

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
WESTERN ZONE, BENCH PUNE
AT PUNE

EXECUTION APPLICATION NO. 08 OF 2024 (WZ)
IN
ORIGINAL APPLICATION NO. 122 OF 2023 (WZ)

Rohit Manohar Joshi

... APPLICANT

V/s

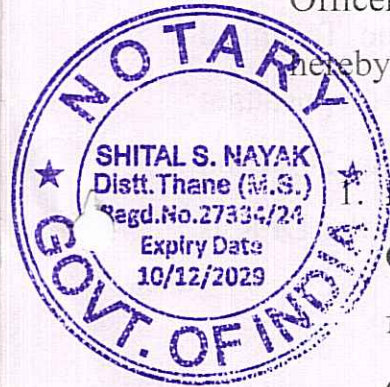
Thane Municipal Corporation, Thane
and Others

... RESPONDENTS

ADDITIONAL AFFIDAVIT

MAY IT PLEASE THE HON'BLE TRIBUNAL:

I, Smt. Manisha Pradhan, Age Adult, Occu.: Service (Chief Environment Officer), having office at Thane Municipal Corporation, Thane, do hereby state on solemn affirmation as under:-

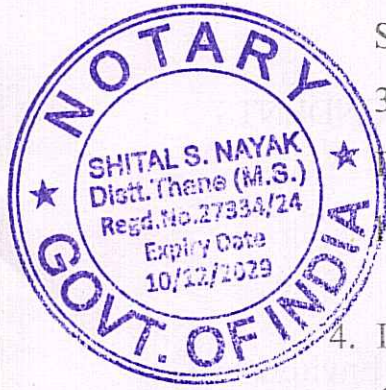


1. I say that, I am working in the capacity of Chief Environment Officer with the Respondent No. 1 and well conversant with the facts of the present case. Hence, I am able to depose the same on oath. I say that, I am filing this Affidavit to place before this Hon'ble Tribunal the factual aspects in respect of the present case.

2. I say that the Respondent No.1 had filed a detailed affidavit dated 1st January 2025. The contents of the said affidavit are affirmed, reiterated as part and parcel of the present affidavit. I say that during the hearing of the present application on 9th January 2025, the Hon'ble Tribunal had directed the Respondent No.1 to place the

status of the landfill site, and the permissions received thereon. I say that I am filing the present affidavit in compliance to the said directions.

3. I say that the Respondent No.6 (Collector, Thane) vide its order dated 22nd April 2024 has handed over the government land bearing Survey No.4 admeasuring 6.63 Hectares, Survey No.5 admeasuring 11.55 Hectares, Survey No.13 admeasuring 7.64 Hectares and Survey No.14 admeasuring 8.90 Hectares totally admeasuring 34.72 Hectares situated at Village Aatkoli, Taluka Bhiwandi, District Thane. Copy of the order dated 22nd April 2024 is annexed hereto and marked as ANNEXURE – R-1.



4. I say that in compliance to the resolution approved by the Standing Committee of the Respondent No.1, M/s. MaRS Planning & Engineering Services Pvt. Ltd., was appointed as the Technical Consultant for Sanitary Landfill Site. I say that the said consultant prepared the Detailed Project Report (DPR) dated August 2024 and submitted the same to the Respondent No.1. Copy of the DPR is annexed hereto and marked as ANNEXURE – R-2.

5. I further say that in accordance to the DPR, the Respondent No.1 submitted the application dated 23rd September 2024 for prior Environmental Clearance to the State Environmental Impact Assessment Authority, Maharashtra (SEIAA). The SEAC, Maharashtra has granted the Standard Terms of Reference (ToR) vide its letter dated 20th December 2024. Copy of the said ToR

dated 20th December 2024 is annexed hereto and marked as ANNEXURE – R-3.

6. I say that, in terms of the ToR received by the Respondent No.1, the Respondent No.1 also on dt. 30.07.2024 applied for the Authorisation under the Municipal Solid Waste Management Rules, 2016 (MSW) to the Respondent No.5 (MPCB). The proposal for grant of Authorisation is pending with the Respondent No.5. Copy of the application for authorisation as made to the Respondent No.5 is annexed hereto and marked as ANNEXURE – R-4.

I say that whatever stated hereinabove is true and correct to the best of my knowledge, information, belief and legal advice, which I believe to be true.

Solemnly affirmed at Thane on this 17 day of February, 2025

Deponent

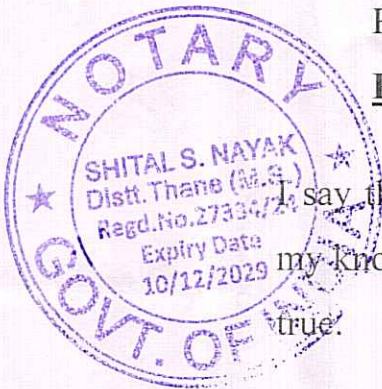
मनिषा प्रधान
मुख्य पर्यावरण अधिकारी
तण्णे महानगरपालिका कार्यालय

BEFORE ME

SHITAL S. NAYAK
ADVOCATE & NOTARY
Distt. Thane (Maharashtra)
Regd. No. 27334

NOTED & REGISTERED

Sr.No. 47 Date 17/02/2025



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Handwritten signature

BEFORE ME

SHI TAL B. NAYAK
ADVOCATE & NOTARY
Dist. Term (Chattahoochee)
Reg. No. 5733



NOTED & REGISTERED
State of Georgia



जिल्हाधिकारी व जिल्हादंडाधिकारी कार्यालय, ठाणे

वाचले :-

१. अतिरिक्त आयुक्त (२), ठाणे महानगरपालिका, ठाणे यांचेकडील पत्र दि. ०४/१२/२०२३
२. तहसीलदार, भिवंडी यांचेकडील पत्र दि. १२/१२/२०२३
३. या कार्यालयाकडील पत्र क्र. महसूल/क १/टे ३/भिवंडी-आतकोली/ज. मागणी-ठामपा-क्षपणभूमी/२०२३, दि. १९/१२/२०२३
४. उप वनसंरक्षक, ठाणे वनविभाग, ठाणे यांचेकडील पत्र क्र. कक्ष-१/२०/जमीन/४७८८/२०२३-२४, दि. १३/१२/२०२३
५. शासन, महसूल व वनविभाग, मंत्रालय, मुंबई यांचेकडील शासन ज्ञापन क्र. जमीन-२७२४/प्र.क्र.०९/ज-४, दि. १५/०३/२०२४
६. या कार्यालयाचे पत्र क्र. महसूल/कक्ष १/टे ३/भिवंडी-आतकोली/जमीन मागणी-ठाणे मनपा/२०२४, दि. २६/०३/२०२४

उप आयुक्त, घनकचरा व्यवस्थापन विभाग, ठाणे महानगरपालिका, ठाणे यांचेकडील पत्र क्र. जा. क्र. ठामपा/घनकच/अति-आ (२)/उप-आ-०९, दि. ०३/०४/२०२४

क्र.महसूल/क १/टे ३/भिवंडी-आतकोली-स.नं. ४ व इतर/ज. मागणी-कब्जाहक्क/ठामपा-क्षपणभूमी/एसआर क्र. /२०२४

दि. १०/४/२०२४
22 APR 2024

आदेश :-

ज्याअर्थी, उपोद्घातातील अ. क्र. १ अन्वये ठाणे शहरातील घनकचऱ्याचे शास्त्रोक्त पध्दतीने व्यवस्थापन करणेकामी ठाणे शहरालगत साधारण: दहा हेक्टर इतकी जमीन उपलब्ध करून देणेबाबत अतिरिक्त आयुक्त (२), ठाणे महानगरपालिका, ठाणे यांनी या कार्यालयास विनंती केलेली आहे.

ज्याअर्थी, उपोद्घातातील अ. क्र. २ अन्वये मौ. आतकोली, ता. भिवंडी येथील स.नं. ४ क्षेत्र ६-६३-०० हे.आर., स.नं. ५ क्षेत्र ११-५५-०० हे.आर., स.नं. १३ क्षेत्र ७-६४-०० हे.आर., स.नं. १४ क्षेत्र ८-९०-०० हे.आर. एकूण क्षेत्र ३४-७२-०० हे.आर. भोगवटादार सदरी गुरचरण महाराष्ट्र सरकार अशी नोंद असलेली जमीन ठाणे शहरातील घनकचऱ्याचे शास्त्रोक्त पध्दतीने व्यवस्थापन करणेकामी ठाणे महानगरपालिका यांना देणेकरीता तहसीलदार, भिवंडी यांनी विहित नमुन्यात अहवाल या कार्यालयास सादर केलेला आहे.

ज्याअर्थी, तहसीलदार, भिवंडी यांनी सादर केलेल्या अहवालाचे अनुषंगाने उपोद्घातातील अ. क्र. ३ अन्वये या कार्यालयाकडून जमीन मागणीचा प्रस्ताव विहित नमुन्यात मा. विभागीय आयुक्त, कोकण विभाग यांचे कार्यालयास सादर करणेत आला व त्यानुसार मा. विभागीय आयुक्त, कोकण विभाग यांनी त्यांचेकडील पत्र क्र. मशा/कार्या-१/जमीन-१/कावि-११७९२८५/२०२३, दि. २७/१२/२०२३ रोजी शासनास प्रस्ताव सादर केलेला आहे.

ज्याअर्थी, उपोद्घातातील अ. क्र. ५ अन्वये मौ. आतकोली, ता. भिवंडी येथील स.नं. ४ क्षेत्र ६-६३-०० हे.आर., स.नं. ५ क्षेत्र ११-५५-०० हे.आर., स.नं. १३ क्षेत्र ७-६४-०० हे.आर., स.नं. १४ क्षेत्र ८-९०-०० हे.आर. एकूण क्षेत्र ३४-७२-०० हे.आर. भोगवटादार सदरी गुरचरण महाराष्ट्र सरकार अशी नोंद असलेली जमीन ठाणे महानगरपालिका यांना महाराष्ट्र जमीन महसूल संहिता, १९६६ चे कलम ४० व कलम २२ (अ) तसेच महाराष्ट्र जमीन महसूल (सरकारी जमिनीची विल्हेवाट करणे) नियम १९७१ मधील नियम ५० मधील तरतुदीनुसार प्रचलित वार्षिक शिघ्रगणकानुसार येणारी जमिनीची किंमत वसूल करुन कब्जेहक्काने भोगवटादार वर्ग-२ या धारणाधिकाराने शास्त्रोक्त क्षपणभूमीसाठी अटी व शर्तीवर प्रदान करण्यास शासनाने मंजूरी दिलेली आहे.

ज्याअर्थी, उपोद्घातातील अ.क्र. ६ अन्वये मौ. आतकोली, ता. भिवंडी येथील स.नं. ४ क्षेत्र ६-६३-०० हे.आर., स.नं. ५ क्षेत्र ११-५५-०० हे.आर., स.नं. १३ क्षेत्र ७-६४-०० हे.आर., स.नं. १४ क्षेत्र ८-९०-०० हे.आर. एकूण क्षेत्र ३४-७२-०० हे.आर. या जमिनीची प्रचलित वार्षिक शिघ्रगणकानुसार येणारी कब्जेहक्काची रक्कम रु. १,९४,१५,४२४/- शासन जमा करणेबाबत मा. आयुक्त, ठाणे महानगरपालिका, ठाणे यांना कळविणेत आले होते.

ज्याअर्थी, उपोद्घातातील अ. क्र. ७ अन्वये मौ. आतकोली, ता. भिवंडी येथील स.नं. ४ क्षेत्र ६-६३-०० हे.आर., स.नं. ५ क्षेत्र ११-५५-०० हे.आर., स.नं. १३ क्षेत्र ७-६४-०० हे.आर., स.नं. १४ क्षेत्र ८-९०-०० हे.आर. एकूण क्षेत्र ३४-७२-०० हे.आर. या जमिनीची प्रचलित वार्षिक शिघ्रगणकानुसार येणारी कब्जेहक्काची रक्कम रु. १,९४,१५,४२४/- (बँक ऑफ महाराष्ट्र, टी.एम.सी. पाचपाखाडी शाखा, धनाकर्ष क्र. ५९०८७७, दि. ०३/०४/२०२४) चलन क्र. GRN MH००० १९००७६ २०२४-२५M, दि. ०४/०४/२०२४ नुसार शासन जमा केलेली आहे.

ज्याअर्थी, उपोद्घातातील अ. क्र. ५ मधील अटी व शर्तीमध्ये शासनाने विषयांकित जमीन वन जमीन नाही, याबाबत जिल्हाधिकारी यांनी खात्री करणेबाबत नमुद केलेले आहे.

ज्याअर्थी, उपोद्घातातील अ. क्र. ४ अन्वये उप वनसंरक्षक, ठाणे वन विभाग, ठाणे यांनी मौ. आतकोली, ता. भिवंडी येथील स.नं. ४ क्षेत्र ६-६३-०० हे.आर., स.नं. ५ क्षेत्र ११-५५-०० हे.आर., स.नं. १३ क्षेत्र ७-६४-०० हे.आर., स.नं. १४ क्षेत्र ८-९०-०० हे.आर. एकूण क्षेत्र ३४-७२-०० हे.आर. या जमिनीस भारतीय वन अधिनियम १९२७ व महाराष्ट्र खाजगी वने (संपादन) १९७५ सुधारणा १९७८ च्या तरतुदी लागू नसल्याचे या कार्यालयास कळविले आहे.

त्याअर्थी, मी, जिल्हाधिकारी, ठाणे मला, महाराष्ट्र जमीन महसूल संहिता, १९६६ चे कलम ४० व कलम २२ (अ) तसेच महाराष्ट्र जमीन महसूल (सरकारी जमिनीची विल्हेवाट करणे) नियम १९७१ मधील नियम ५० मधील तरतुदीनुसार दिलेल्या अधिकारांचा वापर करुन मौ. आतकोली, ता. भिवंडी येथील स.नं. ४ क्षेत्र ६-६३-०० हे.आर., स.नं. ५ क्षेत्र ११-५५-०० हे.आर., स.नं. १३ क्षेत्र ७-६४-०० हे.आर., स.नं. १४ क्षेत्र ८-९०-०० हे.आर. एकूण क्षेत्र ३४-७२-०० हे.आर. भोगवटादार सदरी गुरचरण महाराष्ट्र सरकार अशी नोंद असलेली जमीन ठाणे शहरातील घनकचऱ्याचे शास्त्रोक्त पध्दतीने व्यवस्थापन करणेकामी ठाणे महानगरपालिका यांना खालील नमुद अटी व शर्तीवर प्रदान करीत आहे.

अटी व शर्ती :-

१. विषयांकित जमीन अर्जदार संस्था ही भोगवटादार वर्ग -२ म्हणून धारण करतील.
२. अर्जदार शासनाच्या पूर्व परवानगीशिवाय सदर जमीन हस्तांतरण / गहाण / तारण ठेवणार नाही. सदर जमिनीचा वापर मंजूर प्रयोजनासाठी करणे अर्जदार यांच्यावर बंधनकारक राहिल. तसेच सदर जागेचा विकास व देखभाल अर्जदार यांनी स्वतःच करणे बंधनकारक राहिल.
३. सदर जमिनीचा मंजूर प्रयोजनासाठी वापर करणे थांबविल्यास, मंजूर जमीन शासनास विनामोबदला परत करावी लागेल.
४. सदर जमिनीखालील सर्व खाणी, खनिज पदार्थ दगड खाणी या वरील शासनाचे अधिकार राखून ठेवले असून महाराष्ट्र जमीन महसूल संहिता, १९६६ मधील तरतूदीनुसार खाणीचे काम करण्यासाठी, खनिजांचा शोध घेण्यासाठी सर्व वाजवी सोयीसह त्या ठिकाणापर्यंत पोहोचण्याचा अधिकार शासनास राहिल.
५. महसूल व वनविभागाचे कोणतेही व केव्हाही देण्यात येणारे निर्देश सर्व संबंधितांवर बंधनकारक राहतील.
६. प्रस्तुत प्रकरणी नियोजन प्राधिकरण तसेच इतर सक्षम प्राधिकार्यांच्या आवश्यक त्या परवानग्या घेणे अर्जदार यांना बंधनकारक राहिल.
७. सदर जमिनीचा ताबा अर्जदार यांस दिल्यापासून दोन वर्षांच्या आत जमिनीचा वापर करणे आवश्यक राहिल.
८. विषयांकित जमिनीचा क्षपणभूमी करीता वापर करणेपूर्वी महाराष्ट्र प्रदूषण नियंत्रण मंडळाकडील ना - हरकत दाखला व विहित अटी व शर्तीचे पालन करणे अर्जदार यांचेवर बंधनकारक राहिल.
९. भविष्यात लेखापरिक्षणामध्ये आकारावयाच्या मुल्यांकनाबाबत आक्षेप उपस्थित झाल्यास त्यानुसार होणारी फरकाची रक्कम संबंधित अर्जदार यांचेकडून शासन जमा करणे बंधनकारक राहिल. याबाबत अर्जदार यांचेकडून तहसीलदार, भिवंडी यांनी लेखी हमीपत्र घेण्यात यावे.
१०. प्रस्तुत प्रकरणी विकास परवानगी देतेवेळी प्रस्तावाधीन जागेस एकत्रिकृत विकास नियंत्रण नियमावलीतील तरतूदीनुसार विहित रुंदीचा रस्ता उपलब्ध असणे आवश्यक आहे.
११. प्रस्तुत जमिनीचा ताबा देण्यापूर्वी आदेशातील सर्व अटी / शर्ती मान्य असल्याबाबत शासन परिपत्रक, क्र. मुद्रांक-२०१७/अनौ.क्र. १९/प्र.क्र. १३३/म-१ (धोरण), दि. २४/१२/२०२० मधील तरतूदीनुसार विहित नमुन्यातील नोंदणीकृत करारनामा करून देणे अर्जदार यांचेवर बंधनकारक राहिल.
१२. प्रस्तावित प्रयोजनाच्या व सुरक्षेच्या अनुषंगाने राज्य व केंद्र शासनाच्या विविध विभागांनी वेळोवेळी निर्गमित केलेले आदेश / सूचना या प्रकरणी बंधनकारक राहतील व त्यानुषंगाने आवश्यक खबरदारी / काळजी घेणे बंधनकारक राहिल.
१३. प्रस्तावित प्रयोजनामुळे लगतच्या खातेदारांना कोणत्याही प्रकारचा त्रास होणार नाही, त्यांच्या वैध वहिवाटीस बाधा येणार नाही याची दक्षता घेणे अनिवार्य राहिल.
१४. सदर जापनातील अटी व शर्ती मान्य असल्याबाबत अर्जदार यांचेकडून लेखी हमीपत्र घेण्यात यावे.



१५. वरील नमुद अटी / शर्तीपैकी कोणत्याही अटी / शर्तीचा भंग केल्यास शर्तभंगाबाबत सदर शासकीय जमीन शासन जमा करण्याचा अधिकार शासनास राहिल.
१६. प्रस्तावित प्रकल्पामुळे, सार्वजनिक आरोग्याचा व प्रदुषणाचा प्रश्न निर्माण होणार नाही याची दक्षता संबंधीतांनी घेणे बंधनकारक राहिल.
१७. याप्रकरणी कोणताही न्यायालयीन अथवा अन्य कोणताही प्रकारचा वाद उद्भवल्यास त्या संदर्भातील सर्व जबाबदारी संबंधीतांची राहिल.
१८. प्रदान करणेत आलेल्या जमिनीचा ताबा घेतले नंतर जमिनीवर अतिक्रमण होऊ न देण्याची तसेच सदर जागेवर अतिक्रमण झाल्यास ती दुर करणेची सर्वस्वी जबाबदारी संबंधीतांवर राहिल.

सही/-

(अशोक शिनगारे)

जिल्हाधिकारी ठाणे

प्रत -

१. मा. आयुक्त, ठाणे महानगरपालिका, ठाणे यांना माहितीसाठी व आवश्यक त्या कार्यवाहीसाठी
 २. मा. अप्पर मुख्य सचिव, महसूल, मुद्रांक व नोंदणी शुल्क विभाग, मंत्रालय, मुंबई यांचेकडे माहितीसाठी सविनय सादर.
 ३. मा. विभागीय आयुक्त, कोंकण विभाग, नवी मुंबई यांचेकडे माहितीसाठी सविनय सादर
 ४. विशेष भुसंपादन अधिकारी, जिल्हाधिकारी कार्यालय ठाणे (समन्वय शाखा) यांचेकडे रवाना
 ५. उपविभागीय अधिकारी, भिवंडी विभाग, भिवंडी यांचेकडे माहितीसाठी रवाना.
 ६. तहसिलदार, भिवंडी यांचेकडे माहितीसाठी व आवश्यक कार्यवाहीसाठी रवाना.
- २/- अर्जदार संस्थेस जमिनीचा ताबा देऊन वर नमुद केलेल्या अटी व शर्ती मान्य असलेबाबत लेखी हमीपत्र लिहून घेणेत यावे. तसेच सदर जमिनीचा नोंदणीकृत करारनामा करणेत यावा. व तदनंतर अधिकार अभिलेख अद्यावत करून त्याबाबतचा अहवाल या कार्यालयास सादर करावा.
७. उपअधिक्षक भूमि अभिलेख, भिवंडी यांचेकडे माहितीसाठी व आवश्यक कार्यवाहीसाठी रवाना.
 ८. मंडळ अधिकारी पडद्या/तलाठी साझा अर्जुनली यांचेकडे माहितीसाठी व आवश्यक कार्यवाहीसाठी रवाना.



स्थळप्रतीवर मा. जिल्हाधिकारी यांची स्वाक्षरी अस.

(Handwritten signature)

(रेवणू लेभे)

तहसिलदार (महसूल)

जिल्हाधिकारी कार्यालय ठाणे

Detailed Project Report For Construction of Sanitary Landfill at Thane

[Division Kokan, District Thane]

(Draft Stage)



Submitted To

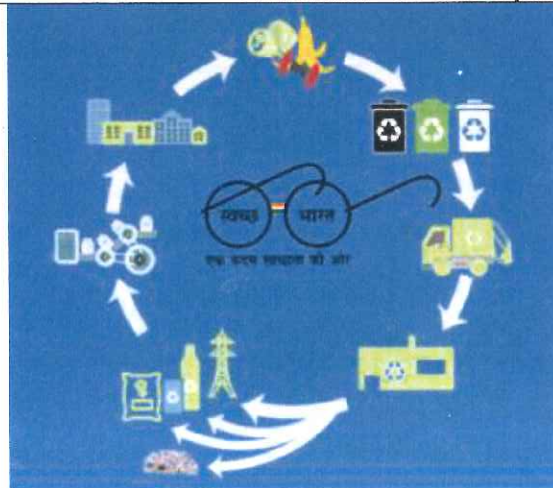
Municipal Corporation Thane

New Administrative Building, Chandan Wadi, Pachpakhadi,
Mahapalika Bhavan Rd,
Thane West, Thane
Maharashtra -400602
Dist: Thane (Maharashtra)

Submitted By

MaRS Planning & Engineering Services Pvt. Ltd.

Nr. Serene Elegancy, B/h Rajthal,
S.P. Ring Road, Bopal-Ambli
Ahmedabad - 380 058. Gujarat (INDIA)



AUGUST 2024 / REVISION 0

Detailed Project Report (DPR)

Name of Project :- **Detailed Project Report for Construction of Sanitary Landfill at Thane**
[Division Kokan, District Thane]

Proposed Capacity :- **5,99,516.00 Cum**

Proposed Time of Completion :- **12 Months**

Proposed Project Cost :- **Rs. 123,15,07,586.00**



Technical support



Disclaimer

This report is prepared on the basic data produced, analysed and obtained from the secondary sources like CDP, DPR, site visit and consultation with the stakeholder & ULB Officials. Every effort has been taken to check the accuracy of the data source however this cannot be construed as fully reliable. The objective of the report is to firm up the policy level decision making for the project. However, Consultants cannot be held responsible for the decision taken solely based on this report.

EXECUTIVE SUMMARY

The present Detailed Project Report (DPR) has proposed an appropriate system for Processing & Disposal of Municipal Solid Waste for Thane Municipal Corporation.

The interventions proposed in this report are limited to the processing of Municipal Solid Waste which includes commercial, residential and other waste generated within the limits of Thane Municipal Corporation either in solid or semi-solid form excluding hazardous waste, biomedical Waste, dead animals including all carcasses, visceral remains, hides, hoofs or such other animal parts, construction & demolition waste, e-waste etc.

[1.0] POPULATION PROJECTIONS

As of 2011 census records, the total population of Thane Municipal Corporation was 1841488. A decadal growth rate of about 38.47% was witnessed for a period between 2001 to 2011. A detailed Population Projections with various methods are shown in the report. The following is the final population projections for various years are shown as under-

Details	Year 2011	Year 2023	Year 2027	Year 2032	Year 2037	Year 2042
Population	18,41,488	23,60,777	25,64,585 <small>Considered for Design</small>	28,44,262	31,54,439	34,98,442

[2.0] WASTE GENERATION PROJECTIONS

Analysing the urban growth trends and based on the quantification survey undertaken in Thane Municipal Corpora and SBM-2.0 Operational Guidelines, the average GPCD considered for designing the project is 550. It is further assumed that the average GPCD will increase based on the changes in the consumption habits due to urbanization. Based on these factors the projected solid waste generation for planning the MSWM System is detailed in the following table. "

Details	Year 2023	Year 2027	Year 2032	Year 2037	Year 2042
Assumed GPCD	550	572	601	631	663
Waste Generation Per Day (MT/Day)	1,298.00	1,467.00 <small>Considered for Design</small>	1,709.40	1,990.00	2,319.00

[3.0] ADOPTED DESIGN CRITERIA AND REQUIREMENTS FOR WASTE PROCESSING

[3.1] The following are key adopted criteria/assumptions for designing MSW Processing Infrastructure for Thane Municipal Corpora

The Entire Processing System is designed assuming that Mixed waste is required to be processed.	%age of Wet Waste	55%
The Composition of Wet & Dry Waste is----->	%age of Dry Waste	45%
Average Precipitation taken for designing system		2146

[4.0] EXISTING INFRASTRUCTURE AVAILABLE WITH ULB

The following are existing status of Infrastructure for MSWM Available with Thane Municipal Corpora

[4.4] SANITARY LANDFILL SITE

CIVIL WORKS	NA
PLANT, MACHINERY, EQUIPMENT	NA
VEHICLES	NA
OTHER	NA

[4.5] OTHER FACILITY

CIVIL WORKS	NA
PLANT, MACHINERY, EQUIPMENT	NA
VEHICLES	NA
OTHER	NA
ELECTRICITY CONNECTION	NA
WATER CONNECTION	NA

[6.0] ADOPTED DESIGN CRITERIA AND REQUIREMENTS FOR WASTE DISPOSAL

[6.1] The following are key adopted criteria/assumptions for designing MSW Disposal Infrastructure for Thane Municipal Corpora

The adopted criteria/assumptions for designing Disposal system is ----->	%age of Inert to be Disposed in SLF	20%
	Assumed Density of inert- (KG/ CuM)	1000
	Assumed Compacted Density of inert-(KG/CuM)	1000

[6.2] The following are the requirements for Waste Disposal in Thane Municipal Corpora

Projection Parameters	Year 2011	Year 2023	Year 2027	Year 2032	Year 2037	Year 2042
Population	18,41,488	23,60,777	25,64,585	28,44,262	31,54,439	34,98,442
Waste Generation Per Day (In MT)	902.30	1298.00	1467.00	1709.40	1990.00	2319.00
Inert Disposal Required (in MT/Day)	NA	259.60	293.40	341.90	398.00	463.80
Average (2023-2027) Per Day Intert Generation Qty. Required to be disposed (in MT)	NA	NA	276.50	317.65	369.95	430.90
Total Capacity Required Averaging of Inert Qty. (in MT)			504613.00	579711.00	675159.00	786393.00
Total Capacity Required Averaging of Inert Qty. (in CuM)			504613.00	579711.00	675159.00	786393.00

EXECUTIVE SUMMARY

[7.0] PROPOSED INFRASTRUCTURE REQUIREMENTS FOR WASTE DISPOSAL

[7.1] PART-B REQUIREMENTS FOR CONSTRUCTION OF SCIENTIFIC LANDFILL SITE (CELL-1 & 2) FOR YEAR UPTO 2032

[i] PROPOSED CIVIL WORKS FOR CONSTRUCTION OF SCIENTIFIC LANDFILL SITE (CELL-1 & 2) FOR YEAR UPTO 2032

Estimate Ref.	Components	
B (1.1)	Construction of Scientific Landfill Site (Location 1)	Proposed
	Includes	
	Bottom Sealing System	Proposed
B (1.2)	Construction of Scientific Landfill Site (Location 2)	Proposed
	Includes	
	Top Sealing System	Proposed
B (1.3)	Construction of Leachate Collection Tank (For Location 1)	Proposed
B (1.4)	Construction of Leachate Collection Tank (For Location 2)	Proposed
B (1.5)	Construction of RE WALL & Gabion structure	Proposed
B (1.6)	Site formation Work	Proposed

[10.0] AREA REQUIREMENTS FOR PROPOSED INFRASTRUCTURE

[10.1] The following are existing status of Land available with Thane Municipal Corpora

Total Available Area (in Sq.M.)	Existing Constructions on Site (in Sq.M)	Net Area Available (in Sq.M)
3,50,000	0	3,50,000

[10.2] The following are the land requirements for the proposed infrastructure

Details of Component	Proposed Built up Area	Buffer Area @ 50%	Total Area Required
CONSTRUCTION OF SCIENTIFIC LANDFILL SITE (CELL-1 & 2) FOR YEAR UPTO 2032	57,999.25	57,999.75	1,15,999.00
	57,999.25	57,999.75	1,15,999.00

[10.3] Land Area Available after Construction of Proposed Infrastructure will be **2,34,001 SQ MT** **Sufficient Area Available**

[11.0] ADOPTED RATE FOR ESTIMATING & COSTING

[11.1] The Estimates & Costing for all Civil Works are done based on the State SOR Applicable for Corporation Areas

[11.2] The Rates for all Plant, Machinery, Equipments are adopted based on MJP SWM DSR 2023-24

PROJECT COST SUMMARY

Construction Works for Processing & Disposal of Municipal Solid Waste in
Thane Municipal Corporation

District - Thane, Konkan Division

Sr No	Particulars	Unit	Required Capacity (2027) (i)	Existing Capacity available (ii)	Proposed Capacity in SBM 2.0 (i - ii = iii)	Proposed Amount in Rs. In SBM 2.0	Reference
A Sanitary Landfill (SLF)							
1	Civil Works					₹ 1,01,47,55,755.84	
2	Plant & Machinery	TPD	318.00	0.00	318.00	₹ -	
Sub- Total of A (A.1 + A.2)						₹ 1,01,47,55,755.84	RECAP B
B Total Project Basic Cost							
1	Civil Works (A.1)					₹ 1,01,47,55,755.84	
2	Plant & Machinery (A.2)					₹ -	
Sub- Total of B (B.1 + B.2 + B.3)						₹ 1,01,47,55,755.84	
C MJP Fees (1% of B, inclusive of GST)						₹ 1,01,47,557.56	
D PMC Fees (2% of B)						₹ 2,02,95,115.12	
E GST (18%)							
1	Civil Works (A1)*18%					₹ 18,26,56,036.05	
2	Plant & Machinery (A2)*18%					₹ -	
3	PMC Fees (18% of D)					₹ 36,53,120.72	
F Sub- Total of E (E.1 + E.2 + E.3)						₹ 18,63,09,156.77	
TC-1 Total Project Cost of MSWM Plant (B+C+D+F)						₹ 1,23,15,07,585.29	

PROJECT COST SUMMARY

**Construction Works for Processing & Disposal of Municipal Solid Waste in
Thane Municipal Corporation**

District - Thane, Konkan Division

Z	Total Project Cost				
1	Project Cost (Civil Cost + Machinery Cost)		₹ 1,01,47,55,755.84	Say...	₹ 1,01,47,55,756.00
2	Total MJP Fee (1% of Z1)		₹ 1,01,47,557.56	Say...	₹ 1,01,47,558.00
3	Total PMC Fee (2% of Z1 and including 18% GST)		₹ 2,39,48,235.84	Say...	₹ 2,39,48,236.00
4	Total GST (excluding GST on PMC)		₹ 18,26,56,036.05	Say...	₹ 18,26,56,036.00
TPC	Total Project Cost	Amount	₹		1,23,15,07,586.00
	(Sum of Z.1, Z.2, Z.3, Z.4)	in words		One Twenty Three Crore, Fifteen Lakh, Seven Thousand, Five Hundred Eighty-Six Rupees only	
Prepared by:					
M/s. MaRS Planning and Engineering Services Pvt. Ltd Technical Consultant					
Checked / Approved By:					
Thane Municipal Corporation District - Thane, Division - Konkan					

PROJECT COST SUMMARY

Construction Works for Processing & Disposal of Municipal Solid Waste in
Thane Municipal Corporation

District - Thane, Division - Konkan

Ref	Component	Amount	Reference
<u>A</u>	CONSTRUCTION OF SCIENTIFIC LANDFILL SITE (CELL-1 & 2) FOR YEAR UPTO 2032		
	CIVIL WORKS ₹	1,01,47,55,755.84	
	SUB TOTAL :- A ₹	1,01,47,55,755.84	RECAP B
<u>i</u>	Total Project Cost (A) ₹	1,01,47,55,755.84	
<u>ii</u>	Add GST on (i) ₹	18,26,56,036.00	18.00%
<u>iii</u>	Add MJP TS Fees on (i) ₹	1,01,47,558.00	1.00%
<u>iv</u>	TPI/PMC Consultancy Fee including GST on (i) ₹	2,39,48,236.00	Net Rate Approved 2.000% Rate including 18% GST 2.360%
<u>v</u>	Total Cost of Project (i+ii+iii+iv)	1,23,15,07,585.84	
	Say....	1,23,15,07,586.00	
Prepared by: M/s. MaRS Planning and Engineering Services Pvt. Ltd Technical Consultant			
Checked / Approved By: Thane Municipal Corporation District - Thane, Division - Konkan			

PART-B RECAPITULATION SHEET CONSTRUCTION OF SCIENTIFIC LANDFILL SITE (CELL-1 & 2) FOR YEAR UPTO 2032 THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN								
Nos.	Particular	Size			Qty	Unit	Amount	Specification or Estimate Ref.
		L	W	H				
B (1.0)	CIVIL WORKS							
B (1.1)	Construction of Scientific Landfill Site (Location 1) Includes Construction of Bottom Sealing System Construction of Top Sealing System				23,006.25	SqM	46,00,54,657.00	(B 1.1) BOQ
							35,75,93,865.00	
							10,24,60,792.00	
B (1.2)	Construction of Scientific Landfill Site (Location 2) Includes Construction of Bottom Sealing System Construction of Top Sealing System				34,993.00	SqM	53,78,34,710.00	(B 1.2) BOQ
							38,19,82,367.00	
							15,58,52,343.00	
B (1.3)	Construction of Leachate Collection Tank (For Location 1)	10.00	9.00	4.00	288.00	Cum	16,03,701.00	(B 1.3) BOQ
B (1.4)	Construction of Leachate Collection Tank (For Location 2)	10.00	10.00	3.00	438.00	Cum	15,44,287.00	(B 1.4) BOQ
B (1.5)	Construction of RE wall & Gabion Structure	-	-	-	1,714.18	Sqm	1,20,67,143.78	(B 1.5) BOQ
		-	-	-	485.96	Cum		
B (1.6)	Site formation Work	-	-	-	6,293.50	Cum	16,51,257.06	(B 1.6) BOQ
Sub Total:- B (1.0)							1,01,47,55,755.84	

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A. Project Background

1. Introduction

1. The concept of landfills in urban India was initially developed as large areas of land situated far away from residential areas and the garbage disposed continuously recycled so that the landfill doesn't exhaust itself. But urban population expansion over the years has translated to landfills becoming dump yards, with little regard for their capacity or lifespan.
2. In India the meaning of landfilling process has changed to simply dumping the waste in areas outside the city without taking any kind of sanitary measures. The landfills are meant for reducing the exposure between human and environment from toxic waste but it takes a toll on the human as we are exposed to the problems associated with the waste directly i.e from the soil and the groundwater pollution.
3. Swachh Maharashtra Mission (SMM) has appointed MaRS Planning & Engineering Services Pvt. Ltd. for Preparation of Detailed Project Report (DPR), Transaction Advisory and Provide Supervision & Monitoring Services for Implementation of Solid Waste Management Projects for ULBs in the State of Maharashtra for **Konkan Division under SBM-Urban 2.0 vide Letter of Empanelment executed on date 14.02.2023 for Konkan Division.**
4. The Consultant has undertaken the field survey and data collection on 20/06/2024 & 21/06/2024. This report outlines the survey data, analysis, methodology and finally gives Design requirements for Construction of SLF.

2. Project formulation Justification (need for the project)

5. Landfills in India pose numerous threats due to their unscientific design and indiscriminate disposal of waste. One of the major threats' landfills poses is the emission of methane gas due to accumulation of waste. Methane is the leading cause of fires at landfills, resulting in garbage burning which causes severe air pollution. Landfills also pose tremendous health hazards due to them being a storehouse of virus and bacteria, causing cardiovascular and lung diseases.
6. Unlike just a demarcated space for disposing waste, a scientific landfill is constructed as a sustainable space for waste disposal and treatment of municipal solid waste. The technology deployed in constructing a scientific landfill is simple and a scientific landfill ensures complete control over gas developed in the landfill and leachate (water that has infiltrated through a solid and leached out) as well as limited access of vectors such as rodents and flies to the waste.
7. Landfills in India were never constructed in a scientific manner. They were simply lands demarcated by state governments and municipal bodies to dump waste. That resulted in most landfills in India exhausting their lifespan and emitting poisonous gases such as methane.
8. Scientific landfills also act as degassing systems by reducing the production of methane. Since the layers soak most of the impurities in the waste disposed, methane generates slowly compared to the generation speed in ordinary landfills. Vertical wells installed in scientific landfills help extract methane regularly, and the gas can then be used for electricity and heat generation purposes.

9. A scientific landfill ensures that there is no risk of pollutants seeping underground or enough generation of methane to light up the garbage. This reduces the risk of environmental or health hazards tremendously. Scientific landfills can treat the waste while it is disposed, making them important in urban waste management

3. ***Provision in Solid Waste Management Rules (SWM) Rules, 2016***

10. The Government of India has notified the Solid Waste Management Rules (SWM) Rules, 2016 for proper and effective management of municipal solid waste (MSW). Under the SWM Rules, 2016, following provisions have been made to manage sanitary landfill of MSW.

Clause 15: Duties and responsibilities of local authorities: -

- *stop land filling or dumping of mixed waste soon after the timeline as specified in rule 23 for setting up and operationalisation of sanitary landfill is over;*
- *allow only the non-usable, non-recyclable, non-biodegradable, non-combustible and non-reactive inert waste and pre-processing rejects and residues from waste processing facilities to go to sanitary landfill and the sanitary landfill sites shall meet the specifications as given in Schedule-I, however, every effort shall be made to recycle or reuse the rejects to achieve the desired objective of zero waste going to landfill;*

Clause 20: Criteria and actions to be taken for solid waste management in hilly areas: -

- *Construction of landfill on the hill shall be avoided. A transfer station at a suitable enclosed location shall be setup to collect residual waste from the processing facility and inert waste. A suitable land shall be identified in the plain areas down the hill within 25 kilometres for setting up sanitary landfill. The residual waste from the transfer station shall be disposed of at this sanitary landfill.*
- *In case of non-availability of such land, efforts shall be made to set up regional sanitary landfill for the inert and residual waste.*

4. ***Project Objective***

11. The following are the project objectives-
- To design a district/Regional level Sanitary Landfill site covering multiple Urban local body for disposal of inert post processing of Municipal Solid Waste.

5. ***Consultant Overall Scope of Work in project***

12. The following are the scope of work for the assignment-
- a) Preparation of Detailed Project Report (DPR)
 - To assess the quantity of waste disposal for the period of preferably for 2023-to-2032-year projections
 - Land Requirement for 20 years projections.
 - Ensure Landfill height restrictions based on proximity with nearby Airport.

- Land selection based on the SWM Rules 2016, C&D Waste management, SWM CPHEEO Manual 2016, CPCB Guidelines ensuring social and environmental sensitivity and safeguards.
 - Detailed SLF Layout Planning for 5 years period including Buffer Zone, Green Belt, etc.
 - Detailed Design, Drawing of SLF with Bottom Liner and Capping Liner components,
 - Landfill-Gas and Leachate Collection and Conveyance System, etc.
 - Detailed Planning, Design, Costing for Civil, Electrical, Mechanical, Instrumentation, etc. works, all the Equipment, usable life of Equipment, machineries, etc. based on the requirements of the site.
 - Detailed Design, Drawing of Allied infrastructure
 - Identification of required clearances / permissions in DPR, to be received from relevant authorities (State Pollution Control Board, Airport / Airfield Authorities, Flood Control/Ground water Management Authorities etc.) for setting up SLF.
 - Propose Post Closure O&M Plan for 5 years.
 - Detailed Cost Estimate of Capital Expenditure
- b) Tender Preparation, Evaluation and Awarding of work Contracts
- Prepare Tender Document in consultation with the official in charge.
 - Prepare & assist in finalization of Bid Documents for Uploading on e-procurement portal of Government of Maharashtra or GeM portal.
 - Answering the technical queries raised by the contractors in the pre bid meeting.
 - Preparing all the pre bid questionnaire and clarifications.
 - Assisting in evaluation of bids received by ULB.
 - Recommendation for award of work contracts.
 - Issue of letter of intent, preparation and signing of contract for appointment of contractors for goods and services.
- c) PMC services for Project Monitoring and Supervision during Implementation period
- Review and approve all the Contractor's design, drawings and implementation schedules.
 - Visit the site of works, at intervals and as instructed, and collect information with photographs related to physical progress of implementation.
 - Undertake Proof checking of designs or completed works with scrutiny of supporting documentations etc. in order to make a compliance report and grant approval on completed works.
 - Prepare and submit progress report on progress of works.

B. Technical Aspects of Sanitary Landfill Site**1. Introduction**

13. The term 'landfill' is used herein to describe a unit operation for final disposal of Municipal Solid Waste on land, designed and constructed with the objective of minimum impact to the environment by incorporating essential components described in this report. This term encompasses other terms such as 'secured landfill' and 'engineered landfills' which are also sometimes applied to municipal solid waste (MSW) disposal units.
14. The term 'landfill' can be treated as synonymous to 'sanitary landfill' of Municipal Solid Waste, only if the latter is designed on the principle of waste containment and is characterized by the presence of a liner and leachate collection system to prevent ground water contamination. The term 'sanitary' landfill has been extensively used in the past to describe MSW disposal units constructed on the basis of 'dump and cover' but with no protection against ground water pollution. Such landfills do not fall under the term 'municipal solid waste landfills' as used in this chapter.
15. Landfills are typically constructed using engineered mounds of layered waste on top of an impermeable layer of clay or other waterproof material. Keeping control of the water in the landfill is paramount and landfills are often designed with leachate pipes (perforated pipes below the waste but above the waterproof layer) that collect water that has percolated down through the landfill and waste materials. This water can then be treated and released or used for other activities. The leachate pipes and pumps prevent the accumulation of water underneath the landfill and on top of the water proof layer, making leaks into groundwater or nearby waterways less likely. Other vertical pipes may be used to collect methane gas that can be used on site to generate electricity. Once a landfill is "full" or is no longer used (e.g. the urban area has grown around the landfill and residents don't want an active, smelly landfill near their homes), the landfill will be capped with an impermeable clay layer or Phyto capped (using soil and plants) to prevent water infiltration into the landfill. Essentially, the landfill is sealed. Groundwater monitoring wells outside the landfill are active during the life of the landfill and after to detect contamination from the landfill if it leaks into the groundwater.

2. Types of Waste Accepted at Landfills

16. The Landfilling will be done for the following types of waste:
 - (i) Comingled waste (mixed waste) not found suitable for waste processing;
 - (ii) Pre-processing and post-processing rejects from waste processing sites;
 - (iii) Non-hazardous waste not being processed or recycled.
17. Landfilling will usually not be done for the following waste streams in the municipal solid waste:
 - (i) Biowaste/garden waste;
 - (ii) Dry recyclables.
18. Landfilling of hazardous waste stream in the municipal waste will be done at a hazardous waste landfill site; such a site will be identified by the State Government and is likely to be operated by industries of a district/state. If such a landfill is not available, municipal authorities will

dispose the hazardous waste in a special hazardous waste cell in the MSW landfill. Such a cell will be designed as per Ministry of Environment and Forests (MoEF) guidelines for hazardous waste disposal.

19. Landfilling of construction and demolition waste will be done in a separate landfill where the waste can be stored and mined for future use in earthwork or road projects. If such a landfill site is not available, the waste will be stored in a special cell at a MSW landfill from where it can be mined for future use. Construction and demolition waste can be used as a daily cover at MSW landfills; however, only minimum thickness of cover should be provided. All excess construction waste should be stored in the separate landfill cell.

3. Essential Components of SLF

20. The term sanitary landfill is used herein to describe a unit operation for final disposal of 'Municipal Solid Waste' on land, designed and constructed with the objective of minimizing impact to the environment and according to the SWM Rules.

Table 1: Essential Components of SLF	
1. Geological barrier	8. Landfill body
2. Impermeable base liner	9. Filling and compacting in layers
3. Drainage layer	10. Gas venting system
4. Leachate collection system	11. Protective cover system
5. Storm - water drain ditch	12. Gas collectors
6. Bordering dams	13. Groundwater control
7. Circulation roads	14. Re-planting
Source: Central Public Health and Environmental Engineering Organization (CPHEEO) Manual, GoI	

21. Figure above illustrates the essential components of an MSW sanitary landfill which include:
- A liner system at the base and sides of the sanitary landfill which prevents migration of leachate or gas to the surrounding soil;
 - A leachate collection and control facility which collects and extracts leachate from within and from the base of the sanitary landfill and then treats the leachate;
 - A gas collection and control facility (optional for small sanitary landfills) which collects and extracts gas from within and from the top of the sanitary landfill and then treats it or uses it for energy recovery;
 - A final cover system at the top of the sanitary landfill which enhances surface drainage, prevents infiltrating water, and supports surface vegetation;
 - A surface water drainage system which collects and removes all surface runoff from the sanitary landfill site;

- An environmental monitoring system which periodically collects and analyses air, surface water, soil, gas, and groundwater samples around the sanitary landfill site; and
- A closure and post-closure plan which lists the steps that must be taken to close and secure a sanitary landfill site once the filling operation has been completed and the activities for long-term monitoring and operation and maintenance (O&M) of the completed sanitary landfill are functional.

