Land Transport Authority ITSO Division	Division/Section: **ITSO Division /ITSO OCC Traffic Operations**	**Rev No.** **2**
		Effective Date: **Xx Dec 2020**
	Document No**:** **ITSO/OCC/SOP/EOP04.001**	

Handling Tunnel Fire

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DOCUMENT CONTROL

REV	DOCUMENT TITLE & COPY NUMBER	Date	Prepared by	Reviewed by	Approved by
0	Handling Tunnel Fire Copy____of _____	15th December 2009	Melvin Yeo (SOE)	Ng Soon Han, Frankie (HD, ITSC OCC)	Soh Ling Tim (MOPN)
1	Handling Tunnel Fire Copy____of _____	XX October 2013	Chiam Zhi Wei (DysOE) Chua Teck Leong (AOM, ITSO OCC)	Ng Soon Han, Frankie (DOM, ITSO OCC)	Yeo Se Lay (SM,Ops)
2	Handling Tunnel Fire Copy____of _____	XX December 2020	Daniel Wu (AOM) Lye Keng Fatt (DM, ITSO OCC)	Ng Soon Han, Frankie (Mgr, ITSO OCC)	Yeo Se Lay (DDIT)

AMENDMENT HISTORY RECORD

Rev. No.	Effective Date of Change	Section & Sub-Section Amended	Amendments/ References	Party Requesting for Change
1	XX Oct 2013	Whole Document	Due to organization change of division name from ITSC to ITSO.	DOM, ITSO OCC
2	XX Dec 2020	Whole Document	Due to change of Staff Designations in ITSO OCC. Delete SOE, insert DM Delete DySOE, insert DyAM	Mgr, ITSO OCC

Section 1. Introduction

1.1.1 This document describes the process involved in handling a Tunnel fire.

1.1.2 Unlike other open expressways a fire in an enclosed environment can rapidly develop into a major crisis, thus any confirm report or alarm of fire will require a total tunnel closure.

1.1.3 Confirm fire in tunnel must be escalated to the management and LTOC (Refer to Attachment 5) immediately for the purpose of activation of LTA CMG (Crisis Management Group) officers and for the escalation of information to the higher authority and media.

Section 2. Personnel Involved

a) ITSO OCC staff (DM (ITSO OCC), tunnel OE and 1 extra OE)
b) LTM & VRS staff
c) Other LTA department staff
d) External Agencies (Police / TP, SCDF)
e) ITSO ops support (only when CMT is activated)
f) LTOC (only when CMG is activated)

Section 3. Actions & Process

Sub-Section 3.1 Handling A False Tunnel Fire Notification

3.1.1 Upon notification of a fire via the Tunnel fire alarm system or reports from public, use CCTV or send RC and LTM to site to confirm.

3.1.2 If the fire notification is confirmed false, DM(ITSO OCC) will acknowledge the fire alarm immediately and put off the buzzer if it is via the fire alarm panel. If it is via public calls take no further action and treat as a hoax.

3.1.3 For false alarm notification via the alarm panel, the DM(ITSO OCC) or Tunnel OE will reset the detector. If false alarm persists, the DM(ITSO OCC) or Tunnel OE will isolate the detector and Tunnel OE will notify the Maintenance Team and tunnel contractor. Please refer to ITSO/OCC/WM/SYS03.011 for isolation of a fire alarm.

Sub-Section 3.2 Handling A Confirmed Tunnel Fire Notification

3.2.1 If fire is confirmed, upon DM(ITSO OCC) instruction to close the tunnel, the Tunnel OE shall implement or initiate fire plans in the IW PP plan and open IR. Closure sequence usually by ground personnel will be 1) Diversion & Entrances, 2) Main carriageway, 3) Exit. At the same time, the DM(ITSO OCC) shall contact SCDF, Traffic Police and Divisional Police about the fire incident and provide them RV point(Please see table A for RV point).

3.2.2 Once RV point is set, DM(ITSO OCC) will advise Tunnel OE to display a row of flashing amber Lane Use Signal (LUS) in the non-incident bound tunnel, across all lanes at the location opposite to the fire location. This will facilitate the SCDF rescue vehicle (which will come from the opposite box) to locate the fire. LTM & RC may need to close lane 1 in the opposite Tunnel box for SCDF access.

3.2.3 The DyAM will assist to activate 2 x VRS and 2 x LTM to site and break in RBBI to the whole tunnel and inform Traffic Watch (MediaCorp) to make radio broadcasts of the fire. He will also inform LTA call centre and other transport or rescue-related agencies with regards to the incident

3.2.4 The DM(ITSO OCC) will inform DDIT via phone and escalate the tunnel fire closure to the higher management and LTOC (Refer to Attachment 5). Following that, he will need to inform ITSO maintenance team and RIMS to do a site check. FC is to create a work order for ITSO contractor for the purpose of tracking their presence and response. **(The maintenance team must provide OCC on their KPI on this matter)**

3.2.5 The first LTM and VRS which arrived will proceed to the incident scene to collate all information and encounter and update LTA OCC accordingly. The Recovery Crew & LTM should try to contain or put out the fire if possible. If the fire is out of control the Recovery Crew shall wait for the arrival of the SCDF and police at a safe location and assist them wherever possible.

3.2.6 The second LTM and VRS which arrived will proceed to the upstream exit to divert all motorists out of expressway. More resources may be needed depending on the severity and extension of the incident.

3.2.7 The DM(ITSO OCC) will assign DyAM to take over his role while he manages the tunnel incident. He will also make arrangement for the zone 1 OE to assist the tunnel OE until the whole incident is over.

3.2.8 The DM(ITSO OCC) will advise the zone 1 OE to facilitate more green time on all upstream slip exits due to the closure. Beside adjusting traffic light, he will assist to implement all advisory messages on leading and adjoining expressways. He will also handle all public feedback if any.

3.2.9 The Tunnel OE shall switch the tunnel lighting to maximum and adjust the ventilation according to needs or as per SCDF's advice (if the latter already reached site).

3.2.10 In the event that SCDF commander need to be at ITSO OCC to perform rescue operation, upon their arrival, DM(ITSO OCC) will respond to his requests and also offer advice to them until the KCO or other the next higher rank officer(M(ITSO OCC) or DOM(ITSO OCC). When the KCO or the next higher-rank officers arrive, the SCDF officer will liaise via the KCO.

3.2.11 Once the fire is put out, DM(ITSO OCC) will coordinate with ITSO LO on site to see if there were any damaged equipment and inform all relevant parties accordingly and update the KOC or the next higher-rank officer.

3.2.12 Tunnel will be opened only after clearance given by SCDF Officer in command and approval given by the KCO. ITSO LO will assist by checking with ITSO maintenance team and RIMS team to see if the tunnel is safe to open after a thorough system and equipment checks.

3.2.13 Once approval is given, DM(ITSO OCC) will instruct LTM on site to do a sweep. He will also advise the OE to open the tunnels in stages according to this sequence of tunnel opening 1) Exit, 2) Main carriageway, 3) Entrance. Detailed plans are stored in the PP plan of the IW. The tunnel OE will execute the plan and remove all closure messages as instructed by DM (ITSO OCC).

3.2.14 DM shall submit a detailed report of the fire incident to the Manager (Operations).

Section 4. Abbreviations

ITSO Intelligent Transport Systems Operations
LTA Land Transport Authority
LTM Land Transport Authority Traffic Marshals
PTZ Pan Tilt Zoom Camera
OE Operations Executive
OCC Operations Control Center
RC Recovery Crew
SCDF Singapore Civil Defence Force
DM(ITSO OCC) Deputy Manager (ITSO OCC)
DyAM Deputy Assistant Manager
TP Traffic Police
VRS Vehicle Recovery Service
VMS Variable Message Signs
LTOC Land Transport Operation Centre
KCO Key Contact Officer

ATTACHMENT 1-TUNNEL SECTORS 1-9, PORTAL AND SLIP ROAD ID

A1a) TUNNEL SECTORS (Use for Description to VRS & LTM)

Sector 1 = Kg Java Tunnel towards AYE before exit to Cairnhill Circle

Sector 2 = Kg Java Tunnel towards AYE after Cairnhill Circle

Sector 3 = Open Expressway towards AYE between the two tunnels

Sector 4 = Chin Swee Tunnel towards AYE before exit to Havelock Road

Sector 5 = Chin Swee Tunnel and depressed expressway towards AYE

Sector 6 = Depressed expressway and Chin Swee Tunnel towards SLE before Exit 2 to Clemenceau Ave/Merchant Road

Sector 7 = Chin Swee Tunnel after exit 2 towards SLE

Sector 8 = Open Expressway towards SLE

Sector 9 = Kg Java Tunnel towards SLE

A1b) SLIP ROAD ID (Use for Description to VRS & LTM)

Slip A = Entrance from Bt Timah Road to CTE towards SLE

Slip B = Exit 6 to Bt Timah Road from CTE toward AYE

Slip C = Entrance from Cairnhill Circle to Chin Swee Tunnel towards SLE

Slip D = Exit 5 to Cairnhill Circle from Chin Swee Tunnel towards AYE

Slip G = Entrance from Kramat Road to Kg Java Tunnel towards SLE

Slip H = Exit 4 to Orchard Road from Open Expressway towards AYE

Slip K = Exit 2 to Clemenceau Ave/Merchant Road from Chin Swee Tunnel towards SLE

Slip K1 = Exit to Merchant Road from Chin Swee Tunnel towards SLE

Slip K2 = Exit to Clemenceau Ave 2 from Chin Swee Tunnel towards SLE

Slip L = Entrance from Merchant Road to Chin Swee Tunnel towards AYE

Slip M = Entrance from Upper Cross St to Chin Swee Tunnel towards SLE

Slip N = Exit to Havelock Road from Chin Swee Tunnel towards AYE

A1c) TUNNEL PORTAL NAMES

Bukit Timah Portal = Entrance of Kg Java Tunnel towards AYE

Kramat Portal = Entrance of Chin Swee Tunnel towards AYE

Chin Swee Portal = Entrance of Chin Swee Tunnel towards SLE

Cairnhill Portal = Entrance of Kg Java Tunnel towards SLE

ATTACHMENT 2

CTE TUNNEL
(COMMUNICATION WITH TRAFFIC POLICE)

OUTSIDE SECTOR 1

"Before Kampong Java Tunnel, going towards AYE"

SECTOR 1 / SECTOR 2

"Inside Kampong Java Tunnel, going towards AYE"

SECTOR 3

"Opened expressway, going towards AYE, after Kampong Java Tunnel"

SECTOR 4

"Inside Chin Swee Tunnel, going towards AYE"

SECTOR 5

"Inside Chin Swee Tunnel, going towards AYE, you can come in by Merchant Road entrance"

SECTOR 6

"Depressed expressway before Chin Swee Tunnel, going towards Ang Mo Kio, you can come in by Outram Road entrance"

SECTOR 7 (BEFORE UPPER CROSS STREET ENTRANCE)

"Inside Chin Swee Tunnel, going towards Ang Mo Kio, you can come in by Outram Road entrance"

SECTOR 7 (AFTER UPPER CROSS STREET ENTRANCE)

"Inside Chin Swee Tunnel, going towards Ang Mo Kio, you can come in by Upper Cross Street entrance"

SECTOR 8

"Opened expressway, going towards Ang Mo Kio, you can come in by Kramat Road entrance"

SECTOR 9

"Inside Kampong Java Tunnel, going towards Ang Mo Kio"

OUTSIDE SECTOR 9

"Outside Kampong Java Tunnel, going towards Ang Mo Kio"

Note: For communication with external agencies actual entrance and exit names (as shown in ATTACHMENT 2) must be used to describe tunnel entrance and exit slip. Sectors 1-9 reference (See ATTACHMENT 1 for description) is used mainly for communication with tunnel contractors, LTA traffic marshals and Vehicle recovery service crew

ATTACHMENT 3

EMERGENCY STAIRCASE LOCATION (ES)

1. ES 01 - in Kampong Java Tunnel (Northbound) at 5.00km. The street door leads to Cavenagh Road, near the drive-in POSB.

2. ES 02 - in Kampong Java Tunnel (Northbound) at 4.75km. The street door leads to open space near Monk's Hill School (Monk's Hill Road/Winstedt Road).

3. ES 03 - in Kampong Java Tunnel (Southbound) at Exit 5 4.60km (towards Cairnhill Circle). The street door leads to Cavenagh Road.

4. ES 04 - in Chin Swee Tunnel (Northbound) at 3.50km . The street door leads to Clemenceau Avenue near Penang Road junction.

5. ES 05 - in Chin Swee Tunnel (Northbound) at 3.24km. The street door leads to Clemenceau Avenue near Oxley Rise.

6. ES 06 - in Chin Swee Tunnel (Northbound) at 2.97km. The street door leads to Clemenceau Avenue near Fort Canning Park.

7. ES 07 - in Chin Swee Tunnel (Southbound) at 2.82 km. The street door leads to CTE Tunnel Control Building facing River Valley Road.

8. ES 08 - in Chin Swee Tunnel (Northbound) at 2.82 km. The street door leads to CTE Tunnel Control Building facing Clemenceau Avenue.

9. ES 09 - in Chin Swee Tunnel (Southbound) at Exit 2, 2.55km towards Havelock Road. The street door leads to Merchant Road.

