आज़ादी का अमृत महोत्सव

G20 भारत 2023 INDIA

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF HOUSING AND URBAN AFFAIRS

स्वच्छ भारत
एक कदम स्वच्छता की ओर

DESIGNING FOR RESILIENCE

RASHMI BHARDWAJ

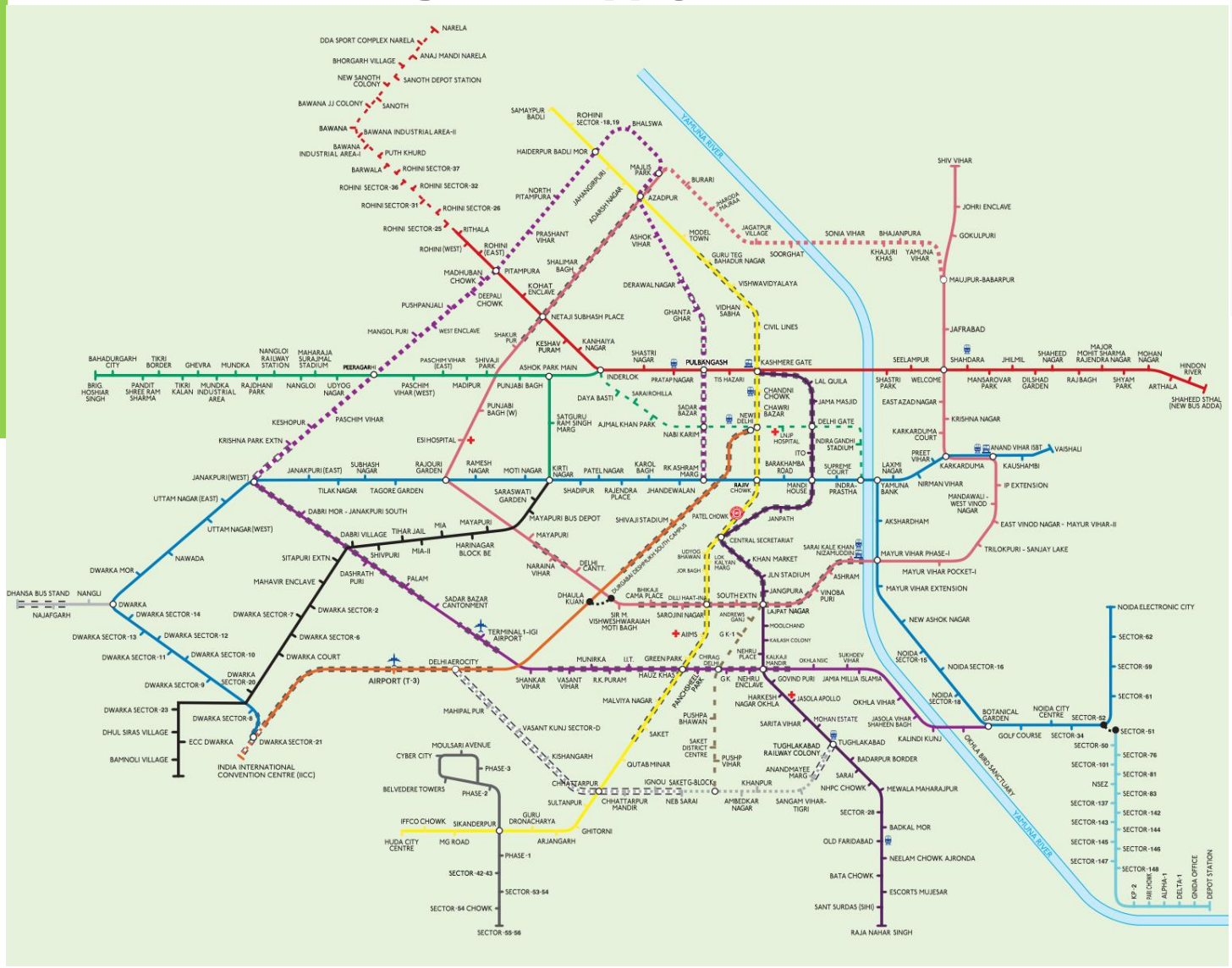
DELHI METRO RAIL CORPORATION LTD.

16th Urban Mobility India Conference & Expo 2023

DESIGNING FOR RESILIENCE

- **ABSORPTIVE CAPACITY** – *ABILITY TO ABSORB SHOCKS & STRESSES AND MAINTAIN NORMAL FUNCTIONING;*
- **RESTORATIVE CAPACITY** – *ABILITY TO RECOVER QUICKLY FOLLOWING A SHOCK OR STRESS AND RETURN TO NORMAL;*
- **EQUITABLE ACCESS** – *ABILITY TO PROVIDE ACCESS ACROSS THE COMMUNITY DURING BOTH SHOCKS AS WELL AS NORMAL TIMES;*
- **ADAPTIVE CAPACITY** – *ABILITY TO CHANGE IN RESPONSE TO SHOCKS AND STRESSES TO MAINTAIN NORMAL FUNCTIONING*

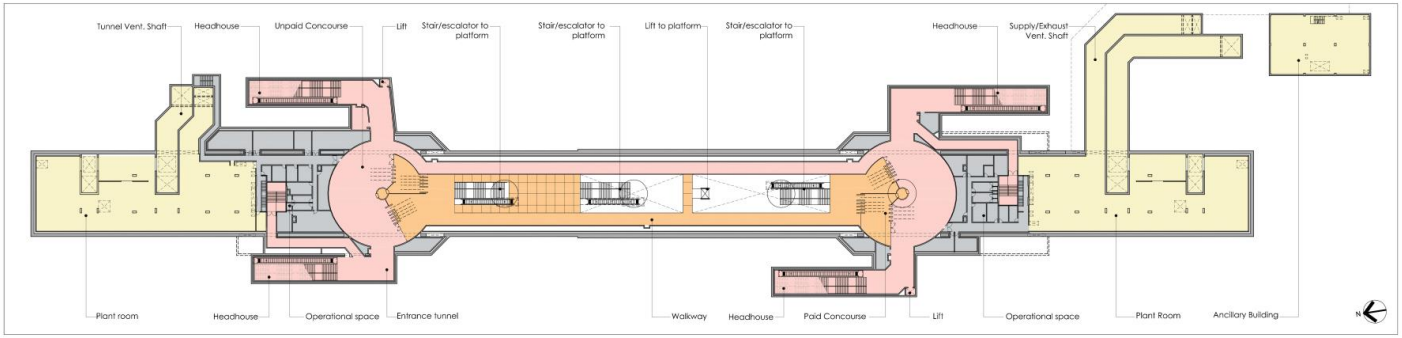
DELHI MRTS NETWORK



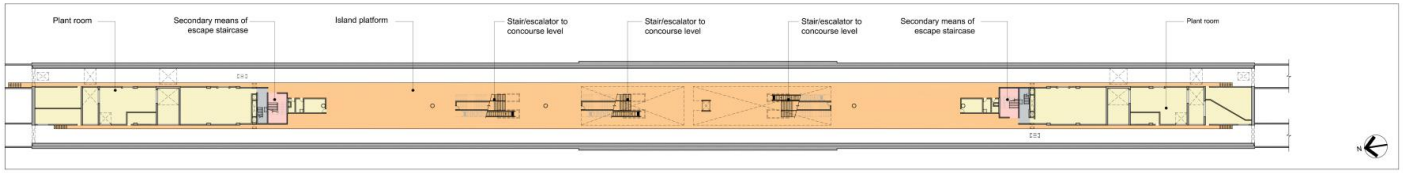
INTERCHANGE DETAILS	NUMBER OF STATIONS
INTERCHANGE STATIONS (WITHIN DMRC NETWORK)	30 nos.
INTERCHANGE WITH RAILWAYS	8 nos.
INTERCHANGE WITH ISBT	4 nos.
INTERCHANGE WITH AIRPORT	2 nos.

DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY

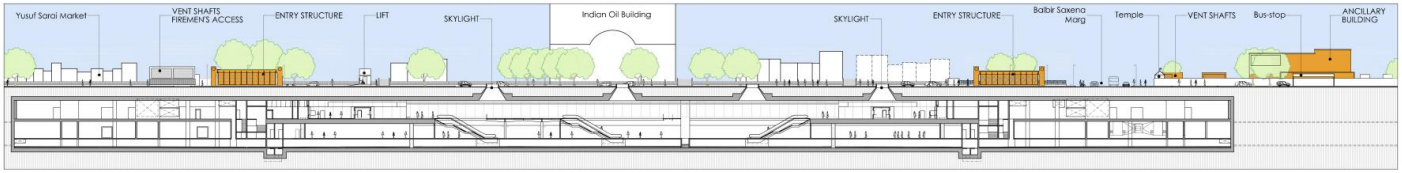
- PLANNING FOR SURGE OF USERS – BUILDING SPARE CAPACITY, EASE OF DISPERSION, LEVEL OF SERVICE



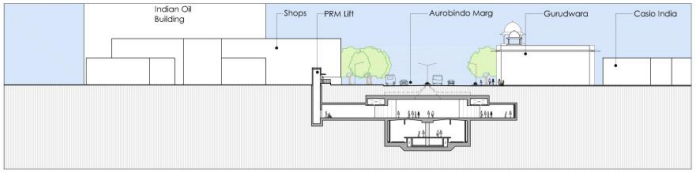
CONCOURSE PLAN



PLATFORM PLAN



LONG SECTION



SHORT SECTION

INTERIOR IMAGES

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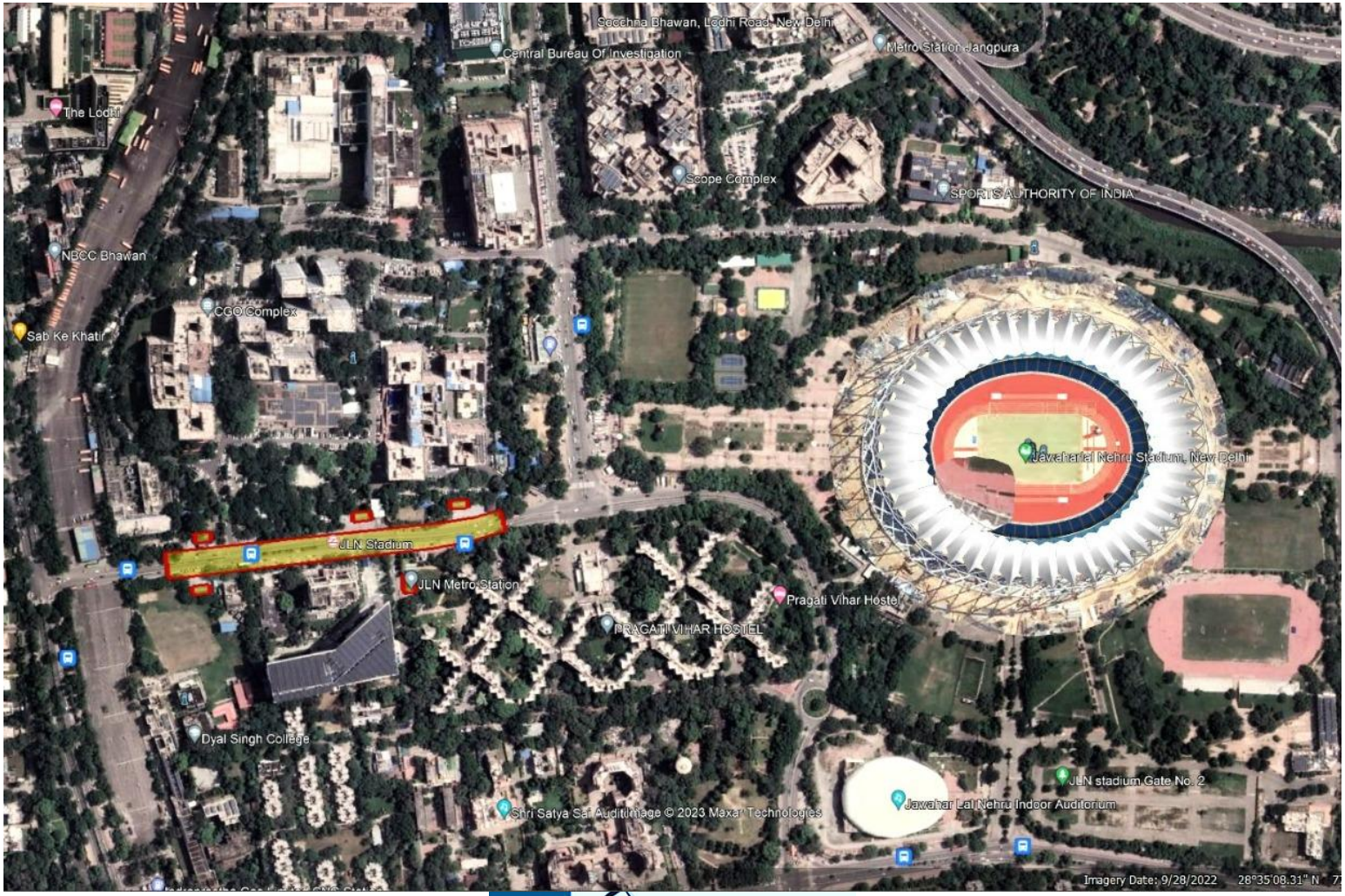
DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY - JLN STADIUM UNDERGROUND STATION