4. **Requirements for SLF under SBM-2.0 (Urban) Funding**

22. The following are the prescribed guidelines for development of Sanitary Landfills for availing funds under SBM-2.0 (Urban)-

- *Only the inert waste (mostly from street sweeping) and process rejects (in no case should this exceed 20% of total waste) which are not suitable for any of the above dry and wet waste treatment processes can be sent to sanitary landfills.*
- *It is recommended that SLFs are set up as separate business amenities levying tipping/gate fee as per the quantity and quality of waste received at the facility. Free use of SLF / LF may not be allowed, to increase the processing & recycling efficiency by the ULBs and its contractors.*

5. **Approach & Methodology**

23. The following is the approach and methodology adopted for designing the project.

a) Guiding Principles for Design

24. The following are the key guiding principles to be kept in mind for designing the proposed Landfill site-

- Protect public health and safety;
- Maximize the protection of the environment and minimize any adverse environmental impacts caused by the old landfill including as may be required, recommended or advisable pursuant to any environmental management plan and EIA reporting conducted on, at or near the Site;
- Design the landfill facility to be functionally effective, enable economic operations, and require minimum maintenance;
- Integrate the engineering design for the new cell, with the current infrastructure and facilities in Thane landfill site and address the accumulation of on-site excavated soil, optimize the drainage and collection of leachates, and optimize leachate management;
- Design the landfill facility to receive non-hazardous MSW mainly residential and commercial streams from Thane, and other ULB in the project area;
- Design the landfill facility to allow for the progressive development of all systems and site development works in a number of phases corresponding to cell.
- Prepare the design prepared according to established international experience and best practice and shall comply with applicable standards and regulations. The Consultant shall consult with client for review of intermediate and final design deliverables and collect comments for incorporation in the design, if applicable;

- Provide collection, and discharge systems for leachate so as to meet discharge requirements to support the water quality needs of the receiving water body, bottom lined lagoons or any down gradient receiving valleys;
 - Design the civil, electro-mechanical and lining materials works so that they will have a minimum life of 5 years and be able to with stand foreseeable seismic and climatic events; and
 - Design the auxiliary facilities and developments so that all construction tasks are clearly explained, to-be-built facilities are drawn with adequate details, and quality control measures are fully identified.
25. The design shall include the following facilities and systems without being limited to them subject to the outcome of initial consultations with the counterparts and site investigations and guidelines of SWM Rules, 2016 (Govt. of India)-
- Site preliminaries and preparatory works prior to sanitary landfill cell construction (surveying, access roads, ramps, location for stockpiling of excavated materials, etc.)
 - Construction works including general excavation/embankments with grading, compaction, contour, and subgrade treatment to reach the required levels,
 - Construction of the cell bases and sides and the cell geometry formation.
 - Construction of temporary roads, tracks, and drainage networks
 - Lateral side slope, berms, and embankment constructions- cut fill works
 - Construction of passive and active barrier systems, sealing on cell bases and sides
 - Geo-synthetic materials supply and placement (liner barrier protection system)
 - Construction of storm water (runoff water) collection and drainage systems
 - Construction of the leachate drainage layers, chambers, networks, piping, manholes and sump/reservoir works
 - Construction of the sanitary cell bottom/details around the slotted pipes
 - Construction of the leachate storage reservoir and transfer system (pumping, piping, earthworks) and lined leachate storage pond.
 - Earthworks, anchor trenches, dikes, civil, and electromechanical works
 - Other auxiliary works, ancillaries, peripheral equipment, and site final developments.

b) Task to be undertaken for designing

Task 1: Data Collection and Records Documentation

- Review the baseline and all project related information including the following:
 - Maps for project area relevant locations.
 - Technical confirmations of the proposed site selection, stability and landfill cell sitting criteria.
 - Site plans for the construction site.
 - Relevant data, info, brochures, leaflets, etc. for the envisaged project supplies.
 - Walkover survey and site investigation
 - All relevant sites specific information including geography, topography, soil conditions and permeability, site boundaries, etc.
 - Existing underground utilities.
 - Areas architectural setup.
 - Locally available construction materials.

Task 2: Consultations

- In order to ensure a coherent approach, launch a series of extensive meetings with UBs and the counterparts with a view of defining the overall requirements in all aspects including:

- Architectural setup and general layout
- Surface areas
- Occupancy requirements
- Space requirements and capacity
- Space allocation
- Utilities' requirements
- Minimum acceptable standards and requirements
- Design standards and performance criteria
- Others

Task 3: Surveying Works

- In this task, it is necessary to carry out the required detailed leveling surveys and contour topography for the landfill cell site. The site survey shall include all boundaries, benchmarks, coordinate, networks, general location, angles, lengths, surrounding facilities, levels in 5 meters intervals, etc. to prepare a detailed site layout, alignment, roads profiles, extent of embankment and cut slopes profiles, cross sections, general ground layouts and facilitate cut and fill calculations and other downstream work.

Task 4: Geotechnical/Soil Investigations and Analysis

- Field investigations and laboratory subsurface soil exploration tests will be critical to the success of the siting and design of the landfill and shall be carried out to ensure the viability and cost estimates of the project, of the different facilities in accordance with approved national codes of practice. The results shall define the soil bearing capacity and other physical, as well as, mechanical properties of the soils encountered.
 - *Field Work: Subsurface explanation or borings shall be executed by rotary drilling rigs at the selected sites and to appropriate depths to confirm assumptions made in the conceptual design on quantity of soil material available within the site for cover purposes, permeability of the base of the landfill cell and of the material to be used for final cover, bearing capacity of the base of the landfill cell, stability of any slopes to be cut, groundwater regime, and baseline quality of ground and surface water.*
 - *Laboratory Tests: Mechanical, physical and chemical laboratory tests shall be performed in accordance with the approved standards by an independent and governmental recognized institute. The minimum test frequency for each testing will be determined as per standard.*

Task 6: Engineering Design for the Facilities

- Prepare all required preliminary architectural and general engineering designs, drawings, calculations, plans, cost estimates, etc. for all site development works with appropriate coordinates and topography including-
 - The location of the sanitary cell in the landfill site (coordinates and topography)-general layout
 - Site layout plans including preparation works, internal roads, access roads, auxiliary facilities, connection to external facilities and utilities, etc
 - General architectural designs and drawings for the site facilities under the scope of work.
 - General site preparatory works (i.e. excavation, clearing, draining, filling, grading and consolidation, as needed) design, profiles and cross sections
 - General access roads design, profiles and cross sections.
 - General Earthworks plans of the sanitary cell, profiles and cross sections

- General excavation works layouts, reference points and slope construction profiles
- General storm water collection and drainage sections and layouts
- General leachate collection system, leachate zone sections, pumping, sump/ reservoir, conveyance Network, storage pond, drainage and pumping, layouts, sections, and profiles
- General Lining (geo-membrane and geo-synthetic materials) bottom, manholes, reservoir and slopes of the sanitary cell sections and layouts
- General geo-membrane contour and Leachate bottom drainage System sections, profiles, and layouts. All recommended lining materials should be in accordance with the specifications.
- General active barrier layouts, embankment cross section, and anchor trench layouts for geo-synthetics
- General bottom and lateral side containment barrier systems sections, and layouts.
- Municipal utilities at the landfill site (power supply and water supply requirements & layouts).
- General layouts for the landfill cell closure works, final reshaping and plateau construction, final side slope development, final capping cover.
- General Layout of the recommended gas collection system.
- Electro-mechanical work design: perform engineering and undertake design of the following electro-mechanical work, in accordance with the findings and mitigative measures recommended by the environmental assessment and public participation studies if available:
 - Electrical power and distribution system; and
 - Pumping unit for leachate to the assigned leachate storage pond.

Task 7: Specifications, Bill of Quantities and Final Cost Estimates

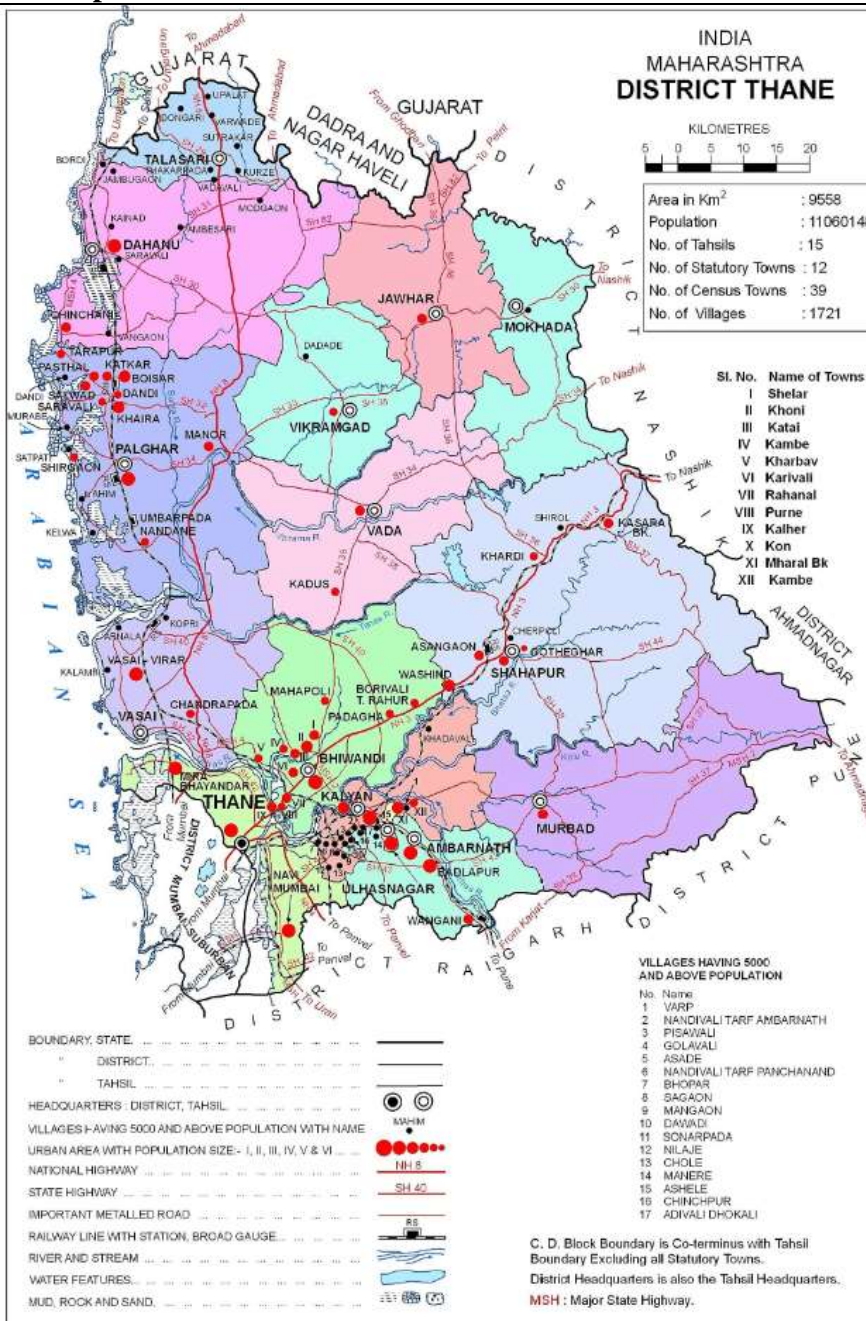
- Prepare all required technical specifications and bidding documentation in accordance with national standards for all works components designed. Furthermore, detailed BOQ's shall also be prepared of all items of works and for each component and subcomponent on separate basis. The BOQ's shall be developed to such a level of details as to allow easy estimation of construction costs, which would allow receipt of responsive contractor bids for the works under consideration.

C. Details of Proposed Site and its surroundings

1. City Brief

26. Thane is a City in Thane District of Maharashtra State, India. also known as Thana. Thana is a metropolitan city located on the northwestern side of the state of Maharashtra in India and on the northeastern side of Mumbai.

Table 2: Location Map



27. Population of Thane 1,841,488 distributed over a land area of about 147 square kilometers (57 sq mi), Thane city is the 15th most populous city in India with a population of 1,890,000 according to the 2011 census.

2. Land availability of Proposed SLF

28. The following are the location details of the Proposed SLF Site –

Table 3: Location of Proposed SLF Site



Site Name	Location	Area	Revenue Details	Ownership	Current Dumping
Atkholi Dumpsite	19°19'52.15"N 73°10'22.82"E	35.4 Ha	Yes	Thane Municipal corporation	NO

Source: ULB

3. Land Records of Proposed SLF

29. The following are the details Land records available with the ULB.

Table 4: Details of Land Records available with ULB

गाव नमुना ६ फेरफार नोंदवही (फेरफार पत्रक) [महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवहा (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम १०]			
गाव :- आतकोली		तालुका :- भिवंडी	जिल्हा :- ठाणे
नोंदीचा अनुक्रमांक	सपादन केलेल्या अधिकाराचे स्वरूप	परिणाम झालेले भुमापन व उपविभाग क्रमांक	अधिकार्याचे नाव , आयातारी व शेरा
2491	<p>फेरफाराचा प्रकार : अनोदणीकृत नोंदीचा प्रकार : आदेश व दस्तावेज फेरफाराचा दिनांक : 31/05/2024 माहिती मिळालेचा दिनांक :- 30/05/2024</p> <p>बाजूस दाखल केलेल्या स.नं.ची जमीन मा.जिल्हाधिकारी सो.ठाणे यांचेकडील आदेश क्र.महसूल/क-१/टे-३/भिवंडी-आतकोली-स.नं.४ व इतर/ज. मागणी - कब्जाहक्क/ ठामप - क्षपणभूमी/एसआर क्र. /२०२४ दि.२२/०४/२०२४ अन्वये मौजे - आतकोली, ता.भिवंडी येथील स.नं.४ क्षेत्र ६.६३०० हे.आर., स.नं.५ क्षेत्र ११.५५०० हे.आर., स.नं.१३ क्षेत्र ७.६४०० हे.आर., स.नं.१४ क्षेत्र ८.९००० हे.आर. एकुण क्षेत्र ३४.७२०० हे.आर. ही जमीन महाराष्ट्र जमीन महसूल संहिता, १९६६ चे कलम ४० व कलम २२ (अ) तसेच महाराष्ट्र जमीन महसूल (सरकारी जमिनीची विल्हेवाट करणे) नियम १९७१ मधील नियम ५० मधील तरतुदीनुसार भोगवटदार सदरी गुरचरण महाराष्ट्र सरकार अशी नोंद असलेली जमीन ठाणे शहरातील घनकचऱ्याचे शास्त्रीय पध्दतीने व्यवस्थापन करणेकामी ठाणे महानगरपालिका यांना आदेशामधील खालील नमूद अटी व शर्तीवर कब्जाहक्काने प्रदान करण्यात आलेली आहे.</p> <p>अटी व शर्ती खालील प्रमाणे-</p> <p>१. विषयांकित जमीन अर्जदार संस्था ही भोगवटदार वर्ग -२ म्हणून धारण करतील.</p> <p>२. अर्जदार शासनाच्या पूर्व परवानगीशिवाय सदर जमीन हस्तांतरण / गहाण / तारण ठेवणार नाही. सदर जमिनीचा वापर मंजूर प्रयोजनासाठी करणे अर्जदार यांच्यावर बंधनकारक राहिल. तसेच सदर जागेचा विकास व देखभाल अर्जदार यांनी स्वतःच करणे बंधनकारक राहिल.</p> <p>३. सदर जमिनीचा मंजूर प्रयोजनासाठी वापर करणे थांबविल्यास , मंजूर जमीन शासनास विनामोबदला परत करावी लागेल.</p> <p>४. सदर जमिनीखालील सर्व खाणी , खनिज पदार्थ दगड खाणी या वरील शासनाचे अधिकार राखून ठेवले असून महाराष्ट्र जमीन महसूल संहिता, १९६६ मधील तरतुदीनुसार खाणीचे काम करण्यासाठी , खनिजांचा शोध घेण्यासाठी.सर्व वाजवी सोयीसह त्या ठिकाणापर्यंत पोहोचण्याचा अधिकार शासनास राहिल.</p> <p>५. महसूल व वनविभागाचे कोणतेही व केव्हाही देण्यात येणारे निर्देश सर्व संबंधितांवर बंधनकारक राहतील.</p> <p>६. प्रस्तुत प्रकरणी नियोजन प्राधिकरण तसेच इतर सक्षम प्राधिकार्यांच्या आवश्यक त्या परवानग्या घेणे अर्जदार यांना बंधनकारक राहिल.</p> <p>७. सदर जमिनीचा ताबा अर्जदार यांस दिल्यापासून दोन वर्षांच्या आत जमिनीचा वापर करणे आवश्यक राहिल.</p> <p>८. विषयांकित जमिनीचा क्षपणभूमी करीता वापर करणेपूर्वी महाराष्ट्र प्रदूषण नियंत्रण मंडळाकडील ना - हरकत दाखला व विहित अटी व शर्तीचे पालन करणे अर्जदार यांचेवर बंधनकारक राहिल.</p> <p>९. भविष्यात लेखापरिक्षणामध्ये आकारावयाच्या मुल्यांकनाबाबत आक्षेप उपस्थित झाल्यास त्यानुसार होणारी फरकाची रक्कम संबंधित अर्जदार यांचेकडून शासन जमा करणे बंधनकारक राहिल. याबाबत अर्जदार यांचेकडून तहसीलदार , भिवंडी यांनी लेखी हमीपत्र घेण्यात यावे.</p> <p>१०. प्रस्तुत प्रकरणी विकास परवानगी देतेवळी प्रस्तावाधीन जागेस एकत्रिकृत विकास नियंत्रण नियमावलीतील तरतुदीनुसार विहित रूढीचा रस्ता उपलब्ध असणे आवश्यक आहे.</p> <p>११. प्रस्तुत जमिनीचा ताबा देण्यापूर्वी आदेशातील सर्व अटी / शर्ती मान्य असल्याबाबत शासन परिपत्रक , क्र. मुद्रांक-२०१७/अनी.क्र. १९/प्र.क्र. १३३/म-१ (धोरण) , दि. २४/१२/२०२० मधील तरतुदीनुसार विहित नमुन्यातील नोंदणीकृत करारनामा करून देणे अर्जदार यांचेवर</p>	<p>13(मंजूर), 14(मंजूर), 4 (मंजूर), 5 (मंजूर)</p> <p>एकूण :- 4</p>	<p>मा. जिल्हाधिकारी ठाणे यांचेकडील क्र.महसूल/ क-१/ टे-३/ भिवंडी-आतकोली-स.नं.४ व इतर/ ज.मागणी-कब्जाहक्क/ ठामपा-क्षपणभूमी/ एसआर क्र. /2024 दि.22/04/2024 रोजीचे आदेश व मा. तहसीलदार भिवंडी यांचेकडील क्र.महसूल/ क-१/ टे-१०/ जबा/ कावि- 1156/2024 /2403 दि.29/04/2024 रोजीचे पत्र तसेच मा. सह दुय्यम निबंधक भिवंडी-१ यांचेकडील करारनामा दस्त क्र.7503/2024 दि.07/05/2024 च्या सुची क्र.2 ची नक्कल पाहिली. सबब नोंद प्रमाणित.</p> <p>(संतोष प्रभाकर आगिबले) मंडळ अधिकारी:- पडधा ता.: भिवंडी जि.: ठाणे दि.: 06/06/2024</p>

Table 4: Details of Land Records available with ULB


<p>बंधनकारक राहिल.</p> <p>१२. प्रस्तावित प्रयोजनाच्या व सुरक्षेच्या अनुषंगाने राज्य व केंद्र शासनाच्या विविध विभागांनी वेळोवेळी पाठ निर्गमित केलेले आदेश / सूचना या प्रकरणी बंधनकारक राहतील व त्यानुषंगाने आवश्यक खबरदारी / काळजी घेणे बंधनकारक राहिल.</p> <p>१३. प्रस्तावित प्रयोजनामुळे लगतच्या खातेदारांना कोणत्याही प्रकारचा त्रास होणार नाही, त्यांच्या वैध वहिवाटीस बाधा येणार नाही याची दक्षता घेणे अनिवार्य राहिल.</p> <p>१४. सदर जापनातील अटी व शर्ती मान्य असल्याबाबत अर्जदार यांचेकडून लेखी हमीपत्र घेण्यात यावे.</p> <p>१५. वरील नमुद अटी / शर्तीपैकी कोणत्याही अटी / शर्तीचा भंग केल्यास शर्तभंगाबाबत सदर शासकीय जमीन शासन जमा करण्याचा अधिकार शासनास राहिल.</p> <p>१६. प्रस्तावित प्रकल्पामुळे, सार्वजनिक आरोग्याचा व प्रदुषणाचा प्रश्न निर्माण होणार नाही याची दक्षता संबंधितांनी घेणे बंधनकारक राहिल.</p> <p>१७. याप्रकरणी कोणताही न्यायालयीन अथवा अन्य कोणताही प्रकारचा धाद उद्भवल्यास त्या संदर्भातील सर्व जबाबदारी संबंधितांची राहिल.</p> <p>१८. प्रदान करणेत आलेल्या जमिनीचा ताबा घेतले नंतर जमिनीवर अतिक्रमण होऊ न देण्याची तसेच सदर जागेवर अतिक्रमण झाल्यास ती दुर करणेची सर्वस्वी जबाबदारी संबंधितांवर राहिल.</p> <p>तरी सदर बाबत मा.जिल्हाधिकारी सो.ठाणे यांचेकडील आदेश क्र.महसूल/क.१८-३/भिवंडी-आतकोली-स.नं.४ व इतर/ज. मागणी - फळाहक्क/ ठामप-क्षपणभूमी/एसआर क्र./२०२४, दि.२२/०४/२०२४, मा. तहसिलदारसो. भिवंडी यांचेकडील पत्र क्र.महसूल/क.१८.१०/जबा/कावि-११५६/२०२४/२०४०३ दिनांक- २९/०४/२०२४ व सह दुय्यम निबंधक, भिवंडी १ यांजकडील करारनामा दस्त क्रमांक - ७५०३/२०२४ दि.०७/०५/२०२४ अन्वये नोंद दाखल केली असे.</p> <p>हितसंबंधितांना नोटीस बजावल्याचा दि. फेरफार नोंद निर्गतीचा दि. 06/06/2024</p> <p>(रोहन राजेंद्र पवार) तलाठी आतकोली साझा अर्जुनली ता. भिवंडी जि. ठाणे</p>	
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"या प्रमाणित प्रतीसाठी फी म्हणून १५/- रुपये मिळाले."
दिनांक :- 06/06/2024
सांकेतिक क्रमांक :- 2721001002753900016202431

(नाव :- रोहन राजेंद्र पवार)
तलाठी साझा :- अर्जुनली ता. भिवंडी जि :- ठाणे
तलाठी साझा अर्जुनली
ता. भिवंडी, जि. ठाणे

Table 4: Details of Land Records available with ULB

अहवाल दिनांक : 06/06/2024


महाराष्ट्र शासन
गाव नमुना सात (अधिकार अभिलेख पत्रक)
(महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवहा (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम ३,५,६ आणि ७)

गाव :- आतकोली (552609) तालुका :- भिवंडी जिल्हा :- ठाणे
PU-ID : 22260497196 भूमापन क्रमांक व उपविभाग : 4

भू-धारणा पध्दती : भोगवटादार वर्ग - 2 शेताचे स्थानिक नाव :

क्षेत्र, एकक व आकारणी	खाते क्र.	भोगवटादाराचे नांव	क्षेत्र	आकार	पो.ख.	फे.फा.	कुळ, खंड व इतर अधिकार
क्षेत्राचे एकक हे.आर.चौ.मी	222	गुदघरण महाराष्ट्र सरकार	6.63.00			(2491)	कुळाचे नाव व खंड
अ) लागवड योग्य क्षेत्र	316	ठाणे महानगरपालिका, ठाणे	6.63.00			(2491)	इतर अधिकार
जिरायत							सक्षम प्राधिकार्यांच्या पूर्व परवानगी शिवाय हस्तांतरास बंदी - गृह निर्माण संस्था/औद्योगिक आस्थापना/वैज्ञानिक संस्था यांना वाटप जमीन (2491)
बागायत							[नियम] (2491)
एकूण ला.यो.	6.63.00						[पंजामतीची मानकी कमी अटीवर आहे] (2491)
क्षेत्र							प्रलंबित फेरफार : नाही.
ब) पोट-खराब क्षेत्र (लागवड अयोग्य)							शेवटचा फेरफार क्रमांक : 2491 व दिनांक : 06/06/2024
धर्म (अ)	-						
धर्म (ब)	-						
एकूण पो.ख.	0.00.00						
एकूण क्षेत्र	6.63.00						
(अ-ब)							
आकारणी	0.00						
जुडी किंवा विशेष-आकारणी							
जुने फेरफार क्र. (431] 476] 658] 2332] 2289] 2491)							सीमा आणि भूमापन चिन्ह :

गाव नमुना बारा (पिकांची नोंदवही)
(महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवहा (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम २९)

गाव :- आतकोली (552609) तालुका :- भिवंडी जिल्हा :- ठाणे
भूमापन क्रमांक व उपविभाग : 4

पिकाखालील क्षेत्राचा तपशील								लागवडीसाठी उपलब्ध नसलेली जमीन	शेरा
वर्ष	हंगाम	खाता क्रमांक	पिकाचा प्रकार	पिकाचे नाव	जल सिंचित	अजल सिंचित	जल सिंचनाचे साधन	स्वरूप क्षेत्र	
(१)	(२)	(३)	(४)	(५)	(६)	(७)	(८)	(९)	(१०)
					हे.आर. चौ.मी	हे.आर. चौ.मी			हे.आर. चौ.मी
2021-22	सर्पण वर्ष	222					गायरण पत्र	6.6300	


टीप : * सदरची नोंद मोबाइल ०प द्वारे घेणेत आलेली आहे

"या प्रमाणित प्रतीसाठी फी म्हणून १५/- रुपये मिळाले."
दिनांक :- 06/06/2024
सांकेतिक क्रमांक :-

(नाव :- रोहन राजेंद्र पवार)
तलाठी साक्षा :- अर्जुनलीता :- भिवंडी जि :- ठाणे
रोहन राजेंद्र पवार
तलाठी साक्षा अर्जुनलीता
ता. भिवंडी, जि. ठाणे

Table 4: Details of Land Records available with ULB

अहवाल दिनांक : 06/06/2024


महाराष्ट्र शासन
गाव नमुना सात (अधिकार अभिलेख पत्रक)
[महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवहा (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम ३,५,६ आणि ७]

गाव :- आतकोली (552609) तालुका :- भिवंडी जिल्हा :- ठाणे

PU-ID : 30892230711 भूमापन क्रमांक व उपविभाग : 5

भू-धारणा पध्दती : भोगवटादार वर्ग - 2 शेताचे स्थानिक नाव :

क्षेत्र, एकक व आकारणी	खाते क्र.	भोगवटादाराचे नांव	क्षेत्र	आकार	पो.ख.	फे.फा.	कुळ, खंड व इतर अधिकार	
क्षेत्राचे एकक हे.आर.ची.मी	322	मुरवयण महाराष्ट्र सरकार	11.55.00			(2491)	कुळाचे नाव व खंड	
अ) लागवड योग्य क्षेत्र जिरायत 11.55.00	316	ठाणे महानगरपालिका, ठाणे	11.55.00			(2491)	इतर अधिकार	
बागायत							सक्षम प्राधिकार्यांच्या पूर्व परवानगी शिवाय हस्तांतरास बंदी - गृह निर्माण संस्था/औद्योगिक आस्थापना/शैक्षणिक संस्था यांना वाटप जमीन (2491)	
एकूण ला.यो. क्षेत्र 11.55.00							[कन्व्ह-](2491)	
ब) पोट-खराब क्षेत्र (लागवड अयोग्य)							[पंचायतीच्या मालकी-](2491)	
वर्ग (अ) -							[काही अटीवर-आहे-](2491)	
वर्ग (ब) -								
एकूण पो.ख. 0.00.00							प्रनवित फेरफार : नाही.	
एकूण क्षेत्र 11.55.00							शेवटचा फेरफार क्रमांक : 2491 व दिनांक : 06/06/2024	
अ+ब)								
आकारणी 0.00								
जुडी किंवा विशेष-आकारणी								
जने फेरफार क्र. (431) (476) (658) (2332) (2489) (2491)								सोमा आणि भूमापन विन्हे :

गाव नमुना बारा (पिकांची नोंदवही)
[महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवहा (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम २९]

गाव :- आतकोली (552609) तालुका :- भिवंडी जिल्हा :- ठाणे

भूमापन क्रमांक व उपविभाग : 5

पिकाखालील क्षेत्राचा तपशील								लागवडीसाठी उपलब्ध नसलेली जमीन		शेरा
वर्ष	हंगाम	खाता क्रमांक	पिकाचा प्रकार	पिकाचे नाव	जल सिंचित	अजल सिंचित	जल सिंचनाचे साधन	स्वरूप	क्षेत्र	
(१)	(२)	(३)	(४)	(५)	(६)	(७)	(८)	(९)	(१०)	(११)
					हे.आर. ची.मी	हे.आर. ची.मी			हे.आर. ची.मी	
2021-22	संपूर्ण वर्ष	222						गायरण पत्र	11.5500	

टीप : * सदरची नोंद मोबाइल 0प द्वारे घेणेत आलेली आहे


"या प्रमाणित प्रतीसाठी फी म्हणून १५/- रुपये मिळाले."
दिनांक :- 06/06/2024
सांकेतिक क्रमांक :-

(नाव :- रोहन राजेंद्र पवार)
तलाठी साझा :- अर्जुनलीता :- भिवंडी, जि :- ठाणे


रोहन राजेंद्र पवार
तलाठी साझा अर्जुनलीता
ता. भिवंडी, जि. ठाणे

Table 4: Details of Land Records available with ULB

अहवाल दिनांक : 06/06/2024


महाराष्ट्र शासन
गाव नमुना सात (अधिकार अभिलेख पत्रक)
[महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवध्या (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम ३,५,६ आणि ७]

गाव :- आतकोली (552609) तालुका :- भिवंडी जिल्हा :- ठाणे
PU-ID : 17240492216 भूमापन क्रमांक व उपविभाग : 13


17240492216

भू-धारणा पध्दती : भोगवटादार वर्ग - 2 शेताचे स्थानिक नाव :

क्षेत्र, एकक व आकारणी	खाते क्र.	भोगवटादाराचे नांव	क्षेत्र	आकार	पो.ख.	फे.फा.	कुळ, खंड व इतर अधिकार
क्षेत्राचे एकक ह.आर.ची.मी	222	मुरघरम महाराज सरकार	7.64.00			(2491)	कुळाचे नाव व खंड
अ) लागवड योग्य क्षेत्र जिरायत	316	ठाणे महानगरपालिका, ठाणे	7.64.00			(2491)	इतर अधिकार सक्षम प्राधिकार्यांच्या पूर्व परवानगी शिवाय हस्तांतरास बंदी - गृह निर्माण संस्था/औद्योगिक आस्थापना/शैक्षणिक संस्था यांना वाटप जमीन (2491) [योग्य महसूल प्रमाणपत्र] (2491) [पिकाखालीची मागेची कपटी] (2491) [अटीवर जमिने] (2491) [इतर] (2491)
भाग्यायत	-						प्रलंबित फेरकार : नाही.
एकुण ला.यो. क्षेत्र	7.64.00						शेवटचा फेरकार क्रमांक : 2491 व दिनांक : 06/06/2024
ब) पोट-खराब क्षेत्र (लागवड अयोग्य)							
सर्ग (अ)	-						
सर्ग (ब)	-						
एकुण पो.ख.	0.00.00						
एकुण क्षेत्र अ+ब)	7.64.00						
आकारणी	0.00						
मुठी किंवा विशेष- आकारणी							
जुने फेरकार क्र (431 M 476 M 658 M 2332 M 2/19 M 2491)							सोसा आणि भूमापन चिन्हे :

गाव नमुना बारा (पिकांची नोंदवही)
[महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवध्या (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम २९]

गाव :- आतकोली (552609) तालुका :- भिवंडी जिल्हा :- ठाणे
भूमापन क्रमांक व उपविभाग : 13

पिकाखालील क्षेत्राचा तपशील								लागवडीसाठी उपलब्ध नसलेली जमीन	शेरा
वर्ष	हंगाम	खाता क्रमांक	पिकाचा प्रकार	पिकाचे नाव	जल सिंचित	अजल सिंचित	जल सिंचनाचे साधन	स्वरूप क्षेत्र	
(१)	(२)	(३)	(४)	(५)	(६)	(७)	(८)	(९)	(१०)
					ह.आर. ची.मी	ह.आर. ची.मी			ह.आर. ची.मी
2021-22	सप्टेंबर	222						गायवण पड	7.6400

टीप : * सदरची नोंद मोबाइल ऍप द्वारे घेणेत आलेली आहे

"या प्रमाणित प्रतीसाठी फी म्हणून १५/- रुपये मिळाले."
दिनांक :- 06/06/2024
सांकेतिक क्रमांक :-

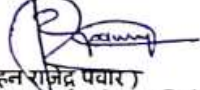


(नाव :- रोहन राजेंद्र पवार)
तलाठी साझा :- अर्जुनलीता :- भिवंडी जि :- ठाणे
रोहन राजेंद्र पवार
तलाठी साझा अर्जुनलीता
ता. भिवंडी, जि. ठाणे

Table 4: Details of Land Records available with ULB

अहवाल दिनांक : 06/06/2024


महाराष्ट्र शासन
गाव नमुना सात (अधिकार अभिलेख पत्रक)
[महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवही (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम ३,५,६ आणि ७]

गाव :- आतकोली (552609) तालुका :- भिवंडी जिल्हा :- ठाणे
PU-ID : 38361401821 भूमापन क्रमांक व उपविभाग : 14

भू-धारणा पध्दती : भोगवटादार वर्ग - 2 शेताचे स्थानिक नाव :

क्षेत्र, एकक व आकारणी	खाते क्र.	भोगवटादाराचे नांव	क्षेत्र	आकार	पो.ख.	फे.फा.	कुळ, खंड व इतर अधिकार
क्षेत्राचे एकक हे.आर.ची.मी	222	सुदधरण महाराष्ट्र सरकार	8.90.00			(2491)	कुळाचे नाव व खंड
अ) लागवड योग्य क्षेत्र	316	ठाणे महानगरपालिका, ठाणे	8.90.00			(2491)	इतर अधिकार
जिरायत							सकाम प्राधिकार्यांच्या पूर्व परवानगी शिवाय हस्तांतरण बंदी - गृह निर्माण संस्था/औद्योगिक आस्थापना/शैक्षणिक संस्था यांना वाटप जमीन (2491)
बागायत							इतर
एकूण ला.यो. क्षेत्र							[नो-नॉन-महसूल प्रभाग] (2491)
ब) पोट-खराब क्षेत्र (लागवड अयोग्य)							[पंचायतीची मानकीकरण] (2491)
घर्मे (अ)							[अटीवर आहे] (2491)
घर्मे (ब)							
एकूण पो.ख.							प्रलंबित फेरफार : नाही.
एकूण क्षेत्र (अ+ब)							शेवटचा फेरफार क्रमांक : 2491 व दिनांक : 06/06/2024
आकारणी							
जुडी किये विशेष-आकारणी							

जुने फेरफार क्र. (431 व 476 व 658 व 2332 व 2489 व 2491) सीमा आणि भूमापन चिन्ह :


गाव नमुना बारा (पिकांची नोंदवही)
[महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवही (तयार करणे व सुस्थितीत ठेवणे) नियम, १९७१ यातील नियम २९]

गाव :- आतकोली (552609) तालुका :- भिवंडी जिल्हा :- ठाणे
भूमापन क्रमांक व उपविभाग : 14

पिकाखालील क्षेत्राचा तपशील								लागवडीसाठी उपलब्ध नसलेली जमीन		शेरा
वर्ष	हंगाम	खाता क्रमांक	पिकाचा प्रकार	पिकाचे नाव	जल सिंचित	अजल सिंचित	जल सिंचनाचे साधन	स्वरूप	क्षेत्र	
(१)	(२)	(३)	(४)	(५)	(६)	(७)	(८)	(९)	(१०)	(११)
					हे.आर. ची.मी	हे.आर. ची.मी			हे.आर. ची.मी	
2021-22	सर्पण वर्ष	222						गायरण पत्र	8.9000	

टीप : * सदरची नोंद मोबाइल App द्वारे घेणे आलेली आहे

"या प्रमाणित प्रतीसाठी फी म्हणून १५/- रुपये मिळाले."
दिनांक :- 06/06/2024
सांकेतिक क्रमांक :-


(नाव :- रोहन प्रसाद पवार)
तलाठी साझा :- अर्जुनलीता :- भिवंडी जि :- ठाणे
तलाठी साझा अर्जुनलीता
ता. भिवंडी, जि. ठाणे

Source: ULB

4. Site suitability Analysis for Proposed site

30. Pursuant to guidance in the SWM Rules, 2016 and based on good practices, the minimum siting distance criteria in following Table 5 are considered as restricted zone for site suitability analysis. Construction of sanitary landfills for municipal waste within restricted zones should be avoided at all costs.

Table 5: Landfill site suitability analysis				
No.	Place	Minimum siting distance	Thane SLF site Data	Site suitability
1	Coastal regulation, wetland, critical habitat areas, sensitive eco-fragile areas, and flood plains as recorded for the last 100 years	Sanitary landfill site not permitted within these identified areas	Not available	NA
2	Rivers	100 Meter away from the flood plain	>1200 Meter	Permissible
3	Ponds, Lakes, water bodies	200 Meter	>1200 Meter	Permissible
4	Non-meandering water channel (canal, drainage, etc.)	30 Meter	>600 Meter	Permissible
5	Highway or	500 Meter	>700 Meter	Permissible
	railway line,		>3500 Meter	Permissible
	Water supply wells		No water supply well	Permissible
6	Habitation	500 Meter	>600 M	Permissible
7	Earthquake zone	500 Meter from faulty line fracture*	Not applicable due to site in zone 3	Permissible
8	Flood prone area	Sanitary landfill site not permitted	No such area	Permissible
9	Water table (highest level)	The bottom liner of the landfill should be above 2 m from the highest water table		
10	Airport	20 Km**	>40 km (Chhatrapati Shivaji Maharaj International Airport) >35 km (Navi Mumbai Airport)	Permissible

* The urban local bodies (ULBs) located in seismic zone 4 and 5 should consult the seismic fault map before finalizing the site for the sanitary landfill. They should also ensure that when the sanitary landfill is designed, the seismic factors are taken into consideration in determining the stability of the landfill structure.

** In a special case, a landfill site may be setup within 10-20 km away from the airport or airbase if there is no objection certificate from the civil aviation authority or air force as the case may be.

Source: -CPHEEO Manual 2016 and analysis by consultant

5. Surrounding Site Environment around Proposed SLF Site

31. The following are the details of site surrounding and its distances to the Proposed SLF Site.

Table 6: Surrounding Site Environment around Proposed SLF Site



Source:- Consultant

32. With reference to the above stated Site suitability (spatial and attributional) analysis the site is considered as **Permissible for the Sanitary Landfilling activities** with no harm to the surrounding flora and fauna, water bodies and human settlements having considerable distance from the site as per SWM Rules 2016. The site will be called “Proposed Site” or “Proposed SLF Site”. Further Baseline historical data and the available physical and social infrastructure for the Proposed SLF Site is being scrutinized for the gap analysis.

6. Historical Imagery of Proposed SLF Site

33. The following are the details of site surrounding and its distances to the Proposed SLF Site.

Table 7: Historical imagery of the Proposed SLF Site








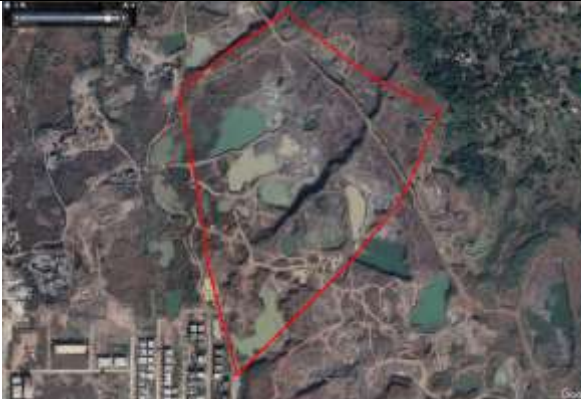




Year 2012	Year 2013
	
Year 2014	Year 2015
	
Year 2016	Year 2017
	
Year 2018	Year 2019
	

Table 7: Historical imagery of the Proposed SLF Site

Year 2020	Year 2021
	
Year 2023	Year 2024
	

Source: Consultant

7. Existing Situation of Proposed SLF Site and its surrounding

34. The general field observations made during the site visit are as under
- Proposed site has no basic facilities like water, electricity connection and security gate.
 - Proposed site has Rocky land.
35. The following is the status of infrastructure available at the Proposed SLF Site –

No.	Details	Available	Functional	Remarks
1	Electricity Connections	NA	NA	
2	Water Connection	NA	NA	
3	Processing Infrastructure	NA	NA	
4	Boundary Wall	NA	NA	
5	Office cum Security Cabin	NA	NA	
6	Gate	NA	NA	
7	Faecal Sludge Treatment Plant	NA	NA	
8	Composting Pit	NA	NA	

Source: Field Survey by Consultant

D. Design Requirements for Sanitary Landfill Site**1. Population Projections for Urban Local Body****Table 9: Proposed Population for Urban Local Body**

EXISTING DETAILS OF POPULATION FOR THANE						
YEAR	Average Annual Growth Rate	Population	Average Increase	Incremental Increase	Decadal Growth Rate	Percentage Increase / Decade
1971	0	170675				
1981	8.16%	309897	139222	0	61.46%	0.82
1991	15.92%	803389	493492	354270	99.94%	1.59
2001	5.72%	1262551	459162	-34330	46.24%	0.57
2011	4.59%	1841488	578937	119775	38.47%	0.46
			1670813	439715	246.12%	3.43823
	Value of 'N'	5	4	3	4	4
		Average	417703 (Mean)	146572 (Inc. mean)	61.53% (Dec. rate)	1.4 (Geo. rate)
	Reference Population P ₁	1841488	X	Y	r _d	r _g (Negative Excluded)
			As per CSWAP decadal growth rate		23.00%	
METHODS USED FOR POPULATION PROJECTIONS						
Formula						
1. Arithmetical Increase Method $P_n = P_1 + nX$			3. Geometrical Growth Method $P_n = P_1 * (1 + r_g / 100)^n$			
2. Incremental Increase Method $P_n = P_1 + nX + n(n+1)Y/2$			4. Decadal Growth Method $P_n = P_1 * (1 + r_d / 100)^n$			
Where						
P ₁ is a reference population		X is a arithmetical mean		r _d is a decadal average growth ratio		
n is a number of decade from reference year		Y is a incremental increase mean		r _g is a geometrical average growth ratio		
N is a no. of decades whose data has been taken in calculation						

YEARWISE POPULATION PROJECTIONS BY DIFFERENT METHODS FOR THANE							
Year	Value of 'n'	By Airthmetical Increase Method	By Incremental Increase Method	By Geometrical Method	Average of A,B,C)	Decadal growth method (Actual)	Decadal Growth Method (Assuming 23% Growth per Decade)
		(A)	(B)	(C)	(D)	(E)	(F)
2012	0.1	18,83,258	18,91,319	20,06,742	19,27,106	19,31,941	18,80,007
2013	0.2	19,25,029	19,42,618	21,86,825	20,18,157	20,26,837	19,19,331
2014	0.3	19,66,799	19,95,380	23,83,069	21,15,083	21,26,395	19,59,478
2015	0.4	20,08,569	20,49,609	25,96,924	22,18,367	22,30,842	20,00,465
2016	0.5	20,50,340	21,05,304	28,29,971	23,28,538	23,40,420	20,42,309
2017	0.6	20,92,110	21,62,464	30,83,930	24,46,168	24,55,381	20,85,028
2018	0.7	21,33,880	22,21,090	33,60,680	25,71,883	25,75,988	21,28,641
2019	0.8	21,75,651	22,81,183	36,62,265	27,06,366	27,02,519	21,73,166
2020	0.9	22,17,421	23,42,740	39,90,914	28,50,358	28,35,266	22,18,623
2021	1.0	22,59,191	24,05,763	43,49,055	30,04,670	29,74,533	22,65,030
2022	1.1	23,00,962	24,70,252	47,39,336	31,70,183	31,20,641	23,12,408
2023	1.2	23,42,732	25,36,207	51,64,641	33,47,860	32,73,925	23,60,777
2024	1.3	23,84,502	26,03,627	56,28,112	35,38,747	34,34,739	24,10,158
2025	1.4	24,26,273	26,72,513	61,33,175	37,43,987	36,03,452	24,60,572
2026	1.5	24,68,043	27,42,865	66,83,562	39,64,823	37,80,452	25,12,040
2027	1.6	25,09,813	28,14,682	72,83,340	42,02,612	39,66,146	25,64,585
2028	1.7	25,51,584	28,87,966	79,36,941	44,58,830	41,60,962	26,18,229
2029	1.8	25,93,354	29,62,715	86,49,197	47,35,089	43,65,347	26,72,995
2030	1.9	26,35,124	30,38,929	94,25,369	50,33,141	45,79,770	27,28,906
2031	2.0	26,76,895	31,16,610	1,02,71,195	53,54,900	48,04,727	27,85,987
2032	2.1	27,18,665	31,95,756	1,11,92,925	57,02,449	50,40,733	28,44,262
2033	2.2	27,60,435	32,76,367	1,21,97,370	60,78,057	52,88,332	29,03,756
2034	2.3	28,02,205	33,58,444	1,32,91,953	64,84,201	55,48,092	29,64,495
2035	2.4	28,43,976	34,41,988	1,44,84,763	69,23,576	58,20,612	30,26,503
2036	2.5	28,85,746	35,26,997	1,57,84,616	73,99,120	61,06,518	30,89,809
2037	2.6	29,27,516	36,13,471	1,72,01,115	79,14,034	64,06,468	31,54,439
2038	2.7	29,69,287	37,01,412	1,87,44,731	84,71,810	67,21,151	32,20,421
2039	2.8	30,11,057	37,90,818	2,04,26,870	90,76,248	70,51,291	32,87,783
2040	2.9	30,52,827	38,81,690	2,22,59,962	97,31,493	73,97,647	33,56,555
2041	3.0	30,94,598	39,74,028	2,42,57,555	1,04,42,060	77,61,017	34,26,764
2042	3.1	31,36,368	40,67,831	2,64,34,411	1,12,12,870	81,42,234	34,98,442
2043	3.2	31,78,138	41,63,100	2,88,06,616	1,20,49,285	85,42,177	35,71,620
2044	3.3	32,19,909	42,59,835	3,13,91,701	1,29,57,148	89,61,766	36,46,328
2045	3.4	32,61,679	43,58,035	3,42,08,769	1,39,42,828	94,01,964	37,22,599
2046	3.5	33,03,449	44,57,701	3,72,78,639	1,50,13,263	98,63,784	38,00,465
2047	3.6	33,45,220	45,58,833	4,06,23,998	1,61,76,017	1,03,48,289	38,79,960
2048	3.7	33,86,990	46,61,431	4,42,69,566	1,74,39,329	1,08,56,593	39,61,118

ADOPTED POPULATION FOR DESIGN FOR THANE

Year	By Airthmetical Increase Method (A)	By Incremental Increase Method (B)	By Geometrical Method (C)	Average of A,B,C) (D)	By Decadel Growth Method (E)	Adopted Population for Design (F) (As per 23% Growth per Decade)
2023	23,42,732	25,36,207	51,64,641	33,47,860	32,73,925	23,60,777
2027	25,09,813	28,14,682	72,83,340	42,02,612	39,66,146	25,64,585
2032	27,18,665	31,95,756	1,11,92,925	57,02,449	50,40,733	28,44,262
2037	29,27,516	36,13,471	1,72,01,115	79,14,034	64,06,468	31,54,439
2042	31,36,368	40,67,831	2,64,34,411	1,12,12,870	81,42,234	34,98,442
2047	33,45,220	45,58,833	4,06,23,998	1,61,76,017	1,03,48,289	38,79,960

Source: Consultant

2. Calculation of Inert Quantity and Capacity of SLF

36. The Following are the Calculation of Inert Quantity and Capacity of SLF.

Table 10: Calculation of Inert Quantity and Capacity of SLF

Projection Parameters	Year 2011	Year 2023	Year 2027	Year 2032	Year 2037	Year 2042
Population	18,41,488	23,60,777	25,64,585	28,44,262	31,54,439	34,98,442
Waste Generation Per Day (In MT)	902.30	1298.00	1467.00	1709.40	1990.00	2319.00
Inert Disposal Required (in MT/Day)	NA	259.60	293.40	341.90	398.00	463.80
Average (2023-2027) Per Day Inert Generation Qty. Required to be disposed (in MT)	NA	NA	276.50	317.65	369.95	430.90
Total Capacity Required Averaging of Inert Qty. (in MT)			504613.00	579711.00	675159.00	786393.00
Total Capacity Required Averaging of Inert Qty. (in CuM)			504613.00	579711.00	675159.00	786393.00

Source: Consultant

3. Phasing of Landfill Site Development

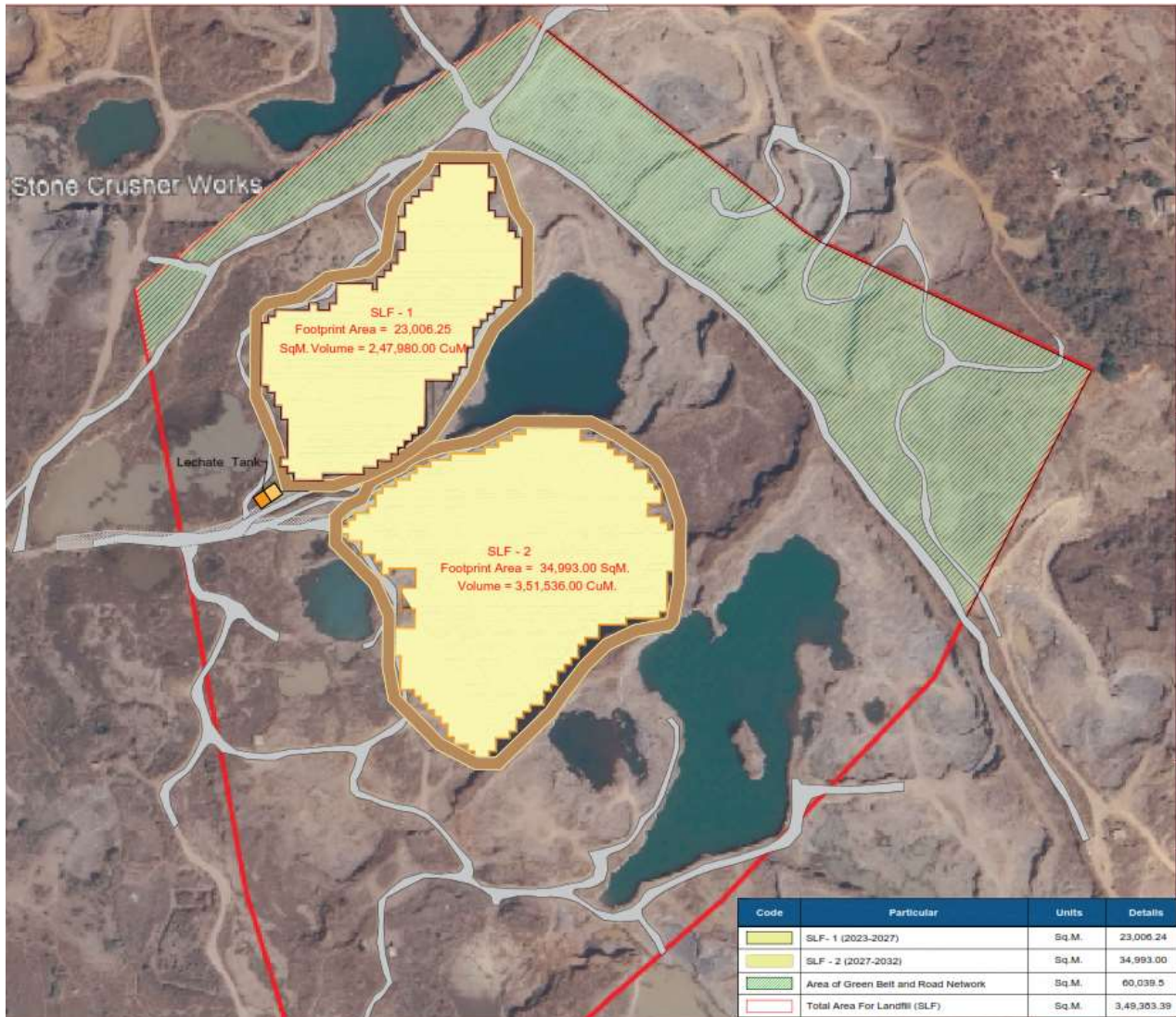
37. Phase 1 Development at location-1- A new landfill cell is proposed for Phase-1 at Location-1 which can accommodate **2,47,980 m³** volume of inert waste including cover material. The preliminary design and capacity are done in the following table.