10. ES 10 - in Chin Swee Tunnel (Southbound) at 2.25 km. The street door leads to Havelock Road/ Chin Swee Road junction

NOTE: The dry risers are located together with the Emergency Staircase and breeching inlets are located near the various facility buildings and ITSO control building.

ATTACHMENT 4 Tunnel Closing Sequence & Opening Sequence by the Predefine Plan.

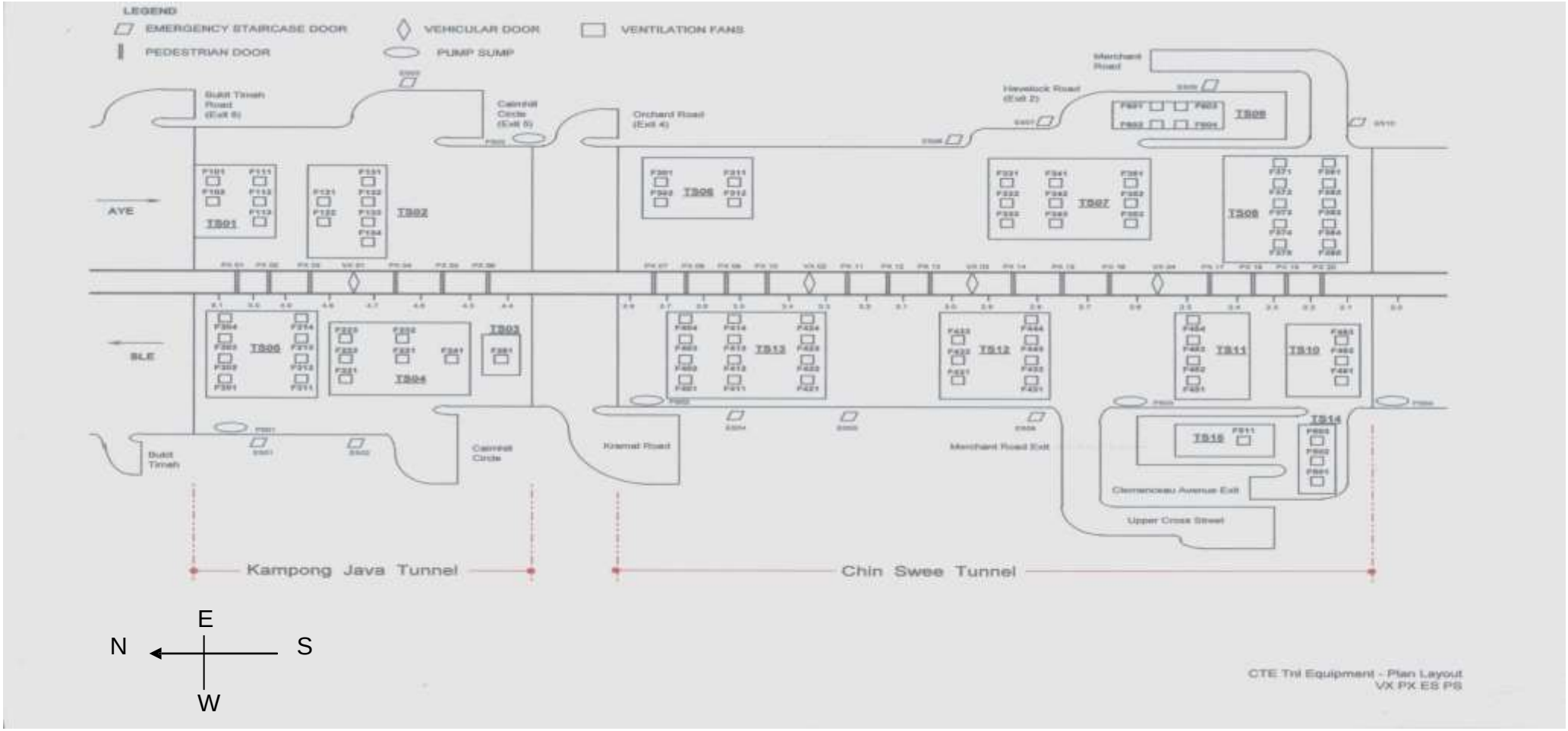
Tunnel Predefine Plan Closure Sequence

a) Close the affected sector
b) Close the sector upstream of the affected sector (and the opposite sectors sequentially)
c) Close all the slip entrances
d) Close the opposite bound sectors to facilitate the rescue teams entering the tunnel in the opposite direction
e) Close the remaining sectors
f) Keep the exits opened, less there is fire at the exits

Tunnel Predefine Plan Opening Sequence

- Open all the exits
- Open the main carriageways from downstream to upstream
- Open the entrances

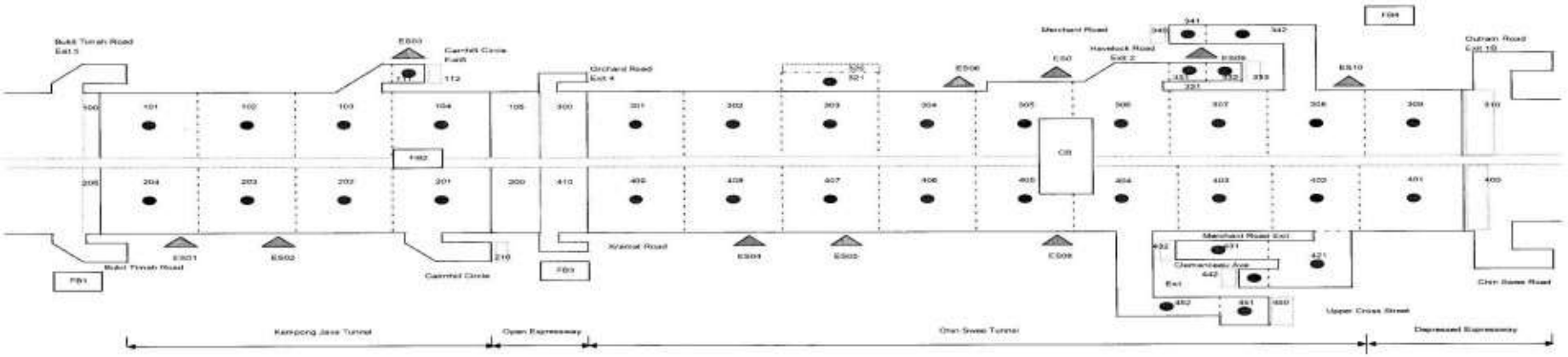
ATTACHMENT 5 -Location Plan For CTE Tunnel Pump Sumps, Vehicular Doors, Pedestrian Doors And Emergency Staircase Doors



ATTACHMENT 6

Layout Plan

FIRE ZONES IN CTE TUNNEL



Fire Area	Chainage	
	From	To
101	5.119	4.953
102	4.953	4.786
103	4.786	4.619
104	4.619	4.398
111	4.619D	4.503D
201	4.398	4.619
	4.470C	4.479C
202	4.619	4.786
203	4.786	4.953
204	4.953	5.119

Fire Area	Chainage	
	From	To
301	3.810	3.559
302	3.559	3.314
303	3.314	3.069
304	3.069	2.888
305	2.888	2.706
306	2.706	2.525
307	2.525	2.303
308	2.303	2.051
309	2.051	1.862
321	3.118J	3.069J
331	2.525N	2.377N
332	2.377N	2.231N
341	2.544L	2.520L
342	2.520L	2.303L

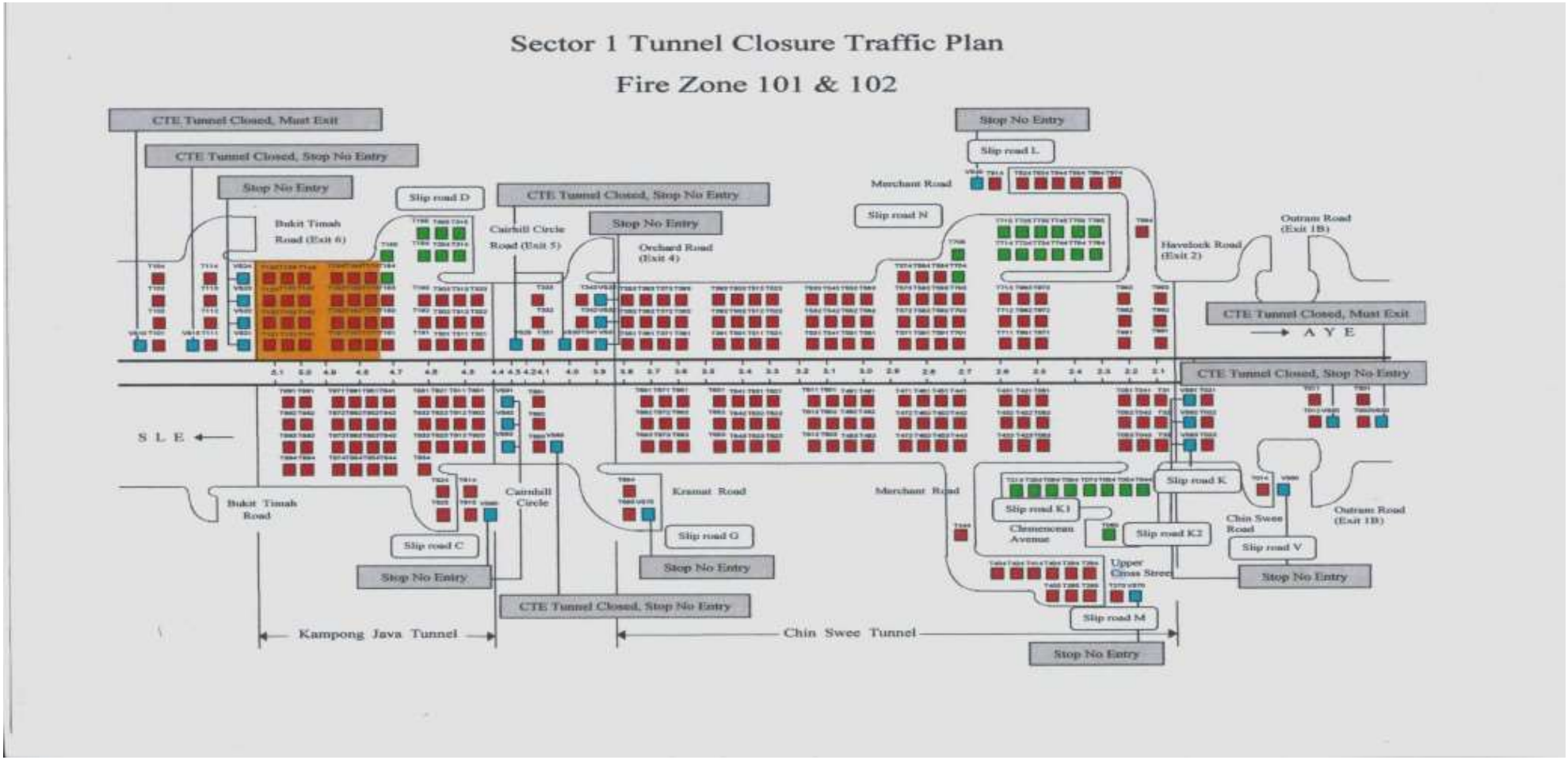
Fire Area	Chainage	
	From	To
401	1.862	2.083
402	2.083	2.217
403	2.217	2.475
404	2.475	2.706
405	2.706	2.888
406	2.888	3.069
407	3.069	3.314
408	3.314	3.559
409	3.559	3.810
421	2.217K	2.314K
431	2.314K1	2.544K1
441	2.314K2	2.374K2
451	2.249M	2.309M
452	2.309M	2.475M

Addibonal Areas with no fire detection eqpt but ventilation plan exist	
Fire Area	Location
100	Before entrance to Kg Java Tunnel > AYE
105	After Kg Java Tunnel exit > AYE
112	After Exit 5 (Slip D) Cairnhill Circle
200	Before entrance to Kg Java Tunnel >SLE
205	After Kg Java Tunnel exit > SLE
210	Before Cairnhill Entrance (Slip C) >SLE
300	Before entrance to Chin Swee Tunnel >AYE
310	After Chin Swee Tunnel exit > AYE
320	Before (unused) Slip J entrance > AYE
333	After Exit 4 (Slip N) Havelock Rd
340	Before Merchant Rd entrance (Slip L) > AYE
400	Before entrance to Chin Swee Tunnel > SLE
410	After Chin Swee Tunnel exit > SLE
442	After Clemenceau Ave exit (Slip K2) > SLE
432	After Merchant Rd exit (Slip K1) > SLE
450	Before Upper Cross St entrance (Slip M) > SLE

Ops-Traffic Fire Plans-Final

CTE Tunnel Traffic Closure Fire Plans

A6a)



