



Los Angeles County Metropolitan Transportation Authority

Metro Red Line Heavy Rail Line: Los Angeles - Wilshire
Corridor - Segment 1, 2A, 2B, 3 and
East Los Angeles Extension

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FAMILIARIZATION AND CHARACTERISTICS OF THE METRO RED LINE



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**FAMILIARIZATION
and
CHARACTERISTICS
of the
METRO RED LINE**

Produced by:
LACMTA
Red Line Rail Operations

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PURPOSE

The purpose of this manual is to familiarize Emergency Response Agency Personnel with operating characteristics and unique features of the Los Angeles County Metropolitan Transportation Authority's (LACMTA) Metro Red Line.

This manual will also provide a general overview of the Heavy Rail System, including explanations on the vehicle, traction power distribution system, mainline right-of-way and other important elements within the system.

OBJECTIVE

The objectives of this manual are threefold:

To generate common knowledge among personnel in Emergency Response Agencies, such as Law Enforcement, Fire and Paramedic Units, and to enhance their response with Rail Personnel, when emergency interaction between agencies is required.

To minimize potential danger to passengers and emergency response personnel.

To maximize the effectiveness of the responding agencies in emergency situations by increasing their knowledge of the Metro Red Line Rail System.

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HISTORY OF METRO RED LINE

The Metro Red Line is a Heavy Rail Transit System designed, built and operated by the Los Angeles County Metropolitan Transportation Authority (LACMTA) and financed by federal funding, Proposition A (1/2% sales tax) and two statewide tax measures for Public Transit.

The initial groundbreaking ceremony for the Red Line was held at 1st and Hill Sts. In 1986. The Metro Red Line commenced passenger operations on January 30, 1993 with the first segment consisting of five stations. Each segment is designed as Minimum Operating Segments (MOS), followed by the segment numbers. It is currently designed to be built in three segments, with plans for future east and west extensions.

The Metro Red Line has a bore configuration which is currently in place from Union Station, downtown Los Angeles to Wilshire and Wilshire Avenue in the Mid-town Wilshire district. Currently, there are eight passenger stations in the subway, with five additional stations to be opened by December 1998. The five new stations which are considered Segment-2B are Vermont/Beverly, Vermont/Santa Monica, Vermont/Sunset, Hollywood/Western and Hollywood/Vine.

Minimum Operating Segment-1 (MOS-1) begins at Union Station. It then turns southwesterly to 1st and Hill Street (Civic Center Station). From Civic Center, the line proceeds south under Hill Street to 5th Street, where it makes another stop at Pershing Square Station. Curving southwesterly again, it continues to the Metro Center Station under 7th and Flower Streets, where it connects with the Metro Blue Line. It then continues west on 7th Street under the Harbor Freeway, to Wilshire and Alvarado (MacArthur Park Station).

MOS-2A, continues westward beneath Wilshire Blvd. to Wilshire/Vermont Station. Departing Wilshire/Vermont Station the tracks branch out into two separate directions. MOS-2A continues westbound beneath Wilshire Blvd. to Wilshire/Normandie Station and Wilshire/Western Stations. This section of subway is considered the West Branch.

MOS-2B scheduled to open in December of 1998 will turn northward under Vermont Avenue from Wilshire/Vermont Station to Vermont/Beverly Station, Vermont/Santa Monica Station and Vermont/Sunset Stations. At this point the alignment turns west beneath Hollywood Blvd. to Hollywood/Western and Hollywood/Vine Stations.

The next segment, MOS-3 is actively under construction and is scheduled to open in the future. The alignment will continue under Hollywood Blvd. to Hollywood/Highland Station and turn north beneath the Hollywood Hills to Universal City Station and then to North Hollywood Station under Lankersheim and Chanler Blvds.

The Metro Red Line also interfaces with Metrolink trains at Union Station with transfer connections to Moorpark, Santa Clarita, San Bernardino, Riverside, Clairmont, Anaheim and San Fernando. In addition to Metrolink transfer points, at 7th/Metro Center, passengers can transfer southbound to Long Beach on the Metro Blue Line trains.

Current plans call for an extension of the east terminal at Union Station with an alignment to East Los Angeles. This project is considered The East Los Angeles Extension. It will be known as the East Branch. Excavation is scheduled to begin in April of 1997 with a completion date of 2006. The proposed stations would be Little Tokyo Station (3rd/Santa Fe Ave.), First Street/Boyle, Ceaser Chavez/Soto and First/Lorena Stations. This alignment has future plans to extend to Whittier Blvd/Atlantic Ave. adding three more stations; Whittier/Rowen, Whittier/Arizona and Whittier/Atlantic.

History indeed, will ultimately tell if were on the right track. The Metro Red Line project has been a difficult task during all its planning and construction. The contractors, consultants, engineers, and all the staff at the LACMTA involved in the construction of the Metro Red Line have been and are continuing to work hard in the building of a World Class Rail System without inconvenience to our riding public and the citizens of the County of Los Angeles. LACTMA is proud to provide the citizens of Los Angeles County with a safe, reliable and environmentally clean running alternate mode of transportation, bridging us into the 21st Century.

RAIL CENTRAL CONTROL FACILITY AND YARD CONTROL

RAIL CONTROL CENTER

The Rail Central Control Facility, staffed by Rail Transit Operations Supervisors, is the nerve center for Rail Operations. This facility is located at 2000 East Imperial Highway, in the city of Los Angeles. The facility operates 24 hours per day, 365 days per year. The Rail Controllers work closely with Law Enforcement, Rail Operations Supervisors, Train Operators, Closed Circuit T.V. Operators, Equipment Maintenance and Facilities Maintenance Personnel. In addition, contact with Bus Dispatchers and Bus Operators enhances Rail Operations. Radio and telephone communications link the Rail Controller with the personnel vital to Rail Operations.

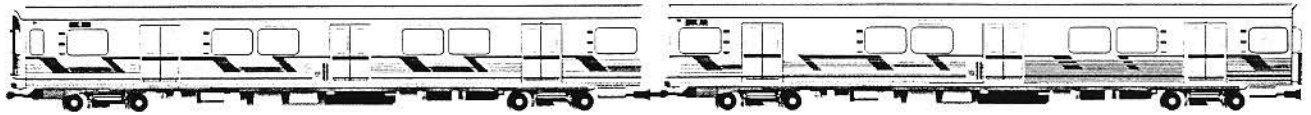
The Rail Controller is also able to monitor a variety of critical functions vital to the system by means of Transit Automatic Control and SCADA (TRACS).

Some of the functions that are monitored by TRACS are:

- Traction Power and related facilities
- Train Control and Communication Buildings
- Track Circuitry
- Passenger Stations
- Building Intrusion Detection
- Fire Detection at vital facilities
- Radio Communication Systems
- Station Ticket Vending Machines
- Gas Monitoring and Ventilation

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RAIL VEHICLE CHARACTERISTICS

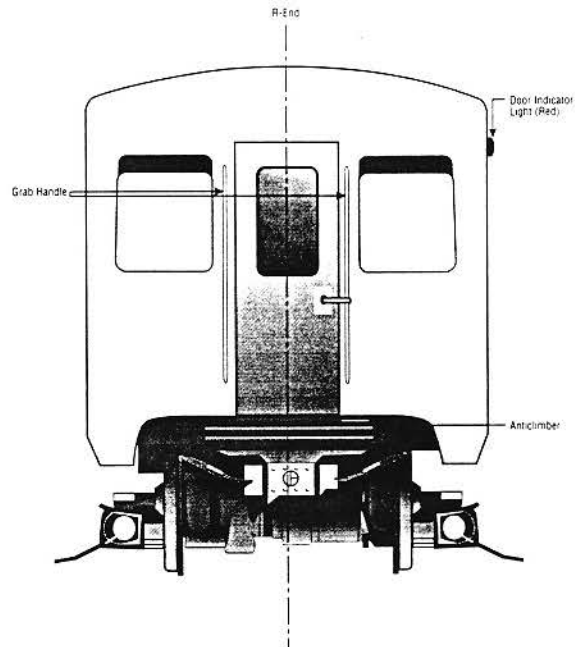
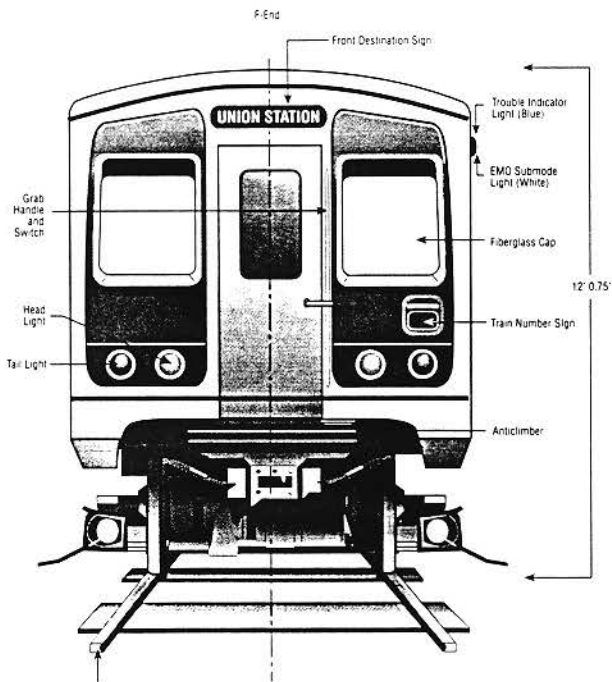
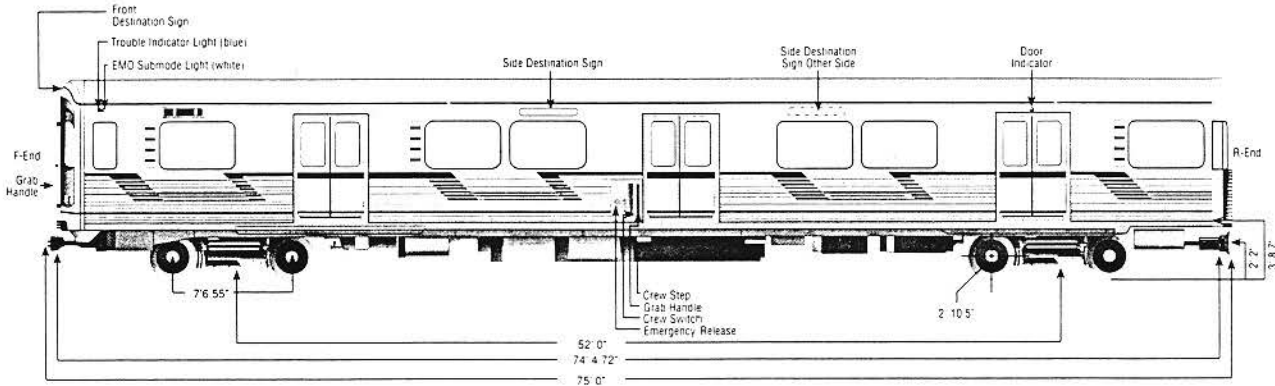


CONSTRUCTION:	Stainless steel fastened by welding of flush riveting end underframe. Fiberglass reinforced plastic outer shell at cab end.
SUPPLIER/ MANUFACTURER:	Breda Costruzioni Ferroviarie Societa per Azioni Italy.
PROPULSION:	Four traction motors per car operated from 750 VDC.
BRAKING:	Pneumatically actuated friction brakes at each wheel. Dynamic regenerative braking through propulsion system. Hand operated mechanical parking brake.
CAR CONFIG.:	One A car and one B car, minimum operating vehicle. Six car consist, maximum.
CAR LENGTH:	75 feet.
CAR WIDTH:	10 feet, 4 inches.
CAR HEIGHT:	12 feet, 7 inches.
CAR WEIGHT:	80,000 pounds.
WHEEL DIAMETER:	34.5 inches.
SEATED LOAD:	59 passengers, (1 wheel chair space.)
STANDING/SEATED:	169 Passengers (220 crushload).
MAXIMUM SPEED:	70 miles per hour.
MAXIMUM ACCELERATION:	3 miles per hour per second.
FULL SERVICE BRAKING:	3 miles per hour per second.
EMERGENCY BRAKING:	4.2 miles per hour per second.
ELECTRICAL POWER REQUIREMENTS:	750 VDC nominal supplied from contact rail. Used for traction motors, converter, air compressor, heating elements, air conditioning, evaporator and condenser.
NUMBER ORDERED:	30 (Segment 1) = 15 married pair.

NOTE: 74 Rail Vehicles manufactured by Breda Costruzioni Ferroviarie have been ordered and delivery of the first pair of vehicles was in September 1996. 30 vehicles are scheduled for delivery for MOS-2B, 30 for MOS-3 and 14 vehicles for the East Los Angeles Extension.

CAR EXTERIOR

The passenger vehicles operating on the Metro Red Line are built by Breda Construzioni Ferroziarie of Italy. These cars operate as dependent pairs and are assembled so that a cab is placed at each end of a pair to enable bi-directional travel. The Operators cab is equipped with all the controls and indicators needed for one person to operate a multi-car train. Panels and doors separate the cab from the passenger compartments. There are two trucks per car. Truck assemblies support the vehicle and contain vital parts such as the wheels, axles, traction (electrical) motors, gear boxes and friction brakes.