Table 11: SLF (Location 1) for Phase-1

No.	Type of Landfill cell	Dimension	Capacity (m3)	Area covered on ground (m2)
1.	As per Topography	As per Topography	2,47,980.00	23,006.25
		Total	2,47,980.00	23,006.25

38. Phase 2 Development at Location-2- A new landfill cell is proposed for Phase-2 at Location-2 which can accommodate **3,51,536 m³** volume of inert waste including cover material. The preliminary design and capacity are done in the following table.

No.	Type of Landfill cell	Dimension	Capacity (m3)	Area covered on ground (m2)
1	As per Topography	As per Topography	3,51,536.00	34,993.00
		Total	3,51,536.00	34,993.00



4. Proposed Components of SLF

39. The Proposed Components for Construction of SLF are shown below:

Table 13: Proposed Components for SLF



Installation and operation of small SLF

- (a) Excavation of site (b) Installation of base sealing system including Leachate & Gas Collection System, (c) discharge of inert in excavated portion, (d) add daily cover manually or through vehicle, (e) Installation of Top sealing system including soil cover and vegetative cover

40. The seven essential components of a SLF are-

1. A liner system at the base and sides of the SLF site which prevents migration of leachate or gas to the surrounding soil.
2. A leachate collection and control facility which collects and extracts leachate from within and from the base of the landfill and then treats the leachate.
3. A gas collection and control facility (optional for small sized SLF) which collects and extracts gas from within and from the top of the landfill and then treats it or uses it for energy recovery.
4. A final cover system at the top of the SLF site which enhances surface drainage, prevents infiltrating water and supports surface vegetation.
5. A surface water drainage system which collects and removes all surface runoff from the SLF site.
6. An environmental monitoring system which periodically collects and analyses air, surface water, soil-gas and ground water samples around the SLF site.
7. A closure and post-closure plan which lists the steps that must be taken to close and secure the SLF site once the filling operation has been completed and the activities for long-term monitoring, operation and maintenance of the completed SLF.

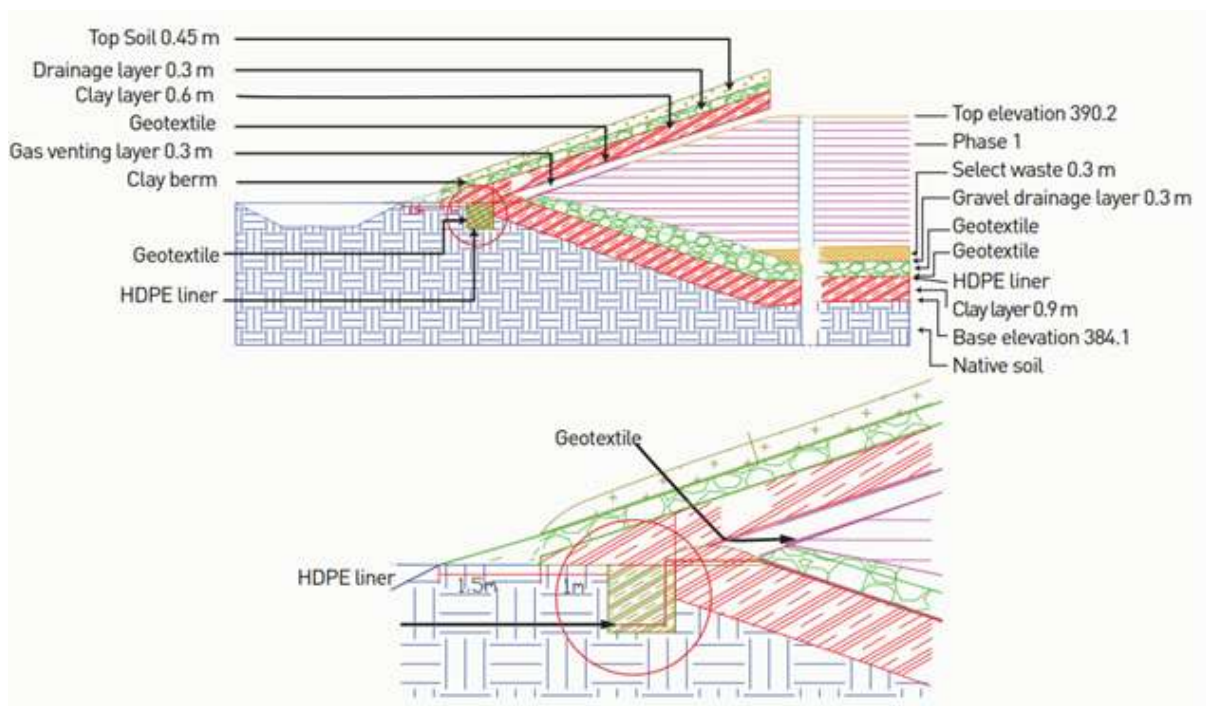
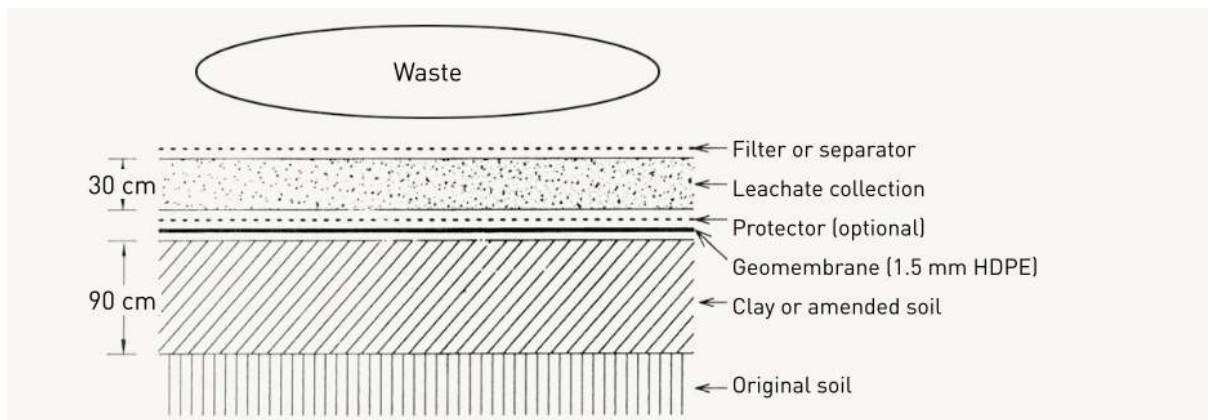
5. Proposed Requirements for SLF

41. The requirements for SLF are broadly divided into three components i.e. (1) Excavation & Earth Works, (2) Bottom sealing system and (3) Top sealing system. The first two components is required during the construction of the facility. The top sealing system shall be carried out at the end of completely filling of inert. The SLF requirements are presented below-

a) Excavation and Earth Works

42. The layout shall be made in such a way that all planed areas have sufficient inclination to guarantee an unhindered run off of leachate and storm water. The SLF shall be done in such a manner, that the amount of cut and fills are finally in a balance. Required cover material shall be made available. A trapezoidal shape is ideal for excavation.

b) Bottom Sealing System



43. The bottom sealing system has to the following elements:

1. **Compacted Clay/ Amended Soil layer / mineral sealing layer** - A 90cm thick compacted clay or amended soil (amended with bentonite) as per IS: 6186-1986 Specification to reach the permeability not greater than 1×10^{-7} cm/sec. The amended soil layer shall meet the following criteria:
 - Hydraulic conductivity of $k < 10^{-7}$ cm/sec or less
 - Specified thickness
 - Absence of shrinkage cracks due to desiccation
 - Absence of clods in the compacted clay layer
 - Adequate strength for stability of liner under compressive loads as well as alongside slopes
 - Minimal influence of leachate/waste on hydraulic conductivity
 - Percentage Fines – between 40 and 50% (IS: 2720 Part IV)
 - Placidity Index – between 10 and 30% (IS 2720 – part V)
 - Liquid Limit – 25 to 30% (IS 2720 – part V)
 - Clay content – 18 to 25%

Alternatively, use geo-synthetic clay layer (GCL) in place of compacted clay or amended soil, to avoid utilization of valuable clay.

2. **HDPE Geo-membrane layer**- The second sealing liner will be a High-density polyethylene (HDPE) geo-membrane with a minimum thickness of 1.5 mm. The geo-membrane can only be installed during favorable weather conditions. For the constructing of the layer the following items have to be considered
 - Welding of the HDPE layer is only possible if the sun does not shine directly on the HDPE layer in summer time (danger of blistering).
 - Water is not allowed on the base of the HDPE layer,
 - Before work starts the way of placing has to be defined in a plan,
 - The placed HDPE layer must be fixed (e. g. sandbags),
 - No equipment must drive on the welded HDPE layers (only the necessary equipment for welding), and
 - Every welding seam has to be double checked (stability, density with under pressure method, thickness, visual inspection).
3. **Protection Layer (Optional)**: - A protection layer (of silty soil) should be 20-30 cm thick or, alternatively, a protection layer (geotextile) should be 400 grams per square meter (g/m^2) for bottom liner and 200 g/m^2 for top cover, depending on the landfill height. If the planned height (height +depth) of the landfill is more than 20 m, geotextile should be 800 g/m^2 .
4. **Drainage (Leachate) Layer**- The drainage layer shall be made up of granular soil of permeability coefficient (k) greater than 10^{-2} cm/sec. The size of material to be used shall be 25 mm and fraction content of material size less than 25 mm should not be more than 5%. Clean coarse sand is the preferred material for this layer; however, gravel may also be used. Here, Construction and Demolition (C&D) waste can also be utilized in top cover in place of granular soil. In this case the size of material to be used shall be maximum 25 mm size. The quality control test for drainage layer shall include test for grain size and permeability by following test method:

• Parameter	Test Method
• Grain Size	Is 2720 (Part 4)

- Permeability IS 2720 (Part 17)

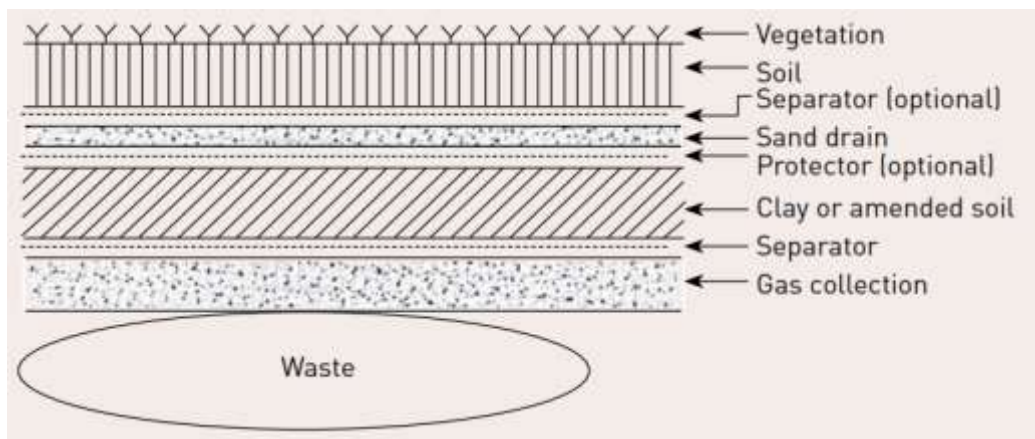
The test results shall meet the material specifications to be used in drainage layer.

- 5. Soil Layer (For Protection)-** For protection of the Geotextile layer, a soil layer of 300 mm thickness must be applied. A suitable binding material (suitable combination of coarse and fine particles) should be used. This material must be installed during favorable weather conditions. The following qualities are required:
 - *at least 10 mass-% of clay particles with a high adsorptive capacity,*
 - *maximum 5 mass-% of organic substances and*
 - *maximum 15 mass-% of carbonate.*
- 6. Gas management system (if applicable)-** It is required to provide a suitable gas management system. The system shall be according to the gas generation estimate from the SLF site, whether active or passive, as per the CPCB guidelines & MSW Rules, 2016.
- 7. Leachate management system-** It is required to construct a leachate management system including leachate collection network, storage tank and Treatment Facilities. The system should in such a way that there is a possibility of leachate recirculation to the maximum possible extent. For the remaining leachate, a suitably treatment unit should be provided before its final disposal into the nearest water body, ensuring that the quality of water in the nearest water body as well as the ground water is not deteriorated further to that determined in the baseline testing. The overall leachate system shall be such as to ensure that there is no percolation of the leachate into the ground and raw leachate does not come into contact with any water body without treatment.

c) Top Sealing System

44. The Top sealing system has to the following elements:

- 1. Gas drainage layer:** The layer should be a 30 cm thick granular gas drainage layer formed by crushed gravel or crushed demolition waste to facilitate gas collection.
- 2. Mineral clay layer:** The mineral material (60 cm) should be clay or amended soil and should satisfy permeability requirements of $k = 10 \text{ cm/s}$. If the available soil has higher permeability, additional layers of 1.5 mm HDPE can be installed over 60 cm thick soil layer. The overall equivalence of such design of soil plus additional layers has to be checked and certified by geotechnical experts. 1.5 mm HDPE liner should be covered with a 20 cm protection layer or geotextile.
- 3. Water drainage layer:** The water drainage layer should be 30 cm thick formed by crushed gravel. The gravel layer should be covered by a geotextile or alternate separator to prevent clogging of the drainage layer by the overlying soil. An alternative is a drainage mat (Secudrain), but it is more costly.
- 4. Vegetative soil layer:** The top layer should be 45 cm thick vegetative soil.



d) Testing of top soil

45. Testing of topsoil shall be performed on representative samples of each principal type or combination of topsoil material. At least one set of tests shall be performed on each borrow source proposed. A minimum of 2 kg of top soil from each proposed borrow source shall be sent to the designated laboratory at least 15 days prior to placement. Testing shall consist of the determination of maximum particle size in accordance with ASTM D 422, pH in accordance with ASTM D 4972 and organic content in accordance with ASTM D 2974. No topsoil shall be placed until the borrow source assessment report is approved. The report shall include the location of each source, estimated quantity of borrow available, logs of subsurface exploration and laboratory test results.

e) Topsoil Placement

46. Topsoil shall not be placed when the base is excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading. Topsoil shall be placed in one lift and shall be evenly spread to a final compacted thickness of desired thickness. Topsoil shall be traffic compacted using approved placement equipment. On slopes, topsoil shall be placed from bottom of the slope upward.

f) Protection and Stock piling of top soil

47. Erosion rills or other damage that occurs during construction shall be repaired and grades re-established. Repairs to the select topsoil layer shall be documented including location and volume of soil layer affected, corrective action taken, and results of retests. Storage or stockpiling of material on the completed surface of the topsoil layers shall not be permitted.

g) HDPE Lining Specifications

48. Smooth HDPE Liner (in bottom liner and top cover): - The lining material shall be of highest quality high-density polyethylene (HDPE) sheeting, manufactured in using virgin high-density polyethylene resin entirely free of plasticisers or other filler materials. Only 10% of the resin may be from edge cut-offs. The HDPE sheet shall be manufactured through Flat Cast extrusion technology and shall have minimum length of 150 m and minimum width of 7 m per roll to reduce the no of welding/seaming points. The liner material shall be supplied with a 125mm-film sheet along the roll longitudinal edges in order to keep this zone clean and to stop

oxidization. This film shall be removed immediately before welding. The overlapping and welding area shall be marked with a white line to assure an optimum welding. The welding area on the outside edge of the liner shall be smooth. The thickness of the HDPE Geo-membrane shall not vary across the roll by more than 5%. The properties of the geo membrane have given in table below:

Table 14: Specification for Smooth HDPE Liner (in bottom liner and top cover)				
Description	Test Method	Unit	Minimum Value	Frequency of Test
Thickness Nominal	ASTM D 5199	mm	1.50 (should not vary across the roll by more than 5%)	Every Roll
Density	ASTM D 1505	gm/cc	0.94	Every 5th role
Melt Flow Index (recommended in GRI Standards)	ASTM D 1238- (190° C – 2.16 kg)	Gm/10 min	≤ 1.0	
Tensile Strength at Yield (recommended as per GRI standards)	ASTM D 6693	kN/m	24	Every 5th role
Tensile Strength at break	ASTM D 6693	N/mm	42	Every 5th role
Elongation at Yield	ASTM D 6693	%	15	Every 5th roll
Elongation at Break	ASTM D 6693	%	≥700	Every 5th roll
Tear Resistance	ASTM D 1004	N	200	Every 5th roll
Puncture Resistance	ASTM D 4833	N	480	Every 5th roll
Low temp Brittleness(optional)	UNE EN-495	-	No Cracks (optional criteria)	
Carbon Black Content	ASTM D 1603	%	2 - 3 %	Every 5th roll
Carbon Black Dispersion	ASTM D 5596		Cat 1-2	Every 5th roll
Cold Belding at –20°C (optional)	ASTM D 2136	-	passed (optional criteria)	Every 5th roll
NCTL	ASTM D 5397	Hrs	>300	
Environmental Stress Crack Resistance – (ESRC Test.)	DIN 16726	Hrs	NR	Every 5th roll
Dimensional Stability	ASTM D 1204 (1 h, 100 ° C)	%	± 2	Every 5th roll
Roll Width		m	7	Every roll
Oxidative Induction Time (OIT) (min. ave)	ASTM D 3895	Mins	100	
Oven Aging at 85° C – Standard OIT (min. ave.) % retained after 90 days	ASTM D 3895	%	55	
Chemical Resistance				Every 5th

Description	Test Method	Unit	Minimum Value	Frequency of Test
				roll
(a)Resistance to Chemical Waste Mixture	-	-	Test method not clear	
(b) Resistance to Pure chemical Reagents.	-	-	Test method not clear	
Source: Market Analysis				

49. The immediate surface to be lined so that it is free of irregularities, protrusion, vegetation, excessive water, loose soil or abrupt changes in grade. The supporting surfaces does not certain contain stones or other matter of such composition shape or size which may be damaging to the HPDE and there are no excessively soft surfaces areas.
50. *Textured HDPE Liner (on side slope for cover):* - The material specification and testing for one side textured HDPE geomembrane shall be as following: The specifications comply with the accepted GRI norms.

No.	Description	Test Method	Value	Frequency
1.	Thickness miles (min. ave.)	D 5994	Nom. (-5%)	Per roll
a.	Lowest individual for 8 out of 10 values		-10%	
b.	Lowest individual; for any of the 10 values		-15%	
2.	Asperity Height mils (min. ave.)	GM 12	10 mil	Every 2 nd roll
3.	Density (min. ave.)	D 1505/D 792	0.940 g/cc	200,000 lb
4.	Tensile Properties (min. ave)	D 6693 Type IV		20,000 lb
a.	Yield strength		126 lb/in	
b.	Break strength		90 lb/in	
c.	Yield elongation		12%	
d.	Break elongation		100%	
5.	Tear resistance (min. ave.)	D 1004	42 lb	45,000 lb
6.	Puncture resistance (min. ave.)	D 4833	90 lb	45,000 lb
7.	Stress Crack Resistance	D 5397 (App.)	300hr	Per GRI GM 10
8.	Carbon Black Content (range)	D 1603	2% - 3%	20,000 lb
9.	Carbon Black Dispersion	D 5596	*	45,000 lb
10.	Oxidative Induction Time (OIT) (min. ave.)			200,000 lb
a.	Standard OIT or,	D 3895	100 min.	
b.	High Pressure OIT	D 5885	400 min	
11.	Oven Aging at 85°	D5721		Per each formulation
a.	Standard OIT (min. ave.) - % retained after 90 days, or,	D 3895	55%	
b.	High Pressure OIT (min. ave.) - % retained after 90 days	D 5885	80%	
12.	UV Resistance	GM 11		Per each formulation
(a)	Standard OIT (min. ave.), or,	D 3895	N.R.	
(b)	High Pressure OIT (min. ave.) - % retained after 1600 hrs	D 5885	50%	
* Carbon black dispersion (only near spherical agglomerates) for 10 different views: 9 in categories 1 or 2 and 1 in category 3 Source: Market Analysis				

h) Tests and Samples during Construction of the Sealing Systems

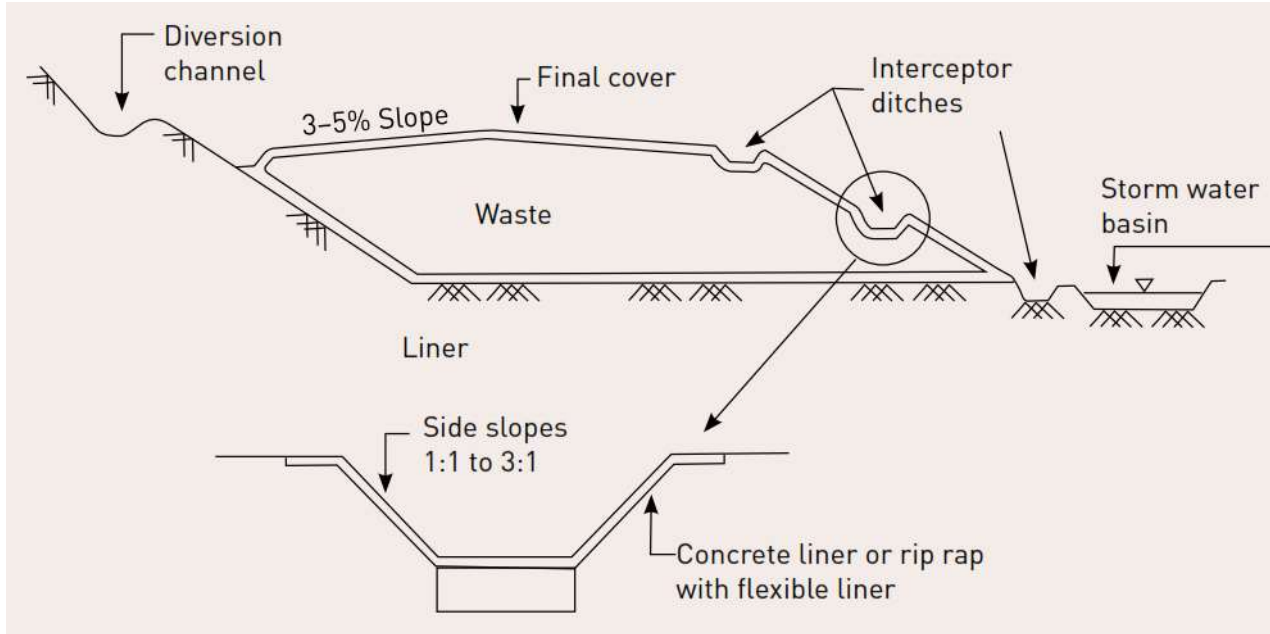
51. The tests and samples during construction of the sealing system need to be agreed with the Contracting Authority but it is likely that they will include the following items.
52. Aptitude Test: The fundamental suitability (aptitude test) of the used materials provided for the mineral base and surface sealing system must be proven before construction works start. The suitability tests of the used mineral sealing material have to be approved by laboratory tests and a test field. The following laboratory testing is required.
- *grain-size distribution*
 - *water content*
 - *consistency of material*
 - *water absorption of material*
 - *portion of organic materials*
 - *portion of carbonate*
 - *density*
 - *proctor density*
 - *water permeability*
 - *homogeneity*
53. The suitability of the used drainage material has to be also approved by laboratory tests. The following tests are required:
- *grain-size distribution*
 - *content of organic materials*
 - *content of carbonate*
54. Test Field: Within a test field the suitability of the clay must be proven under the supposed site conditions. These test fields are the basis for all conditions stipulated for later application by an independent supervisor.
55. Construction starts with 4 layers of 225 mm each and includes all above mentioned laboratory tests and examinations required for each layer by taking some samples. Visual tests have to be performed by trial pits. The test fields have to be performed outside of the sealing areas. The results from the test field (including the results of the laboratory tests) must be evaluated and documented including the following statements with regard to the design of the mineral sealing system.
- *Compacting methods*
 - *Compacting equipment*
 - *Number of compacting transitions*
 - *Operation speed of compacting equipment*
 - *Thickness of un-compacted layers (before compaction)*
 - *Type of homogenization*
56. The test field must be at least 20 m in length, the minimum width must be 2 machine widths plus the required ramps 1: 10 and the embankments 1: 5 as well as the distance of acceleration and deceleration with driving tracks as wide as the equipment, which are arranged alongside. The test fields should be located at the bottom and embankment area of the SLF site. They should represent the same slopes as SLF site. After the mineral sealing material has been tested, the application of the other sealing compounds, protection layer and drainage layer will be

tested in the test field accordingly. This will be done for the base sealing as well as for the surface sealing.

57. Quality Assurance during Construction Works: For the quality assurance during construction works the requirements are as follows:
- *The mineral sealing layers must be built under weather conditions which are following required conditions (water content, degree of compression, coefficient of permeability; example: no construction during heavy rain fall)*
 - *The top of each completed layer of the mineral sealing system must be dewatered sufficiently. Shrinkage cracks must be avoided by taking technical measures.*
 - *Soil lumps which are bigger than 32 mm shall not be used for construction the mineral sealing.*
 - *The sealing material must be homogenous and show regular placement water content. The layers must achieve a homogenous sealing mass. The layers shall overlap.*
 - *After completion of each compacted layer an acceptance test must be carried out before starting the next layer.*
 - *During and after incorporation the following tests and checks must be carried out especially for the mineral-sealing layer (for re-cultivation layer, drainage layer and compensation layer the test has to be done similar):*
 - *density*
 - *thickness of each layer*
 - *flatness of each layer*
 - *grain-size distribution*
 - *water content*
 - *consistency of material*
 - *water absorption of material*
 - *proctor density*
 - *permeability*
 - *content of organic parts & carbonate*
58. These tests should be carried according a defined scheme. The laboratory test for the aptitude test and the quality assurance during construction works have to be carried out by a qualified geo-technical institute.
- i) Infrastructure Requirements
59. The following site infrastructure should be provided:
- *Site Entrance and Fencing*
 - *Administrative and Site Control Offices*
 - *Access Roads*
 - *Waste Inspection and Sampling Facility*
 - *Equipment Workshops and Garages*
 - *Signs and Directions*
 - *Water Supply*
 - *Lighting*
 - *Fire Fighting Equipment.*
60. The following equipment is required at a landfill site:
- (a) *Dozers – for spreading waste and daily cover*
 - (b) *Landfill Compactors – for compaction of waste*
 - (c) *Loader Backhoes – for loading of waste (internal movement), for excavating trenches etc., for embankment construction*
 - (d) *Backhoes and front-end loaders (instead of (c) above)*
 - (e) *Tractor trailers – for internal movement of waste or daily cover soil*

(f) *Poclains or heavy-duty backhoes for large excavation and embankment construction*

61. *Storm Water Management-* All surface water ditches, culverts, drainage channels, and settling ponds (storm water ponds) should be designed using hydrometeorological data. The following is the indicate storm water management system post closure of the site-



62. The following are the design requirements for SLF.

Table 16: Design Requirement for Construction of Scientific Landfill Site (till 2032) for Thane

No.	Parameter	Year 2027	Unit Assumptions
i	Total Quantity of Waste	5,79,711.00	MT
ii	Density of Waste	0.900	Cum/Mt
iii	Compacted Density of Waste Consider for Design	1.000	Cum/Mt
iv	Compacted Volume of Waste	5,79,711.00	Cum
Size Design			
1	Total required volume for Scientific Capping	5,79,711.00	cum
2	Provide Depth of Landfill for Location 1	26.00	m
3	Provide Depth of Landfill for Location 1	26.00	m
4	provide side slope below center V : H	1:2	
5	provide side slope above center V : H	1:3	
6	Foot print area for Location 1 (As per site condition)	23,006.25	sqm
7	Foot print area for Location 2 (As per site condition)	34,993.00	sqm
8	Proposed Volume for SLF Location 1	2,47,980.00	Cum
Volume Calculation for SLF Location 1			

Table 16: Design Requirement for Construction of Scientific Landfill Site (till 2032) for Thane

No.	Parameter	Year 2027		Unit Assumptions		
	Part1 Triangle Area	49	Part 4 Triangle Area	4		
	Triangle length	346.92	Triangle length	758.86		
	Triangle Volume	16999.08	Triangle Volume	3035.44		
	Surface area Area	7813.29	Surface area Area	17536.92		
	Surface volume	54693.03	Surface volume	35073.84		
	Net volume	37693.95	Net volume	32038.4		
	Part2 Triangle Area	5	Part 5 Triangle Area	4		
	Triangle length	751.44	Triangle length	513.07		
	Triangle Volume	3757.2	Triangle Volume	2052.28		
	Surface area Area	17388.3	Surface area Area	9989.15		
	Surface volume	86941.5	Surface volume	19978.3		
	Net volume	83184.3	Net volume	17926.02		
	Part 3 Triangle Area	25	Part 6 Triangle Area	4		
	Triangle length	657.87	Triangle length	307.95		
	Triangle Volume	16446.75	Triangle Volume	1231.8		
	Surface area Area	17388.31	Surface area Area	3937.58		
	Surface volume	86941.55	Surface volume	7875.16		
	Net volume	70494.8	Net volume	6643.36		
	Total Volume 247980.83					
	9	Proposed Volume for SLF Location 2	2,47,980.00		Cum	
	Volume Calculation for SLF Location 2					
	Part1 Triangle Area	12.25	Part3 Triangle Area	4		
	Triangle length	584.24	Triangle length	761.84		
	Triangle Volume	7156.94	Triangle Volume	3047.36		
	Surface area Area	11613	Surface area Area	24978.63		
	Surface volume	40645.5	Surface volume	49957.26		
	Net volume	33488.56	Net volume	46909.9		
	Part2 Triangle Area	81	Part4 Triangle Area	4		
	Triangle length	859.62	Triangle length	608.62		
	Triangle Volume	69629.22	Triangle Volume	2434.48		
	Surface area Area	32894.24	Surface area Area	16376.88		
	Surface volume	296048.16	Surface volume	32753.76		
	Net volume	226418.94	Net volume	30319.28		
	Part5 Triangle Area		4			
	Triangle length		450.43			
	Triangle Volume		1801.72			
Surface area Area		8100.27				
Surface volume		16200.54				
Net volume		14398.82				
Total Volume 351535.5						
10	Total Proposed Volume for SLF Location 1 & 2	5,99,516.33		Cum		
	Design Check	SAFE				

Table 16: Design Requirement for Construction of Scientific Landfill Site (till 2032) for Thane

No.	Parameter	Year 2027	Unit Assumptions
Estimation of Leachate Generation			
11	Average Total Precipitation	2146.00	mm/Year
12	Plan area of operating phase (Location 1+2)	57999.25	Sqm
13	Assume Precipitation	0.70	Assuming 70% precipitation in monsoon period
14	Precipitation (monsoon period)	1502.00	mm/ Considered for 4 months (monsoon period)
15	Assume Precipitation Days (monsoon period)	120.00	days
16	Peak leachate Quantity for Location 1 (thumb rule basis)	288.00	cu.m. per day
17	Peak leachate Quantity for Location 2 (thumb rule basis)	438.00	cu.m. per day
18	Peak leachate Quantity for Location 1+2 (thumb rule basis)	726.00	cu.m. per day
Design of Leachate Collection Pipe			
19	Dia of Lateral pipes (HDPE perforated)	200.00	mm
20	Dia of Header pipes (HDPE perforated)	250.00	mm
21	Spacing of Lateral pipe required	20.00	m
22	Number of Lateral pipe (Location 1)	12.00	Nos. (as per Drawing)
23	Number of Header pipe (Location 1)	1.00	Nos. (as per Drawing)
24	Number of Lateral pipe (Location 2)	11.00	Nos. (as per Drawing)
25	Number of Header pipe (Location 2)	1.00	Nos. (as per Drawing)
26	Total Length of Lateral pipe (Location 1)	1153.73	m (as per Drawing)
27	Total length of Header pipe (Location 1)	266.80	m (as per Drawing)
28	Total Length of Lateral pipe (Location 2)	1789.69	m (as per Drawing)
29	Total length of Header pipe (Location 2)	288.40	m (as per Drawing)
Estimation of Leachate Holding Unit			
30	Assume Leachate holding days	1.00	Day
31	Leachate Storage Quantity for SLF Location 1	288.00	Cum
32	Assume Depth for Storage Unit for SLF Location 1	3.00	m
33	Assume Width for Storage Unit for SLF Location 1	10.00	m
34	Required Length for Storage Unit for SLF Location 1	10.00	m
35	Leachate Storage Quantity for SLF Location 2	438.00	Cum
36	Assume Depth for Storage Unit for SLF Location 1	5.00	m
37	Assume Width for Storage Unit for SLF Location 1	10.00	m
38	Required Length for Storage Unit for SLF Location 1	9.00	m
Estimation of Gas Vent Pipe			
39	Dia of Lateral pipes (HDPE perforated)	200	mm
40	Dia of Header pipes (HDPE)	250	mm
41	Spacing of Lateral pipe required	20	m
42	Number of Lateral perforated pipe (Location 1)	12.00	Nos. (as per Drawing)
43	Number of Header pipe (Location 1)	12.00	Nos. (as per Drawing)
44	Number of Lateral perforated pipe (Location 2)	11.00	Nos. (as per Drawing)
45	Number of Header pipe (Location 2)	11.00	Nos. (as per Drawing)
44	Total Length of Lateral pipe (Location 1)	1153.73	m (as per Drawing)
47	Total length of Header pipe (Location 1)	30.69	m (as per Drawing)
48	Total Length of Lateral pipe (Location 2)	1789.69	m (as per Drawing)
49	Total length of Header pipe (Location 2)	28.13	m (as per Drawing)

Source: Proposed by consultant

63. The following are the other Infrastructural Requirements to be developed along with SLF as per guidelines.

Table 17: Minimum Requirements for SLF			
No	Description	Minimum Requirements	Unit
For Location 1			
1	Construction of Scientific Landfill Site (Cell-1, Location 1)	23,006.25	Sqm
1.1	Top Sealing System		
1.1.1	Geosynthetic clay Liner (GCL)	23,696.18	Sqm
1.1.2	HDPE Liner of 1.5 mm thick	23,696.18	Sqm
1.1.3	Non-woven geotextile	23,696.18	Sqm
1.1.4	Drainage layer	23,006.00	Cum
1.1.5	Vegetative cover	23,006.00	Cum
1.2	Bottom Sealing System		
1.2.1	Geosynthetic clay Liner (GCL)	1,38,747.95	Sqm
1.2.2	HDPE Liner of 1.5 mm thick	1,38,747.95	Sqm
1.2.3	Non-woven geotextile	2,77,495.91	Sqm
1.2.4	Drainage layer	40,412.03	Cum
2	Construction of Leachate Collection Tank	288.00	Cum
For Location 2			
1	Construction of Scientific Landfill Site (Cell-2, Location 2)	34,993.00	Sqm
1.1	Top Sealing System		
1.1.1	Geosynthetic clay Liner (GCL)	36,042.79	Sqm
1.1.2	HDPE Liner of 1.5 mm thick	36,042.79	Sqm
1.1.3	Non-woven geotextile	36,042.79	Sqm
1.1.4	Drainage layer	34,993.00	Cum
1.1.5	Vegetative cover	34,993.00	Cum
1.2	Bottom Sealing System		
1.2.1	Geosynthetic clay Liner (GCL)	1,48,229.02	Sqm
1.2.2	HDPE Liner of 1.5 mm thick	1,48,229.02	Sqm
1.2.3	Non-woven geotextile	2,96,458.05	Sqm
1.2.4	Drainage layer	43,173.50	Cum
2	Construction of Leachate Collection Tank	438.00	Cum
Source: Consultant			

64. Various safety aspects which are need to be manage for SLF are describe as below.

a) HEALTH AND SAFETY:

65. The landfill management (municipality or private operator) should be responsible for all aspects of site safety, including public safety in areas adjoining the site. The safety officer of the municipality or of the private operator should also be responsible for the health and safety of landfill staff. He or she should support the landfill management in the following tasks:
- planning, operation, maintenance, and inspection of installations with regard to health and safety;
 - Organization and realization of training and instructions of landfill staff with regard to occupational health and safety;
 - assessment and evaluation of accidents; and
 - internal reporting on safety aspects.

b) PERSONAL ACCIDENT

66. In case of accidents involving injuries, the following procedures have to be applied:
- stop work immediately;
 - inform first aider;
 - inform management; and
 - call medical services (ambulance emergency number should be duly filled in and maintained by the responsible landfill operator).

c) FIRE PREVENTION AND PROTECTION GENERAL REQUIREMENTS

67. In any case, the actual firefighting operation is under the responsibility of the fire brigade of the urban local body (ULB). To prevent fire incidents, the following rules have to be applied:
- Banning smoking in all areas of the sanitary landfill.
 - Handling material on fire as well as setting fire to materials on the landfill are strictly forbidden.
 - Waste that has been unloaded in the filling area has to be examined visually for potential fire sources (glowing ash or glowing burning remains). If fire sources are located, these have to be neutralised with cover material immediately.
 - All mobile equipment or vehicles should be furnished with a fire extinguisher.
 - Fire Control.
68. In case of fire, the following basic rules of conduct have to be complied with:
- Every fire has to be reported immediately.
 - The preservation and protection of lives and health have priority over firefighting.
 - Alarm signals should be heeded.

E. Cost Estimates & Implementation Plan**1. Cost Estimates CAPEX**

69. The following are the summary of CAPEX for Development of SLF –

Table 18: Summary of CAPEX for Development of SLF –

Nos.	Particular	Size			Qty	Unit	Amount	Specification or Estimate Ref.
		L	W	H				
B (1.0)	CIVIL WORKS							
B (1.1)	Construction of Scientific Landfill Site (Location 1) Includes Construction of Bottom Sealing System Construction of Top Sealing System				23,006.25	SqM	46,00,54,657.00 35,75,93,865.00 10,24,60,792.00	(B 1.1) BOQ
B (1.2)	Construction of Scientific Landfill Site (Location 2) Includes Construction of Bottom Sealing System Construction of Top Sealing System				34,993.00	SqM	53,78,34,710.00 38,19,82,367.00 15,58,52,343.00	(B 1.2) BOQ
B (1.3)	Construction of Leachate Collection Tank (For Location 1)	10.00	9.00	4.00	288.00	Cum	16,03,701.00	(B 1.3) BOQ
B (1.4)	Construction of Leachate Collection Tank (For Location 2)	10.00	10.00	3.00	438.00	Cum	15,44,287.00	(B 1.4) BOQ
B (1.5)	Construction of RE wall & Gabion Structure	-	-	-	1,714.18	Sqm	1,20,67,143.78	(B 1.5) BOQ
B (1.6)	Site formation Work	-	-	-	6,293.50	Cum	16,51,257.06	(B 1.6) BOQ
Sub Total:- B (1.0)							1,01,47,55,755.84	

Source: Consultant

2. Cost Estimates OPEX

70. The following are the Assumptions for calculation of OPEX for Development of SLF –

Table 19: Assumptions of OPEX for Development of SLF –

1. Assumption for Soil cover			
Sr. No	Details		Unit
1	Total inert	5,79,711.00	MT
2	Per Month incoming Inert	9,662.00	MT
3	Soil Cover requirement	10%	in %
4	Soil requirement	966.00	MT
5	Filling in plinth and floors with approved excavated material in 15cm. to 20cm. layers including watering and compacting etc. Complete [SOR Ref: -PWD/state/DSR/22-23/Item no.21.36/ Page No. 157] Considering 1 MT/Cum Density	125.94	Rs. Per Cum
6	Soil cover cost	1,21,658.04	Rs per Month
2. Assumption for Manpower requirements			
Sr. No	Details		Unit
1	Administration / Site Manager	1	Nos.
2	Technical / Electrical	1	Nos.
3	Labour	1	Nos.
4	Security guard	1	Nos.
5	Administration / Site Manager	495.00	Rs. Per Day

Table 19: Assumptions of OPEX for Development of SLF –			
6	Technical / Electrical	445.00	Rs. Per Day
7	Labour	359.00	Rs. Per Day
8	Security guard	359.00	Rs. Per Day
9	Per day Charge	1,658.00	Rs. Per Day
10	Per month charge	49,740.00	INR
3. Assumption for Depreciation cost calculation			
Sr. No	Details		Unit
1	Depreciation rate for Civil Construction	10%	Per year
2	Total cost of Civil Construction Work	1,01,47,55,755.84	INR
3	Depreciation value Per year	10,14,75,575.58	INR
4	Depreciation value Per Month	84,56,298.00	INR
4. Assumption for Electricity Requirements			
Sr. No	Details		Unit
1	Per day unit (Kwh) use	50.00	Kwh
2	Per unit rate	8.00	INR
3	Total charge per day	400.00	INR
4	Total charge per month	12,000.00	INR
5. Assumption for water Requirements			
Sr. No	Details		Unit
1	Water requirement in litter	20,000.00	Per day
2	Per 1000 litter water charge	30.00	INR
3	Total water charge per day	600.00	INR
4	Total charge per month	18,000.00	INR
6. Assumption for contingencies			
Sr. No	Details		Unit
1	Total operational cost per Month	86,57,696.04	Per day
2	Contingencies	5%	in %
3	Total Contingencies	4,32,885.00	INR
Source: Consultant			

71. The following are the summary of OPEX for Development of SLF –

Table 20: Summary of OPEX for Development of SLF –			
No.	Details	Unit	Monthly expense (In Lakh)
1	For Soil covering	In INR	7,654.00
2	For Manpower	In INR	49,740.00
3	For Depreciation	In INR	3,99,887.00
4	For Electricity	In INR	48,000.00
5	For water	In INR	18,000.00
6	For Contingencies	In INR	26,164.00
7	OPEX for 1 Month	In INR	5,49,445.00
8	OPEX for 12 Months	In INR	65,93,340.00
Source: Consultant			

3. Proposed Implementation timeframe

72. The following are the proposed timeframe for implementation

Particulars	Time Line of Implementation in Week															
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24-27	27-30	30-33	33-36	36-39	39-42	42-45	45-48
Obtaining applicable clearances from different authorities																
Site Clearance of Landfill site																
Mobilization of staff of contractor, plant, machinery equipment etc.																
Excavation for Proposed cell																
Bed & Side Slope Preparation for Bottom sealing system (Bund's creation)																
Bed Preparation on native soil																
Preparation of Drainage Layer																
Installation of HDPE Liner																
Installation of GCL - 6 mm																
Installation of Geo textile (400 GSM)																
Installation of leachate collection network																
Construction of Internal Road, Leachate collection well																

Source: Consultant

4. Proposed Funding Mechanism

73. The following is the CAPEX sharing mechanism under for all the infrastructure to be financed under Swachh Bharat Mission (Urban) 2.0.

