

**BEFORE THE NATIONAL GREEN TRIBUNAL EASTERN
ZONE BENCH, KOLKATA.**

Miscellaneous Application No. ¹² 49/2025/EZ

In

Original Application No. 94/2020/EZ

S.D. Loda

Applicant(s)

Versus

The Union of India & Ors.

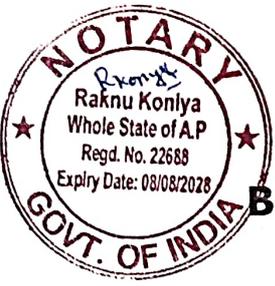
Respondent(s)

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Filed by;

Adv. Pantu Rai
Advocate.



**BEFORE THE NATIONAL GREEN TRIBUNAL EASTERN
ZONE BENCH, KOLKATA.**

Miscellaneous Application No. ¹²42/2025/EZ

In

Original Application No.94/202/EZ

S.D. Loda

Applicant(s)

Versus

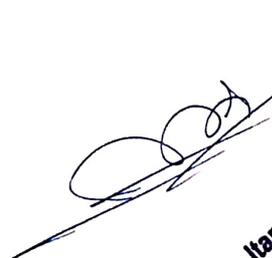
The Union of India & Ors.

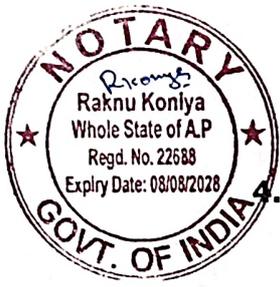
Respondent(s)

**ADDITIONAL AFFIDAVIT ON BEHALF OF THE ITANAGAR
MUNICIPAL CORPORATION (RESPONDENT NO.5)**

I, Shri Kego Jilen (APCS), aged about 59 years, presently serving as the Commissioner, Itanagar Municipal Corporation (hereinafter referred to as "IMC"), Government of Arunachal Pradesh, Itanagar, do hereby solemnly affirm and state as follows:

1. That I am the Commissioner of the Itanagar Municipal Corporation and Respondent No. 5 in the present petition. I am well acquainted with the facts and circumstances of the case and am duly authorized and competent to swear this affidavit on behalf of the answering respondent.
2. That I have gone through the order dated 05/01/2023 passed by this Hon'ble Court in Miscellaneous Application No. 42/2025/EZ in Original Application No. 94/202/EZ and have understood the contents thereof. Further, it is stated that I have also gone through the relevant files and records.
3. That with regard to Paragraph Nos. 1, 2, 3, 4, 5 and 6 of the said order, the deponent offers no comments, as the same are not the subject matter of the present deponent.


Commissioner
Itanagar Municipal Corporation

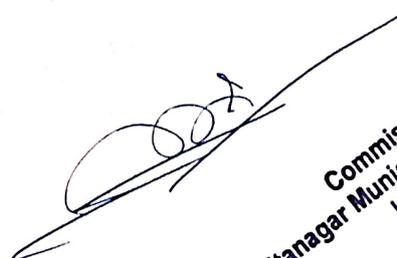


That with regard to Paragraph No. 7 of the said order, the deponent agrees to some parts thereof; however, it is respectfully submitted that the statement regarding funding of a Sewage Treatment Plant (STP) at Ward No. 5 with a capacity of 3 MLD at an estimated cost of Rs. 38.08 Crores, sanctioned during the year 2017–2018 under the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), is incorrect. No such funding has been received by Respondent No. 5 for the construction of the said STP. Therefore, the question of progress status does not arise at all.

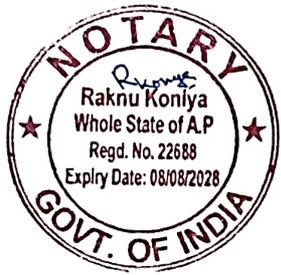
It is further submitted that, as per the directions contained in Paragraph 38 at Page 45 of the order dated 25/08/2022, in Original Application No.94/2020 EZ, Respondent No. 2 was directed to look into the matter and expedite the release of funds for the construction of the Sewage Treatment Plant (STP) at Ward No. 5, initially estimated at Rs. 80.00 Crores. However, till date, no funds have been released.

It is pertinent to mention that due to the prolonged delay in funding, the estimated cost has escalated to Rs. 92,01,26,000/- (Rupees Ninety-Two Crore One Lakh Twenty-Six Thousand Only) and may further increase with time. Accordingly, the revised Detailed Project Report (DPR) with the escalated cost was forwarded to Respondent No. 2 through the proper channel, i.e., the Director, Urban Local Bodies, Government of Arunachal Pradesh, on 13/06/2025 vide Office Memo No. IMC/Estt.422/2024-25/596-04, with a request for early release of funds in compliance with this Hon'ble Court's order dated 25/08/2022 and to avoid any potential contempt proceedings. However, till date, no appropriate response regarding the release of funds has been received.

A copy of the letter sent to the Director, Urban Local Bodies, Government of Arunachal Pradesh, on 13/06/2025 vide Office Memo No. IMC/Estt.422/2024-25/596-04, along with the DPR of the said STP at Ward No. 5, Itanagar Municipal


Commissioner
Itanagar Municipal Corporation
Itanagar

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Corporation, is annexed herewith and marked as **ANNEXURE-P/1** and **ANNEXURE-P/2**.

- 4.1. That with regard to the Septage Treatment Plant (STP) with a capacity of 100 KLD at Chimpu, Itanagar, under Ward No. 1 of IMC, it is respectfully submitted that the said plant has been completed and is presently operational and running on a trial basis.

The copy of the completion report as well as commission report by the respective Executive Engineer –Part-I IMC are annexed herewith and marked as **ANNEUXRE- P/3 & ANNEXURE-P/4**.

5. That in regard to Para no.8,9,10,11,12,13,14,15,16 ,17 18 & 19 of the said order deponent offers no comments as such direction was given to other respondents.
6. Hence, this Affidavit.

VERIFICATION

I, the above named deponent do hereby verify that I have read and understood the contents of above additional affidavit and the same are true and correct to the best of my knowledge and belief no part of the same is false and nothing material has been concealed therefrom.

Verified at^{4th}..... on date of^{Feb}..... 2026

Deponent

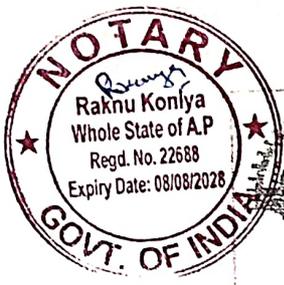
Commissioner
Itanagar Municipal Corporation
Itanagar

Deponent

Commissioner
Itanagar Municipal Corporation
Itanagar

Raknu Koniya
NOTARY

Govt. of India, Regd. No. 22688
Papum Pare District
Whole State of Arunachal Praedsh



OFFICE OF THE COMMISSIONER
ITANAGAR MUNICIPAL CORPORATION
ITANAGAR

Dated: Itanagar, the 13th June 2025

IMC/Estt-422/2024-25/596-04

To,

The Director,
Urban Local Bodies,
Government of Arunachal Pradesh,
Itanagar.

Sub : Forwarding of Revised Detailed Project Report (DPR) for Construction of Sewage Treatment Plant (STP) in Ward No. 5, Itanagar Municipal Corporation & DPR for the Rejuvenation of the Pachin and Senki Rivers and their tributaries under the Itanagar Capital Region in compliance with the NGT Court Judgment Order dated 25/08/2022 in OA No. 94/2020 (EZ).

Ref : Para Nos. 38 & 39 of the Hon'ble NGT Court Judgment Order dated 25/08/2022 in OA No. 94/2020 (EZ)

Respected Sir,

With reference to the subject and judgment cited above, and in compliance with Paragraphs 38 and 39 of the Hon'ble National Green Tribunal (NGT) Court Judgment Order dated 25/08/2022 (OA No. 94/2020 - EZ), the revised Detailed Project Report (DPR) for the Construction of Sewage Treatment Plant (STP) in Ward No. 5, Itanagar Municipal Corporation, is hereby enclosed. The project is estimated at ₹92,01,26,000/- (Rupees Ninety-Two Crore One Lakh Twenty-Six Thousand only).

In addition, a copy of the DPR for the Rejuvenation of the Pachin and Senki Rivers and their tributaries under the Itanagar Capital Region, amounting to ₹10,00,00,00,000/- (Rupees One Thousand Crore only), is also enclosed for your kind consideration.

Despite several reminders submitted to your esteemed office regarding the aforementioned projects, no funding has been received to date for the execution of these crucial public welfare initiatives.

In light of the directives of the Hon'ble NGT, it is earnestly requested that necessary action be initiated at your end to secure appropriate funding from the Government, thereby ensuring compliance with the court's order and avoiding any potential contempt proceedings.

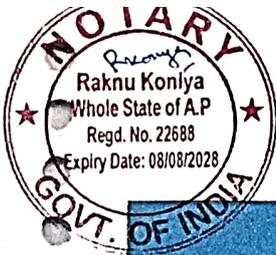
Enclosed: As Above.

Yours faithfully,

(Datun Sadu) APCS
Joint Commissioner
Itanagar Municipal Corporation
Itanagar

Dated: Itanagar, the 13th June 2025

Office Memo :- IMC/Estt-422/2024-25/596-04



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ANNEXURE 339

ITANAGAR MUNICIPAL CORPORATION

DETAILED PROJECT REPORT

FOR

CONSTRUCTION OF SEWAGE TREATMENT PLANT
(STP) IN WARD NO. 05 OF ITANAGAR
MUNICIPAL CORPORATION, ITANAGAR,
ARUNACHAL PRADESH

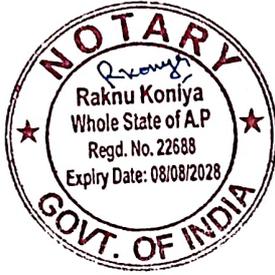
June, 2023

OFFICE OF THE EXECUTIVE ENGINEER,
ITANAGAR MUNICIPAL CORPORATION,
ITANAGAR, ARUNACHAL PRADESH

Prepared by :

R.T.T. ENTERPRISES

'C' Sector, Opp. BSNL GMT Office,
Bank Tinali, Dist. Papum Pare,
Itanagar, Arunachal Pradesh 791111

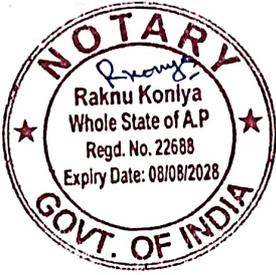


-6-

PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

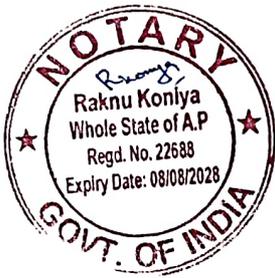
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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

EXECUTIVE SUMMARY



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

EXECUTIVE SUMMARY

The Detailed Project Report (DPR) for Construction of Sewage Treatment Plant in Ward No. – 05 of Itanagar Municipal Corporation, Itanagar, Arunachal Pradesh, comprises of the following Chapters as below :-

Chapter 1 covers **Introduction and Brief Description** with Brief History of Arunachal Pradesh and Itanagar Town with its Geographical Location, Climate, Topography etc.

Chapter 2 covers **Population Projection & Flow Calculation** with the subheads as Population Projection, Design Basis, Flow Calculation of STP, Raw Sewage and Treated Effluent Quality Standards.

As no previous record of population data is available for ward no. 5, the population projection of this particular locality is made on the basis of the population projection of the Itanagar town for which historical data is readily available. The summary of the Projected Population for the Base Year 2025, Intermediate Year 2040 & Final Year 2055 for Itanagar is given by the following Table:-

Year	2025	2040	2055
Projected Population	86854	122375	163269

For the proposed locality, the no. of household is 12000.

Considering 3.5 persons per household, the present population is

$$= 12000 \times 3.5 = 42000 \text{ persons.}$$

Keeping the same population increase as per the projection of the total town population, the estimated population of the present locality comes out as 60000 in the year 2040.

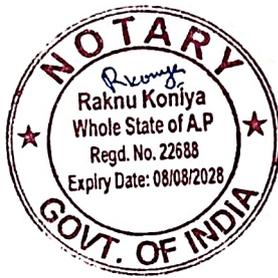
Per capita water supply is taken as 135 LPCD. It is recommended that maximum 80% of water supply is expected to reach the sewer system. Therefore, Interception Factor of 0.80 is adopted for Hydraulic Design of Interception and diversion system.

The Flow of the proposed STP = $60000 \times 135 \times 0.8 / 10^6 = 6.48 \text{ MLD.}$

Considering, 10% for Proportionate Infiltration Allowance,

The Design Flow of proposed STP = $6.48 \times 1.1 = 7.128 \text{ MLD.}$

Hence, the STP is to be provided to cater for the projected flow of **7.5 MLD.**



PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

Chapter 3 covers Scope of Work and Brief Description of Treatment Process including possibilities of re-use of treated effluent.