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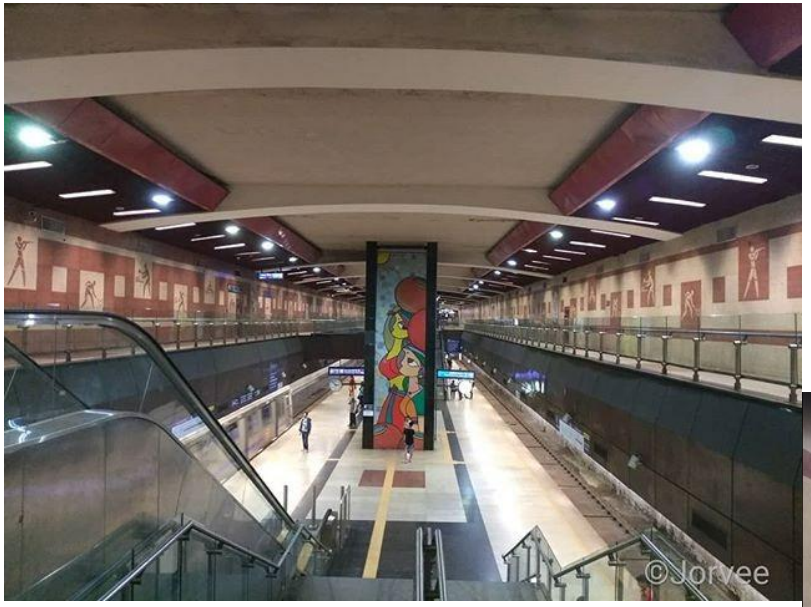
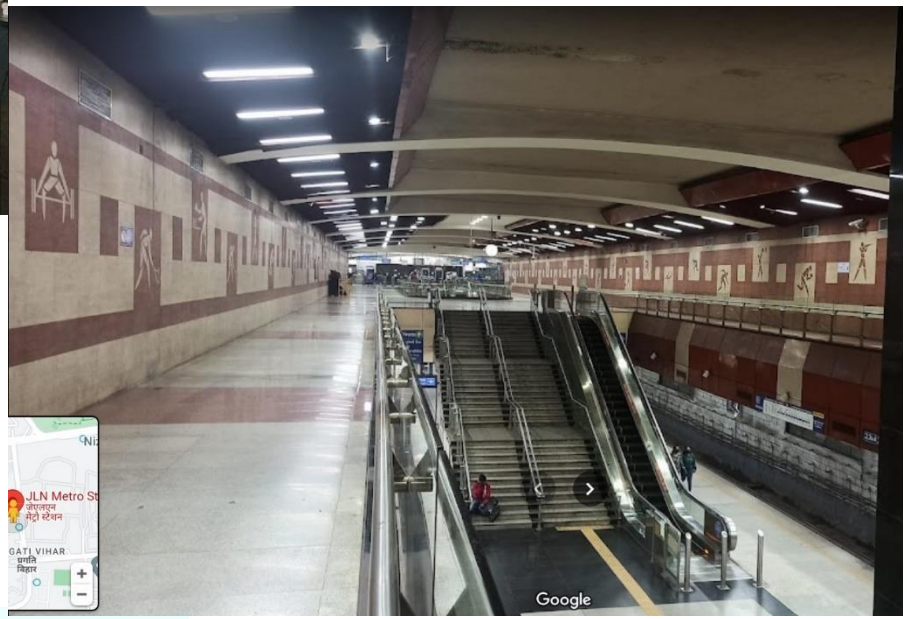
DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY - JLN STADIUM UNDERGROUND STATION



BUILT SPECIFICALLY TO CATER TO JLN STADIUM DURING COMMONWEALTH GAMES



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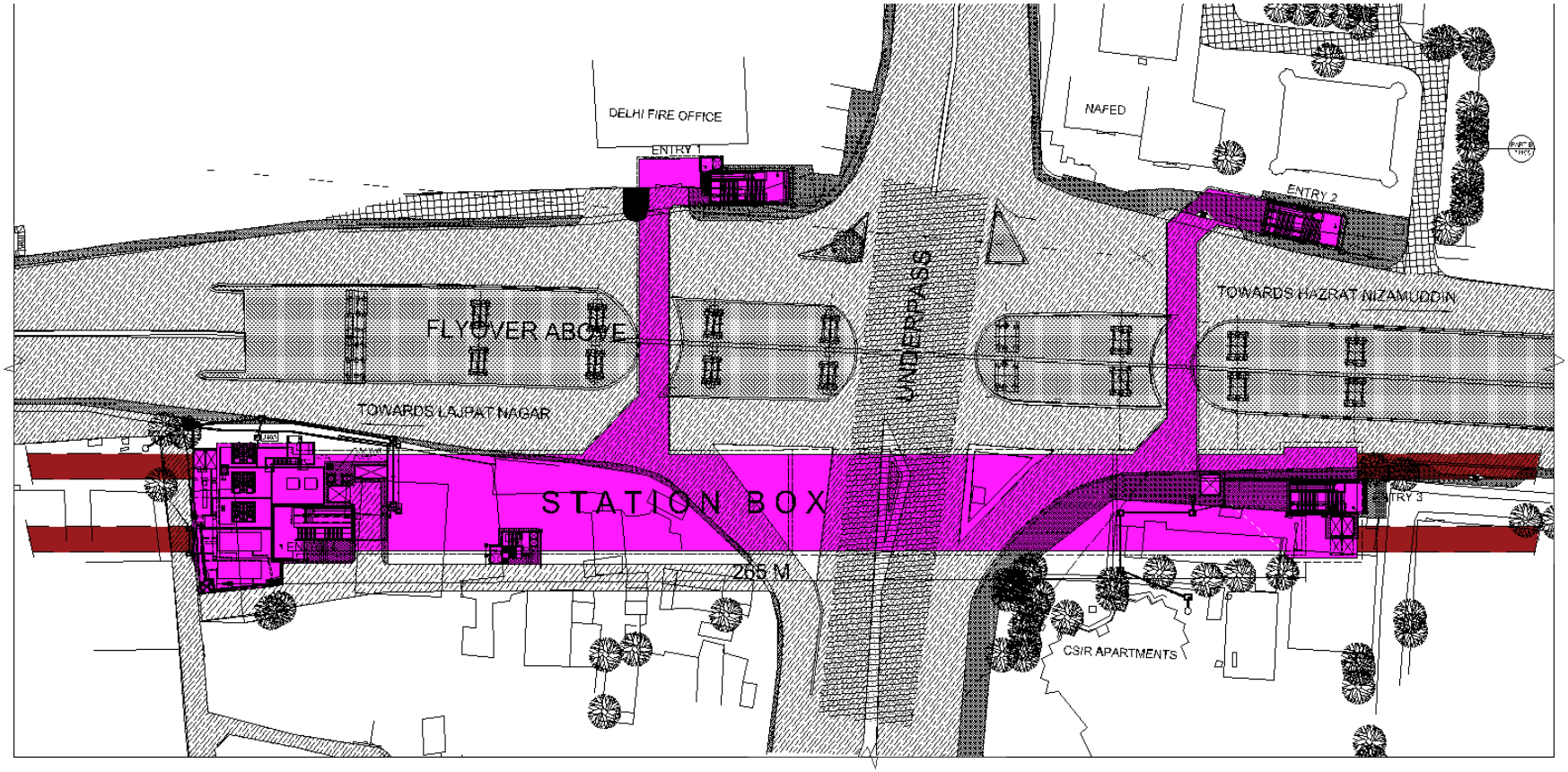
DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY – ASHRAM UNDERGROUND STATION