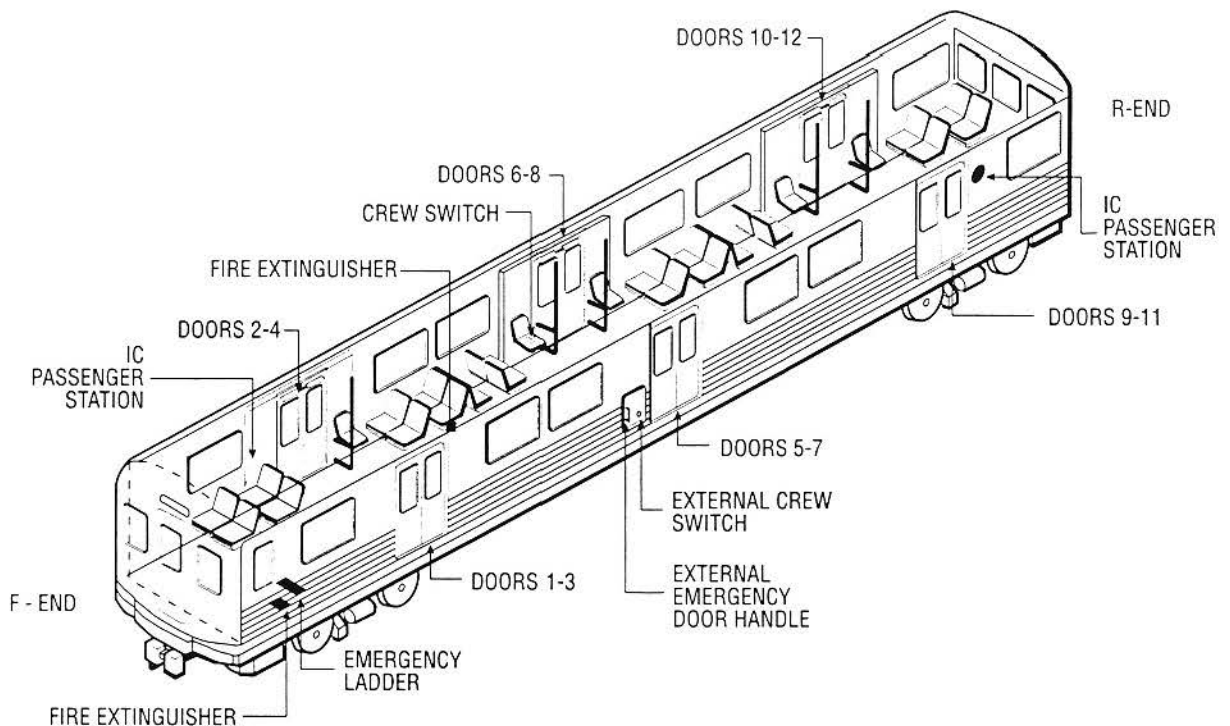


CAR INTERIOR

Each car seats 59 passengers, along with one wheelchair space, but can accommodate 220 passengers in a standing "crush load". The cars are designed with end doors between them, thus allowing movement by passengers from one car to the other, only during emergencies. Most of the seats are arranged to accommodate two passengers in a transverse arrangement. Fluorescent light fixtures are installed in the passenger compartment to provide illumination of the passenger entrances and seating areas. The lights are automatically activated when the train is energized with auxiliary power.

Each car is equipped with two (2) 10 pound (4.5KG) Foray multi-purpose dry chemical fire extinguishers. These extinguishers, classified at 10-A,60-BC, are located in each cab behind the Operator's seat and one between the transverse arrangement in the passenger seats.

There are two (2) Passenger Intercoms (IC) push button controls per car for emergency communication with the Train Operator. These controls illuminate when a passenger depresses the push button on the intercom unit.



WINDOWS

A dependant pair contains 24 glazing glass passenger windows which provide passenger viewing and cannot be opened. Ventilation for the passengers and operators' cab is provided by an air conditioning system.

DOORS

There are six (6) double-sliding doors on each side of a dependant pair. Door operation is controlled from the operating cab and allows the Operator to open all doors on either or both sides of the train.

BATTERY

The batteries are Nickel Cadmium and located in the "B" car. The car battery supplies 37.5 VDC to the interior lighting system, doors and the air conditioning system in the event of loss of traction power.

EMERGENCY DOOR OPERATION

All doors may be manually opened in an emergency from inside the car by pulling downward on the inside emergency Red Ball located just above each set of doors. Once the handle is pulled down, the air to the door is released and the doors can be manually separated. When activated, the train comes to a complete stop. (See illustration on page 15.)

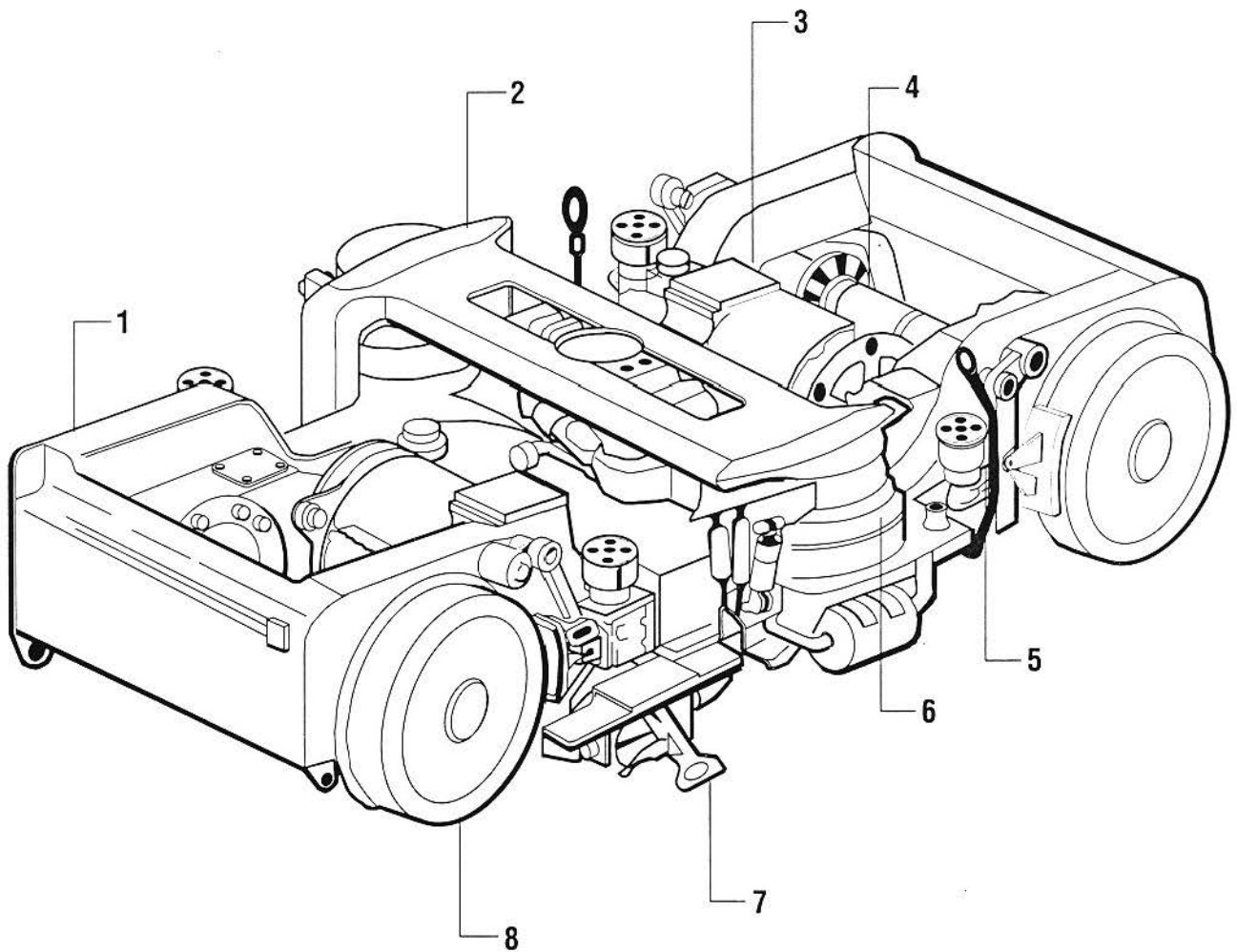
For personnel outside the vehicle of a dependant pair, entry can be gained by use of four (4) doors that may be opened from the outside of the train. These small access doors are located on each side of a car at the center section adjacent to the passengers doors #5 & 7 and #6 & 8. This access can be achieved with the External Crew Switch, which requires a barrel key. The other, is by the use of the External Emergency Door Handle, which must be pulled to release the air. After waiting 5 seconds, the doors may be manually separated.

If entry into the Operating Cab of either end of the dependant pair of a train is required, a barrel key is necessary to unlock the "F" end doors.

BRAKES

There are two types of brakes on each vehicle: dynamic and friction brakes. Normal braking is a combination of dynamic and friction brakes referred to as blended braking. Dynamic braking is the primary braking system in which electric current, derived from the motors, acts as a generator and provided controlled braking.

Full service braking is the maximum braking that can be obtained without going into an emergency stop condition. Emergency braking is the maximum braking that can be obtained, but once activated cannot be released until the train has come to a complete stop and required associated actions are initiated.

