

添付資料



コルカタ東西地下鉄整備事業補足調査 DFR  
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## **添付資料 1 Current Situation Survey at Esplanade Station**

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添付資料 1 (1) Report on Current Situation Survey at Esplanade Station (Topographic Survey)



**REPORT ON CURRENT SITUATION SURVEY AT ESPLANADE  
STATION  
(TOPOGRAPHIC SURVEY)**

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# 1. Introduction

The surveys on current situation of the Esplanade Metro Station are as outlined in the Terms of Reference are:

1. Layout and Facilities of the Esplanade Station
2. Number of passengers at 15-minute intervals by direction (in/out)
3. Transportation mode to/from the station
4. Esplanade Station Area Urban Establishment Survey

Out of the above items 2 and 3 are related to traffic survey and have been dealt separately in Traffic Survey. Items 1 and 4 deals with topography survey of the current situation of the Esplanade Station and areas within 500m radius of the Esplanade station and covered briefly in this report.

The field survey was carried out after obtaining permissions from KMRC and all relevant departments like KMC, Police etc. KMRC issued letter to various departments on request of Yachiyo Engineering Co. Ltd, Japan, requesting them to extend necessary assistance and facilitate the above surveys, besides issuing permission required to conduct the field survey work. The survey agency communicated the request for permission to local police station to allow coordinated field work during day and at night time.

Due to dense population of the survey area and huge volume of traffic combined with congestion prevailing throughout the day and till late in evening, major field work was carried out at night at different locations.

The results of topographic field survey were used to prepare a current situation map of topographical features as outlined in the Terms of Reference.

## 2. Brief Description of Esplanade Survey Area

The Esplanade area is demarcated by,

1. Bentinck Street to the North,
2. Park Street to the South,
3. Raj Bhawan (Governor's Place) to the West
4. Chandni Chawk Market/KMC to the East

This area is described as the Heart of Kolkata and has grown into a Central Business Area over centuries. The locality has several iconic public and private buildings and establishments like The Grand Hotel, Kolkata Municipal Corporation, Hogg Market, Metro Cinema, CESC(Victoria House), Statesman House, Chandni Charwk Market apart from innumerable Government offices, Private offices, Shopping Malls, Hotels, Restaurants, Cinema halls. Most of these establishments are located at North, North East and South East side of the survey area and make the locality very densely populated.

The commercial utility of the locality is immense to shop owners and shoppers alike. The footpath/sidewalk on the entire eastern side is lined with low priced shops selling variety of products. The locality also flourishes as a destination to large number of hawkers and street vendors who sell their merchandise during the day and evening without any permanent shop or setup. The large population of footpath vendors with small shops, food stalls, street vendors with make-shift stalls and mobile hawkers, mostly from low-income background, turn the footpath/sidewalk into over-crowded place from morning till late evening.

At the western side of Esplanade metro station is the century old Tram Terminus cum Depot, Inter-state and Inter-city Bus Terminus for Government and Private bus services, Bidhan Market, Curzon Park, Sahid Minar (monument), Clubs, low priced shops, street vendors and roadside food stalls. The iconic Raj Bhavan is situated on the far west of the survey zone. Outside the zone of survey lies the world famous cricket stadium-Eden Gardens, city's famous football club tents and their stadium.

The presence of such an important commercial area with multifarious businesses and well road transport and metro connectivity draws huge commuters to the place. Besides the daily volume of traffic, additional surge is understood on the days of cricket matches. Few days of field survey also witnessed similar crowd on match days.

The bus terminus of Esplanade is the major bus terminus for not only the Government busses but also for public busses. Long Distance busses going to various parts of West Bengal also operates from this terminus. The Metro station serves the city people to ensure quick and effective mass transportation connecting north-south of the city. The Calcutta Tram Company have terminus for tram and buses at Esplanade. Besides, taxis are found waiting on the western side near Bidhan Market, Bus terminus, Tram terminus and Metro Entrances throughout the day. Construction work of East-West metro is also going on at North West side.

There are various hotels and restaurants, apart from the star hotels, which range from side walk food stalls to family restaurants serving every class of people of Kolkata with its delectable food at affordable prices.

Esplanade area is famous for its shopping centers; the SS Hogg Market (New Market) is the biggest market in this area where every item of daily, luxury and entertainment can be found. Another market is the Chandni Chawk Market with its spread of wholesale and retail consumer durables attracts buyers from all walks of life. The arterial roads like Jawaharlal Nehru Road, S.N.Banerjee Road, Lenin Sarani, C.R Avenue and its connecting streets (including street and lanes around SS Hogg Market, Chandni Chawk Market) are medium to densely populated with hawkers and street vendors, mostly from low-income background, daily come to the area for livelihood.

The south-western part of the Esplanade area is known as The Lungs of Kolkata for the vast Maidan area with playground of different clubs and associations and also the Eden Garden Park and Stadium.

### **3. Scope of Work**

#### Layout and Facilities of the Esplanade Station

Layout Plan of the existing Esplanade Station showing the facilities of the station. The work is proposed to be carried out based on the details/drawings of floor plans of the underground station and above ground structures to be collected from Kolkata Metro Rail authorities.

#### Esplanade Station Area Urban Establishment Survey for Station Facility Plan

The work specification include surveying existing establishments within 500m radius from Esplanade Station as centre.

The target for this survey will be Existing buildings, facilities, services, area zone and land use. The features that will be plotted on map are:

- Plotting bus stops, taxi stands (if exist)
- Plotting locations of inter-city bus terminus, tram terminus
- Plotting business (mainly retails and markets) buildings and locations
- Plotting office building locations (with no. of floor, area and use type)
- Plotting hotel/accommodation
- Plotting cinema/theatre halls
- Plotting market complex
- Plotting public and other services

A map will be prepared on a scale – 1:1000 to depict the above structures and facilities. A report will describe the following-

- Functions and buildings and facilities.
- Location of buildings and facilities.
- General data of buildings described above.



## 4. Work Approach and Survey Team

The field survey was carried out with control points shared by KMRC. The survey manpower comprised of 02 Sr. Surveyors, 02 Surveyors, 08 Survey Assistants and traffic marshall . Two teams, each comprising 01 Sr. Surveyor, 01 Surveyor, 04 Survey Assistants and 02 traffic marshall. The work area within 500m radius of Esplanade Station was be divided into following zones:

- a) North East Zone
- b) South East Zone
- c) North West Zone, and
- d) South West Zone

The two teams scheduled the survey work starting with North East and South East zones and then engaged North West and South West zones.

Accordingly, survey work was conducted as per time schedule drawn in consultation with police and local administration:

- 1. 6.00 am to 1.00 pm for Day survey
- 2. 10.00 pm to 6.00 am for Night survey

The survey teams observed safety norms at work site throughout the field work.

## 5. Methodology of Survey

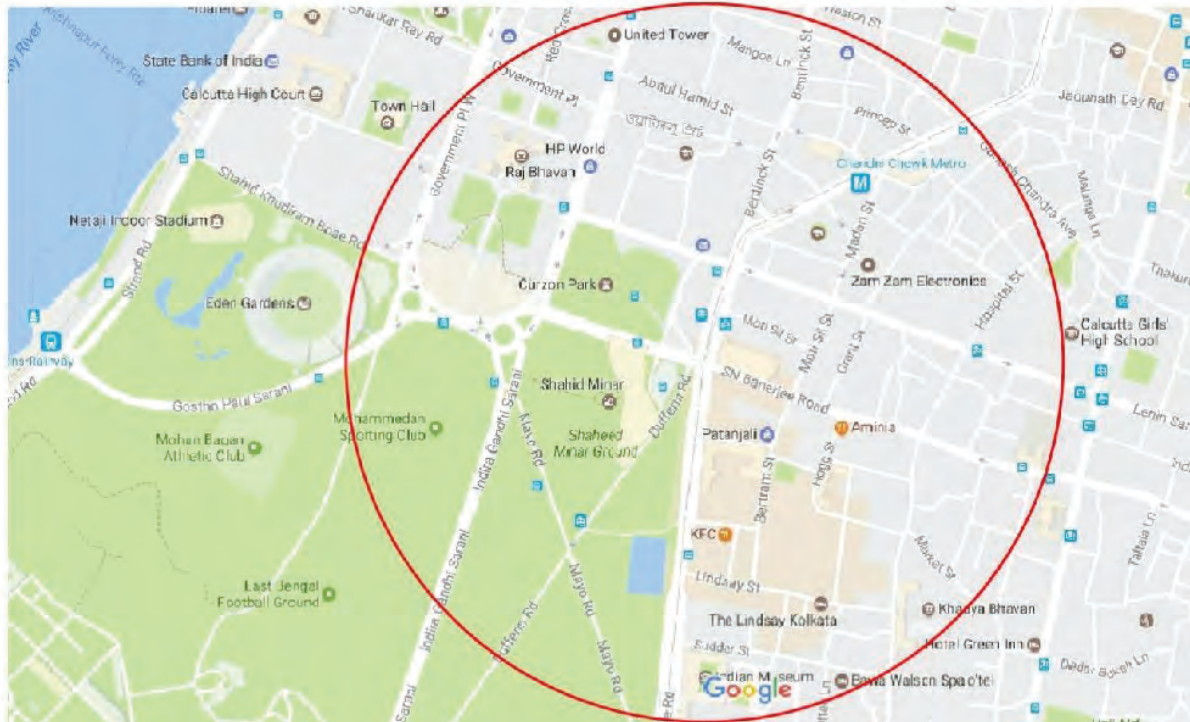
The total surveyed area was reckoned about 7,85,000sqm. considering 500m radius from the existing Esplanade Metro Station. Most of the areas are congested and busy with commercial activities.

As per the instruction of KMRC letter, survey commenced from 23April17 and as advised by KMRC the reference points ES-T20 (N=49085.930, E=49491.140, RL=+5.428) and ES-T21 (N=49077.204, E=49380.274, RL=+5.600) situated nearer to the Esplanade Metro Station were used as reference.

The survey Instruments & tools used in this project are:

1. Total Station Trimble make complete set with two nos. Prism set. 01 no.
2. Total Station Topcon make complete set with two nos. Prism set 01 no.
3. Auto Level Sokkia make with two nos. 4M. Alluminium Staff 01 no.
4. Optical Prism and Rod
5. Survey Staff
6. Measuring Tape
7. Pegs, and other accessories.

Closed Traverse was done nearer to land/property boundary as per availability of clear vision. Traverse points were chosen not more than 300m. Level check was also carried out from the given Bench Mark/ control point to all the Traverse Stations by Auto Level. All topographical features like buildings, roads, metro entrances, markets, shops, hotels, cinemas, malls, tram track, bus stop, bus terminus drain, manhole, electric pole, lamp post, telephone post, junction box, manhole, foot path, water tap, trees, etc. were surveyed. The spot levels were taken in 20m interval in normal and in undulated area in closer interval according to the ground condition.



**Survey Area demarcated in Red.**

Photographs were taken during the survey. The work progress was communicated to the Client by weekly e-mail update.

The survey data are plotted on a map/drawing to scale 1:1000. (Refer topo map ref-RUPL/YEC/KOL/001 titled: 'Topographical Survey Map of 500m radius of Esplanade Station.)

The street level plan of Esplanade metro station is prepared as per field survey of above ground metro structures. The underground floor layout plans are sourced from Metro Rail drawing of mezzanine/concourse and platform level plans. Due to huge traffic handled at this busy metro station, access to the station for surveying and associated security concerns limited the detailed physical measurements inside the station and therefore surveyors had to rely on existing drawing.

(Refer Esplanade Station layouts- Street Level Plan, Mezzanine/Concourse Plan & Platform Plan)

## 6. Safety

Standard safety measures used by all team members which includes,

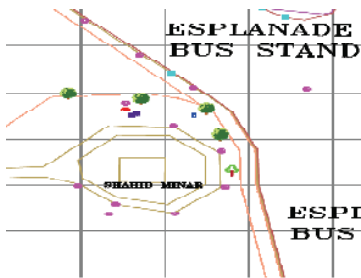
- a) Safety Helmet
- b) Safety Shoes.
- c) Reflective Jackets.

Each team deployed dedicated traffic Marshall to assist the team by temporary regulating traffic within the active survey zone.

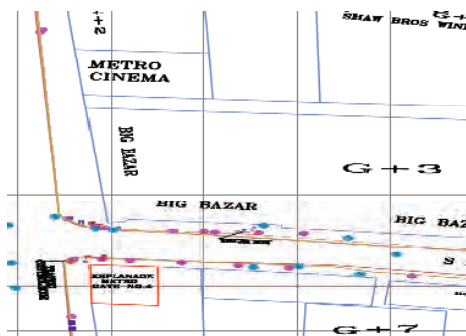


**Survey Team Member with Safety Equipments**

## Appendix I: Plates



**Shahid Minar** – Historical Monument from British era. Notable landmark to the south of designated survey area (near private bus stand).

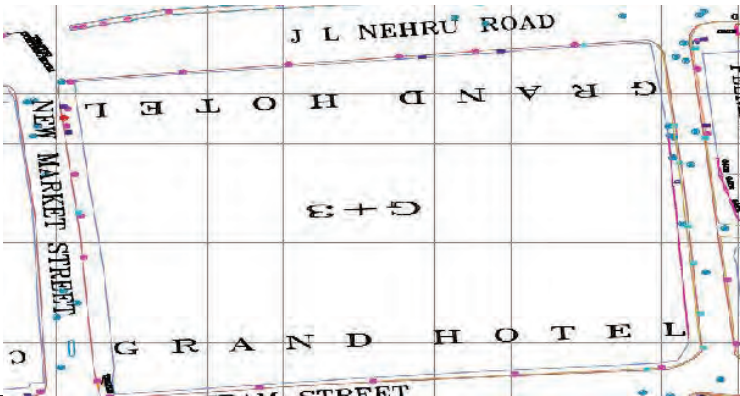


**Big Bazar Building** – The Big Bazar/Metropolitan Building is a Heritage Commercial Building. Office of Major Insurance companies of India. It is situated at the junction of S.N. Banerjee Road and J.L. Nehru Road (besides Metro Cinema building). The sidewalks of this building are covered with street vendors.





**Grand Hotel** – Grand Hotel is a 5-star Hotel. Commercial Place. The Peerless Inn Hotel is just beside the Grand Hotel which is also a 5-star Hotel. The sidewalk beneath the Grand hotel is also full of street vendors.



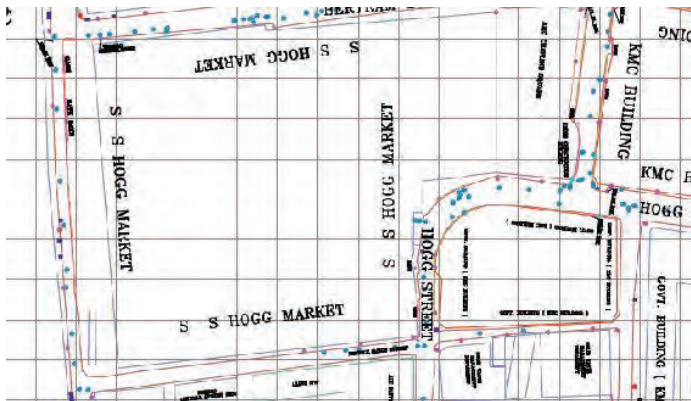
**Kolkata Municipal Corporation Building** – The Head Quarter building of Kolkata Municipal Corporation. This is also an old British era Heritage building.





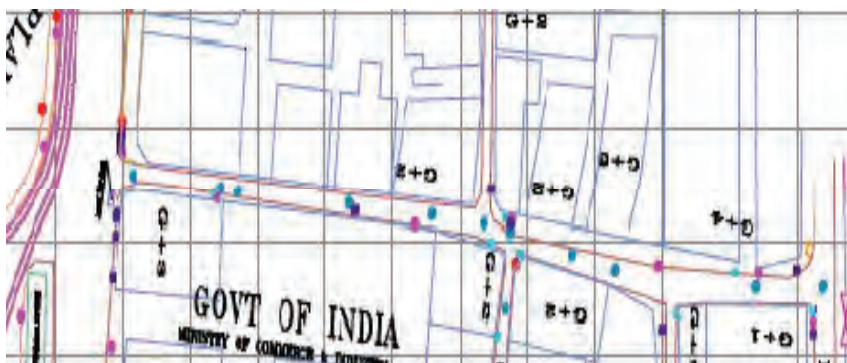
**SS Hogg Market (New Market)**

– Main Market Place for all type of goods (daily needs to luxury). As seen in picture the main market is inside covered building and all the outside streets are full of street vendors (temporary vendors).



**James Hickey Sarani (Deckers Lane)**

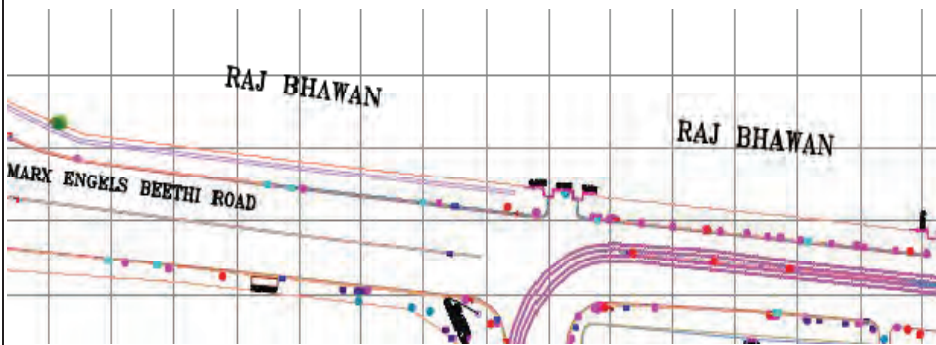
– Also known as Food Street. It is full of Street food vendors.



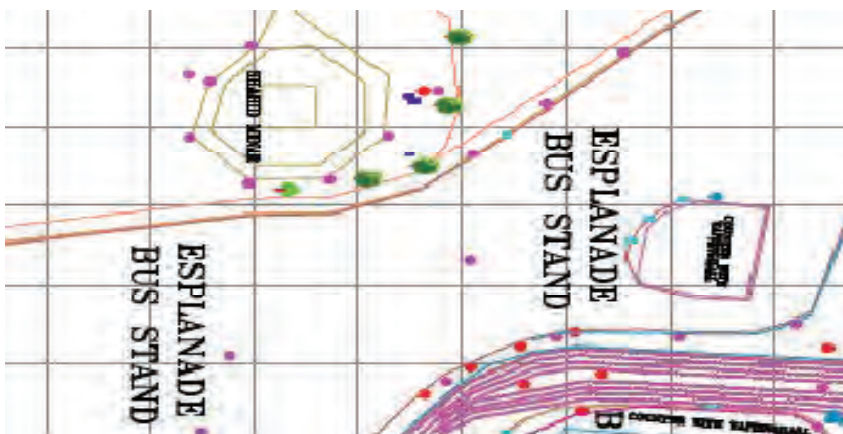




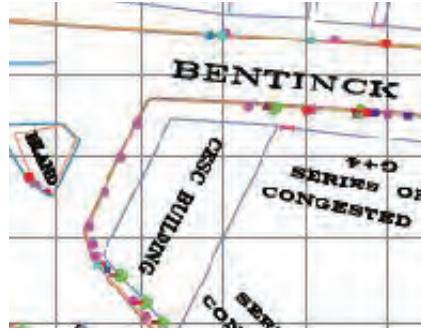
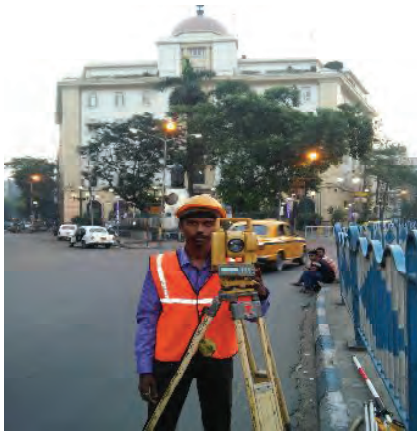
**Raj Bhawan (Governor's Place)** – Official residence of Governor of West Bengal.



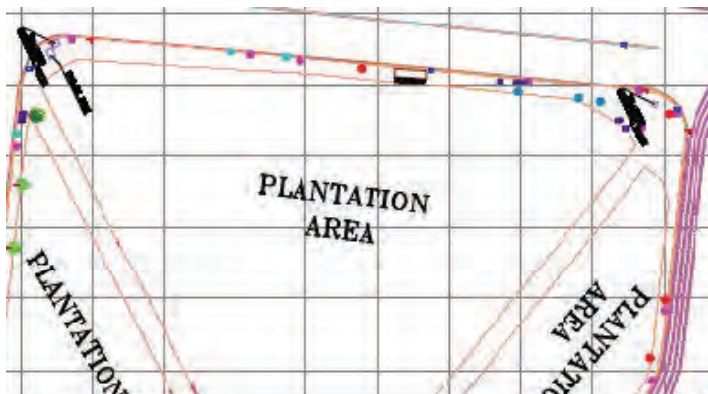
**Esplanade Bus Stand** – The private bus stand at Esplanade. There are also Govt. bus stand in Esplanade. The Shahid Minar can be spotted at the upper right corner of the picture.







**CESC House** – The CESC House/Victoria House is the main business building of Calcutta Electric Supply Corporation.

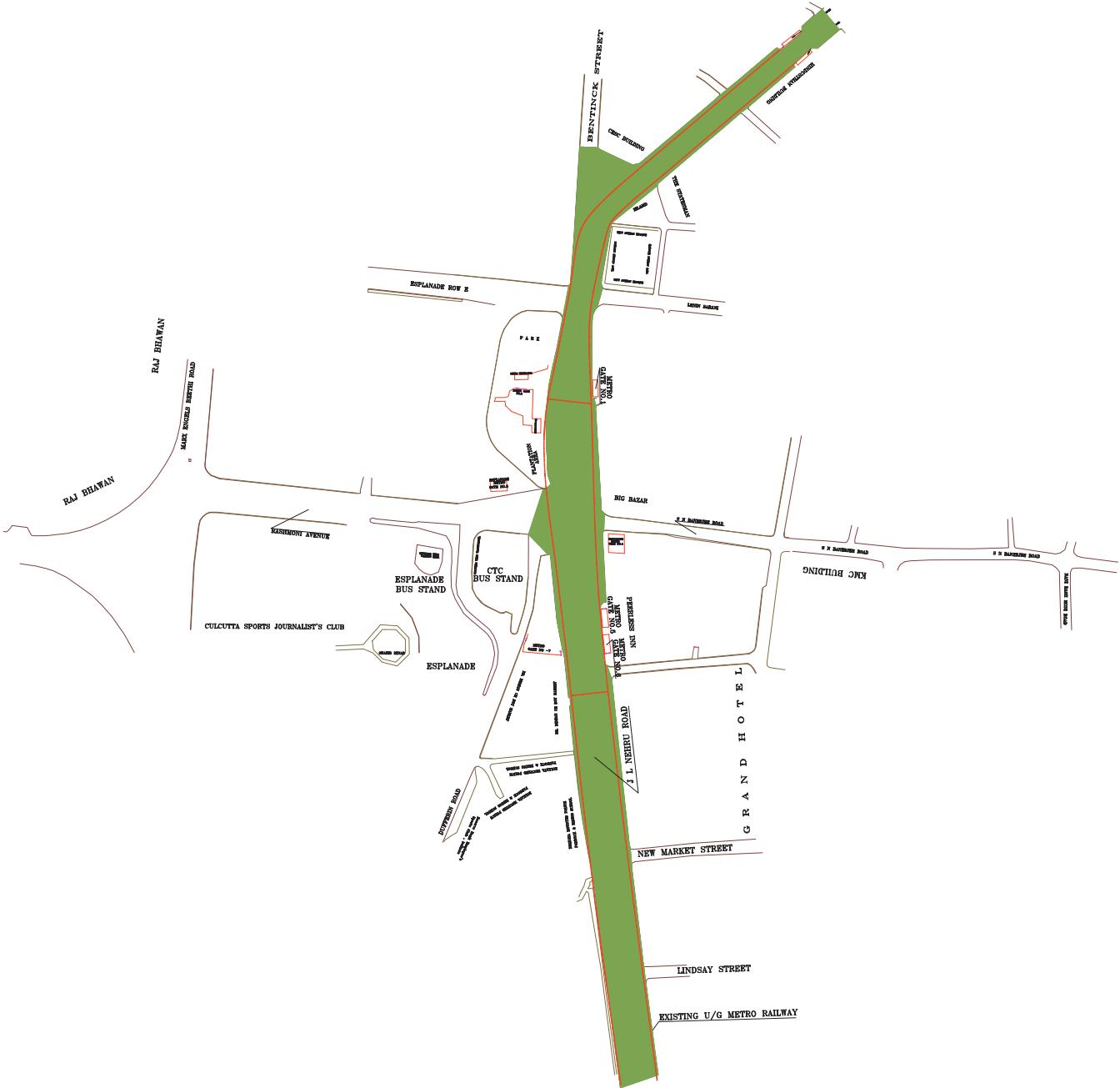


**Curzon Park** - The Curzon Park is a renowned landmark just beside the Tram Terminus at Esplanade.



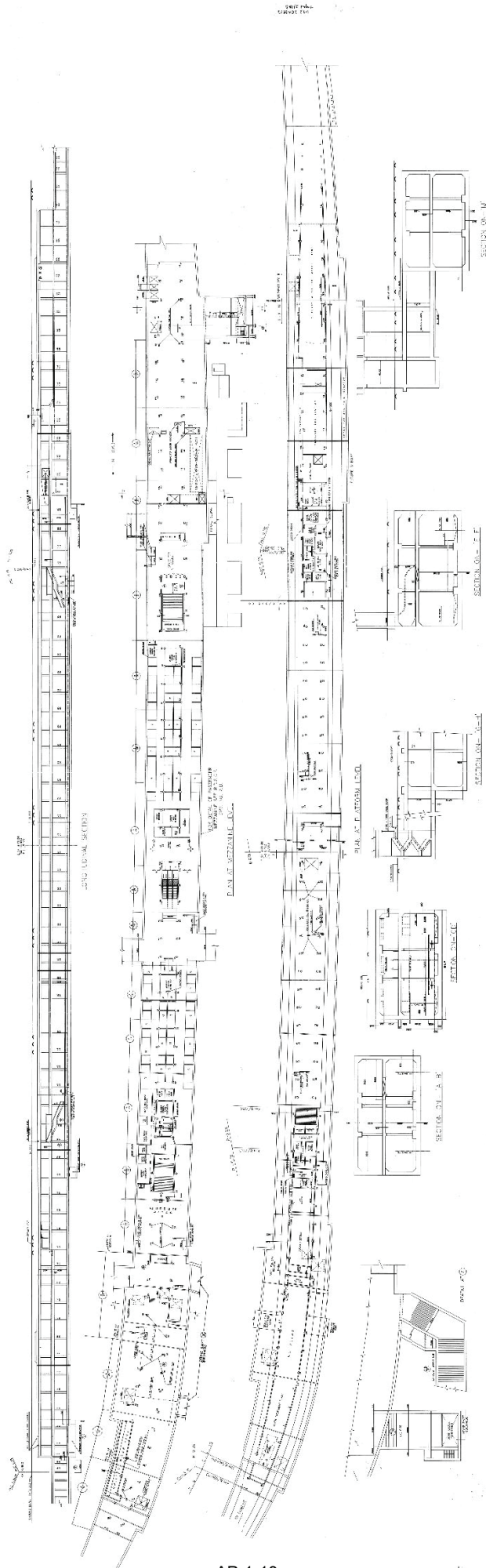
**Aerial View of Esplanade showing the Bus Stand (partly) and the Shahid Minar. The Eden Garden Stadium can be spotted in the background of the picture (Photo taken from Grand Hotel).**

添付資料 1 (2) Street Plan of Present Condition of Esplanade Metro Station Area



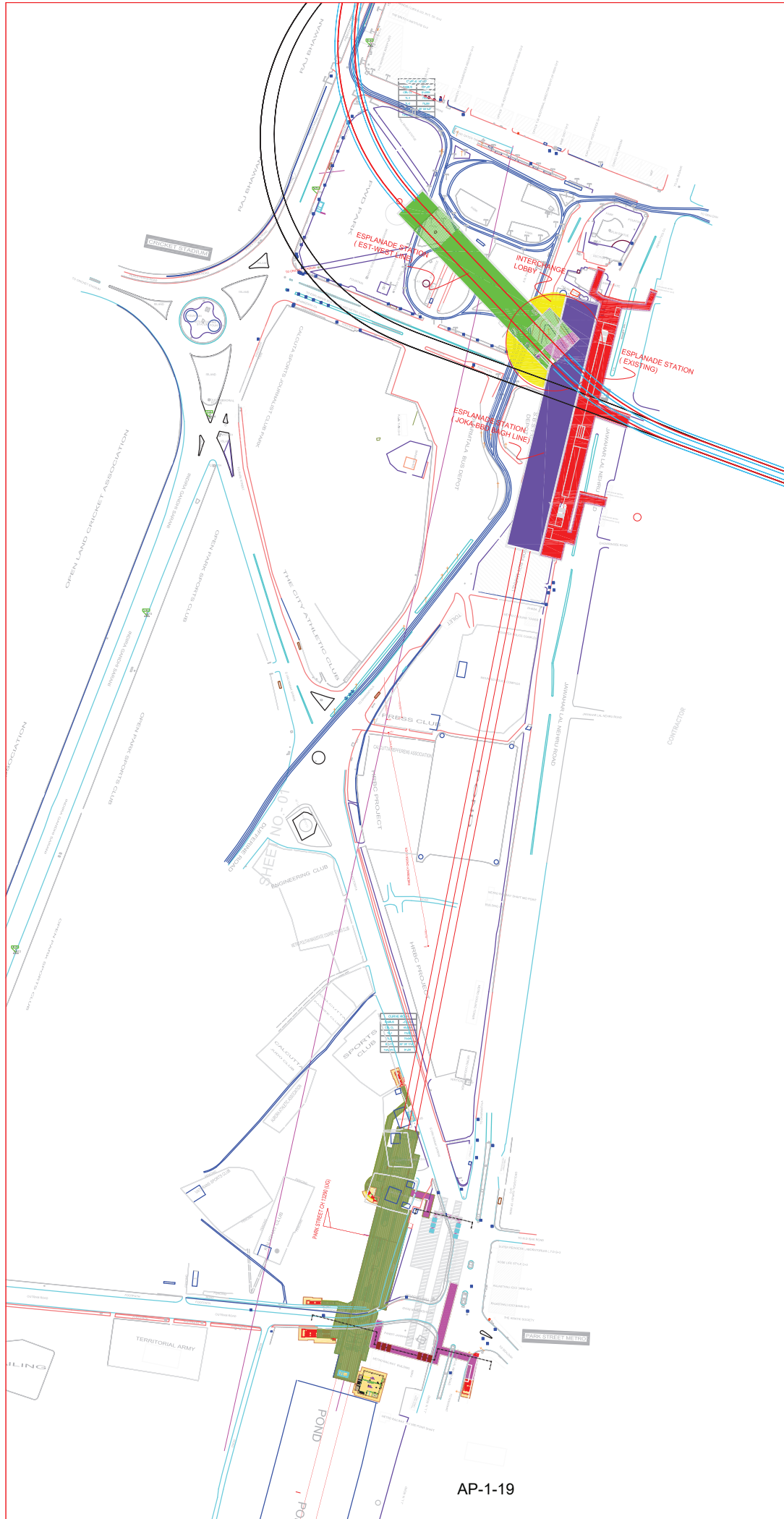
AP-1-17

# 添付資料 1 (3) North South Metro Line Esplanade Station Floor Plan

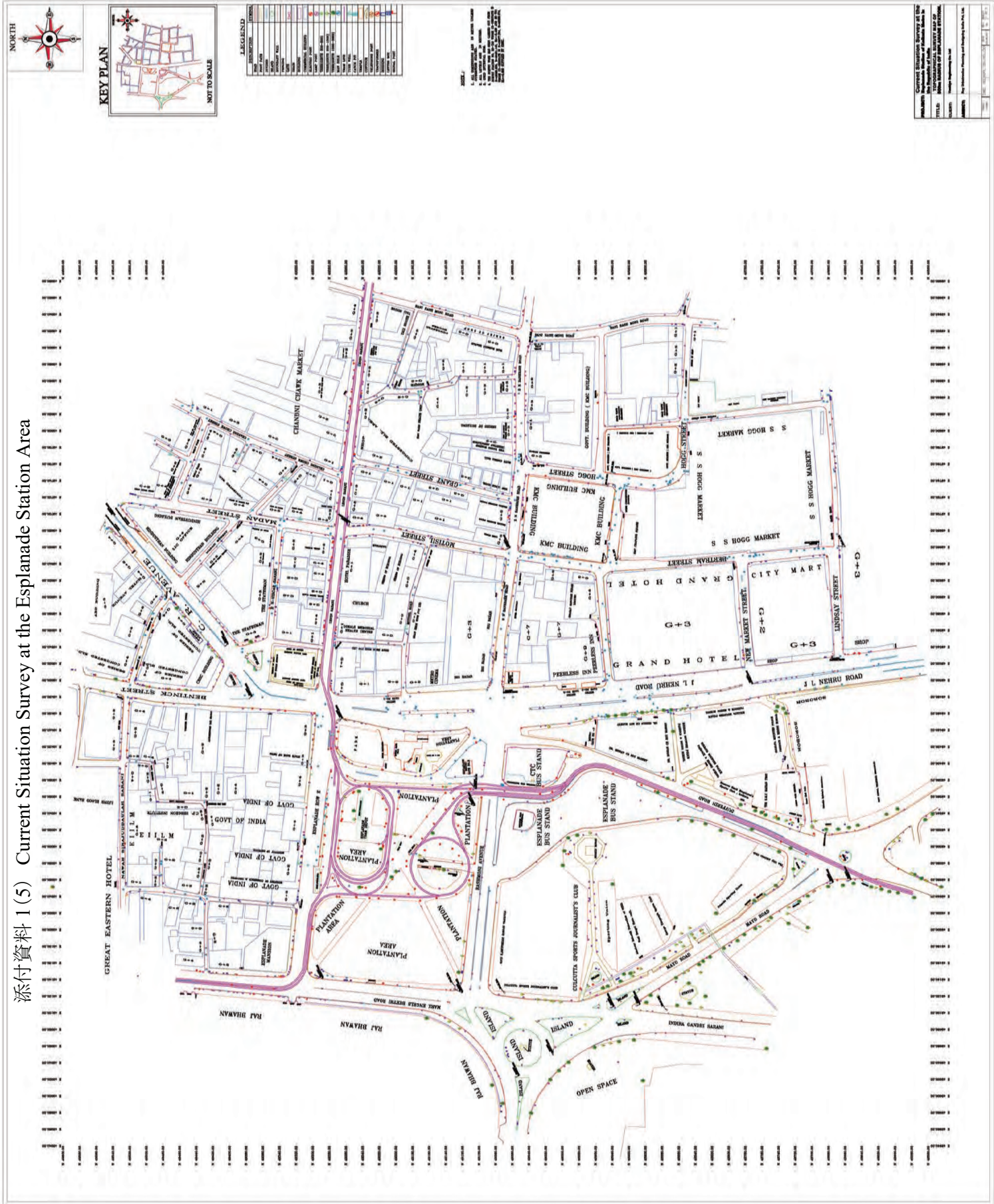




添付資料 1 (4) Three Metro Line Station Layout Plan at Esplanade Station



添付資料 1 (5) Current Situation Survey at the Esplanade Station Area



## **添付資料 2 Traffic Analysis on Esplanade Station**

添付資料 2 (1) : Traffic Analysis Report on Traffic Survey of Esplanade Metro, June 2017 (R1)

添付資料 2 (2) : Traffic Analysis Annexure 1: Gate wise Passenger Count Survey Data

添付資料 2 (3) : Traffic Analysis Annexure 2: Combined Inbound OD Data

添付資料 2 (4) : Traffic Analysis Annexure 3: Combined Outbound OD Data

添付資料 2 (5) : Traffic Analysis Annexure 4: Demand Data between Rail Station and Metro Station (Outbound)

添付資料 2 (6) : Traffic Analysis Annexure 5: Demand Data between Rail Station and Metro Station (Inbound)





**Traffic Analysis-Final Report**  
**Traffic Survey at the Esplanade Metro**



**June 2017**  
**R1**

## Table of Content

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2. Brief on Traffic Survey
3. Data Checking
4. Traffic Data Analysis
5. Conclusion and Major Findings

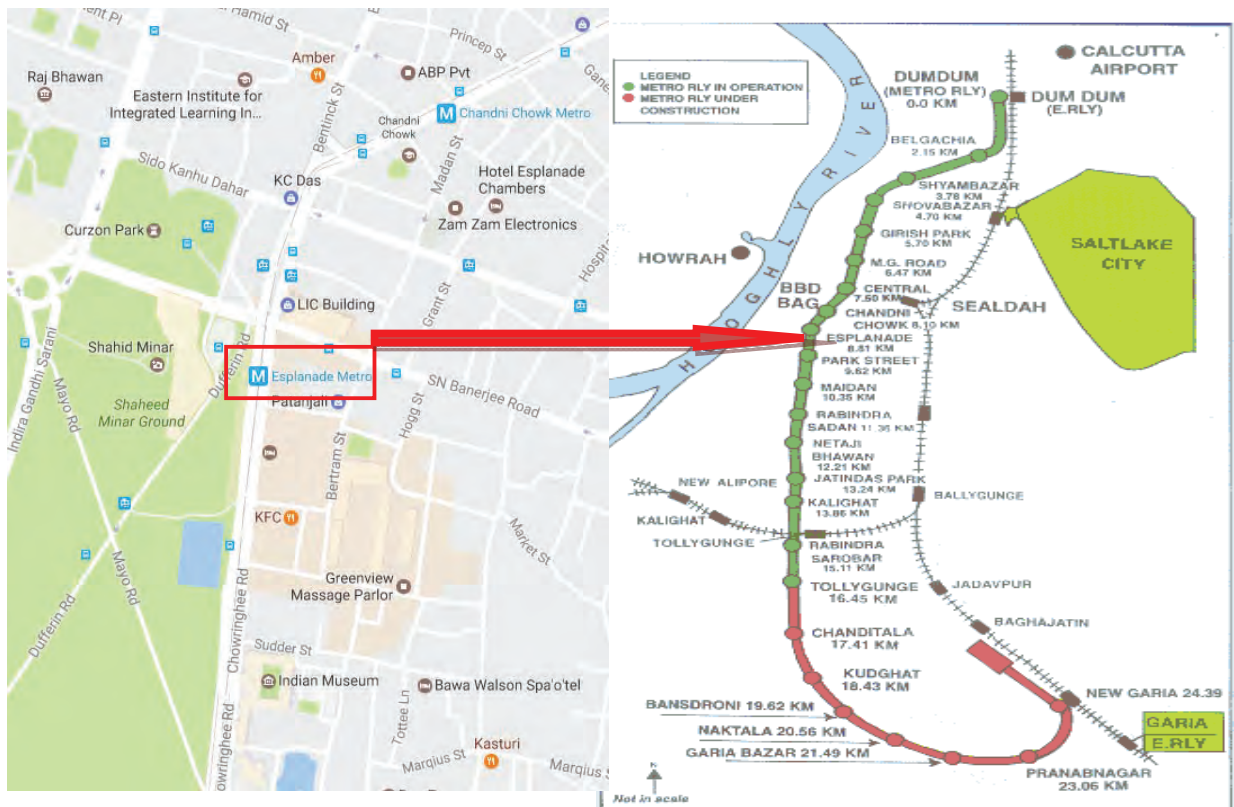
# Traffic Analysis Report on Traffic Survey of Esplanade Metro

## 1. Executive Summary

This report presents passenger count data analysis and Origin Destination survey analysis summary; carried out by the Consultants for collecting the ridership data, travel pattern, existing access modes and suburban connectivity from the metro station.

