

# ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT



## KARACHI MOBILITY PROJECT YELLOW BRT CORRIDOR

Annexure  
March 08, 2024

Volume 2 of 2



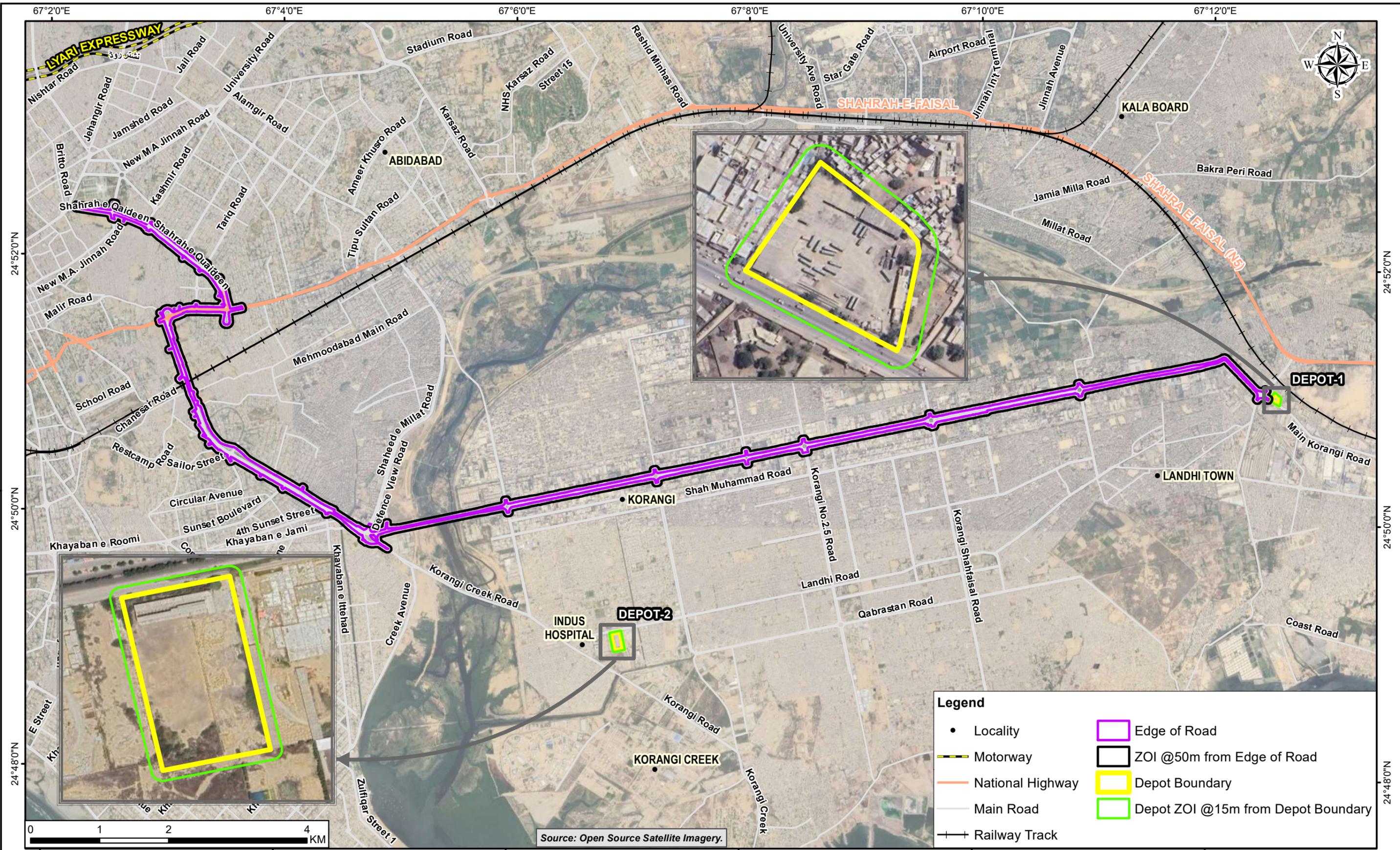
**Sindh Mass Transit Authority**

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## **ANNEXURES**

## **ANNEX-I: ZONE OF INFLUENCE**



Source: Open Source Satellite Imagery.

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

HEAD OFFICE:- NESPAK HOUSE , 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04						DRAWN	M.MUNEEB
03						SUBMITTED	RAMLA S.
02						RECOMMENDED	
01						CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	APPROVED	M.SHARIQ	

**PROJECT**

**KARACHI MOBILITY PREPARATION PROJECT (YELLOW BUSS RAPID TRANSIT)**

<b>ROAD EDGE - ZOI MAP</b>		<b>SCALE</b>
		1:50,000
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH-2024		0

**ANNEXURE-II: SMTA's LETTER**



No. PD/KMP/SMTA/2022//382

Karachi, Dated: Thursday, Dec 26<sup>th</sup>, 2022

To,

**CHIEF ENGINEER,  
NESPAK,  
Karachi.**

**SUBJECT: Consulting Services for Preparation of Detailed Design, Procurement Support, and Construction Supervision for Karachi Mobility Project (Yellow Bus Rapid Transit) – Right of Way (ROW).**

1. With reference to the letter No. 4309/50P/RZ/01/2569 dated September 28, 2022 and meeting with Managing Director SMTA on 19<sup>th</sup> December 2022,
2. The ROW data coordination with the JV team shows that project alignment is planned on government roads, therefore, the design needs to follow the existing road area; façade to façade.
3. It may be noted that the JV consultants were instructed to conduct survey to identify existing structure (permanent, temporary/ moveable and others) along the alignment and provide the detailed report to the client i.e. updated Compensation Livelihood & Rehabilitation Plan (CLRP).
4. ~~Citing the situation and project dynamics, the JV consultants are expected to~~ submit the following documents for timely progress over the project components at their earliers by 31<sup>st</sup> December 2023:
  - a) Segment wise conceptual design plan (Main Corridor).
  - b) Updated Compensation & Livelihood Rehabilitation Plan (CLRP) report.An early response is requested in the matter.

*Encl: Letter No. 4309/50P/RZ/01/2569*

  
**PROJECT DIRECTOR  
KARACHI MOBILITY PROJECT –  
YELLOW BRTS**

*A copy is forwarded for information to:*

1. Managing Director, Sindh Mass Transit Authority, GoS.
2. Director Infrastructure & Planning, Sindh Mass Transit Authority, GoS.
3. PS to Secretary Transport and Mass Transit Department.
4. Master File.

# NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED

13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi - 74400, Pakistan.



4309/50P/RZ/01/2569

September 28, 2022

**Project Director**  
Karachi Mobility Project  
House D-43, Shakra-e-Ghalib  
Block-2, Clifton  
Karachi

**Preparation of Detailed Design, Procurement Support and Construction Supervision for Karachi Mobility Project (Yellow Bus Rapid Transit)**  
- Updating / Finalizing of EIA / SIA / CLRP

Dear Sir,

This is with reference to your letter referred at s. no. 1 through which your goodself has requested the JV to update the EIA based on the extracted ROW from SMTA provided maps / layouts. Reference is also made to the below and various meetings regarding the updating of EIA, SIA and CLRP, for the subject project.

S. No.	Reference Letter	Subject
1	SMTA Letter no. PD/KMP/SMTA/2022/L-1182 dated September 21, 2022	Update on EIA based on Extracted ROW provided by SMTA
2	SMTA Letter no. PD/KMP/SMTA/2022/L-1070 dated September 01, 2022	Approved layout plan for DHA Phase I-VII acquired from Clifton Cantonment Board (CBC)
3	JV Letter no. 4309/50P/RZ/01/2548 dated July 06, 2022	Response to Korangi Township layout plan provided by SMTA and request to provide missing data along main corridor and direct / feeder services
4	SMTA Letter no. PD/KMP/SMTA/2022/L-1023 dated June 24, 2022	Approved layout plan for Korangi Township acquired from Karachi Development Authority (KDA)
5	JV letter no. P21161/F/L0066-22 dated June 24, 2022	Submission of draft ESIA Report based on available information
6	Email from JV Consultants P21161-0100D - Karachi Mobility Project (Yellow Bus Rapid Transit) dated April 6, 2022	Request for clarification on CLRP
7	Meeting held at SMTA office dated February 25, 2022	Progress meeting with SMTA on EIA / SIA / CLRP
8	Meeting held at SEPA office dated December 14, 2021	Meeting held at SEPA office regarding EIA and SIA

During the meeting held at SEPA office referred at s. no. 08, SEPA officials clearly informed SMTA and JV Consultants that "An EIA of the complete project should be submitted and approved before the start of construction activities".

Your letter referred at s. no. 1 above states that the data regarding the remaining Right-of Way (ROW) shall be provided in due course of time. In order for us to finalize the EIA, SIA and CLRP, we need the complete ROW information so a comprehensive report can be submitted to SEPA to initiate the approval process. Noting that, on the data provided by SMTA vide letters referred at s. no. 2 & 4 above, we conveyed our reservations to SMTA vide our letter referred at s. no. 3. However, we proceeded at that time based on the information provided by SMTA.

(Contd. P.2)

Furthermore, the EIA, SIA and CLRP have to be based on the finalized design. It must be noted that the design of the project is yet to be finalized and the same will have to be incorporated in the ESIA Report before submission to SEPA or WB for their review and approval. Following major decisions are still pending at your end in this regard:

- 1) Number and type of roads structure along the main corridor,
- 2) Number and location of the BRT stations, and
- 3) Fueling mechanism.

Notwithstanding the above and in spite of all the delays in getting required information from SMTA, we continued working to prepare the required ESIA Report based on some technical assumptions and a draft ESIA Report was submitted accordingly to the SMTA vide letter referred at s. no. 5, for review and advanced comments till all other missing information are provide by SMTA as well as the pending technical design issues are decided by SMTA.

Please be assured that as soon as we receive the complete data and long pending decisions from Client, we shall revise and update the EIA/SIA report for onward submission to the Client for SEPA approval.

Thanking you and assuring you our best professional services at all times.

Sincerely,  
for National Engineering Services Pakistan (Pvt.) Limited



Rehan Zamin  
Project Manager

- Cc. - Managing Director, SMTA  
- Deputy Team Leader, DAR-NESPAK JV  
- GM / Head, NESPAK, Karachi

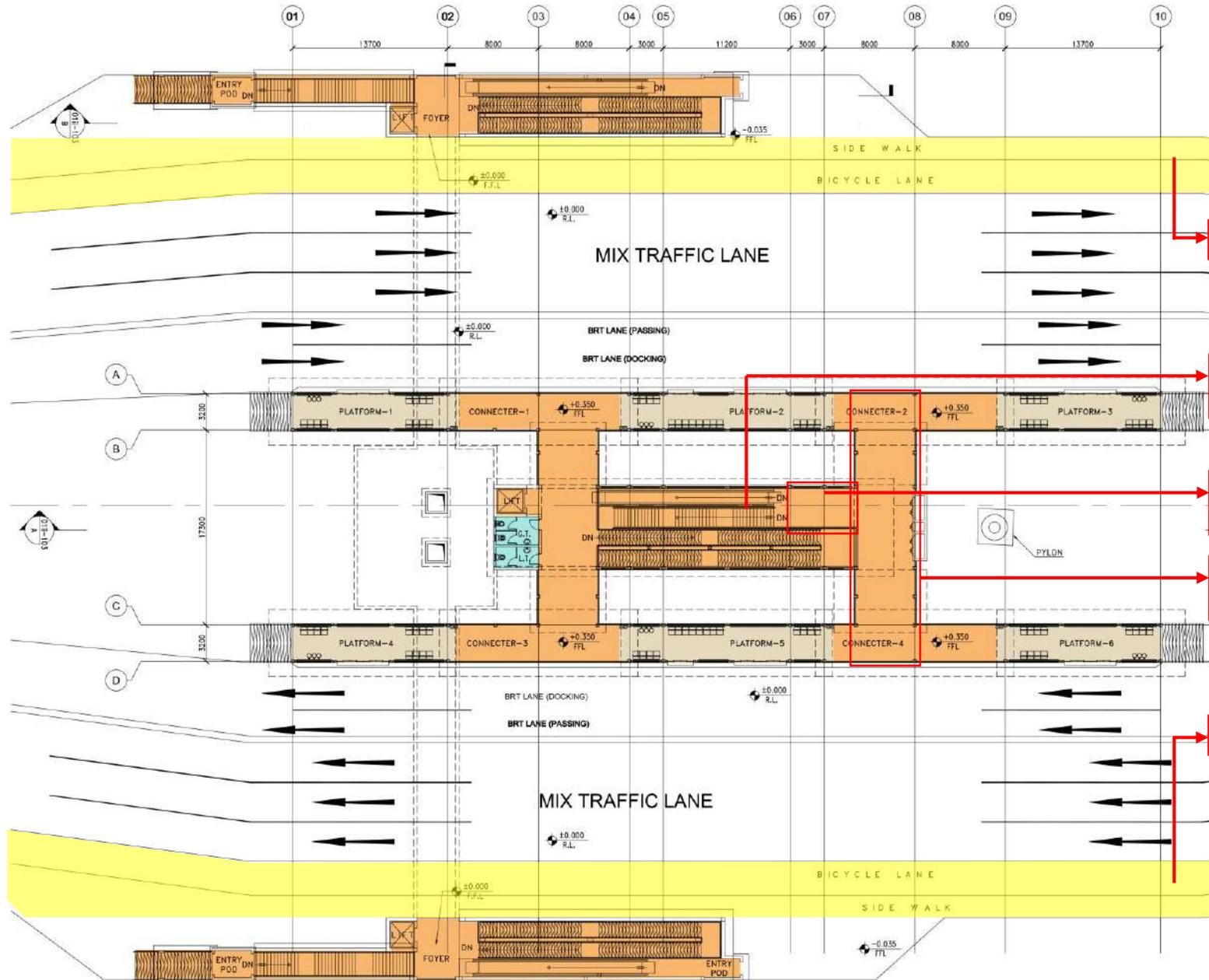
RECEIVED  
SMTA-TMTD

Dairy No. 13.13

Dated: 28/09/22

## **ANNEX-III: LAYOUT OF STATIONS**

B.R.T .  
STATION  
TYPE- A



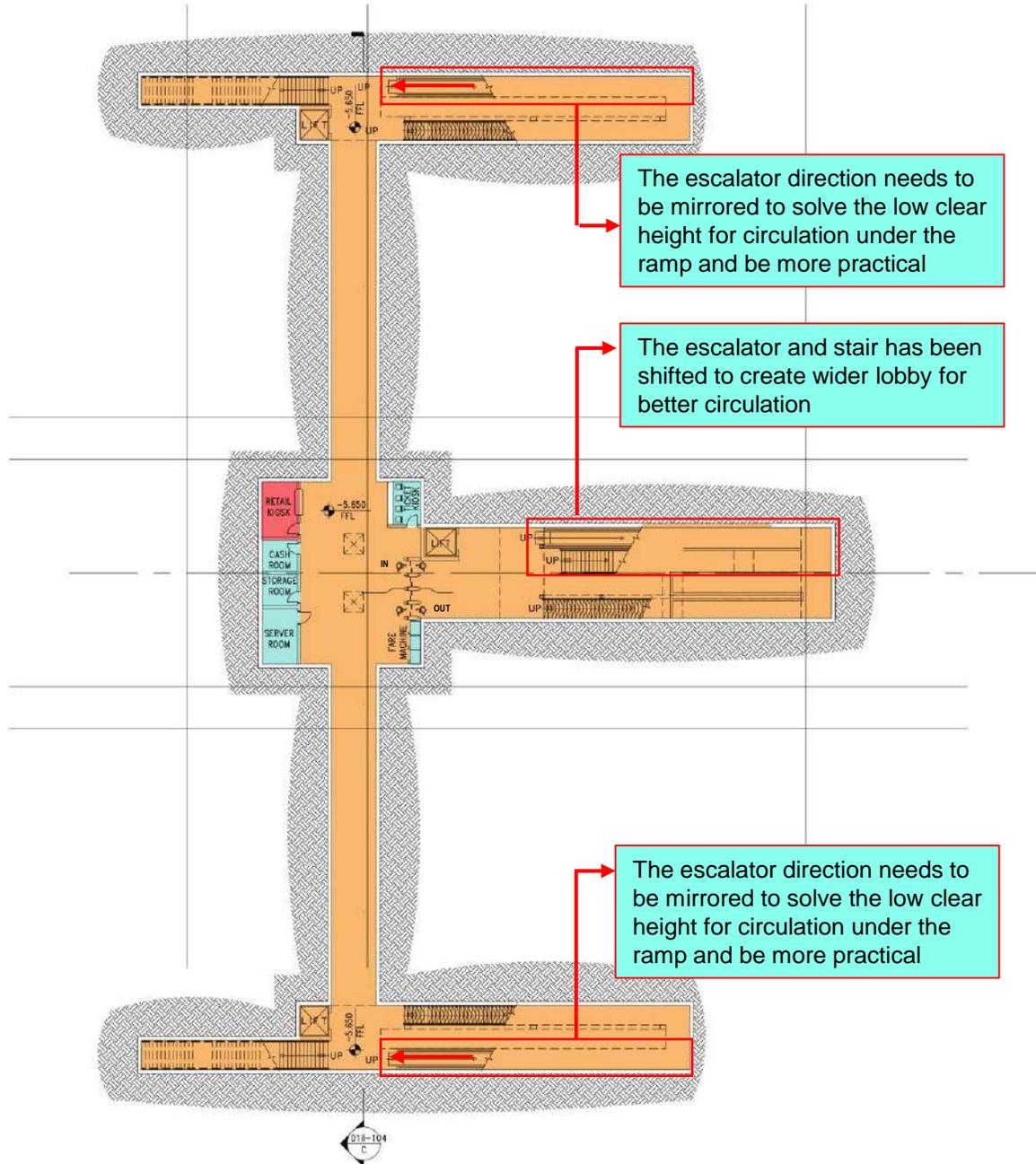
Clear sidewalk and bicycle lane

Stair and escalator has been shifted

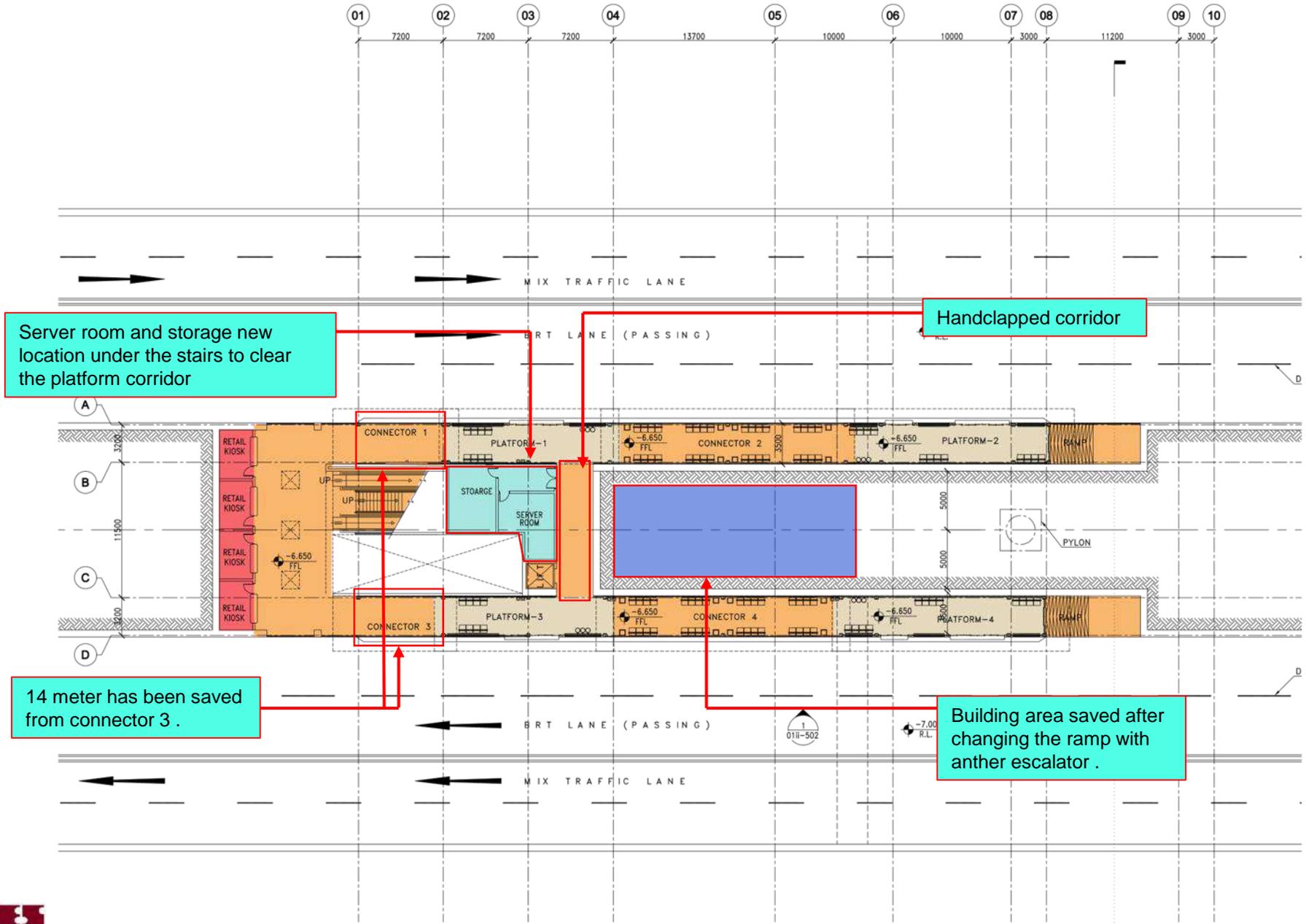
Bigger Lobby has been created for better circulation

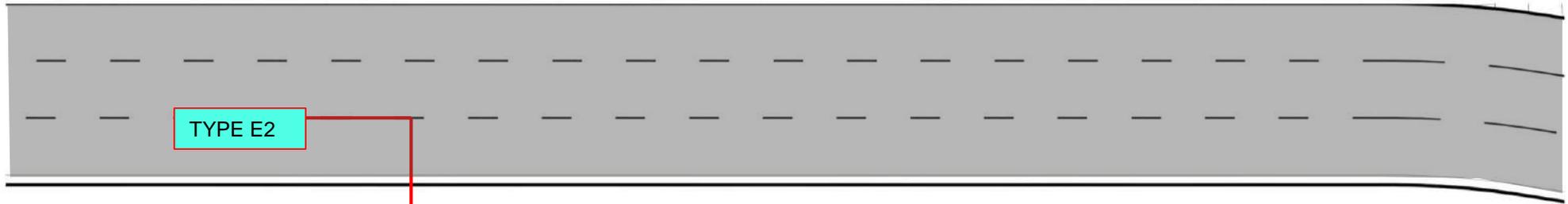
Passenger connection corridor width has been unified

Clear sidewalk and bicycle lane



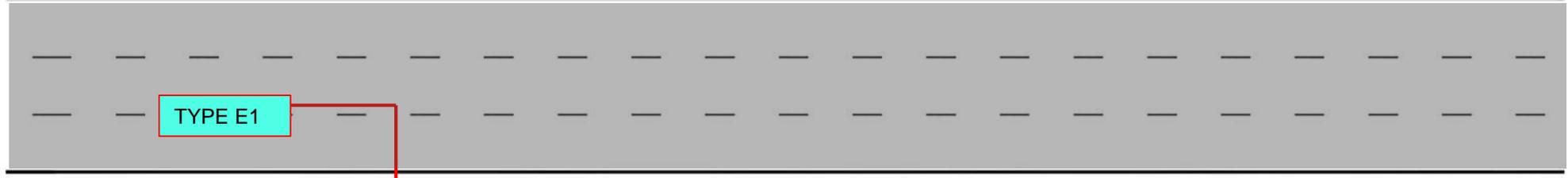
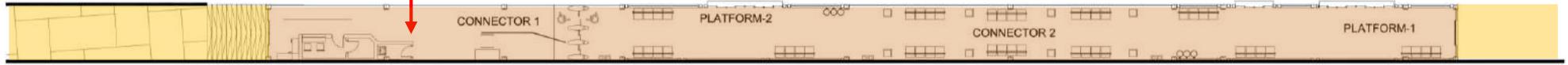
B.R.T.  
STATION  
TYPE - E





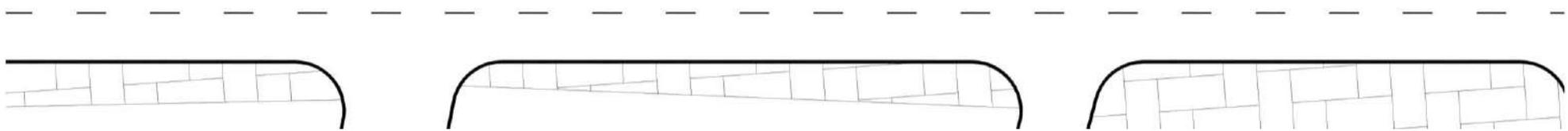
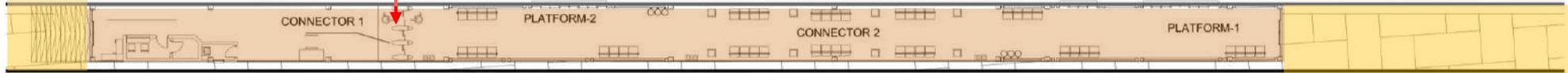
TYPE E2

BRT LANE →



TYPE E1

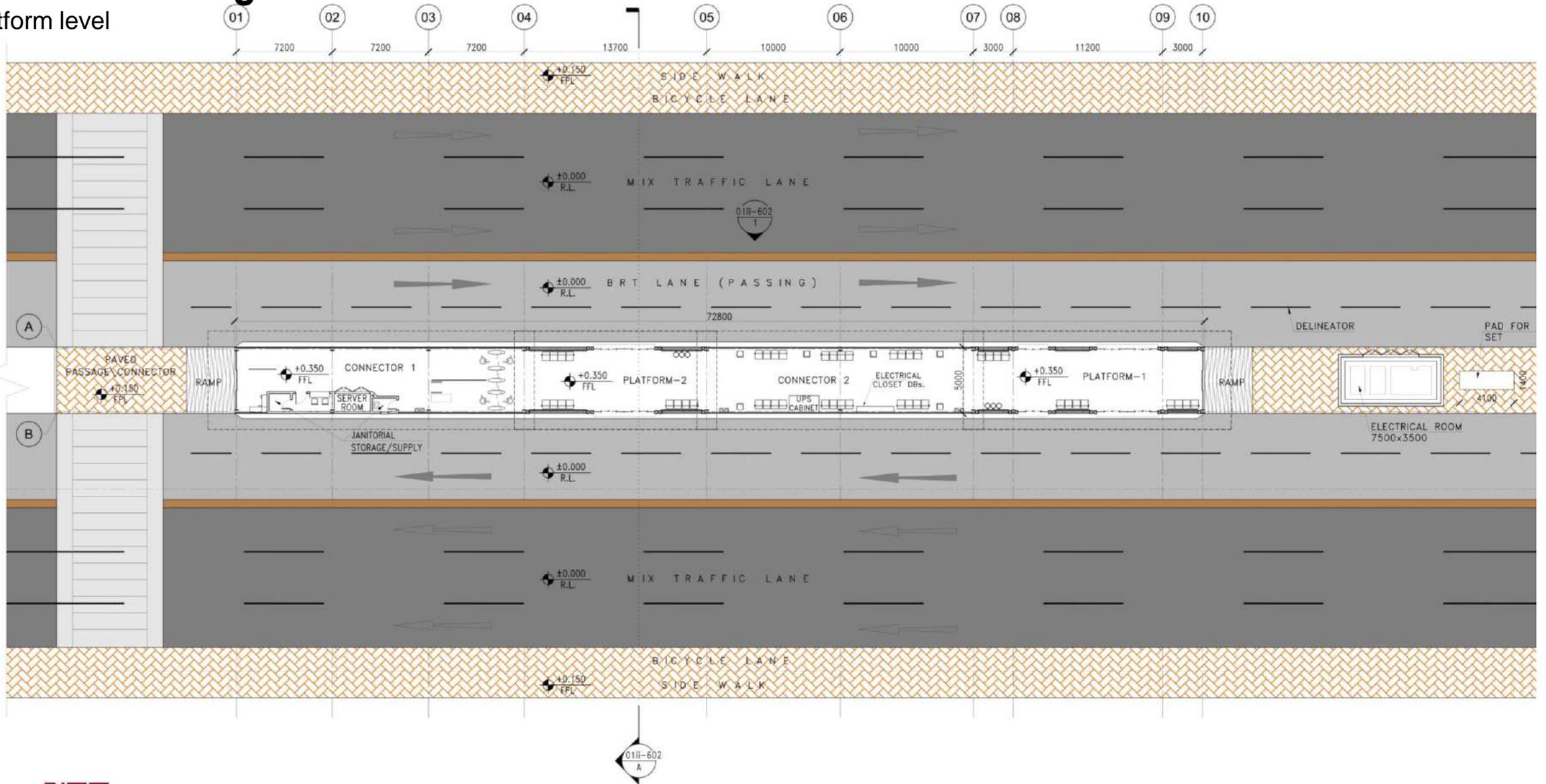
← BRT LANE



B.R.T .  
STATION  
TYPE - F

# Current design

platform level



## **ANNEXURE-IV: ENVIRONMENTAL MONITORING RESULTS**



# PERAC RESEARCH & DEVELOPMENT FOUNDATION

Government of Pakistan, Ministry of Energy, Petroleum Division

## TEST REPORT

Page 1 of 6

<b>Customer 's Name</b>	M/s. NEC Consultants (Pvt) Ltd-(LES)	<b>Test Report No</b>	001417-001
<b>Customer's Ref</b>	E-mail - 19-02-19	<b>Reporting Date</b>	20-03-2019
<b>Date</b>	20-02-2019	<b>Sample Code</b>	18001315-01
<b>Sample Description</b>	Waste Water (From Sewage Drain near Artistic Fabric Mills), (T=21°C)	<b>Receiving Date</b>	20-02-2019

TEST METHOD	PARAMETERS	TEST RESULTS
Manual	Temperature, °C	21
D-1293	pH @ 25 °C	7.32
APHA-507	Biochemical Oxygen Demand (BOD5), mg/L	145
D-1252	Chemical Oxygen Demand (COD), mg/L	545
APHA-209C	Total Suspended Solids (TSS), mg/L	100
APHA-209B	Total Dissolved Solids (TDS), mg/L	3530
D-4281	Grease & Oil, mg/L	22
D-1783	Phenolic Compounds as Phenols, mg/L	Nil
D-512	Chloride (Cl), mg/L	1065
APHA-413D	Fluoride (F), mg/L	2.46
APHA-4500 CNE	Cyanide (CN), mg/L	0.012
D-2330	Anionic Detergent, mg/L	0.30
D-516	Sulphate (SO <sub>4</sub> ), mg/L	365
APHA-427D	Sulphide (S=), mg/L	Nil
D-1426	Ammonia (NH <sub>3</sub> ), mg/L	9.28
By A.A	Cadmium (Cd), mg/L	Nil
By ICP-OES	Arsenic (As), mg/L	* ND
By A.A	Chromium (Cr), mg/L	Nil
By A.A	Copper (Cu), mg/L	Nil

Prepared By

Section Incharge (E)/(HC)/(ST)

Head R&ASD

The analysed based on Sample (s) provided to us by the Client. The interpretation or options expressed represent the best judgment (E. & O.E.). We have no responsibility and warranty or representation in connection with which such report is used.

Rev. No.0	Dated: 21-01-2000	F-10-05
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7-B, Korangi Industrial Area, Adjacent NRL, Karachi-74900  
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 Website: www.prdlab.com, Email: info@prdlab.com, prd@cyber.net.pk





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Page 2 of 6

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<b>Date</b>	20-02-2019	<b>Sample Code</b>	18001315-01
<b>Sample Description</b>	Waste Water (From Sewage Drain near Artistic Fabric Mills), (T=21°C)	<b>Receiving Date</b>	20-02-2019

TEST METHOD	PARAMETERS	TEST RESULTS
By A.A	Lead (Pb), mg/L	Nil
By ICP-OES	Mercury (Hg), mg/L	* ND
By ICP-OES	Selenium (Se), mg/L	* ND
By A.A	Nickel (Ni), mg/L	Nil
By A.A	Silver (Ag), mg/L	0.03
Calculated	Total Toxic Metals, mg/L	2.52
By A.A	Zinc (Zn), mg/L	0.18
By A.A	Barium (Ba), mg/L	1.60
By A.A	Iron (Fe), mg/L	1.0
By A.A	Manganese (Mn), mg/L	0.18
D-3082	Boron (B), mg/L	0.89
In-House	Chlorine (Cl <sub>2</sub> ), mg/L	Nil

\* **Limit of Detection is 0.01 mg/L**

**Prepared By**

**Section Incharge (E)/(HC)/(ST)**

**Head R&ASD**

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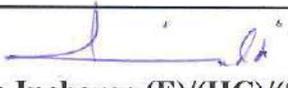
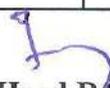
Government of Pakistan, Ministry of Energy, Petroleum Division

## TEST REPORT

Page 3 of 6

<b>Customer's Name</b>	M/s. NEC Consultants (Pvt) Ltd-(LES)	<b>Test Report No</b>	001417-002
<b>Customer's Ref</b>	E-mail - 19-02-19	<b>Reporting Date</b>	20-03-2019
<b>Date</b>	20-02-2019	<b>Sample Code</b>	18001315-02
<b>Sample Description</b>	Waste Water (From Sewage drain near Afeef Packages Limited) (T=31°C)	<b>Receiving Date</b>	20-02-2019

TEST METHOD	PARAMETERS	TEST RESULTS
Manual	Temperature, °C	31
D-1293	pH @ 25 °C	7.21
APHA-507	Biochemical Oxygen Demand (BOD5), mg/L	83
D-1252	Chemical Oxygen Demand (COD), mg/L	1445
APHA-209C	Total Suspended Solids (TSS), mg/L	525
APHA-209B	Total Dissolved Solids (TDS), mg/L	5995
D-4281	Grease & Oil, mg/L	35
D-1783	Phenolic Compounds as Phenols, mg/L	Nil
D-512	Chloride (Cl), mg/L	2220
APHA-413D	Fluoride (F), mg/L	2.41
APHA-4500 CNE	Cyanide (CN), mg/L	0.03
D-2330	Anionic Detergent, mg/L	0.37
D-516	Sulphate (SO4), mg/L	550
APHA-427D	Sulphide (S=), mg/L	Nil
D-1426	Ammonia (NH3), mg/L	19.52
By A.A	Cadmium (Cd), mg/L	Nil
By ICP-OES	Arsenic (As), mg/L	* ND
By A.A	Chromium (Cr), mg/L	1.70
By A.A	Copper (Cu), mg/L	0.22

 <b>Prepared By</b>	 <b>Section Incharge (E)/(HC)/(ST)</b>	 <b>Head R&amp;ASD</b>
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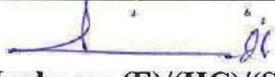
Government of Pakistan, Ministry of Energy, Petroleum Division

## TEST REPORT

Page 4 of 6

<b>Customer 's Name</b>	M/s. NEC Consultants (Pvt) Ltd-(LES)	<b>Test Report No</b>	001417-002
<b>Customer's Ref</b>	E-mail - 19-02-19	<b>Reporting Date</b>	20-03-2019
<b>Date</b>	20-02-2019	<b>Sample Code</b>	18001315-02
<b>Sample Description</b>	Waste Water (From Sewage drain near Afeef Packages Limited) (T=31°C)	<b>Receiving Date</b>	20-02-2019

TEST METHOD	PARAMETERS	TEST RESULTS
By A.A	Lead (Pb), mg/L	Nil
By ICP-OES	Mercury (Hg), mg/L	* ND
By ICP-OES	Selenium (Se), mg/L	* ND
By A.A	Nickel (Ni), mg/L	0.97
By A.A	Silver (Ag), mg/L	0.32
Calculated	Total Toxic Metals, mg/L	4.67
By A.A	Zinc (Zn), mg/L	7.96
By A.A	Barium (Ba), mg/L	0.70
By A.A	Iron (Fe), mg/L	23
By A.A	Manganese (Mn), mg/L	1.40
D-3082	Boron (B), mg/L	0.76
In-House	Chlorine (Cl <sub>2</sub> ), mg/L	Nil
	<b>* Limit of Detection is 0.01 mg/L</b>	

 Prepared By	 Section Incharge (E)/(HC)/(ST)	 Head R&ASD
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## TEST REPORT

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<b>Customer's Name</b>	M/s. NEC Consultants (Pvt) Ltd-(LES)	<b>Test Report No</b>	001417-003
<b>Customer's Ref</b>	E-mail - 19-02-19	<b>Reporting Date</b>	20-03-2019
<b>Date</b>	20-02-2019	<b>Sample Code</b>	18001315-03
<b>Sample Description</b>	Waste Water (From Sewage drain near Cornpak Ltd.), (T=19.5°C)	<b>Receiving Date</b>	20-02-2019

TEST METHOD	PARAMETERS	TEST RESULTS
Manual	Temperature, °C	19.5
D-1293	pH @ 25 °C	13.57
APHA-507	Biochemical Oxygen Demand (BOD5), mg/L	655
D-1252	Chemical Oxygen Demand (COD), mg/L	1675
APHA-209C	Total Suspended Solids (TSS), mg/L	140
APHA-209B	Total Dissolved Solids (TDS), mg/L	3550
D-4281	Grease & Oil, mg/L	18
D-1783	Phenolic Compounds as Phenols, mg/L	Nil
D-512	Chloride (Cl), mg/L	530
APHA-413D	Fluoride (F), mg/L	2.35
APHA-4500 CNE	Cyanide (CN), mg/L	0.02
D-2330	Anionic Detergent, mg/L	0.23
D-516	Sulphate (SO <sub>4</sub> ), mg/L	360
APHA-427D	Sulphide (S <sup>=</sup> ), mg/L	78
D-1426	Ammonia (NH <sub>3</sub> ), mg/L	7.92
By A.A	Cadmium (Cd), mg/L	Nil
By ICP-OES	Arsenic (As), mg/L	* ND
By A.A	Chromium (Cr), mg/L	Nil
By A.A	Copper (Cu), mg/L	0.26

 Prepared By	 Section Incharge (E)/(HC)/(ST)	 Head R&ASD
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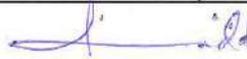


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Government of Pakistan, Ministry of Energy, Petroleum Division

TEST REPORT		Page 6 of 6	
Customer 's Name	M/s. NEC Consultants (Pvt) Ltd-(LES)	Test Report No	001417-003
Customer's Ref	E-mail - 19-02-19	Reporting Date	20-03-2019
Date	20-02-2019	Sample Code	18001315-03
Sample Description	Waste Water (From Sewage drain near Cornpak Ltd.), (T=19.5°C)	Receiving Date	20-02-2019

TEST METHOD	PARAMETERS	TEST RESULTS
By A.A	Lead (Pb), mg/L	Nil
By ICP-OES	Mercury (Hg), mg/L	* ND
By ICP-OES	Selenium (Se), mg/L	* ND
By A.A	Nickel (Ni), mg/L	Nil
By A.A	Silver (Ag), mg/L	0.45
Calculated	Total Toxic Metals, mg/L	2.19
By A.A	Zinc (Zn), mg/L	0.15
By A.A	Barium (Ba), mg/L	0.56
By A.A	Iron (Fe), mg/L	1.0
By A.A	Manganese (Mn), mg/L	0.10
D-3082	Boron (B), mg/L	0.92
In-House	Chlorine (Cl <sub>2</sub> ), mg/L	Nil
* Limit of Detection is 0.01 mg/L		

 Prepared By	 Section Incharge (E)/(HC)/(ST)	 Head R&ASD
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Hourly Data of Ambient Air Quality Monitoring (Brooks Chowrangi)

S. No	Date	Time	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Air Temperature (°C)	Humidity (%)	Wind speed (m/s)	Wind direction
1	6/3/2019	16:00	34.9	62.3	78.1	7.7	4.1	49.9	95.6	386.3	0.15	25.7	60	11	SSE
2	6/3/2019	17:00	32.5	59.8	66	3.4	3.5					25.9	57	11	S
3	6/3/2019	18:00	31.8	72.7	70.7	8.1	3					25.8	55	10	S
4	6/3/2019	19:00	31.3	75.5	72.2	8.6	2.6					25.3	52	15	SSW
5	6/3/2019	20:00	37.9	98.6	71	8.3	3.4					24.3	60	8	SSW
6	6/3/2019	21:00	32.7	84.3	72	8.6	3.3					23.1	68	10	SSW
7	6/3/2019	22:00	34.4	95.3	74.1	8.8	3					22.7	67	6	S
8	6/3/2019	23:00	30.4	93.1	67.3	8.5	5.7					22.6	67	8	S
9	6/3/2019	0:00	30.6	87	68.6	9	5.5					22.3	67	8	SSW
10	6/3/2019	1:00	28.1	79.2	64	3.8	6.6					22.2	68	5	SSW
11	7/3/2019	2:00	26.2	62.8	58.3	2.2	7.6					22.1	68	6	S
12	7/3/2019	3:00	25.9	42.6	61.7	7.1	6.1					21.7	69	5	SSW
13	7/3/2019	4:00	30.8	57.6	59.8	9	5.2					21	70	1	SSW
14	7/3/2019	5:00	34.8	63.7	58.5	8.5	4.3					20.8	72	3	SSW
15	7/3/2019	6:00	37.4	52.1	57.3	9.3	2.8					20.3	74	2	S
16	7/3/2019	7:00	45.3	76.1	52.9	8.9	3.4					20.2	76	2	S
17	7/3/2019	8:00	49.9	96.8	57.5	10.2	2.3					20	77	1	SSE
18	7/3/2019	9:00	58.3	93.7	62.7	10.8	3.9					19.7	79	1	S
19	7/3/2019	10:00	63.7	85.1	64.4	8.8	4.5					21.3	75	2	SW
20	7/3/2019	11:00	69.2	61.6	77.7	6.6	6.4					22.8	71	5	SSW
21	7/3/2019	12:00	65.4	34.6	79.6	11.2	5					24.2	65	3	NW
22	7/3/2019	13:00	68.9	48.7	92.1	11.1	7.2					25.9	54	3	SSW
23	7/3/2019	14:00	57.2	29.3	55	8.6	10.6					26.8	53	7	S
24	7/3/2019	15:00	54.3	42.7	47.8	14.2	2.6					22.1	68	6	S
25	7/3/2019	16:00	55.4	38.2	48.4	2.2	2.2					21.7	69	5	SSW

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Hourly Data of Ambient Air Quality Monitoring (Dawood Chowrangi)

S. No	Date	Time	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Air Temperature (°C)	Humidity (%)	Wind speed (m/s)	Wind direction
1	4/3/2019	12:00	56.7	22.2	41.7	17.3	1.4	58.2	137.5	391.4	0.17	20.7	77	1	W
2	4/3/2019	13:00	59.8	21.3	44.2	17.5	6.8					20.4	77	2	W
3	4/3/2019	14:00	64.2	20.1	41.4	18.1	6.6					20.2	79	1	W
4	4/3/2019	15:00	68.6	23.5	44.1	16.7	16.7					20.2	80	1	WNN
5	4/3/2019	16:00	63.9	33.2	50.5	9.7	9.7					20.1	80	1	WNN
6	4/3/2019	17:00	60.5	39.6	58.2	4.9	4.9					20.1	81	1	WNN
7	4/3/2019	18:00	66.2	42.6	84.2	6.5	6.5					19.9	82	1	WSW
8	4/3/2019	19:00	73.3	45.6	81.6	5.1	5.1					19.8	83	1	WSW
9	4/3/2019	20:00	75.5	44	80	6.6	6.6					19.7	82	0	WSW
10	4/3/2019	21:00	69.4	45.1	72.4	8.2	8.2					19.4	82	0	WNN
11	4/3/2019	22:00	64.9	40.2	65.3	8	7.5					18.6	82	1	E
12	4/3/2019	23:00	54	45.7	60.4	6.5	12.2					18.4	81	3	ENE
13	5/3/2019	0:00	50.1	55	57.4	5.1	8					17.9	71	0.8	NW
14	5/3/2019	1:00	44	50.4	56.9	8	10.7					17.7	60	1	SSW
15	5/3/2019	2:00	47.1	55.9	61.9	10.7	8.3					17.3	52	3	SSW
16	5/3/2019	3:00	37.7	44.8	56.8	8.3	8.7					17.6	60	1	SSW
17	5/3/2019	4:00	40.6	42.1	66.3	8.7	8.7					18.5	77	1	W
18	5/3/2019	5:00	37.3	55.5	63.3	8.7	9.8					18.4	77	2	W
19	5/3/2019	6:00	39.8	48	66.5	9.8	8.2					19.2	79	0.7	W
20	5/3/2019	7:00	36.1	43.2	65.4	8.2	8					19.6	80	1	WNN
21	5/3/2019	8:00	47.3	61.3	76.3	8	6					20.1	80	1	WNN
22	5/3/2019	9:00	49.6	57.1	95.3	6	11.5					20.1	81	1	WNN
23	5/3/2019	10:00	59.1	53.9	94.7	11.5	16.7					20.9	82	1	WSW
24	5/3/2019	11:00	63.4	45.1	82.1	16.7	10.7					21.8	83	1	WSW
25	5/3/2019	12:00	66.6	39.9	60.4	10.7	11.1					22.1	80	1	WNN

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**Hourly Data of Ambient Air Quality Monitoring (Khayaban-e-Ittehad)**

S. No	Date	Time	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Air Temperature (°C)	Humidity (%)	Wind speed (m/s)	Wind direction
1	8/3/2019	19:00	38.4	36.1	83.5	12.5	1.7	104	145.3	371.2	0.28	24.6	62	6	S
2	8/3/2019	20:00	35.8	41.1	72.6	8.9	1.8					23.5	68	5	SW
3	8/3/2019	21:00	38.4	41.7	64.6	8.7	2					23.1	71	8	SSW
4	8/3/2019	22:00	33.6	36.2	62.1	8.3	1.1					22.8	73	8	WSW
5	8/3/2019	23:00	35	52.9	63.9	8.3	0.8					22.6	71	3	SW
6	8/3/2019	0:00	32.1	25.6	63	11	0.9					22.4	72	3	W
7	8/3/2019	1:00	30.5	43.9	63.8	7.8	1					21.9	74	3	WSW
8	9/3/2019	2:00	35.8	52.7	66.6	7.9	0.7					21.4	77	2	WNW
9	9/3/2019	3:00	31.2	54.9	69.6	6.8	2.1					21.1	78	1	NNW
10	9/3/2019	4:00	28.6	57.7	65.7	8	0.9					21.4	77	3	NW
11	9/3/2019	5:00	30	64.8	62.5	9.9	1.7					20.5	81	1	NW
12	9/3/2019	6:00	34	71.6	60.8	11.1	2.6					20.5	81	1	NW
13	9/3/2019	7:00	35.2	69.6	60.5	11.2	3.3					19.9	81	1	NNW
14	9/3/2019	8:00	36.5	68.2	60.2	11.3	2.1					20.2	81	1	W
15	9/3/2019	9:00	38.2	62.3	59.7	11.4	1.8					20.2	80	2	NNW
16	9/3/2019	10:00	45	60.4	53.1	9.5	2					21.2	78	2	NNW
17	9/3/2019	11:00	42.2	55.8	59.7	11.2	3.7					23.8	67	4	WSW
18	9/3/2019	12:00	45.7	50.4	74.6	8.4	3.7					24.4	63	6	W
19	9/3/2019	13:00	43.8	39	81.5	11	2.9					25.6	55	5	WNW
20	9/3/2019	14:00	40.8	45.9	78.2	9.7	3.4					25.7	60	9	SW
21	9/3/2019	15:00	46	20.2	69.2	8.5	3.1					26.3	58	10	S
22	9/3/2019	16:00	40.3	24.7	75.2	4.1	3					26.1	56	11	S
23	9/3/2019	17:00	45.2	45.8	78	9.8	2					25.9	52	10	S
24	9/3/2019	18:00	44	45	73.7	10.1	2.2					24.9	53	11	S
25	9/3/2019	19:00	46.2	49.8	73.3	10.7	1.3					23.4	65	11	S



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**Hourly Data of Ambient Air Quality Monitoring (Khudadad Chwok)**

S. No	Date	Time	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Air Temperature (°C)	Humidity (%)	Wind speed (m/s)	Wind direction
1	9/3/2019	22:00	35.4	28.1	51.2	10	1.3	41.6	98.4	314.7	0.19	22.7	67	5	SSW
2	9/3/2019	23:00	36.7	28.5	48.5	6.9	1.2					22.5	67	6	SSW
3	9/3/2019	0:00	35.7	29.9	57.3	4.6	1.3					22.3	67	7	SSW
4	9/3/2019	1:00	31.7	33.6	55.5	9.4	1.2					22.1	68	5	SSW
5	9/3/2019	2:00	33.7	40.4	55.8	10.4	1.2					21.9	68	4	SSW
6	9/3/2019	3:00	39.1	28.1	45.7	2.6	1.2					21.6	69	3	SSW
7	10/3/2019	4:00	37.4	23.9	28.1	6.6	1.1					21.1	70	3	SSW
8	10/3/2019	5:00	33.7	24.9	27.8	7.6	1.2					20.8	71	3	SSW
9	10/3/2019	6:00	33.7	23.5	29.3	7.6	1.1					20.3	75	1	S
10	10/3/2019	7:00	38.5	18.4	40.1	8.1	1					20.1	76	3	SSW
11	10/3/2019	8:00	41.7	45.1	47.9	7.5	1.2					19.9	78	2	S
12	10/3/2019	9:00	44.4	27.9	52.1	9.7	1.2					19.9	79	1	SSE
13	10/3/2019	10:00	48.6	34.2	48.5	7.7	1.3					21.6	75	1	S
14	10/3/2019	11:00	50.3	30.5	36.9	8	1.1					23.3	70	5	S
15	10/3/2019	12:00	52.7	31.6	43.8	8.3	1					25.2	54	2	WNW
16	10/3/2019	13:00	48.1	30.9	51.9	9.9	1.2					26.9	42	7	S
17	10/3/2019	14:00	44.9	31.4	55.7	10.5	1.2					26.6	52	7	WSW
18	10/3/2019	15:00	46.1	28.4	54.1	9.2	1.2					26.4	60	5	WSW
19	10/3/2019	16:00	37.9	27.1	56.5	10.8	1					25.8	63	9	S
20	10/3/2019	17:00	40.4	27.5	56.5	11.1	1.2					25.1	63	9	SSW
21	10/3/2019	18:00	37.1	47.3	37.8	8.8	1.3					24.6	67	11	SSW
22	10/3/2019	19:00	31	40.9	39.9	9.6	1.2					24.4	64	12	S
23	10/3/2019	20:00	38.5	42.1	37.3	8.7	1.3					26.8	48	4	S
24	10/3/2019	21:00	37.1	38.5	38.1	10.1	1.1					25.3	54	5	WSW
25	10/3/2019	22:00	32.9	46.4	35.6	9.6	1.3					24.9	58	3	WSW