- **PLANNING WITH LACK OF SPACE– USING SPARE CAPACITY**



DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY – ASHRAM UNDERGROUND STATION

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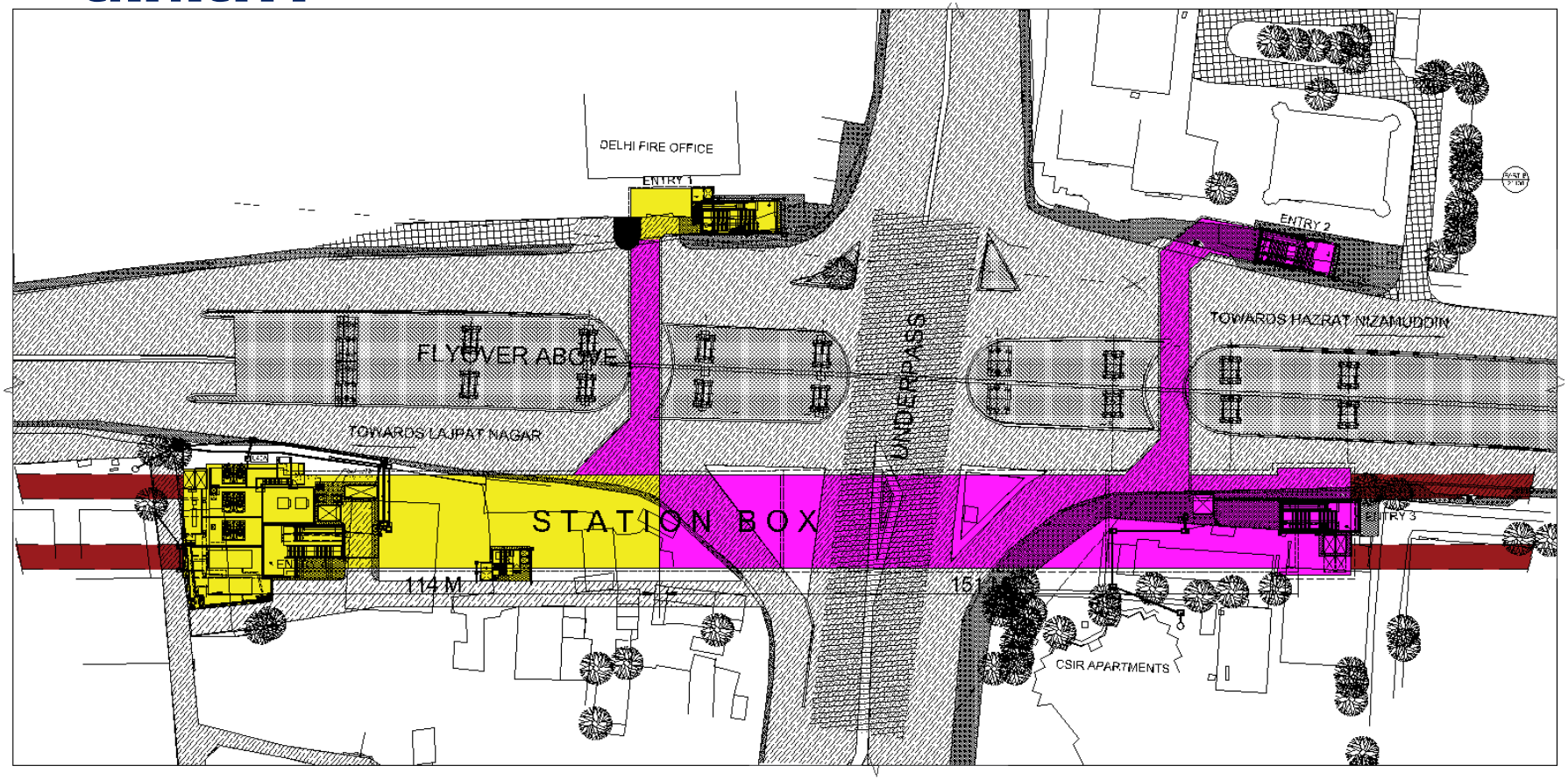

DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY – ASHRAM UNDERGROUND STATION