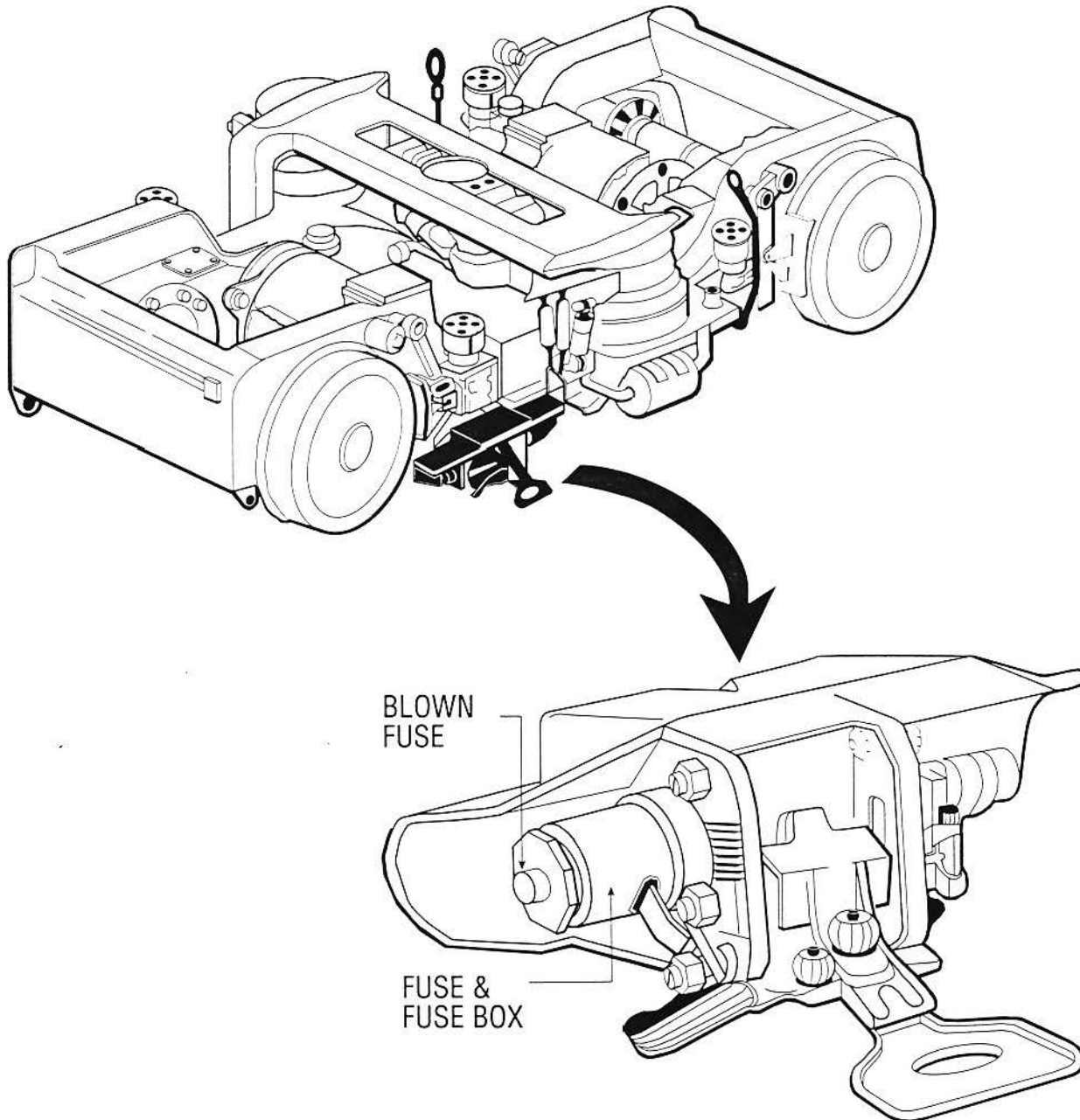


1. Frame Assembly
2. Bolster Beam
3. Motor Gear Unit
4. Primary Suspension

5. Shoe Brake
6. Air Bag
7. Current Collector
8. Wheel Set

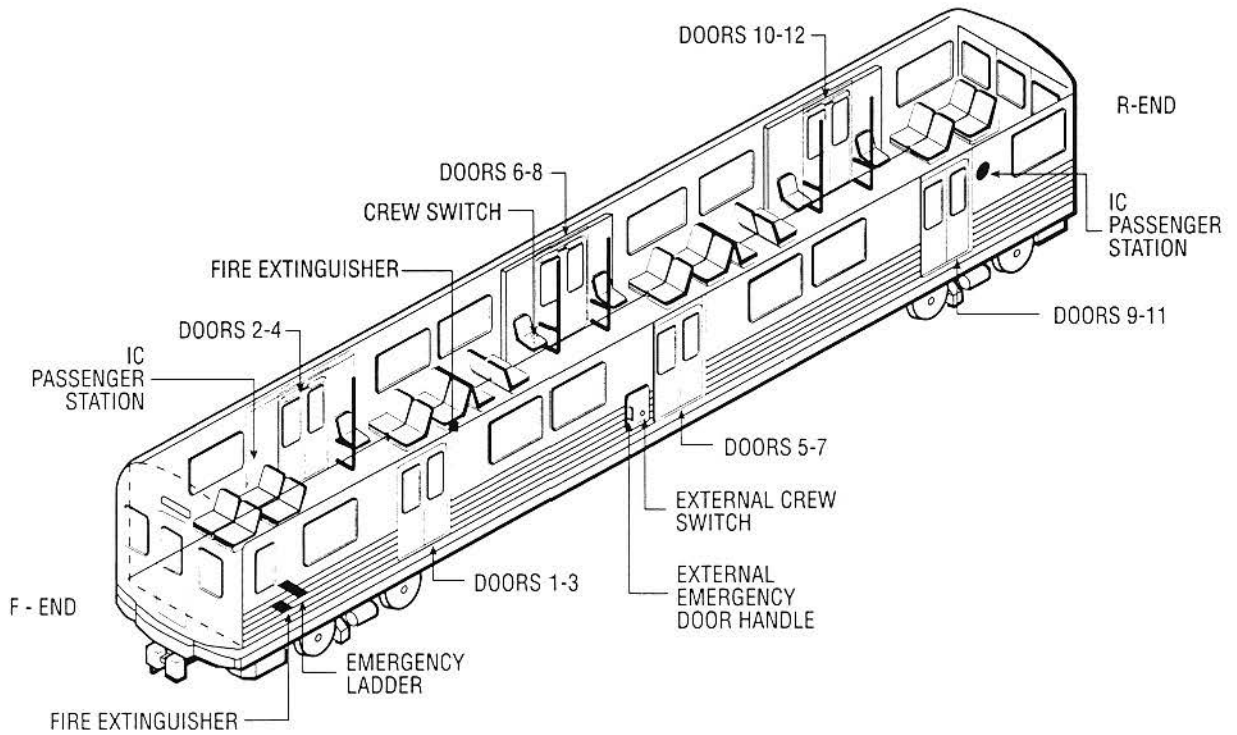
CONTACT RAIL SYSTEM-COLLECTOR SHOE

The Contact Rail system is where the electrical conductor (rail adjacent to running rail) provides the 750 VDC direct current to the vehicle through contact with the current collector shoes on the vehicles trucks. The collector shoe is that part of the current collector assembly that slides along the electrified contact rail to conduct primary power to the vehicle, and return regenerative braking power from the vehicle to the contact rail. There are four (4) collector shoes on each car. When one collector shoe is energized by making contact with the contact rail, all collector shoes are energized.

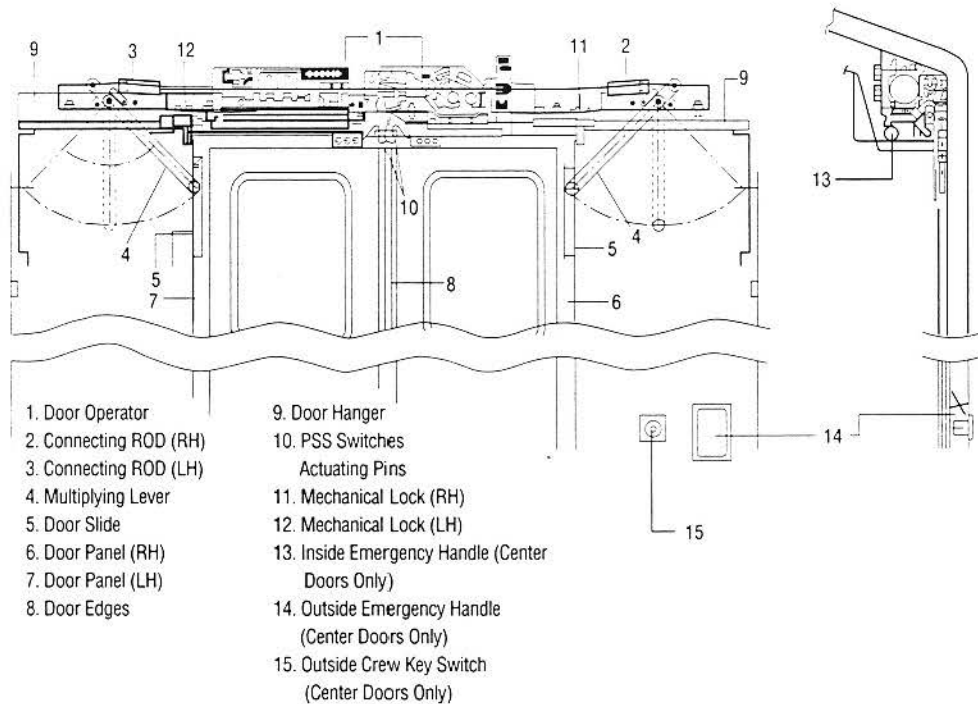


ILLUSTRATIONS OF EMERGENCY DOOR ENTRY

OUTSIDE



INSIDE



MAINLINE CHARACTERISTICS

CAB SIGNALS

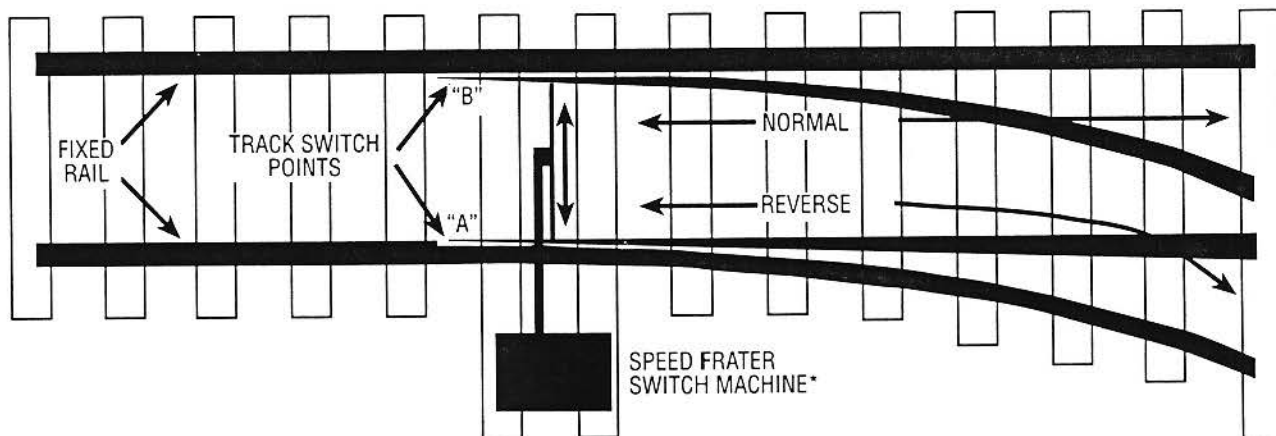
Cab Signals primary functions are to maintain safe distance between trains to ensure separation of all trains in the system. The Automatic Train Protection System, (ATP), assures train detection, separation and speed regulation. ATP also includes train speeds and provides precise station stopping and train berthing verification under Automatic Train Operation.. By controlling train speeds, separation distance is maintained. Should one train attempt to overtake another and reduce the separation, the Cab Signal System will impose a lower speed, or STOP signal to the offending vehicle to restore the distance.

Speed commands are transmitted to the train through the track rails and picked up by receiver coils mounted under the operating cab of each train. The Train Operator must respond by braking to the displayed speed on the train Operating Console.

Should the Train Operator fail to respond to the speed commands received by the (ATP), an over-speed situation develops and the train will automatically be stopped.

TRACK SWITCHES

The Metro Red Line contains remote controlled track switches which are used to move a train from one track to another. These same switches can also be manually operated. Remote switches in Cab Signal Territory can move at anytime, in any direction. Always stand clear of all track switches. The illustration below shows points to be avoided on switches.



NOTE: Tampering with track switches is prohibited and could potentially cause an accident and/or derailment.

MILEMARKERS

For ease of identification and as a specific reference point, mile post markers are used between eastern and western terminals and are marked not to exceed distances more than a 10th of a mile.

CROSSPASSAGES AND EMERGENCY EXITS

In the event of any possible tunnel evacuation, there are various crosspassages strategically located throughout the tunnel. These crosspassages are used for the transfer of passengers from one bore to another. From west of Westlake Station, some crosspassages are designated as emergency exits to street level.

All crosspassages include a Blue Light Station. At these stations there is a Emergency Trip Station (ETS) box for the purpose of de-energizing a section of track. The ETS box includes an Emergency telephone (ETEL) and Fire Department telephone (FTEL).

At each station, there are emergency exits for the purpose of station evacuation. Emergency exits can be accessed from track level, platform level, mezzanine and ancillary levels.

CROSSPASSAGES AND EMERGENCY EXITS

There are green and red emergency exits signs throughout the subway system. GREEN exit signs are locations on the Mainline that identify emergency exits leading to street level. RED exit signs are located on the Mainline that identify emergency exits that does not lead to the street level. (One track to another)

EMERGENCY WALKWAYS

In an emergency, passengers will always exit according to the instructions received from the Train Operator. There is a designated walkway area through out the Red Line system on both bores of the tunnel to allow emergency personnel access to equipment and trains, and to off-load passengers in cases of extreme emergencies.

SPECIAL NOTE: *Because trains rely on unobstructed tracks to operate, it is essential to maintain at least one clear track whenever there is an accident or incident which requires response and subsequent investigation by local Emergency Response Agencies. It is for this reason that Metro Red Line Rail Operations Supervisor will request at least one track to be opened/cleared when an accident or incident occurs.*

ACCESS TO RIGHT OF WAY (R.O.W.)

In the event access to the R.O.W. is required in an emergency and entry from platform areas is not practical, emergency personnel have three other options:

1. Ride a train from the opposite direction.
2. Make entry from Emergency Exits and Crosspassages at several locations.
3. Make entry from the Portal or adjacent station platforms.

STREET LEVEL EMERGENCY EXITS

STATIONS	HATCHES
UNION STATION	4
CIVIC CENTER STATION	3
PERSHING SQUARE	4
METRO CENTER	13
WESTLAKE STATION	4
MID-TUNNEL (BET. POCKET & VERMONT) WILSHIRE BLVD./PARKVIEW	1
WILSHIRE BLVD./COMMONWEALTH	1
VERMONT STATION	11
MID-TUNNEL (BET. VERMONT & NORMANDIE) 6TH STREET/BERENDO	1
WILSHIRE BLVD./KENMORE	1
NORMANDIE STATION	5
WESTERN STATION	6
MID-TUNNEL BET. WILSHIRE/VERMONT & VERMONT/BEVERLY 5TH STREET/NEW HAMPSHIRE	1
VERMONT AVE./3RD STREET	1
VERMONT/BEVERLY	7
VERMONT/SANTA MONICA	6
VERMONT/SUNSET	5
HOLLYWOOD/WESTERN	8
HOLLYWOOD/VINE	9

TRACTION POWER SUBSTATIONS

CHARACTERISTICS OF TRACTION POWER

Electrical power for the Metro Red Line is supplied by standard high-voltage AC power service from the City of Los Angeles Department of Water and Power (DWP). There are also two (2) specialized emergency back-up supply units available from diesel generators installed in the Main Yard and at Vermont Station currently maintained by LACMTA traction power personnel.

The standard DWP supply configuration consists of two 34.5 kv feeders distributed from separate buses of a receiving power station. This "dual feed" arrangement ensures that the probability of service interruption due to DWP line or switchgear problems is quite low.

Two DWP feeds enter the Metro Red Line property at each Red Line traction power substation location. A DWP controlled transfer switch selects between the feeds, supplying only one service to each substation at any instant.

In the consideration of the possibility of a catastrophic failure of DWP supply, a third feeder is provided to each traction power substation. This feeder originates from a stationary diesel-engine generator in the Main Yard and at Vermont station and is connected to selected tunnel ventilation fans via a track area conduit and a special bus in each substation. The purpose of this supply is solely to prevent a dangerous accumulation of explosive gas in the tunnel during a lengthy DWP outage.

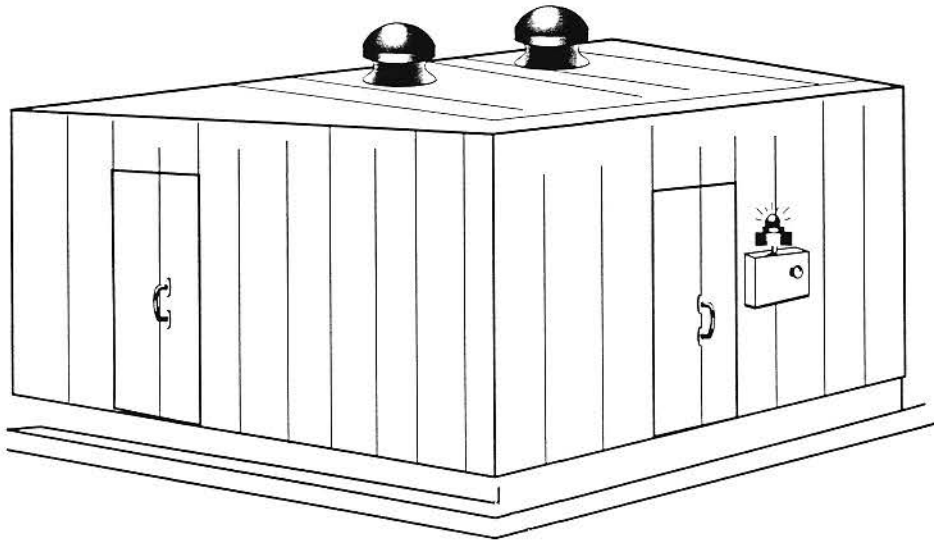
The electrical power system furnishes power to operate passenger vehicles (traction power), passenger station equipment, and other Red Line facilities. The traction power portion of the system is monitored through TRACS and supervised and controlled by Rail Controllers at the Rail Central Control Facility.