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**Hourly Data of Ambient Air Quality Monitoring (KPT Interchange)**

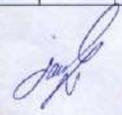
S. No	Date	Time	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Air Temperature (°C)	Humidity (%)	Wind speed (m/s)	Wind direction
1	7/3/2019	18:00	46.6	36.1	60.6	6.2	1.6	58.2	105.7	355.8	0.3	25.1	64	9	SSW
2	7/3/2019	19:00	49.5	33.6	64.4	9.5	1.7					24.5	67	9	S
3	7/3/2019	20:00	45.1	64	65.2	8.2	1.5					24.4	65	11	S
4	7/3/2019	21:00	48	56.1	60.8	8.3	1.4					24.4	41	6	S
5	7/3/2019	22:00	40.1	61.2	63.6	9.5	1.5					24.3	45	6	W
6	7/3/2019	23:00	43.9	61.9	53.6	8.6	4.7					24.3	51	2	WSW
7	7/3/2019	0:00	40.6	59.4	48.6	5.7	2.7					24.1	54	4	SSW
8	7/3/2019	1:00	40.3	66.3	63.6	8	2.2					23.9	57	2	SSW
9	7/3/2019	2:00	45.1	84.5	72.9	7.8	2.8					23.4	62	4	WSW
10	8/3/2019	3:00	40.2	81.1	72.1	8.8	3.3					22.6	62	2	SW
11	8/3/2019	4:00	35.7	77.2	70.7	7.4	1.8					22.3	67	3	W
12	8/3/2019	5:00	40.3	83.2	64	8.2	1.2					22.2	69	1	W
13	8/3/2019	6:00	42.5	66.2	67	10.6	1.2					22.9	69	2	WSW
14	8/3/2019	7:00	43.1	55.8	71.8	9.3	1.2					23.8	64	1	W
15	8/3/2019	8:00	48.6	75.6	56.3	6.3	1.3					24.2	67	1	W
16	8/3/2019	9:00	46.5	45.1	53.1	9.1	1.3					24.8	68	1	W
17	8/3/2019	10:00	53.4	41.2	51.5	14.8	3.2					25.1	66	1	WSW
18	8/3/2019	11:00	57.1	73.8	58.8	24.2	3.6					25.5	66	2	WNW
19	8/3/2019	12:00	59.3	57.8	56.4	14.1	4.1					25.4	66	2	NW
20	8/3/2019	13:00	65.1	44.3	60	16.6	3.5					25.7	66	1	ESE
21	8/3/2019	14:00	68.1	34.2	64.6	19.8	2					25.8	59	1	NE
22	8/3/2019	15:00	72.6	35.4	66.4	12.3	1.4					26.1	58	2	E
23	8/3/2019	16:00	70.9	37.9	73.5	13.3	1.2					26.5	60	2	NE
24	8/3/2019	17:00	64.5	36.6	62.4	18	1.2					25.2	59	1	NNE
25	8/3/2019	18:00	67.6	31	64	9.5	1					26.5	61	1	NE



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**Hourly Data of Ambient Air Quality Monitoring (Murtaza Chowrang)**

S. No	Date	Time	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Air Temperature (°C)	Humidity (%)	Wind speed (m/s)	Wind direction
1	5/3/2019	14:00	45.4	29.7	49.8	14	2.1	74.9	111.4	333.3	0.16	25.8	59	8	SSW
2	5/3/2019	15:00	52.2	30.8	50.7	12.3	1.3					25.7	57	9	SW
3	5/3/2019	16:00	49.6	32.6	58.5	11.5	2.6					25.6	56	6	SSW
4	5/3/2019	17:00	51	40.6	61.5	7.1	1.5					25.8	53	9	SW
5	5/3/2019	18:00	52	47.6	58.1	6.9	0.8					25.3	59	9	SW
6	5/3/2019	19:00	56.7	40.9	54.6	6.3	1.1					24.7	60	8	WSW
7	5/3/2019	20:00	50.5	38.7	57.5	6.5	2.4					24	66	5	WSW
8	5/3/2019	21:00	48.5	37.4	57.6	7.7	1.7					23.1	69	8	SW
9	5/3/2019	22:00	43.2	33.8	59.8	13.1	1.6					22.8	72	7	SW
10	5/3/2019	23:00	50.1	40.1	63.5	6.9	1.3					22.6	71	7	SW
11	5/3/2019	0:00	42.1	45	55.4	9.6	1.8					22.4	72	3	SW
12	6/3/2019	1:00	40.9	39	52.2	8.3	1.3					22.1	73	3	W
13	6/3/2019	2:00	46.9	30.1	46.4	6.7	2.2					21.5	75	1	NNW
14	6/3/2019	3:00	47.3	28	56.8	7.9	2.3					21.2	77	2	NW
15	6/3/2019	4:00	45.6	29.9	53.3	6.4	2					21.2	78	2	NW
16	6/3/2019	5:00	42.1	30.2	62.2	8	4.1					21.3	78	2	NW
17	6/3/2019	6:00	46.6	37	57.7	8	1.7					20.5	81	1	WNW
18	6/3/2019	7:00	47.2	39.2	56.7	8	1.8					20.3	80	1	NW
19	6/3/2019	8:00	50.5	42.4	63	8	2.2					20.2	81	1	WNW
20	6/3/2019	9:00	49.7	37	63.6	7.9	2.5					19.8	82	1	NNW
21	6/3/2019	10:00	51.7	43.4	64.7	7.1	4.1					20.4	80	2	N
22	6/3/2019	11:00	55.8	36.3	69.3	8.2	2.7					22.7	72	4	W
23	6/3/2019	12:00	50.3	38.9	64.2	10.9	2.1					24.1	63	6	WNW
24	6/3/2019	13:00	48.8	43.9	58.8	17.4	1.6					25.4	59	6	WNW
25	6/3/2019	14:00	52.4	45	55.3	3.9	1.6					25.9	59	9	SW



Dr. Jawad Nasir  
A/DH (EM&M)  
SAR Wing SUPARCO

**Noise Level Monitoring Data (Day Time) in dB(A) Leg**

Sites Name	Site 01 (Dawood Chowrangi)	Site 02 (Murtaza Chowrangi)	Site 03 (Brooks Chowrangi)	Site 04 (KPT Interchange)	Site 05 (Khayaban-e- Ittehad)	Site 06 (Khudadad Chowk)
Time/Date	04/03/2019 to 5/3/2019	5/03/2019 to 6/3/2019	6/03/2019 to 7/3/2019	7/03/2019 to 8/3/2019	8/03/2019 to 9/3/2019	9/03/2019 to 10/3/2019
0600	79.3	78.9	79.6	78.6	72.2	80.4
0700	83.2	81.2	80.4	78.9	74.8	80.3
0800	88.1	83.1	81.8	81.1	79.9	79.8
0900	84.7	83.5	83.1	82.3	81.2	90.1
1000	83.5	87.1	82.4	83.5	83.7	76.2
1100	85.2	84.2	86.8	80.9	83.2	78.6
1200	82.1	83.8	74.3	83.6	82.5	80.1
1300	83.4	80.9	84.9	80.2	86.1	79.6
1400	87.1	82.3	84.5	84.9	83.8	78.2
1500	83.2	78.4	93	84.3	84.1	77.6
1600	81.8	81.9	88.4	84.2	85.3	79.7
1700	82.8	79.7	90.1	81.1	86.8	80.3
1800	85.1	83.1	91.4	82.4	88.2	75
1900	80.8	78.7	82.6	87.5	84.6	75
2000	80.8	82.1	80.1	83.8	89.3	75
2100	83.7	83.7	81.5	82.3	85.1	74
2200	78.5	81.8	82.7	80.6	82.7	85



Dr. Jawad Nasir  
A/ DH (EM&M)  
SAR Wing, SUPARCO

Noise Level Monitoring Data (Night Time) in dB(A) Leq

Sites Name	Site 01 (Dawood Chowrangi)	Site 02 (Murtaza Chowrangi)	Site 03 (Brooks Chowrangi)	Site 04 (KPT Interchange)	Site 05 (Khayaban-e- Ittehad)	Site 06 (Khudadad Chowk)
Time/Date	04/03/2019 to 5/3/2019	5/03/2019 to 6/3/2019	6/03/2019 to 7/3/2019	7/03/2019 to 8/3/2019	8/03/2019 to 9/3/2019	9/03/2019 to 10/3/2019
2200	78.5	81.8	82.7	80.6	82.7	85
2300	79.9	76.7	80.9	82.5	86.9	75
0000	80.1	79.3	79.9	79.3	80.4	75
0100	76.6	75.1	78.4	77.9	83.3	74
0200	70.8	70.8	77.7	83.2	76.8	72
0300	73.1	71.6	78.4	79.6	75.9	81.2
0400	75.1	72.8	81.6	78.9	76.1	85.9
0500	80.7	73.9	80.2	79.9	70.8	85.2
0600	79.3	78.9	79.6	78.6	72.2	80.4



Dr. Jawad Nasir  
A/ DH (EM&M)  
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# PAKISTAN SPACE & UPPER ATMOSPHERE RESEARCH COMMISSION

(SUPARCO ENVIRONMENTAL LABORATORY)

SEPA Certified Lab (EPA/LAB/Certificate-01-2009)  
EMS (ISO 14001:2015), Certified Lab (CeSP E-15091803)

## NOISE MONITORING REPORT

**Report Reference #:** 10405-ES/R-020 **Reporting Date:** 13-03-2019  
**Monitoring Duration:** Day Time (06:00 to 22:00) **Monitoring Date:** 04-03-2019 to 10-03-2019  
**Client Name:** NEC Consultant Private Limited  
**Address:** 22 Km off Ferozpur Road near Gajjumatta, Metro Bus Station Lahore  
**Monitoring Location:** Karachi **Contact Number:** 0300-4592646  
**Field Official:** Muhammad Khalid **Designation:** Research Associate

S. No.	Monitoring Points	SEQS*	Unit	Result	Method/ Instrument	Remarks
1.	Site 01 (Dawood Chowrangi)	75**	dB(A) Leq***	83.1	Noise Level Analyzer	Does Not Comply With SEQS
2.	Site 02 (Murtaza Chowrangi)			82		
3.	Site 03 (Brooks Chowrangi)			84		
4.	Site 04 (KPT Interchange)			82.4		
5.	Site 05 (Khayaban-e-Ittehad)			83.1		
6.	Site 06 (Khudadad Chowk)			79.1		

\*SEQS: Sindh Environmental Quality Standard

\*\*75: Day time SEQS for Industrial Area

\*\*\*dB (A) Leq: Time weighted average of level of sound in decibel on scale which is relatable to human hearing

**Report Prepared By:** Tooba Nazar  
(Sub-Engineer -II)

**Report Reviewed By:** M. Sarfaraz Khan  
SH (Environmental Monitoring & Modeling Div)

**Report Approved By:** Dr. Jawad Nasir  
DH (Environmental Monitoring & Modeling Div)

Note: This report cannot be challenged in any court or this cannot be used in court of law for any negotiation or standardization

Pakistan Space & Upper Atmosphere Research Commission (SUPARCO)  
P.O. Box 8402, SUPARCO Road, Gulzar-e-Hijri, Sector 28, Karachi  
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# PAKISTAN SPACE & UPPER ATMOSPHERE RESEARCH COMMISSION

(SUPARCO ENVIRONMENTAL LABORATORY)

SEPA Certified Lab (EPA/LAB/Certificate-01-2009)  
EMS (ISO 14001:2015), Certified Lab (CeSP E-1509180)

## NOISE MONITORING REPORT

**Report Reference #:** 10405-ES/R-021  
**Monitoring Duration:** Night Time (22:00 to 06:00)  
**Client Name:** NEC Consultant Private Limited  
**Address:** 22 Km off Ferozpur Road near Gajjumatta, Metro Bus Station Lahore  
**Monitoring Location:** Karachi  
**Field Official:** Muhammad Khalid  
**Reporting Date:** 13-03-2019  
**Monitoring Date:** 04-03-2019 to 10-03-2019  
**Contact Number:** 0300-4592646  
**Designation:** Research Associate

S. No.	Monitoring Points	SEQS*	Unit	Result	Method/ Instrument	Remarks
1.	Site 01 (Dawood Chowrangi)	65**	dB(A) Leq***	77.1	Noise Level Analyzer	Does Not Comply With SEQs
2.	Site 02 (Murtaza Chowrangi)			75.7		
3.	Site 03 (Brooks Chowrangi)			79.9		
4.	Site 04 (KPT Interchange)			80.1		
5.	Site 05 (Khayaban-e-Ittehad)			78.3		
6.	Site 06 (Khudadad Chowk)			79.3		

\*SEQS: Sindh Environmental Quality Standard

\*\*65: Night time SEQs for Industrial Area

\*\*\*dB (A) Leq: Time weighted average of level of sound in decibel on scale which is relatable to human hearing

**Report Prepared By:** Tooba Nazar  
(Sub-Engineer -II)

**Report Reviewed By:** M. Sarfaraz Khan  
SH (Environmental Monitoring & Modeling Div)

**Report Approved By:** Dr. Jawad Nasir  
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**ENVIRONMENTAL MONITORING, SAMPLING  
AND TESTING REPORT 2022**



NATIONAL ENGINEERING  
SERVICES PAKISTAN



HSE Services

***Project:*** Karachi Mobility Project–Yellow Bus Rapid Transit(BRT)Corridor



*Monitoring Date: 07 February 2022 to 17 February 2022*



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**1. Executive Summary:**Description of Project

<b>Project Name</b>	Karachi Mobility Project–Yellow Bus Rapid Transit(BRT)Corridor
<b>Project Type</b>	Ambient Air Monitoring, Noise Monitoring, Wastewater/Surface Water & Drinking Water Sampling & Analysis.
<b>Laboratory Name</b>	M/s HSE Services
<b>Laboratory Address</b>	209–210–B 2 <sup>nd</sup> Floor Phase II, Dhedhi Busines Ave, Plot E–2, State Avenue Road, S.I.T.E Karachi.
<b>Client Name</b>	M/s National Engineering Services Pakistan Pvt. Ltd.
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah–e–Faisal, Karachi–74400

Consultant’s Team Details

Mr. Kashif Ali	Field Analyst (Site Team Member 1)
Mr. Zeeshan Ali	Field Analyst (Site Team Member 2)
Mr. Faran Ali	Field Analyst (Site Team Member 3)

Monitoring Locations

Sr #	Monitoring Locations	Co-ordinates
1	Depot -1, Mufti Mehmood Masjid , Dawood Chowrangi, KIA Karachi	<b>Longitude:</b> 67.20951 <b>Latitude:</b> 24.8500
2	Jamia Darul Uloom, Singer Chowrangi, KIA, Karachi	<b>Longitude:</b> 67.11911 <b>Latitude:</b> 24.83828
3	Near to SBB Dewan University, Shan Chowrangi, KIA Karachi	<b>Longitude:</b> 67.11898 <b>Latitude:</b> 24.83827
4	Near to EBM, Brooks Chowrangi, KIA, Karachi	<b>Longitude:</b> 67.11361 <b>Latitude:</b> 24.81808
5	Depot-2 , Near Indus Hospital, Korangi Crossing, Karachi	<b>Longitude:</b> 67.05514 <b>Latitude:</b> 24.84743

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6	National Medical Center, Abbasi Shaheed Raod, Karachi	<b>Longitude:</b> 67.051954 <b>Latitude:</b> 24.85353
7	Gora Qabristan, Abbasi Shaheed Road Karachi	<b>Longitude:</b> 67.05907 <b>Latitude:</b> 24.86115
8	Institute of Orthopedics and Surgery Hospital Nursary, P.E.C.H.S Karachi	<b>Longitude:</b> 67.05548 <b>Latitude:</b> 24.86547
9	Rehmania Qabristan Tariq Road, Shahrah e Quaideen Karachi	<b>Longitude:</b> 67.04597 <b>Latitude:</b> 24.87359
10	Khudadad, Chowrangi, Shahrah e Quaideen Karachi	<b>Longitude:</b> 67.04825 <b>Latitude:</b> 24.87049

**Document of Reference**

SEQS 2016 (Sindh Environmental Quality Standard) has been referred as a guideline to measure the results of monitoring.

- a. References for Monitoring of Ambient Air and Noise
- b. References for Sampling
- c. References for Testing Methods

**Monitoring Findings**

A successful environmental monitoring survey has been conducted at prescribed locations and found that the major part of the monitoring complies with SEQS 2016. The observations and results are discussed in detail in continuous sheets.

**2. Description of Monitoring****2.1 Objective:**

HSE Services deployed aforementioned team at prescribed sites on said dates for 24 Hours Continuous Ambient Air Monitoring, 24 Hours Continuous Noise Monitoring, Surface Water Sampling & Drinking Water Sampling & Analysis respectively. The aim of the monitoring is to prepare a comprehensive result of different parameter of environmental testing to build baseline for environment of said project.

**2.2 Scope of Work:**



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Scope of Work (SOW) was set up in accordance with the contract awarded by M/s NESPAK to M/s HSE Services:

- Ambient Air Monitoring of 24 Hours at 10 Different locations. Parameters to be measured are in accordance with SEQS..
- Noise Monitoring of 24 Hours at the location. dB(A).
- Surface Water ,Wastewater and Drinking Water at site and Analysis of parameters in accordance with SEQS.
- Reporting of the results and observation

**2.3 List of Tables:**

**Table 2.4.1:** SEQS Limits for Ambient Air Monitoring

**Table 2.4.2:** SEQS Limits for Noise Monitoring

**Table 2.4.3:** SEQS Limits for Drinking Water

**Table 2.4.4 :**SEQS Limits for Waste Water

**Table 2.5.3:** Instrument Description for Ambient Air, Noise, & Water



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2.4 Environmental Monitoring Guidelines

The following sections provide a thorough understanding on environmental aspects related to the:

- a) Ambient Air
- b) Noise
- c) Water (Drinking and Waste)

2.4.1 Ambient Air

Ambient air monitoring is the systematic, long-term assessment of pollutant levels by measuring the quantity and types of certain pollutants in the surrounding, outdoor air. Reasons to monitor ambient could be;

- assess the extent of pollution;
- provide air pollution data in a timely manner;
- support implementation of air quality standards;
- evaluate the effectiveness of emissions control strategies;
- provide information on air quality trends;
- provide data for the evaluation of air quality models

According to SEQs, following are the parameters and their limits for 24 hours ;

Table 2.4.1

S. No.	Parameters	SEQS Limits
1.	Carbon Monoxide CO	5 mg/m <sup>3</sup>
2.	Sulphur Dioxide SO <sub>2</sub>	120 ug/m <sup>3</sup>
3.	Oxides of Nitrogen as NO	40 ug/m <sup>3</sup>
4.	Oxides of Nitrogen as NO <sub>2</sub>	80 ug/m <sup>3</sup>
5.	Particulate Matter PM 10	150 ug/m <sup>3</sup>
6.	Particulate Matter PM 2.5	35 ug/m <sup>3</sup>
7.	Particulate Matters Respirable SPM	500 ug/m <sup>3</sup>
8.	Lead (Pb)	1.5 ug/m <sup>3</sup>



9.	Ozone O3	130 ug/m <sup>3</sup>
----	----------	-----------------------

### 2.4.2 Noise

Noise pollution adversely affects the lives of millions of people. Problems related to noise include stress related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity. Noise Induced Hearing Loss (NIHL) is the most common and often discussed health effect.

According to SEQS, Noisy areas need to be monitored and it is to be ensured that controls are applied in order to maintain sound within the prescribed limits;

Table 2.4.2

SEQS Limit	Industrial Area	Commercial Area	Residential Area	Silence Zone
Day Time	75	65	55	50
Night Time	65	55	45	45

Day Time Hours: 6:00 am to 10:00 pm

Night Time Hours: 10:00 pm to 6:00 am

### 2.4.3 Drinking Water

Safe and readily available water is important for public health, whether it is used for drinking, domestic use, food production or recreational purposes. Contaminated water and poor sanitation are linked to transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid, and polio. Absent, inadequate, or inappropriately managed water and sanitation services expose individuals to preventable health risks.

In order to prevent diseases and mitigate human health risks, SEQS 2010 regulates following safe drinking water limits;

Table 2.4.3

S. No.	Parameters	SEQS Limits
1.	pH	6.5-8.5
2.	Total Dissolved Solids	<1000 (mg/L)
3.	Phenolic compound	0.002 (mg/L)
4.	Chloride	<250 (mg/L)

5.	Total Hardness as CaCO <sub>3</sub>	<500 (mg/L)
6.	Aluminum	0.2 (mg/L)
7.	Residual Chlorine	0.2-0.5
8.	Antimony	<0.005 (mg/L)
9.	Arsenic	0.05 (mg/L)
10.	Taste	Non-Objectionable
11.	Odour	Non-Objectionable
12.	Barium	0.7 (mg/L)
13.	Boron	0.3 (mg/L)
14.	Copper	0.2 (mg/L)
15.	Lead	<0.05 (mg/L)
16.	Mercury	<0.001 (mg/L)
17.	Nickel	0.02 (mg/L)
18.	Manganese	0.5 (mg/L)
19.	Zinc	<5 (mg/L)
20.	Selenium	0.01 (mg/L)
21.	Cyanide	0.05 (mg/L)
22.	Chromium	<0.05 (mg/L)
23.	Fluoride	1.5 (mg/L)
24.	Cadmium	0.01 (mg/L)
25.	Nitrate	0.5 (mg/L)
26.	Nitrite	3 (mg/L)
27.	Color	<15 TCU
28.	Turbidity	<5 NTU
29.	Total Coliform	0/100 ml
30.	Escherichia Coliform	0/100 ml
31.	Pesticides	0.15 (mg/L)

#### 2.4.4 Wastewater

Wastewater refers to treated water or untreated water that flows out of a treatment plant, sewer, or industrial outfall. Generally, it refers to wastes discharged into surface waters.

Effluent is generally considered to be water pollution such as the outflow from a sewage treatment facility or the wastewater discharge from industrial facilities or domestically discharged water. In order to restrict communities for safe disposal of effluent into surface water, SEQS have stated following limits;

**Table 2.4.4**

<b>S. No</b>	<b>Parameters</b>	<b>SEQS Limits</b>
1.	pH	6 – 9
2.	Biological Oxygen Demand	80 (mg/L)
3.	Chemical Oxygen Demand	150 (mg/L)
4.	Total Dissolved Solids	3500 (mg/L)
5.	Total Suspended Solids	200 (mg/L)
6.	Oil & Grease	10 (mg/L)
7.	Chloride	1000 (mg/L)
8.	Phenolic compound	0.1 (mg/L)
9.	Fluoride	10 (mg/L)
10.	Anionic Detergent	20 (mg/L)
11.	Selenium	0.5 (mg/L)
12.	Sulphide	1 (mg/L)
13.	Ammonia	40 (mg/L)
14.	Cadmium	0.1 (mg/L)
15.	Chromium	1 (mg/L)
16.	Copper	1 (mg/L)
17.	Lead	0.5 (mg/L)
18.	Mercury	0.01 (mg/L)
19.	Nickel	1 (mg/L)
20.	Silver	1 (mg/L)
21.	Zinc	5 (mg/L)
22.	Total Iron	8 (mg/L)

23.	Manganese	1.5
24.	Boron	6 (mg/L)
25.	Sulphate	600 (mg/L)
26.	Arsenic	1 (mg/L)

27.	Chlorine	1 (mg/L)
28.	Total Toxic Metals	2 (mg/L)
29.	Barium	1.5
30.	Cyanide	1
31.	Temperature	40± ≤03°C

## 2.5 Methodology

### 2.5.1 Water Sampling Methodology:

Following methodology was adopted for water sampling and analysis:

#### ***2.5.1.1 Sample Collection***

The water samples were collected from identified sampling points. The sampling was carried out in accordance to the Standard Operating Procedures (SOP) based on the recognized methods of United State Environmental Protection Agency (USEPA), World Health Organization (WHO) and American Public Health Association (APHA) for water sampling and analysis.

#### ***2.5.1.2 Preservation***

Preservation is important in order to minimize the changes in the sample. The collected water samples were preserved in appropriate containers as per APHA Guidelines, the method of which is given as under:-

Samples were preserved below pH -2 by addition of sulphuric acid and stored below 4 °C.

#### ***2.5.1.3 Sample Identification and Chain of Custody***

The collected samples were labeled and assigned a unique sample identification number, along with sampling date and time of collection. All the relevant information (sample location, time of collection, sample identification, temperature, collected by, preservation techniques etc.) was recorded immediately on the Chain of Custody form signed by HSE Services field Analyst.

#### ***2.5.1.4 Transportation***

Ice box filled with ice, maintained at temperature 4°C ±5°C was used for transporting the sample from the collection site to the environmental laboratory.

### 2.5.2 Ambient Air Sampling methodology

1. Placement of analyzers on a flat table or rack and mounted on it.
2. Made Pneumatic Connections.

3. Connected all the Pneumatic Tubes 1st END at Exhaust Port of Analyzer and 2nd end at the PUMP's INLET PORT.

4. SAMPLE INLET of the analyzer was remained open in Ambient Air for auto suction of sample.

5. After all connections, Turned the PUMP on.

6. Waited for 60 Sec. until the Pressure level is maintained inside the analyzers.

7. Turned the Analyzers ON.

8. Waited for few minutes until analyzers are stabilized & start giving readings.

9. Synchronized all the analyzers time even seconds also.

10. Noted down the time when analyzers starts sampling.

11. Perform the desired time Instantaneous / Hourly / Daily or Weekly Monitoring.

### 2.5.3 Ambient Noise Monitoring Methodology

1. First a point of monitoring is selected to check the ambient noise.

2. A Leq Noise meter is installed on a tripod stand.

3. Leq meter along with tripod stand is placed on point of monitoring.

4. RS 232 cable attached with Leq meter is connected with laptop to store the values.

5. Switched on the laptop and meter.

6. Instantaneously and hourly data logging started.

7. After 24 hour data is saved for report preparation.

### 2.5.2 Monitoring & Sampling Coordinates:

The locations where measurements were performed were selected based on the agreed TORs with client and which are as follows;

#### Ambient Air, Noise, Drinking Water, WasteWater Monitoring Sites

Sr #	Monitoring Locations	Co-ordinates
1	Depot -1, Mufti Mehmood Masjid , Dawood Chowrangi, KIA Karachi	<b>Longitude:</b> 67.20951 <b>Latitude:</b> 24.8500
2	Jamia Darul Uloom, Singer Chowrangi, KIA, Karachi	<b>Longitude:</b> 67.11911 <b>Latitude:</b> 24.83828
3	Near to SBB Dewan University, Shan Chowrangi, KIA Karachi	<b>Longitude:</b> 67.11898 <b>Latitude:</b> 24.83827
4	Near to EBM, Brooks Chowrangi, KIA, Karachi	<b>Longitude:</b> 67.11361 <b>Latitude:</b> 24.81808
5	Depot-2 , Near Indus Hospital, Korangi Crossing, Karachi	<b>Longitude:</b> 67.05514 <b>Latitude:</b> 24.84743
6	National Medical Center, Abbasi Shaheed Raod, Karachi	<b>Longitude:</b> 67.051954 <b>Latitude:</b> 24.85353

7	Gora Qabristan, Abbasi Shaheed Road Karachi	<b>Longitude:</b> 67.05907 <b>Latitude:</b> 24.86115
8	Institute of Orthopedics and Surgery Hospital Nursary, P.E.C.H.S Karachi	<b>Longitude:</b> 67.05548 <b>Latitude:</b> 24.86547
9	Rehmania Qabristan Tariq Road, Shahrah e Quaideen Karachi	<b>Longitude:</b> 67.04597 <b>Latitude:</b> 24.87359
10	Khudadad, Chowrangi, Shahrah e Quaideen Karachi	<b>Longitude:</b> 67.04825 <b>Latitude:</b> 24.87049

### 2.5.3 Monitoring Equipment:

The measurements were performed by using different equipment. The details of the equipment are as follows;

**Table 2.5.3: Equipment For Ambient Air Monitoring & Noise**

S. No	Parameters	Equipment
1.	CO	Testo 315-3 for CO Detection
2.	NO	Ecotech Analyzer
3.	NO2	Ecotech Analyzer
4.	SO2	Ecotech Analyzer
5.	PM 10/ PM 2.5/ SPM	Laser Particle Multifunctional Detector
6.	O3	Ecotech Analyzer
7.	Lead	Lead Assembly & Lab Analysis on AAS
8.	Noise	Extech Noise Meter

### For Water Sampling & Analysis

S. No	Parameters	Equipment
1.	Drinking Water SEQS 2016	Site Sampling and Lab Analysis as per *APHA & **ASTM Methods
2.	Waste Water SEQS 2016	Site Sampling and Lab Analysis as per *APHA & **ASTM Methods
3.	Surface Water SEQS 2016	Site Sampling and Lab Analysis as per *APHA & **ASTM Methods

\*APHA stands for American Public Health Association

\*\*American Society for Testing & Materials

#### 2.5.4 Monitoring Parameters:

Refer **Table 2.4.1 – Table 2.4.4**

#### 2.5.5 Monitoring Procedure:

##### Step 1

- Awarding of contract
- Coordination and confirmation of monitoring schedule
- Arrangement and deployment of site team at site

##### Step 2

- 24 hours continuous monitoring of ambient air at the point and measurement taken on average basis. Equipment were set up at mutually agreed point (as according to the prescribed coordinates) and continuous monitoring of air quality was conducted without any interruption.
- 24 hours continuous monitoring of noise of surroundings and measurement taken on average basis.
- Water samples collected from site and preserved samples in ice boxes to maintain the temperature until delivery to laboratory.

##### Step 3

- Reporting of the results

### 3. Reports

#### Point 1: Mufti Mehmood Masjid

### Ambient Air Monitoring Report



<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-01	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	07-Feb-2022 till 08-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Depot -1, Mufti Mehmood Masjid	<b>Site Location</b>	Dawood Chowrangi, KIA Karachi
<b>Longitude:</b>	67.20951535	<b>Latitude:</b>	24.85003173

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	9.02	<b>High</b>
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	11.29	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	6.78	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	9.76	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	105.61	OK
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	84.33	<b>High</b>
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	349.08	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	12	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

**NOTE:**

- \*Test results are based on an average value derived from 24 hour readings.
  - \*Test results of CO are based on an average value derived from 8 hour readings.
  - \*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.
- SEQS=Sindh Environmental Quality Standards  
 ND=Not detectable .  
 BDL=Below Detectable limit  
 The instruments used were duly calibrated.  
 The measurements were carried out on client's request.  
 The client is responsible for lawful usage of reported data in future.  
 This report is not valid for Court evidence/ Judicial knowledge

### 24 Hour Monitoring Data for Ambient Air

**Log table 2.0**

Date	Time	Oxides of Nitrogen as NO (µg/m <sup>3</sup> )	Nitrogen Dioxide as NO <sub>2</sub> (µg/m <sup>3</sup> )	Sulfur Dioxide as SO <sub>2</sub> (µg/m <sup>3</sup> )	Carbon Monoxide as CO (µg/m <sup>3</sup> )	Particulate Matter (10-Microns) (µg/m <sup>3</sup> )	Particulate Matter (2.5-Microns) (µg/m <sup>3</sup> )	Suspended Particulate Matter (µg/m <sup>3</sup> )	Lead Pb (µg/m <sup>3</sup> )	Ozone (µg/m <sup>3</sup> )
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7-Feb-22	1:00 PM	12.009	4.498	8.754	17.184	144.5	116.7	356	-
7-Feb-22	2:00 PM	11.945	1.767	8.267	9.165	155.1	124.1	308	12.0073
7-Feb-22	3:00 PM	13.012	0.869	10.312	6.874	112.6	90.5	345	-
7-Feb-22	4:00 PM	11.829	2.62	8.078	10.31	99.3	77.1	317	-
7-Feb-22	5:00 PM	9.633	5.412	9.221	8.019	102.5	95.4	348	-
7-Feb-22	6:00 PM	10.482	6.521	9.981	5.728	115.9	88.3	351	-
7-Feb-22	7:00 PM	7.611	3.407	6.02	5.728	98.3	77.4	387	-
7-Feb-22	8:00 PM	8.793	5.623	6.929	9.165	88.1	79.5	318	-
7-Feb-22	9:00 PM	12.391	4.201	9.232	-	95.5	77.3	362	-
7-Feb-22	10:00 PM	10.261	7.992	6.881	-	95.7	65.9	363	-
7-Feb-22	11:00 PM	12.236	9.279	12.529	-	78.4	59.4	342	-
8-Feb-22	12:00 AM	9.427	6.878	8.463	-	93.8	71.3	366	-
8-Feb-22	1:00 AM	11.905	2.216	10.998	-	91.5	83.4	382	-
8-Feb-22	2:00 AM	11.63	0.786	11.624	-	83.6	69.9	394	--
8-Feb-22	3:00 AM	10.631	4.826	9.587	-	101.7	85.2	348	-
8-Feb-22	4:00 AM	12.459	9.839	11.728	-	98.4	80.1	307	-
8-Feb-22	5:00 AM	12.749	11.593	10.446	-	84.6	66.7	338	-
8-Feb-22	6:00 AM	12.637	13.286	10.568	-	95.7	80.7	396	-
8-Feb-22	7:00 AM	11.212	8.462	11.926	-	106.5	78.9	321	-
8-Feb-22	8:00 AM	9.312	7.113	10.248	-	110.4	93.4	322	-
8-Feb-22	9:00 AM	12.407	10.835	10.279	-	115.9	87.6	357	-
8-Feb-22	10:00 AM	12.644	13.23	11.261	-	121.3	81.3	345	-
8-Feb-22	11:00 AM	12.775	12.455	11.09	-	119.8	101.6	316	-
8-Feb-22	12:00 PM	10.995	9.251	9.84	-	125.6	92.4	389	-

ND

ND: Not Detectable

## Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-01	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	07-Feb-2022 till 08-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Mufti Mehmood Masjid	<b>Site Location</b>	Dawood Chowrangi, Karachi

Description			
Measuring Unit	Decibels dB(A)		
SEQS Limits Day Time	75 dB(A)	SEQS Limits Night Time	65 dB(A)
Average Noise Day Time	60.683 dB(A)	Average Noise Night Time	49.327 dB(A)

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Industrial Area.

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

**24 Hour Monitoring Data for Noise**

**Report No. HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-01**

Date	Time	Classification	Noise
7-Feb-22	1:00 PM	Day Time SEQS Limits 75 dB(A)	68.7
7-Feb-22	2:00 PM		59.1
7-Feb-22	3:00 PM		60.1
7-Feb-22	4:00 PM		56.3
7-Feb-22	5:00 PM		61.2
7-Feb-22	6:00 PM		58.7
7-Feb-22	7:00 PM	Night Time SEQS Limits 65 dB(A)	56.4
7-Feb-22	8:00 PM		57.1
7-Feb-22	9:00 PM		51.7
7-Feb-22	10:00 PM		50.3
7-Feb-22	11:00 PM		48.2
8-Feb-22	12:00 AM		46.2
8-Feb-22	1:00 AM	Day Time SEQS Limits 75 dB(A)	48.1
8-Feb-22	2:00 AM		47.3
8-Feb-22	3:00 AM		44.6
8-Feb-22	4:00 AM		43.2
8-Feb-22	5:00 AM		49.5
8-Feb-22	6:00 AM		51.1
8-Feb-22	7:00 AM	Day Time SEQS Limits 75 dB(A)	53.5
8-Feb-22	8:00 AM		65.3
8-Feb-22	9:00 AM		67.6
8-Feb-22	10:00 AM		57.9
8-Feb-22	11:00 AM		61.2
8-Feb-22	12:00 PM		64.7

## Point 2: Jamia Darul Uloom



### Ambient Air Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-02	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	08-Feb-2022 till 09-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Jamia Darul uloom	<b>Site Location</b>	Singer Chowrangi, KIA, Karachi
<b>Longitude:</b>	67.11911	<b>Latitude:</b>	24.83828

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	4.86	OK
2	Oxides of Nitrogen as NO	μg/m <sup>3</sup>	ASTM D-3824	40	10.3	OK
3	Nitrogen Dioxide	μg/m <sup>3</sup>	ASTM-D-3824	80	12.44	OK
4	Sulphur Dioxide	μg/m <sup>3</sup>	ASTM D-2914	120	7.14	OK
5	Particulate Matter (10-Microns)	μg/m <sup>3</sup>	RFPS-0706-162	150	114.2	OK
6	Particulate Matter (2.5-Microns)	μg/m <sup>3</sup>	RFPS-0316-232	75	79.08	<b>High</b>
7	Suspended Particulate Matter	μg/m <sup>3</sup>	ASTM-D 4096	500	334.9	OK
8	Ozone	μg/m <sup>3</sup>	ASTM D-5156	130	0.28	OK
9	Lead	μg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

#### NOTE:

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

**\*Test results of O3 are based on an average value derived from 1 hour readings.**

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

### **24 Hour Monitoring Data for Ambient Air**

**Report No. HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-02**

Date	Time	Oxides of Nitrogen as NO (µg/m³)	Nitrogen Dioxide as NO2 (µg/m³)	Sulfur Dioxide as SO2 (µg/m³)	Carbon Monoxide as CO (µg/m³)	Particulate Matter (10-Microns) (µg/m³)	Particulate Matter (2.5-Microns) (µg/m³)	Suspended Particulate Matter (µg/m³)	Lead Pb (µg/m³)	Ozone (µg/m³)
8-Feb-22	3:00 PM	12.276	15.609	8.939	4.582	132.5	108.2	322	<b>ND</b>	-
8-Feb-22	4:00 PM	12.391	12.341	9.232	3.437	99.3	78.4	315		-
8-Feb-22	5:00 PM	12.268	9.378	9.405	5.728	145.1	114.4	317		-
8-Feb-22	6:00 PM	12.21	12.089	9.625	6.874	123.3	98.2	336		-
8-Feb-22	7:00 PM	12.451	9.578	8.771	4.582	159.4	119.3	347		-
8-Feb-22	8:00 PM	12.513	13.057	9.268	3.437	136.4	89.9	314		-
8-Feb-22	9:00 PM	12.396	11.455	9.969	4.582	123.3	75.2	297		-
8-Feb-22	10:00 PM	12.236	10.373	12.648	5.728	98.7	77.1	289		-
8-Feb-22	11:00 PM	12.259	11.549	6.202	-	95.4	66.3	247		-
9-Feb-22	12:00 AM	10.465	8.451	3.426	-	89.3	59.8	307		-
9-Feb-22	1:00 AM	6.224	8.326	2.101	-	82.8	65.7	311		-
9-Feb-22	2:00 AM	7.369	9.021	3.009	-	90.4	56.7	344		-
9-Feb-22	3:00 AM	4.01	5.894	2.964	-	117.7	65.8	358		-
9-Feb-22	4:00 AM	5.994	7.561	3.626	-	126.4	71.6	394		-
9-Feb-22	5:00 AM	3.12	4.356	1.969	-	116.3	73.8	358		-
9-Feb-22	6:00 AM	6.901	8.896	3.46	-	98.1	59.8	326		-
9-Feb-22	7:00 AM	8.149	10.542	2.991	-	97.5	85.3	346		-
9-Feb-22	8:00 AM	10.837	14.964	4.863	-	108.7	84.5	346		-
9-Feb-22	9:00 AM	12.155	18.659	8.529	-	106.4	77.6	317		-
9-Feb-22	10:00 AM	12.237	17.543	9.24	-	133.5	85.4	389		-
9-Feb-22	11:00	12.259	19.654	9.361	-	95.4	59.3	367		-

	AM								
9-Feb-22	12:00 PM	12.311	18.359	10.741	-	125.6	68.2	354	-
9-Feb-22	1:00 PM	12.495	21.959	11.091	-	101.6	73.7	392	0.2862
9-Feb-22	2:00 PM	11.674	18.988	9.971	-	138.4	83.9	346	-

## Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-02	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	08-Feb-2022 till 9-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Jamia Darul uloom	Singer Chowrangi, KIA, Karachi	

Description			
<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	73.183 dB(A)	<b>Average Noise Night Time</b>	64.183 dB(A)

**NOTE:**

- Limits stated above are prescribed in SEQS for Noise for Residential Area.
- The instruments used were duly calibrated.
- The measurements were carried out on client's request.
- The client is responsible for lawful usage of reported data in future.
- This report is not valid for Court evidence/ Judicial knowledge
- The measurement results are based on the reading taken at the time of monitoring

## 24 Hour Monitoring Data for Noise

**Report  
No.**

**HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-02**

<b>Date</b>	<b>Time</b>	<b>Classification</b>	<b>Noise</b>
8-Feb-22	3:00 PM	Day Time SEQS Limits 75 dB(A)	73.2
8-Feb-22	4:00 PM		72.3
8-Feb-22	5:00 PM		<b>75.6</b>
8-Feb-22	6:00 PM		<b>78.3</b>
8-Feb-22	7:00 PM	Night Time SEQS Limits 65 dB(A)	<b>68.7</b>
8-Feb-22	8:00 PM		<b>76.8</b>
8-Feb-22	9:00 PM		<b>72.6</b>
8-Feb-22	10:00 PM		<b>71.2</b>
8-Feb-22	11:00 PM		<b>68.6</b>
9-Feb-22	12:00 AM		<b>67.4</b>
9-Feb-22	1:00 AM		62.3
9-Feb-22	2:00 AM		57.2
9-Feb-22	3:00 AM		54.6
9-Feb-22	4:00 AM		54.9
9-Feb-22	5:00 AM		56.8
9-Feb-22	6:00 AM	59.1	
9-Feb-22	7:00 AM	Day Time SEQS Limits 75 dB(A)	63.2
9-Feb-22	8:00 AM		70.4
9-Feb-22	9:00 AM		72.2
9-Feb-22	10:00 AM		73.6
9-Feb-22	11:00 AM		72.9
9-Feb-22	12:00 PM		73.7
9-Feb-22	1:00 PM		<b>77.6</b>
9-Feb-22	2:00 PM		<b>75.2</b>

### Point 3: Near to SBB Dewan University

## Ambient Air Monitoring Report



<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-03	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	09-Feb-2022 till 10-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Near to SBB Dewan University	<b>Site Location</b>	Shan Chowrangi, KIA, Karachi
<b>Longitude:</b>	67.11898	<b>Latitude:</b>	24.83827

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	1.43	OK
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	12.17	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	16.46	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	9.73	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	157.72	High
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	111.83	High
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	264.90	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	6.44	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

#### NOTE:

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

\*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

### 24 Hour Monitoring Data for Ambient Air

**Report No.** HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-03

Date	Time	Oxides of Nitrogen as NO (µg/m <sup>3</sup> )	Nitrogen Dioxide as NO <sub>2</sub> (µg/m <sup>3</sup> )	Sulfur Dioxide as SO <sub>2</sub> (µg/m <sup>3</sup> )	Carbon Monoxide as CO (µg/m <sup>3</sup> )	Particulate Matter (10-Microns) (µg/m <sup>3</sup> )	Particulate Matter (2.5-Microns) (µg/m <sup>3</sup> )	Suspended Particulate Matter (µg/m <sup>3</sup> )	Lead Pb (µg/m <sup>3</sup> )	Ozone (µg/m <sup>3</sup> )
9-Feb-22	2:30 PM	12.165	13.671	10.826	-	323.5	231.1	554.6	ND	-
9-Feb-22	3:30 PM	12.211	14.289	10.179	-	334.7	230.3	565		-
9-Feb-22	4:30 PM	11.095	19.124	9.711	-	206.8	147.7	354.5		-
9-Feb-22	5:30 PM	11.825	19.122	10.209	-	79.0	56.4	135.4		-
9-Feb-22	6:30 PM	12.016	19.143	10.882	-	232.8	166.3	399.1		-
9-Feb-22	7:30 PM	12.545	19.139	9.763	-	192.7	137.6	330.3		-
9-Feb-22	8:30 PM	12.256	23.141	10.096	-	242.6	173.3	415.9		-
9-Feb-22	9:30 PM	12.166	19.173	9.204	-	168.3	120.2	168.3		-
9-Feb-22	10:30 PM	12.309	10.107	9.402	-	132.2	92.3	224.5		-
9-Feb-22	11:30 PM	12.84	17.131	9.659	-	107.1	76.5	183.6		-
10-Feb-22	12:30 AM	12.263	19.146	8.416	-	103.1	73.6	176.7		-
10-Feb-22	1:30 AM	11.675	18.459	8.293	-	117.1	83.6	200.7		-
10-Feb-22	2:30 AM	12.136	16.477	6.755	-	97.2	69.4	166.6		-
10-Feb-22	3:30 AM	12.427	12.787	8.006	-	131.9	94.2	226.1		-
10-Feb-22	4:30 AM	12.699	19.124	8.618	-	214.5	153.2	367.7		-
10-Feb-22	5:30 AM	12.124	20.121	9.456	-	378.2	270.1	648.3		-
10-Feb-22	6:30 AM	11.845	19.988	9.277	2.291	195.9	139.9	335.8		-
10-Feb-22	7:30 AM	12.171	19.195	9.653	1.146	135.5	96.7	232.2		-
10-Feb-22	8:30 AM	12.297	15.919	9.985	1.146	70.9	50.6	121.5		-
10-Feb-22	9:30 AM	12.411	11.232	10.275	2.291	72.6	51.8	124.4		-
10-Feb-22	10:30 AM	12.176	17.987	12.261	1.146	64.9	46.3	111.2		-
10-Feb-22	11:30 AM	12.212	16.518	12.644	1.146	51.3	36.6	87.9		-
10-Feb-22	12:30 PM	12.221	15.869	10.045	1.146	58.8	42.0	100.8		-
10-Feb-22	1:30 PM	12.201	18.564	10.009	1.146	73.9	52.8	126.7		6.4469

## Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-03	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s Nespak Pvt. Ltd.		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	09-Feb-2022 till 10-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Near to SBB Dewan University	<b>Site Location</b>	Shan Chowrangi, KIA, Karachi

### Description

<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	74.375 dB(A)	<b>Average Noise Night Time</b>	64.291 dB(A)

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Residential Area.

