Regular checking of service and emergency brakes.
- Adequate maintenance spares will be stocked for smooth operation.

## **ENVIRONMENT MANAGEMENT PLAN**

### **Land Environment:**

#### **Construction Phase:**

The land for proposed Sabarimala Ropeway Project comes partly under Forest Land (12.675 Hectares). Thus, a total of 12.675 ha of forest land in Periyar Wildlife Sanctuary for the development of Sabarimala Temple needs to be diverted for construction of ropeway and 250 number of trees will be cut down. The diversion of forest land will be required for construction of terminal stations, and line towers along the corridor.

#### **Operation Phase:**

Although no major impact on land is envisaged during the operation phase, proper collection shall be taken care for no disposal of solid or hazardous waste & wastewater on land.

### **Air Environment**

#### **Construction phase:**

During the construction activities for the proposed terminal stations there will be fugitive emissions such as particulate emission etc. on small scale. The particulate emissions will be minimal and short term in nature. For the construction of line towers, the generation of the dust will be low as compared to the construction of terminal stations. Moreover, the dust generated during the construction phase will be considerably reduced due to localized meteorological conditions. Following mitigation measures will be adopted during the construction phase:

- ☐ Water sprinkling will be done to mitigate the impacts of dust generation.
- ☐ Vehicles used in the transportation of construction material will be kept fully covered

- ☐ DG set shall be installed with adequate stack height to avoid concentration of emissions on ground.
- ☐ Construction material will be stored inside the project boundary and will be covered with tarpaulin cover.
- ☐ To minimize the occupational health hazard, proper mask shall be provided to the workers who are engaged in dust generation activity.

### **Operation Phase:**

The operation of the proposed ropeway will not involve major air emissions as ropeway operation is an environment - friendly non-polluting transport system.

DG sets of capacity 1 x 125 kVA at LTP and 1 x 25 kVA at UTP is proposed for backup power supply. These D.G. Sets will be provided with proper stack height as per the CPCB norms.

As per the specifications from D.G. Set manufacturer, the emissions rates that shall be maintained are given in Table below:

| <b>D. G. Set.<br/>Capacity</b> | <b>No.</b> | <b>PM<br/>gm/kw-hr</b> | <b>NO<sub>x</sub><br/>gm/kw-hr</b> | <b>SO<sub>2</sub><br/>gm/kw-hr</b> | <b>CO<br/>gm/kw-hr</b> |
|--------------------------------|------------|------------------------|------------------------------------|------------------------------------|------------------------|
| 125 kVA                        | 1          | 0.3                    | 9.2                                | 1.3                                | 3.5                    |
| 25 kVA                         | 1          | 0.3                    | 9.2                                | 1.3                                | 3.5                    |

The impact of pollutants such as SO<sub>2</sub>, NO<sub>x</sub> and CO mainly released from D.G sets and their concentration & impact will be very negligible and of short term duration.

The system will be operated mainly on electricity provided by Grid. DG sets will be used as a stand-by only at the time of power failure.

### **Noise Environment**

#### **Construction Phase:**

The noise emission sources during construction phase will include construction machineries/ equipment to be employed at site.

The management measures for noise & vibration control are as follows:

- Standard methods and machinery will be used.
- Job rotation and provision of earmuffs to the workers in high noise areas.

- Vehicles used in the transportation of construction material will be kept fully covered & will be PUC certified.
- DG set shall be installed with adequate stack height to avoid concentration of emissions on ground and shall be acoustically enclosed.
- Noise barrier shall be installed to prevent dispersion of the noise.

### **Operation Phase:**

DG set of capacity 1 x 125 kVA at LTP and 1 x 25 kVA at UTP is proposed for backup power supply. Acoustically enclosed DG Sets will be bought.

The noise & vibration management measures are discussed below:

- Noise free and less air pollution emitting, acoustically enclosed DG Sets, approved by the CPCB will be bought and installed.
- The system will be operated mainly on electricity provided by Grid. DG sets will be used as a stand-by only at the time of power failure. DG sets shall be installed on proper vibration pads to avoid vibration impacts.
- The noise pollution due to operation of DG set can be controlled by installation of silent cowling to a value of 65 dB (A).

The normal ropeway operations are always lower than 50 dB (A) of noise level. Proper maintenance of the ropeway during the operational phase will be done to ensure low or no noise and environmental impacts.

### **Water Environment**

#### **Construction Phase:**

Approx. 40 local workers will be preferably employed for the proposed ropeway.

Water will mainly be required for ropeway development, dust suppression & human consumption. It is estimated that around 2 KLD of water will be required for domestic and construction activities. Domestic wastewater generated from labours will be discharged to a septic tank followed by soak pit.

### Operation Phase:

Approx. 800 - 1000 visitors (including dormitory and ropeway complex) are expected in a day and there shall be a provision of 50 staff during the operation of the ropeway. There will be provision of toilets at LTP and UTP for the visitors & staff. Bio-toilets will also be provided at LTP and UTP. The total water requirement has been estimated as 13.3 KLD. 5 KLD of fresh water requirement will be met by Municipal Supply. Rest of water requirement will be met by reusing treated water generated from Sewage Treatment Plant of capacity 10 KLD.

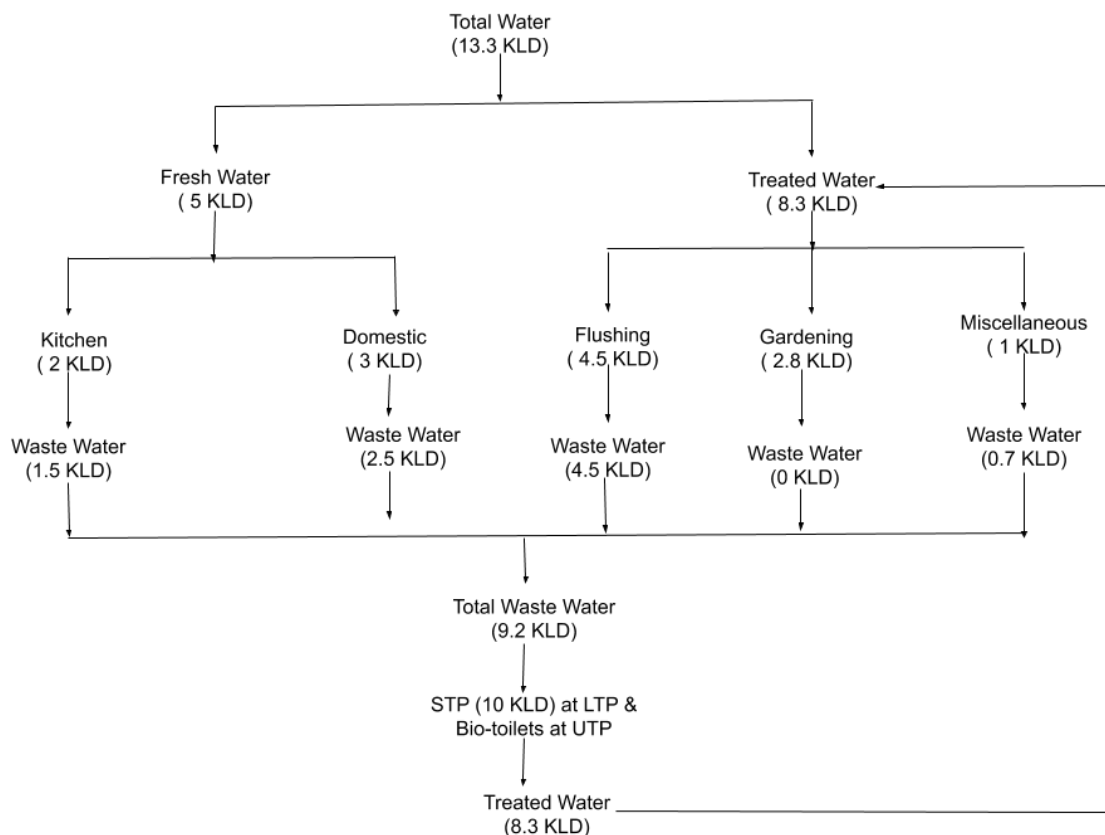
Water will be used mainly for flushing & hand-washing, kitchen, drinking, Gardening & misc. purposes. 9.2 KLD of waste water will be generated which will be treated in STP of capacity 10 KLD located at LTP and bio-toilets located at UTP.