Chapter 4 covers Abstract of Project Cost for the Proposed Sewage Treatment Plant.

SL. NO.	DESCRIPTION OF WORK	Approx. Cost Rs. (in Lakh.)		TOTAL COST (INR in Lakh)	Refer
		Civil Works	Electro-Mech. Works		
A.	Capital Cost				
1	Jungle Cutting, Earth Filling and Site Development	128.95		128.95	ANX-I
2	Laying of New Sewer Lines & Manhole Chambers, Desilting of Existing Drains etc.	2,327.49		2,327.49	ANX-II
3	Construction of New 7.50 MLD SBR type Sewage Treatment Plant	1,181.25	1,443.75	2,625.00	ANX-III & Attach-III
4	Construction of Retaining Wall	1,170.07		1,170.07	ANX-IV
5	Construction of Approach Road to the STP Site	98.50		98.50	ANX-V
6	Restoration of Bituminous Road	38.78		38.78	ANX-VI
7	Restoration of Cement Concrete Road	122.10		122.10	ANX-VII
8	Indoor Type 2500 KVA Dry Transformer – complete with all required Accessories including Installation Charges.		150.00	150.00	
	Total	5,067.14	1,593.75	6,660.89	
	Add. GST @ 18%	912.09	286.88	1198.96	
	Sub-Total (A)	5,979.23	1,880.63	7,859.85	
B.	Operation & Maintenance for 5 Years				
	a) SBR Type STP including Power Charges			1034.21	ANX-VIII
	b) Other Components			30.00	
9	Deposit & Other Charges to the Electric Supply Authority			100.00	
10	Incidental Charges			20.00	
11	PROJECT PREPARATION (Detailed Survey, Design of Structures, vetting of designs and Project preparation before execution.		@ 1.5% of Capex	117.90	
12	ESMF and Communication & Outreach activities @ 0.5% on Capital Cost			39.30	
	Sub-Total (B)	-	-	1,341.41	
TOTAL PROJECT COST (A+B)				9,201.26	

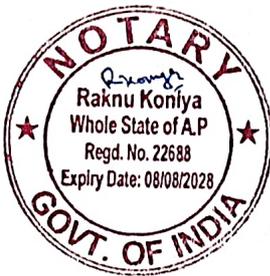
RUPEES NINETY-TWO CRORE ONE LAKH TWENTY-SIX THOUSAND ONLY.

M/s R.T.T. ENTERPRISES
C-Sector, Itanagar- 791111
Arunachal Pradesh

E/2

Assistant Engineer
Itanagar Sub-Division-I
Itanagar Municipal Corporation

Executive Engineer-I
Itanagar Municipal Corporation
Itanagar

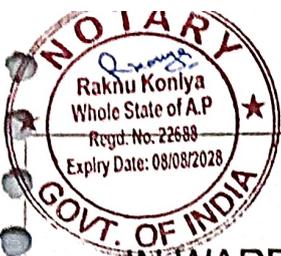


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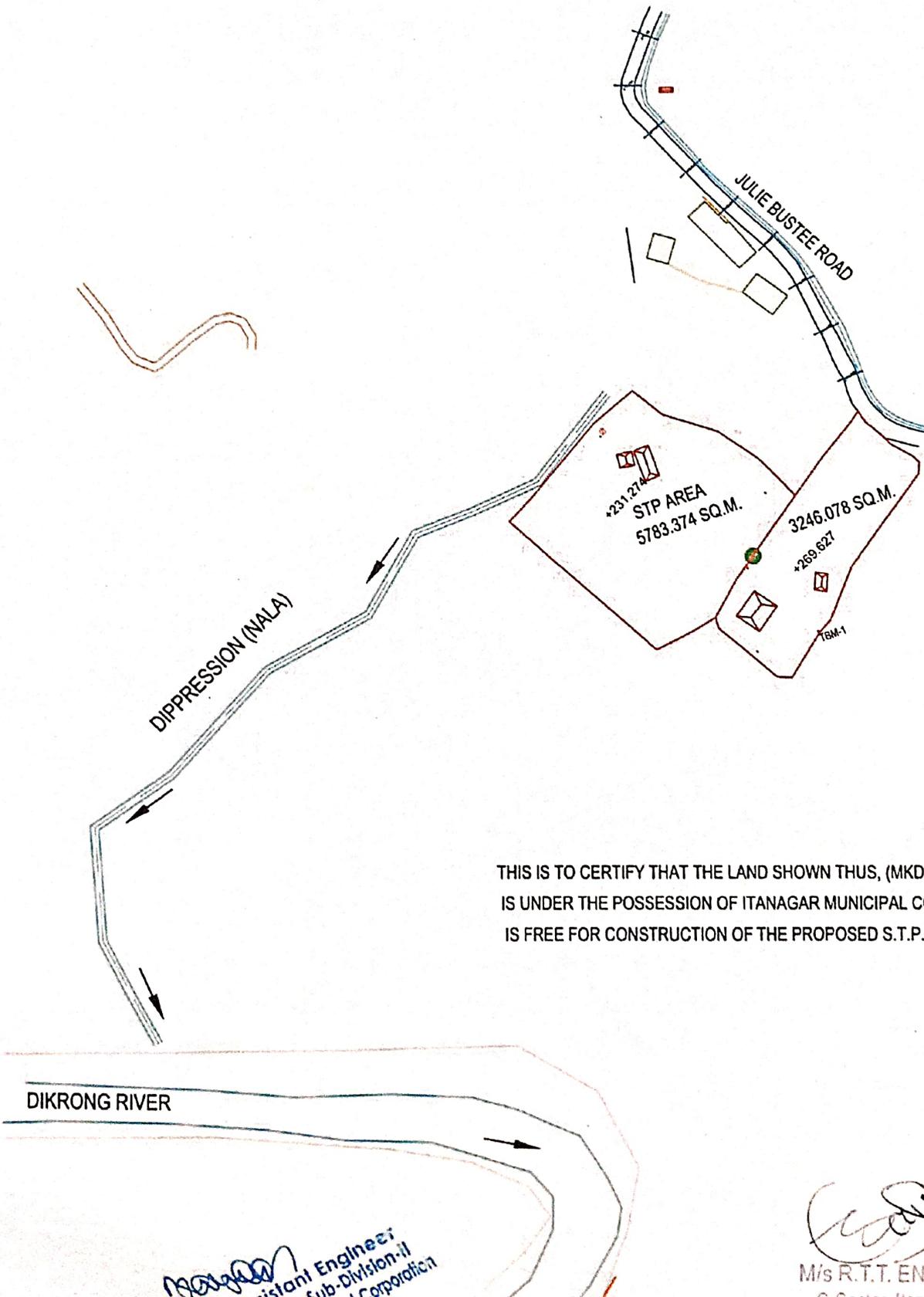
PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

Chapter 5 covers Detailed Calculation of the Project Cost under different Annexures.

- Annexure I - Estimated Cost for Jungle Cutting, Earth Filling and Site Development.
- Annexure II - Estimated Cost for Laying of New Sewer Lines & Manhole Chambers, Desilting of Existing Drains etc.
- Annexure III- Estimated Cost for Construction of 7.5 MLD SBR type Sewage Treatment Plant
- Annexure IV - Estimated Cost for Construction of RCC Retaining Wall.
- Annexure V - Estimated Cost for Construction of Approach Road to the STP Site
- Annexure VI- Estimated Cost for Restoration of Bituminous Road
- Annexure VII- Estimated Cost for Restoration of Cement Concrete Road
- Annexure VIII- Estimated Cost for Operation & Maintenance for 5 Years



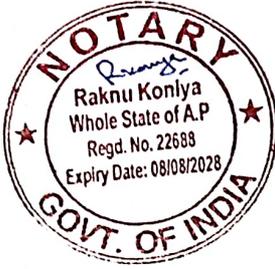
**SITE PLAN FOR PROPOSED S.T.P.
IN WARD NO. 05 OF ITANAGAR MUNICIPAL CORPORATION,
ITANAGAR, ARUNACHAL PRADESH.**



THIS IS TO CERTIFY THAT THE LAND SHOWN THUS, (MKD. BY RED COLOUR) IS UNDER THE POSSESSION OF ITANAGAR MUNICIPAL CORPORATION AND IS FREE FOR CONSTRUCTION OF THE PROPOSED S.T.P.

[Signature]
Assistant Engineer
Itanagar Sub-Division-II
Itanagar Municipal Corporation

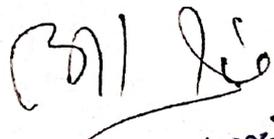
[Signature]
M/s R.T.T. ENTERPRISES
C-Sector, Itanagar- 791111
Arunachal Pradesh

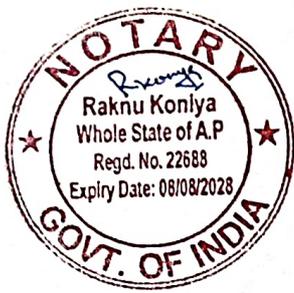


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TO WHOM IT MAY CONCERN

Calculation for Population Projection and Flow calculation, as depicted in Chapter - 2,
in Page No. 9 & 10, is being in order.


Executive Engineer-I
Itanagar Municipal Corporation
Itanagar

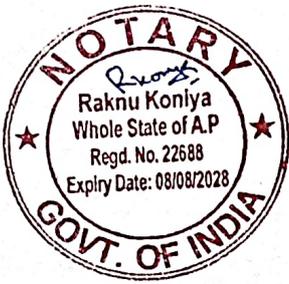


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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

DETAILED PROJECT REPORT (DPR)



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

CHAPTER - 1

INTRODUCTION & BRIEF DESCRIPTION

❖ Brief History of the State

Arunachal Pradesh is an Indian state that gained its statehood on 20 February, 1987. With Itanagar as its capital, Arunachal Pradesh borders Nagaland and Assam to the south and shares international borders with China in the north, Myanmar in the east, and Bhutan in the west. The location of the state is shown in the following Map of India:

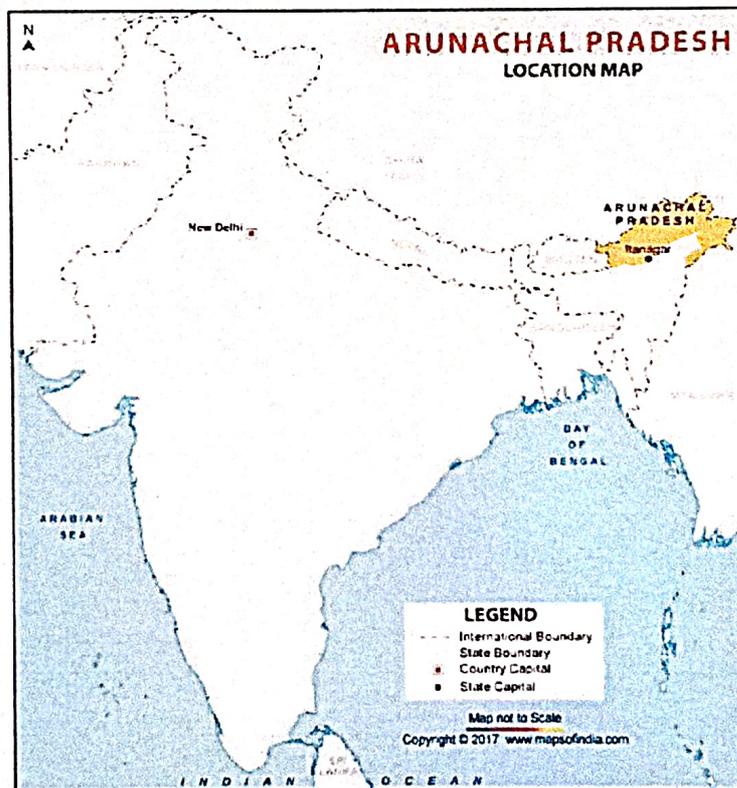
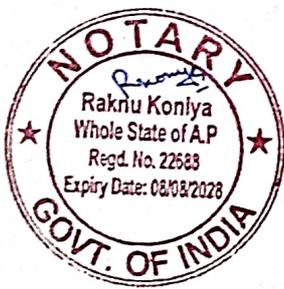


Figure showing Location of the State

In 1912–13, the British Indian government made agreements with the indigenous peoples of the Himalayas of northeastern India to set up the Balipara frontier tract in the west, the Sadiya frontier tract in the east, and the Abor and Mishmi hills and the Tirap frontier tract in the south. Together those tracts became the North East Frontier Agency, which is now Arunachal Pradesh.