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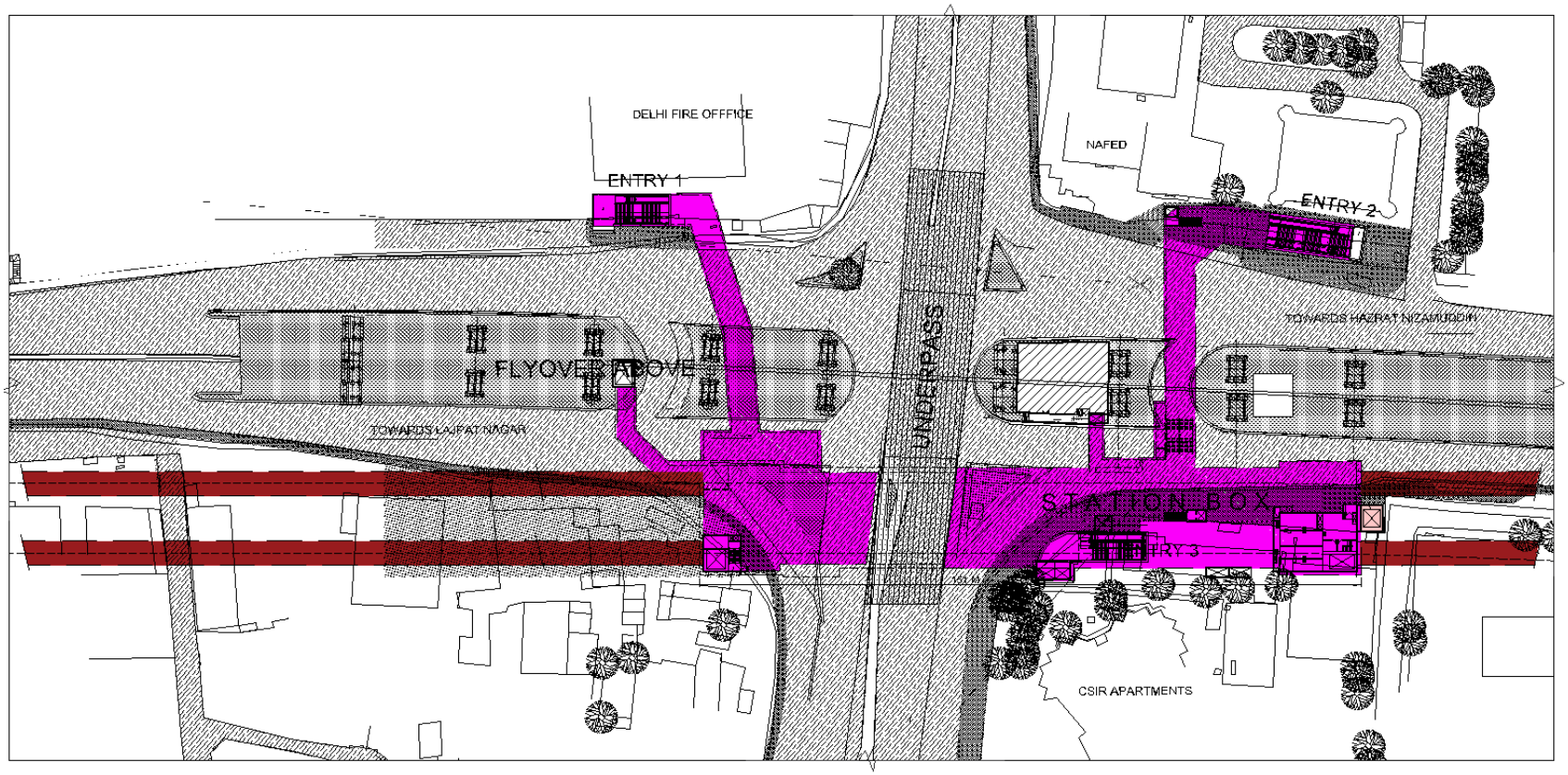
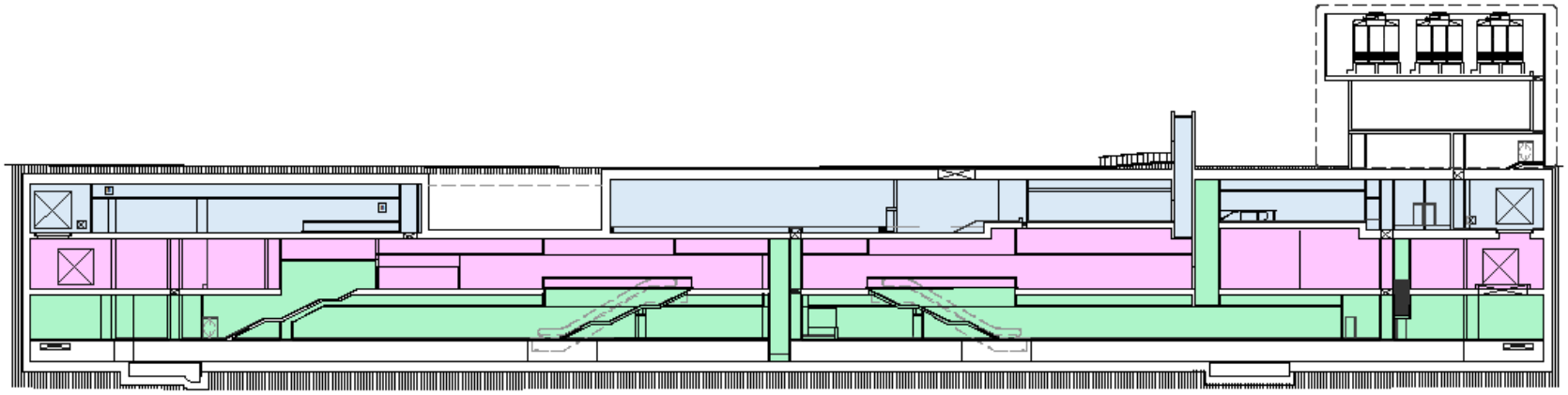
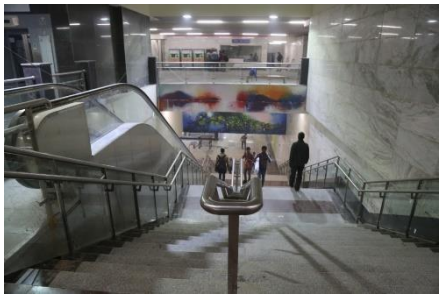
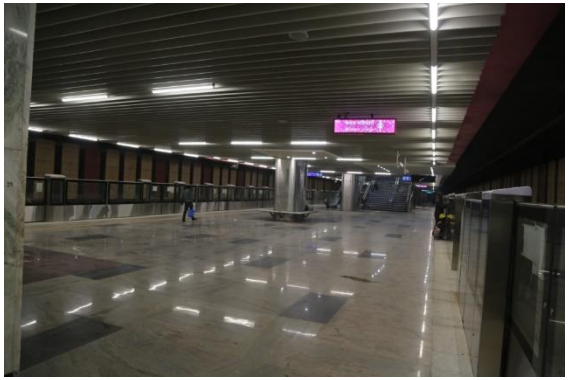


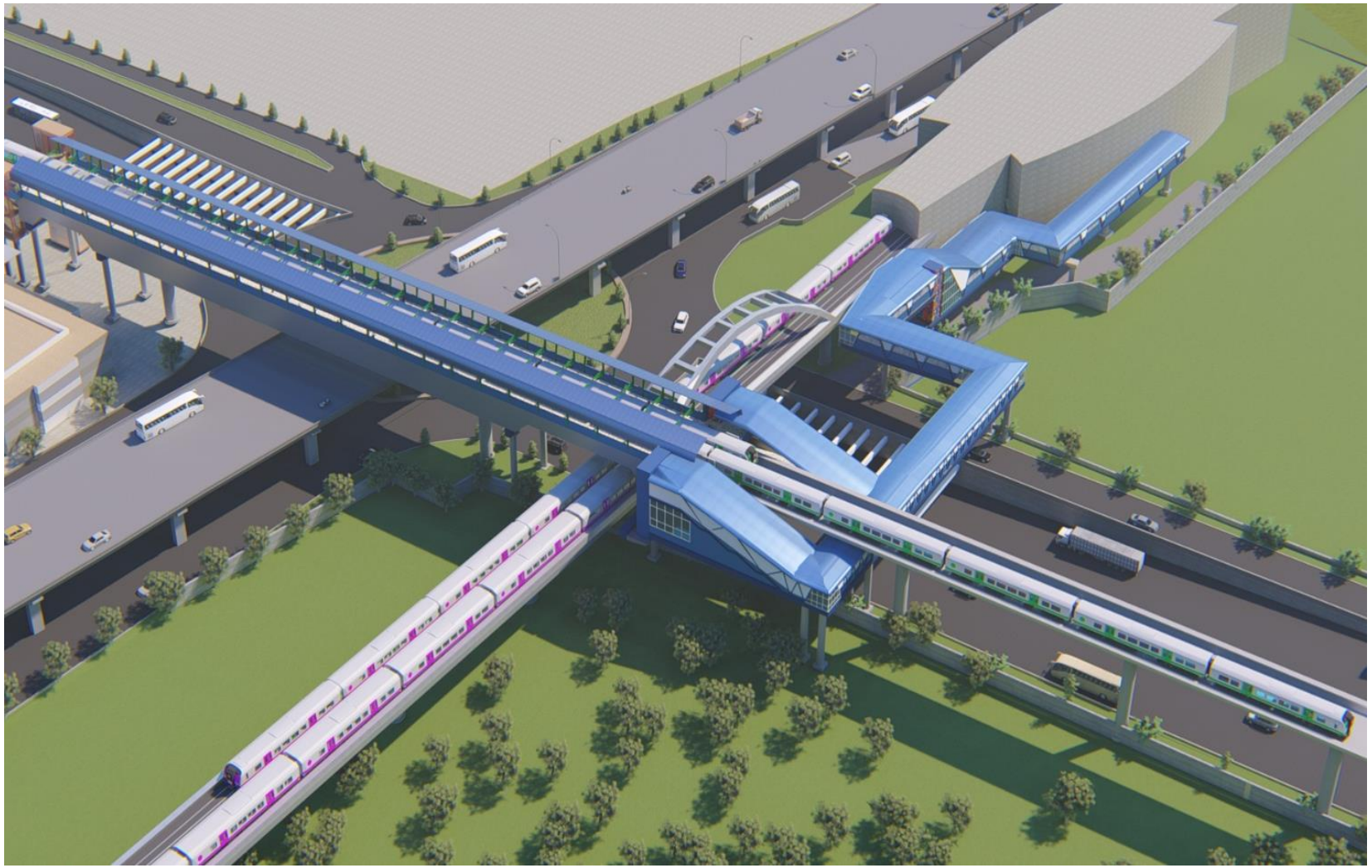
DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY – ASHRAM UNDERGROUND STATION