Table 22: Proposed Financial Structure & Funding Mechanism				
Type of ULB	Class of ULB	Govt. of India (GoI)	Govt. of Maharashtra	Urban Local Body
		Share	Share	Share
Municipal Corporation	A+	25%	35%	40%
	A	25%	35%	40%
	B	25%	35%	40%
	C	25%	45%	30%
	D	33%	37%	30%
Municipal Council	A	33%	52%	15%
	B	50%	40%	10%
	C	50%	45%	5%
Nagar Panchayat	-	50%	45%	5%
Proposed CAPEX Sharing of Thane Municipal Corporation	C	₹ 61,57,53,793.00	₹ 55,41,78,414.00	₹ 6,15,75,379.00
Source: महाराष्ट्र शासन, नगर विकास विभाग, शासन निर्णय क्रमांक-स्वमअ-2022/प्र. क्र.73/नभव 34, Date: - 15 July, 2022				

74. The ULB Share can be covered under the grant of 15th Finance Commission (Proposed amount under grant as per the leading financial year Budget).

F. Environment Mitigation Measures & O&M Requirements**1. Environment Mitigation Measures**

75. In order to ensure the optimal performance of the landfill site, checking the environmental pollution and complying with the regulatory requirements is essential. The following checklist of measures are prescribed for during operation of Landfill site.

- Landfill Siting and Buffer Zones
 - 250 meters distance from residential development
 - Visual impacts should be minimized by evaluating location alternatives
 - 3 km distance from a turbojet airport and 1.6 km of a piston-type airport or as permitted by the aviation authority.
 - 500 meters distance from drinking, irrigation, or livestock water supply wells located down gradient of the landfill, unless alternative water sources are readily and economically available.
 - Areas within the landfill boundaries should be located outside of the 10-year groundwater recharge area for existing or pending water supply development
 - Perennial stream should not be located within 300 meters downgradient of the proposed landfill cell development, unless diversion, culverting or channelling is economically and environmentally feasible to protect the stream from potential contamination

- Site geology and hydrogeology
 - Landfills should be located in gently sloped topography to ensure proper leachate collection
 - Groundwater's seasonally high table level (i.e., 10 years high) should be at least 1.5 meters below the proposed base of any excavation or site preparation
 - Suitable soil cover material should be available on-site to meet the needs for intermediate and final cover

- Prevention from potential hazards:
 - Landfills should be sited outside of a floodplain subject to 10-year floods
 - There should be no significant seismic risk within the region of the landfill
 - No fault lines or significantly fractured geologic structure should be present within 500 meters of the perimeter of the proposed landfill
 - There should be no underlying limestone, carbonate, fissured or other porous rock formations which would be incompetent as barriers to leachate and gas migration

- Leachate control from MSW landfills:
 - Site landfills in areas with stable geology and avoid siting near particularly vulnerable or sensitive ecosystems and groundwater and surface water resources
 - Design and operate the landfill in accordance with applicable national requirements and internationally recognized standards to minimize leachate generation

- Treat leachate onsite and/or discharge to municipal wastewater system
- Minimize the daily exposed working face and use perimeter drains and landfill cell compaction
- Prevent run-on of precipitation into the active area of the landfill; systems should be designed to handle the peak discharge from a 25-year storm
- Collect and control run-off from the active area of the landfill

- Groundwater and leachate monitoring:
 - Measure and record the quantity and quality of leachate generated
 - Install groundwater monitoring wells outside the landfill perimeter to evaluate the movement of leachate into groundwater, 1 well in the upgradient and 2 wells in the downgradient flow direction from the landfill.
 - The groundwater monitoring system should be consistent with applicable national regulations and internationally recognized standards
 - Regularly sample the monitoring wells and analyse for constituents to check the efficiency of the system.

- To control and monitor landfill gas emissions, if applicable:
 - Include landfill gas management system designed and operated in accordance with applicable national requirements and recognized international standards

- To control dust and odor emissions:
 - Compact and cover waste promptly after discharge from the vehicle delivering the waste
 - Minimize open tipping face area
 - Dispose of odorous sludge in covered trenches
 - Restrict acceptance of loads known to be particularly odorous
 - Restrict tipping activities during periods of adverse weather
 - Seal sump covers
 - Aerate leachate storage areas

- To prevent, minimize, and control dispersal of litter:
 - Avoid siting of facilities in particularly exposed, windy areas
 - Provide perimeter planting, landscaping, or fences to reduce wind
 - Pin waste by use of dozers and landfill compactors immediately after discharge from the vehicles delivering the waste
 - Use soil or artificial cover materials so that deposited waste is held in place
 - Use scaring techniques or natural predators to control scavenging birds
 - Provide an emergency tipping area/foul weather cell for lightweight wastes such as paper
 - Construct temporary banks and bunds immediately adjacent to the tipping area, install strategically placed mobile catch fences close to the tipping area or on the nearest downwind crest, and/or fully enclose of the tipping area within a mobile litter net system

- Install wind fencing upwind of the tipping area to reduce the wind strength as it crosses the facility
- Temporarily close the facility to specific or all waste or vehicle types when weather conditions are particularly adverse

- Closure and Post-Closure

- Development of a closure plan which specifies the necessary environmental objectives and controls, future land use, closure schedule, financial resources, and monitoring arrangements
- Evaluation, selection, and application of closure methods consistent with post- closure use
- Application of final cover components that are consistent with post closure use and local climatic conditions. The final cover should provide long term environmental protection.
- Financial instruments in place to cover the costs of closure and post-closure care and monitoring

76. The following environmental parameters shall be monitored on a regular basis.

- *Quality of Leach ate after Treatment*
- *Surface Water Quality*
- *Ground Waste Quality*
- *Quantity and Quality of Gas Generated*
- *Ambient Air Quality*

Description	Sampling Specifications
Quality of Leach ate after Treatment	One grab Sampling at out let of the treatment plant every month
Surface Water Quality	One grab Sample at upstream side and one grab sample at downstream side for water bodies near the landfill site every month
Ground Waste Quality	One sample at upstream side and three samples at downstream side of the landfill site every month
Quantity and Quality of Gas Generated	24 hours continuous stack monitoring at selected vent on every month
Ambient Air Quality	48 hours continuous ambient air quality monitoring at one location in upwind and three locations in downwind directions every month

Source: Proposed by the consultant

2. *O&M Requirements*

Component	Operation Requirement	Maintenance Requirement
Sanitary Landfill Site	(a)SLF site should be fully secured and developed according to SWM Rules, 2016. (b)Waste subjected to land filling should be non-biodegradable nature.	(a) Monitoring of air quality and water quality on periodical basis. (b) A vegetation cover shall be

Table 24 : Operation and maintenance Requirements for Sanitary landfill site		
Component	Operation Requirement	Maintenance Requirement
	<p>(c) Waste should be covered and well compacted at the day end with minimum 10-15 cm of soil or inert material.</p> <p>(d) Prior to commencement of monsoon season, an intermediate cover of 40- 60 cm thickness of soil should be placed with proper compaction and grading.</p> <p>(e) Proper arrangement for drainage, leachate and landfill gas management should be made.</p> <p>(f) After completion of landfill site, a final cover should be provided before closure of the site.</p>	<p>provided and maintained over the completed site.</p> <p>(c) Post closure care should be conducted for at least 15 years and long-term monitoring shall consist of followings:</p> <p>i. Maintaining the integrity and effectiveness of the final cover.</p> <p>ii. Monitoring leachate collection system</p> <p>iii. Monitoring of ground water</p> <p>iv. Maintaining and operating the landfill gas collection system</p>
<p>Suggestions:</p> <ul style="list-style-type: none"> • SLF site should be given to experienced private entrepreneur on Design, Build, Operate, Maintain and Transfer (DBOMT) basis. • Regular upkeep and maintenance mechanism of the SLF site should be in place. If the entire system is in private hands, proper supervision will be required at municipal level. • Proper record keeping of number of vehicles arrived; quantity and nature of waste should be maintained. 		

****End of Report****

Glossary of Terms

1. **“aerobic composting”** means a controlled process involving microbial decomposition of organic matter in the presence of oxygen;
2. **“anaerobic digestion”** means a controlled process involving microbial decomposition of organic matter in absence of oxygen;
3. **“authorisation”** means the permission given by the State Pollution Control Board or Pollution Control Committee, as the case may be, to the operator of a facility or urban local authority, or any other agency responsible for processing and disposal of solid waste;
4. **“biodegradable waste ”** means any organic material that can be degraded by micro-organisms into simpler stable compounds;
5. **“bio-methanation”** means a process which entails enzymatic decomposition of the organic matter by microbial action to produce methane rich biogas;
6. **“brand owner”** means a person or company who sells any commodity under a registered brand label.
7. **“buffer zone”** means zone of no development to be maintained around solid waste processing and disposal facility, exceeding 5 TPD of installed capacity. This will be maintained within total area allotted for the solid waste processing and disposal facility.
8. **“bulk waste generator”** means and includes buildings occupied by the Central government departments or undertakings, State government departments or undertakings, local bodies, public sector undertakings or private companies, hospitals, nursing homes, schools, colleges, universities, other educational institutions, hostels, hotels, commercial establishments, markets, places of worship, stadia and sports complexes having an average waste generation rate exceeding 100kg per day;
9. **“bye-laws”** means regulatory framework notified by local body, census town and notified area townships for facilitating the implementation of these rules effectively in their jurisdiction.
10. **“census town”** means an urban area as defined by the Registrar General and Census Commissioner of India;
11. **“combustible waste”** means non-biodegradable, non-recyclable, non-reusable, non-hazardous solid waste having minimum calorific value exceeding 1500 kcal/kg and excluding chlorinated materials like plastic, wood pulp, etc;
12. **“composting”** means a controlled process involving microbial decomposition of organic matter;
13. **“contractor”** means a person or firm that undertakes a contract to provide materials or labour to perform a service or do a job for service providing authority;
14. **“co-processing”** means use of non-biodegradable and non-recyclable solid waste having calorific value exceeding 1500k/cal as raw material or as a source of energy or both to replace or supplement the natural mineral resources and fossil fuels in industrial processes;

15. **“decentralised processing”** means establishment of dispersed facilities for maximizing the processing of biodegradable waste and recovery of recyclables closest to the source of generation so as to minimize transportation of waste for processing or disposal;
16. **"disposal"** means the final and safe disposal of post processed residual solid waste and inert street sweepings and silt from surface drains on land as specified in Schedule I to prevent contamination of ground water, surface water, ambient air and attraction of animals or birds;
17. **“domestic hazardous waste”** means discarded paint drums, pesticide cans, CFL bulbs, tube lights, expired medicines, broken mercury thermometers, used batteries, used needles and syringes and contaminated gauge, etc., generated at the household level;
18. **"door to door collection"** means collection of solid waste from the door step of households, shops, commercial establishments, offices, institutional or any other non-residential premises and includes collection of such waste from entry gate or a designated location on the ground floor in a housing society, multi storied building or apartments, large residential, commercial or institutional complex or premises;
19. **“dry waste”** means waste other than bio-degradable waste and inert street sweepings and includes recyclable and non-recyclable waste, combustible waste and sanitary napkin and diapers, etc;
20. **“dump sites”** means a land utilised by local body for disposal of solid waste without following the principles of sanitary land filling;
21. **“extended producer responsibility” (EPR)** means responsibility of any producer of packaging products such as plastic, tin, glass and corrugated boxes, etc., for environmentally sound management, till end-of-life of the packaging products;
22. **“facility”** means any establishment wherein the solid waste management processes namely segregation, recovery, storage, collection, recycling, processing, treatment or safe disposal are carried out;
23. **"fine"** means penalty imposed on waste generators or operators of waste processing and disposal facilities under the bye-laws for non-compliance of the directions contained in these rules and/or bye- laws
24. **"Form"** means a F8orm appended to these rules;
25. **“handling”** includes all activities relating to sorting, segregation, material recovery, collection, secondary storage, shredding, baling, crushing, loading, unloading, transportation, processing and disposal of solid wastes;
26. **“inerts”** means wastes which are not bio-degradable, recyclable or combustible street sweeping or dust and silt removed from the surface drains;
27. **“incineration”** means an engineered process involving burning or combustion of solid waste to thermally degrade waste materials at high temperatures;
28. **“informal waste collector”** includes individuals, associations or waste traders who are involved in sorting, sale and purchase of recyclable materials;
29. **"leachate"** means the liquid that seeps through solid waste or other medium and has extracts of dissolved or suspended material from it;

30. "**local body**" for the purpose of these rules means and includes the municipal corporation, nagar nigam, municipal council, nagarpalika, nagarpalika parishad, municipal board, nagar panchayat and town panchayat, census towns, notified areas and notified industrial townships with whatever name they are called in different States and union territories in India;

31. "**materials recovery facility**" (MRF) means a facility where non-compostable solid waste can be temporarily stored by the local body or any other entity mentioned in rule 2 or any person or agency authorised by any of them to facilitate segregation, sorting and recovery of recyclables from various components of waste by authorised informal sector of waste pickers, informal recyclers or any other work force engaged by the local body or entity mentioned in rule 2 for the purpose before the waste is delivered or taken up for its processing or disposal;

32. "**non-biodegradable waste**" means any waste that cannot be degraded by microorganisms into simpler stable compounds;

33. "**operator of a facility**" means a person or entity, who owns or operates a facility for handling solid waste which includes the local body and any other entity or agency appointed by the local body;

34. "**primary collection**" means collecting, lifting and removal of segregated solid waste from source of its generation including households, shops, offices and any other non-residential premises or from any collection points or any other location specified by the local body;

35. "**processing**" means any scientific process by which segregated solid waste is handled for the purpose of reuse, recycling or transformation into new products;

36. "**recycling**" means the process of transforming segregated non-biodegradable solid waste into new material or product or as raw material for producing new products which may or may not be similar to the original products;

37. "**redevelopment**" means rebuilding of old residential or commercial buildings at the same site, where the existing buildings and other infrastructures have become dilapidated;

38. "**refused derived fuel**" (RDF) means fuel derived from combustible waste fraction of solid waste like plastic, wood, pulp or organic waste, other than chlorinated materials, in the form of pellets or fluff produced by drying, shredding, dehydrating and compacting of solid waste;

39. "**residual solid waste**" means and includes the waste and rejects from the solid waste processing facilities which are not suitable for recycling or further processing;

40. "**sanitary land filling**" means the final and safe disposal of residual solid waste and inert wastes on land in a facility designed with protective measures against pollution of ground water, surface water and fugitive air dust, wind-blown litter, bad odour, fire hazard, animal menace, bird menace, pests or rodents, greenhouse gas emissions, persistent organic pollutants slope instability and erosion;

41. "**sanitary waste**" means wastes comprising of used diapers, sanitary towels or napkins, tampons, condoms, incontinence sheets and any other similar waste;

42. "**Schedule**" means the Schedule appended to these rules;

43. "**secondary storage**" means the temporary containment of solid waste after collection at secondary waste storage depots or MRFs or bins for onward transportation of the waste to the processing or disposal facility;

44. "**segregation**" means sorting and separate storage of various components of solid waste namely biodegradable wastes including agriculture and dairy waste, non-biodegradable wastes including recyclable waste, nonrecyclable combustible waste, sanitary waste and non-recyclable inert waste, domestic hazardous wastes, and construction and demolition wastes;

45. "**service provider**" means an authority providing public utility services like water, sewerage, electricity, telephone, roads, drainage, etc;

46. "**solid waste**" means and includes solid or semi-solid domestic waste, sanitary waste, commercial waste, institutional waste, catering and market waste and other non-residential wastes, street sweepings, silt removed or collected from the surface drains, horticulture waste, agriculture and dairy waste, treated bio-medical waste excluding industrial waste, bio-medical waste and e-waste, battery waste, radio-active waste generated in the area under the local authorities and other entities mentioned in rule 2;

47. "**sorting**" means separating various components and categories of recyclables such as paper, plastic, cardboards, metal, glass, etc., from mixed waste as may be appropriate to facilitate recycling;

48. "**stabilising**" means the biological decomposition of biodegradable wastes to a stable state where it generates no leachate or offensive odours and is fit for application to farm land, soil erosion control and soil remediation;

49. "**street vendor**" means any person engaged in vending of articles, goods, wares, food items or merchandise of everyday use or offering services to the general public, in a street, lane, side walk, footpath, pavement, public park or any other public place or private area, from a temporary built up structure or by moving from place to place and includes hawker, peddler, squatter and all other synonymous terms which may be local or region specific; and the words "street vending" with their grammatical variations and cognate expressions, shall be construed accordingly;

50. "**tipping fee**" means a fee or support price determined by the local authorities or any state agency authorised by the State government to be paid to the concessionaire or operator of waste processing facility or for disposal of residual solid waste at the landfill;

51. "**transfer station**" means a facility created to receive solid waste from collection areas and transport in bulk in covered vehicles or containers to waste processing and, or, disposal facilities;

52. "**transportation**" means conveyance of solid waste, either treated, partly treated or untreated from a location to another location in an environmentally sound manner through specially designed and covered transport system so as to prevent the foul odour, littering and unsightly conditions;

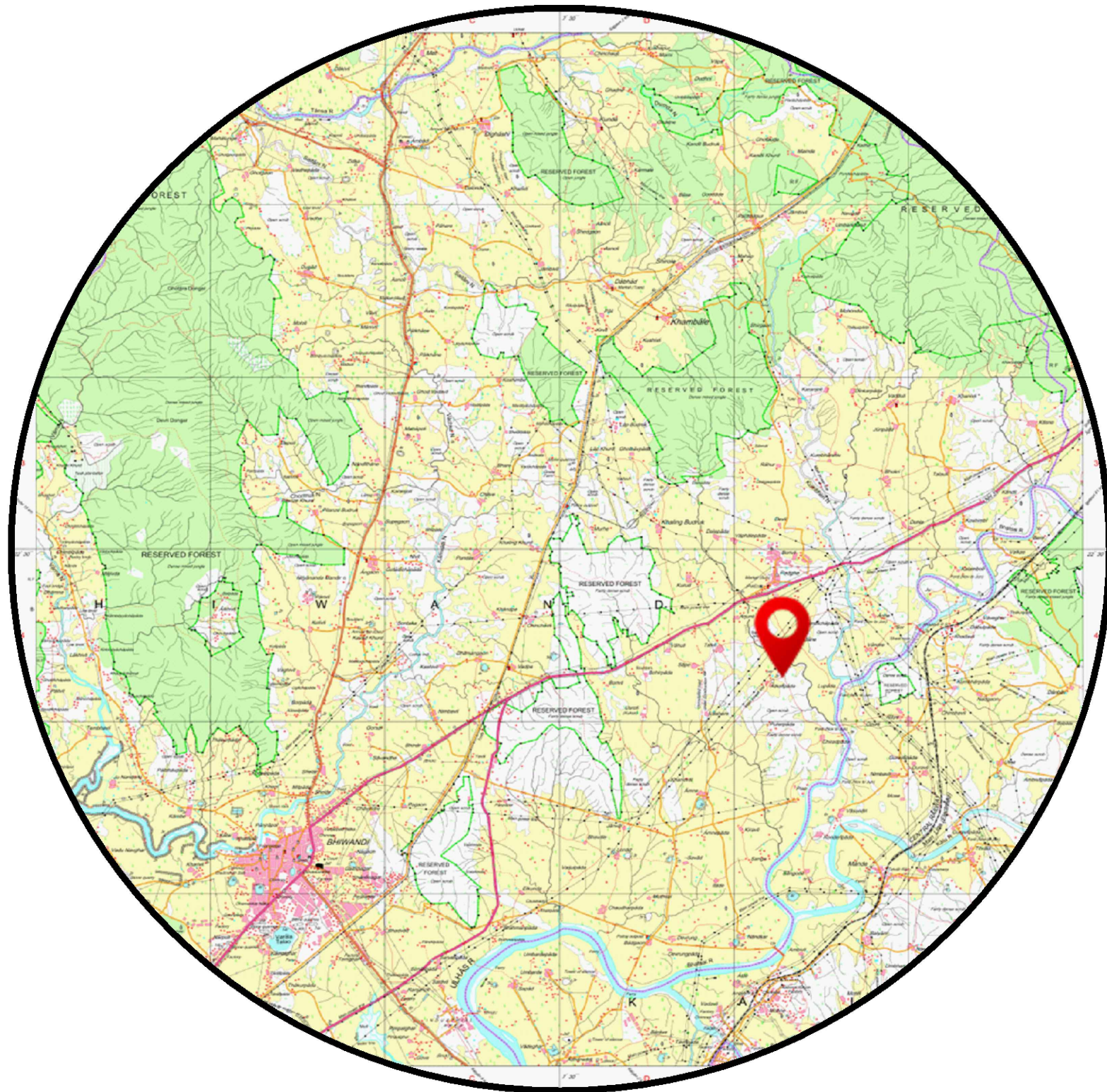
53. "**treatment**" means the method, technique or process designed to modify physical, chemical or biological characteristics or composition of any waste so as to reduce its volume and potential to cause harm;

54. "**user fee**" means a fee imposed by the local body and any entity mentioned in rule 2 on the waste generator to cover full or part cost of providing solid waste collection, transportation, processing and disposal services.

55. "**vermi composting**" means the process of conversion of bio-degradable waste into compost using earth worms;

56. "**waste generator**" means and includes every person or group of persons, every residential premises and non-residential establishments including Indian Railways, defence establishments, which generate solid waste;

Annexure 1: - Drawings



CONVENTIONAL SYMBOLS

Express Highway: with toll; with bridge; with distance stone			
Roads, metalled: according to importance			
Roads, double carriageway: according to importance			
Unmetalled Road, Cart-track, Pack-track and pass, Foot-path			
Streams: with track in bed; undefined; Canal			
Dams: masonry or rock-filled; earthwork; Weir			
River: dry with water channel; with island & rocks; Tidal river			
Submerged rocks, Shoal, Swamp, Reeds			
Wells: lined; unlined; Tube-well; Spring; Tanks; perennial; dry			
Embankments: road or rail; tanks; broken ground			
Railways, broad gauge: double; single with station; under constr.			
Railways, other gauges: double; single with distance stone; do			
Mineral: line or tramway; Kin. Cutting with tunnel			
Contours with sub-features, Rocky slopes, Cliffs			
Sand features: (flats); (benches); hills (permanent); (dunes); (shifting)			
Towns or Villages: inhabited; deserted; Fort			
Huts: permanent; temporary; Tower; Antiquities			
Temple, Chhatra, Church, Mosque, Idgah, Tomb, Graves			
Lighthouse, Lightship, Buoys: lighted; unlighted; Anchorage			
Mine: Vise on trestle; Gross; Scrub			
Palm: palmyra; other; Plantain, Coriander, Bamboo, Other trees			
Areas: cultivated; wooded; Surveyed tree			
Boundary International			
state: demarcated; undemarcated			
district: subdivision; tahsil or taluk; forest			
Boundary pillars: surveyed; unfocused			
Heights, triangulated; station; point; approximate			
Bench-mark: geodetic; tertiary; canal			
Post office, Telegraph office, Overhead tank			
Rest House or Inspection Bungalow, Circuit House, Police Station			
Camping ground, Forest: reserved; protected			
Spaced names: administrative; locality or tribal			
Hospital, Dispensary, Veterinary hospital / dispensary			
Aerodrome, Helipad, Tourist site			
Power line: with pylons surveyed; with poles unsurveyed			

Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
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Drawing Name
 TOPOGRAPHY MAP

Revision History

DATE	NO.	REVISION	DRAWN	CHECKED	APPROVED

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Client
Authority
 Directorate, Urban Administration & Development, Government of Maharashtra
Nodal Authority- Urban Local Body

Consultant

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Size
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Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
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Drawing Name
 Contour Map

Revision History

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303

Stone Crusher Works

Lechate Tank

SLF - 1

Footprint Area = 23,006.25 SqM.
Volume = 2,47,980.00 CuM.

SLF - 2

Footprint Area = 34,993.00 SqM.
Volume = 3,51,536.00 CuM.

Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
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Drawing Name
Site Plan

Revision History

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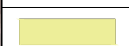

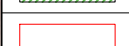
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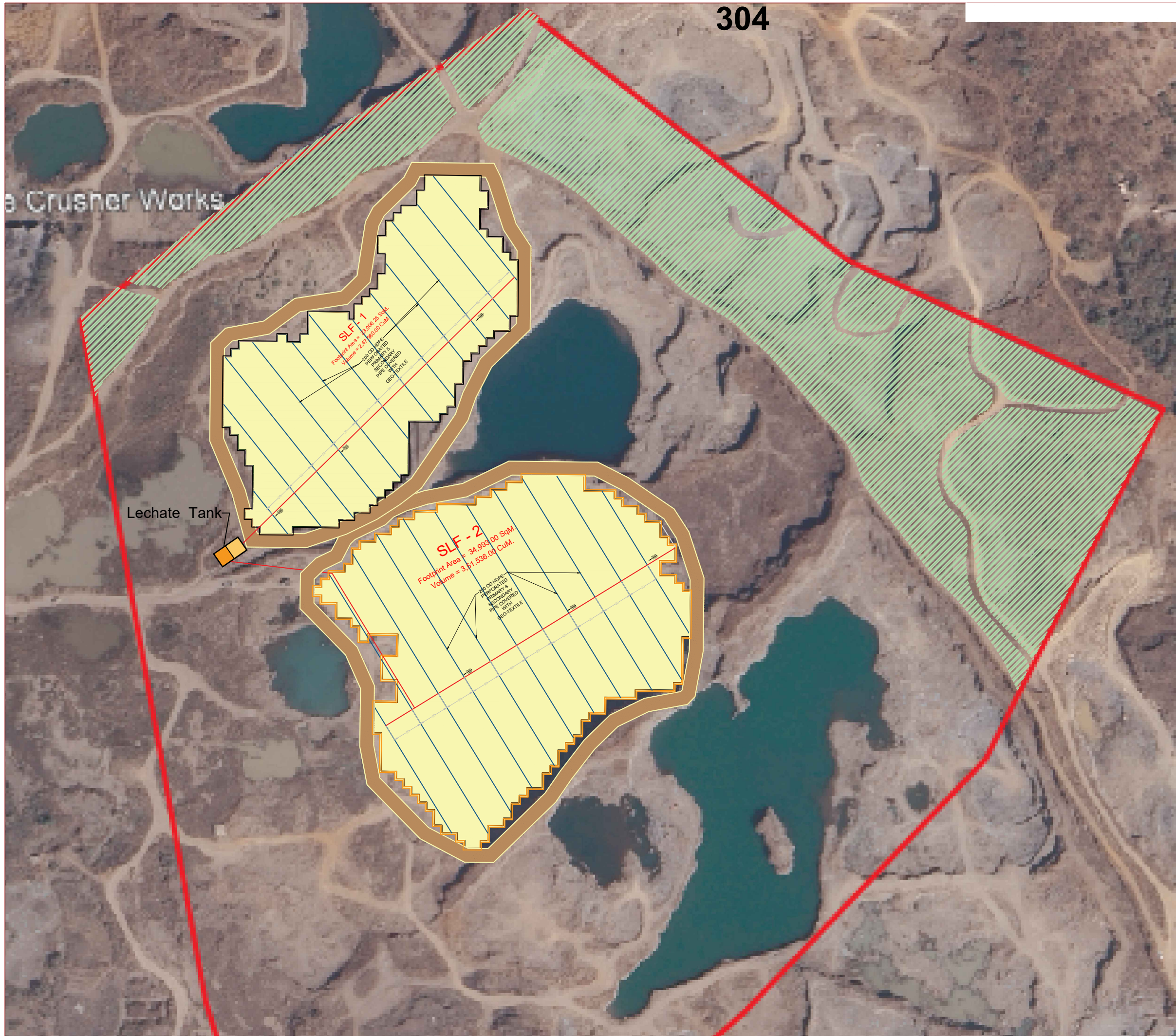
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Code	Particular	Units	Details
	SLF- 1 (2023-2027)	Sq.M.	23,006.24
	SLF - 2 (2027-2032)	Sq.M.	34,993.00
	Area of Green Belt and Road Network	Sq.M.	60,039.5
	Total Area For Landfill (SLF)	Sq.M.	3,49,383.39



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Drawing Name
 SLF Development Plan

Revision History

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Nodal Authority- Urban Local Body

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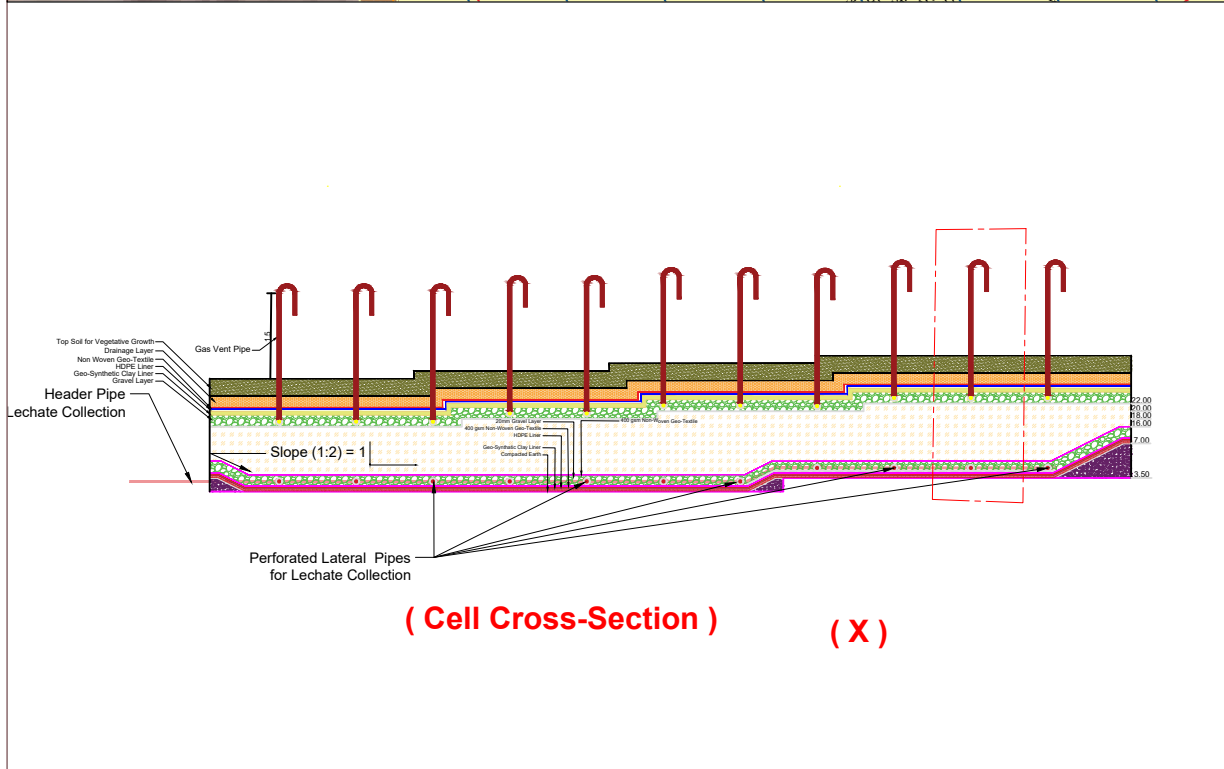
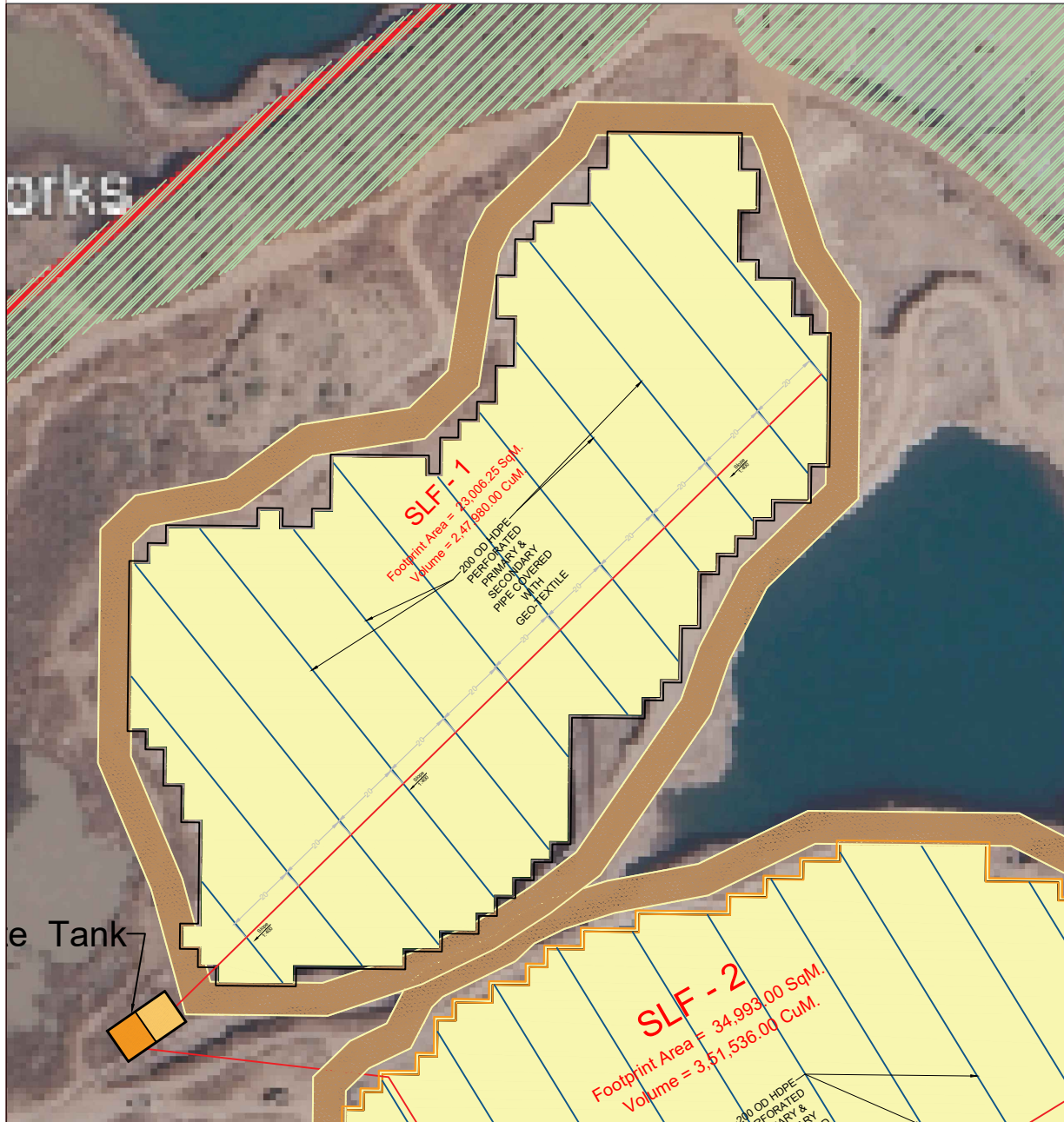
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Key Map Of SLF 1

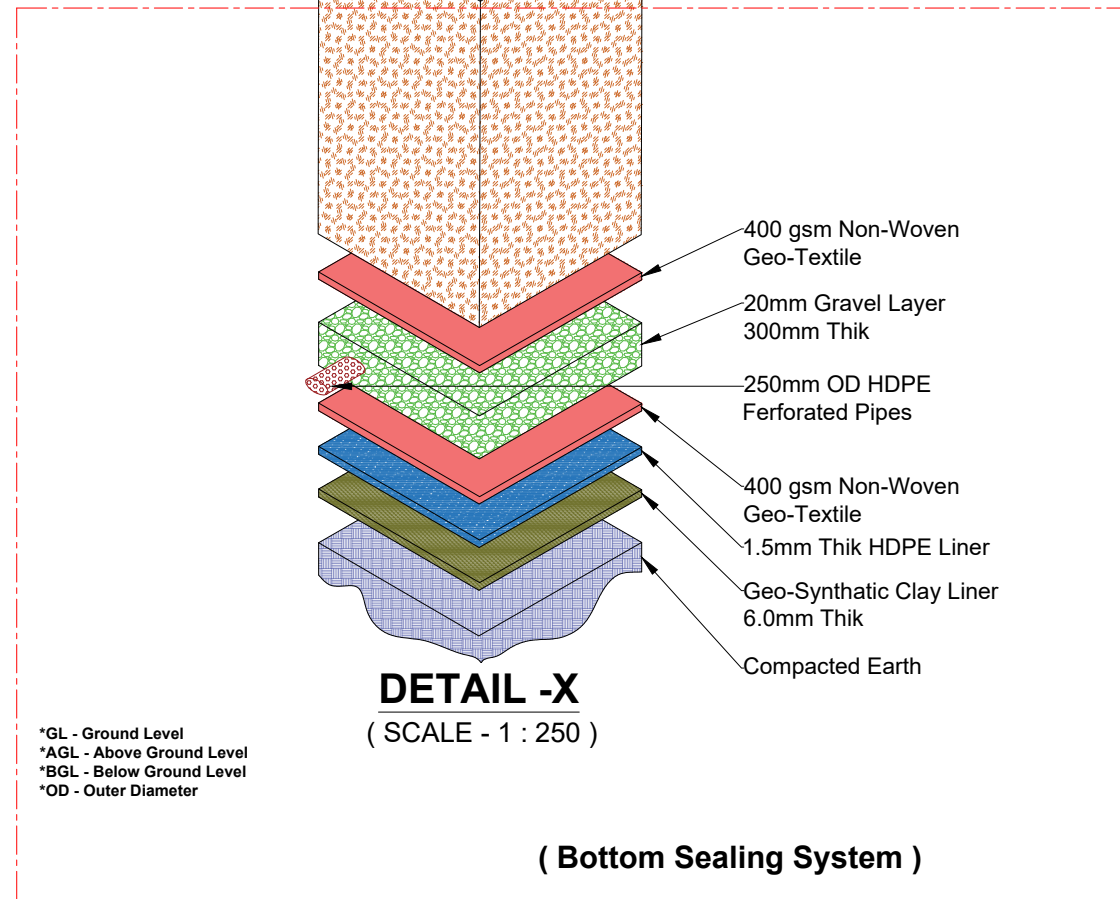
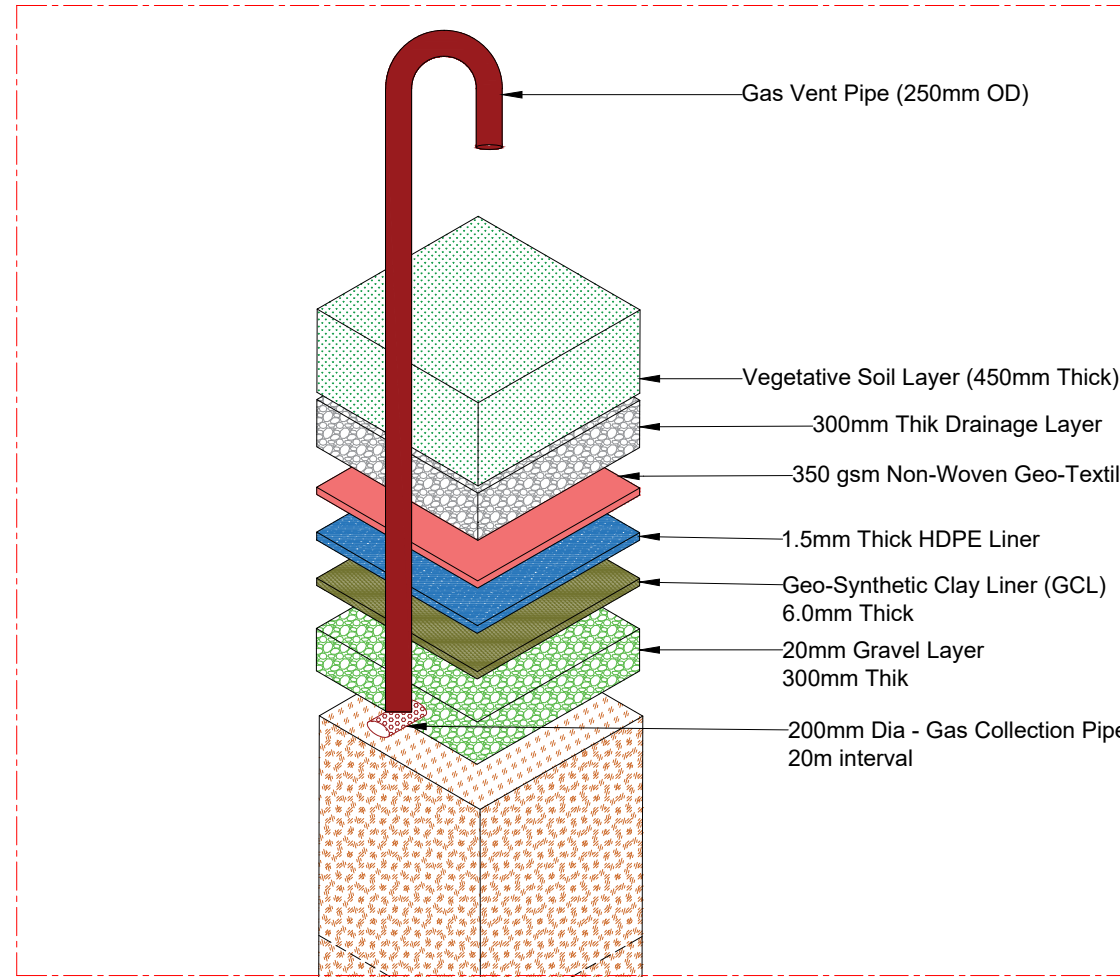


(Cell Cross-Section) (X)

305

(Details of X)

(Top Sealing System)



DETAIL -X
(SCALE - 1 : 250)

(Bottom Sealing System)

*GL - Ground Level
*AGL - Above Ground Level
*BGL - Below Ground Level
*OD - Outer Diameter

Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
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Drawing Name
Liner Details Layout for SLF-1