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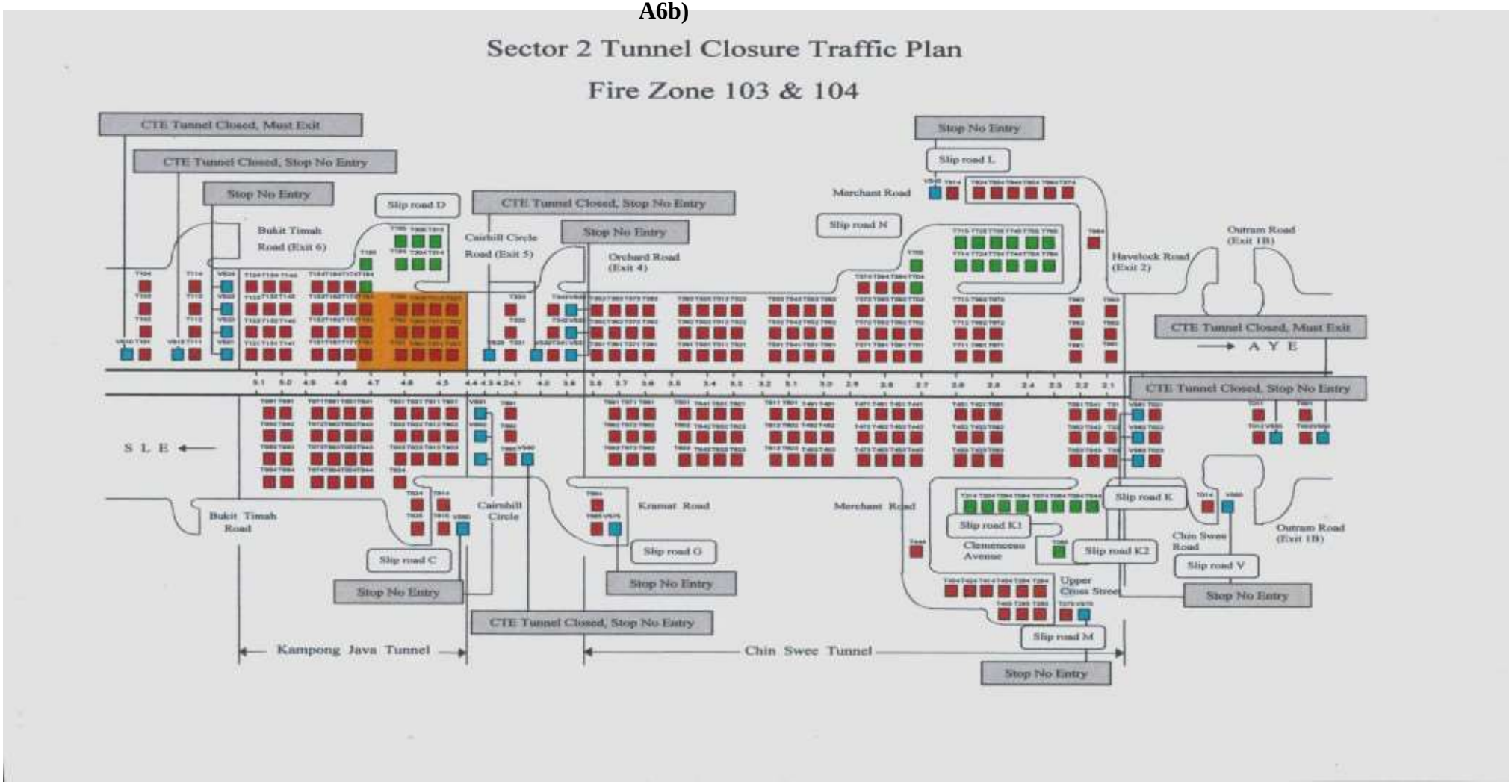
Sector 2 Tunnel Closure Traffic Plan
Fire Zone 103 & 104
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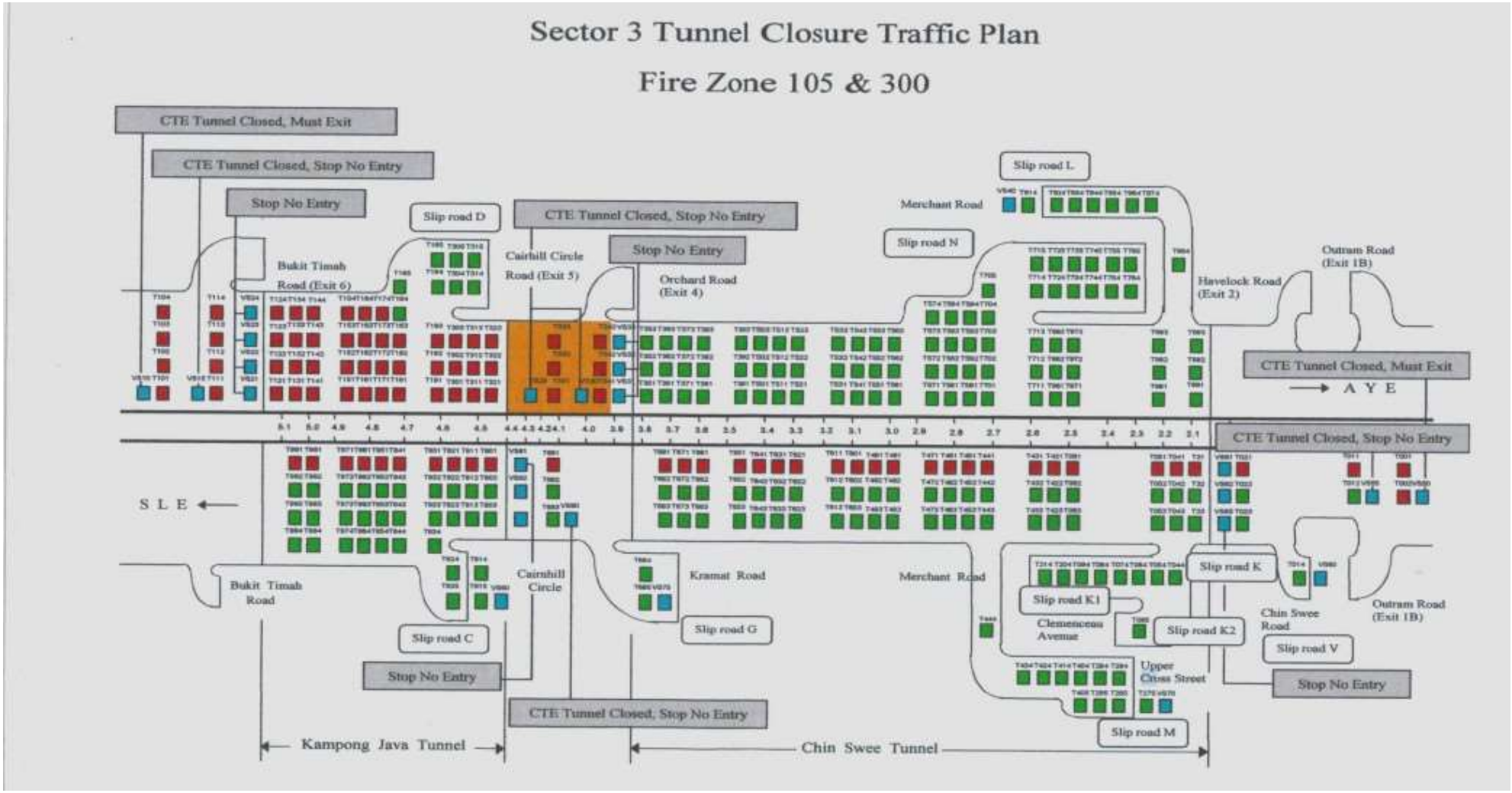
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road D
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Stop No Entry
Slip road L
Merchant Road
Slip road N
Havelock Road (Exit 2)
Outram Road (Exit 1B)
CTE Tunnel Closed, Must Exit
A Y E
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Merchant Road
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Slip road V
Outram Road (Exit 1B)
Upper Cross Street
Slip road C
Stop No Entry
Slip road G
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Stop No Entry
Kampong Java Tunnel
Chin Swee Tunnel

A6c)


Sector 3 Tunnel Closure Traffic Plan
Fire Zone 105 & 300
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CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road L
Merchant Road
Slip road N
Bukit Timah Road (Exit 6)
Cairhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Havelock Road (Exit 2)
Outram Road (Exit 1B)
CTE Tunnel Closed, Must Exit
A Y E
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Merchant Road
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Outram Road (Exit 1B)
Slip road V
Upper Cross Street
Stop No Entry
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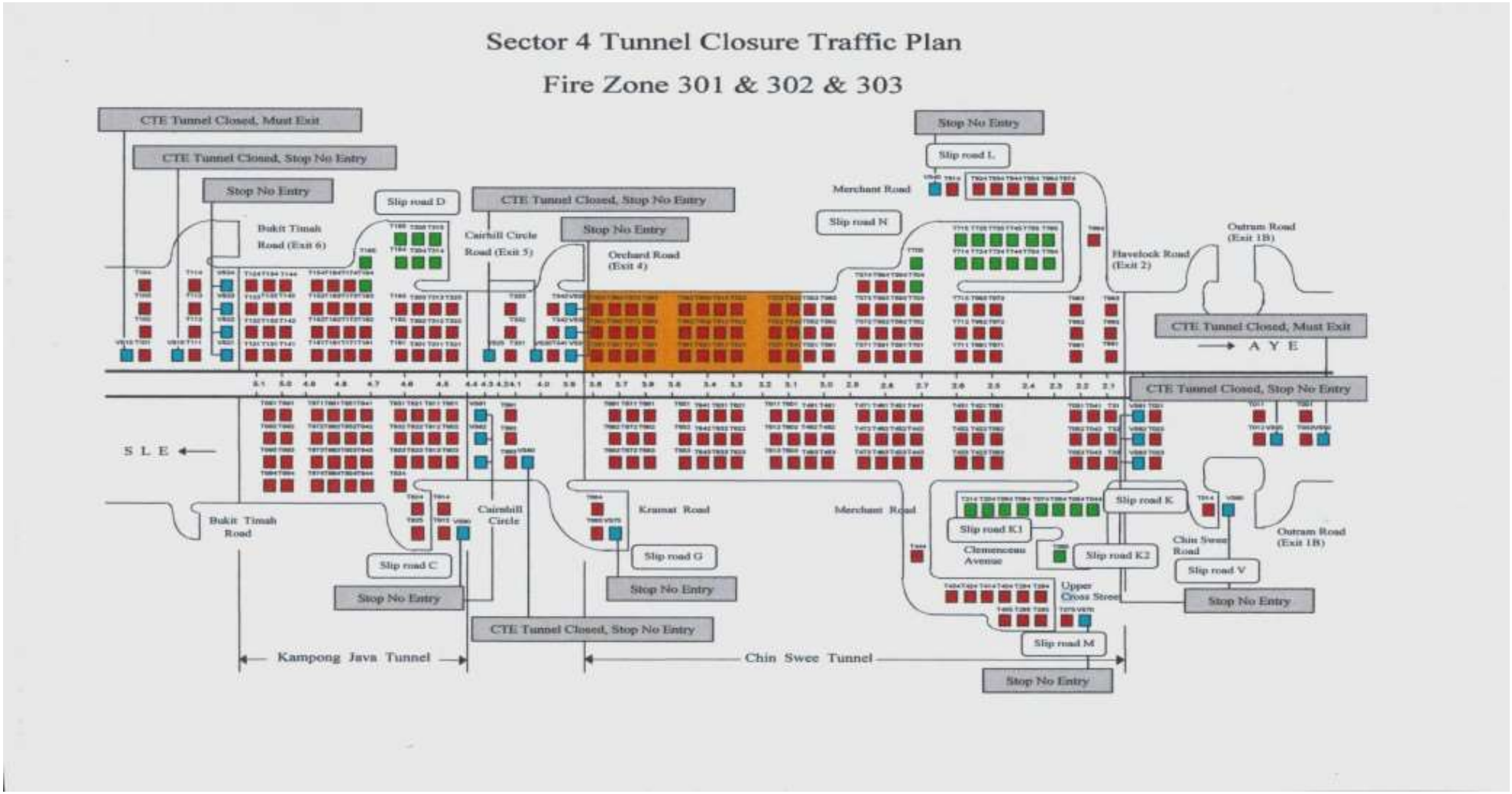
Slip road G
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel

A6d)