Water storage tank will be at LTP and UTP. For drinking water, water cooler/water Dispenser shall be provided at both LTP & UTP. Detailed water management is given below:

### WATER MANAGEMENT

| Particulars                    | Population | Factor | Water requirement ( in KLD) | Domestic ( in KLD) | Flushing ( in KLD) | Waste water generated ( in KLD) |
|--------------------------------|------------|--------|-----------------------------|--------------------|--------------------|---------------------------------|
| Staff                          | 50         | 45     | 2.5                         | 1                  | 1.5                |                                 |
| Visitors                       | 800 -1000  | 5      | 5                           | 2                  | 3                  |                                 |
| Sub total                      |            |        | 7.5                         | 3                  | 4.5                |                                 |
| Waste water                    |            |        |                             | 2.5                | 4.5                | 7                               |
| Gardening                      |            |        | 2.8                         |                    |                    | 0                               |
| Kitchen                        |            |        | 2                           |                    |                    | 1.5                             |
| Misc.                          |            |        | 1                           |                    |                    | 0.7                             |
| <b>Total Water requirement</b> |            |        | <b>13.3</b>                 |                    |                    | <b>9.2</b>                      |

## **WATER BALANCE**



## **SCHEME OF BIO-TOILETS**

A Bio-Toilet is a complete waste management solution which reduces solid human waste to biogas and pure water, with the help of a bacterial inoculum. Bio-Digester is a decomposition mechanized toilet system which decomposes Human Excretory Waste in the digester tank using specific high graded bacteria further converting it into methane and water, discharged further to the desired surface. Bio-digester technology treats human waste at the source. A collection of anaerobic bacteria that has been adapted to work at temperatures as low as -5°C and as high as 50°C act as inocula (seed material) to the bio-digesters and convert the organic human waste into water, methane, and carbon-dioxide. The anaerobic process inactivates the pathogens responsible for water-borne diseases and treats the fecal matter without the use of an external energy source.

The only by-products of the waste treatment process are pathogen-free water, which is good for gardening, and bio-gas. Bio-toilets do not require sewage connectivity and because the

process is self-contained, bio-toilets are also maintenance-free. Some specific features of the Bio-Toilets are given below:

- 100% sludge – Free disposal of human waste
- Eco Friendly - Decomposes solid waste to water and biogas
- Eliminates need for expensive waste treatment
- Clean discharge - The water discharged from the Pronto Bio-Toilet is colorless, odorless and devoid of solid particles
- 100% hazard free – On a dry weight basis, 90% of the solid waste is reduced
- 100% maintenance free – Bio-Digester tanks do not require any form of maintenance
- No repeat dosing of bacterial inoculum
- Easy to transport and install in any terrain
- Plays a critical role in preventable healthcare

The residual water from Bio-Toilets

- Is colorless, odorless and devoid of any solid particles
- Requires no further treatment / waste management
- Can be used for irrigation purposes

| Features       | Bio-Toilet                                                 |
|----------------|------------------------------------------------------------|
| Composition    | 1) Pre-fab Toilet<br>2) <b>Bio-Digester Tank</b>           |
| Space          | <b>1/3rd</b> of Septic Tank & Soak Pit                     |
| Technology     | Tank contains <b>Bacterial Inoculum</b> to decompose Waste |
| End Product(s) | <b>Water &amp; biogas</b>                                  |
| Waste Emptying | Not Required                                               |
| Maintenance    | Minimum Maintenance                                        |
| Decomposition  | 90%                                                        |

### SCHEMATIC DIAGRAM OF BIO-TOILETS



### **SCHEME OF SEWAGE TREATMENT PLANT**

Total quantity of wastewater generation will be 9.2 KLD which will be treated in STP of total capacity 10 KLD. Total 8.3 KLD of treated water will be generated from STP which will be reused completely within the site for purposes like flushing, miscellaneous and gardening.

The Sewage Treatment Plant of 10 KLD based on MBBR Technology offered has some distinct advantages over conventional activated sludge processes. The scheme is proven, under a variety of operating conditions, and is highly flexible in operation.

| Particulars                             | Total (in KLD) |
|-----------------------------------------|----------------|
| Total Wastewater generated              | 9.2            |
| STP Capacity                            | 10             |
| Treated Water Reuse                     | 8.3            |
| Treated Water discharged to sewer line. | 0              |

The characteristics of Raw sewage and the characteristics required for the treated water will be as given in Table 10 and 11 respectively.

**Table 10: RAW SEWAGE CHARACTERISTICS**

|      |                      |         |
|------|----------------------|---------|
| Flow | m <sup>3</sup> / day | 9.2 KLD |
|------|----------------------|---------|



|              |        |           |
|--------------|--------|-----------|
| pH           | -      | 7.5 – 8.0 |
| BOD          | mg / l | 200 - 350 |
| COD          | mg / l | 400 - 500 |
| TSS          | mg / l | 100       |
| Oil & Grease | mg / l | 10        |

The Sewage Treatment Plant (STP) will give treated water, which will be reused for Flushing, Gardening, Cooling & miscellaneous purposes.

**Table 11: TREATED SEWAGE CHARACTERISTICS**

|              |        |         |
|--------------|--------|---------|
| pH           | -      | 6.5-9.0 |
| BOD          | mg / l | <20     |
| COD          | mg / l | <50     |
| TSS          | mg / l | <50     |
| Oil & Grease | mg / l | NIL     |

### **TREATMENT PROCESS:**

It is proposed to treat the complete wastewater in a scientific manner through a properly planned treatment plant. The objective is to stabilize the decomposable organic matters present in sewage to get an effluent and sludge having characteristics which are within safe limits. To have an efficient treatment system, this aerationn system is proposed consisting of MBBR Technology. The sewage treatment plant can be constructed in such a way that it becomes viable by providing Treated water for reuse and sludge that can be used as manure for further use.