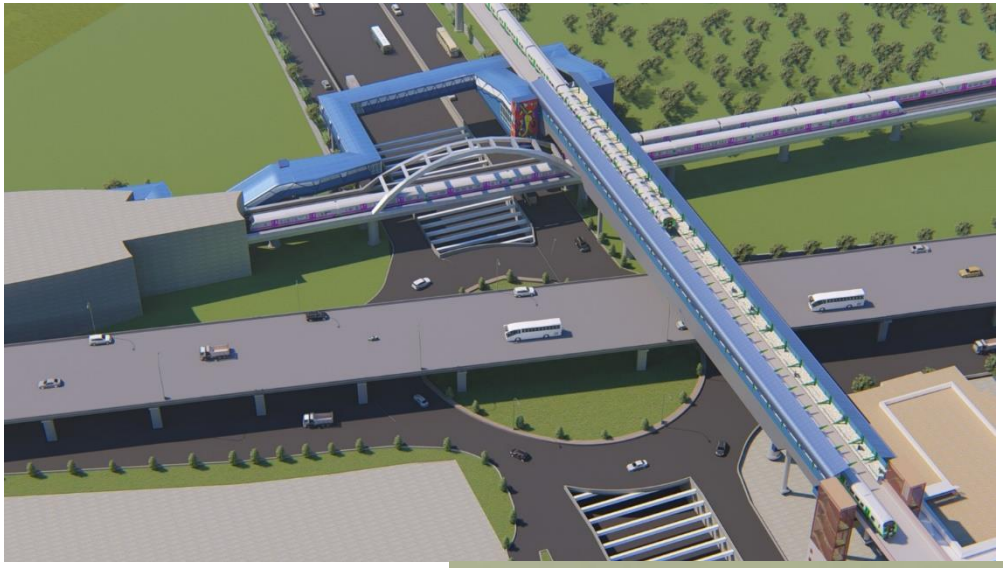


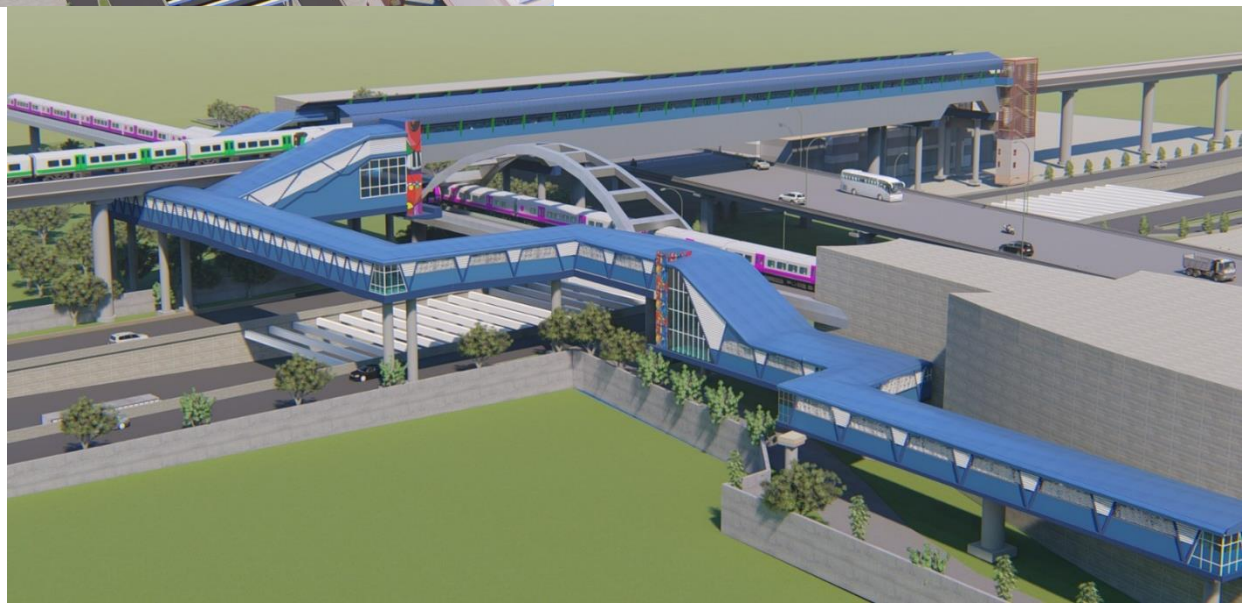
DESIGNING FOR RESILIENCE – BUILDING RESILIENT STRUCTURES – PUNJABI BAGH INTERCHANGE