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

The northern boundary of the territory (now of the state) determined at that time became known as the McMahon Line; it is about 550 miles (885 km) long and has been a lasting point of contention between India and China. The boundary takes its name from Sir Henry McMahon, secretary in the Indian foreign department and representative of Great Britain at the conference held in 1912-13 in Shimla, in the state of Himachal Pradesh, to settle frontier and other matters relating to Tibet. To the British, the line marked the geographic, ethnic and administrative boundary between the two regions, and delegates from Great Britain, China, and Tibet agreed that the frontier between Tibet and North-eastern India indeed should follow the crest of the high Himalayas. Two days later, however, the Chinese republican government disavowed its delegate and refused to sign a convention.

After the independence of India in 1947, China made claims to practically the whole upland area of what was then Assam state, arguing that the McMahon Line had never been accepted by China and was the result of British aggression. In letters to the Indian prime minister, Jawaharlal Nehru, the Chinese prime minister, Zhou Enlai, quoted a map in the 1929 edition of Encyclopaedia Britannica showing the disputed territory as Chinese, with the boundary following the alignment of Chinese maps. Some Chinese maps before 1935 showed the North East Frontier Agency (i.e., Arunachal Pradesh) as part of India and since then as part of Tibet. The Survey of India (1883) depicted the disputed tribal areas as de-facto administered by British India. British and Indian maps since 1914 have usually followed the McMahon Line. If the Chinese claims were allowed, the Indian-Chinese border would follow roughly the margin of the Assam plain, a frontier almost impossible to defend. Following that dispute, Chinese troops crossed the McMahon Line on August 26, 1959, and captured an Indian outpost at Longju, a short distance south of the line. They abandoned that outpost in 1961, but in October 1962 they again crossed the line, this time in force. After first striking toward the Tanglha ridge and Tawang near the border with Bhutan, the Chinese later extended their attack along the whole frontier. Deep inroads were made at a number of points. Later the Chinese agreed to withdraw approximately to the McMahon Line, and in 1963 they returned Indian troops who had been held as prisoners of war.

Mentions of the region can be found in the Indian epics Ramayana and Mahabharata and also in other texts such as Kalika and Bhagavad Purana. The present ruins of Bhismaknagar, in the Dibang Valley district, are mentioned as the palace of King Bhishmaka, the father of Rukmini in the Bhagavad Purana and the Mahabharata. Bhismaknagar also finds its mention in the Kalika Purana. Karbi, a tribe in Arunachal Pradesh, consider themselves the descendants of Vali & Sugriva. The main archaeological sites of present-day Arunachal Pradesh, including Bhismaknagar Fort, Roing, Goms Fort, East Siang, Ita Fort and Itanagar,



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PREPARATION OF DPR FOR CONSTRUCTION OF SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

were built during the 8th to 15th centuries. These archaeological sites were built by Chutia kings, who ruled the regions of present-day Assam and Arunachal Pradesh. During the 16th century, the Chutia dynasty began to decline, when they were defeated by the Ahom kings. The northern part of the region was under the control of Bhutan and Tibet, while the region's other parts were ruled by Ahom kings until the British annexation in 1858.

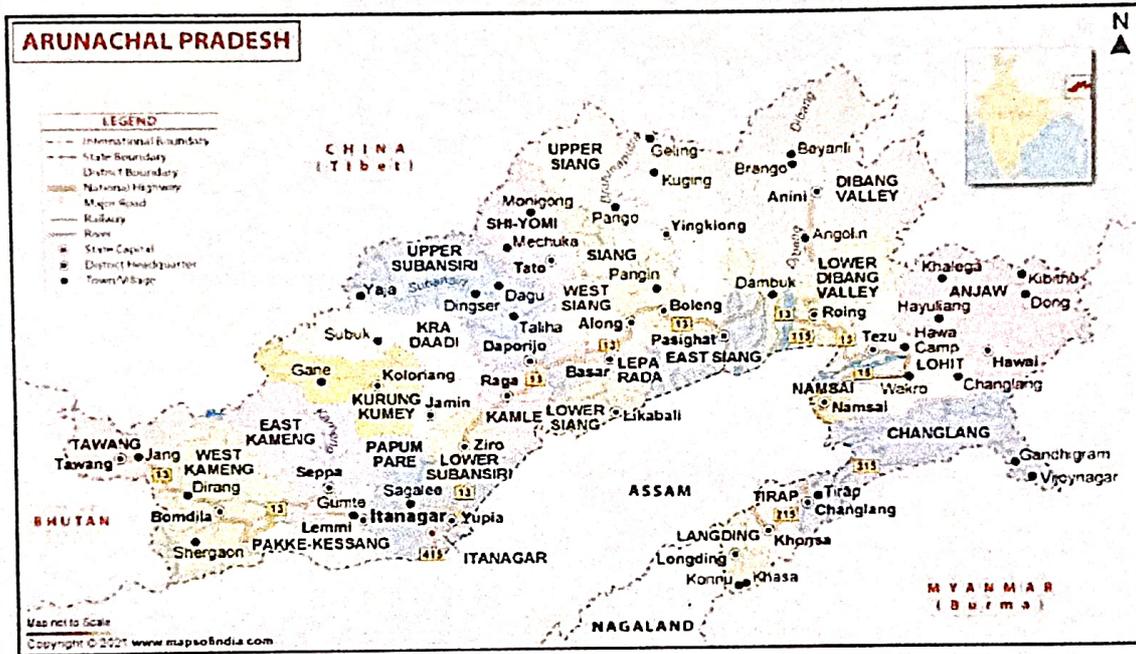
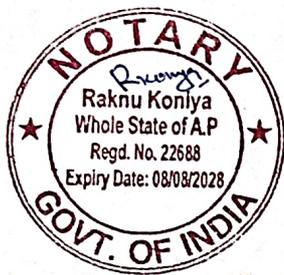


Figure showing Map of Arunachal Pradesh

❖ **River Systems in the State**

The major rivers of the state are the Brahmaputra and its tributaries—the Dibang (Sikang), Lohit, Subansiri, Kameng, and Tirap. The Brahmaputra [known as the Tsangpo in the Tibet Autonomous Region of China and as the Dihang (Siang) in Arunachal Pradesh] flows eastward from Mansarovar Lake in Tibet before dipping south through the Himalayas into north-central Arunachal Pradesh. The river then winds its way southward across the length of the state, cutting a narrow, steep-sided gorge into the mountainous terrain. The Brahmaputra finally emerges onto the northern edge of the Assam plains—a finger of which extends into south-eastern Arunachal Pradesh—near the town of Pasighat. It is joined by the Dibang and the Lohit rivers a short distance beyond Pasighat, just south of the border between Assam and Arunachal Pradesh. West of the Brahmaputra, the Subansiri is the only tributary to cross the main Himalayan ranges. The Kameng and other rivers in the area rise



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on the southern flanks of the mountains. The Tirap River drains the South-eastern part of the state.

❖ **Brief History of Itanagar**

Itanagar is the capital city of India's North-Eastern state of Arunachal Pradesh, set in the foothills of the Himalayas. It is also the administrative headquarters of Papum Pare district. Itanagar is called the 'Land of Dawn-lit Mountains' as it is situated in the lap of the majestic Himalayas. It is an important tourist spot in this region.

According to a legend, Itanagar was believed to be the home to many Hindu mythological characters like Princess Rukmini, King Bhismaka and Lord Parashuram. In fact, the place has found frequent citation in the heroic tales of Ramayana, Mahabharata and other Vedic texts. On the other hand, historians believe that many indigenous ethnic groups, that trace back their roots to the Tibeto-Burman tribes, ruled the place in the past. Since there is no concrete proof on the origins of this region, speculations on their origin are primarily based on the traditions and food habits of the local people.

In the past, several tribes that were prominent in the region such as Nyishis, Adis, Galos, Apatanis and the Miri's ruled Itanagar. Today, however, the place sees a very small population of the decedents of these ethnic groups. In the 16th century, the tribes belonging to the nearby region captured the place. The Ahom dynasty ruled the place with an iron hand until British annexed it. Later, the place underwent territory issues with China, which continued until 1987.

The only historical record in this province is the chronicles of the Ahom Dynasty belonging to the 16th century. The Ita Fort is the best example of the powerful Ahom rule in Itanagar. According to the records maintained by tribes of Monpa and Sherdukpen, the Monpa chiefs ruled the northwestern part of the state. The Monpa chieftains are said to be a part of the Monyul Empire. The Monyul dynasty flourished during 500 BC. Save for a few sections on the northern frontier that was captured and ruled by Tibet and Bhutan tribes, the remaining parts of the region was controlled by the Ahoms. The place continued to be administered by the Ahoms until the British seized the place in the year 1858.

Itanagar Municipal Corporation was formed in the year 2022.

A map of Itanagar Municipal Corporation area is annexed in 'Attachment - 1'.

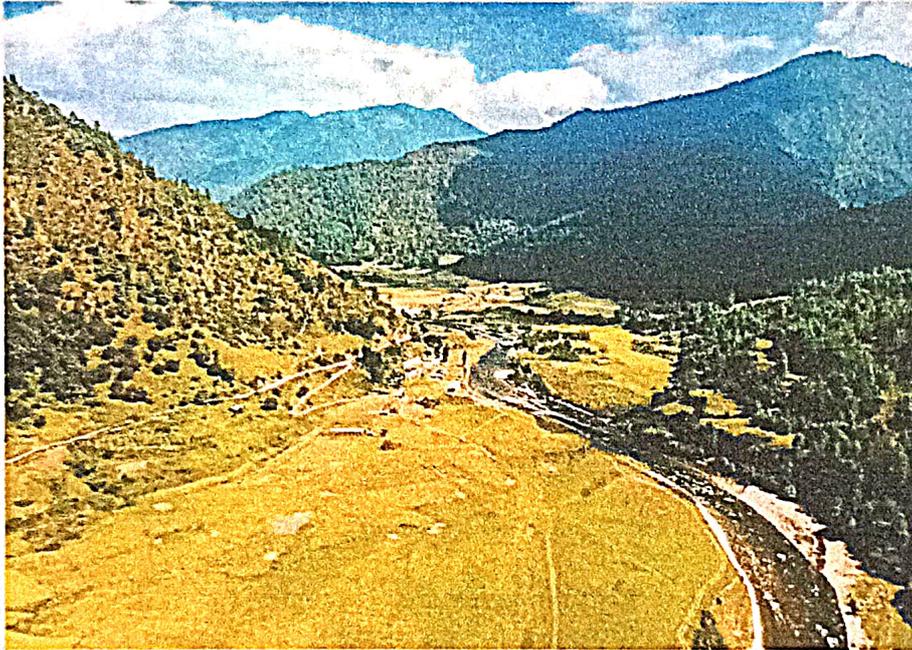


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❖ Geographical Location

Itanagar is located at an altitude of 530 meters above Mean Sea Level between 27.1⁰ North latitude and 93.6⁰ East longitudes. The Dikrong River passes through Itanagar and finally falls into the Brahmaputra in Lakhimpur District of Assam. Itanagar Town is having a population of 59490 according to 2011 Census. The average literacy of the town is 67%.



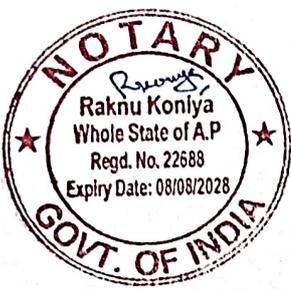
❖ Connectivity

Railway

Naharlagun railway station is the nearest railway station, which is nearly 15 km away from the city. Taxi and bus services are easily available from the railway station to Itanagar. Donyi Polo Express can be availed which runs on all days of a week from Guwahati and Shatabdi Express is available thrice a week from Guwahati. The Arunachal AC Superfast Express runs between Naharlagun and Anand Vihar Terminal twice a week which is the only direct train that connects Arunachal Pradesh with the Capital of Nation.

Roadways

National Highway 415 connects Itanagar to Arunachal Pradesh and the rest of the country. Regular bus and taxi services are available from Guwahati and Lokpriya Gopinath Bordoloi International Airport.



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❖ Climate

The climate of Arunachal Pradesh varies with topography and elevation. The foothill zone is subtropical and has a hot and humid climate; in the lower valleys, summer temperatures in June, July, and August typically rise into the mid-30°C, while winter high temperatures in December, January, and February usually reach about 13°C. Average temperatures decrease as elevations increase in the mountains. Itanagar features a humid subtropical climate with dry winters and hot humid and wet summers.