The purpose of the study was to calculate total generated and attracted passengers at Esplanade metro station and understand travel pattern. This survey data captures feeder system and actual origin & destination information of the metro users, which gives an idea on available existing feeder system and user's choice. The report presents hourly variation of passengers, peak hour, and suburban connectivity information. From the captured data, The Consultants identifies major suburban connectivity, which is presented in the report. All the analyzed results presented in the report in the table, graphics or chart format for better way presenting the outputs.

Esplanade is a station of the Kolkata Metro. The station is located at the northern end of Jawaharlal Nehru Road in Kolkata. It would probably become the largest station of the Kolkata Metro in the future. Below is the map where location of Esplanade metro has been Show in **Figure 1**. This is underground metro station. The metro station to the south is Park Street and to the north is ChadniChowk.



**Figure 1: Location of Esplanade Metro Station**

Esplande is one of the busiest metro stations in Kolkata. The demand is too high in this station particularly in the peaks. The Consultants deployed eight to ten supervisors and

## Traffic Analysis Report on Traffic Survey of Esplanade Metro

educated enumerators. Most of enumerators had similar work experience. Supervisors and enumerators targeted to capture more than 20% sample size and it is huge number of samples. The deployed enumerators details presented in **Appendix 1**. Data was checked and few of the samples removed from the datasheet due to incomplete information. Survey procedure, details of survey, outputs and major finding has been discussed in details in the report.

### 2. Brief on Traffic Survey

The survey was carried out at Esplanade Metro station on 10th May 2017. The survey duration was same as operating hours of the metro at Esplanade Metro station. **Figure 2** presents the details of metro operating hours.

FIRST/LAST TRAIN FROM KAVI SUBHAS TO DUMDUM/NOAPARA IN UP DIRECTION (MON-SATURDAY)				FIRST/LAST TRAIN FROM DUMDUM/NOAPARA TO KAVI SUBHAS IN DN DIRECTION (MON- SATURDAY)				
STATION		FIRST TRAIN	LAST TRAIN	STATION		FIRST TRAIN	LAST TRAIN	
KAVI SUBHAS		6:45	21:55	NOAPARA		7:02	21:49	
SAHID KHUDIRAM		6:49	21:58	DUM DUM		6:45	21:55	
KAVI NAZRUL		6:52	22:00	BELGACHIA		6:49	21:58	
GITANJALI		6:54	22:02	SHYAMBAZAR		6:52	22:00	
MASTERDA SURYA SEN		6:56	22:04	SOVABAZAR SUTANUTI		6:54	22:02	
NETAJI		7:00	22:07	GIRISH PARK		6:56	22:04	
MAHANAYAK UTTAM KR		7:04	22:10	MAHATMA GANDHI RD		6:59	22:06	
RABINDRA SAROBAR		7:07	22:12	CENTRAL		7:02	22:08	
KALIGHAT		7:09	22:14	CHANDNI CHOWK		7:04	22:10	
JATIN DAS PARK		7:11	22:16	ESPLANADE		7:06	22:11	
NETAJI BHAVAN		7:14	22:18	PARK STREET		7:08	22:13	
RABINDRA SADAN		7:16	22:20	MAIDAN		7:09	22:14	
MAIDAN		7:18	22:22	RABINDRA SADAN		7:11	22:16	
PARK STREET		7:19	22:23	NETAJI BHAVAN		7:13	22:18	
ESPLANADE		7:21	22:25	JATIN DAS PARK		7:15	22:20	
CHANDNI CHOWK		7:23	22:26	KALIGHAT		7:18	22:22	
CENTRAL		7:25	22:28	RABINDRA SAROBAR		7:21	22:24	
MAHATMA GANDHI RD		7:27	22:30	MAHANAYAK UTTAM KR		7:24	22:27	
GIRISH PARK		7:30	22:32	NETAJI		7:29	22:31	
SOVABAZAR SUTANUTI		7:32	22:34	MASTERDA SURYA SEN		7:33	22:34	
SHYAMBAZAR		7:35	22:36	GITANJALI		7:35	22:36	
BELGACHIA		7:39	22:39	KAVI NAZRUL		7:38	22:38	
DUM DUM	A	6:45	7:45	22:44	SAHID KHUDIRAM		7:41	22:40
NOAPARA	A	6:53	7:51		KAVI SUBHAS	A	7:45	22:44

Source:[http://www.mtp.indianrailways.gov.in/view\\_section.jsp?lang=0&id=0,2,528](http://www.mtp.indianrailways.gov.in/view_section.jsp?lang=0&id=0,2,528)

Figure 2: Metro Operating Hours

## Traffic Analysis Report on Traffic Survey of Esplanade Metro

The survey agency deployed enumerators 30 minutes prior to the metro operation start. The senior supervisors provided hands on training to the enumerators on survey procedure, sample, format and approach, before conducting the survey. Data was collected from eight separate gates at Esplanade Metro. Gates are listed below.

- Gate 1: Metro Cinema
- Gate 2: K.C Das
- Gate 3: Rani Rashmani Road
- Gate 4: S N Banerjee Road
- Gate 5: Peerless Inn
- Gate 6: Grand Hotel
- Gate 7: Bidhan Market
- Gate 8: Opposite Grand Hotel

The details of gates and surroundings have been presented in the **Figure 3**



**Figure 3: Gates and Surroundings of Esplanade Metro**

## **Traffic Analysis Report on Traffic Survey of Esplanade Metro**

The main attraction points of surrounding Esplanade metro are RajBhavan, Eden Garden, Dharmatala market area, Dharmatala bus terminal, Assembly House, ShahidMinar, and others are areas such as schools, restaurants, shopping malls and various clubs.

### **2.1 Traffic Surveys Details**

In order to capture the representative passenger flow characteristics, travel pattern, access mode to/from metro and data on feeder system, the Consultants conducted following primary traffic surveys:

- Passenger Count Survey
- Origin-Destination Survey

### **2.2 Methodology for Traffic Surveys**

#### ***Passenger Counts***

The survey was conducted at entry of each gate location as mentioned in the Inception Report. Trained enumerators carried out traffic counting manually, using numerical approach instead of tally marks. For the purpose of counts, a day was divided into shifts and separate enumerators, with supervisors, were assigned for each shift. The count data were recorded at 15-minute intervals in each direction. The surveys were supervised and sample checking was carried out.

The following procedure was followed for manual traffic count:

- Enumerators manually counted passenger sitting at entry/exit of the gate, format was numeric instead of tally as there was huge passenger demand at this station. Number of passengers were collected for every 2-3 minutes and then summed up for 15 minutes.
- Senior supervisors explained the format to the team;
- Time tracking was done by one of the enumerator;
- Exact place for the enumerators were at stair of each gate near police posting;
- Planning was done well in advance to ensure the accuracy and reliability of the count;
- Supervisors conducted sample counts in each direction during the survey to validate the count with enumerator's count. It was checked to see whether enumerators were counting properly or not; and
- Administrative authorities were made aware about the survey, location and the date of survey well in advance;

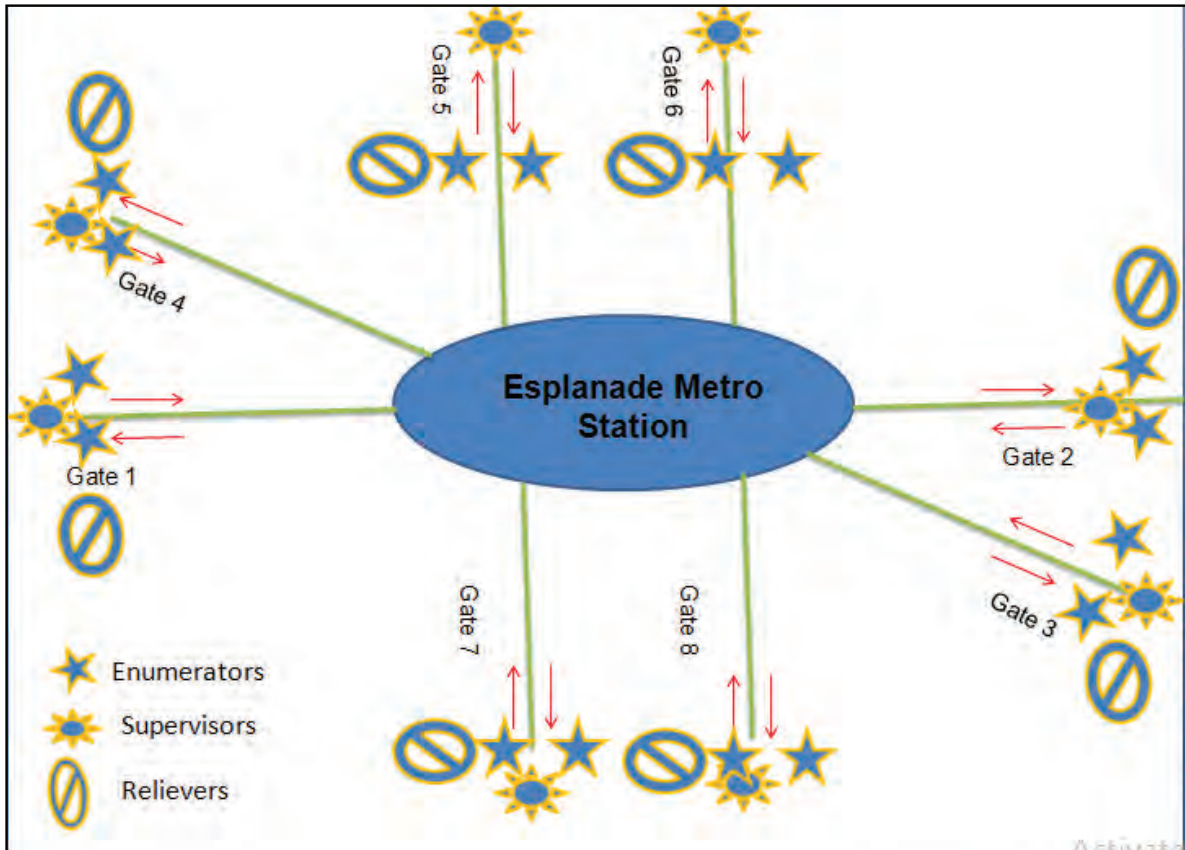
#### ***Origin-Destination Survey***

The origin-destination survey was carried out with the primary objective of studying the travel pattern of passengers of metro users and to estimate potential demand of suburban



## Traffic Analysis Report on Traffic Survey of Esplanade Metro

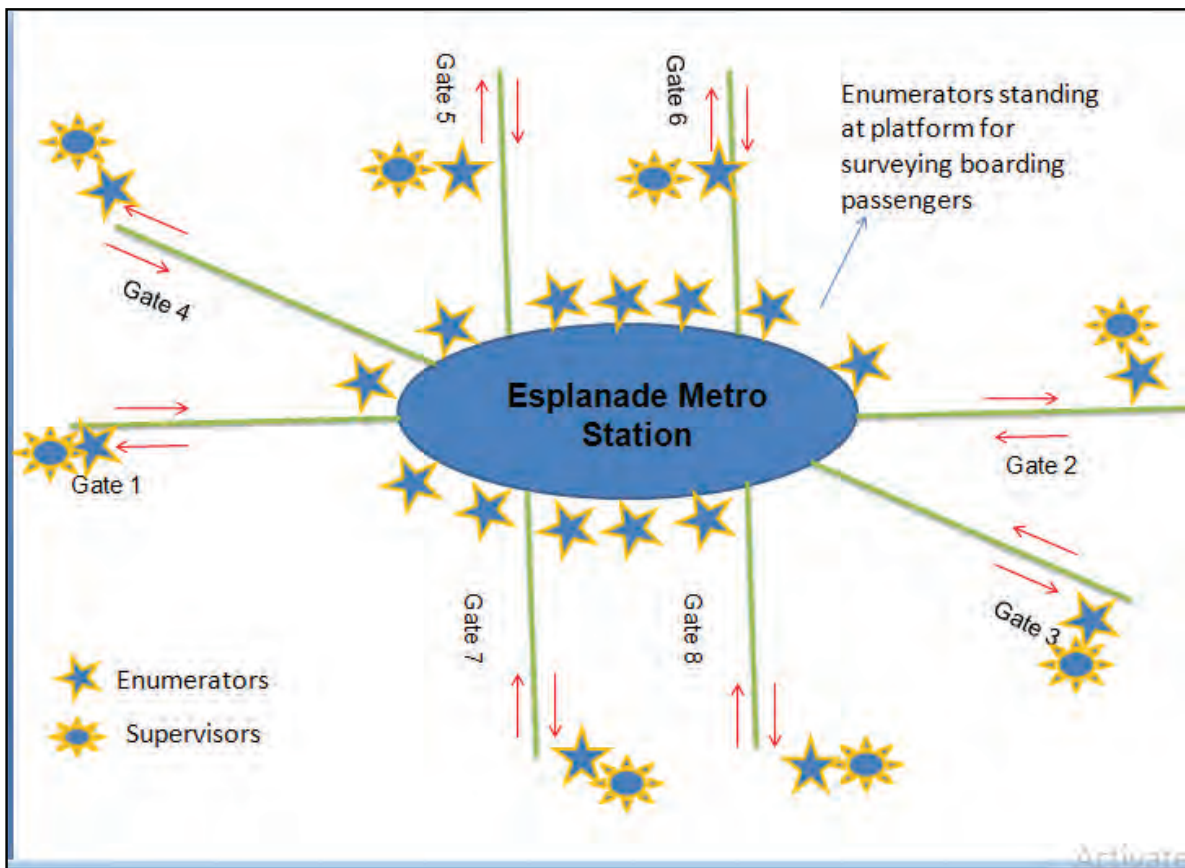
train user who are using the metro. Roadside interview method was adopted for the survey. The passengers were approached on random sample basis and trained enumerators interviewed the passengers and the required information/ data was collected. The survey agency deployed eight to ten supervisors and educated enumerators. Most of enumerators have similar work experience. **Figure 4 and Figure 5** presents the schematic plan of deployment of enumerators and supervisors for passenger count and OD survey..



**Figure 4: Deployment Strategy of PassengerCount**

For internal purpose, the survey agency divided the total survey duration into two shifts. Two enumerators and one reliever were deployed for passenger count and one supervisor was deployed to supervise the survey at each shift at each gate.

## Traffic Analysis Report on Traffic Survey of Esplanade Metro



**Figure 5: Deployment Strategy of OD Survey**

Most of the enumerators were educated. Sufficient training has given prior to the start of the surveys on questionnaires, sample size, approaching the passengers. Few of the supervisors have more than 25 years of experience in conducting such surveys.

The following procedure was followed for conducting OD survey:

- The senior supervisors explained to the enumerators the OD questionnaires and way to approach the passengers;
- The enumerators briefed the purpose of survey before asking questions and were polite with the passengers and conveyed gratitude;
- Survey at each location was conducted simultaneously with passenger number counts;
- Necessary permission from the related authorities were obtained well in advance;
- Enumerators were deployed on shift basis to eliminate the possibility of fatigue. Minimum one supervisor was present for each direction during the entire period of the survey;
- Data collected for each direction was checked at regular interval;



## **Traffic Analysis Report on Traffic Survey of Esplanade Metro**

- All the relevant information was filled up by the concerned enumerators/supervisors on each sheet of both the shifts for each direction;
- All safety measures for enumerators/supervisors were taken and arrangement of adequate water and first-aid was done.

### **3. Data Checking**

Data collected from the site were collated, edited and entered into the computer and analyzed using spread sheet (Microsoft Excel).

Origin and destination information has been categorized into 24 stations, which were specified by the Client. All the data has been thoroughly checked and removed the data which has incomplete information.

## Traffic Analysis Report on Traffic Survey of Esplanade Metro

### 4. Traffic Data Analysis

#### Passenger Count Data Summary

Analysis was carried out to derive:

- Total number of passengers
- Hourly variation of passengers
- Peak hour passenger numbers
- Directional distribution

#### Total Passenger Information

Table 1 presents the combined passenger demand for all gates.

**Table 1: Combined 15 minutes passenger count data at Esplanade Metro Station**

Time Period			Inbound	Outbound	Combined
07:00	-	07:15	96	53	149
07:15	-	07:30	83	244	327
07:30	-	07:45	138	251	389
07:45	-	08:00	150	265	415
08:00	-	08:15	165	512	677
08:15	-	08:30	179	547	726
08:30	-	08:45	263	491	754
08:45	-	09:00	246	491	737
09:00	-	09:15	263	425	688
09:15	-	09:30	320	414	734
09:30	-	09:45	323	441	764
09:45	-	10:00	416	641	1057
10:00	-	10:15	451	826	1277
10:15	-	10:30	461	762	1223
10:30	-	10:45	448	966	1414
10:45	-	11:00	412	778	1190
11:00	-	11:15	344	941	1285
11:15	-	11:30	356	1017	1373
11:30	-	11:45	490	988	1478
11:45	-	12:00	522	951	1473
12:00	-	12:15	569	1082	1651
12:15	-	12:30	500	987	1487
12:30	-	12:45	615	910	1525
12:45	-	13:00	650	941	1591
13:00	-	13:15	693	912	1605
13:15	-	13:30	644	795	1439
13:30	-	13:45	666	795	1461
13:45	-	14:00	607	894	1501
14:00	-	14:15	504	736	1240

## Traffic Analysis Report on Traffic Survey of Esplanade Metro

14:15	-	14:30	537	822	1359
14:30	-	14:45	678	684	1362
14:45	-	15:00	718	891	1609
15:00	-	15:15	665	1020	1685
15:15	-	15:30	608	879	1487
15:30	-	15:45	726	1083	1809
15:45	-	16:00	674	1048	1722
16:00	-	16:15	750	1071	1821
16:15	-	16:30	712	1049	1761
16:30	-	16:45	750	1095	1845
16:45	-	17:00	721	907	1628
17:00	-	17:15	822	1172	1994
17:15	-	17:30	908	1063	1971
17:30	-	17:45	969	1057	2026
17:45	-	18:00	963	1005	1968
18:00	-	18:15	1069	1159	2228
18:15	-	18:30	1018	978	1996
18:30	-	18:45	1311	1215	2526
18:45	-	19:00	1486	1111	2597
19:00	-	19:15	1778	989	2767
19:15	-	19:30	1383	919	2302
19:30	-	19:45	1164	611	1775
19:45	-	20:00	1190	753	1943
20:00	-	20:15	994	651	1645
20:15	-	20:30	956	569	1525
20:30	-	20:45	1002	452	1454
20:45	-	21:00	896	322	1218
21:00	-	21:15	890	284	1174
21:15	-	21:30	659	213	872
21:30	-	21:45	542	131	673
21:45	-	22:00	306	102	408
22:00	-	22:15	130	113	243
22:15	-	22:30	0	0	0
22:30	-	22:45	0	0	0
			<b>39549</b>	<b>45474</b>	<b>85023</b>

Gate wise all the data sheet has been presented in **Annexure 1**.

### **Directional Split**

The directional passenger count data was analyzed to establish the directional distribution of demand. The directional distribution of passengers is presented in **Table 2**.

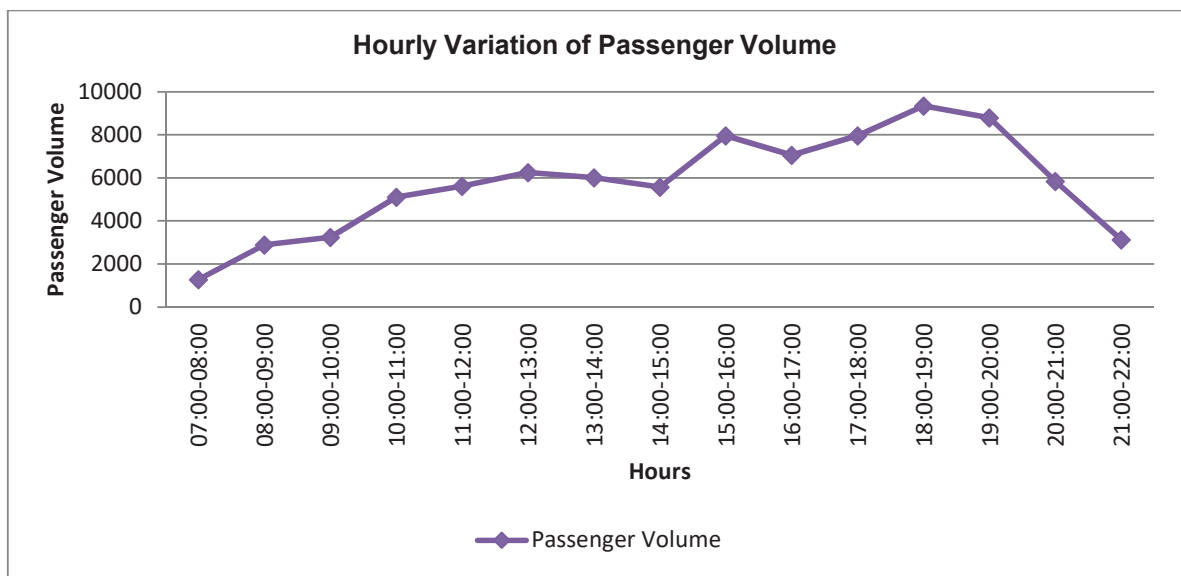
## Traffic Analysis Report on Traffic Survey of Esplanade Metro

**Table 2- Bound wise Passenger Split (%)**

Movement	Total Passengers	Directional Split (%)
Inbound	39549	46.52
Outbound	45474	53.48
total	85023	100

### Hourly Variation of Passengers

Hourly variations of passengers at Esplanade metro station are plotted in **Figure 6**.



**Figure 6: Hourly Variation of Passengers at Esplanade Metro**

### Peak Hours and Passenger Volume

The peak hour passengers with the peak hours are presented in **Table 3**

**Table 3- Peak Hours and Passenger Volume**

Movement	Passenger Volume	Peak Hour
Inbound	5958	18:30-19:30
Outbound	4463	18:00-19:00
Combined	10192	18:30-19:30

### **OD Data Analysis Output**

The travel characteristics obtained from O-D survey facilitate the identification of travel pattern, trip origin and destinations, suburban station origin/destination, user's feeder mode choice. The data collected from passenger OD was used to calculate the following:

## Traffic Analysis Report on Traffic Survey of Esplanade Metro

- Expansion Factor
- Passenger attraction/generation pattern
- Access mode Pattern
- Travel pattern of prime origin and Suburban Rail Station

In order to assess the movement pattern in the project influence area, a zoning system was adopted. For this study all the existing metro stations are only part of zoning system as presented in **Table 4**.

**Table 4- Zone Details**

Zone Number	Zone Name/Station Name
1	New Garia
2	Shahid Khudiram
3	Garia
4	Naktala
5	Bansdroni
6	Kudghat
7	Tollyguange
8	Rabindra sarobar
9	Kalighat
10	Jathin Das Park
11	Netaji Bhavan
12	Rabindra Sadan
13	Maidan
14	Park Street
15	Chadni Chak
16	Central
17	MG Road
18	Girish Park
19	Sova Bazar
20	Shyam Bazar
21	Belgachhia
22	Dumdum
23	Noapara

### Expansion Factor

OD sample size and expansion factor for both the bound has been presented in **Table 5**.

**Table 5: OD Sample Size and Expansion Factors**

Bound	Passenger Count	Sample Captured	Sample Size(%)	Expansion Factor
Inbound	39549	8036	20.3	4.921
Outbound	45474	9049	19.9	5.025
Total	85023.0	17085.0	20.1	



## Traffic Analysis Report on Traffic Survey of Esplanade Metro

### Passenger Generation and Attraction Summary

The travel pattern of passengers moving to / from Esplanade from / to other metro station was studied. The data collected from the field were subsequently grouped according to origin and destination, which led to development of the zoning system. The sample data was expanded based on expansion factor. **Annexure 2** and **Annexure 3** present raw data of Origin Destination survey. **Table 6** presents the details of trip production/attraction.

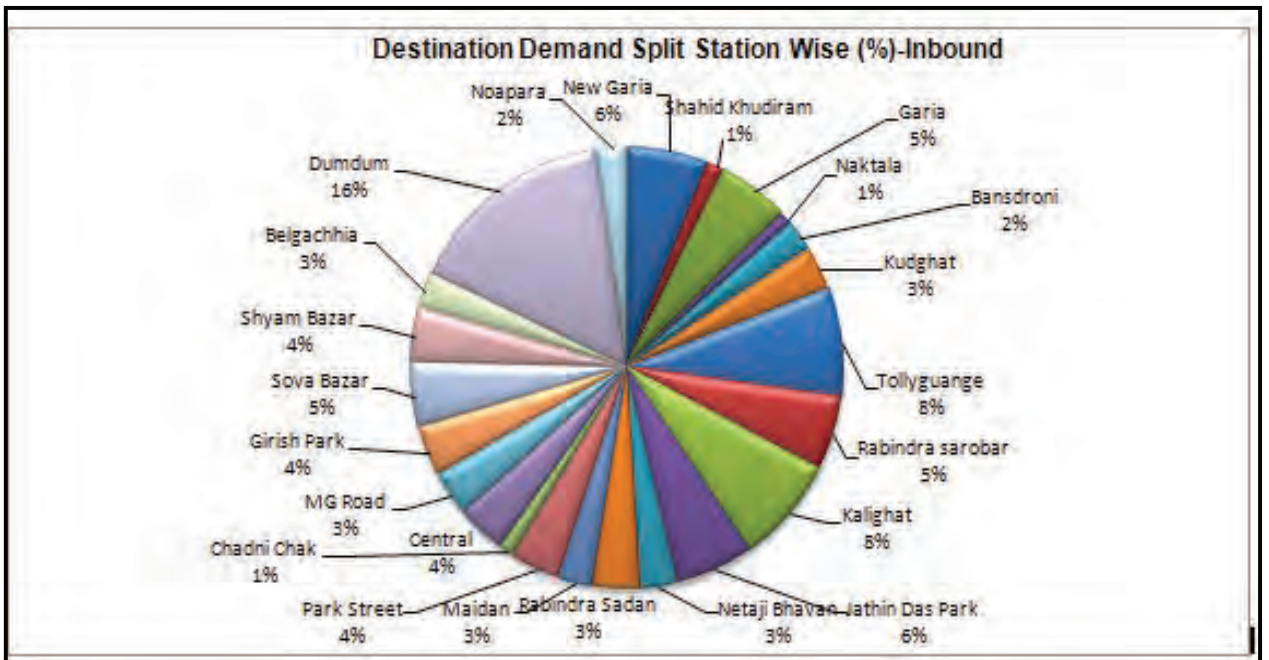
**Table 6: Travel Pattern Details**

Station Code	Metro Station	Inbound		Outbound	
		Attracted Passengers	Attracted Passenger (%)	Generated Passengers	Generated Passengers (%)
1	New Garia	2426	6.01	1407	3.09
2	Shahid Khudiram	512	1.31	543	1.19
3	Garia	2116	5.37	2663	5.86
4	Naktala	399	1.02	452	0.99
5	Bansdroni	896	2.17	608	1.34
6	Kudghat	1250	3.06	296	0.65
7	Tollyguange	3155	8.04	3427	7.54
8	Rabindra sarobar	2131	5.41	2065	4.54
9	Kalighat	3101	7.97	2744	6.03
10	Jathin Das Park	2284	5.81	2327	5.12
11	Netaji Bhavan	1147	2.99	1734	3.81
12	Rabindra Sadan	1383	3.55	1332	2.93
13	Maidan	989	2.52	869	1.91
14	Park Street	1447	3.72	1106	2.43
15	Chadni Chak	463	1.20	216	0.48
16	Central	1486	3.76	2005	4.41
17	MG Road	1304	3.34	900	1.98
18	Girish Park	1462	3.75	1075	2.36
19	Sova Bazar	1855	4.62	6950	15.28
20	Shyam Bazar	1580	3.92	593	1.30
21	Belgachhia	1029	2.69	688	1.51
22	Dumdum	6216	15.56	11020	24.23
23	Noapara	920	2.20	452	0.99

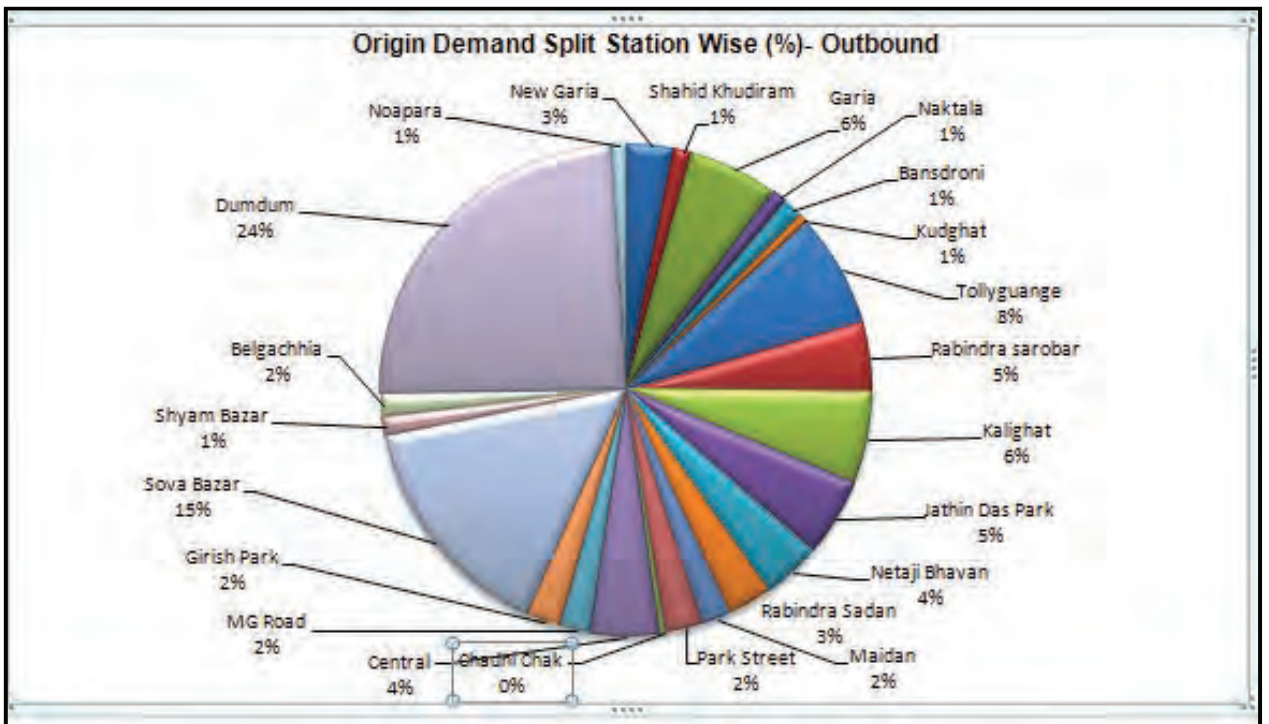
**Figure 7** and **Figure 8** presents the passenger travel pattern details

**Traffic Analysis Report on Traffic Survey of Esplanade Metro**

**Figure 7: Destination Demand Split (%) - Inbound**



**Figure 8: Origin Demand Split (%) – Outbound**



**Access Mode From/To Esplanade Metro Station Summary**

Figure 9 and Figure 10 presents Inbound and outbound passenger to/from Esplanade metro access mode composition.