Revision History

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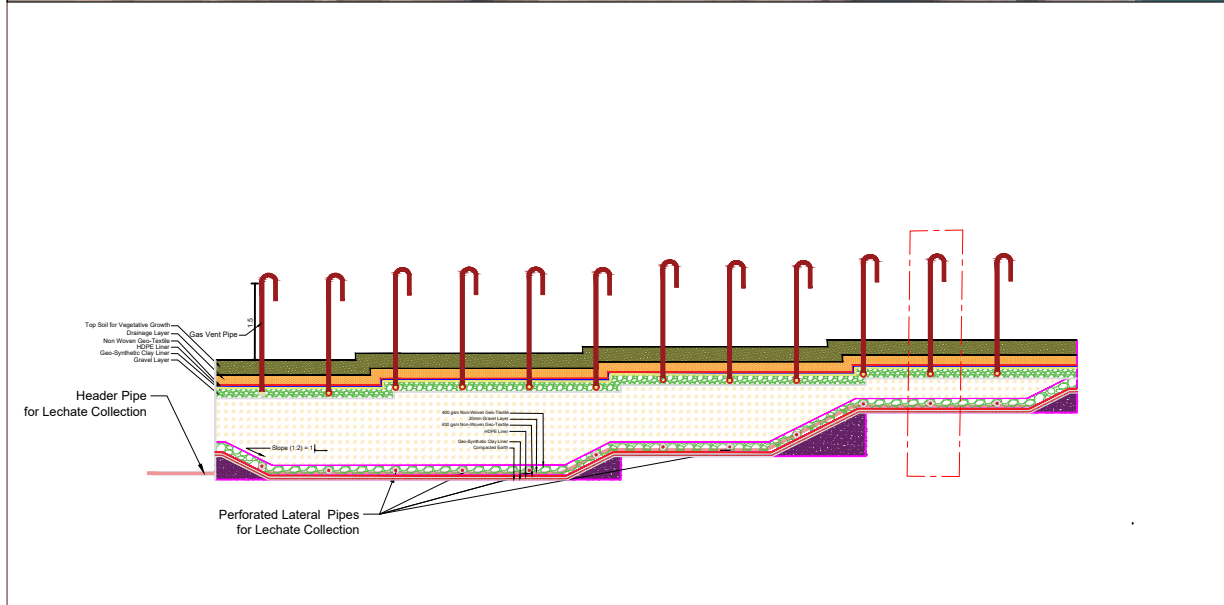
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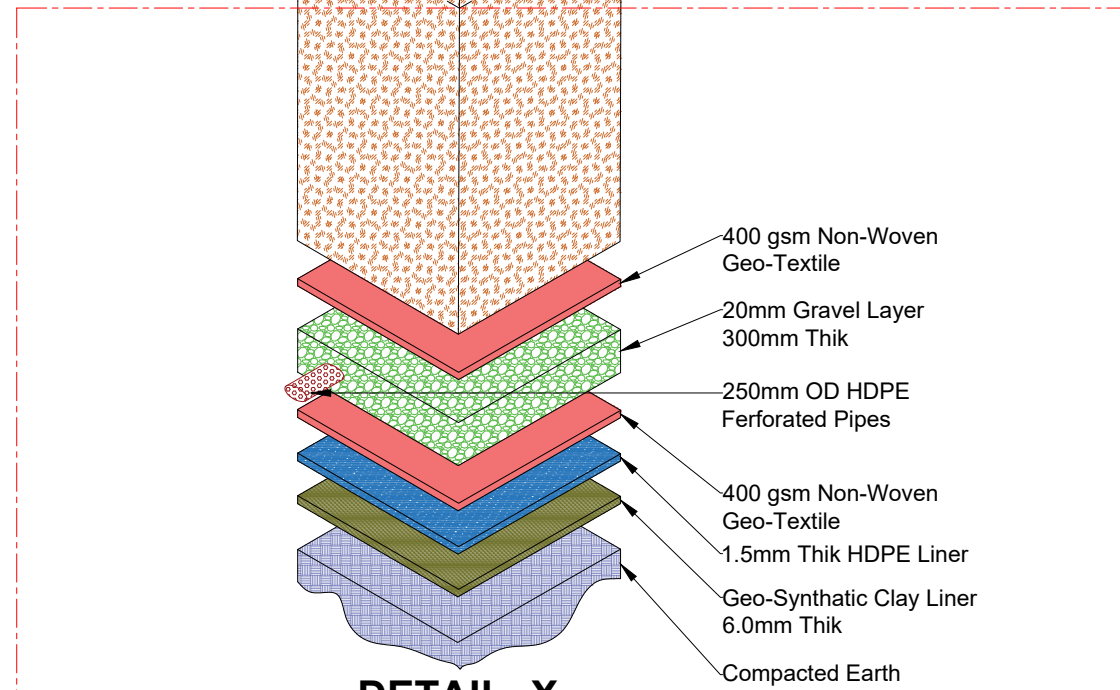
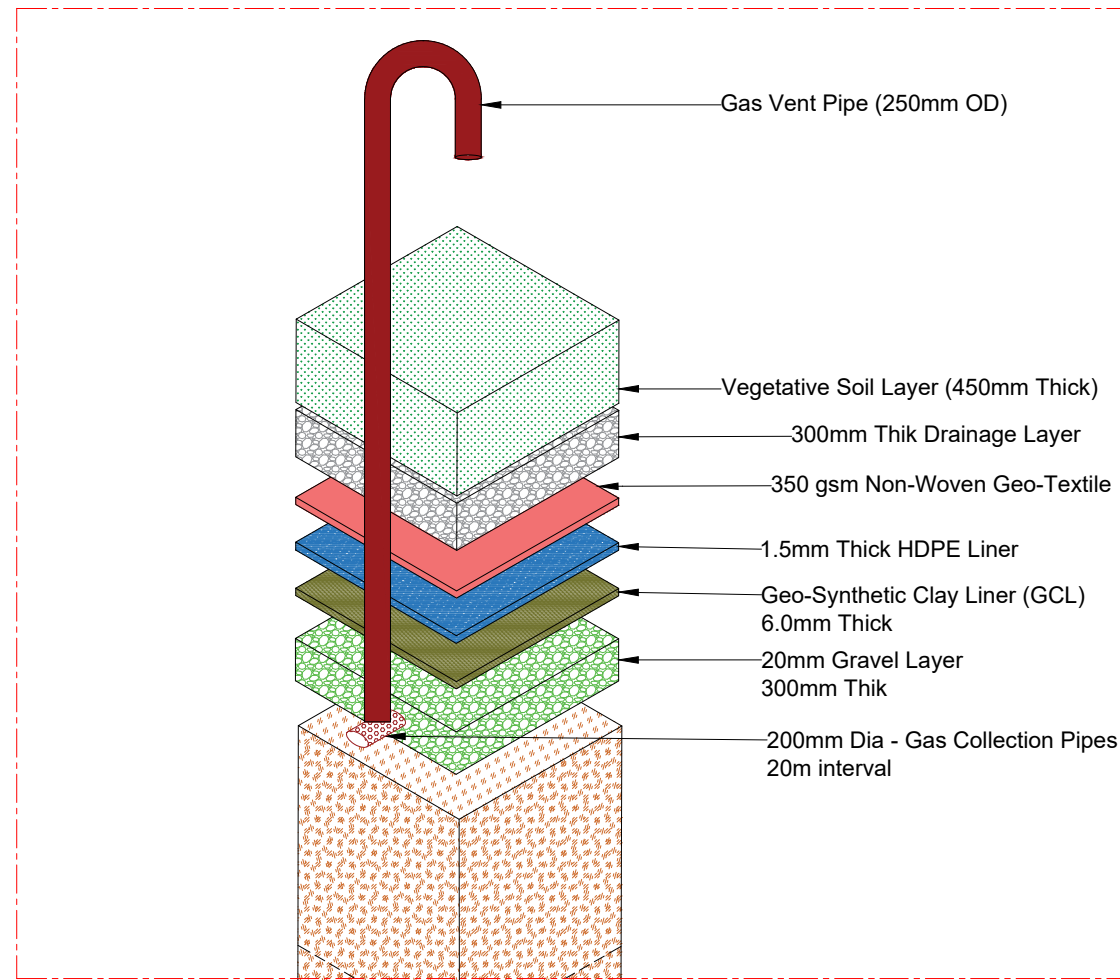
Key Map of SLF 2



(Cell Cross-Section) (X)

306

**(Details of X)
(Top Sealing System)**



**DETAIL -X
(SCALE - 1 : 250)**

(Bottom Sealing System)

*GL - Ground Level
*AGL - Above Ground Level
*BGL - Below Ground Level
*OD - Outer Diameter

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Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

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Drawing Name
Liner Details Layout for SLF- 2

Revision History

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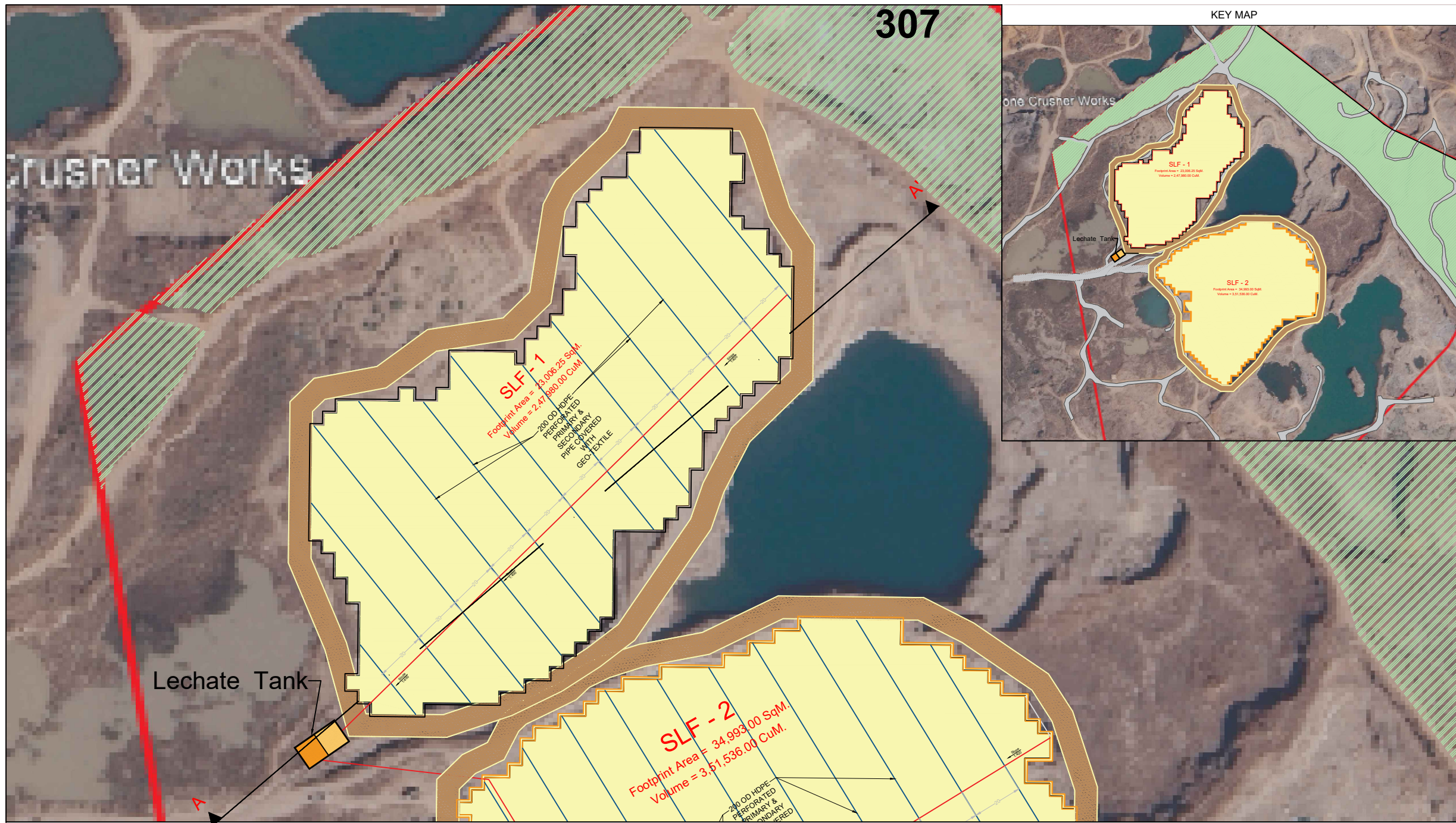
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Size **A3**



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Drawing No. C-06 R0	Scale NTS	Drawing Status Issued for DPR Approval
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Drawing Name
 Detailed Layout for Cell-1

Revision History

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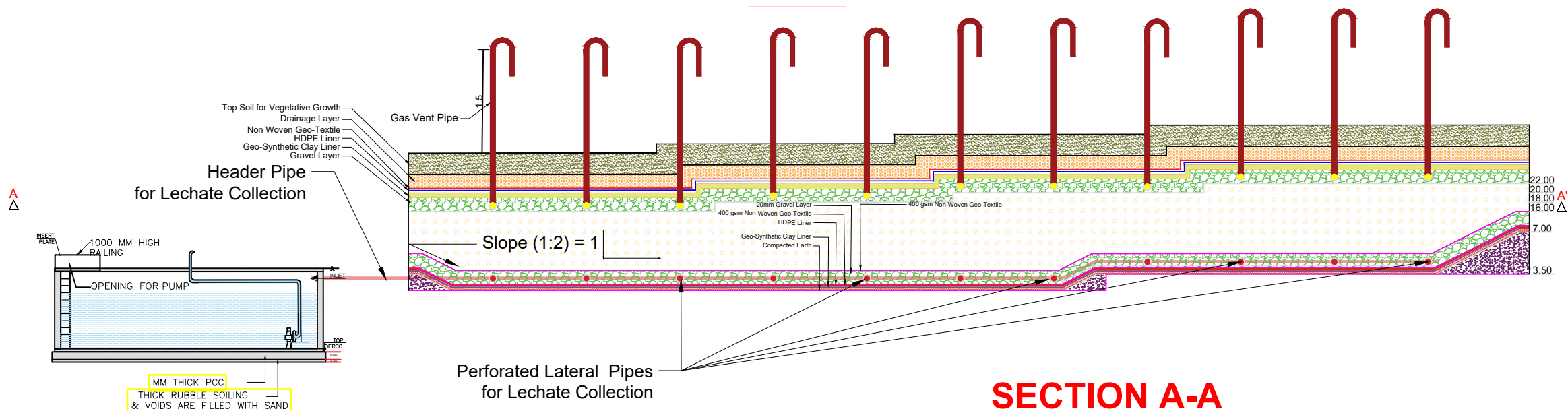
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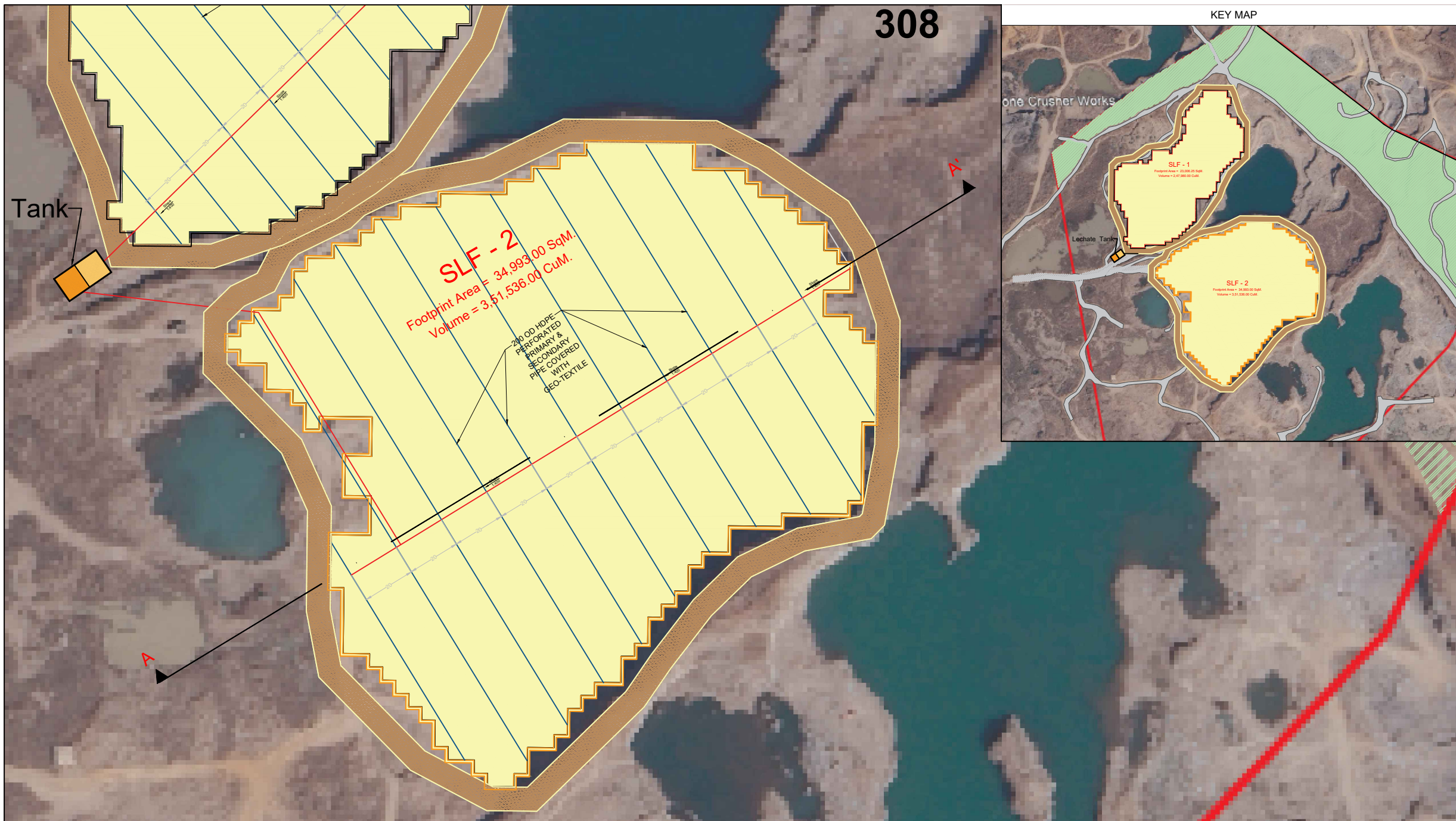
Size

A3

PLAN

SECTION A-A





Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

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Drawing Name
 Detailed Layout for Cell-1

Revision History

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DATE	NO.	REVISION	DRAWN	CHECKED	APPROVED

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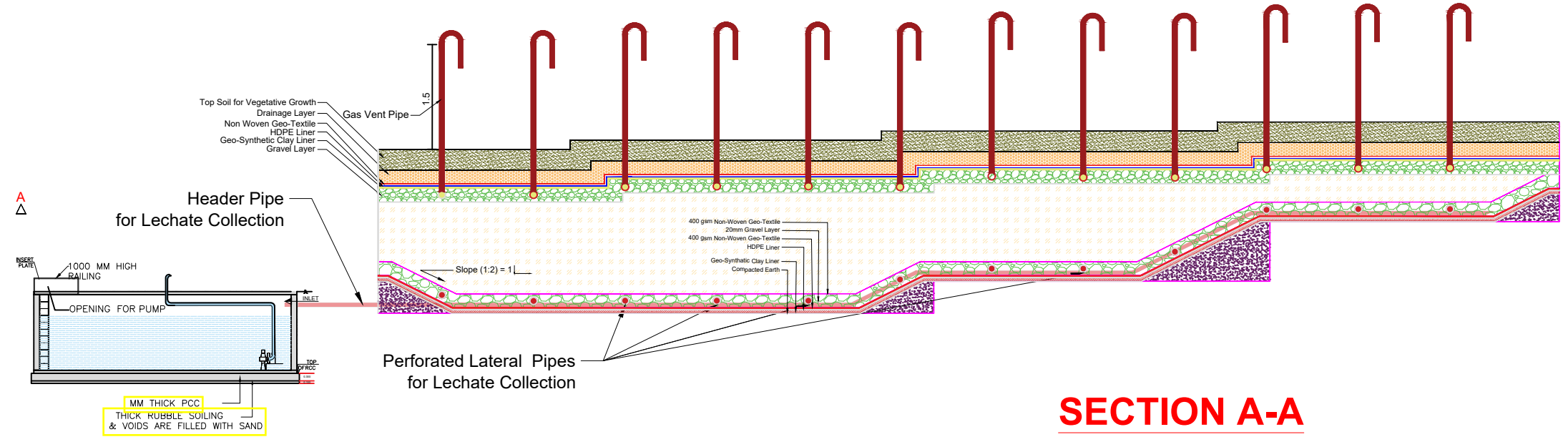
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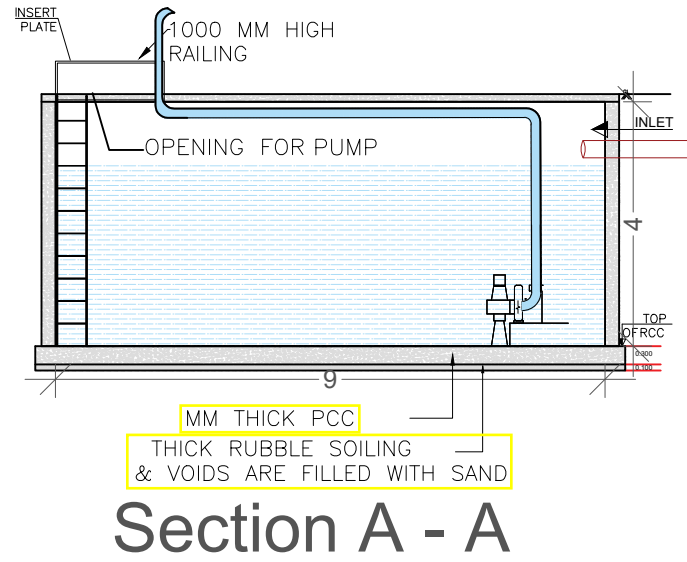
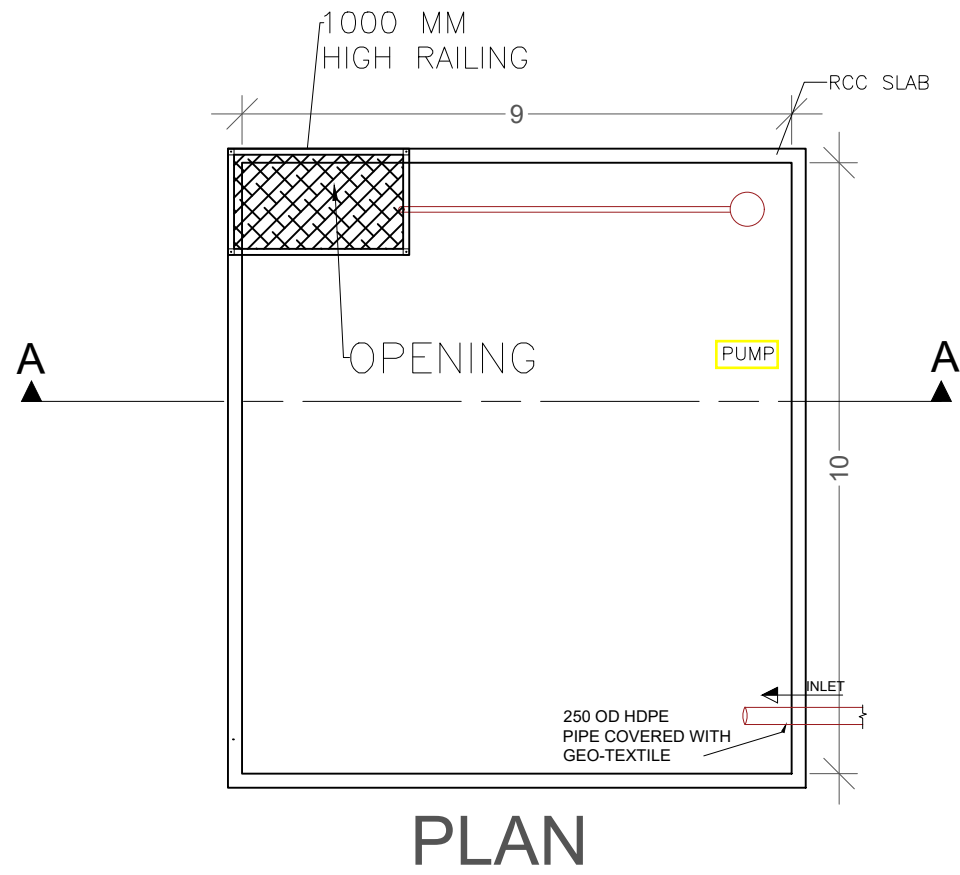
Size
A3

PLAN



SECTION A-A

309 Lechate Tank For SLF 1



Section A - A

Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
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 - All Dimensions are in M unless specified.

Drawing No. C-08 R0	Scale NTS	Drawing Status Issued for DPR Approval
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Drawing Name
Lechate Collection Tank

Revision History

DATE	NO.	REVISION	DRAWN	CHECKED	APPROVED

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Client

Authority
Directorate, Urban Administration & Development, Government of Maharashtra
Nodal Authority- Urban Local Body

Consultant

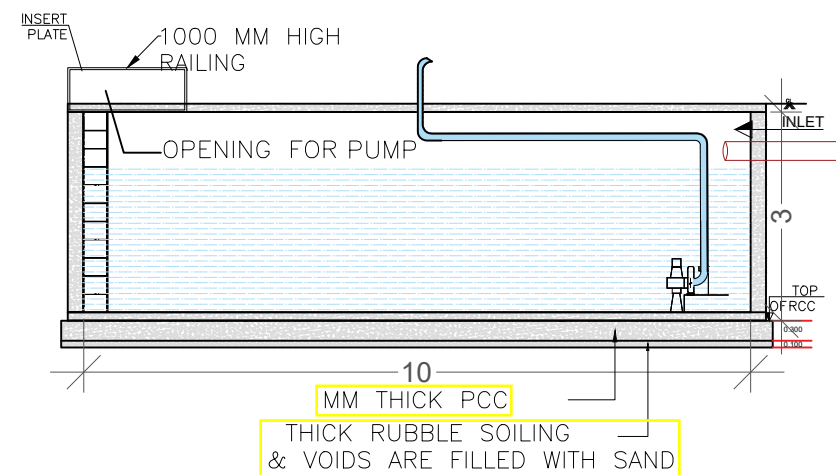
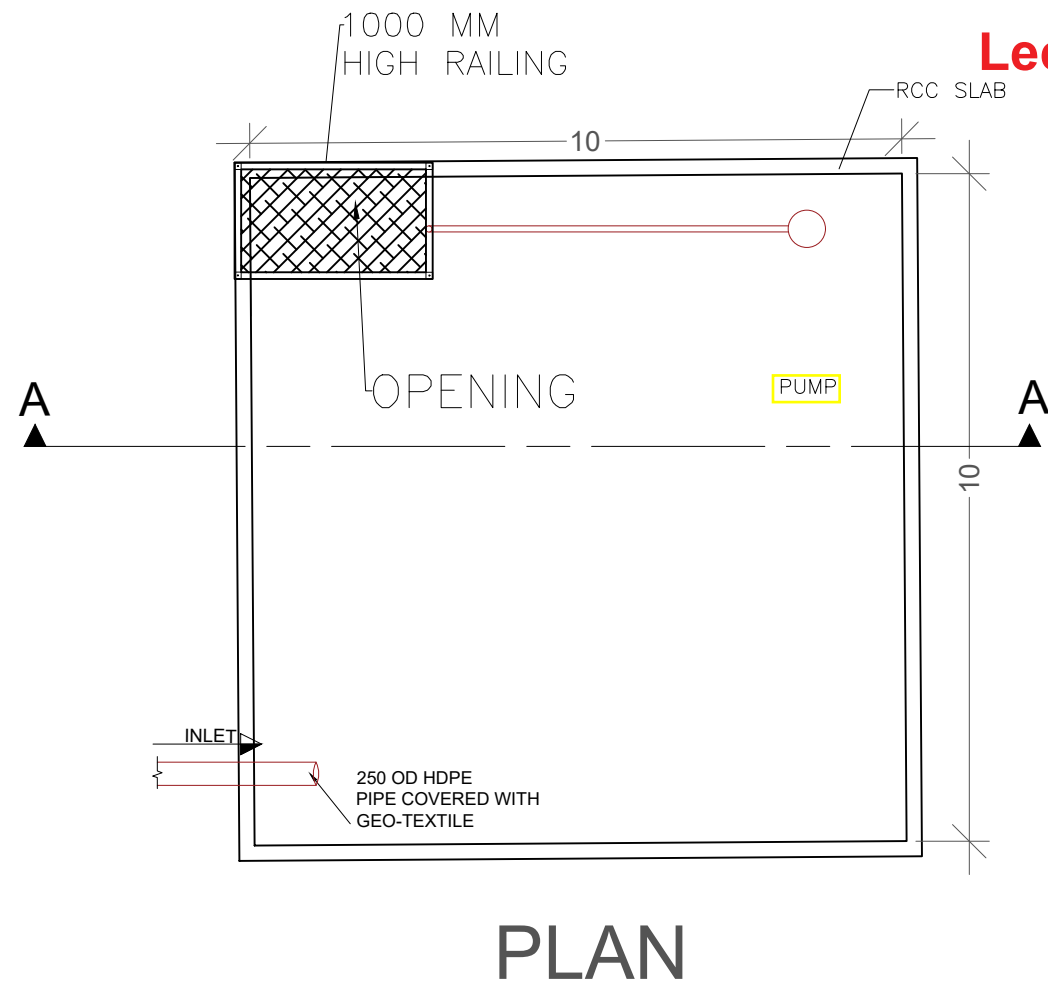
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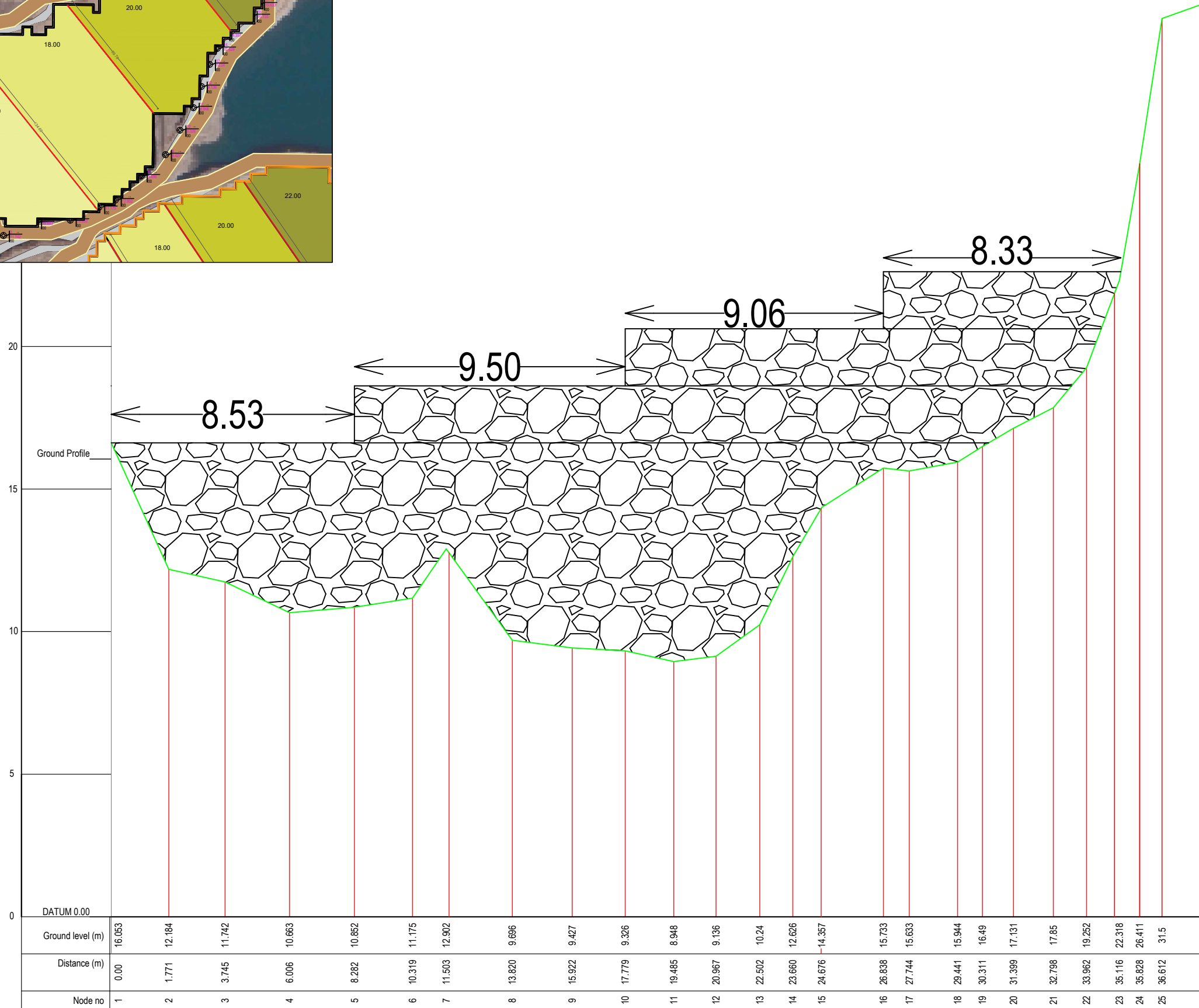
Size
A3

Lechate Tank For SLF 2



Section A - A

310



NODE 1 TO 26 (Line no L1)

Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
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Drawing No. C-09 R0	Scale NTS	Drawing Status Issued for DPR Approval
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Drawing Name
Gabian structure DETAIL

Revision History

DATE	NO.	REVISION	DRAWN	CHECKED	APPROVED

Drawn by Draftsmen (CS/ NT/ NR)	Designed by Subject Expert	Checked by SWM Expert (HP / RB / MS)	Approved by Team Leader (JNP / SP / JS)
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Client
Authority
Directorate, Urban Administration & Development, Government of Maharashtra
Nodal Authority- Urban Local Body

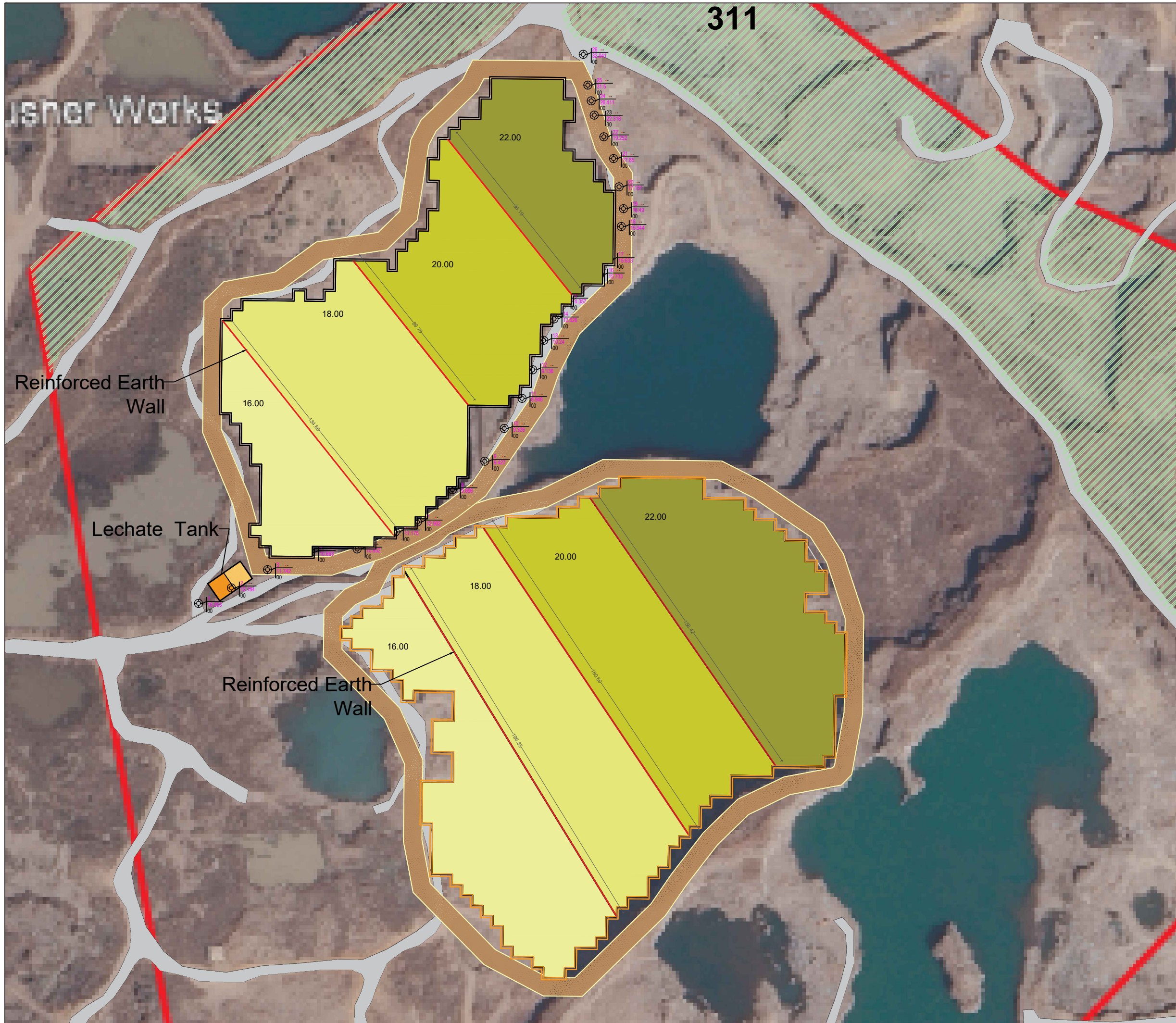


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Size
A3



311

ISHER WORKS

Reinforced Earth Wall

Lechate Tank

Reinforced Earth Wall

Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
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Drawing No. C-09 R0	Scale NTS	Drawing Status Issued for DPR Approval
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Drawing Name
 Reinforced Earth WALL DETAIL

Revision History

NO.	DATE	REVISION	DRAWN	CHECKED	APPROVED

DATE	NO.	REVISION	DRAWN	CHECKED	APPROVED

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Client


 **Authority**
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Nodal Authority- Urban Local Body

Consultant

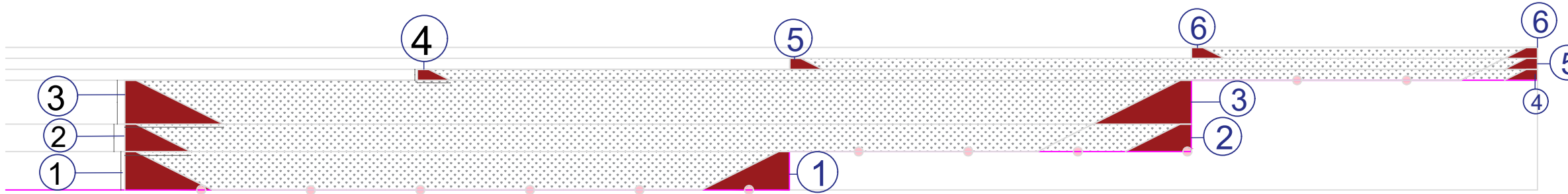
 **MaRS PIVOTAL PLANNING SERVICES**

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 **Size**
A3

312 Bunds For SLF 1



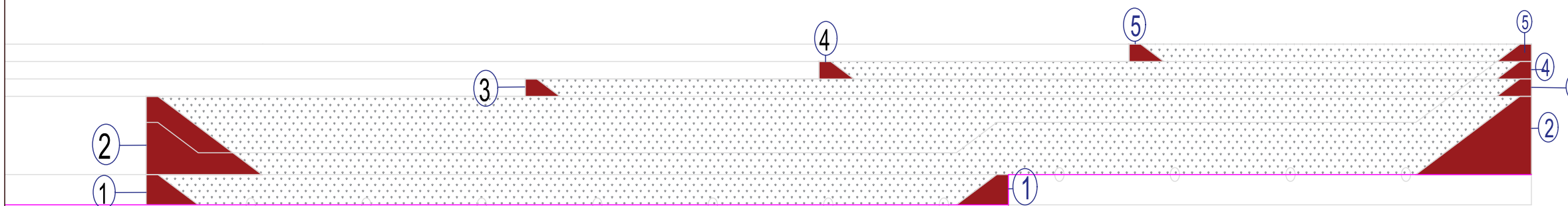
Bunds Size For SLF 1

No.	Size			
	Top Width	Bottom Width	Height	Length (m)
1	2.0	16.0	7.0	479
2	2.0	12.0	5.0	827.5
3	2.0	18.0	8.0	827.5
4	2.0	6.0	2.0	812.8
5	2.0	6.0	2.0	565
6	2.0	6.0	2.0	341.2

Bunds Size For SLF 2

No.	Size			
	Top Width	Bottom Width	Height	Length (m)
1	2.0	9.0	3.5	668.13
2	2.0	20.0	9.0	1057.3
3	2.0	6.0	2.0	802.8
4	2.0	6.0	2.0	651.52
5	2.0	6.0	2.0	486

Bunds For SLF 2



Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
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Drawing Name
BUNDS SECTIONS DETAIL

Revision History

DATE	NO.	REVISION	DRAWN	CHECKED	APPROVED

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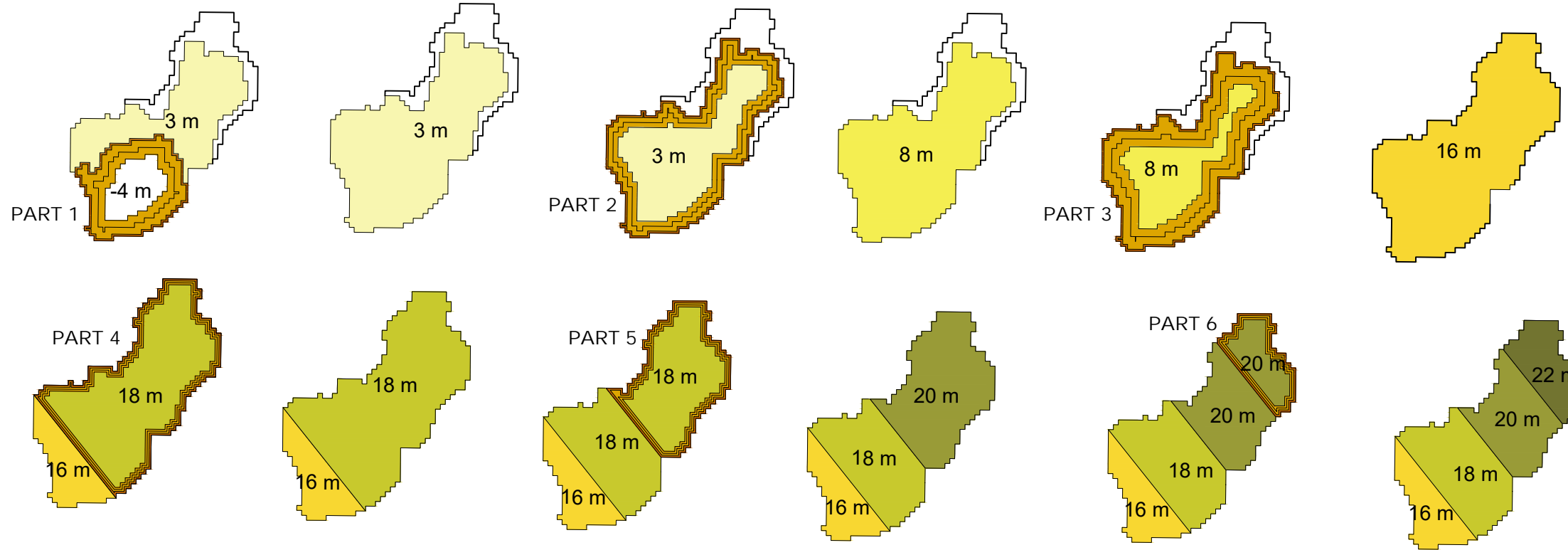
Client
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Nodal Authority- Urban Local Body

Consultant
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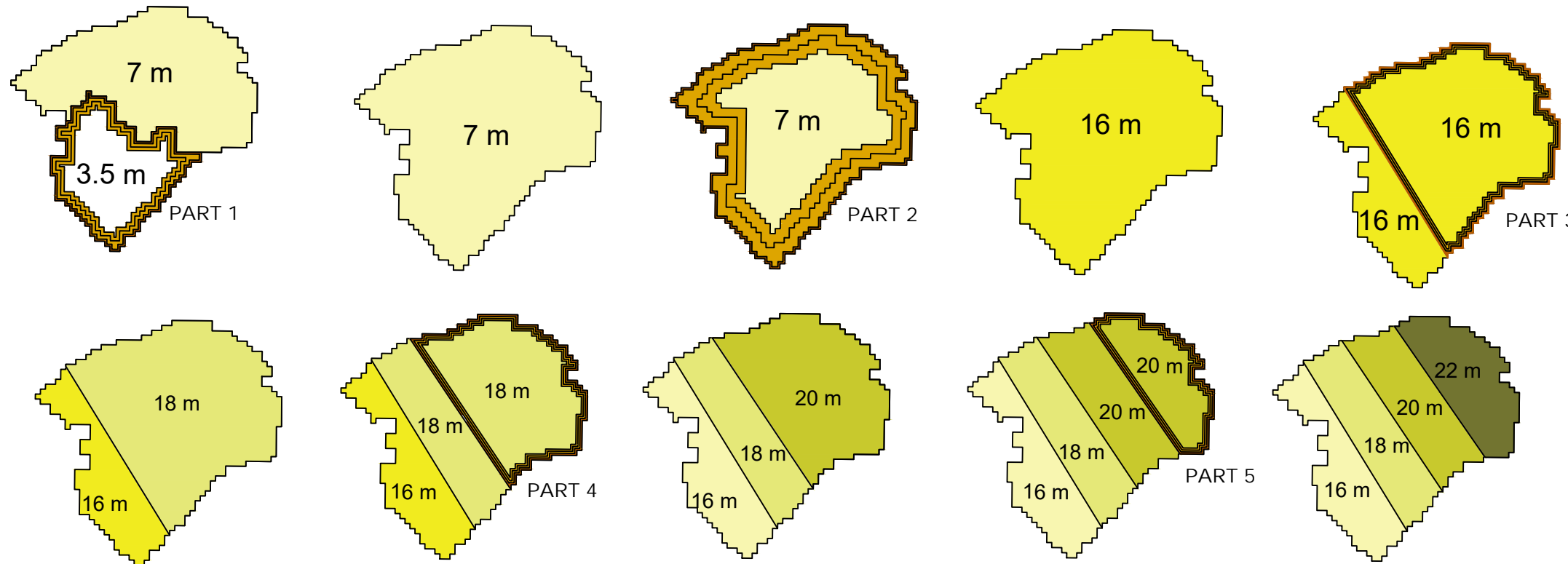
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	Size A3
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313 SLF 1 Level wise



SLF 2 Level wise



Project Name
Preparation of Detailed Project Report for Solid Waste Management in Maharashtra

Sub Project
Regional Sanitary Landfill at THANE

Division KOKAN	District THANE	Urban Local Body THANE
--------------------------	--------------------------	----------------------------------

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Drawing No. C-05 R0	Scale NTS	Drawing Status Issued for DPR Approval
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Drawing Name
 SLF Drawing Level

Revision History

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Client

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Nodal Authority- Urban Local Body

Consultant


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A3

Annexure 2: - BOQ

PART-B
ABSTRACT SHEET

Ref: B (1.1)		PART A:- ABSTRACT SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 1)					
ITEM DESCRIPTION	Quantity	Unit	Rate	Amount	
BOTTOM SEALING SYSTEM					
Item No. 1 / Bunds formation					
1.1 Filling in plinth and floors with contractors material/brought from outside and approved by Engineer incharge in layers of 15 cm to 20 cm including watering and compaction etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no. 21.37/Page No. 157]	139,091.50	Cum	125.94	17,517,183.51	
Item No. 2 / Bottom Sealing System					
2.1 GCL - 6 mm thick with Installation and Transportation (Market Rate)	138,747.95	Sqm	640.00 ₹	88,798,689.60	
2.2 HDPE Liner (1.5 mm Smooth) with Installation and Transportation (Market Rate)	138,747.95	Sqm	740.00 ₹	102,673,484.85	
2.3 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]	138,747.95	Sqm	217.25 ₹	30,142,507.06	
2.4 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]	40,412.03	Cum	1893.30 ₹	76,512,006.11	
2.5 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]	138,747.95	Sqm	217.25 ₹	30,142,507.06	
Item No. 3 / Leachate collection System					
3.1 Providing , Laying and fixing, jointing Eco Drain 250 mm SN-04 Nu-Drain Upvc pipe or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 & 16098 with fittings such a bends, tees, coupler, etc. jointing with rubber lubricant, including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.33/ Page no.291]	266.80	Rmt	1883.85 ₹	502,611.85	
3.2 Providing , laying and fixing ,jointing Eco- drain 200 mm SN 4 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees tees, coupler etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated materialetc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.32/ Page no.291]	1,153.73	Rmt	979.18 ₹	1,129,713.38	
TOTAL COST:-> BOTTOM SEALING SYSTEM				₹	347,418,703.42
4. ADD ROYALTY					
For Murum in void filling between 80 mm metal of soling	6,061.8038	Cum	₹ 237.37	₹	1,438,890.36
For metal 80 mm Above of soling	40,412.0250	Cum	₹ 216.18	₹	8,736,271.56
TOTAL :-> 4. ADD ROYALTY				₹	10,175,161.92
TOTAL COST INCLUDING ROYALTY FOR BOTTOM SEALING SYSTEM (Round Off):->				₹	357,593,865.00