A total of (15) substations are included as part of the Red Line system in segments 1, 2A and 2B, one at each passenger station along the mainline and two in the yard for yard operations and Main Shop Bldg. The thirteen substations along the mainline are located underground in station ancillary areas and require forced-air ventilation for temperature control.

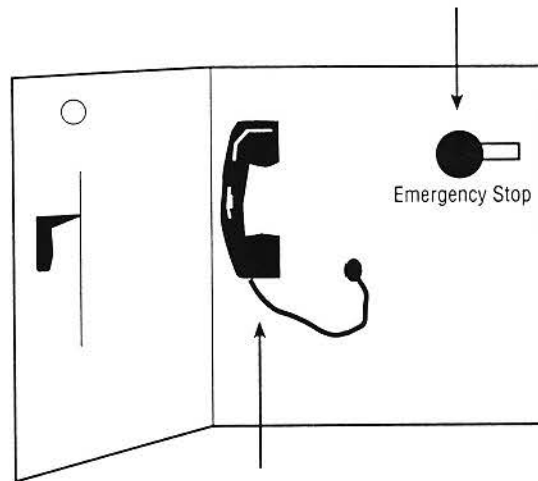
Note: TRACTION POWER SUBSTATIONS SHOULD ALWAYS BE CONSIDERED ENERGIZED WITH HIGH VOLTAGE POWER AT ALL TIMES!!! TYPICAL TRACTION POWER BUILDING

TYPICAL TRACTION POWER BUILDING

Blue Light ETS Indicator



EMERGENCY STOP BUTTON



IN-HOUSE PHONE

DIRECT DIAL TO
CENTRAL CONTROL FACILITY 3-5290

TRACTION POWER SUBSTATION (TPSS)

BUILDING ADDRESSES

The following listing, on file with the City of Los Angeles, contains the permanent addresses assigned to Metro Rail Red Line, Segment 1, 2A and 2B Substations/TPSS.

#1	320 South Santa Fe Av. (Two TPSS) Power Source: DWP	Los Angeles
#2	Union Station 801 Vignes Street Power Source: DWP	Los Angeles
#3	Civic Center 101 South Hill Street Power Source: DWP	Los Angeles
#4	Pershing 500 South Hill Street Power Source: DWP	Los Angeles
#5	7th/Metro Center 739 West 7th Street Power Source: DWP	Los Angeles
#6	Wilshire/Alvarado 660 South Alvarado Power Source: DWP	Los Angeles
#7	Wilshire/Vermont 3191 Wilshire Boulevard Power Source: DWP	Los Angeles
#8	Wilshire/Normandie 3510 Wilshire Boulevard Power Source: DWP	Los Angeles
#9	Wilshire/Western 3775 Wilshire Boulevard Power Source: DWP	Los Angeles
#10	Vermont/Beverly 301 North Vermont Avenue Power Source: DWP	Los Angeles
#11	Vermont/Santa Monica 1015 North Vermont Avenue Power Source: DWP	Los Angeles
#12	Vermont/Sunset 1500 North Vermont Avenue Power Source: DWP	Los Angeles
#13	Hollywood/Western 5450 Hollywood Boulevard Power Source: DWP	Los Angeles
#14	Hollywood/Vine 6250 Hollywood Boulevard Power Source: DWP	Los Angeles

FUTURE METRO RED LINE SUBSTATIONS

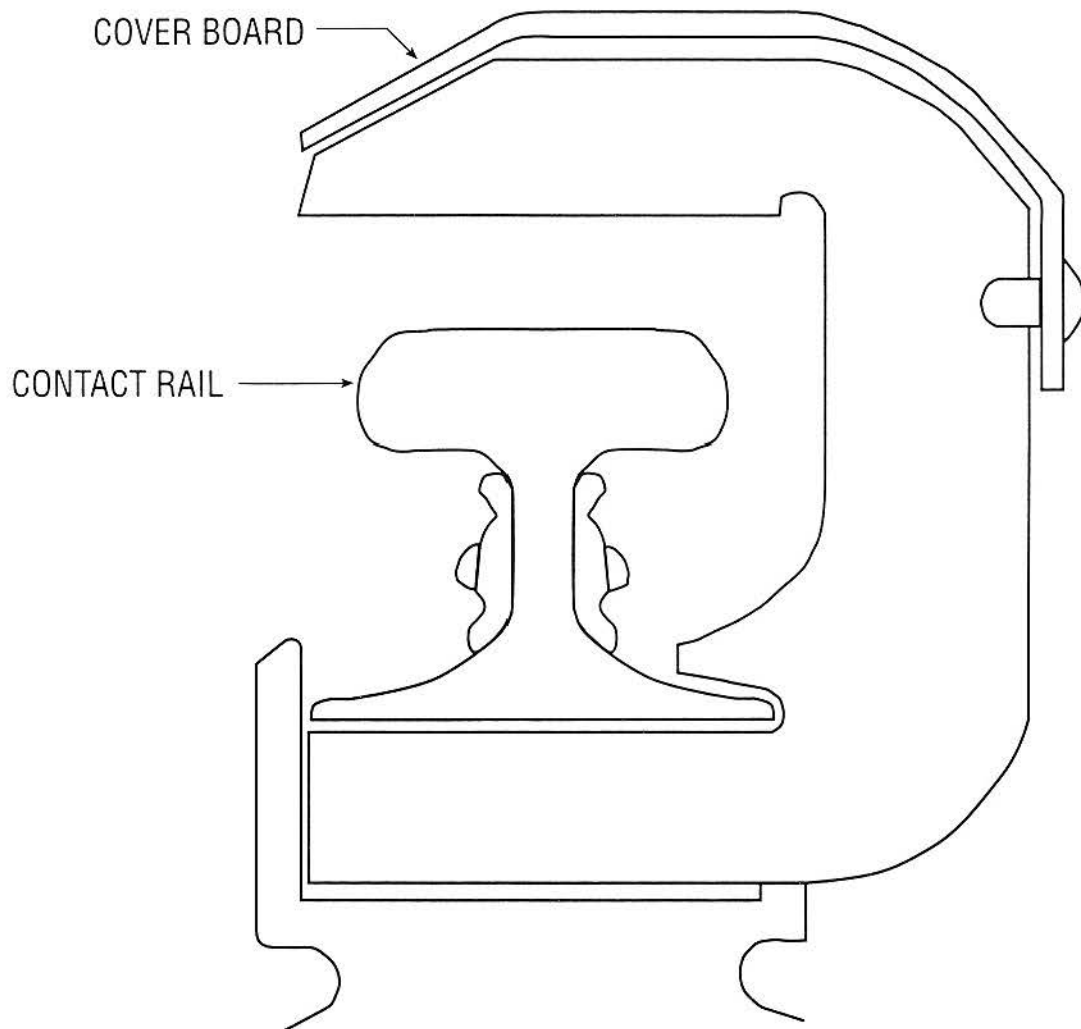
#15	Hollywood/Highland TBD Power Source: DWP	TBD
#16	Universal City Station TBD Power Source: DWP	TBD
#17	North Hollywood Station TBD Power Source: DWP	TBD
#18	Little Tokyo Station TBD Power Source: DWP	TBD
#19	First/Boyle TBD Power Source: DWP	TBD
#20	Chavez/Soto TBD Power Source: DWP	TBD
#21	First/Lorena TBD Power Source: DWP	TBD

The list of addresses has been filed with the Fire/Life Safety Committee and will be used to expedite emergency responses.

CONTACT RAIL SYSTEM

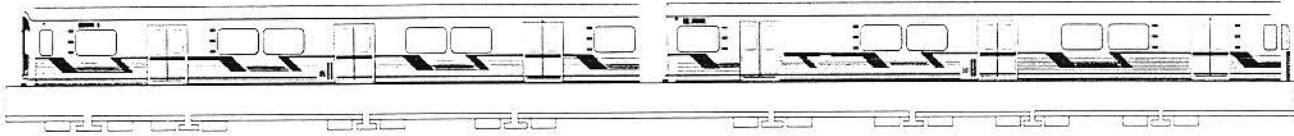
The Contact Rail system contains several interdependent components called the Contact Rail, Contact Rail Cover Board. (See illustration below).

At no time shall any object or person come within 10' of the Contact Rail System without prior authorization from the Proper Authority.



Note: THE ENTIRE CONTACT RAIL SYSTEM SHOULD BE CONSIDERED ENERGIZED WITH HIGH VOLTAGE AT ALL TIMES.

CONTACT RAIL SYSTEM (CONT.)



GAP SECTION - A BREAK OR DISTANCE BETWEEN CONTACT RAIL SECTION, WHICH CAN BE BRIDGED BY THE COLLECTOR SHOES OF THE LEAD AND REAR TRUCK OF A CAR.



NOTE: *Non-Bridgeable Gaps in the contact rail longer than the distance between the front and rear collector shoes, (52ft), on the trucks of a single passenger vehicle. This gap causes interrupted traction power to the vehicle for continued rail vehicle movement.*

STATION CHARACTERISTICS

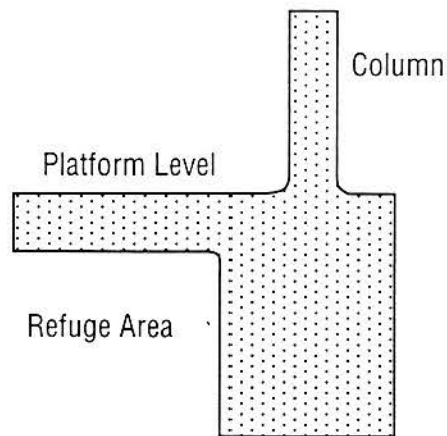
Upon completion of MOS-2B, there will be a total of thirteen (13) passenger stations in operation on the METRO RED LINE. The completion of MOS-3 will bring the amount of stations to sixteen (16). Future plans include an expansion of the system and calls for added stations, to be specified later.

Station characteristics: Two levels, Mezzanine Level and the Platform Level.

- * Provide transit connections, at the 7th/Metro Center for connection to the Blue Line.
- * Serve major sources of ridership.

Escalators, stairs, and elevators will provide normal vertical circulation between surface, mezzanine, and platform levels of Red Line stations. Stations are equipped for both attended and unattended operation.

If someone should become trapped on the Right-of-Way at station locations, there is a refuge area directly under the platform overhang.



Sideview of Platform

Each of the stations have Fire Department Standpipe Connections located at each end of the platform, near the emergency exit stairways. In addition, most platforms have a standpipe located in the center of the platform, with some stations having two platform level standpipes.

If an emergency at a station should occur and evacuation is required, patrons may exit at stairways to street level or parking lot levels. In addition, emergency exits are located at each end of the platform, which will allow the patrons to exit the platform to street level.

There are fifteen crosspassages in MOS-1, none of which exit to street level. In MOS-2A, there are seven crosspassages located at approximately 750' intervals between Station. These crosspassages access the adjacent tunnel and are utilized to assist passengers in train evacuation involving Fire, Smoke or Gas emergencies. Four of these crosspassages also exit to street level. The diagram on page 30 specifies emergency exit locations at MOS-2A Stations, crosspassages and their street exit locations.

In MOS-2B, there are nineteen (19) crosspassages, two (2) of which exit to street level. These are crosspassages #18 and #19. (See Vermont/Hollywood Corridor diagram).

In MOS-3, there will be thirty-four (34) additional crosspassages not including four mid-tunnel shafts identified as La Brea Access Shaft, Track Level Rooms, North Access SHaft and Min-Vent Shaft. (See Hollywood Corridor diagram).

With the opening of Segments 1, 2A, 2B and 3, there will be a total of ninety-one (91) crosspassages with various street level access/egress locations.

In addition, exit signs at stations and at crosspassages that do not exit to street access will be RED in color. Exit signs that exit to street level will be GREEN in color. This exit sign color coding system, is a recent change in policy and the existing Red Line System has been modified for adaptation.

Most stations have auxiliary rooms located in different locations which house electrical equipment which may include elevator/escalator system wiring and apparatus, signaling circuitry and traction power sources.

The Metro Red Line is designed to handle a maximum train length of six cars (three dependent pairs). AT this point and time, four car trains (two dependent pairs) will operate during all service periods. While the projected volume of passengers does not warrant a four car consist during all peak service periods, a two car train (one dependent pair) will be operated in off-peak hours.

When MOS-3 is completed, six-car trains are scheduled to operate alternately from both the West Branch and from North Hollywood Station to Union Station.

Station amenities will include benches. Each station will have public telephones, passenger assistance intercoms, (P-Tels) and Emergency Intercoms, (E-Tels) direct to the CCTV monitors at the Rail Central Center.

At the completion of SEG-2B, crossovers will be used at Union Station, Wilshire/Western Station (West Branch) and Hollywood/Vine Station as a means of a train turn-back. When SEG-3 is completed, train turn-backs on the main corridor will be controlled at the North Hollywood Station. In addition, upon completion of the East Los Angeles Extension, train turn-backs will be made at the First/Lorena Station.

If an abnormal operating condition is expected to interrupt Red Line service for an extended period of time, alternative bus service may be instituted. The Rail Controller will coordinate this action, called a "Bus Bridge," with the Bus Operation Control Center.