Sector 4 Tunnel Closure Traffic Plan
Fire Zone 301 & 302 & 303
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Stop No Entry
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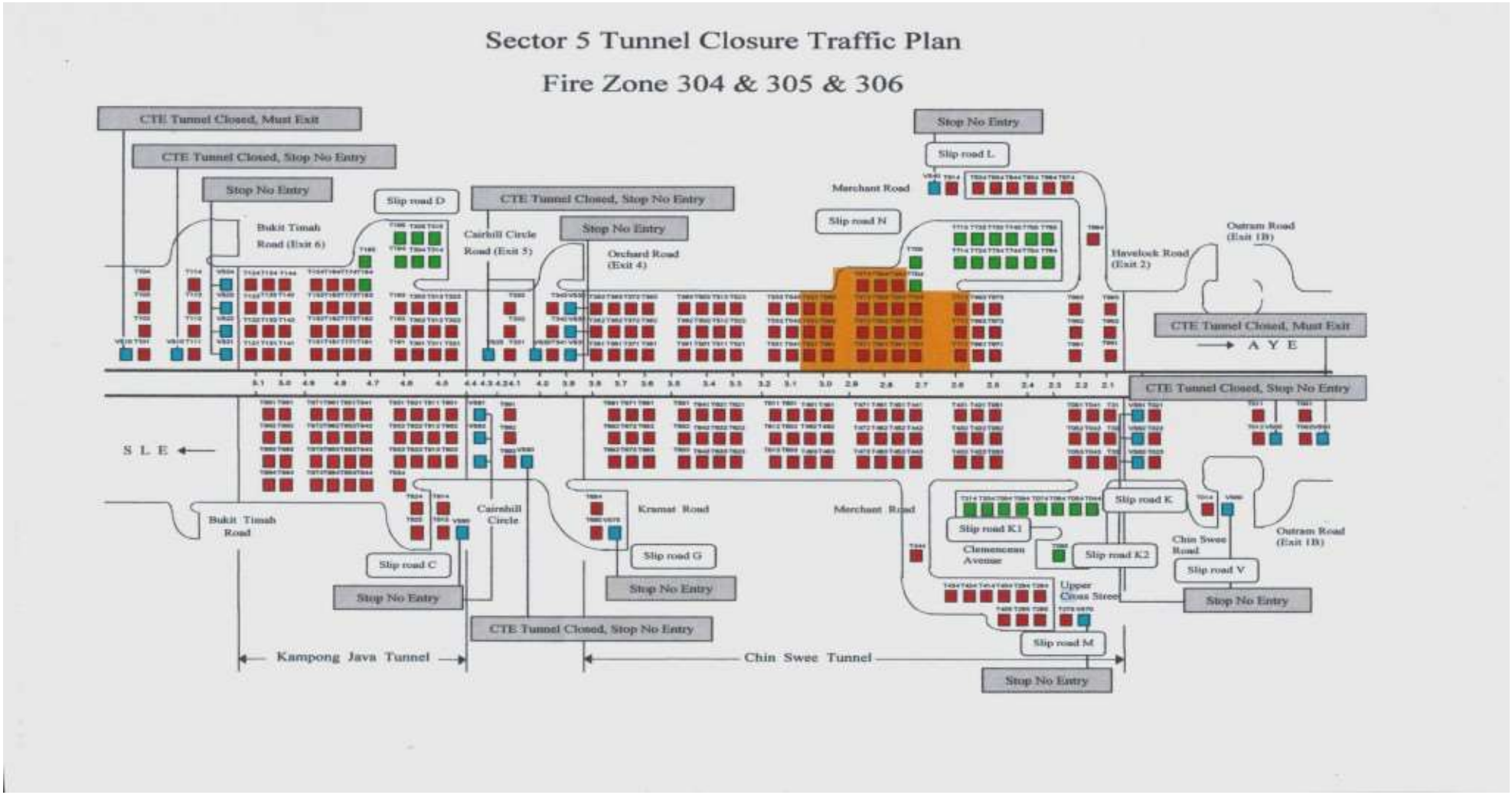
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Stop No Entry
Slip road L
Merchant Road
Slip road N
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Havelock Road (Exit 2)
Outram Road (Exit 1B)
CTE Tunnel Closed, Must Exit
A Y E
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Merchant Road
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Slip road V
Outram Road (Exit 1B)
Slip road C
Slip road G
Stop No Entry
Stop No Entry
Upper Cross Street
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel
Stop No Entry

A6e)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Fire Zone 304 & 305 & 306
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Stop No Entry
Slip road D
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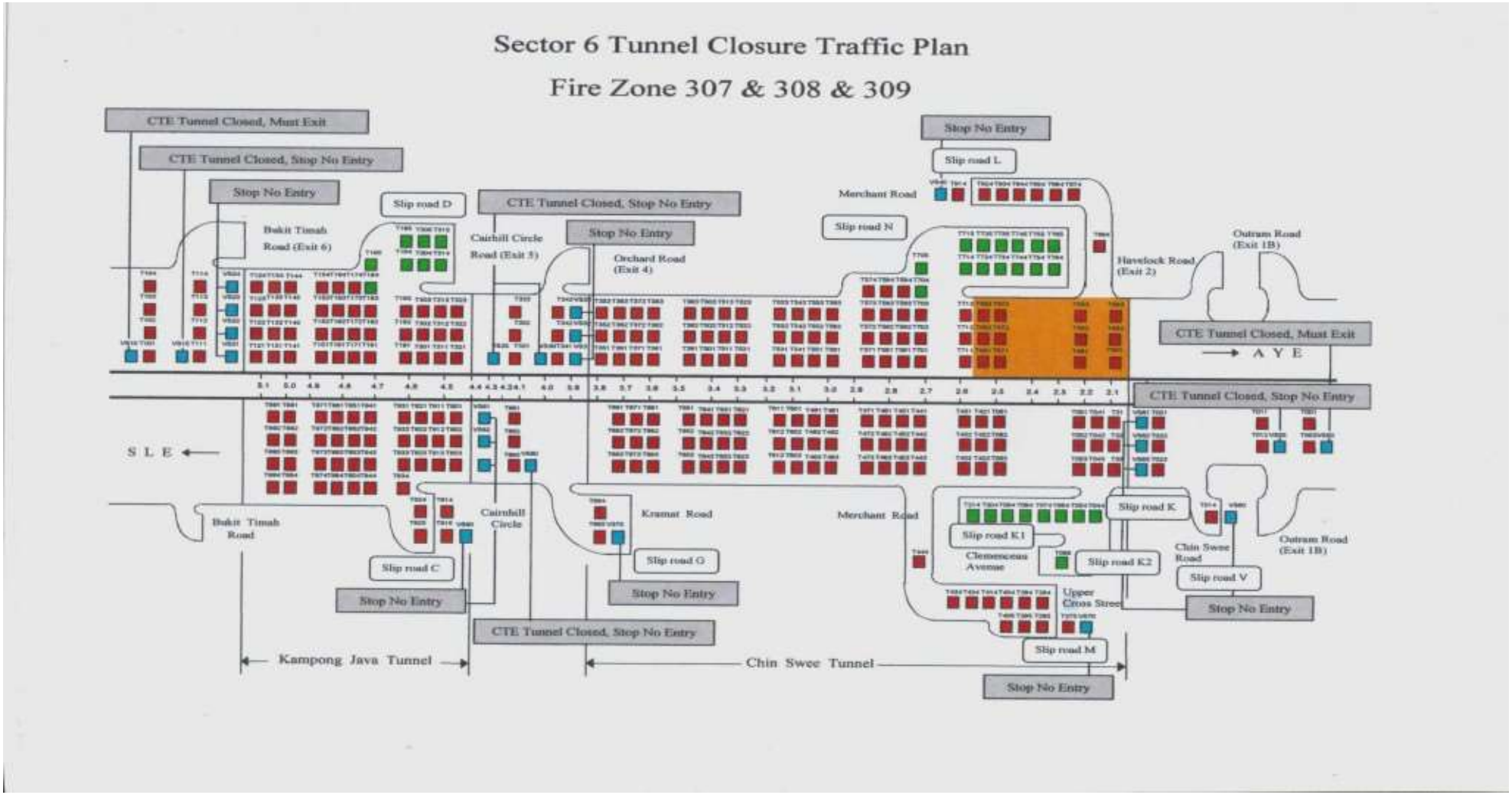
Stop No Entry
Stop No Entry
Slip road L
Merchant Road
Slip road N
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Havelock Road (Exit 2)
Outram Road (Exit 1B)
CTE Tunnel Closed, Must Exit
A Y E
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Merchant Road
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Slip road V
Outram Road (Exit 1B)
Upper Cross Street
Slip road C
Slip road G
Stop No Entry
Stop No Entry
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel
Stop No Entry

A6f)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Fire Zone 307 & 308 & 309
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CTE Tunnel Closed, Stop No Entry
Stop No Entry
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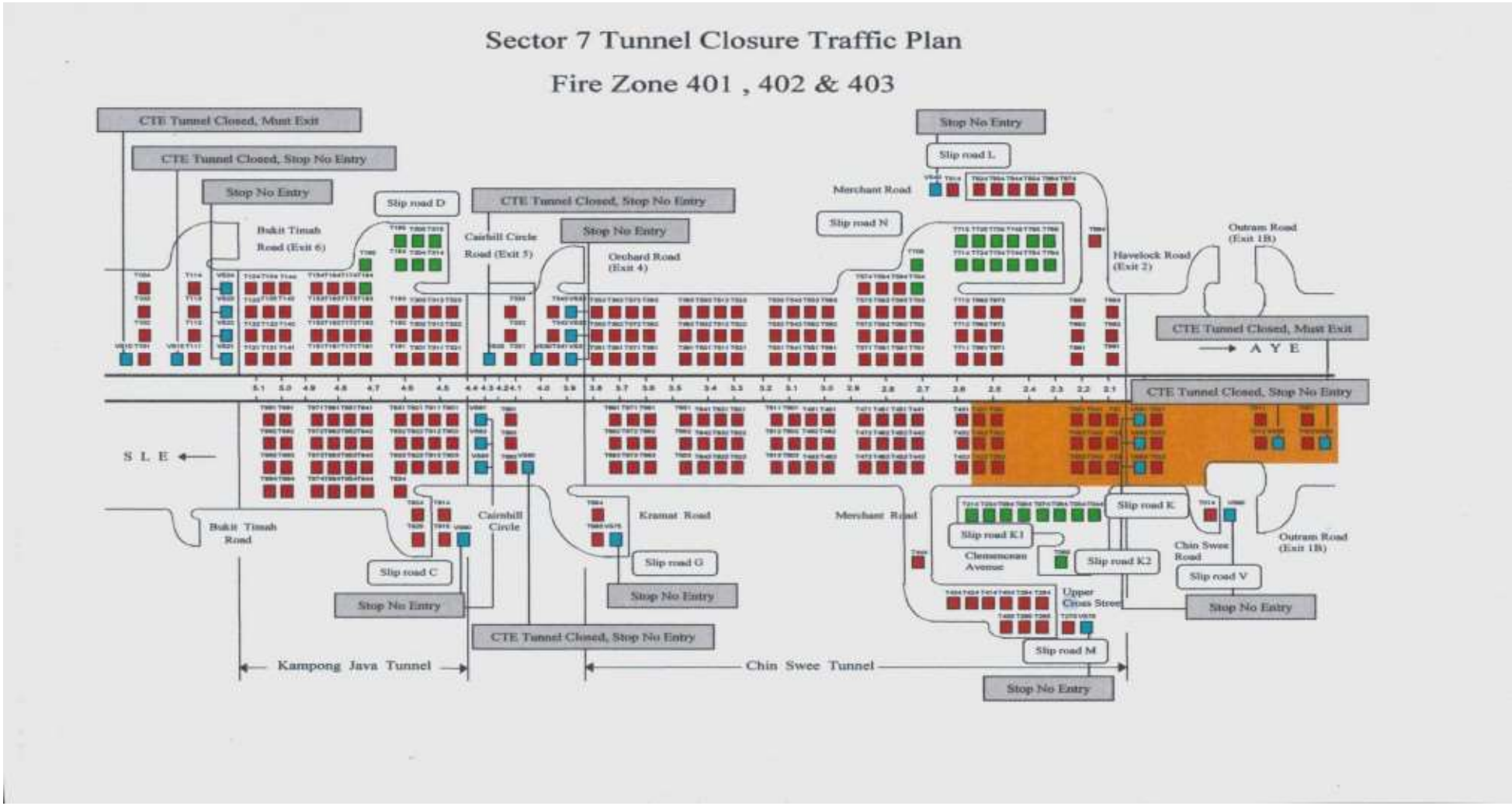
Bukit Timah Road (Exit 6)
Cairhill Circle Road (Exit 5)
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Orchard Road (Exit 4)
Stop No Entry
Slip road L
Merchant Road
Slip road N
Havelock Road (Exit 2)
Outram Road (Exit 1B)
CTE Tunnel Closed, Must Exit
A Y E
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairhill Circle
Kramat Road
Merchant Road
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Slip road V
Outram Road (Exit 1B)
Upper Cross Street
Stop No Entry
Slip road C
Stop No Entry
Slip road O
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel
Stop No Entry

A6g)