# Traffic Analysis Report on Traffic Survey of Esplanade Metro

Figure 9: Esplanade Inbound Station Access Mode Composition (%)

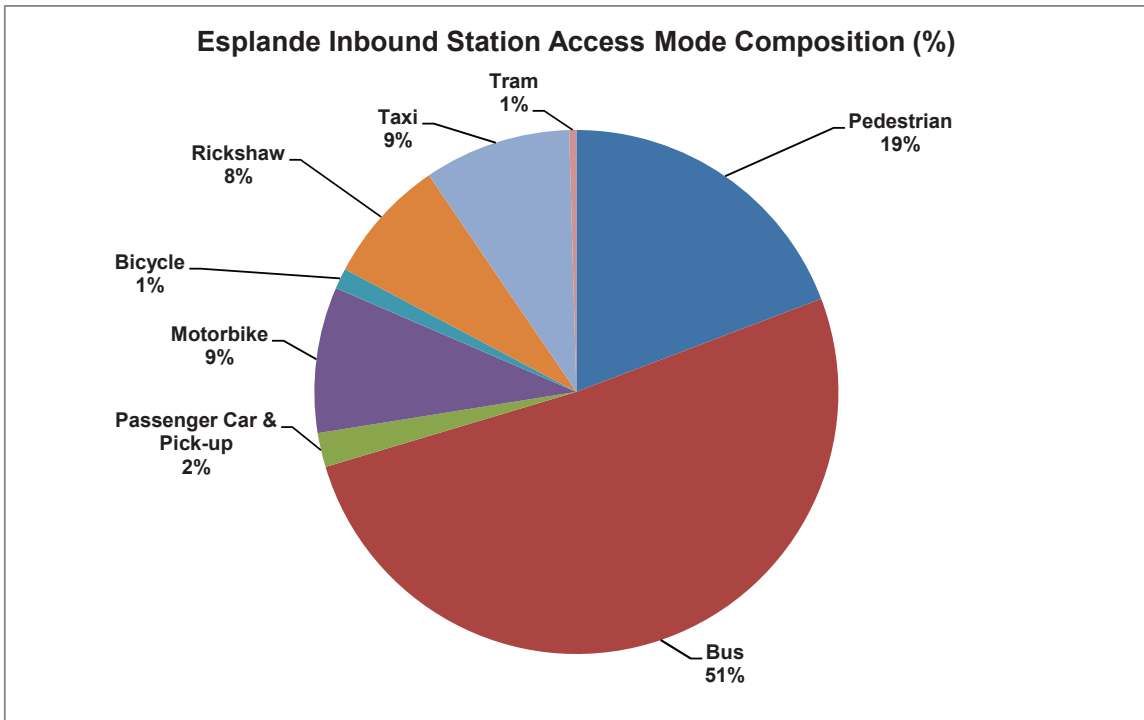
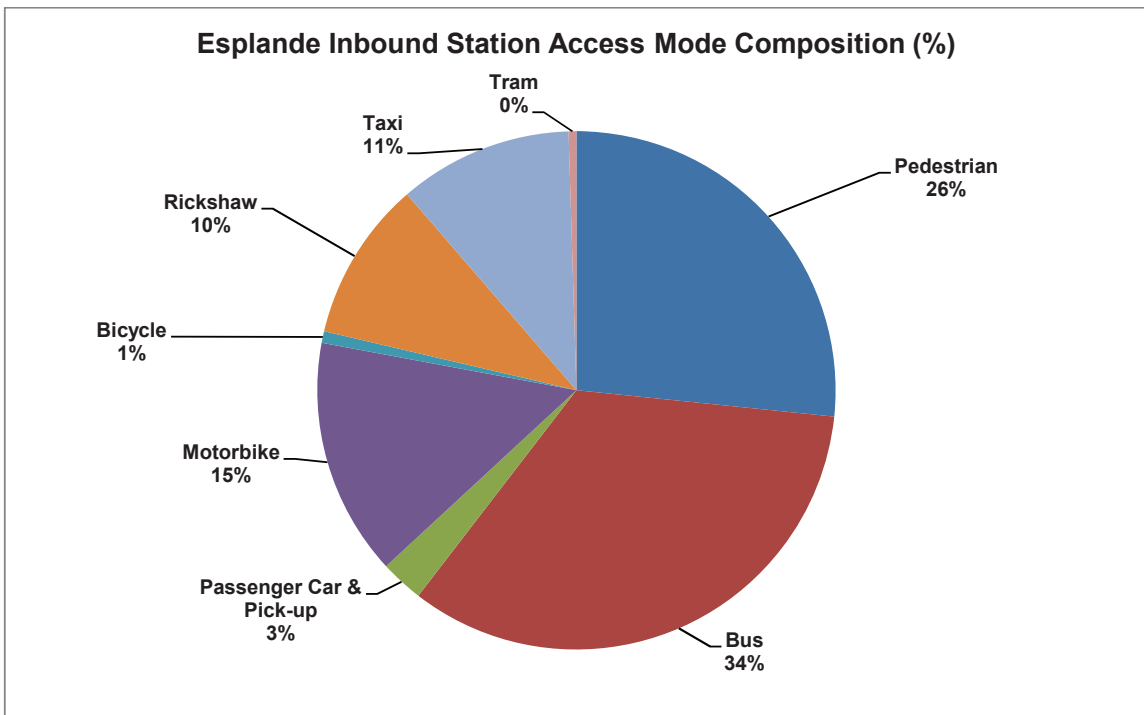


Figure 10: Esplanade Inbound Station Access Mode Composition (%)



## Traffic Analysis Report on Traffic Survey of Esplanade Metro

### **Suburban Rail Connectivity**

- For the outbound direction, the LAST suburban station (alighting) station used to access the Metro was recorded. The Consultant was interested in the linkage point of the metro and the suburban rail
- For the inbound direction, the FIRST suburban station (boarding) station they used after alighting from the Metro has recorded.

During survey, few of the passengers have not responded regarding suburban connectivity. Some data was removed from the total data collected during data checking due to incomplete data and wrong data. Suburban connectivity details of Inbound and Outbound direction have been presented in **Annexure 4** and **Annexure 5** in matrix format for better understanding. Below is the key suburban connectivity route for Esplanade Inbound and Outbound passengers.

#### **A. For Inbound Movements**

- Dumdum Metro Station to Dumdum Station
- New Garia Metro Station to New Garia Station
- Garia Metro to Garia Station
- Rabindra Sarovar Metro to Rabindra Sarovar Station
- Central Metro to Sealdah
- Kalighat Metro to Ballyguange
- Tollyguange Metro to Tollyguange Station

#### **B. For Outbound Movements**

- Dumdum Station to Dumdum Metro Station
- New Garia Station to New Garia Metro Station
- Ballyguange to Kalighat Metro
- Dumdum Station to Sovabazar Metro
- Ravindra Sarovar Station to Ravindra Sarovar Metro
- Ultodanga to Sovabazar

## Traffic Analysis Report on Traffic Survey of Esplanade Metro





### 5. Conclusion and Major Findings

The key observations and major finding:

- Total passenger demand at Esplanade Metro Station is 85,023 where Inbound is 46% and Outbound is 54% ;
- Overall peak hour is at evening 18:30-19:30 hours;
- Dumdum Metro station is producing/attracting maximum number of passengers due to rail station connectivity;
- Some rail station to metro connectivity routes require improvement in future;
- Most number of passengers chose bus as an access mode for metro.

添付資料 2(2) Traffic Analysis Annexure 1: Gate wise Passenger Count Survey Data

Annexure 1A- Gate 1 Inbound

TRAFFIC COUNT SURVEY											
LOCATION No.		Gate No. : 1									
Date		Survey Date : 10.5.17			Supervisor		Sudipto Mukherjee				
Surveyor's name	Direction			1	2	Surveyor's name	Direction			1	2
	Survey Time			In	OUT		Survey Time			IN	Out
											
	7:00	-	7:15	11			15:00	-	15:15	105	
	7:15	-	7:30	7			15:15	-	15:30	105	
	7:30	-	7:45	20			15:30	-	15:45	90	
	7:45	-	8:00	10			15:45	-	16:00	110	
	8:00	-	8:15	41			16:00	-	16:15	100	
	8:15	-	8:30	70			16:15	-	16:30	115	
	8:30	-	8:45	85			16:30	-	16:45	108	
	8:45	-	9:00	49			16:45	-	17:00	120	
	9:00	-	9:15	70			17:00	-	17:15	122	
	9:15	-	9:30	67			17:15	-	17:30	125	
	9:30	-	9:45	65			17:30	-	17:45	147	
	9:45	-	10:00	102			17:45	-	18:00	138	
	10:00	-	10:15	89			18:00	-	18:15	152	
	10:15	-	10:30	72			18:15	-	18:30	160	
	10:30	-	10:45	66			18:30	-	18:45	173	
	10:45	-	11:00	61			18:45	-	19:00	170	
	11:00	-	11:15	70			19:00	-	19:15	180	
	11:15	-	11:30	60			19:15	-	19:30	150	
	11:30	-	11:45	92			19:30	-	19:45	170	
	11:45	-	12:00	104			19:45	-	20:00	165	
	12:00	-	12:15	100			20:00	-	20:15	115	
	12:15	-	12:30	78			20:15	-	20:30	115	
	12:30	-	12:45	135			20:30	-	20:45	110	
	12:45	-	13:00	92			20:45	-	21:00	105	
	13:00	-	13:15	106			21:00	-	21:15	94	
	13:15	-	13:30	121			21:15	-	21:30	60	
	13:30	-	13:45	105			21:30	-	21:45	70	
	13:45	-	14:00	103			21:45	-	22:00	53	
	14:00	-	14:15	85			22:00	-	22:15	27	
	14:15	-	14:30	123			22:15	-	22:30		
	14:30	-	14:45	116			22:30	-	22:45		
	14:45	-	15:00	125							

We will be using premade counting sheet ( where Gate no. of Metro stn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100





A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.



Annexure 1B- Gate 1 Outbound

TRAFFIC COUNT SURVEY											
LOCATION No.		Gate No. : 1									
Date		Survey Date : 10.5.17		Supervisor		Sudipta Nag					
Surveyor's name	Direction			1	2	Surveyor's name	Direction			1	2
	Survey Time			In	OUT		Survey Time			IN	Out
											
	7:00	-	7:15		8		15:00	-	15:15		144
	7:15	-	7:30		24		15:15	-	15:30		113
	7:30	-	7:45		34		15:30	-	15:45		169
	7:45	-	8:00		32		15:45	-	16:00		139
	8:00	-	8:15		85		16:00	-	16:15		98
	8:15	-	8:30		112		16:15	-	16:30		170
	8:30	-	8:45		67		16:30	-	16:45		201
	8:45	-	9:00		81		16:45	-	17:00		148
	9:00	-	9:15		60		17:00	-	17:15		227
	9:15	-	9:30		36		17:15	-	17:30		110
	9:30	-	9:45		47		17:30	-	17:45		158
	9:45	-	10:00		107		17:45	-	18:00		142
	10:00	-	10:15		158		18:00	-	18:15		105
	10:15	-	10:30		89		18:15	-	18:30		133
	10:30	-	10:45		163		18:30	-	18:45		179
	10:45	-	11:00		51		18:45	-	19:00		158
	11:00	-	11:15		197		19:00	-	19:15		144
	11:15	-	11:30		192		19:15	-	19:30		134
	11:30	-	11:45		103		19:30	-	19:45		100
	11:45	-	12:00		122		19:45	-	20:00		115
	12:00	-	12:15		125		20:00	-	20:15		93
	12:15	-	12:30		146		20:15	-	20:30		83
	12:30	-	12:45		133		20:30	-	20:45		72
	12:45	-	13:00		143		20:45	-	21:00		57
	13:00	-	13:15		141		21:00	-	21:15		38
	13:15	-	13:30		121		21:15	-	21:30		30
	13:30	-	13:45		101		21:30	-	21:45		23
	13:45	-	14:00		150		21:45	-	22:00		14
	14:00	-	14:15		94		22:00	-	22:15		11
	14:15	-	14:30		86		22:15	-	22:30		
	14:30	-	14:45		98		22:30	-	22:45		
	14:45	-	15:00		136						

We will be using premade counting sheet ( where Gate no. of Metro stn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

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Annexure 1C- Gate 2 Inbound

TRAFFIC COUNT SURVEY											
LOCATION No.			Gate No. : 2								
Date			Survey Date : 10.05.17				Supervisor		Sayak Ghosh		
Surveyor's name	Direction Survey Time			1	2	Surveyor's name	Direction Survey Time			1	2
				In	OUT					IN	Out
	7:00	-	7:15	25			15:00	-	15:15	95	
	7:15	-	7:30	3			15:15	-	15:30	51	
	7:30	-	7:45	19			15:30	-	15:45	108	
	7:45	-	8:00	15			15:45	-	16:00	82	
	8:00	-	8:15	13			16:00	-	16:15	108	
	8:15	-	8:30	22			16:15	-	16:30	101	
	8:30	-	8:45	24			16:30	-	16:45	88	
	8:45	-	9:00	18			16:45	-	17:00	102	
	9:00	-	9:15	5			17:00	-	17:15	113	
	9:15	-	9:30	15			17:15	-	17:30	150	
	9:30	-	9:45	28			17:30	-	17:45	136	
	9:45	-	10:00	35			17:45	-	18:00	163	
	10:00	-	10:15	38			18:00	-	18:15	183	
	10:15	-	10:30	46			18:15	-	18:30	177	
	10:30	-	10:45	69			18:30	-	18:45	168	
	10:45	-	11:00	57			18:45	-	19:00	192	
	11:00	-	11:15	51			19:00	-	19:15	261	
	11:15	-	11:30	50			19:15	-	19:30	284	
	11:30	-	11:45	80			19:30	-	19:45	278	
	11:45	-	12:00	57			19:45	-	20:00	265	
	12:00	-	12:15	52			20:00	-	20:15	252	
	12:15	-	12:30	53			20:15	-	20:30	174	
	12:30	-	12:45	52			20:30	-	20:45	152	
	12:45	-	13:00	66			20:45	-	21:00	138	
	13:00	-	13:15	96			21:00	-	21:15	88	
	13:15	-	13:30	81			21:15	-	21:30	90	
	13:30	-	13:45	150			21:30	-	21:45	76	
	13:45	-	14:00	109			21:45	-	22:00	60	
	14:00	-	14:15	86			22:00	-	22:15	22	
	14:15	-	14:30	79			22:15	-	22:30		
	14:30	-	14:45	91			22:30	-	22:45		
	14:45	-	15:00	97							

We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

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A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.

Annexure 1D- Gate 2 Outbound

TRAFFIC COUNT SURVEY															
LOCATION No.			Gate No. : 2												
Date			Survey Date : 10.05.17				Supervisor				Dipanjn Roy				
Surveyor's name	Direction Survey Time			1		2		Surveyor's name	Direction Survey Time			1		2	
				In	OUT	IN	Out					IN	Out		
	7:00	-	7:15						15:00	-	15:15				123
	7:15	-	7:30				20		15:15	-	15:30				100
	7:30	-	7:45				48		15:30	-	15:45				129
	7:45	-	8:00				28		15:45	-	16:00				139
	8:00	-	8:15				41		16:00	-	16:15				122
	8:15	-	8:30				64		16:15	-	16:30				141
	8:30	-	8:45				76		16:30	-	16:45				172
	8:45	-	9:00				89		16:45	-	17:00				174
	9:00	-	9:15				84		17:00	-	17:15				228
	9:15	-	9:30				112		17:15	-	17:30				213
	9:30	-	9:45				109		17:30	-	17:45				140
	9:45	-	10:00				139		17:45	-	18:00				128
	10:00	-	10:15				209		18:00	-	18:15				140
	10:15	-	10:30				180		18:15	-	18:30				153
	10:30	-	10:45				215		18:30	-	18:45				164
	10:45	-	11:00				128		18:45	-	19:00				110
	11:00	-	11:15				156		19:00	-	19:15				89
	11:15	-	11:30				169		19:15	-	19:30				80
	11:30	-	11:45				182		19:30	-	19:45				82
	11:45	-	12:00				130		19:45	-	20:00				64
	12:00	-	12:15				132		20:00	-	20:15				87
	12:15	-	12:30				135		20:15	-	20:30				94
	12:30	-	12:45				110		20:30	-	20:45				46
	12:45	-	13:00				100		20:45	-	21:00				44
	13:00	-	13:15				100		21:00	-	21:15				29
	13:15	-	13:30				148		21:15	-	21:30				18
	13:30	-	13:45				84		21:30	-	21:45				25
	13:45	-	14:00				118		21:45	-	22:00				23
	14:00	-	14:15				102		22:00	-	22:15				14
	14:15	-	14:30				115		22:15	-	22:30				
	14:30	-	14:45				81		22:30	-	22:45				
	14:45	-	15:00				100								

We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.

Annexure 1E- Gate 3 Inbound

TRAFFIC COUNT SURVEY											
LOCATION No.		Gate No. :		3							
Date		Survey Date :		5.201		Supervisor		Rakesh Mondal			
Surveyor's name	Direction Survey Time			1	2	Surveyor's name	Direction Survey Time			1	2
				In	OUT					IN	Out
	7:00	-	7:15	32			15:00	-	15:15	44	
	7:15	-	7:30	14			15:15	-	15:30	73	
	7:30	-	7:45	22			15:30	-	15:45	48	
	7:45	-	8:00	27			15:45	-	16:00	45	
	8:00	-	8:15	31			16:00	-	16:15	72	
	8:15	-	8:30	23			16:15	-	16:30	68	
	8:30	-	8:45	28			16:30	-	16:45	88	
	8:45	-	9:00	60			16:45	-	17:00	74	
	9:00	-	9:15	62			17:00	-	17:15	94	
	9:15	-	9:30	69			17:15	-	17:30	108	
	9:30	-	9:45	65			17:30	-	17:45	136	
	9:45	-	10:00	74			17:45	-	18:00	130	
	10:00	-	10:15	43			18:00	-	18:15	160	
	10:15	-	10:30	40			18:15	-	18:30	210	
	10:30	-	10:45	58			18:30	-	18:45	362	
	10:45	-	11:00	67			18:45	-	19:00	460	
	11:00	-	11:15	19			19:00	-	19:15	515	
	11:15	-	11:30	43			19:15	-	19:30	360	
	11:30	-	11:45	46			19:30	-	19:45	146	
	11:45	-	12:00	88			19:45	-	20:00	118	
	12:00	-	12:15	49			20:00	-	20:15	63	
	12:15	-	12:30	70			20:15	-	20:30	55	
	12:30	-	12:45	61			20:30	-	20:45	52	
	12:45	-	13:00	72			20:45	-	21:00	60	
	13:00	-	13:15	65			21:00	-	21:15	40	
	13:15	-	13:30	68			21:15	-	21:30	28	
	13:30	-	13:45	55			21:30	-	21:45	16	
	13:45	-	14:00	74			21:45	-	22:00	10	
	14:00	-	14:15	51			22:00	-	22:15		
	14:15	-	14:30	42			22:15	-	22:30		
	14:30	-	14:45	35			22:30	-	22:45		
	14:45	-	15:00	41							





We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.

Annexure 1F- Gate 3 Outbound

TRAFFIC COUNT SURVEY											
LOCATION No.		Gate No. :		3		Date		Survey Date :		5.201	
		Supervisor		Jeet Mistri							
Surveyor's name	Direction Survey Time			1	2	Surveyor's name	Direction Survey Time			1	2
				In	OUT					IN	Out
											
	7:00	-	7:15		8		15:00	-	15:15	110	
	7:15	-	7:30		49		15:15	-	15:30	73	
	7:30	-	7:45		53		15:30	-	15:45	120	
	7:45	-	8:00		91		15:45	-	16:00	100	
	8:00	-	8:15		75		16:00	-	16:15	109	
	8:15	-	8:30		97		16:15	-	16:30	97	
	8:30	-	8:45		57		16:30	-	16:45	160	
	8:45	-	9:00		70		16:45	-	17:00	62	
	9:00	-	9:15		95		17:00	-	17:15	82	
	9:15	-	9:30		104		17:15	-	17:30	180	
	9:30	-	9:45		86		17:30	-	17:45	210	
	9:45	-	10:00		113		17:45	-	18:00	131	
	10:00	-	10:15		101		18:00	-	18:15	208	
	10:15	-	10:30		150		18:15	-	18:30	180	
	10:30	-	10:45		97		18:30	-	18:45	205	
	10:45	-	11:00		112		18:45	-	19:00	200	
	11:00	-	11:15		54		19:00	-	19:15	130	
	11:15	-	11:30		79		19:15	-	19:30	100	
	11:30	-	11:45		105		19:30	-	19:45	93	
	11:45	-	12:00		96		19:45	-	20:00	119	
	12:00	-	12:15		109		20:00	-	20:15	81	
	12:15	-	12:30		82		20:15	-	20:30	76	
	12:30	-	12:45		89		20:30	-	20:45	43	
	12:45	-	13:00		95		20:45	-	21:00	47	
	13:00	-	13:15		110		21:00	-	21:15	48	
	13:15	-	13:30		78		21:15	-	21:30	22	
	13:30	-	13:45		111		21:30	-	21:45	10	
	13:45	-	14:00		107		21:45	-	22:00	12	
	14:00	-	14:15		90		22:00	-	22:15		
	14:15	-	14:30		104		22:15	-	22:30		
	14:30	-	14:45		86		22:30	-	22:45		
	14:45	-	15:00		98						

We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.

Annexure 1G- Gate 4 Inbound

TRAFFIC COUNT SURVEY											
LOCATION No.			Gate No. : 04								
Date			Survey Date : 10.05.2017			Supervisor		debasish saha			
Surveyor's name	Direction Survey Time			1	2	Surveyor's name	Direction Survey Time			1	2
				In	OUT					IN	Out
	7:00	-	7:15	3			15:00	-	15:15	100	
	7:15	-	7:30	19			15:15	-	15:30	82	
	7:30	-	7:45	16			15:30	-	15:45	167	
	7:45	-	8:00	26			15:45	-	16:00	81	
	8:00	-	8:15	29			16:00	-	16:15	127	
	8:15	-	8:30	14			16:15	-	16:30	113	
	8:30	-	8:45	40			16:30	-	16:45	102	
	8:45	-	9:00	30			16:45	-	17:00	115	
	9:00	-	9:15	27			17:00	-	17:15	118	
	9:15	-	9:30	44			17:15	-	17:30	112	
	9:30	-	9:45	67			17:30	-	17:45	134	
	9:45	-	10:00	58			17:45	-	18:00	138	
	10:00	-	10:15	69			18:00	-	18:15	140	
	10:15	-	10:30	63			18:15	-	18:30	130	
	10:30	-	10:45	70			18:30	-	18:45	90	
	10:45	-	11:00	50			18:45	-	19:00	157	
	11:00	-	11:15	44			19:00	-	19:15	353	
	11:15	-	11:30	71			19:15	-	19:30	139	
	11:30	-	11:45	75			19:30	-	19:45	160	
	11:45	-	12:00	68			19:45	-	20:00	239	
	12:00	-	12:15	137			20:00	-	20:15	120	
	12:15	-	12:30	78			20:15	-	20:30	132	
	12:30	-	12:45	92			20:30	-	20:45	161	
	12:45	-	13:00	116			20:45	-	21:00	96	
	13:00	-	13:15	112			21:00	-	21:15	87	
	13:15	-	13:30	110			21:15	-	21:30	69	
	13:30	-	13:45	125			21:30	-	21:45	55	
	13:45	-	14:00	100			21:45	-	22:00	25	
	14:00	-	14:15	66			22:00	-	22:15		
	14:15	-	14:30	82			22:15	-	22:30		
	14:30	-	14:45	127			22:30	-	22:45		
	14:45	-	15:00	110							

or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.



Annexure 1G- Gate 4 Outbound

TRAFFIC COUNT SURVEY											
LOCATION No.		gate no :- 4									
Date		10.05.2017			Supervisor			sunil sarma			
Surveyor's name	Direction Survey Time			1	2	Surveyor's name	Direction Survey Time			1	2
				In	OUT					IN	Out
	7:00	-	7:15		2		15:00	-	15:15		65
	7:15	-	7:30		13		15:15	-	15:30		90
	7:30	-	7:45		15		15:30	-	15:45		97
	7:45	-	8:00		9		15:45	-	16:00		86
	8:00	-	8:15		82		16:00	-	16:15		89
	8:15	-	8:30		17		16:15	-	16:30		151
	8:30	-	8:45		32		16:30	-	16:45		64
	8:45	-	9:00		45		16:45	-	17:00		51
	9:00	-	9:15		27		17:00	-	17:15		138
	9:15	-	9:30		36		17:15	-	17:30		84
	9:30	-	9:45		57		17:30	-	17:45		81
	9:45	-	10:00		63		17:45	-	18:00		127
	10:00	-	10:15		112		18:00	-	18:15		165
	10:15	-	10:30		81		18:15	-	18:30		73
	10:30	-	10:45		129		18:30	-	18:45		140
	10:45	-	11:00		67		18:45	-	19:00		117
	11:00	-	11:15		72		19:00	-	19:15		147
	11:15	-	11:30		80		19:15	-	19:30		97
	11:30	-	11:45		109		19:30	-	19:45		45
	11:45	-	12:00		63		19:45	-	20:00		79
	12:00	-	12:15		104		20:00	-	20:15		91
	12:15	-	12:30		78		20:15	-	20:30		69
	12:30	-	12:45		88		20:30	-	20:45		126
	12:45	-	13:00		141		20:45	-	21:00		49
	13:00	-	13:15		96		21:00	-	21:15		27
	13:15	-	13:30		90		21:15	-	21:30		19
	13:30	-	13:45		60		21:30	-	21:45		21
	13:45	-	14:00		90		21:45	-	22:00		8
	14:00	-	14:15		60		22:00	-	22:15		
	14:15	-	14:30		95		22:15	-	22:30		
	14:30	-	14:45		65		22:30	-	22:45		
	14:45	-	15:00		72						

We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.

Annexure 1H- Gate 5 Inbound

TRAFFIC COUNT SURVEY											
LOCATION No.		Gate No. : 5									
Date		Survey Date : 10.05.2017				Supervisor		suprio nath dhar			
Surveyor's name	Direction Survey Time			1	2	Surveyor's name	Direction Survey Time			1	2
				In	OUT					IN	Out
	7:00	-	7:15	9			15:00	-	15:15	49	
	7:15	-	7:30	2			15:15	-	15:30	29	
	7:30	-	7:45	19			15:30	-	15:45	45	
	7:45	-	8:00	9			15:45	-	16:00	26	
	8:00	-	8:15	8			16:00	-	16:15	40	
	8:15	-	8:30	3			16:15	-	16:30	30	
	8:30	-	8:45	18			16:30	-	16:45	28	
	8:45	-	9:00	19			16:45	-	17:00	19	
	9:00	-	9:15	18			17:00	-	17:15	12	
	9:15	-	9:30	15			17:15	-	17:30	15	
	9:30	-	9:45	12			17:30	-	17:45	9	
	9:45	-	10:00	20			17:45	-	18:00	12	
	10:00	-	10:15	14			18:00	-	18:15	21	
	10:15	-	10:30	8			18:15	-	18:30	38	
	10:30	-	10:45	22			18:30	-	18:45	73	
	10:45	-	11:00	28			18:45	-	19:00	90	
	11:00	-	11:15	10			19:00	-	19:15	26	
	11:15	-	11:30	11			19:15	-	19:30	57	
	11:30	-	11:45	21			19:30	-	19:45	70	
	11:45	-	12:00	34			19:45	-	20:00	20	
	12:00	-	12:15	15			20:00	-	20:15	24	
	12:15	-	12:30	6			20:15	-	20:30	31	
	12:30	-	12:45	24			20:30	-	20:45	12	
	12:45	-	13:00	58			20:45	-	21:00	16	
	13:00	-	13:15	40			21:00	-	21:15	19	
	13:15	-	13:30	50			21:15	-	21:30	20	
	13:30	-	13:45	15			21:30	-	21:45	28	
	13:45	-	14:00	44			21:45	-	22:00	12	
	14:00	-	14:15	16			22:00	-	22:15		
	14:15	-	14:30	8			22:15	-	22:30		
	14:30	-	14:45	35			22:30	-	22:45		
	14:45	-	15:00	22							

We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.

Annexure 1H- Gate 5 Outbound

TRAFFIC COUNT SURVEY													
LOCATION No.		Gate No. : 5											
Date		Survey Date : 10.05.17				Supervisor							
						snehasish dey							
Surveyor's name	Direction		1 In		2 OUT		Surveyor's name	Direction		1 IN		2 Out	
	Survey Time							Survey Time					
	7:00	-	7:15			3		15:00	-	15:15			44
	7:15	-	7:30			12		15:15	-	15:30			30
	7:30	-	7:45			7		15:30	-	15:45			64
	7:45	-	8:00			9		15:45	-	16:00			24
	8:00	-	8:15			45		16:00	-	16:15			34
	8:15	-	8:30			71		16:15	-	16:30			30
	8:30	-	8:45			67		16:30	-	16:45			50
	8:45	-	9:00			24		16:45	-	17:00			25
	9:00	-	9:15			30		17:00	-	17:15			20
	9:15	-	9:30			5		17:15	-	17:30			18
	9:30	-	9:45			16		17:30	-	17:45			25
	9:45	-	10:00			11		17:45	-	18:00			12
	10:00	-	10:15			10		18:00	-	18:15			69
	10:15	-	10:30			8		18:15	-	18:30			84
	10:30	-	10:45			30		18:30	-	18:45			52
	10:45	-	11:00			20		18:45	-	19:00			50
	11:00	-	11:15			33		19:00	-	19:15			9
	11:15	-	11:30			22		19:15	-	19:30			30
	11:30	-	11:45			15		19:30	-	19:45			25
	11:45	-	12:00			54		19:45	-	20:00			36
	12:00	-	12:15			60		20:00	-	20:15			39
	12:15	-	12:30			46		20:15	-	20:30			28
	12:30	-	12:45			45		20:30	-	20:45			3
	12:45	-	13:00			44		20:45	-	21:00			11
	13:00	-	13:15			52		21:00	-	21:15			7
	13:15	-	13:30			36		21:15	-	21:30			10
	13:30	-	13:45			17		21:30	-	21:45			5
	13:45	-	14:00			67		21:45	-	22:00			
	14:00	-	14:15			26		22:00	-	22:15			
	14:15	-	14:30			19		22:15	-	22:30			
	14:30	-	14:45			44		22:30	-	22:45			
	14:45	-	15:00			20							





We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.

Annexure 1H- Gate 6 Inbound

TRAFFIC COUNT SURVEY											
LOCATION No.		Gate No. : 6									
Date		Survey Date : 10.05.17				Supervisor		Sujay Saha			
Surveyor's name	Direction			1	2	Surveyor's name	Direction			1	2
	Survey Time			In	OUT		Survey Time			IN	Out
											
	7:00	-	7:15	3			15:00	-	15:15	155	
	7:15	-	7:30	6			15:15	-	15:30	170	
	7:30	-	7:45	4			15:30	-	15:45	174	
	7:45	-	8:00	9			15:45	-	16:00	190	
	8:00	-	8:15	9			16:00	-	16:15	212	
	8:15	-	8:30	7			16:15	-	16:30	191	
	8:30	-	8:45	15			16:30	-	16:45	205	
	8:45	-	9:00	17			16:45	-	17:00	213	
	9:00	-	9:15	12			17:00	-	17:15	282	
	9:15	-	9:30	7			17:15	-	17:30	305	
	9:30	-	9:45	20			17:30	-	17:45	297	
	9:45	-	10:00	21			17:45	-	18:00	245	
	10:00	-	10:15	35			18:00	-	18:15	281	
	10:15	-	10:30	38			18:15	-	18:30	209	
	10:30	-	10:45	47			18:30	-	18:45	302	
	10:45	-	11:00	51			18:45	-	19:00	317	
	11:00	-	11:15	62			19:00	-	19:15	299	
	11:15	-	11:30	58			19:15	-	19:30	289	
	11:30	-	11:45	69			19:30	-	19:45	245	
	11:45	-	12:00	71			19:45	-	20:00	310	
	12:00	-	12:15	93			20:00	-	20:15	335	
	12:15	-	12:30	103			20:15	-	20:30	365	
	12:30	-	12:45	126			20:30	-	20:45	391	
	12:45	-	13:00	119			20:45	-	21:00	406	
	13:00	-	13:15	174			21:00	-	21:15	456	
	13:15	-	13:30	117			21:15	-	21:30	332	
	13:30	-	13:45	132			21:30	-	21:45	261	
	13:45	-	14:00	115			21:45	-	22:00	121	
	14:00	-	14:15	130			22:00	-	22:15	65	
	14:15	-	14:30	110			22:15	-	22:30		
	14:30	-	14:45	145			22:30	-	22:45		
	14:45	-	15:00	175							





We will be using premade counting sheet ( where Gate no. of Metro stn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for helping others boys and over all monitaring one person.

## Annexure 1I- Gate 6 Outbound

TRAFFIC COUNT SURVEY										
LOCATION No.		Gate No. : 6								
Date		Survey Date : 10.05.17			Supervisor		Ratna Saha Mondal			
Surveyor's name	Direction		1 In	2 OUT	Surveyor's name	Direction		1 IN	2 Out	
	Survey Time					Survey Time				
	7:00	-	7:15			15:00	-	15:15	7	345
	7:15	-	7:30			15:15	-	15:30	16	301
	7:30	-	7:45			15:30	-	15:45	26	298
	7:45	-	8:00			15:45	-	16:00	21	351
	8:00	-	8:15			16:00	-	16:15	64	425
	8:15	-	8:30			16:15	-	16:30	76	315
	8:30	-	8:45			16:30	-	16:45	71	288
	8:45	-	9:00			16:45	-	17:00	89	320
	9:00	-	9:15			17:00	-	17:15	68	358
	9:15	-	9:30			17:15	-	17:30	74	333
	9:30	-	9:45			17:30	-	17:45	93	312
	9:45	-	10:00			17:45	-	18:00	143	342
	10:00	-	10:15			18:00	-	18:15	161	348
	10:15	-	10:30			18:15	-	18:30	174	215
	10:30	-	10:45			18:30	-	18:45	271	340
	10:45	-	11:00			18:45	-	19:00	311	321
	11:00	-	11:15			19:00	-	19:15	343	254
	11:15	-	11:30			19:15	-	19:30	362	291
	11:30	-	11:45			19:30	-	19:45	345	150
	11:45	-	12:00			19:45	-	20:00	376	269
	12:00	-	12:15			20:00	-	20:15	432	213
	12:15	-	12:30			20:15	-	20:30	371	170
	12:30	-	12:45			20:30	-	20:45	295	102
	12:45	-	13:00			20:45	-	21:00	220	49
	13:00	-	13:15			21:00	-	21:15	292	33
	13:15	-	13:30			21:15	-	21:30	210	36
	13:30	-	13:45			21:30	-	21:45	258	9
	13:45	-	14:00			21:45	-	22:00	232	11
	14:00	-	14:15			22:00	-	22:15	250	17
	14:15	-	14:30			22:15	-	22:30	260	
	14:30	-	14:45			22:30	-	22:45	162	
	14:45	-	15:00						309	





We will be using premade counting sheet ( where Gate no. of Metro stn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitarng one person.

Annexure 1J- Gate 7 Inbound Outbound

TRAFFIC COUNT SURVEY											
LOCATION No.		Gate No. : 8									
Date		Survey Date : 10.05.17			Supervisor						
Surveyor's name	Direction Survey Time			1	2	Surveyor's name	Direction Survey Time			1	2
				In	OUT					IN	Out
											
	7:00	-	7:15	11	22		15:00	-	15:15	86	184
	7:15	-	7:30	27	109		15:15	-	15:30	78	169
	7:30	-	7:45	28	65		15:30	-	15:45	75	179
	7:45	-	8:00	37	73		15:45	-	16:00	90	200
	8:00	-	8:15	29	75		16:00	-	16:15	68	192
	8:15	-	8:30	36	59		16:15	-	16:30	55	126
	8:30	-	8:45	33	78		16:30	-	16:45	93	143
	8:45	-	9:00	39	40		16:45	-	17:00	72	118
	9:00	-	9:15	64	55		17:00	-	17:15	61	114
	9:15	-	9:30	79	45		17:15	-	17:30	42	123
	9:30	-	9:45	57	30		17:30	-	17:45	52	118
	9:45	-	10:00	87	64		17:45	-	18:00	89	117
	10:00	-	10:15	130	72		18:00	-	18:15	64	121
	10:15	-	10:30	135	78		18:15	-	18:30	51	130
	10:30	-	10:45	102	56		18:30	-	18:45	74	112
	10:45	-	11:00	86	86		18:45	-	19:00	62	129
	11:00	-	11:15	80	83		19:00	-	19:15	81	197
	11:15	-	11:30	38	111		19:15	-	19:30	55	165
	11:30	-	11:45	83	120		19:30	-	19:45	41	101
	11:45	-	12:00	87	103		19:45	-	20:00	45	54
	12:00	-	12:15	98	103		20:00	-	20:15	54	40
	12:15	-	12:30	86	105		20:15	-	20:30	69	44
	12:30	-	12:45	113	132		20:30	-	20:45	112	58
	12:45	-	13:00	119	189		20:45	-	21:00	67	57
	13:00	-	13:15	76	118		21:00	-	21:15	90	91
	13:15	-	13:30	85	107		21:15	-	21:30	42	67
	13:30	-	13:45	74	157		21:30	-	21:45	27	35
	13:45	-	14:00	51	128		21:45	-	22:00	18	19
	14:00	-	14:15	39	109		22:00	-	22:15	7	50
	14:15	-	14:30	75	136		22:15	-	22:30	3	6
	14:30	-	14:45	113	139		22:30	-	22:45		
	14:45	-	15:00	133	149						

We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

A set of boys will count number of inbound passangers, a different set of boys will be counting the number of outbound passangers

A different set of boys will be there for interviewing passangers( inbound & outbound). We will deploy 6 manpower fo each gate ,

one for counting inbound passangers, one for counting outbound passangers , one for interviewing inbond passanger, one for interviewing outbond passanger two for halping others boys and over all monitaring one person.