### **Different Components of the Plant**

In the proposed treatment scheme, the following component unit shall be provided:

- ☐ Screen chamber
- ☐ Bar screen /Grit chamber within effluent collection sump.
- ☐ Submersible type raw effluent re-lift pumps
- ☐ Equalization tank
- ☐ MBBR tank/ Aeration tank
- ☐ Tube settler
- ☐ Clarified Water, Filtered Water & Soft Water Storage Tanks
- ☐ Filter feed pump
- ☐ Tertiary Treatment Units (Filtration, U.V treatment)

- ☐ Treated Water Supply Pumps
- ☐ Sludge return pump
- ☐ Sludge holding tank
- ☐ Centrifuge for solid waste management
- ☐ Sludge loading pumps
- ☐ Sludge drying beds, Centrifuge/Filter Press

## **PROCESS DESCRIPTION**

- a) Raw sewage from main sewer line shall be collected through gravity pipes into the screen chamber. This manually cleaned screen shall be provided to remove floating and big size particles which may otherwise choke the pumps and pipelines.
- b) After screening, the wastewater shall be allowed to pass through a grit chamber to remove the grit material. The screens and grit chambers shall be accessible so that they may be manually cleaned from time to time.
- c) The screened wastewater from the Grit chamber shall be then passed into the equalization tank to homogenize the wastewater quality and also even out flow fluctuations and feed waste water of uniform quality at a constant rate to subsequent treatment units. Air mixing shall be provided to mix the contents of the equalization tank. A coarse bubble aeration grid shall be provided to mix the contents of the equalization tank and also to avoid septic conditions in the tank. From the equalization tank the wastewater will be pumped into an MBBR Tank.
- d) The MBBR process uses small plastic carrier elements to provide growth sites for bacteria attachment in a suspended growth medium. The carrier elements shall allow a higher biomass concentration to be maintained in the reactor. This shall increase the biological treatment capacity for the given reactor volume.
- e) The carrier elements shall be continuously kept in suspension by the aeration system. The agitation pattern in the reactor shall be designed to provide an upward movement of the carriers across the surface of the retention screen which creates a scrubbing effect to prevent clogging. Combination of fine & coarse bubbles may be provided to provide oxygen as per detailing.
- f) From the MBBR tank mixed liquor shall flow by gravity into the Tube settler. The solids will settle in the tank. The sludge that settles down shall be transferred to sludge

holding tank via sludge loading pumps, with provision of sludge return to the bioreactor if necessary.

g) From the tube settler, treated wastewater will be fed by means of filter/softener feed pump sets to pass through dual media filters, activated carbon filters and softeners and stored in the filtered water and soft water storage tanks. The activated carbon filters shall ensure removal of all coloration and odours present in the treated effluent.

h) The filtered, clean and odourless water from filtered water tank is then fed through a variable frequency drive hydro-pneumatic system to the external treated effluent rings as per the master plan, from where connections are taken to the garden hydrant system and to each unit for flushing water as per detailing.

i) Excess sludge from the tube settler will be taken periodically into sludge holding tank. In this tank sludge will be aerated for self-stabilization. Air will be shut off periodically and supernatant water will be transferred to the aeration tank creating stabilized sludge. The final sludge shall be de-watered through a centrifuge mechanism. Sludge loading arrangements shall also be provided for direct disposal of sludge to sludge tankers / trolleys.

### Hydraulic Flow Diagram of STP based on MBBR Technology

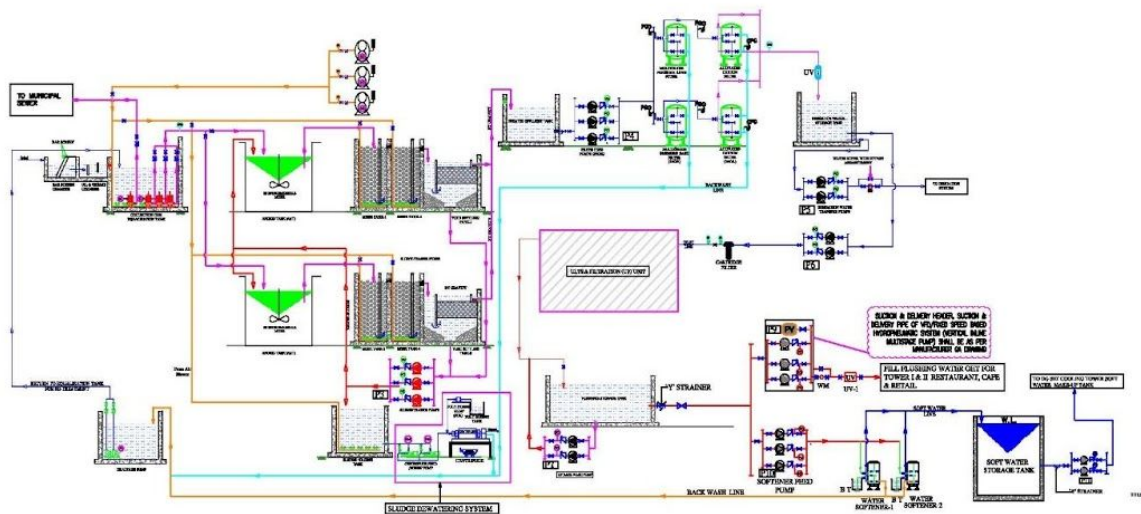


Figure 1 Flow Diagram of STP based on MBBR Technology

### StormWater Management

Maximum collection of rainwater will be done and reused wherever possible.

Garland drains are proposed around the pillars/towers to ensure the proper drainage of the storm water and to prevent disturbance to the drainage pattern of the area.

### Solid Waste Management

**Construction Phase:** Wastes which are likely to be generated during the construction of terminals include the following:

- **Municipal Waste:** Site clearance
- **Construction Waste:** Construction materials arising from the construction may include waste timber work, spent concrete and cement screening and material and equipment wrappings.
- **Excavated materials:** Excavation during pillar foundations will lead to generation of excess soil. Top soil will be used for landscaping and left out soil will be used for land filling.
- During construction, Approx. 40 local workers will be preferably employed, no labour camp will be setup at the site. Approx. 6 kg/day wastes will be generated which will be sent to solid waste/landfill site.

**Operation Phase:** During operation phase, solid waste will be generated by ropeway users (750 persons), staff (50 persons), etc. The estimates of the solid waste generated from the proposed project have been shown in table below:

| Type of Waste      | Colour of Bin | Category      | Disposal Method                                                              | Total Waste (kg/day)           |
|--------------------|---------------|---------------|------------------------------------------------------------------------------|--------------------------------|
| Organic Waste      | Green         | Biodegradable | The waste will be treated in Organic Waste Convertor converted into compost. | 85<br>(13 TPA)                 |
| Recyclable Waste   | Blue          | Recyclable    | Collected and given to approved recycler                                     | 36<br>(5 TPA)                  |
| <b>Total Waste</b> |               |               |                                                                              | <b>121 kg/day<br/>(18 TPA)</b> |

2 no. of Organic Waste Convertors will be installed each at LTP (for general waste) and UTP (for temple wastes like flowers, fruits etc.) for treatment and disposal of biodegradable waste. Recyclable wastes like cardboard, paper etc. will be collected and given to approved recycler.

The proposed project will be a Plastic-free zone. So, there will be no generation of plastic waste.

The waste oil generated from D.G sets will be sent to authorize hazardous waste disposal authority.