Sector 7 Tunnel Closure Traffic Plan
Fire Zone 401 , 402 & 403
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Stop No Entry
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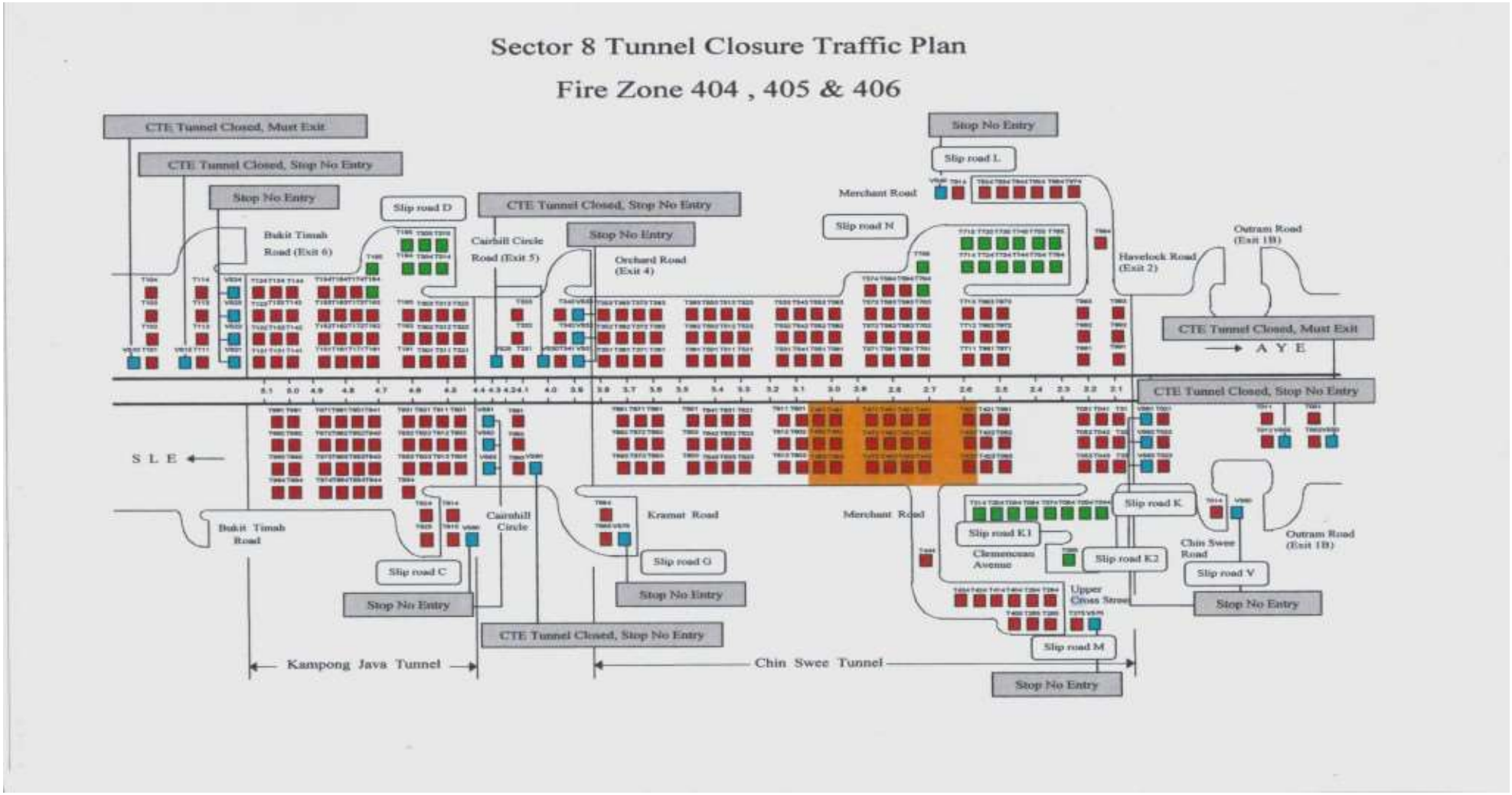
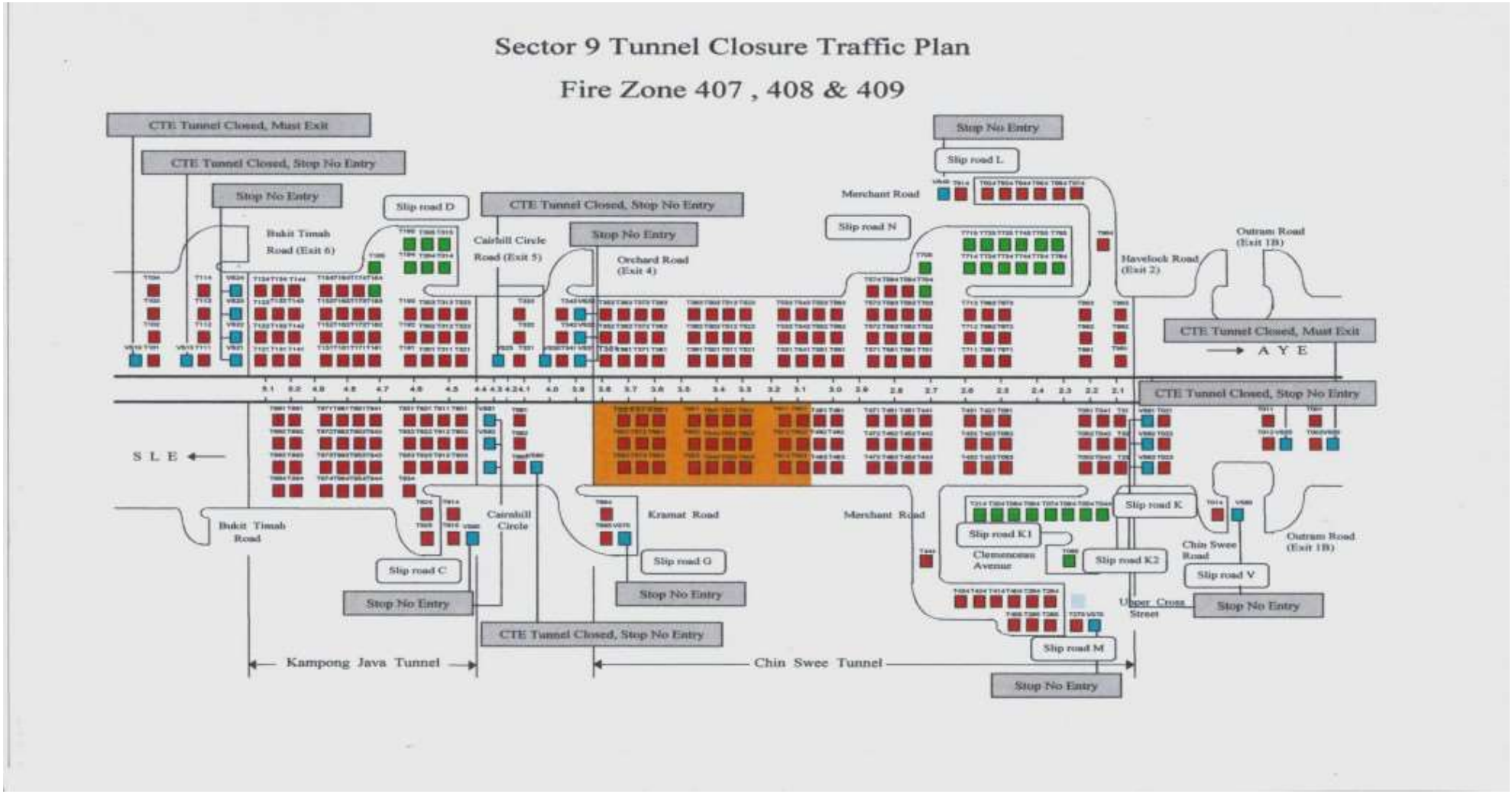
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road L
Merchant Road
Slip road N
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Havelock Road (Exit 2)
Outram Road (Exit 1B)
CTE Tunnel Closed, Must Exit
A Y E
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Merchant Road
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Slip road V
Outram Road (Exit 1B)
Upper Cross Street
Stop No Entry
Slip road C
Stop No Entry
Slip road G
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel
Stop No Entry

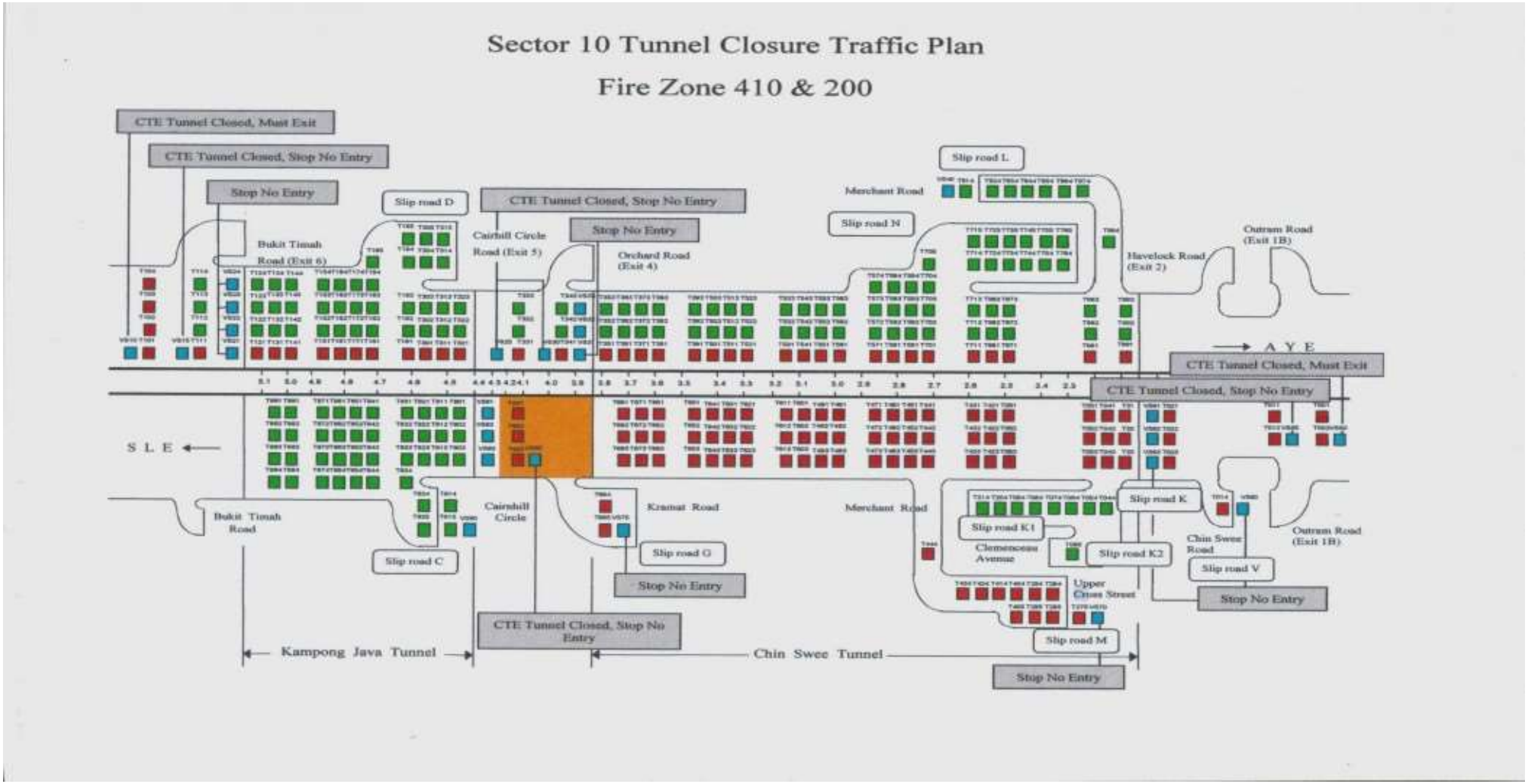
A6h)


Sector 8 Tunnel Closure Traffic Plan
Fire Zone 404 , 405 & 406
CTE Tunnel Closed, Must Exit
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road L
Merchant Road
Slip road D
CTE Tunnel Closed, Stop No Entry
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Stop No Entry
Orchard Road (Exit 4)
Slip road N
Havelock Road (Exit 2)
Outram Road (Exit 1B)
CTE Tunnel Closed, Must Exit
A Y E
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Merchant Road
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Outram Road (Exit 1B)
Slip road V
Upper Cross Street
Stop No Entry
Slip road C
Stop No Entry
Slip road G
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel
Stop No Entry

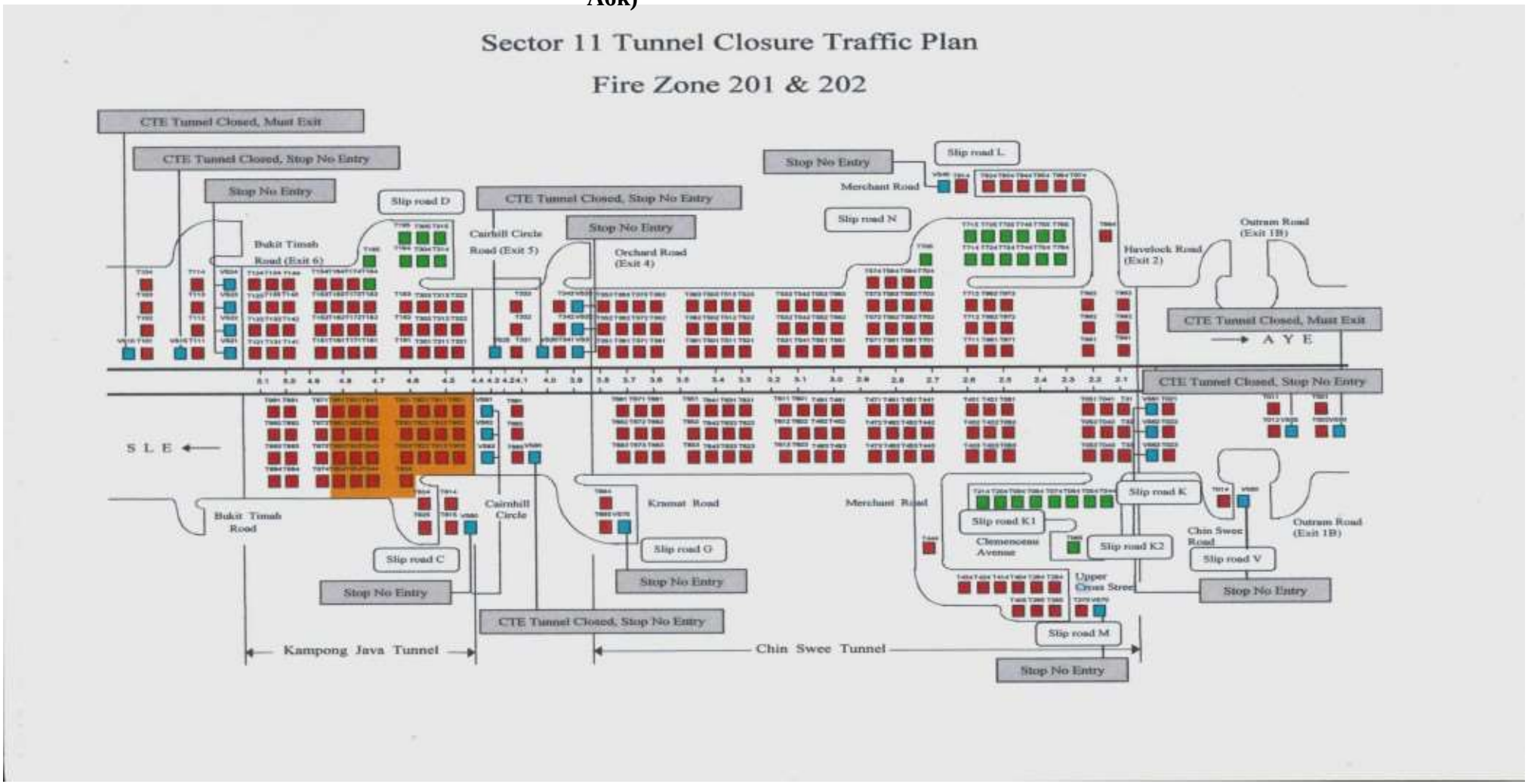
A6i)