❖ Topography and Soil

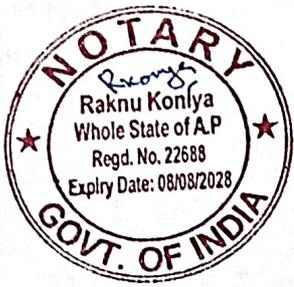
The physical features of the city is divided into two parts namely the Foothill Region and the Hilly Region. The foothill region receives heavy rainfall during monsoon and this area is covered by Dense tropical evergreen forests. This area forma the agricultural land of the region. The mountainous area of the region forms the hilly region. The hilly region is covered with dense and thick forests. The area has very limited agricultural land and jhum cultivation is practiced in this area.

Soils vary considerably with terrain. Generally, however, they are acidic and, in mountainous areas, subject to erosion. The major soil types are inceptisols, entisols, and ultisols. River valleys are characterized by rich alluvial soils that are highly suited for agriculture.

❖ Water Supply and Sewerage System

As per Census 2011, the Itanagar town is supplied with treated tap water from source. The only source of water supply for the city is underground water. There is open drainage system in Itanagar town. There are 22 latrine pits and 13,141 latrine flush/pour flush in Itanagar town as recorded in the Census 2011. The storm water drainage system consists of natural drainage system (Nallah) and major drains in the town. There are roadside open drains, either pucca or kutcha. Open drains are available along almost all roads of the town, which end up mostly into the Nallah and in some cases, into local ponds or open fields.

The sewage generated is directly being dumped in the Dikrong River stretch which is polluting the river to a great extent. At present there is only a 3.0 MLD STP at Naharlagun city which is highly insufficient to treat the total sewage generated from Itanagar, Naharlagun, Nirjula and Banderbewa.



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❖ Need of the Project

Presently, there is an utmost requirement of STP to cater for the sewage generated from Ward No. 5 of Itanagar Municipal Corporation (IMC). Area covered are Doni, Dokum, IRBN, Birup Colony, backside Itaport, backside Hilltop Colony etc.



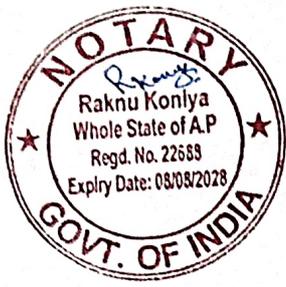
Satellite View of Doni Colony

Absence of a sewerage network resulting the sewerage being drained to open or vacant land as well as into river. Most of the surface water and sewerage gets mixed up resulting in storm water drains being used as sewers. The natural water bodies such as ponds and streams are also getting polluted by the sewerage. Hence, a STP is required for this region.

The study of residential building focuses on the planning of the new water source. The campus lacks water source inside the compound. Large amount of water is needed for daily use, but in summer the availability of fresh water is very less. So, in order to overcome this situation, the treated water from STP can be used for washing, gardening etc. except for drinking purpose. This will be highly beneficial for this locality.

Proposed location of the STP is Julli by the side of Juli Basti Road. Probable Households of the concerned locality is 12000 as per the **Concept Paper of IMC**.

This STP project will intercept the sewage and divert the same into the proposed STP from where it can be reused (except for drinking) and the treated water will be discharged into the Dikrong river. Suitable network shall be provided to take the sewage upto the STP. Entire



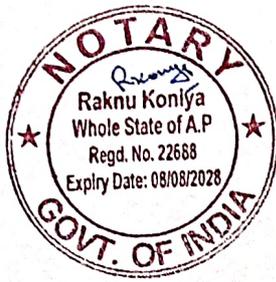
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sewage network will be with HDPE pipe as HDPE pipes are more flexible, light weight and easy to carry.

Since space is a constraint in Itanagar, in the proposed locality, SBR (Sequential Batch Reactor) type system is being provided which is space saving as well as more efficient.

The Concept Paper and Judgment of National Green Tribunal (NGT) is annexed in 'Attachment - 2' & 'Attachment - 3' respectively.



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CHAPTER - 2

POPULATION PROJECTION & FLOW CALCULATION

❖ **Population Projection**

As no previous record of population data is available for ward no. 5, the population projection of this particular locality is made on the basis of the population projection of the Itanagar town for which historical data is readily available.

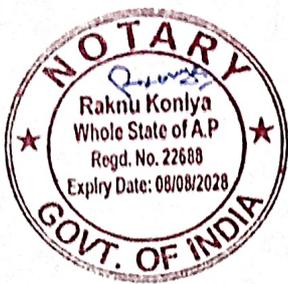
Population Data of Itanagar Town has been collected from the Census Records of the last 4 decades, namely, for the years 1981, 1991, 2001, 2011. In order to predict future population for the design years, the available data from the year 1981 to 2011 has been used and projected for the year by different methods as Arithmetic Increase Method, Incremental Increase Method and Graphical Method as follows:

A. Arithmetical Progression Method

YEAR	POPULATION	INCREASE IN POPULATION IN EACH DECADES	AVERAGE INCREASE PER DECADE (X)	PROJECTED POPULATION		
				$P_n = P_0 + n.X$		
				2025 (n=1.4)	2040 (n=2.9)	2055 (n=4.4)
1981	6406					
1991	16545	10139				
2001	35022	18477				
2011	59490	24468				
	Total	53084	17695	84263	110805	137347

B. Incremental Increase Method

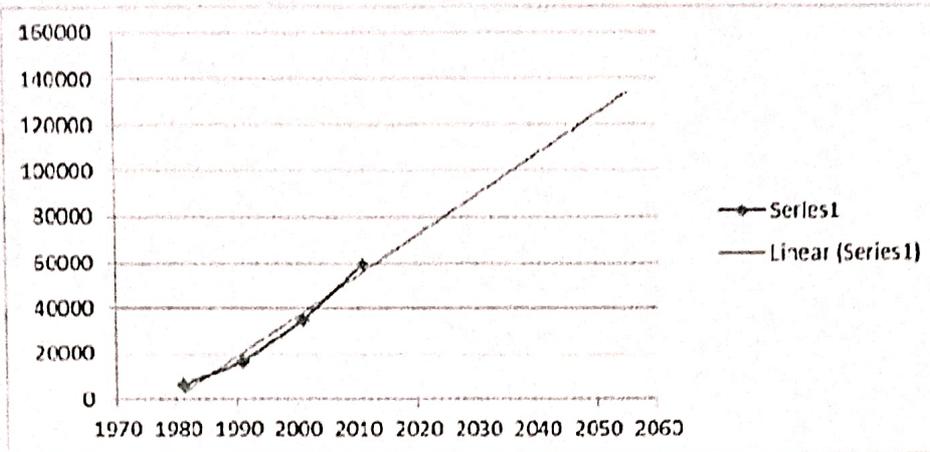
YEAR	POPULATION	INCREASE IN POPULATION IN EACH DECADES	INCREMENTAL INCREASE	PROJECTED POPULATION		
				$P_n = P_0 + n.X + n.\{(n+1)/2\}.Y$		
				2025 (n=1.4)	2040 (n=2.9)	2055 (n=4.4)
1981	6406					
1991	16545	10139				
2001	35022	18477	8338			
2011	59490	24468	5991			
	TOTAL	53084	14329	96299	151320	222461
		X =	Y =			
		17695	7165			



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C. Graphical Method



PROJECTED POPULATION (From Graph)		
2025	2040	2055
80000	105000	130000

The Projected Population is calculated by taking the average of the data obtained from the above Methods.

The summary of the Projected Population for the Base Year 2025, Intermediate Year 2040 & Final Year 2055 for Itanagar is given by the following Table:-

Year	2025	2040	2055
Projected Population	86854	122375	163269

For the proposed locality, the no. of household is 12000.

Considering 3.5 persons per household, the present population is

$$= 12000 \times 3.5 = 42000 \text{ persons.}$$

Keeping the same population increase as per the projection of the total town population, the estimated population of the present locality comes out as 60000 in the year 2040.



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❖ Design Basis

Introduction

Design of facilities for the collection and disposal of wastewater is dictated primarily by the estimated loadings to be handled. In developing such estimates, it is necessary to determine on a unit basis the flow or volume of wastewater. With respect to flow, peak flow rates must be known in order to determine the hydraulic capacities of sewers, effluent disposal facilities.

The design criteria adopted are generally in line with CPHEEO Manual, and standard Government practices. Wherever felt necessary, guidelines lay down in other internationally accepted manual/ text books are followed.

Sewerage & Drainage System

System Configuration

Two different system configurations for storm and wastewater disposal are followed. These are combined system and separate system.

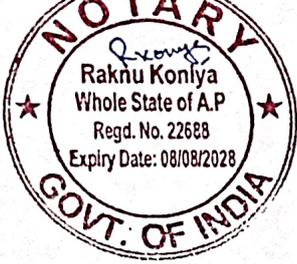
- **Combined System** : In this system the sewage as well as the storm water flows through the same conduit. As quantum of storm water flow is several times greater than the dry weather flow, the system carries an insignificant flow for major period of a year.
- **Separate System** : In this case the sewage and storm water flows are catered through separate conduits. Although the wastewater (sewage) flow rate varies over time, but the conduits are designed to cater to the peak flow upto the sewage treatment plant. In separate system storm water is never allowed to mix intentionally with the dry weather flow (DWF).

Separate sanitary and storm sewers are desirable in any drainage system. The major advantages of separate systems are the protection of water-courses from pollution and exclusion of storm water from the treatment system with a consequent saving in treatment plant construction and operating cost. However, this requires larger space as two different sets of conduits are to be laid in a separate system.

The sewer network in the proposed Project (Ward No. 05 & part of Ward No. 04) will be designed as a Separate System to carry DWF only.

House Connections and Inlet Arrangements

House connections through inspection pits are to be provided to collect only wastewater (DWF) from premises.



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Design Norms

The collection, transmission and disposal system of wastewater (DWF) drainage system is to be designed based on the estimated load to be handled.

Regarding the DWF for which the system is to be designed, peak flow has been taken into consideration to determine the required hydraulic capacities of sewers. Due consideration has been given to the consumption rate of water per capita per day in estimating generation of wastewater from houses and other sources.

Design Period

The design period for sewerage and drainage network are so decided that the systems will operate effectively for at least another thirty years after their completion. The project horizon is considered as year 2055 AD.

Population

Population projection is considered and design of proposed sewerage system has been adopted based on the ward-wise density of population.

Forecast of the future population trend is necessary for proper planning and design of the interventions. The design period for sewerage and drainage schemes are planned to meet the requirements for next 30 years after their implementation and commissioning.

Considering a population growth rate of 3.095% per annum and using the following equation, the protected population for the future years can be determined:

$$P_n = P_0 \left(1 + \frac{r}{100}\right)^n$$

where, P_n = population after 'nth' decades

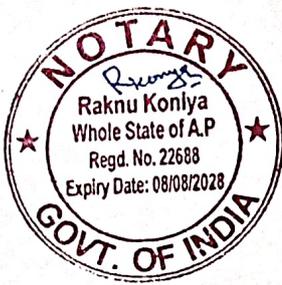
P_0 = initial population

n = planning horizon period

r = population growth rate per decade i.e. 35% in this case

For network analysis and hydraulic design of sewers, the entire area will be divided into a number of zones / catchments. Since the area is in the process of development, it is difficult to assess the exact population distribution within the proposed area. For design purpose, it is assumed that the population will be evenly distributed within the entire city area i.e. population density will be uniform.

Some provisions may be allowed to be provided in the network system for the vacant areas for future use.



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Wastewater Estimation

For estimation of wastewater, three important components viz. sanitary sewage, ICI (institutional, commercial & industrial) waste and ground water infiltration has been considered. For design of a combined system, storm water inflow through manholes and other drainage connections together with wastewater generation have been considered.

As the major portion of infiltration and storm inflow occurs during periods of prolonged precipitation, it is necessary to consider sewage volume in terms of both dry weather and wet weather flow. Dry weather flow consists of wastewater generated during non-monsoon period i.e., at zero or very little precipitation. Wet weather flow consists of wastewater plus infiltration and storm water inflow to the sewerage system.

Sanitary Sewage

Per capita sewage flow is conventionally determined from a study of recorded flow data and population served. With the basic data of present flow at hand, future changes are projected and suitable future design allowances are determined.

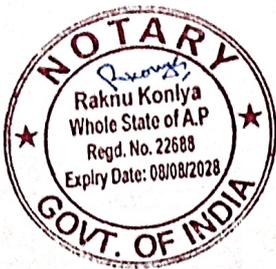
Per capita sewage generation is directly proportional to the per capita water supply rate. Theoretically the entire wastewater generated from a community is expected to reach the sewer. However, due to evaporation, seepage loss, leakage etc., only a fraction of the total wastewater generation will find their way to the sewers. Data on unit sewage flow obtained from various sources indicate that per capita sewage quantities within India are estimated to be in between 70-90% of established per capita water supply rate.