### **SPECIFICATIONS OF ORGANIC WASTE CONVERTOR**

| <b>No. of OWC Provision</b> | <b>Capacity per batch</b> | <b>Power</b> | <b>Dimension (l x w x h)</b> |
|-----------------------------|---------------------------|--------------|------------------------------|
| 2                           | 50 kg/batch               | 8 HP         | 2.18 m x 1.19 m              |

| <b>Biodegradable Waste (kg/day)</b> | <b>Batch Capacity</b> | <b>Curing Capacity</b> | <b>Time taken</b>                         | <b>No of Batches</b> |
|-------------------------------------|-----------------------|------------------------|-------------------------------------------|----------------------|
| 43                                  | 50 kg/batch           | 100 kg/day             | Machine Time- 15-20 m<br>Total Time- 1 hr | 1 batch/day          |
| 42                                  | 50 kg/batch           | 100 kg/day             | Machine Time- 15-20 m<br>Total Time- 1 hr | 1 batch/day          |

- No. of Organic Waste Convertor = 2 no.
- Volume of Waste = 0.17 m<sup>3</sup>/day
- Capacity of curing for 1 day = 0.17 m<sup>3</sup>
- Capacity of curing for 10 days = 1.7 m<sup>3</sup>
- Space Area for Curing = 5.66 m<sup>2</sup>
- Space for Organic Waste Convertors (OWC-130):- 2 x 2.18 m x 1.19 m = 5.19 m<sup>2</sup>
- Area designated for Storage and Management of Solid Waste = 6.89 m<sup>2</sup>
- Space allocated in the Project = 50 m<sup>2</sup>

### **Technology of Organic Waste Convertor**

#### **Salient Features**

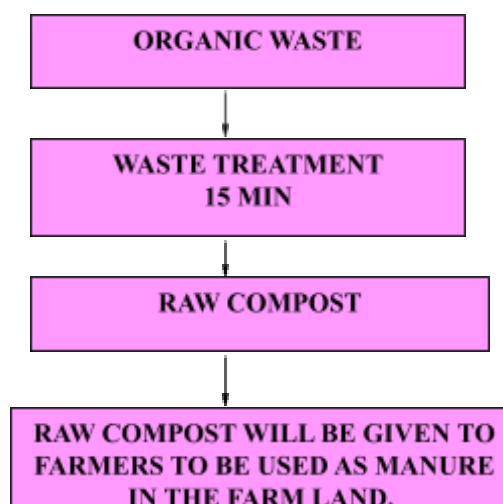
- Quick waste disposal solution
- Easy to operate, fast, takes very less space and makes waste odour free.

- APT for Household, Industrial canteen, Restaurants, Temples, Markets, Large housing complex
- Organic Waste Converter uses bio-culture to decompose waste into black manure
- It helps maintain hygiene and create cleaner, greener and healthier environment.

### Process Description for Organic Waste Converter Machine System

- The segregated organic waste is bio-mechanically treated in the **Organic Waste Converter Machine**.
- Waste is homogenized with bio-culture and organic media. The coarse wastes are **shredded** prior to feeding into OWC machine. Leachate is also controlled during homogenization process.
- The output from Machine is **raw compost** which is uniform in colour and soil structured coarse powder, and also **free of bad odour**.
- The matured compost can be utilized for gardening or will be given in farm land.

### Process flow chart



### Ecological Environment

The alignment partly falls within a Forest land which needs to be diverted for development of terminal stations & line towers. About 126750 sqm (12.675 ha) of the area of forest land will be required to be diverted 250 number of trees will be cut down.

### Socio Economic Scenario

The proposed Sabarimala Ropeway Project has a very favourable socio economic impact.

The major facts are mentioned below: -

- There will be no displacement or immigration of the human population due to the proposed project.
- Quick and barrier free transport facility will be available throughout the year with reduced physical hardship and safer way of travel
- With increased tourist traffic, more economic activity will follow thus leading to direct & indirect income for locals.
- Better transportation infrastructure, improved access to and from the community.
- Provide direct and indirect employment opportunities to the local people.
- Additional avenue for revenue in the form of revenue share from the operator of ropeway

## **SAFETY AND RESCUE PLAN**

### **Safety Plan**

The ropeway system will be designed, manufactured and installed in accordance with the latest standards of ropeway technology, will feature state-of-the-art equipment and operate automatically (with the exception of cabin parking). It will fully comply with the latest IS Standards and safety requirements for Aerial Passenger Ropeways.

Before making it for public use the ropeway project shall be thoroughly inspected to ensure the ropeway project is safe for public use. After getting clearance certificate, the commercial operation of the ropeway would be able to commence.

### **Safety Measures**

- In order to enhance system reliability, besides the electric main drive unit (AC motor), two independent hydrostatic emergency drive units shall be allowed for operation of the system at a reduced capacity and in emergency cases.
- A hydraulic emergency drive will be installed to bring the passengers in case of a power failure back to the station.
- The detachable system features friction sheaves at the incoming and outgoing sides of the stations. These sheaves transmit the speed of the rope via double V-belts to the conveyors which transport the carriers through the stations. This configuration ensures positive



control and synchronization of rope speed and carrier conveying speed in each station in both forward and reverse directions, irrespective of the drive selected.

- Key functions of the ropeway, such as rope speed and grip opening and closing operations, are monitored and controlled by electronic safety circuits in order to ensure smooth operation and maximum safety.
- Fixed rope tensioning is achieved by two hydraulic cylinders in the tensioning terminal for each rope loop.
- The ropeway is designed for one main direction of rotation. For special requirements, rescue and service purposes, reverse operation is permitted at a limited speed.
- All elements of the ropeway are mounted onto a steel structure which is anchored on concrete foundations.
- The Gondolas shall be provided with door lock, which cannot be opened by the passengers
- In the event of main supply power failure, full capacity D.G. Sets provided to supply power to run drive motors.
- Emergency push buttons should be provided at all stations to stop the ropeway, if required.
- Proper protection bridge will be provided where the alignment crossing over the certain building and pathways in the main Pamba complex.

### **Rescue Arrangement:**

The rescue of stranded passengers shall be carried out by the following method:

- It will be ensured that each tower is accessible, e.g. for maintenance and rescue purposes.
- The ropeway system would be provided with suitable means for rescue shall be provided (ladders capstans, etc.) to facilitate the rescue of passengers who might remain trapped along the line on account of unforeseen stopping of the installation, in a reasonable short time and in the easiest and safest manners. The use of such equipment shall not require the help of the passengers.
- The chosen rescue equipment shall be such that the rescue operation can be carried out in a perfect manner even at the most critical points of the route (over water spread, rigged terrain, high elevation above ground, etc.)

### **Ambulance Car Arrangement:**

- The proposed ropeway will provide Ambulance activities and arrangement for first aid activities will be maintained for the same.
- Staff specialised in first aid activities will be allocated for the same.

### **PROJECT SCHEDULE & COST ESTIMATES**

The estimated project cost of Rs 80 Crores.

The scheduled completion date shall occur after 3 years after getting all clearances and permissions. On or before the scheduled Completion date, the concessionaire shall have completed the construction of the entire project.