Sector 9 Tunnel Closure Traffic Plan
Fire Zone 407 , 408 & 409
CTE Tunnel Closed, Must Exit
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road D
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Slip road L
Merchant Road
Slip road N
Havelock Road (Exit 2)
Outram Road (Exit 1B)
A Y E
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Slip road C
Slip road G
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Slip road V
Upper Cross Street
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel

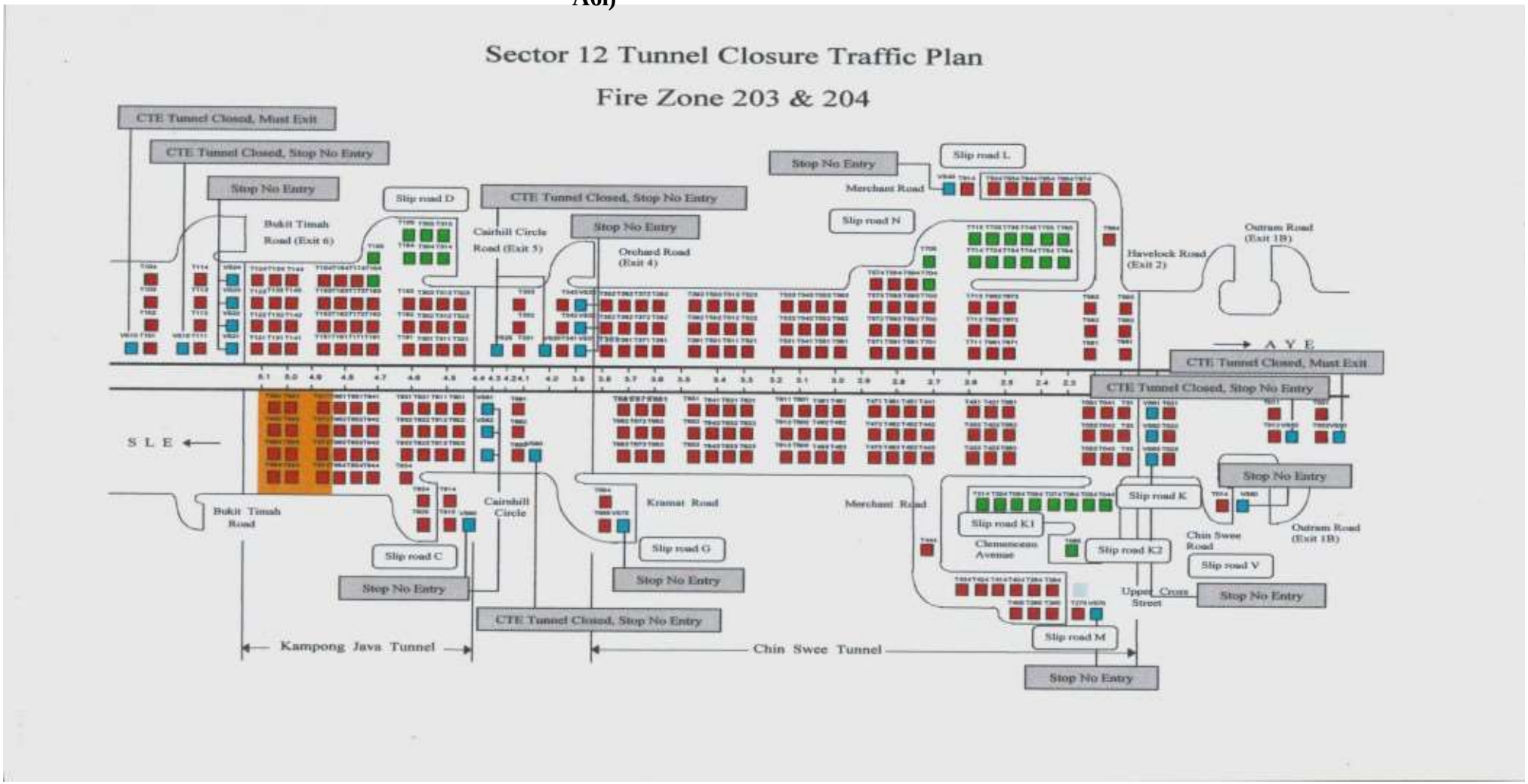
A6j)


Sector 10 Tunnel Closure Traffic Plan
Fire Zone 410 & 200
CTE Tunnel Closed, Must Exit
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road D
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road L
Merchant Road
Slip road N
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Havelock Road (Exit 2)
Outram Road (Exit 1B)
A Y E
CTE Tunnel Closed, Must Exit
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Merchant Road
Slip road K
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Outram Road (Exit 1B)
Slip road V
Stop No Entry
Upper Cross Street
Slip road C
Slip road G
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel
Stop No Entry

A6k)

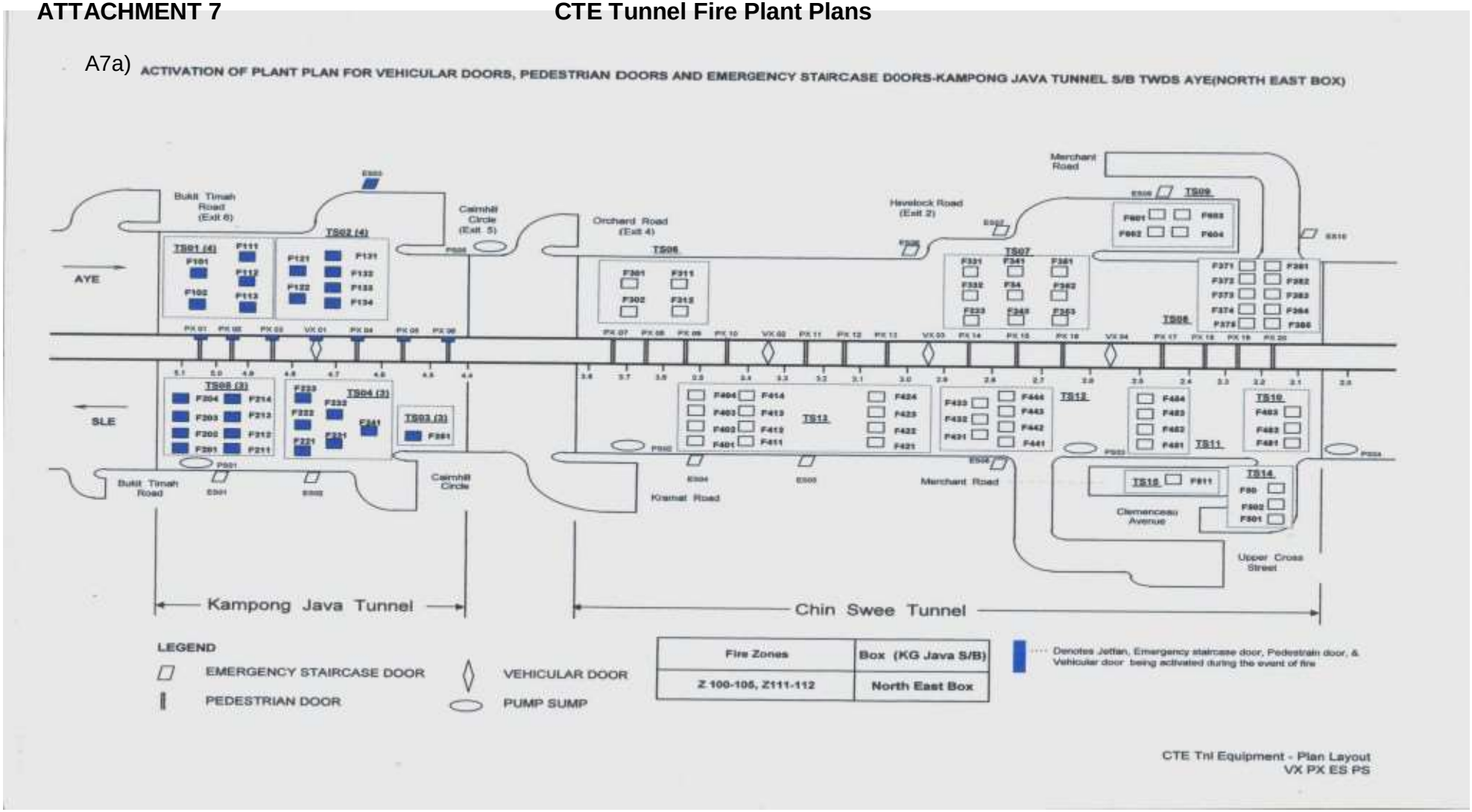

Sector 11 Tunnel Closure Traffic Plan
Fire Zone 201 & 202
CTE Tunnel Closed, Must Exit
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road D
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Merchant Road
Slip road L
Slip road N
Havelock Road (Exit 2)
Outram Road (Exit 1B)
A Y E
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Slip road C
Slip road G
Slip road K
Slip road K1
Slip road K2
Clemenceau Avenue
Chin Swee Road
Slip road V
Upper Cross Street
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel

A6l)

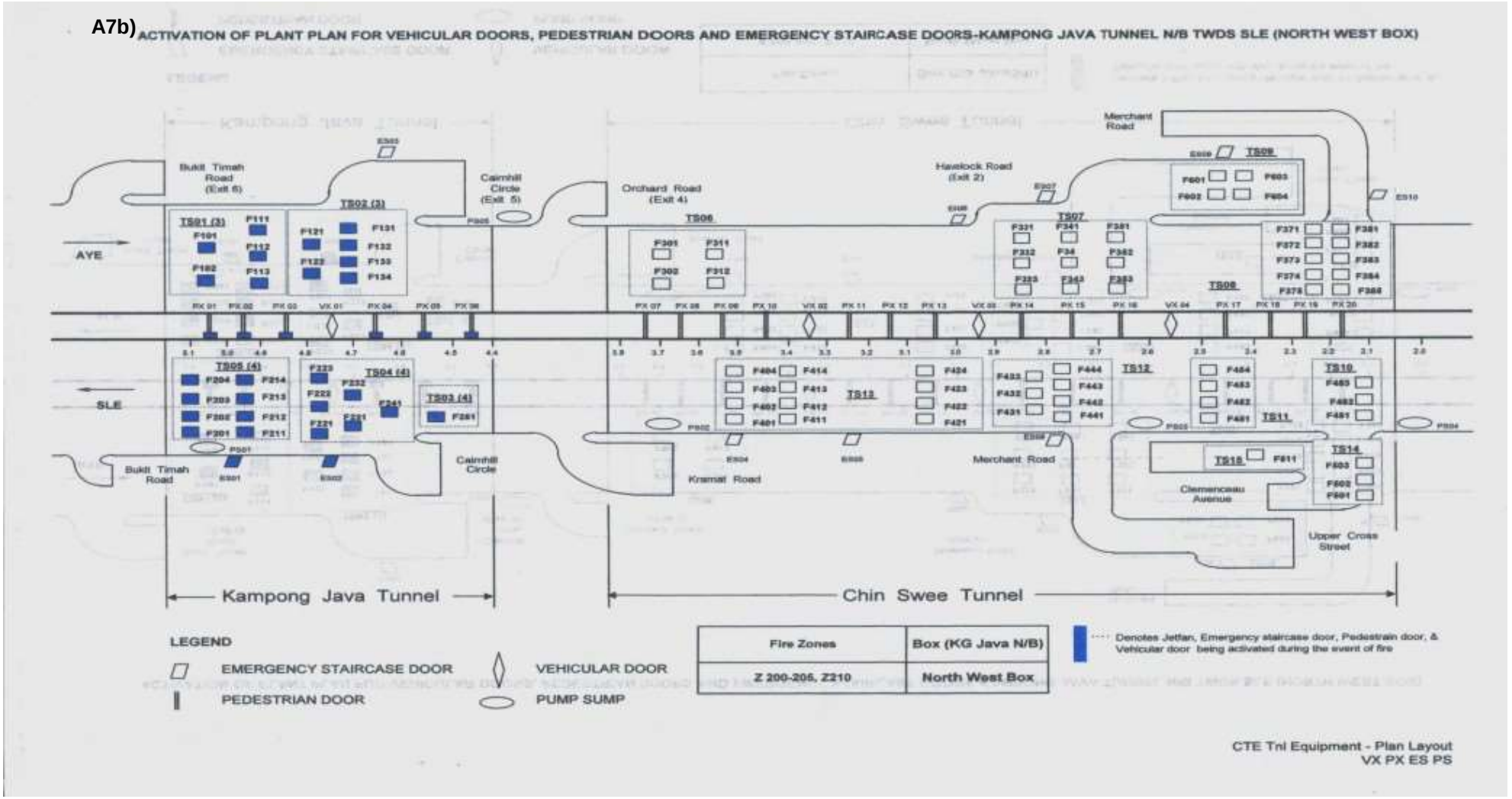

Sector 12 Tunnel Closure Traffic Plan
Fire Zone 203 & 204
CTE Tunnel Closed, Must Exit
CTE Tunnel Closed, Stop No Entry
Stop No Entry
Slip road D
Bukit Timah Road (Exit 6)
Cairnhill Circle Road (Exit 5)
Orchard Road (Exit 4)
Stop No Entry
Slip road L
Merchant Road
Slip road N
Havelock Road (Exit 2)
Outram Road (Exit 1B)
A Y E
CTE Tunnel Closed, Must Exit
CTE Tunnel Closed, Stop No Entry
S L E
Bukit Timah Road
Cairnhill Circle
Kramat Road
Merchant Road
Slip road K
Stop No Entry
Slip road K1
Clemenceau Avenue
Slip road K2
Chin Swee Road
Outram Road (Exit 1B)
Slip road V
Upper Cross Street
Stop No Entry
Slip road C
Stop No Entry
Slip road G
Stop No Entry
CTE Tunnel Closed, Stop No Entry
Slip road M
Kampong Java Tunnel
Chin Swee Tunnel
Stop No Entry