ICI Contribution

The area under command zone i.e. Ward no. 05 & part of Ward no. 04, catchment is predominantly commercial and partially residential. From the prevailing land-use pattern and trend of development, it is felt that the entire area is and will remain as both commercial and residential. The wastewater inflow from existing institutions, commercial set-ups within this area is expected to contribute substantially to the overall system. Large industries, if comes within this catchment area in future (possibility appears to be remote) are expected to have their independent arrangement for handling wastewater and as such are not expected to have considerable impact in the overall design. Accordingly, no separate provision towards ICI demand has been kept.

Infiltration

To determine capacity requirements of proposed sewer network infiltration allowance has been duly taken into consideration.



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Estimate of flow in sanitary sewers may include certain flows due to infiltration of groundwater through joints. Since sewers are designed for peak discharges, allowances for groundwater infiltration for the worst condition in the area should be made as maximum of 20000 litres/ha/day and 3500 litres/Km/day.

Design Flow

The design of sewers is based on peak flow rather than average flow and the ratio of maximum to average flow varies according to location of the sewerage system, i.e. extent of the contributory area from which the sewage is being collected. For design of sewerage system estimation of peak flow are made by multiplying the average flow generated with a peak factor, which in turn depends on the contributory population. The following peak factors have been adopted in design as per CPHEEO guidelines:

- | | |
|--|--------|
| 1. Population less than 20000 | : 3.00 |
| 2. Population in between 20000 to 50000 | : 2.50 |
| 3. Population in between 50000 to 750000 | : 2.25 |
| 4. Population exceeding 750000 | : 2.00 |

Depth of Flow

From considerations of ventilation in wastewater flow, sewers are not allowed to run full. For combined sewers, design is dictated predominantly by the rate of storm runoff. As such major portion of the sewer remains empty during entire DWF period. During rainfall event, the flow will be highly diluted; more over the pipe will carry design discharge for a very brief period of time. As such the requirement of additional space for ventilation is not considered in a sewer designed for combined flow. For sewers designed to carry dry weather flow only, the ratio of depth of flow to diameter of conduit has been kept as 80%.

Roughness Coefficient

Carrying capacities of conduits are determined based on Manning's Formula as suggested in the CPHEEO Manual. The following values of Manning's roughness coefficient 'n' have been adopted for determining carrying capacity of conduits running under gravity:

- | | |
|--------------------------------------|---------|
| New spigot-socket concrete sewers | : 0.011 |
| New stoneware sewers | : 0.012 |
| New concrete sewers above 1500mm dia | : 0.012 |
| New brick/RCC sewers | : 0.015 |
| Proposed sewers by GRP | : 0.011 |



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Existing brick sewers	: 0.017
Unlined open channels	: 0.025
Channel with brick sides and concrete bottom	: 0.015
Brick lined channels	: 0.017

Minimum Velocity of Flow and Slope

Minimum mean velocity, known as 'self-cleansing velocity' is desired to be maintained in sewers to prevent long-term deposition of solid material. A common design criterion is to maintain a value of 0.75 m/sec when the pipe is running full. However, velocity as low as 0.3 m/sec, may be allowed to transport sand/ silt particles etc. [Ref.-Fair & Gayer].

However, for a combined sewer system, it is not always possible to maintain the self-cleansing velocity, particularly those in upper stretches of the system during dry weather flow condition. This is an inherent weakness of combined system of drainage. However, it is expected that the silt deposited will be flushed out during peak flows. Where it is not possible to maintain self-cleansing velocity during the time of peak flows, cleaning and desilting the sewers will be more frequently required.

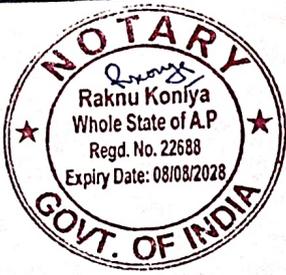
For smaller sewers, the following minimum slopes have been recommended:

<u>Diameter of sewers (mm)</u>	<u>Minimum slope</u>
200	1 in 250
250	1 in 350
300	1 in 450
400	1 in 600
450	1 in 800
500	1 in 1000
600	1 in 1250

Maximum Velocity of Flow and Slope

Excessively high velocity of flow has a tendency to cause abrasion, although this is generally not a problem for modern pipe materials. However, the maximum velocity should not exceed 3 m/sec under normal circumstances to minimize:

5. Energy losses at bends and junctions
6. Formation of hydraulic jumps leading to intermittent pipe choking
7. Formation of cavitations that causes structural damage
8. Air entrainment
9. Possibility of scouring



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Hydraulic Formula / Design Formula

For open channel, gravity flow, Manning's formula is used for designing slope and diameter of the sewer line to carry the design flow at stated velocity.

$$\text{Manning's formula : } V = \frac{1}{n} R^{2/3} S^{1/2}$$

For circular conduits

$$V = 3.968 \times 10^3 \times D^{2/3} \times 1/n \times S^{1/2}$$

And

$$Q = 3.118 \times 10^3 \times D^{2/3} \times 1/n \times S^{1/2}$$

Where,

Q	=	Discharge in Ips
S	=	Slope of hydraulic gradient
D	=	Internal Dia of the pipe in mm
R	=	Hydraulic radius in m
V	=	Velocity in mps
n	=	Manning's coefficient of roughness

❖ Flow Calculation

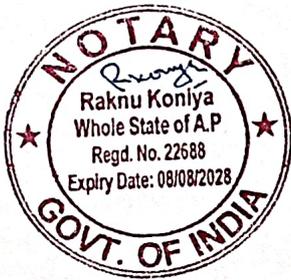
As per CPHEEO Manual on Water Supply and Treatment, the recommended values of water supply for domestic and non-domestic purposes for Cities provided with piped water supply where sewerage system is existing/contemplated as 135 Litres per capita per day (LPCD). For Itanagar, per capita water supply is taken as 135 LPCD. It is recommended that maximum 80% of water supply is expected to reach the sewer system. Therefore, Interception Factor of 0.80 is adopted for Hydraulic Design of Interception and diversion system.

The Flow of the proposed STP = $60000 \times 135 \times 0.8 / 10^6 = 6.48$ MLD.

Considering, 10% for Proportionate Infiltration Allowance,

The Design Flow of proposed STP = $6.48 \times 1.1 = 7.128$ MLD.

Hence, the STP is to be provided to cater for the projected flow of **7.5 MLD**.



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❖ Raw Sewage Characteristics

Wastewater samples are collected from two collection points - one from the Dikrong River near STP site and another from Doni Dokum Colony, to know the various properties of waste water sample. Analysis was conducted in laboratory following the prescribed IS standards for pH, TSS, COD, BOD, TKN, TP, Total Coliform etc. The detailed Laboratory Test Results are annexed with this DPR as 'Attachment-4'.

❖ Treated Effluent Quality Standards

Treated Effluent Standard of the STP sewage should be in the range as shown in the following Table, based on the directives issued by National Green Tribunal (NGT) on 30th April, 2019:

Parameters	Allowable Limits (Standards for New STPs design after notification date)
pH	5.5-9.0
BOD (mg/L)	≤ 10
COD (mg/L)	≤ 50
TSS (mg/L)	≤ 20
N-total (mg/L)	≤ 10
TP	≤ 1
Faecal Coliform (MPN/100mL)	Desirable ≤ 100 Permissible ≤ 230

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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

CHAPTER - 3

SCOPE OF WORK

& BRIEF DESCRIPTION OF THE TREATMENT PROCESS

❖ Scope of Work

The proposed **Scope of Work** are as follows:-

- Survey of the entire area
- Jungle Cutting, Earth Filling and Site Development.
- Entire network of Sewer Lines with Manhole Chambers.
- Desilting of Existing Drains.
- Laying of New Sewer Lines to carry the waste water to the STP.
- Providing a New SBR type Sewage Treatment Plant (STP)
- Construction of Approach Road to the STP Site
- Construction of RCC Retaining Wall.
- Road Restoration Work
- Providing all Electrical Panels, Sub-Panels, Transformer etc. for the STP.
- Operation & Maintenance for 5 Years
- Providing Environmental Monitoring during Construction Phase, Operation Phase & for Communication & Outreach & GAAP Activities

❖ Surveying Work for Collection of Data

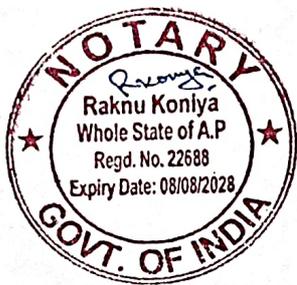
Preparation of Detailed Project Report is based on the available data that has been obtained by undertaking suitable survey and investigation work. Collection of data needs to be gathered for the town for abatement of pollution of the river from wastewater generated by the town. The DPR is prepared on the basis of the data obtained from survey work.

Some Photographs showing the Survey Work in progress are as under:



PREPARATION OF DPR FOR CONSTRUCTION OF SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH





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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

❖ Brief Description of the Treatment Process

A Sewage Treatment Plant of 7.50 MLD capacity based on SBR System is being recommended. SBR System requires less land requirement and less costing. SBR is the only technology which satisfies the effluent quality standards recommended by CPCB without any tertiary treatment. SBR technology has inbuilt system to handle variable flow. Hence, treated effluent quality is always assured with SBR. As the Aeration Tank becomes the Settling Tank, it has large surface area and can comfortably accommodate peak flows. This also eliminates the danger of exceeding the Settling Tank's overflow capacity at peak flow. SBR System also responds to shock loads in better manner. Hence, amongst many alternatives, SBR is the most feasible treatment methodology for Sewage Treatment Plant at Ward No. 05 of Itanagar Municipal Corporation under the Proposed Project.

A 7.50 MLD Capacity SBR type Sewage Treatment Plant shall be provided with the following Treatment Units:

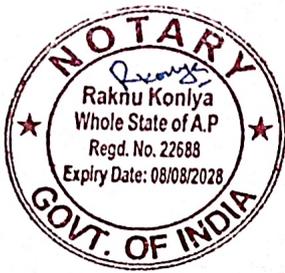
- Stilling Chamber
- Fine Screen Channels
- Grit Chambers
- SBR Basin
- Air Blower
- Chlorination Tank
- Sludge Sump
- Polyelectrolyte Dosing Tank
- Centrate Sump
- Centrifuge

Stilling Chamber

An Inlet Stilling Chamber is provided ahead of Fine Screen Channels to receive the sewage from Main Pumping Station via Rising Main.

Fine Screen Chamber

From the Stilling Chamber, the Raw Sewage flows to the Fine Screen Chambers which consists of bar screen placed across the channel to trap the floating materials. The spacing of bars is kept depending on the degree of treatment required. The bars arrest the floating materials which have to be removed periodically. Mechanical Fine Bar Screens with manual standby facility for the 100% of the flow are provided for the screening operation.



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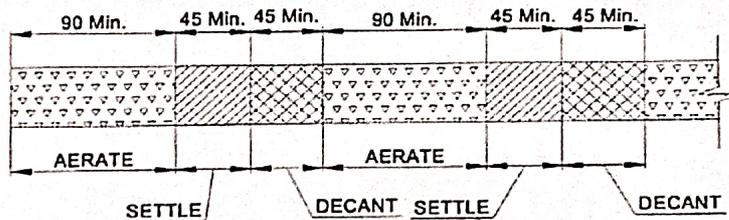
PREPARATION OF DPR FOR CONSTRUCTION OF SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

Grit Chamber

The screened sewage flows through Grit Removal System consisting of Mechanical Grit Removal Mechanism. It is possible to separate the gritty material, which are generally inorganic in nature. Mechanical De-gritter with manual standby facility for the 100% of the flow is provided for the grit removal. Grit removal is necessary to protect the moving mechanical equipment and pumps.

SBR Basin

Raw sewage, after primary treatment, flows into the SBR Basin by gravity. The system makes use of the variable volume treatment in combination with biological selector and operated in a fed-batch reactor mode. This Basin will serve the double purpose of aeration and settling in the same tank, one after the other, batchwise, i.e., in sequence. The complete biological operation in the SBR tank is divided into three cycles:-



**OPERATING SCHEDULE
REQUIRED FOR DISCHARGE OR REUSE**

During the period of a cycle, the liquid volume inside the Reactor increases from a set operating bottom water level. During Fill-Aeration sequence, mixed liquor from the aeration zone is recycled into the Selector Aeration ends at a predetermined period of the cycle to allow the biomass to flocculent and settle under quiescent condition. After a specific settling period, the treated supernatant is decanted, using a Moving Weir Decanter. The liquid level in the Reactor is so returned to the bottom water level after which the cycle is repeated. Solids are wasted from the Reactor during the decanting phase.

Chlorination System

Treated sewage from SBR basins will be collected in a Chlorination Tank where disinfectant will be added for disinfection at suitable dosing rate. Baffle walls shall be



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
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provided in the tank to facilitate hydraulic mixing of treated sewage. Treated Sewage after Chlorine Contact tank shall be disposed off into nearby water body or it can be reused for various non-potable purposes such as Gardening, Washing cars etc.