Ref: B (1.1)		PART A:- ABSTRACT SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 1)					
ITEM DESCRIPTION	Quantity	Unit	Rate	Amount	
TOP SEALING SYSTEM					
Item No. 5 / Top Sealing System					
Gas Collection Layer					
5.1 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]	6,901.80	Cum	1893.30 ₹	13,067,164.14	
Gas Collection Vent Pipe					
5.2 Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]	1,153.73	Rmt	343.19 ₹	395,944.56	
5.3 Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]	18.00	Rmt	343.19 ₹	6,177.36	
5.4 GCL - 6 mm thick with Installation and Transportation	23,696.18	Sqm	640.00 ₹	15,165,555.20	
5.5 HDPE Liner (1.5 mm Smooth) with Installation and Transportation (Market Rate)	23,696.18	Sqm	740.00 ₹	17,535,173.20	
5.6 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]	23,696.18	Sqm	217.25 ₹	5,147,912.17	
5.7 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]	23,006.00	Cum	1893.30 ₹	43,557,213.79	
Local top soil for vegetative growth					
5.8 Spreading fresh garden soil / silt & manure in excavated area of depth 30cms. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/Sr no. 13/ Page no. 11]	23,006.00	Sqm	28.36 ₹	652,392.41	
5.9 Mexican or Korian Grass Turf , Selection No.1 American blue grass, / Barmuda etc ready to fixlawn turf in Slabs/ Rolls of required variety as directed Rates Including breakage,& Transportation Damage losses. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/14 Lawn grass Sr no. 2/ Page no. 38]	23,006.00	Sqm	225.64 ₹	5,191,131.36	
TOTAL COST:-> TOP SEALING SYSTEM				₹	100,718,664.19
6. ADD ROYALTY					
For Murum in voide filling between 80 mm metal of soling	1,035.2700	Cum	₹ 237.37 ₹	245,742.04	
For metal 80 mm Above of soling	6,901.8000	Cum	₹ 216.18 ₹	1,492,031.12	
TOTAL :-> 6. ADD ROYALTY				₹	1,737,773.16
TOTAL COST INCLUDING ROYALTY FOR TOP SEALING SYSTEM (Round Off):->				₹	102,456,437.00
TOTAL COST (TOP & BOTTOM SEALING SYSTEM WITH ROYALTY)				₹	460,050,302.00

Ref: B (1.2)		PART A:- ABSTRACT SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 2)					
ITEM DESCRIPTION	Quantity	Unit	Rate	Amount	
BOTTOM SEALING SYSTEM					
Item No. 1 / Bunds formation					
1.1 Filling in plinth and floors with contractors material/brought from outside and approved by Engineer incharge in layers of 15 cm to 20 cm including watering and compaction etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no. 21.37/Page No. 157]	133,056.76	Cum	125.94	16,757,168.67	
Item No. 2 / Bottom Sealing System					
2.1 GCL - 6 mm thick with Installation and Transportation (Market Rate)	148,229.02	Sqm	640.00 ₹	94,866,574.51	
2.2 HDPE Liner (1.5 mm Smooth) with Installation and Transportation (Market Rate)	148,229.02	Sqm	740.00 ₹	109,689,476.78	
2.3 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]	148,229.02	Sqm	217.25 ₹	32,202,236.37	
2.4 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]	43,173.50	Cum	1893.30 ₹	81,740,304.52	
2.5 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]	148,229.02	Sqm	217.25 ₹	32,202,236.37	
Item No. 3 / Leachate collection System					
3.1 Providing , Laying and fixing, jointing Eco Drain 250 mm SN-04 Nu-Drain Upvc pipe or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 & 16098 with fittings such a bends, tees, coupler, etc. jointing with rubber lubricant, including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.33/ Page no.291]	1,789.69	Rmt	1883.85 ₹	3,371,511.98	
3.2 Providing , laying and fixing ,jointing Eco- drain 200 mm SN 4 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated materialetc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.32/ Page no.291]	288.40	Rmt	979.18 ₹	282,396.52	
TOTAL COST:-> BOTTOM SEALING SYSTEM				₹	371,111,905.72
4. ADD ROYALTY					
For Murum in void filling between 80 mm metal of soling	6,476.0253	Cum	₹ 237.37	₹	1,537,214.12
For metal 80 mm Above of soling	43,173.5018	Cum	₹ 216.18	₹	9,333,247.61
TOTAL :-> 4. ADD ROYALTY				₹	10,870,461.73
TOTAL COST INCLUDING ROYALTY FOR BOTTOM SEALING SYSTEM (Round Off):->				₹	381,982,367.00

Ref: B (1.2)		PART A:- ABSTRACT SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 2)					
ITEM DESCRIPTION	Quantity	Unit	Rate	Amount	
TOP SEALING SYSTEM					
Item No. 5 / Top Sealing System					
Gas Collection Layer					
5.1 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]	10,497.90	Cum	1893.30 ₹	19,875,653.07	
Gas Collection Vent Pipe					
5.2 Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]	1,789.69	Rmt	343.19 ₹	614,197.45	
5.3 Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]	16.50	Rmt	343.19 ₹	5,662.58	
5.4 GCL - 6 mm thick with Installation and Transportation	36,042.79	Sqm	640.00 ₹	23,067,385.60	
5.5 HDPE Liner (1.5 mm Smooth) with Installation and Transportation (Market Rate)	36,042.79	Sqm	740.00 ₹	26,671,664.60	
5.6 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]	36,042.79	Sqm	217.25 ₹	7,830,169.98	
5.7 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]	34,993.00	Cum	1893.30 ₹	66,252,176.91	
Local top soil for vegetative growth					
5.8 Spreading fresh garden soil / silt & manure in excavated area of depth 30cms. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/Sr no. 13/ Page no. 11]	34,993.00	Sqm	28.36 ₹	992,313.65	
5.9 Mexican or Korian Grass Turf , Selection No.1 American blue grass, / Barmuda etc ready to fixlawn turf in Slabs/ Rolls of required variety as directed Rates Including breakage,& Transportation Damage losses. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/14 Lawn grass Sr no. 2/ Page no. 38]	34,993.00	Sqm	225.64 ₹	7,895,908.00	
TOTAL COST:-> TOP SEALING SYSTEM				₹	153,205,131.84
6. ADD ROYALTY					
For Murum in voide filling between 80 mm metal of soling	1,574.6850	Cum	₹ 237.37 ₹	373,782.98	
For metal 80 mm Above of soling	10,497.9000	Cum	₹ 216.18 ₹	2,269,436.02	
TOTAL :-> 6. ADD ROYALTY				₹	2,643,219.00
TOTAL COST INCLUDING ROYALTY FOR TOP SEALING SYSTEM (Round Off):->				₹	155,848,351.00
TOTAL COST (TOP & BOTTOM SEALING SYSTEM WITH ROYALTY)				₹	537,830,718.00

Ref: **B (1.3)****PART A:- ABSTRACT SHEET**

Name of Work

Construction of Leachate Collection Tank (For Location 1)

ITEM DESCRIPTION	Quantity	Unit	Rate	Amount
Item No. 1 / Excavation				
1.1 Excavation for roadway in hard rock by controlled blasting including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stocking as directed.(Inculding 50% Utilisation of useable Excavated material) [SOR Ref:-PWD/state/DSR/22-23/Item no.2.15/ Page no. 24]	484.54	cum	262.38	₹ 127,129.92
Item No. 2 / PCC				
2.1 Providing and laying Cast in situ/Ready Mix cement concrete in M15 of trap/ granite/quartzite/gneiss metal for bed blocks, foundation blocks and such other items including bailing out water, Steel centering, formwork, laying/ pumping, compacting, roughening them if special finish is to be provided, finishing uneven and honeycombed surface and curing etc. complete. The Cement Mortar 1:3 plaster is considered for rendering uneven and honeycombed surface only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (Wooden centering will not be allowed.), with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With fine aggregate (Crushed sand VSI Grade) [SOR Ref:-PWD/state/DSR/ 22-23/Item no.24.08/Page no. 176]	10.30	cum	7635.57	₹ 78,627.74
Item No. 3 / Site Treatment				
3.1 Providing preconstructional antitermite treatment as per I.S. 6313 (Part-II) treatment by treating the backfill in immediate contact with foundation at the rate of 5 litres of emulsion concentrate of 1.0 percent of clorophyrifos per One Square Metre of vertical surface area covering 10 years guarantee on bond paper. [SOR Ref:-PWD/state/DSR/22-23/Item no.21.23/Page No. 155]	107.08	sqm	117.50	₹ 12,581.85
Item No. 4/ R.C.C. Upto Plinth Level				
4.1 Providing and laying in situ/Ready Mix cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. work in foundations like raft, strip foundations, grillage and footings of R.C.C. columns and steel stanchions etc. including bailing out water, formwork, laying/pumping cover blocks, compaction and curing roughening the surface if special finish is to be provided (Excluding reinforcement and structural steel) etc.complete, with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.25.11/Page no. 178]	78.97	cum	8383.67	₹ 662,031.17
Item No. 5 / Reinforcement				
5.1 Providing and fixing in position TMT-FE-500 bar reinforcement of various diameters for R.C.C. pile caps, footings, foundations, slabs, beams columns, canopies, staircase, newels, chajjas, lintels pardis, copings, fins, arches etc. as per detailed designs, drawings and schedules. including cutting, bending, hooking the bars, binding with wires or tack welding and supporting as required complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.26.33/ Page No. 188]	6.33	MT	94646.57	₹ 599,112.78

Ref: **B (1.3)****PART A:- ABSTRACT SHEET**

Name of Work

Construction of Leachate Collection Tank (For Location 1)

ITEM DESCRIPTION	Quantity	Unit	Rate	Amount
Item No. 6/ Filling				
6.1 Filling in plinth and floors with approved excavated material in 15cm. to 20cm. layers including watering and compacting etc.complete [SOR Ref:-PWD/state/DSR/22-23/Item no.21.36/ Page No. 157] Tank size	35.27	cum	125.94	₹ 4,442.01
Item No. 7 / Openings				
7.1 Providing and fixing Ductile iron manhole cover of light/medium/heavy duty with frame of any size over inspection chamber etc. complete (Prior permission of S.E. is to be obtained before inclusion of this item in the estimate) [SOR Ref:-PWD/state/DSR/22-23/Item no.50.30/ Page no. 336]	16.20	kg	78.71	₹ 1,275.14
Item No. 8 / Leachate collection Pump				
8.1 Providing and installing Submersible 7.5 HP Leachate pump of ISI mark dry type squirrel cage induction type, IP 68 the class of insulation is F-class having SD 50m, 2880 RPM, 3 Phase, Dol, using copper cable of approx 15m in length of size 1x4x2.5mm square, discharge size 80mm, capacity 16 to 20 cum per hr with head of 16 to 20m including all electrical connections, starter making connection to the motor and other safety devices to electrical panel board as per manufacturer specifications. [SOR Ref:-MJP/state/SWM DSR/23-24/section-3/Item no.B4/Page No. 37]	1.00	Nos	92938.47	₹ 92,938.47
TOTAL COST:-> CONSTRUCTION OF LEACHATE COLLECTION TANK (FOR LOCATION 1)				₹ 1,578,139.08
9. ADD ROYALTY				
9.1				
For Sand of M-15 PCC	4.5309	Cum	₹ 237.37	₹ 1,075.51
For Sand of M-20 RCC	33.6039	Cum	₹ 237.37	₹ 7,976.56
For Metal 40 mm Above of M-15 PCC	5.7666	Cum	₹ 216.18	₹ 1,246.63
For Metal 20 mm Above of M-15 PCC	2.2655	Cum	₹ 216.18	₹ 489.75
For Metal 12/10 mm Above of M-15 PCC	1.1327	Cum	₹ 216.18	₹ 244.87
For Metal 20 mm Above of M-20 RCC	45.0688	Cum	₹ 216.18	₹ 9,742.97
For Metal 12/10 mm Above of M-20 RCC	22.1390	Cum	₹ 216.18	₹ 4,786.02
TOTAL :-> 9. ADD ROYALTY				₹ 25,562.31
TOTAL COST INCLUDING ROYALTY (Round off):->				₹ 1,603,701.00

Ref: **B (1.4)****PART A:- ABSTRACT SHEET**

Name of Work

Construction of Leachate Collection Tank (For Location 2)

ITEM DESCRIPTION	Quantity	Unit	Rate	Amount
Item No. 1 / Excavation				
1.1 Excavation for roadway in hard rock by controlled blasting including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stocking as directed.(Inculding 50% Utilisation of useable Excavated material) [SOR Ref:-PWD/state/DSR/22-23/Item no.2.15/ Page no. 24]	415.74	cum	262.38	₹ 109,079.02
Item No. 2 / PCC				
2.1 Providing and laying Cast in situ/Ready Mix cement concrete in M15 of trap/ granite/quartzite/gneiss metal for bed blocks, foundation blocks and such other items including bailing out water, Steel centering, formwork, laying/ pumping, compacting, roughening them if special finish is to be provided, finishing uneven and honeycombed surface and curing etc. complete. The Cement Mortar 1:3 plaster is considered for rendering uneven and honeycombed surface only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (Wooden centering will not be allowed.), with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With fine aggregate (Crushed sand VSI Grade) [SOR Ref:-PWD/state/DSR/ 22-23/Item no.24.08/Page no. 176]	11.36	cum	7635.57	₹ 86,767.26
Item No. 3 / Site Treatment				
3.1 Providing preconstructional antitermite treatment as per I.S. 6313 (Part-II) treatment by treating the backfill in immediate contact with foundation at the rate of 5 litres of emulsion concentrate of 1.0 percent of clorophyrifos per One Square Metre of vertical surface area covering 10 years guarantee on bond paper. [SOR Ref:-PWD/state/DSR/22-23/Item no.21.23/Page No. 155]	117.94	sqm	117.50	₹ 13,857.90
Item No. 4/ R.C.C. Upto Plinth Level				
4.1 Providing and laying in situ/Ready Mix cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. work in foundations like raft, strip foundations, grillage and footings of R.C.C. columns and steel stanchions etc. including bailing out water, formwork, laying/pumping cover blocks, compaction and curing roughening the surface if special finish is to be provided (Excluding reinforcement and structural steel) etc.complete, with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.25.11/Page no. 178]	75.90	cum	8383.67	₹ 636,326.01
Item No. 5 / Reinforcement				
5.1 Providing and fixing in position TMT-FE-500 bar reinforcement of various diameters for R.C.C. pile caps, footings, foundations, slabs, beams columns, canopies, staircase, newels, chajjas, lintels pardis, copings, fins, arches etc. as per detailed designs, drawings and schedules. including cutting, bending, hooking the bars, binding with wires or tack welding and supporting as required complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.26.33/ Page No. 188]	6.08	MT	94646.57	₹ 575,451.14

Ref: **B (1.4)****PART A:- ABSTRACT SHEET**

Name of Work

Construction of Leachate Collection Tank (For Location 2)

ITEM DESCRIPTION	Quantity	Unit	Rate	Amount	
Item No. 6 / Filling					
6.1 Filling in plinth and floors with approved excavated material in 15cm. to 20cm. layers including watering and compacting etc.complete [SOR Ref:-PWD/state/DSR/22-23/Item no.21.36/ Page No. 157] Tank size	28.47	cum	125.94	₹ 3,585.87	
Item No. 7 / Openings					
7.1 Providing and fixing Ductile iron manhole cover of light/medium/heavy duty with frame of any size over inspection chamber etc. complete (Prior permission of S.E. is to be obtained before inclusion of this item in the estimate) [SOR Ref:-PWD/state/DSR/22-23/Item no.50.30/ Page no. 336]	16.20	kg	78.71	₹ 1,275.14	
Item No. 8/ Leachate collection Pump					
8.1 Providing and installing Submersible 7.5 HP Leachate pump of ISI mark dry type squirrel cage induction type, IP 68 the class of insulation is F-class having SD 50m, 2880 RPM, 3 Phase, Dol, using copper cable of approx 15m in length of size 1x4x2.5mm square, discharge size 80mm, capacity 16 to 20 cum per hr with head of 16 to 20m including all electrical connections, starter making connection to the motor and other safety devices to electrical panel board as per manufacturer specifications. [SOR Ref:-MJP/state/SWM DSR/23-24/section-3/Item no.B4/Page No. 37]	1.00	Nos	92938.47	₹ 92,938.47	
TOTAL COST:-> CONSTRUCTION OF LEACHATE COLLECTION TANK (FOR LOCATION 2)				₹ 1,519,280.81	
9. ADD ROYALTY					
9.1	For Sand of M-15 PCC	5.0000	Cum	₹ 237.37	₹ 1,186.84
	For Sand of M-20 RCC	32.3008	Cum	₹ 237.37	₹ 7,667.25
	For Metal 40 mm Above of M-15 PCC	6.3636	Cum	₹ 216.18	₹ 1,375.68
	For Metal 20 mm Above of M-15 PCC	2.5000	Cum	₹ 216.18	₹ 540.45
	For Metal 12/10 mm Above of M-15 PCC	1.2500	Cum	₹ 216.18	₹ 270.22
	For Metal 20 mm Above of M-20 RCC	43.3211	Cum	₹ 216.18	₹ 9,365.16
	For Metal 12/10 mm Above of M-20 RCC	21.2805	Cum	₹ 216.18	₹ 4,600.43
TOTAL :-> 9. ADD ROYALTY				₹ 25,006.03	
TOTAL COST INCLUDING ROYALTY (Round off):->				₹ 1,544,287.00	

Ref: **B (1.5)****PART A:- ABSTRACT SHEET**

Name of Work

Construction of RE WALL & Gabion structure

ITEM DESCRIPTION	Quantity	Unit	Rate	Amount
Item No. 1 / Gabion Structure				
<p>1.1 Providing and Constructing gabion structure 1 Meter high or required section made up of soft mechanically woven hexagonal shaped G.I. wire confirming to IS 16014:2012 having zinc plus PVC coating of overall diameter of 3.7 mm and tying lacing wire of 3.2 mm with edge wire confirming to overall diameter 4.4 mm edges being mechanically selvedge including placing in position, fitting neatly with trap stone rubble (15 to 23 cm) all loose ends to be securely tied (Excluding transportation) etc. complete. (In Dry condition and for under water installation extra cost to be considered) [SOR Ref:-PWD/state/DSR/22-23/Item no.7.21/ Page no. 72]</p>	485.96	cum	4522.30	₹ 2,197,654.72
Item No. 2 / RE Wall				
<p>Construction of Reinforced Earth Wall in M-35 Block Facia by Providing and Laying CE marked Knitted and PVC coated Polyester Uniaxial Geogrid (Techgrid) of Techfab India indegeniously manufactured from selected high tenacity polyester yarn with high molecular weight (> 25000 g/mol), and low carboxyl end group (<30mmol/Kilogram) for Reinforced soil wall (extruded PP geogrids & Polyester strips & Geostrips, Steel Strips not allowed & not accepted) with granular fill of PHI-32 degree (design is to be carried out in accordance with BS-8006 / FHWA) with concrete block by M-35 as facia, casting & erection of blocks with Techgrid, providing & laying levelling pad by M-15, providing and laying coping beam by M-35, providing and laying 300mm thick filtermedia etc. 1.20 completed as per necessary drawing and instruction of Engineer-in-charge. Excluding providing, laying and compacting selected backfill and retained fill behind the wall, excavation and ground improvement, if any. The reinforced earth wall and slope should have 100% coverage of 5m width Knitted and PVC coated Polyester Geogrid. (Coating of Geogrid/ Reinforcing geosynthetic material with LDPE, approved, Bitumen and any other coating will not be allowed and will not be accepted). (Specification: MORTH Section3100) with prior approval of concerned Superitending Engineer. a) RE Wall Height 1 to 4 meter [SOR Ref:-PWD/state/DSR/22-23/Item no.50.45 (a)/ Page no. 72]</p>	1,714.18	Sqm	5757.56	₹ 9,869,489.06
TOTAL COST:-> B (1.5)				₹ 12,067,143.78

Ref: **B (1.6)****PART A:- ABSTRACT SHEET**

Name of Work

Site formation Work

ITEM DESCRIPTION	Quantity	Unit	Rate	Amount
Item No. 1 / Site formation work				
1.1 Excavation for roadway in hard rock by controlled blasting including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stocking as directed.(Inculding 50% Utilisation of useable Excavated material)	6,293.50	cum	262.38 ₹	1,651,257.06
TOTAL COST:-> B (1.6)				₹ 1,651,257.06

PART-B
MEASUREMENT SHEET

Ref: B (1.1)		PART B:- MEASUREMENTS SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 1)					
ITEM DESCRIPTION	L	W	D/H	Quantity Unit	
BOTTOM SEALING SYSTEM					
A Thickness of Liner					
Geo textile (400 GSM)				0.00 m	
Drainage Layer				0.30 m	
Geo textile (400 GSM)				0.00 m	
HDPE Geo membrane (1.5 MM Smooth)				0.0015 m	
GCL - 6 mm thick				0.006 m	
Total thickness of liner				0.3075 m	
Item No. 1 / Bunds formation					
1.1 Filling in plinth and floors with contractors material/brought from outside and approved by Engineer incharge in layers of 15 cm to 20 cm including watering and compaction etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no. 21.37/Page No. 157]					
For SLF Location 1					
	1)At -4m Depth to 3 m Elevation	479	2.00	7.00	
		Cross sectional area of Bunds.....(1)		63.00 Sqm	
		Volume of Bunds.....(1)		30177.00 Cum	
	2)At 3m Depth to 8 m Elevation	827.5	2.00	5.00	
		Cross sectional area of Bunds.....(2)		35.00 Sqm	
		Volume of Bunds.....(2)		28962.50 Cum	
	3)At 8m Depth to 16 m Elevation	827.5	2.00	8.00	
		Cross sectional area of Bunds.....(3)		80.00 Sqm	
		Volume of Bunds.....(3)		66200.00 Cum	
	4)At 16m Depth to 18 m Elevation	812.8	2.00	2.00	
		Cross sectional area of Bunds.....(4)		8.00 Sqm	
		Volume of Bunds.....(4)		6502.40 Cum	
	5)At 18m Depth to 20 m Elevation	565	2.00	2.00	
		Cross sectional area of Bunds.....(5)		8.00 Sqm	
		Volume of Bunds.....(5)		4520.00 Cum	
	6)At 20m Depth to 22 m Elevation	341.2	2.00	2.00	
		Cross sectional area of Bunds.....(6)		8.00 Sqm	
		Volume of Bunds.....(6)		2729.60 Cum	
		Total Cross sectional Area(A1).....(1+2+...+6)		202.00 Sqm	
		Total Volume(B1).....(1+2+...+6)		139091.50 Cum	

Ref: B (1.1)	PART B:- MEASUREMENTS SHEET			
Name of Work				
Construction of Scientific Landfill Site (Location 1)				
ITEM DESCRIPTION	L	W	D/H	Quantity Unit
Item No. 2 / Bottom Sealing System				
Bottom Sealing Area for Location 1				
Bottom area/Foot print area at Location 1				23006.25 Sqm
Bunds Side slop area at -4m depth to 3m Elevation	479.00	14.00	7.00	23471.00 Sqm
Bunds Top area at 3m Elevation	479.00	2.00		958.00 Sqm
Bottom area at 3m Level			10072.26	0.00 Sqm
Bunds Side slop area at 3m depth to 8m Elevation	827.50	10.00	5.00	20687.50 Sqm
Bunds Top area at 8m Elevation	827.50	2.00		1655.00 Sqm
Bottom area at 8m Level			6455.00	0.00 Sqm
Bunds Side slop area at 8m depth to 16m Elevation	827.50	16.00	8.00	52960.00 Sqm
Bunds Top area at 16m Elevation	827.50	2.00		1655.00 Sqm
Bottom area at 16m Level				0.00 Sqm
Bunds Side slop area at 16m depth to 18m Elevation	812.80	4.00	2.00	3251.20 Sqm
Bunds Top area at 18m Elevation	812.80	2.00		1625.60 Sqm
Bottom area at 18m Level				0.00 Sqm
Bunds Side slop area at 18m depth to 20m Elevation	565.00	4.00	2.00	2260.00 Sqm
Bunds Top area at 20m Elevation	565.00	2.00		1130.00 Sqm
Bottom area at 20m Level				0.00 Sqm
Bunds Side slop area at 20m depth to 22m Elevation	341.20	4.00	2.00	1364.80 Sqm
Bunds Top area at 22m Elevation	341.20	2.00		682.40 Sqm
Total.....(A)				134706.75 Sqm
2.1 GCL - 6 mm thick with Installation and Transportation (Market Rate)				
Laying Area	134706.75	Area		134706.75 Sqm
Extra for Wastage	3%			4041.20 Sqm
Total				138747.95 Sqm
2.2 HDPE Liner (1.5 mm Smooth) with Installation and Transportation (Market Rate)				
Laying Area	134706.75	Area		134706.75 Sqm
Extra for Wastage	3%			4041.20 Sqm
Total				138747.95 Sqm
2.3 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]				
Laying Area	134706.75	Area		134706.75 Sqm
Extra for Wastage	3%			4041.20 Sqm
Total				138747.95 Sqm

Ref: B (1.1)		PART B:- MEASUREMENTS SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 1)					
ITEM DESCRIPTION		L	W	D/H	Quantity Unit
2.4	Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]				
	Laying Area	134706.75	Area	0.30	40412.03 Cum
				Total	40412.03 Cum
2.5	Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]				
	Laying Area Extra for Wastage	134706.75 3%	Area		134706.75 Sqm 4041.20 Sqm
				Total	138747.95 Sqm
Item No. 3 / Leachate collection System					
3.1	Providing , Laying and fixing , jointing Eco Drain 250 mm SN-04 Nu-Drain Upvc pipe or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 & 16098 with fittings such a bends, tees, coupler, etc. jointing with rubber lubricant, including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.33/ Page no.291]				
	250 MM Pipe				266.80 Rmt
				Total	266.80 Rmt
3.2	Providing , laying and fixing , jointing Eco- drain 200 mm SN 4 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated materialetc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.32/ Page no.291]				
	200 MM Pipe				1153.73 Rmt
				Total	1153.73 Rmt
4. ADD ROYALTY					
	For Murum in void filling between 80 mm metal of soling	0.15	Per Cum	40412.03	Cum
	For metal 80 mm Above of soling	1.00	Per Cum	40412.03	Cum

Ref: B (1.1)	PART B:- MEASUREMENTS SHEET			
Name of Work				
Construction of Scientific Landfill Site (Location 1)				
ITEM DESCRIPTION	L	W	D/H	Quantity Unit
TOP SEALING SYSTEM				
Item No. 5 / Top Sealing System				
A Top Sealing Area	Topsealing area is equal to footprint area			23006.00 Sqm
B Thickness of Liner	Gas collection layer 0.3 m GCL - 6 mm thick 0.006 m HDPE Geo membrane (1.5 MM Smooth) 0.0015 m Geo textile (400 GSM) 0 m Drainage Layer 0.3 m Vegetative Soil Layer (450 mm thick) 0.45 m Total thickness of liner 1.0575 m			
Gas Collection Layer				
5.1 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]				
Drainage Layer	23006.00	Area	0.3	6901.80 Cum
Total				6901.80 Cum
Gas Collection Vent Pipe				
5.2 Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]				
Lateral pipe				Total 1153.73 Rmt
5.3 Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]				
Hader pipe				Total 30.69 Rmt
5.4 GCL - 6 mm thick with Installation and Transportation				
Laying Area	23006.00	Area		
Extra for Wastage	3%			23006.00 Sqm 690.18 Sqm
Total				23696.18 Sqm
5.5 HDPE Liner (1.5 mm Smooth) with Installation and Transportation (Market Rate)				
Laying Area	23006.00	Area		
Extra for Wastage	3%			23006.00 Sqm 690.18 Sqm
Total				23696.18 Sqm

Ref: B (1.1)	PART B:- MEASUREMENTS SHEET			
Name of Work Construction of Scientific Landfill Site (Location 1)				
ITEM DESCRIPTION	L	W	D/H	Quantity Unit
5.6 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]				
	23006.00	Area		23006.00 Sqm
		3%		690.18 Sqm
			Total	23696.18 Sqm
5.7 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]				
	23006.00	Area	0.3	23006.00 Cum
			Total	23006.00 Cum
Local top soil for vegetative growth				
5.8 Spreading fresh garden soil / silt & manure in excavated area of depth 30cms. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/Sr no. 13/ Page no. 11]				
	23006.00	Area		23006.00 Sqm
			Total	23006.00 Sqm
5.9 Mexican or Korian Grass Turf , Selection No.1 American blue grass, / Barmuda etc ready to fixlawn turf in Slabs/ Rolls of required variety as directed Rates Including breakage,& Transportation Damage losses. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/14 Lawn grass Sr no. 2/ Page no. 38]				
	23006.00	Area		23006.00 Sqm
			Total	23006.00 Sqm
6. ADD ROYALTY				
	0.15	Per Cum	6901.80	Cum
	1.00	Per Cum	6901.80	Cum

Ref: B (1.2)		PART B:- MEASUREMENTS SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 2)					
ITEM DESCRIPTION	L	W	D/H	Quantity Unit	
BOTTOM SEALING SYSTEM					
A Thickness of Liner					
Geo textile (400 GSM)			0.00 m		
Drainage Layer			0.30 m		
Geo textile (400 GSM)			0.00 m		
HDPE Geo membrane (1.5 MM Smooth)			0.0015 m		
GCL - 6 mm thick			0.006 m		
Total thickness of liner			0.3075 m		
Item No. 1 / Bunds formation					
1.1	Filling in plinth and floors with contractors material/brought from outside and approved by Engineer incharge in layers of 15 cm to 20 cm including watering and compaction etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no. 21.37/Page No. 157]				
For SLF Location 2					
	1)At 3.5m Depth to 7 m Elevation	668.13	2.00	3.50	
	Cross sectional area of Bunds.....(1)				19.25 Sqm
	Volume of Bunds.....(1)				12861.50 Cum
	2)At 7m Depth to 16 m Elevation	1057.3	2.00	9.00	
	Cross sectional area of Bunds.....(2)				99.00 Sqm
	Volume of Bunds.....(2)				104672.70 Cum
	3)At 16m Depth to 18 m Elevation	802.8	2.00	2.00	
	Cross sectional area of Bunds.....(3)				8.00 Sqm
	Volume of Bunds.....(3)				6422.40 Cum
	4)At 18m Depth to 20 m Elevation	651.52	2.00	2.00	
	Cross sectional area of Bunds.....(4)				8.00 Sqm
	Volume of Bunds.....(4)				5212.16 Cum
	5)At 20m Depth to 22 m Elevation	486	2.00	2.00	
	Cross sectional area of Bunds.....(5)				8.00 Sqm
	Volume of Bunds.....(5)				3888.00 Cum
	Total Cross sectional Area(A2).....(1+2+...+5)				142.25 Sqm
	Total Volume(B2).....(1+2+...+5)				133056.76 Cum
Item No. 2 / Bottom Sealing System					
Bottom Sealing Area for Location 2					
	Bottom area/Foot print area at Location 2				34993.00 Sqm
	Bunds Side slop area at 3.5m depth to 7m Elevation	668.13	7.00	3.50	8184.59 Sqm
	Bunds Top area at 7m Elevation	668.13	2.00		1336.26 Sqm
	Bunds Side slop area at 7m depth to 16m Elevation	1057.30	18.00	9.00	85641.30 Sqm
	Bunds Top area at 16m Elevation	1057.30	2.00		2114.60 Sqm
	Bunds Side slop area at 16m depth to 18m Elevation	802.80	4.00	2.00	3211.20 Sqm
	Bunds Top area at 18m Elevation	802.80	2.00		1605.60 Sqm
	Bunds Side slop area at 18m depth to 20m Elevation	651.52	4.00	2.00	2606.08 Sqm
	Bunds Top area at 20m Elevation	651.52	2.00		1303.04 Sqm
	Bunds Side slop area at 20m depth to 22m Elevation	486.00	4.00	2.00	1944.00 Sqm
	Bunds Top area at 22m Elevation	486.00	2.00		972.00 Sqm
	Total.....(B)				143911.67 Sqm
2.1	GCL - 6 mm thick with Installation and Transportation (Market Rate)				
	Laying Area	143911.67	Area		143911.67 Sqm
	Extra for Wastage	3%			4317.35 Sqm
	Total				148229.02 Sqm
2.2	HDPE Liner (1.5 mm Smooth) with Installation and Transportation (Market Rate)				
	Laying Area	143911.67	Area		143911.67 Sqm
	Extra for Wastage	3%			4317.35 Sqm
	Total				148229.02 Sqm

Ref: B (1.2)		PART B:- MEASUREMENTS SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 2)					
ITEM DESCRIPTION		L	W	D/H	Quantity Unit
2.3 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]					
Laying Area		143911.67	Area		143911.67 Sqm
Extra for Wastage		3%			4317.35 Sqm
		Total		148229.02	Sqm
2.4 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]					
Laying Area		143911.67	Area	0.30	43173.50 Cum
		Total		43173.50	Cum
2.5 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]					
Laying Area		143911.67	Area		143911.67 Sqm
Extra for Wastage		3%			4317.35 Sqm
		Total		148229.02	Sqm
Item No. 3 / Leachate collection System					
3.1 Providing , Laying and fixing, jointing Eco Drain 250 mm SN-04 Nu-Drain Upvc pipe or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 & 16098 with fittings such a bends, tees, coupler, etc. jointing with rubber lubricant, including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.33/ Page no.291]					
250 MM Pipe					1789.69 Rmt
		Total		1789.69	Rmt
3.2 Providing , laying and fixing ,jointing Eco- drain 200 mm SN 4 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees tees, coupler etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated materialetc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.32/ Page no.291]					
200 MM Pipe					288.40 Rmt
		Total		288.40	Rmt
4. ADD ROYALTY					
For Murum in void filling between 80 mm metal of soling		0.15	Per Cum	43173.50	Cum
For metal 80 mm Above of soling		1.00	Per Cum	43173.50	Cum

Ref: B (1.2)		PART B:- MEASUREMENTS SHEET					
Name of Work							
Construction of Scientific Landfill Site (Location 2)							
ITEM DESCRIPTION		L	W	D/H	Quantity Unit		
TOP SEALING SYSTEM							
Item No. 5 / Top Sealing System							
A	Top Sealing Area	Top sealing area is equal to footprint area			34993.00	Sqm	
B	Thickness of Liner						
		Gas collection layer			0.3 m		
		GCL - 6 mm thick			0.006 m		
		HDPE Geo membrane (1.5 MM Smooth)			0.0015 m		
		Geo textile (400 GSM)			0 m		
		Drainage Layer			0.3 m		
		Vegetative Soil Layer (450 mm thick)			0.45 m		
		Total thickness of liner			1.0575 m		
Gas Collection Layer							
5.1	Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]						
		Drainage Layer	34993.00	Area	0.3	10497.90 Cum	
					Total	10497.90 Cum	
Gas Collection Vent Pipe							
5.2	Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]						
		Lateral pipe				Total	1789.69 Rmt
5.3	Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]						
		Hader pipe				Total	28.13 Rmt
5.4	GCL - 6 mm thick with Installation and Transportation						
		Laying Area	34993.00	Area	34993.00 Sqm		
		Extra for Wastage	3%	1049.79 Sqm			
					Total	36042.79 Sqm	

Ref:	B (1.2)	PART B:- MEASUREMENTS SHEET			
Name of Work					
Construction of Scientific Landfill Site (Location 2)					
ITEM DESCRIPTION	L	W	D/H	Quantity Unit	
5.5 HDPE Liner (1.5 mm Smooth) with Installation and Transportation (Market Rate)					
Laying Area	34993.00	Area		34993.00	Sqm
Extra for Wastage	3%			1049.79	Sqm
			Total	36042.79	Sqm
5.6 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]					
Laying Area	34993.00	Area		34993.00	Sqm
Extra for Wastage	3%			1049.79	Sqm
			Total	36042.79	Sqm
5.7 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]					
Drainage Layer	34993.00	Area	0.3	34993.00	Cum
			Total	34993.00	Cum
Local top soil for vegetative growth					
5.8 Spreading fresh garden soil / silt & manure in excavated area of depth 30cms. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/Sr no. 13/ Page no. 11]					
	34993.00	Area		34993.00	Sqm
			Total	34993.00	Sqm
5.9 Mexican or Korian Grass Turf , Selection No.1 American blue grass, / Barmuda etc ready to fixlawn turf in Slabs/ Rolls of required variety as directed Rates Including breakage,& Transportation Damage losses. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/14 Lawn grass Sr no. 2/ Page no. 38]					
Landscaping Area	34993.00	Area		34993.00	Sqm
			Total	34993.00	Sqm
6. ADD ROYALTY					
For Murum in void filling between 80 mm metal of soling	0.15	Per Cum	10497.90	Cum	
For metal 80 mm Above of soling	1.00	Per Cum	10497.90	Cum	

Ref: **B (1.3)****PART B:- MEASUREMENTS SHEET**

Name of Work

Construction of Leachate Collection Tank (For Location 1)

ITEM DESCRIPTION	Nos.	L	W	D/H	Quantity Unit
Item No. 1 / Excavation					
<p>1.1 Excavation for roadway in hard rock by controlled blasting including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stocking as directed.(Inculding 50% Utilisation of useable Excavated material) [SOR Ref:-PWD/state/DSR/22-23/Item no.2.15/ Page no. 24]</p> <p style="text-align: right;">Leachate storage tank</p>	1	10.86	9.86	4.53	484.54 cum
Total :-					484.54 cum
Item No. 2 / PCC					
<p>2.1 Providing and laying Cast in situ/Ready Mix cement concrete in M15 of trap/ granite/quartzite/gneiss metal for bed blocks, foundation blocks and such other items including bailing out water, Steel centering, formwork, laying/ pumping, compacting, roughening them if special finish is to be provided, finishing uneven and honeycombed surface and curing etc. complete. The Cement Mortar 1:3 plaster is considered for rendering uneven and honeycombed surface only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (Wooden centering will not be allowed.), with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With fine aggregate (Crushed sand VSI Grade) [SOR Ref:-PWD/state/DSR/ 22-23/Item no.24.08/Paae no. 176]</p> <p style="text-align: right;">Leachate storage tank</p>	1	10.66	9.66	0.10	10.30 cum
Total :-					10.30 cum
Item No. 3 / Site Treatment					
<p>3.1 Providing preconstructional antitermite treatment as per I.S. 6313 (Part-II) treatment by treating the backfill in immediate contact with foundation at the rate of 5 litres of emulsion concentrate of 1.0 percent of clorophyrifos per One Square Metre of vertical surface area covering 10 years guarantee on bond paper. [SOR Ref:-PWD/state/DSR/22-23/Item no.21.23/Page No. 155]</p> <p style="text-align: right;">Building Size</p>	1	10.86	9.86		107.08 sqm
Total :-					107.08 sqm
Item No. 4/ R.C.C. Upto Plinth Level					
<p>4.1 Providing and laying in situ/Ready Mix cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. work in foundations like raft, strip foundations, grillage and footings of R.C.C. columns and steel stanchions etc. including bailing out water, formwork, laying/pumping cover blocks, compaction and curing roughening the surface if special finish is to be provided (Excluding reinforcement and structural steel) etc.complete, with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.25.11/Page no. 178]</p>					
For Raft RCC	1.00	10.66	9.66	0.30	30.89 cum
Long wall	2.00	10.46	0.23	4.00	19.25 cum
Short Wall	2.00	9.00	0.23	4.00	16.56 cum
Slab	1.00	10.46	9.46	0.13	12.37 cum
Total :-					79.07 cum
Opening	1.00	0.90	0.90	0.13	0.10 Cum
Total :-					0.10 cum
(A-B.....)					78.97 cum
Item No. 5 / Reinforcement					
<p>5.1 Providing and fixing in position TMT-FE-500 bar reinforcement of various diameters for R.C.C. pile caps, footings, foundations, slabs, beams columns, canopies, staircase, newels, chajjas, lintels pardis, copings, fins, arches etc. as per detailed designs, drawings and schedules. including cutting, bending, hooking the bars, binding with wires or tack welding and supporting as required complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.26.33/ Page No. 188]</p>					
For Raft RCC	30.89	@	80	Kg/Cum	2471.41 kg
Long wall	19.25	@	80	Kg/Cum	1539.71 kg
Short Wall	16.56	@	80	Kg/Cum	1324.80 kg
Slab	12.37	@	80	Kg/Cum	989.52 kg
Total :-					6,325.44 kg
(A-B.....)					6.33 MT

Ref: **B (1.3)****PART B:- MEASUREMENTS SHEET**

Name of Work

Construction of Leachate Collection Tank (For Location 1)

ITEM DESCRIPTION	Nos.	L	W	D/H	Quantity	Unit
Item No. 6 / Filling						
6.1 Filling in plinth and floors with approved excavated material in 15cm. to 20cm. layers including watering and compacting etc.complete [SOR Ref:-PWD/state/DSR/22-23/Item no.21.36/ Page No. 157]						
Total Excavation					484.54	cum
				(A).....	484.54	cum
Item No. 2 / PCC					10.30	cum
Item No. 4/ R.C.C. Upto Plinth Level					78.97	cum
Tank size					360.00	
				(B).....	449.26	cum
				Total :-	35.27	cum
Item No. 7 / Openings						
7.1 Providing and fixing Ductile iron manhole cover of light/medium/heavy duty with frame of any size over inspection chamber etc. complete (Prior permission of S.E. is to be obtained before inclusion of this item in the estimate) [SOR Ref:-PWD/state/DSR/22-23/Item no.50.30/ Page no. 336]						
Manhole cover	1.00	0.90	0.90		0.81	sqm
Assume weight 20Kg/Sqm					20.00	Kg/sqm
				Total :-	0.81	sqm
						16.20 kg
Item No. 8 / Leachate collection Pump						
8.1 Providing and installing Submersible 7.5 HP Leachate pump of ISI mark dry type squirrel cage induction type, IP 68 the class of insulation is F-class having SD 50m, 2880 RPM, 3 Phase, Dol, using copper cable of aprox 15m in length of size 1x4x2.5mm square, discharge size 80mm, capacity 16 to 20 cum per hr with head of 16 to 20m including all electrical connections, starter making connection to the motor and other safety devices to electrical panel board as per manufacturer specifications. [SOR Ref:-MJP/state/SWM DSR/23-24/section-3/Item no.B4/Page No. 37]						
Leachate Pump	1.00					1.00 Nos
9. ADD ROYALTY						
9.1						
For Sand of M-15 PCC	0.44	Per Cum	10.30			Cum
For Sand of M-20 RCC	0.43	Per Cum	79.07			Cum
For Metal 40 mm Above of M-15 PCC	0.56	Per Cum	10.30			Cum
For Metal 20 mm Above of M-15 PCC	0.22	Per Cum	10.30			Cum
For Metal 12/10 mm Above of M-15 PCC	0.11	Per Cum	10.30			Cum
For Metal 20 mm Above of M-20 RCC	0.57	Per Cum	79.07			Cum
For Metal 12/10 mm Above of M-20 RCC	0.28	Per Cum	79.07			Cum

Ref: **B (1.4)****PART B:- MEASUREMENTS SHEET**

Name of Work

Construction of Leachate Collection Tank (For Location 2)

ITEM DESCRIPTION	Nos.	L	W	D/H	Quantity Unit
Item No. 1 / Excavation					
1.1 Excavation for roadway in hard rock by controlled blasting including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stocking as directed.(Inculding 50% Utilisation of useable Excavated material) [SOR Ref:-PWD/state/DSR/22-23/Item no.2.15/ Page no. 24]					
Leachate storage tank	1	10.86	10.86	3.53	415.74 cum
				Total :-	415.74 cum
Item No. 2 / PCC					
2.1 Providing and laying Cast in situ/Ready Mix cement concrete in M15 of trap/ granite/quartzite/gneiss metal for bed blocks, foundation blocks and such other items including bailing out water, Steel centering, formwork, laying/ pumping, compacting, roughening them if special finish is to be provided, finishing uneven and honeycombed surface and curing etc. complete. The Cement Mortar 1:3 plaster is considered for rendering uneven and honeycombed surface only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (Wooden centering will not be allowed.), with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With fine aggregate (Crushed sand VSI Grade) [SOR Ref:-PWD/state/DSR/ 22-23/Item no.24.08/Page no. 176]					
Leachate storage tank	1	10.66	10.66	0.10	11.36 cum
				Total :-	11.36 cum
Item No. 3 / Site Treatment					
3.1 Providing preconstructional antitermite treatment as per I.S. 6313 (Part-II) treatment by treating the backfill in immediate contact with foundation at the rate of 5 litres of emulsion concentrate of 1.0 percent of clorophyrifos per One Square Metre of vertical surface area covering 10 years guarantee on bond paper. [SOR Ref:-PWD/state/DSR/22-23/Item no.21.23/Page No. 155]					
Building Size	1	10.86	10.86		117.94 sqm
				Total :-	117.94 sqm
Item No. 4/ R.C.C. Upto Plinth Level					
4.1 Providing and laying in situ/Ready Mix cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. work in foundations like raft, strip foundations, grillage and footings of R.C.C. columns and steel stanchions etc. including bailing out water, formwork, laying/pumping cover blocks, compaction and curing roughening the surface if special finish is to be provided (Excluding reinforcement and structural steel) etc.complete, with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.25.11/Page no. 178]					
For Raft RCC	1.00	10.66	10.66	0.30	34.09 cum
Long wall	2.00	10.46	0.23	3.00	14.43 cum
Short Wall	2.00	10.00	0.23	3.00	13.80 cum
Slab	1.00	10.46	10.46	0.13	13.68 cum
			(A.....)	Total :-	76.00 cum
Opening	1.00	0.90	0.90	0.13	0.10 Cum
			(B.....)	Total :-	0.10 cum
			(A-B.....)		75.90 cum
Item No. 5 / Reinforcement					
5.1 Providing and fixing in position TMT-FE-500 bar reinforcement of various diameters for R.C.C. pile caps, footings, foundations, slabs, beams columns, canopies, staircase, newels, chajjas, lintels pardis, copings, fins, arches etc. as per detailed designs, drawings and schedules. including cutting, bending, hooking the bars, binding with wires or tack welding and supporting as required complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.26.33/ Page No. 188]					
For Raft RCC	34.09	@	80	Kg/Cum	2727.25 kg
Long wall	14.43	@	80	Kg/Cum	1154.78 kg
Short Wall	13.80	@	80	Kg/Cum	1104.00 kg
Slab	13.68	@	80	Kg/Cum	1094.12 kg
				Total :-	6,080.15 kg
					6.08 MT