Annexure 1K- Gate 8 Inbound Outbound

TRAFFIC COUNT SURVEY											
LOCATION No.		Gate No. :									
Date		Survey Date :		Supervisor							
Surveyor's name	Direction Survey Time			1	2	Surveyor's name	Direction Survey Time			1	2
				In	OUT					IN	Out
	7:00	-	7:15	2	3		15:00	-	15:15	31	5
	7:15	-	7:30	5	1		15:15	-	15:30	20	3
	7:30	-	7:45	10	3		15:30	-	15:45	19	27
	7:45	-	8:00	17	2		15:45	-	16:00	50	9
	8:00	-	8:15	5	45		16:00	-	16:15	23	2
	8:15	-	8:30	4	51		16:15	-	16:30	39	19
	8:30	-	8:45	20	43		16:30	-	16:45	38	17
	8:45	-	9:00	14	53		16:45	-	17:00	6	9
	9:00	-	9:15	5	6		17:00	-	17:15	20	5
	9:15	-	9:30	24	2		17:15	-	17:30	51	2
	9:30	-	9:45	9	3		17:30	-	17:45	58	13
	9:45	-	10:00	19	1		17:45	-	18:00	48	6
	10:00	-	10:15	33	3		18:00	-	18:15	68	3
	10:15	-	10:30	59	2		18:15	-	18:30	43	10
	10:30	-	10:45	14	5		18:30	-	18:45	69	23
	10:45	-	11:00	12	3		18:45	-	19:00	38	26
	11:00	-	11:15	8	3		19:00	-	19:15	63	19
	11:15	-	11:30	25	2		19:15	-	19:30	49	22
	11:30	-	11:45	24	9		19:30	-	19:45	54	15
	11:45	-	12:00	13	7		19:45	-	20:00	28	17
	12:00	-	12:15	25	17		20:00	-	20:15	31	7
	12:15	-	12:30	26	24		20:15	-	20:30	15	5
	12:30	-	12:45	12	18		20:30	-	20:45	12	2
	12:45	-	13:00	8	9		20:45	-	21:00	8	8
	13:00	-	13:15	24	3		21:00	-	21:15	16	11
	13:15	-	13:30	12	5		21:15	-	21:30	18	11
	13:30	-	13:45	10	7		21:30	-	21:45	9	3
	13:45	-	14:00	11	2		21:45	-	22:00	7	15
	14:00	-	14:15	31	5		22:00	-	22:15	9	21
	14:15	-	14:30	18	7		22:15	-	22:30	1	3
	14:30	-	14:45	16	9		22:30	-	22:45	-	-
	14:45	-	15:00	15	7						

We will be using premade counting sheet ( where Gate no. of Metro strn. Gate will be mentioned on different sheet , inbound or Outbound will be mentioned on the sheets ) .Each boy will be handed over premade counting sheet that contains number 1 to 100

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添付資料 2(3) : Traffic Analysis Annexure 4: Demand Data between Rail Station and Metro Station (Outbound)

Annexure 4- Demand Data between Rail Station and Metro Station (Outbound)

Station Name/Metro Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	New Garia	Shahid Khudiram	Garia	Naktala	Bansidromi	Kudghat	Tollygunge	Rabindra sarobar	Kalighat	Jadhav Park	Netaji Bhawan	Rabindra Sardan	Maidan	Park Street	Chandri Chak	Central	MG Road	Girish Park	Sova Bazar	Shyam Bazar	Belgachhia	Dumdum	Noapara		
Bapthalain	5						30	5	10	5	10	13	14	14	16	5	17	18	20	20	21	22	23	24	
Baranagar	5					10	5	10	5	5	15	5			5			65	10	25	15	15			
Bhadrabad										10										25			5		
Bidhan Nagar	15	25	45	0	10	0	15	35	25	60	35	20	5	0	5	30	10	20	251	10	25	754	10	15	
Grara	85	35	181	70		10	40	5	5	20	5	10	25	5	5	5		5	75	5	10	5	10	10	
Jadavpur			5				90	10	15	10	10	5	10	75	5	5			5		5	30	10	10	
Kalighati							5	10	5	5	5	5	10			5		5							
Lake Gardens							5	5	5	5	5	5	5			5		5							
New Ashok							45	25	5	55	15	5	5			10		5		5		20	25		
New Ashok	358		141		5	5	5	25	20	5	10	5	5			5		5		5		20	25		
PAIK PARA			5				5	5	5	5	5	5	5			5		5		5					
Ravindra Saroai	5		130		6	6	130	125	45	5	35	15	10	10	10	240	65	20	221	20			5	5	
Sealdah	20		15		5		15	15	15	10	10	5	5			5		75						5	
Tollygunge	5	60	11		5		241	5	25	10	10	5	5			5		15	190					5	
Uludaoga			10				5																		

添付資料 2 (4) : Traffic Analysis Annexure 5: Demand Data between Rail Station and Metro Station (Inbound)

Annexure 5- Demand Data between Rail Station and Metro Station (inbound)

Metro Station Name/Sub-Station	Bhagalpatti	Bally	Ballygunge	Baranagar	Barulpur	Dum Dum	Dunlop	Garib	Howrah	Jadavpur	Lake Gardens	MAKTALA	New Garib	Rabindra Sarovar	Saikatgachhi	Saaidah	Solarpur	Tollygunge
New Garib	128				20	20		15					601				69	
Shahid Khudiram			0										69				49	
Garib			0					517		5			44	15			5	
Naktala			0									10						
Bansdroni			0					5									5	
Kudghat			64															
Tollygunge			0							25								
Rabindra Sarovar			20										10	30				177
Belgachhia			64											251				79
Jethi Das Park			64											5				
Rabindra Sarovar			0								15							
Netaji Bhawan			0															
Rabindra Sadan			0			44			69									
Maidan			0						5									
Park Street			0			25			39									
Chandni Chalk			0			59								10				
Central			0			143												
MG Road			0			128												
MG Road			0			133												
Grish Park			0			133							10					
Sova Bazar			0			212			20									
Shyam Bazar			0			177												
Belgachhia			0			128												
Dum Dum		25	0	108		1954			5									
Noapara		54	0	64		113												

**添付資料 3 Traffic Demand Forecast Report by RITES**

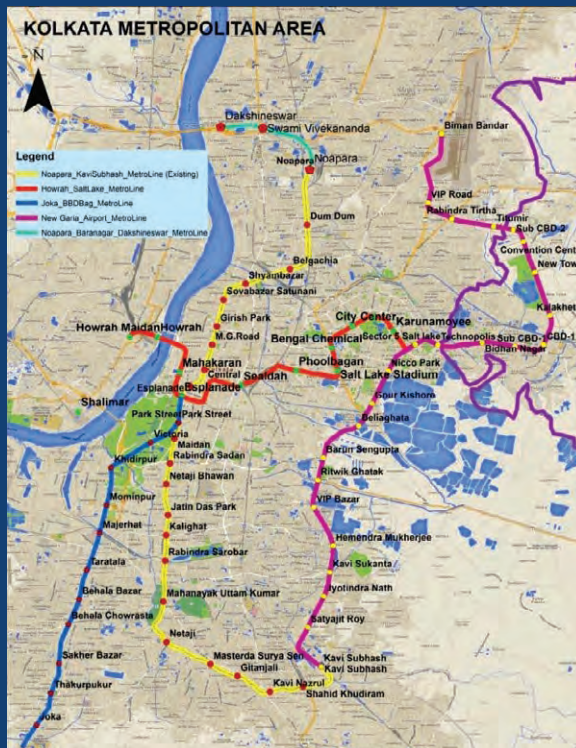




Kolkata Metro Rail Corporation Ltd.



## DPR OF KOLKATA EAST-WEST METRO FROM SALT LAKE SECTOR V TO HOWRAH MAIDAN VIA ESPLANADE ON REALIGNED ROUTE STUDY ON TRAFFIC DEMAND FORECAST



## FINAL REPORT OF RIDERSHIP

DECEMBER 2017





## 6 TRANSPORT DEMAND FORECAST

### 6.1 FUTURE GROWTH SCENARIO

Vision 2025 for KMA and Master Plan for Traffic and Transportation for Kolkata gives the likely growth to take place within the various areas of study area. The Masterplan also gives locations of various land uses such as residential, commercial, industrial uses etc. The study area is estimated to have population of about 82.28 Lakh in 2025, 89.62 Lakh by 2035 and 95.68 Lakh by 2050. The employment in this area, which is 32.06 Lakh in 2017, is expected to grow to about 42.09 Lakh in 2050. Similarly, student enrolment is expected to grow from 14.15 Lakh in 2017 to 19.69 Lakh in 2050. Traffic zone wise distribution of population, employment and student enrolment in 2017, 2025, 2035 and 2050 are given in **Chapter 4**.

The proposed growth of population and economy is expected to generate high travel demand. An integrated landuse transportation model has been built to enable estimation of future travel demand. The development of travel demand model has been discussed in detail in **Chapter 5**. As per travel demand modeling exercise, daily intra travel demand is expected to grow from 68.45 Lakh person trips in year 2017 to 83.69 Lakh in year 2035.

### 6.2 ASSUMPTIONS FOR TRANSPORT DEMAND FORECASTING

The following assumptions have been made for forecasting transport demand for the years 2025 and 2035:

- i. Calibrated and validated travel demand model has been used
- ii. Land use parameters (population, employment and student enrolment) have been distributed in various traffic zones for 2025 and 2035.
- iii. The fare levels of metro have been considered same as that of the existing Kolkata Metro Railway.
- iv. Inter-city passenger to/from the study area will grow at the growth rate of 1.5%.
- v. The special generator passenger traffic of airport and railway stations in Kolkata is expected to grow at 2% per annum.
- vi. Goods traffic is expected to grow at 1% per annum up to 2035.

### 6.3 TRANSPORT DEMAND FORECAST FOR KOLKATA METRO NETWORK

The Kolkata Metro Network considered for the Ridership Assessment on the entire system consists of following corridors and extensions:

1. Line-1: Dakshineswar – Noapara – KaviSubhash Metro Corridor (North-South)
2. Line-2: East-West Metro Corridor from Howrah Maidan to Salt Lake Sector V
3. Line-2A: East Extension of Kolkata East-West Metro from Salt Lake Sector V to Biman Bandar (Airport) via Haldiram (Teghoria)
4. Line-2B: West Extension of Kolkata East-West Metro from Howrah Maidan to Santragachi
5. Line-3: Joka – Esplanade Corridor
6. Line-4: KaviSubhash (New Garia) – Haldiram (Teghoria)

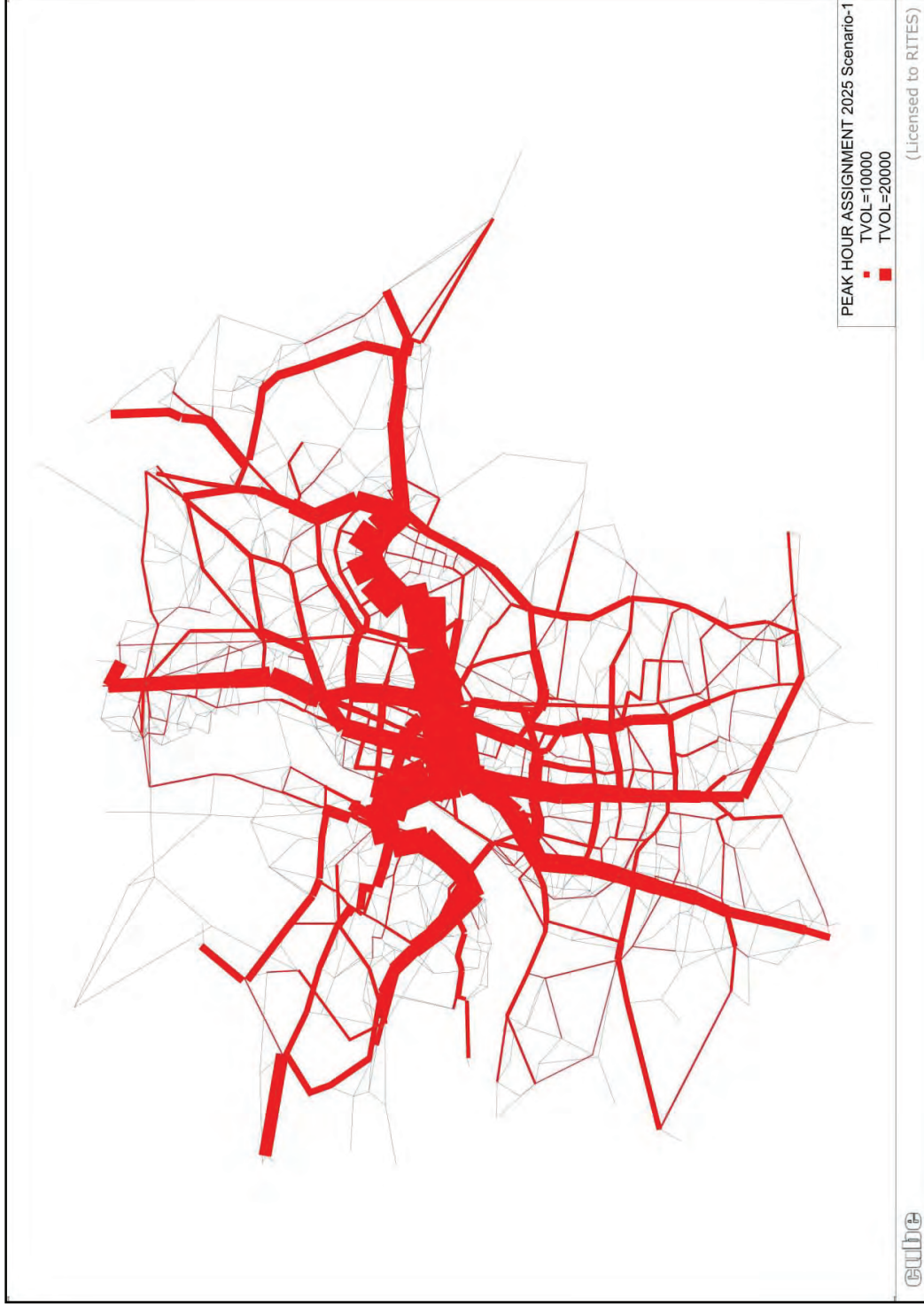
Considering the above assumptions and calibrated/validated traffic demand model, forecasting of transport demand has been carried out for 2 scenarios for 2025 & 2035 for East-West Metro Corridor:

- a. **Scenario-1:** Entire Metro Network with all Extensions: This includes the entire Metro System comprising North-South Corridor from Dakshineswar to Kavi Subhash, East-West Metro Corridor from Santragachi to Biman Bandar via Howrah Maidan, Salt Lake Sector V and Haldiram. Also under construction corridors Joka-Esplanade and New Garia – Haldiram Corridor has been considered as part of this scenario.
- b. **Scenario-2:** Metro Network without Line-2A and Line-2B (Without Extensions of Kolkata East-West Metro Corridor): This comprises the entire Metro system excluding East-West Metro Corridor extension from Howrah Maidan to Santragachi and Salt Lake Sector V to Biman Bandar.

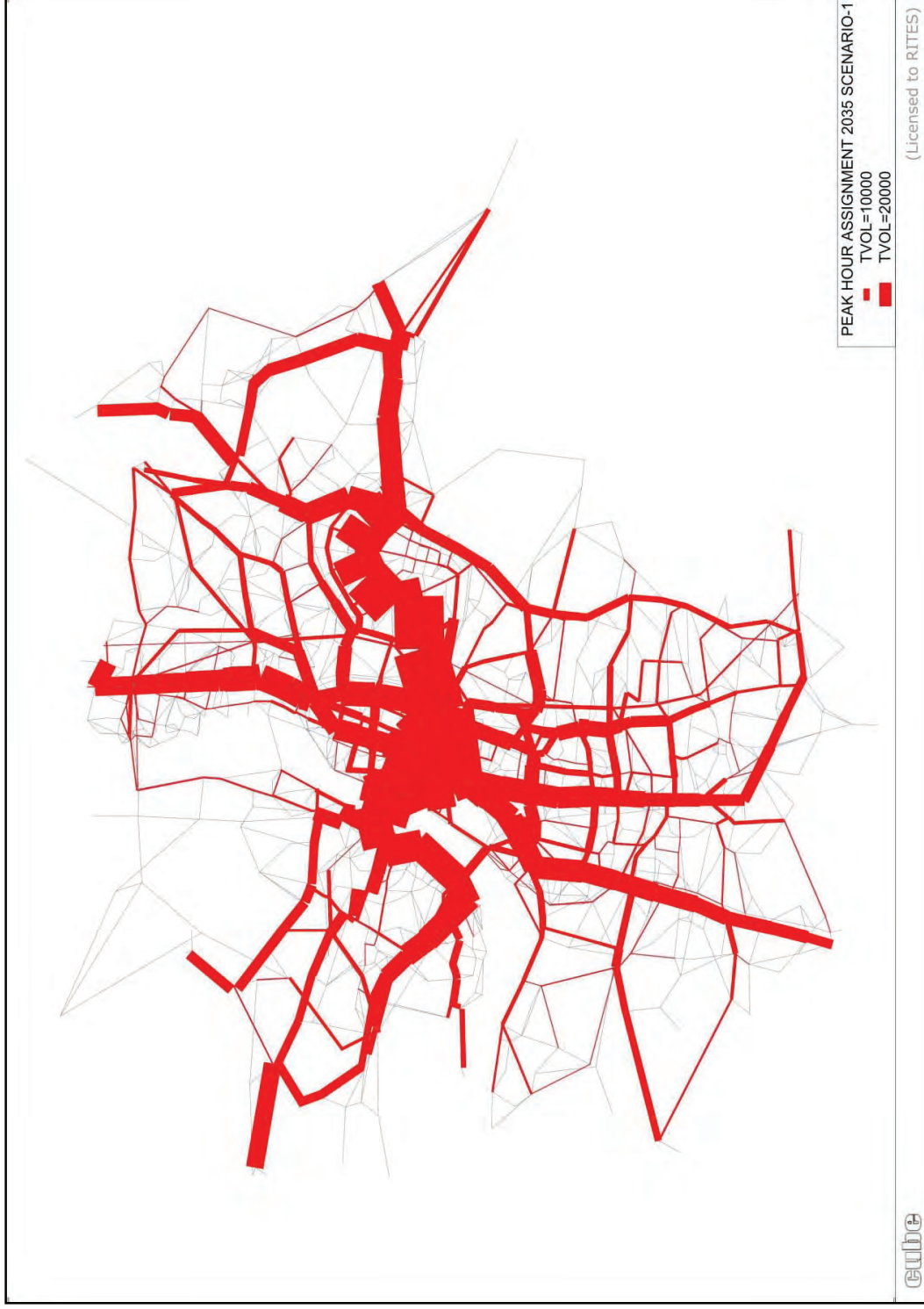
Overall modal split of passenger trips for various modes in Scenario-1&Scenario-2 for the years 2025 and 2035 are given in **Table 6-1** and **Table 6-2**. The modal split (% of trips by public transport to total motorised trips) in favor of public transport in 2035 is expected to be 71.26%.

The traffic assignment in 2025 & 2035 on road network for public transport and other vehicles are given in **Figure 6-1**, **Figure 6-2**, **Figure 6-3** and **Figure 6-4** respectively. These figures show that the East-West Metro Corridor will take the maximum passenger load in the entire network.

**FIGURE 6-1: PEAK HOUR ASSIGNMENT IN 2025 (SCENARIO-1)**



**FIGURE 6-2: PEAK HOUR ASSIGNMENT IN 2035 (SCENARIO-1)**



**FIGURE 6-3: PEAK HOUR ASSIGNMENT IN 2025 (SCENARIO-2)**





**FIGURE 6-4: PEAK HOUR ASSIGNMENT IN 2035 (SCENARIO-2)**



**TABLE 6-1: DAILY TRIPS BY VARIOUS MODES IN 2025 & 2035 (SCENARIO-1)**

S.No.	Mode	2017(Household)		2025		2035	
		Trips	Modal Share	Trips	Modal Share	Trips	Modal Share
1	Car	390461	5.70%	429536	5.58%	469660	5.61%
2	2-Wheeler	511474	7.47%	547290	7.11%	598111	7.15%
3	Auto/Taxi	1113600	16.27%	1217876	15.83%	1330504	15.90%
4	PT	4829686	70.56%	5501168	71.48%	5970667	71.34%
	<b>Total</b>	<b>6845221</b>	<b>100.0%</b>	<b>7695870</b>	<b>100.0%</b>	<b>8368942</b>	<b>100.0%</b>

**TABLE 6-2: STATION LOADS ON LINE-1 IN 2025 (SCENARIO-1)**

CORRIDOR 1		DAKSHINESWAR TO KAVI SUBHASH 2025					
STATION NAME	CUBE CODE	DAK-KVS		KVS-DAK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Dakshineswar	2029	29630	0	0	58612	29630	58612
Baranagar	2030	3503	8	37	3806	3539	3815
Noapara	2031	11396	229	421	11565	11817	11794
Dum Dum	2032	85935	5768	7697	76377	93631	82145
Belgachia	2033	27684	3957	4272	31560	31955	35517
Shyam Bazar	2034	19458	776	1312	17346	20770	18121
Shobha Bazar	2035	42191	4617	5955	42782	48146	47399
Girish Park	2036	24331	2864	5359	23467	29690	26331
MG Road	2037	30392	9596	10051	35621	40443	45216
Central	2038	25905	4690	6597	21713	32502	26402
Chandni	2039	20390	8765	10547	12425	30937	21191
Esplanade	2040	72878	88709	63889	96549	136767	185258
Park Street	2041	8065	32486	41491	8864	49556	41350
Maidan	2042	3903	12500	13650	4842	17553	17342
RabindraSadan	2043	8640	16024	24125	8961	32765	24985
Netaji Bhawan	2044	2267	5904	6284	2475	8551	8379
Jatin Das Park	2045	10188	28309	36443	10901	46631	39209
Kalighat	2046	5956	32664	39258	6177	45213	38841
RabindraSaroobar	2047	4946	31144	37047	6313	41993	37457
MahanayakUttam Kumar (Tollygunge)	2048	4426	18286	23283	4465	27709	22751
Netaji (Kudghat)	2049	8656	12226	14305	8092	22961	20318
Masterda Surya Sen (Bansdroni)	2050	6877	33447	26769	8973	33647	42420
Gitanjali (Naktala)	2051	4754	17817	20153	3702	24907	21519
KaviNazrul (Garia)	2052	6323	35379	38394	6432	44717	41811
ShahidKhudiram (Briji)	2053	145	19550	25798	111	25943	19661
KaviSubhash (New Garia)	2054	0	43122	48994	0	48994	43122
<b>Total</b>		<b>468837</b>	<b>468836</b>	<b>512129</b>	<b>512129</b>	<b>980966</b>	<b>980966</b>

**TABLE 6-3: STATION LOADS ON LINE-2 IN 2025 (SCENARIO-1)**

CORRIDOR 2		SANTRAGACHI TO BIMAN BANDAR 2025					
STATION NAME	CUBE CODE	SNG-BMB		BMB-SNG		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Santragachi Bus Terminal	2001	18408	0	0	36060	18408	36060
Santragachi	2002	21805	574	413	106419	22218	106993



CORRIDOR 2		SANTRAGACHI TO BIMAN BANDAR 2025					
STATION NAME	CUBE CODE	SNG-BMB		BMB-SNG		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Railway Station							
Baksara	2003	7877	414	713	31867	8590	32281
Belepole	2004	18294	917	2387	53031	20681	53948
Padmapukur	2005	14145	1162	1640	25303	15785	26465
Shalimar	2006	14682	1348	499	21344	15181	22692
Nabanna	2007	17419	1041	5310	28307	22729	29347
Upper Foreshore Road	2008	20131	1275	5709	26120	25840	27395
Howrah Maidan	2009	39204	3322	17505	34095	56708	37417
Howrah Railway Station	2011	103775	2215	8450	111898	112225	114113
Mahakaran	2012	57509	12956	30044	58996	87553	71953
Esplanade	2013	152480	84548	164449	171575	316929	256123
Sealdah	2014	55020	116170	114728	71380	169748	187550
Phoolbagan	2015	10686	36983	43925	10631	54610	47615
Salt Lake Stadium	2016	9797	24139	23671	9430	33468	33568
Bengal Chemical	2017	1833	3989	5770	1950	7603	5939
City Centre	2018	4980	14435	15517	4820	20497	19255
Central Park	2019	5047	14284	14196	5325	19243	19609
Karunamoyee	2020	3019	19022	36264	1672	39283	20694
Salt Lake Sector V	2021	23222	110446	113092	23040	136314	133486
Keshtopur	2022	6461	20728	20339	7942	26800	28670
Dum Dum Park	2023	735	23305	38129	740	38864	24045
Baguihati	2024	642	39010	73366	682	74009	39692
Raghunathpur	2025	189	16773	46477	115	46666	16887
Haldiram (Teghoria)	2026	180	23765	22532	37	22711	23802
Kaikhali	2027	35	5004	4539	2	4574	5005
Biman Bandar (Airport)	2028	0	29752	33119	0	33119	29752
<b>Total</b>		<b>607575</b>	<b>607575</b>	<b>842779</b>	<b>842779</b>	<b>1450354</b>	<b>1450354</b>

**TABLE 6-4: STATION LOADS ON LINE-3 IN 2025 (SCENARIO-1)**

CORRIDOR 3		JOKA – ESPLANADE 2025					
STATION NAME	CUBE CODE	JOK-ESP		ESP-JOK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Joka	2078	39876	0	0	50690	39876	50690
Thakurpukur	2079	47211	210	210	44519	47422	44729
Sakher Bazar	2080	10419	95	81	9405	10500	9500
Behala Chowrasta	2081	15974	204	255	16403	16229	16606
Behala Bazar	2082	25163	870	881	24004	26044	24874
Taratala	2083	23802	2026	1825	23322	25627	25348
Majherhat	2084	14961	3530	3832	12038	18793	15568
Mominpur	2085	15162	3240	2744	12349	17906	15589
Khidderpore	2086	23735	8387	9079	20958	32814	29345
Victoria	2087	226	3173	2067	359	2293	3531
Park Street	2088	3286	58704	67741	2716	71026	61419
Esplanade	2089	0	139378	128046	0	128046	139378
<b>Total</b>		<b>219816</b>	<b>219816</b>	<b>216761</b>	<b>216761</b>	<b>436577</b>	<b>436577</b>

**TABLE 6-5: STATION LOADS ON LINE-4 IN 2025 (SCENARIO-1)**

<b>CORRIDOR 4</b>		<b>KAVI SUBHASH (NEW GARIA) - HALDIRAM (TEGHORIA) 2025</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>KVS-HLD</b>		<b>HLD-KVS</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
KaviSubhash (New Garia)	2055	46890	0	0	45177	46890	45177
Satyajit Roy	2056	24989	6444	7613	20513	32602	26957
JyotindraNath	2057	9449	0	0	8647	9449	8647
KaviSukanta	2058	1033	0	0	3002	1033	3002
Hemendra Mukherjee	2059	17863	804	807	16109	18671	16913
VIP Bazar	2060	9405	1237	1159	9063	10564	10299
RitwikGhatak	2061	21394	5567	4992	15305	26386	20871
BarunSengupta	2062	19590	4777	3183	24117	22772	28895
Beliaghata	2063	3604	3972	3293	3474	6898	7446
Gour Kishore	2064	10907	3966	5078	4935	15985	8900
Nicco Park	2065	6306	4138	4526	4593	10831	8731
Salt Lake Sector V	2066	64435	54906	44168	53633	108602	108539
Technopolis	2067	1511	6712	6376	1766	7886	8478
Bidhan Nagar	2068	3087	19016	21122	3210	24208	22225
Sub CBD-1	2069	2899	17173	16379	1775	19279	18948
CBD	2070	6578	36823	21455	3960	28034	40783
Kalakhetra	2071	4147	17910	16758	3752	20905	21662
New Town	2072	1209	14657	5692	1246	6901	15903
Convention Centre	2073	1178	7282	6620	1394	7798	8676
Sub CBD-2	2074	773	11865	10507	833	11279	12699
Titumir	2075	718	7706	7495	763	8213	8468
RabindraTirtha	2076	1272	13243	22165	1810	23436	15052
Haldiram (Teghoria)	2077	0	21039	19688	0	19688	21039
<b>Total</b>		<b>259235</b>	<b>259235</b>	<b>229075</b>	<b>229075</b>	<b>488310</b>	<b>488310</b>

**TABLE 6-6: STATION LOADS ON LINE-1 IN 2035 (SCENARIO-1)**

<b>CORRIDOR 1</b>		<b>DAKSHINESWAR TO KAVI SUBHASH 2035</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>DAK-KVS</b>		<b>KVS-DAK</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Dakshineswar	2029	31057	0	0	62020	31057	62020
Baranagar	2030	3649	8	38	3976	3687	3984
Noapara	2031	11791	241	430	12026	12221	12267
Dum Dum	2032	91360	6455	8820	82049	100180	88504
Belgachia	2033	28132	4067	4661	32088	32792	36155
Shyam Bazar	2034	21391	786	1445	17550	22837	18336
Shobha Bazar	2035	43417	4640	6184	42796	49601	47436
Girish Park	2036	24919	2968	5692	24004	30610	26972
MG Road	2037	31876	9977	10480	36650	42356	46627
Central	2038	27437	4732	6653	21787	34090	26519
Chandni	2039	22250	8957	11026	12731	33277	21688
Esplanade	2040	79825	97453	68444	108400	148269	205853
Park Street	2041	8340	34352	42960	9656	51301	44008
Maidan	2042	3970	13300	14200	4981	18170	18281
RabindraSadon	2043	9078	17246	26408	9327	35486	26573
Netaji Bhawan	2044	2476	5937	6323	2756	8799	8693
Jatin Das Park (Hazra)	2045	10843	29744	37742	11552	48585	41296
Kalighat	2046	6321	33215	39898	6640	46219	39855
RabindraSarobar	2047	5598	32081	37623	6800	43221	38881
MahanayakUttam Kumar (Tollygunge)	2048	5213	18289	23292	5194	28505	23483
Netaji (Kudghat)	2049	10790	12244	14432	9530	25222	21774
Masterda Surya Sen (Bansdroni)	2050	8264	33821	27125	10666	35389	44486

<b>CORRIDOR 1</b>		<b>DAKSHINESWAR TO KAVI SUBHASH 2035</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>DAK-KVS</b>		<b>KVS-DAK</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Gitanjali (Naktala)	2051	6059	18830	21159	4543	27219	23374
KaviNazrul (Garia)	2052	7705	39527	41958	7857	49663	47383
ShahidKhudiram (Briji)	2053	151	21353	29910	115	30061	21468
KaviSubhash (New Garia)	2054	0	51690	58795	0	58795	51690
<b>Total</b>		<b>501910</b>	<b>501910</b>	<b>545697</b>	<b>545697</b>	<b>1047607</b>	<b>1047607</b>

**TABLE 6-7: STATION LOADS ON LINE-2 IN 2035 (SCENARIO-1)**

<b>CORRIDOR 2</b>		<b>SANTRAGACHI TO BIMAN BANDAR 2035</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>SNG-BMB</b>		<b>BMB-SNG</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Santragachi Bus Terminal	2001	20730	0	0	46133	20730	46133
Santragachi Railway Station	2002	26785	651	476	128170	27261	128821
Baksara	2003	9119	462	815	41609	9934	42071
Belepole	2004	25222	1080	2879	67089	28101	68169
Padmapukur	2005	16370	1264	1807	30296	18177	31559
Shalimar	2006	15559	1475	509	22789	16068	24263
Nabanna	2007	21359	1210	6071	33918	27431	35128
Upper Foreshore Road	2008	22224	1369	6204	28133	28428	29502
Howrah Maidan	2009	48902	3732	20926	40596	69829	44329
Howrah Railway Station	2011	142484	2554	10537	153105	153021	155659
Mahakaran	2012	77776	17528	41074	80141	118850	97668
Esplanade	2013	180935	98577	192898	206302	373833	304879
Sealdah	2014	72554	157570	154678	95464	227231	253034
Phoolbagan	2015	11941	44445	50086	12101	62027	56546
Salt Lake Stadium	2016	10842	25807	24645	10781	35487	36588
Bengal Chemical	2017	2239	4200	6116	2350	8355	6550
City Centre	2018	5237	14846	15717	5122	20954	19967
Central Park	2019	5864	17202	16565	6301	22429	23503
Karunamoyee	2020	3937	23960	50633	1922	54570	25883
Salt Lake Sector V	2021	27193	154069	154578	27480	181770	181550
Keshtopur	2022	6819	23596	23060	8627	29879	32223
Dum Dum Park	2023	743	24918	45307	758	46051	25677
Baguihati	2024	652	45547	91430	694	92081	46241
Raghunathpur	2025	193	18744	61604	121	61798	18865
Haldiram (Teghoria)	2026	181	29193	27300	40	27481	29233
Kaikhali	2027	35	5802	5052	2	5088	5804
Biman Bandar (Airport)	2028	0	36094	39077	0	39077	36094
<b>Total</b>		<b>755895</b>	<b>755895</b>	<b>1050043</b>	<b>1050043</b>	<b>1805938</b>	<b>1805938</b>

**TABLE 6-8: STATION LOADS ON LINE-3 IN 2035 (SCENARIO-1)**

<b>CORRIDOR 3</b>		<b>JOKA – ESPLANADE2035</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>JOK-ESP</b>		<b>ESP-JOK</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Joka	2078	56823	0	0	72002	56823	72002
Thakurpukur	2079	53257	227	227	50233	53484	50460

CORRIDOR 3		JOKA – ESPLANADE2035					
STATION NAME	CUBE CODE	JOK-ESP		ESP-JOK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Sakher Bazar	2080	10898	103	88	9857	10986	9960
BehalaChowrasta	2081	16355	248	299	16839	16654	17087
Behala Bazar	2082	25897	938	946	24912	26843	25850
Taratala	2083	25428	2102	1894	25300	27322	27403
Majherhat	2084	17235	4185	4574	13913	21808	18099
Mominpur	2085	16178	3321	2944	13174	19122	16495
Khidderpore	2086	24840	10064	10753	22757	35593	32822
Victoria	2087	226	3773	2622	374	2848	4147
Park Street	2088	3508	63825	78458	3061	81965	66886
Esplanade	2089	0	161858	149617	0	149617	161858
<b>Total</b>		<b>250644</b>	<b>250644</b>	<b>252422</b>	<b>252422</b>	<b>503065</b>	<b>503065</b>

TABLE 6-9: STATION LOADS ON LINE-4 IN 2035 (SCENARIO-1)

CORRIDOR 4		KAVI SUBHASH (NEW GARIA) - HALDIRAM (TEGHORIA) 2035					
STATION NAME	CUBE CODE	KVS-HLD		HLD-KVS		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
KaviSubhash (New Garia)	2055	58738	0	0	56298	58738	56298
Satyajit Roy	2056	31724	7221	8545	26007	40269	33228
JyotindraNath	2057	11731	0	0	10862	11731	10862
KaviSukanta	2058	1334	0	0	3794	1334	3794
Hemendra Mukherjee	2059	23710	852	886	20790	24596	21641
VIP Bazar	2060	11547	1298	1210	10968	12757	12266
RitwikGhatak	2061	27707	5994	5307	19603	33014	25598
BarunSengupta	2062	25309	4832	3189	31854	28498	36686
Beliaghata	2063	4593	4211	3438	4504	8031	8715
Gour Kishore	2064	14125	4018	5103	5982	19227	9999
Nicco Park	2065	7964	4178	4638	5099	12602	9277
Salt Lake Sector V	2066	99992	62351	49890	81512	149882	143863
Technopolis	2067	2327	6729	6478	2729	8805	9457
Bidhan Nagar	2068	4690	24248	27870	4591	32560	28839
Sub CBD-1	2069	5942	25453	24924	3267	30867	28719
CBD	2070	13894	55053	32631	6477	46525	61530
Kalakhetra	2071	10423	43031	39322	9458	49744	52489
New Town	2072	1406	26698	7238	1763	8643	28462
Convention Centre	2073	1774	12453	10748	2083	12522	14536
Sub CBD-2	2074	1084	17925	15793	1173	16877	19098
Titumir	2075	993	12833	12273	1027	13266	13860
RabindraTirtha	2076	1280	15517	27490	1828	28770	17344
Haldiram (Teghoria)	2077	0	27392	24695	0	24695	27392
<b>Total</b>		<b>362285</b>	<b>362285</b>	<b>311666</b>	<b>311666</b>	<b>673951</b>	<b>673951</b>

TABLE 6-10: SECTION LOADING FOR KOLKATA METRO SYSTEM IN SCENARIO-1

From	To	2025		2035	
		DIR1	DIR2	DIR1	DIR2
<b>Corridor 1: Dakshineswar – Kavi Subhash (New Garia)</b>					
Dakshineswar	Baranagar	1116	2172	1275	2507
Baranagar	Noapara	1230	2308	1423	2685
Noapara	Dum Dum	1568	2655	1808	3085
Dum Dum	Belgachia	6345	7303	7199	8356
Belgachia	Shyam Bazar	7751	9295	8543	10339
Shyam Bazar	Shobha Bazar	10768	11549	12575	13242