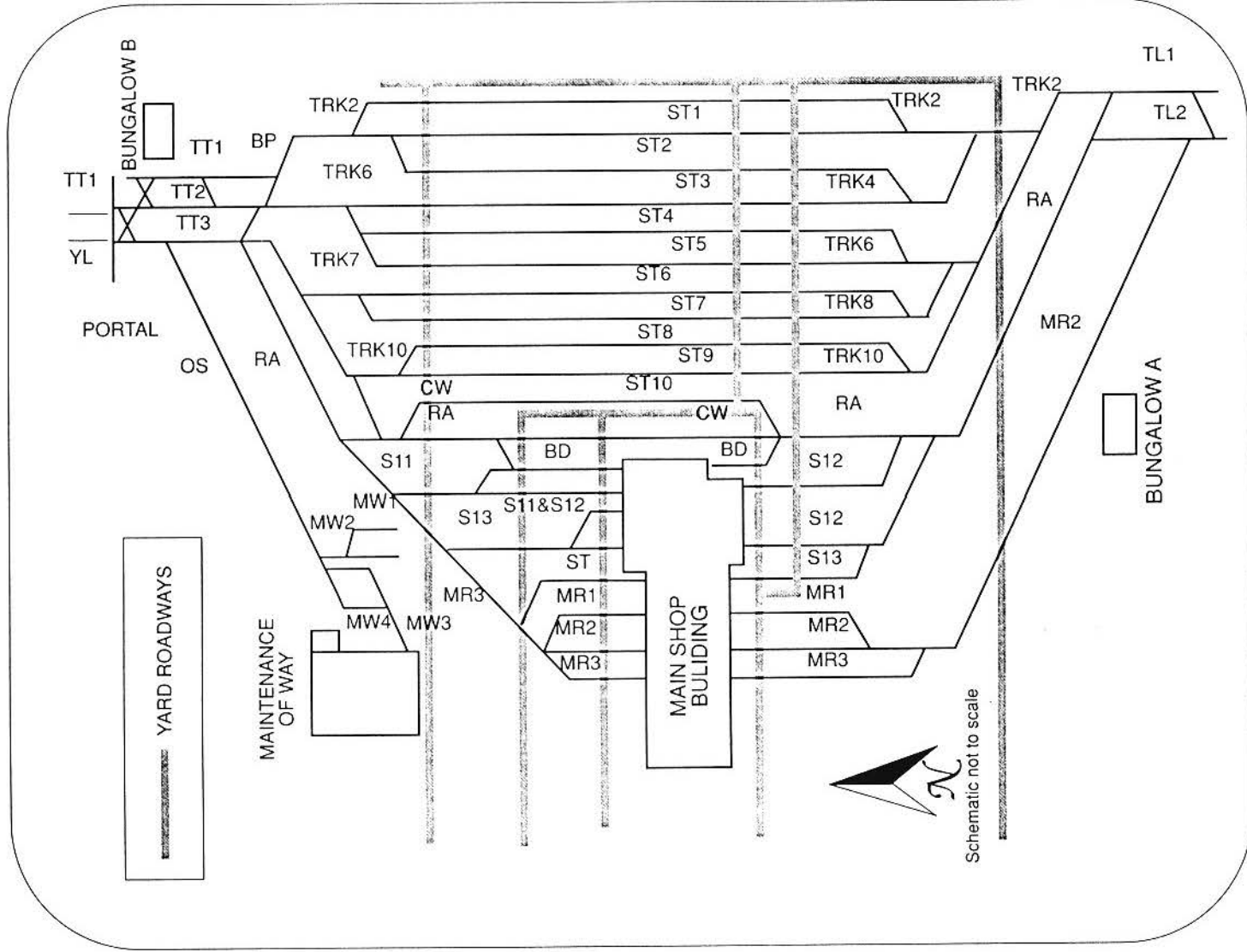
Some stations have adjacent parking facilities, Kiss and Ride areas, and/or bus pull-in areas to accommodate patrons arriving by automobile or by bus.

Restroom facilities are not provided, for security purposes.

Stations and associated equipment have been designed to function without a station agent on duty. Any necessary control of the station and/or contact with patrons will be accomplished by using closed circuit television (CCTV), public address equipment and other electronic monitoring systems.

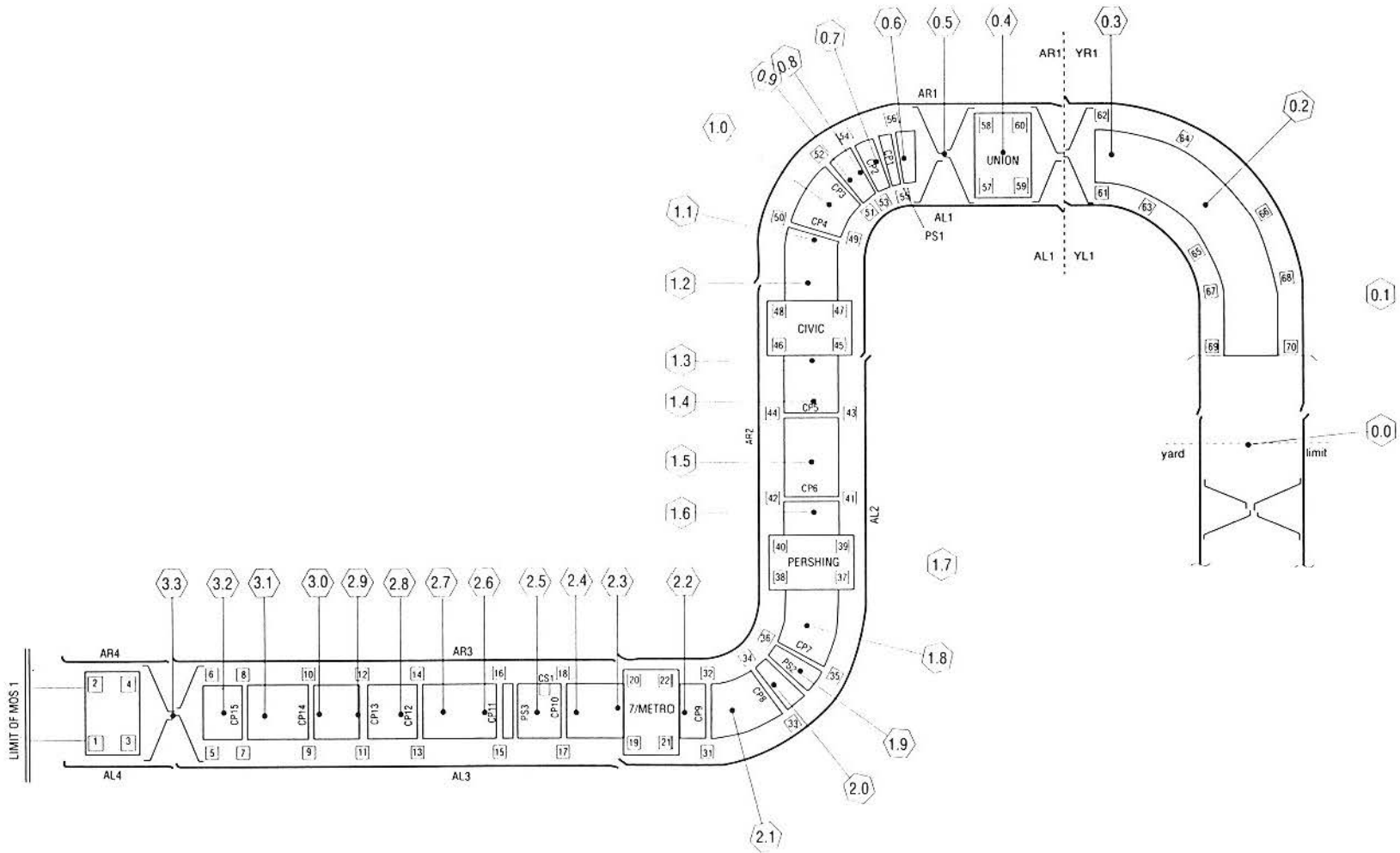
Station facilities are equipped with a Public Address (PA) subsystem, for announcements to stations, vehicles, ancillary rooms, the Rail Control Center and the Main Yard. The PA subsystem can be controlled from the Rail Control Center, Emergency Management Panels (EMP), located at each station, command posts, at each station, and from the Main Yard.

As the system expands, it becomes more complex. Knowing and understanding the underground tunneling system is vital to all emergency response agencies. Therefore, it is imperative that you familiarize yourself with as many components necessary to be proficient during emergency response procedures. This will insure the best possible response time necessary during any emergency.