Sludge Handling System

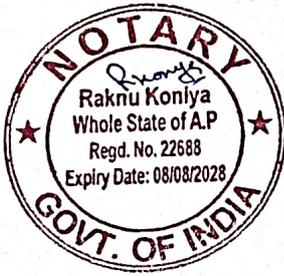
The sludge from the SBR Basins is withdrawn through sludge withdrawal system and collected in the Sludge Sump. Minimum of 6 hrs hold-up volume shall be provided. The sludge shall be then pumped to Solid Bowl Centrifuge for dewatering of sludge. Centrifuge Feed Pumps shall be of positive displacement type screw pumps. Dewatering Polyelectrolyte shall be dosed online prior to centrifuge feed. The dosing system shall include one Solution Preparation and one Solution Dosing Tank of minimum 8 hrs. The sludge in form of wet cake from Centrifuges will be collected and disposed off.

The Process Design Calculations of the proposed Sewage Treatment Plant is annexed as 'Attachment-5'.

Hydraulic Calculations and Design of new Sewer Lines is annexed as 'Attachment-6'.

❖ Possibilities for Re-Use of Treated Effluent

The attempt shall be made for exploring the possibilities for reuse of treated effluent from STP for various non-potable purposes such as Industrial, Irrigation, Pisciculture, Horticulture, Ground Water Recharge etc. Subsequent to such utilization, the excess quantum of the treated effluent from STP is to be discharged into the River. The vacant land, inside the STP Complex, can be used for future expansion of the Sewage Treatment Plant and can be used for cultivation and beautification purpose also.



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

CHAPTER - 4

ABSTRACT OF PROJECT COST

SL. NO.	DESCRIPTION OF WORK	Approx. Cost Rs. (in Lakh.)		TOTAL COST (INR in Lakh)	Refer
		Civil Works	Electro-Mech. Works		
A.	Capital Cost				
1	Jungle Cutting, Earth Filling and Site Development	128.95		128.95	ANX-I
2	Laying of New Sewer Lines & Manhole Chambers, Desilting of Existing Drains etc.	2,327.49		2,327.49	ANX-II
3	Construction of New 7.50 MLD SBR type Sewage Treatment Plant	1,181.25	1,443.75	2,625.00	ANX-III & Attach-III
4	Construction of Retaining Wall	1,170.07		1,170.07	ANX-IV
5	Construction of Approach Road to the STP Site	98.50		98.50	ANX-V
6	Restoration of Bituminous Road	38.78		38.78	ANX-VI
7	Restoration of Cement Concrete Road	122.10		122.10	ANX-VII
8	Indoor Type 2500 KVA Dry Transformer – complete with all required Accessories including Installation Charges.		150.00	150.00	
	Total	5,067.14	1,593.75	6,660.89	
	Add. GST @ 18%	912.09	286.88	1198.96	
	Sub-Total (A)	5,979.23	1,880.63	7,859.85	
B.	Operation & Maintenance for 5 Years				
	a) SBR Type STP including Power Charges			1034.21	ANX-VIII
	b) Other Components			30.00	
9	Deposit & Other Charges to the Electric Supply Authority			100.00	
10	Incidental Charges			20.00	
11	PROJECT PREPARATION (Detailed Survey, Design of Structures, vetting of designs and Project preparation before execution.	@ 1.5% of Capex		117.90	
12	ESMF and Communication & Outreach activities @ 0.5% on Capital Cost			39.30	
	Sub-Total (B)	-	-	1,341.41	
TOTAL PROJECT COST (A+B)				9,201.26	

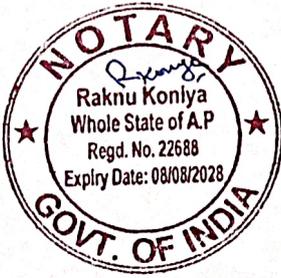
RUPEES NINETY-TWO CRORE ONE LAKH TWENTY-SIX THOUSAND ONLY.

M/s R.T.T. ENTERPRISES
C-Sector, Itanagar- 791111
Arunachal Pradesh

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Executive Engineer-I
Itanagar Municipal Corporation
Itanagar

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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

CHAPTER - 5

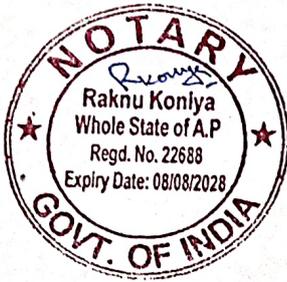
DETAILED CALCULATION OF THE PROJECT COST

The Cost of the entire project is divided into two parts:

- i) Capital Cost of Civil & Electro-Mechanical Work (CAPEX)
- ii) Operation and Maintenance Cost of Civil & Electro-Mechanical Work (OPEX)

The Detailed Calculation of the Project Cost under different Annexures are as follows :-

- Annexure I - Estimated Cost for Jungle Cutting, Earth Filling and Site Development.
- Annexure II - Estimated Cost for Laying of New Sewer Lines & Manhole Chambers, Desilting of Existing Drains etc.
- Annexure III- Estimated Cost for Construction of 7.5 MLD SBR type Sewage Treatment Plant
- Annexure IV - Estimated Cost for Construction of RCC Retaining Wall.
- Annexure V - Estimated Cost for Construction of Approach Road to the STP Site
- Annexure VI- Estimated Cost for Restoration of Bituminous Road
- Annexure VII- Estimated Cost for Restoration of Cement Concrete Road
- Annexure VIII- Estimated Cost for Operation & Maintenance for 5 Years



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (SIP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

ANNEXURE - I

Estimated Cost for Jungle Cutting, Earth Filling and Site Development

Sl. No.	Description of Item of Works	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Refer
1	Clearing compound premises of shrubs, plants, jungles etc., removal of rubbish, earth etc. from the working site and disposal of the same beyond the compound etc	1	LS	LS	20,00,000.00	
2	Earth work in excavation in saturated soil upto a depth of 61 cm including pumping or bailing out water and banking in 20 cm layers for the purpose of making embankments or filling up ground depressions, lead upto 50 m and lift upto 1.50 m.	5,734.37	Cu.m.	482.90	27,69,129.20	SOR AP 2021 I-14 P-27
3	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications RCC Grade M20 Using Concrete Mixer	384.00	Cu.m.	9,846.00	37,80,864.00	It-12.8 (E) case-I
4	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	38.40	MT	98,902.58	37,97,859.07	It-12-41
5	Centring and Shuttering including strutting, propping etc. and removal of form work for ... b) walls (any thickness) including attached pilasters, buttresses, plinth and string course etc.	1,152.00	Sq.m.	474.80	5,46,969.60	It-12-35
				TOTAL	1,28,94,821.87	



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

ANNEXURE - II

Estimated Cost for Proposed Sewerage Network at Ward No.-05

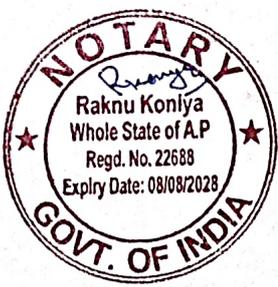
According to Design calculations of proposed Network, the length of sewers are as appended :

<u>NODE</u>	<u>DIA. (MM)</u>	<u>DISTANCE (M.)</u>			
A-D	300	1912.2	CC	CC	3327.25
D-E	400	562.57	BT	BT	923.87
B-E	300	1314.8	CC		
E-F	500	361.3	BT		
C-D	400	100.25	CC		

Proposed lengths of different Sewers :

300 mm dia. DWC HDP PIPES	3550	m.	1420	Nos.
400 mm dia DWC HDP PIPES	1016	m.	406	Nos.
500 mm dia DWC HDP PIPES	1557	m.	623	Nos.

<u>Sl. No.</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Rate (Rs.)</u>	<u>Amount (Rs.)</u>	<u>Schedule Ref.</u>
1	Demolishing cement concrete 1: 3: 6 or richer mix including disposal off material within 50 metres lead. In ground floor including roof	8,273.25	Cum.	2,007.10	1,66,05,240.08	PWD Bldg AP 2021, Item no. 15.2.21
2	Earth work in excavation in foundation and trenches in soils containing 50% or more of shingle or small size boulders upto 30 cm size, lift upto 1.50 m and stacking the Excavated soil not more than 3 m clear from the edge of the excavation and returning the stacked soil in 15 cm layers when required, into plinth, sides of foundation etc consolidating each deposited layer by ramming and watering and then disposing of all surplus excavated soil as directed within a lead of 50m (a) Depth of excavation not exceeding 2,500 mm	15,569.64	Cum.	319.34	49,72,008.84	UDMAD 1(B)
3	Extra for lead of 50 m or part thereof for earth work in all soils including shingles, small size boulders upto 30 cm size and saturated soil.	15,569.64	Cum.	22.90	3,565.45	PWD Bldg AP 2018, Item no.5, Page 23
4	Extra for every additional lift of 1.50 m or part thereof for earth work in all soils including shingles, small size boulders upto 30 cm size but excluding saturated soil and rock.	15,569.64	Cu.m.	15.40	2,397.72	PWD Bldg AP 2018, Item no.6, Page 23

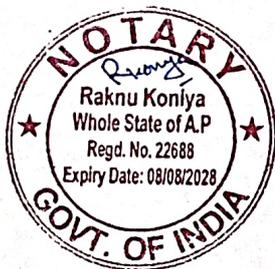


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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
IIANAGAR MUNICIPAL CORPORATION, IIANAGAR, ARUNACHAL PRADESH

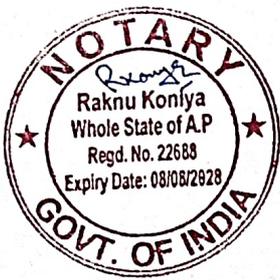
Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
5	Filling in plinth with sand under floors including watering, ramming, consolidating and dressing complete	10,431.66	Cum.	2,161.20	2,25,44,903.59	DSR 2021 2.27
6	Removal of rubbish, earth etc. from the working site and disposal of the same beyond the compound, in conformity rules for such disposal, loading into truck and and cleaning the site in all respect as per direction of Engineer-in-Charge.	5,137.98	Cum	166.00	8,52,904.68	PWD WB Bldg 2017 Page-12, Item No.13
7	Single Brick Flat Soling of picked jhama bricks including ramming and dressing bed to proper level and filling joints with local sand.	5,211.75	Sqm.	355.00	18,50,171.25	PWD Bldg 2017, Item 1, Page 14
8	Cement concrete with graded jhama khoa(30 mm size) excluding shuttering In ground floor and foundation. (b) 1:3:6 proportion	904.73	Cum.	6,578.00	59,51,300.78	APSR 2021 12.4
9	Hire and labour charges for 5 cm. thick close timbering with planks battens, runners struts etc. complete removing them incl. penetration of shoring as per direction of the Engineer-in-Charge. (Vertical surface of contact area with supporting earth to be measured, payment for penetration will not be allowed)					UD&MAD Item 6,
	a) Beyond 1.0 M. upto 2.0 M trench width. depth upto 6.00 M below G.L.	11,164.65	Sqm.	727.00	81,16,700.55	
	b) Beyond 2.0 M. and upto 4.0 M. trench width depth upto 6.0 M. below G.L.	11,164.65	Sqm.	754.00	84,18,146.10	
10	Hire and labour charges for shoring with Sheet pile (12 mm thick) & ISMB250 runner, struts, anchor, tie etc. complete. Beam section conforming to IS226 IS:808 & SP(6)-1964 including cutting to requisite length, fabrication with necessary welding conforming to IS: 816-1956 & IS: 1995 using electrodes of approved make and brand conforming to IS: 814-1957 including driving and complete removing them as per direction of the Engineer-in-Charge. For overall depth of excavation from G.L., a) 4.0 M to below 5.0 M.	3,189.90	Sqm.	9,396.00	2,99,72,300.40	UD&MAD Sch. (Drg) 2018 Item 8, Page 23