From	To	2025		2035	
		DIR1	DIR2	DIR1	DIR2
Shobha Bazar	Girish Park	12415	13486	14401	15189
Girish Park	MG Road	13773	14720	15880	16448
MG Road	Central	15784	17122	18079	18970
Central	Chandni	18265	18121	21150	19977
Chandni	Esplanade	19634	18318	22811	20104
Esplanade	Park Street	19025	22803	21694	25640
Park Street	Maidan	14694	17828	16656	20386
Maidan	Rabindra Sadan	15605	18877	17583	21452
RabindraSadan	Netaji Bhawan	14332	17456	15892	19583
Netaji Bhawan	Jatin Das Park (Hazra)	13988	17248	15518	19355
Jatin Das Park (Hazra)	Kalighat	12051	15427	13091	17139
Kalighat	RabindraSarobar	10509	12936	11389	14315
RabindraSarobar	MahanayakUttam Kumar (Tollygunge)	8716	10419	9389	11529
MahanayakUttam Kumar (Tollygunge)	Netaji (Kudghat)	7654	9015	8378	10174
Netaji (Kudghat)	Masterda Surya Sen (Bansdroni)	6988	8039	7808	9192
Masterda Surya Sen (Bansdroni)	Gitanjali (Naktala)	5216	6750	6072	7957
Gitanjali (Naktala)	KaviNazrul (Garia)	4474	5907	5224	7004
KaviNazrul (Garia)	ShahidKhudiram (Briji)	2698	4005	3039	4771
ShahidKhudiram (Briji)	KaviSubhash (New Garia)	1673	2280	1939	2709
<b>PHPDT</b>		<b>22803</b>		<b>25640</b>	
<b>Corridor 2: Santragachi – Howrah – Salt Lake Sector V – Biman Bandar (Airport)</b>					
Santragachi Bus Terminal	Santragachi Railway Station	1559	3590	1770	4678
Santragachi Railway Station	Baksara	3473	11456	4165	14379
Baksara	Belepole	4129	14071	4979	17938
Belepole	Padmapukur	5853	18143	7338	23225
Padmapukur	Shalimar	6930	19845	8623	25325
Shalimar	Nabanna	7724	21288	9437	26910
Nabanna	Upper Foreshore Road	9019	22734	11110	28757
Upper Foreshore Road	Howrah Maidan	10088	24036	12333	30202
Howrah Maidan	Howrah Railway Station	13909	24767	17403	31085

From	To	2025		2035	
		DIR1	DIR2	DIR1	DIR2
Howrah Railway Station	Mahakaran	24075	35076	31616	45559
Mahakaran	Esplanade	28976	38387	38149	49943
Esplanade	Sealdah	34786	40322	44863	52287
Sealdah	Phoolbagan	25429	33932	32351	43966
Phoolbagan	Salt Lake Stadium	23066	31636	29454	41208
Salt Lake Stadium	Bengal Chemical	21684	30291	28001	39901
Bengal Chemical	City Centre	21474	30039	27781	39644
City Centre	Central Park	20923	29584	27201	39224
Central Park	Karunamoyee	20107	29022	26157	38581
Karunamoyee	Salt Lake Sector V	18967	25572	24704	33597
Salt Lake Sector V	Keshtopur	11072	13935	13744	17547
Keshtopur	Dum Dum Park	10385	13488	12777	16909
Dum Dum Park	Baguihati	9236	11487	11489	14465
Baguihati	Raghunathpur	6306	7110	7808	8908
Raghunathpur	Haldiram (Teghoria)	4301	4588	5436	5682
Haldiram (Teghoria)	Kaikhali	2407	2796	2985	3403
Kaikhali	Biman Bandar (Airport)	2024	2460	2502	2998
<b>PHPDT</b>		<b>40322</b>		<b>52287</b>	
<b>Corridor 3: Joka – Esplanade</b>					
Joka	Thakurpukur	4538	5881	6473	8385
Thakurpukur	Sakher Bazar	6654	7784	8814	10505
Sakher Bazar	BehalaChowrasta	7454	8486	9632	11223
BehalaChowrasta	Behala Bazar	8814	10085	11026	12846
Behala Bazar	Taratala	10613	11697	12829	14455
Taratala	Majherhat	12046	13139	14391	16076
Majherhat	Mominpur	12905	14155	15468	17400
Mominpur	Khidderpore	14163	15641	16927	19246
Khidderpore	Victoria	14766	16013	17412	19595
Victoria	Park Street	14549	15821	17150	19352
Park Street	Esplanade	11030	11517	13124	13978
<b>PHPDT</b>		<b>16013</b>		<b>19595</b>	
<b>Corridor 4: New Garia (Kavi Subhash) – Haldiram (Teghoria)</b>					
KaviSubhash (New Garia)	Satyajit Roy	2403	1999	2899	2310
Satyajit Roy	JyotindraNath	3565	2580	4457	3194
JyotindraNath	KaviSukanta	3729	2787	4671	3467
KaviSukanta	Hemendra Mukherjee	3756	2853	4710	3557
Hemendra Mukherjee	VIP Bazar	4939	3844	6276	4844
VIP Bazar	RitwikGhatak	5300	4149	6762	5239
RitwikGhatak	BarunSengupta	6015	4702	7685	5984

From	To	2025		2035	
		DIR1	DIR2	DIR1	DIR2
BarunSengupta	Beliaghata	6980	6058	9204	7908
Beliaghata	Gour Kishore	6648	5786	8842	7607
Gour Kishore	Nicco Park	7215	5966	9643	7919
Nicco Park	Salt Lake Sector V	7700	6259	10286	8279
Salt Lake Sector V	Technopolis	10895	13816	16414	20020
Technopolis	Bidhan Nagar	10447	13410	15956	19605
Bidhan Nagar	Sub CBD-1	9316	12251	14376	17945
Sub CBD-1	CBD	8083	11327	12425	16511
CBD	Kalakhetra	4132	10312	6316	14884
Kalakhetra	New Town	3866	10061	5764	14368
New Town	Convention Centre	3448	9951	5082	14257
Convention Centre	Sub CBD-2	2978	9639	4239	13781
Sub CBD-2	Titumir	1991	8769	2663	12371
Titumir	RabindraTirtha	1666	8482	2084	11848
RabindraTirtha	Haldiram (Teghoria)	1200	1044	1519	1358
<b>PHPDT</b>		<b>13816</b>		<b>20020</b>	

**TABLE 6-11: DAILY TRIPS BY VARIOUS MODES IN 2020, 2025, 2035 & 2050 (SCENARIO-2)**

S.No.	Mode	2020		2025		2035		2050	
		Trips	Modal Share	Trips	Modal Share	Trips	Modal Share	Trips	Modal share
1	Car	404410	5.65%	437562	5.69%	478711	5.72%	583148	5.95%
2	2-Whlr	516177	7.22%	557536	7.24%	609440	7.28%	690318	7.04%
3	Auto/Taxi	1138755	15.92%	1230272	15.99%	1344248	16.06%	1518875	15.49%
4	PT	5092171	71.20%	5470500	71.08%	5936544	70.94%	7010621	71.52%
	<b>Total</b>	<b>7151513</b>	<b>100%</b>	<b>7695870</b>	<b>100%</b>	<b>8368943</b>	<b>100%</b>	<b>9802961</b>	<b>100%</b>

**TABLE 6-12: STATION LOADS ON LINE-1 IN 2020 (SCENARIO-2)**

CORRIDOR 1	DAKSHINESWAR TO KAVI SUBHASH 2020							
	STATION NAME	CUBE CODE	DAK-KVS		KVS-DAK		TOTAL	
			BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
	Dakshineswar	2029	28487	0	0	56436	28487	56436
	Baranagar	2030	3285	8	37	3598	3322	3607
	Noapara	2031	11180	235	427	11317	11607	11552
	Dum Dum	2032	87389	5590	7757	73853	95147	79443
	Belgachia	2033	27630	4027	4201	30649	31831	34676
	Shyam Bazar	2034	15648	857	1311	16427	16960	17285
	Shobha Bazar	2035	34030	4720	6257	41496	40287	46216
	Girish Park	2036	22502	2930	6265	24520	28768	27450
	MG Road	2037	23271	9583	9902	34764	33173	44347
	Central	2038	22816	4712	6596	20316	29412	25028
	Chandni	2039	18668	8760	10699	11228	29367	19988
	Esplanade	2040	46301	40999	47777	52900	94078	93899
	Park Street	2041	8425	32115	39194	8621	47619	40736
	Maidan	2042	3709	10941	12855	4551	16564	15492



CORRIDOR 1		DAKSHINESWAR TO KAVI SUBHASH 2020					
STATION NAME	CUBE CODE	DAK-KVS		KVS-DAK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
RabindraSadana	2043	13258	34745	24262	23435	37520	58180
Netaji Bhawan	2044	2165	5569	5965	3097	8130	8667
Jatin Das Park	2045	9675	24899	31835	10769	41510	35669
Kalighat	2046	5638	29635	34673	6059	40311	35694
RabindraSarobar	2047	4454	28534	33367	5908	37821	34442
MahanayakUttam Kumar (Tollygunge)	2048	3786	17257	22746	3815	26531	21072
Netaji (Kudghat)	2049	7621	11927	13536	7274	21158	19201
Masterda Surya Sen (Bansdroni)	2050	6075	32496	25825	8005	31900	40501
Gitanjali (Naktala)	2051	3959	17094	19500	3287	23459	20381
KaviNazrul (Garia)	2052	5108	32949	35838	5155	40946	38103
ShahidKhudiram (Briji)	2053	131	17509	23158	100	23288	17609
KaviSubhash (New Garia)	2054	0	37119	43597	0	43597	37119
<b>Total</b>		<b>415212</b>	<b>415212</b>	<b>467580</b>	<b>467581</b>	<b>882792</b>	<b>882792</b>

**TABLE 6-13: STATION LOADS ON LINE-2 IN 2020 (SCENARIO-2)**

CORRIDOR 2		HOWRAH MAIDAN TO SALT LAKE SECTOR V 2020					
STATION NAME	CUBE CODE	SNG-BMB		BMB-SNG		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Howrah Maidan	2009	48943	0	0	33772	48943	33772
Howrah Railway Station	2011	77566	18	236	91151	77802	91169
Mahakaran	2012	47341	7304	4185	48296	51526	55600
Esplanade	2013	113461	37925	42017	117562	155478	155487
Sealdah	2014	28506	101579	90477	28169	118983	129748
Phoolbagan	2015	5929	31265	35000	5793	40929	37058
Salt Lake Stadium	2016	5226	23055	19942	5163	25168	28219
Bengal Chemical	2017	1389	3166	3305	1489	4694	4655
City Centre	2018	2502	13141	12791	2597	15293	15738
Central Park	2019	2059	12276	12219	2605	14278	14882
Karunamoyee	2020	1283	21022	25773	2258	27056	23280
Salt Lake Sector V	2021	0	83455	92912	0	92912	83455
<b>Total</b>		<b>334205</b>	<b>334206</b>	<b>338856</b>	<b>338855</b>	<b>673061</b>	<b>673061</b>

**TABLE 6-14: STATION LOADS ON LINE-3 IN 2020 (SCENARIO-2)**

CORRIDOR 3		JOKA – ESPLANADE 2020					
STATION NAME	CUBE CODE	JOK-ESP		ESP-JOK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Joka	2078	32255	0	0	45824	32255	45824
Thakurpukur	2079	39845	188	188	38981	40033	39169
Sakher Bazar	2080	9239	85	72	8281	9311	8366
BehalaChowrasta	2081	14003	188	239	14616	14241	14804
Behala Bazar	2082	22232	830	841	21295	23073	22125
Taratala	2083	20341	1990	1791	20455	22132	22445
Majherhat	2084	11601	3936	3632	8294	15233	12230
Mominpur	2085	11614	4147	2685	9208	14299	13355

CORRIDOR 3		JOKA – ESPLANADE 2020					
STATION NAME	CUBE CODE	JOK-ESP		ESP-JOK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Khidderpore	2086	20392	8065	8747	16822	29139	24887
Victoria	2087	125	2919	2265	916	2389	3834
Park Street	2088	888	59061	67797	1031	68685	60093
Esplanade	2089	0	101127	97465	0	97465	101127
<b>Total</b>		<b>182534</b>	<b>182534</b>	<b>185723</b>	<b>185723</b>	<b>368257</b>	<b>368258</b>

**TABLE 6-15: STATION LOADS ON LINE-4 IN 2020 (SCENARIO-2)**

CORRIDOR 4		KAVI SUBHASH (NEW GARIA) - HALDIRAM (TEGHORIA) 2020					
STATION NAME	CUBE CODE	KVS-HLD		HLD-KVS		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
KaviSubhash (New Garia)	2055	37265	0	0	36597	37265	36597
Satyajit Roy	2056	17944	5431	6668	14776	24612	20207
JyotindraNath	2057	6825	0	0	6616	6825	6616
KaviSukanta	2058	745	0	0	2293	745	2293
Hemendra Mukherjee	2059	12595	837	699	12366	13294	13203
VIP Bazar	2060	6835	1129	1064	6845	7898	7974
RitwikGhatak	2061	14961	4964	4566	11297	19527	16262
BarunSengupta	2062	13618	4644	3103	24292	16721	28936
Beliaghata	2063	2545	3836	3211	2704	5756	6540
Gour Kishore	2064	5975	3964	8585	3656	14560	7621
Nicco Park	2065	3972	4331	5341	3356	9313	7687
Salt Lake Sector V	2066	48344	37132	32775	57769	81120	94901
Technopolis	2067	1666	8872	8228	1770	9895	10643
Bidhan Nagar	2068	2657	14269	14844	2631	17501	16900
Sub CBD-1	2069	1679	8716	8392	984	10071	9700
CBD	2070	4486	16176	10629	2878	15115	19054
Kalakheta	2071	529	3187	2990	489	3519	3675
New Town	2072	1025	9854	4451	1001	5476	10854
Convention Centre	2073	311	1692	1555	367	1866	2059
Sub CBD-2	2074	396	8627	7512	403	7908	9030
Titumir	2075	111	3166	3519	153	3630	3319
RabindraTirtha	2076	315	15405	38519	197	38834	15602
Haldiram (Teghoria)	2077	0	28566	26790	0	26790	28566
<b>Total</b>		<b>184799</b>	<b>184799</b>	<b>193441</b>	<b>193441</b>	<b>378240</b>	<b>378240</b>

**TABLE 6-16: STATION LOADS ON LINE-1 IN 2025 (SCENARIO-2)**

CORRIDOR 1		DAKSHINESWAR TO KAVI SUBHASH 2025					
STATION NAME	CUBE CODE	DAK-KVS		KVS-DAK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Dakshineswar	2029	29036	0	0	58258	29036	58258
Baranagar	2030	3281	8	37	3604	3318	3612
Noapara	2031	11344	229	421	11504	11766	11734
Dum Dum	2032	90177	5829	8228	76103	98405	81932
Belgachia	2033	27881	4123	4284	31079	32165	35201
Shyam Bazar	2034	16376	794	1349	16895	17724	17689
Shobha Bazar	2035	33793	4659	6275	41547	40068	46206
Girish Park	2036	22803	2934	6376	24890	29178	27824
MG Road	2037	23670	9777	10045	35671	33715	45448
Central	2038	23540	4698	6632	20674	30172	25372
Chandni	2039	19363	8859	10883	11481	30246	20340

Esplanade	2040	49827	42372	49522	55622	99348	97994
Park Street	2041	8640	31994	39474	8931	48114	40926
Maidan	2042	3887	12500	13650	4825	17537	17325
RabindraSadon	2043	14007	36136	25293	24728	39300	60864
Netaji Bhawan	2044	2355	5625	5957	3232	8312	8857
Jatin Das Park (Hazra)	2045	10331	25520	32237	11377	42567	36897
Kalighat	2046	6036	29907	34908	6434	40944	36341
RabindraSarobar	2047	5065	28939	33454	6429	38519	35368
MahanayakUttam Kumar (Tollygunge)	2048	4702	17148	22606	4675	27308	21824
Netaji (Kudghat)	2049	8908	11988	13760	8285	22667	20273
Masterda Surya Sen (Bansdroni)	2050	7104	33092	26317	9256	33420	42348
Gitanjali (Naktala)	2051	4936	17530	19986	3876	24921	21405
KaviNazrul (Garia)	2052	6629	34991	37809	6737	44438	41728
ShahidKhudiram (Briji)	2053	146	19650	25924	111	26069	19761
KaviSubhash (New Garia)	2054	0	44532	50800	0	50800	44532
<b>Total</b>		<b>433834</b>	<b>433834</b>	<b>486223</b>	<b>486222</b>	<b>920056</b>	<b>920056</b>

**TABLE 6-17: STATION LOADS ON LINE-2 IN 2025 (SCENARIO-2)**

<b>CORRIDOR 2</b>		<b>HOWRAH MAIDAN TO SALT LAKE SECTOR V 2025</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>SNG-BMB</b>		<b>BMB-SNG</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Howrah Maidan	2009	57670	0	0	40772	57670	40772
Howrah Railway Station	2011	85279	17	245	99988	85524	100005
Mahakaran	2012	53686	8010	4567	54892	58253	62902
Esplanade	2013	128970	39971	44103	135304	173073	175274
Sealdah	2014	33901	109566	98511	32649	132412	142215
Phoolbagan	2015	7064	32669	36871	7207	43935	39876
Salt Lake Stadium	2016	6182	23442	20168	6374	26350	29816
Bengal Chemical	2017	1642	3153	3292	1746	4934	4899
City Centre	2018	2823	13241	12807	2961	15630	16201
Central Park	2019	2784	13918	13864	3353	16648	17271
Karunamoyee	2020	1532	26719	36872	2671	38404	29390
Salt Lake Sector V	2021	0	110827	116617	0	116617	110827
<b>Total</b>		<b>381532</b>	<b>381531</b>	<b>387942</b>	<b>387941</b>	<b>769473</b>	<b>769473</b>

**TABLE 6-18: STATION LOADS ON LINE-3 IN 2025 (SCENARIO-2)**

<b>CORRIDOR 3</b>		<b>JOKA - ESPLANADE 2025</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>JOK-ESP</b>		<b>ESP-JOK</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Joka	2078	35607	0	0	50583	35607	50583
Thakurpukur	2079	43433	211	211	42448	43643	42658
Sakher Bazar	2080	9719	96	82	8734	9801	8830
BehalaChowrasta	2081	14378	205	257	14996	14634	15202
Behala Bazar	2082	22799	876	887	21954	23686	22830
Taratala	2083	21191	2041	1840	21378	23031	23419
Majherhat	2084	12520	4183	3837	9034	16357	13217
Mominpur	2085	12452	4304	2757	9853	15209	14157
Khidderpore	2086	21181	8398	9089	17694	30269	26093
Victoria	2087	133	3170	2466	1034	2599	4204
Park Street	2088	939	60794	70798	1348	71737	62142
Esplanade	2089	0	110072	106834	0	106834	110072
<b>Total</b>		<b>194350</b>	<b>194350</b>	<b>199055</b>	<b>199055</b>	<b>393406</b>	<b>393406</b>

**TABLE 6-19: STATION LOADS ON LINE-4 IN 2025 (SCENARIO-2)**

CORRIDOR 4	KAVI SUBHASH (NEW GARIA) - HALDIRAM (TEGHORIA) 2025							
	STATION NAME	CUBE CODE	KVS-HLD		HLD-KVS		TOTAL	
			BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
KaviSubhash (New Garia)	2055	47995	0	0	46632	47995	46632	
Satyajit Roy	2056	23101	6449	7901	19039	31002	25488	
JyotindraNath	2057	8821	0	0	8486	8821	8486	
KaviSukanta	2058	940	0	0	2950	940	2950	
Hemendra Mukherjee	2059	17930	941	805	16354	18735	17294	
VIP Bazar	2060	8532	1235	1158	8342	9690	9577	
RitwikGhatak	2061	19825	5549	5050	14357	24876	19906	
BarunSengupta	2062	18335	4845	3179	32089	21514	36934	
Beliaghata	2063	3182	3977	3328	3365	6510	7342	
Gour Kishore	2064	7275	4018	8967	4363	16242	8381	
Nicco Park	2065	5196	4275	5439	3730	10635	8005	
Salt Lake Sector V	2066	72591	36893	32719	76705	105311	113597	
Technopolis	2067	2250	9427	8825	2464	11075	11891	
Bidhan Nagar	2068	3814	18786	20653	3716	24467	22503	
Sub CBD-1	2069	3678	16723	15850	2022	19528	18745	
CBD	2070	9329	35522	21108	5729	30438	41251	
Kalakhetra	2071	4635	17252	16147	4288	20782	21539	
New Town	2072	1273	14413	5617	1313	6890	15725	
Convention Centre	2073	1209	7218	6456	1422	7665	8640	
Sub CBD-2	2074	722	11878	10635	723	11358	12601	
Titumir	2075	169	8152	8271	215	8440	8367	
RabindraTirtha	2076	306	18186	43406	192	43712	18378	
Haldiram (Teghoria)	2077	0	35371	32981	0	32981	35371	
<b>Total</b>		<b>261108</b>	<b>261108</b>	<b>258494</b>	<b>258494</b>	<b>519602</b>	<b>519602</b>	

**TABLE 6-20: STATION LOADS ON LINE-1 IN 2035 (SCENARIO-2)**

CORRIDOR 1	DAKSHINESWAR TO KAVI SUBHASH 2035							
	STATION NAME	CUBE CODE	DAK-KVS		KVS-DAK		TOTAL	
			BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Dakshineswar	2029	30435	0	0	61759	30435	61759	
Baranagar	2030	3416	8	38	3757	3454	3765	
Noapara	2031	11739	242	431	11966	12169	12208	
Dum Dum	2032	96051	6515	9336	81652	105387	88167	
Belgachia	2033	28381	4227	4674	31513	33055	35740	
Shyam Bazar	2034	18021	803	1480	16992	19501	17795	
Shobha Bazar	2035	33365	4681	6528	41403	39893	46084	
Girish Park	2036	23291	3036	6794	25361	30084	28397	
MG Road	2037	24035	10148	10471	36590	34506	46739	
Central	2038	24884	4741	6690	20658	31574	25398	
Chandni	2039	21110	9072	11404	11767	32514	20838	
Esplanade	2040	56220	46460	53095	63227	109315	109687	
Park Street	2041	8926	33950	40596	9728	49522	43678	
Maidan	2042	3950	13300	14200	4960	18150	18260	
RabindraSadan	2043	15076	39345	27791	28002	42867	67347	
Netaji Bhawan	2044	2575	5666	5986	3609	8560	9275	
Jatin Das Park (Hazra)	2045	10995	26840	33141	12064	44136	38904	
Kalighat	2046	6396	30380	35204	6891	41601	37272	
RabindraSarobar	2047	5707	29819	33836	6909	39543	36728	
MahanayakUttam Kumar (Tollygunge)	2048	5472	17100	22628	5392	28100	22491	

<b>CORRIDOR 1</b>		<b>DAKSHINESWAR TO KAVI SUBHASH 2035</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>DAK-KVS</b>		<b>KVS-DAK</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Netaji (Kudghat)	2049	11033	12014	13883	9716	24916	21731
Masterda Surya Sen (Bansdroni)	2050	8491	33470	26668	10946	35159	44416
Gitanjali (Naktala)	2051	6239	18538	20993	4718	27232	23256
KaviNazrul (Garia)	2052	8010	39130	41358	8161	49368	47291
ShahidKhudiram (Briji)	2053	152	21449	30036	116	30188	21565
KaviSubhash (New Garia)	2054	0	53034	60595	0	60595	53034
<b>Total</b>		<b>463967</b>	<b>463967</b>	<b>517855</b>	<b>517855</b>	<b>981822</b>	<b>981822</b>

**TABLE 6-21: STATION LOADS ON LINE-2 IN 2035 (SCENARIO-2)**

<b>CORRIDOR 2</b>		<b>HOWRAH MAIDAN TO SALT LAKE SECTOR V 2035</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>SNG-BMB</b>		<b>BMB-SNG</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Howrah Maidan	2009	76310	0	0	50454	76310	50454
Howrah Railway Station	2011	116903	16	298	136811	117202	136827
Mahakaran	2012	73538	11220	6306	75535	79843	86756
Esplanade	2013	158234	49761	54545	167267	212779	217028
Sealdah	2014	44906	149729	134944	43073	179850	192802
Phoolbagan	2015	8470	39818	45809	8835	54279	48653
Salt Lake Stadium	2016	7365	25061	20952	7864	28317	32925
Bengal Chemical	2017	2072	3334	3469	2174	5541	5507
City Centre	2018	3178	13512	12814	3338	15992	16850
Central Park	2019	3433	16724	16122	4176	19555	20900
Karunamoyee	2020	1708	33734	49571	3228	51279	36962
Salt Lake Sector V	2021	0	153208	157926	0	157926	153208
<b>Total</b>		<b>496117</b>	<b>496117</b>	<b>502755</b>	<b>505487</b>	<b>998872</b>	<b>998872</b>

**TABLE 6-22: STATION LOADS ON LINE-3 IN 2035 (SCENARIO-2)**

<b>CORRIDOR 3</b>		<b>JOKA – ESPLANADE2035</b>					
<b>STATION NAME</b>	<b>CUBE CODE</b>	<b>JOK-ESP</b>		<b>ESP-JOK</b>		<b>TOTAL</b>	
		<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>	<b>BOARDING</b>	<b>ALIGHTING</b>
Joka	2078	50725	0	0	71892	50725	71892
Thakurpukur	2079	48738	227	227	47692	48965	47919
Sakher Bazar	2080	10179	104	89	9180	10267	9283
BehalaChowrasta	2081	14743	250	301	15428	15044	15678
Behala Bazar	2082	23482	944	951	22853	24433	23796
Taratala	2083	22706	2116	1908	23323	24614	25439
Majherhat	2084	14741	5115	4577	10421	19318	15535
Mominpur	2085	13440	4835	2955	10587	16395	15421
Khidderpore	2086	22207	10071	10757	19046	32964	29117
Victoria	2087	135	3769	3059	1235	3193	5004
Park Street	2088	961	65914	81824	1603	82785	67516
Esplanade	2089	0	128712	126611	0	126611	128712
<b>Total</b>		<b>222054</b>	<b>222054</b>	<b>233258</b>	<b>233258</b>	<b>455312</b>	<b>455312</b>

**TABLE 6-23: STATION LOADS ON LINE-4 IN 2035 (SCENARIO-2)**

CORRIDOR 4		KAVI SUBHASH (NEW GARIA) - HALDIRAM (TEGHORIA) 2035					
STATION NAME	CUBE CODE	KVS-HLD		HLD-KVS		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
KaviSubhash (New Garia)	2055	59793	0	0	57748	59793	57748
Satyajit Roy	2056	29619	7223	8869	24372	38489	31594
JyotindraNath	2057	11100	0	0	10699	11100	10699
KaviSukanta	2058	1241	0	0	3742	1241	3742
Hemendra Mukherjee	2059	23745	1007	883	21298	24628	22305
VIP Bazar	2060	10620	1296	1209	10207	11830	11503
RitwikGhatak	2061	26265	5975	5371	18556	31636	24531
BarunSengupta	2062	24096	4913	3186	44276	27282	49189
Beliaghata	2063	4183	4215	3475	4404	7658	8620
Gour Kishore	2064	9028	4067	10447	5269	19475	9336
Nicco Park	2065	6770	4315	5557	4178	12327	8493
Salt Lake Sector V	2066	108497	42550	38416	110525	146913	153075
Technopolis	2067	3135	9605	9093	3438	12227	13043
Bidhan Nagar	2068	5502	24028	27353	5156	32855	29184
Sub CBD-1	2069	7103	24881	24174	3590	31277	28470
CBD	2070	18212	53340	32119	8959	50331	62299
Kalakhetra	2071	11529	41500	37886	10666	49415	52166
New Town	2072	1472	26179	7155	1852	8627	28031
Convention Centre	2073	1816	12364	10508	2122	12324	14486
Sub CBD-2	2074	1008	17951	15968	1020	16976	18971
Titumir	2075	177	13495	13335	215	13512	13710
RabindraTirtha	2076	323	21208	56319	246	56641	21454
Haldiram (Teghoria)	2077	0	45123	41216	0	41216	45123
<b>Total</b>		<b>365234</b>	<b>365235</b>	<b>352537</b>	<b>352537</b>	<b>717772</b>	<b>717772</b>

**TABLE 6-24: STATION LOADS ON LINE-1 IN 2050 (SCENARIO-2)**

CORRIDOR 1		DAKSHINESWAR TO KAVI SUBHASH 2050					
STATION NAME	CUBE CODE	DAK-KVS		KVS-DAK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Dakshineswar	2029	33910	0	0	69415	33910	69415
Baranagar	2030	3769	9	40	4147	3809	4156
Noapara	2031	13280	245	457	13546	13737	13792
Dum Dum	2032	106651	7334	10533	90214	117184	97548
Belgachia	2033	30188	4777	5079	33734	35267	38511
Shyam Bazar	2034	20028	801	1641	18547	21669	19348
Shobha Bazar	2035	34738	4636	6907	43377	41646	48013
Girish Park	2036	24679	3138	7342	26865	32020	30003
MG Road	2037	26216	11141	11280	40593	37495	51735
Central	2038	27103	4721	6799	22091	33902	26812
Chandni	2039	23658	9771	12508	12948	36166	22719
Esplanade	2040	64611	51278	58969	71984	123580	123262
Park Street	2041	10040	38517	60186	11134	70225	49651
Maidan	2042	4486	13500	16800	5621	21286	19121
RabindraSadon	2043	17170	43935	13869	31847	31039	75782
Netaji Bhawan	2044	2935	6173	6410	4087	9345	10260
Jatin Das Park	2045	12441	29498	36239	13672	48680	43170
Kalighat	2046	7274	33279	38607	7882	45881	41161
RabindraSarobar	2047	6708	33137	37383	8019	44092	41155
MahanayakUttam Kumar	2048	6056	18218	24175	5961	30230	24179

CORRIDOR 1		DAKSHINESWAR TO KAVI SUBHASH 2050					
STATION NAME	CUBE CODE	DAK-KVS		KVS-DAK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
(Tollygunge)							
Netaji (Kudghat)	2049	13797	13436	15658	12106	29455	25542
Masterda Surya Sen (Bansdroni)	2050	10521	37397	29691	13501	40213	50898
Gitanjali (Naktala)	2051	7989	20901	23635	6025	31624	26926
KaviNazrul (Garia)	2052	9420	44033	46390	9598	55810	53631
ShahidKhudiram (Briji)	2053	176	24673	34665	135	34841	24808
KaviSubhash (New Garia)	2054	0	63294	71786	0	71786	63294
<b>Total</b>		<b>517842</b>	<b>517842</b>	<b>577049</b>	<b>577049</b>	<b>1094891</b>	<b>1094891</b>

**TABLE 6-25: STATION LOADS ON LINE-2 IN 2050 (SCENARIO-2)**

CORRIDOR 2		HOWRAH MAIDAN TO SALT LAKE SECTOR V 2050					
STATION NAME	CUBE CODE	HMD-SLSV		SLSV-HMS		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Howrah Maidan	2009	93273	0	0	60984	93273	60984
Howrah Railway Station	2011	134897	17	339	157797	135236	157814
Mahakaran	2012	85431	13062	7354	87729	92785	100790
Esplanade	2013	183235	57279	62442	195080	245677	252359
Sealdah	2014	50449	172765	155745	48336	206194	221100
Phoolbagan	2015	9685	44139	51298	10066	60983	54205
Salt Lake Stadium	2016	8405	26812	22220	9130	30625	35943
Bengal Chemical	2017	2431	3451	3593	2530	6024	5982
City Centre	2018	3784	14978	14119	3975	17903	18952
Central Park	2019	4174	19604	18838	5030	23012	24633
Karunamoyee	2020	2101	39297	58250	3906	60351	43204
Salt Lake Sector V	2021	0	186462	190364	0	190364	186462
<b>Total</b>		<b>577865</b>	<b>577866</b>	<b>584562</b>	<b>584562</b>	<b>1162427</b>	<b>1162427</b>

**TABLE 6-26: STATION LOADS ON LINE-3 IN 2050 (SCENARIO-2)**

CORRIDOR 3		JOKA – ESPLANADE 2050					
STATION NAME	CUBE CODE	JOK-ESP		ESP-JOK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Joka	2078	58884	0	0	83473	58884	83473
Thakurpukur	2079	58586	264	264	57241	58850	57505
Sakher Bazar	2080	11707	122	104	10580	11812	10702
BehalaChowrasta	2081	16811	334	392	17639	17203	17973
Behala Bazar	2082	26682	1141	1145	26123	27827	27264
Taratala	2083	25754	2462	2215	26580	27969	29042
Majherhat	2084	16921	5926	5285	12014	22206	17940
Mominpur	2085	15431	5596	3405	12244	18836	17840
Khidderpore	2086	24533	11551	12305	21114	36839	32665
Victoria	2087	154	4550	3666	1578	3820	6128
Park Street	2088	1069	74603	93267	1801	94336	76404
Esplanade	2089	0	149983	148336	0	148336	149983



CORRIDOR 3		JOKA – ESPLANADE 2050					
STATION NAME	CUBE CODE	JOK-ESP		ESP-JOK		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
Total		256532	256532	270385	270385	526917	526917

**TABLE 6-27: STATION LOADS ON LINE-4 IN 2050 (SCENARIO-2)**

CORRIDOR 4		KAVI SUBHASH (NEW GARIA) - HALDIRAM (TEGHORIA) 2050					
STATION NAME	CUBE CODE	KVS-HLD		HLD-KVS		TOTAL	
		BOARDING	ALIGHTING	BOARDING	ALIGHTING	BOARDING	ALIGHTING
KaviSubhash (New Garia)	2055	72685	0	0	70121	72685	70121
Satyajit Roy	2056	36785	8081	9975	30189	46760	38270
JyotindraNath	2057	13711	0	0	13256	13711	13256
KaviSukanta	2058	1647	0	0	4657	1647	4657
Hemendra Mukherjee	2059	28918	1208	1071	26206	29989	27414
VIP Bazar	2060	13164	1490	1386	12609	14550	14099
RitwikGhatak	2061	33231	6919	6204	23625	39435	30545
BarunSengupta	2062	29701	5524	3541	56170	33242	61694
Beliaghata	2063	5569	4848	4016	5812	9585	10660
Gour Kishore	2064	10856	4369	11653	6406	22509	10776
Nicco Park	2065	8303	4470	5919	4900	14223	9370
Salt Lake Sector V	2066	134354	53186	48469	133744	182823	186930
Technopolis	2067	4095	10688	10255	4465	14350	15152
Bidhan Nagar	2068	6984	28306	32793	6539	39776	34845
Sub CBD-1	2069	9734	30101	29850	4844	39584	34945
CBD	2070	25177	66183	40095	12269	65271	78452
Kalakhetra	2071	18336	64864	59383	16904	77720	81768
New Town	2072	1659	32220	8228	2176	9887	34397
Convention Centre	2073	2196	15659	13033	2520	15229	18179
Sub CBD-2	2074	1141	21626	19337	1153	20478	22778
Titumir	2075	306	16823	16681	397	16987	17220
RabindraTirtha	2076	304	25963	66492	188	66797	26151
Haldiram (Teghoria)	2077	0	56328	50768	0	50768	56328
Total		458856	458855	439148	439149	898004	898004

**TABLE 6-28: SECTION LOADING FOR KOLKATA METRO SYSTEM IN SCENARIO-2**

From	To	2020		2025		2035		2050	
		DIR1	DIR2	DIR1	DIR1	DIR1	DIR2	DIR1	DIR2
<b>Corridor 1: Dakshineswar – Kavi Subhash (New Garia)</b>									
Dakshineswar	Baranagar	1062	2482	1114	2365	1272	2756	1466	3216
Baranagar	Noapara	1168	2606	1227	2499	1419	2933	1635	3421
Noapara	Dum Dum	1495	2939	1567	2847	1806	3335	2084	3887
Dum Dum	Belgachia	6734	7590	7046	7685	7995	8793	8930	9878
Belgachia	Shyam Bazar	8171	9635	8466	9739	9348	10833	10261	11970
Shyam Bazar	Shobha Bazar	10840	11736	11380	12005	13277	13739	14781	15276
Shobha Bazar	Girish Park	12299	13603	12867	13895	14894	15626	16498	17224
Girish Park	MG Road	13542	14824	14138	15135	16260	16880	17949	18511
MG Road	Central	14222	16928	14833	17360	16918	19220	18682	21165
Central	Chandni	16533	17827	17278	18261	19948	20124	22100	22132
Chandni	Esplanade	17797	17933	18613	18348	21566	20123	23950	22118