ATTACHMENT 7 **CTE Tunnel Fire Plant Plans**

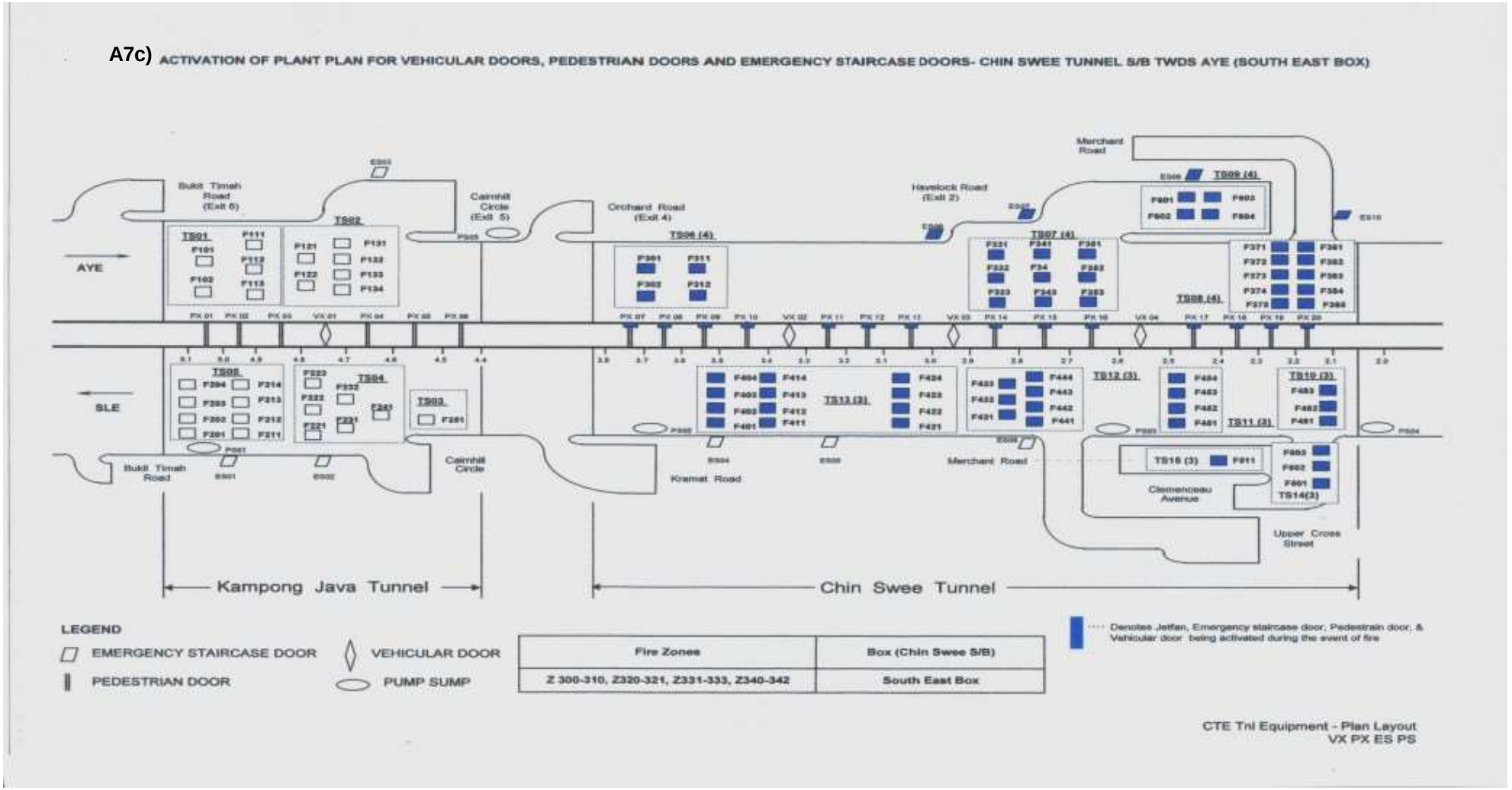
A7a) **ACTIVATION OF PLANT PLAN FOR VEHICULAR DOORS, PEDESTRIAN DOORS AND EMERGENCY STAIRCASE D0ORS-KAMPONG JAVA TUNNEL S/B TWDS AYE(NORTH EAST BOX)**



A7b) ACTIVATION OF PLANT PLAN FOR VEHICULAR DOORS, PEDESTRIAN DOORS AND EMERGENCY STAIRCASE DOORS-KAMPONG JAVA TUNNEL N/B TWDS SLE (NORTH WEST BOX)



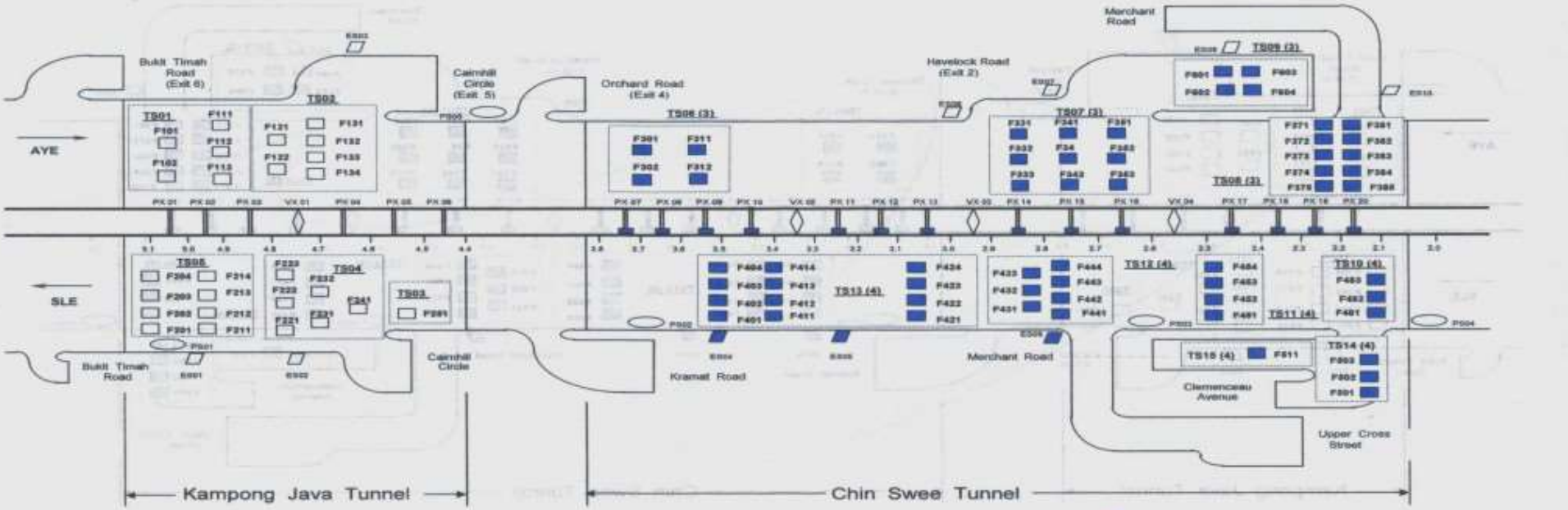
A7c) ACTIVATION OF PLANT PLAN FOR VEHICULAR DOORS, PEDESTRIAN DOORS AND EMERGENCY STAIRCASE DOORS- CHIN SWEE TUNNEL S/B TWDS AYE (SOUTH EAST BOX)



Fire Zones	Box (Chin Swee S/B)
Z 300-310, Z320-321, Z331-333, Z340-342	South East Box

A7d)

ACTIVATION OF PLANT PLAN FOR VEHICULAR DOORS, PEDESTRIAN DOORS AND EMERGENCY STAIRCASE DOORS-CHIN SWEE TUNNEL N/B TWDS SLE (SOUTH WEST BOX)



ATTACHMENT 8a) Fire In Tunnel Checklist

Time	Tunnel OE	DyAM	DM (ITSO OCC)
H + 0 min	❑ Alert DM immediately if there is a fire in CTE Tunnel		❑ Give instruction to close tunnel ➢ To decide whether to close incident bound only or both bound.
H + 1 To 3 min	❑ Determine fire location and activate plant plan(both bound). ➢ Switch on Jet Fan ➢ Switch on line light to 100% ➢ Switch on strobe light ❑ Determine which fire zone and activate fire plan (upon DM instruction to close tunnel) ➢ To launch the fire plan(whether incident bound or both bound) as advised by DM (ITSO OCC) ❑ Create IR ➢ The start time will be base on the time we confirm the incident ➢ All lanes must be crossed so that the messages proposed will be tunnel closed and this information will be send to TW accurately.	❑ Assist to break in RBBI ❑ Dispatch 2 x VRS and 2(or 3) X LTM to site ➢ The 1st VRS and LTM which arrived will report to incident location. ➢ If the fire is on SLE bound, the 2nd LTM / VRS will proceed to divert all traffic out at Outram Exit. The 3rd LTM will proceed to close Chin Swee Rd Entrance. ➢ If the fire is on City bound, the 2nd LTM/VRS will proceed to divert all traffic out at Bt Timah Exit. ❑ Inform TW ➢ Fax IR to TW ➢ Call and tell them to announce the incident as top priority.	❑ Inform SCDF, TP/Div Police. The following information must be provided to them. ➢ Type of Incident ➢ Exact Location ➢ Best route to take to avoid traffic congestion ➢ RV point**(refer to Table A)** *RV is still pending discussion with external agencies ❑ Notify KPE OCC / LTOC ❑ Inform MOPN and DDIT by phone and “INCIDENT” group by sms. *Who will activate CMT? *LTOC to activate CMG?

Time	Tunnel OE	Dy AM	DM(ITSO OCC)
H + 3 To 10 min	❑ Using CCTV, ensure the fire plan was successfully executed and all messages are correct while waiting for VRS or LTM to reach site.	❑ Inform LTA Call Centre(1800-2255582) so that they can assist to inform member of public who call in and enquire. ❑ Inform SCDF(AB) so that they can inform all AB(who are on the way to convey sick patient to hospital) not to pass by the affected route (The DyAM will assist the DM (ITSO OCC) and Tunnel OE in the first 10minutes. The reason is that since DM (ITSO OCC) is fully focus on managing the incident, the Dy AM will assist to oversee the traffic on other part of the island, both EMAS and EA)	❑ Inform traffic planning team to flush out traffic due to closure of tunnel. If the above is not possible(eg, during PH, weekends or night time) ask another OE to take over zone 1 and assign zone 1 OE to assist SOE in flushing traffic(if necessary) ❑ Instruct zone 1 OE to implement messages on expressway leading to tunnel and adjoining expressways ❑ Ensure all slip entrances are physically closed ➢ If the fire is on city bound, send 1 LTM / VRS to close slip L (Merchant Rd Entrance) ➢ If the fire is on SLE bound, send 3 LTM / VRS to close slip M(Upper Cross St entrance), slip G(Kramat Rd Entrance) and slip C(Cairnhill Circle Entrance)

Time	Tunnel OE	Zone 1 OE	DM
Arrival of VRS & LTM	❑ Get update from LTM and VRS and inform DM (ITSO OCC) and update IR ➢ Any injuries ➢ Any fatalities ➢ Any damaged to equipment, structure, road surface, etc	❑ Assist DM (ITSO OCC) to flush the traffic out of tunnel. ➢ Refer to **Table B** on Traffic light intersection and phase to increase ❑ Assist DM (ITSO OCC) to implement messages on expressways leading to tunnel and adjoining expressways. ➢ Refer to **Table C** on specific messages to be implemented on CTE and adjoining expressways ❑ Open heavy traffic IR on all affected roads due to the closing of tunnel. ❑ Check VRS & LTM on site is assisting to secure site and control traffic ❑ Update Traffic Watch if necessary ❑ To assist as required or directed by DM (ITSO OCC).	❑ Inform RIMS OIC of CTE Tunnel ➢ Mr Ang Miah Yew(98211813) ❑ Inform ITSO maintenance team ➢ Mr Yap Hwee Kheng(92957813) for tunnel and plant equipment ➢ Mr William Chia(97257532) for field equipment ❑ Update “INCIDENT” group and LTOC on the progress.(if necessary)