### **COST ON ENVIRONMENT MANAGEMENT PLAN**

| <b>Sl No</b> | <b>Description</b>                 | <b>Capital Cost (Rs. In Lacs)</b> | <b>Recurring Cost (Rs. in Lacs/ Year)</b> |
|--------------|------------------------------------|-----------------------------------|-------------------------------------------|
| <b>1</b>     | <b>Landscaping</b>                 | 2.0                               | 0.5                                       |
| <b>2</b>     | <b>Bio-toilets</b>                 | 60.0                              | 1.0                                       |
| <b>3</b>     | <b>Air &amp; Water Generator</b>   | 0.5                               | 0.1                                       |
| <b>4</b>     | <b>Solid Waste Management/ OWC</b> | 20.0                              | 2.0                                       |
| <b>5</b>     | <b>Environmental Monitoring</b>    | -                                 | 0.5                                       |
|              | <b>Total</b>                       | <b>Rs. 28.5 Lacs</b>              | <b>Rs. 4.1 Lacs/yr</b>                    |

### **PROJECT BENEFITS**

Aerial Ropeway is fast emerging technologies of providing not only tourist experience but an urban transportation means especially for hilly. It is totally environment friendly with no generation of any type of pollutants. The land requirement is minimal as the transportation happens aerielly thereby reducing any impact on the surface flora and fauna of the region.

Beside ropeway system would lead to: -

- Better Transport Potential
- Reduced Pollution
- Improved Environment
- Avoiding Pilferage during transport

- Speedy transit of Material
- Senior Citizen/especially abled person will easily visit the Mandir.
- In case of emergency, evacuation will be done easily.

## **SECTION E: ANNEXURES**

## Content

|                                                            |             |
|------------------------------------------------------------|-------------|
| <b>ENCLOSURE 1: DISCLOSURE OF ENVIRONMENTAL CONSULTANT</b> | <b>D-3</b>  |
| <b>ENCLOSURE 2: AUTHORIZATION OF CONSULTANT</b>            | <b>D-6</b>  |
| <b>ENCLOSURE 3: EARLIER TOR LETTER</b>                     | <b>D-8</b>  |
| <b>ENCLOSURE 4: LAYOUT PLAN</b>                            | <b>D-16</b> |
| <b>ENCLOSURE 5: TOPOGRAPHICAL MAP</b>                      | <b>D-19</b> |

## **ENCLOSURE 1: DISCLOSURE OF ENVIRONMENTAL CONSULTANT**

**Environmental Consultant: M/s Perfact Enviro Solutions Pvt. Ltd.**



# Quality Council of India

## National Accreditation Board for Education & Training



### Certificate of Accreditation

#### **Perfact Enviro Solutions Pvt.Ltd.**

505, 5th Floor, NM Mall, Mangalam Palace, Sector – 3, Rohini, New Delhi - 110085

**Accredited as Category - A** organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations:  
Version 3 for preparing EIA-EMP reports in the following Sectors:

| Sl.No | Sector Description                                                                                                                                                                                                                    | Sector (as per) |           | Cat. |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|------|
|       |                                                                                                                                                                                                                                       | NABET           | MoEFCC    |      |
| 1     | Mining of minerals including Open cast/ Underground mining                                                                                                                                                                            | 1               | 1 (a) (i) | A    |
| 2     | Thermal power plants                                                                                                                                                                                                                  | 4               | 1 (d)     | B    |
| 3     | Mineral beneficiation including palletisation                                                                                                                                                                                         | 7               | 2 (b)     | A    |
| 4     | Metallurgical industries (ferrous & non-ferrous)                                                                                                                                                                                      | 8               | 3 (b)     | B    |
| 5     | Cement plants                                                                                                                                                                                                                         | 9               | 3 (b)     | A    |
| 6     | Leather/skin/hide processing industry                                                                                                                                                                                                 | 15              | 4 (f)     | A    |
| 7     | Synthetic organic chemicals industry (dyes and dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates) | 21              | 5 (f)     | A    |
| 8     | Distilleries                                                                                                                                                                                                                          | 22              | 5 (g)     | A    |
| 9     | Sugar Industry                                                                                                                                                                                                                        | 25              | 5 (j)     | B    |
| 10    | Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)                                                                      | 28              | 6 (b)     | B    |
| 11    | Airports                                                                                                                                                                                                                              | 29              | 7(a)      | A    |
| 12    | Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes                                                                                          | 31              | 7 (c)     | A    |
| 13    | Common hazardous waste treatment, storage and disposal facilities (TSDFs)                                                                                                                                                             | 32              | 7(d)      | B    |
| 14    | Bio medical waste Treatment Facilities                                                                                                                                                                                                | 32a             | 7(da)     | B    |
| 15    | Aerial ropeways                                                                                                                                                                                                                       | 35              | 7 (g)     | A    |
| 16    | Common Municipal Solid Waste Management Facility (CMSWMF)                                                                                                                                                                             | 37              | 7 (i)     | B    |
| 17    | Building and construction projects                                                                                                                                                                                                    | 38              | 8 (a)     | B    |
| 18    | Townships and Area development projects                                                                                                                                                                                               | 39              | 8 (b)     | A    |

**Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SA AC minute dated Sep 14, 2018, posted on QCI-NABET website.**

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/18/0845 dated Dec 19, 2018. The accreditation needs to be renewed before the expiry date by Perfact Enviro Solutions Pvt.Ltd following due process of assessment.

Sr. Director, NABET  
Dated: Dec 19, 2018

Certificate No.  
NABET/EIA/1619/ SA 078

Valid up to  
May 27, 2019

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.



# National Accreditation Board for Education and Training

(Member - International Accreditation Forum & Pacific Accreditation Cooperation)



May 21, 2019

QCI/NABET/EIA/ACO/19/984

Perfact Enviro Solutions Pvt. Ltd  
5th Floor, Front Wing, NN Mall,  
Sector-3, Rohini,  
New Delhi-110085

## Sub: Validity of Accreditation as EIA Consultant organization

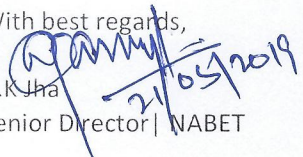
Dear Sir,

This has reference to the accreditation of your organization under QCI-NABET EIA Scheme, the validity of Perfact Enviro Solutions Pvt. Ltd is hereby extended till Nov 21, 2019 or completion of assessment process, whichever is earlier.

The above extension is subject to the submission of required information/documents related to assessment on time to NABET.

You are requested not to use this letter after expiry of the above stated date.

With best regards,

  
A.K. Jha  
Senior Director | NABET



## **ENCLOSURE 2: AUTHORIZATION OF CONSULTANT**

**Environmental Consultant: M/s Perfact Enviro Solutions Pvt. Ltd.**

## **ENCLOSURE 3: EARLIER TOR LETTER**

F. No. 10-17/2017-IA-III  
Government of India  
Ministry of Environment, Forest & Climate Change  
(I.A. Division)

Indira Paryavaran Bhawan  
Aliganj, Jorbagh Road,  
New Delhi - 110003

Date: 6<sup>th</sup> July, 2017

To,

**M/s Eighteenth Step Damodar Cable Car Pvt. Ltd,**  
4D, E V Homes, Azad Road, Kaloor,  
Ernakulam, - 682017, Kerala  
E-mail: [umagem@gmail.com](mailto:umagem@gmail.com)

**Subject: Sabarimala Ropeway Project' at Sabarimala, Kerala by M/s Eighteenth Step Damodar Cable Car Pvt. Ltd – Terms of Reference - reg.**

Sir,

Kindly refer your online proposal No. IA/KL/MIS/63039/2017 dated 7<sup>th</sup> March, 2017 along with project documents including Form-I, Pre-feasibility Report and draft 'Terms of Reference' as per the EIA Notification, 2006 seeking Terms for Reference for the above project under EIA Notification, 2006. The proposal was considered by the EAC (Infra-2) in its meeting held on 25<sup>th</sup> - 27<sup>th</sup> May, 2017.