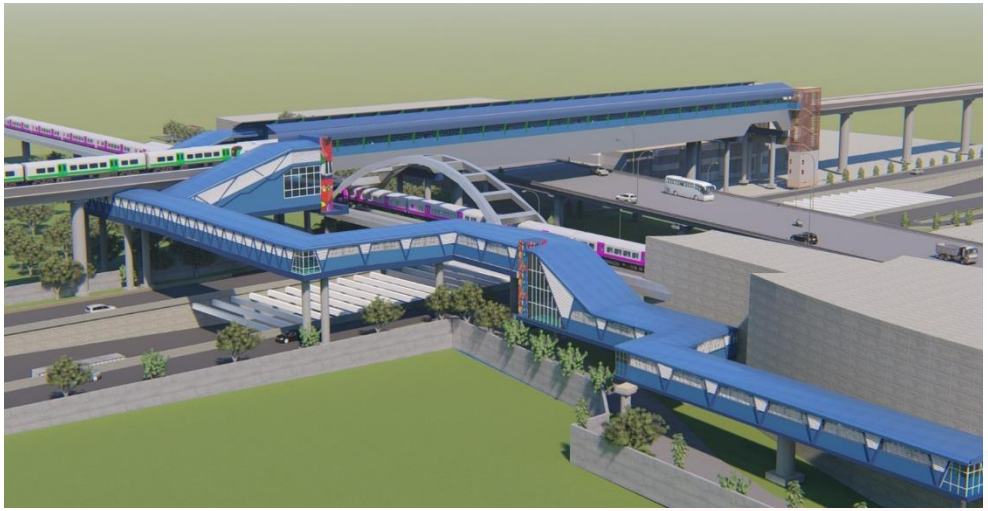
DESIGNING FOR RESILIENCE – BUILDING RESILIENT STRUCTURES – PUNJABI BAGH INTERCHANGE

- **STRUCTURAL RESILIENCE**





DESIGNING FOR RESILIENCE – BUILDING RESILIENT STRUCTURES – PUNJABI BAGH INTERCHANGE



DESIGNING FOR RESILIENCE – BUILDING RESILIENT STRUCTURES – PUNJABI BAGH INTERCHANGE

INCREMENT OF 2.1 LAKH PASSENGER TRIPS PER DAY ON BOTH THE LINES AFTER OPENING OF THIS INTERCHANGE

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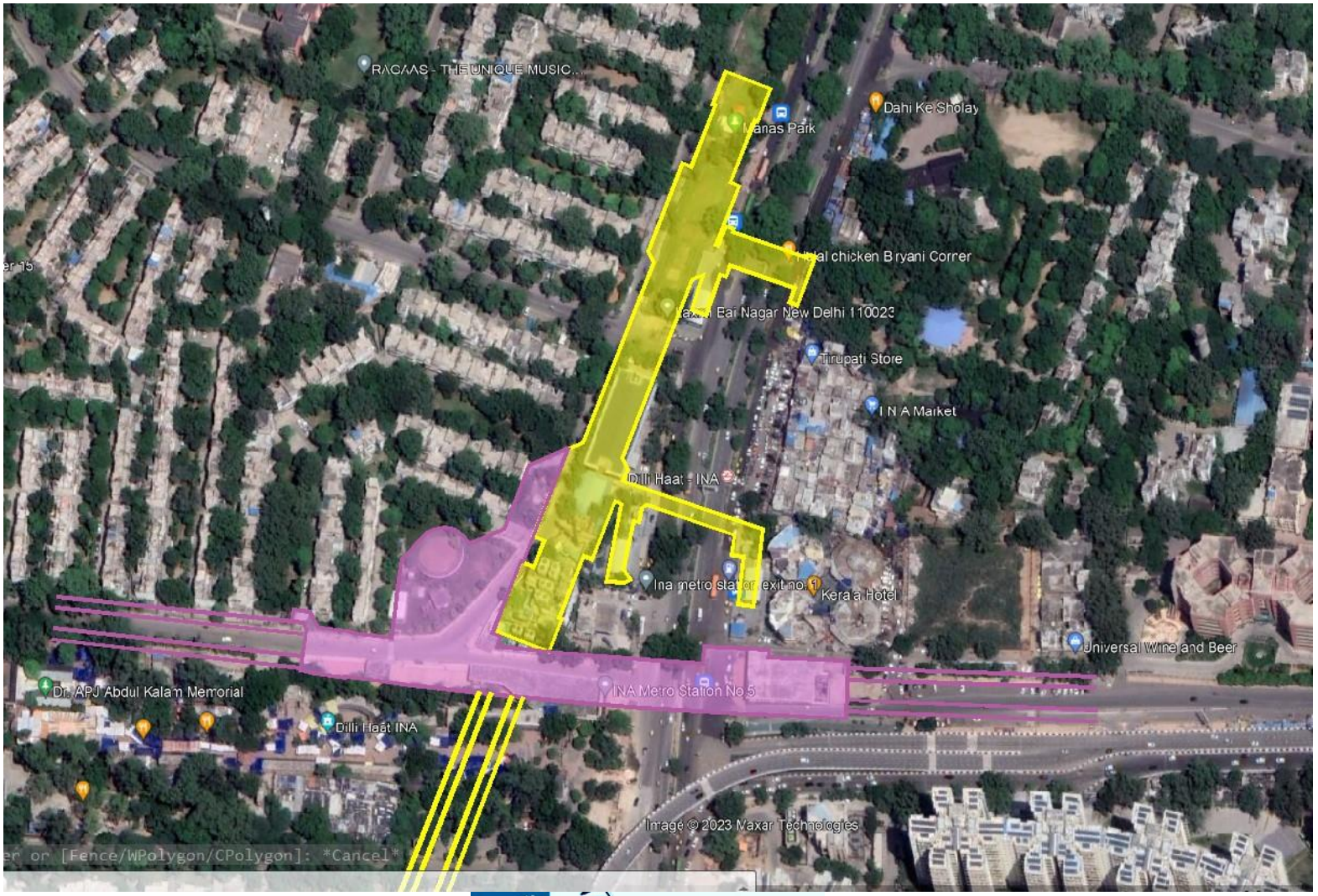
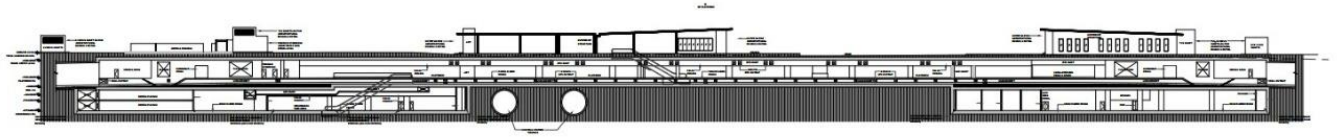
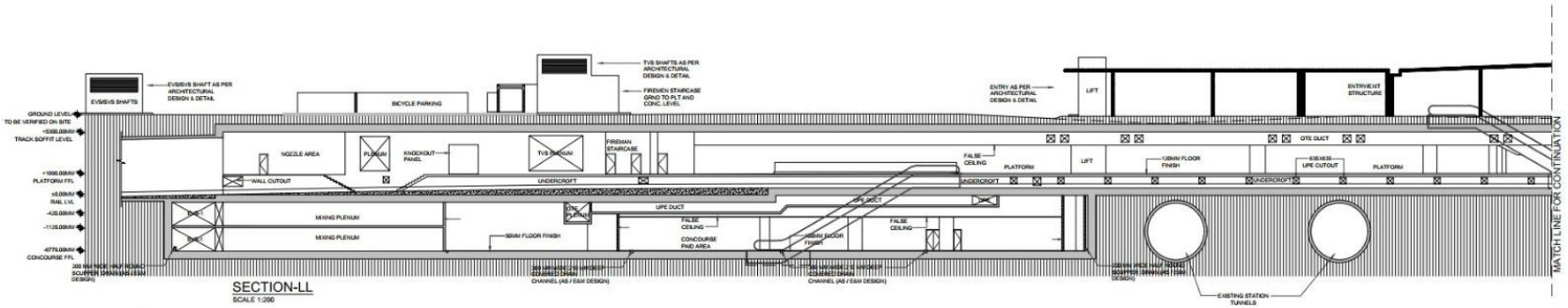
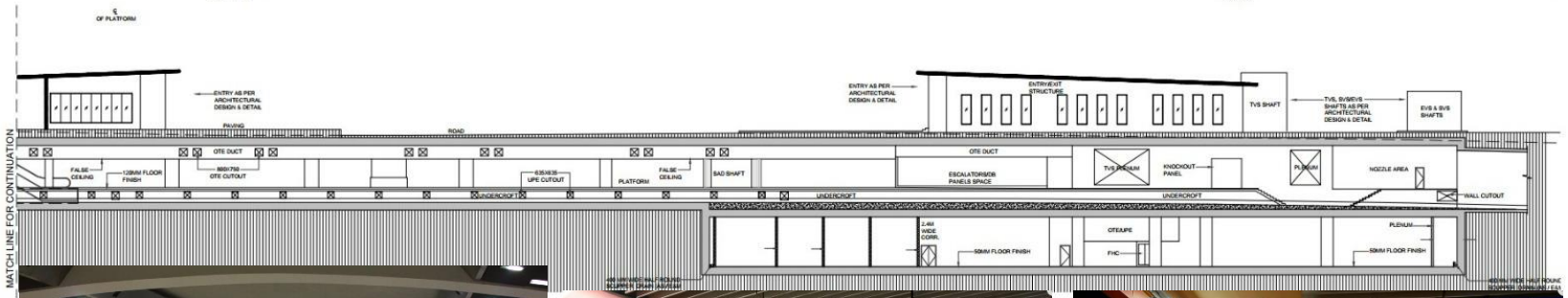
DESIGNING FOR RESILIENCE – BUILDING RESILIENT STRUCTURES – INA INTERCHANGE