Ref: **B (1.4)****PART B:- MEASUREMENTS SHEET**

Name of Work

Construction of Leachate Collection Tank (For Location 2)

ITEM DESCRIPTION	Nos.	L	W	D/H	Quantity	Unit
Item No. 6 / Filling						
6.1 Filling in plinth and floors with approved excavated material in 15cm. to 20cm. layers including watering and compacting etc.complete [SOR Ref:-PWD/state/DSR/22-23/Item no.21.36/ Page No. 157]						
Total Excavation					415.74	cum
				(A).....	415.74	cum
Item No. 2 / PCC					11.36	cum
Item No. 4/ R.C.C. Upto Plinth Level					75.90	cum
Tank size					300.00	
				(B).....	387.26	cum
				Total :-	28.47	cum
Item No. 7 / Openings						
7.1 Providing and fixing Ductile iron manhole cover of light/medium/heavy duty with frame of any size over inspection chamber etc. complete (Prior permission of S.E. is to be obtained before inclusion of this item in the estimate) [SOR Ref:-PWD/state/DSR/22-23/Item no.50.30/ Page no. 336]						
Manhole cover	1.00	0.90	0.90		0.81	sqm
				Total :-	0.81	sqm
Assume weight 20Kg/Sqm			20.00	Kg/sqm	16.20	kg
Item No. 8/ Leachate collection Pump						
8.1 Providing and installing Submersible 7.5 HP Leachate pump of ISI mark dry type squirrel cage induction type, IP 68 the class of insulation is F-class having SD 50m, 2880 RPM, 3 Phase, Dol, using copper cable of aprox 15m in length of size 1x4x2.5mm square, discharge size 80mm, capacity 16 to 20 cum per hr with head of 16 to 20m including all electrical connections, starter making connection to the motor and other safety devices to electrical panel board as per manufacturer specifications. [SOR Ref:-MJP/state/SWM DSR/23-24/section-3/Item no.B4/Page No. 37]						
Leachate Pump	1.00					1.00 Nos
9. ADD ROYALTY						
9.1						
For Sand of M-15 PCC	0.44	Per Cum	11.36			Cum
For Sand of M-20 RCC	0.43	Per Cum	76.00			Cum
For Metal 40 mm Above of M-15 PCC	0.56	Per Cum	11.36			Cum
For Metal 20 mm Above of M-15 PCC	0.22	Per Cum	11.36			Cum
For Metal 12/10 mm Above of M-15 PCC	0.11	Per Cum	11.36			Cum
For Metal 20 mm Above of M-20 RCC	0.57	Per Cum	76.00			Cum
For Metal 12/10 mm Above of M-20 RCC	0.28	Per Cum	76.00			Cum

Ref: **B (1.5)****PART B:- MEASUREMENTS SHEET**

Name of Work

Construction of RE WALL & Gabion structure

ITEM DESCRIPTION	Nos.	L	W	D/H	Quantity Unit
Item No. 1 / Gabion Structure					
<p>1.1 Providing and Constructing gabion structure 1 Meter high or required section made up of soft mechanically woven hexagonal shaped G.I. wire conforming to IS 16014:2012 having zinc plus PVC coating of overall diameter of 3.7 mm and tying lacing wire of 3.2 mm with edge wire conforming to overall diameter 4.4 mm edges being mechanically selvage including placing in position, fitting neatly with trap stone rubble (15 to 23 cm) all loose ends to be securely tied (Excluding transportation) etc. complete. (In Dry condition and for under water installation extra cost to be considered) [SOR Ref:-PWD/state/DSR/22-23/Item no.7.21/ Page no. 72]</p>					
Below 16 m	146.57	Sqm	2.00		293.14 cum
From 16m to 18 m	47.84	Sqm	2.00		95.68 cum
From 18m to 20 m	32.55	Sqm	2.00		65.10 cum
From 20m to 22 m	16.02	Sqm	2.00		32.04 cum
				Total :-	485.96 cum
Item No. 2 / RE Wall					
<p>Construction of Reinforced Earth Wall in M-35 Block Facia by Providing and Laying CE marked Knitted and PVC coated Polyester Uniaxial Geogrid (Techgrid) of Techfab India indigenously manufactured from selected high tenacity polyester yarn with high molecular weight (> 25000 g/mol), and low carboxyl end group (<30mmol/Kilogram) for Reinforced soil wall (extruded PP geogrids & Polyester strips & Geostrips, Steel Strips not allowed & not accepted) with granular fill of PHi-32 degree (design is to be carried out in accordance with BS-8006 / FHWA) with concrete block by M-35 as facia, casting & erection of blocks with Techgrid, providing & laying levelling pad by M-15, providing and laying coping beam by M-1.20 35, providing and laying 300mm thick filtermedia etc. completed as per necessary drawing and instruction of Engineer-in-charge. Excluding providing, laying and compacting selected backfill and retained fill behind the wall, excavation and ground improvement, if any. The reinforced earth wall and slope should have 100% coverage of 5m width Knitted and PVC coated Polyester Geogrid. (Coating of Geogrid/ Reinforcing geosynthetic material with LDPE, approved, Bitumen and any other coating will not be allowed and will not be accepted). (Specification: MORTH Section3100) with prior approval of concerned Superintending Engineer. a) RE Wall Height 1 to 4 meter [SOR Ref:-PWD/state/DSR/22-23/Item no.50.45 (a)/ Page no. 72]</p>					
Length of RE wall for Location 1	320.63		2.00		641.26 Sqm
Length of RE wall for Location 1	536.46		2.00		1072.92 Sqm
				Total :-	1714.18 Sqm

Ref: **B (1.6)**

PART B:- MEASUREMENTS SHEET

Name of Work

Site formation Work

ITEM DESCRIPTION	Nos.	L	W	D/H	Quantity Unit
Item No. 1 / Site formation work					
1.1 Excavation for roadway in hard rock by controlled blasting including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stocking as directed.(Inculding 50% Utilisation of useable Excavated material)					
<small>ISQR Ref:-PWD/etate/DSR/22-23/Item no 2 15/ Page no. 241</small>					
Formation work for Leachate tank 1 (As Per Cutting & Filling sheet 1)	1.00				3856.00 cum
Formation work for Leachate tank 2 (As Per Cutting & Filling sheet 2)	1.00				2437.50 cum
				Total :-	6293.50 cum

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Sheet 1

FID	ELE	Area	Formation level	Difference	Cutting Height	Cutting Volume	Filling Height	Filling Volume
0	12.011	25	3.5	-8.511	-8.511	-212.77	0	0.00
1	14.114	12	3.5	-10.614	-10.614	-127.37	0	0.00
2	14.066	6	3.5	-10.566	-10.566	-63.40	0	0.00
3	10.728	17	3.5	-7.228	-7.228	-122.88	0	0.00
4	12.657	25	3.5	-9.157	-9.157	-228.93	0	0.00
5	11.844	7	3.5	-8.344	-8.344	-58.41	0	0.00
6	12.051	1	3.5	-8.551	-8.551	-8.55	0	0.00
7	12.535	25	3.5	-9.035	-9.035	-225.88	0	0.00
8	12.055	4	3.5	-8.555	-8.555	-34.22	0	0.00
9	12.184	18	3.5	-8.684	-8.684	-156.31	0	0.00
10	11.397	25	3.5	-7.897	-7.897	-197.43	0	0.00
11	11.395	15	3.5	-7.895	-7.895	-118.43	0	0.00
12	11.155	24	3.5	-7.655	-7.655	-183.72	0	0.00
13	11.742	3	3.5	-8.242	-8.242	-24.73	0	0.00
14	11.554	25	3.5	-8.054	-8.054	-201.35	0	0.00
15	11.119	14	3.5	-7.619	-7.619	-106.67	0	0.00
16	11.24	5	3.5	-7.74	-7.74	-38.70	0	0.00
17	11.44	1	3.5	-7.94	-7.94	-7.94	0	0.00
18	10.781	25	3.5	-7.281	-7.281	-182.03	0	0.00
19	8.812	25	3.5	-5.312	-5.312	-132.80	0	0.00
20	9.511	4	3.5	-6.011	-6.011	-24.04	0	0.00
21	8.765	3	3.5	-5.265	-5.265	-15.80	0	0.00
22	11.017	25	3.5	-7.517	-7.517	-187.92	0	0.00
23	9.687	20	3.5	-6.187	-6.187	-123.74	0	0.00
24	10.043	25	3.5	-6.543	-6.543	-163.57	0	0.00
25	8.331	21	3.5	-4.831	-4.831	-101.45	0	0.00
26	11.503	25	3.5	-8.003	-8.003	-200.08	0	0.00
27	3.311	14	3.5	0.189	0	0.00	0.189	2.65
28	13.821	2	3.5	-10.321	-10.321	-20.64	0	0.00
29	11.692	15	3.5	-8.192	-8.192	-122.88	0	0.00
30	11.587	25	3.5	-8.087	-8.087	-202.18	0	0.00
31	11.155	25	3.5	-7.655	-7.655	-191.37	0	0.00
32	11.385	4	3.5	-7.885	-7.885	-31.54	0	0.00
33	11.161	5	3.5	-7.661	-7.661	-38.31	0	0.00
			Total			-3856.00		2.65

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Sheet 2

FID	ELE	Shape_Area	Area	Formation level	Difference	Cutting Height	Cutting Volume	Filling Height	Filling Volume
12	3.5	24.87047902	24	-4	-7.5	-7.5	-180.00	0	0.00
13	3.5	24.87297993	3	-4	-7.5	-7.5	-22.50	0	0.00
14	3.5	24.8727265	25	-4	-7.5	-7.5	-187.50	0	0.00
15	3.5	24.86996085	14	-4	-7.5	-7.5	-105.00	0	0.00
16	3.5	24.8724617	5	-4	-7.5	-7.5	-37.50	0	0.00
17	3.5	24.8727265	1	-4	-7.5	-7.5	-7.50	0	0.00
18	3.5	24.8714832	25	-4	-7.5	-7.5	-187.50	0	0.00
19	3.5	24.87248795	25	-4	-7.5	-7.5	-187.50	0	0.00
20	3.5	24.87047902	4	-4	-7.5	-7.5	-30.00	0	0.00
21	3.5	24.87047902	3	-4	-7.5	-7.5	-22.50	0	0.00
23	3.5	24.87297993	20	-4	-7.5	-7.5	-150.00	0	0.00
24	3.5	24.8702595	25	-4	-7.5	-7.5	-187.50	0	0.00
25	3.5	24.8699871	21	-4	-7.5	-7.5	-157.50	0	0.00
27	3.5	24.87248795	14	-4	-7.5	-7.5	-105.00	0	0.00
32	3.5	24.87270025	4	-4	-7.5	-7.5	-30.00	0	0.00
33	3.5	24.87270025	5	-4	-7.5	-7.5	-37.50	0	0.00
3	3.5	24.87147642	17	-4	-7.5	-7.5	-127.50	0	0.00
10	3.5	24.87248795	25	-4	-7.5	-7.5	-187.50	0	0.00
26	3.5	24.87297993	25	-4	-7.5	-7.5	-187.50	0	0.00
11	3.5	24.8727265	15	-4	-7.5	-7.5	-112.50	0	0.00
30	3.5	24.8699871	25	-4	-7.5	-7.5	-187.50	0	0.00
				Total			-2437.50		0.00

Annexure 3: - SOR

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
1.5 Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness. [SOR Ref:-PWD/state/DSR/22-23/Item no.2.09/Page No. 23]	₹ 12.60	CUM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.2.09/Page No. 23	₹ 12.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 0.12	
C. Sub Total (C = A-B)	₹ 11.88	
D. Add Extra for 5% Corporation Charge	₹ 0.59	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 0.12	
F. Net Rate Arrived (C+D+E)	₹ 12.59	
1.6 Excavation for roadway in earth, soil of all sorts, sand, gravel or soft murum including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stacking as directed. [SOR Ref:-PWD/state/DSR/22-23/Item no.2.11/Page No. 23]	₹ 124.89	CUM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.2.11/Page No. 23	₹ 119.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 1.19	
C. Sub Total (C = A-B)	₹ 117.81	
D. Add Extra for 5% Corporation Charge	₹ 5.89	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 1.19	
F. Net Rate Arrived (C+D+E)	₹ 124.89	
2. PCC/ FOUNDATION		
2.1 Providing and laying Cast in situ/Ready Mix cement concrete in M15 of trap/ granite/quartzite/gneiss metal for bed blocks, foundation blocks and such other items including bailing out water, Steel centering, formwork, laying/ pumping, compacting, roughening them if special finish is to be provided, finishing uneven and honeycombed surface and curing etc. complete. The Cement Mortar 1:3 plaster is considered for rendering uneven and honeycombed surface only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (Wooden centering will not be allowed.), with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With fine aggregate (Crushed sand VSI Grade) [SOR Ref:-PWD/state/DSR/ 22-23/Item no.24.08/Page no. 176]	₹ 7,635.57	CUM
A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.24.08/Page no. 176	₹ 6,359.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 63.59	
C. Deduct SCADA	₹ 126.00	
D. Sub Total (C = A-B-C)	₹ 6,169.41	
E. Add Extra for 5% Corporation Charge	₹ 308.47	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 63.59	
G. Add Transportatin of Material		
a. Metal/ Course aggregates/40 mm	₹ 485.43	₹ 693.47 0.700
b. Metal/ Course aggregates/ 20 mm	₹ 152.56	₹ 693.47 0.220
c. Screened Sand	₹ 305.13	₹ 693.47 0.440
d. Cement	₹ 150.98	₹ 503.27 0.300
H. Total Transportation of Materials	₹ 1,094.10	
I. Net Rate Arrived (D+E+F+H)	₹ 7,635.57	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>2.2 Providing and laying Cast in situ/Ready Mix cement concrete in M-10 of trap/ granite/ quartzite/ gneiss metal for foundation and bedding including bailing out water, Steel centering, formwork, laying/pumping, compacting, roughening them if special finish is to be provided, finishing if required and curing complete, with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/concrete Batch mix plant (Pan mixer) etc. complete. With fine aggregate (Crushed sand VSI Grade) [SOR Ref:-PWD/state/DSR/ 22-23/Item no.24.01/Page no. 175]</p>	₹ 7,074.80	CUM
<p>A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.24.01/Page no. 175</p>	₹ 5,830.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 58.30	
C. Deduct SCADA	₹ 126.00	
D. Sub Total (C = A-B-C)	₹ 5,645.70	
E. Add Extra for 5% Corporation Charge	₹ 282.29	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 58.30	
G. Add Transportatin of Material		Carting Rate Proportion
a. Metal/ Course aggregates/40 mm	₹ 485.43	₹ 693.47 0.700
b. Metal/ Course aggregates/ 20 mm	₹ 166.43	₹ 693.47 0.240
c. Screened Sand	₹ 325.93	₹ 693.47 0.470
d. Cement	₹ 110.72	₹ 503.27 0.220
H. Total Transportation of Materials	₹ 1,088.51	
I. Net Rate Arrived (D+E+F+H)	₹ 7,074.80	
3. COLUMN/ FOUNDATION		
<p>3.1 Providing and laying in situ/Ready Mix cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. work in foundations like raft, strip foundations, grillage and footings of R.C.C. columns and steel stanchions etc. including bailing out water, formwork, laying/pumping cover blocks, compaction and curing roughening the surface if special finish is to be provided (Excluding reinforcement and structural steel) etc.complete, with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.25.11/Page no. 178]</p>	₹ 8,383.67	CUM
<p>A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.25.11/Page no. 178</p>	₹ 7,104.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 71.04	
C. Deduct SCADA	₹ 126.00	
D. Sub Total (C = A-B-C)	₹ 6,906.96	
E. Add Extra for 5% Corporation Charge	₹ 345.35	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 71.04	
G. Add Transportatin of Material		Carting Rate Proportion
a. Metal/ Course aggregates/ 40 mm (Crusher Metal)	₹ 395.28	₹ 693.47 0.570
b. Metal/ Course aggregates/ 20 mm	₹ 194.17	₹ 693.47 0.280
c. Sand	₹ 294.72	₹ 693.47 0.425
d. Cement	₹ 176.14	₹ 503.27 0.350
H. Total Transportation of Materials	₹ 1,060.32	
I. Net Rate Proposed (D+E+F+H)	₹ 8,383.67	
4. FILLING/ FOUNDATION		
<p>4.1 Filling in plinth and floors with approved excavated material in 15cm. to 20cm. layers including watering and compacting etc.complete [SOR Ref:-PWD/state/DSR/22-23/Item no.21.36/ Page No. 157]</p>	₹ 125.94	CUM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.21.36/ Page No. 157</p>	₹ 120.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 1.20	
C. Sub Total (C = A-B)	₹ 118.80	
D. Add Extra for 5% Corporation Charge	₹ 5.94	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 1.20	
F. Net Rate Arrived (C+D+E)	₹ 125.94	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
5. COLUMN ABOVE GROUND LEVEL		
5.1 Providing and laying Cast in situ/Ready Mix cement concrete M- 20 of trap / granite /quartzite/ gneiss metal for R.C.C. columns as per detailed designs and drawing or as directed including centering, formwork, cover blocks, laying/pumping, compaction finishing the formed surfaces with cement mortar 1:3 of sufficient minimum thickness to give a smooth and even surface or roughening if special finish is to be provided and curing etc. complete, (Excluding reinforcement and structural steel).with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand [SOR Ref:-PWD/state/DSR/ 22-23/Item no.25.31/Page no. 179]	₹ 15,393.28	CUM
<i>A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.25.31/Page no. 179</i>	₹ 13,783.00	
<i>B. Deduct 1% on Labour Ami./ cess/ insu.</i>	₹ 137.83	
<i>C. Deduct SCADA</i>	₹ 126.00	
<i>D. Sub Total (C = A-B-C)</i>	₹ 13,519.17	
<i>E. Add Extra for 5% Corporation Charge</i>	₹ 675.96	
<i>F. Add Deducted 1% on Labour Ami./ cess/ insu.</i>	₹ 137.83	
<i>G. Add Transportatin of Material</i>		<i>Carting Rate Proportion</i>
<i>a. Metal/ Course aggregates/ 40 mm (Crusher Metal)</i>	₹ 395.28	₹ 693.47 0.570
<i>b. Metal/ Course aggregates/ 20 mm</i>	₹ 194.17	₹ 693.47 0.280
<i>c. Sand</i>	₹ 294.72	₹ 693.47 0.425
<i>d. Cement</i>	₹ 176.14	₹ 503.27 0.350
<i>H. Total Transportation of Materials</i>	₹ 1,060.32	
<i>I. Net Rate Proposed (D+E+F+H)</i>	₹ 15,393.28	
6. BEAMS		
6.1 Providing and laying Cast in situ/Ready Mix cement concrete M- 20 of trap / granite /quartzite/ gneiss metal for R.C.C. beams and lintels as per detailed designs and drawings or as directed including centering, formwork, cover blocks, laying/pumping, compactionand roughening the surface if special finish is to be provided and curing etc. complete. (Excluding reinforcement and structural steel). with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand [SOR Ref:-PWD/state/DSR/ 22-23/Item no.25.50/Page no. 181]	₹ 13,804.33	CUM
<i>A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.25.50/Page no. 181</i>	₹ 12,269.00	
<i>B. Deduct 1% on Labour Ami./ cess/ insu.</i>	₹ 122.69	
<i>C. Deduct SCADA</i>	₹ 126.00	
<i>D. Sub Total (C = A-B-C)</i>	₹ 12,020.31	
<i>E. Add Extra for 5% Corporation Charge</i>	₹ 601.02	
<i>F. Add Deducted 1% on Labour Ami./ cess/ insu.</i>	₹ 122.69	
<i>G. Add Transportatin of Material</i>		<i>Carting Rate Proportion</i>
<i>a. Metal/ Course aggregates/ 40 mm (Crusher Metal)</i>	₹ 395.28	₹ 693.47 0.570
<i>b. Metal/ Course aggregates/20 mm</i>	₹ 194.17	₹ 693.47 0.280
<i>c. Sand</i>	₹ 294.72	₹ 693.47 0.425
<i>d. Cement</i>	₹ 176.14	₹ 503.27 0.350
<i>H. Total Transportation of Materials</i>	₹ 1,060.32	
<i>I. Net Rate Proposed (D+E+F+H)</i>	₹ 13,804.33	
7. FILLING/ FLOORING		
7.1 Filling in plinth and floors with contractors material/brought from outside and approved by Engineer incharge in layers of 15 cm to 20 cm including watering and compaction etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no. 21.37/Page No. 157]	₹ 1,293.23	CUM
<i>A. Basic Rate as per PWD/state/DSR/22-23/Item no. 21.37/Page No. 157</i>	₹ 599.00	
<i>B. Deduct 1% on Labour Ami./ cess/ insu.</i>	₹ 5.99	
<i>C. Sub Total (C = A-B)</i>	₹ 593.01	
<i>D. Add Extra for 5% Corporation Charge</i>	₹ 29.65	
<i>E. Add Deducted 1% on Labour Ami./ cess/ insu.</i>	₹ 5.99	
<i>F. Add Transportatin of Material</i>		<i>Carting Rate Proportion</i>
<i>a. Hard Murum</i>	₹ 664.58	₹ 664.58 1.000
<i>G. Total Transportation of Materials</i>	₹ 664.58	
<i>H. Net Rate Proposed (C+D+E+G)</i>	₹ 1,293.23	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION		Net Rate Proposed	Unit
7.2 Providing soling using 80 mm size trap metal in 15 cm. layer including filling voids with Crushed sand/grit, ramming, watering etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.21.40/Page no. 157]		₹ 2,290.24	CUM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.21.40/Page no. 157	₹	1,454.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹	14.54	
C. Sub Total (C = A-B)	₹	1,439.46	
D. Add Extra for 5% Corporation Charge	₹	71.97	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹	14.54	
F. Add Transportatin of Material			Carting Rate Proportion
a. Metal/ Course aggregates/ 80 mm (Hand Broken Metal)	₹	664.58	₹ 664.58 1.000
b. Hard Murum	₹	99.69	₹ 664.58 0.150
G. Total Transportation of Materials	₹	764.27	
H. Net Rate Proposed (C+D+E+G)	₹	<u>2,290.24</u>	
7.3 Providing and laying cement concrete flooring 50 mm thick with M15 cement concrete laid to proper level and slope in alternate bays including compaction filling joints, marking lines to give the appearance of tiles of 30cm x 30cm or other size laid diagonally/ square etc finishing smooth (with extra cement) in any colour as directed and curing etc. complete. With Natural Sand [SOR Ref:-PWD/state/DSR/22-23/Item no.33.13/Page no. 214]		₹ 664.71	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.33.13/Page no. 214	₹	581.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹	5.81	
C. -	₹	-	
D. Sub Total (C = A-B-C)	₹	575.19	
E. Add Extra for 5% Corporation Charge	₹	28.76	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹	5.81	
G. Add Transportatin of Material			Carting Rate Proportion
a. Metal/ Course aggregates /20 mm	₹	22.88	₹ 693.47 0.033
b. Metal/ Course aggregates /12/10 mm	₹	7.63	₹ 693.47 0.011
c. Sand	₹	15.26	₹ 693.47 0.022
d. Cement	₹	9.18	₹ 503.27 0.018
H. Total Transportation of Materials	₹	54.95	
I. Net Rate Proposed (D+E+F+H)	₹	<u>664.71</u>	
7.4 Providing and laying Antiskid Ceramic tiles of approved quality of size 30 cm x 30 cm and confirming to IS 15622-2006 (Group-B IIA) for antiskid flooring in required position laid on a bed of 1:4 cement mortar including cement float, filling joint with cement slurry cleaning curing etc. complete. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.33.67/ Page No. 220]		₹ 1,276.22	SQM
A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.33.67/ Page No. 220	₹	1,200.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹	12.00	
C. -	₹	-	
D. Sub Total (C = A-B-C)	₹	1,188.00	
E. Add Extra for 5% Corporation Charge	₹	59.40	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹	12.00	
G. Add Transportatin of Material			Carting Rate Proportion
a. Sand	₹	11.79	₹ 693.47 0.017
b. Cement	₹	5.03	₹ 503.27 0.010
H. Total Transportation of Materials	₹	16.82	
I. Net Rate Proposed (D+E+F+H)	₹	<u>1,276.22</u>	
7.5 Machine polishing to cement/marble mosaic tiled flooring or any other type of flooring including cleaning, washing, etc. complete. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.33.78/ Page No. 221]		₹ 204.41	SQM
A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.33.78/ Page No. 221	₹	177.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹	1.77	
C. -	₹	-	
D. Sub Total (C = A-B-C)	₹	175.23	
E. Add Extra for 5% Corporation Charge	₹	8.76	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹	1.77	
G. Add Transportatin of Material			Carting Rate Proportion
a. Sand	₹	13.87	₹ 693.47 0.020
b. Cement	₹	4.78	₹ 503.27 0.010
H. Total Transportation of Materials	₹	18.65	
I. Net Rate Proposed (D+E+F+H)	₹	<u>204.41</u>	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
8. SLABS		
<p>8.1 Providing and laying Cast in situ/Ready Mix cement concrete M- 20 of trap/ granite / quartzite/ gneiss metal for R.C.C. slabs and landings as per detailed designs and drawings including centering, formwork, cover blocks, laying/pumping, compaction/finishing the formed surfaces with cement mortar 1:3 of sufficient minimum thickness to give a smooth and even surface or roughening if special finish is to be provided and curing etc. complete.(Excluding reinforcement and structural steel).with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand [SOR Ref:-PWD/state/DSR/22-23/item no. 25.70/ page no. 182]</p>	₹ 15,550.00	CUM
A. Basic Rate as per PWD/state/DSR/22-23/item no. 25.70/ page no. 182	₹ 13,932.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 139.32	
C. Deduct SCADA	₹ 126.00	
D. Sub Total (C = A-B-C)	₹ 13,666.68	
E. Add Extra for 5% Corporation Charge	₹ 683.33	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 139.32	
G. Add Transportatin of Material		Carting Rate Proportion
a. Metal/ Course aggregates/ 20 mm	₹ 395.28	₹ 693.47 0.570
b. Metal/ Course aggregates/12/10 mm	₹ 194.17	₹ 693.47 0.280
c. Sand	₹ 294.72	₹ 693.47 0.425
d. Cement	₹ 176.14	₹ 503.27 0.350
H. Total Transportation of Materials	₹ 1,060.32	
I. Net Rate Proposed (D+E+F+H)	₹ 15,549.65	
9. REINFORCEMENT		
<p>9.1 Providing and fixing in position TMT-FE-500 bar reinforcement of various diameters for R.C.C. pile caps, footings, foundations, slabs, beams columns, canopies, staircase, newels, chajjas, lintels pardis, copings, fins, arches etc. as per detailed designs, drawings and schedules. including cutting, bending, hooking the bars, binding with wires or tack welding and supporting as required complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.26.33/ Page No. 188]</p>	₹ 94,646.57	Metric Ton
A. Basic Rate as per PWD/state/DSR/22-23/Item no.26.33/ Page No. 188	₹ 89,703.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 897.03	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 88,805.97	
E. Add Extra for 5% Corporation Charge	₹ 4,440.30	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 897.03	
G. Add Transportatin of Material		Carting Rate Proportion
a. Steel / TMT FE 500 steel bars	₹ 503.27	₹ 503.27 1.000
H. Total Transportation of Materials	₹ 503.27	
I. Net Rate Proposed (D+E+F+H)	₹ 94,646.57	
10. OPENING/ DOOR & WINDOWS		
<p>10.1 Providing and fixing steel window of various sizes as per detailed drawing without hot dip zinc coating, without ventilators, including fabricating / glazing with plain / obscured glass panels of approved type and quality, iron oxidised fixtures and fastenings, finishing with oil painting two coats complete (with guard bars 12 mm square at 10 cm c/c.) [SOR Ref:-PWD/state/DSR/22-23/Item no.39.20/ Page no. 247]</p>	₹ 5,115.26	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.39.20/ Page no. 247	₹ 4,874.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 48.74	
C. Sub Total (C = A-B)	₹ 4,825.26	
D. Add Extra for 5% Corporation Charge	₹ 241.26	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 48.74	
F. Net Rate Arrived (C+D+E)	₹ 5,115.26	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>10.2 Providing and fixing rolling shutter fabricated from steel laths of minimum thickness 0.9 mm with lock plate of 3.15 mm thickness reinforced with 35 x 35 x 5 mm angle section fitted with sliding bolts and handles for both sides, deep M.S. channel section of depth and thickness not less than 65 mm and 3.15 mm respectively with hold fast arrangements, M.S. Bracket plate 300 x 300 x 3.15 mm minimum size and shape with square bar, suspension shaft of minimum 32 mm diameter, hood cover of M.S. sheet not less than 0.9 mm thickness and of any size at top and safety devices including mechanical gear operation arrangement consisting of worm gear wheels and worms of high grade cast iron or mild steel and one coat of red lead primer etc. complete. (I.S. 62481979) (With mechanical gear) [SOR Ref:-PWD/state/DSR/22-23/Item no.39.25/ Page no. 249]</p>	₹ 5,570.75	SQM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.39.25/ Page no. 249</p>	₹ 5,308.00	
<p>B. Deduct 1% on Labour Ami./ cess/ insu.</p>	₹ 53.08	
<p>C. Sub Total (C = A-B)</p>	₹ 5,254.92	
<p>D. Add Extra for 5% Corporation Charge</p>	₹ 262.75	
<p>E. Add Deducted 1% on Labour Ami./ cess/ insu.</p>	₹ 53.08	
<p>F. Net Rate Arrived (C+D+E)</p>	₹ 5,570.75	
<p>10.3 Providing and fixing 34 mm thick moulded door shutter consisting of solid core single leaf flush door of 30 mm thickness lipped with 15 mm (5mm x 3) thick x 30 mm width on one style and top rail and 10 mm (5mm x 2) thick x 30 mm width on other style and bottom rails. The inner panels laminated with 2 mm thick termite proof, water proof and fire resistant moulded PVC sheet with 2,4,6 design in different plain and /or prelim colours on one side after routing the moulded design on flush doors and 2 mm plain and /or pre lam PVC on other side using rubber adhesive on flush door and solvent cement adhesive on the PVC lipping etc. as per direction of Engineer in charge and manufacturers specification and drawing etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.39.56/ Page No. 256]</p>	₹ 7,786.24	SQM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.39.56/ Page No. 256</p>	₹ 7,419.00	
<p>B. Deduct 1% on Labour Ami./ cess/ insu.</p>	₹ 74.19	
<p>C. Sub Total (C = A-B)</p>	₹ 7,344.81	
<p>D. Add Extra for 5% Corporation Charge</p>	₹ 367.24	
<p>E. Add Deducted 1% on Labour Ami./ cess/ insu.</p>	₹ 74.19	
<p>F. Net Rate Arrived (C+D+E)</p>	₹ 7,786.24	
<p>10.4 Providing and fixing 34 mm thick moulded door shutter consisting of solid core single leaf flush door of 30 mm thickness lipped with 15 mm (5mm x 3) thick x 30 mm width on one style and top rail and 10 mm (5mm x 2) thick x 30 mm width on other style and bottom rails. The inner panels laminated with 2 mm thick termite proof, water proof and fire resistant moulded PVC sheet with 2,4,6 design in different plain and /or prelim colours on one side after routing the moulded design on flush doors and 2 mm plain and /or pre lam PVC on other side using rubber adhesive on flush door and solvent cement adhesive on the PVC lipping etc. as per direction of Engineer in charge and manufacturers specification and drawing etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.39.56/ Page No. 256]</p>	₹ 7,786.24	SQM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.39.56/ Page No. 256</p>	₹ 7,419.00	
<p>B. Deduct 1% on Labour Ami./ cess/ insu.</p>	₹ 74.19	
<p>C. Sub Total (C = A-B)</p>	₹ 7,344.81	
<p>D. Add Extra for 5% Corporation Charge</p>	₹ 367.24	
<p>E. Add Deducted 1% on Labour Ami./ cess/ insu.</p>	₹ 74.19	
<p>F. Net Rate Arrived (C+D+E)</p>	₹ 7,786.24	
<p>10.5 Providing and fixing solid core flush door shutter in double leaf 32 mm thick decorative ype of exterior grade as per detailed drawings approved face veneers 3 mm thick on both aces or as directed, all necessary beads, mouldings and lipping, wrought iron hold fasts, chromium plated fixtures and fastenings, with brass mortise lock, chromium plated handles on both sides, and finishing with French Polish etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.39.95/ Page No. 293]</p>	₹ 3,971.31	SQM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.39.95/ Page No. 239</p>	₹ 3,784.00	
<p>B. Deduct 1% on Labour Ami./ cess/ insu.</p>	₹ 37.84	
<p>C. Sub Total (C = A-B)</p>	₹ 3,746.16	
<p>D. Add Extra for 5% Corporation Charge</p>	₹ 187.31	
<p>E. Add Deducted 1% on Labour Ami./ cess/ insu.</p>	₹ 37.84	
<p>F. Net Rate Arrived (C+D+E)</p>	₹ 3,971.31	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
10.6 Providing and fixing aluminium grill diamond mesh type DG202 of 7.5 mm thick including fixing in position anodised aluminium frame section of 80 x 38 mm x 1.22 mm size box, cutting to the required size with all wastage, labour, lead lift etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.39.76/ Page No. 260]	₹ 6,160.57	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.39.76/ Page No. 260	₹ 5,870.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 58.70	
C. Sub Total (C = A-B)	₹ 5,811.30	
D. Add Extra for 5% Corporation Charge	₹ 290.57	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 58.70	
F. Net Rate Arrived (C+D+E)	₹ 6,160.57	
11. BRICKWORK		
11.1 Providing second class Burnt Brick masonry with conventional/I.S. type bricks in cement mortar 1:6 in superstructure including striking joints, raking out joints, watering and scaffolding etc. Complete [SOR Ref:-PWD/state/DSR/22-23/Item no.27.05/ Page No. 197]	₹ 10,191.17	CUM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.27.05/ Page No. 197	₹ 7,994.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 79.94	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 7,914.06	
E. Add Extra for 5% Corporation Charge	₹ 395.70	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 79.94	
G. Add Transportatin of Material		Carting Rate Proportion
a. Brick	₹ 1,539.80	₹ 1,620.84 0.950
b. Sand	₹ 221.91	₹ 693.47 0.320
c. Cement	₹ 39.76	₹ 503.27 0.079
H. Total Transportation of Materials	₹ 1,801.47	
I. Net Rate Proposed (D+E+F+H)	₹ 10,191.17	
11.2 Providing second class Burnt Brick masonry with conventional/ I.S. type bricks in cement mortar 1:6 in foundations and plinth of inner walls/ in plinth external walls including bailing out water manually, striking joints on unexposed faces, raking out joints on exposed faces and watering etc. Complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.27.01/ Page No. 197]	₹ 9,940.34	CUM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.27.01/ Page No. 197	₹ 7,755.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 77.55	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 7,677.45	
E. Add Extra for 5% Corporation Charge	₹ 383.87	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 77.55	
G. Add Transportatin of Material		Carting Rate Proportion
a. Brick	₹ 1,539.80	₹ 1,620.84 0.950
b. Sand	₹ 221.91	₹ 693.47 0.320
c. Cement	₹ 39.76	₹ 503.27 0.079
H. Total Transportation of Materials	₹ 1,801.47	
I. Net Rate Proposed (D+E+F+H)	₹ 9,940.34	
11.3 Providing internal cement plaster 20mm thick in two coats in cement mortar 1:3 without neeru finish, to concrete, brick surface, in all positions including scaffolding and curing etc.complete. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.32.08/ Page No. 209]	₹ 434.80	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.32.08/ Page No. 209	₹ 393.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 3.93	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 389.07	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 19.45	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 3.93	
G. Add Transportatin of Material		Carting Rate Proportion
a. Sand	₹ 16.64	₹ 693.47 0.024
b. Cement	₹ 5.74	₹ 503.27 0.011
H. Total Transportation of Materials	₹ 22.38	
I. Net Rate Proposed (D+E+F+H)	₹ 434.83	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION		Net Rate Proposed	Unit
11.3 Providing Laterite stone masonry in cement mortar 1:6 in Superstructure including racking out joints when plastering is to be done/striking joints when no plastering is to be done watering and scaffolding. [SOR Ref:-PWD/Division/DSR/22-23/Item no.6/ Page No. 1]		₹ 7,002.50	CUM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.27.01/ Page No. 197	₹ 6,509.00		
B. Deduct on Labour Ami./ cess/ insu.	₹ 65.09		
C. -	₹ -		
D. Sub Total (C = A-B-C)	₹ 6,443.91		
E. Sub Total (C = A-B-C)	₹ 322.20		
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 65.09		
G. Add Transportatin of Material			Carting Rate Proportion
a. Laterite Stone	₹ -	₹ -	0.739
b. Sand	₹ 145.63	₹ 693.47	0.210
c. Cement	₹ 25.67	₹ 503.27	0.051
H. Total Transportation of Materials	₹ 171.30		
I. Net Rate Proposed (D+E+F+H)	₹ 7,002.49		
12. PLASTERING			
12.1 Providing internal cement plaster 12mm thick in single coat in cement mortar 1:4 without neeru finish to concrete or brick surfaces, in all positions including scaffolding and curing etc. complete. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.32.04/ Page No. 209]		₹ 304.93	SQM
A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.32.04/ Page No. 209	₹ 278.00		
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 2.78		
C. -	₹ -		
D. Sub Total (C = A-B-C)	₹ 275.22		
E. Add Extra for 5% Corporation Charge	₹ 13.76		
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 2.78		
G. Add Transportatin of Material			Carting Rate Proportion
a. Sand	₹ 10.40	₹ 693.47	0.015
b. Cement	₹ 2.77	₹ 503.27	0.006
H. Total Transportation of Materials	₹ 13.17		
I. Net Rate Proposed (D+E+F+H)	₹ 304.93		
12.2 Providing internal cement plaster 20mm thick in two coats in cement mortar 1:4 without neeru finish, to concrete, brick surface, in all positions including scaffolding and curing etc.complete. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.32.07/ Page No. 209]		₹ 422.52	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.32.07/ Page No. 209	₹ 382.00		
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 3.82		
C. -	₹ -		
D. Sub Total (C = A-B-C)	₹ 378.18		
E. Add Extra for 5% Corporation Charge	₹ 18.91		
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 3.82		
G. Add Transportatin of Material			Carting Rate Proportion
a. Sand	₹ 17.34	₹ 693.47	0.025
b. Cement	₹ 4.28	₹ 503.27	0.009
H. Total Transportation of Materials	₹ 21.61		
I. Net Rate Proposed (D+E+F+H)	₹ 422.52		
12.3 Providing internal cement plaster 20mm thick in two coats in cement mortar 1:3 without neeru finish, to concrete, brick surface, in all positions including scaffolding and curing etc.complete. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.32.08/ Page No. 209]		₹ 434.80	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.32.08/ Page No. 209	₹ 393.00		
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 3.93		
C. -	₹ -		
D. Sub Total (C = A-B-C)	₹ 389.07		
E. Add Extra for 5% Corporation Charge	₹ 19.45		
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 3.93		
G. Add Transportatin of Material			Carting Rate Proportion
a. Sand	₹ 16.64	₹ 693.47	0.024
b. Cement	₹ 5.74	₹ 503.27	0.011
H. Total Transportation of Materials	₹ 22.38		
I. Net Rate Proposed (D+E+F+H)	₹ 434.83		