From	To	2020		2025		2035		2050	
		DIR1	DIR2	DIR1	DIR1	DIR1	DIR2	DIR1	DIR2
Esplanade	Park Street	18923	19903	20348	20491	23432	22816	26354	25410
Park Street	Maidan	15833	16241	16478	16396	18940	18591	21490	20920
Maidan	RabindraSad an	16252	16712	17385	17440	19863	19653	22539	22127
RabindraSada n	Netaji Bhawan	13404	16190	14257	16889	15839	18952	17820	21347
Netaji Bhawan	Jatin Das Park (Hazra)	12929	16117	13760	16807	15255	18889	17178	21299
Jatin Das Park (Hazra)	Kalighat	11152	14628	11888	15254	12906	16999	14495	19154
Kalighat	Rabindra Sarobar	9751	12400	10434	12944	11305	14379	12701	16205
RabindraSaro bar	MahanayakU ttam Kumar (Tollygunge)	8104	10087	8735	10574	9408	11751	10537	13223
MahanayakUt tam Kumar (Tollygunge)	Netaji (Kudghat)	6987	8640	7667	9168	8392	10394	9506	11825
Netaji (Kudghat)	Masterda Surya Sen (Bansdroni)	6308	7685	7018	8202	7839	9423	8917	10723
Masterda Surya Sen (Bansdroni)	Gitanjali (Naktala)	4534	6382	5251	6918	6110	8194	7022	9401
Gitanjali (Naktala)	KaviNazrul (Garia)	3828	5570	4522	6075	5274	7241	6068	8317
KaviNazrul (Garia)	ShahidKhudir am (Briji)	2170	3780	2752	4191	3094	5024	3563	5782
ShahidKhudir am (Briji)	KaviSubhash am (New Garia)	1232	2208	1722	2460	1989	2958	2310	3417
<b>PHPDT</b>		<b>19903</b>		<b>20491</b>		<b>23432</b>		<b>26354</b>	
<b>Corridor 2: Howrah Maidan– Salt Lake Sector V</b>									
Howrah Maidan	Howrah Railway Station	7255	3833	7215	3853	9353	4882	12278	6276
Howrah Railway Station	Mahakaran	16837	15037	16691	14859	22541	20257	29215	26136
Mahakaran	Esplanade	22644	21395	22793	21549	30720	29297	39730	37792
Esplanade	Sealdah	30175	31195	30689	32386	40041	42730	51130	54669
Sealdah	Phoolbagan	18111	23554	19220	25358	24670	33304	31399	42535
Phoolbagan	Salt Lake Stadium	15240	20434	16630	22496	21533	29738	27602	38162
Salt Lake Stadium	Bengal Chemical	13200	18524	14840	20849	19681	28151	25552	36474
Bengal Chemical	City Centre	13007	18322	14677	20678	19514	27980	25372	36289
City Centre	Central Park	12312	17673	14073	20139	18907	27490	24692	35752
Central Park	Karunamoyee	11323	16832	13110	19381	17708	26639	23148	34652
Karunamoyee	Salt Lake Sector V	9644	14426	11146	15312	15125	20804	19896	27354
<b>PHPDT</b>		<b>31195</b>		<b>32386</b>		<b>42730</b>		<b>54669</b>	

From	To	2020		2025		2035		2050	
		DIR1	DIR2	DIR1	DIR1	DIR1	DIR2	DIR1	DIR2
<b>Corridor 3: Joka – Esplanade</b>									
Joka	Thakurpukur	3903	5322	4309	5881	6145	8385	7134	9748
Thakurpukur	Sakher Bazar	5791	7100	6316	7774	8365	10496	9805	12285
Sakher Bazar	Behala Chowrasta	6542	7787	7093	8483	9160	11220	10708	13106
Behala Chowrasta	Behala Bazar	7856	9371	8425	10089	10528	12858	12273	14970
Behala Bazar	Taratala	9645	11001	10207	11718	12312	14496	14271	16809
Taratala	Majherhat	11039	12418	11621	13173	13855	16137	16000	18676
Majherhat	Mominpur	11616	13235	12232	14031	14603	17259	16867	19984
Mominpur	Khidderpore	12316	14393	12965	15281	15409	18837	17804	21844
Khidderpore	Victoria	12922	14742	13554	15636	15880	19169	18323	22218
Victoria	Park Street	12716	14668	13332	15579	15613	19126	18001	22201
Park Street	Esplanade	8771	10058	9245	0,889	10937	13315	12633	15461
<b>PHPDT</b>		<b>14742</b>		<b>15636</b>		<b>19169</b>		<b>22218</b>	
<b>Corridor 4: New Garia (Kavi Subhash) – Haldiram (Teghoria)</b>									
KaviSubhash (New Garia)	Satyajit Roy	2040	1866	2454	2181	2952	2562	3475	3013
Satyajit Roy	JyotindraNath	2970	2284	3602	2743	4496	3424	5558	4280
JyotindraNath	KaviSukanta	3070	2441	3749	2950	4691	3697	5799	4636
KaviSukanta	Hemendra Mukherjee	3085	2489	3771	3016	4725	3787	5850	4755
Hemendra Mukherjee	VIP Bazar	3883	3331	4940	4104	6271	5203	7726	6477
VIP Bazar	RitwikGhatak	4105	3577	5226	4399	6681	5590	8288	6994
RitwikGhatak	BarunSengupta	4574	4026	5885	4947	7544	6329	9372	7878
BarunSengupta	Beliaghata	4785	5596	6818	7012	9027	9253	11107	11417
Beliaghata	Gour Kishore	4452	5319	6483	6735	8662	8948	10706	11080
Gour Kishore	Nicco Park	4562	4921	6662	6354	8912	8468	11005	10547
Nicco Park	Salt Lake Sector V	4777	5017	7050	6520	9454	8694	11651	10807
Salt Lake Sector V	Technopolis	8001	13778	13357	17547	19528	24893	23742	30057
Technopolis	Bidhan Nagar	7487	13323	12815	17064	18958	24385	23085	29462
Bidhan Nagar	Sub CBD-1	6695	12582	11723	15935	17417	22759	21229	27452
Sub CBD-1	CBD	6157	12089	10548	15013	15548	21326	19037	25663
CBD	Kalakheta	4942	11748	6870	14231	9834	20033	12310	23996
Kalakheta	New Town	4824	11640	6613	13990	9303	19539	11513	23250
New Town	Convention Centre	4494	11544	6196	13880	8625	19429	10709	23124
Convention Centre	Sub CBD-2	4395	11473	5714	13569	7764	18953	9569	22592
Sub CBD-2	Titumir	3647	10829	4720	12663	6175	17489	7592	20749
Titumir	RabindraTirtha	3498	10696	4349	12307	5528	16866	6790	19969
RabindraTirtha	Haldiram (Teghoria)	2526	2463	3192	3137	4175	4109	5120	5047
<b>PHPDT</b>		<b>13778</b>		<b>17547</b>		<b>24893</b>		<b>30057</b>	

## 6.4 SUMMARY OF TRANSPORT DEMAND FORECAST FOR METRO NETWORK

**Ridership on Metro System, 2025 & 2035:** Daily Ridership on the entire metro system for the years 2025 and 2035 is expected to be 25.86 Lakh passenger trips, 31.05 Lakh passenger trips for Scenario-1, 20.06 Lakh passenger trips and 24.30 Lakh passenger trips for Scenario-2 respectively. Line wise daily passenger boardings and trips for 2025 and 2035 are shown in **Table 6-21** and **Table 6-22**.

**TABLE 6-29: DAILY RIDERSHIP FOR KOLKATA METRO SYSTEM (SCENARIO-1)**

S No.	Corridor Name	Daily Boarding	
		2025	2035
1	Dakshineswar – Kavi Subhash	980966	1047607
2	Santragachi – Biman Bandar	1450354	1805938
3	Joka - Esplanade	436577	503065
4	New Garia - Haldiram	488310	673951
	<b>Total Daily Metro Boardings / Trips</b>	<b>3356207</b>	<b>4034561</b>

**TABLE 6-30: DAILY RIDERSHIP FOR KOLKATA METRO SYSTEM (SCENARIO-2)**

S No.	Corridor Name	Daily Boarding			
		2020	2025	2035	2050
1	Dakshineswar – Kavi Subhash	882792	920056	981822	1094891
2	Howrah Maidan – Salt Lake Sector V	673061	769473	998872	1162427
3	Joka - Esplanade	368257	393406	455312	526917
4	New Garia - Haldiram	378240	519602	717772	898004
	<b>Total Daily Metro Boardings / Trips</b>	<b>2302350</b>	<b>2602537</b>	<b>3153778</b>	<b>3682239</b>

## 6.5 SUMMARY OF INTERCHANGE TRAFFIC IN METRO NETWORK

There is an interchange station at Esplanade in the Metro System, which is major interchange station for Noapara – Kavi Subhash, East-West Metro & Joka-Esplanade Corridors. The summary of interchange boarding is given below for 2020, 2025, 2035 & 2050:

**TABLE 6-31: SUMMARY OF INTERCHANGE TRAFFIC AT ESPLANADE**

Particulars	2020	2025	2035	2050
Total boarding at Esplanade (including all three Lines and Surrounding Zones)	347021	379526	448705	517593
Boarding at Esplanade from Surrounding Zones	72747	78973	93546	103714
Total Interchange boarding at Esplanade (from all three lines)	<b>274274</b>	<b>300281</b>	<b>355159</b>	<b>405879</b>

## 6.6 PERFORMANCE EVALUATION OF EAST-WEST METRO CORRIDOR

The performance of the East-West Metro Corridor is assessed for various years of operation from 2020, 2025, 2035 & 2050. The table below gives the summary of the performance evaluation in various years:

**TABLE 6-32: PERFORMANCE EVALUATION OF EAST-WEST METRO**

<b>Evaluation Parameters</b>	<b>2020</b>	<b>2025</b>	<b>2035</b>	<b>2050</b>	<b>Units</b>
Passenger Kilometers for East West Metro from Salt Lake to Howrah Maidan (PKm)	4648315	5546883	7300042	8620156	PKm
Total Length of the Corridor (Scenario-2)	15.631	15.631	15.631	15.631	Km
Total Daily Trips	673061	769473	998872	1162427	Passengers
Average Trip Length (Km)	6.91	7.21	7.31	7.42	Km



**添付資料 4 Economic Analysis Report by RITES**





## 3 ECONOMIC ANALYSIS

### 3.1 INTRODUCTION

The economic appraisal has been carried out within the broad framework of Social Cost – Benefit Analysis Technique. It is based on the incremental costs and benefits and involves comparison of project costs and benefits in economic terms under the “with” and “without” project scenario. In the analysis, the cost and benefit streams arising under the above project scenarios have been estimated in terms of market prices and economic values have been computed by converting the former using appropriate shadow prices.

This has been done to iron out distortions due to externalities and anomalies arising in real world pricing systems. The annual streams of project costs and benefit have been compared over the analysis period of 30 years to estimate the net cost / benefit and to calculate the economic viability of the project in terms of EIRR & ENPV.

#### 3.1.1 Evaluation Assumptions

Project horizon comprises of the construction and operation period of the Rail based transit project. The annual streams of project costs and benefit have been compared over the analysis period of 30 years to estimate the net cost / benefit and to calculate the economic viability of the project in terms of EIRR. The key assumptions used in the evaluation are listed in **TABLE 3-1** .

**TABLE 3-1: KEY EVALUATION ASSUMPTIONS**

Parameter	Assumption
Price Level	April 2017-March 2018
Construction period	2008-2021
First year of operation of East-West Corridor of Kolkata MRTS	2020
Daily to annual factor	340

### 3.2 ESTIMATION OF ECONOMIC COST OF KOLKATA EAST-WEST METRO CORRIDOR

The economic costs of the capital works and annual operation and maintenance costs have been calculated estimates by excluding:

- Price contingencies/price escalations
- Import duties and taxes

- Sunk costs
- Interest payment, principal payment and interest during construction period

The economic costs (**TABLE 3-2**) have been derived from by using following shadow price factor for each component to take care of the distortions brought by above factors.

**TABLE 3-2: FACTORS USED FOR CONVERTING PROJECT COSTS TO ECONOMIC COSTS**

S. No	Item	Factor
1	Capital Cost	0.83
2	Operations & Maintenance Cost	0.87

**TABLE 3-3** give the Capital and O& M costs of the system at April 2017 – March 2018 Price levels in economic terms.

**TABLE 3-3: ECONOMIC COSTS OF EAST - WEST METRO CORRIDOR - CAPITAL AND O&M (RS IN CRORE)**

Cost Component	Metro
Construction Cost Including Private land and R&R	8283
O&M Costs	
• 2020	262.30

### 3.3 ECONOMIC BENEFITS OF KOLKATA EAST-WEST METRO CORRIDOR

East-West Kolkata Metro Corridor will yield tangible and non-tangible savings due to equivalent reduction in road traffic and certain socio-economic benefits. The introduction of East-West Kolkata Metro will result in reduction in number of Buses, IPT, usage of private vehicles, air pollution and increase in the speed of road-based vehicles. This, in turn, will result in significant social benefits due to reduction in fuel consumption, vehicle operating cost and travel time of passengers. Reduction in accidents, pollution and road maintenance costs are the other benefits to the society in general. The benefit stream includes:

- Savings in Capital and operating cost (on present congestion norms) of carrying the total volume of passenger traffic by existing Transport System in case East-West Kolkata Metro Project is not taken up.
- Savings in operating costs of different modes due to de-congestion including those that would continue to use the existing transport network even after the East-West Kolkata Metro Project is introduced.
- Savings in time of commuters using the East-West Kolkata Metro over the existing transport modes because of faster speed of Metro.

- Savings in time of those passengers continuing on existing modes, because of reduced congestion on roads.
- Savings on account of prevention of accidents and pollution with introduction of East-West Kolkata Metro.

The Quantification of some of the social benefits has not been attempted because universally acceptable norms do not exist to facilitate such an exercise. However, it has been considered appropriate to highlight the same, as given below:

- Reduced road stress
- Better accessibility to facilities in the influence area
- Economic stimulation in the micro region of the infrastructure
- Increased business opportunities
- Overall increased mobility
- Facilitating better planning and up-gradation of influence area
- Improving the image of the city

Following factors have been used for converting project benefits to economic costs (TABLE 3-4).

**TABLE 3-4: FACTORS USED FOR CONVERTING PROJECT BENEFITS IN TERMS OF ECONOMIC COSTS**

S. No	Item	Factor
1	Savings in Capital & Operating Cost of Buses & Private Vehicles	0.83
2	Savings in Passenger Time	1.0
3	Savings in VOC	0.9
4	Savings in Accident Costs	0.9
5	Savings in Pollution Costs	1.0

### 3.3.1 Input Parameters

Inputs used for Economic analysis have been collected from primary and secondary data sources. Vehicle Operating cost (VOC) and Value of Travel Time (VOT) are the two important parameters of Economic Analysis.

**Vehicle Operating Cost (VOC):** VOC is a function of speed, road roughness, carriageway, width/capacity, rise and fall per unit. The VOC unit cost have been taken from the “Manual on Economic Evaluation of Highway Projects in India, 2009” by the Indian Road Congress (IRC).

The VOC has been adjusted for East-West Kolkata Metro Corridor according to the traffic, road conditions, fuel cost in the city as recommended in the manual. **TABLE**

3-5 gives the mode wise VOC to estimate benefits accruing to the society from the project.

**TABLE 3-5: MODE WISE VOC FOR KOLKATA EAST-WEST METRO CORRIDOR**

Mode	VOC* Rs /Km
Bus	26.48
Car	6.39
2 Wheeler	1.95
Auto	3.19
Taxi	6.39

*\*Source IRC SP 30 (2009) Values brought to 2017 level using factor of 5%*

**Value of Travel Time (VOT):** VOT is another important parameter of Economic Analysis. It refers to the cost of time spent on transport. It includes costs of both work and non-work trips. Mode wise value of time has calculated as per RITES Household Survey 2017. **TABLE 3-6** gives the mode wise VOT to estimate benefits accruing to the society from the project.

**TABLE 3-6: MODE WISE VOT FOR KOLKATA EAST-WEST METRO CORRIDOR**

Mode	Value of Travel Time*Passenger/ Hour
Bus	40.0
Car	92.0
2 Wheeler	50.0
Auto	40.0
Taxi	40.0

*Source: \*Figures calculated as per RITES Household Survey, 2017*

Other operational parameters required to assess the savings in VOC and VOT, accidents, pollution for the system are presented in **TABLE 3-7**.

**TABLE 3-7: MODE WISE OPERATIONAL PARAMETERS – EAST WEST METRO CORRIDOR**

Mode	Average Lead KM		Veh-KM/ Day	Average Speed (Km/Hr)*		Occupancy
	Without East-West Metro Corridor	With East-West Metro Corridor		Without East-West Metro Corridor	With East-West Metro Corridor	
Bus	12.4	11.4	165	10	12	55
Car	13.0	11.5	26	18	21.6	2
2wheeler	12.3	10.9	24	18	21.6	1.1
Auto	3.9	3.6	150	16	19.2	3
Taxi	12.0	10.9	150	16	19.2	2

*Source: RITES Field Studies 2017,\* Derived from Transport Demand model*

Other benefits that will accrue to the society include reduction in emission, savings due to reduction in accidents. The input for the benefit estimation from these parameters includes the emission factors by vehicle category as given by CPCB (TABLE 3-8), the accident statistics (TABLE 3-9) and cost of accidents is presented in (TABLE 3-10).

**TABLE 3-8: MODE WISE EMISSION FACTORS (Gram/Km)**

Vehicle Type/ Pollutant	CO	HC	NOX	PM	CO2
2-wheeler	1.4	0.7	0.3	0.05	28.58
Auto	2.45	0.75	0.12	0.08	77.89
Cars (incl. cabs)	1.39	0.15	0.12	0.02	139.52
Bus (incl. BRT)	3.72	0.16	6.53	0.24	787.72
Treatment Cost (Rs. /ton)	1,00,000	1,00,000	1,00,000	1,00,000	500

Source: Appraisal guidelines for Metro Rail Project Proposals MoHUA, GOI 2017

**TABLE 3-9: VEHICLES AND ACCIDENTS STATISTICS IN KOLKATA**

Year	Total Accidents	Fatal Accidents
2013	4437	420
2014	4561	431
2015	4347	412
2016	4104	388

**TABLE 3-10: COST OF ACCIDENTS**

Type of Accident	Accident Cost (Rs.)	
	(2004 prices)*	(2017 prices)**
Cost of fatal accident	437342	824674
Cost of major accident	64256	121164
Cost of damage to Two wheelers	2286	4311
Cost of damage to Car	9763	18410
Cost of damage to buses in road accidents	32818	61883

Source: \*Appraisal guidelines for Metro Rail Project Proposals MoHUA, GOI 2017

\*\*derived using escalation factor of 5%

### 3.3.2 Estimation of Project Benefits

Quantifiable benefits accrued to the society owing to implementation of the Metro project include:

- Travel Time Savings
  - Travel Time Savings due to higher speed of MRTS project as compared to 'Without' project scenario.

- Congestion reduction due to modal shift leads to fewer vehicles on roads. This also contributes to time savings of passengers travelling on other modes.
- Savings in Vehicle Operating Cost
  - Absence of vehicles on road due to modal shift passengers on Metro
  - Smoother operations of passenger trips of other mode vehicles owing to reduced congestion on roads.
- Savings from Accident Reduction
  - Reduction in fatal and injury accidents due less no of vehicles on roads
  - Savings in damage cost to vehicles involved in accidents.
- Savings from Pollution Reduction
  - Absence of vehicles on road due to modal shift passengers on Metro
  - Less pollution due to reduced congestion on roads.

Above socio-economic benefits have been converted in money cost. With input from above tables, the accrued project benefits for Kolkata Metro East-West Corridor during the frame work period of 30 years have been summarized in **TABLE 3-11** and **TABLE 3-12**.

**TABLE 3-11: SAVINGS IN EAST WEST METRO CORRIDOR DUE TO LESS NUMBER OF VEHICLES (In RS. CRORE)**

S.No	BENEFITS	2020	2030	2040	2050
1	Benefits due to less no. of buses	338.1	451.4	609.8	775.8
2	Benefits due to less no. of other vehicles	704.5	826.7	950	1082

**TABLE 3-12: SAVINGS IN EAST WEST METRO CORRIDOR ON DIFFERENT HEADS (In RS. CRORE)**

S.No	BENEFITS	2020	2025	2035	2050
1	Saving in VOC due to less number of vehicles on road	311.5	352.5	468.9	625.2
2	Saving in VOC due to decongestion effect on road	49.8	53.6	57.4	68.6
3	Saving in value of passenger time	681.21	752.77	905.48	1059.42
4	Reduction in Pollution due to less number of vehicles on road	20.26	22.74	29.57	38.84
5	Reduction in Pollution due to decongestion effect on road	7.01	7.59	8.22	9.63
6	Benefits due to reduction in accidents	4.3	4.6	5.4	7.1



### 3.4 EIRR FOR 30 YEARS

For deriving the values of economic indicators (EIRR, ENPV), cost and benefit stream has been constructed in terms of money value.

Metro Rail Policy 2017 prescribes 14% as acceptable EIRR rate for metro project, same has been considered as the social cost of capital. The summary of the ENPV and EIRR is presented in **TABLE 3-13**.

**TABLE 3-13: ECONOMIC RETURN PARAMETERS OF EAST-WEST METRO CORRIDOR**

S.NO	PARAMETER	MRTS
1	EIRR	16.87
2	ENPV - Social cost of capital @14%	Rs. 1290 Crore

### 3.5 OUTCOME ON ECONOMIC VIABILITY

The project has EIRR more than 14%, indicating that the benefits to the society are more than the social cost of capital of 14%. It also meets the acceptable norm of MOUD. Thus the project is economically viable and should be implemented.

#### 3.5.1 Sensitivity Analysis

A sensitivity analysis of the EIRR with 10% cost overrun, 10% Maintenance overrun, 10% reduction in traffic materialization, 10% reduction in benefits and combination of increase in cost and reduction in benefits both by 10% has been carried out. The summary of EIRR is presented in **TABLE 3-14**. The cost and benefit streams for Metro system is presented in **TABLE 3-15**.

Cost and benefit stream has also been worked out considered O&M cost as per KMRC DPR of East –West Metro Corridor of Kolkata. The EIRR and ENPV are 15.64% and Rs. 730 Crore respectively. The cost and benefit streams for Metro system is presented in **TABLE 3-16**.

**TABLE 3-14: EIRRs- SENSITIVITY ANALYSIS**

S.No.	Sensitivity	EIRR (%)	NPV of Economic Benefit at 14% (Rs. in Crore)
1	Basic EIRR	16.87	1290
2	With increase in Cost by 10%	15.45	710
3	With increase in Maintenance Cost by 10%	16.73	1224
4	With reduction in ridership by 10%	14.10	41
5	With reduction in benefits by 10%	15.18	522
6	With increase in cost and reduction in benefits by 10%	13.88	-58

**TABLE 3-15: COST AND BENEFIT STREAM FOR KOLKATA EAST-WEST METRO CORRIDOR (IN CRORE)**

PRICE LEVEL: APRIL 2017 – MARCH 2018

Period	Capital Cost	O&M Cost	Addition Cost + Replacement Cost	Total Cost	Saving in Capital Cost of Reduced Buses	Saving in Capital Cost of Reduced Cost of other vehicles	VOC Saving of all vehicles	Savings due to Decongestion Effect	Savings in Passenger time	Savings due to Less pollution	Savings due to Less number of accidents	Total Savings	Net Cash Flow (Rs. in Crore)
2018-19	5236.47			5236.5									-5236.5
2019-20	1071.53			1071.5									-1071.5
2020-21	566.89	124.2		691.1	338.1	704.5	311.5	49.8	681.2	27.3	4.3	2116.7	1425.6
2021-22		124.2		124.2	11.3	12.2	319.3	50.5	695.0	27.9	4.4	1120.6	996.4
2022-23		124.2		124.2	11.3	12.2	327.3	51.3	709.0	28.5	4.4	1144.0	1019.8
2023-24		124.2		124.2	11.3	12.2	335.5	52.1	723.3	29.1	4.5	1167.9	1043.7
2024-25		124.2		124.2	11.3	12.2	343.9	52.8	737.9	29.7	4.6	1192.4	1068.2
2025-26		124.2		124.2	11.3	12.2	352.5	53.6	752.8	30.3	4.6	1217.4	1093.2
2026-27		124.2		124.2	11.3	12.2	362.7	54.0	766.8	31.0	4.7	1242.7	1118.5
2027-28		124.2		124.2	11.3	12.2	373.2	54.4	781.1	31.7	4.8	1268.7	1144.5
2028-29		124.2		124.2	11.3	12.2	384.0	54.7	795.7	32.4	4.9	1295.2	1171.0
2029-30		124.2		124.2	11.3	12.2	395.1	55.1	810.5	33.1	4.9	1322.3	1198.1
2030-31		124.2		124.2	451.4	826.7	406.5	55.5	825.6	33.9	5.0	2604.5	2480.3
2031-32		124.2		124.2	15.8	12.3	418.3	55.9	841.0	34.6	5.1	1383.0	1258.8
2032-33		124.2		124.2	15.8	12.3	430.4	56.2	856.7	35.4	5.2	1412.0	1287.8
2033-34		124.2		124.2	15.8	12.3	442.9	56.6	872.6	36.2	5.3	1441.7	1317.5
2034-35		124.2		124.2	15.8	12.3	455.7	57.0	888.9	37.0	5.3	1472.1	1347.9
2035-36		124.2		124.2	15.8	12.3	468.9	57.4	905.5	37.8	5.4	1503.1	1378.9
2036-37		124.2		124.2	15.8	12.3	478.0	58.1	915.0	38.4	5.5	1523.1	1398.9
2037-38		124.2		124.2	15.8	12.3	487.2	58.8	924.6	39.1	5.6	1543.4	1419.2
2038-39		124.2		124.2	15.8	12.3	496.7	59.5	934.3	39.7	5.7	1564.0	1439.9
2039-40		124.2	304.8	429.0	15.8	12.3	506.3	60.2	944.1	40.4	5.8	1585.0	1156.0
2040-41		124.2	305.3	429.5	609.8	950.0	516.1	60.9	954.0	41.1	5.9	3137.8	2708.3
2041-42		124.2		124.2	16.6	13.2	526.1	61.7	964.0	41.7	6.0	1629.3	1505.1
2042-43		124.2		124.2	16.6	13.2	536.3	62.4	974.1	42.4	6.1	1651.2	1527.0
2043-44		124.2		124.2	16.6	13.2	546.7	63.1	984.4	43.2	6.2	1673.4	1549.2
2044-45		124.2		124.2	16.6	13.2	557.3	63.9	994.7	43.9	6.4	1695.9	1571.7
2045-46		124.2		124.2	16.6	13.2	568.1	64.7	1005.1	44.6	6.5	1718.7	1594.5
2046-47		124.2		124.2	16.6	13.2	579.1	65.4	1015.7	45.4	6.6	1741.9	1617.7
2047-48		124.2		124.2	16.6	13.2	590.3	66.2	1026.4	46.1	6.7	1765.5	1641.3
2048-49		124.2		124.2	16.6	13.2	601.7	67.0	1037.1	46.9	6.8	1789.4	1665.2
2049-50		124.2		124.2	16.6	13.2	613.4	67.8	1048.0	47.7	6.9	1813.6	1689.4
												<b>EIRR</b>	<b>16.87%</b>
												<b>ENPV@14%</b>	<b>1290</b>

**TABLE 3-16: COST AND BENEFIT STREAM FOR KOLKATA EAST-WEST METRO CORRIDOR AS PER KMRC DPR (IN CRORE)**

PRICE LEVEL: APRIL 2017 – MARCH 2018

Period	Capital Cost	O&M Cost	Addition Cost + Replacement Cost	Total Cost	Saving in Capital Cost of Reduced Buses	Saving in Capital Cost of Reduced Cost of other vehicles	VOC Saving of all vehicles	Savings due to Decongestion Effect	Savings in Passenger time	Savings due to Less pollution	Savings due to Less number of accidents	Total Savings	Net Cash Flow (Rs. in Crore)
2018-19	5236.47			5236.5									-5236.5
2019-20	1071.53			1071.5									-1071.5
2020-21	566.89	228.2		795.1	338.1	704.5	311.5	49.8	681.2	27.3	4.3	2116.7	1321.6
2021-22		228.2		228.2	11.3	12.2	319.3	50.5	695.0	27.9	4.4	1120.6	892.3
2022-23		228.2		228.2	11.3	12.2	327.3	51.3	709.0	28.5	4.4	1144.0	915.8
2023-24		228.2		228.2	11.3	12.2	335.5	52.1	723.3	29.1	4.5	1167.9	939.7
2024-25		228.2		228.2	11.3	12.2	343.9	52.8	737.9	29.7	4.6	1192.4	964.2
2025-26		228.2		228.2	11.3	12.2	352.5	53.6	752.8	30.3	4.6	1217.4	989.2
2026-27		228.2		228.2	11.3	12.2	362.7	54.0	766.8	31.0	4.7	1242.7	1014.5
2027-28		228.2		228.2	11.3	12.2	373.2	54.4	781.1	31.7	4.8	1268.7	1040.4
2028-29		228.2		228.2	11.3	12.2	384.0	54.7	795.7	32.4	4.9	1295.2	1066.9
2029-30		228.2		228.2	11.3	12.2	395.1	55.1	810.5	33.1	4.9	1322.3	1094.1
2030-31		228.2		228.2	15.8	12.3	406.5	55.5	825.6	33.9	5.0	1350.5	1123.6
2031-32		228.2		228.2	15.8	12.3	418.3	55.9	841.0	34.6	5.1	1380.0	1154.8
2032-33		228.2		228.2	15.8	12.3	430.4	56.2	856.7	35.4	5.2	1410.0	1183.8
2033-34		228.2		228.2	15.8	12.3	442.9	56.6	872.6	36.2	5.3	1441.7	1213.5
2034-35		228.2		228.2	15.8	12.3	455.7	57.0	888.9	37.0	5.3	1472.1	1243.9
2035-36		228.2		228.2	15.8	12.3	468.9	57.4	905.5	37.8	5.4	1503.1	1274.9
2036-37		228.2		228.2	15.8	12.3	482.0	58.1	915.0	38.4	5.5	1523.1	1294.9
2037-38		228.2		228.2	15.8	12.3	496.7	58.8	924.6	39.1	5.6	1543.4	1315.2
2038-39		228.2		228.2	15.8	12.3	511.9	59.5	934.3	39.7	5.7	1564.0	1335.8
2039-40		228.2	304.8	533.0	15.8	12.3	527.6	60.2	944.1	40.4	5.8	1585.0	1051.9
2040-41		228.2	305.3	533.5	609.8	950.0	516.1	60.9	954.0	41.1	5.9	1606.8	2604.2
2041-42		228.2		228.2	16.6	13.2	526.1	61.7	964.0	41.7	6.0	1629.3	1401.1
2042-43		228.2		228.2	16.6	13.2	536.3	62.4	974.1	42.4	6.1	1651.2	1423.0
2043-44		228.2		228.2	16.6	13.2	546.7	63.1	984.4	43.2	6.2	1673.4	1445.1
2044-45		228.2		228.2	16.6	13.2	557.3	63.9	994.7	43.9	6.4	1695.9	1467.7
2045-46		228.2		228.2	16.6	13.2	568.1	64.7	1005.1	44.6	6.5	1718.7	1490.5
2046-47		228.2		228.2	16.6	13.2	579.1	65.4	1015.7	45.4	6.6	1741.9	1513.7
2047-48		228.2		228.2	16.6	13.2	590.3	66.2	1026.4	46.1	6.7	1765.5	1537.2
2048-49													
2049-50		228.2		228.2	16.6	13.2	601.7	67.0	1037.1	46.9	6.8	1789.4	1561.1
		228.2		228.2	16.6	13.2	613.4	67.8	1048.0	47.7	6.9	1813.6	1585.4
												EIRR	15.64%
												ENPV@14%	730



## 添付資料 5 Other Related Information

添付資料 5 (1) -01 : General Alignment Drawing Set (East Bound)

添付資料 5 (1) -02 : General Alignment Drawing Set (West Bound)

添付資料 5 (2) -01 : Central Park Depot Site Layout (Definitive Drawing)

添付資料 5 (2) -02 : Central Park Depot Alignment Drawing

添付資料 5 (3) -01 : General Drawing Set (Esplanade Station)

添付資料 5 (3) -02 : General Drawing Set (New Mahakaran Station)

添付資料 5 (4) : Overview Single Line Diagram (Electrical Power)

添付資料 5 (5) : Overview Diagram (Signaling and Telecommunication)

添付資料 5 (6) : Comparison Table of Signaling and Train Control System

添付資料 5 (7) : General Rolling Stock Design Drawing (DM Car)

添付資料 5 (8) : Supplemental Information (Signaling and Telecommunication)

添付資料 5 (9) : Esplanade NFPA Report

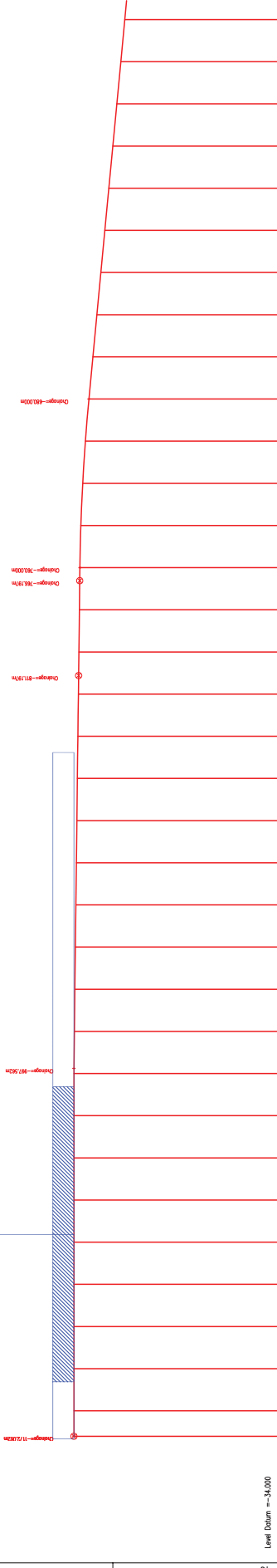
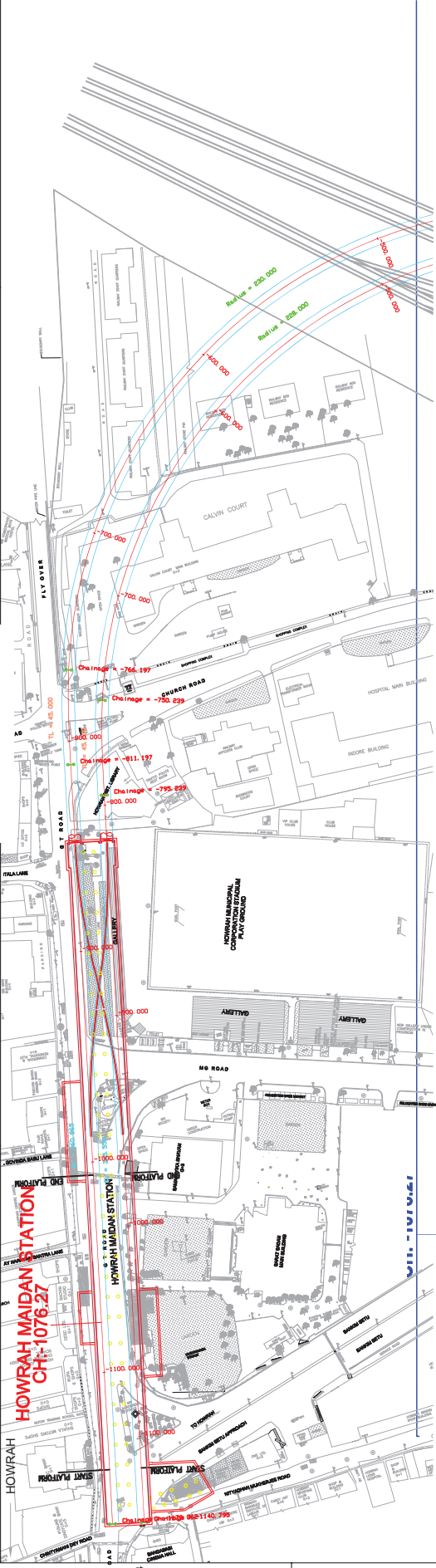


添付資料 5(1)-01 General Alignment Drawing Set (East Bound)



GAD EAST BOUND LINE

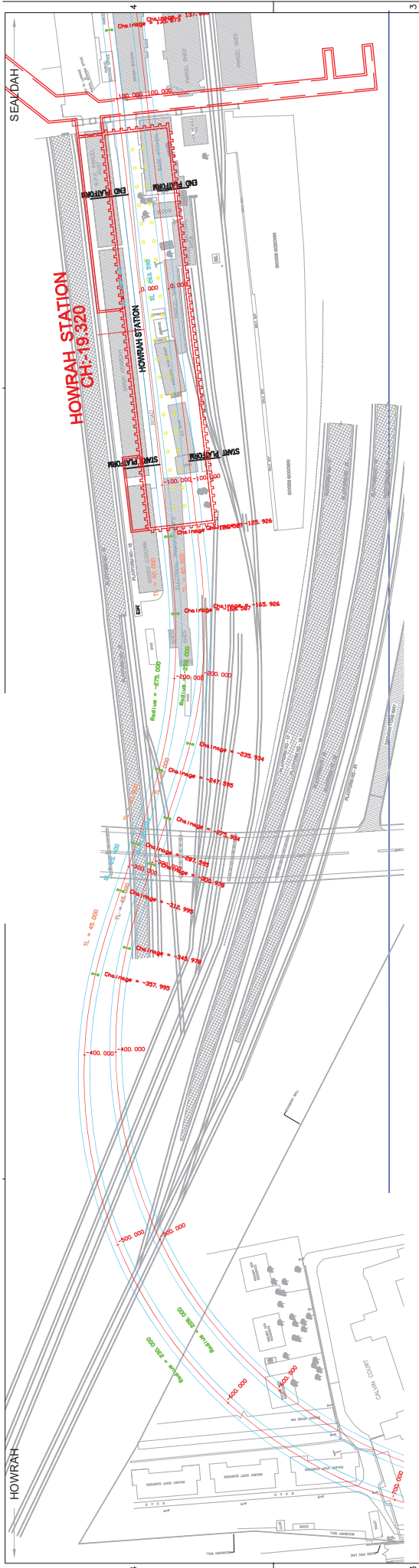




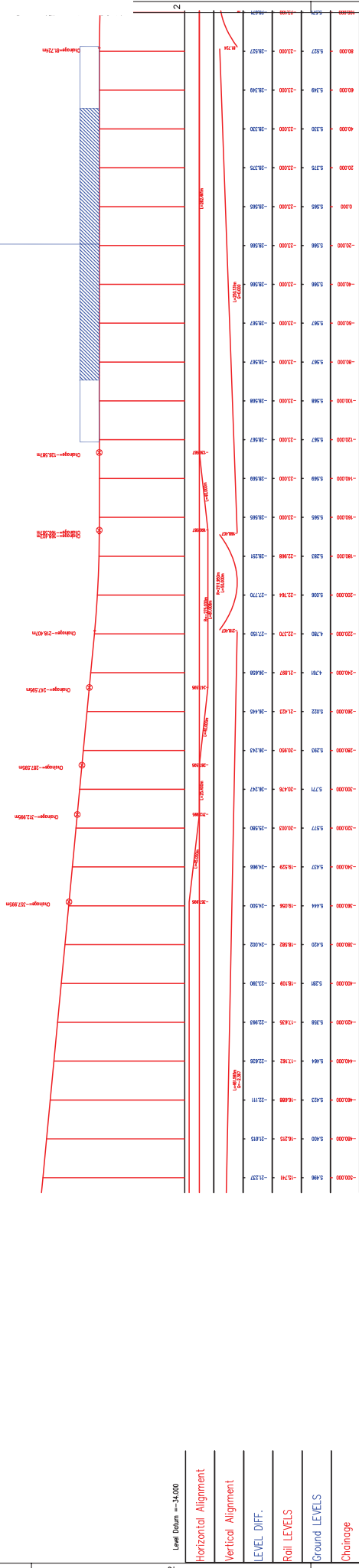
LEVEL DIFF.	Roll LEVELS	Ground LEVELS	Change
0.00	11.722	11.722	0.000
0.00	11.700	11.700	0.000
0.00	11.678	11.678	0.000
0.00	11.656	11.656	0.000
0.00	11.634	11.634	0.000
0.00	11.612	11.612	0.000
0.00	11.590	11.590	0.000
0.00	11.568	11.568	0.000
0.00	11.546	11.546	0.000
0.00	11.524	11.524	0.000
0.00	11.502	11.502	0.000
0.00	11.480	11.480	0.000
0.00	11.458	11.458	0.000
0.00	11.436	11.436	0.000
0.00	11.414	11.414	0.000
0.00	11.392	11.392	0.000
0.00	11.370	11.370	0.000
0.00	11.348	11.348	0.000
0.00	11.326	11.326	0.000
0.00	11.304	11.304	0.000
0.00	11.282	11.282	0.000
0.00	11.260	11.260	0.000
0.00	11.238	11.238	0.000
0.00	11.216	11.216	0.000
0.00	11.194	11.194	0.000
0.00	11.172	11.172	0.000
0.00	11.150	11.150	0.000
0.00	11.128	11.128	0.000
0.00	11.106	11.106	0.000
0.00	11.084	11.084	0.000
0.00	11.062	11.062	0.000
0.00	11.040	11.040	0.000
0.00	11.018	11.018	0.000
0.00	11.000	11.000	0.000

NOTES:  
 1. THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY, CONDITIONS OF BUILDINGS, SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.  
 2. THE CONTRACTOR SHALL COMPLY THE CONTRACT TERMS SHALL BE PROPOSED / DETERMINED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.  
 3. THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE EAST BOUND LINE/TUNNEL.  
 4. THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RITES DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.