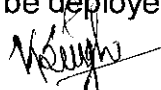
2. The details of the project, as per the documents submitted by the project proponent, and also as informed during the above said meeting, are under:-

(i) The proposed Sabarimala Ropeway Project shall be developed at Sabarimala, Kerala Further to the decision of High Power Committee to implement Sabarimala Ropeway Project which is also part of the Sabarimala Master Plan approved by High Court of Kerala, M/s Eighteenth Step Damodar Cable Car Pvt. Ltd. is entitled for construction and operation of the ropeway project.

(ii) The proposed system to be installed will be Detachable Grip Monocable Ropeway System. The Project is a 2706.42-m long ropeway, covering an area of 38389.04 sq m (including Terminal Stations, ropeway corridor, towers and Parking). The proposed ropeway shall be developed from LTP at Hill top near KSEB Substation (Pamba) to UTP at Sannidhanam behind Police Barack at Mallikapauram (Sabrimala). There will be a continuous ropeway line from LTP to UTP.

(iii) The project being an Aerial Ropeway falls under the item 7 (g) of the EIA Notification, 2006 and is a designated Project as per Schedule and falls under category A, as it attracts the general condition. The selected alignment falls in some part of Periyar Wildlife Sanctuary. The Latitude & longitude of the site are LTP- 77° 03'58.07"E, 9°24'54.95"N, and UTP- 77° 04'45.41"E, 9° 26'12.32"N.

(iv) To meet the terrain, length and capacity requirement a Detachable Monocable system is appropriate in this Alignment. Maximum 40 numbers labour will be deployed during peak construction phase. Ropeway will be used for material handling (carrying capacity of 50 TPH) and shifting persons in emergency situation. Staff for operation & maintenance to be deployed at project will be about 50 persons.



- (v) Proper arrangement of water supply and sewage disposal will be made at site.
- (vi) Power Load Requirement will be 95 KW. DG set of capacities 1 x 125 KVA at Drive station (LTP) is proposed for backup power supply. These D.G. Sets will be provided with proper stack height as per the CPCB norms & will be bought acoustically enclosed.
- (vii) There shall be a provision of 50 staff during the operation of the ropeway. There shall be a provision of Bio- Toilets at lower and upper terminal for the staff.
- (viii) The total water requirement for emergency & other misc. purpose has been estimated as 5 KLD and the source will be municipal supply. Water shall be used mainly for flushing & hand washing, drinking, Gardening & misc. purposes. The generation of total waste water will be 3 KLD, which shall be disposed into Soak pit.
- (ix) Total 23 Kg/day of waste will be generated due to the proposed development. The Organic Waste will be treated in Organic Waste Converter proposed at UTP and converted into compost. The Recyclable Waste Collected and given to approved recycler. Plastic will be minimum used in the area.
- (x) There will be no displacement or immigration of the human population due to the proposed project. Risk assessment shall be done and proper safety and security measures shall be undertaken. Proper prevention and timely maintenance of ropes, machines etc will be scheduled to prevent any accident. Maintenance team will be trained to handle any type of contingency in time of emergency. All safety guidelines shall be adhered to and followed during construction and operation phases. First aid facilities will be provided at site.
- (xi) Total cost of the ropeway project is Rs. 40 Crores.

3. The EAC, in its meeting held on 25<sup>th</sup>–27<sup>th</sup> May, 2017, after detailed deliberations, recommended the project for grant of ToR as specified by the Ministry as Standard ToR in April, 2015 for the said project/activity and the following TOR in addition to Standard ToR for preparation of EIA-EMP report and allowed PP to use baseline data up to 31<sup>st</sup> May, 2017. As per the recommendation of the EAC, the Ministry of Environment, Forest and Climate Change hereby accords ToR to the project 'Sabarimala Ropeway Project' at Sabarimala, Kerala by M/s Eighteenth Step Damodar Cable Car Pvt. Ltd for preparation of the Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) with the following specific and general conditions in addition to Standard ToR provided at Annexure -1:-

- (i) Importance and benefits of the project.
- (ii) A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)
- (iii) Stage - I forest clearance to be submitted.
- (iv) Permission from Forest Department for cutting of trees.
- (v) Copy of application submitted for clearance from NBWL for Periyar Wildlife Sanctuary.
- (vi) Toposheet map of 10 km distance indicating eco-sensitive areas dully authenticated by the Wildlife warden.
- (vii) Route map of proposed ropeway project.

- (viii) Layout maps of proposed project indicating location of upper station and lower station, building, food court, parking, greenbelt area, utilities etc.
- (ix) Numbers of persons/projections of tourist.
- (x) Cost of project and time of completion.
- (xi) A note on appropriate process and materials to be used to encourage reduction in carbon foot print. Optimize use of energy systems in buildings that should maintain a specified indoor environment conducive to the functional requirements of the building by following mandatory compliance measures (for all applicable buildings) as recommended in the Energy conservation building code (ECBC) 2007 of the Bureau of Energy Efficiency, Government of India. The energy system includes air conditioning systems, indoor lighting systems, water heaters, air heaters and air circulation devices. Use
- (xii) Details of air emission, effluents, solid waste and hazardous waste generation and their management.
- (xiii) Management of Organic waste convertor may be explored at LTP.
- (xiv) Complete list of materials to be handled along with safety measures and environmental impacts on handling. The EIA would include a design of material handling, passenger handling and evacuee handling cars along with a safety management plan for each.
- (xv) The impact of odors from the bio-toilets and its management.
- (xvi) The increment in foot falls as a result of implementation of the project along with a justification on the adequacy of the existing and proposed infrastructure including toilets.
- (xvii) An assessment of the impact of all activities being carried out or proposed to be carried out by the project shall be made for traffic densities and parking capabilities in a 2 kms. radius from the site. A detailed traffic management and a traffic decongestion plan drawn up through an organization of repute and specializing in Transport Planning shall be submitted with the EIA.
- (xviii) Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract).
- (xix) The E.I.A. should specifically address to vehicular traffic management and parking facilities. Parking facility/Plan dedicated for trucks to be incorporated.
- (xx) An onsite disaster management plan shall be drawn up to account for risks and accidents. This onsite plan shall be dovetailed with the onsite management plan for the district.
- (xxi) Safety clearances from all the concerned departments.
- (xxii) Public hearing to be conducted and issues raised and commitments made by the project proponent on the same should be included in EIA/EMP Report in the form of tabular chart with financial budget for complying with the commitments made.
- (xxiii) Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included.



- (xxiv) Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.
- (xxv) A tabular chart with index for point wise compliance of above TORs.