Time	Tunnel OE	Zone 1 OE	DM
Arrival of SCDF, AB and Police.	❑ Monitor and receive update from VRS or LTM. Update IR ➢ Any injuries ➢ Any fatalities ➢ Any damaged to equipment, structure, road surface, etc ❑ Provide necessary assistance to SCDF or SPF as directed by DM (ITSO OCC).	❑ Update KPE on congestion (if required): ➢ Junctions ➢ Adjoining expressway	❑ Render assistance and act in accordance to SCDF or SPF scene commander in ITSO OCC as far as practicable(if they are stationed at OCC). Otherwise, OCC will assist all SCDF request via VRS or LTM on site. ❑ Update “INCIDENT” group & LTOC on the progress.(if necessary)
Arrival of ITSO LO	❑	❑	❑ Get LO to link up with SCDF, Police, TP, RIMS and ITSO maintenance team on site and update OCC ➢ Any equipment or structure damage? ➢ How long does the recovery work take? ➢ How soon can the tunnel be opened? ❑ Update “INCIDENT” group & LTOC on the progress.(if necessary)

Time	Tunnel OE	Zone 1 OE	DM
Re-opening of Tunnel	❑ Wait for clearance from DM (ITSO OCC) for commencement of Tunnel opening. ❑ Once clearance given, Inform LTM / VRS to sweep through tunnel. ❑ Once tunnel is cleared, de-activate fire plan and remove all messages on TIP, TTP and TEP. ❑ Inform LTM and VRS to commence Tunnel re-opening and all those stationed at slip entrances to stand down. ❑ Tidy up IR for AAR	❑ Once tunnel is opened, update Traffic Watch ❑ Once tunnel is opened, remove all messages on adjoining expressways ❑ Tidy up IR for AAR	❑ Seek confirmation from LO that all investigation and recovery work had completed, all system and equipment checks had completed and tunnel is safe to open to motorist. ❑ Update DDIT**(9295 7802)** that tunnel is safe to re-opened. ❑ Once permission given to declare incident stand down, instruct OE to commence opening of Tunnel ❑ Once tunnel is opened, update KPE OCC and LTOC by phone. ❑ Once tunnel is opened, update “INCIDENT”group by sms.

ATTACHMENT 8 b) Fire at Exit Slip Checklist

Time	Tunnel OE	Other Zone OE	DM
H + 0 min	❑ Detects & confirm fire by CCTV camera. ❑ Inform DM (ITSO OCC) & Create Exit Slip Fire IR and implement the respective plant and fire traffic plan. ❑ Activate LTM and RC to incident site ➢ To close all upstream affected entrance slips ➢ Perform traffic control at Fire location. ***(Personnel on site to DON MASK)*** ➢ Close affected exit and divert traffic.	❑ Call SCDF & Police to inform: ➢ Fire location eg. Fire @ CTE SB tunnel 2.4km Havelock Rd exit slip ➢ Accident if any. ➢ Casualties – Persons Injured (If possible to be view by CCTV) ➢ Camera to view ➢ Access route. ➢ RV Pt – Eg. ES10 or nearest VX door.	❑ Inform OE on SCDF and TP access route and RV Pt if situation permits.

***NOTE for any fire occurrence along the exit slip that is very near the tunnel main carriage treat it as a main tunnel fire and follow checklist in ATTACHMENT 8 a)**

H + 1 To 3 min	❑ Call Traffic Watch ❑ Call One-Call-Center.**(6538 8330)** ❑ Call LTOC. **(6396 2952)**	❑ Handle public calls and continue with respective zone duties.	❑ Call DDIT ❑ SMS incident to Key Officers.
Arrival of VRS & LTM	❑ Monitor upstream traffic and CO level. ❑ Update Traffic Watch	❑ Handle public calls and continue with respective zone duties	❑ Inform RIMS and maintenance staff. ❑ Check for expected congestion: ➢ Junctions ➢ Adjoining expressway
Arrival of SCDF and Police.	❑ Info update	❑ Handle public calls and continue with respective zone duties	❑ Info update to DDIT & key officers
Reopening of Tunnel	❑ Update situation record ❑ Remove response plan and close IR ❑ Update Traffic Watch ❑ Inform LTM and VRS to commence re-opening of upstream entrances and affected exit	❑ Handle public calls and continue with respective zone duties.	❑ Seek clearance from RIMS and maintenance staff that Tunnel is safe to open. ❑ Check Congestion at upstream has cleared. ❑ Update DDIT & key officers via sms

ATTACHMENT 8c) Fire at Entry Slip Checklist

Time	Tunnel OE	Other Zone OE	DM
H + 0 min	❑ Detects & confirm fire by CCTV camera. ❑ Inform DM & Create Entry Slip Fire IR and implement the respective plant and fire traffic plan. ❑ Activate LTM and RC to incident site ➢ To close all upstream affected entrance slips ➢ Perform traffic control at Fire location. ***(Personnel on site to DON MASK)*** ➢ Close affected entrance and divert traffic.	❑ Call SCDF & Police to inform: ➢ Fire location eg. Fire @ CTE SB tunnel 2.4km Merchant Rd entrance slip ➢ Accident if any. ➢ Casualties – Persons Injured.(If possible to be view by CCTV) ➢ Camera to view ➢ Access route. ➢ RV Pt – Eg. ES10 or nearest VX door.	❑ Inform OE on SCDF and TP access route and RV Pt if situation permits.
H + 1 To 3 min	❑ Call Traffic Watch ❑ Call One-Call-Center**.(6538 8330)** ❑ Call LTOC. **(6396 2952)**	❑ Handle public calls and continue with respective zone duties.	❑ Call DDIT ❑ SMS incident to Key Officers.

***NOTE for any fire occurrence along the entry slip that is very near the tunnel main carriage treat it as a main tunnel fire and checklist in ATTACHMENT 8a)**

Time	Tunnel OE	Other Zone OE	DM
Arrival of VRS & LTM	❑ Monitor upstream traffic and CO level. ❑ Update Traffic Watch		❑ Inform RIMS and maintenance staff. ❑ Check for expected congestion: ➢ Junctions ➢ Adjoining expressway
Arrival of SCDF and Police.	❑ Info update	❑ Handle public calls and continue with respective zone duties	❑ Info update to DDIT & key officers
Re-opening of Tunnel	❑ Update situation record ❑ Remove response plan and close IR ❑ Update Traffic Watch ❑ Inform LTM and VRS to commence re-opening of upstream entrances and affected entrance	❑ Handle public calls and continue with respective zone duties.	❑ Seek clearance from RIMS and maintenance staff that Tunnel is safe to open. ❑ Check Congestion at upstream has cleared. ❑ Update key officers via sms

ATTACHMENT 8b) Fire at Exit Slip Checklist

1) If the fire is small or further away from main carriageway, OCC will manage the incident as accordance to EMAS protocol(only the mentioned Exit is closed. Messages will be implemented accordingly. RBBI break-in but no fire plan will be activated.

2) If the fire is big or near the main carriageway, OCC will manage the incident as accordance to main tunnel and follow the checklist in attachment 8a)

ATTACHMENT 8c) Fire at Entry Slip Checklist

1) If the fire is small or further away from main carriageway, OCC will manage the incident as accordance to EMAS protocol(only the mentioned Entrance is closed. Messages will be implemented accordingly. Traffic will be diverted to arterial roads.

2) If the fire is big or near the main carriageway, OCC will manage the incident as accordance to main tunnel and follow the checklist in attachment 8a)

ATTACHMENT 8d) Fire at Depressed Expressway

1) If the fire is small or further away from main carriageway, OCC will manage the incident as accordance to EMAS protocol(only the mentioned Entrance is closed. Messages will be implemented accordingly. Traffic will be diverted to arterial roads.

2) If the fire is big or near the main carriageway, OCC will manage the incident as accordance to main tunnel and follow the checklist in attachment 8a)

ATTACHMENT 8e) Fire at Open Expressway

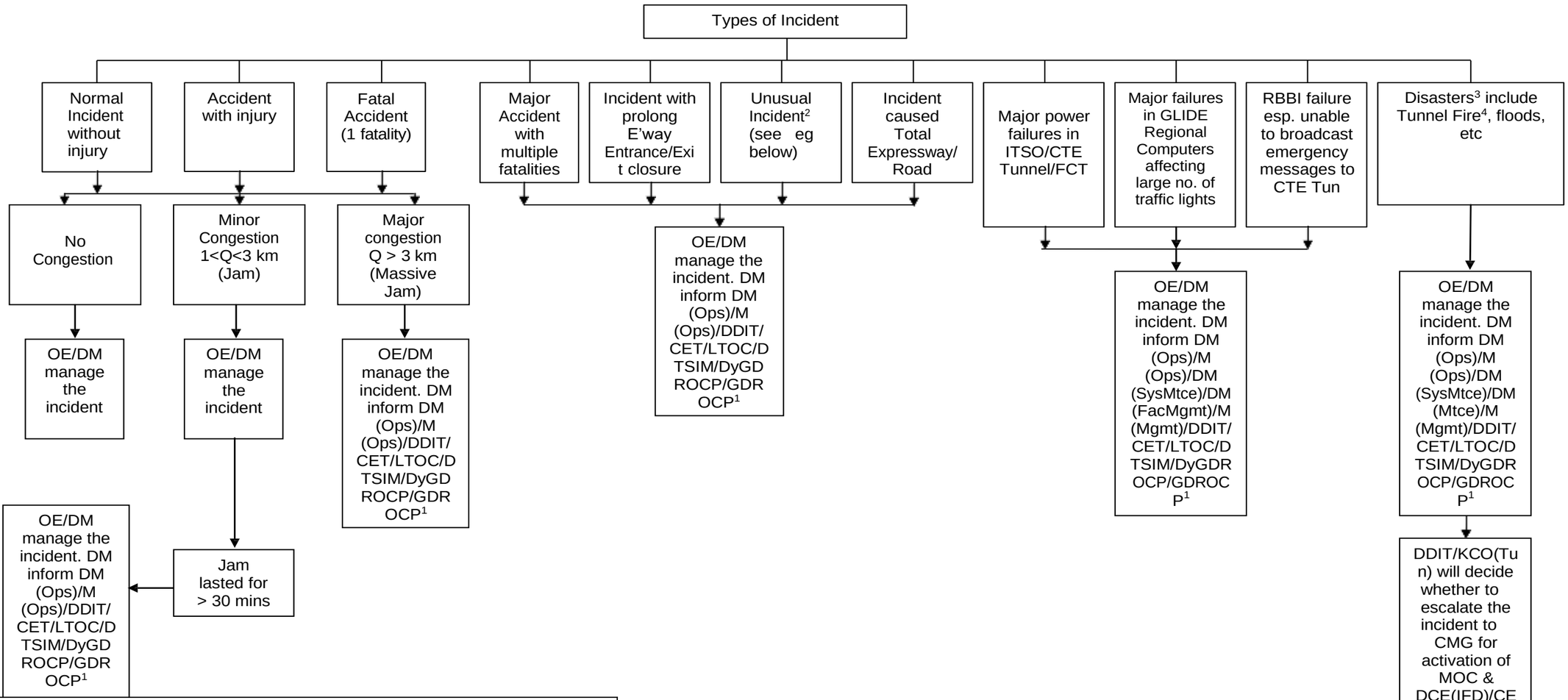
1) If the fire is small or further away from main carriageway, OCC will manage the incident as accordance to EMAS protocol(only the affected lane will be closed. Messages will be implemented accordingly. No RBBI break-in and no fire plan will be activated.

2) If the fire is big or near the main carriageway, OCC will manage the incident as accordance to main tunnel and follow the checklist in attachment 8a)

****Note: The above are just a guide. It will have to be discussed further with DDIT and come to a finalised consensus and agreement.**

ATTACHMENT 9

ESCALATION OF INFORMATION ON INCIDENTS



[1]To exclude those who are on leave

[2]Some examples of Unusual Incidents:
(a) Abnormal massive jam on arterial roads
(b) Huge obstacles such as fallen trees (affecting > 50% of carriageway)
(c) Road cave-in
(d) Serious upheaval of road surface
(e) Flooding
(f) Serious road settlement, subsidence or undulating carriageway over a considerable length of road
(g) Unauthorised works on roads that adversely affect traffic flow / unusual events on roads
(h) Severe damage to overhead gantry/cantilever sign causing massive jam or posing safety hazard (Also to inform DM (Fac Mgmt) & M (Mgmt) if it is an EMAS sign)

[3]Disaster – Please refer to the LTA CMG Minor Disaster List

[4]For Tunnel fire, SCDF takes command and control of the rescue and recovery operations

SMS Message
(a) Est. Nos. of SMS per incident: (i) Start of an incident (ii) updates when there is a change in status (iii) End of an incident.
Min. = 3nos.
(b) Format : <Time> : <New or U/D> : <Type of incident> : <Location> : <Actions taken> : <Impact of incident>
E.g. 0650hrs : New – Accident CTE(AYE) aft PIE(Changi) on Ln 1. TP & TW informed. Congestion 4km up to AMK Ave 1