<p>KOLKATA METRO RAIL PROJECT EAST-WEST METRO CORRIDOR</p>	<p>JK JATIN KULBANA INC. CHIEF ENGINEER MB. MKE BOARDMAN</p>	<p>PROJECT:- KOLKATA METRO PROJECT EAST - WEST METRO CORRIDOR</p>	<p>NAME SIGN</p>
	<p>DRAWN BY JK</p>	<p>TITLE:- HORIZONTAL &amp; VERTICAL ALIGNMENT</p>	<p>M Y C E L MANSUKH RECON YBC M Y C E L MANSUKH RECON YBC</p>
	<p>CHECKED BY BND</p>	<p>EAST BOUND LINE</p>	<p>General Consultant: Kolkata East West Metro KMRCCL, Munshi Premchand Sarani Kolkata-700021 Tel: +91-33-22622942</p>
	<p>APPROVED BY MB</p>	<p>DWG NO. REV. 0</p>	<p>SCALE:- 1:1500 (A3) DATE:- 16/03/2016</p>

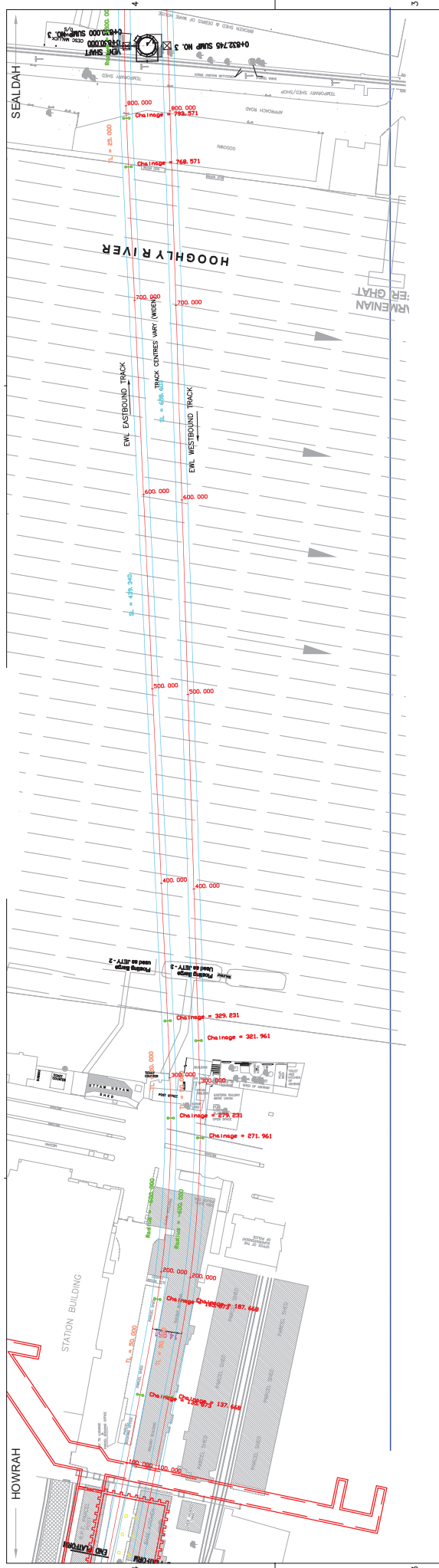


**HOWRAH STATION  
CH: -19.32**

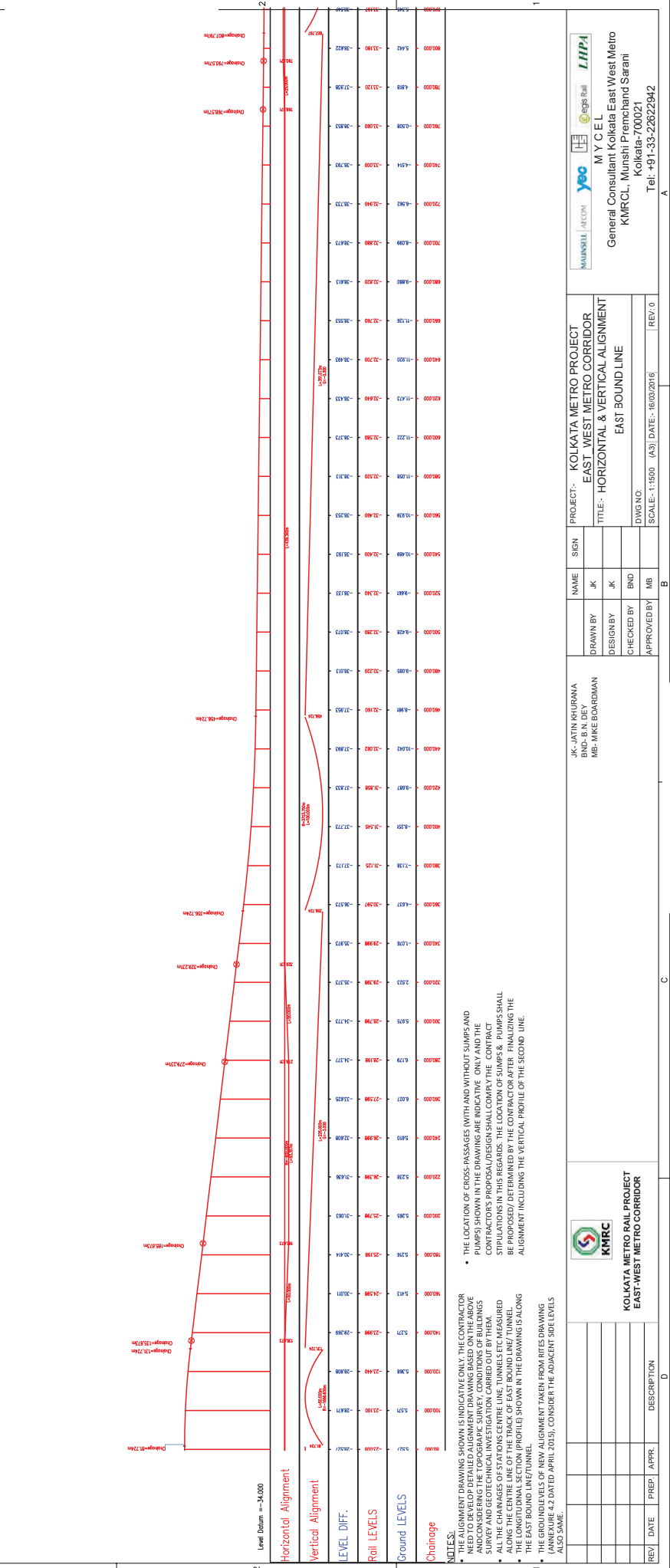


- NOTES:**
- THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY, CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CONCERNED AUTHORITIES.
  - ALONG THE CENTRE LINE OF THE TRACK OF EAST BOUND LINE/TUNNEL.
  - THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE EAST BOUND LINE/TUNNEL.
  - THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RTIS DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.
  - THE LOCATION OF CROSS-PASSAGES (WITH AND WITHOUT PUMPS) AND PUMPS SHOWN IN THE DRAWING ARE INDICATIVE ONLY AND THE CONTRACTOR'S PROPOSAL/DESIGN SHALL COMPLY THE CONTRACTORS SHALL BE PROPOSED/DEFERRED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.

<b>KMRC</b> KOLKATA METRO RAIL PROJECT EAST-WEST METRO CORRIDOR		PROJECT:- KOLKATA METRO PROJECT EAST - WEST METRO CORRIDOR TITLE:- HORIZONTAL & VERTICAL ALIGNMENT EAST BOUND LINE DWG NO. _____ SCALE:- 1:1500 (A3) DATE:- 16/03/2016 REV: 0		
JK JATIN KILDIRA MB: MKE BOARDMAN		SIGN _____ NAME _____ DRAWN BY JK DESIGNED BY BND CHECKED BY MB APPROVED BY MB	M Y C E L General Consultant: Kolkata East West Metro KMRCCL, Munshi Premchand Sarani Kolkata-700021 Tel: +91-33-22622942	
REV	DATE	PREP	APPR	DESCRIPTION



AP-5-4



- NOTES:**
- THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.
  - THE CONTRACTOR SHALL VERIFY THE GROUND LEVELS AND PROPOSED RAIL LEVELS SHALL BE PROPOSED / DETERMINED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.
  - THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE EAST BOUND LINE/TUNNEL.
  - THE EAST BOUND LINE/TUNNEL.
  - THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RTES DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.

REV.	DATE	PREP.	APPR.	DESCRIPTION

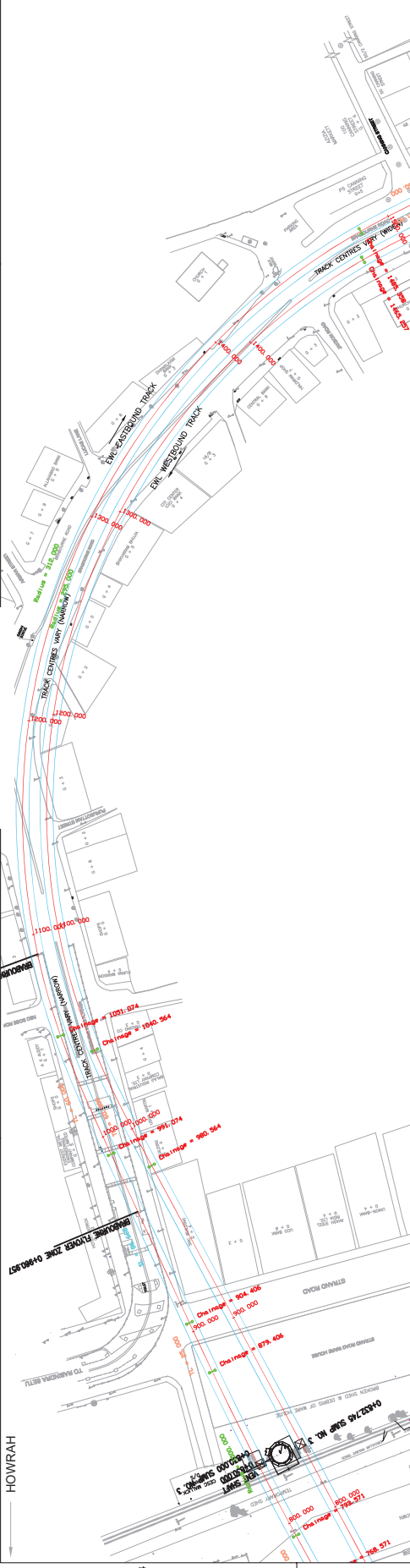
JK JATIN KULBANA INC. CHIEF ENGINEER MB- MKE BOARDMAN	PROJECT:	KOLKATA METRO PROJECT		
	SIGN	EAST - WEST METRO CORRIDOR		
	NAME	JK		
	DRAWN BY	JK		
JK JATIN KULBANA INC. CHIEF ENGINEER MB- MKE BOARDMAN	DESIGN BY	JK		
	CHECKED BY	BND		
	APPROVED BY	MB		
	DATE	16/03/2016		

 <b>KOLKATA METRO RAIL PROJECT</b> <b>EAST-WEST METRO CORRIDOR</b>	 <b>M Y C E L</b> General Consultant Kolkata East West Metro KMRCL, Munshi Premchand Sarani Kolkata-700021 Tel: +91-33-22622942
--	--

SEALDAH

HOWRAH



CROSS PASSAGE

CROSS PASSAGE

CROSS PASSAGE

VENT SHAFT

Horizontal Alignment	Vertical Alignment	LEVEL DIFF.	Rail LEVELS	Ground LEVELS	Change
0+00.00	1.500m		0+00.00	0+00.00	
0+10.00	1.500m		0+10.00	0+10.00	
0+20.00	1.500m		0+20.00	0+20.00	
0+30.00	1.500m		0+30.00	0+30.00	
0+40.00	1.500m		0+40.00	0+40.00	
0+50.00	1.500m		0+50.00	0+50.00	
0+60.00	1.500m		0+60.00	0+60.00	
0+70.00	1.500m		0+70.00	0+70.00	
0+80.00	1.500m		0+80.00	0+80.00	
0+90.00	1.500m		0+90.00	0+90.00	
1+00.00	1.500m		1+00.00	1+00.00	
1+10.00	1.500m		1+10.00	1+10.00	
1+20.00	1.500m		1+20.00	1+20.00	
1+30.00	1.500m		1+30.00	1+30.00	
1+40.00	1.500m		1+40.00	1+40.00	
1+50.00	1.500m		1+50.00	1+50.00	
1+60.00	1.500m		1+60.00	1+60.00	
1+70.00	1.500m		1+70.00	1+70.00	
1+80.00	1.500m		1+80.00	1+80.00	
1+90.00	1.500m		1+90.00	1+90.00	
2+00.00	1.500m		2+00.00	2+00.00	
2+10.00	1.500m		2+10.00	2+10.00	
2+20.00	1.500m		2+20.00	2+20.00	
2+30.00	1.500m		2+30.00	2+30.00	
2+40.00	1.500m		2+40.00	2+40.00	
2+50.00	1.500m		2+50.00	2+50.00	
2+60.00	1.500m		2+60.00	2+60.00	
2+70.00	1.500m		2+70.00	2+70.00	
2+80.00	1.500m		2+80.00	2+80.00	
2+90.00	1.500m		2+90.00	2+90.00	
3+00.00	1.500m		3+00.00	3+00.00	
3+10.00	1.500m		3+10.00	3+10.00	
3+20.00	1.500m		3+20.00	3+20.00	
3+30.00	1.500m		3+30.00	3+30.00	
3+40.00	1.500m		3+40.00	3+40.00	
3+50.00	1.500m		3+50.00	3+50.00	
3+60.00	1.500m		3+60.00	3+60.00	
3+70.00	1.500m		3+70.00	3+70.00	
3+80.00	1.500m		3+80.00	3+80.00	
3+90.00	1.500m		3+90.00	3+90.00	
4+00.00	1.500m		4+00.00	4+00.00	
4+10.00	1.500m		4+10.00	4+10.00	
4+20.00	1.500m		4+20.00	4+20.00	
4+30.00	1.500m		4+30.00	4+30.00	
4+40.00	1.500m		4+40.00	4+40.00	
4+50.00	1.500m		4+50.00	4+50.00	
4+60.00	1.500m		4+60.00	4+60.00	
4+70.00	1.500m		4+70.00	4+70.00	
4+80.00	1.500m		4+80.00	4+80.00	
4+90.00	1.500m		4+90.00	4+90.00	
5+00.00	1.500m		5+00.00	5+00.00	
5+10.00	1.500m		5+10.00	5+10.00	
5+20.00	1.500m		5+20.00	5+20.00	
5+30.00	1.500m		5+30.00	5+30.00	
5+40.00	1.500m		5+40.00	5+40.00	
5+50.00	1.500m		5+50.00	5+50.00	
5+60.00	1.500m		5+60.00	5+60.00	
5+70.00	1.500m		5+70.00	5+70.00	
5+80.00	1.500m		5+80.00	5+80.00	
5+90.00	1.500m		5+90.00	5+90.00	
6+00.00	1.500m		6+00.00	6+00.00	
6+10.00	1.500m		6+10.00	6+10.00	
6+20.00	1.500m		6+20.00	6+20.00	
6+30.00	1.500m		6+30.00	6+30.00	
6+40.00	1.500m		6+40.00	6+40.00	
6+50.00	1.500m		6+50.00	6+50.00	
6+60.00	1.500m		6+60.00	6+60.00	
6+70.00	1.500m		6+70.00	6+70.00	
6+80.00	1.500m		6+80.00	6+80.00	
6+90.00	1.500m		6+90.00	6+90.00	
7+00.00	1.500m		7+00.00	7+00.00	
7+10.00	1.500m		7+10.00	7+10.00	
7+20.00	1.500m		7+20.00	7+20.00	
7+30.00	1.500m		7+30.00	7+30.00	
7+40.00	1.500m		7+40.00	7+40.00	
7+50.00	1.500m		7+50.00	7+50.00	
7+60.00	1.500m		7+60.00	7+60.00	
7+70.00	1.500m		7+70.00	7+70.00	
7+80.00	1.500m		7+80.00	7+80.00	
7+90.00	1.500m		7+90.00	7+90.00	
8+00.00	1.500m		8+00.00	8+00.00	
8+10.00	1.500m		8+10.00	8+10.00	
8+20.00	1.500m		8+20.00	8+20.00	
8+30.00	1.500m		8+30.00	8+30.00	
8+40.00	1.500m		8+40.00	8+40.00	
8+50.00	1.500m		8+50.00	8+50.00	
8+60.00	1.500m		8+60.00	8+60.00	
8+70.00	1.500m		8+70.00	8+70.00	
8+80.00	1.500m		8+80.00	8+80.00	
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9+10.00	1.500m		9+10.00	9+10.00	
9+20.00	1.500m		9+20.00	9+20.00	
9+30.00	1.500m		9+30.00	9+30.00	
9+40.00	1.500m		9+40.00	9+40.00	
9+50.00	1.500m		9+50.00	9+50.00	
9+60.00	1.500m		9+60.00	9+60.00	
9+70.00	1.500m		9+70.00	9+70.00	
9+80.00	1.500m		9+80.00	9+80.00	
9+90.00	1.500m		9+90.00	9+90.00	
10+00.00	1.500m		10+00.00	10+00.00	

**NOTES:**

- THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY, CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.
- THE CONTRACTOR SHALL COMPLY THE CONDITIONS MENTIONED IN THE CONTRACT DOCUMENTS AND SHALL BE RESPONSIBLE FOR THE PROPOSED/DEFERRED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.
- THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE EAST BOUND LINE/TUNNEL.
- THE EAST BOUND LINE/TUNNEL.
- THE GROUNDLEVELS OF NEW ALIGNMENT TAKEN FROM RTES DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDELEVELS ALSO SAME.

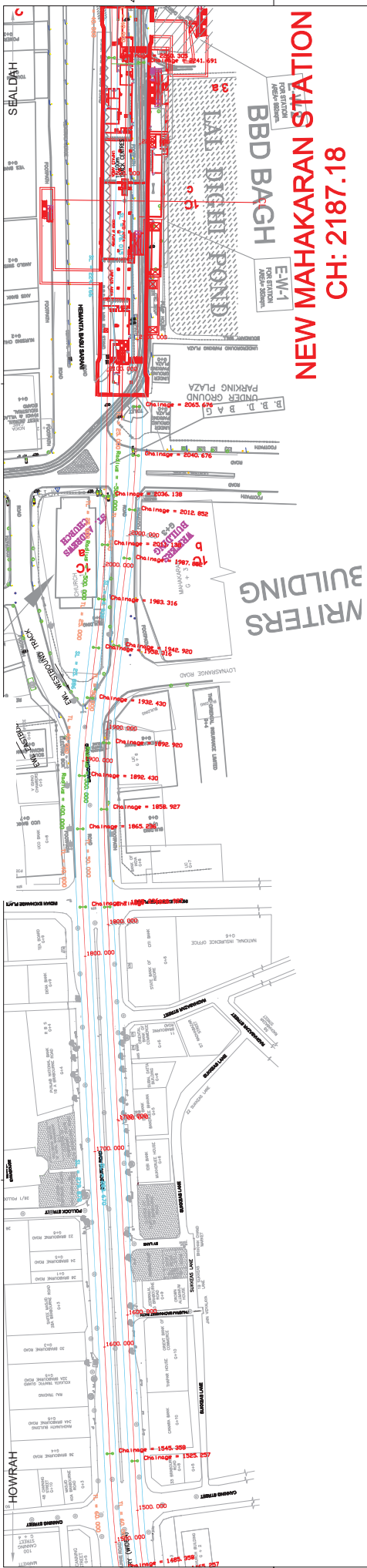
	PROJECT:-	KOLKATA METRO PROJECT		
	DRAWN BY	JK	EAST - WEST METRO CORRIDOR	
	DESIGNED BY	JND	TITLE:- HORIZONTAL & VERTICAL ALIGNMENT	
	CHECKED BY	BND	EAST BOUND LINE	
APPROVED BY	MB	DWG NO.	SCALE:- 1:1500 (A3)	DATE:- 16/03/2016
REV.	DATE	PREP.	APPR.	DESCRIPTION

**JK JATIN KILDIRIAN**  
 JK JATIN KILDIRIAN  
 MB- MKE BOARDMAN

**KMRCL**  
 KOLKATA METRO RAIL PROJECT  
 EAST-WEST METRO CORRIDOR

**M Y C E L**  
 General Consultant: Kolkata East West Metro  
 KMRCL, Munshi Premchand Sarani  
 Kolkata-700021  
 Tel: +91-33-22622942





**CROSS PASSAGE**

**CROSS PASSAGE**

**CROSS PASSAGE**



Stationing	Ground Level (m)	Rail Level (m)	Change (m)
100.00	17.00	17.00	0.00
110.00	17.00	17.00	0.00
120.00	17.00	17.00	0.00
130.00	17.00	17.00	0.00
140.00	17.00	17.00	0.00
150.00	17.00	17.00	0.00
160.00	17.00	17.00	0.00
170.00	17.00	17.00	0.00
180.00	17.00	17.00	0.00
190.00	17.00	17.00	0.00
200.00	17.00	17.00	0.00
210.00	17.00	17.00	0.00
220.00	17.00	17.00	0.00
230.00	17.00	17.00	0.00
240.00	17.00	17.00	0.00
250.00	17.00	17.00	0.00
260.00	17.00	17.00	0.00
270.00	17.00	17.00	0.00
280.00	17.00	17.00	0.00
290.00	17.00	17.00	0.00
300.00	17.00	17.00	0.00
310.00	17.00	17.00	0.00
320.00	17.00	17.00	0.00
330.00	17.00	17.00	0.00
340.00	17.00	17.00	0.00
350.00	17.00	17.00	0.00
360.00	17.00	17.00	0.00
370.00	17.00	17.00	0.00
380.00	17.00	17.00	0.00
390.00	17.00	17.00	0.00
400.00	17.00	17.00	0.00
410.00	17.00	17.00	0.00
420.00	17.00	17.00	0.00
430.00	17.00	17.00	0.00
440.00	17.00	17.00	0.00
450.00	17.00	17.00	0.00
460.00	17.00	17.00	0.00
470.00	17.00	17.00	0.00
480.00	17.00	17.00	0.00
490.00	17.00	17.00	0.00
500.00	17.00	17.00	0.00
510.00	17.00	17.00	0.00
520.00	17.00	17.00	0.00
530.00	17.00	17.00	0.00
540.00	17.00	17.00	0.00
550.00	17.00	17.00	0.00
560.00	17.00	17.00	0.00
570.00	17.00	17.00	0.00
580.00	17.00	17.00	0.00
590.00	17.00	17.00	0.00
600.00	17.00	17.00	0.00
610.00	17.00	17.00	0.00
620.00	17.00	17.00	0.00
630.00	17.00	17.00	0.00
640.00	17.00	17.00	0.00
650.00	17.00	17.00	0.00
660.00	17.00	17.00	0.00
670.00	17.00	17.00	0.00
680.00	17.00	17.00	0.00
690.00	17.00	17.00	0.00
700.00	17.00	17.00	0.00
710.00	17.00	17.00	0.00
720.00	17.00	17.00	0.00
730.00	17.00	17.00	0.00
740.00	17.00	17.00	0.00
750.00	17.00	17.00	0.00
760.00	17.00	17.00	0.00
770.00	17.00	17.00	0.00
780.00	17.00	17.00	0.00
790.00	17.00	17.00	0.00
800.00	17.00	17.00	0.00
810.00	17.00	17.00	0.00
820.00	17.00	17.00	0.00
830.00	17.00	17.00	0.00
840.00	17.00	17.00	0.00
850.00	17.00	17.00	0.00
860.00	17.00	17.00	0.00
870.00	17.00	17.00	0.00
880.00	17.00	17.00	0.00
890.00	17.00	17.00	0.00
900.00	17.00	17.00	0.00
910.00	17.00	17.00	0.00
920.00	17.00	17.00	0.00
930.00	17.00	17.00	0.00
940.00	17.00	17.00	0.00
950.00	17.00	17.00	0.00
960.00	17.00	17.00	0.00
970.00	17.00	17.00	0.00
980.00	17.00	17.00	0.00
990.00	17.00	17.00	0.00
1000.00	17.00	17.00	0.00
1010.00	17.00	17.00	0.00
1020.00	17.00	17.00	0.00
1030.00	17.00	17.00	0.00
1040.00	17.00	17.00	0.00
1050.00	17.00	17.00	0.00
1060.00	17.00	17.00	0.00
1070.00	17.00	17.00	0.00
1080.00	17.00	17.00	0.00
1090.00	17.00	17.00	0.00
1100.00	17.00	17.00	0.00
1110.00	17.00	17.00	0.00
1120.00	17.00	17.00	0.00
1130.00	17.00	17.00	0.00
1140.00	17.00	17.00	0.00
1150.00	17.00	17.00	0.00
1160.00	17.00	17.00	0.00
1170.00	17.00	17.00	0.00
1180.00	17.00	17.00	0.00
1190.00	17.00	17.00	0.00
1200.00	17.00	17.00	0.00
1210.00	17.00	17.00	0.00
1220.00	17.00	17.00	0.00
1230.00	17.00	17.00	0.00
1240.00	17.00	17.00	0.00
1250.00	17.00	17.00	0.00
1260.00	17.00	17.00	0.00
1270.00	17.00	17.00	0.00
1280.00	17.00	17.00	0.00
1290.00	17.00	17.00	0.00
1300.00	17.00	17.00	0.00
1310.00	17.00	17.00	0.00
1320.00	17.00	17.00	0.00
1330.00	17.00	17.00	0.00
1340.00	17.00	17.00	0.00
1350.00	17.00	17.00	0.00
1360.00	17.00	17.00	0.00
1370.00	17.00	17.00	0.00
1380.00	17.00	17.00	0.00
1390.00	17.00	17.00	0.00
1400.00	17.00	17.00	0.00
1410.00	17.00	17.00	0.00
1420.00	17.00	17.00	0.00
1430.00	17.00	17.00	0.00
1440.00	17.00	17.00	0.00
1450.00	17.00	17.00	0.00
1460.00	17.00	17.00	0.00
1470.00	17.00	17.00	0.00
1480.00	17.00	17.00	0.00
1490.00	17.00	17.00	0.00
1500.00	17.00	17.00	0.00
1510.00	17.00	17.00	0.00
1520.00	17.00	17.00	0.00
1530.00	17.00	17.00	0.00
1540.00	17.00	17.00	0.00
1550.00	17.00	17.00	0.00
1560.00	17.00	17.00	0.00
1570.00	17.00	17.00	0.00
1580.00	17.00	17.00	0.00
1590.00	17.00	17.00	0.00
1600.00	17.00	17.00	0.00
1610.00	17.00	17.00	0.00
1620.00	17.00	17.00	0.00
1630.00	17.00	17.00	0.00
1640.00	17.00	17.00	0.00
1650.00	17.00	17.00	0.00
1660.00	17.00	17.00	0.00
1670.00	17.00	17.00	0.00
1680.00	17.00	17.00	0.00
1690.00	17.00	17.00	0.00
1700.00	17.00	17.00	0.00
1710.00	17.00	17.00	0.00
1720.00	17.00	17.00	0.00
1730.00	17.00	17.00	0.00
1740.00	17.00	17.00	0.00
1750.00	17.00	17.00	0.00
1760.00	17.00	17.00	0.00
1770.00	17.00	17.00	0.00
1780.00	17.00	17.00	0.00
1790.00	17.00	17.00	0.00
1800.00	17.00	17.00	0.00
1810.00	17.00	17.00	0.00
1820.00	17.00	17.00	0.00
1830.00	17.00	17.00	0.00
1840.00	17.00	17.00	0.00
1850.00	17.00	17.00	0.00
1860.00	17.00	17.00	0.00
1870.00	17.00	17.00	0.00
1880.00	17.00	17.00	0.00
1890.00	17.00	17.00	0.00
1900.00	17.00	17.00	0.00
1910.00	17.00	17.00	0.00
1920.00	17.00	17.00	0.00
1930.00	17.00	17.00	0.00
1940.00	17.00	17.00	0.00
1950.00	17.00	17.00	0.00
1960.00	17.00	17.00	0.00
1970.00	17.00	17.00	0.00
1980.00	17.00	17.00	0.00
1990.00	17.00	17.00	0.00
2000.00	17.00	17.00	0.00
2010.00	17.00	17.00	0.00
2020.00	17.00	17.00	0.00
2030.00	17.00	17.00	0.00
2040.00	17.00	17.00	0.00
2050.00	17.00	17.00	0.00
2060.00	17.00	17.00	0.00
2070.00	17.00	17.00	0.00
2080.00	17.00	17.00	0.00
2090.00	17.00	17.00	0.00
2100.00	17.00	17.00	0.00

**NOTES:**

- THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMISSIONS AND APPROVALS FROM THE CONCERNED AUTHORITIES.
- ALONG THE CENTRE LINE OF THE TRACK OF EAST BOUND LINE/TUNNEL.
- THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE EAST BOUND LINE/TUNNEL.
- THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RTDS DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.
- THE LOCATION OF CROSS-PASSAGES (WITH AND WITHOUT PUMPS) AND PUMPS SHOWN IN THE DRAWING ARE INDICATIVE ONLY AND THE CONTRACTOR'S PROPOSAL/DESIGN SHALL COMPLY WITH THE CONDITIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMISSIONS AND APPROVALS FROM THE CONCERNED AUTHORITIES.
- ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.

**JK JATIN KULONKA**  
DIRECTOR  
MB - MKE BOARDMAN

**KMRC**  
KOLKATA METRO RAIL PROJECT  
EAST-WEST METRO CORRIDOR

**PROJECT:-** KOLKATA METRO PROJECT  
**EAST - WEST METRO CORRIDOR**

**TITLE:-** HORIZONTAL & VERTICAL ALIGNMENT  
**EAST BOUND LINE**

DWG NO. \_\_\_\_\_  
SCALE:- 1:1500 (A3) DATE:- 16/03/2016 REV. 0

**NAME** SIGN

**DRAWN BY** JK

**DESIGNED BY** JK

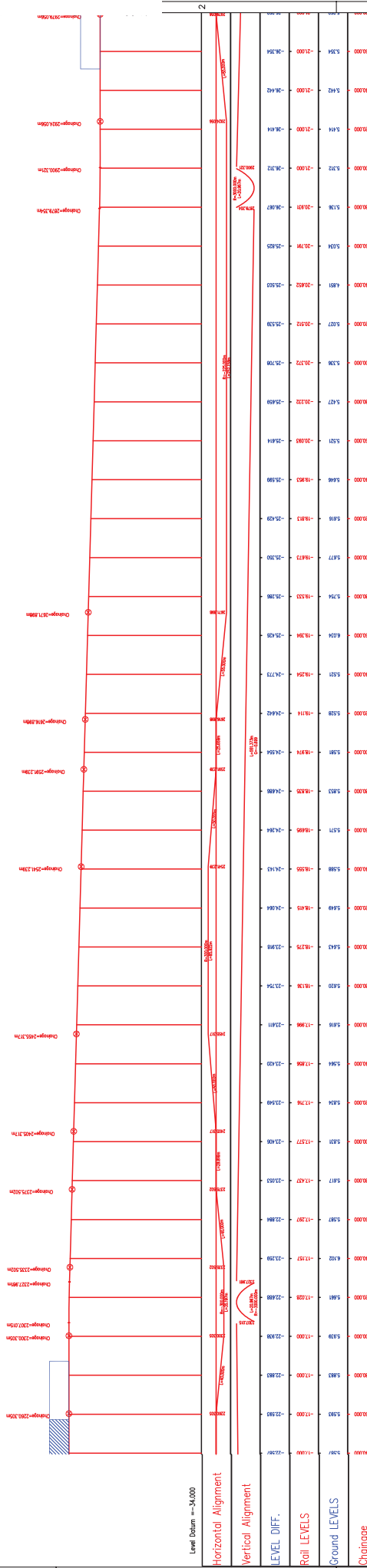
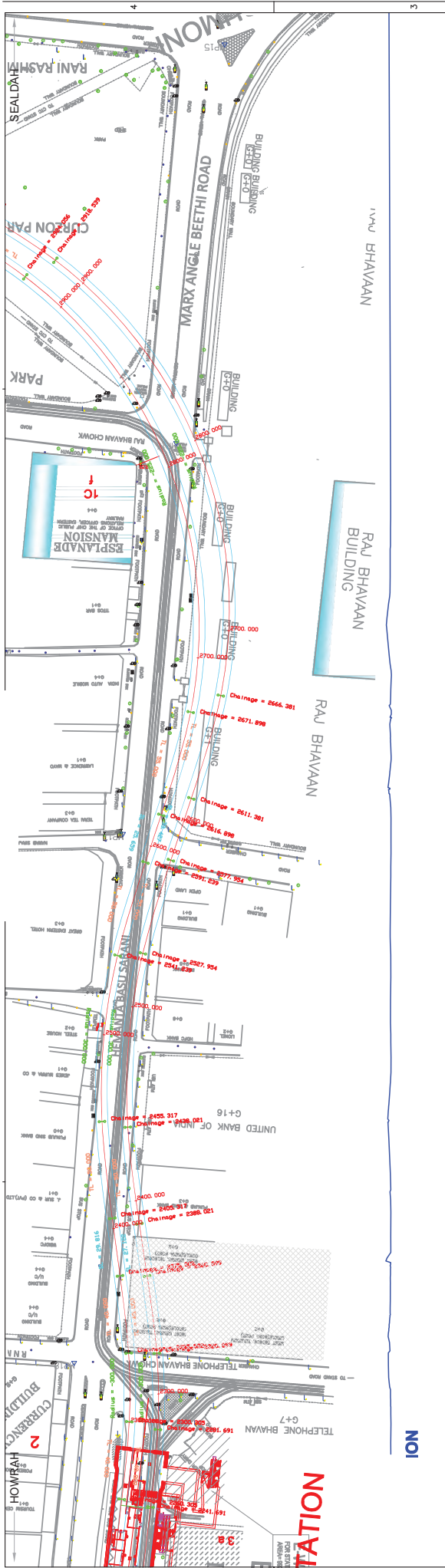
**CHECKED BY** BND

**APPROVED BY** MB

**REV.** **DATE** **PREP.** **APPR.** **DESCRIPTION**

**MAHAKARAN** **TECON** **Y&C** **LLIPA** **M Y C E L**

General Consultant: Kolkata East West Metro  
KMRC, Munshi Premchand Sarani  
Kolkata-700021  
Tel: +91-33-22622942



Level Datum = +M.SL.000

Stationing	Horizontal Alignment	Vertical Alignment	LEVEL DIFF.	Rail LEVELS	Ground LEVELS	Clearance
0+00			-17.000	17.000	14.000	3.000
0+10			-17.000	17.000	14.000	3.000
0+20			-17.000	17.000	14.000	3.000
0+30			-17.000	17.000	14.000	3.000
0+40			-17.000	17.000	14.000	3.000
0+50			-17.000	17.000	14.000	3.000
0+60			-17.000	17.000	14.000	3.000
0+70			-17.000	17.000	14.000	3.000
0+80			-17.000	17.000	14.000	3.000
0+90			-17.000	17.000	14.000	3.000
1+00			-17.000	17.000	14.000	3.000
1+10			-17.000	17.000	14.000	3.000
1+20			-17.000	17.000	14.000	3.000
1+30			-17.000	17.000	14.000	3.000
1+40			-17.000	17.000	14.000	3.000
1+50			-17.000	17.000	14.000	3.000
1+60			-17.000	17.000	14.000	3.000
1+70			-17.000	17.000	14.000	3.000
1+80			-17.000	17.000	14.000	3.000
1+90			-17.000	17.000	14.000	3.000
2+00			-17.000	17.000	14.000	3.000

NOTES:

- THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.
- CONTRACTOR'S PROPOSAL/DESIGN SHALL COMPLY THE CONDITIONS SHALL BE PROPOSED/ DETERMINED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.
- THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE EAST BOUND LINE/TUNNEL.
- THE EAST BOUND LINE/TUNNEL.
- THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RTES DRAWING (ANNEXURE 4.2 DATED APRIL 2015), CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.