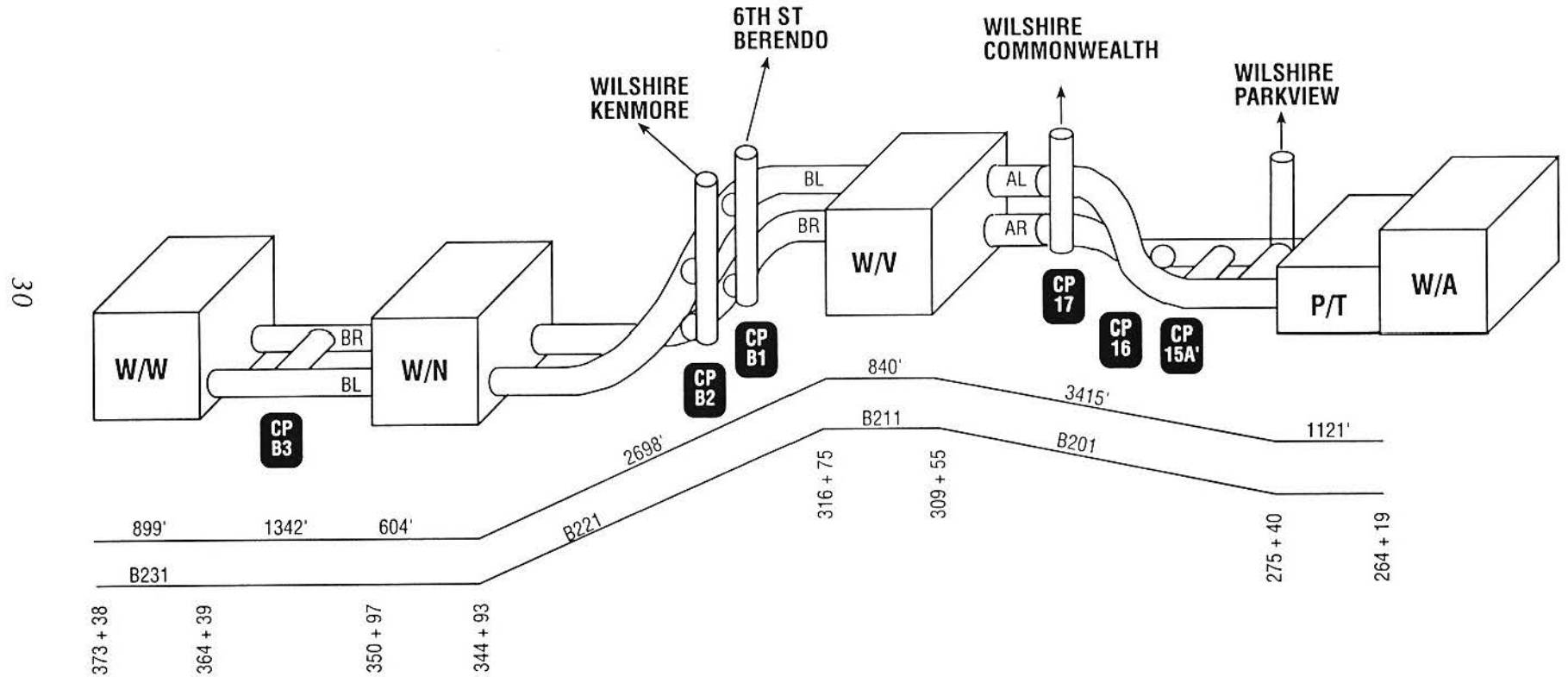
RED LINE YARD SCHEMATIC

SEGMENT 1 MAIN LINE: CROSS PASSAGE, ETS & MILE MARKERS

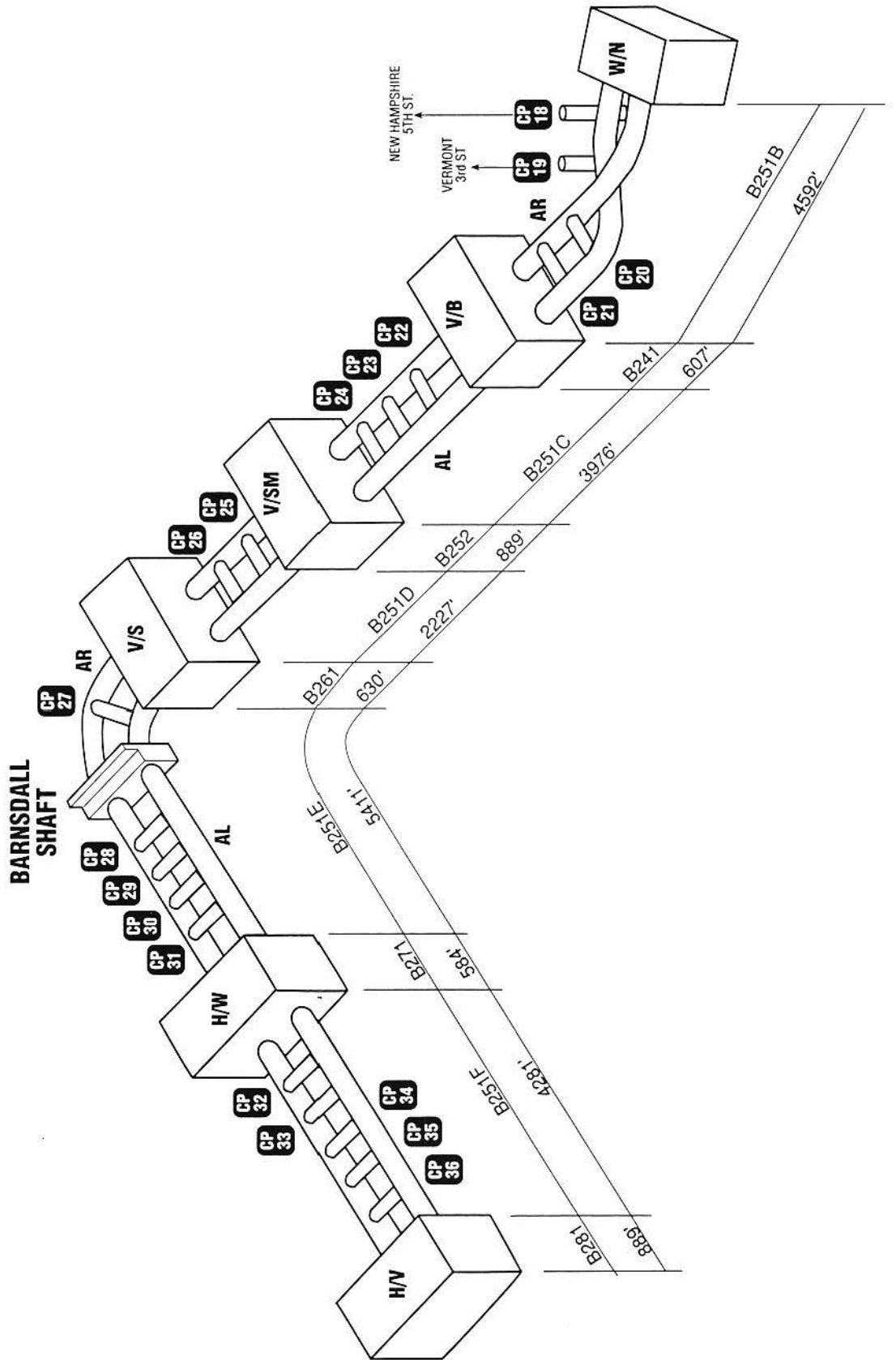


SEGMENT - 2A

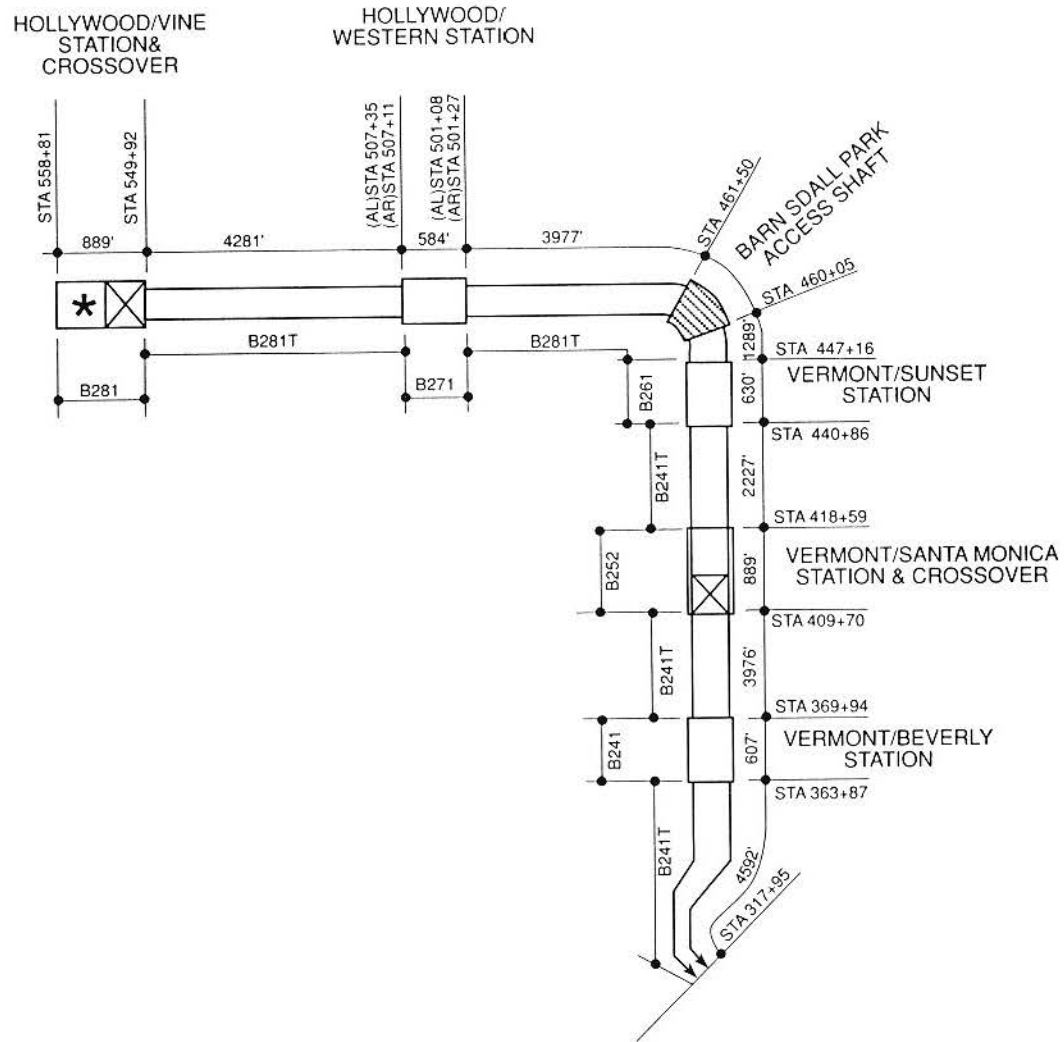
WILSHIRE CORRIDOR STATION & TUNNEL CONFIGURATION



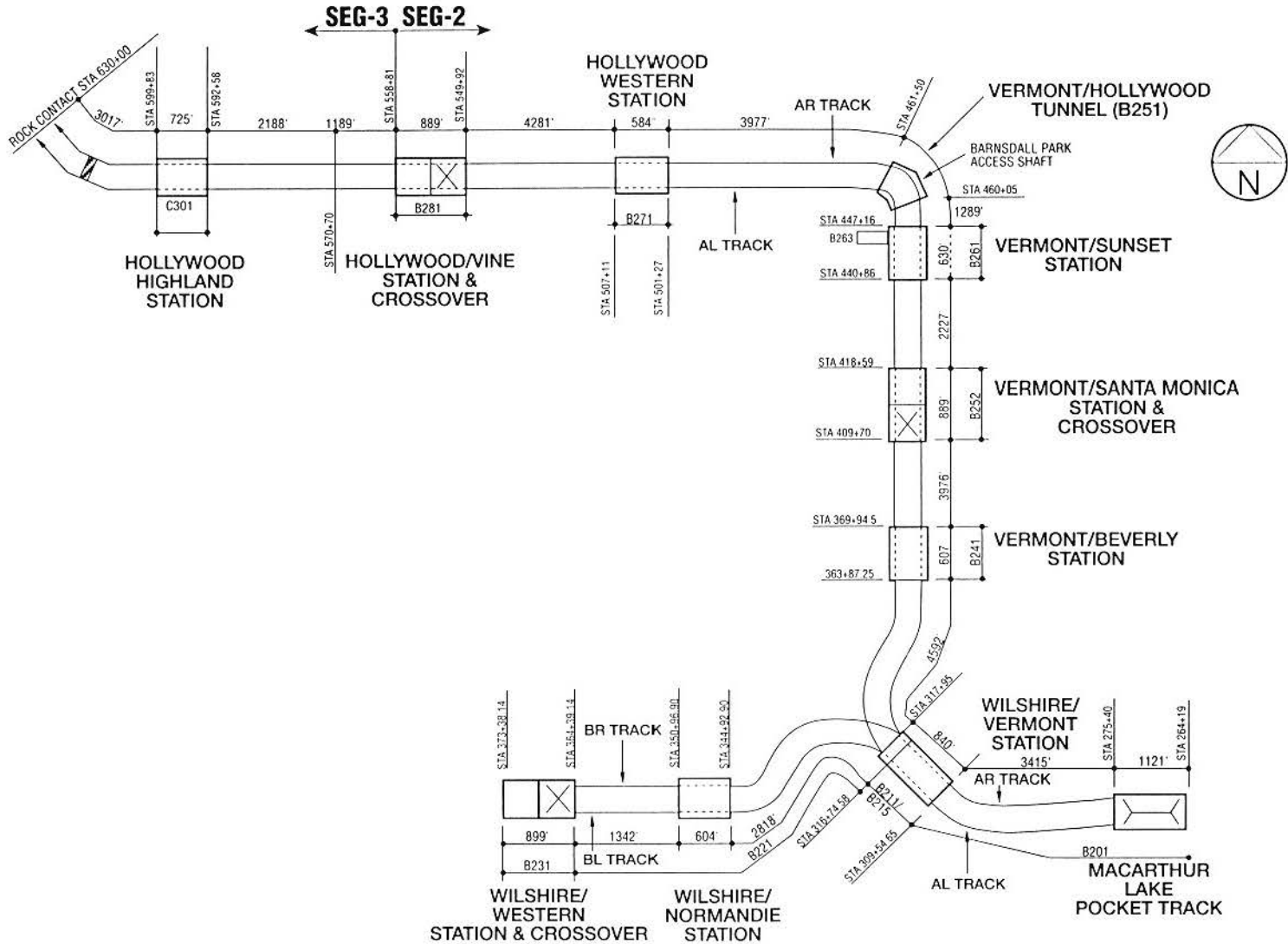
MOS-2B
VERMONT/HOLLYWOOD CORRIDOR STATION & TUNNEL CONFIGURATION



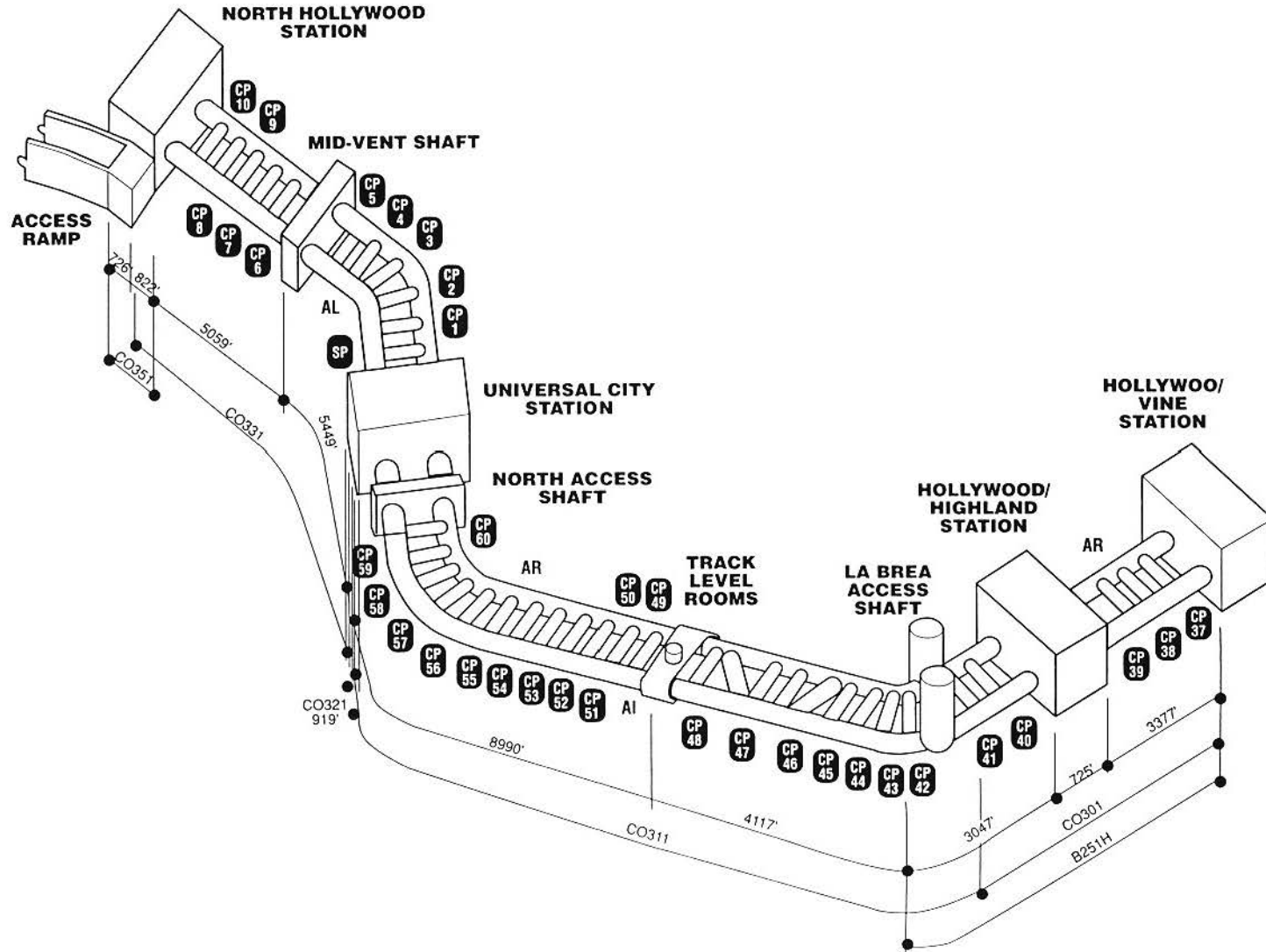
SEGMENT - 2B VERMONT/HOLLYWOOD CORRIDOR



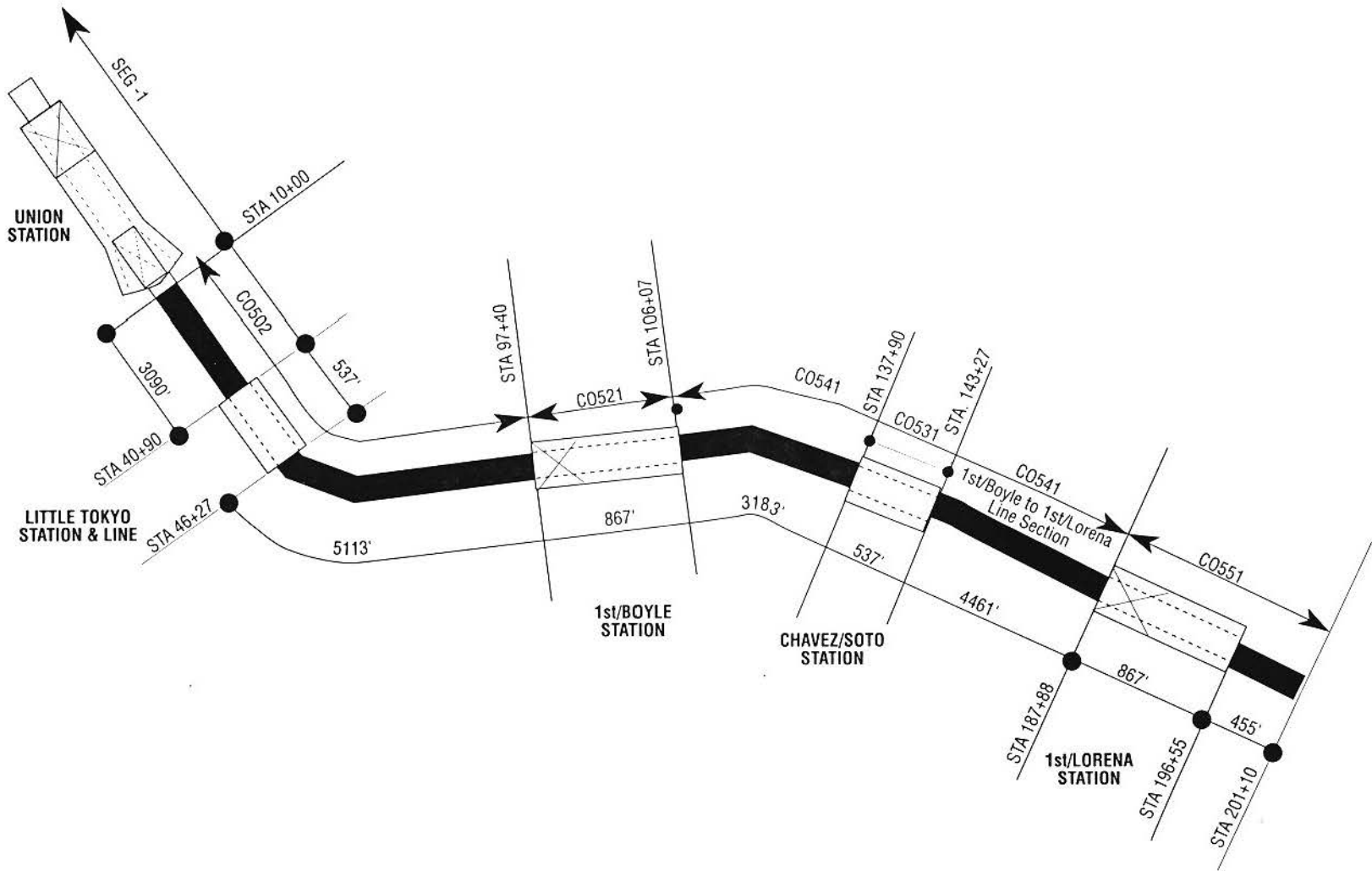
METRO RED LINE - SEGMENT 2



MOS-3 HOLLYWOOD CORRIDOR STATION & TUNNEL CONFIGURATION



SEGMENT 3 EAST SIDE EXTENSION



FARE COLLECTION FOR METRO RED LINE




Each station will have at least two Ticket Vending Machines. The TVM's are located in an area known as "Free Zones".

How to Buy a Metro Red Line Ticket

STEP 1 Select Fare

Regular Fare	Press Button	Cost of Fare:
One-Way	A	\$1.35
One-Way with Transfer to Bus or Rail	B	\$1.60
Round Trip (No Transfer Available)	C	\$2.70

Two (2) children (under age 5) may ride free with each adult.

Senior/ Disabled*	Press Two Buttons	Cost of Fare:
One-Way	A + 	\$0.45
Way with Transfer to Bus or Rail	B + 	\$0.55
Round Trip (No Transfer Available)	C + 	\$0.90

*Medicare Card holders qualify.

STEP 2 Insert Money/ Tokens

STEP 3 Take Ticket/ Change from Loser tray

Your ticket is valid **one-way** until the printed expiration time. A **round-trip** ticket is valid for return to this station on date printed.




Persons on the platform or train must present a valid fare on request...failure to do so could result in a citation (Section 640 California Penal Code.)

Para Comprar un Boleto para el Metro, Línea Roja

PASO 1 Seleccione el Pasaje

Precio Regular	Oprima el boton	Precio del pasaje
En una dirección	A	\$1.35
En una dirección con boleto de trasbordo para autobus o ferrocarril	B	\$1.60
Ida y vuelta sin boleto de trasbordo	C	\$2.70

Dos niños, menores de 5 años, pueden viajar gratis con cada adulto.

Mayores de edad/ Incapacitados*	Oprima dos botones	Precio del pasaje:
En una dirección	A + 	\$0.45
En una dirección Con boleto de trasbordo para autobus o ferrocarril	B + 	\$0.55
Ida y vuelta sin boleto de trasbordo	C + 	\$0.90

*Medicare Card holders qualify.

PASO 2 Deposite el Dinero/ Ficha

PASO 3 Tome el Boleto y el Cambio de la Bandeja Inferior

El boleto de ida en una dirección es válido hasta la hora de vencimiento impresa en el mismo. El boleto de ida y vuelta es válido para regresar a esta estación en la fecha impresa en el mismo.

Los pasajeros deberán presentar un boleto válido en las plataformas o en los trenes. No tener boleto o prueba de pago puede resultar en una multa (Sección 640 del Código Penal de California).

The ticket vending system is a self-service, barrier free system. Passengers will not have to pass through any turnstiles or barriers, allowing for quick and easy boarding or egress.

The system is "user-friendly". The video display screen, as well as written instructions, informs passengers where to insert money and push buttons. The machines will print custom tickets for various destinations and make change.

Once patrons have bought tickets, patrons will wait in a specially marked "paid" area of the platform until their train arrives.

HEAVY RAIL SECURITY

GENERAL DESCRIPTION

Security on the Metro Red Line will work in conjunction with local agencies. Security will consist of uniformed and plain clothed Law Enforcement Officials assigned to the trains. Typical coverage includes officers patrolling the line in a marked patrol vehicle, riding trains throughout the system and requesting proof of fares. Ordinances are enforced by the issuance of a standard criminal citation which is processed through local Municipal Courts.

Additional Law Enforcement responsibilities include: preparing incident or arrest reports, issuance of parking citations and impounding vehicles, testifying in court when subpoenaed, assisting and providing information to the public, and ensuring the safety of passengers on the trains and in the stations.

Law enforcement officers, will circulate randomly, verifying that riders have paid their fare and issuing citations to those who have not paid.

A major concern involving all of our stations is the safety and security of our patrons, employees and equipment. The use of Closed Circuit Television will allow surveillance from the Central Control Facility. Patrols by Law Enforcement Agencies, along with LACMTA personnel (Supervisors, Operators and Facility Maintenance Personnel) will enhance security. These personnel will be in direct contact with the Central Control Facility.

EMERGENCY SITUATIONS

Response to an emergency condition begins when an employee becomes aware of the condition and makes the necessary notification. The employee will contact the Central Control Facility and give as much information as possible regarding location, direction, the nature of the problem and remain on scene, giving periodic updates until a Rail Transit Operations Supervisor (RTOS) can arrive or the employee is released by the Central Control Facility.

The RTOS responsible for line supervision, and when necessary, implementing emergency response programs. Additionally, the RTOS will conduct special investigations of accidents, prepare follow-up reports and make safety recommendations, for LACMTA purposes.

The RTOS will act as the ON-SCENE COORDINATOR, (OSC), for outside Emergency Response Agencies. The OSC can be identified by a white vest with lettering identifying this individual as ON-SCENE COORDINATOR.