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

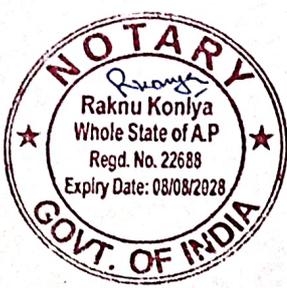
Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
11	Construction of manhole with chamber of size as per requirement without shaft with cement brick work (1:4) over 150mm. thick jhama cement conc. (1:4:8) bed over a layer of brick flat soling including providing 150mm. thick R.C.C. slab with ordinary cement concrete (mix 1:1.5:3) with reinf. as per standard drawing over the chamber chamber, brick on edge flooring with ordinary cement concrete (mix 1:2:4) in the invert with 20mm. thick cement plastering (1:4) finished fine with neat cement 1.50 mm. thick in the inside walls and invert, including supplying, fitting and fixing R.C.P.C. manhole cover & frame (35 M.T. load bearing capacity) with ordinary cement concrete (mix 1:2:4) & C.I. steps (4kg. Each) including cutting hard crust, excavation, dewatering, back filling and removal of spoils but excluding shoring complete as per standard drawing. (Depth of invert shall be between 1.25 m. and 1.80 m. below G.L.). i) Average depth of invert 1.25 m. below G.L with 250 mm. thick brick work. Manhole Without Shaft					UD&MAD Sch. (Drainage) 2018 Item 24, Page 28
	a) 150 mm to 400 mm dia having internal size (1500mmx750mm)	149.00	Each	26,898.00	40,07,802.00	
	b) Above 400 mm to 600 mm dia having internal size (1500mmx1100mm)	30.00	Each	31,347.00	9,40,410.00	
	ii) Addition to rate of manhole chamber without shaft as per above item for each addition in depth of 150 mm. or part thereof. With 250 mm. thick brick work.					UD&MAD Sch. (Drainage) 2018 Item 24 (ii), Page 28
	a) 150 mm to 400 mm dia having internal size (1500mmx750mm)	852.00	Each	3,228.00	27,50,256.00	
	b) Above 400 mm to 600 mm dia having internal size (1500mmx1100mm)	92.00	Each	3,762.00	3,46,104.00	
12	Construction of manhole with chamber of size as given below as per requirement and 600mm X 600mm. (inside measurement) square shaft, with cement brick work (1:4) over 150 mm. thick jhama cement concrete (1:4:8) bed, over a layer of brick flat soling including providing 150mm. thick R.C.C. slab with ordinary					UD&MAD Sch. (Drainage) 2018 Item 25, Page 29



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PREPARATION OF DPR FOR CONSTRUCTION OF SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
12 contd.	concrete (mix 1:1.5:3) with reinforcement as per standard drawing over the chamber, brick-on-edge flooring with ordinary cement concrete (mix 1:2:4) in the invert with 20mm.thick cement plaster (1:4) finished fine with 1.5mm. thick neat cement in the inside walls and invert including supplying, fitting and fixing R.C.P.C. cover and frame (35 M.T. load bearing capacity) with ordinary cement concrete (mix 1:2:4) and C.I. steps (4 Kg. each) including cutting hard crust, excavation, de-watering, back filling and removal of spoils but excluding shoring complete as per standard drawing. (Depth of invert shall not be less than 1.80M below G.L.) Average depth of invert 2.5m. below G.L. i) With 250mm. thick brick work					
	a) 150 mm to 400 mm dia having internal size (1500mmx750mm)	169.00	Each	38,129.00	64,43,801.00	
	b) Above 400 mm to 600 mm dia having internal size (1500mmx1100mm)	67.00	Each	43,548.00	29,17,716.00	
	c) Above 600 mm to 900 mm dia having internal size (1500mmx1500mm)	4.00	Each	49,004.00	1,96,016.00	
	ii) Addition or reduction to rate of manhole as per above item for each addition or reduction in depth of 150mm. or part thereof. With 250mm. thick brick work (Depth of invert should not exceed 3.00M.)					UD&MAD Sch. (Drainage) 2018 Item 25 (ii), Page 28
	b) Above 400 mm to 600 mm dia having internal size (1500mmx1100mm)	264.00	Each	1,664.00	4,39,296.00	
13	Supplying & laying Double Wall Corrugated (with external annular corrugation and smooth internal walls) High Density Polyethelene Pipes conforming to IS 16098 (Part-II):2013 having Stiffness Class of SN 8 with Ring Stiffness not less than 8.00 KN/Sqm. and Impact Resistance TIR value not more than 10% including necessary jointing materials for nonpressure underground Drainage, Sewerage & Cross drainage application					VENDOR QUOTATION

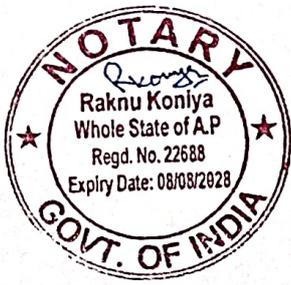


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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
	250 mm dia DWC HDP PIPES	2,700.00	Metres	3,000.00	81,00,000.00	
	315 mm dia. DWC HDP PIPES	1,630.00	Metres	4,811.00	78,41,930.00	
	400 mm dia DWC HDP PIPES	2,505.00	Metres	8,324.00	2,08,51,620.00	
	500 mm dia DWC HDP PIPES	1,125.00	Metres	10,550.00	1,18,68,750.00	
	600 mm dia DWC HDP PIPES	958.00	Metres	12,000.00	1,14,96,000.00	
14	Removal of silt, slush, musks or any other foul materials from open drains or nikashis of any size and depth, manholes, gully pits, catch pits etc. by any other method approved of impure / inflammable / asphyxiating gases from the drains etc. with staging if necessary, stacking of the materials properly away from traffic lane as far as practicable lead upto 75 mtr. with all labour and materials and hire charges of tools and plants as per direction of Engineerin-Charge. For Open Nikashi or Drain. Transportation of silt, slush or other foul materials from the working site and disposal of the same beyond the area of Municipal Corporation / Municipality / Notified Area Authority / Industrial Township Authority including the cost of loading, unloading, transportation and making arrangement of necessary land for disposal, spreading and leveling as necessary etc. complete (Land for disposal to be arranged by the contractor). (Payment to be made on the basis of stack measurement after deducting sinkage/shrinkage at the rate of 1/9th of volume) For Day Time	9,600.00	Cu.m.	948.00	91,00,800.00	UD & MAD Sch. (Drainage) 2018 Item 15, Page 24
15	Laying of 600 mm dia MS Main	370.00	Metres	Lump Sum	2,50,00,000.00	
	TOTAL				21,15,90,140.44	
				R.O.	21,15,90,140.00	
	ADD. LEAD @ 10%				2,11,59,014.00	
				TOTAL	23,27,49,154.00	



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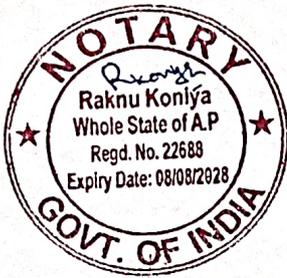
PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

ANNEXURE-III

Estimated Cost for Proposed 7.5 MLD SBR type Sewage Treatment Plant

Civil Works	...	Rs.	1,181.25 Lakh
Electro-Mech. Works	...	Rs.	<u>1,443.75 Lakh</u>
Total	...	Rs.	2,625.00 Lakh

For detailed Cost Estimation of 7.5 MLD SBR type Sewage Treatment Plant,
refer 'Attachment -7' of this DPR.



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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

ANNEXURE - IV

Estimated Cost for Construction of Retaining Wall

RCC Retaining Wall-6.00m height

Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
1	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, incl. setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides & bottom and backfilling with approved material)					
	Ordinary soil					
	Manual Means					APSR'2021
	above 3m depth	2,800.00	169.00	Cum	4,73,200.00	It-12-1 (A)
2	Providing and laying in foundations and plinth cement concrete 1 : 3 : 6(1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) excluding the cost of centring and shuttering.	280.00	6,578.00	Cum	18,41,840.00	It-12-4
3	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications					
	RCC Grade M20 Height upto 5m					
	Using concrete Mixer	5,320.00	9,846.00	Cum	5,23,80,720.00	It-12.8 (E) case-I
4	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	417.62	98,902.58	MT	4,13,03,695.46	It-12-41
5	Centring and Shuttering including strutting, propping etc. and removal of form work for ... b) walls (any thickness) including attached pillasters, buttresses, plinth and string course etc.	8,400.00	474.80	Sq.m.	39,88,320.00	It-12-35
6	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing. Complete as per drawing and Technical specifications	417.62	176.00	Each	73,501.12	It-13.8
7	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification Granular material	417.62	1,248.00	Cum	5,21,189.76	It-13.9.A
8	Add carriage of Materials				57,87,554.00	Attach.-8A
				TOTAL	= 10,63,70,020.34	
	Add. Lead @ 10%				1,06,37,002.03	
				Say Rs.	= 11,70,07,022.37	



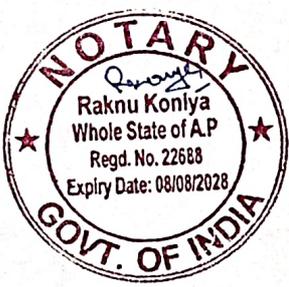
- 2/6 -

PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

ANNEXURE - V

Estimated Cost for Construction of Approach Road

Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
1	Embankment Construction with Material Obtained from Borrow Pits (Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2)	3,600.00	231.00	Cum	8,31,600.00	APSR 2021
2	Preparation of Sub Grade:) Preparation of sub grade (Preparation of sub grade by excavating earth to an average depth of 22.50 cm, dressing to camber and consolidating with road roller, making good the undulations etc. and disposal of surplus earth, lead upto 50 m.	3,000.00	91.00	Sqm	2,73,000.00	APSR 2021, Item-4.18(A)
3	Consolidation of sub-grade with road roller of 8 to 12 tonne capacity including making good the undulations etc. with earth or quarry spoils etc. and rerolling the sub grade	3,000.00	4.55	Sqm	13,650.00	Item-4.18(B)
4	By Mix in Place Method (Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader 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) a0 Grading I material	900.00	1,544.00	Cum	13,89,600.00	Item-4.2(i)
5	Water Bound Macadam (Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.					
i	WBM grd-II By Manual Means Using Screening Type-B (11.2mm Agg.	300.00	2,571.00	Cum	7,71,300.00	Item-4.9(A) 2(c)
ii	WBM grd-III By Manual Means Using Screening Type-A (13.2mm Agg.	300.00	2,612.00	Cum	7,83,600.00	Item-4.9(A) 3(B)

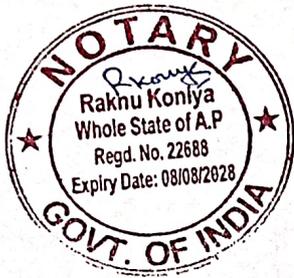


- 47 -

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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
5	Prime coat (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means.)	3,000.00	41.00	Sqm	1,23,000.00	Item-5.1
6	Bituminous Macadam (Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction) Grading -II (19mm nominal Size)	150.00	10,577.00	Cum	15,86,550.00	Item-5.3.ii
7	Teak Coat, Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.	3,000.00	15.00	Sqm	45,000.00	Item-5.2
8	Bituminous Concrete (Providing and laying bituminous concrete with 100- 120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects) specification clause No. 508 complete in all respects) Grading-II(10mm nominal Size)	120.00	14,650.00	Cum	17,58,000.00	Item-5.8.ii
	Add for carriage of materials				22,74,755.00	Attach.-8B
			TOTAL		98,50,055.00	



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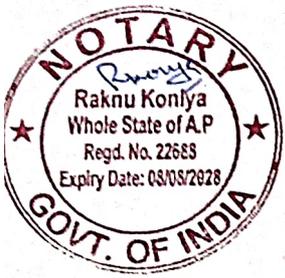
PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

ANNEXURE - VI

Estimated Cost for Restoration of Bituminous Road

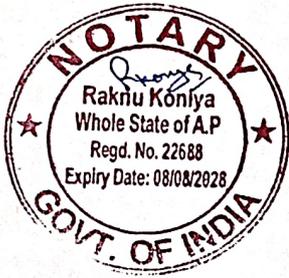
Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
1	Embankment Construction with Material Obtained from Borrow Pits (Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2)	1,100.00	231.00	Cum	2,54,100.00	APSR 2021
2	Preparation of Sub Grade:) Preparation of sub grade (Preparation of sub grade by excavating earth to an average depth of 22.50 cm, dressing to camber and consolidating with road roller, making good the undulations etc. and disposal of surplus earth, lead upto 50 m.	600.00	91.00	Sqm	54,600.00	APSR 2021, Item-4.18(A)
3	Consolidation of sub-grade with road roller of 8 to 12 tonne capacity including making good the undulations etc. with earth or quarry spoils etc. and rerolling the sub grade	600.00	4.55	Sqm	2,730.00	Item-4.18(B)
4	By Mix in Place Method (Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader 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) a0 Grading I material	180.00	1,544.00	Cum	2,77,920.00	Item-4.2(i)
5	Water Bound Macadam (Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.					
i	WBM grd-II By Manual Means Using Screening Type-B (11.2mm Agg.	60.00	2,571.00	Cum	1,54,260.00	Item-4.9(A) 2(c)
ii	WBM grd-III By Manual Means Using Screening Type-A (13.2mm Agg.	60.00	2,612.00	Cum	1,56,720.00	Item-4.9(A) 3(B)