### **General Guidelines**

- (i) The EIA document shall be printed on both sides, as far as possible.
  - (ii) All documents should be properly indexed, page numbered.
  - (iii) Period/date of data collection should be clearly indicated.
  - (iv) Authenticated English translation of all material provided in Regional languages.
  - (v) The letter/application for EC should quote the MoEF&CC File No. and also attach a copy of the letter prescribing the TOR.
  - (vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.
  - (vii) The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR. The index of the final EIA-EMP report, must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time of applying for EC.
  - (viii) Grant of TOR does not mean grant of EC.
  - (ix) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.
  - (x) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF Office memorandum dated 4<sup>th</sup> August, 2009).
  - (xi) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF Office Memorandum dated 4<sup>th</sup> August, 2009). The project leader of the EIA study shall also be mentioned.
  - (xii) All the TOR points as presented before the Expert Appraisal Committee (EAC) shall be covered.
4. The above 'TOR' should be considered for 'Sabarimala Ropeway Project' at Sabarimala, Kerala by M/s Eighteenth Step Damodar Cable Car Pvt. Ltd in addition to all the relevant information as per the 'General Structure of EIA'

given in Appendix III and IIIA in the EIA Notification, 2006. You are requested to kindly submit the final EIA/EMP report prepared as per TORs to the Ministry for considering the proposal for environmental clearance *within 3 years as per the MoEF&CC O.M. No. J-11013/41/2006-IA.II (I) dated 8<sup>th</sup> October, 2014.*

5. A detailed draft EIA/EMP report should be prepared in terms of the above additional ToR and should be submitted to the State Pollution Control Board for conducting Public Hearing. Public Hearing to be conducted for the project in accordance with the provisions of the EIA Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing should be conducted based on the ToR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the web-site.
6. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc.
7. The prescribed ToR would be valid for a period of three years for submission of the EIA/EMP Report.

  
(Dr. Vinod K. Singh)  
Scientist D

**Copy to:**

The Member Secretary, Kerala State Pollution Control Board, Pattom P O,  
Thiruvananthapuram - 695004 (Kerala). Fax: 0471- 2318134, 2318152.

**Annexure - I**

**7(g): STANDARD TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR AERIAL ROPEWAYS AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT**

- (i) Examine and submit a brief description of the project-name, project site, geology, topography, nature, size, location of the project, project coverage, master plan, length of the proposed aerial rope way, details of ROW, height from MSL and its importance to the region/ State.
- (ii) Any adverse impact of the works already carried out.
- (iii) Submit the details of facilities viz. administration building, restaurant, toilets, waste collection and disposal etc at Lower terminal and upper terminal including parking area.
- (iv) Submit the details of trees required to be cut for the project, including the type, girth size etc. Necessary permission from competent authority shall be obtained for tree cutting. Compensatory tree plantation shall be carried out and cost provision should be made for regular maintenance. Details to be submitted.
- (v) Examine and submit the likely impact due to influx of people and associated developments
- (vi) Submit maps of the project area and 10 km surrounding area from boundary of the proposed/existing project area, thereby delineating project areas wild life sanctuaries notified under the Wild Life (Protection) Act, 1972/critically polluted areas as identified by the CPCB from time to time/notified eco-sensitive areas/inter state boundaries and international boundaries. Any bio- diversity park or any protected site.
- (vii) Submit baseline data and description of existing situation of the land at the proposed project site including description of terrain, hill slopes, inland topography, slope and elevation, rock types, regional tectonic setting (reported fractures/faulting/folding, warping), and history of any volcanic activity, seismicity and associated hazards.
- (viii) Submit details of power requirement and source. Energy efficiency measures in the activity should be drawn up. PP should also submit details of D.G. Sets along with noise control measures.





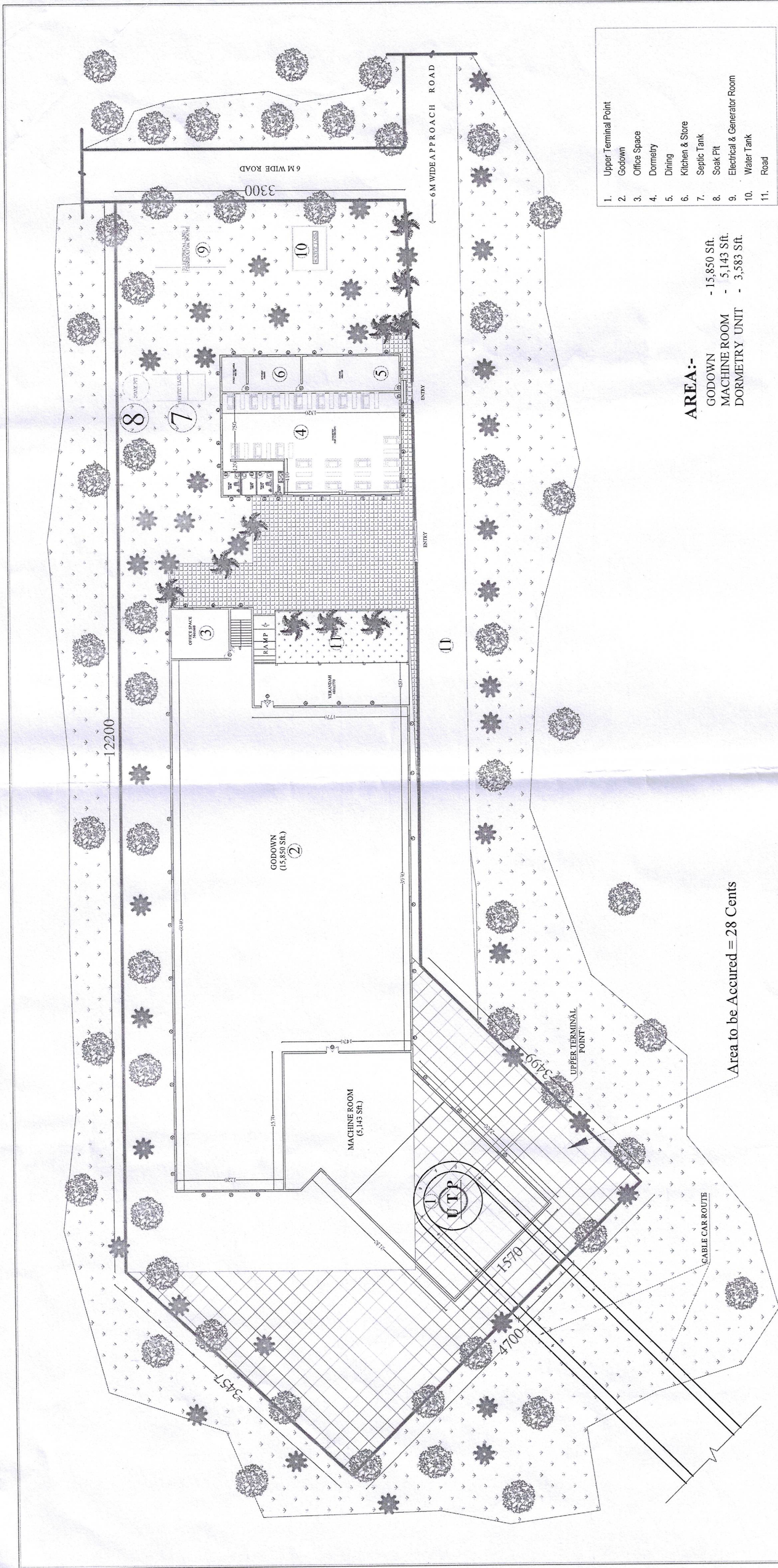
- (ix) Details of anticipated impact during construction stage and operation stage w.r.t. landslides, surface drainage etc., should be predicted. The existing surrounding features up to 1 km and impact on them should be addressed separately.
- (x) PP should examine and submit activities associated with aerial ropeway construction and operations and likely associated hazards and accidents. It is therefore desirable that based on the categories of hazards prevailing at the project site, risk assessment may be carried out by specialists in the field and recommendations may be implemented. Risk assessment should be carried out for seismicity, slope stability, soil erosion, and flood hazard.
- (xi) Any litigation pending against the proposed project and/or any direction/order passed by any court of law against the project, if so, details thereof should be provided.
- (xii) Submit Certificate from the competent authorities for safety of ropeway and its monitoring.
- (xiii) Public hearing to be conducted for the project in accordance with provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing should be conducted based on the ToR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the web-site.
- (xiv) A detailed draft EIA/EMP report should be prepared in accordance with the above additional TOR and should be submitted to the Ministry in accordance with the Notification.
- (xv) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- (xvi) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- (xvii) Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website "[http://moef.nic.in/Manual/Aerial Ropeway](http://moef.nic.in/Manual/AerialRopeway)".