***NOTE:** The RTOS functions are intended to assist the Incident Commander during an emergency situation. The knowledge and direct radio contact the RTOS has can be beneficial and increase safety of all personnel at the scene.*

The LACMTA considers the following as being incidents and/or accidents:

- Broken or faulty signals.
- Broken or faulty Control/TRACS indications.
- Broken or faulty wayside equipment.
- Broken or faulty vehicle equipment.
- Violations of instructions, train orders and/or bulletins.
- Collision of a train with a maintenance vehicle or alighting personnel from a train that requires medical attention.
- Mainline or Yard derailments.
- Any incident and/or accident that requires evacuation of personnel.
- Fire or explosion on a train or LACMTA facility or construction site.
- Collision between trains.
- Collision between trains and track or wayside equipment.

- Incidents and/or accidents involving a runaway train.
- Incidents and/or accidents involving Mainline Interlockings.
- Chemical spills or uncontrolled release of a compressed gas or hazardous materials.
- Any individual with an injury requiring medical treatment.
- Industrial injuries occurring at a LACMTA facility or construction site.
- Intrusions affecting any Rail Property.
- Death

After arriving at the scene, the RTOS will relay pertinent information between the responding teams and the Central Control Facility. In addition, an assessment of damage, injuries, condition of stations, the traction power system and tracks will be conveyed to the Central Control Facility while working with all response team members at the scene.

In any situation, once everyone is safe and anyone needing medical attention is attended to, the first priority of the RTOS is to restore normal train service. It is for this reason that the RTOS will ask that power be restored, if it has been removed, and that the tracks are cleared of all vehicles and/or equipment.

In all incidents/accidents, the OSC will work closely with outside Emergency Response Agencies, to give support and any information that may be needed. If one track can be cleared, it is a priority to get that track open so that train service can be restored. The RTOS will remain on scene until the incident scene is released by the appropriate Emergency Response Agency.

NOTE: Evacuation of passengers from the trains, except in a dire emergency, must be with the Rail Controllers approval. The RTOS will monitor and remain in constant radio contact with the Central Control Facility at all times.

Actual rescue of victims is the responsibility of the local Fire Department. On occasion, however, they may require assistance from transit system personnel or equipment. This assistance shall be provided as requested.

It is recognized that certain operations, such as jacking train cars and removing pinned victims require specialized equipment and should only be done by trained LACMTA personnel. Effective liaison between the Fire and/or Law Enforcement personnel in charge and the Accident Investigation Team is vital to avoid situations which may further endanger personnel or result in excessive damage to equipment.

The Rail Accident Investigation Team for LACMTA is comprised of:

- On-Scene Coordinator
- Rail Operations Manager
- Vehicle Maintenance
- Facility Maintenance
- Rail Safety
- Risk Management

To help address any problems that might occur, emergency scenarios will be set up in the near future. All agencies that might be affected by an emergency will be asked to attend. Page no. 42 reflects potential emergencies, indicating types of scenarios that will be conducted.

Safety training classes are on-going and arrangements can be made for any interested parties to attend.

EMERGENCY MANAGEMENT PANELS (EMP's)

All stations on the Metro Red Line will have Emergency Management Panels (EMP's) in which Fire Department Agencies will have access. Equipment contained inside the EMP's that are vital to emergency responding personnel are:

- Emergency Response Procedures and Facilities map book.
- Local control of emergency fan ventilation systems that will enable the control of emergency fan configurations in supply or exhaust mode depending on the emergency.
- Public Address System with a button to activate a pre-recorded public address announcement message and activates an electronic message board giving evacuation instructions to patrons at stations.
- Local controls to home elevators and stop down escalators.
- Emergency telephones will provide direct communications to the Central Control Facility.
- Fire Department telephone hook-up
- Ability to monitor fire detection, fire suppression, intrusion detection, gas monitoring and facilities by way of a lighted panel in MOS-1 or computer monitors in MOS-2A, MOS-2B, and all future stations.

Methods of entry into the EMP will be covered with Emergency Response Agencies at a later date.

Fire Department connections and fire sprinkler systems are provided in many locations. As built drawings will be provided later for all Fire Departments to identify the locations of these connections and sprinkler systems. All Departments are invited to do Pre-Planning visits to all facilities. All visits are to be coordinated with the Central Control Facility prior and upon arrival to any facilities.

NOTE: During an emergency, the RTOS will respond to the EMP to set up a Command Post until the incident commander arrives on scene. This is the location where outside responding agencies need to contact the OSC.