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
13. COLOURING		
<p>13.1 Providing and applying colour-wash of approved colour and shade in two coats to new surface including scaffolding, brushing and brooming down (excluding base coat of white-wash) etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.36.05/ Page no. 227]</p>	₹ 19.94	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.36.05/ Page no. 227	₹ 19.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 0.19	
C. Sub Total (C = A-B)	₹ 18.81	
D. Add Extra for 5% Corporation Charge	₹ 0.94	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 0.19	
F. Net Rate Arrived (C+D+E)	₹ 19.94	
14. STEEL SHED WORKS		
<p>14.1 Providing and fabricating structural steel work in rolled sections, fixed with connecting plates or angle cleats in main and cross beams, hip and jack rafters, purlins connecting to truss members and the like, as per detailed designs and drawing or as directed including cutting, fabricating, hoisting, erecting, fixing in position, making riveted /bolted / welded connections and one coat of anticorrosive paint and over it two coats of oil painting of approved quality and shade etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.23.02/Page No. 173]</p>	₹ 1,06,885.28	Metric Ton
A. Basic Rate as per PWD/state/DSR/22-23/Item no.23.02/Page No. 173	₹ 1,01,844.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 1,018.44	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 1,00,825.56	
E. Add Extra for 5% Corporation Charge	₹ 5,041.28	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 1,018.44	
G. Add Transportatin of Material		<i>Carting Rate Proportion</i>
a. Steel Transport	₹ -	₹ - 1.000
H. Total Transportation of Materials	₹ -	
I. Net Rate Proposed (D+E+F+H)	₹ 1,06,885.28	
<p>14.2 Providing and fixing colour coated Zinalume (R) AZ150 (min 150 gms/sq.mt. total on each side) profiled sheets for roofing. The feed material is manufactured out of nominal 0.45 mm Base Metal Thickness (BMT) (0.5 mm TCT), Hi-strength steel with min.550 MPa yield strength, metallic hot dip coated with Aluminium-Zinc alloy (55% aluminium 43.4% zinc 1.6% silicon) with COLORBOND (R) steel quality super durable polyester paint coat (with inorganic pigment). The paint shall have a total coating thickness of nominal 35 um, comprising of nominal 25 um exterior coat on top surface and nominal 10 um reverse coat on back surface. Profile sheet shall have nom. 9501050 mm effective cover width and nominal 25-30 mm deep ribs with subtle square fluting in the five pan at nominal 180-250 mm center- to-center. The end rib shall be designed for anti-capillary groove. and return leg. The feed material should have coil manufacturers product details marked a regular interval. Including fasteners with min. fastened with min. 25 um Zinc-Tin alloy coated, Hex head, self-drilling screw etc. complete. (weight of profile 4.52 Kilogram/ One Square Metre) [SOR Ref:-PWD/state/DSR/22-23/Item no.38.34/ Page no. 236]</p>	₹ 1,231.06	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.38.34/ Page no. 236	₹ 1,173.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 11.73	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 1,161.27	
E. Add Extra for 5% Corporation Charge	₹ 58.06	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 11.73	
G. Add Transportatin of Material		<i>Carting Rate Proportion</i>
a. Steel Transport	₹ -	₹ - 1.000
H. Total Transportation of Materials	₹ -	
I. Net Rate Proposed (D+E+F+H)	₹ 1,231.06	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>14.3 Providing and fixing self supporting steel roofing system for a Godown or alike made up of structural grade steel sheet of 912 millimeter width (tolerance +/- 2 millimeter), moulded at site using mechanical press dies to the desired curve and shape to form 605 millimeter wide interlocking panels . The interlocking panels shall be pressed to close the seam forming water tight joints for a span of 15.30 meter having arch rise as 3.06 meter, arch length 17.75 meter. The base material made up of imported galvalume steel complying to ASTM A792 having base metal thickness of 0.80 millimeter (tolerace + / - 0.02 millimeter) with alloy coating AZ 150 and paint coating of regular modified polyster , top coat 25 micron and bottom coat 12 micron as per approved colour , including fixing hangers , clamps etc.as may be necessary of Proflex standard, including fixing sky light of 2 millimeter thick polycarbonate sheet of size 2' x 7' and turbo ventilator of 24" diameter to be installed at every 30 feet along the length of roof including finishing, testing and cleaning etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.38.41/ Page no. 239]</p>	₹ 2,376.07	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.38.41/ Page no. 239	₹ 2,264.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 22.64	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 2,241.36	
E. Add Extra for 5% Corporation Charge	₹ 112.07	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 22.64	
G. Add Transportatin of Material		Carting Rate Proportion
a. Steel Transport	₹ -	₹ - 1.000
H. Total Transportation of Materials	₹ -	
I. Net Rate Proposed (D+E+F+H)	₹ 2,376.07	
<p>14.4 Providing and fixing corrugated galvanised iron sheets of 0.63mm thick (24 B.W.G.) for roofing without wind tiles including fastening with galvanised iron screws and bolts, lead and bitumen washers as per drawing etc. complete.(Weight of 5.5 Kilogram/sq.m.) [SOR Ref:-PWD/state/DSR/22-23/Item no.38.04/ Paage no. 2331 [SOR Ref:-PWD/state/DSR/22-23/Item no.38.34/ Page no. 236]</p>	₹ 913.05	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.38.04/ Paage no. 2331	₹ 870.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 8.70	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 861.30	
E. Add Extra for 5% Corporation Charge	₹ 43.07	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 8.70	
G. Add Transportatin of Material		Carting Rate Proportion
a. Steel Transport	₹ -	₹ - 1.000
H. Total Transportation of Materials	₹ -	
I. Net Rate Proposed (D+E+F+H)	₹ 913.07	
15. Other		
<p>15.1 Providing and fixing 50mm diameter and 1.5 mm thick vertical and top Stainless steel hand railing in S.S.304 Grade with Stainless steel square / circular pipe bracing of size 32 mm x32mm x1.5 mm in 3 rows including fabricating ,fixtures, errecting, necessary welding, grinding, finishing, buffing to stainless steel pipe etc. complete [SOR Ref:-PWD/state/DSR/22-23/Item no.51.111/Page No. 379]</p>	₹ 3,633.37	RM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.51.111/Page No. 379	₹ 3,462.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 34.62	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 3,427.38	
E. Add Extra for 5% Corporation Charge	₹ 171.37	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 34.62	
G. Add Transportatin of Material		Carting Rate Proportion
a. Steel Transport	₹ -	₹ - 1.000
H. Total Transportation of Materials	₹ -	
I. Net Rate Proposed (D+E+F+H)	₹ 3,633.37	
<p>15.2 Providing and laying damp proof course 50 mm thick in M20 cement concrete layer and bitumen / using cement with waterproofing compound curing, formwork etc. complete. [SOR Ref:-PWD/state/DSR/ 22-23/Item no.31.01/Page no. 205]</p>	₹ 527.32	SQM
A. Basic Rate as per PWD/state/DSR/ 22-23/Item no.31.01/Page no. 205	₹ 432.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 4.32	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 427.68	
E. Add Extra for 5% Corporation Charge	₹ 21.38	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 4.32	
G. Add Transportatin of Material		Carting Rate Proportion
a. Metal/ Course aggregates/ 40 mm (Crusher Metal)	₹ 27.74	₹ 693.47 0.040
b. Metal/ Course aggregates/ 20 mm	₹ 22.88	₹ 693.47 0.033
c. Sand	₹ 15.26	₹ 693.47 0.022
d. Cement	₹ 8.05	₹ 503.27 0.016
H. Total Transportation of Materials	₹ 73.93	
I. Net Rate Proposed (D+E+F+H)	₹ 527.32	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>15.3 Providing and applying one coat of thiazolinones (TZ) based Microbial Wall Wash and Anti-rooting Solution treatment as approved by Engineer in charge to entire surface of external wall. At the junction of chajja and wall and also on the parapet wall top, give a coat of anti fungal treatment. Cracks, if any, shall be filled with acrylic polymeric nonshrink crack filler putty as approved by Engineer in charge, before giving waterproofing treatment to the external surfaces. This is followed by one coat of 2 (methoxycarbonyl)-1-propene-Butyl-2 propenoate (MPBP) based polymeric waterproofing solution as approved by Engineer in charge, having a non toxic acrylic polymer liquid and white cement mix in proportion 1:1 by weight with coat interval as 24 hours. Air curing shall be done for 24 hours. Before giving this treatment the entire surface of wall shall be thoroughly cleaned to remove existing paint, dust, dirt, oil etc. After the waterproofing treatment is cured, provide and apply two coats of titanium dioxide based 2-(methoxycarbonyl)-1-propenebutyl-2 propenoate (TMPBP) emulsion, heat insulating, waterproofing exterior coating as approved by Engineer in charge in the desired shade. The inter-coat gap to be 24 hours. The rate shall include complete treatment mentioned above. 100% Acrylic, Decorative, Waterproofing, Heat Insulating, Exterior Coating, Anticarbonation Coating should have following minimum properties: 1. Specific Gravity: 1.3 ± 0.1 at 25°C 2. pH: 7.0 to 10.00 3. Viscosity: 18 to 30 sec. at 25°C by Ford Cup No. B-4 (Dilute 2 parts of product with 1 part of water) (If scaffolding is required, same shall be provided and will be paid under relevant item) [SOR Ref:-PWD/state/DSR/22-23/Item no.52.19/ Page no. 430]</p>	₹ 413.50	SQM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.52.19/ Page no. 430</p>	₹ 394.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 3.94	
C. Sub Total (C = A-B)	₹ 390.06	
D. Add Extra for 5% Corporation Charge	₹ 19.50	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 3.94	
F. Net Rate Arrived (C+D+E)	₹ 413.50	
<p>15.4 Providing and fixing mild steel grill gate with angle iron frame 65mm x 65mm x 10mm with iron bars at 150mm C/C and diagonal flats as per the detailed drawing including hinges, pivot block locking arrangement, welding riveting and oil painting of three coats of approved shade Weight of gate 35 Kilogram/Smt. [SOR Ref:-PWD/state/DSR/22-23/Item no.44.10/ Page no. 294]</p>	₹ 3,347.90	SQM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.44.10/ Page no. 294</p>	₹ 3,190.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 31.90	
C. Sub Total (C = A-B)	₹ 3,158.10	
D. Add Extra for 5% Corporation Charge	₹ 157.91	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 31.90	
F. Net Rate Arrived (C+D+E)	₹ 3,347.91	
<p>15.5 Providing , laying and fixing ,jointing Eco- drain 200 mm SN 4 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated materialetc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.32/ Page no.291]</p>	₹ 979.18	RM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.43.32/ Page no. 291</p>	₹ 933.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 9.33	
C. Sub Total (C = A-B)	₹ 923.67	
D. Add Extra for 5% Corporation Charge	₹ 46.18	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 9.33	
F. Net Rate Arrived (C+D+E)	₹ 979.18	
<p>15.5 Providing , Laying and fixing , jointing Eco Drain 250 mm SN-04 Nu-Drain Upvc pipe or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 & 16098 with fittings such a bends, tees, coupler, etc. jointing with rubber lubricant, including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.33/ Page no.291]</p>	₹ 1,883.85	RM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.43.33/ Page no. 291</p>	₹ 1,795.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 17.95	
C. Sub Total (C = A-B)	₹ 1,777.05	
D. Add Extra for 5% Corporation Charge	₹ 88.85	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 17.95	
F. Net Rate Arrived (C+D+E)	₹ 1,883.85	
<p>15.6 Providing , laying and fixing ,jointing Eco- drain 110 mm SN 8 Nu- Drain Upvc pipes or of equivalent make, manufacture as per EN 13476 or equivalent as per I.S.15328 with fittings such a bends, tees, coupler, etc, jointing with rubber lubricant including necessary excavation, trench refilling with selective excavated material etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.43.30/ Page no.291]</p>	₹ 343.19	RM
<p>A. Basic Rate as per PWD/state/DSR/22-23/Item no.43.30/ Page no. 291</p>	₹ 327.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 3.27	
C. Sub Total (C = A-B)	₹ 323.73	
D. Add Extra for 5% Corporation Charge	₹ 16.19	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 3.27	
F. Net Rate Arrived (C+D+E)	₹ 343.19	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
15.7 Bentonite addition 6% in soil which is to be used for compacted clay liner. Specs- As per Manufacturer's specs (Note: After adding bentonite in the soil, it should be tested in the laboratory & if permeability is less than 1/10 ⁻⁷ cm/s the soil should be changed) [SOR Ref:-MJP/state/SWM DSR/23-24/section-3/Item no.B2/Page No. 37]	₹ 6,961.33	MT
A. Basic Rate as per SWM/DSR/23-24/Section-3/Item no.B2/ Page no. 37 B. Deduct 1% on Labour Ami./ cess/ insu. C. Sub Total (C = A-B) D. Add Extra for 5% Corporation Charge E. Add Deducted 1% on Labour Ami./ cess/ insu. F. Net Rate Arrived (C+D+E)	₹ 6,633.00 ₹ 66.33 ₹ 6,566.67 ₹ 328.33 ₹ 66.33 ₹ 6,961.33	
15.8 Providing and laying CE Marked Needle Punched and Mechanically Bonded Non-Woven Geotextile (TechGeo) indigenously manufactured from high quality polypropylene staple fibres (continuous filament will not be accepted) of Techfab India on the prepared subgrade for separation, drainage & filtration application with necessary overlaps as per drawing etc. complete. (Specification: MORTH Section-700) with prior approval of concerned Superintending Engineer. d) TFI TECHGEO PR-40 [SOR Ref:-PWD/state/DSR/22-23/Item no.50.34/ Page no.338]	₹ 217.25	SQM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.50.34/ Page no. 338 B. Deduct 1% on Labour Ami./ cess/ insu. C. Sub Total (C = A-B) D. Add Extra for 5% Corporation Charge E. Add Deducted 1% on Labour Ami./ cess/ insu. F. Net Rate Arrived (C+D+E)	₹ 207.00 ₹ 2.07 ₹ 204.93 ₹ 10.25 ₹ 2.07 ₹ 217.25	
16. Gardening		
16.1 Excavation for planting lawn/ shrub/ flower bed/ hedges/ edges/ canna bed in earth, soil of all types, soft murum, including removing the excavated material up to a distance of 50 mtrs. for a depth of 30 cms. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/Sr no. 3/ Page no. 11]	₹ 75.25	SQM
A. Basic Rate as per PWD/Parks & Garden /SOR/22-23/Sr no.3/ Page no. 11 B. Deduct 1% on Labour Ami./ cess/ insu. C. Sub Total (C = A-B) D. Add Extra for 5% Corporation Charge E. Add Deducted 1% on Labour Ami./ cess/ insu. F. Net Rate Arrived (C+D+E)	₹ 71.70 ₹ 0.72 ₹ 70.98 ₹ 3.55 ₹ 0.72 ₹ 75.25	
16.2 Spreading fresh garden soil / silt & manure in excavated area of depth 30cms. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/Sr no. 13/ Page no. 11]	₹ 28.36	SQM
A. Basic Rate as per PWD/Parks & Garden /SOR/22-23/Sr no.13/ Page no. 11 B. Deduct 1% on Labour Ami./ cess/ insu. C. Sub Total (C = A-B) D. Add Extra for 5% Corporation Charge E. Add Deducted 1% on Labour Ami./ cess/ insu. F. Net Rate Arrived (C+D+E)	₹ 27.02 ₹ 0.27 ₹ 26.75 ₹ 1.34 ₹ 0.27 ₹ 28.36	
16.3 Mexican or Korian Grass Turf , Selection No.1 American blue grass, / Barmuda etc ready to fixlawn turf in Slabs/ Rolls of required variety as directed Rates Including breakage,& Transportation Damage losses. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/14 Lawn grass Sr no. 2/ Page no. 38]	₹ 225.64	SQM
A. Basic Rate as per PWD/Parks & Garden /SOR/22-23/14 Lawn grass Sr no.2/ Page no. 38 B. Deduct 1% on Labour Ami./ cess/ insu. C. Sub Total (C = A-B) D. Add Extra for 5% Corporation Charge E. Add Deducted 1% on Labour Ami./ cess/ insu. F. Net Rate Arrived (C+D+E)	₹ 215.00 ₹ 2.15 ₹ 212.85 ₹ 10.64 ₹ 2.15 ₹ 225.64	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>16.4 Flowering trees like Gulmohar, Raintree, Patelethophorum, bottle brush,sonmohor, spathodia etc. in poly bag (Height mini. 3 to 4 ft.) Specification:- Minimum Girth 2 to 3 c.m. Minimum 4 to 5 Branches with Maximum number of Leaves,Plant should be Healthy condition Free from pest and diseases,well seteled in appropriate size of Plybag,uniform in size and root system are undamaged. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/5 (a) Flowering Trees Sr no. 3,4,11,13,14/ Page no. 22]</p>	₹ 57.72	Nos
<p>A. <i>Basic Rate as per PWD/Parks & Garden /SOR/22-23/ 5 (a) Flowering Trees Sr no. 3,4,11,13,14/ Page no. 22</i></p>	₹ 55.00	
B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i>	₹ 0.55	
C. <i>Sub Total (C = A-B)</i>	₹ 54.45	
D. <i>Add Extra for 5% Corporation Charge</i>	₹ 2.72	
E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i>	₹ 0.55	
F. <i>Net Rate Arrived (C+D+E)</i>	₹ 57.72	
<p>16.5 Flowering trees like Mogara,Murraya, Nerium, Ratrani etc. in poly bag (Height mini. 15 to 60 cm.) Specification:- Well Developed ,Fresh, Healthy half in bloom, free from pest and diseases. [SOR Ref:-PWD/Parks & Garden/SOR/22-23/1 (a) Flowering Shrubs, Sr no. 14,15,17,19/ Page no. 15 & 16]</p>	₹ 20.99	Nos
<p>A. <i>Basic Rate as per PWD/Parks & Garden/SOR/22-23/1 (a) Flowering Shrubs, Sr no. 14,15,17,19/ Page no. 15 & 16</i></p>	₹ 20.00	
B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i>	₹ 0.20	
C. <i>Sub Total (C = A-B)</i>	₹ 19.80	
D. <i>Add Extra for 5% Corporation Charge</i>	₹ 0.99	
E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i>	₹ 0.20	
F. <i>Net Rate Arrived (C+D+E)</i>	₹ 20.99	
<p>16.6 Fixing and Transporting of self watering system tree guard-insertion of sapling in self watering tree guard and capping the bottom with expandable rubber seal. Supporting the bamboo with the help of cable tie. Bamboo to be buried 0.15 mt ht. below of excavated pit. Strengthening the bamboo in pit with adequate measures. Circulating the barbed wire around tree guard at middle ht. from bottom and fixing it. Thr rates excluding the cost of barbed wire, bamboo, expandable seal, tree guard and all other required material. Fixing to be carried out as per manual instruction. [SOR Ref:-PWD/state/DSR/22-23/Item no.8.31/ Page no. 79]</p>	₹ 131.19	Nos
<p>A. <i>Basic Rate as per PWD/state/DSR/22-23/Item no.8.31/ Page no. 79</i></p>	₹ 125.00	
B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i>	₹ 1.25	
C. <i>Sub Total (C = A-B)</i>	₹ 123.75	
D. <i>Add Extra for 5% Corporation Charge</i>	₹ 6.19	
E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i>	₹ 1.25	
F. <i>Net Rate Arrived (C+D+E)</i>	₹ 131.19	
17. Road work		
<p>17.1 Watering and compacting of embankment formed of materials obtained from the road cutting within a lead of 50 m, not less than 97 % of standard Proctor density after laying them in layers of 20 cm. to 30 cm. with vibratory roller. [SOR Ref:-PWD/state/DSR/22-23/Item no.2.23/ Page no. 24]</p>	₹ 95.50	CUM
<p>A. <i>Basic Rate as per PWD/state/DSR/22-23/Item no.2.23/ Page no. 24</i></p>	₹ 91.00	
B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i>	₹ 0.91	
C. <i>Sub Total (C = A-B)</i>	₹ 90.09	
D. <i>Add Extra for 5% Corporation Charge</i>	₹ 4.50	
E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i>	₹ 0.91	
F. <i>Net Rate Arrived (C+D+E)</i>	₹ 95.50	
<p>17.2 Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader/ Paver on prepared surface and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- Plant Mix Method and Grading - I Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.01/ Page no. 27]</p>	₹ 2,139.93	CUM
<p>A. <i>Basic Rate as per PWD/state/DSR/22-23/Item no.3.01/ Page no. 27</i></p>	₹ 2,039.00	
B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i>	₹ 20.39	
C. <i>Sub Total (C = A-B)</i>	₹ 2,018.61	
D. <i>Add Extra for 5% Corporation Charge</i>	₹ 100.93	
E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i>	₹ 20.39	
F. <i>Net Rate Arrived (C+D+E)</i>	₹ 2,139.93	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>17.2 Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material [SOR Ref:-PWD/state/DSR/22-23/Item no.3.05/ Page no. 27]</p>	₹ 1,893.30	CUM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.3.05/ Page no. 27	₹ 1,804.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 18.04	
C. Sub Total (C = A-B)	₹ 1,785.96	
D. Add Extra for 5% Corporation Charge	₹ 89.30	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 18.04	
F. Net Rate Arrived (C+D+E)	₹ 1,893.30	
<p>17.3 Construction of dry lean cement concrete Sub- base over a prepared sub grade with coarse and fine aggregate (natural sand/ VSI grade finely washed crushed sand) conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm , cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant/ Weigh batch mixer, transported to site with all leads and lifts, aid with a paver with electronic sensor /by suitable means as approved by Engineer-in-charge , compacting with vibratory roller, finishing, curing and including preparation of sub-grade surface if required etc. complete. with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. [SOR Ref:-PWD/state/DSR/22-23/item no. 5.13/ page no. 43]</p>	₹ 3,707.82	CUM
A. Basic Rate as per PWD/state/DSR/22-23/item no. 5.13/ page no. 43	₹ 3,659.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 36.59	
C. Deduct SCADA	₹ 126.00	
D. Sub Total (C = A-B-C)	₹ 3,496.41	
E. Add Extra for 5% Corporation Charge	₹ 174.82	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 36.59	
G. Add Transportatin of Material		Carting Rate Proportion
a. Metal/ Course aggregates/ 20 mm	₹ -	₹ 693.47 0.000
b. Metal/ Course aggregates/12/10 mm	₹ -	₹ 693.47 0.000
c. Sand	₹ -	₹ 693.47 0.000
d. Cement	₹ -	₹ 503.27 0.000
H. Total Transportation of Materials	₹ -	
I. Net Rate Proposed (D+E+F+H)	₹ 3,707.82	
<p>17.4 Providing and laying in-situ M30 Grade unreinforced plain cement concrete pavement over a prepared sub base with 43 grade cement , coarse and fine aggregate(natural sand/ VSI grade finely washed crushed sand) conforming to IS 383, using fine and coarse aggregates combined gradation as per Table 600-3 of MORTH Specification 2013, mixed in a batching and mixing plant/ non tilting mixer and Weigh batcher as per approved mix design, admixtures, transporting to site, spreading, laying with approved make paver, compacted and finished in a continuous operation, finishing to lines and grades as directed by Engineer-in-charge and curing by curing compound /by providing cement vata in cement Mortar 1:8 @0.6m X 0.6m centre to centre, admeasuring 80 mm at bottom and 40 mm at top with depth of 75mm and maintaining the same throughout curing period by any other method approved by Engineer-in charge. with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete. [SOR Ref:-PWD/state/DSR/22-23/item no. 5.01/ page no. 37]</p>	₹ 8,910.49	CUM
A. Basic Rate as per PWD/state/DSR/22-23/item no. 5.13/ page no. 43	₹ 7,582.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 75.82	
C. Deduct SCADA	₹ 126.00	
D. Sub Total (C = A-B-C)	₹ 7,380.18	
E. Add Extra for 5% Corporation Charge	₹ 369.01	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 75.82	
G. Add Transportatin of Material		Carting Rate Proportion
a. Metal/ Course aggregates/ 20 mm	₹ 395.28	₹ 693.47 0.570
b. Metal/ Course aggregates/12/10 mm	₹ 194.17	₹ 693.47 0.280
c. Sand	₹ 294.72	₹ 693.47 0.425
d. Cement	₹ 201.31	₹ 503.27 0.400
H. Total Transportation of Materials	₹ 1,085.48	
I. Net Rate Proposed (D+E+F+H)	₹ 8,910.49	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>17.5 Providing and fixing in position TMT FE 500, 32 mm dia dowel bars precoated with anticorrosive epoxy paint of required Dia. 60 cms. Long and at 30.00 cm. C/C and wherever directed including handling, straightening, necessary cutting supported by TMT FE 500, chairs with proper alignment by using properly designed assembly of Bulkheads lubricating half length with bituminous paint as directed etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.5.14/ Page No. 43]</p>	₹ 1,067.90	Nos
A. Basic Rate as per PWD/state/DSR/22-23/Item no.5.14/ Page No. 43	₹ 538.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 5.38	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 532.62	
E. Add Extra for 5% Corporation Charge	₹ 26.63	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 5.38	
G. Add Transportatin of Material		<i>Carting Rate Proportion</i>
a. Steel / TMT FE 500 steel bars	₹ 503.27	₹ 503.27 1.000
H. Total Transportation of Materials	₹ 503.27	
I. Net Rate Proposed (D+E+F+H)	₹ 1,067.90	
<p>17.6 Providing and fixing in position TMT FE 500, tie bars precoated with anticorrosive epoxy paint of 12 mm dia. 70 cms.long and at 30.00 cm. C/C and wherever directed including handling, straightening wrapping with paper of approved quality for half length, necessary cutting, handling, straightening , supported by assembly of TMT FE 500, chairs with proper alignment etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.5.16/ Page No. 43]</p>	₹ 824.42	Nos
A. Basic Rate as per PWD/state/DSR/22-23/Item no.5.16/ Page No. 43	₹ 306.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 3.06	
C. -	₹ -	
D. Sub Total (C = A-B-C)	₹ 302.94	
E. Add Extra for 5% Corporation Charge	₹ 15.15	
F. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 3.06	
G. Add Transportatin of Material		<i>Carting Rate Proportion</i>
a. Steel / TMT FE 500 steel bars	₹ 503.27	₹ 503.27 1.000
H. Total Transportation of Materials	₹ 503.27	
I. Net Rate Proposed (D+E+F+H)	₹ 824.42	
<p>17.7 Providing and Laying hot applied thermoplastic road marking strip on Bituminous Surface of specified shade/ colour of 2.5 mm thick including 1.5 Refractive index reflectorizing glass beads @ 250gm/sqm .Thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35:2015. Initial Dry reflectivity RL shall be > 250 mcd/sqm/lux measured in the initial 7 days and sustained reflectivity RL of 100 mcd/sqm/ lux and Qd of 100 mcd/sqm/ lux measured at the end of 2 years by means of a Standard Reflectometer of Zehntner, EasyLux, Delta make capable of measuring RL & QD both according to IRC 35:2015 clause 15.5. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-in-charge and in accordance with applicable specifications.(Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). [SOR Ref:-PWD/state/DSR/22-23/Item no.6.12 a/ Page no. 48]</p>	₹ 698.97	CUM
A. Basic Rate as per PWD/state/DSR/22-23/Item no.6.12 a/ Page no. 48	₹ 666.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 6.66	
C. Sub Total (C = A-B)	₹ 659.34	
D. Add Extra for 5% Corporation Charge	₹ 32.97	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 6.66	
F. Net Rate Arrived (C+D+E)	₹ 698.97	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>17.8 Providing and laying Cast in situ/Ready Mix cement concrete in M15 of trap/ granite/quartzite/gneiss metal for foundation and bedding / steps including steel centering, formwork, laying/pumping, compacting, roughening them if special finish is to be provided, finishing uneven and honeycombed surface and curing etc. complete. The Cement Mortar 1:3 plaster is considered for rendering uneven and honeycombed surface, only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (Wooden centering will not be allowed.),with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/concrete Batch mix plant (Pan mixer) etc. complete. With fine aggregate (Crushed sand VSI Grade) [SOR Ref:-PWD/state/DSR/22-23/Item no. 24.14/ page no. 177]</p>	₹ 7,725.39	CUM
<p>A. <i>Basic Rate as per PWD/state/DSR/22-23/item no. 24.14/ page no. 177</i></p>	₹ 6,359.00	
<p>B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i></p>	₹ 63.59	
<p>C. <i>Deduct SCADA</i></p>	₹ 126.00	
<p>D. <i>Sub Total (C = A-B-C)</i></p>	₹ 6,169.41	
<p>E. <i>Add Extra for 5% Corporation Charge</i></p>	₹ 308.47	
<p>F. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i></p>	₹ 63.59	
<p>G. <i>Add Transportatin of Material</i></p>		Carting Rate Proportion
<p>a. <i>Metal/ Course aggregates/ 40 mm</i></p>	₹ 485.43	₹ 693.47 0.700
<p>b. <i>Metal/ Course aggregates/ 20 mm</i></p>	₹ 152.56	₹ 693.47 0.220
<p>c. <i>Metal/ Course aggregates/12/10 mm</i></p>	₹ 76.28	₹ 693.47 0.110
<p>d. <i>Sand</i></p>	₹ 308.59	₹ 693.47 0.445
<p>e. <i>Cement</i></p>	₹ 161.05	₹ 503.27 0.320
<p>H. <i>Total Transportation of Materials</i></p>	₹ 1,183.91	
<p>I. <i>Net Rate Proposed (D+E+F+H)</i></p>	₹ 7,725.39	
<p>17.9 Providing and fixing coloured glazed earthenware lipped flat back/corner type urinal with PVC 5 liters flushing cistern with fittings,capacity with fittings, inlet pipe and stop tap, brackets for fixing the cistern, P.V.C. flush pipe with fittings including lead soil pipe, lead trap and soil pipe connection up to the outside face of the wall. [SOR Ref:-PWD/state/DSR/22-23/Item no.41.61/ Page no. 271]</p>	₹ 5,025.01	CUM
<p>A. <i>Basic Rate as per PWD/state/DSR/22-23/Item no.41.61/ Page no. 271</i></p>	₹ 4,788.00	
<p>B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i></p>	₹ 47.88	
<p>C. <i>Sub Total (C = A-B)</i></p>	₹ 4,740.12	
<p>D. <i>Add Extra for 5% Corporation Charge</i></p>	₹ 237.01	
<p>E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i></p>	₹ 47.88	
<p>F. <i>Net Rate Arrived (C+D+E)</i></p>	₹ 5,025.01	
<p>18.1 Providing and fixing white glazed earthenware sink 600mm x 200mm x 450mm including all connection of the G.I. supply and P.V.C. waste pipes up to the outside face of the wall, cold water chromium plated screw down bib tap, rolled steel or C.I. brackets, rubber plug with chain and stop tap complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.41.75/ Page no. 273]</p>	₹ 5,955.91	CUM
<p>A. <i>Basic Rate as per PWD/state/DSR/22-23/Item no.41.75/ Page no. 273</i></p>	₹ 5,675.00	
<p>B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i></p>	₹ 56.75	
<p>C. <i>Sub Total (C = A-B)</i></p>	₹ 5,618.25	
<p>D. <i>Add Extra for 5% Corporation Charge</i></p>	₹ 280.91	
<p>E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i></p>	₹ 56.75	
<p>F. <i>Net Rate Arrived (C+D+E)</i></p>	₹ 5,955.91	
<p>18.2 Providing and fixing Orissa type white glazed earthenware 575 mm water closet pan including S trap with earthenware foot rests, cast iron soil and vent pipe upto outside face of the wall 1:2:4 brick bat lime concrete bedding without flushing tank and its accessories etc. complete. [SOR Ref:-PWD/state/DSR/22-23/Item no.42.30/ Page no. 277]</p>	₹ 4,205.35	CUM
<p>A. <i>Basic Rate as per PWD/state/DSR/22-23/Item no.42.30/ Page no. 277</i></p>	₹ 4,007.00	
<p>B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i></p>	₹ 40.07	
<p>C. <i>Sub Total (C = A-B)</i></p>	₹ 3,966.93	
<p>D. <i>Add Extra for 5% Corporation Charge</i></p>	₹ 198.35	
<p>E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i></p>	₹ 40.07	
<p>F. <i>Net Rate Arrived (C+D+E)</i></p>	₹ 4,205.35	
<p>18.3 Designing, supplying, installing, commissioning & testing of CCTV IR water proof camera suitable for upto 100ft. with control key board, DVR, Hard Disk,cables, UPT transreceivers etc. complete with not less than following specifications. 1. Four numbers of IP Camera with night vision functionality with range up to 30 meters. Camera construction shall be suitable for weather proof outdoor installation. 2. Eight Channel DVR with metal body construction, having software features of motion detect recording. 3. 3.5 inch 2 GB HDD 4. 8 port POE Switch 5. 32 inch LED Screen, Keyboard & mouse. [SOR Ref:-MJP/state/MECH/ELECT/SSR/23-24/Item no.1.9/ Page no. 52]</p>	₹ 52,894.80	JOB
<p>A. <i>Basic Rate as per MECH/ELECT/state/SSR/22-23/Item no.1.9/ Page no. 52</i></p>	₹ 50,400.00	
<p>B. <i>Deduct 1% on Labour Ami./ cess/ insu.</i></p>	₹ 504.00	
<p>C. <i>Sub Total (C = A-B)</i></p>	₹ 49,896.00	
<p>D. <i>Add Extra for 5% Corporation Charge</i></p>	₹ 2,494.80	
<p>E. <i>Add Deducted 1% on Labour Ami./ cess/ insu.</i></p>	₹ 504.00	
<p>F. <i>Net Rate Arrived (C+D+E)</i></p>	₹ 52,894.80	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
19. Water Supply work		
19.1 Excavation for foundation/ pipe trenches in hard murum, including removing the excavated material upto a distance of 50 M and lifts as below, stacking and spreading as directed by Engineer-in-charge, normal dewatering, preparing the bed for foundation and excluding backfilling, etc. complete. [SOR Ref:-MJP/state/SSR/23-24/Section E/Item no.1/ Page no. 37]	₹ 196.25	CUM
A. Basic Rate as per MJP/state/SSR/23-24/Section E/Item no.1/ Page no. 37	₹ 187.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 1.87	
C. Sub Total (C = A-B)	₹ 185.13	
D. Add Extra for 5% Corporation Charge	₹ 9.26	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 1.87	
F. Net Rate Arrived (C+D+E)	₹ 196.26	
19.2 Providing and supplying in ISI mark rigid PVC-O class-500 (PN-16,200 MM DIA) s/s pipe (push on joints) pressure pipes conforming to IS specifications no 16647-2017 inclusive cost of EPDM gasket seals on joints including all statutory duties excluding GST levied by Government of India and Government of Maharashtra in all respect including third party inspection charges of agency approved by MJP, transit insurance loading, unloading charges conveyance to the departmental store/ site and stacking the same in closed shade duly protected from sunrays etc complete. [SOR Ref:-MJP/state/SSR/23-24/Section I(II)/Item no.3/ Page no. 77]	₹ 1,546.30	RM
A. Basic Rate as per MJP/state/SSR/23-24/Section I(II)/Item no.3/ Page no. 77	₹ 1,407.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 14.07	
C. Sub Total (C = A-B)	₹ 1,392.93	
D. Add Extra for 5% Corporation Charge	₹ 139.29	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 14.07	
F. Net Rate Arrived (C+D+E)	₹ 1,546.29	
19.3 Refilling the trenches with available excavated stuff with soft material first over pipeline and then hard material in 15 cm layers with all leads and lifts including consolidation, surcharging, etc. complete. [SOR Ref:-MJP/state/SSR/23-24/Section E/Item no.15/ Page no. 40]	₹ 198.90	CUM
A. Basic Rate as per MJP/state/SSR/23-24/Section E/Item no.15/ Page no. 40	₹ 181.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 1.81	
C. Sub Total (C = A-B)	₹ 179.19	
D. Add Extra for 5% Corporation Charge	₹ 17.92	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 1.81	
F. Net Rate Arrived (C+D+E)	₹ 198.92	
19.5 Providing, erecting and giving test of submersible pump set conforming to IS 8034 and motor conforming to IS 9283, with water proof winding. Pump shall be suitable for various delivery head and discharge with stainless steel shaft. Motor suitable for working on 415 V ± 10%, 3 Ph, 50 Hz A.C. Supply, with cable guard, thrust carbon/fiber bearing to withstand entire hydraulic thrust. The pump set shall be suitable for direct coupling, with suitable suction strainer. Pump should have suitable discharge out let as per manufacturer's design. Antithrust stream lined non return valve shall be provided with the pump. 3 m submersible copper conductor cable in single / double run and 2 pairs of suitable size erection clamp 10 mm thick shall be provided with each pump. [SOR Ref:-MJP/state/SSR/22-23/Section E/Item no.PM 1-2-5/ Page no. 1]	₹ 41,429.01	Number
A. [SOR Ref:-MJP/state/SSR/23-24/Item no.PM 1-2-5/ Page no. 1]	₹ 39,475.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 394.75	
C. Sub Total (C = A-B)	₹ 39,080.25	
D. Add Extra for 5% Corporation Charge	₹ 1,954.01	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 394.75	
F. Net Rate Arrived (C+D+E)	₹ 41,429.01	
19.5 Providing, erecting and giving test of submersible pump set conforming to IS 8034 and motor conforming to IS 9283, with water proof winding. Pump shall be suitable for various delivery head and discharge with stainless steel shaft. Motor suitable for working on 415 V ± 10%, 3 Ph, 50 Hz A.C. Supply, with cable guard, thrust carbon/fiber bearing to withstand entire hydraulic thrust. The pump set shall be suitable for direct coupling, with suitable suction strainer. Pump should have suitable discharge out let as per manufacturer's design. Antithrust stream lined non return valve shall be provided with the pump. 3 m submersible copper conductor cable in single / double run and 2 pairs of suitable size erection clamp 10 mm thick shall be provided with each pump. [SOR Ref:-MJP/state/SSR/22-23/Section E/Item no.PM 1-2-5/ Page no. 1]	₹ 41,429.01	Number
A. [SOR Ref:-MJP/state/SSR/23-24/Item no.PM 1-2-5/ Page no. 1]	₹ 39,475.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 394.75	
C. Sub Total (C = A-B)	₹ 39,080.25	
D. Add Extra for 5% Corporation Charge	₹ 1,954.01	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 394.75	
F. Net Rate Arrived (C+D+E)	₹ 41,429.01	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
<p>19.6 Providing and fixing Ductile iron manhole cover of light/medium/heavy duty with frame of any size over inspection chamber etc. complete (Prior permission of S.E. is to be obtained before inclusion of this item in the estimate) [SOR Ref:-PWD/state/DSR/22-23/Item no.50.30/ Page no. 336]</p>	₹ 78.71	Kg
<p>A. [SOR Ref:-PWD/state/DSR/22-23/Item no.50.30/ Page no. 336]</p>	₹ 75.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 0.75	
C. Sub Total (C = A-B)	₹ 74.25	
D. Add Extra for 5% Corporation Charge	₹ 3.71	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 0.75	
F. Net Rate Arrived (C+D+E)	₹ 78.71	
<p>19.7 Providing and Constructing gabion structure 1 Meter high or required section made up of soft mechanically woven hexagonal shaped G.I. wire conforming to IS 16014:2012 having zinc plus PVC coating of overall diameter of 3.7 mm and tying lacing wire of 3.2 mm with edge wire conforming to overall diameter 4.4 mm edges being mechanically selvedge including placing in position, fitting neatly with trap stone rubble (15 to 23 cm) all loose ends to be securely tied (Excluding transportation) etc. complete. (In Dry condition and for under water installation extra cost to be considered) [SOR Ref:-PWD/state/DSR/22-23/Item no.7.21/ Page no. 72]</p>	₹ 4,522.30	Cum
A. Basic Rate as per PWD/state/DSR/22-23/Item no.7.21/ Page no. 72	₹ 4,309.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 43.09	
C. Sub Total (C = A-B)	₹ 4,265.91	
D. Add Extra for 5% Corporation Charge	₹ 213.30	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 43.09	
F. Net Rate Arrived (C+D+E)	₹ 4,522.30	
<p>19.8 Construction of Reinforced Earth Wall in M-35 Block Facia by Providing and Laying CE marked Knitted and PVC coated Polyester Uniaxial Geogrid (Techgrid) of Techfab India indigenously manufactured from selected high tenacity polyester yarn with high molecular weight (> 25000 g/mol), and low carboxyl end group (<30mmol/Kilogram) for Reinforced soil wall (extruded PP geogrids & Polyester strips & Geostrips, Steel Strips not allowed & not accepted) with granular fill of PHI-32 degree (design is to be carried out in accordance with BS-8006 / FHWA) with concrete block by M-35 as facia, casting & erection of blocks with Techgrid, providing & laying levelling pad by M-15, providing and laying coping beam by M-35, providing and laying 300mm thick filtermedia etc. completed as per necessary drawing and instruction of Engineer-in-charge. Excluding providing, laying and compacting selected backfill and retained fill behind the wall, excavation and ground improvement, if any. The reinforced earth wall and slope should have 100% coverage of 5m width Knitted and PVC coated Polyester Geogrid. (Coating of Geogrid/ Reinforcing geosynthetic material with LDPE, approved, Bitumen and any other coating will not be allowed and will not be accepted). (Specification: MORTH Section3100) with prior approval of concerned Superintending Engineer. a) RE Wall Height 1 to 4 meter [SOR Ref:-PWD/state/DSR/22-23/Item no.50.45 (a)/ Page no. 72]</p>	₹ 5,757.56	Sqm
A. Basic Rate as per PWD/state/DSR/22-23/Item no.50.45 (a)/ Page no. 72	₹ 5,486.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 54.86	
C. Sub Total (C = A-B)	₹ 5,431.14	
D. Add Extra for 5% Corporation Charge	₹ 271.56	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 54.86	
F. Net Rate Arrived (C+D+E)	₹ 5,757.56	
<p>19.9 Excavation for roadway in hard rock by controlled blasting including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stocking as directed.(Including 50% Utilisation of useable Excavated material) [SOR Ref:-PWD/state/DSR/22-23/Item no.2.15/ Page no. 24]</p>	₹ 262.38	Cum
A. Basic Rate as per PWD/state/DSR/22-23/Item no.2.15/ Page no. 24	₹ 250.00	
B. Deduct 1% on Labour Ami./ cess/ insu.	₹ 2.50	
C. Sub Total (C = A-B)	₹ 247.50	
D. Add Extra for 5% Corporation Charge	₹ 12.38	
E. Add Deducted 1% on Labour Ami./ cess/ insu.	₹ 2.50	
F. Net Rate Arrived (C+D+E)	₹ 262.38	

RATE ANALYSIS & ADOPTED RATES BASED ON SOR
THANE MUNICIPAL CORPORATION, DISTRICT - THANE, DIVISION - KONKAN

ITEM DESCRIPTION	Net Rate Proposed	Unit
1.0 Providing and installing Submersible 7.5 HP Leachate pump of ISI mark dry type squirrel cage induction type, IP 68 the class of insulation is F-class having SD 50m, 2880 RPM, 3 Phase, DoI, using copper cable of aprox 15m in length of size 1x4x2.5mm square, discharge size 80mm, capacity 16 to 20 cum per hr with head of 16 to 20m including all electrical connections, starter making connectiopr to the motor and other safety devices to electrical panel board as per manufacturere specifications. [SOR Ref:-MJP/state/SWM DSR/23-24/section-3/Item no.B4/Page No. 37]	₹	92,938.47 Nos.
A. Basic Rate as per MJP/state/SWM DSR/23-24/Section -3/Item no. B4/Page No. 37	₹	88,555.00
B. Deduct 1% on Labour Ami./ ccess/ insu.	₹	885.55
C. Sub Total (C = A-B)	₹	87,669.45
D. Medium dumping with Machine operation Capacity 51- 100 Cum	₹	4,383.47
E. Add Deducted 1% on Labour Ami./ ccess/ insu.	₹	885.55
F. Net Rate Arrived (C+D+E)	₹	92,938.47



सत्यमेव जयते

File No.: SIA/MH/INFRA2/495220/2024

Government of India

Ministry of Environment, Forest and Climate Change

(Issued by the State Level Expert Appraisal Committee(SEAC),
MAHARASHTRA)



Dated 20/12/2024

To,

DR RANI SHINDE
THANE MUNICIPAL CORPORATION
THANE MUNICIPAL CORPORATION, MAHANAGR PALIKA BHAWAN, PACHPAKHADI,
THANE, Thane, THANE, MAHARASHTRA, 400602
hoswm@thanecity.gov.in

Subject: Grant of Standard Terms of Reference (ToR) to the proposed Project under the EIA Notification 2006-
and as amended thereof-regarding.

Sir/Madam,

This is in reference to your application submitted to SEAC vide proposal number SIA/MH/INFRA2/495220/2024 dated 23/09/2024 for grant of Terms of Reference (ToR) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) ToR Identification No.	TO24B3401MH5724594N
(ii) File No.	SIA/MH/INFRA2/495220/2024
(iii) Clearance Type	Fresh ToR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	7(i) Common Municipal Solid Waste Management Facility (CMSWMF)
(vii) Name of Project	Integrated Solid Waste Management Project at Atkoli village Thane Maharashtra by Thane Municipal Corporation.
(viii) Name of Company/Organization	THANE MUNICIPAL CORPORATION
(ix) Location of Project (District, State)	THANE, MAHARASHTRA
(x) Issuing Authority	SEAC
(xii) Applicability of General Conditions	NO

3. The SEAC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after detailed examination hereby decided to grant Standard Terms of

Reference to the instant proposal of M/s.THANE MUNICIPAL CORPORATION under the provisions of the aforementioned Notification.

4. The brief about products and by products as submitted by the Project proponent in Form-1 (Part A, B) and Standard Terms of Reference are annexed to this letter as Annexure (1).
5. The Ministry reserves the right to stipulate additional TORs, if found necessary.
6. The Standard Terms of Reference (ToR) to the aforementioned project is under provisions of EIA Notification, 2006 and as amended thereof. It does not tantamount to approvals/consent/permissions etc required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
7. The granted letter, all the documents submitted as a part of application viz. Form-1 Part A and Part B are available on PARIVESH portal which can be accessed by scanning the QR Code above.

Copy To

N/A

Annexure 1

Standard Terms of Reference for conducting Environment Impact Assessment Study for Common Municipal Solid Waste Management Facility (CMSWMF) and information to be included in EIA/EMP report

1. Project Details

Sr. No.	Terms of Reference
1.1	Importance and benefits of the project.
1.2	The project should be designed based on the population projections as by Master Plan and in conformity to the Municipal Solid Waste Management Rules 2006 as amended from time to time.
1.3	Examine and submit details of alternative technologies viz. RDF shall also be evolved.
1.4	Examine and submit details of storm water/leachate collection from the composted area including leachate treatment options proposed.
1.5	Submit a copy of the layout plan of project site showing solid waste storage, green belt (width & length, 33% of the project area), all roads, prominent wind direction, processing plant & buildings etc. should be provided.
1.6	Submit the details of sanitary land fill site, impermeability and whether it would be lined, if so details thereof.
1.7	The EIA would include a separate chapter on the conformity of the proposals to the Municipal Solid Waste Management Rules, 2016 and the Construction and Demolition Waste Management Rules, 2016 including the sitting criteria therein.
1.8	Details of various waste management units with capacities for the proposed project. Details of utilities indicating size and capacity to be provided.

Sr. No.	Terms of Reference
1.9	Details of storage and disposal of pre-processing and post-processing rejects/inerts.
1.10	List of proposed end receivers for the rejects/inerts should be provided. MoUs to be submitted in this regard.
1.11	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
1.12	NOC from local or nearest airport within 20 km and any flight funnel restrictions.
1.13	The project proponents should consult the Municipal solid waste Management manual of the Ministry of Housing and Urban Affairs, Government of India and draw up project plans accordingly.
1.14	Details of man-power requirement (regular and contract).
1.15	Process description along with major equipment's and machineries, process flow sheet (quantitative) from waste material to disposal to be provided.

2. Land Environment

Sr. No.	Terms of Reference
2.1	Submit a 10 km. radius map (on survey of India toposheet) showing co-ordinates of project site, national highway, state highway, district road/approach road, river, canal, natural drainage; protected areas, under Wild Life (Protection) Act, archaeological site, natural lake, flood area, human settlements (with population), industries, high tension electric line, prominent wind direction (summer and winter), effluent drain, if any and ponds etc. should be presented and impacts assessed on the same.
2.2	Submit a copy of the land use certificate from the competent authority.
2.3	Submit a copy of the topography of the area indicating whether the site requires any filling, if so, the details of filling, quantity of fill material required, its source and transportation, etc.
2.4	A sensitivity analysis of the site shall be carried out as per the CPCB site selection criteria and form part of the EIA report.
2.5	Post project reclamation management program with financial allocation.

3. Environmental Monitoring and Management

Sr. No.	Terms of Reference
3.1	Examine and submit details of monitoring of water quality around the landfill site. Water analysis shall also include for nitrate and phosphate.
3.2	Examine and submit details of the odour control measures.
3.3	Submit a copy of the status of ambient air quality and surface and ground water quality, soil type, cropping pattern, land use pattern, population, socio-economic status, anticipated air and water pollution.

Sr. No.	Terms of Reference
3.4	Examine and submit the details of one complete season AAQ data (except monsoon) with the dates of monitoring, impact of the project on the AAQ of the area (including H2S, CH4).
3.5	Submit Environmental Management Plan and Environmental Monitoring Plan with costs and parameters.
3.6	Examine and submit the details of impact on environmental sensitive areas.
3.7	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.
3.8	Possible carbon footprint contribution from each activities and mitigation measures proposed shall be included as part of Environment Management Plan.

4. Water Environment

Sr. No.	Terms of Reference
4.1	Examine and submit details of impact on water bodies/rivers/ ponds and mitigative measures during rainy season.
4.2	Examine and submit the details of surface hydrology and water regime and impact on the same.

5. Water Management

Sr. No.	Terms of Reference
5.1	Requirement of water with source of supply, status of approval, water balance diagram.
5.2	Details of effluent treatment and reuse and recycling process.
5.3	Action plan for measures to be taken for excessive leachate generation during monsoon period.
5.4	Pre-project monitoring of ground water quality is required.

6. Waste Management

Sr. No.	Terms of Reference
6.1	Submit the criteria for assessing waste generation. Any segregation of hazardous and bio- medical wastes. Submit a copy of detailed plan of waste management.

7. Drainage

Sr. No.	Terms of Reference
7.1	Details of Drainage of the project upto 5 km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of

Sr. No.	Terms of Reference
	the river shall also be provided.
7.2	Examine and submit the details of impact on the drainage and nearby habitats/settlements (surroundings).

8. Energy Requirement

Sr. No.	Terms of Reference
8.1	A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project.
8.2	Details of the adequate power back up facility, to meet the energy requirement in case of power failure from the grid.

9. Disaster Management Plan

Sr. No.	Terms of Reference
9.1	Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster.
9.2	Risk and hazard identification and details of proposed mitigation measures.

10. Socio-Economic Environment

Sr. No.	Terms of Reference
10.1	Examine and submit the details of rehabilitation/compensation package for the project effected people, if any.
10.2	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.
10.3	Report on health and hygiene to be maintained for the sanitation workers at the work place.

11. Court Cases

Sr. No.	Terms of Reference
11.1	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

12. Miscellaneous

Sr. No.	Terms of Reference
12.1	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/Common Municipal Solid Wastes .

Additional Terms of Reference

N/A

Annexure 2

Details of Products & By-products

Name of the product /By-product	Product / By-product	Quantity	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Compost	Product	390	Tonnes per day	Road	NA

Validity unknown

Digitally Signed by : Suryakant Nikam
Member Secretary, SEAC

Date: 20/12/2024



Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

APPLICATION FOR OBTAINING THE AUTHORIZATION

To :The Member secretary,
Maharashtra Pollution Control Board

1. Name of the municipal authority/ Name of the agency appointed by the municipal authority

Thane Municipal Corporation

2. Correspondence Address

DMC SWM Office, 2nd floor, TMC Admin Bldg., Panchpakhadi, Thane West

Telephone No.

9867234024

Fax No.

3. Nodal Officer (Officer authorised by the municipal authority or gency responsible for operation of processing or disposal facility)

DMC SWM

Designation of officer

Health Officer

4. Authorization applied for (Please select)

Setting up & operation of disposal facility

5.1 Processing of waste

i. Location of site

Atakoli

ii. Name of waste processing technology

SLF

iii. Details of processing technology

SLF

iv. Quantity of waste to be processed per day

600

v. Site clearance from local authority

No

vi. Details of agreement between municipal authority and operating agency

NA

vii. Utilization programme for waste processed(Product utilization)

as per rule

viii. Methodology for disposal of waste processing rejects (Quantity and Quality)

as per rule

ix. Measures to be taken for prevention and control of environmental pollution

as per rule

x. Investment on project and expected returns

NA

xi. Measures to be taken for safety of workers working in the plant

As per rule

5.2 Disposal of waste

i. Number of sites identified

1

ii. Layout maps of site

1

iii. Quantity of waste to be disposed per day

600

iv. Nature and composition of waste

MSW

v. Details of methodology or criteria followed for site selection

as per rule

vi. Details of existing site under operation

NA

vii. Methodology and operational details of landfilling

as per rule

viii. Measures taken to check environmental pollution

As per rule