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## **ENCLOSURE 4: LAYOUT PLAN**

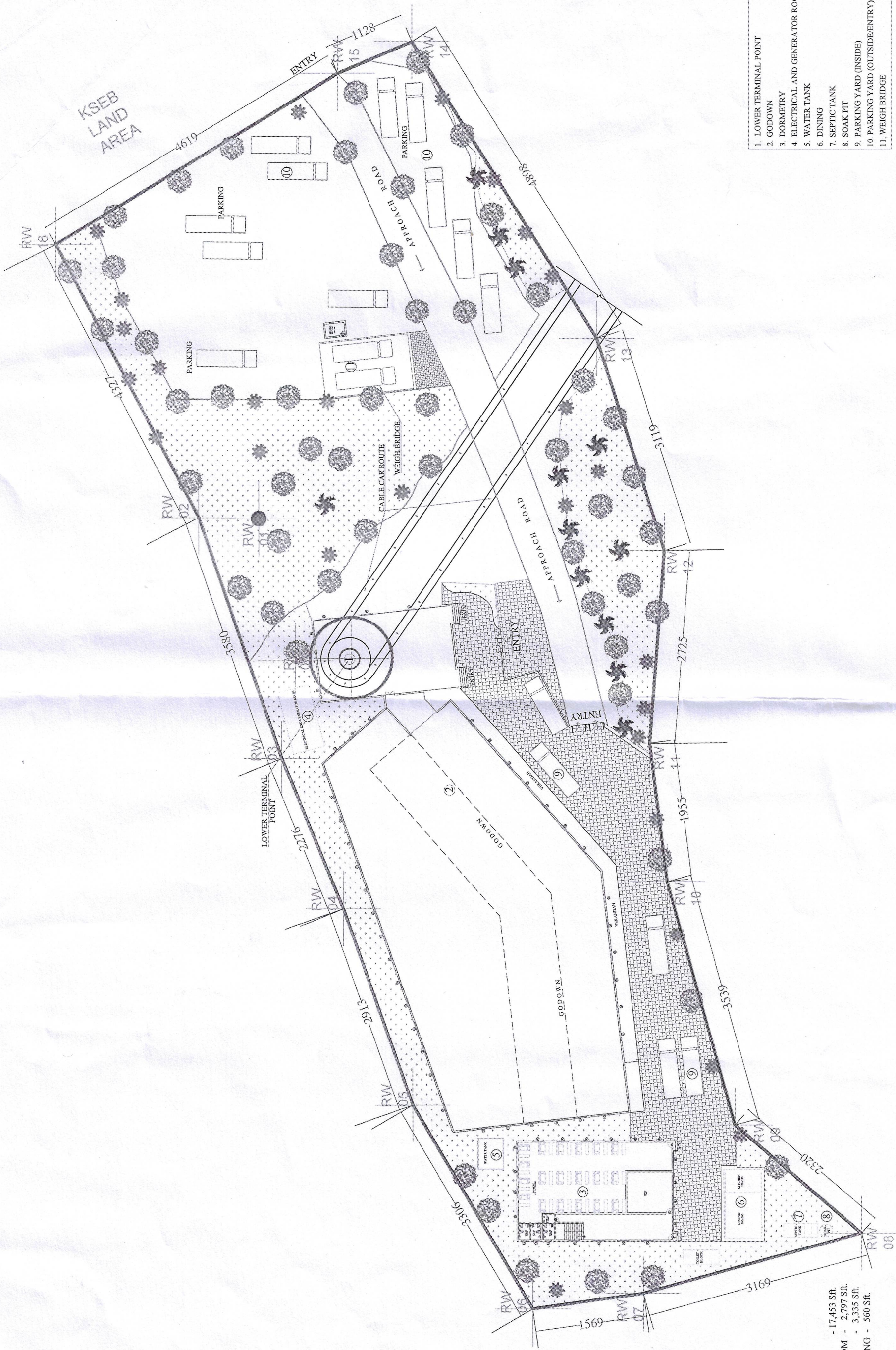




|                                                                                                                                                                                        |                                                            |  |                       |                     |                             |  |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--|-----------------------|---------------------|-----------------------------|--|--------|
| <b>ARCHITECTS:</b><br><b>BINESH SUKUMAR ARCHITECTS &amp; PLANNERS</b><br>7th FLOOR, PENTA TOWER, KALOOR, KOCHI - 682017<br>Phone : 0484 - 2537668. E-mail : binesharchitects@gmail.com | <b>CLIENT : Eighteenth Step Damodar Cable Car Pvt Ltd.</b> |  | <b>SHEET CONTENT</b>  |                     | <b>UPPER TERMINAL POINT</b> |  | REV. 0 |
|                                                                                                                                                                                        | <b>PROJECT : Proposed Sabarimala Ropeway Project</b>       |  | DRAWN BY:<br>Jyothish | CHECKED BY:<br>B.S. | DATE:<br>16-05-18           |  |        |



Drawn: C3



**AREA:-**

GODOWN - 17,453 Sft.  
MACHINE ROOM - 2,797 Sft.  
DORMETRY - 3,335 Sft.  
KITCHEN/DINING - 560 Sft.

- 1. LOWER TERMINAL POINT
- 2. GODOWN
- 3. DORMETRY
- 4. ELECTRICAL AND GENERATOR ROOM
- 5. WATER TANK
- 6. DINING
- 7. SEPTIC TANK
- 8. SOAK PIT
- 9. PARKING YARD (INSIDE)
- 10. PARKING YARD (OUTSIDE/ENTRY)
- 11. WEIGH BRIDGE

**ARCHITECTS:**

**BINESH SUKUMAR ARCHITECTS & PLANNERS**

7th FLOOR, PENTA TOWER, KALOOR, KOCHI - 682017

Phone : 0484 - 2537668. E-mail : binesharchitects@gmail.com

CLIENT : Eighteenth Step Damodar Cable Car Pvt Ltd.

PROJECT : Proposed Sabarimala Ropeway Project

SHEET CONTENT

LOWER TERMINAL POINT

DRAWN BY: Jyothish

CHECKED BY: B.S.

DATE:

16-05-18

REV. 0



## **ENCLOSURE 5: TOPOGRAPHICAL MAP**



# TOPOGRAPHICAL MAP-10KM RADIUS AREA

## SABRIMALA ROPEWAY PROJECT, PATHANAMTHITTA, KERALA

### M/S EIGHTEENTH STEPDAMODAR CABLE CAR PRIVATE LIMITED