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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
6	Prime coat (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means.)	600.00	41.00	Sqm	24,600.00	Item-5.1
7	Bituminous Macadam (Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction) Grading -II (19mm nominal Size)	30.00	10,577.00	Cum	3,17,310.00	Item-5.3.ii
8	Teak Coat, Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.	600.00	15.00	Sqm	9,000.00	Item-5.2
9	Bituminous Concrete (Providing and laying bituminous concrete with 100- 120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)specification clause No. 508 complete in all respects) Grading-II(10mm nominal Size)	24.00	14,650.00	Cum	3,51,600.00	Item-5.8.ii
	Add for carriage of materials				22,74,755.00	Attach.-8B
			TOTAL		38,77,595.00	



PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

ANNEXURE - VII

Estimated Cost for Restoration of Cement Concrete Road

Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)	Schedule Ref.
1	Embankment Construction with Material Obtained from Borrow Pits (Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2)	7,319.95	231.00	Cum	16,90,908.45	APSR 2021
2	Preparation of Sub Grade:) Preparation of sub grade (Preparation of sub grade by excavating earth to an average depth of 22.50 cm, dressing to camber and consolidating with road roller, making good the undulations etc. and disposal of surplus earth, lead upto 50 m.	3,992.70	91.00	Sqm	3,63,335.70	APSR 2021, Item-4.18(A)
3	Consolidation of sub-grade with road roller of 8 to 12 tonne capacity including making good the undulations etc. with earth or quarry spoils etc. and rerolling the sub grade	3,992.70	4.55	Sqm	18,166.79	Item-4.18(B)
4	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications RCC Grade M20 Using Concrete Mixer	798.54	9,846.00	Cum	78,62,424.84	Item-4.2(i)
	Add for carriage of materials				22,74,755.00	Attach-8B
			TOTAL		1,22,09,590.78	



-5X1-

PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

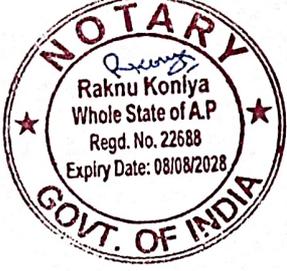
ANNEXURE - VIII

Estimated Cost for Operation & Maintenance for 5 Years

**COST OF ANNUAL OPERATION &
MAINTENANCE OF CIVIL & ELECTRO-
MECHANICAL WORKS OF SEWAGE
TREATMENT PLANT**

(Refer
1,83,46,563 Attachment-ID)

OPERATION & MAINTENANCE COST FOR NEXT 5 YEARS		
Year	Total Amount	Remarks
1st	1,83,46,563.00	Considering, Increase @ 6% per year
2nd	1,94,47,356.78	
3rd	2,06,14,198.19	
4th	2,18,51,050.08	
5th	2,31,62,113.08	
TOTAL	10,34,21,281.13	

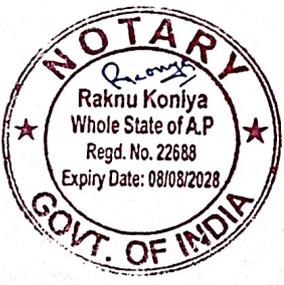


- SR -

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PREPARATION OF DPR FOR CONSTRUCTION OF
SEWAGE TREATMENT PLANT (STP) IN WARD NO. 05 OF
ITANAGAR MUNICIPAL CORPORATION, ITANAGAR, ARUNACHAL PRADESH

ATTACHMENTS



- 5X3 -

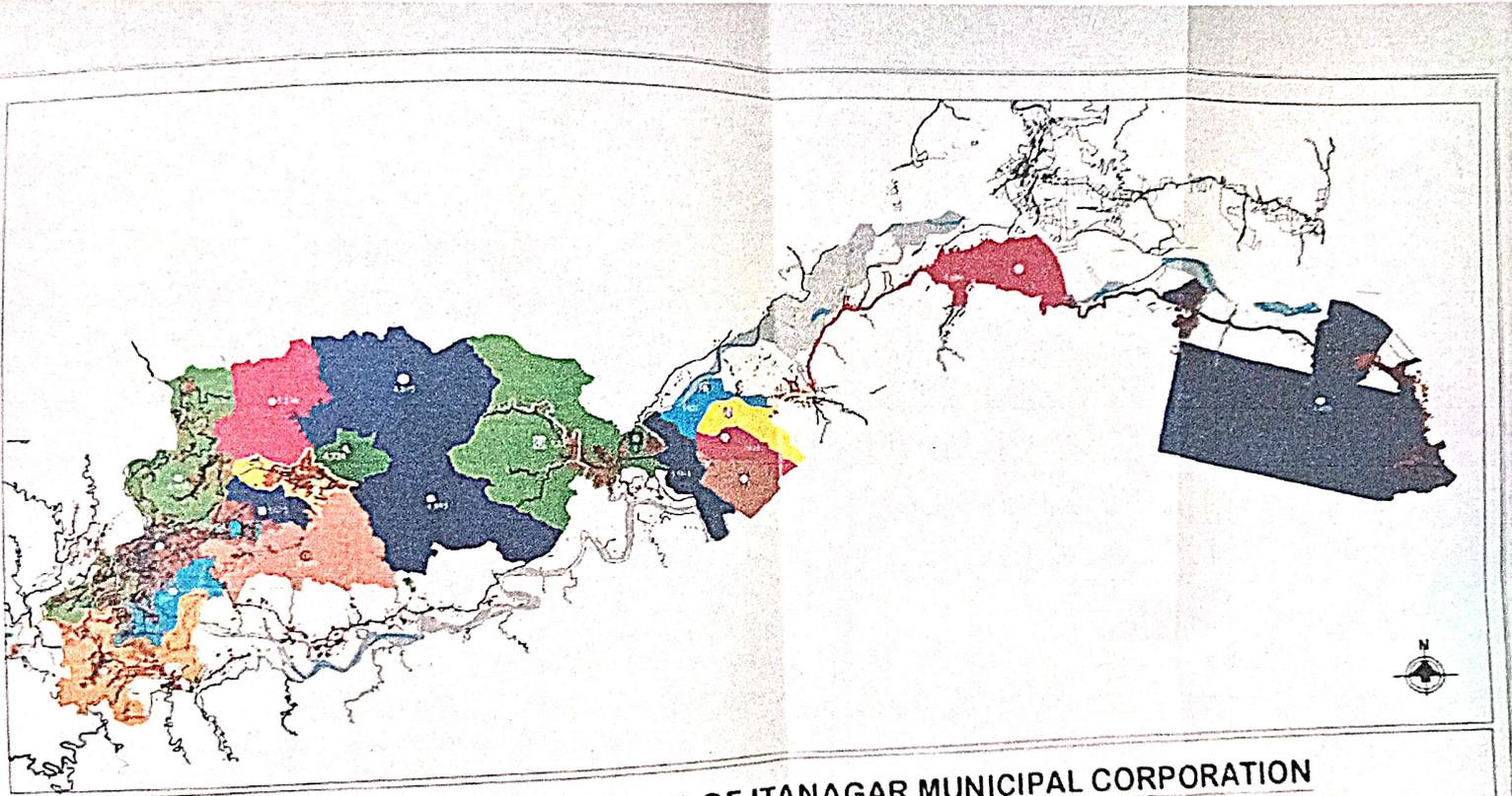
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ATTACHMENT-1

**Drawing showing area / Wards of
Itanagar Municipal Corporation**



- SX4 -



MAP OF ITANAGAR MUNICIPAL CORPORATION

LEGEND

	WARD BOUNDARIES
	WARD Hatch
	ROAD BLACKTOP
	WATER BODY
	EXISTING BUILDING

BOUNDARY DESCRIPTION

NORTH	Ganga Vill. Senki River, Dana Hill, Barapani Riv, Moddi Village, Yupa Bounuoh, Dakong River
EAST	Dikrong Assam
SOUTH	Chumou River/Vill, Senki River, Juliang, Pagalata, Pachri River, Moddi Vill, Nayah Vill, Kanatigka Vill, RF Area
WEST	Dokkato Halla, Zoi



Total Wards	Total Area	Population
20/00	31.84 square	1,01,772



Sheet Title	Itanagar Municipal Corporation Map	NORTH
City No.	- 1 of 1	
Scale	0:100000	Scale: NTS
Prepared by	ENGINEER (AEP)	ADMINISTRATOR (DMC)
Checked by	ENGINEER (AEP)	ADMINISTRATOR (DMC)
Approved by	ADMINISTRATOR (DMC)	S. SINGH (DPS)



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ANNEXURE-3/89

**OFFICE OF THE EXECUTIVE ENGINEER PT-I
ITANAGAR MUNICIPAL CORPORATION
ITANAGAR.**

IMC

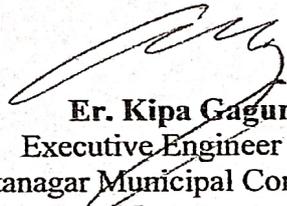
File No. IMC/ESTT-422/2022-23/1062-64

Dated Itanagar, the 31st July' 2025

COMPLETION REPORT.

Certified that Construction of "Septage Management Treatment Plant for 100 KLD at Chimpu, Itanagar" has been completed on 02/09/2024 under AMRUT 1.0 Programme as per Contract agreement vide Agreement No – IMC/AMRUT (NIT) – 131/2017 – 18 (Ph – II), Dated 05/03/2019.

Yours Faithfully


Er. Kipa Gagung
Executive Engineer (Pt-I)
Itanagar Municipal Corporation
Itanagar.

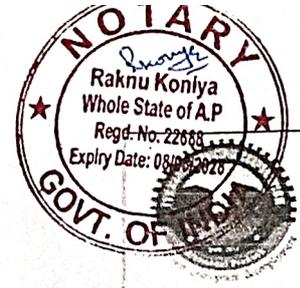
Memo No. IMC/ESTT-422/2022-23/1062-64

Dated Itanagar, the 31st July' 2025

Copy to:-

1. PA to Commissioner, IMC for information please.
2. Assistant Engineer (ISD-I) for information please.
2. Office copy.


Executive Engineer (Pt-I)
Itanagar Municipal Corporation
Itanagar.



-5X6-

ANNEXURE-8/4
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**OFFICE OF THE EXECUTIVE ENGINEER PT-I
ITANAGAR MUNICIPAL CORPORATION
ITANAGAR.**

IMC

File No. IMC/ESTT-422/2022-23/ 1059-61

Dated Itanagar, the 31st July' 2025

COMMISSION REPORT.

Certified that Construction of "Septage Management Treatment Plant for 100 KLD at Chimpu, Itanagar" has been commission on 02/09/2024 under AMRUT 1.0 Programme.

Yours Faithfully


Er. Kipa Gagung
Executive Engineer (Pt-I)
Itanagar Municipal Corporation
Itanagar.

Memo No. IMC/ESTT-422/2022-23/ 1059-61

Dated Itanagar, the 31st July' 2025

Copy to:-

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2. Assistant Engineer (ISD-I) for information please.
2. Office copy.


Executive Engineer (Pt-I)
Itanagar Municipal Corporation
Itanagar.

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V A K A L A T N A M A

BEFORE THE NATIONAL GREEN TRIBUNAL, KOLKATA/EZ

MA No. 42 of 2025/EZ

O.A No.94 of 2020

S.D. Loda

.....

Plaintiff
Petitioners

-Versus-

The Union of India & Ors

Defendant
Opposite Party

On behalf of R-5

Know all men by these presents that by Vakalatnama I/We
appoint the Advocate or Advocates for filing the Memorandum of appeal of petition

For entering appearance in
the above matter for appearing in conducting and arguing the same,
for depositing or withdrawing any money in connection therewith for
moving the Court in any matter connected therewith , for preparing
the paper book in the case and for putting in papers petitions etc.
on my / our behalf for filing taking back any documents for
withdrawing suits or appeals or petitions with permission to
institute fresh suits etc. For signing and filing petitions of
compromise in connections with said matter and for taking copies of
paper form the Record and I/We further say that any act, done by
my/one said Advocate or advocates or by any of them after accepting
this Vakalatnama, shall be considered as my/our true lawful act.

And I/We further hereby agree and undertake to pay the said
Advocate his or their fees are settled and all others sums that my
be necessary to carry out the requisition of the Court and otherwise
to enable the Advocates to conduct property. Failing which the said
Advocate after notice to me/us will be liberty to withdraw from the
further conduct to the case.

IN WITNESS WHERE OF I/We sign and execute this Vakalatnama on
this the 03rd day of on February 2026

Name of Advocate:-

1. Adv. Pantu Rai.



Commissioner
Managar Municipal Corporation
Managar