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

## 24 Hour Monitoring Data for Noise

**Report**

**No.**

**HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-03**

<b>Date</b>	<b>Time</b>	<b>Classification</b>	<b>Noise</b>
9-Feb-22	2:30 PM	Day Time SEQS Limits 75 dB(A)	<b>74.6</b>
9-Feb-22	3:30 PM		<b>75.9</b>
9-Feb-22	4:30 PM		<b>72.1</b>
9-Feb-22	5:30 PM		<b>81.3</b>
9-Feb-22	6:30 PM	Night Time SEQS Limits 65 dB(A)	<b>79.2</b>
9-Feb-22	7:30 PM		<b>78.7</b>
9-Feb-22	8:30 PM		<b>78.1</b>
9-Feb-22	9:30 PM		<b>76.6</b>
9-Feb-22	10:30 PM		<b>70.1</b>
9-Feb-22	11:30 PM		<b>67.2</b>
10-Feb-22	12:30 AM		<b>66.3</b>
10-Feb-22	1:30 AM		60.1
10-Feb-22	2:30 AM		58.4
10-Feb-22	3:30 AM		56.1
10-Feb-22	4:30 AM		57.3
10-Feb-22	5:30 AM	59.4	
10-Feb-22	6:30 AM	Day Time SEQS Limits 75 dB(A)	57.3
10-Feb-22	7:30 AM		62.1
10-Feb-22	8:30 AM		<b>79.6</b>
10-Feb-22	9:30 AM		<b>79.9</b>
10-Feb-22	10:30 AM		<b>77.4</b>
10-Feb-22	11:30 AM		<b>78.3</b>
10-Feb-22	12:30 PM		<b>76.3</b>
10-Feb-22	1:30 PM		<b>77.7</b>

## Point 4: Near to EBM

### Ambient Air Monitoring Report



<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-04	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	10-Feb-2022 till 11-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Near to EBM	<b>Site Location</b>	Brooks Chowrangi, KIA, Karachi
<b>Longitude:</b>	67.11361	<b>Latitude:</b>	24.81808

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	9.32	High
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	10.86	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	12.17	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	6.23	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	160.47	High
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	122.42	High
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	284.77	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	12.1	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

#### NOTE:

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

\*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

**24 Hour Monitoring Data for Ambient Air**

**Report**

**No. HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-04**

Date	Time	Oxides of Nitrogen as NO (µg/m³)	Nitrogen Dioxide as NO2 (µg/m³)	Sulfur Dioxide as SO2 (µg/m³)	Carbon Monoxide as CO (µg/m³)	Particulate Matter (10-Microns) (µg/m³)	Particulate Matter (2.5-Microns) (µg/m³)	Suspended Particulate Matter (µg/m³)	Lead Pb (µg/m³)	Ozone (µg/m³)
10-Feb-22	6:00 PM	12.486	19.671	4.743	-	297.2	231.1	532.3	<b>N D</b>	-
10-Feb-22	7:00 PM	12.487	18.289	5.79	-	357.8	230.3	508.4		-
10-Feb-22	8:00 PM	11.523	19.124	8.192	-	211.4	147.7	367.1		-
10-Feb-22	9:00 PM	13.132	19.122	6.344	-	80.2	56.4	144.5		-
10-Feb-22	10:00 PM	13.131	19.123	7.689	-	240.6	166.3	413.4		-
10-Feb-22	11:00 PM	11.523	19.137	8.724	-	90.4	74.9	171.3		-
11-Feb-22	12:00 AM	13.461	21.141	7.854	-	242.6	173.3	419.9		-
11-Feb-22	1:00 AM	13.529	9.173	8.158	-	168.3	139.1	313.4		-
11-Feb-22	2:00 AM	11.672	10.107	7.958	-	132.2	92.3	229.8		-
11-Feb-22	3:00 AM	10.613	17.131	6.997	-	107.1	76.5	187.5		-
11-Feb-22	4:00 AM	12.912	19.146	7.876	-	103.1	73.6	180.7		-
11-Feb-22	5:00 AM	10.139	18.459	6.992	-	117.1	96.4	219.3		-
11-Feb-22	6:00 AM	9.168	16.477	5.896	-	97.2	69.4	169.6		-
11-Feb-22	7:00 AM	0.526	2.787	8.099	-	131.9	103.5	240.1		-
11-Feb-22	8:00 AM	12.286	19.124	9.189	24.5	214.5	179.9	394.4		-
11-Feb-22	9:00 AM	11.337	20.121	7.730	11.6	196.2	166.4	367.6		-
11-Feb-22	10:00 AM	7.192	9.981	5.776	9.5	195.9	139.9	341.8		-
11-Feb-22	11:00 AM	9.419	0.165	3.275	7.0	135.5	107.1	247.1		-
11-Feb-22	12:00 PM	0.149	0.019	4.368	1.5	70.9	50.6	127.5		-
11-Feb-22	1:00 PM	0.495	11.232	4.639	18.5	173.5	149.1	329.6		12.1094
11-Feb-22	2:00 PM	16.855	2.987	4.232	1.5	189.3	171.4	366.9		-
11-Feb-22	3:00 PM	15.865	2.518	2.763	0.5	114.6	92.5	217.4		-
11-Feb-22	4:00 PM	24.007	8.869	2.728	-	101.2	81.1	187.2		-
11-Feb-22	5:00 PM	6.808	7.564	3.686	-	82.6	69.4	157.9		-

## Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016 /AA-04	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	10-Feb-2022 till 11-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Near to SBB Dewan University	<b>Site Location</b>	Shan Chowrangi, KIA, Karachi

Description			
<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	74.990 dB(A)	<b>Average Noise Night Time</b>	70.046 dB(A)

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Residential Area.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

## 24 Hour Monitoring Data for Noise

**HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-  
Report No. 04**

<b>Date</b>	<b>Time</b>	<b>Classification</b>	<b>Noise</b>
10-Feb-22	6:00 PM	Night Time SEQS Limits 65 dB(A)	<b>77.8</b>
10-Feb-22	7:00 PM		<b>76.9</b>
10-Feb-22	8:00 PM		<b>74.8</b>
10-Feb-22	9:00 PM		<b>75.6</b>
10-Feb-22	10:00 PM		60.1
10-Feb-22	11:00 PM		52.3
11-Feb-22	12:00 AM		59.2
11-Feb-22	1:00 AM		<b>72.6</b>
11-Feb-22	2:00 AM		<b>74.2</b>
11-Feb-22	3:00 AM		<b>75.4</b>
11-Feb-22	4:00 AM		<b>70.6</b>
11-Feb-22	5:00 AM		<b>69.9</b>
11-Feb-22	6:00 AM		<b>71.2</b>
11-Feb-22	7:00 AM		70.9
11-Feb-22	8:00 AM	<b>76.7</b>	
11-Feb-22	9:00 AM	<b>77.9</b>	
11-Feb-22	10:00 AM	<b>78.5</b>	
11-Feb-22	11:00 AM	<b>75.6</b>	
11-Feb-22	12:00 PM	<b>76.3</b>	
11-Feb-22	1:00 PM	<b>72.7</b>	
11-Feb-22	2:00 PM	<b>77.4</b>	
11-Feb-22	3:00 PM	69.7	
11-Feb-22	4:00 PM	73.3	
11-Feb-22	5:00 PM	<b>75.9</b>	

## Point 5: Depot-2 , Near to Indus Hospital



### Ambient Air Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-05	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	11-Feb-2022 till 12-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Depot-2, Near Indus Hospital	<b>Site Location</b>	Korangi Crossing, Karachi
<b>Longitude:</b>	67.05514	<b>Latitude:</b>	24.84743

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	2.7	OK
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	8.97	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	6.73	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	3.93	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	130	OK
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	90.18	<b>High</b>
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	216.4	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	11.99	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

#### NOTE:

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

\*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

**Report No. HSE/ENV/22/FEB/AM/1538/SEQS201  
6/AA-05**

Date	Time	Oxides of Nitrogen as NO (µg/m³)	Nitrogen Dioxide as NO2 (µg/m³)	Sulfur Dioxide as SO2 (µg/m³)	Carbon Monoxide as CO (µg/m³)	Particulate Matter (10-Microns) (µg/m³)	Particulate Matter (2.5-Microns) (µg/m³)	Suspended Particulate Matter (µg/m³)	Lead Pb (µg/m³)	Ozone (µg/m³)
11-Feb-22	7:00 PM	12.301	1.675	5.757	-	123.0	87.8	210.8	<b>ND</b>	-
11-Feb-22	8:00 PM	6.414	10.261	4.288	-	120.7	86.2	206.9		-
11-Feb-22	9:00 PM	7.217	0.717	3.875	-	127.1	91.8	218.9		-
11-Feb-22	10:00 PM	10.394	13.463	3.628	-	121.9	87	208.9		-
12-Feb-22	11:00 PM	4.763	13.872	3.538	-	203.4	145.3	348.7		-
12-Feb-22	12:00 AM	11.789	7.016	4.188	-	112.0	80	192.0		-
12-Feb-22	1:00 AM	12.529	8.163	5.363	-	120.1	86.8	206.9		-
12-Feb-22	2:00 AM	10.686	9.106	4.012	-	127.8	85.8	213.6		-
12-Feb-22	3:00 AM	9.987	10.298	3.896	-	182.4	118.7	301.1		-
12-Feb-22	4:00 AM	4.927	8.434	3.497	-	160.3	114.5	274.8		-
12-Feb-22	5:00 AM	13.400	4.804	4.68	-	146.6	104.7	251.3		-
12-Feb-22	6:00 AM	14.362	10.563	6.129	-	177.5	126.7	177.5		-
12-Feb-22	7:00 AM	0.518	1.787	2.105	-	199.6	130.4	330		-
12-Feb-22	8:00 AM	4.713	6.705	3.109	-	131.2	93.7	224.9		-
12-Feb-22	9:00 AM	5.685	3.589	3.972	6.5	157.1	112.2	269.3		-
12-Feb-22	10:00 AM	7.192	9.981	2.58	8.5	176.1	125.8	301.9		-
12-Feb-22	11:00 AM	8.418	0.163	0.208	9.5	210.2	150.1	360.3		-
12-Feb-22	12:00 PM	19.191	3.062	3.011	2	117.8	84.1	201.9		-
12-Feb-22	1:00 PM	12.713	3.897	7.472	3.5	67.3	48.0	115.3		-
12-Feb-22	2:00 PM	6.513	7.884	1.696	4	54.7	39.0	93.7		-
12-Feb-22	3:00 PM	8.390	11.031	3.941	2.5	68.5	48.9	117.4	11.99 92	

12-Feb-22	4:00 PM	1.463	4.926	3.269	1.5	46.3	33.1	79.4	-
12-Feb-22	5:00 PM	4.975	3.932	4.91	-	55.9	39.9	95.8	-
12-Feb-22	6:00 PM	16.979	6.316	5.408	-	112.6	80.4	193	-

### Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-05	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	11-Feb-2022 till 12-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Near Indus Hospital	<b>Site Location</b>	Korangi Crossing, Karachi

Description			
<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	77.833 dB(A)	<b>Average Noise Night Time</b>	75.125 dB(A)

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Residential Area.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

## 24 Hour Monitoring Data for Noise

**Report**

**No.**

**HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-05**

<b>Date</b>	<b>Time</b>	<b>Classification</b>	<b>Noise</b>
11-Feb-22	7:00 PM	Night Time SEQS Limits 65 dB(A)	<b>79.1</b>
11-Feb-22	8:00 PM		<b>78.2</b>
11-Feb-22	9:00 PM		<b>74.9</b>
11-Feb-22	10:00 PM		<b>76.7</b>
12-Feb-22	11:00 PM		<b>81.3</b>
12-Feb-22	12:00 AM		<b>79.7</b>
12-Feb-22	1:00 AM		<b>76.1</b>
12-Feb-22	2:00 AM		<b>68.9</b>
12-Feb-22	3:00 AM		<b>70.2</b>
12-Feb-22	4:00 AM		<b>76.1</b>
12-Feb-22	5:00 AM		<b>75.4</b>
12-Feb-22	6:00 AM		64.9
12-Feb-22	7:00 AM	Day Time SEQS Limits 75 dB(A)	74.7
12-Feb-22	8:00 AM		<b>78.2</b>
12-Feb-22	9:00 AM		<b>89.6</b>
12-Feb-22	10:00 AM		<b>84.3</b>
12-Feb-22	11:00 AM		<b>81.4</b>
12-Feb-22	12:00 PM		<b>78.2</b>
12-Feb-22	1:00 PM		<b>78.2</b>
12-Feb-22	2:00 PM		72.8
12-Feb-22	3:00 PM		72.5
12-Feb-22	4:00 PM		74.5
12-Feb-22	5:00 PM		74.8
12-Feb-22	6:00 PM		74.8

## Point 6: National Medical Center

### Ambient Air Monitoring Report



<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-06	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	12-Feb-2022 till 13-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	National Medical Center	<b>Site Location</b>	Abbasi Shaheed Road, Karachi
<b>Longitude:</b>	67.051954	<b>Latitude:</b>	24.85353

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	1.5	OK
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	20.50	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	11.3	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	5.08	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	105.4	OK
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	78.54	<b>High</b>
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	133.5	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	11.99	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

#### NOTE:

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

\*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

**24 Hour Monitoring Data for Ambient Air**

**Report No. HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-06**

Date	Time	Oxides of Nitrogen as NO (µg/m³)	Nitrogen Dioxide as NO2 (µg/m³)	Sulfur Dioxide as SO2 (µg/m³)	Carbon Monoxide as CO (µg/m³)	Particulate Matter (10-Microns) (µg/m³)	Particulate Matter (2.5-Microns) (µg/m³)	Suspended Particulate Matter (µg/m³)	Lead Pb (µg/m³)	Ozone (µg/m³)
12-Feb-22	9:00 PM	1.452	7.807	5.118	-	97.5	77.2	140.6	ND	-
12-Feb-22	10:00 PM	7.783	7.429	4.347	-	91.1	73.8	134.4		-
12-Feb-22	11:00 PM	0.947	12.434	3.984	-	123.5	91.4	117.1		-
13-Feb-22	12:00 AM	8.267	2.414	3.958	-	159.7	94.5	120.6		-
13-Feb-22	1:00 AM	2.348	5.868	3.852	-	147.6	95.3	99.2		-
13-Feb-22	2:00 AM	0.598	0.239	3.826	-	97.5	76.3	90.3		-
13-Feb-22	3:00 AM	3.507	1.798	2.022	-	105.5	88.2	83.5		-
13-Feb-22	4:00 AM	25.012	4.174	2.126	-	40.7	45.7	71.3		-
13-Feb-22	5:00 AM	3.787	11.212	2.162	-	55.4	35.4	68.6		-
13-Feb-22	6:00 AM	16.011	3.717	19.728	-	102.4	87.5	189.9		-
13-Feb-22	7:00 AM	6.094	0.185	2.153	-	107.6	90.5	180.6		-
13-Feb-22	8:00 AM	0.02	12.064	2.292	-	65.1	59.4	111.6		-
13-Feb-22	9:00 AM	3.251	6.394	0.638	2	36.4	30.8	62.4		-
13-Feb-22	10:00 AM	11.423	7.445	0.062	1.5	48.7	40.1	83.5		-
13-Feb-22	11:00 AM	8.99	0.94	1.364	0.5	76.9	64.5	131.8		-
13-Feb-22	12:00 PM	21.268	7.42	8.472	ND	100	80.4	171.4		-
13-Feb-22	1:00 PM	8.604	5.174	8.4472	ND	220.1	131.2	377.3		-
13-Feb-22	2:00 PM	13.809	0.561	8.456	ND	113.5	91.5	194.8		11.9994
13-Feb-22	3:00 PM	37.002	18.921	7.756	1.5	197	140.7	337.7		-
13-Feb-22	4:00 PM	270.89	138.15	6.554	2.0	201.5	113.5	141.1		-
13-Feb-22	5:00 PM	6.763	1.364	6.554	-	61.7	51.1	73.3		-
13-Feb-22	6:00 PM	3.74	6.784	7.928	-	102.4	99.2	60.8		-
13-Feb-22	7:00 PM	10.523	8.735	7.125	-	94.5	81.2	76.7		-
13-Feb-22	8:00 PM	20.012	0.117	3.102	-	59.7	45.7	84.8		-

## Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-06	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	12-Feb-2022 till 13-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	National Medical Center	<b>Site Location</b>	Abbasi Shaheed Road, Karachi

Description			
<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	63.755 dB(A)	<b>Average Noise Night Time</b>	60.166 dB(A)

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Residential Area.

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

## 24 Hour Monitoring Data for Noise

**Report**

**No.**

**HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-06**

<b>Date</b>	<b>Time</b>	<b>Classification</b>	<b>Noise</b>
12-Feb-22	9:00 PM	Night Time SEQS Limits 65 dB(A)	<b>66.4</b>
12-Feb-22	10:00 PM		<b>66.4</b>
12-Feb-22	11:00 PM		56.5
13-Feb-22	12:00 AM		56.2
13-Feb-22	1:00 AM		60.7
13-Feb-22	2:00 AM		59.3
13-Feb-22	3:00 AM		59.6
13-Feb-22	4:00 AM		55.1
13-Feb-22	5:00 AM		55.8
13-Feb-22	6:00 AM		57.4
13-Feb-22	7:00 AM	Day Time SEQS Limits 75 dB(A)	60.8
13-Feb-22	8:00 AM		67.2
13-Feb-22	9:00 AM		67.0
13-Feb-22	10:00 AM		62.9
13-Feb-22	11:00 AM		62.9
13-Feb-22	12:00 PM		62.8
13-Feb-22	1:00 PM		63.6
13-Feb-22	2:00 PM		62.9
13-Feb-22	3:00 PM		62.8
13-Feb-22	4:00 PM		63.4
13-Feb-22	5:00 PM	65.9	
13-Feb-22	6:00 PM	62.8	
13-Feb-22	7:00 PM	Night Time SEQS Limits 65 dB(A)	62.7
13-Feb-22	8:00 PM		<b>65.9</b>

## Point 7: Gora Qabrastan



### Ambient Air Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-07	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	13-Feb-2022 till 14-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Gora Qabrastan	<b>Site Location</b>	Abbasi Shaheed Raod, Karachi
<b>Longitude:</b>	67.05907434	<b>Latitude:</b>	24.86115785

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	7.5	High
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	7.17	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	7.33	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	9.48	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	112.75	OK
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	78.97	High
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	191.73	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	11.83	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

#### NOTE:

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

\*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

## Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-07	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	13-Feb-2022 till 14-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Gora Qabrastan	<b>Site Location</b>	Abbasi Shaheed Raod, Karachi

Description			
<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	73.358 dB(A)	<b>Average Noise Night Time</b>	<b>66.88 dB(A)</b>

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Residential Area.  
The instruments used were duly calibrated.  
The measurements were carried out on client's request.  
The client is responsible for lawful usage of reported data in future.  
This report is not valid for Court evidence/ Judicial knowledge  
The measurement results are based on the reading taken at the time of monitoring

## 24 Hour Monitoring Data for Noise

**Report No.** HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-07

<b>Date</b>	<b>Time</b>	<b>Classification</b>	<b>Noise</b>
13-Feb-22	10:00 PM	Night Time SEQS Limits 65 dB(A)	<b>72.0</b>
13-Feb-22	11:00 PM		<b>75.1</b>
14-Feb-22	12:00 AM		69.3
14-Feb-22	1:00 AM		54.5
14-Feb-22	2:00 AM		52.3
14-Feb-22	3:00 AM		57.6
14-Feb-22	4:00 AM		62.1
14-Feb-22	5:00 AM		52.5
14-Feb-22	6:00 AM		<b>75.2</b>
14-Feb-22	7:00 AM		Day Time SEQS Limits 75 dB(A)
14-Feb-22	8:00 AM	65.2	
14-Feb-22	9:00 AM	70.2	
14-Feb-22	10:00 AM	71.8	
14-Feb-22	11:00 AM	71.9	
14-Feb-22	12:00 PM	72.1	
14-Feb-22	1:00 PM	<b>76.3</b>	
14-Feb-22	2:00 PM	<b>76.1</b>	
14-Feb-22	3:00 PM	<b>77.5</b>	
14-Feb-22	4:00 PM	<b>77.8</b>	
14-Feb-22	5:00 PM	<b>80.2</b>	
14-Feb-22	6:00 PM	<b>79.7</b>	
14-Feb-22	7:00 PM	Night Time SEQS Limits 65 dB(A)	<b>74.9</b>
14-Feb-22	8:00 PM		<b>77.6</b>
14-Feb-22	9:00 PM		<b>78.5</b>

## Point 8: Institute of Orthopedics and Surgery Hospital



### Ambient Air Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-08	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	14-Feb-2022 till 15-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Institute of Orthopedics and Surgery Hospital	<b>Site Location</b>	P.E.C.H.S Karachi
<b>Longitude:</b>	67.05548184	<b>Latitude:</b>	24.86547459

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	4.81	OK
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	3.91	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	3.03	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	5.41	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	120.37	OK
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	84.11	<b>High</b>
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	204.48	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	11.99	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

#### NOTE:

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

\*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

**24 Hour Monitoring Data for Ambient Air**

**Report No. HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-08**

Date	Time	Oxides of Nitrogen as NO (µg/m <sup>3</sup> )	Nitrogen Dioxide as NO <sub>2</sub> (µg/m <sup>3</sup> )	Sulfur Dioxide as SO <sub>2</sub> (µg/m <sup>3</sup> )	Carbon Monoxide as CO (µg/m <sup>3</sup> )	Particulate Matter (10-Microns) (µg/m <sup>3</sup> )	Particulate Matter (2.5-Microns) (µg/m <sup>3</sup> )	Suspended Particulate Matter (µg/m <sup>3</sup> )	Lead Pb (µg/m <sup>3</sup> )	Ozone (µg/m <sup>3</sup> )
14-Feb-22	11:00 PM	5.625	1.729	5.622	-	84.6	60.4	145	<b>ND</b>	-
15-Feb-22	12:00 AM	1.707	0.863	6.911	-	97.7	69.8	167.5		-
15-Feb-22	1:00 AM	1.232	2.082	6.197	-	102.1	71.2	173.3		-
15-Feb-22	2:00 AM	4.047	0.114	5.884	-	81.5	58.2	139.7		-
15-Feb-22	3:00 AM	7.019	2.195	4.128	-	80.7	52.9	133.6		-
15-Feb-22	4:00 AM	3.942	2.011	4.302	-	97.7	69.8	167.5		-
15-Feb-22	5:00 AM	1.444	1.055	4.33	-	86.4	61.7	148.1		-
15-Feb-22	6:00 AM	0.975	0.668	4.361	-	88.5	63.2	151.7		-
15-Feb-22	7:00 AM	3.694	0.806	4.399	-	83.9	59.9	143.8		-
15-Feb-22	8:00 AM	1.531	0.296	5.265	-	106.9	76.4	183.3		-
15-Feb-22	9:00 AM	3.590	0.443	5.708	-	130.8	93.4	224.2		-
15-Feb-22	10:00 AM	5.285	2.066	6.25	5.5	133.9	95.6	229.5		-
15-Feb-22	11:00 AM	2.210	0.256	5.64	2.0	164.3	117.3	281.6		-
15-Feb-22	12:00 PM	2.468	0.045	3.948	3.5	117.4	83.9	201.3		11.9993
15-Feb-22	1:00 PM	0.118	0.957	4.242	4.5	116.2	81.8	198		-
15-Feb-22	2:00 PM	5.662	2.871	5.117	6.5	143.9	101.8	245.7		-
15-Feb-22	3:00 PM	6.773	4.981	6.102	5.0	154.3	99.3	253.6		-

22										
15-Feb-22	4:00 PM	10.188	11.348	7.602	5.5	184.4	100.7	285.1		-
15-Feb-22	5:00 PM	8.781	14.431	7.705	6.0	136.6	95.2	231.8		-
15-Feb-22	6:00 PM	2.52	0.6992	5.541	-	133.0	95	228.0		-
15-Feb-22	7:00 PM	0.419	0.606	6.489	-	157.3	112.3	269.6		-
15-Feb-22	8:00 PM	5.712	8.781	5.752	-	132.9	94.9	227.8		-
15-Feb-22	9:00 PM	7.687	9.439	4.473	-	146.3	104.2	250.5		-
15-Feb-22	10:00 PM	1.223	3.581	3.953	-	127.6	99.8	227.4		-

## Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-08	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	14-Feb-2022 till 15-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Institute of Orthopedics and Surgery Hospital	<b>Site Location</b>	P.E.C.H.S Karachi

Description			
<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	70.858 dB(A)	<b>Average Noise Night Time</b>	<b>67.841 dB(A)</b>

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Residential Area.

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

### 24 Hour Monitoring Data for Noise

**Report No. HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-08**

Date	Time	Classification	Noise
14-Feb-22	11:00 PM	Night Time SEQS Limits 65 dB(A)	62.5
15-Feb-22	12:00 AM		62.3
15-Feb-22	1:00 AM		64.5
15-Feb-22	2:00 AM		64.6
15-Feb-22	3:00 AM		64.1
15-Feb-22	4:00 AM		63.2
15-Feb-22	5:00 AM		64.8
15-Feb-22	6:00 AM		<b>65.4</b>
15-Feb-22	7:00 AM	Day Time SEQS Limits 75 dB(A)	66.7
15-Feb-22	8:00 AM		66.7
15-Feb-22	9:00 AM		66.7
15-Feb-22	10:00 AM		71.1
15-Feb-22	11:00 AM		71.5
15-Feb-22	12:00 PM		71.9
15-Feb-22	1:00 PM		72.1
15-Feb-22	2:00 PM		72.2
15-Feb-22	3:00 PM		72.8
15-Feb-22	4:00 PM		70.9
15-Feb-22	5:00 PM	71.3	
15-Feb-22	6:00 PM	<b>76.4</b>	
15-Feb-22	7:00 PM	Night Time SEQS Limits 65 dB(A)	<b>75.6</b>
15-Feb-22	8:00 PM		<b>76.1</b>
15-Feb-22	9:00 PM		<b>75.9</b>
15-Feb-22	10:00 PM		<b>75.1</b>

## Point 9: Rehmania Qabristan

### Ambient Air Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-09	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Date of Sampling</b>	15-Feb-2022 till 16-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Rehmania Qaberistan	<b>Site Location</b>	Tariq Road, Karachi
<b>Longitude:</b>	67.04597	<b>Latitude:</b>	24.87359

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	5.8	<b>High</b>
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	5.95	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	5.81	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	5.31	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	111.8	OK
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	82.99	<b>High</b>
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	131.83	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	12.002	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

#### NOTE:

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

\*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

Report No.		HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-09								
Date	Time	Oxides of Nitrogen as NO ( $\mu\text{g}/\text{m}^3$ )	Nitrogen Dioxide as NO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	Sulfur Dioxide as SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	Carbon Monoxide as CO ( $\mu\text{g}/\text{m}^3$ )	Particulate Matter (10-Microns) ( $\mu\text{g}/\text{m}^3$ )	Particulate Matter (2.5-Microns) ( $\mu\text{g}/\text{m}^3$ )	Suspended Particulate Matter ( $\mu\text{g}/\text{m}^3$ )	Lead Pb ( $\mu\text{g}/\text{m}^3$ )	Ozone ( $\mu\text{g}/\text{m}^3$ )
15-Feb-22	11:00 PM	5.238	5.296	7.862	-	145.2	114.9	117.2	ND	-
16-Feb-22	12:00 AM	7.432	2.317	5.813	-	112.5	89.4	91.3		-
16-Feb-22	1:00 AM	5.329	5.419	5.937	-	106.7	91.8	109.7		-
16-Feb-22	2:00 AM	3.521	7.291	3.659	-	97.6	78.5	129.8		-
16-Feb-22	3:00 AM	7.431	10.734	6.755	-	95.8	65.4	87.6		-
16-Feb-22	4:00 AM	11.126	5.561	5.431	-	68.7	84.2	77.8		-
16-Feb-22	5:00 AM	13.213	3.768	7.345	-	88.1	74.1	86.4		-
16-Feb-22	6:00 AM	2.595	1.617	9.213	-	101.5	79.4	89.7		-
16-Feb-22	7:00 AM	5.213	3.568	5.425	-	97.6	77.3	77.2		-
16-Feb-22	8:00 AM	7.463	7.122	3.298	-	88.5	59.4	81.7		-
16-Feb-22	9:00 AM	10.615	9.345	4.502	-	82.3	78.6	96.4		-
16-Feb-22	10:00 AM	13.757	13.421	3.624	7.5	95.4	76.5	130.4		-
16-Feb-22	11:00 AM	10.506	10.987	2.751	4.5	88.7	56.6	151.8		-
16-Feb-22	12:00 PM	9.675	9.829	5.231	5.0	106.8	55.9	143.7		-
16-Feb-22	1:00 PM	1.118	3.109	6.30	6.5	124.9	107.5	209.6		-
16-Feb-22	2:00 PM	2.254	4.025	5.391	7.0	147.6	121.6	176.4		12.002
16-Feb-22	3:00 PM	3.943	6.374	4.103	5.5	158.1	91.7	184.1		-
16-Feb-22	4:00 PM	4.992	3.335	4.245	3.0	156.4	99.4	136.4		-
16-Feb-22	5:00 PM	0.819	0.097	2.77	7.5	166.9	103.6	177.2		-
16-Feb-22	6:00 PM	4.919	9.109	7.379	-	103.5	79.9	163.1		-

16-Feb-22	7:00 PM	2.349	4.024	6.741	-	134.8	88.1	164.3	-
16-Feb-22	8:00 PM	1.919	3.143	6.101	-	114.5	65.6	183.2	-
16-Feb-22	9:00 PM	6.319	9.012	4.301	-	106.4	71.7	159.7	-
16-Feb-22	10:00 PM	1.112	0.991	3.924	-	95.8	80.8	139.3	-

**24 Hour Monitoring Data for Ambient Air**

**Noise Monitoring Report**

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-09	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Testing Date</b>	15-Feb-2022 till 16-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Rehmania Qaberistan	<b>Site Location</b>	Tariq Road, Karachi

<b>Description</b>			
<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	71.091 dB(A)	<b>Average Noise Night Time</b>	<b>68.516 dB(A)</b>

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Residential Area.

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

**24 Hour Monitoring Data for Noise**

**Report No.** HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-09

Date	Time	Classification	Noise
15-Feb-22	11:00 PM	Night Time	<b>76.4</b>

16-Feb-22	12:00 AM	SEQS Limits 65 dB(A)	<b>78.1</b>
16-Feb-22	1:00 AM		<b>81.5</b>
16-Feb-22	2:00 AM		<b>73.2</b>
16-Feb-22	3:00 AM		52.5
16-Feb-22	4:00 AM		55.1
16-Feb-22	5:00 AM		57.6
16-Feb-22	6:00 AM		55.3
16-Feb-22	7:00 AM	Day Time SEQS Limits 75 dB(A)	60.4
16-Feb-22	8:00 AM		68.9
16-Feb-22	9:00 AM		71.6
16-Feb-22	10:00 AM		72.9
16-Feb-22	11:00 AM		68.9
16-Feb-22	12:00 PM		70.7
16-Feb-22	1:00 PM		74.6
16-Feb-22	2:00 PM		73.9
16-Feb-22	3:00 PM		74.1
16-Feb-22	4:00 PM		73.1
16-Feb-22	5:00 PM	73.1	
16-Feb-22	6:00 PM	70.9	
16-Feb-22	7:00 PM	Night Time SEQS Limits 65 dB(A)	<b>69.3</b>
16-Feb-22	8:00 PM		<b>73.6</b>
16-Feb-22	9:00 PM		<b>74.1</b>
16-Feb-22	10:00 PM		<b>75.5</b>

### Point 10: Khudadad Chowrangi

### Ambient Air Monitoring Report



<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-10	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		

<b>Date of Sampling</b>	16-Feb-2022 till 17-Feb-2022	<b>Sampling Duration</b>	24 Hours
<b>Location of Sampling</b>	Khudadad Chowrangi	<b>Site Location</b>	Shahrah e Quaideen Karachi
<b>Longitude:</b>	67.04825713	<b>Latitude:</b>	24.87049035

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results*	Remarks
1	Carbon Monoxide	mg/m <sup>3</sup>	ASTM D3162 - 12	5	4.0	OK
2	Oxides of Nitrogen as NO	µg/m <sup>3</sup>	ASTM D-3824	40	6.95	OK
3	Nitrogen Dioxide	µg/m <sup>3</sup>	ASTM-D-3824	80	5.87	OK
4	Sulphur Dioxide	µg/m <sup>3</sup>	ASTM D-2914	120	6.11	OK
5	Particulate Matter (10-Microns)	µg/m <sup>3</sup>	RFPS-0706-162	150	101.35	OK
6	Particulate Matter (2.5-Microns)	µg/m <sup>3</sup>	RFPS-0316-232	75	76.22	<b>HIGH</b>
7	Suspended Particulate Matter	µg/m <sup>3</sup>	ASTM-D 4096	500	177.92	OK
8	Ozone	µg/m <sup>3</sup>	ASTM D-5156	130	12	OK
9	Lead	µg/m <sup>3</sup>	ASTM D-6785	1.5	ND	OK

**NOTE:**

\*Test results are based on an average value derived from 24 hour readings.

\*Test results of CO are based on an average value derived from 8 hour readings.

\*Test results of O<sub>3</sub> are based on an average value derived from 1 hour readings.

SEQS=Sindh Environmental Quality Standards

ND=Not detectable .

BDL=Below Detectable limit

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

## 24 Hour Monitoring Data for Ambient Air

**Report No. HSE/ENV/22/FEB/AM/1538/SEQS  
2016/AA-10**

Date	Time	Oxides of Nitrogen as NO (µg/m <sup>3</sup> )	Nitrogen Dioxide as NO <sub>2</sub> (µg/m <sup>3</sup> )	Sulfur Dioxide as SO <sub>2</sub> (µg/m <sup>3</sup> )	Carbon Monoxide as CO (µg/m <sup>3</sup> )	Particulate Matter (10-Microns) (µg/m <sup>3</sup> )	Particulate Matter (2.5-Microns) (µg/m <sup>3</sup> )	Suspended Particulate Matter (µg/m <sup>3</sup> )	Lead Pb (µg/m <sup>3</sup> )	Ozone (µg/m <sup>3</sup> )
16-Feb-22	12:00 AM	3.721	0.048	7.387	-	116.4	83.2	204.6	<b>ND</b>	-
16-Feb-22	1:00 AM	2.205	4.167	7.331	-	121.7	85.9	211.5		-
16-Feb-22	2:00 AM	0.717	1.712	7.204	-	131.3	98.7	236.4		-

16-Feb-22	3:00 AM	1.561	7.801	6.991	-	113.4	79.1	197.5	-
16-Feb-22	4:00 AM	0.795	5.821	5.827	-	87.4	75.9	153.8	-
16-Feb-22	5:00 AM	3.000	8.72	7.073	-	96.8	71.5	157.9	-
16-Feb-22	6:00 AM	12.115	5.57	7.52	-	91.6	83.5	156.3	-
16-Feb-22	7:00 AM	8.861	7.346	7.377	-	158.7	129.2	278.1	-
16-Feb-22	8:00 AM	26.14	3.783	7.297	-	155.3	124.6	270.2	-
16-Feb-22	9:00 AM	3.846	11.95	5.915	4.5	101.7	72.6	179.3	-
16-Feb-22	10:00 AM	16.902	1.527	6.46	0.5	119	85	211.5	-
16-Feb-22	11:00 AM	8.090	8.995	7.561	8.5	119.9	95.4	209.4	-
16-Feb-22	12:00 PM	6.34	5.779	7.276	7.5	98.5	77.3	177.8	-
16-Feb-22	1:00 PM	2.325	3.705	4.886	7.0	122.8	87.7	217.5	12.0003
16-Feb-22	2:00 PM	1.302	1.962	3.866	0.5	84.7	63.4	163.4	-
16-Feb-22	3:00 PM	11.872	16.771	2.361	1.5	89.6	52.6	145.2	-
16-Feb-22	4:00 PM	15.523	18.180	1.263	2.0	82.4	54.7	140.1	-
16-Feb-22	5:00 PM	4.427	10.314	6.776	-	64.2	45.9	113.5	-
16-Feb-22	6:00 PM	9.590	2.012	7.216	-	55.3	49.3	97.8	-
16-Feb-22	7:00 PM	15.175	3.51	5.897	-	126.3	90.2	221.3	-
16-Feb-22	8:00 PM	8.663	8.912	5.959	-	71.3	50.9	127.7	-
16-Feb-22	9:00 PM	0.337	0.705	5.790	-	63.8	46.1	113.1	-
16-Feb-22	10:00 PM	1.509	1.078	5.617	-	70.2	48.9	124.6	-
16-Feb-22	11:00 PM	1.992	0.549	5.872	-	90.3	77.9	161.7	-

### Noise Monitoring Report

<b>Report No.</b>	HSE/ENV/22/FEB/AM/1538/SEQS2016/AA-10	<b>Date of Reporting</b>	Saturday, February 19, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		

<b>Testing Date</b>	16-Feb-2022 till 17-Feb-2022	<b>Testing Duration</b>	24 Hours
<b>Start Time</b>	1:00 PM	<b>End Time</b>	12:00 PM
<b>Location of Sampling</b>	Khudadad Chowrangi	<b>Site Location</b>	Khudadad Chowrangi, Karachi

Description			
<b>Measuring Unit</b>	Decibels dB(A)		
<b>SEQS Limits Day Time</b>	75 dB(A)	<b>SEQS Limits Night Time</b>	65 dB(A)
<b>Average Noise Day Time</b>	73.125 dB(A)	<b>Average Noise Night Time</b>	<b>68.975 dB(A)</b>

**NOTE:**

Limits stated above are prescribed in SEQS for Noise for Residential Area.

The instruments used were duly calibrated.

The measurements were carried out on client's request.

The client is responsible for lawful usage of reported data in future.

This report is not valid for Court evidence/ Judicial knowledge

The measurement results are based on the reading taken at the time of monitoring

### 24 Hour Monitoring Data for Noise

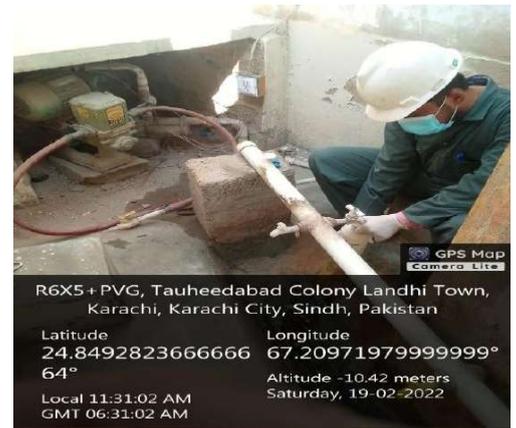
**Report No. HSE/ENV/22/FEB/AM/1538/SEQS2016/NL-10**

Date	Time	Classification	Noise
16-Feb-22	12:00 AM	Night Time SEQS Limits 65 dB(A)	<b>72.8</b>
16-Feb-22	1:00 AM		<b>73.1</b>
16-Feb-22	2:00 AM		<b>70.3</b>
16-Feb-22	3:00 AM		<b>69.8</b>
16-Feb-22	4:00 AM		<b>66.7</b>
16-Feb-22	5:00 AM		60.2
16-Feb-22	6:00 AM		<b>65.4</b>
16-Feb-22	7:00 AM	Day Time SEQS Limits 75 dB(A)	73.3
16-Feb-22	8:00 AM		<b>74.1</b>
16-Feb-22	9:00 AM		72.8
16-Feb-22	10:00 AM		<b>76.9</b>
16-Feb-22	11:00 AM		72.8
16-Feb-22	12:00 PM		73.5
16-Feb-22	1:00 PM		72.8
16-Feb-22	2:00 PM		72.9
16-Feb-22	3:00 PM		73.1
16-Feb-22	4:00 PM		72.3
16-Feb-22	5:00 PM		71.9

16-Feb-22	6:00 PM		71.1
16-Feb-22	7:00 PM	Night Time SEQS Limits 65 dB(A)	<b>72.6</b>
16-Feb-22	8:00 PM		<b>74.5</b>
16-Feb-22	9:00 PM		<b>69.7</b>
16-Feb-22	10:00 PM		<b>61.2</b>
16-Feb-22	11:00 PM		<b>71.4</b>

**WATER**  
**TESTING**  
**REPORTS**

## Drinking Water-01



## Water Analysis Report

<b>Report No.</b>	HSE/ENV/22/FEB/DW/1538/S EQS2016/DW-01	<b>Reporting Date</b>	February 28, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Sample Nature</b>	Drinking Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	February 16, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	February 16, 2022	<b>Sampling Location</b>	Dawood Chowrangi Karachi

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH	--	ASTM D-1293	6.5-8.5	7.65
2	Total Dissolved Solids	mg/L	APHA 2540-C	<1000	339
3	Phenolic compound	mg/L	Lovibond-315	0.002	BDL
4	Chloride	mg/L	ASTM D-512	<250	130.76

5	Total Hardness as CaCO <sub>3</sub>	mg/L	ASTM D-1126	<500	215.89
6	Aluminum	mg/L	Lovibond-40	0.2	ND
7	Residual Chlorine	mg/L	Lovibond-100	0.2-0.5	<0.1
8	Antimony	mg/L	ASTM D-3697	<0.005	ND
9	Arsenic	mg/L	Palintest Method	0.05	ND
10	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	Non Objectionable/ Acceptable
11	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	Non Objectionable/ Acceptable
12	Barium	mg/L	ASTM D-4382	0.7	ND
13	Boron	mg/L	Lovibond-85	0.3	<0.1
14	Copper	mg/L	Lovibond-149	2.0	<0.05
15	Lead	mg/L	Lovibond-232	<0.05	ND
16	Mercury	mg/L	Kit Method	<0.001	ND
17	Nickel	mg/L	Lovibond-255	<0.02	ND
18	Manganese	mg/L	Lovibond-242	0.5	ND
19	Zinc	mg/L	Lovibond-400	<5	0.06
20	Selenium	mg/L	APHA 4500 Se	0.01	BDL
21	Cyanide	mg/L	Lovibond-156	0.05	ND
22	Chromium	mg/L	Lovibond-124	<0.05	ND
23	Flouride	mg/L	Lovibond-170	1.5	0.49
24	Cadmium	mg/L	Lovibond-87	0.01	ND
25	Nitrate	mg/L	Lovibond-265	0.5	BDL
26	Nitrite	mg/L	Lovibond-270	3	BDL
27	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
28	Turbidity	NTU	Lovibond-385	<5	BDL
29	Total Coliform	count/100ml	APHA9222-B	0/100ml	ND
30	Escherichia Coli	count/100ml	APHA9222-D	0/100ml	ND
31	Pesticides	mg/L	HPLC	0.15	ND

\*ND : Not Detectable

\*BDL: Below Detection Level

## Drinking Water-02



### Water Analysis Test Report

<b>Report No.</b>	HSE/ENV/22/FEB/DW/1538/SEQS 2016/DW-02	<b>Reporting Date</b>	February 28, 2022
<b>Client Name</b>	M/s Nespak Pvt. Ltd.		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Sample Nature</b>	Drinking Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	February 16, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	February 16, 2022	<b>Sampling Location</b>	Dar-ul-uloom

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH	--	ASTM D-1293	6.5-8.5	7.74
2	Total Dissolved Solids	mg/L	APHA 2540-C	<1000	355
3	Phenolic compound	mg/L	Lovibond-315	0.002	BDL
4	Chloride	mg/L	ASTM D-512	<250	123.29
5	Total Hardness as CaCO <sub>3</sub>	mg/L	ASTM D-1126	<500	193.12
6	Aluminum	mg/L	Lovibond-40	0.2	ND
7	Residual Chlorine	mg/L	Lovibond-100	0.2-0.5	<0.1
8	Antimony	mg/L	ASTM D-3697	<0.005	ND
9	Arsenic	mg/L	Palintest Method	0.05	ND
10	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	Non Objectionable/ Acceptable
11	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	Non Objectionable/ Acceptable
12	Barium	mg/L	ASTM D-4382	0.7	ND
13	Boron	mg/L	Lovibond-85	0.3	<0.1
14	Copper	mg/L	Lovibond-149	2.0	<0.05
15	Lead	mg/L	Lovibond-232	<0.05	ND
16	Mercury	mg/L	Kit Method	<0.001	ND
17	Nickel	mg/L	Lovibond-255	<0.02	ND

18	Manganese	mg/L	Lovibond-242	0.5	ND
19	Zinc	mg/L	Lovibond-400	<5	0.09
20	Selenium	mg/L	APHA 4500 Se	0.01	BDL
21	Cyanide	mg/L	Lovibond-156	0.05	ND
22	Chromium	mg/L	Lovibond-124	<0.05	ND
23	Flouride	mg/L	Lovibond-170	1.5	0.52
24	Cadmium	mg/L	Lovibond-87	0.01	ND
25	Nitrate	mg/L	Lovibond-265	0.5	BDL
26	Nitrite	mg/L	Lovibond-270	3	BDL
27	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
28	Turbidity	NTU	Lovibond-385	<5	BDL
29	Total Coliform	count/100ml	APHA9222-B	0/100ml	ND
30	Escherichia Coli	count/100ml	APHA9222-D	0/100ml	ND
31	Pesticides	mg/L	HPLC	0.15	ND

\*ND : Not Detectable

\*BDL: Below Detection Level

## Drinking Water-03



## Water Analysis Test Report

<b>Report No.</b>	HSE/ENV/22/FEB/DW/1538/S EQS2016/DW-03	<b>Reporting Date</b>	February 28, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Sample Nature</b>	Drinking Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	February 16, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	February 16, 2022	<b>Sampling Location</b>	Near Indus Hospital

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH	--	ASTM D-1293	6.5-8.5	7.96

2	Total Dissolved Solids	mg/L	APHA 2540-C	<1000	351
3	Phenolic compound	mg/L	Lovibond-315	0.002	BDL
4	Chloride	mg/L	ASTM D-512	<250	122.11
5	Total Hardness as CaCO <sub>3</sub>	mg/L	ASTM D-1126	<500	206.511
6	Aluminum	mg/L	Lovibond-40	0.2	ND
7	Residual Chlorine	mg/L	Lovibond-100	0.2-0.5	<0.1
8	Antimony	mg/L	ASTM D-3697	<0.005	ND
9	Arsenic	mg/L	Palintest Method	0.05	ND
10	Taste	.....	Sensory Method	Non Objectionable / Acceptable	Non Objectio nable / Acceptab le
11	Odour	.....	Sensory Method	Non Objectionable / Acceptable	Non Objectio nable/ Acceptab le
12	Barium	mg/L	ASTM D-4382	0.7	ND
13	Boron	mg/L	Lovibond-85	0.3	<0.1
14	Copper	mg/L	Lovibond-149	2.0	<0.05
15	Lead	mg/L	Lovibond-232	<0.05	ND
16	Mercury	mg/L	Kit Method	<0.001	ND
17	Nickel	mg/L	Lovibond-255	<0.02	ND
18	Manganese	mg/L	Lovibond-242	0.5	ND
19	Zinc	mg/L	Lovibond-400	<5	0.08
20	Selenium	mg/L	APHA 4500 Se	0.01	BDL
21	Cyanide	mg/L	Lovibond-156	0.05	ND
22	Chromium	mg/L	Lovibond-124	<0.05	ND
23	Flouride	mg/L	Lovibond-170	1.5	0.51
24	Cadmium	mg/L	Lovibond-87	0.01	ND
25	Nitrate	mg/L	Lovibond-265	0.5	BDL
26	Nitrite	mg/L	Lovibond-270	3	BDL
27	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
28	Turbidity	NTU	Lovibond-385	<5	BDL
29	Total Coliform	count/100 ml	APHA9222-B	0/100ml	ND
30	Escherichia Coli	count/100 ml	APHA9222-D	0/100ml	ND
31	Pesticides	mg/L	HPLC	0.15	ND

\*ND : Not Detectable

\*BDL: Below Detection Level

## Drinking Water-04

### Water Analysis Test Report



<b>Report No.</b>	HSE/ENV/22/FEB/DW/1538/SEQS20 16/DW-04	<b>Reporting Date</b>	Monday, February 28, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Sample Nature</b>	Drinking Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	February 16, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	February 16, 2022	<b>Sampling Location</b>	Cardiac Surgery Hospital

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH	--	ASTM D-1293	6.5-8.5	7.72
2	Total Dissolved Solids	mg/L	APHA 2540-C	<1000	353
3	Phenolic compound	mg/L	Lovibond-315	0.002	BDL
4	Chloride	mg/L	ASTM D-512	<250	115.82
5	Total Hardness as CaCO <sub>3</sub>	mg/L	ASTM D-1126	<500	193.17
6	Aluminum	mg/L	Lovibond-40	0.2	ND
7	Residual Chlorine	mg/L	Lovibond-100	0.2-0.5	<0.1
8	Antimony	mg/L	ASTM D-3697	<0.005	ND
9	Arsenic	mg/L	Palintest Method	0.05	ND
10	Taste	.....	Sensory Method	Non Objectionable / Acceptable	Non Objectionable / Acceptable

11	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	Non Objectionable/ Acceptable
12	Barium	mg/L	ASTM D-4382	0.7	ND
13	Boron	mg/L	Lovibond-85	0.3	<0.1
14	Copper	mg/L	Lovibond-149	2.0	<0.05
15	Lead	mg/L	Lovibond-232	<0.05	ND
16	Mercury	mg/L	Kit Method	<0.001	ND
17	Nickel	mg/L	Lovibond-255	<0.02	ND
18	Manganese	mg/L	Lovibond-242	0.5	ND
19	Zinc	mg/L	Lovibond-400	<5	0.06
20	Selenium	mg/L	APHA 4500 Se	0.01	BDL
21	Cyanide	mg/L	Lovibond-156	0.05	ND
22	Chromium	mg/L	Lovibond-124	<0.05	ND
23	Flouride	mg/L	Lovibond-170	1.5	0.48
24	Cadmium	mg/L	Lovibond-87	0.01	ND
25	Nitrate	mg/L	Lovibond-265	0.5	BDL
26	Nitrite	mg/L	Lovibond-270	3	BDL
27	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
28	Turbidity	NTU	Lovibond-385	<5	BDL
29	Total Coliform	count/ 100ml	APHA9222-B	0/100ml	ND
30	Escherichia Coli	count/ 100ml	APHA9222-D	0/100ml	ND
31	Pesticides	mg/L	HPLC	0.15	ND

\*ND : Not Detectable

\*BDL: Below Detection Level

## Drinking Water-05



### Water Analysis Test Report

<b>Report No.</b>	HSE/ENV/22/FEB/DW/1538/SEQS2 016/DW-05	<b>Reporting Date</b>	28,February 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Sample Nature</b>	Drinking Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	16, February 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	16, February 2022	<b>Sampling Location</b>	National Medical Center
<b>Longitude</b>		<b>Latitude</b>	

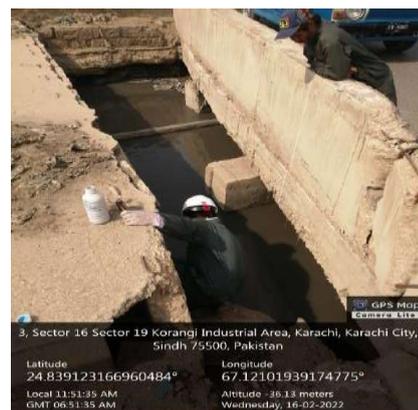
S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @	--	ASTM D-1293	6.5-8.5	6.75
2	Total Dissolved Solids	mg/L	APHA 2540-C	<1000	264
3	Phenolic compound	mg/L	Lovibond-315	0.002	BDL
4	Chloride	mg/L	ASTM D-512	<250	176.684
5	Total Hardness as CaCO <sub>3</sub>	mg/L	ASTM D-1126	500	21.738
6	Aluminum	mg/L	Lovibond-40	0.2	ND
7	Residual Chlorine	mg/L	Lovibond-100	0.2-0.5	<0.1
8	Antimony	mg/L	ASTM D-3697	<0.005	ND
9	Arsenic	mg/L	Palintest Method	0.05	ND
10	Taste	.....	Sensory Method	Non Objectionable Acceptable	Non Objectionable / Acceptable
11	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	Non Objectionable/ Acceptable
12	Barium	mg/L	ASTM D-4382	0.7	ND
13	Boron	mg/L	Lovibond-85	0.3	<0.1

14	Copper	mg/L	Lovibond-149	2.0	<0.05
15	Lead	mg/L	Lovibond-232	<0.05	ND
16	Mercury	mg/L	Kit Method	<0.001	ND
17	Nickel	mg/L	Lovibond-255	<0.02	ND
18	Manganese	mg/L	Lovibond-242	0.5	ND
19	Zinc	mg/L	Lovibond-400	<5	0.06
20	Selenium	mg/L	APHA 4500 Se	0.01	DL
21	Cyanide	mg/L	Lovibond-156	0.05	ND
22	Chromium	mg/L	Lovibond-124	<0.05	ND
23	Flouride	mg/L	Lovibond-170	1.5	0.19
24	Cadmium	mg/L	Lovibond-87	0.01	ND
25	Nitrate	mg/L	Lovibond-265	0.5	BDL
26	Nitrite	mg/L	Lovibo d-270	3	BDL
27	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
28	Turbidity	NTU	Lovibond-385	<5	BDL
29	Total Coliform	count/10 0ml	APHA9222-B	0/100ml	ND
30	Escherichia Coli	count/10 0ml	APHA9222-D	0/100ml	ND
31	Pesticides	mg/L	HPLC	0.15	ND

\*ND : Not Detectable

\*BDL: Below Detection Level

## Wastewater -01



### Water Analysis Test Report

<b>Report No.</b>	HSE/ENV/22/FEB/WW/1538/SEQ S2016/WW-01	<b>Reporting Date</b>	February 28, 2022
<b>Client Name</b>	M/s Nespak Pvt. Ltd.		
<b>Client Adress</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	February 16, 2022	<b>Analysis Type</b>	Chemical
<b>Date of Sample Received</b>	February 16, 2022	<b>Site Location</b>	Shan Chowrangi

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03 °C	29
2	pH	--	ASTM D-1293	6 to 9	8.10
3	Biological Oxygen Demand	mg/L	APHA 5210	80	<b>961</b>
4	Chemical Oxygen Demand	mg/L	ASTM D-1252	150	<b>2980</b>
5	otal Dissolved Solids	mg/L	APHA 2540-C	3 00	<b>10425</b>
6	Total Suspended Solids	mg/L	APHA 2540-D	200	131
7	Oil & Grease	mg/L	ASTM D-4281	10	<b>85</b>
8	Chloride	mg/L	ASTM D-512	1000	<b>2125.95</b>
9	Phenolic compound	mg/L	Lovibond 315	0.1	0.72
10	Fluoride	mg/L	Lovibond 170	10	1.98
11	Anionic Detergent	mg/L	ASTM D-6173	20	0.37
12	Selenium	mg/L	APHA 4500 Se	0.5	BDL
13	Sulfide	mg/L	Lovibond 365	1.0	0.18
14	Ammonia	mg/L	Lovibond-60	40	0.84
15	Cadmium	mg/L	Lovibond-87	0.1	ND
16	Chromium	mg/L	Lovibond-124	1.0	0.026
17	Copper	mg/L	Lovibond-149	1.0	<b>1.24</b>
18	Lead	mg/L	Lovibond-232	0.5	<0.1

19	Mercury	mg/L	Kit Method	0.01	ND
20	Nickel	mg/L	Lovibond-255	1.0	0.16
21	Silver	mg/L	ASTM-D3866	1.0	ND
22	Zinc	mg/L	Lovibond-400	5.0	0.23
23	Total Iron	mg/L	Lovibond-222	8.0	0.32
24	Manganese	mg/L	Lovibond-242	1.5	0.37
25	Boron	mg/L	Lovibond-85	6.0	0.2
26	Sulfate	mg/L	Lovibond-360	600	598.19
27	Arsenic	mg/L	Palintest Kit	1.0	0.012
28	Chlorine	mg/L	Lovibond-100	1.0	0.98
29	Total Toxic Metals	mg/L	Kit Method	2.0	<2
30	Barium	mg/L	ASTM D-4382	1.5	BDL
31	Cyanide	mg/L	Lovibond-156	1.0	ND
32	Pesticides	mg/L	HPLC	0.15	ND

**\*ND : Not Detectable**

**\*BDL: Below Detection Level**

## Wastewater-02

## Water Analysis Test Report



GPS Map  
32-A Shahrah-e-Qaideen, P.E.C.H.S Block 2 Block 2 PECHS, Karachi,  
Karachi City, Sindh, Pakistan  
Latitude 24.860105091452716° Longitude 67.05900105557004°  
Local 01:23:17 PM Altitude -43.98 meters  
GMT 08:23:17 AM Wednesday, 16 Feb 2022

<b>Report No.</b>	HSE/ENV/22/FEB/WW/1538/SEQS2016/WW-02	<b>Reporting Date</b>	Monday, February 28, 2022
<b>Client Name</b>	M/s NESPAK		
<b>Client Address</b>	13th Floor, NICL Building, Abbasi Shaheed Road, Off Shahrah-e-Faisal, Karachi-74400		
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	February 16, 2022	<b>Analysis Type</b>	Chemical
<b>Date of Sample Received</b>	February 16, 2022	<b>Site Location</b>	Front of Nasla Tower

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03 °C	30
2	pH	--	ASTM D-1293	6 to 9	7.40
3	Biological Oxygen Demand	mg/L	APHA 5210	80	<b>115</b>
4	Chemical Oxygen Demand	mg/L	ASTM D-1252	150	<b>359</b>
5	Total Dissolved Solids	mg/L	APHA 2540-C	3500	<b>1282</b>
6	Total Suspended Solids	mg/L	APHA 2540-D	200	119
7	Oil & Grease	mg/L	ASTM D-4281	10	9
8	Chloride	mg/L	ASTM D-512	1000	480.8 2
9	Phenolic compound	mg/L	Lovibond 315	0.1	<0.1
10	Fluoride	mg/L	Lovibond 170	10	1.27
11	Anionic Detergent	mg/L	ASTM D-6173	20	0.29
12	Selenium	mg/L	APHA 4500 Se	0.5	BDL
13	Sulfide	mg/L	Lovibond 365	1.0	0.08
14	Ammonia	mg/L	Lovibond-60	40	0.39
15	Cadmium	mg/L	Lovibond-87	0.1	ND
16	Chromium	mg/L	Lovibond-124	1.0	0.019
17	Copper	mg/L	Lovibond-149	1.0	<b>1.00</b>
18	Lead	mg/L	Lovibond-232	0.5	<0.1

19	Mercury	mg/L	Kit Method	0.01	ND
20	Nickel	mg/L	Lovibond-255	1.0	0.6
21	Silver	mg/L	ASTM-D3866	1.0	ND
22	Zinc	mg/L	Lovibond-400	5.0	0.17
23	Total Iron	mg/L	Lovibond-222	8.0	0.25
24	Manganese	mg/L	Lovibond-242	1.5	0.30
25	Boron	mg/L	Lovibond-85	6.0	0.1
26	Sulfate	mg/L	Lovibond-360	600	129.8 1
27	Arsenic	mg/L	Palintest Kit	1.0	0.008
28	Chlorine	mg/L	Lovibond-100	1.0	0.10
29	Total Toxic Metals	mg/L	Kit Method	2.0	<2
30	Barium	mg/L	ASTM D-4382	1.5	BDL
31	Cyanide	mg/L	Lovibond-156	1.0	ND
32	Pesticides	mg/L	HPLC	0.15	ND

\*ND : Not Detectable

\*BDL: Below Detection Level

**Comments/Remarks:**

- The client is responsible for lawful usage of reported data.
- This report is not valid for any negotiation or judicial use.
- The measurement results based on the time of monitoring.
- Results relate only to the items tested without prejudice.