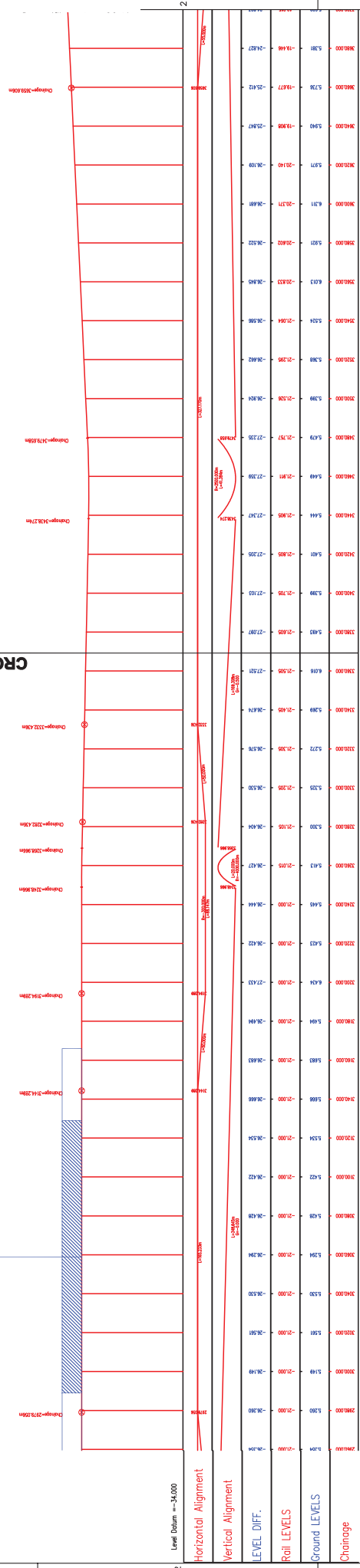
		<b>PROJECT:- KOLKATA METRO PROJECT</b> <b>EAST - WEST METRO CORRIDOR</b>	
<b>NAME</b> JK <b>DRAWN BY</b> JK <b>DESIGNED BY</b> JK <b>CHECKED BY</b> BND <b>APPROVED BY</b> MB		<b>SIGN</b> <b>TITLE:- HORIZONTAL &amp; VERTICAL ALIGNMENT</b> <b>EAST BOUND LINE</b> DWG NO. _____ SCALE:- 1:1500 (A3) DATE:- 16/03/2016 REV: 0	
<b>JK JATIN KULURNA</b> MB - MKE BOARDMAN			
		<b>KOLKATA METRO RAIL PROJECT</b> <b>EAST-WEST METRO CORRIDOR</b>	
REV	DATE	PREP	DESCRIPTION

General Consultant: Kolkata East West Metro  
 KMRC, Munshi Premchand Sarani  
 Kolkata-700021  
 Tel: +91-33-22622942



**CROSS PASSAGE**

**ESPLANADE STATION  
CH: 3058.95**



**NOTES:**

- THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY, CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.
- THE CONTRACTOR SHALL COMPLY THE CONDITIONS AS MENTIONED ABOVE AND BE PROPOSED / DETERMINED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.
- THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE EAST BOUND LINE/TUNNEL.
- THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RTDS DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDELEVELS ALSO SAME.

PROJECT: KOLKATA METRO PROJECT  
EAST - WEST METRO CORRIDOR  
TITLE: HORIZONTAL & VERTICAL ALIGNMENT  
EAST BOUND LINE

NAME: SIGN  
DRAWN BY: JK  
DESIGNED BY: JK  
CHECKED BY: BND  
APPROVED BY: MB

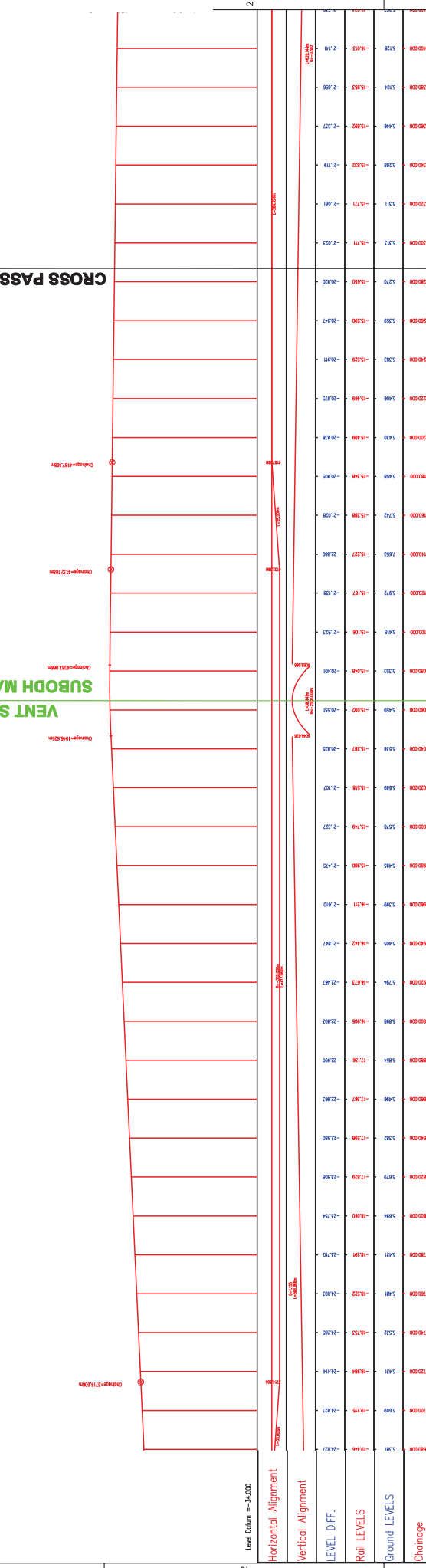
JK JATIN GUPTA  
MB: MKE BOARDMAN

SCALE: 1:1500 (A3) DATE: 16/03/2016 REV: 0

KMRC  
KOLKATA METRO RAIL PROJECT  
EAST-WEST METRO CORRIDOR

General Consultant: Kolkata East West Metro  
KMRC, Munshi Premchand Sarani  
Kolkata-700021  
Tel: +91-33-22622942





REV	DATE	PREP.	APPR.	DESCRIPTION

JK JATIN GUPTA INC. ENGINEER MB. MKE BOARDMAN		PROJECT:- <b>KOLKATA METRO PROJECT</b> <b>EAST - WEST METRO CORRIDOR</b>
DRAWN BY JK	SIGN	TITLE:- <b>HORIZONTAL &amp; VERTICAL ALIGNMENT</b> <b>EAST BOUND LINE</b>
DESIGNED BY BND	CHECKED BY MB	DWG NO. SCALE:- 1:1500 (A3) DATE:- 16/03/2016
APPROVED BY	REV. 0	

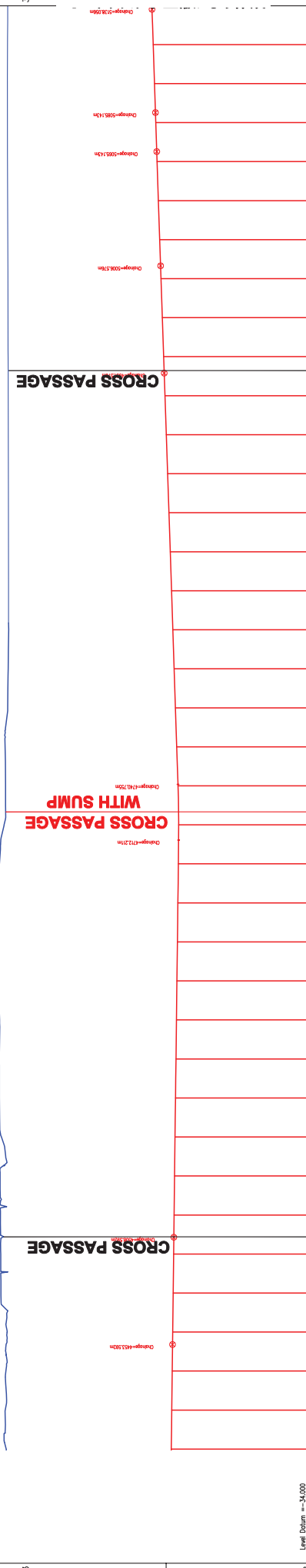
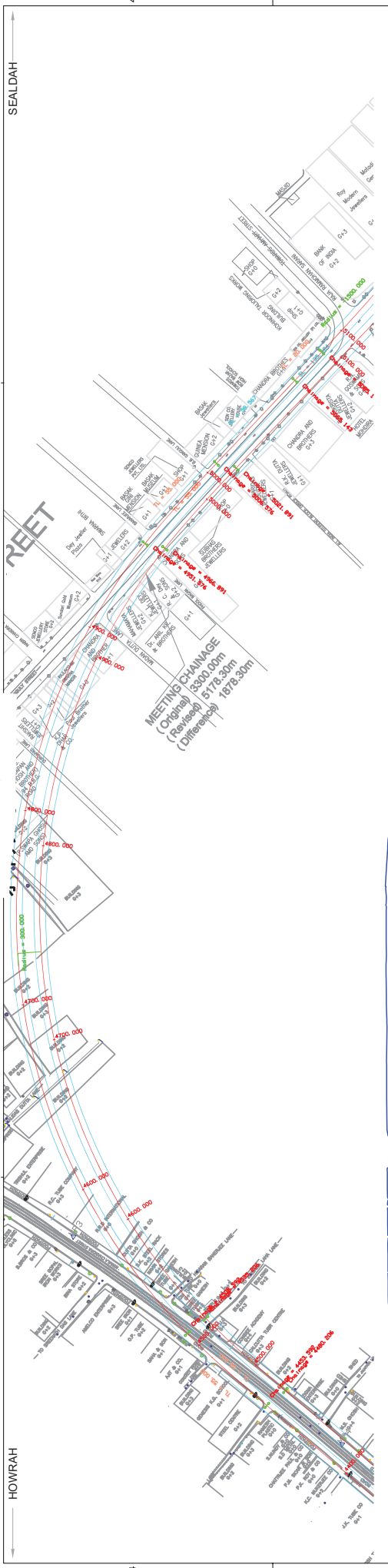
  

	<b>KOLKATA METRO RAIL PROJECT</b> <b>EAST-WEST METRO CORRIDOR</b>
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THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY, CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM. CONTRACTOR'S PROPOSAL/DESIGN SHALL COMPLY THE CONDITIONS SHALL BE PROPOSED / DETERMINED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.

THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RTDS DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.



LEVEL DIFF.	Rail LEVELS	Ground LEVELS	Change
4000.00	4000.00	4000.00	0.00
4050.00	4050.00	4050.00	0.00
4100.00	4100.00	4100.00	0.00
4150.00	4150.00	4150.00	0.00
4200.00	4200.00	4200.00	0.00
4250.00	4250.00	4250.00	0.00
4300.00	4300.00	4300.00	0.00
4350.00	4350.00	4350.00	0.00
4400.00	4400.00	4400.00	0.00
4450.00	4450.00	4450.00	0.00
4500.00	4500.00	4500.00	0.00
4550.00	4550.00	4550.00	0.00
4600.00	4600.00	4600.00	0.00
4650.00	4650.00	4650.00	0.00
4700.00	4700.00	4700.00	0.00
4750.00	4750.00	4750.00	0.00
4800.00	4800.00	4800.00	0.00
4850.00	4850.00	4850.00	0.00
4900.00	4900.00	4900.00	0.00
4950.00	4950.00	4950.00	0.00
5000.00	5000.00	5000.00	0.00
5050.00	5050.00	5050.00	0.00
5100.00	5100.00	5100.00	0.00
5150.00	5150.00	5150.00	0.00
5200.00	5200.00	5200.00	0.00
5250.00	5250.00	5250.00	0.00
5300.00	5300.00	5300.00	0.00
5350.00	5350.00	5350.00	0.00
5400.00	5400.00	5400.00	0.00
5450.00	5450.00	5450.00	0.00
5500.00	5500.00	5500.00	0.00
5550.00	5550.00	5550.00	0.00
5600.00	5600.00	5600.00	0.00
5650.00	5650.00	5650.00	0.00
5700.00	5700.00	5700.00	0.00
5750.00	5750.00	5750.00	0.00
5800.00	5800.00	5800.00	0.00
5850.00	5850.00	5850.00	0.00
5900.00	5900.00	5900.00	0.00
5950.00	5950.00	5950.00	0.00
6000.00	6000.00	6000.00	0.00
6050.00	6050.00	6050.00	0.00
6100.00	6100.00	6100.00	0.00
6150.00	6150.00	6150.00	0.00
6200.00	6200.00	6200.00	0.00
6250.00	6250.00	6250.00	0.00
6300.00	6300.00	6300.00	0.00
6350.00	6350.00	6350.00	0.00
6400.00	6400.00	6400.00	0.00

**NOTES:**

- THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY, CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.
- THE CONTRACTOR SHALL VERIFY THE EXISTING CONDITIONS AND SHALL BE PROPOSED/ DETERMINED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.
- THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE EAST BOUND LINE/TUNNEL.
- THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RITES DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.

**KOLKATA METRO RAIL PROJECT**  
EAST - WEST METRO CORRIDOR  
EAST BOUND LINE

PROJECT: KOLKATA METRO PROJECT  
EAST - WEST METRO CORRIDOR  
TITLE: HORIZONTAL & VERTICAL ALIGNMENT  
EAST BOUND LINE

NAME: JK  
DRAWN BY: JK  
DESIGN BY: JK  
CHECKED BY: BND  
APPROVED BY: MB

JK JATIN KULRANA  
INC. CHIEF ENGINEER  
MB: MIKE BOARDMAN

**KMRC**

**KOLKATA METRO RAIL PROJECT**  
EAST - WEST METRO CORRIDOR

General Consultant: Kolkata East West Metro  
KMRC, Munshi Premchand Sarani  
Kolkata-700021  
Tel: +91-33-22622942

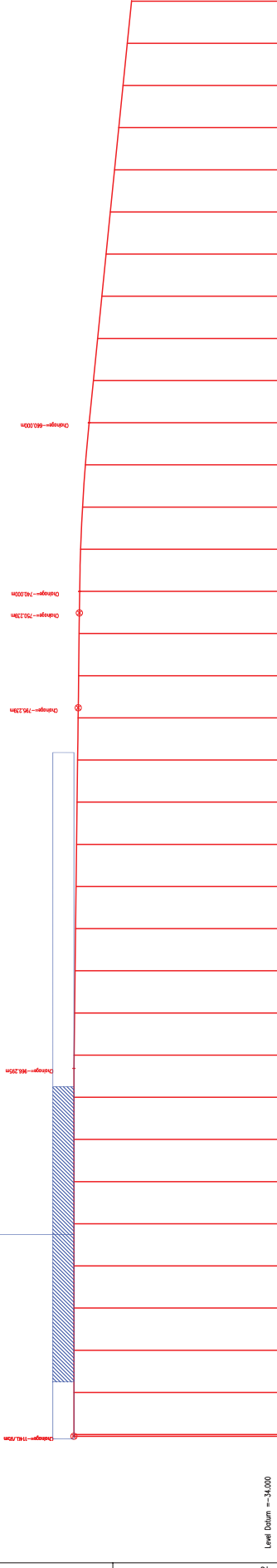
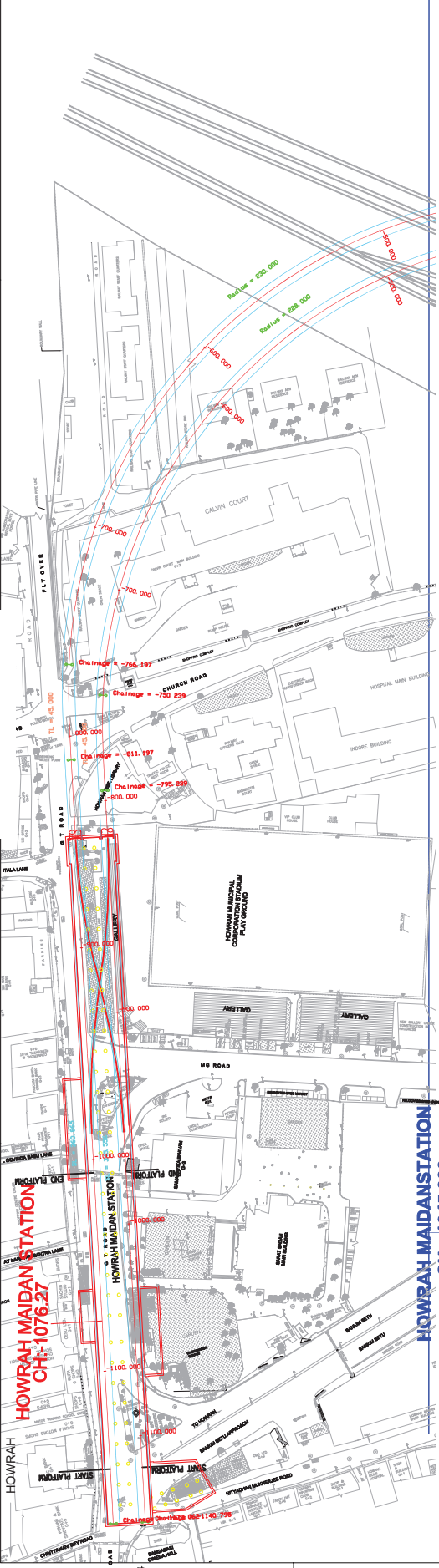
SCALE: 1:1500 (A3) DATE: 16/03/2016 REV: 0





GAD WEST BOUND LINE

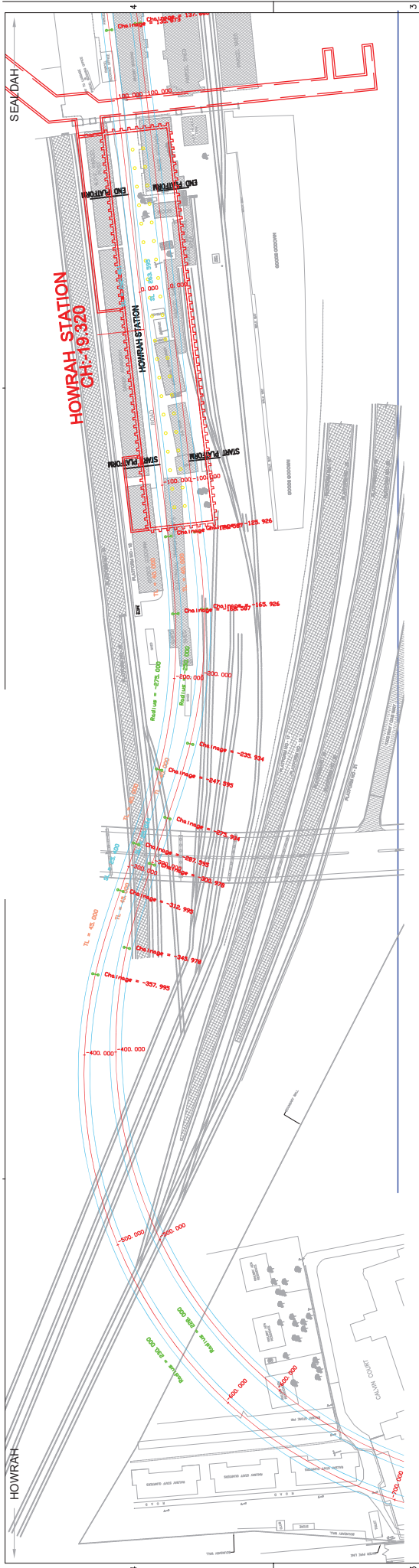




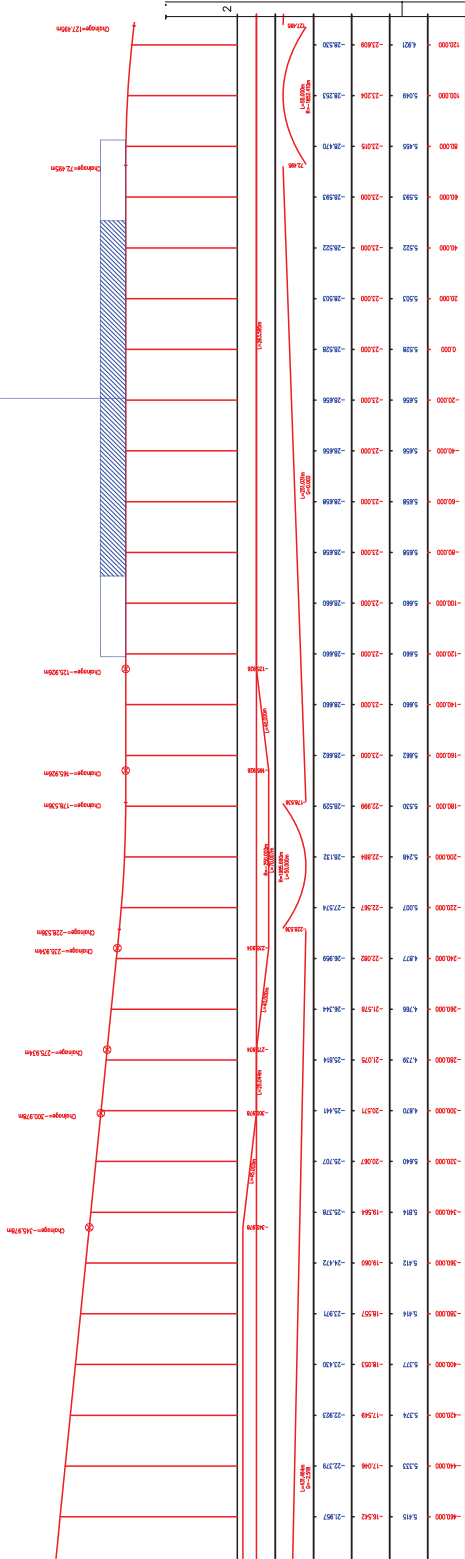
Stationing	Ground Levels	Rail Levels	Level Diff.
1000+00	10.00	10.00	0.00
1000+10	10.10	10.10	0.00
1000+20	10.20	10.20	0.00
1000+30	10.30	10.30	0.00
1000+40	10.40	10.40	0.00
1000+50	10.50	10.50	0.00
1000+60	10.60	10.60	0.00
1000+70	10.70	10.70	0.00
1000+80	10.80	10.80	0.00
1000+90	10.90	10.90	0.00
1001+00	11.00	11.00	0.00
1001+10	11.10	11.10	0.00
1001+20	11.20	11.20	0.00
1001+30	11.30	11.30	0.00
1001+40	11.40	11.40	0.00
1001+50	11.50	11.50	0.00
1001+60	11.60	11.60	0.00
1001+70	11.70	11.70	0.00
1001+80	11.80	11.80	0.00
1001+90	11.90	11.90	0.00
1002+00	12.00	12.00	0.00
1002+10	12.10	12.10	0.00
1002+20	12.20	12.20	0.00
1002+30	12.30	12.30	0.00
1002+40	12.40	12.40	0.00
1002+50	12.50	12.50	0.00
1002+60	12.60	12.60	0.00
1002+70	12.70	12.70	0.00
1002+80	12.80	12.80	0.00
1002+90	12.90	12.90	0.00
1003+00	13.00	13.00	0.00
1003+10	13.10	13.10	0.00
1003+20	13.20	13.20	0.00
1003+30	13.30	13.30	0.00
1003+40	13.40	13.40	0.00
1003+50	13.50	13.50	0.00
1003+60	13.60	13.60	0.00
1003+70	13.70	13.70	0.00
1003+80	13.80	13.80	0.00
1003+90	13.90	13.90	0.00
1004+00	14.00	14.00	0.00
1004+10	14.10	14.10	0.00
1004+20	14.20	14.20	0.00
1004+30	14.30	14.30	0.00
1004+40	14.40	14.40	0.00
1004+50	14.50	14.50	0.00
1004+60	14.60	14.60	0.00
1004+70	14.70	14.70	0.00
1004+80	14.80	14.80	0.00
1004+90	14.90	14.90	0.00
1005+00	15.00	15.00	0.00
1005+10	15.10	15.10	0.00
1005+20	15.20	15.20	0.00
1005+30	15.30	15.30	0.00
1005+40	15.40	15.40	0.00
1005+50	15.50	15.50	0.00
1005+60	15.60	15.60	0.00
1005+70	15.70	15.70	0.00
1005+80	15.80	15.80	0.00
1005+90	15.90	15.90	0.00
1006+00	16.00	16.00	0.00
1006+10	16.10	16.10	0.00
1006+20	16.20	16.20	0.00
1006+30	16.30	16.30	0.00
1006+40	16.40	16.40	0.00
1006+50	16.50	16.50	0.00
1006+60	16.60	16.60	0.00
1006+70	16.70	16.70	0.00
1006+80	16.80	16.80	0.00
1006+90	16.90	16.90	0.00
1007+00	17.00	17.00	0.00
1007+10	17.10	17.10	0.00
1007+20	17.20	17.20	0.00
1007+30	17.30	17.30	0.00
1007+40	17.40	17.40	0.00
1007+50	17.50	17.50	0.00
1007+60	17.60	17.60	0.00
1007+70	17.70	17.70	0.00
1007+80	17.80	17.80	0.00
1007+90	17.90	17.90	0.00
1008+00	18.00	18.00	0.00
1008+10	18.10	18.10	0.00
1008+20	18.20	18.20	0.00
1008+30	18.30	18.30	0.00
1008+40	18.40	18.40	0.00
1008+50	18.50	18.50	0.00
1008+60	18.60	18.60	0.00
1008+70	18.70	18.70	0.00
1008+80	18.80	18.80	0.00
1008+90	18.90	18.90	0.00
1009+00	19.00	19.00	0.00
1009+10	19.10	19.10	0.00
1009+20	19.20	19.20	0.00
1009+30	19.30	19.30	0.00
1009+40	19.40	19.40	0.00
1009+50	19.50	19.50	0.00
1009+60	19.60	19.60	0.00
1009+70	19.70	19.70	0.00
1009+80	19.80	19.80	0.00
1009+90	19.90	19.90	0.00
1010+00	20.00	20.00	0.00
1010+10	20.10	20.10	0.00
1010+20	20.20	20.20	0.00
1010+30	20.30	20.30	0.00
1010+40	20.40	20.40	0.00
1010+50	20.50	20.50	0.00
1010+60	20.60	20.60	0.00
1010+70	20.70	20.70	0.00
1010+80	20.80	20.80	0.00
1010+90	20.90	20.90	0.00
1011+00	21.00	21.00	0.00
1011+10	21.10	21.10	0.00
1011+20	21.20	21.20	0.00
1011+30	21.30	21.30	0.00
1011+40	21.40	21.40	0.00
1011+50	21.50	21.50	0.00
1011+60	21.60	21.60	0.00
1011+70	21.70	21.70	0.00
1011+80	21.80	21.80	0.00
1011+90	21.90	21.90	0.00
1012+00	22.00	22.00	0.00
1012+10	22.10	22.10	0.00
1012+20	22.20	22.20	0.00
1012+30	22.30	22.30	0.00
1012+40	22.40	22.40	0.00
1012+50	22.50	22.50	0.00
1012+60	22.60	22.60	0.00
1012+70	22.70	22.70	0.00
1012+80	22.80	22.80	0.00
1012+90	22.90	22.90	0.00
1013+00	23.00	23.00	0.00
1013+10	23.10	23.10	0.00
1013+20	23.20	23.20	0.00
1013+30	23.30	23.30	0.00
1013+40	23.40	23.40	0.00
1013+50	23.50	23.50	0.00
1013+60	23.60	23.60	0.00
1013+70	23.70	23.70	0.00
1013+80	23.80	23.80	0.00
1013+90	23.90	23.90	0.00
1014+00	24.00	24.00	0.00
1014+10	24.10	24.10	0.00
1014+20	24.20	24.20	0.00
1014+30	24.30	24.30	0.00
1014+40	24.40	24.40	0.00
1014+50	24.50	24.50	0.00
1014+60	24.60	24.60	0.00
1014+70	24.70	24.70	0.00
1014+80	24.80	24.80	0.00
1014+90	24.90	24.90	0.00
1015+00	25.00	25.00	0.00
1015+10	25.10	25.10	0.00
1015+20	25.20	25.20	0.00
1015+30	25.30	25.30	0.00
1015+40	25.40	25.40	0.00
1015+50	25.50	25.50	0.00
1015+60	25.60	25.60	0.00
1015+70	25.70	25.70	0.00
1015+80	25.80	25.80	0.00
1015+90	25.90	25.90	0.00
1016+00	26.00	26.00	0.00
1016+10	26.10	26.10	0.00
1016+20	26.20	26.20	0.00
1016+30	26.30	26.30	0.00
1016+40	26.40	26.40	0.00
1016+50	26.50	26.50	0.00
1016+60	26.60	26.60	0.00
1016+70	26.70	26.70	0.00
1016+80	26.80	26.80	0.00
1016+90	26.90	26.90	0.00
1017+00	27.00	27.00	0.00
1017+10	27.10	27.10	0.00
1017+20	27.20	27.20	0.00
1017+30	27.30	27.30	0.00
1017+40	27.40	27.40	0.00
1017+50	27.50	27.50	0.00
1017+60	27.60	27.60	0.00
1017+70	27.70	27.70	0.00
1017+80	27.80	27.80	0.00
1017+90	27.90	27.90	0.00
1018+00	28.00	28.00	0.00
1018+10	28.10	28.10	0.00
1018+20	28.20	28.20	0.00
1018+30	28.30	28.30	0.00
1018+40	28.40	28.40	0.00
1018+50	28.50	28.50	0.00
1018+60	28.60	28.60	0.00
1018+70	28.70	28.70	0.00
1018+80	28.80	28.80	0.00
1018+90	28.90	28.90	0.00
1019+00	29.00	29.00	0.00
1019+10	29.10	29.10	0.00
1019+20	29.20	29.20	0.00
1019+30	29.30	29.30	0.00
1019+40	29.40	29.40	0.00
1019+50	29.50	29.50	0.00
1019+60	29.60	29.60	0.00
1019+70	29.70	29.70	0.00
1019+80	29.80	29.80	0.00
1019+90	29.90	29.90	0.00
1020+00	30.00	30.00	0.00

NOTES:  
 1. THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY, CONDITIONS OF BUILDINGS, SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.  
 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMISSIONS AND APPROVALS FROM THE CONCERNED AUTHORITIES.  
 3. THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE WEST BOUND LINE/TUNNEL.  
 4. THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RTES DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.

<p>KOLKATA METRO RAIL PROJECT EAST-WEST METRO CORRIDOR</p>		<p>M Y C E L General Consultant: Kolkata East West Metro KMRCCL, Munshi Premchand Sarani Kolkata-700021 Tel: +91-33-22622942</p>	
<p>PROJECT: KOLKATA METRO PROJECT EAST - WEST METRO CORRIDOR</p>		<p>TITLE: HORIZONTAL &amp; VERTICAL ALIGNMENT WEST BOUND LINE</p>	
<p>NAME: JK</p>		<p>DATE: 16/03/2016</p>	
<p>DRAWN BY: JK</p>		<p>SCALE: 1:1500 (A3)</p>	
<p>DESIGNED BY: JK</p>		<p>REV. 0</p>	
<p>CHECKED BY: BND</p>			
<p>APPROVED BY: MB</p>			



### HOWRAH STATION CH: -19.32



Level Datum = +34.000

Horizontal Alignment

Vertical Alignment

LEVEL DIFF.

Rail LEVELS

Ground LEVELS

Chainage

**NOTES:**

- THE ALIGNMENT DRAWING SHOWN IS INDICATIVE ONLY. THE CONTRACTOR NEED TO DEVELOP DETAILED ALIGNMENT DRAWING BASED ON THE ABOVE AND CONSIDERING THE TOPOGRAPHIC SURVEY CONDITIONS OF BUILDINGS SURVEY AND GEOTECHNICAL INVESTIGATION CARRIED OUT BY THEM.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CONCERNED AUTHORITIES.
- THE LONGITUDINAL SECTION (PROFILE) SHOWN IN THE DRAWING IS ALONG THE WEST BOUND LINE/TUNNEL.
- THE GROUND LEVELS OF NEW ALIGNMENT TAKEN FROM RTES DRAWING (ANNEXURE 4.2 DATED APRIL 2015). CONSIDER THE ADJACENT SIDE LEVELS ALSO SAME.

- THE LOCATION OF CROSS-PASSAGES (WITH AND WITHOUT SUMPS AND PUMPS) SHOWN IN THE DRAWING ARE INDICATIVE ONLY AND THE CONTRACTOR'S PROPOSAL/DESIGN SHALL COMPLY THE CONTRACTOR'S SHALL BE PROPOSED/ DETERMINED BY THE CONTRACTOR AFTER FINALIZING THE ALIGNMENT INCLUDING THE VERTICAL PROFILE OF THE SECOND LINE.

REV.	DATE	PREP.	APPR.	DESCRIPTION

		<b>KOLKATA METRO RAIL PROJECT EAST-WEST METRO CORRIDOR</b>	
JK JATIN GUPTA IN-CHARGE MB-MKE BOARDMAN		PROJECT:- KOLKATA METRO PROJECT EAST -WEST METRO CORRIDOR TITLE:- HORIZONTAL & VERTICAL ALIGNMENT WEST BOUND LINE	
DRAWN BY JK	SIGN	M Y C E L M Y C E L General Consultant Kolkata East West Metro KMRCCL, Munshi Premchand Sarani Kolkata-700021 Tel: +91-33-22622942	DWG NO. SCALE:- 1:1500 (A3) DATE:- 16/03/2016 REV: 0
DESIGNED BY BND	APPROVED BY MB	MAHARAJA ENGINEERING CONSULTANTS M Y C E L L I I P A	B