UPCOMING EMERGENCY SCENARIOS

- Bomb Threat
- Hostage Situation
- Fire/Smoke on board a train
- Disabled Train/Single Tracking
- Accidental Uncoupling
- Person hit by train
- Derailment/Collision
- Fires at Substation
- Evacuations
- Earthquake Loss of Power/System Evacuation
- Loss of Power CCF Requiring Local Control of Operations
- Train Fire in Tunnel
- Hazardous Material Spill
- Natural Gas Smell

IMPORTANT ADDRESSES/PHONE NUMBERS

Rail Activation Manager, Operations

320 South Santa Fe. Ave.
Los Angeles, CA 90013
(213) 922-3232

Rail Activation Secretary, Operations

(213) 922-3332

Rail Activation Supervisors, Operations

(213) 922-3257
(213) 922-3258

Rail Central Control Facility

2000 East Imperial Highway
Los Angeles, CA 90059
(213) 563-5290

Rail Central Control Manager

(213) 563-5026

Metro Red Line Yard Control

320 South Santa Fe. Ave.
Los Angeles, CA 90013
(213) 922-3200

Metro Red Line Manager, Operations

(213) 922-3220

Metro Red Line Secretary

(213) 922-3213

Metro Red Line Instruction

(213) 922-3213

Metro Red Line Equipment Maintenance Manager

(213) 922-3304

Metro Red Line MOW Facilities Maintenance Manager

(213) 922-3280

Rail Safety Department

One Gateway Plaza
Los Angeles, CA 90012
(213) 922-4964

LACTMA News Bureau

One Gateway Plaza
Los Angeles, CA 90012
(213) 922-2700

Test Control

TBD
TBD

DEFINITIONS

ACCIDENT-

Unforeseen event or occurrence which results in injury or property damage.

ASPECT -

Appearance or sound of a signal.

AUTOMATIC TRAIN CONTROL (ATC) -

Complete, automated, train control system comprised of ATO, ATP and ATS.

AUTOMATIC TRAIN OPERATION (ATO) -

Sub-System within ATC which monitors and maintains safe train operation through a combination of train detection, train separation and speed regulation.

AUTOMATIC TRAIN PROTECTION (ATP) -

Sub-System within ATC which monitors and maintains safe train operation through a combination of train detection, train separation and speed regulation.

AUTOMATIC TRAIN SUPERVISION (ATS) -

Sub-System within ATC which monitors train operation, maintains scheduled traffic patterns and is subordinate to ATP.

BALLAST -

Selected material placed on the rail roadbed for the purpose of holding the track structure in line.

BLUE FLAG/LIGHT-

Flag/Light displayed on both ends of a train on the track is an indication that rail employees are on or about the vehicle.

BLUE LIGHT STATION-(BLS) -

Designated location within the Rail System, identified by a blue light, where traction power may be DE-ENERGIZED and emergency telephones are located.

BRAKE, DYNAMIC -

Primary braking system where the electric current derived from the motors, acting as a generator, provides controlled braking.

BRAKE, EMERGENCY -

Maximum braking that can be obtained with Friction Brake. Once activated, emergency brakes cannot be released until the train has come to a complete stop.

BRAKE, FRICTION -

Controlled, air-blended systems applying stopping forces to brake shoe on each wheel tread.

BRAKE, FULL SERVICE -

Combination of dynamic and friction braking used for normal stopping without implementing emergency brake.

CAB -

The operating compartment of a rail vehicle from which control of the vehicle is achieved.

CAB SIGNAL TERRITORY -

That part of the Mainline where Cab Signals govern train movement and speed.

CENTRAL CONTROL FACILITY (CCF)-

Location from which Mainline Operations are authorized, controlled and directed.

CHOCK, WHEEL-

Device placed between the top of the rail and the rail vehicle wheel to prevent vehicle movement when brakes are not applied or are defective.

CLEARANCE (NO)-

Locations within Heavy Rail where no clearance exists between fixed whayside structures and moving vehicles operating on tracks

COLLECTOR SHOE-

Device located on each side of each truck that rests or slides on the Contact Rail, collects 750 VDC and transfers power to the traction motors.

CONTACT RAIL -

Electrical conductor (adjacent to running rail) which provides the 750 VDC to the vehicle through contact with collector shoes on the vehicle.

CONTACT RAIL SIDE APPROACH-

Mounted extension of the contact rail which provides a method for lifting the vehicle collector shoes onto the contact rail.

CONTROL, YARD

Location from which Yard Operations are authorized and directed.

CONSIST -

Number and specific identity of rail vehicles that make up a train.

COUPLE -

Connecting rail vehicles together in order to permit the resulting train to be operated from one cab.

COUPLER -

Device for joining mechanical, electrical and pneumatic systems of dependant pair vehicles.

CROSSOVER -

Arrangement of tracks and switches providing a route from one track to another.

DEADMAN -

Device built into the Manual Controller which shall be held in the activated position before movement can occur and which is designed to bring a moving train to a full service stop if proper positioning is not maintained while the train is being operated in MTO, RMO and EMO.

DE-ENERGIZE -

To remove electrical power.

DERAILMENT -

Occurrence in which one or more wheels of a rail vehicle loses its normal relationship with the head of the rail.

DIVERGING ROUTE -

A route which changes a train's directional movement over a reverse switch position allowing for a crossover movement.

EMERGENCY TRIP STATION (ETS) -

Push button device at Blue Light Stations that, when activated, de-energizes traction power to each designated contact rail section within the limits of the power feed.

EMERGENCY-

A condition that may result in injury or death to persons, employees or damage to equipment or property.

EMERGENCY MANAGEMENT PANEL-

Command panel installed on a wall in public areas of each passenger station for coordination of fire/rescue and emergency response forces. Also serves as a back-up to the TRACS System for ventilation control, gas monitoring and communications.

EMERGENCY TELEPHONE (E-TEL)-

Located throughout system providing direct communication to the proper authority.

EMERGENCY WALKWAY-

Footpath for right-of-way access/egress.

ENERGIZE -

To apply electrical power.

ENERGIZED, EQUIPMENT -

Electrical apparatus, wires, cables, switches and motors which are connected to an electrical power source and are always considered "energized".

FLAG -

Devices used for relaying hand signals or to restrict operations. Flags may be made of cloth, metal or other suitable material or may be a light during hours of reduced visibility, darkness or in underground sections.

FLAGGER -

Person designated to provide flag protection for a work party on the Right-Of-Way.

FLAG PROTECTED AREA-

Flags/lanterns placed by work crews for protection whenever working within 10 feet of centerline of the track.

GAP SECTION -

A break or distance between contact rail sections which can be bridged by vehicle collector shoes.

GAP SECTION, NON-BRIDGEABLE-

A gap in the contact rail that is longer than the distance between the front and rear collector shoes on a vehicle.

GRADE CROSSING-

Crossing over tracks by a road, footpath or another track.

HAZARD-

Real or potential condition that may cause injury, death, damage or loss of equipment/property.

HI-RAIL VEHICLE

Vehicle with rubber tires equipped with steel flanged wheels that allow the vehicles to be operated on or off the tracks.

IMMEDIATE SUPERVISOR-

Designated Rail Supervisor and Management personnel.

INCIDENT -

Unusual event or occurrence which does not result in injury or property damage.

INDICATION -

Information conveyed by the aspect of a signal.

INTERLOCKING -

Arrangement of signals, switches, tracks and control apparatus so interconnected that functions shall succeed each other in a predetermined sequence, thus permitting train movements over routes only if nonconflicting conditions exists.

LOCAL CONTROL PANEL-

Wayside train control equipment having interlocking controls located in station train control and communications rooms.

MAINLINE -

Territory controlled by CCF consisting of main track, interlockings, turnbacks, tail tracks and yard lead tracks to the Yard Limit sign. Mainline Tracks are identified as:

- **AR/BR/YR**-Normal westbound tracks from Yard Limit.
- **AL/BL/YL**-Normal eastbound tracks to Yard Limit.

MANUAL CONTROLLER -

Control handle device that allows Train Operator to manually control movement of a train.

NOTICES-(procedure) -

Procedure notices will advise the Test Operating Personnel on the procedure to be followed in a particular circumstance. All notices will be numbered consecutively from January 1 of each year.

ON-SCENE COORDINATOR (OSC)-

First MTA Rail employee to arrive at the scene of an accident/incident until relieved by a Rail Transit Operations Supervisor, who declares as "in charge" of the accident/incident scene for all Rail Operations response activities. The **OSC** is Rail Operations primary contact with all emergency response agencies.

PERFORMANCE LEVEL -

One of the series of command from ATS to Automatic Speed Regulation (ASR), used to modify acceleration and ATP speed limits only when ATP speed is above 25 M.P.H., to achieve a desired traffic pattern.

1. PL - 1: 100 percent ATP speed limit and 100 percent acceleration.
2. PL - 2: 85 Percent ATP speed limit and 100 percent acceleration.
3. PL - 3: 85 percent ATP speed limit and acceleration limited to 2.4 mi/hr/sec, which is 80% acceleration.
4. PL - 4: 75 Percent ATP speed limit and acceleration limited to 2.4 mi/hr/sec, which is 80% acceleration.
5. PL - 5: 50 percent ATP speed limit and acceleration limited to 1.5 mi/hr/sec, which is 50% acceleration

PORTAL -

Location where trains enter/exit underground sections.

POSTED SPEED -

Maximum allowable speed over a section of track by fixed or temporary signals and rules.

POWER CLEARANCE -

Form which when completed records the energized or de-energized status of traction power apparatus, i.e. breakers and grounding straps.

PROPER AUTHORITY-

Governing authority for Mainline, Yard or Shop territory.

PROPULSION-

electrical forces produced for train acceleration.

RAIL VEHICLE -

Self propelled vehicle operating on tracks which could be a passenger vehicle, Hi-Rail vehicle or other truck and track equipment.

RED TAG -

A two-part, red identification tag issued by the Test Controller to designated construction, testing or maintenance personnel that have been approved in the Track Allocation Meeting to work in an area where the contact rail will NOT be energized and train operations will not be conducted while the Red Tag is in their possession. Test Controller will give the individuals one half of the Red Tag and keep the other half. Not until all Red Tags are returned to the Test Controller will traction power be restored or reassignment of the red tags be permitted by the Test Controller.

RED TAG AREA -

The limits of the Red Tag area may change weekly during Track Allocation Meeting every Thursday, the Track Allocation Coordinator will define the limits of the Red Tag area for the following week.

RED TAG DESK -

The desk where Red Tags are distributed and returned. The Red Tag Coordinator is located at the Red Tag Desk.

RESCUE TRAIN -

Rail vehicle used to transport rescue personnel, passengers or retrieve disabled rail vehicles.

RESTRICTED SPEED-

Operating speed that will permit stopping a train within one-half the range of vision, short of an improperly aligned switch, track defect, rail vehicle or train or any obstruction, never exceeding 15 mph.

REVERSE RUNING-

Train movement in reverse direction on designated track.

RIGHT-OF-WAY-

Designated area of Mainline and the Yard within fences.

ROUTE-

Path a train follows through crossovers or interlockings.

R.T.O.S. -

Rail Transit Operations Supervisor.

SECTIONALIZING -

Specific de-energized section of contact rail.

SIGNAL -

Method or device, the aspect of which conveys information affecting movement of trains.

SIGNAL HAND-

Aspect conveying an indication given by the motion or position of a person's hand/arm, flag, light or object.

SINGLE TRACK OPERATION -

Operation within defined limits governing bi-directional train movement over a single track on the Mainline.

SLIP/SLIDE SYSTEM -

Automatic system for detecting and preventing excessive rail car wheel slips and slides during acceleration and braking.

SLOW ZONE -

Area within defined limits for wayside conditions requiring reduced operating speeds.

SPEED LIMIT-

Maximum allowable speed a train may operate.

STATION RUN-THROUGH-

Passing a station platform without stopping.

STINGER-

Hand held portable device which provides traction power to a train.

SUBSTATION -

Facility used to transform 34.5 KVAC to lower voltages for distribution to station facilities.

SWEEP TRAIN -

First train to operate over any section of Mainline track each day or after an interruption of service exceeding one hour. Train Operators shall operate at restricted speed and be alert, stopping short of:

- obstructions on the track
- damage to track, contact rail or wayside signals
- improperly aligned switches
- conditions which may be hazardous to the operation of trains.

Should hazardous conditions exist, trains shall be stopped and the condition reported to CCF.

SWITCH -

Device for establishing a route from one track to another.

TC&C -

Train Control and Communication Room.

TERMINAL STATION -

Location where scheduled trips begin and end.

TEST CONTROLLER -

The designated employee on duty at the Test Control Facility with absolute authority over all movements on or affecting Start-Up Segments of the Mainline.

TEST COORDINATOR -

Designated employee responsible for conducting test.

TEST CONTROL FACILITY -

The location where all Start-Up Segments of Mainline operations are authorized, directed, and controlled.

TRACK-

Two adjacent running rails over which trains operate.

TRACK ALLOCATION -

Published weekly summary that indicates the specific contractors, maintenance and testing personnel that will be scheduled to work in the Metro Red Line system for the following week. It indicates the limits, time, and dates of the week for these activities.

TRACK, POCKET-

Designated tracks auxiliary to the Mainline for storing rail vehicles and other rail activities.

TRACTION POWER SUB-STATION (TPSS)-

Facility used to transform and rectify 34.5 KVAC to 750 VDC for distribution to the contact rail.

TRACTION POWER SYSTEM-

Electrical power distribution system which provides 750 VDC to operate passenger vehicles.

TRAIN -

One or more designated rail vehicles operating as a single unit.

TRAIN OPERATOR -

Rail employee responsible for direct control and responsibility for the safe movement of a train.

TRAINLINE -

System where electric and pneumatic functions are routed through and between vehicles so that signals may be transmitted to all vehicles.

TRAIN STOP -

Electrically operated mechanical device located adjacent to a running rail which stops a train by activating emergency brakes.

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