### 4. Photo Log



Plate 1: Ambient Air monitoring at Depot -1 Mufti Mehmood Masjid



Plate 2: Ambient Air monitoring at Jamia Darul uloom



Plate 3: Ambient Air monitoring at PECHS



Plate 4: Noise Monitoring Near Rahmania Qabrastan



Plate 5: Noise Monitoring at Khudadad Chowrangi



Plate 6: Noise Monitoring Near Indus Hospital, Korangi



Plate 7: Drinking water sampling at Dawood Chowrangi



Plate 8: Drinking water sampling at Darul Uloom



Plate 9: Drinking water sampling Near Indus Hospital



Plate 10: Drinking water sampling at National Medical Center



Plate 11: Wastewater sampling from drain near National Medical Center

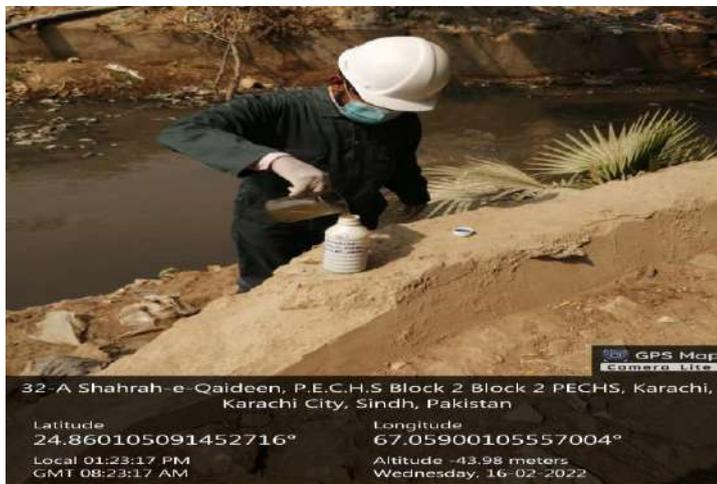


Plate 12: Wastewater sampling from drain in front of Nasla Tower

## 4. Discussion on Monitoring Results

### a) Ambient Air

Ambient air Monitoring Results shows that there are consistent out of compliance readings of PM 2.5 and mostly PM 10 is also not in compliance. On the running road these readings are expected due to lack of water showering and less plantation around the road. Overall, hazardous ambient gases are within compliance except at few points.

### b) Noise

As the study is done in commercial and industrial areas so the noise level was slightly high as compare to normal road side areas. However overall noise effect is within the limit of SEQS.

### **c) Drinking And Wastewater**

Some parameters of wastewater and drinking water such as TDS ,chlorides BOD,COD are in not compliance with SEQS Drinking Water and Waste water standards which should be considered for the project and need attention.

**Analyzed By :**  
**(Field Analyst)**

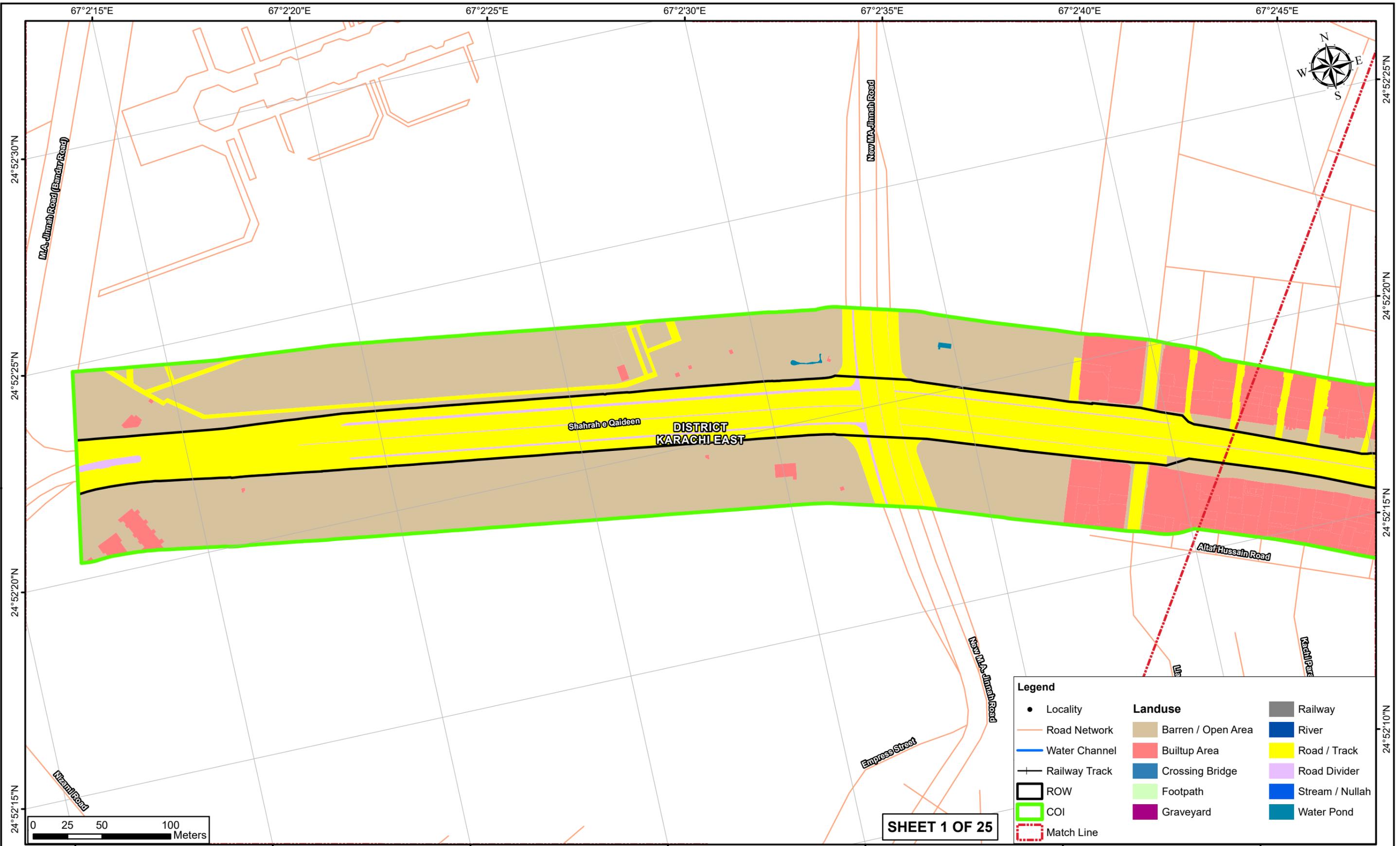
**Report Prepared By :**  
**(Assistant Analyst)**

**Report Verified By:**  
**(Chief Chemist)**

HSE Services

**Date of Issue:** March 16, 2022

## **ANNEXURE-V: LANDUSE MAPS**



Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
— ROW	Footpath
— COI	Graveyard
— Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**SHEET 1 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

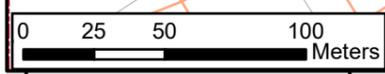
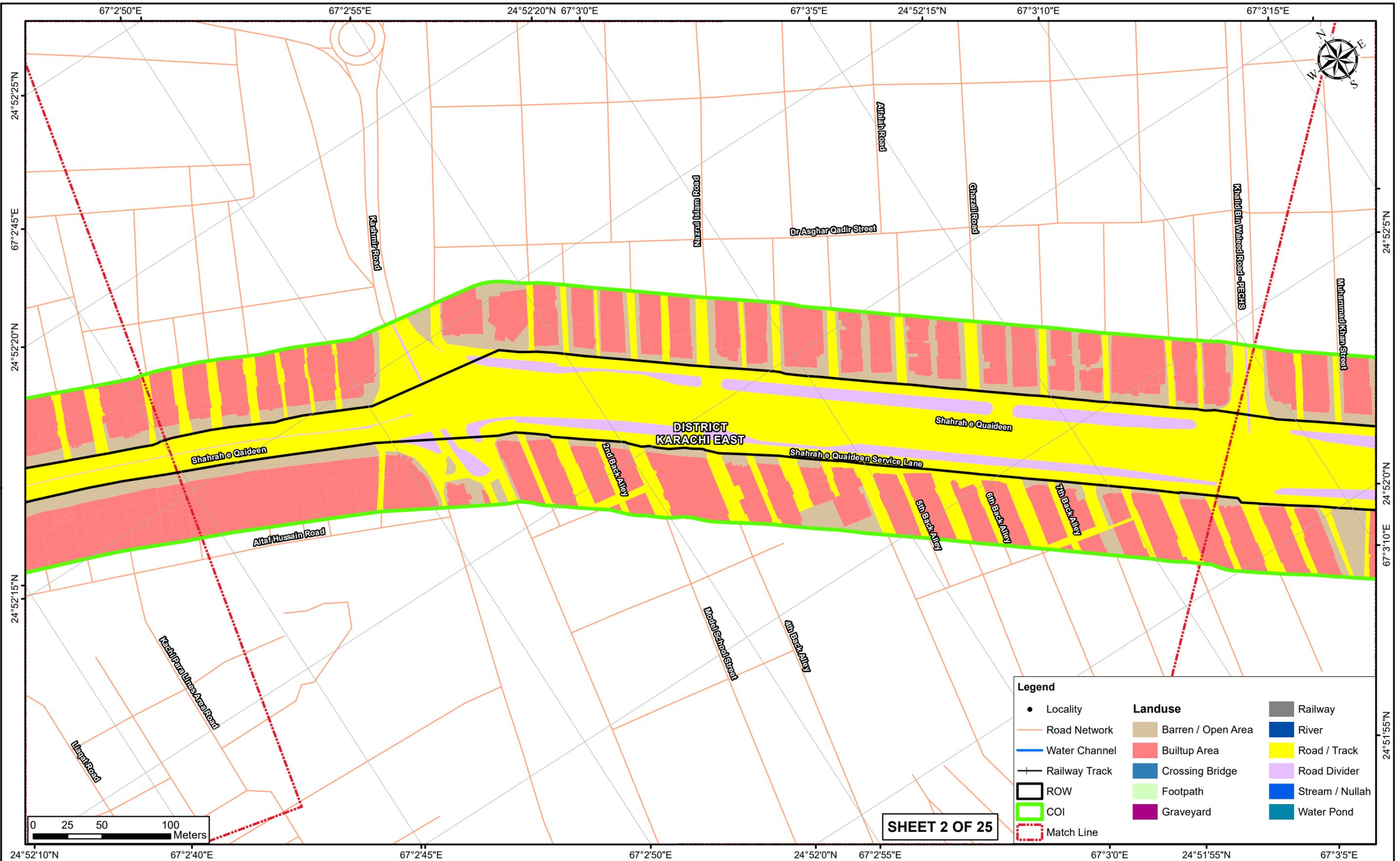
HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

LANDUSE MAP		SCALE
DATE	FIG. NO.	REV.
MARCH, 2022		0



**SHEET 2 OF 25**

Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
— ROW	Footpath
— COI	Graveyard
— Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

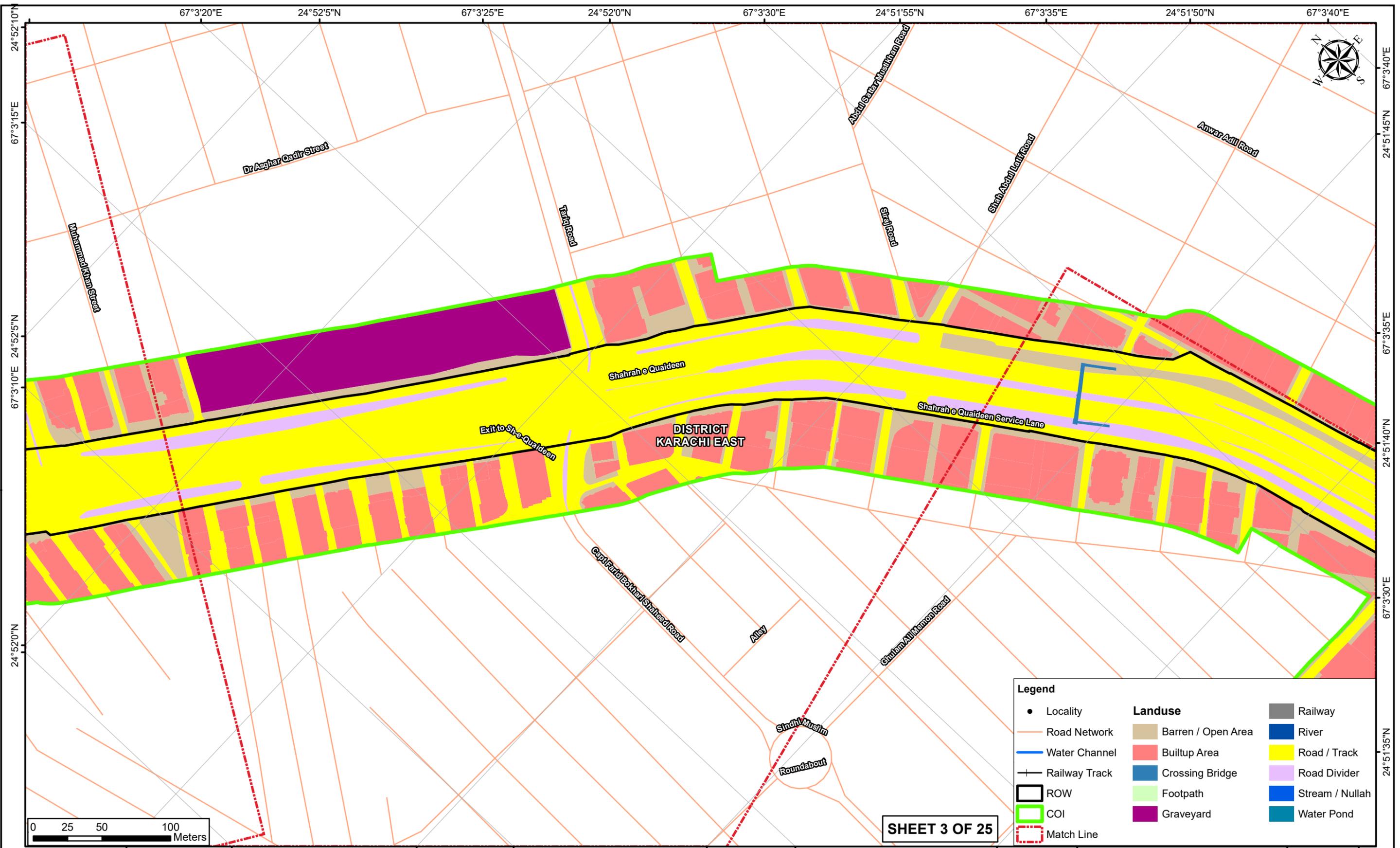
HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

LANDUSE MAP		SCALE
DATE	FIG. NO.	REV.
MARCH, 2022		0



Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
— ROW	Footpath
— COI	Graveyard
— Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**SHEET 3 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

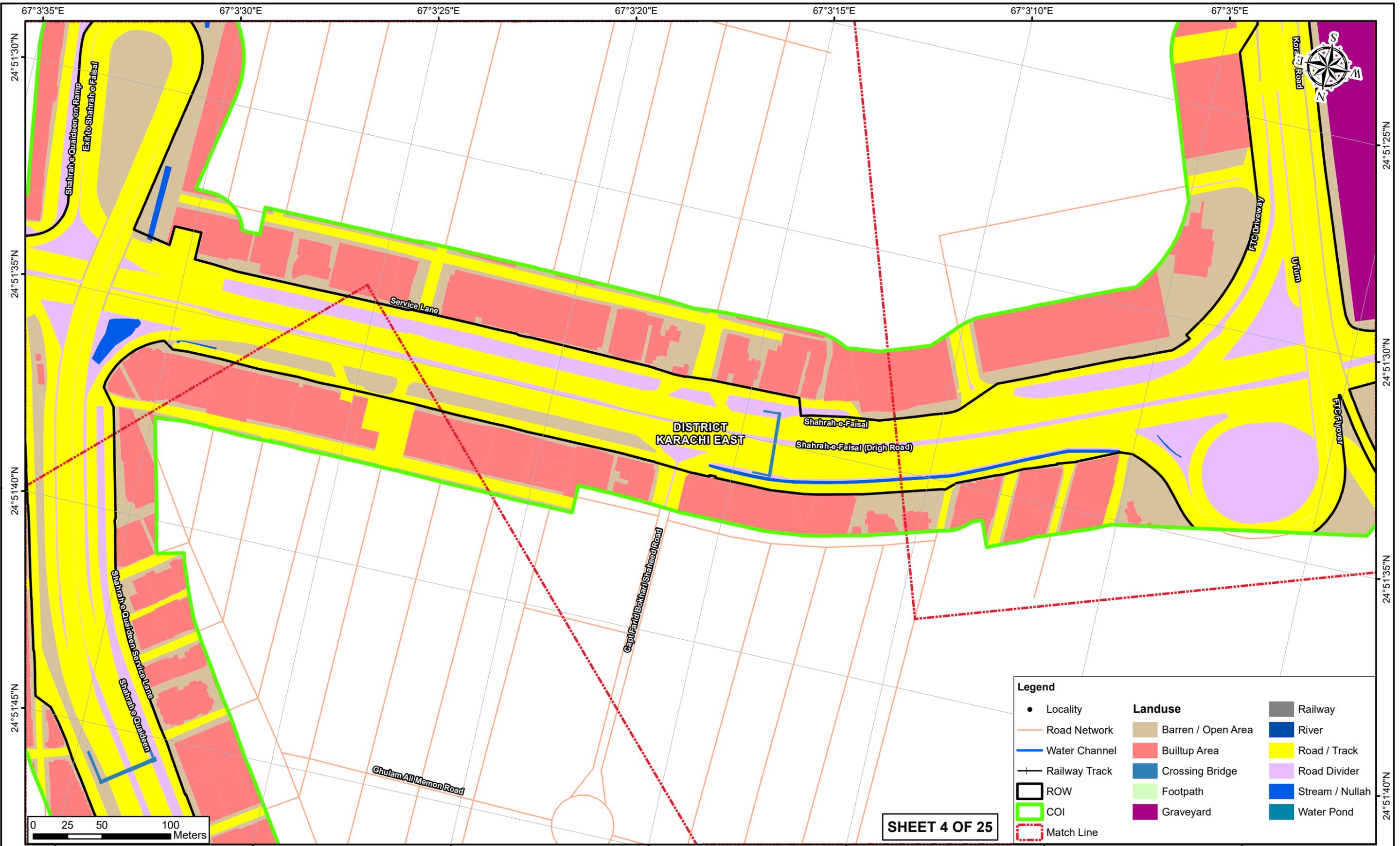
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REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

LANDUSE MAP		SCALE
DATE	FIG. NO.	REV.
MARCH, 2022		0



**SHEET 4 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

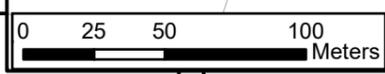
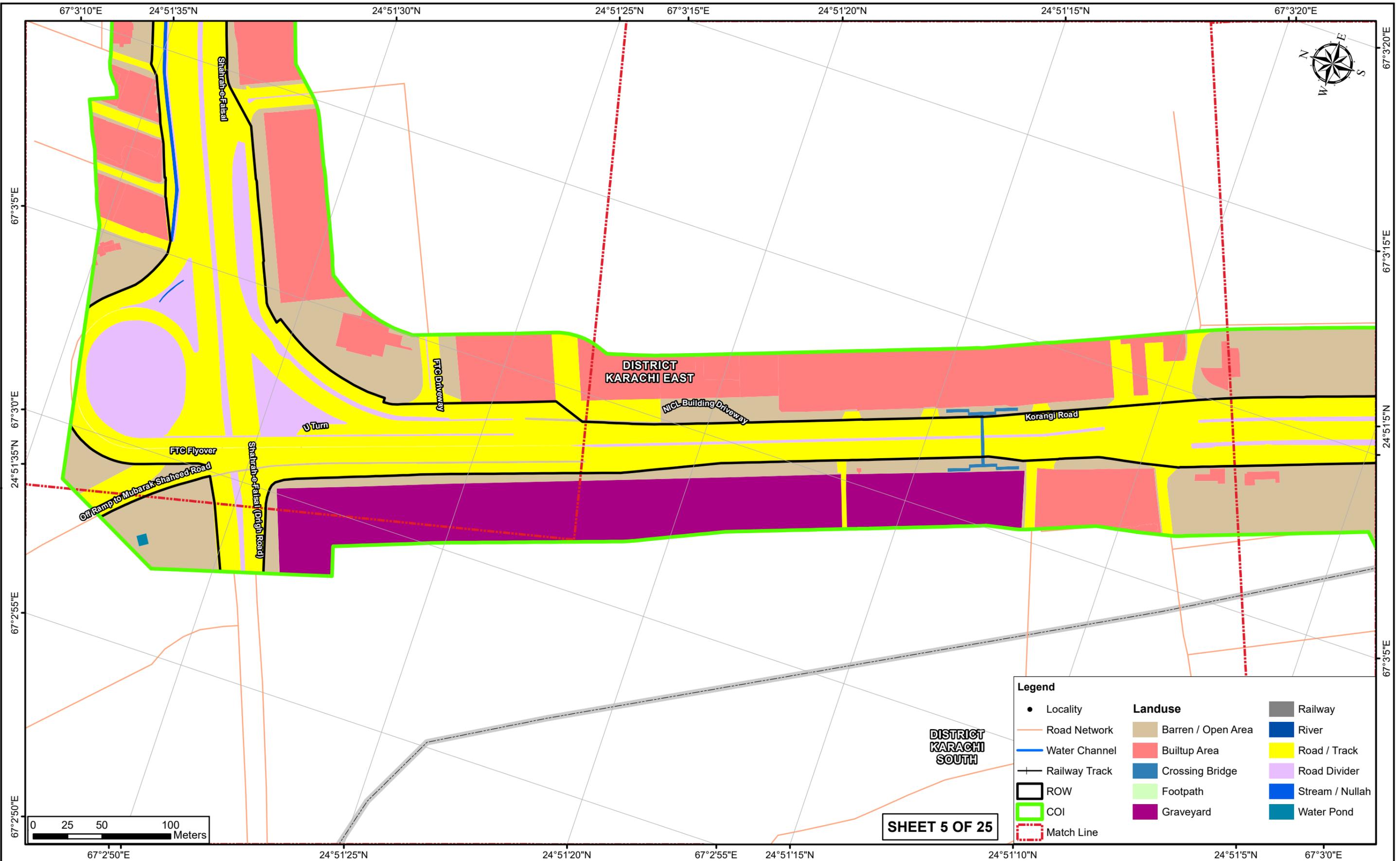
HEAD OFFICE:- NESPAK HOUSE , 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04						DRAWN	M.MUNEEB
03						SUBMITTED	RAMLA S.
02						RECOMMENDED	
01						CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	APPROVED	M.SHARIQ	

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
		1:2,500
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0



**SHEET 5 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

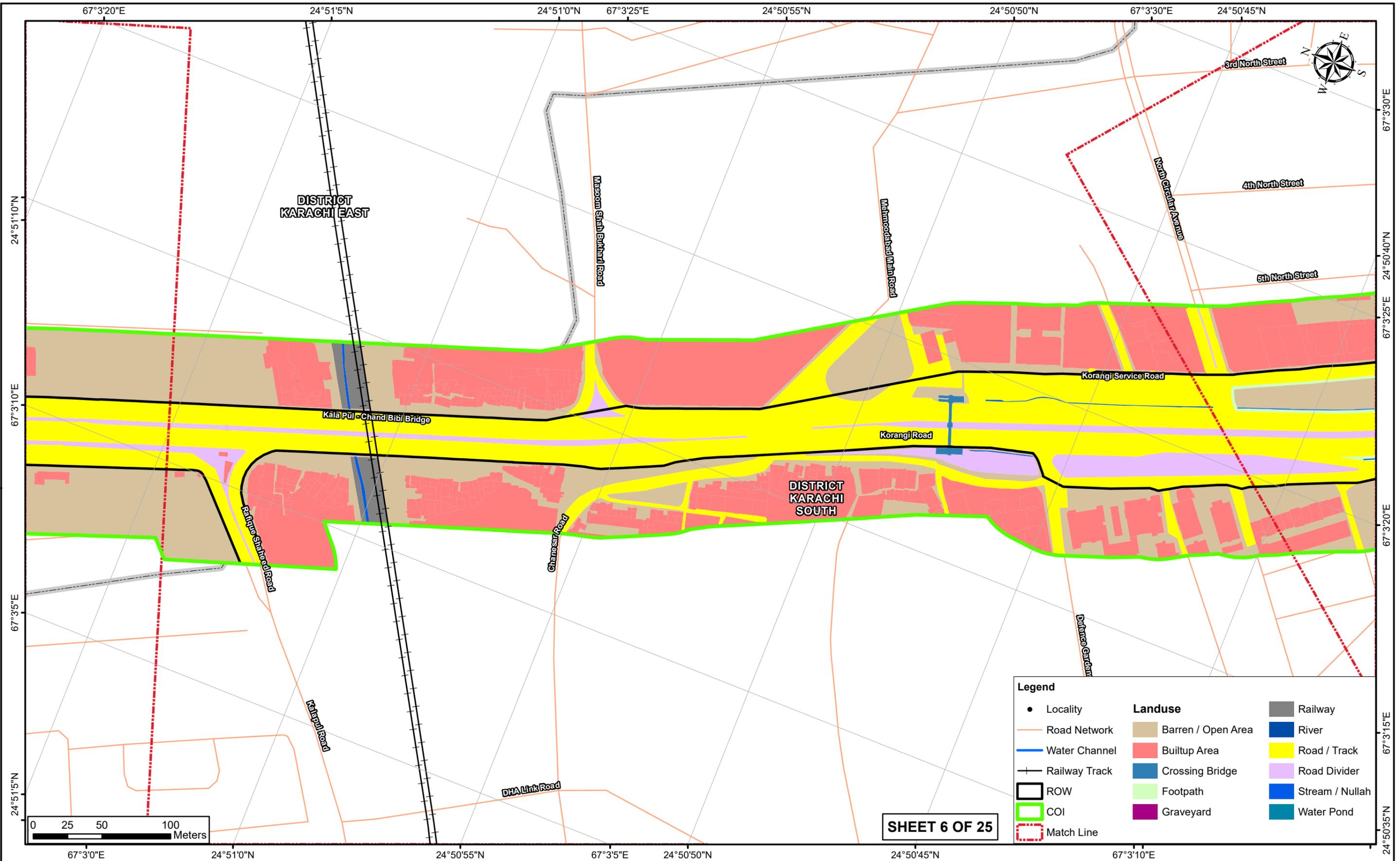
HEAD OFFICE:- NESPAK HOUSE , 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04				DRAWN	M.MUNEEB
03				SUBMITTED	RAMLA S.
02				RECOMMENDED	
01				CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
		1:2,500
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0



Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
— ROW	Footpath
— COI	Graveyard
— Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**SHEET 6 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

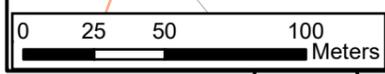
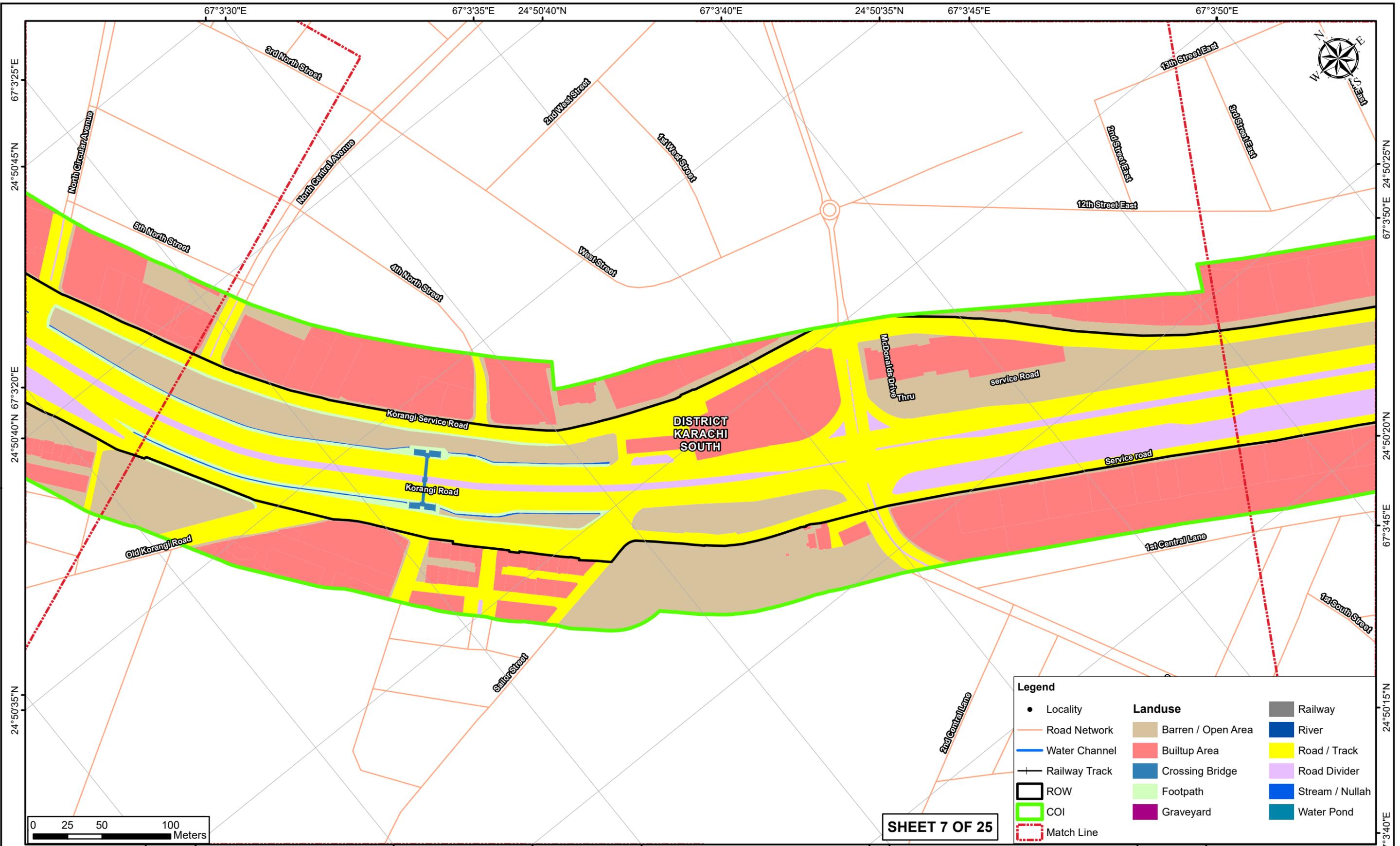
HEAD OFFICE:- NESPAK HOUSE , 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

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**PROJECT**

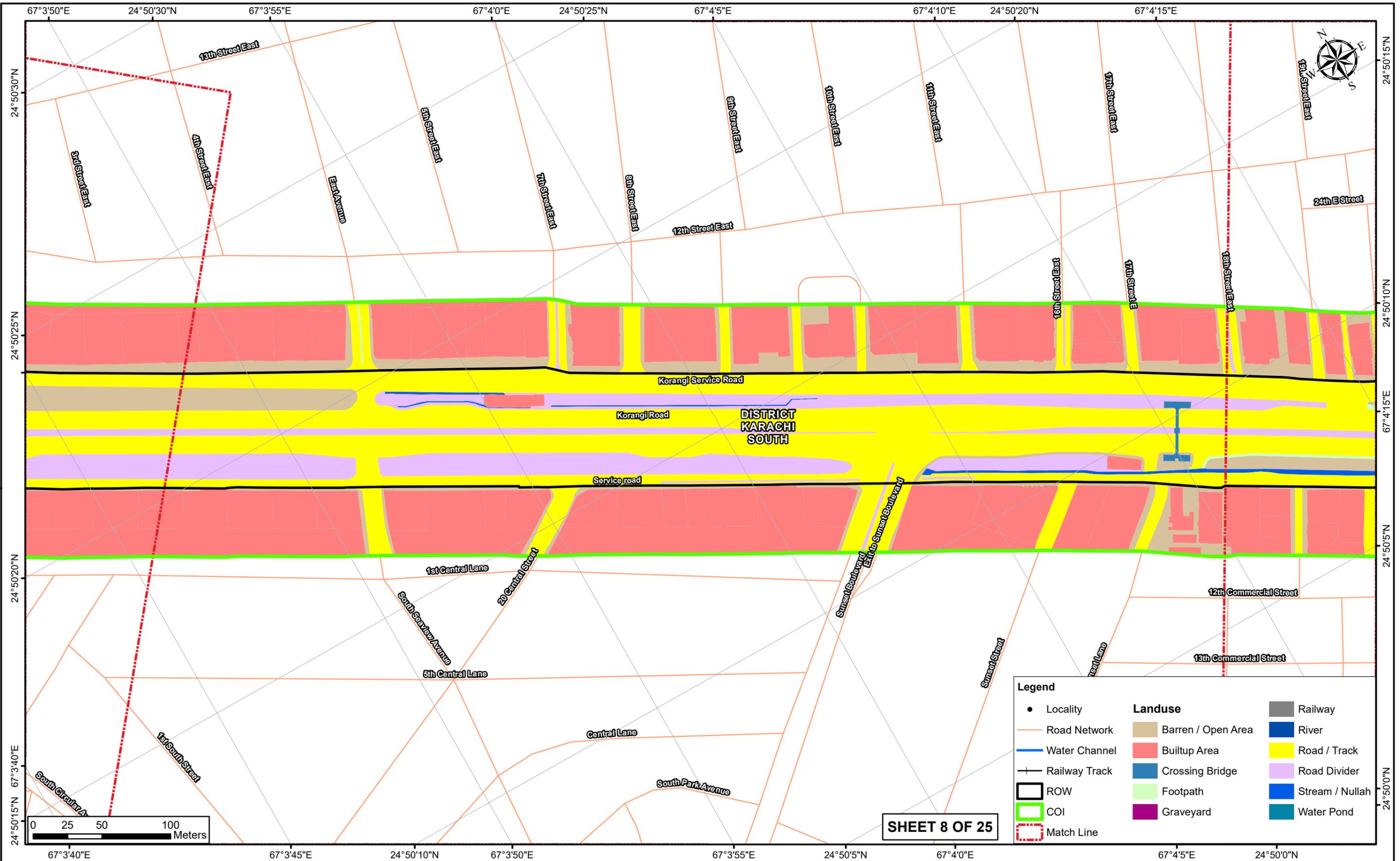
**KARACHI URBAN MOBILITY PROJECT - BRTS YELLOW LINE**

LANDUSE MAP		SCALE
DATE	FIG. NO.	REV.
MARCH, 2022		0



**SHEET 7 OF 25**

<b>CLIENT</b>  <b>SINDH MASS TRANSIT AUTHORITY (SMTA)</b>	<b>CONSULTANT</b>  <b>NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD</b> HEAD OFFICE:- NESPAK HOUSE , 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				DRAWN	M.MUNEEB	<b>PROJECT</b> <b>KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE</b>	<b>LANDUSE MAP</b>		<b>SCALE</b> 1:2,500
		03				SUBMITTED	RAMLA S.				
		02				RECOMMENDED			<b>DATE</b> MARCH, 2022	<b>FIG. NO.</b>	<b>REV.</b> 0
		01				CHD/VER.					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ				



**SHEET 8 OF 25**

Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
— ROW	Footpath
— COI	Graveyard
— Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

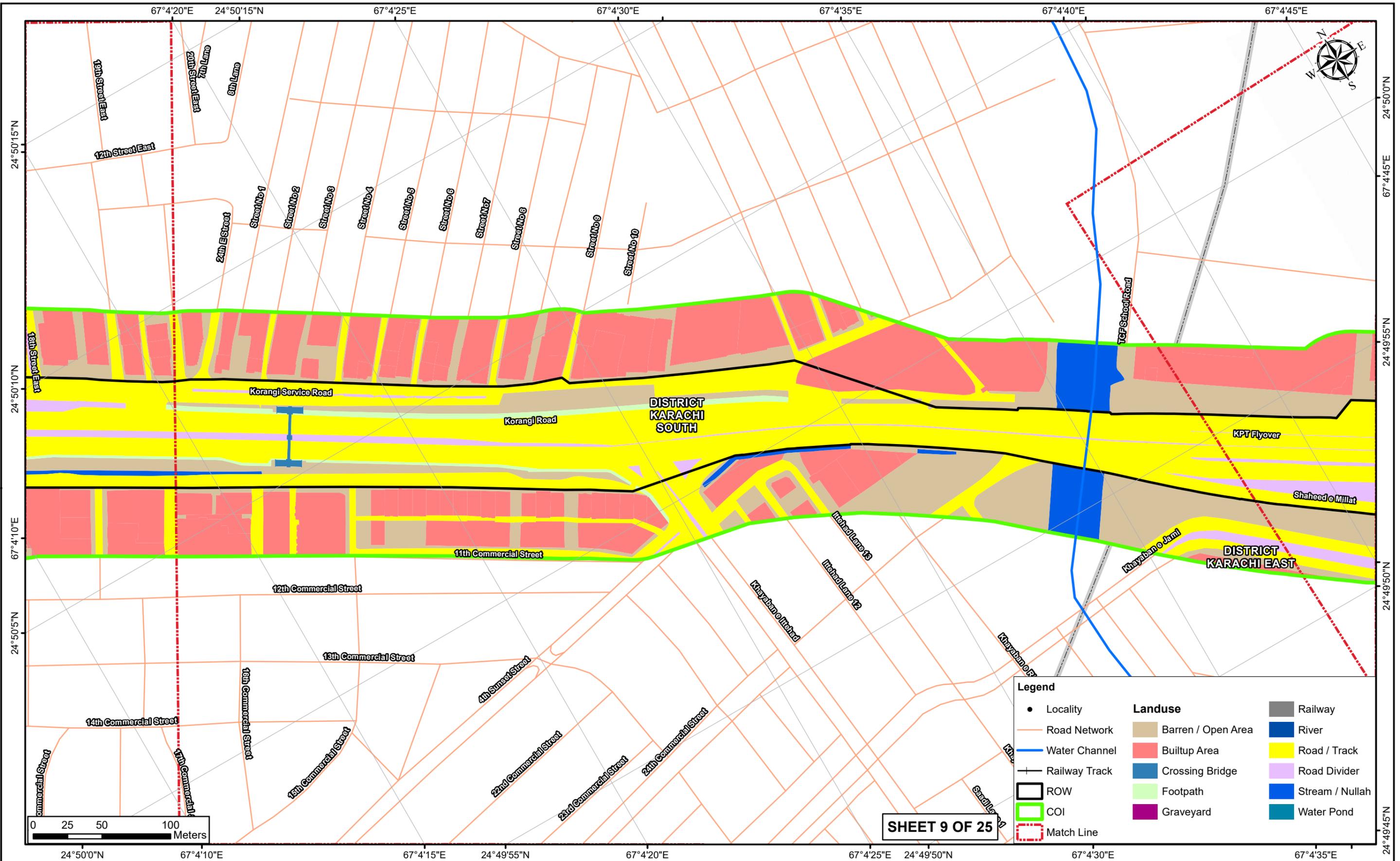
HEAD OFFICE:- NESPAK HOUSE , 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

LANDUSE MAP		SCALE
DATE	FIG. NO.	REV.
MARCH, 2022		0



**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

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03											
02											
01											
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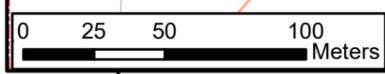
**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0

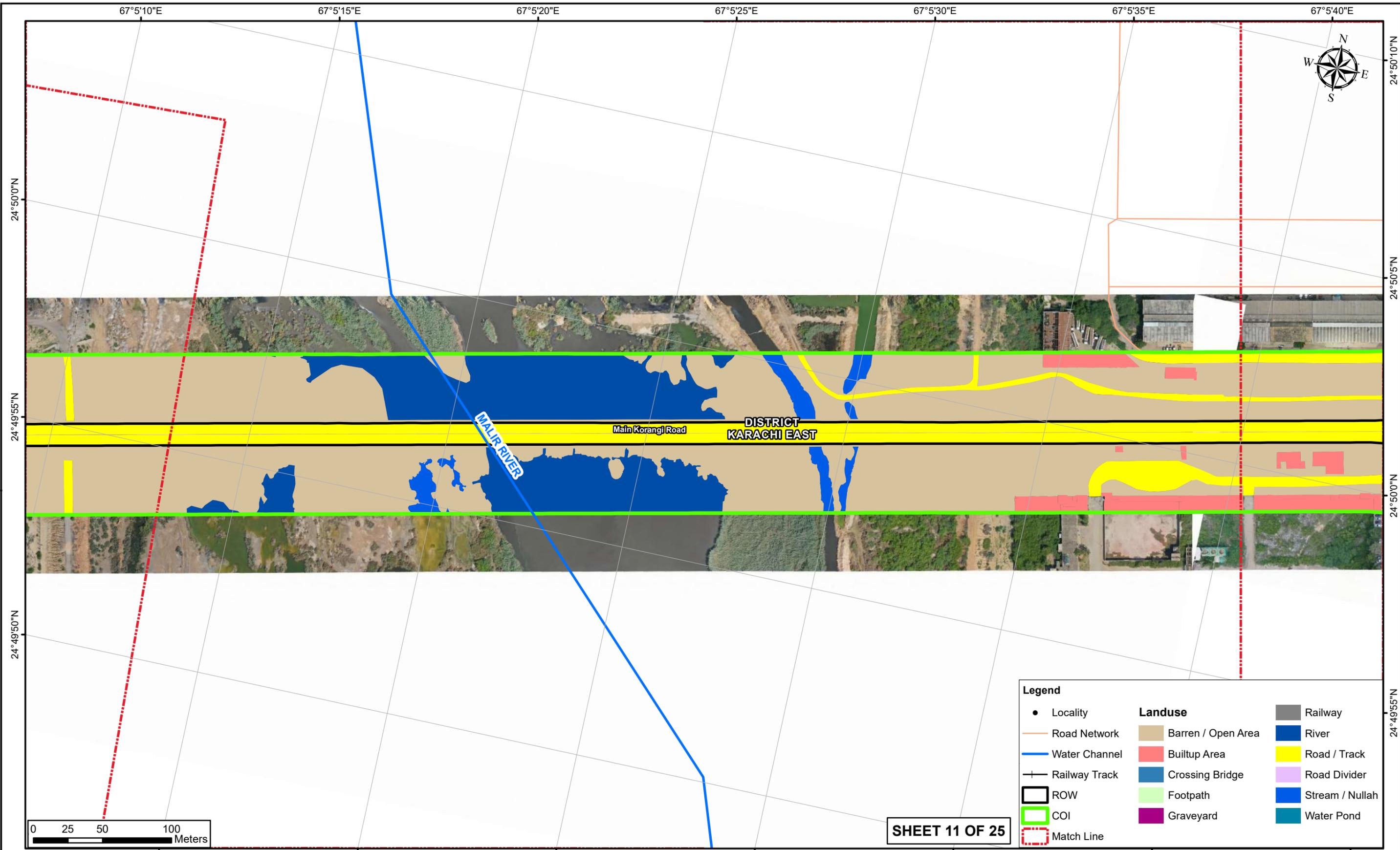


Legend		
• Locality	<b>Landuse</b>	■ Railway
— Road Network	■ Barren / Open Area	■ River
— Water Channel	■ Builtup Area	■ Road / Track
— Railway Track	■ Crossing Bridge	■ Road Divider
— ROW	■ Footpath	■ Stream / Nullah
— COI	■ Graveyard	■ Water Pond
— Match Line		



**SHEET 10 OF 25**

<b>CLIENT</b> <b>SINDH MASS TRANSIT AUTHORITY (SMTA)</b>	<b>CONSULTANT</b> <b>NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD</b> HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				<b>DRAWN</b>	M.MUNEEB	<b>PROJECT</b> <b>KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE</b>	<b>LANDUSE MAP</b>		<b>SCALE</b>
		03				<b>SUBMITTED</b>	RAMLA S.				1:2,500
		02				<b>RECOMMENDED</b>			<b>DATE</b> MARCH, 2022	<b>FIG. NO.</b>	<b>REV.</b> 0
		01				<b>CHD/VER.</b>					
		<b>REV.</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>APPROVED</b>	<b>APPROVED</b>	<b>M.SHARIQ</b>				



**SHEET 11 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

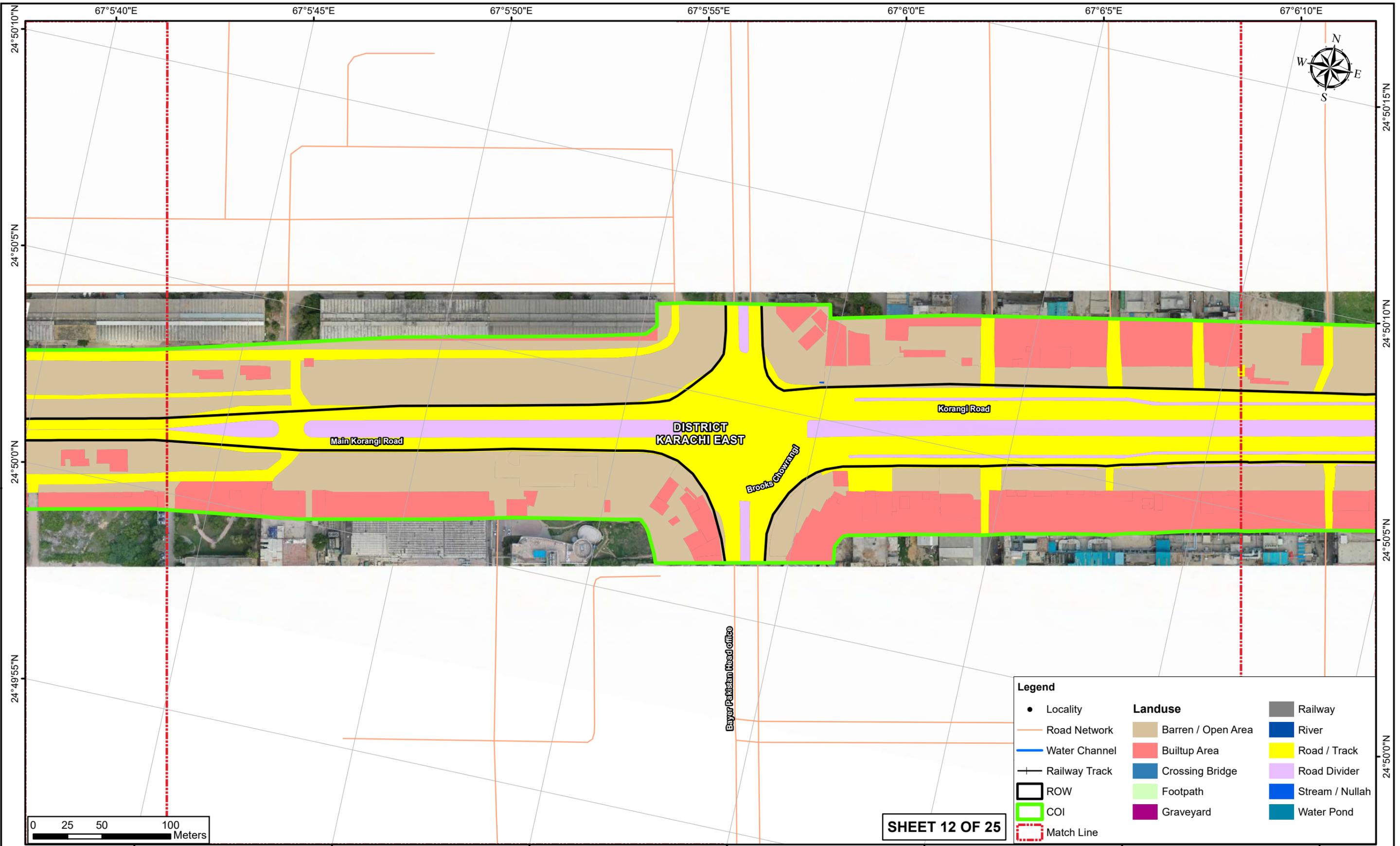
HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04				DRAWN	M.MUNEEB
03				SUBMITTED	RAMLA S.
02				RECOMMENDED	
01				CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLOW LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
		<b>1:2,500</b>
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0