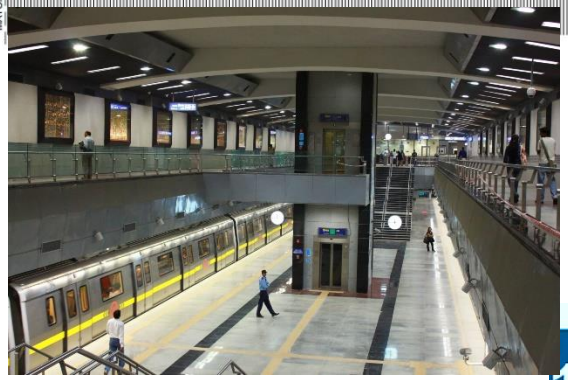


DESIGNING FOR RESILIENCE – BUILDING RESILIENT STRUCTURES – INA INTERCHANGE



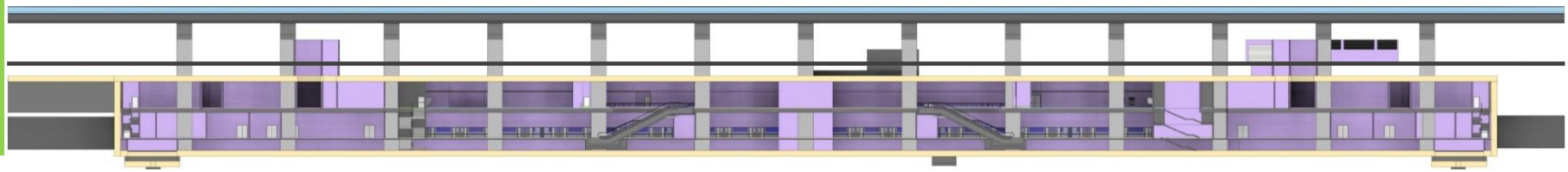




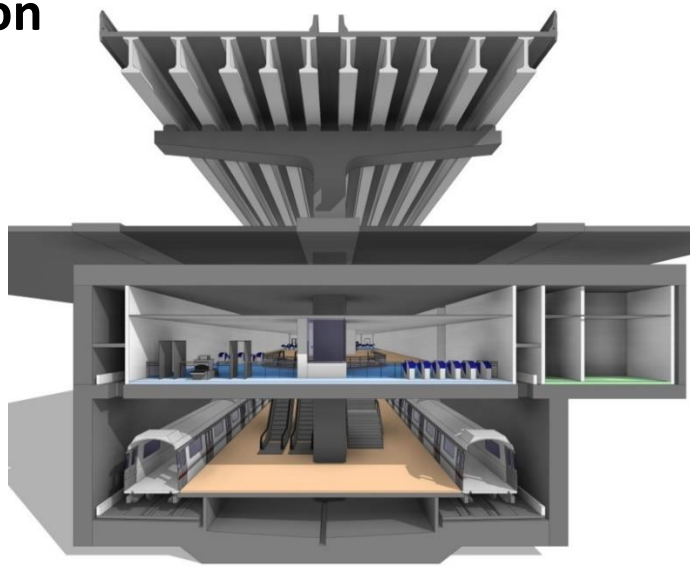


DESIGNING FOR RESILIENCE – BUILDING RESILIENT STRUCTURES – MAA ANADMAYEE MARG UNDERGROUND STATION

Elevated Road



Long Section



Cross Section

DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY – FIRE & LIFE SAFETY DESIGN

- PERFORMANCE BASED FIRE SAFETY DESIGN IS A MEASURE OF DISASTER RESILIENCE OF THE SYSTEM.
- PROVISIONS INCORPORATED IN NBC 2016 WITH FURTHER AMENDMENT ISSUED IN 2019.
- FURTHER DEVELOPMENT OF INDIAN CODES & GUIDELINES PERTAINING TO RAIL BASED SYSTEMS

DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY – FIRE & LIFE SAFETY DESIGN

FOR STATIONS –

- **PLANNING & DESIGN PROVISIONS WITH EMPHASIS ON MAKING THE STATIONS RESILIENT TO WITHSTAND FIRE EMERGENCIES.**
- **LIFE SAFETY** – OCCUPANCY, EGRESS, TRAVEL DISTANCE, COMPARTMENTATION, FIRE DETECTION, ALARMS ETC
- **FIRE FIGHTING** - HYDRANTS, SPRINKLERS, WATER TANKS

DESIGNING FOR RESILIENCE – BUILDING ABSORPTIVE CAPACITY – FIRE & LIFE SAFETY DESIGN

FOR TUNNELS –

- IMPROVEMENTS IN DESIGN OF TUNNELS & CROSS PASSAGES TO MAKE THEM SAFER FOR EVACUATION

THANK YOU

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