**SHEET 12 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

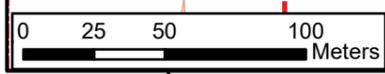
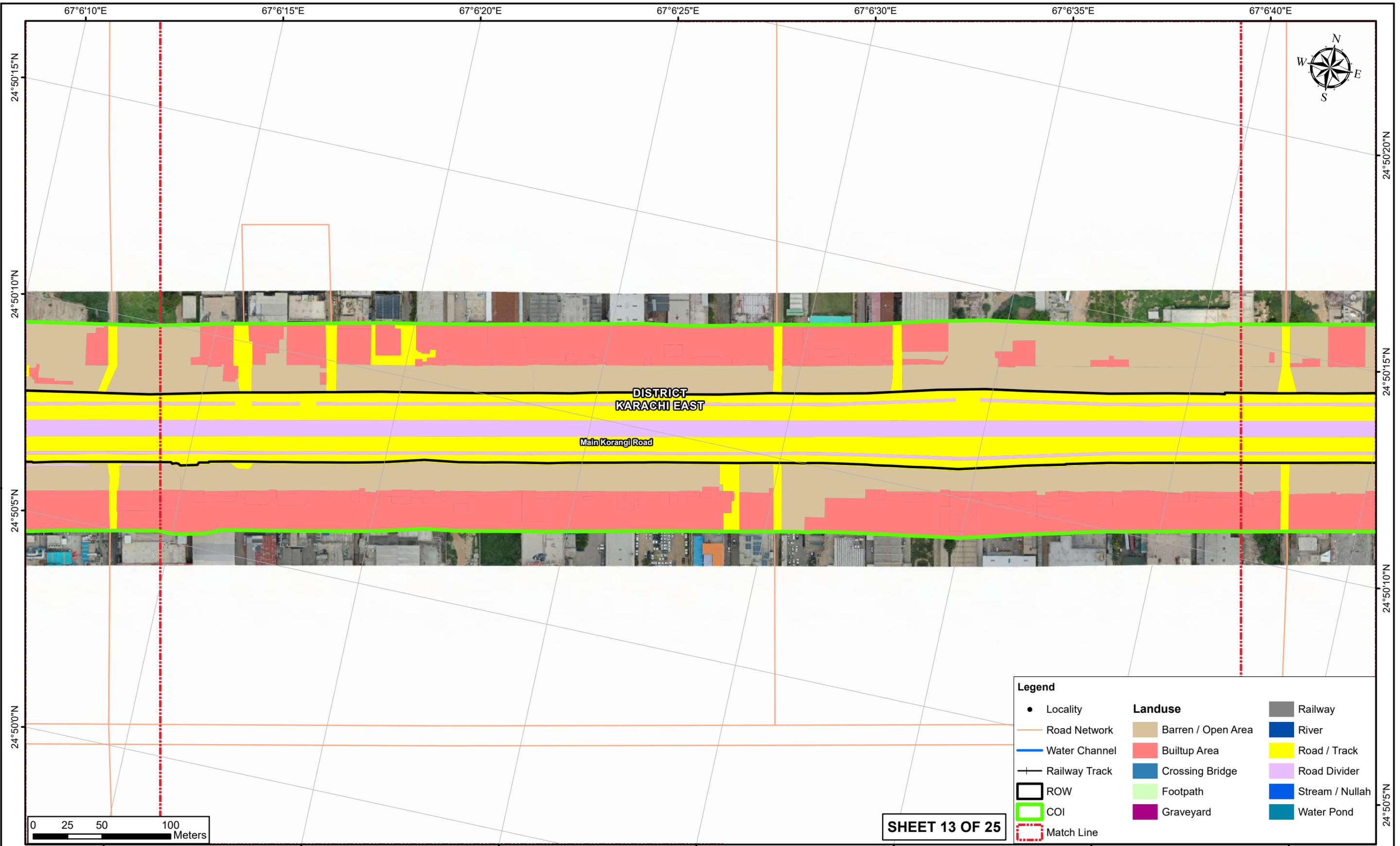
HEAD OFFICE:- NESPAK HOUSE , 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04				DRAWN	M.MUNEEB
03				SUBMITTED	RAMLA S.
02				RECOMMENDED	
01				CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
		<b>1:2,500</b>
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0



**SHEET 13 OF 25**

Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
— ROW	Footpath
— COI	Graveyard
— Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

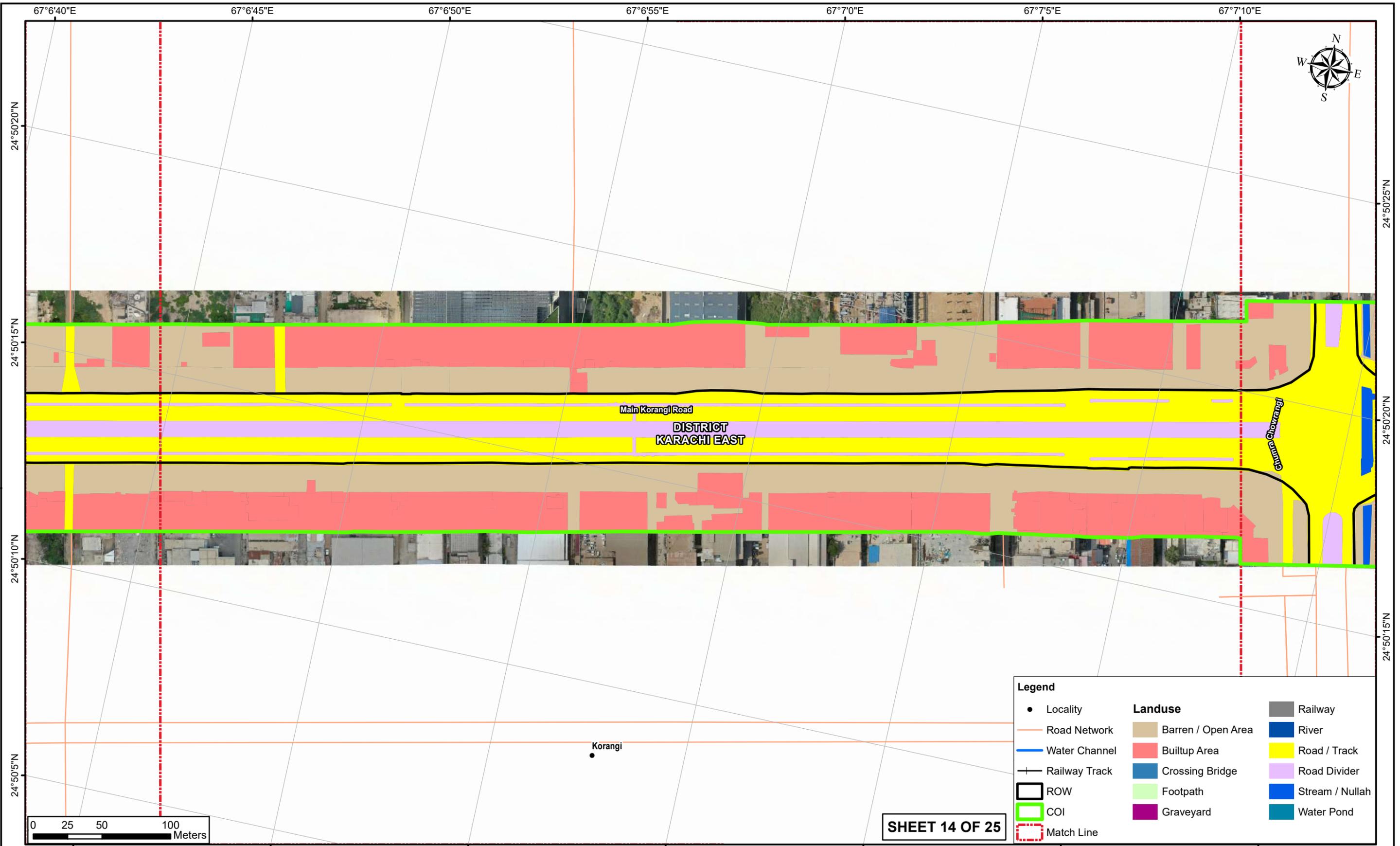
HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

LANDUSE MAP		SCALE
DATE	FIG. NO.	1:2,500
MARCH, 2022		REV. 0



**SHEET 14 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

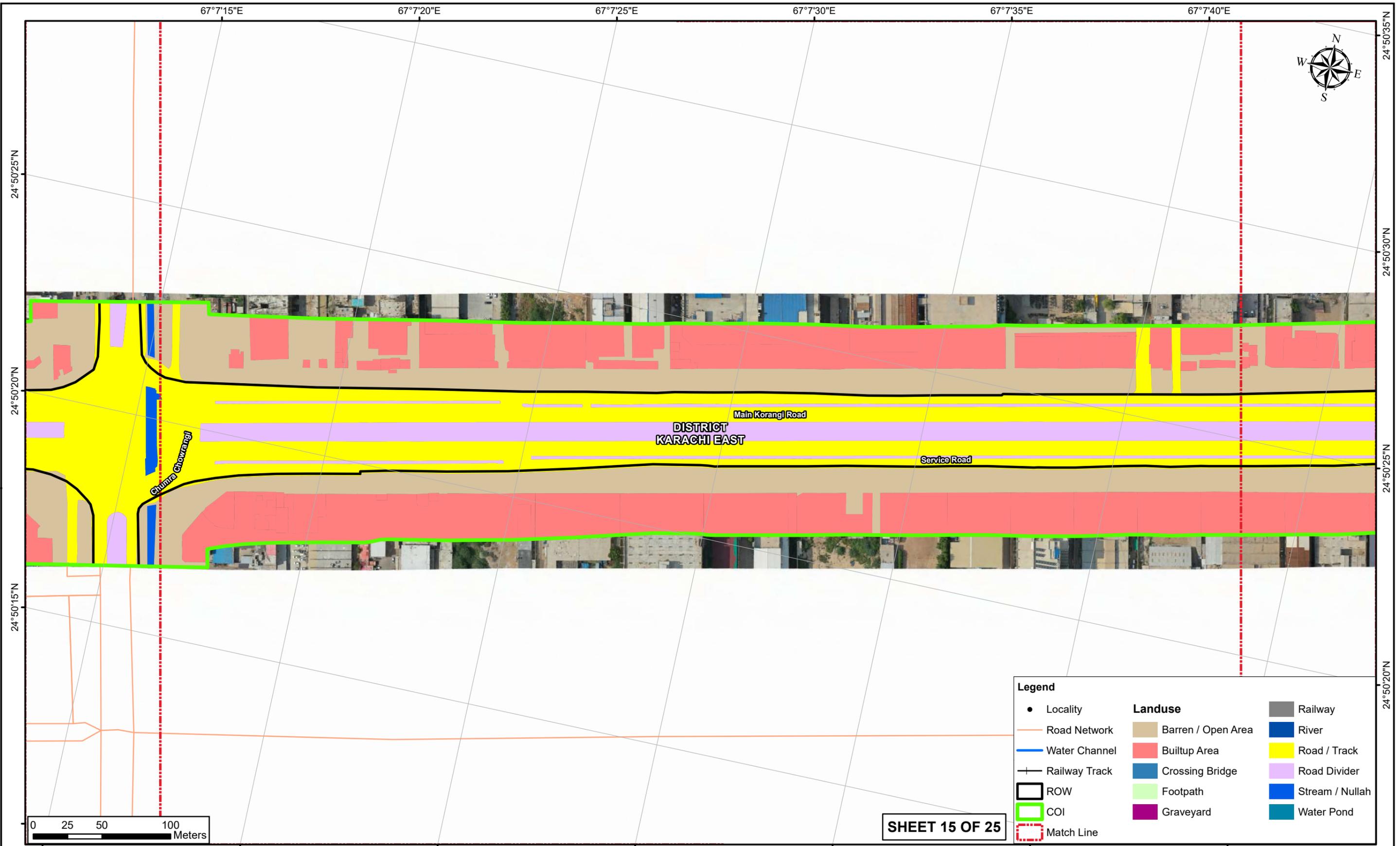
HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04										
03										
02										
01										
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ					

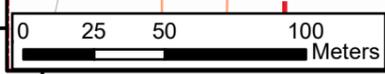
**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLOW LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
		1:2,500
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0



Legend		
• Locality	<b>Landuse</b>	■ Railway
— Road Network	■ Barren / Open Area	■ River
— Water Channel	■ Builtup Area	■ Road / Track
— Railway Track	■ Crossing Bridge	■ Road Divider
□ ROW	■ Footpath	■ Stream / Nullah
□ COI	■ Graveyard	■ Water Pond
□ Match Line		



**SHEET 15 OF 25**

<b>CLIENT</b>  <b>SINDH MASS TRANSIT AUTHORITY (SMTA)</b>	<b>CONSULTANT</b>  <b>NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD</b> HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				DRAWN	M.MUNEEB	<b>PROJECT</b> <b>KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE</b>	<b>LANDUSE MAP</b>		SCALE
		03				SUBMITTED	RAMLA S.				1:2,500
		02				RECOMMENDED			DATE MARCH, 2022	FIG. NO.	REV. 0
		01				CHD/VER.					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ				



Legend		
• Locality	<b>Landuse</b>	■ Railway
— Road Network	■ Barren / Open Area	■ River
— Water Channel	■ Builtup Area	■ Road / Track
— Railway Track	■ Crossing Bridge	■ Road Divider
□ ROW	■ Footpath	■ Stream / Nullah
□ COI	■ Graveyard	■ Water Pond
□ Match Line		

**SHEET 16 OF 25**

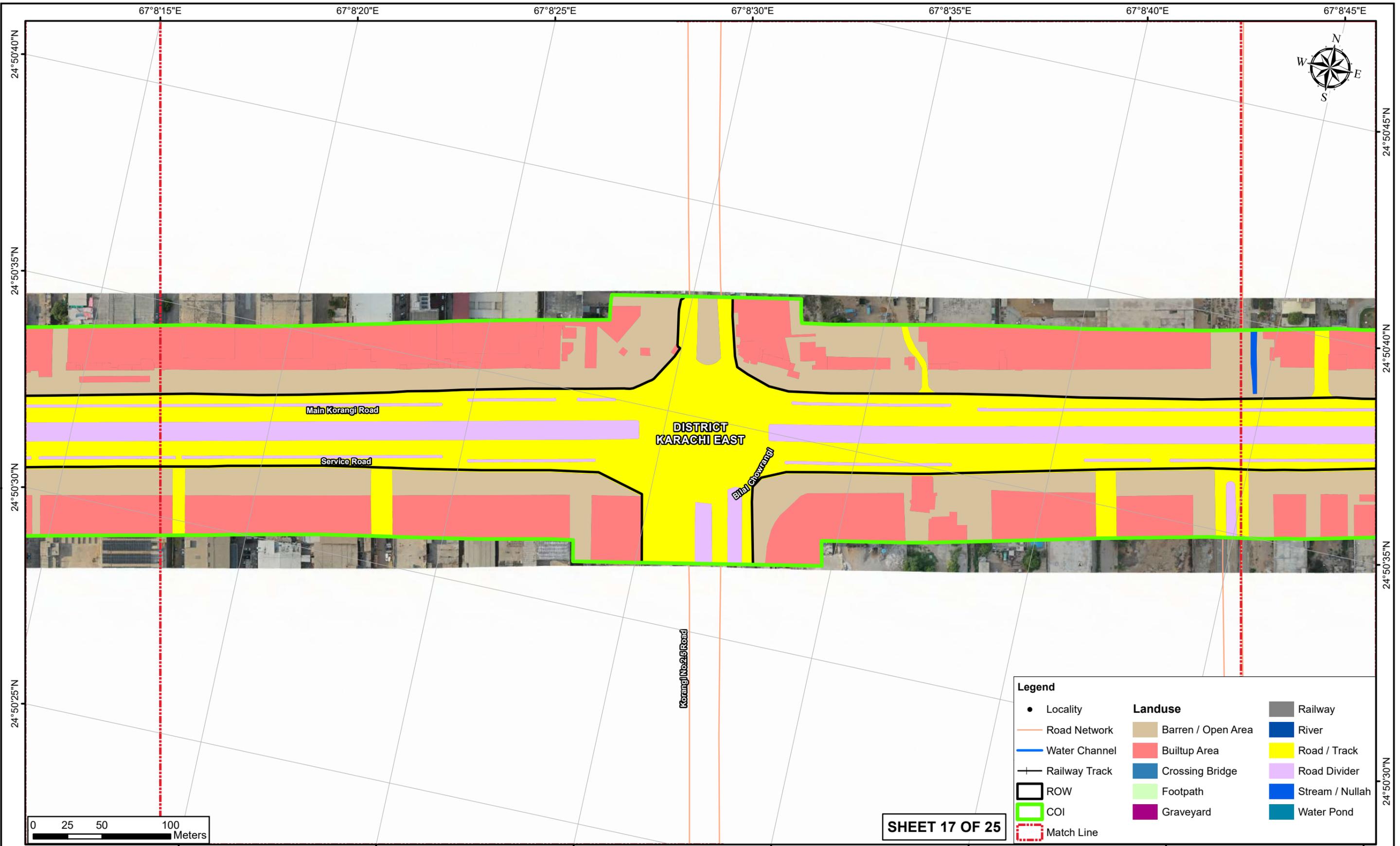
**CLIENT**  
  
**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**  
  
**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**  
 HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**  
**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0



**SHEET 17 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04										
03										
02										
01										
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
		<b>1:2,500</b>
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0



**SHEET 18 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

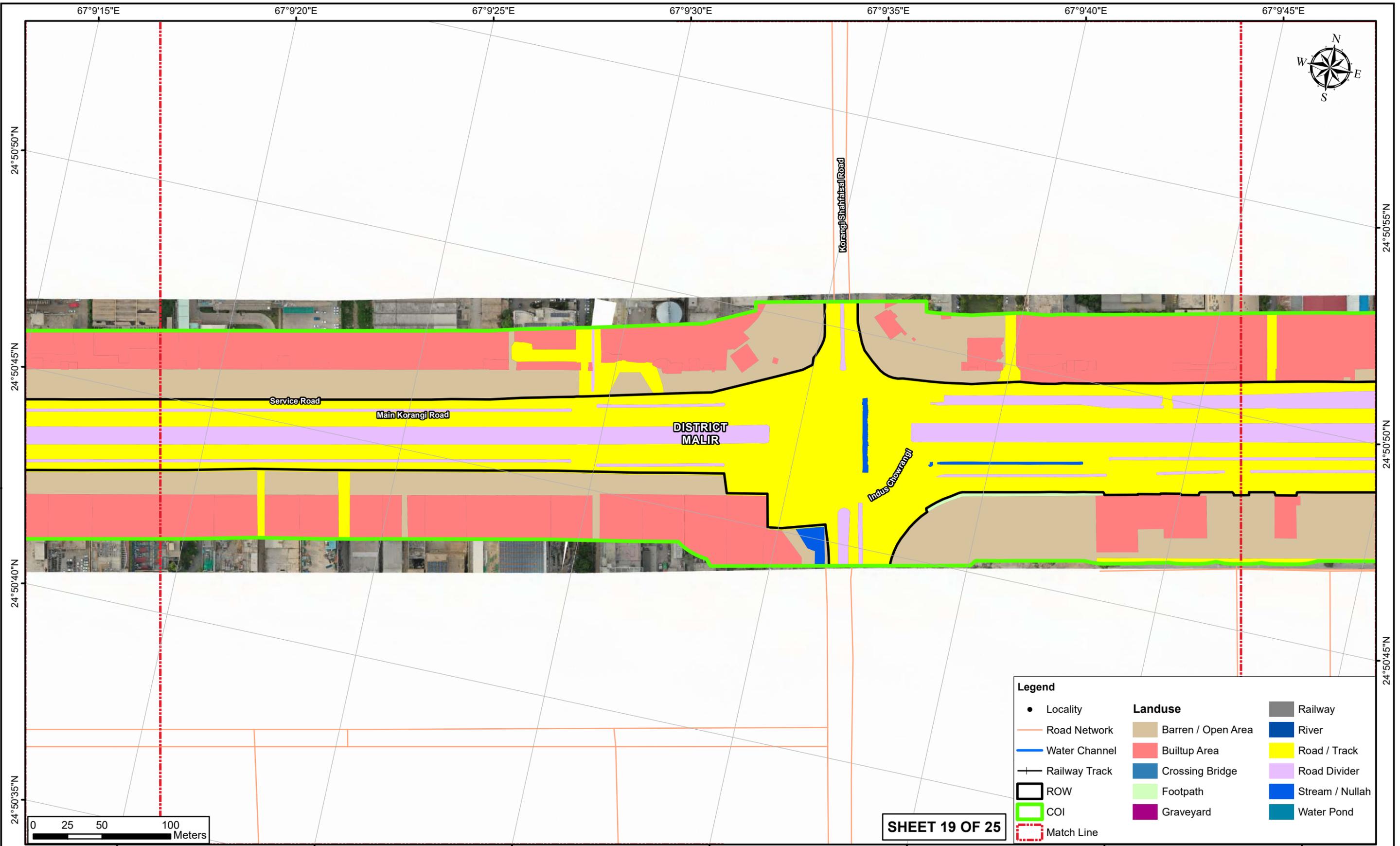
HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04				DRAWN	M.MUNEEB
03				SUBMITTED	RAMLA S.
02				RECOMMENDED	
01				CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
		<b>1:2,500</b>
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0



Legend		
• Locality	<b>Landuse</b>	■ Railway
— Road Network	■ Barren / Open Area	■ River
— Water Channel	■ Builtup Area	■ Road / Track
— Railway Track	■ Crossing Bridge	■ Road Divider
□ ROW	■ Footpath	■ Stream / Nullah
□ COI	■ Graveyard	■ Water Pond
□ Match Line		

**SHEET 19 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

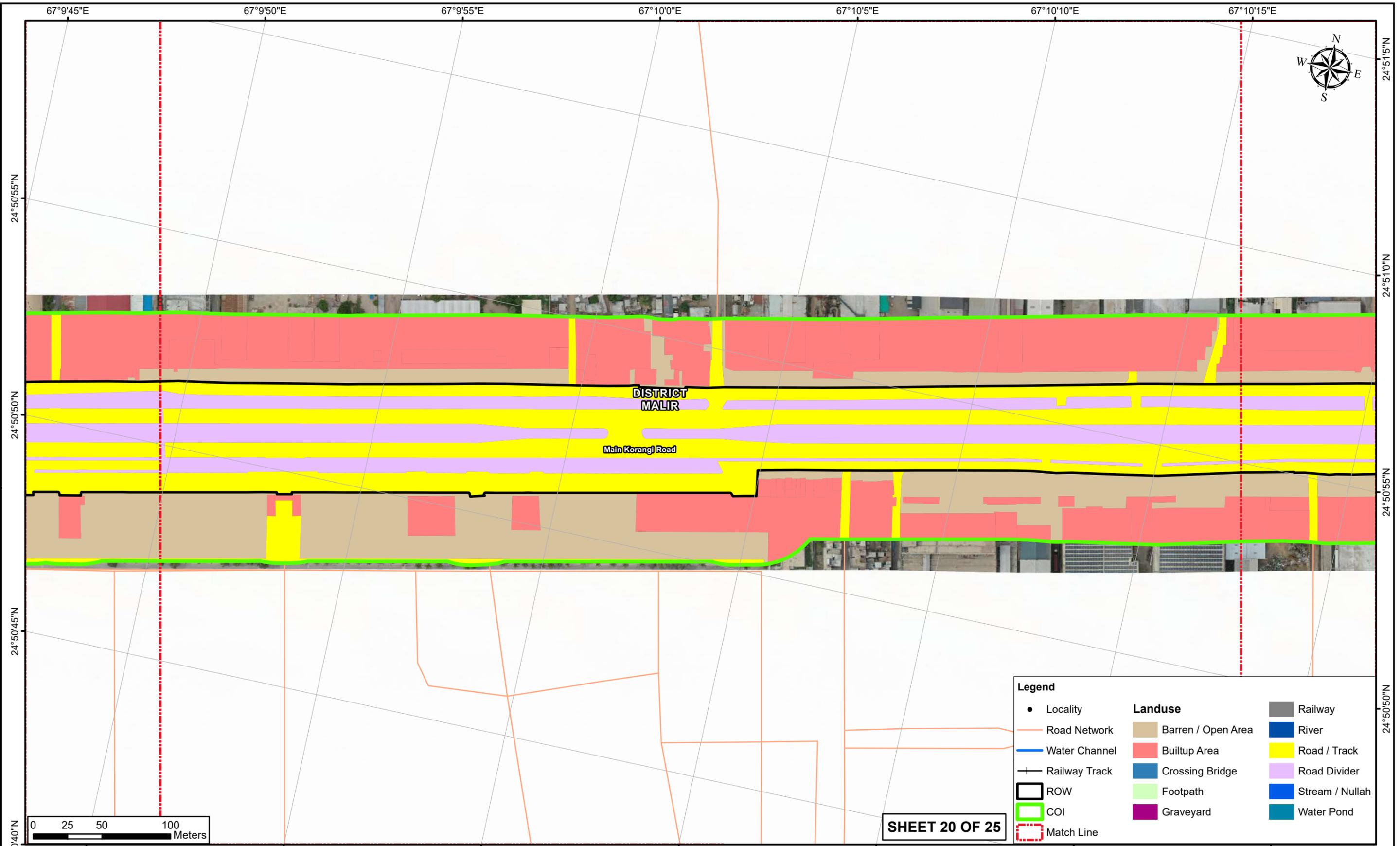
HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

LANDUSE MAP		SCALE
DATE	FIG. NO.	REV.
MARCH, 2022		0



Legend		
•	Locality	
—	Road Network	
—	Water Channel	
—	Railway Track	
—	ROW	
—	COI	
—	Match Line	
Landuse		
■	Barren / Open Area	■
■	Builtup Area	■
■	Crossing Bridge	■
■	Footpath	■
■	Graveyard	■
■	Railway	■
■	River	■
■	Road / Track	■
■	Road Divider	■
■	Stream / Nullah	■
■	Water Pond	■

**SHEET 20 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

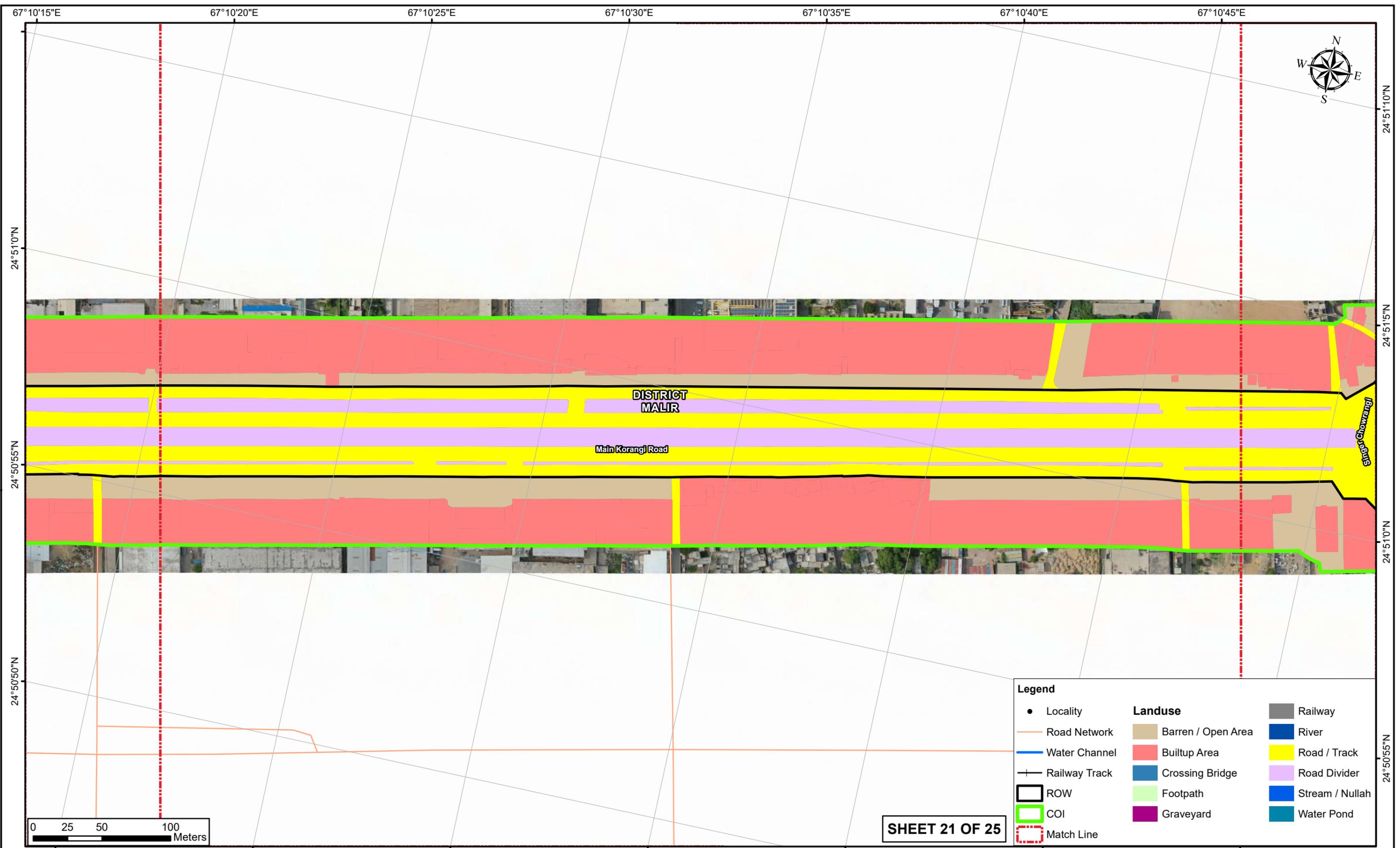
HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

LANDUSE MAP			SCALE
DATE	FIG. NO.	REV.	1:2,500
MARCH, 2022		0	



**SHEET 21 OF 25**

Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
□ ROW	Footpath
□ COI	Graveyard
□ Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

LANDUSE MAP		SCALE
DATE	FIG. NO.	REV.
MARCH, 2022		0



**Legend**

• Locality	<b>Landuse</b>	■ Railway
— Road Network	■ Barren / Open Area	■ River
— Water Channel	■ Builtup Area	■ Road / Track
— Railway Track	■ Crossing Bridge	■ Road Divider
□ ROW	■ Footpath	■ Stream / Nullah
□ COI	■ Graveyard	■ Water Pond
□ Match Line		

**SHEET 22 OF 25**

<b>CLIENT</b> <b>SINDH MASS TRANSIT AUTHORITY (SMTA)</b>	<b>CONSULTANT</b> <b>NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD</b> HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				DRAWN	M.MUNEEB	<b>PROJECT</b> <b>KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE</b>	<b>LANDUSE MAP</b>		SCALE
		03				SUBMITTED	RAMLA S.				1:2,500
		02				RECOMMENDED			DATE MARCH, 2022	FIG. NO.	REV. 0
		01				CHD/VER.					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ				



Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
— ROW	Footpath
— COI	Graveyard
— Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**SHEET 23 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ
04					
03					
02					
01					

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

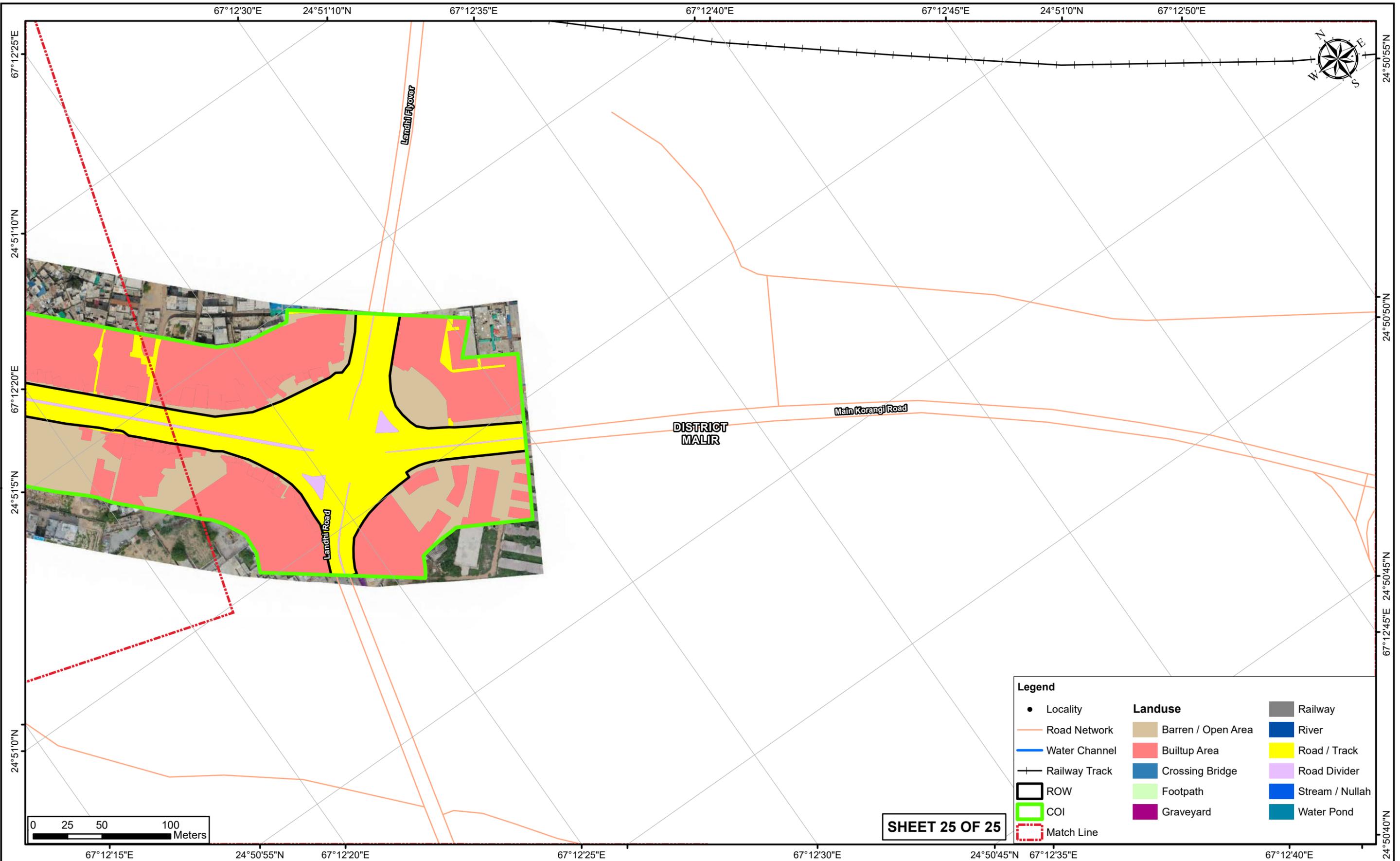
LANDUSE MAP		SCALE
DATE	FIG. NO.	REV.
MARCH, 2022		0



Legend	
• Locality	<b>Landuse</b>
— Road Network	Barren / Open Area
— Water Channel	Builtup Area
— Railway Track	Crossing Bridge
— ROW	Footpath
— COI	Graveyard
— Match Line	Railway
	River
	Road / Track
	Road Divider
	Stream / Nullah
	Water Pond

**SHEET 24 OF 25**

<b>CLIENT</b> <b>SINDH MASS TRANSIT AUTHORITY (SMTA)</b>	<b>CONSULTANT</b> <b>NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD</b> HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04			DRAWN	M.MUNEEB	<b>PROJECT</b> <b>KARACHI URBAN MOBILITY PROJECT - BRTS YELLOW LINE</b>	<b>LANDUSE MAP</b>		SCALE
		03			SUBMITTED	RAMLA S.				1:2,500
		02			RECOMMENDED					
		01			CHD/VER.					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED		M.SHARIQ	DATE	FIG. NO.
						MARCH, 2022		0		



**SHEET 25 OF 25**

**CLIENT**



**SINDH MASS TRANSIT AUTHORITY (SMTA)**

**CONSULTANT**



**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD**

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	M.MUNEEB
03					SUBMITTED	RAMLA S.
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

**PROJECT**

**KARACHI URBAN MOBILITY PROJECT - BRTS YELLO W LINE**

<b>LANDUSE MAP</b>		<b>SCALE</b>
		<b>1:2,500</b>
<b>DATE</b>	<b>FIG. NO.</b>	<b>REV.</b>
MARCH, 2022		0

## **ANNEX-VI-A: PHA OVERALL TREE INVENTORY DATA**



# KARACHI METROPOLITAN CORPORATION

**OFFICE OF THE DEPUTY DIRECTOR PARKS AND HORTICULTURE DEPARTMENT**

Inside Bagh-e-Jinnah (Frere Hall), Fatima Jinnah Road, Karachi Cantt, Karachi Phone:99204300 Fax:99204327

No. DD/(P&H)KMC/ 72 /2023

Dated: 17/10/2023

To,

The Managing Director,  
Karachi Mass Transit Authority.

**SUBJECT: SUBMISSION OF INVENTORY SURVEY REPORT OF YELLOW LINE BRTS PROJECT ROUTE FROM NUMAISH ROUNDABOUT TO FUTURE ROUNDABOUT, KARACHI**

With reference to the subject noted above, undersigned being a Focal Person of Parks and Horticulture Department, KMC for the Yellow Line BRTS Project, as desired the Inventory Survey Report from Numaish Roundabout to Future Roundabout has been completed and attached herewith for submission please.

  
DEPUTY DIRECTOR/FOCAL PERSON  
Parks and Horticulture

K.M.C.

DEPUTY DIRECTOR  
Parks & Horticulture Deptt.  
Karachi Metropolitan Corporation

Copy for information to the Director General, P&H, KMC

## Inventory Survey from Numaish Round About to Future Round About

S.No	Name of Place	No. of Trees
1.	Numaish Round About to Society Office Signal	44
2.	Society Office Signal to Norani Kabab Signal	460
3.	Norani Kabab Signal to Tariq Road Signal	235
4.	Tariq Road Signal to Connecting Bridge Shahrah-E-Faisal	526
5.	Around The Bridge of Shahrah-E-Faisal	55
6.	Nursery Stop Shahrah-E-Faisal to FTC Building Corner	1815
7.	Opp: FTC Building Tikona to Under Bridge	26
8.	FTC Building to DHA Office Signal	2857
9.	DHA Office Signal to Defence Roundabout	1758
10.	Defence Signal to Akhter Colony (Ittehad Road)	506
11.	Akhter Colony (Ittehad Road) to Qayumabad Roundabout	105
12.	Under Roundabout of Qayumabad	93
13.	Jam Sadiq Bridge to Brook Round About	1708
14.	Brook Round About to Chamra Round About	8450
15.	Chamra Round About to Veta Round About	5111
16.	Veta Round About to Bilal Round About	3160
17.	Bilal Round About to Singer Round About	4797
18.	Singer Round About to Murtaza Round About	3600
19.	Murtaza Round About to Future Round About	2903
20.	Future Round About to Depo	46
21.	Depo to Inside Depo	15
	<b>Total</b>	<b>38270</b>

  
 DEPUTY DIRECTOR  
 Parks & Horticulture Deptt.  
 Karachi Metropolitan Corporation

Area: FROM : NUMAISH ROUND ABOUT TO SOCIETY OFFICE SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	2	16	3	-	1	20
2	Olevendar	-	-	-	-	-	-
3	Bogenvellia	-	-	-	-	-	-
4	Neem	-	1	2	-	4	07 Nos
5	Date Palm	-	-	-	-	-	-
6	Terminalia	-	-	-	-	-	-
7	Bari	-	1	-	-	-	1
8	Gul Mohar	-	-	-	-	-	-
9	Apple Apple	-	-	-	-	-	-
10	Keeker	-	1	-	-	-	01 No
11	Dum Dum.	-	-	-	-	-	-
12	Eucalyptus	1	-	-	-	-	1
13	Coconut						

DEPUTY DIRECTOR  
 Parks & Horticulture Deptt.  
 Karachi Metropolitan Corporation

Karachi Metropolitan Corporation  
 Parks & Horticulture Deptt.  
 Karachi

Area:

FROM :

NUMAISH ROUND ABOUT TO SOCIETY OFFICE SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	-	-	-	-	-	-
16	Pepal	-	4	-	-	1	5 Nos
17	Tecomastan	-	-	-	-	-	-
18	Moringa	-	3	-	-	2	5 Nos
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	-	-	-	-
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	-	-
23	Ficus	-	-	-	-	-	-
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	1	-	-	-	1 No
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-



Area:

FROM :

SOCIETY OFFICE SIGNAL TO NORANI KABAB SIGNAL

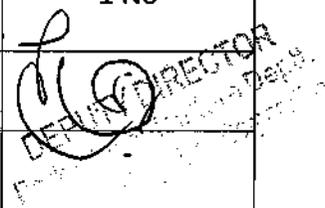
SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	-	17	165	28	2	212 Nos
2	Olevendar	-	3	10	-	-	13 Nos
3	Bogenvellia	-	1	22	6	1	30 Nos
4	Neem	-	2	36	24	5	67 Nos
5	Date Palm	-	2	9	6	2	19 Nos
6	Terminalia						
7	Bari	-	-	-	6	1	7 Nos
8	Gul Mohar	-	-	-	-	-	-
9	Apple Apple	-	-	-	-	-	-
10	Keeker	-	1	-	-	-	01 No
11	Dum Dum.	-	-	-	-	-	-
12	Eucalyptus	-	1	15	2	2	20 Nos
13	Coconut						

DEPARTMENT OF  
 FORESTRY  
 RAJASTHAN

Area:

FROM : SOCIETY OFFICE SIGNAL TO NORANI KABAB SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	16	-	-	8	24 Nos
15	Lignum	-	2	5	-	2	9 nos
16	Pepal	-	4	-	-	1	5 Nos
17	Tecomastan	-	-	-	-	-	-
18	Moringa	-	-	2	-	2	4 Nos
19	Badam	-	1	-	-	-	1 No
20	Sukhechain	-	-	-	3	-	3 nos
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	1	1 No
23	Ficus	-	-	-	-	4	4 nos
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	1	-	-	-	1 No
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	2	-	-	-	2 nos


  
 DIRECTOR  
 Forest Department, Maharashtra

Area:

FROM : SOCIETY OFFICE SIGNAL TO NORANI KABAB SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
29	Ixzora	-	-	-	-	-	-
30	Jetropa	-	-	-	-	-	-
31	Areli	-	-	-	-	-	-
32	Champa	-	-	-	-	-	-
33	Chandni	-	-	-	-	-	-
34	Pasonia	-	-	-	-	-	-
35	Thispasia	-	-	2	-	-	2 Nos
36	Nasora	-	2	2	-	-	4 Nos
37	Alastonia	-	-	2	-	-	2 nos
38	Thawatia	-	-	9	-	-	9 nos
39	Chaina Badam	-	-	1	-	-	1 No
40	Raintree	-	-	1	-	-	1 no
41	Table palm	-	-	1	-	-	1 no
42	Gul mohar	-	1	1	-	4	6 nos

DEPARTMENT OF FORESTS AND WILDLIFE CONSERVATION  
 GOVT. OF KARNATAKA



Area: FROM : NORANI KABAB SIGNAL TO TARIQ ROAD SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	-	49	18	17	1	76
2	Olevendar	-	1	-	4	-	5 nos
3	Bogenvellia	-	3	5	6	-	14 nos
4	Neem	-	24	24	17	1	66 Nos
5	Date Palm	-	2	2	11	-	15 Nos
6	Terminalia	-	-	-	-	-	-
7	Bari	-	1	-	4	-	5 Nos
8	Gul Mohar	-	-	-	-	1	1 No
9	Apple Apple	-	-	-	-	-	-
10	Keeker	-	1	-	-	-	01 No
11	Dum Dum.	-	-	-	-	-	-
12	Eucalyptus	-	1	-	-	-	1 No
13	Coconut	-	2	-	-	-	2 nos

DEPARTMENT OF  
 Parks & Horticulture  
 Katta

Area: FROM : NORANI KABAB SIGNAL TO TARIQ ROAD SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	-	2	5	-	2	9 nos
16	Pepal	-	3	2	4	2	11 Nos
17	Tecomastan	-	-	-	-	3	3 Nos
18	Moringa	-	-	2	-	2	4 Nos
19	Badam	-	-	1	-	-	1 No
20	Sukhechain	-	-	-	3	-	3 nos
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	1	-	-	1 No
23	Ficus	-	-	3	1	-	4 Nos
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	1	-	-	-	1 No
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	2	-	-	-	2 nos

Area: FROM : NORANI KABAB SIGNAL TO TARIQ ROAD SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
29	Ixzora	-	-	-	-	-	-
30	Jetropa	-	-	-	-	-	-
31	Areliia	-	-	-	2	-	2 nos
32	Champa	-	-	-	-	-	-
33	Chandni	-	-	-	-	-	-
34	Pasonia	-	-	-	-	1	1 no
35	Thispasia	-	-	1	-	-	1 Nos
36	Pilloo	-	-	3	-	-	3 Nos
37	Ashook pentolata	-	3	-	-	-	3 nos
	Total						235 Nos

Handwritten signature and official stamp of the surveying department, including the number 235 Nos.

Area: FROM : TARIQ ROAD SIGNAL TO CONNECTING BRIDGE SHAHRAH-E-FAISAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	14	11	17	19	1	62 Nos
2	Olevendar + Thawatia	59 + 9 = 68	-	-	13	-	81 Nos
3	Bogenvellia	10	-	3	17	-	30 nos
4	Neem	-	-	28	22	8	58 Nos
5	Date Palm	7	1	3	2	-	13 Nos
6	Terminalia	-	-	3	3	2	10 Nos
7	Bari	2	1	-	4	-	2 Nos
8	Gul Mohar	2	-	3	3	3	11 Nos
9	Apple Apple	-	-	-	-	-	-
10	Keeker	1	-	2	-	-	3 Nos
11	Dum Dum.	9	-	6	-	-	15 Nos
12	Eucalyptus	-	1	22	18	3	43 Nos
13	Coconut	-	-	-	-	-	-

DEPARTMENT OF  
FISH

Area:

FROM : TARIQ ROAD SIGNAL TO CONNECTING BRIDGE SHAHRAH-E-FAISAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	2	-	-	-	2 nos
15	Lignum	-	-	-	13	6	16 nos
16	Pepal	-	3	2	4	2	11 Nos
17	Tecomastan	-	-	-	-	-	-
18	Moringa	-	1	2	9	-	12 Nos
19	Badam	-	-	-	-	4	4 No
20	Sukhechain	-	-	-	-	2	2 Nos
21	Jungle jalabi	-	-	-	1	-	1 No
22	Imli	-	-	1	-	-	1 No
23	Ficus	-	-	8	-	-	8 Nos
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

Handwritten signature and official stamp of the Department of Environment and Forests, Government of Punjab, Lahore.

Area: FROM : TARIQ ROAD SIGNAL TO CONNECTING BRIDGE SHAHRAH-E-FAISAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
29	Ixzora	-	-	-	-	-	-
30	Jetropa	1	-	1	-	-	2 nos
31	Arelia	-	-	-	-	-	-
32	Champa	-	2	2	-	-	4 Nos
33	Chandni	-	-	-	-	-	-
34	Pasonia	-	1	-	-	-	1 no
35	Bagain	1	-	-	-	-	1 no
36	Pillo	-	-	-	1	-	1 No
37	Silver palm	-	-	6	-	-	6 nos
38	Akashia	-	-	1	-	-	1 No
39	Pechartia palm	-	4	4	-	-	8 Nos
40	Mixed shrub	100	-	-	-	-	100 Nos
42	Palms	-	-	-	-	12	12 Nos
43	Papaya	-	-	-	-	2	2 Nos
	Total						526

DEPUTY DIRECTOR  
 PAPER & PENS  
 10/11/2023

Area:

FROM:

AROUND THE BRIDGE OF SHAHRAH-E-FAISAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	-	-	-	-	-	-
2	Olevendar/Thawatia	-	-	-	-	-	-
3	Bogenvellia	-	-	-	-	6	6 Nos
4	Neem	-	-	-	-	1	1 Nos
5	Date Palm	-	-	-	-	-	-
6	Terminalia	-	-	-	-	-	-
7	Bari	-	-	-	-	-	-
8	Gul Mohar	-	-	-	-	-	-
9	Apple	-	-	-	-	7	7 Nos
10	Keeker	-	-	-	-	-	-
11	Dum Dum.	-	-	-	-	1	1 Nos
12	Eucalyptus	-	-	-	-	2	2 Nos
13	Coconut	-	-	-	-	1	1 Nos

DE

Area: FROM: AROUND THE BRIDGE OF SHAHRAH-E-FAISAL

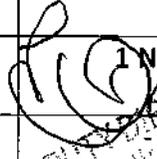
SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	2	2 Nos
15	Lignum	-	-	-	-	6	6 Nos
16	Pepal	-	-	-	-	-	-
17	Tecomastan	-	-	-	-	-	-
18	Moringa	-	-	-	-	-	-
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	-	-	-	-
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	-	-
23	Ficus	-	-	-	-	26	26 Nos
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

DEPUTY COMMISSIONER  
 SHAHRAH-E-FAISAL  
 DISTRICT WEST BENGAL  
 GOVERNMENT OF WEST BENGAL



Area: FROM : NURSERY STOP SHAHRAH-E-FAISAL TO FTC BUILDING CORNER

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	265	1	694	233	6	1199 Nos
2	Olevendar + Thawatia	100	-	-	-	-	100 Nos
3	Bogenvellia	34	-	3	3	-	37 Nos
4	Neem	-	-	1	13	9	23 Nos
5	Date Palm	-	-	6	17	6	29 Nos
6	Terminalia	1	-	3	-	-	4 Nos
7	Bari	1	-	2	4	10	16 Nos
8	Gul Mohar	-	-	5	-	-	5 Nos
9	Apple Apple	-	-	-	-	9	9 Nos
10	Keeker	1	-	2	-	-	3 Nos
11	Dum Dum.	-	-	-	-	2	2 Nos
12	Eucalyptus	-	-	1	-	-	1 No
13	Coconut	-	-	-	-	-	

  
 DEPUTY DIRECTOR  
 Planning & Management Dept.  
 Horticulture Department, DWR  
 Hyderabad

Area: FROM : NURSERY STOP SHAHRAH-E-FAISAL TO FTC BUILDING CORNER

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	8	-	4	12 Nos
15	Lignum	117	-	35	51	6	209 nos
16	Pepal	-	-	-	5	8	13 Nos
17	Tecomastan	-	-	-	-	2	2 Nos
18	Moringa	-	-	-	-	-	-
19	Badam	6	-	1	3	1	11 Nos
20	Sukhechain	-	-	-	-	-	-
21	Jungle jalabi	1	-	-	1	4	6 Nos
22	Imli	-	-	-	-	2	2 Nos
23	Ficus	-	-	8	-	-	8 Nos
24	Dryceenia	-	8	-	-	-	8 Nos
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	2	2 Nos

DEPARTMENT OF ENVIRONMENT AND FORESTS  
GOVERNMENT OF PUNJAB, INDIA

Area:

FROM : NURSERY STOP SHAHRAH-E-FAISAL TO FTC BUILDING CORNER

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
29	Ixzora	-	-	-	-	6	6 nos
30	Jetropa	-	-	-	-	-	-
31	Arelia	-	-	1	-	6	7 Nos
32	Champa	-	2	2	-	-	4 Nos
33	Chandni	-	-	-	-	-	-
34	Pasonia	-	-	8	1	2	11 Nos
35	Gondni	-	-	5	-	-	5 Nos
36	Pihooram	-	-	11	-	-	11 Nos
37	Silver palm	-	-	-	-	1	1 No
38	Akeshia	-	-	1	-	-	1 no
39	Foxtel palm	-	-	-	-	4	4 nos
40	Peachartia palm	-	-	4	--	-	4 nos
42	American palm	5	-	-	-	4	9 nos
43	Kajalia phanata	1	-	--	1	-	1 no

DEPUTY DIRECTOR  
Parks & Horticulture Deptt.  
Karnal District, Uttar Pradesh





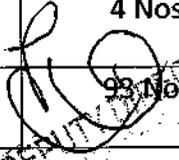
## Ecological Survey

Dated \_\_\_\_\_/2023

Area:

FROM: FTC BUILDING TO DHA OFFICE SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	-	144	151	181	73	449 Nos
2	Olevendar/Thawatia	58	1	22	2	-	83 Nos
3	Bogenvellia	30	29	45	72	163	339 Nos
4	Neem	7	10	46	54	57	174 Nos
5	Date Palm	1+23=24	2+3=5	19+3=22	1	2	22+32 Nos. 44 Nos
6	Terminalia	-	-	6	21	-	27 Nos
7	Bari	-	2	9	12	1	24 Nos
8	Gul Mohar	18	37	5	77	26	163 Nos
9	Apple	-	-	-	2	4	6 Nos
10	Keeker	-	-	4	5	-	9 Nos
11	Dum Dum.	-	9	-	-	-	9 Nos
12	Eucalyptus	-	-	-	-	4	4 Nos
13	Coconut	-	3	45	30	15	93 Nos

  
 DEPUTY DIRECTOR  
 Forest Department  
 Government of Karnataka

Area: FROM: FTC BUILDING TO DHA OFFICE SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	-	11	58	14	29	112 Nos
16	Pepal	-	5	14	51	12	72 Nos
17	Tecomastan	-	-	23	-	-	23 Nos
18	Moringa	-	3	4	-	6	13 Nos
19	Badam	15	-	-	15	3	33 Nos
20	Sukhechain	-	-	-	18	32	50 Nos
21	Jungle jalabi	-	-	-	1	4	5 Nos
22	Imli	-	1	-	-	-	1 Nos
23	Ficus	-	-	-	12	22	34 Nos
24	Dryceenia	-	-	3	-	-	3 Nos
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	1	-	-	-	-	1 Nos

Area:

FROM:

FTC BUILDING TO DHA OFFICE SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
29	Ixzora	-	-	-	22	-	22 Nos
30	Jetropa	-	-	-	-	-	-
31	Arelia	-	-	-	-	-	-
32	Champa	-	-	-	-	-	-
33	Chandni	-	-	-	-	-	-
34	Pasonia	-	1	-	-	-	1 Nos
35	Thispacia	-	-	7	-	-	7 Nos
36	Croton	-	-	-	-	22	22 Nos
37	China Palm	-	-	3	-	-	3 Nos
38	Baqain	-	-	2	-	-	2 Nos
39	Gondni	-	-	1	-	-	1 Nos
40	Pilloo	-	-	1	-	-	1 Nos
41	Ashok Pentolata	-	-	-	3	-	3 Nos
42	Silver Palm	-	-	19	-	-	19 Nos
43	Akashia	56	-	6	1	49	112 Nos

Area:

FROM:

FTC BUILDING TO DHA OFFICE SIGNAL

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
44	Arocera	-	1	-	-	-	1 Nos
45	Tebobia	12	12	12	-	-	36 Nos
46	Amaltas	1	-	1	47	-	49 Nos
47	Anjeer	-	1	-	-	-	1 Nos
48	African Tulip	-	-	39	-	-	39 Nos
49	Triangle Palm	5	-	-	-	-	5 Nos
50	Cheecoo	-	-	2	-	-	2 Nos
51	Habiscus	-	-	8	-	1	9 Nos
52	Agave	2	-	-	-	-	2 Nos
53	Cornocarpus Bush	3	-	-	12	-	15 Nos
54	Damdham Bush	49	18	27	-	-	94 Nos
55	Damdham Bush	5	-	6	-	-	11 Nos
56	Doranta Haiges	-	4	-	-	-	4 Nos
57	Ficus Haige	-	3	-	-	-	3 Nos
58	Cyrus Palm	-	-	-	-	11	11 Nos

DEPUTY COMMISSIONER  
 District Forest Officer  
 Forest Department  
 Government of Karnataka



## Ecological Survey

Dated \_\_\_\_\_/2023

Area:

FROM: DHA OFFICE SIGNAL to DEFENCE ROUNDABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps		85	68+1	20	76	250 Nos
2	Olevendar/Thawatia	77	-	3	25	-	105 Nos
3	Bogenvellia	-	2	62	116	18	198 Nos
4	Neem	14	6	7	58	8	93 Nos
5	Date Palm	23	8	19	72	21	143 Nos
6	Terminalia	-	-	6	23	17	46 Nos
7	Bari	-	1	2	-	-	3 Nos
8	Gul Mohar	25	-	7	24	26	82 Nos
9	Apple	1	3	2	-	3	9 Nos
10	Keeker	-	6	-	1	-	7 Nos
11	Dum Dum.	1	1	9+15	89	30	145 Nos
12	Eucalyptus	-	1	2	-	-	3 Nos
13	Coconut	12	16	52	-	-	80 Nos

DEPUTY DIRECTOR  
 Planning and Development  
 Department of Urban Planning  
 Government of Karnataka  
 Bangalore

Ecological Survey

Dated \_\_\_\_\_/2023

Area: FROM: DHA OFFICE SIGNAL to DEFENCE ROUNDABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	1	7+2	20	14	16	60 Nos
15	Lignum	-	15	34	10	18	77 nos
16	Pepal	-	3	3	32	2	40 Nos
17	Tecomastan	-	-	-	-	-	-
18	Moringa	2	3	-	-	7	12 Nos
19	Badam	1	-	-	9	1	11 Nos
20	Sukhechain	-	-	15	-	-	15 Nos
21	Jungle jalabi	-	1	3	4	2	10 Nos
22	Imli	-	-	1	-	-	1 Nos
23	Ficus	-	2	16+2	66	6	92 Nos
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	40	-	40 Nos

DEPUTY COMMISSIONER  
 District Administration  
 District Office  
 District Administration  
 District Office  
 District Administration  
 District Office

Area: FROM: DEFENCE SIGNAL to AKHTER COLONY (ITTEHAD ROAD)

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	-	6	30	-	113	149 Nos
2	Olevendar/Thawatia	-	-	45+14	-	-	59 Nos
3	Bogenvellia	32	-	8	-	2	42 Nos
4	Neem	-	1	15	-	1	17 Nos
5	Date Palm	-	-	-	-	-	-
6	Terminalia	1+46	2	1+7	-	1	58 Nos
7	Bari	-	1	-	-	-	1 Nos
8	Gul Mohar	-	-	12	-	-	12 Nos
9	Apple	-	-	-	-	-	-
10	Keeker	-	-	3	2	4	9 Nos
11	Dum Dum.	-	-	9+26	-	-	35 Nos
12	Eucalyptus	-	-	-	-	-	-
13	Coconut	-	-	7	-	-	-

  
 DEPUTY DIRECTOR  
 Park, ...  
 ...

Area:

FROM : NURSERY STOP SHAHRAH-E-FAISAL TO FTC BUILDING CORNER

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
44	Boganvella Bush	5	-	-	-	-	5 Nos
45	Kajalia Fannata	-	-	2	-	-	2 Nos
46	Tebobia	-	16	32	-	-	48 Nos
47	Taali	-	2	-	-	-	2 Nos
48	Indian Tulips	-	16	-	-	-	16 Nos
49	Triangle Palm	-	-	3	-	-	3 Nos
50	Cheecu	-	8	-	-	-	8 Nos
51	Anaar	-	-	-	-	1	1 Nos
52	Arenthimam	-	-	6	-	-	6 Nos
53	Ground Cover (Bushes)	-	-	20	-	-	20 Nos
	Total						1758 Nos

  
 DEPUTY DIRECTOR  
 Parks & Horticulture  
 Bangalore

Area: FROM: DEFENCE SIGNAL to AKHTER COLONY (ITTEHAD ROAD)

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
29	Ixzora	-	-	-	-	-	-
30	Jetropa	-	-	-	-	-	-
31	Arelia	-	-	-	-	-	-
32	Champa	-	-	-	-	-	-
33	Chandni	-	-	-	-	-	-
34	Pasonia	-	-	-	-	-	-
35	Thispacia	-	1	41	-	-	42 Nos
36	Baqeen	-	-	11	-	-	11 Nos
37	Ashok Pentoleta	-	-	1	-	-	1 Nos
38	Tebobia	-	-	6	-	-	6 Nos
	Total						506 Nos

DEPUTY DIRECTOR
   
 Forests, Government of Karnataka

Ecological Survey

Dated \_\_\_\_\_/2023

Area: FROM: DEFENCE SIGNAL to AKHTER COLONY (ITTEHAD ROAD)

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	-	2	-	-	-	2 nos
16	Pepal	-	-	3	-	7	10 Nos
17	Tecomastan	-	-	12	-	-	12 Nos
18	Moringa	-	-	-	-	-	-
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	29	-	-	29 Nos
21	Jungle jalabi	-	1	-	-	-	1 Nos
22	Imli	-	-	-	-	-	-
23	Ficus	-	-	3	-	-	3 Nos
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

DEPT. OF FORESTRY  
 PUNE  
 1/11/2023

Area: FROM: AKHTER COLONY to QAYUMABAD ROUNDABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	-	-	-	-	-	-
16	Pepal	-	-	1	-	-	1 Nos
17	Tecomastan	-	-	-	-	-	-
18	Moringa	-	-	-	-	-	-
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	5	-	-	5 Nos
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	-	-
23	Ficus	-	-	-	-	-	-
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

DEPUTY DIRECTOR  
 Horticulture Deptt.  
 Bangalore Corporation

Ecological Survey

Dated \_\_\_\_\_/2023

Area: FROM: AKHTER COLONY to QAYUMABAD ROUNDABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	-	18	27	-	-	45 Nos
2	Olevendar/Thawatia	-	-	11+2	-	-	13 Nos
3	Bogenvellia	-	-	-	-	-	-
4	Neem	-	-	33	-	-	33 Nos
5	Date Palm	-	-	-	-	-	
6	Terminalia	-	-	-	-	-	
7	Bari	-	-	1	-	-	1 Nos
8	Gul Mohar	-	-	-	-	-	-
9	Apple	-	-	-	-	-	-
10	Keeker	-	-	-	-	-	-
11	Dum Dum.	-	-	1	-	-	1 Nos
12	Eucalyptus	-	-	-	-	-	
13	Coconut	-	-	-	-	-	

DEPARTMENT OF SURVEY  
 GOVERNMENT OF WEST BENGAL  
 KOLKATA

## Ecological Survey

Dated \_\_\_\_\_/2023

Area: FROM: UNDER ROUNDABOUT OF QAYUMABAD

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	2	-	-	-	-	2 Nos
2	Olevendar/Thawatia	13	-	-	-	-	13 Nos
3	Bogenvellia	4	-	-	-	-	4 Nos
4	Neem	1	-	-	-	-	1 Nos
5	Date Palm	7	-	-	-	-	7 Nos
6	Terminalia	-	-	-	-	-	-
7	Bari	-	-	-	-	-	-
8	Gul Mohar	40	-	-	-	-	40 Nos
9	Apple	-	-	-	-	-	-
10	Keeker	-	-	-	-	-	-
11	Dum Dum.	-	-	-	-	-	-
12	Eucalyptus	-	-	-	-	-	-
13	Coconut	-	-	-	-	-	-

DEPUTY DIRECTOR  
 Parks & Horticulture Deptt.  
 Karachi Metropolitan Corporation





Area:

FROM:

UNDER ROUNDABOUT OF QAYUMABAD

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	-	-	-	-	-	-
16	Pepal	1	-	-	-	-	1 Nos
17	Tecomastan	-	-	-	-	-	-
18	Moringa	13	-	-	-	-	13 Nos
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	-	-	-	-
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	-	-
23	Ficus	2	-	-	-	-	2 Nos
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	1	-	-	-	-	1 Nos

DEPUTY COMMISSIONER  
 P. M. QAYUMABAD  
 DISTRICT PAFKOT  
 PAFKOT

Area: FROM : JAM SADIQ BRIDGE TO BROOKS ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	21	-	-	-	52	73
16	Pepal	-	03	-	07	10	
17	Tecomastan	-	-	-	-	-	-
18	Moringa	01	-	-	-	-	01
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	-	-	04	04
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	02	02
23	Ficus	-	-	-	-	-	-
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mengo tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

DEPUTY DIRECTOR  
 Punjab Horticulture Development Corporation  
 Lahore

Area: FROM : JAM SADIQ BRIDGE TO BROOKS ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	614	98	-	-	479	1191
2	Olevendar	125	-	-	-	-	125
3	Bogenvellia	135	-	-	-	-	135
4	Neem	15	07	-	-	78	100
5	Date Palm	-	02	-	-	-	02
6	Terminalia	-	-	-	-	-	-
7	Bari	01	03	-	-	06	10
8	Gul Mohar	03	-	-	-	03	06
9	Apple Apple	-	05	-	-	-	05
10	Keeker	-	04	-	-	10	14
11	Dum Dum.	-	-	-	-	-	-
12	Eucalyptus	-	-	-	-	05	05
13	Coconut	-	-	-	-	-	-

*(Handwritten Signature)*  
 DEPARTMENT OF  
 FORESTRY  
 GOVERNMENT OF  
 WEST BENGAL

Area:

FROM:

DHA OFFICE SIGNAL to DEFENCE ROUNDABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
29	Ixzora	-	-	-	-	1	1 nos
30	Jetropa	-	-	-	-	-	-
31	Arelia	-	-	-	-	-	-
32	Champa	-	-	-	12	9	21 Nos
33	Chandni	-	-	-	-	-	-
34	Pasonia	-	-	5	-	6	11 Nos
35	Thispacia	-	-	38	-	-	38 Nos
36	Alstonia	-	1	4	-	-	05 Nos
37	China Badam	-	-	-	-	-	-
38	Raintry	-	-	8	-	-	08 Nos
39	Baqeen	-	-	1	-	-	1 Nos
40	Papaya	-	-	-	-	2	2 Nos
41	Crotan	-	-	-	24	-	24 Nos
42	Ulta Ashok	-	-	-	-	6	6 Nos
43	Akaishia	3	5	-	-	-	8 Nos

DEFENCE ROUNDABOUT  
 PAFKAR  
 PAFKAR  
 PAFKAR



Area: FROM : BROOKS ROUND ABOUT TO CHAMRA ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	4376	361	-	-	1938	6675
2	Olevendar	559	-	-	-	-	559
3	Bogenvellia	366	-	-	-	-	366
4	Neem	78	34	-	-	81	193
5	Date Palm	1	12	-	-	35	48
6	Terminalia	3	-	-	-	-	03
7	Bari	5	5	-	-	10	20
8	Gul Mohar	1	21	-	-	17	39
9	Apple Apple	2	7	-	-	21	30
10	Keeker	10	189	-	-	13	212
11	Dum Dum.	3	150	-	-	13	1253
12	Eucalyptus	-	1	-	-	2	3
13	Coconut	-	3	-	-	2	3

Area: FROM : BROOKS ROUND ABOUT TO CHAMRA ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	6	-	-	25	31
15	Lignum	-	58	-	-	-	58
16	Pepal	-	4	-	-	11	15
17	Tecomastan	-	-	-	-	-	-
18	Moringa	-	-	-	-	6	6
19	Badam	-	-	-	-	12	12
20	Sukhechain	-	-	-	-	2	2
21	Jungle jalabi	-	-	-	-	3	3
22	Imli	-	-	-	-	4	4
23	Ficus	-	-	-	-	-	-
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	2	2
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

Handwritten signature and official stamp of the Forest Officer, Chamra Roundabout, District Forest Office, Bhopal.



Ecological Survey

Dated \_\_\_\_\_/2023

Area: FROM : CHAMRA ROUND ABOUT TO VITA ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	2429	417	-	-	1270	4116
2	Olevendar	16	-	-	-	-	16
3	Bogenvellia	109	-	-	-	-	109
4	Neem	10	29	-	-	34	73
5	Date Palm	11	8	-	-	11	30
6	Terminalia	-	-	-	-	6	6
7	Bari	5	14	-	-	19	38
8	Gul Mohar	-	13	-	-	66	79
9	Apple Apple	-	9	-	-	3	12
10	Keeker	24	6	-	-	19	49
11	Dum Dum.	250	5	-	-	19	295
12	Eucalyptus	-	-	-	-	-	-
13	Coconut	-	24	-	-	-	-

Handwritten signature and stamp with the number 24.

Area: FROM : CHAMRA ROUND ABOUT TO VITA ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	8	9	-	-	37	54
15	Lignum	13	94	-	-	22	129
16	Pepal	-	2	-	-	8	10
17	Tecomastan	2	-	-	-	6	8
18	Moringa	-	-	-	-	-	-
19	Badam	-	-	-	-	-	-
20	Sukhechain	3	-	-	-	1	4
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	-	-
23	Ficus	27	-	-	-	30	57
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	2	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

DEPUTY DIRECTOR  
 Forest Department, Durgam  
 Hyderabad



Area: FROM: VITA ROUNDABOUT TO BILAL ROUNDABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	644	91	-	-	415	1150 Nos
2	Olevendar/Thawatia	-	-	-	-	-	-
3	Bogenvellia	205	10	-	-	-	215 Nos
4	Neem	1	32	-	-	19	52 Nos
5	Date Palm	1	2	-	-	2	5 Nos
6	Terminalia	-	-	-	-	-	-
7	Bari	-	12	-	-	2	14 Nos
8	Gul Mohar	70	-	-	-	8	78 Nos
9	Apple	-	8	-	-	1	9 Nos
10	Keeker	4	60	-	-	-	64 Nos
11	Dum Dum.	300	613	-	-	-	913 Nos
12	Eucalyptus	-	-	-	-	3	3 Nos
13	Coconut	-	-	-	-	8	8 Nos

DEPUTY DISTRICT OFFICER  
 Forest & Horticulture  
 Karachi

Area: FROM: VITA ROUNDABOUT TO BILAL ROUNDABOUT

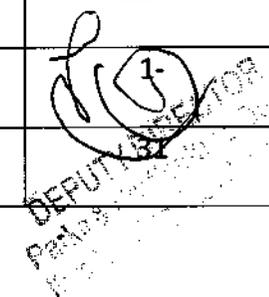
SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	11	19	-	-	19	49 Nos
15	Lignum	22	32	-	-	25	79 Nos
16	Pepal	-	5	-	-	13	18 Nos
17	Tecomastan	-	-	-	-	50	50 Nos
18	Moringa	5	4	-	-	2	11 Nos
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	-	-	-	-
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	1	-	-	-	-	1 Nos
23	Ficus	125	11	-	-	11	147 Nos
24	Dryceenia	20	-	-	-	-	20 Nos
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

Handwritten signature and official stamp of the Forest Department, Government of Karnataka.



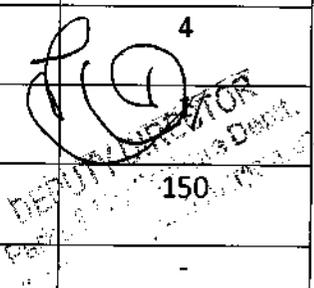
Area: FROM : BILAL ROUND ABOUT TO SINGER ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	625	1434	-	-	784	2843
2	Olevendar	-	1	-	-	-	1
3	Bogenvellia	15	2	-	-	6	23
4	Neem	27	28	-	-	56	111
5	Date Palm	-	9	-	-	21	30
6	Terminalia	-	-	-	-	-	-
7	Bari	2	5	-	-	10	17
8	Gul Mohar	-	2	-	-	10	12
9	Apple Apple	-	1	-	-	22	23
10	Keeker	9	10	-	-	3	22
11	Dum Dum.	1000	100	-	-	70	1170
12	Eucalyptus	6	4	-	-	-	
13	Coconut	-	-	-	-	21	


  
 DEPUTY DIRECTOR  
 Forest Department  
 Punjab

Area: FROM : BILAL ROUND ABOUT TO SINGER ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	9	1	-	-	3	11
15	Lignum	4	4	-	-	-	8
16	Pepal	2	4	-	-	26	32
17	Tecomastan	-	-	-	-	10	10
18	Moringa	-	2	-	-	9	11
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	5	-	-	1	6
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	1	-	-	-	1
23	Ficus	15	1	-	-	234	250
24	Dryceenia	-	-	-	-	-	-
25	Burh	1	-	-	-	3	4
26	Mango tree	1	-	-	-	-	-
27	Aranthemium	150	-	-	-	-	150
28	Jaman	-	-	-	-	-	-


  
 DEPUTY INSPECTOR  
 PIMPRI CHINCHWAD DISTRICT



Area: FROM : SINGER ROUND ABOUT TO MURTAZA ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	8	1358	-	-	757	2123
2	Olevendar	-	-	-	-	-	-
3	Bogenvellia	4	46	-	-	18	68
4	Neem	135	175	-	-	46	356
5	Date Palm	4	11	-	-	3	18
6	Terminalia	-	-	-	-	-	-
7	Bari	17	100	-	-	19	136
8	Gul Mohar	1	12	-	-	-	13
9	Apple Apple	-	10	-	-	-	10
10	Keeker	224	57	-	-	22	323
11	Dum Dum.	-	200	-	-	10	210
12	Eucalyptus	-	-	-	-	-	-
13	Coconut	-	-	-	-	1	1

DEPUTY DIRECTOR  
 Planning & Development  
 District Administration  
 District Administration

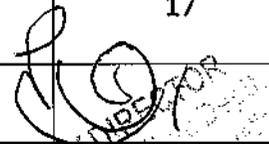
Area: FROM : SINGER ROUND ABOUT TO MURTAZA ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	15	-	-	-	-	15
15	Lignum	-	27	-	-	103	130
16	Pepal	4	37	-	-	19	60
17	Tecomastan	-	-	-	-	-	-
18	Moringa	2	-	-	-	17	19
19	Badam	6	7	-	-	1	14
20	Sukhechain	4	-	-	-	-	4
21	Jungle jalabi	-	10	-	-	-	10
22	Imli	-	-	-	-	-	-
23	Ficus	33	34	-	-	13	80
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	4	-	-	-	4



Area: FROM : MURTAZA ROUND ABOUT TO FUTURE ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	-	1134	-	-	247	1381
2	Olevendar	-	-	-	-	-	-
3	Bogenvellia	-	12	-	-	06	18
4	Neem	199	41	-	-	51	291
5	Date Palm	01	09	-	-	05	15
6	Terminalia	-	-	-	-	-	-
7	Bari	20	04	-	-	09	33
8	Gul Mohar	-	03	-	-	10	14
9	Apple Apple	-	-	-	-	-	-
10	Keeker	84	35	-	-	318	437
11	Dum Dum.	-	30	-	-	-	30
12	Eucalyptus	12	04	-	-	01	17
13	Coconut	-	-	-	-	-	-

  
 DEPUTY INSPECTOR  
 P. O. Box No. 1000, GPO, Lahore  
 Pakistan

Area: FROM : MURTAZA ROUND ABOUT TO FUTURE ROUND ABOUT

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	21	-	-	-	21
15	Lignum	-	07	-	-	3	10
16	Pepal	04	08	-	-	19	31
17	Tecomastan	-	-	-	-	-	-
18	Moringa	19	03	-	-	-	22
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	-	-	11	11
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	-	-
23	Ficus	-	110	-	-	-	110
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	05	05

DEPUTY DIRECTOR  
 PUNJAB AGRICULTURE  
 LUDHIANA



Area: FROM : FUTURE ROUND ABOUT TO DEPO

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	12	-	-	-	-	12
2	Olevendar	-	-	-	-	-	-
3	Bogenvellia	-	-	-	-	-	-
4	Neem	8	-	-	-	-	8
5	Date Palm	2	-	-	-	-	2
6	Terminalia	-	-	-	-	-	-
7	Bari	-	-	-	-	-	-
8	Gul Mohar	-	-	-	-	-	-
9	Apple Apple	-	-	-	-	-	-
10	Keeker	-	-	-	-	-	-
11	Dum Dum.	20	-	-	-	-	20
12	Eucalyptus	-	-	-	-	-	-
13	Coconut	-	-	-	-	-	-

  
 DEPUTY DIRECTOR  
 Parks & Horticulture  
 Muzaffargarh District  
 Muzaffargarh

Area: FROM : FUTURE ROUND ABOUT TO DEPO

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	-	-	-	-	-	-
16	Pepal	4	-	-	-	-	4
17	Tecomastan	-	-	-	-	-	-
18	Moringa	-	-	-	-	-	-
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	-	-	-	-
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	-	-
23	Ficus	-	-	-	-	-	-
24	Dryceenia	-	-	-	-	-	-
25	Burh	-	-	-	-	-	-
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-

*(Handwritten signature and stamp)*  
 Date: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Name: \_\_\_\_\_  
 Designation: \_\_\_\_\_



Area: FROM : DEPO TO INSIDE DEPO

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
1	Caronocarps	2	-	-	-	-	2
2	Olevendar	-	-	-	-	-	-
3	Bogenvellia	-	-	-	-	-	-
4	Neem	1	-	-	-	-	1
5	Date Palm	-	-	-	-	-	-
6	Terminalia	-	-	-	-	-	-
7	Bari	1	-	-	-	-	1
8	Gul Mohar	-	-	-	-	-	-
9	Apple Apple	-	-	-	-	-	-
10	Keeker	-	-	-	-	-	-
11	Dum Dum.	-	-	-	-	-	-
12	Eucalyptus	1	-	-	-	-	-
13	Coconut						

  
 DEPUTY DIRECTOR  
 Peatland Development  
 Ministry of Natural Resources  
 and Environment

Ecological Survey

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Area: FROM : DEPO TO INSIDE DEPO

SNo	Species Name	Central Island	Services Land (Left Side)		Service Land (Right Side)		Remarks
			Left	Right	Left	Right	
14	Palm	-	-	-	-	-	-
15	Lignum	-	-	-	-	-	-
16	Pepal	8	-	-	-	-	8
17	Tecomastan	-	-	-	-	-	-
18	Moringa	-	-	-	-	-	-
19	Badam	-	-	-	-	-	-
20	Sukhechain	-	-	-	-	-	-
21	Jungle jalabi	-	-	-	-	-	-
22	Imli	-	-	-	-	-	-
23	Ficus	-	-	-	-	-	-
24	Dryceenia	-	-	-	-	-	-
25	Burh	2	-	-	-	-	2
26	Mango tree	-	-	-	-	-	-
27	Aranthemium	-	-	-	-	-	-
28	Jaman	-	-	-	-	-	-



## **ANNEX-VI-B: NESPAK TREE INVENTORY DATA**

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area:** FROM: **NUMAISH ROUND ABOUT TO SOCIETY OFFICE SIGNAL**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	2	3	-	5 Nos
2.	Olevendar	-	-	-	-
3.	Bogenvellia	-	-	-	-
4.	Neem	-	2	-	2 Nos
5.	Date Palm	-	-	-	-
6.	Terminalia	-	-	-	-
7.	Bari	-	-	-	-
8.	Gul Mohar	-	-	-	-
9.	Apple Apple	-	-	-	-
10.	Keeker	-	-	-	-
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	1	-	-	1 Nos
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	-	-	-	-
17.	Tecomastan	-	-	-	-
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areliia	-	-	-	-
32.	Champa	-	-	-	-
33.	Chandni	-	-	-	-
34.	Pasonia	-	-	-	-

35.	Raintree	-	-	-	-	
36.	Gondni	-	-	-	-	
					<b>Total</b>	<b>8 Nos</b>

**Ecological Survey**

Dated \_\_\_\_\_/2023

Area: FROM: **SOCIETY OFFICE SIGNAL TO NORANI KABAB SIGNAL**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	165	28	183 Nos
2.	Olevendar	-	10	-	10 Nos
3.	Bogenvellia	-	22	6	28 Nos
4.	Neem	-	36	24	60 Nos
5.	Date Palm	-	9	6	15 Nos
6.	Terminalia	-	-	-	-
7.	Bari	-	-	6	6 Nos
8.	Gul Mohar	-	-	-	-
9.	Apple Apple	-	-	-	-
10.	Keeker	-	-	-	-
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	-	15	2	17 Nos
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-

15.	Lignum	-	5	-	5 Nos
16.	Pepal	-	-	-	
17.	Tecomastan	-	-	-	
18.	Moringa	-	2	-	2 Nos
19.	Badam	-	-	-	
20.	Sukhechain	-	-	3	3 Nos
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-			
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areliia	-	-	-	-
32.	Champa	-	-	-	-
33.	Chandni	-	-	-	-

34.	Pasonia	-	-	-	
35.	Thispasia	-	2	-	2 Nos
36.	Nasora	-	2	-	2 Nos
37.	Alastonia		2	-	2 Nos
38.	Thawatia	-	9	-	9 Nos
39.	Chaina Badam	-	1	-	1 Nos
40.	Raintree	-	1	-	1 Nos
41.	Table palm	-	1	-	1 Nos
42.	Gul mohar	-	1	-	1 Nos
43.	Chmpa	-	-	3	3 Nos
44.	Bagain	-	-	-	-
45.	Gondni	-	1	-	1 Nos
46.	Ashook pentotia	-	-	1	1 Nos
<b>Total</b>					<b>353</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

Area: FROM: NORANI KABAB SIGNAL TO TARIQ ROAD SIGNAL

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	18	17	35 Nos
2.	Olevendar	-	-	4	4 Nos
3.	Bogenvellia	-	5	6	11 Nos
4.	Neem	-	24	17	41 Nos
5.	Date Palm	-	2	11	13 Nos
6.	Terminalia	-	-	-	-
7.	Bari	-	-	4	4 Nos
8.	Gul Mohar	-	-	-	-
9.	Apple Apple	5	-	-	5 Nos
10.	Keeker	2	-	-	2 Nos
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	5	-	5 Nos

16.	Pepal	-	2	4	6 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	-	2	-	2 Nos
19.	Badam	-	1	-	1 Nos
20.	Sukhechain	-	-	3	3 Nos
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	1	-	1 Nos
23.	Ficus	-	3	1	4 Nos
24.	Dryceenia	5			5 Nos
25.	Burh	2	-	-	2 Nos
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areliia	-	-	2	2 Nos
32.	Champa	-	-	-	-
33.	Chandni	-	-	-	-
34.	Pasonia	5	-	-	5 Nos

35.	Thispasia	-	1	-	1 Nos
36.	Pilloo	-	3	-	3 Nos
37.	Ashook pentolata	-	-	-	-
<b>Total</b>					<b>115 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area:** FROM: **TARIQ ROAD SIGNAL TO CONNECTING BRIDGE SHAHRAH-E-FAISAL**

S. No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	14	17	19	50 Nos
2.	Olevendar + Thawatia	68	-	13	81 Nos
3.	Bogenvellia	10	3	17	30 Nos
4.	Neem	-	28	22	50 Nos
5.	Date Palm	7	3	2	12 Nos
6.	Terminalia	-	3	3	6 Nos
7.	Bari	2	-	4	4 Nos
8.	Gul Mohar	2	3	3	8 Nos
9.	Apple Apple	-	-	-	-
10.	Keeker	1	2	-	3 Nos
11.	Dum Dum.	9	6	-	15 Nos
12.	Eucalyptus	-	22	18	40 Nos
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	-	13	13 Nos

16.	Pepal	-	2	4	6 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	-	2	9	9 Nos
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	1	1 Nos
22.	Imli	-	1	-	1 Nos
23.	Ficus	-	8	-	8 Nos
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	1	1	-	2 Nos
31.	Areli	-	-	-	-
32.	Champa	-	2	-	2 Nos
33.	Chandni	-	-	-	-
34.	Pasonia	-	-	-	-

35.	Bagain	1	-	-	1 Nos
36.	Pillo	-	-	1	1 Nos
37.	Silver palm	-	6	-	6 Nos
38.	Akashia	-	1	-	1 Nos
39.	Pechartia palm	-	4	-	4 Nos
40.	Mixed shrub	100	-	-	100 Nos
41.	Palms	-	-	-	-
42.	Papaya	-	-	-	-
43.	Arelia	-	-	-	-
<b>Total</b>					<b>454 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

Area: FROM: AROUND THE BRIDGE OF SHAHRAH-E-FAISAL

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	-	-	-
2.	Olevendar/Thawatia	-	-	-	-
3.	Bogenvellia	-	-	-	-
4.	Neem	-	-	-	-
5.	Date Palm	-	-	-	-
6.	Terminalia	-	-	-	-
7.	Bari	-	-	-	-
8.	Gul Mohar	-	-	-	-
9.	Apple	-	-	-	-
10.	Keeker	-	-	-	-
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	-	-	-	-
17.	Tecomastan	-	-	-	-
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Arelia	-	-	-	-
<b>Total</b>					<b>0 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area: FROM: NURSERY STOP SHAHRAH-E-FAISAL TO FTC BUILDING CORNER**

S. No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	265	694	233	1192 Nos
2.	Olevendar + Thawatia	100	-	-	100 Nos
3.	Bogenvellia	34	3	3	40 Nos
4.	Neem	-	1	13	14 Nos
5.	Date Palm	-	6	17	23 Nos
6.	Terminalia	1	3	-	4 Nos
7.	Bari	1	2	4	7 Nos
8.	Gul Mohar	-	5	-	5 Nos
9.	Apple Apple	-	-	-	-
10.	Keeker	1	2	-	3 Nos
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	-	1	-	1 Nos
13.	Coconut	-	-	-	-
14.	Palm	-	8	-	8 Nos
15.	Lignum	117	35	51	203 Nos

16.	Pepal	-	-	5	5 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	-	-	-	-
19.	Badam	6	1	3	10 Nos
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	1	-	1	2 Nos
22.	Imli	-	-	-	-
23.	Ficus	-	8	-	8 Nos
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areliia	-	1	-	1 Nos
32.	Champa	-	2	-	2 Nos
33.	Chandni	-	-	-	-
34.	Pasonia	-	8	1	7 Nos

35.	Gondni	-	5	-	5 Nos
36.	Pihoforam	-	11	-	11 Nos
37.	Silver palm	-	-	-	-
38.	Akeshia	-	1	-	1 Nos
39.	Foxtel palm	-	-	-	-
40.	Pechartia palm	-	4	--	4 Nos
41.	American palm	5	-	-	5 Nos
42.	Kajalia phanata	1	--	1	2 Nos
43.	Bushes carono	-	-	2	2 Nos
44.	Mixed shubs	-	-	-	-
45.	Caronacrps bush	-	20	-	20 Nos
46.	Pepal	-	1	-	1 Nos
<b>Total</b>					<b>1686 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area: FROM: OPP: FTC BUILDING TIKONA TO UNDER BRIDGE**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	-	-	-
2.	Olevendar/Thawatia	-	-	-	-
3.	Bogenvellia	-	-	-	-
4.	Neem	4	-	-	4 Nos
5.	Date Palm	13	-	-	13 Nos
6.	Terminalia	9	-	-	9 Nos
				<b>Total</b>	<b>26 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area:** FROM: **FTC BUILDING TO DHA OFFICE SIGNAL**

S. No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	151	181	332 Nos
2.	Olevendar	-	22	2	24 Nos
3.	Bogenvellia	30	45	72	147 Nos
4.	Neem	7	46	54	107 Nos
5.	Date Palm	24	22	1	47 Nos
6.	Terminalia		6	21	27 Nos
7.	Bari	18	9	12	39 Nos
8.	Gul Mohar	-	5	77	82 Nos
9.	Apple Apple	-	-	2	2 Nos
10.	Keeker	-	-	5	5 Nos
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	45	30	70 Nos
14.	Palm	-	-	-	-
15.	Lignum	-	-	14	14 Nos

16.	Pepal	-	14	51	65 Nos
17.	Tecomastan	-	23	-	23 Nos
18.	Moringa	-	4	15	19 Nos
19.	Badam	15	-	18	33 Nos
20.	Sukhechain	-	-	1	1 Nos
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	12	12 Nos
23.	Ficus	-	-	-	-
24.	Dryceenia	-	3	-	3 Nos
25.	Burh	-	-	-	-
26.	Mengo tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	1	-	-	1 Nos
29.	Ixzora	-	-	22	22 Nos
30.	Jetropa	-	-	-	-
31.	Areli	-	-	-	-
32.	Champa	-	-	-	-
33.	Chandni	-	-	-	-
34.	Pasonia	-	-	-	-

35.	Thispasia	-	-	-	
36.	Croton	-	-	-	
37.	China Palm	-	-	-	
38.	Bakain	-	-	-	
39.	Gondni	-	1	-	1 Nos
40.	Pillo	-	1	-	1 Nos
41.	ASHOOK Pentolats	-		-	
42.	Silver Palm	-	19	-	19 Nos
43.	Akashia	56	6	1	63 Nos
44.	Arocera	-	-	-	-
45.	Tabobnia	12	12	-	24 Nos
46.	Amaltas	1	1	47	49 Nos
47.	Anjeer	-		-	-
48.	African Tulips	-	39	-	39 Nos
49.	Traingle Palm	5	-	-	5 Nos
50.	Chercoo	-	2	-	2 Nos
51.	Habicus	-	8		8 Nos
52.	Agave	2	-		2 Nos
53.	Caronocarpus Bush	3		12	15 Nos

54.	Damdaim Bushes	49	27	-	76 Nos
55.	Dorants	-	-	-	-
56.	Ficus Haiges	-	-	-	-
57.	Cycus Palm	-	-	-	-
58.	Coronocorpas Haiges	-	45	-	45 Nos
59.	Mixed Shrubs	-	-	-	-
60.	Sheesham	-	1	-	1 Nos
<b>Total</b>					<b>1425 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area: FROM: DHA OFFICE SIGNAL TO DEFENCE ROUNDABOUT**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	69	20	89 Nos
2.	Olevendar/Thawatia	77	3	25	105 Nos
3.	Bogenvellia	-	62	116	178 Nos
4.	Neem	14	7	58	79 Nos
5.	Date Palm	23	19	72	114 Nos
6.	Terminalia	-	6	23	29 Nos
7.	Bari	-	2	-	2 Nos
8.	Gul Mohar	25	7	24	56 Nos
9.	Apple	1	2	-	3 Nos
10.	Keeker	-	-	1	1 Nos
11.	Dum Dum.	1	24	89	114 Nos
12.	Eucalyptus	-	2	-	2 Nos
13.	Coconut	12	52	-	64 Nos
14.	Palm	1	20	14	35 Nos
15.	Lignum	-	34	10	44 Nos

16.	Pepal	-	3	32	34 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	2	-	-	2 Nos
19.	Badam	1	-	9	10 Nos
20.	Sukhechain	-	15	-	15 Nos
21.	Jungle jalabi	-	3	4	7 Nos
22.	Imli	-	1	-	1 Nos
23.	Ficus	-	18	66	84 Nos
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	40	40 Nos
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areli	-	-	-	-
32.	Champa	-	-	12	12 Nos
33.	Chandni	-	-	-	-
34.	Pasonia	-	5	-	5 Nos

35.	Thispacia	-	38	-	38 Nos
36.	Alstonia	-	4	-	4 Nos
37.	China Badam	-	-	-	-
38.	Raintry	-	8	-	8 Nos
39.	Baqaeen	-	1	-	1 Nos
40.	Papaya	-	-	-	-
41.	Crotan	-	-	24	24 Nos
42.	Ulta Ashok	-	-	-	-
43.	Akaishia	3	-	-	3 Nos
44.	Boganvella Bush	5	-	-	5 Nos
45.	Kajalia Fannata	-	2	-	2 Nos
46.	Tebobia	-	32	-	32 Nos
47.	Taali	-	-	-	-
48.	Indian Tulips	-	-	-	-
49.	Triangle Palm	-	3	-	3 Nos
50.	Anaar	-	-	-	-
51.	Arenthimam	-	6	-	6 Nos
52.	Ground Cover (Bushes)	-	20	-	20 Nos
<b>Total</b>					<b>1271 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area:** FROM: DEFENCE SIGNAL to AKHTER COLONY

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	30	-	30 Nos
2.	Olevendar/Thawatia	-	59	-	59 Nos
3.	Bogenvellia	32	8	-	38 Nos
4.	Neem	-	15	-	15 Nos
5.	Date Palm	-	-	-	-
6.	Terminalia	47	8	-	55 Nos
7.	Bari	-	-	-	-
8.	Gul Mohar	-	12	-	12 Nos
9.	Apple	-	-	-	-
10.	Keeker	-	3	2	5 Nos
11.	Dum Dum.	-	35	-	35 Nos
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	7	-	7 Nos
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	-	3	-	3 Nos
17.	Tecomastan	-	12	-	12 Nos
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	-	29	-	29 Nos
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	3	-	3 Nos
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areli	-	-	-	-
32.	Champa	-	-	-	-
33.	Chandni	-	-	-	-
34.	Pasonia	-	-	-	-

35.	Thispacia	-	41	-	41 Nos
36.	Baqaeen	-	11	-	11 Nos
37.	Ashok Pentoleta	-	1	-	1 Nos
38.	Tebobia	-	6	-	6 Nos
<b>Total</b>					<b>362 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area:** FROM: **AKHTER COLONY TO QAYUMABAD ROUNDABOUT**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	27	-	27 Nos
2.	Olevendar/Thawatia	-	13	-	13 Nos
3.	Bogenvellia	-	-	-	
4.	Neem	-	33	-	33 Nos
5.	Date Palm	-	-	-	-
6.	Terminalia	-	-	-	-
7.	Bari	-	1	-	1 Nos
8.	Gul Mohar	-	-	-	-
9.	Apple	-	-	-	-
10.	Keeker	-	-	-	-
11.	Dum Dum.	-	1	-	1 Nos
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	-	1	-	1 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	-	5	-	5 Nos
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Baqeen	-	6	-	6 Nos
<b>Total</b>					<b>87 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area:** FROM: **UNDER ROUNDABOUT OF QAYUMABAD**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	2	-	-	2 Nos
2.	Olevendar/Thawatia	13	-	-	13 Nos
3.	Bogenvellia	4	-	-	4 Nos
4.	Neem	1	-	-	1 Nos
5.	Date Palm	7	-	-	7 Nos
6.	Terminalia	-	-	-	-
7.	Bari	-	-	-	-
8.	Gul Mohar	40	-	-	40 Nos
9.	Apple	-	-	-	-
10.	Keeker	-	-	-	-
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	1	-	-	1 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	13	-	-	13 Nos
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	2	-	-	1 Nos
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	1	-	-	1 Nos
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Chandni	-	-	-	-
32.	Pasonia	7	-	-	7 Nos
33.	Lisora	2	-	-	2 Nos
<b>Total</b>					<b>92 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area: FROM: JAM SADIQ BRIDGE TO BROOK ROUND ABOUT**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	614	-	-	614 Nos
2.	Olevendar	125	-	-	125 Nos
3.	Bogenvellia	135	-	-	135 Nos
4.	Neem	15	-	-	15 Nos
5.	Date Palm	-	-	-	-
6.	Terminalia	-	-	-	-
7.	Bari	01	-	-	1 Nos
8.	Gul Mohar	03	-	-	3 Nos
9.	Apple Apple	-	-	-	-
10.	Keeker	-	-	-	-
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	21	-	-	21 Nos

16.	Pepal	-	-	07	7 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	01	-	-	1 Nos
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mengo tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areliia	-	-	-	-
32.	Pasonia	-	-	-	-
<b>Total</b>					<b>922 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area:** FROM: **BROOK ROUND ABOUT TO CHAMRA ROUND ABOUT**

S. No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	1092	-	-	1092 Nos
2.	Olevendar	128	-	-	128 Nos
3.	Bogenvellia	51	-	-	51 Nos
4.	Neem	48	-	-	48 Nos
5.	Date Palm	1	-	-	1 Nos
6.	Terminalia	3	-	-	3 Nos
7.	Bari	5	-	-	5 Nos
8.	Gul Mohar	1	-	-	1 Nos
9.	Apple Apple	2	-	-	2 Nos
10.	Keeker	10	-	-	10 Nos
11.	Dum Dum.	3	-	-	3 Nos
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	-	-	-	-
17.	Tecomastan	-	-	-	-
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areli	-	-	-	-
32.	Pasonia	-	-	-	-
<b>Total</b>					<b>1344 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area: FROM: CHAMRA ROUND ABOUT TO VETA ROUND ABOUT**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	534	-	-	534 Nos
2.	Olevendar	24	-	-	24 Nos
3.	Bogenvellia	32	-	-	32 Nos
4.	Neem	10	-	-	10 Nos
5.	Date Palm	11	-	-	11 Nos
6.	Terminalia	-	-	-	-
7.	Bari	5	-	-	5 Nos
8.	Gul Mohar	-	-	-	-
9.	Apple Apple	-	-	-	-
10.	Keeker	24	-	-	24 Nos
11.	Dum Dum.	47	-	-	47 Nos
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	8	-	-	8 Nos
15.	Lignum	13	-	-	13 Nos

16.	Pepal	-	-	-	-
17.	Tecomastan	2	-	-	2 Nos
18.	Moringa	-	-	-	
19.	Badam	-	-	-	
20.	Sukhechain	3	-	-	3 Nos
21.	Jungle jalabi	-	-	-	
22.	Imli	-	-	-	
23.	Ficus	14	-	-	14 Nos
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Champa	-	-	-	-
31.	Chandni	-	-	-	-
32.	Pasonia	-	-	-	-
<b>Total</b>					<b>727 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area:** FROM: VETA ROUND ABOUT TO BILAL ROUND ABOUT

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	89	-	-	89 Nos
2.	Olevendar	-	-	-	
3.	Bogenvellia	39	-	-	39 Nos
4.	Neem	1	-	-	1 Nos
5.	Date Palm	1	-	-	1 Nos
6.	Terminalia	-	-	-	-
7.	Bari	-	-	-	-
8.	Gul Mohar	27	-	-	27 Nos
9.	Apple Apple		-	-	
10.	Keeker	4	-	-	4 Nos
11.	Dum Dum.	43	-	-	43 Nos
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	11	-	-	11 Nos
15.	Lignum	22	-	-	22 Nos

16.	Pepal	-	-	-	-
17.	Tecomastan				-
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	5	-	-	5 Nos
21.	Jungle jalabi	-	-	-	-
22.	Imli	1	-	-	1 Nos
23.	Ficus	54	-	-	54 Nos
24.	Dryceenia	40	-	-	40 Nos
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areli	-	-	-	-
32.	Champa	-	-	-	-
33.	Chandni	-	-	-	-
34.	Pasonia	-	-	-	-

35.	Baqain	7			7 Nos
36.	Ikra	23			23 Nos
37.	Mix	37			37 Nos
<b>Total</b>					<b>404 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

Area: FROM: BILAL ROUND ABOUT TO SINGER ROUND ABOUT

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Caronocarps	157	-	-	157 Nos
2.	Olevendar	-	-	-	-
3.	Bogenvellia	32	-	-	32 Nos
4.	Neem	27	-	-	27 Nos
5.	Date Palm	-	-	-	-
6.	Terminalia	-	-	-	-
7.	Bari	2	-	-	2 Nos
8.	Gul Mohar	-	-	-	-
9.	Apple Apple	-	-	-	-
10.	Keeker	9	-	-	9 Nos
11.	Dum Dum.	110	-	-	110 Nos
12.	Eucalyptus	6	-	-	6 Nos
13.	Coconut	-	-	-	-
14.	Palm	9	-	-	9 Nos
15.	Lignum	4	-	-	4 Nos

16.	Pepal	2	-	-	2 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	15	-	-	15 Nos
24.	Dryceenia	-	-	-	-
25.	Burh	1	-	-	1 Nos
26.	Mango tree	1	-	-	1 Nos
27.	Aranthemium	92	-	-	92 Nos
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Champa	-	-	-	-
31.	Chandni	-	-	-	-
32.	Pasonia	-	-	-	-
<b>Total</b>					<b>467 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area: FROM: SINGER ROUND ABOUT TO MURTAZA ROUND ABOUT**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Caronocarps	8	-	-	8 Nos
2.	Olevendar	-	-	-	-
3.	Bogenvellia	4	-	-	4 Nos
4.	Neem	27	-	-	27 Nos
5.	Date Palm	4	-	-	4 Nos
6.	Terminalia	-	-	-	-
7.	Bari	17	-	-	17 Nos
8.	Gul Mohar	1	-	-	1 Nos
9.	Apple Apple	-	-	-	-
10.	Keeker	8	-	-	8 Nos
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	15	-	-	15 Nos
15.	Lignum	-	-	-	-

16.	Pepal	4	-	-	4 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	2	-	-	2 Nos
19.	Badam	6	-	-	6 Nos
20.	Sukhechain	4	-	-	4 Nos
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	14	-	-	14 Nos
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areli	-	-	-	-
32.	Champa	-	-	-	-
33.	Chandni	-	-	-	-
<b>Total</b>					<b>114 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area: FROM: MURTAZA ROUND ABOUT TO FUTURE ROUND ABOUT**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	-	-	-	-
2.	Olevendar	-	-	-	-
3.	Bogenvellia	-	-	-	-
4.	Neem	29	-	-	29 Nos
5.	Date Palm	01	-	-	01 Nos
6.	Terminalia	-	-	-	-
7.	Bari	13	-	-	13 Nos
8.	Gul Mohar	-	-	-	-
9.	Apple Apple	-	-	-	-
10.	Keeker	24	-	-	24 Nos
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	12	-	-	12 Nos
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	04	-	-	04 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	19	-	-	19 Nos
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Champa	-	-	-	-
29.	Chandni	-	-	-	-
30.	Arandi	-	-	-	-
31.	Pasonia	-	-	-	-
32.	Akrda	22	-	-	22 Nos
33.	Mix .	-	-	-	-
<b>Total</b>					<b>124 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

**Area: FROM: FUTURE ROUND ABOUT TO DEPO**

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Caronocarps	12	-	-	12 Nos
2.	Olevendar	-	-	-	-
3.	Bogenvellia	-	-	-	-
4.	Neem	8	-	-	8 Nos
5.	Date Palm	2	-	-	2 Nos
6.	Terminalia	-	-	-	-
7.	Bari	-	-	-	-
8.	Gul Mohar	-	-	-	-
9.	Apple Apple	-	-	-	-
10.	Keeker	-	-	-	-
11.	Dum Dum.	20	-	-	20 Nos
12.	Eucalyptus	-	-	-	-
13.	Coconut	-	-	-	-
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	4	-	-	4 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-	-	-	-
25.	Burh	-	-	-	-
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areli	-	-	-	-
32.	Champa	-	-	-	-
33.	Chandni	-	-	-	-
<b>Total</b>					<b>46 Nos</b>

**Ecological Survey**

Date \_\_\_\_\_/2023

Area: FROM: DEPO TO INSIDE DEPO

S.No	Species Name	Central Island	Services Land (Left Side)	Services Land (Right Side)	Remarks
			Right	Left	
1.	Conocarpus	2	-	-	2 Nos
2.	Olevendar	-	-	-	-
3.	Bogenvellia	-	-	-	-
4.	Neem	1	-	-	1 Nos
5.	Date Palm	-	-	-	-
6.	Terminalia	-	-	-	-
7.	Bari	1	-	-	1 Nos
8.	Gul Mohar	-	-	-	-
9.	Apple Apple	-	-	-	-
10.	Keeker	-	-	-	-
11.	Dum Dum.	-	-	-	-
12.	Eucalyptus	1	-	-	1 Nos
13.	Coconut		-	-	
14.	Palm	-	-	-	-
15.	Lignum	-	-	-	-

16.	Pepal	8	-	-	8 Nos
17.	Tecomastan	-	-	-	-
18.	Moringa	-	-	-	-
19.	Badam	-	-	-	-
20.	Sukhechain	-	-	-	-
21.	Jungle jalabi	-	-	-	-
22.	Imli	-	-	-	-
23.	Ficus	-	-	-	-
24.	Dryceenia	-	-	-	-
25.	Burh	2	-	-	2 Nos
26.	Mango tree	-	-	-	-
27.	Aranthemium	-	-	-	-
28.	Jaman	-	-	-	-
29.	Ixzora	-	-	-	-
30.	Jetropa	-	-	-	-
31.	Areliya	8	-	-	8 Nos
32.	Chandni	-	-	-	-
<b>Total</b>					<b>23 Nos</b>

Note: Currently, a very wide central island / Median is available along the 8000 road. It is proposed to maintain the width of Central Island up to 10 meters to maintain horizontal and vertical clearance required for the safety purposes as per NEPRA / KE standards. About 1 to 3 meters of the central island / median along the 8000 road will be utilized for the construction of dedicated BRT Corridor as per site condition.

## **ANNEXURE-VII: SURVEY TOOLS**

**SINDH MASS TRANSIT AUTHORITY (SMTA)  
KARACHI MOBILITY PROJECT  
YELLOW BUS RAPID TRANSIT CORRIDOR  
Questionnaire for Socioeconomic Survey  
(Both for Male and Female)**

Name of the Interviewer \_\_\_\_\_ Date: \_\_\_\_\_

(a) Town / Settlement \_\_\_\_\_ (b) District: \_\_\_\_\_

1. Name of the Respondent \_\_\_\_\_ Father's Name \_\_\_\_\_

2. Contact Number \_\_\_\_\_

3. Sex a. Male b. Female c. Transgender

4. What is your Religion? \_\_\_\_\_ What is your Caste? \_\_\_\_\_

5. What is your age?

a. 18-25 b. 26-35 c. 36-45 d. Above 45

6. Marital Status: a. Married b. Unmarried c. Divorced / Widow

7. What is your caste /ethnic group? \_\_\_\_\_

8. What is your mother tongue? \_\_\_\_\_

9. What is your education?

a. Illiterate b. Primary c. Middle d. Metric  
e. Intermediate f. Graduation g. Above Graduation

10. What is your profession?

a. Govt. Job b. Private Job c. Business / Shop d. Labor  
e. Farmer f. Student g. Any other (Please Specify) \_\_\_\_\_

11. What are your normal working hours? \_\_\_\_\_

12. How many family Members are earning? Male \_\_\_\_\_ Female \_\_\_\_\_ Total \_\_\_\_\_

13. What is your average family monthly income (Rs)? \_\_\_\_\_

14. How much is your average family monthly expenditures (Rs)? \_\_\_\_\_

15. What is the type of your family system? 1. Joint 2. Nuclear

16. Total number of family members? 1. Male \_\_\_\_\_ 2. Female \_\_\_\_\_

17. Children up to 10 years of age: Male \_\_\_\_\_ Female \_\_\_\_\_

Educational status of the family members:

Level of Education	Male	Female	Total
Illiterate			
Primary			
Middle			
Matric			
Intermediate			
Graduate			
Post Graduate and above			
Other			

18. What is type of ownership of your Residential Structure (house )?

1. Self-Owned 2. Rented 3. Encroachers/Squatters

19. What is type of construction of your residential structure?



Service? Service availability\_\_\_ Privacy\_\_\_ Seat Comfort\_\_\_ Ease of Entering/Exiting the Bus\_\_\_  
 Ease of Payment\_\_\_Cleanliness \_\_\_Availability of Wheelchair Space \_\_\_ Safety in the Vehicle\_\_\_\_\_  
 Any other\_\_\_\_\_ Don't know/no answer\_\_\_\_\_

34. Facilities in or nearby the proposed project area?

Facilities	Yes	No	Level	Distance from	Satisfaction (Yes-No.)
1. Educational Institutions					
2. Health Facilities					
3. Religious Place (Mosque / Graveyard)					
4. Recreational Place					
6. Public Transport					
7. Water supply					
8. Solid waste Management					
9. Swearage System					
10. Electricicy					
11. Gas					
12. Telecom					

35. In case of No satisfaction, what are the reasons of dissatisfaction ?

\_\_\_\_\_

36. Does any NGO Exist in your Area? Yes\_\_\_\_\_ No\_\_\_\_\_

If yes, Name of NGO:\_\_\_\_\_ Area of Work:\_\_\_\_\_

Are you member of NGO? Yes\_\_\_\_\_ No\_\_\_\_\_

If yes, role in NGO: \_\_\_\_\_

37. (a)Harassment, Violence and Safety/Security

Have you ever faced harassment and violence during travelling in the public transport?

Yes\_\_\_\_\_ No \_\_\_\_\_ If Yes, Type: \_\_\_\_\_

Have you ever faced crime and security issue during traveling on the road? Yes: \_\_\_ NO.\_\_\_\_

If yes, how many times? \_\_\_\_\_ Where? \_\_\_\_\_

What kind of security issues and criminal situation have you faced? : \_\_\_\_\_

\_\_\_\_\_

and what kind of assets you lost? \_\_\_\_\_

Any complaint or voice raised against violence and Harassment to NGO or Police?

Yes\_\_\_\_\_ No \_\_\_\_\_, if yes where \_\_\_\_\_

Was action taken? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what result and consequences of that complaint?\_\_\_\_\_

Are you satisfied with the action taken? Yes: \_\_\_\_\_ No.\_\_\_\_\_

If Not. Why? \_\_\_\_\_

(b) Security and Protection

What kind of personal protections are required for women during traveling ?

Separate Sitting Place at bus station: \_\_\_\_\_ Separate Queue: \_\_\_\_\_

Separate portion in bus: \_\_\_\_\_ Security Staff: \_\_\_\_\_

Any other: \_\_\_\_\_

38. Do you know about the proposed project? Yes \_\_\_\_\_ No. \_\_\_\_\_

39. Is your land or any asset being acquired due to the implementation of this proposed project?

1. Yes                      2. No

If yes, please give details \_\_\_\_\_

40. In your opinion, should this Project be implemented here? 1. Yes \_\_\_\_\_ 2. No \_\_\_\_\_

If Yes, then reason	Response	If No, then reason	Response
1. Improved Transport facilities		1. Loss of Structures	
		1. Loss of income	
2. Creation of job opportunities		3. Dust & noise pollution	
3. Increase in income generating activities		4. Reduction in number of Customers / Loss of business	
4. Value enhancement of the project area		5. Movement problem / Traffic Issue	
5. Any other (please specify)		6. Any other (please specify)	
6. No response		7. No response	

41. In your opinion, what will be possible impacts of this project?

Impacts (During Construction)	Response	Impacts (After Construction)	Response
1. Loss of income		1. Better Public Transport System	
		2. Better Travelling Facilities	
2. Dust & noise issue		3. Employment Opportunities	
3. Traffic issue/ Movement Problem		4. Reduction in traffic congestion on the road	
4. Safety hazards due to Construction		5. Value enhancement of the project area	
5. Privacy issues		6. Improvement in income	
6. Loss of business		6. Easy crossing the road	
7. Loss of Structures		7. Better facilities at Bus Stations	
8. Any other		9. Any other	
9. No response		10. No response	

42. Any other concern with respect to the proposed Yellow BRT corridor Project?

\_\_\_\_\_

43. What protective measures do you suggest to safeguard your interests?

\_\_\_\_\_

In your opinion, what are some pressing needs of this area?

\_\_\_\_\_

44. Have you travelled in Green Line Bus? Yes \_\_\_\_\_ No. \_\_\_\_\_ if yes are you satisfy

with the service being provided Yes\_\_\_\_\_ No.\_\_\_\_\_ if no reasons\_\_\_\_\_

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**Signature of Interviewer**

**SINDH MASS TRANSIT AUTHORITY (SMTA)  
KARACHI MOBILITY PROJECT  
YELLOW BUS RAPID TRANSIT CORRIDOR  
PUBLIC CONSULTATION**

**1- Identification:** Date \_\_\_\_\_

Location/Settlement: \_\_\_\_\_

Tehsil: \_\_\_\_\_ District: \_\_\_\_\_

Location of Meeting \_\_\_\_\_ Resource Person \_\_\_\_\_

Contact No. of Resource Person. \_\_\_\_\_

**2- Introduction of the Project:** \_\_\_\_\_  
\_\_\_\_\_

**3- Transport Problems Faced by the Local Communities in the City:**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**4- Need of the Project:**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**5- Impacts of the Project:** What types of impacts do you expect due to implementation of project in the area?

Positive Impacts:  
\_\_\_\_\_  
\_\_\_\_\_

Negative Impacts:  
\_\_\_\_\_  
\_\_\_\_\_

**6- Question & Response**

Question	Response


**7- Which Type of the facilities are required:**

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**Suggestion of the Participants:**

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**8- General Observations:**

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**9- Concerns of the Participants:**

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**List of Participants**

<b>Sr. No.</b>	<b>Name</b>	<b>Occupation</b>	<b>Signature/ Thumb (Contact Number)</b>



**SINDH MASS TRANSIT AUTHORITY  
KARACHI MOBILITY PROJECT  
YELLOW BUS RAPID TRANSIT CORRIDOR**

**Gender Survey**

**1) Identification:**

Location/Settlement: \_\_\_\_\_

Tehsil: \_\_\_\_\_ District: \_\_\_\_\_ UC \_\_\_\_\_

Age: \_\_\_\_\_ Education: \_\_\_\_\_

**2) What are the main roles and responsibilities of women in following activities?**

Roles	Involvement (%age)
Household Activities	
Income Generation Activities	
Others	

**3) Decision Making:**

Who decides the following household matters?

Men = 1, Women = 2, Both = 3.	
	Decision maker
Education where to send, whom to send	
Transport Facilities (which to avail)	
Health facilities (from where to avail)	
Number of children to have	
Children Marriages	
What HH assets to buy and sell	
Women to work outside home	
Freedom of minor/personal expense	

**4) Access to Transport Facilities**

What is existing transport option in the area?

How often do you use public transport? Daily \_\_\_\_\_ Weekly \_\_\_\_\_

Fortnightly \_\_\_\_\_ Any other \_\_\_\_\_

What is the main purpose/reason of travelling of/using public transport?

\_\_\_\_\_

What are the preferred hours of travelling? \_\_\_\_\_

Are there any problems for women accessing public transport? Yes \_\_\_\_\_ No. \_\_\_\_\_ (if yes) what are the main problems?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

How would you rate the public transport service in your Area/city?

Sr. No.	Parameter	Very Good	Good	Fair	Bad	Very Bad
1	Availability					
2	Fare					
3	Comfort					
4	Safety					
5	Cleanliness					

6	Time Management					
7	Behavior of Driver/Conductor					

If not good reasons: \_\_\_\_\_

Suggestions for improvements? \_\_\_\_\_

**5) Access to Finance**

What kind of financial services (such as banking, micro-finance, savings) are available to women?  
\_\_\_\_\_

What kind of challenges/constraints women face in accessing financial services?  
\_\_\_\_\_

**6) Access and Control over Resources**

What are the common trends of women ownership of land and assets?  
\_\_\_\_\_

What kind of issues, women face in access and control over resources/assets/property?  
\_\_\_\_\_

**7) Access to Income Earning Opportunities**

Are you involved in Income generating activities? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what are common activities? \_\_\_\_\_

Do your male family members encourage female in jobs? Yes: \_\_\_\_\_ No: \_\_\_\_\_  
\_\_\_\_\_

Are women allowed to work outside home? Yes: \_\_\_\_\_ No: \_\_\_\_\_

What are the main constraints for women in accessing economic opportunities?  
\_\_\_\_\_

Do you satisfy with the private wage/salary?

Yes \_\_\_\_\_ No \_\_\_\_\_ if No, how much it should be per day or per month (Rs.) \_\_\_\_\_

Did you allow saving your salary/income independently in a separate bank account,

Yes \_\_\_\_\_ No \_\_\_\_\_, If No, why explain the reason. \_\_\_\_\_

In which area, the female employees spend their salaries or earnings on?

House construction \_\_\_\_\_ Marriage of her children \_\_\_\_\_

Education \_\_\_\_\_ Kitchen \_\_\_\_\_ Other \_\_\_\_\_

What are the key potentials in the area for increasing women's participation in economic activities?  
\_\_\_\_\_

**8) Women's Participation in Local Forums/Training Programs**

What kind of local forums (formal, informal) exist in the area where women can participate?  
\_\_\_\_\_

Are there any cultural norms and social constraints refraining women to participate in the local forums?

---

What are the key potentials for engaging women in the local networks for development e.g. in public transport sector?

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Do women participate in training programs offered by development partners (NGOs/CSOs)? What kind of training programs has been imparted?

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### 9) Harassment, Violence and Safety/Security

Have you ever faced harassment and violence during travelling in the public transport?

Yes \_\_\_\_\_ No \_\_\_\_\_ If Yes, Type: \_\_\_\_\_

Have you ever faced crime and security issue during traveling on the road? Yes: \_\_\_\_\_ NO. \_\_\_\_\_

If yes, how many times? \_\_\_\_\_ Where? \_\_\_\_\_

What kind of security issues and criminal situation have you faced? : \_\_\_\_\_

and what kind of assets you lost? \_\_\_\_\_

Any complaint or voice raised against violence and Harassment to NGO or Police?

Yes \_\_\_\_\_ No \_\_\_\_\_, if yes where \_\_\_\_\_

Was action taken? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what result and consequences of that complaint?  
\_\_\_\_\_

Are you satisfying with the action taken? Yes: \_\_\_\_\_ No. \_\_\_\_\_

If Not. Why? \_\_\_\_\_

### 10) Security and Protection

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What kind of personal protections are required for women during traveling ?

Separate Sitting Place at bus station: \_\_\_\_\_ Separate Queue: \_\_\_\_\_

Separate portion in bus: \_\_\_\_\_ Security Staff: \_\_\_\_\_

Any other: \_\_\_\_\_

### 11) Project Benefits for Women and Participation

What protective measures do you suggest regarding the project implementation?  
\_\_\_\_\_

How project interventions will benefit women?  
\_\_\_\_\_

Which types of facilities are required at bus stations for women passengers?  
\_\_\_\_\_

What kind of negative impacts on women do you expect due of the proposed Project?

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What kind of Positive impacts on women do you expect of the proposed Project?

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What are the key recommendations for maximizing project benefits for women?

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**Participation:**

Which types of facilities are required in bus for women passengers?

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Which types of facilities are required for the protection and safety of women passengers?

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How women's participation could be ensured in the project implementation?

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**12) Employment in SMTA**

*Are you interested to get professional employment in the public transport Sector?*

Yes: \_\_\_\_\_ No: \_\_\_\_\_ If yes, which Sector? \_\_\_\_\_ **as workers in the transport sector, what type of trainings are required?**

---

**13)** What kind of small business you are looking for along the corridor and at the bus stations?

- a) TUC shop
- b) Kiosk (jewelry, newspaper, mobile accessory and recharge, toys etc.)
- c) Any other option

**14) Any other concerns/comments**

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Interviewer's Signature \_\_\_\_\_

## **ANNEXURE-VIII: MALIR RIVER MANAGEMENT PLAN**

## River Malir Mitigation Plan

The purpose of this mitigation plan is to identify the potential risks during construction of and demolition of Jam Sadiq Bridge and hence minimize impacts received by Malir River. Following is Management practices recommended to be followed by Contractor staff during Construction phase:

Sr. No.	River Protection Measures	Management Practices
1.	Work Site Planning and Communication	All site work shall be planned and scheduled before hand and communicated to all the staff and stakeholders.
2.	Operation and maintenance of machinery	<ul style="list-style-type: none"> <li>• Contractor will ensure that the machinery is to arrive on river site in a clean condition and is to be maintained free of fluid leaks.</li> <li>• Contractor will ensure that the machinery is to be washed, refueled and serviced and fuel is to be stored at least 100 m away from the river site to prevent any deleterious substance from entering the water.</li> <li>• machinery is not re-fueled, either within the river bed, on the foreshore or seabed, or within 10 meters of a waterway.</li> <li>• Batching plants should be placed at least 1 Km from Malir River project site.</li> <li>• Water reuse and recycling strategy should be adopted on all batching plants</li> <li>• Implement Emergency Response Procedures in case of any spill hazard in Malir River.</li> </ul>
3.	Construction material storage and stockpiling	<ul style="list-style-type: none"> <li>• stockpiles of construction materials used during active construction works shall be kept at a distance and covered to ensure protection of River from runoff</li> <li>• Contractor will ensure to avoid accidental spills of oils and lubricants into Malir River.</li> <li>• fuel is not stored at any location where it could enter a waterway</li> </ul>
4.	Construction material transport	<ul style="list-style-type: none"> <li>• Haul-trucks carrying concrete, aggregate and sand fill materials will be kept covered with tarpaulin to help contain the construction materials being transported to the Malir River site.</li> </ul>
5.	Sediment control	<ul style="list-style-type: none"> <li>• Review the weather forecast and undertake the work during suitable weather conditions, so that run-off from disturbed areas is minimized.</li> </ul>

		<ul style="list-style-type: none"> <li>• Stage work to minimize the work area exposed to erosion. Rather than opening the whole site, it may be appropriate to work the site in smaller, discrete areas on a progressive basis</li> <li>• Apply appropriate erosion and sediment control measures which may include installing silt fencing and settling ponds to intercept runoff</li> <li>• Stabilize the site as soon as possible.</li> <li>• Inspect sediment control measures regularly and after rain fall events to ensure their continued effectiveness until the site has been stabilized.</li> </ul>
6.	Solid Waste Management	<ul style="list-style-type: none"> <li>• Contractor will ensure that its staff not to throw any of the waste and the other scarified/scrapped materials directly into the Malir River in order to avoid contamination.</li> </ul>
7.	Access and traffic management	<ul style="list-style-type: none"> <li>• Coordinate with local authorities to establish bypass routes, maintain emergency access, and ensure pedestrian safety.</li> <li>• Communicate construction schedules, road closures, and alternative routes to the local public in advance.</li> </ul>
8.	Management of dust and fugitive emissions	<ul style="list-style-type: none"> <li>• Regular Sprinkling of water to control dust and fugitive emissions.</li> <li>• Consider halting dust producing activities in dry or windy conditions.</li> </ul>
9.	Management of safety	<ul style="list-style-type: none"> <li>• Clearly mark construction zones using safety barriers, fencing and warning signs.</li> <li>• Provide safety training for all construction workers.</li> <li>• Strictly enforce safety protocols.</li> <li>• Workers shall be provided with PPEs.</li> <li>• Emergency preparedness and response system shall be in place to deal with any emergencies</li> </ul>
10.	Maintenance and protection of ecological assets	<ul style="list-style-type: none"> <li>• The specific area of Malir river falling under the project alignment is to be considered as highly degraded in ecological context due to urbanization and contamination of the Malir waters, in result the river supports almost no aquatic life. Thus, minimum impact is expected, however, care must be taken to</li> </ul>

		prevent the pollution due to YBRT project. The dredged spoil and waste created during the construction of the bridge should be properly disposed-off in order to avoid further habitat damage or amplified fragmentation.
11.	Opportunities for environmental enhancement	Ensure the tree plantation/afforestation along the river bank to reduce surface soil erosion and enhancement of the soil compactness and stability. The afforestation will also lead to improved soil fertility, attraction of avifauna and overall all improvement the local environment.
12.	Recording of complaints and concerns	All Complaints and concerns shall be recorded and addressed in line with the GRM in place

This mitigation plan should be continuously reviewed and updated as the project progresses, with adjustments made as needed to address unforeseen challenges and changing circumstances. Effective communication and collaboration with all stakeholders are critical throughout the construction process to ensure successful implementation of the mitigation measures.

## **ANNEX-IX: CHANCE FIND PROCEDURE**

# **ARCHAEOLOGICAL ‘CHANCE FIND’ PROCEDURE**

## **1. BACKGROUND**

The purpose of this document is to address the possibility of archaeological deposits becoming exposed during ground altering activities within the project area and to provide protocols to follow in the case of a chance archaeological find to ensure that archaeological sites are documented and protected as required.

The Antiquities Act, 1975, protects archaeological sites, whether on Provincial Government owned or private land. They are non-renewable, very susceptible to disturbance and are finite in number. Archaeological sites are an important resource that is protected for their historical, cultural, scientific and educational value to the general public and local communities. Impacts to archaeological sites must be avoided or managed by development proponents. The objectives of this ‘Archaeological Chance Find Procedure’ are to promote preservation of archaeological data while minimizing disruption of construction scheduling. It is recommended that due to the moderate to high archaeological potential of some areas within the project area, all on site personnel and contractors be informed of the Archaeological Chance Find Procedure and have access to a copy while on site.

## **2. POTENTIAL IMPACTS TO ARCHAEOLOGICAL SITES**

Developments that involve excavation, movement, or disturbance of soils have the potential to impact archaeological materials, if present. Activities such as road construction, land clearing, and excavation are all examples of activities that may adversely affect archaeological deposits.

## **3. RELEVANT LEGISLATION**

It ensures the protection, preservation, development and maintenance of antiquities in the provinces of Pakistan. The Act defines “antiquities” as ancient products of human activity, historical sites, or sites of anthropological or cultural interest, national monuments, etc. The Act is designed to protect these antiquities from destruction, theft, negligence, unlawful excavation, trade, and export. The law prohibits new construction in the proximity of a protected antiquity and empowers the relevant provincial governments to prohibit excavation in any area that may contain articles of archaeological significance. Under the Act, the subproject proponents are obligated to ensure that no activity is undertaken in the proximity of a protected antiquity, report to the Department of Archaeology, any archaeological discovery made during the course of the project.

## **4. REMEDIES AND PENALTIES**

The Antiquities Act, 1975 provides for heritage inspection or investigation orders, temporary protection orders, civil remedies and penalties to limit contraventions. These powers provide:

“A contravention of any provision of this Act or the rules shall, where no punishment has been specifically provided be punishable with rigorous imprisonment for a term which may extend to two years, or with fine up to rupees ten hundred thousand, or with both. ”

## **5. ARCHAEOLOGICAL ‘CHANCE FIND’ PROCEDURE**

If you believe that you may have encountered any archaeological materials, stop work in the area and follow the procedure below:

The following ‘chance-find’ principles will be implemented by the contractor throughout the construction works to account for any undiscovered items identified during construction works:

- i. Workers will be trained in the location of heritage zones within the construction area and in the identification of potential items of heritage significance.
- ii. Should any potential items be located, the site supervisor will be immediately contacted and work will be temporarily stopped in that area.

- iii. If the site supervisor determines that the item is of potential significance, an officer from the Department of Archaeology (DoA) will be invited to inspect the site and work will be stopped until DoA has responded to this invitation.
- iv. Work will not re-commence in this location until agreement has been reached
- v. between DoA and SMTA as to any required mitigation measures, which may include excavation and recovery of the item.
- vi. A precautionary approach will be adopted in the application of these procedures.

## **6. DETAILED PROCEDURAL STEPS**

- If the Director, department of Archaeology receives any information or otherwise has the knowledge of the discovery or existence of an antiquity of which there is no owner, he shall, after satisfying himself as to the correctness of the information or knowledge, take such steps with the approval of the Government, as he may consider necessary for the custody, preservation and protection of the antiquity.
- Whoever discovers, or finds accidentally, any movable antiquity shall inform forth with the Directorate within seven days of its being discovered or found.
- If, within seven days of his being informed, the Director decides to take over the antiquity for purposes of custody, preservation and protection, the person discovering or finding it shall hand it over to the Director or a person authorized by him in writing.
- Where the Director decides to take over an antiquity, he may pay to the person by whom it is handed over to him such cash reward as may be decided in consultation with the Advisory Committee.
- If any person, who discovers or finds any movable antiquity contravenes the provisions of the Act, he shall be punishable with imprisonment for a term which may extend to five (05) years, or with fine not less than fifteen hundred thousand rupees or with both and the Court convicting such person shall direct that the antiquity in respect of which such contravention has taken place shall stand forfeited to Government.
- The Director or any officer authorized by him with police assistance may, after giving reasonable notice, enter into, inspect and examine any premises, place or area which or the sub-soil of which he may have reason to believe to be, or to contain an antiquity and may cause any site, building, object or any antiquity or the remains of any antiquity in such premises, place or area to be photographed, copied or reproduced by any process suitable for the purpose.
- The owner or occupier of the premises, place or area shall afford all reasonable opportunity and assistance to the Director.
- No photograph, copy of reproduction taken or made shall be sold or offered for sale except by or with the consent of the owner of the object of which the photograph, copy or the reproduction has been taken or made.
- Where substantial damage is caused to any property as a result of the inspection, the Director shall pay to the owner thereof reasonable compensation for the damage in consultation with the Advisory Committee.
- If the Director after conducting an inquiry, has reasonable grounds to believe that any land contains any antiquity, he may approach the Government to direct the Revenue Department to acquire such land or any part thereof and the Revenue Department shall thereupon acquire such land or part under the Land Acquisition Act, 1894 (I of 1894), as for a public purpose.

## **ANNEX-X: WASTE MANAGEMENT PLAN**

## WASTE MANAGEMENT PLAN

### 1. GENERAL INTRODUCTION

Construction work refers to a wide range of materials depending on their origin; they are categorized as general refuse, excavation material, demolition materials and worksite waste material. Construction waste material of the proposed project consists mainly of concrete, bentonite, masonry, limestone, sandstone, metal, and wood. In addition to this, significant amount of municipal waste will also generates from the construction camps.

### 2. ORIGINS AND CAUSES OF CONSTRUCTION WASTE

Origins of Waste	Causes of Waste
Contractual	<ul style="list-style-type: none"> <li>▪ Errors in contract documents; and</li> <li>▪ Contract documents incomplete at commencement of construction.</li> </ul>
Design	<ul style="list-style-type: none"> <li>▪ Design changes;</li> <li>▪ Design and detailing complexity;</li> <li>▪ Design and construction detail errors;</li> <li>▪ Unclear and unsuitable specifications; and</li> <li>▪ Poor coordination and communication (late information, last minute client requirements, slow drawing revision and distribution).</li> </ul>
Procurement	<ul style="list-style-type: none"> <li>▪ Ordering errors (i.e. ordering items not in compliance with specification);</li> <li>▪ Over allowances (i.e. difficulties to order small quantities); and</li> <li>▪ Supplier errors.</li> </ul>
Transportation	<ul style="list-style-type: none"> <li>▪ Damage during transportation;</li> <li>▪ Difficulties for delivery vehicles accessing construction sites;</li> <li>▪ Insufficient protection during unloading; and</li> <li>▪ Inefficient methods of unloading</li> </ul>
On-Site Management and Planning	<ul style="list-style-type: none"> <li>▪ Lack of on-site waste management plans;</li> <li>▪ Improper planning for required quantities;</li> <li>▪ Delays in passing information on types and sizes of materials and components to be used;</li> <li>▪ Lack of on-site material control; and</li> <li>▪ Lack of supervision.</li> </ul>
Material Storage	<ul style="list-style-type: none"> <li>▪ Inappropriate site storage space leading to damage or deterioration;</li> <li>▪ Improper storing methods; and</li> <li>▪ Materials stored far away from point of application.</li> </ul>
Material Handling	<ul style="list-style-type: none"> <li>▪ Materials supplied in loose form;</li> <li>▪ On-site transportation methods from storage to the point of application; and</li> <li>▪ Inadequate material handling.</li> </ul>
Site Operation	<ul style="list-style-type: none"> <li>▪ Accidents due to negligence;</li> <li>▪ Unused materials and products;</li> <li>▪ Equipment malfunction;</li> </ul>

Origins of Waste	Causes of Waste
	<ul style="list-style-type: none"> <li>▪ Poor craftsmanship;</li> <li>▪ Use of wrong materials resulting in their disposal;</li> <li>▪ Time pressure; and</li> <li>▪ Poor work ethics.</li> </ul>
Residual	<ul style="list-style-type: none"> <li>▪ Waste from application processes (i.e. over preparation of mortar);</li> <li>▪ Off-cuts from cutting materials to length;</li> <li>▪ Waste from cutting uneconomical shapes; and</li> <li>▪ Packaging.</li> </ul>
Other	<ul style="list-style-type: none"> <li>▪ Weather</li> <li>▪ Vandalism</li> <li>▪ Theft</li> </ul>

### 3. WASTE MANAGEMENT PLAN

#### i) Waste Management Goals

The contractor established goal that this project will generate at least 50 percent less waste into landfills and the processes shall be employed to ensure that this goal is met. These shall include prevention of damage to materials to be incorporated into the work due to mishandling, improper storage, contamination, inadequate protection, minimizing poor quantity estimation, and through design.

#### ii) Responsibility

- a) The Contractor shall be responsible for the implementation of the administrative portions of this program, including the notification of subcontractor management, the training of the site supervisor and the onsite posting of this plan.
- b) The site supervisor shall be responsible for the implementation of the onsite portions of this program including the training of subcontractor personnel.

#### iii) Waste Prevention Planning

- a) In addition to other requirements specified herein it is a requirement for the work of this project that the contractor comply with the applicable city waste disposal requirements.
- b) Of the inevitable waste that is generated, the waste materials designated in this specification shall be salvaged for reuse and or recycling where practical and possible. Waste disposal in landfills shall be minimized as much as possible.
- c) Project Construction Documents: The Contractor will contractually require all subcontractors to comply with the Construction Waste Management Plan (WMP)". A copy of the WMP will accompany all subcontractor agreements and require subcontractor participation.
- d) The "Waste Management Plan" shall be implemented and executed as follows and as on the chart:
  - i) Practice 3 R strategy for general waste
  - ii) Salvageable materials will be diverted from disposal where feasible;
  - iii) There will be a designated area on the construction site reserved for materials that can be recycled;
  - iv) Areas shall be marked to designate what recycle materials are to be stored there; and

v) Hazardous waste shall be managed by a licensed hazardous waste vendor.

**iv) Communication and Education Plan**

- a) This Waste Management Plan will be posted onsite;
- b) Each subcontractor will be made aware of the intent of this project with respect to reduction of waste and recycling. Onsite recycling containers and/or areas will be plainly marked;
- c) The subcontractor will be expected to make sure all their crews comply with the Waste Management Plan;
- d) All recycling containers and areas will be clearly marked;
- e) Lists of acceptable and unacceptable materials will be posted at the site; and
- f) All subcontractors will be informed in writing of the importance of non-contamination with other materials or trash.

**v) Motivation Plan**

The Contractor will conduct a pre-award meeting for subcontractors. Subcontractors under consideration will be required to attend the meeting to review project goals and requirements with the project team. Attendance will be a prerequisite for award of subcontracts. This document will be an attachment to every subcontract. Copies of the attachment will be posted prominently at the job site.

**vi) Expected Project Waste, Disposal, and Handling**

The following chart identifies waste materials expected on the proposed project, their expected disposal methods and handling procedures. New items may be added as needed.

<b>Material</b>	<b>Disposal Method</b>	<b>Handling Procedure</b>
Refuse and General Waste	Collect general waste in segregated bins to be collected by authorized waste company in Karachi.	Keep separated in designated areas onsite.
Land Clearing Debris	Keep separate for reuse and or wood sale. Suitable materials may be delivered to a composting site. Separate topsoil and rock for future landscaping use.	Keep separated in designated areas onsite.
Clean Dimensional Wood and Palette Wood	Keep separate for reuse by on-site construction or by site employees for either heating stoves or reuse in home projects. May be offered to public.	Keep separated in designated areas onsite.
Painted or Treated Wood	Reuse, off site recycle, and landfill.	Keep separated in designated areas onsite. Place in "Trash" container.
Concrete	Recycle when possible.	Keep separated in designated areas onsite.
Concrete Masonry Units	Keep separate for re-use by on-site construction or by site employees	Keep separated in designated areas onsite
Metals	Recycle off site when possible. Separate copper wire when possible.	Keep separated in designated areas onsite. Place in "Metals" container.
Gypsum drywall (unpainted)	Recycle with supplier when possible.	Keep scraps separate for recycling – stack on pallets in provided onsite. All scrap drywall should be taken back by contractor to drywall supplier
Paint	Reuse onsite; donate to Habitat for Humanity Restore.	Keep separated in designated areas onsite
Insulation	Reuse and landfill.	Keep separated in designated areas onsite.
Glass	Recycle locally.	Keep separated in designated areas onsite.
Plastics	Plastic Bottles: recycle locally; be aware of plastics that are acceptable to recycle facility.	Keep separated in designated areas onsite.

**vii) Waste Disposal Company:**

- a) Authorized Waste Management Company in Karachi
- b) Local Government

**viii) Recycle Hauler**

- a) To be determined;
- b) Contact Address; and
- c) Some or all recycle may be hauled by the authorized representative.

**ix) Possible Recycle Locations and Acceptable Materials**

- a) Coordinate with companies in Karachi or which are authorized accept materials for recycle; and
- b) Using the above as a resource, a list will be kept indicating local opportunities for recycle of expected materials. New locations should be added as needed.

## **ANNEX-XI: OCCUPATIONAL HEALTH SAFETY PLAN**

## **GUIDELINE OCCUPATIONAL HEALTH AND SAFETY PLAN**

Occupational Health and Safety covers all personnel working under the project and will be in line with the World Bank EHS guidelines on health and safety.

The Occupational Health and Safety program will aim to ensure that the workplace is safe and healthy by: addressing the hazards and risks at the workplace; outlining the procedures and responsibilities for preventing, eliminating and minimizing the effects of those hazards and risks; identifying the emergency management plans for the workplace or workplaces; and, specifying how consultation, training and information are to be provided to employees at various workplaces.

Some of the risks/hazards associated with workplaces are due to working close to or at sites associated with the various project construction activities. Other risks associated with the project construction phase include risk of increase of vector borne and other different diseases.

The following sections will be implemented during the construction phase to address and ensure workers' health and safety.

### **1.1 SCREENING AND REGULAR UNANNOUNCED CHECKING OF WORKERS**

As per the procedure for hiring workers, all contractors and labor agencies are required to make all prospective workers undergo medical tests to screen for diseases and sicknesses, prior to selection and employment of any worker. The contractor is also responsible for ensuring that no worker who has a criminal record is employed at the project site. It will be ensured that all workers undergo medical tests to screen diseases at source and at sites in consultation with the designated Health Officer.

In addition to this, the Project Management will also undertake sudden, unannounced checks on workers to look for diseases such as COVID-19, HIV, STDs, and hepatitis and take necessary steps as mandated by the Contractual agreement between the Contractor and the Worker(s).

### **1.2 MINIMIZING HAZARDS AND RISKS AT THE WORKPLACE**

To ensure safety at all work sites, the following will be carried out:

- i. Installation of signboards and symbols in risky and hazardous areas, to inform workers to be careful.
- ii. Construction of barricades around construction sites and deep excavated pits, to cordon off and deter entry of unauthorized personnel and workers into these areas.
- iii. Providing a safe storage site/area for large equipment such as power tools and chains, to prevent misuse and loss.
- iv. Proper Housekeeping: Ensuring that materials are all stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse. Brick stacks will not be more than 7 feet in height and for concrete blocks they will not be more than 6 feet high.
- v. Removing all scrap timber, waste material and rubbish from the immediate work area as the work progresses.
- vi. Where scaffolds are required, ensuring that each scaffold or its components shall be capable of supporting its own weight and at least 4 times the maximum intended load applied or transmitted to it. The platform/scaffold plank shall be at least 15 inches wide and 1.5 inches thick. The rope should be capable of supporting at least 6 times the maximum intended load applied or transmitted to that rope. Pole scaffolds over 60 feet in height shall be designed by a registered professional engineer and shall be

- constructed and loaded in accordance with that design. Where scaffolds are not provided, safety belts/safety nets shall be provided;
- vii. Ensure that all ramps or walkways are at least 6 feet wide, having slip resistance threads and not inclined at more than a slope of 1 vertical and 3 horizontal.
  - viii. Stacking away all excavated earth at least 2 feet from the pit to avoid material such as loose rocks from falling back into the excavated area and injuring those working inside excavated sites.
  - ix. Constructing support systems, such as bracing to adjoining structures that may be endangered by excavation works nearby.
  - x. Only a trained electrician to construct, install and repair all electrical equipment to prevent risks of electrical shocks and electrocution.
  - xi. Install fire extinguishers and/or other fire-fighting equipment at every work site to prepare for any accidental fire hazards.

### 1.3 PROVISION OF PERSONAL PROTECTIVE EQUIPMENT

Risks to the health and safety of workers can be prevented by provision of Personal Protective Equipment (PPEs) to all workers. This will be included in the construction cost for each Contractor. Depending on the nature of work and the risks involved, contractors must provide without any cost to the workers, the following protective equipment:

- i. High visibility clothing for all personnel during road works must be mandatory.
- ii. Helmet shall be provided to all workers, or visitors visiting the site, for protection of the head against impact or penetration of falling or flying objects.
- iii. Safety belt shall be provided to workers working at heights (more than 20 ft) such as roofing, painting, and plastering.
- iv. Safety boots shall be provided to all workers for protection of feet from impact or penetration of falling objects on feet.
- v. Ear protecting devices shall be provided to all workers and will be used during the occurrence of extensive noise.
- vi. Eye and face protection equipment shall be provided to all welders to protect against sparks.
- vii. Respiratory protection devices shall be provided to all workers during occurrence of fumes, dusts, or toxic gas/vapor.
- viii. Safety nets shall be provided when workplaces are more than 25 feet (7.5 m) above the ground or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors or safety belts is impractical.

The specific PPE requirements for each type of work are summarized below.

**Table 1: PPE Requirement List**

Type of Work	PPE
Elevated work	Safety helmet, safety belt (height greater than 20 ft), footwear for elevated work.
Handling work safety	Helmet, leather safety shoes, work gloves.
Welding and cutting work	Eye protectors, shield and helmet, protective gloves.
Grinding work	Dust respirator, earplugs, eye protectors.
Work involving handling of chemical substances	Dust respirator, gas mask, chemical-proof gloves. Chemical proof clothing, air-lined mask, eye protectors.
Wood working	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and dust respirator.
Blasting	Hard hat, eye and hearing protection.
Concrete and masonry work	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and dust respirator.
Excavation, heavy equipment, motor graders, and bulldozer operation	Hard hat, safety boots, gloves, hearing protection.
Quarries	Hard hat, eye protectors, hearing protection, safety footwear, leather

Type of Work	PPE
	gloves and dust respirator.

#### **1.4 PROCEDURES TO DEAL WITH EMERGENCIES SUCH AS ACCIDENTS, SUDDEN ILLNESS AND DEATH OF WORKERS**

First aid kits will be made available at all times throughout the entire construction period by the respective contractors. This is very important, because most work sites will be at some distance from the nearest hospital. In addition to the first aid kits, the following measures should be in place:

- i. Provision of dispensaries by the individual contractor.
- ii. A vehicle shall be on standby from the Project Office so that emergency transportation can be arranged to take severely injured/sick workers to the nearest hospital for immediate medical attention.
- iii. A designated Health Officer/worker for the Project will be identified as a focal person to attend to all health and safety related issues. This employee's contact number will be posted at all work sites for speedy delivery of emergency services. The focal person shall be well versed with the medical system and facilities available at the hospital.
- iv. Communication arrangements, such a provision of radios or mobile communication for all work sites, for efficient handling of emergencies, will be made.

#### **1.5 RECORD MAINTENANCE AND REMEDIAL ACTION**

The Project Management will maintain a record of all accidents and injuries that occur at the work site. This work will be delegated by the contractor to the site supervisor and regularly reviewed every quarter by project management. Reports prepared by the contractor shall include information on the place, date and time of the incident, name of persons involved, cause of incident, witnesses present and their statements. Based on such reports, the management can jointly identify any unsafe conditions, acts or procedures and recommend for the contractor to undertake certain mitigative actions to change any unsafe or harmful conditions.

#### **1.6 COMPENSATION FOR INJURIES AND DEATH**

Any casualty or injury resulting from occupational activities should be compensated as per the local labor laws of Pakistan. Where compensation is sought by the injured party, proper procedures for documentation of the case will be followed, including a detailed report on the accident, written reports from witnesses, report of the examining doctor and his/her recommendation for treatment. Each individual contractor will be responsible for ensuring compensation for the respective workers.

#### **1.7 AWARENESS PROGRAMS**

The Project management will undertake awareness programs through posters, talks, and meetings with the contractors to undertake the following activities:

- i. Dissemination sessions will clarify the rights and responsibilities of the workers regarding interactions with local people (including communicable disease risks, such as HIV/AIDS, COVID-19), work site health and safety, waste management (waste separation, recycling, and composting), and the illegality of poaching.
- ii. Make workers aware of procedures to be followed in case of emergencies such as informing the focal health person who in turn will arrange the necessary emergency transportation or treatment.

## **1.8 NOMINATION OF A HEALTH AND SAFETY FOCAL PERSON**

Within each site (especially if different sites are being implemented by different contractors), a Health and Safety Focal Person will be appointed. The Terms of Reference for the focal person will mainly be as follows:

- i. Function as the focal person/representative for all health and safety matters at the workplace;
- ii. Responsible for maintaining records of all accidents and all health and safety issues at each site, the number of accidents and its cause, actions taken and remedial measures undertaken in case of safety issues;
- iii. Be the link between the contractor and all workers and submit grievances of the workers to the contractor and instructions/directives on proper health care and safety from the contractors back to the workers;
- iv. Ensure that all workers are adequately informed on the requirement to use Personal Protective Equipment and its correct use;
- v. Also responsible for the first aid kit and making sure that the basic immediate medicines are readily available.

## **1.9 SUGGESTED CONTENTS OF OCCUPATIONAL HEALTH AND SAFETY PLAN**

The suggested contents of Occupational Health and Safety Plan to be developed by the Contractor(s) are described below:

- a Purpose
- b Scope of Application
- c Complying Basis
- d Occupational Health and Safety Objectives
- e Organization and Responsibility
  - Contractor's Project Manager
  - HSE Management Department of the Contractor(s)
  - Medical Treatment Room of the Contractor(s)
  - Subcontractor's Project Manager
  - Subcontractor's HSE Managers
  - Occupational Health and Safety
  - Community Health and Safety
- f Health Plan
  - Labour Protection
  - Sanitary Epidemic Prevention
- g Safety Plan
  - Summary
  - Qualification Review
  - Safety Training
  - Construction Plans and Documents
  - Control Measures
  - Monitoring Measures
  - Management of the Key Safety Accidents
- h Public Security Plan
- i Local Community Health and Safety

## **ANNEX-XII: EMERGENCY RESPONSE PLAN**

ANNEXURE-6

**PRELIMINARY  
EMERGENCY RESPONSE  
PROCEDURES**

**YELLOW BRT CORRIDOR**

**DRAFT**

March 2018

**Sindh Mass Transit Authority**

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## **1.0 Emergency Posting Notice**

A posting notice will be displayed at all job sites, which will identify the following:

- Fire & Rescue – Phone Number
- Police Department – Phone Number
- Ambulance – Phone Number
- Nearest Hospital – Phone Number
- Map of job site that identifies the location of the area to assemble in the event of an emergency requiring evacuation

## **2.0 First Aid / Emergency Medical Services**

Outside services will be the primary source of Emergency Medical Treatment (i.e., ambulance, medics, and fire department).

First Aid kits will be maintained and accessible at all job sites. Contents of the First Aid kit will adhere to requirements consistent with the number of employees working at the job site, and will be kept in a weatherproof container. The lead employee will be responsible for performing weekly inventory checks to make sure used contents are replaced. The lead employee will be allowed to perform First Aid / Emergency Medical Services. Action taken will only be to the extent deemed necessary to preserve life.

## **3.0 Alarm System**

In the event of an emergency requiring evacuation of all employees, several warning systems may be utilized, depending on the work site conditions or emergency involved, including:

- Verbal Communication
- Vehicle Horn
- Air Horns

The lead, or designated, employee, will be responsible for sounding the alarm and locating any hearing impaired employees to ensure proper evacuation.

## **4.0 Designated Employees – Training Procedures**

Lead employees will be responsible for the job site coordination and assignment of tasks to designated employee(s) that will assist with emergency procedures.

Designated employees will be provided with the proper training to assist with the following functions:

- First Aid / Emergency Medical Services
- Fire Suppression
- Crisis Response Procedures
- Evacuation Procedures

No employee will be permitted to perform any action that might endanger his/her life or the life of others.

## 5.0 Employee Notification and Training

All employees, permanent and intermittent, to include Project Engineer and supervisors, will be provided necessary training on all elements of the emergency procedures. Employee notification and training will occur when:

- Work begins at a new job site (*Group Training*)
- A new hire is assigned to a specific job site (Individual Training)
- An employee is transferred to a new job site (Individual Training)

When an evacuation occurs:

- Employees must proceed directly to the designated assembly area
- Employees are not to stop and pick up personal belongings when exiting the job site/structure
- Employees are not to block areas that would be considered access for emergency vehicles
- Employees will not be allowed to re-enter the job site/structure without clear indication that it is safe
- Employees cannot leave the job site (assembly area) unless advised to do so by a designated employee or Supervisor
- Employees will be instructed not to respond to news media. Contact with the media is limited to designated Supervisors or Management

The most important focus of an emergency is the protection of human life.

## 6.0 Emergency Escape and Evacuation Procedures

Lead employees will be responsible for evaluating new job sites in order to identify emergency evacuation routes and a safe location for employees to assemble. This information will be documented and posted on the safety bulletin board. Identified exit routes will be checked periodically to ensure they remain unobstructed.

The following tasks will be carried out in the event of an emergency requiring evacuation:

- The lead, or designated, employee will sound the evacuation alarm
- The lead employee will instruct a designated employee to contact the necessary emergency facilities and Management, and proceed to the identified assembly area to perform the necessary head-count
- The lead employee and designated employee(s) will be responsible for making sure the job site / structure is clear of all employees that have not been assigned with specific duties to assist with the evacuation

## 7.0 Fire and Explosion

- All employees will be trained on how to properly use fire suppression equipment
- All employees will be instructed on the following:
- Assess the situation:
- Any employee discovering a fire should quickly and carefully remove any person who is injured or in immediate danger, unless doing so will create the possibility of personal injury
- Employees in the immediate vicinity of the fire, as well as those in surrounding areas, who may be threatened by the fire, must be notified of the existence of the fire
- Only properly trained and authorized employees may attempt to extinguish a small fire, which does not involve electrical components or hazardous substance.
- If the fire appears to be too large, involves toxic substances, or is electrical based, all employees are to leave the area immediately and notify management

When the fire cannot be extinguished using a portable fire extinguisher:

- The lead employee will initiate the evacuation procedures
- The fire will be reported to the appropriate agency(s)
- The emergency evacuation alarm will be sounded
- Without creating exposure to personal injury, attempts should be made to contain the fire, by properly trained and designated employees only (i.e. closing doors and windows in the immediate vicinity and removing any flammable materials)

## 8.0 Earthquake

All employees will be instructed to:

- Move away from windows, temporary walls, partitions, freestanding and heavy objects
- Duck or drop down to the ground
- Attempt to take cover under fixed objects, or interior framing, that may provide safety from falling objects
- Avoid being near any electrical units, flammable or combustible materials
- STAY PUT until the ground / structure stops shaking and it is safe to move

## 9.0 Natural Disasters

Natural disasters include but not limited to, Floods, Tornadoes, and Severe Thunderstorms. Most natural disasters are usually forecast sufficiently in advance for emergency action to be initiated before the exposure becomes serious. In most cases, advising employees of the approaching danger and seeing to it that they are in a safe location will be sufficient, should the incident occur during normal working hours.

## 10.0 Chemical Leak, Spill or Threatened Release

The following procedures will be carried out in the event of a hazardous substance spill:

All employees will be instructed to:

- Notify the lead employee immediately
- All employees, not trained to deal with the exposure, will be instructed to leave the immediate area
- The lead and/or designated employee(s) will:
  - Determine the nature and source of the spill/release. MSDS will be used to determine the characteristics of the material and identify necessary precautions for dealing with the material
  - Depending on the classification and amount of the spill, if warranted, the local fire department and appropriate local environmental agency will be notified
  - Clean-up procedures will be performed by qualified personnel

## **11.0 Bomb Threat**

If a bomb threat is received, the following procedures will be carried out:

All employees will be instructed to:

- Notify the lead employee immediately

The lead employee and/or designated employee(s) will:

- Notify the Police and Fire Department
- The emergency evacuation procedure will be initiated, unless the threat includes instructions not to do so (proper law/emergency enforcement agencies should determine proper course of action in this situation)
- The individual who received the threat should be instructed to document every word of the conversation immediately, if applicable
- A search of the area will be performed by the appropriate law enforcement personnel only
- Access to the building/job site will not be permitted until clearance is given by the appropriate personnel (i.e. police, fire department)

## **12.0 Civil Disturbance**

Civil disorders, usually in the form of large unruly crowds, can interfere with business operations and could cause damage to property and employees. The lead or designated employee will notify the appropriate authorities for assistance. Steps will be taken to assure the safety of all employees, business property and equipment, without creating exposure to personal injury.

## **ANNEX-XIII: TEMPORARY TRAFFIC MANAGEMENT PLAN**

**PRELIMINARY  
TRAFFIC MANAGEMENT PLAN**

**YELLOW BRT CORRIDOR**

**DRAFT**

March 2018

**Sindh Mass Transit Authority**

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## **1.0 Introduction**

This Construction Traffic Management Plan (CTMP) has been prepared to identify and outline the manner in which construction traffic will be managed to ensure the safe and efficient performance of the road network, to minimize adverse effects on the existing community arising from construction traffic, and to provide the community with information about specific management methods to be employed during construction of the Yellow BRT Corridor.

### **1.1 Scope of Construction Traffic Management Plan**

This CTMP covers the various parts of the Yellow Line corridor, phases of construction, levels of construction activity, traffic impacts and the traffic management requirements associated with construction and widening of the roads and bridge at the corridor, and diversion section of public road.

### **1.2 Legislative Requirements of Construction Traffic Management Plan**

There is no legislative requirement for the preparation of CTMP in Pakistan. This CTMP is being prepared for the purpose of manage traffic at Yellow BRT corridor during construction activities to avoid traffic congestion at the site and adverse environmental impacts to the nearby communities. This CTMP will be implemented by the contractors and traffic authorities of the Karachi city to manage traffic during construction.

There are following three traffic related laws in Pakistan:

- National Highway Safety Ordinance 2000
- Motor Vehicle Ordinance 1965
- Motor Vehicle Rules 1969

### **1.3 Construction Traffic Management Plan Objectives**

The objectives of this CTMP are to:

- Ensure the specific requirements of the traffic laws in relation to construction traffic are adhered to;
- Detail the location, nature and duration of traffic associated with the Yellow Line corridor;
- Outline methods to provide clear and timely communication with the community and any directly affected property owners over planned construction activities and associated traffic effects;
- Outline methods to ensure the effects on the level of service of general road users and restrictions on on-street parking are minimized, and safe and clearly defined pedestrian, cyclist and vehicle routes are maintained;
  - Outline methods to ensure that potential impacts upon the physical conditions of any public roads are minimized and are in accordance with the Road Controlling Authority (RCA) and community expectations;
- Outline methods to ensure that any potential nuisance effects (traffic delays, dust, noise etc.) of construction traffic are minimized;
- Outline methods to ensure that any potential health and safety/security effects of construction traffic upon both the public and site staff are minimized;

- Outline methods to ensure that construction staff are aware of all potential traffic effects and that traffic management requirements are successfully implemented; and
- Outline recording and monitoring procedures to ensure that any potential additional construction traffic effects are identified and responded to accordingly.

## 2.0 Traffic Management Roles and Responsibilities

Implementation of the traffic management requirements outlined within this plan will be the responsibility of all site staff, Party A, SMTA, KMC and traffic police. All these parties require close coordination and understanding of roles and responsibilities of each one.

SMTA will be overall responsible to ensure that the CTMP is completely implemented at each construction site as per the requirement mentioned for each site. Party A will be overall responsible for the implementation of traffic management plan in coordination with traffic police and the city authorities such as KMC at each construction site, through contractor. Contractor staff will follow the plan and provide support to the local authorities and traffic police to enforce and maintain traffic management protocols. SMTA will be in close liaison with the Party A and city authorities to abridge communication gap among the implementers and to provide all sort of support needed for the effective implementation of the plan and smooth operation of the traffic.

## 3.0 Consultation

This is a preliminary plan which will be finalized in consultation with design consultant, SMTA and KMC. After detailed designing and construction phasing planning, this preliminary plan will be finalized. If it is desired then the affected communities and the stakeholders will also be consulted to add value in the plan and to avoid any unforeseen problem while implementing it. After finalization, this plan will be shared with the concerned authorities for approval and further actions.

Consultation between the project team and the above parties will continue throughout the construction phase of the project and include advance notice of any potential major traffic disruptions or effects on access routes (pedestrian, cyclist and vehicular). This will include direct contact by phone, email or meeting, as well as more general letter drops. In addition, newspaper advertising and signage will continue to be used.

## 4.0 Traffic Management

### 4.1 Site Access

The Yellow BRT corridor is divided in following seven segments:

Segment-1	Dawood Chowrangi to Future Colony
Segment-2	Korangi Road along Korangi Industrial Area
Segment-3	Malir Bridge
Segment-4	KPT Interchange
Segment-5	KPT Interchange to FTC Flyover
Segment-6	FTC Flyover to Shahrah-e-Faisal
Segment-7	Shahrah-e-Faisal to Shahrah-e Qaideen

#### **4.1.1 Segment-1: Dawood Chowrangi to Future Colony**

This road segment is about 1.3 km. This is the most difficult and congested segment of the corridor dominated by residential and commercial activities. The road width is relatively narrow and heavy traffic in the form of trailers, tankers, trucks and buses frequently move because of adjoining Korangi Industrial Area. This site can be accessed from both sides of Korangi Road from east and west side and from Landhi Road.

#### **4.1.2 Segment-2: Korangi Road along Korangi Industrial Area**

This road segment is about 10 km and is the longest segment of the corridor. This segment is wide along the industrial area. Industries are located at both sides of the road. This segment is accessible from main Korangi road from different sides without any issues.

#### **4.1.3 Segment-3: Malir Bridge**

The Malir Bridge is on the Malir River. It is about 1.4 km long. This bridge can be accessed from both sides of the Korangi Road i.e. east and west.

#### **4.1.4 Segment-4: KPT Interchange**

This segment is the KPT flyover of about 0.8 km in length. This segment can be accessed from Korangi Road from both sides of east and west.

#### **4.1.5 Segment-5: KPT Interchange to FTC Flyover**

This segment is about 2 km. This segment is very crowded. Land use is predominantly the commercial and residential. This segment can be accessed from Korangi Road from both sides, DHA and cantonment.

#### **4.1.6 Segment-6: FTC Flyover to Shahrah-e-Faisal**

This segment is about 2 km and road is very crowded with traffic. Main access of this segment is the Shahrah-e-Faisal Road and Shahrah-e-Qaideen Road.

#### **4.1.7 Segment-7: Shahr-e-Faisal to Shahr-e-Qaideen**

This road segment is about 2.7 km. The turning from Shahrah-e-Faisal to Shahr-e-Qaideen is very narrow. Shahr-e-Qaideen is a wide road and crowded with traffic. This segment can be accessed from Shahrah-e-Faisal, Kashmir Road and New MA Jinnah Road.

### **4.2 Minimizing Construction Traffic**

The construction methods and site access protocols to be employed on site are critical for minimizing potential traffic impacts on the surrounding road network. Measures proposed on site to minimize construction traffic are described as follows:

- On-site parking will be reserved only for those vehicles that need to travel to and from the site daily, with other staff encouraged to use public transport, walk or cycle. Travel arrangements will be monitored to minimize single staff vehicle trips to site;
- Excavated waste material will predominately be transported on truck and trailer units;

- At segment-1, which is very narrow and congested road, the construction vehicles will only be allowed to come to the site only late at night to avoid disturbance in the traffic flow.

### **4.3 Signage**

A comprehensive on-road signage scheme is to assist the control of traffic flows around the construction area. Four types of signage are proposed:

- Regulatory signage (i.e. give-way, one-way);
- Guide signs (i.e. intersection direction signs);
- Permanent warning signs (i.e. school crossing); and
- Temporary traffic management signage (i.e. trucks crossing, new road layout, pedestrian/cyclist signage)

All the above mentioned signs will be erected at construction site as per requirement. Upon completion of construction of each segment and starting new segment, the on road signage scheme will be amended to reflect the new travel routes. This will involve removal of temporary traffic management signage, and repositioning and removal of some of the guide and regulatory signage which related to the previous diversion road.

Mostly signage will be placed at the chowrangis (intersections) to guide the incoming traffic to the construction segments, particularly during Korangi Industrial Area Road segment construction.

### **4.4 Temporary Traffic Management Plans**

On the basis of the duration and scale of the construction site, Temporary Traffic Management Plans (TTMPs) may be implemented for periods ranging from a few minutes to the full duration of the construction program. Site specific TTMPs are the documents that outline TTM procedures to be implemented to ensure safety of both the public and site staff is maintained throughout the duration of each construction activity. Each site specific TTMP will be prepared to ensure construction activities are efficiently conducted using an approved methodology, with approved mitigation measures in place.

The longest road stretch in the corridor is the Korangi Industrial Area Road (also called 8000 Road). There will be extended period of construction at this stretch. The construction phase for this road stretch will require a long term TTMP.

Where appropriate, generic TTMP can be used. A generic TTMP can be issued for long term repetitive activities at similar locations on the road network. For example, a generic site access TTMP is to be prepared for this project, specifying how construction vehicles are to access the site. For all proposed work requiring site specific TTMPs, applications will be submitted by SMTA to the appropriate authority for approval prior to the works commencing.

Each TTMP will describe the nature and extent of temporary traffic management at the work site, access provisions, types of vehicles, and how road users (including pedestrians and cyclists) will be managed by the use of temporary traffic management measures.

The signs and traffic control are temporary in nature and will be managed by the Traffic police and specific contractor staff. The specific contractor staff for traffic management will be on-site at all times when traffic management is in place and will undertake daily inspections and random audits of temporary traffic signage to ensure it is safe and complies with the approved traffic

management plans. An independent traffic management auditor (Third Party Validation) will undertake monthly random audits of active traffic management installations and report back to the SMTA.

Temporary traffic management signs are generally black text on orange background and are intended to convey information with respect to the construction sites and state the main requirements with respect to traffic controls and diversions in place. These signs will be removed at the end of construction of each road stretch.

A 30km/h temporary speed limit will be in place during road stretch construction at each site to encourage lower traffic speeds.

Following are the considerations for the traffic management plan of the Yellow BRT corridor project:

- Traffic management plan should be prepared in consultation with the local authorities as their support will be required before or during the construction period.
- Encroachment at the shoulders and service roads will first be removed. The local authority will be informed well before the construction period and require its support.
- At Korangi Road, the median and the side roads are used illegally as parking bay, rest areas and workshop area, mainly by the transport trucks and trailers. All these unauthorized activities will be discouraged and disallowed well before the start of the construction. The support of local authorities will be required for this purpose.
- At each construction site, the side roads will be constructed first, without restricting the flow of the traffic on the main roads.
- After completing the side roads and connecting the new sewer lines, the construction at the median should be started with proper fencing and cordoning off the median.
- Avoid working on the chowrangi (roundabouts) or intersections along with another road construction works. In case, if it is required then, alternate chowrangi should be selected for the construction work to avoid traffic congestion. If one chowrangi is under work, then traffic can be moved towards other chowrangi, otherwise if all the chowrangi are under work, then there will be no outlet available for the traffic.
- It is better to start and complete road construction work in stages. Only one site, at a time should be started and completed instead of initiating work at all the locations. Traffic management will be easy at one site as compared with as if the whole corridor is under construction work.
- Construction staging plan should be prepared after consulting other project proponents and local authorities (Green Line/Red Line, KWSB, Local Government) to avoid any haphazard at any specific site i.e. everyone is working at a same time at some specific location.
- There should be proper communication to the local public for the traffic diversion plan. The public should be intimated well before time through print and electronic media for traffic routes closures and diversions.
- There should be proper arrangement for traffic management such as flagging, detouring signs, flagmen, safety signs, road barriers, road stoppers, diversion signs, lighting, fences etc.
- Well organized placement and parking of construction machines, vehicles and material to avoid traffic flow restriction and any kind of accident at the site.

#### **4.5 Construction Schedule and Construction Vehicle Volume**

Construction staging plan will be prepared. The traffic management plan will be aligned with the staging plan.

Mostly the construction machinery will remain at construction site for the specified period. Therefore, the typical daily traffic generated to and from site on public roads is related to the delivery of materials or labor (such as delivery of people, construction materials and removal of excavated material). Various sections of the road network will experience more construction traffic than others. The Korangi Industrial Area Road will experience more construction traffic than other areas due to extended period of construction at this area. It will be preferred for those material hauling vehicles, which will only come to the site once a day, that these could come late at night at the site to avoid traffic congestion during day time. It will be strictly followed at Dawood Chowrangi road stretch which is very congested.

The daily traffic volumes will fluctuate depending on the phase of the construction activities and weather conditions. The management of vehicle trips to and from site come under the control of the site specific traffic controller, following the procedures set out in the generic traffic management plan for site access.

Standard hours of work will be 7:00am to 5:30 pm. Night works will not be encouraged at those road stretches closer to residential areas.

#### **4.6 Alternative Vehicle Routes**

It is presumed that the alternative routes will not be required if construction site is well managed. There will be sufficient space available for the management of traffic flow at each construction site.

#### **4.7 Special Events and Emergencies**

Consultation with the local authorities will identify any planned events such as parades, sports events, including those outside the immediate project area that will have an effect on the project works, particularly the temporary traffic management. SMTA, Party A and contractor will react and respond as necessary to such events, and implement or remove temporary traffic management as necessary in co-ordination with the local authorities. In the event of a crash or significant incident, site staff will provide immediate assistance and where necessary, contact the relevant emergency services. Full support to those organizations will be provided to manage traffic whilst the incident is being brought under control.

Any new detour route required as a result of any temporal effects will be analyzed in advance.

#### **4.8 Existing Property Access**

The road construction activities will be planned in such a way that the existing vehicle access to adjacent properties and businesses will be maintained throughout the construction period. There will be no need to construct any alternative route for providing access to all the private vehicles.

Any temporary changes in property access will be discussed with the occupant prior to the start of any works which may affect their access. The traffic management plan will be altered as per the requirement.

#### **4.9 Cyclist, Pedestrian and Mobility Impaired Accessibility**

Footpaths will be maintained on the far side of each road surrounding the construction site. About 2 – 3 m wide shared path along each side of the road will accommodate both pedestrians and off-road cyclists. Construction works will require temporary changes in the position of the footpath. The pedestrian routes will be actively managed by traffic management personnel to ensure temporary footpaths have sufficient width and fencing is continuously provided along the site construction perimeter.

Signage will clearly define identified pedestrian and cyclist access routes on the roads and footpaths adjacent to the construction works.

Traffic management personnel will be located at key locations around the construction site to direct pedestrians. Temporary ramps will bridge any changes in surface level to prevent tripping, and pedestrian bridges and/or steel plates will provide direct access over any trenches to ensure the safest and most direct routes for users are promoted and maintained.

Pedestrian paths and crossings will be provided in accordance with the standard for ease of use by the mobility impaired. Prior to any changes in the footpath network, information will be disseminated to the community.

The standard of access will be monitored throughout construction with regular inspections involving walking, cycling and navigating a wheelchair through the area. Random monthly surveys of pedestrians and cyclists travelling around site will also deliver feedback on the public perception of the paths and identify areas for improvement.

Construction activities may require temporary changes to the footpath routes and their width, however the pedestrian connections will remain open and with a desirable minimum width of 2m. The pedestrian routes will be signed and active traffic management provided where footpaths interface with construction vehicle accesses.

#### **4.10 Parking**

Proper parking places will be identified at each construction site to park construction vehicles and machineries in a manner that it will not hinder flow of routine traffic at the site.

At some areas which are congested such as segment-1 (Dawood Chowrangi), the parking place will be far from the site at Landhi Road. At other places such as Korangi Industrial Area Road, availability of sufficient parking place will not be an issue as sides of the roads and shoulders will be available to safely park the vehicles.

#### **4.11 Site Security**

Each construction site will be secured with a wire mesh boundary fence. Access points will be controlled. Outside of working hours, the site will be patrolled by security guards, who will monitor and report any traffic safety issues.

#### **4.12 Communication**

There will be a communication relationship between all the concerned stakeholders for traffic management. This will ensure that any public enquiries relating to this project received by anyone are promptly directed to SMTA. The project team of SMTA will also be contactable at all times on mobile phone.

Any comments, complaints or compliments will be quickly communicated to the relevant project staff. Also the GRM established for the project will be used by the community to register their complaints.

Regular communications with the community and any directly affected property owners over planned construction activities and associated traffic effects will comprise a key management technique throughout the Project. As the works proceed regular contact will be maintained with the residents and stakeholders by the project liaison person to ensure they are aware of the nature and duration of the works occurring.

In addition, communications activities proposed include:

- Newspaper advertising;
- Focused notification with parties;
- Notification to emergency services of traffic management that may affect access or travel through or around site;
- Notification and consultation with individual property owners and occupiers within 200m of construction activities; and
- The SMTA project website.

Prior to the commencement of construction activities, signage will be erected on the surrounding road network to advise motorists, pedestrians and cyclists of the works being undertaken and direct them to alternative routes for travel in the vicinity of the construction site.

Information boards along the construction site perimeter fence will also inform commuters about the project works as well as a broad range of relevant information.

#### **4.13 Clean Roads**

Procedures to prevent the deposition of slurry, clay or other materials on roads by vehicles leaving the site will include:

- Use of asphalt millings to surface the internal site haul road;
- Provision of wheel cleaning facilities including hoses, brooms and shovels;
- Twice daily monitoring, and education of all construction staff/drivers to monitor for any material which may be accidentally spilt onto public roads from construction traffic;

Adherence to this plan will be included within site induction and weekly toolbox meetings as required to ensure all site staff are aware and practice the required clean roads protocols.

#### **4.14 Dust**

Regular use of water sprinkling at construction sites to suppress dust will be the responsibility of contractor.

#### **4.15 Noise**

Noise abatement measures will be taken to reduce noise impact on workers and community. These measures will include enclosing noise producing machines, maintaining and repairing the noise producing parts of the machines and use of PPE by the workers.

### **5.0 Monitoring and Reporting**

Monitoring of the implementation of the traffic management plan and progress reporting will be very important for the effective enforcement of the plan. SMTA project team will hire consultant for third party validation. The consultant will frequently visit the construction sites and monitor the effectiveness of the plan implementation. The status of implementation will be reported to the project team on fortnightly.

## **ANNEX-XIV: PLANTATION PLAN**

## **TREE PLANTATION/ AFFORESTATION PLAN**

The basic purpose of afforestation/plantation of suitable species in the project area is to reduce the risk been made due to cutting of trees for the proposed project and to enhance green cover and improve the overall environment of the area. Afforestation will not only reduce the risk been made but will also increase the carrying capacity of the area regarding many positive aspects.

Plantation will be done after the removal of trees during the construction work immediately. Plantation of indigenous trees species is highly important to maintain the biodiversity and ecological balance. It is also important to prevent global warming, soil erosion and pollution. Afforestation purifies the environment and helps in reducing the carbon dioxide level. Along with the importance of roads construction, the afforestation activity will further help in enhancing the socio-economic condition of the area and project sustainability.

### **Trees along Roads**

Trees along roads are currently situated on both sides of the tracks and on the neighboring land close to roads. Tree fall hazards along roads became a safety issue so species selection is the critical part. Planting trees along the roads must be encouraged, however as they help stabilize the slopes, provide shades and barrier to light etc.

### **Causes of Tree Falls**

The most common cause of the tree fall are extreme winds, or glaze. These phenomena usually cover extensive areas as they are related to regional weather extremes (windstorms, heavy rains).

Tree falls predominantly affect trees of a certain height. Nyberg and Johansson (2013) suggest that trees with a height over 15 m should be used for modelling of wind-related damage. Actual tree height is however not always available in spatial data. Minor cause of tree fall are the results of non-professional cutting and the loss of stability of rotten trees due to neglected tree maintenance.

### **Importance of tree plantation**

- Trees contribute to their environment by providing oxygen, improving air quality, climate amelioration, conserving water, preserving soil, and supporting wildlife.
- Trees control climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer.
- Trees also preserve warmth by providing a screen from harsh wind.
- Trees also lower the air temperature and reduce the heat intensity of the greenhouse effect by maintaining low levels of carbon dioxide.
- Both above and below ground, trees are essential to the eco-systems in which they reside.

- Trees absorb and store rainwater which reduce runoff and sediment deposit after storms. This helps the ground water supply recharge, prevents the transport of chemicals into streams and prevents flooding.
- Trees, shrubs and turf also filter air by removing dust and absorbing other pollutants like carbon monoxide, sulfur dioxide and nitrogen dioxide.

### **Objectives**

- To Restore native species
- To improve the quality of air and reduce its pollution
- To add color to the landscape and enhances the beauty of the environment
- To uplift the quality of our living environment through active planting, proper maintenance and preservation of trees together with other vegetation.
- To Protect and conserve flora and fauna of the project area.
- To attract rain which is a positive impact on the project area at all.
- To reduce sedimentation by plantation in the project area which will act as protection wall against wind born dust particles.

### **Project Area Enhancement Plan**

#### **Plantation Technique**

Plantation of suitable broad leaved species is to be carried out in the immediate vicinity of the project area. The project area can be afforested and vegetation cover can be improved by adopting standard afforestation technique of digging pits. The project area is suitable for plantation activities and can be managed thoroughly with care.

#### **Pits**

Pits should be dug in the project area at a spacing of 10' linearly. The pits should be of 1.5 feet dia at the top and 1 feet dia at the bottom with a depth of 1-3/4" ft. The earth taken out of the pits will be deposited below each pit in a crescent shape, so as to form a ridge with a clear berm of 9 inches in front. The consecutive crescents will be joined to catch the maximum quantity of moisture. Moreover, planting should be carried out in the pits and sowing on the berms, before or immediately after the first shower of rain.

#### **When to plant**

Planting should be completed early in the rains in as short a time as possible. The trees must be given time to become well established prior to the dry season. A good rule of thumb is to start planting when the soil is moist to a depth of 15-25 cm or to the bottom of the planting hole. Failures because planting is too late are more common than failures because of planting too early. To obtain good results and avoid labor

shortage in these areas considerable preparatory planning is needed. The size of the plantation might have to be adapted to the availability of labor. If dry sites cannot be planted in time, planting should be postponed until the next season.

Four rows of plants will be raised along the roads and Y-BRT route, Distance from the outer boundary of the ROW and between two plants will be kept as 4 meters. Thus, 250 plants are to be raised in a single row. A total number of 250 plants along boundaries and roads will be considered with 2 plants on each row in 1 Av. kilometer. Thus a total of **100,500** trees shall be planted in lieu of the expected **10,050** affected trees/plants, by considering **1:10** compensation standard.

*\*The PHA of KMC will be responsible to carry out the task and may update the planting standards, site selection and species choice as per the requirements and suitability in consultation with supervisory consultant and client.*

### **Trees Recommended**

The following trees are recommended for plantation, along the road.

*\*The PHA may change the species and standard as per actual requirement and suitability.*

<b>S.NO</b>	<b>Local Name</b>	<b>Scientific Name</b>
1	Neem	<i>Azadirachta indica</i>
2	Peepal	<i>Ficus religiosa</i>
3	Arjun	<i>Terminalia arjuna</i>
4	Bhor/Banyan Tree	<i>Ficus benghalensis</i>
5	Jungle jalebi	<i>Pithecellobium dulce</i>
6	Amaltas	<i>Cassia fistula</i>

### **Cost**

The cost and maintenance of about **100,500** plants for afforestation in the project area has been estimated including cost of layout, digging, planting, carriage and watch and ward and its maintenance for four (04) years.

**Table** shows the approximate cost of plantation including four (04) years' maintenance (Standard).

Break-up of Expenditure per Avenue kilometer @ Rs. 1500/- per diem: Break-up of Expenditure per Avenue kilometer or 250 plants @ Rs. 1500/- per diem:

### **FIRST YEAR**

<b>Sr. No.</b>	<b>Item</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount (Rs.)</b>
1.	Layout	1 Av.km	2 MD/Av.km	3000.00

2.	Digging of Pits 2.5 ft. each 2.5x250 = 625 cft.	625 cft.	5 MD/Av.km	7500.00
3.	Cost of Plants including	250 No.	Rs100/- plant	25,000.00
4.	Cost of planting of plants	250 No.	Rs. 25/- plant	6250.00
5.	Carriage of plants from private nursery to site including loading/unloading	250 No.	Rs. 10/- plant	2500.00
6.	Cost of Manure and Bhall (silt) including carriage	1 Av. Km		20,000.00
7.	H/watering 50 times 250x50 with water bowser, one driver and one coolie	12500 no.	5MD/per %0	100,000.00
8.	Weeding twice 250x2	500 no.	2 MD/per %	15,000.00
9.	Reopening of Pits twice (250x2)/cft/pit	500 cft.	2 MD/per %	15,000.00
10.	Unforeseen			5750.00
Total				200,000.00

## **SECOND YEAR**

<b>Sr. No.</b>	<b>Item</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount (Rs.)</b>
1.	Cost of Plants 20% Restocking	50 No.	Rs.100/- plant	5,000.00
2.	Cost of planting	50 No.	Rs. 25/- plant	1250.00
3.	Carriage of plants	50 No.	Rs. 10/- plant	500.00
4.	H/watering 50 times with water bowser, one driver and one coolie	12500 no.	5MD/per %0	100,000.00
5.	Reopening of Pits twice (250x2)	500 cft.	2 MD/per %	1,5000.00
6.	Weeding twice 250x2	500 no.	2 MD/per %	1,5000.00
7.	Unforeseen			1250.00
Total				1,38,,000.00

## **THIRD YEAR**

<b>Sr. No.</b>	<b>Item</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount (Rs.)</b>
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1.	Cost of Plants 10% Restocking 25 No.	25 No.	Rs.100/- plant	2500.00
2.	Cost of planting	25 No.	Rs. 25/- plant	625.00
3.	Carriage of plants	25 No.	Rs. 10/- plant	250.00
4.	H/watering 40 times x250 no.	10,000 no.	5MD/per %0	75000.00
5.	Reopening of Pits twice (250x2)	500	5MD/per %0	3750.00
6.	Unforeseen			2875.00
Total				85,000.00

#### **FOURTH YEAR**

Sr. No.	Item	Quantity	Rate	Amount (Rs.)
1.	H/watering 30 times	7500 no.	5MD/per %0	56250.00
5.	Pruning and cleaning of plants	250 no.	5MD/per %0	1875.00
6.	Unforeseen			1875.00
Total				60,000.00

Cost for raising 1 Av. Km and Maintenance or 250 plants: = Rs.4,83,000/-  
For 4 years

Total cost for **100,500** plants and their maintenance for four (4) years = **RKR. 194,166,000/-**

**Note:** The above rates and calculations are approximate and tentative which will be updated according to the standard rates of concerned PHA of KMC/Implementing Agency, during implementation stage, as per updated and approved standards.

#### **Expected Results**

1. Extensive plantation, raised on both sides of the road will improve the ecological balance as both the flora and fauna are integral part of the ecosystem. Native tree species will be resorted which is playing pivotal role in carbon sequestration, which leads to reduce global warming and storing more carbon.
2. Local people will also get direct benefits in terms of fodder for cattle's, shade, job opportunities during plantations and maintenance for four years, clean air, and balanced temperature. Improved Green cover in the area will also attract the faunal species which are scared away due to construction activities. This shall reduce the noise and air pollution as well.
3. In many ways, fauna of a tract is dependent upon flora for its resting, nesting and roosting activities. With the improved flora of the project area, due to raising of large number of trees, the fauna and especially the avi-fauna shall be attracted to the area. The birds, which were scared away due to noise and degradation of their habitat, shall return to the area.

4. Plantation on both sides of the road and nearby available spaces shall not only reduce the noise and air pollution but will also be a source of attraction for the humans, and Wildlife like mammals, reptiles, birds and other dependents.

## **ANNEX-XV: GUIDELINES FOR COVID 19**

## **PRECAUTIONARY ACTION AGAINST THE POTENTIAL RISK OF NOVEL CORONAVIRUS**

### **INTRODUCTION**

On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak, first identified in Wuhan China. The new name of this is coronavirus disease 2019, abbreviated as COVID-19. In COVID-19, 'CO' stands for 'corona,' 'VI' for 'virus,' and 'D' for disease. Formerly, this disease was referred to as "2019 novel coronavirus" or "2019-nCoV".

Coronaviruses are a large family of viruses. Some cause illness in people, and others, such as canine and feline coronaviruses, only infect animals. Rarely, animal coronaviruses that infect animals have emerged to infect people and can spread between people. This is suspected to have occurred for the virus that causes Coronavirus Disease 2019 (COVID-19). Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) are two other examples of coronaviruses that originated from animals and then spread to people.

The risk of exposure to COVID-19 is no different for employees of Employer, Engineer, Contractor, and suppliers than for the general population. Contractor, therefore, must consider the physical well-being and safety of all the persons entitled to be on the Site and follow reasonable guidelines and recommendations of Government authorities and healthcare professionals. As experience has shown in other countries, confirmed cases of COVID-19 expand exponentially if health and safety controls are left unheeded.

Contractor should enforce all health and safety procedures at Site including sanitary protocols, proper hygiene, social distancing, use of personal protective equipment (PPE), toolbox talks on special COVID-19 requirements, and prompt reporting of health issues related to COVID-19. Contractors must put safeguards in place to keep workers exposed to COVID-19 away from Site for at least 14 days after the last potential exposure.

WHO declared the COVID-19 as a Public Health Emergency of International Concern (PHEIC) in January 2020 and afterwards announced the COVID-19 outbreak as pandemic on 11<sup>th</sup> March 2020 due to the widespread of the disease in 114 countries at that time. WHO Director General urged the countries to take action now to stop the disease.

The rapid spread of COVID-19 hits all the provinces of Pakistan Sindh, Balochistan, Punjab & Khyber Pakhtunkhwa including the Gilgit Baltistan and Azad Jammu & Kashmir. The prevailing virus creates the menacing and distressing situation when it arrived around the closed proximities of the Project Area.

Government of Pakistan has launched the National Action Plan for COVID-19 Pakistan to combat the challenge of prevailing virus, also available at <https://www.nih.org.pk/wp-content/uploads/2020/03/COVID-19-NAP-V2-13-March-2020.pdf>. The Government of Pakistan has launched the real-time data portal for COVID-19 <http://covid.gov.pk/>. These measures are mostly relating to the containment and awareness and capacity building. Besides this COVID-19 daily situation report is also available at <https://www.nih.org.pk/wp-content/uploads/2020/04/COVID-19-Daily-Updated-SitRep-03-April-2020.pdf>.

All the stakeholders are on board to jointly prevent/ limit/ control the spread of COVID-19. All of the staff is required to take precautionary measures as well as maintain social distances. The

use of thermal guns for checking every single person body temperature, placement of relevant flyers and disinfection spray inside of all the containers are few of the measures to combat COVID-19.

## **OBJECTIVE**

Following are the objectives of this report to jointly prevent / limit/ control the spread of COVID-19 at Site that can hamper the progress of proposed Project:

1. To enhance understanding of the evolving COVID-19;
2. To share knowledge on COVID-19 and preparedness measures being implemented at Site;
3. To generate recommendations for adjusting COVID-19 containment and response measures; and
4. Outline the measures taken at Site. The advised measures will help all the stakeholders to plan their work continuity in response to the COVID-19.

Due to the evolving situation of the COVID-19, this document should be read in conjunction with the latest relevant advisories issued by WHO (especially "[Getting your workplace ready for COVID-19, 3 March 2020](#)") and Government of Pakistan.

## **WHAT IS CORONA VIRUS (COVID-19)**

The COVID-19 belongs to a family of viruses known as the Coronaviruses, which can cause illnesses ranging from the common cold to more severe diseases, such as the Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS)<sup>1</sup>.

## **SYMPTOMS**

The symptoms of the COVID-19 are similar to that of regular pneumonia. Typical symptoms include;

- Fever;
- Cough;
- Difficulty in breathing;
- Pneumonia;
- Runny nose;
- Sore throat; and
- Feeling of being unwell.

## **MODE OF SPREAD**

Infected person – person transmission; Infected people can spread COVID-19 through their respiratory secretions via droplets produced when an infected person coughs or sneezes, similar to how influenza and other respiratory pathogens spread. The spread from person-to-person is most likely among close contacts (about 6 feet);

- Infected animals' dead or Alive;

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<sup>1</sup> Source: World Health Organization

- Air by coughing and sneezing;
- Close personal contact, such as touching or shaking hands;
- Touching an object or surface with a virus on it; and
- Touching your mouth nose or eyes before washing your hands.

## **GENERAL STANDARDIZED PRECAUTIONARY MEASURES**

Following measures/recommendations are suggested as a general guidance to be followed for the protection of potential impacts of COVID-19:

Since, there is no vaccine available to protect against human Coronavirus infections. Therefore, transmission can be prevented through following measures:

- Cover your mouth while cough or sneeze;
- Avoid close contact with people who are sick;
- Avoid the use of hard soap;
- Wash your hands often with liquid soap and water for at least 20 seconds;
- All the employees should ensure sanitization of hands at appropriate time;
- Avoid touching your eyes, nose, and mouth with unwashed hands;
- If you are concerned about your symptoms you should see your health care provider at site or in office;
- Use of Personal Protective Equipment (PPE) according to risk (a surgical or N95 mask);
- Do not spit, wrap your oral and nasal secretion with tissue and throw it in a covered dustbin;
- Balance your nutrition and exercise moderately;
- Sterilization / disinfection of medical devices at Site dispensaries; and
- Do not touch, buy or eat wild animals (gamey). Try to avoid visiting markets that sell such animals.

## **PROJECT SITE SPECIFIC PRECAUTIONARY MEASURES**

Measures for protecting staff and labour from exposure to, and infection with, the COVID-19 depend on the type of work being performed and exposure risk, including potential for interaction with infectious people and contamination of the work environment. Regardless of specific exposure risks, following are the main actions that have been jointly taken at Site to combat the COVID-19:

### **Employer's Side**

Employer should issue the notification containing the precautionary measures in the light of GoPb guidelines to be implemented at Site. Upon receiving the Employer notification all the mentioned precautionary measures will be communicated to Engineer staff for compliance. Employer technical staff is also complying with the GoPb guidelines and Contractor suggestion to control the spread of COVID-19 at Site in the best interest of the Project and country.

### **Consultant's Side**

Consultant's top management will issue the orders in the light of GoPb guidelines containing the precautionary measures to control the spread of COVID-19 for the staff working at Site.

Consultant staff at Site will fully complying with the orders including photographic evidence. Considering the severity of the prevailing virus Engineer devised the Standard Operating Procedure (SOP) containing precautionary action against the potential risk of novel corona virus.

Besides, above Consultant will ensure the following precautionary measures at Site.

- Adequate signage and information at all entrances and exits showing what is Corona Virus, how it spreads, what are the symptoms, standard precautions;
- The awareness session for the Contractor staff is equally important as of Consultant staff to combat the COVID-19 at Site. The Consultant will ensuring that Contractor is arranging such session at Site from time to time to reduce the potential risk of COVID-19. Further, all the newly inducted and existing staff have been given HSE training by the Consultant & Contractor.

### **Contractor's Side**

Contractor will communicate various precautionary measures to Employer and Engineer through letters to control the spread of COVID-19 at Site. Following are the major steps to be taken by the Contractor:

- Contractor will convey the instructions and requirements of its superior unit for the prevention and control of COVID-19 epidemic at Site.
- Contractor will establish a special organization for epidemic prevention and control on the Project Site that is responsible for arranging, implementing, publicizing and supervising the epidemic prevention and control measures.
- Launch the plan for epidemic prevention and control on the project Site that includes:
  - All personnel in temporary camp are required to wear masks;
  - Contractor personnel incharge of Site to wear masks;
  - Arranged special personnel to measure and record the temperature of all personnel when entering or leaving the temporary camp;
  - If any person with fever, cold and other symptoms are found, they will be admonished to go home for isolation and asked about the development of the disease every day; and
  - Propagate and implement the epidemic prevention measures for the staffs and labours and warn them not to go outside and home as much as possible.
- All these meetings should carried out through video conference.

Contractor is not limited to the above precautionary measures but practicing and implementing the following;

- Contractor will prepare a pamphlet for the awareness of Site staff to combat the COVID-19. It will also place/posted at strategic points at Site.
- Launch awareness campaign to inform all the staff and labour about the coronavirus, to use facemask, hand hygiene, cough etiquette, and avoidance of close contact with animals and consumption of their raw products.
- Everyday awareness speech in English and Urdu in the temporary camp.
- All the employees are not allowed to go outside of the Project Area or on vacation to their homes and on daily basis visit to sites;

- Contractor will provide medical masks and antibacterial liquid hand wash to all personnel.
- Contractor will prepare the isolation facility at Site and provided three isolated rooms for such patients inside the temporary camp. Each room have three beds, oxygen cylinder, sanitizers, isolation kit, hand wash.
- Thermal scanning will be carried out continuously in the morning for everybody at the main gate of temporary camp.
- Record will be maintained for everyone that includes the temperature value of each person with their names, every morning and afternoon go to each department for scanning separately and noted down their name with temperature values.
- Contractor carry out disinfectant spray on daily basis morning and afternoon in each office and rooms and all the area of the camp.
- SSWMB and Consultant staff will also requested by Contractor to do not interact physically rather through electronically by emails or video conferencing.

## **RECOMMENDATIONS FOR THE CONTROL OF COVID-19 AT SITE**

### **To Avoid Transmission**

For all personnel at Site, it is always a good to practice the following precautionary measures:

- Workers to remain at least two meters apart from each other at all times (social distancing) – i.e. spread out and reduce the number of people working together in one area of the site;
- Avoid eating lunch in the form of group in available mess/canteens at Site;
- Close site canteens/ food preparation and eating areas (avoid gatherings) – workers to bring their own prepared lunch to site and eat alone e.g. in their van, car, or in an open space;
- Avoid in-person meetings if possible. In the case that an in-person meeting is unavoidable, make sure to have it in a well-ventilated area with sufficient space for attendees to distance themselves from one another. For meetings such as toolbox talks, consider breaking them up into smaller group meetings versus one large meeting;
- Introduce enhanced cleaning procedures across the Site and touch points e.g. office equipment, plant and machinery controls, taps/toilet/washing facilities, handrails;
- Stagger start times on site to avoid congestion in entrance areas;
- Reduce the number of people on site inductions at any one time and hold them outdoors if possible;
- Stop workers moving across various sites (potential for cross contamination);
- No outsiders should be at the Project Site;
- Contractor, Consultant and Employer personnel are advised to avoid travelling and in case traveling is unavoidable, prior approval from the management should be essential. In case of travelling, the above mentioned measures need to be strictly followed by the traveller;
- Prompt identification and isolation of potentially infectious individuals is a critical first step in protecting workers and other Site staff. An isolated area should be available at Site to immediately isolate suspected person, as it is most important to stop its spread at Site.
- Rapid Response Team should be formed and be informed immediately in case of suspect and confirmed case of COVID-19.

- Medical team at Site should separate the suspected person displaying fever, cough or difficulty breathing from other personnel; and
- If a person has had close contact with an individual that has confirmed COVID-19, that person will not be allowed to return to the Site until he/she has been symptom free for 14 days.
- Clean and fumigate all the workplaces at Site on daily basis;
- Ask people to stay at home if they have fever, cough, difficulty in breathing, runny nose, sore throat as per organizational rules;
- An immediate replacement of solid soap with liquid anti-bacterial soap bottles may be appropriate.
- Provision of alcohol-based hand sanitizer need to available for all staff;
- Clean the religious places carpets and rugs. Have them washed in place over the weekend and then do regular cleaning;
- Have the cleaners/ maintenance crews regularly clean surfaces that are touched frequently by personnel with disinfectants such as in and out doors;
- Fresh medical tests of staff working should be carried out at Site;
- Dispose of all contaminated waste (gloves, paper, swab handles, etc.) into biohazard waste bags for disposal;
- Ensure that panic is not created. In fact the posters should start with statements such as do not panic and fear the virus but know and prevent; and
- Ensure proper ventilation system for all the personnel at Site.

#### **Use of Personal Protective Equipment (PPEs)**

- Necessary PPE should be available at Site all the times and are being issued to each personnel at Site;
- Practice of using masks is also being ensured by all parties at Site (a surgical or N95 masks);
- Re-usable PPE should be thoroughly cleaned after use and not shared between workers. Single use PPE should be disposed of so that it cannot be reused;

#### **Outside Visitors**

- Visitors should enter with strictly wearing visitors card;
- Ensure sanitization of hands;
- All parties should ensure that the sick persons should be wearing a surgical or N95 masks;
- Note down the complete information of outsiders before entrance;
- Proper screening should be carried out before entering the Site;
- Refrain from handshakes. Rather than shaking hands, visitors may explain why handshakes can contribute to the risk of spread;
- Attempt to maintain a general six (6) feet distance between themselves. This will be challenging to follow at all times but it is Engineer recommendation to follow;
- Refrain from and/or limit touching of workplace surfaces; and
- In addition to these on-site procedures, it is advised to follow their respective organizational instructions related to Site visits.

## **ANNEX-XVI: BASIS OF PPE AND MONITORING COST**

## PPE COSTING

Items	Quantity	Cost / Item (Rs.)	Total Cost (Rs.)
Dust masks	144,000	70	10,080,000
Safety Shoes	1,500	10000	15,000,000
Gloves	3,600	2500	9,000,000
First Aid Box	60	5000	300,000
Ear Plugs	6,000	200	1,200,000
Safety Helmets	3000	1500	4,500,000
Safety Jackets (Hi Vis)	3000	1000	3,000,000
<b>Total: (for 36 months)</b>			43,080,000
<b>Annual cost</b>			14,360,000

**Time required for Construction = 36 months**

**Estimated No. of labor required during construction = 500**

### Environmental Monitoring and Testing Cost Estimate

Sr. No.	Parameter	Mechanism	Frequency	Unit Rate (PKR)	Quantity	Cost (PKRs)	Remarks
<b>A Pre- Construction Phase</b>							
1	Surface Water / Wastewater	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Once	25,000	1x02	50,000	One-time monitoring shall be carried out before the mobilization of Contractor.
2	Drinking Water / Ground Water	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Once	25,000	1x05	125,000	
3	Noise Levels	dBA Leq. as per SEQS 2014	Once	2,000	1x10	20,000	
4	Ambient Air Monitoring	Monitoring of CO, CO <sub>2</sub> , SO <sub>x</sub> , NO <sub>x</sub> , HC and PM <sub>2.5</sub> PM <sub>10</sub> by EPA approved Laboratory	Once	35,000	1x10	350,000	
<b>Total</b>						<b>545,000</b>	
<b>B Construction Phase (36 Months)</b>							
1	Surface Water / Wastewater	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Quarterly	25,000	12x02	600,000	Quarterly monitoring cost for the one-year construction period and will be updated each year based on latest rates during construction timeline of the proposed Project.
2	Drinking Water / Ground Water	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Quarterly	25,000	12x05	1,500,000	
3	Noise Levels	dBA Leq. as per SEQS 2014	Quarterly	2,000	12x10	240,000	
3	Ambient Air Monitoring	Monitoring of CO, CO <sub>2</sub> , SO <sub>x</sub> , NO <sub>x</sub> , HC and PM <sub>2.5</sub> PM <sub>10</sub> by EPA approved Laboratory	Quarterly	35,000	12x10	4,200,000	
<b>Total</b>						<b>6,540,000</b>	<b>Cost is calculated for three (03) years</b>

<b>C OPERATION &amp; MAINTENANCE PHASE (One Year Cost)</b>							
1	Surface water	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Biannually	25,000	02x02	100,000	Biannually monitoring cost for one-year O&M Phase and will be reproduced for next years of O&M based on updated rates.
2	Drinking Water / Ground Water	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Biannually	25,000	02x05	250,000	
3	Noise Levels	dBA Leq. as per SEQS 2014	Biannually	2,000	2x10	40,000	
4	Ambient Air Monitoring	Monitoring of CO, CO <sub>2</sub> , SO <sub>x</sub> , NO <sub>x</sub> , HC and PM <sub>2.5</sub> and PM <sub>10</sub> by EPA approved Laboratory	Biannually	35,000	2x10	700,000	
<b>Total</b>						<b>1,090,000</b>	<b>Cost is calculated for one (01) year</b>
<b>Grand Total</b>						<b>8,175,000</b>	

## **ANNEX-XVII: CONSULTATIONS**

## Departmental Consultations



Meeting with SEPA



Meeting with MD KUTC



Meeting with KATI



Meeting with LATI



Meeting with DHA Officials



Meeting with Dewaan University  
Management



Meetings with Joint Director Urban Source Center



Meeting with Deputy Director Social Welfare (Malir)



Meeting with KWSB Representative



Meeting with PARCO

## Public Consultations



Consultation with Local Community at Shaheed-e-Millat Road



Consultation with APs at Jam Sadiq Bridge



Public Consultation at Industrial Area



Public Consultation at Shahrah-e-Faisal Road



Consultation with AP at Defence Turn Bride



Public Consultation at Industrial Area

## Consultation with Females



Consultation with Students at Dewan University



Women Consultation at Shan Chowrangi



Consultation with Students at Fabtex Apparel Factory



Consultation at Karachi University

## Consultations with Transgender



## ANNEXURE-9

### PROCEEDINGS

A stakeholder consultation workshop was organized on April 18, 2019 at Marriott Hotel, Karachi. The objective of the consultation workshop was to disclose draft version of Environmental Impact Assessment (EIA) report to the stakeholders and get their feedback. The draft EIA report will be finalized in the light of stakeholders' feedback, suggestions and their concerns. This consultation is required by World Bank as per its stakeholder consultation and disclosure policy.

About 20 participants attended the workshop. They were the representatives of Sindh Mass Transit Authority (SMTA), KMC, Urban Resource Centre, K-Electric, SSGC, NED University, Local Government Departments, NESPAK, Sindh EPA, Karachi Public Transport System (KPTS), PPP Unit, and consultants.

The representative of SMTA started the proceedings, welcomed all the participants, explained the objective of the consultation workshop and presented the Yellow BRT Corridor project. After project description, Mr. Shafqat Ullah, Consultant World Bank, presented the anticipated environmental impacts of the project. After the environmental impacts presentation, Mr. Hafeez Buzdar, Consultant World Bank, presented the key findings of the Social Impact Assessment (SIA) of the project.

After the presentation session, participants were requested to pose questions regarding the project, and anticipated environmental and social impacts of the project. Following are the key questions and their answers regarding EIA of the project.

**Q:** Where will the trees be planted in compensation for the cut trees from the Yellow BRT corridor?  
It will be better to plant these trees along the corridor instead of at other places.

**A:** It will be preferred to plant maximum of 2,000 trees along the corridor. The left over trees will be planted at best suitable locations.

**Q:** What about the storm water drainage along the corridor?

**A:** Storm water drainage system will be the part of the BRT corridor design. Storm water drains will be designed and constructed to avoid flooding at the corridor.

**Q:** What about the parking facilities along the corridor? These facilities will be very important for the daily commuters on the corridor.

**A:** There will be no provision of parking facilities as a standard design feature in the Yellow BRT Corridor.

**Q:** Local Tanzeem (Organization) should have been invited in this consultative workshop.

**A:** All the local organizations will be invited at public hearing of the EIA.

**Q:** Pedestrian bridges are not convenient for the old and disabled people. Pedestrian tunnel is a better option.

**A:** Design team will consider this aspect and incorporate maximum possible facilities for the old and disable people following universal access design principles.

**Q:** Elevators at bus stops is not a feasible option as it increases rush. The escalators are better than elevators.

**A:** As above

**Q:** Who will provide buses for Yellow BRT Corridor project?

**A:** The buses will be provided through Public Private Partnership (PPP).

**Q:** Utilities line at the corridor should be known prior to start of construction for the corridor, otherwise there are chances of utility lines damages.

**A:** Mapping of utilities have been prepared in which all the utilities have been marked on the drawings. These drawings have been shared with all the relevant agencies for utility relocation planning and budgeting. Design team is in liaison with these agencies.

**Q:** Why petrol hybrid buses are not used in the project?

**A:** Petrol hybrid buses production is limited in the world. Mostly diesel buses are in the market. The fuel efficiency of diesel buses is better than petrol busses. The petrol buses are also very expensive as compared to diesel buses.

**Q:** Different agencies have also plans to start renovation work (roads, drains etc.) on the proposed BRT corridor. The overlapping of these projects should be avoided to save resources of the city.

**A:** These agencies need close coordination and plan accordingly to avoid overlapping of project activities and wastage of city's budget.

**Q:** Safety distance should be maintained for the corridor from the electric pylons

**A:** Safety distance has been incorporated in the design. At those stretches of the corridor where electric pylons are present, the bus corridor alignment is at a safe distance as suggested by K-Electric.

**Q:** Project timeline should be followed otherwise this project will get delayed as other projects like Green Line.

**A:** The project timeline will be strictly followed to avoid delays. Delays also increase project cost.

**Q:** Who will ensure compliance of environmental and social safeguards during construction and operation of the project?

**A:** There will be project team in SMTA which will be overall responsible for the implementation of the project activities. Under project team, there will be Environmental and Social Cell (ESC) which will particularly be responsible for the compliance of environmental and social safeguards.

**Q:** There can be daily or weekly ticket, inclusive of all charges of bus travel and parking. It will be convenient for the daily commuters.

**A:** The operational design of the product is underway. In this operational design, all these aspects related with fare are being considered.

**Q:** It has been observed at Green Line that when ramps were constructed, the service roads were blocked due to poor designing of the ramps.

**A:** Definitely, all such design factors will be considered during the detailed designing.

**Q:** There should be feeder service in Yellow Line project to serve those people living around the corridor, especially for the workers of Korangi Industrial Area.

**A:** Yellow BRT System will be inclusive of trunk, direct, and feeder services to facilitate maximum passengers to avail BRT system.

**Q:** The Yellow Line project will not be feasible without feeder service.

**A:** Feeder services are included in Yellow BRT Corridor project

**Q:** What about the funding? Is it 100% by the World Bank?

**A:** Total project cost is about US\$ 438.9 million. The contributions from the World Bank and Government of Sindh (GoS) is US\$ 381.9 million and US\$ 19.4 million respectively.

**Q:** The industries located around the Korangi Road discharge their wastewater without any treatment. Will this project also provide treatment to this wastewater?

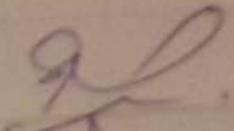
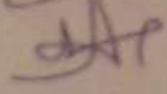
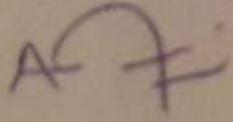
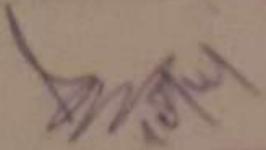
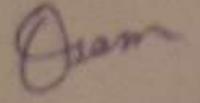
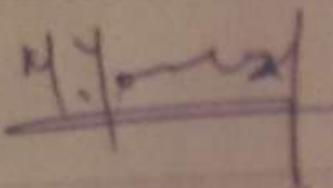
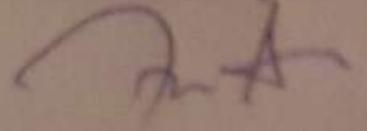
**A:** Wastewater treatment is not under this project. Wastewater treatment will be considered in other World Bank funded projects.

The participants were satisfied with the bus fare of Rs. 15 to 55 (The minimum fare will be increased after every additional kilometer travelled by the passenger), and the expansion of the Jam Sadiq Bridge under the project.

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