

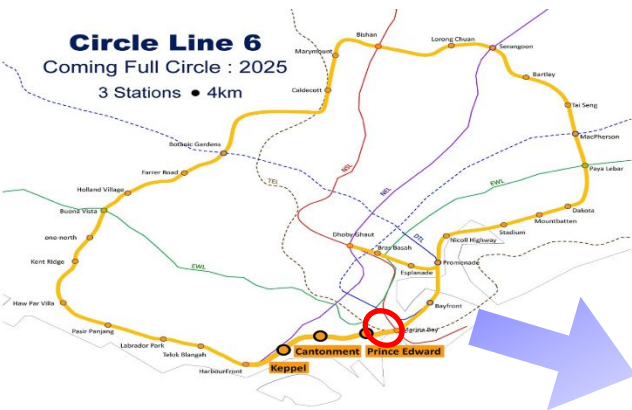
Contract 886

Construction of Cut and Cover Tunnels at Marina Bay Area for Circle Line 6



**Sharing on Planning and Execution of
Effective Safe Management Measures
(SMMs) on C886 Project Site**

1. Project Information
2. Our Planning Guide
3. Planned Activities for Each Phase
4. Safe Management Plan
 - Safe Worksite
 - Safe Workforce
 - Safe Accommodation & Transport
 - Safe Transportation
5. Challenges

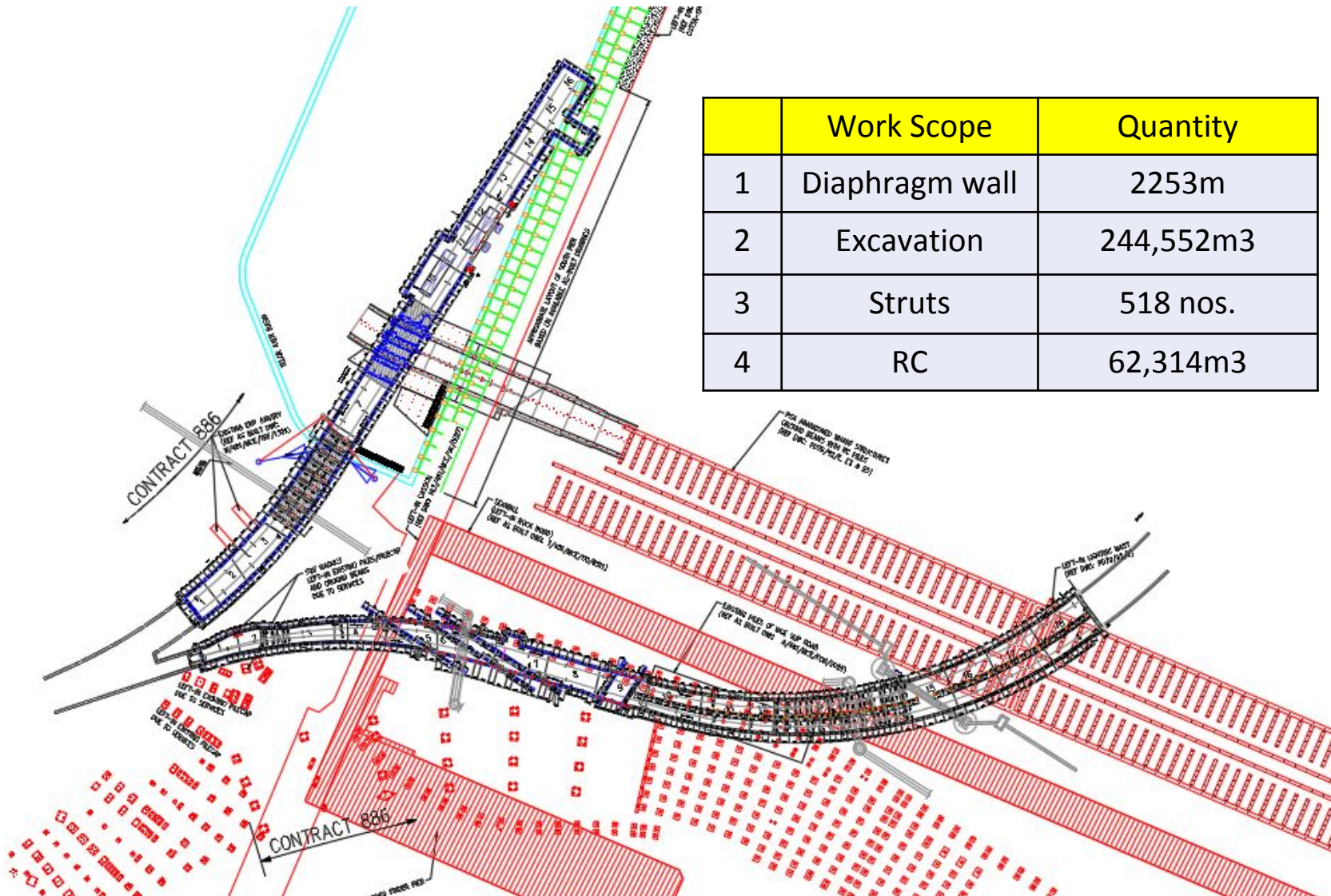


Project Title	CONTRACT C886 Construction of Cut and Cover Tunnel at Marina Bay Area for Circle Line 6
Client	Land Transport Authority
Location	Marina Bay Area
Contract Sum.	S\$ 225,350,000
Contract Period	18 Sep 2017 to 30 Apr 2025
Scope of Work	Structure : Tunnel 832m, Escape building 1 nos. ERSS System : Diaphragm Wall, DSM, Strut & Excavation (Alternative - Partial Top Down) The others : Obstruction Removal, Traffic Decking, Utilities/Drain Diversion, etc.

PROJECT INFORMATION: LOCATION



PROJECT INFORMATION: SCOPE OF WORKS



	Work Scope	Quantity
1	Diaphragm wall	2253m
2	Excavation	244,552m ³
3	Struts	518 nos.
4	RC	62,314m ³

	Underground Obstruction
1	PSA abandoned wharf structures ground beams with RC piles
2	Existing bored piles of MCE slip road
3	Seawall
4	Left-in south pier
5	Telok Ayer Basin
6	SQV Viaduct left-in existing piles
7	Various unknown obstruction

- Start with a small step
 - Pre-COVID work force – 480 pax
 - Current approval (working on site) – 150 pax (30% of original)
- Understand the situation and the various government advisories
 - With the pandemic in the background, we need to negotiate our way forward
 - Guidance from client: LTA
 - Pre-Consultation with BCA for 2 weeks before submission
- Gradual increment of workforce
 - After resumption of work, we are in the process of increasing our workforce.

PLANNED ACTIVITIES FOR EACH PHASES

Phase 1 (Current Stage)	
Activities	Sub-Contractors
D-Wall Construction	KB (2 Team)
Soil Disposal	KKL
Rebar Fabrication	Chin Leong (2 Team)

Planned Duration: 1 Month
Dormitory Plan: TLQ + GSF

Phase 2	
Activities	Sub-Contractors
D-Wall Construction	KBGT (2 Team)
	Pumyang (1 Team)
Sewer	Patience
Soil Disposal and Excavation works (TB07/08)	KKL
Rebar	Chin Leong (2 Team)
Ground Improvement Works (ML18 Testing / GIW at TB10/11)	GCE (1 Team)
Steel Works (TB07/08)	KORI (1 Team)
Ground Improvement works (TB13)	KINC

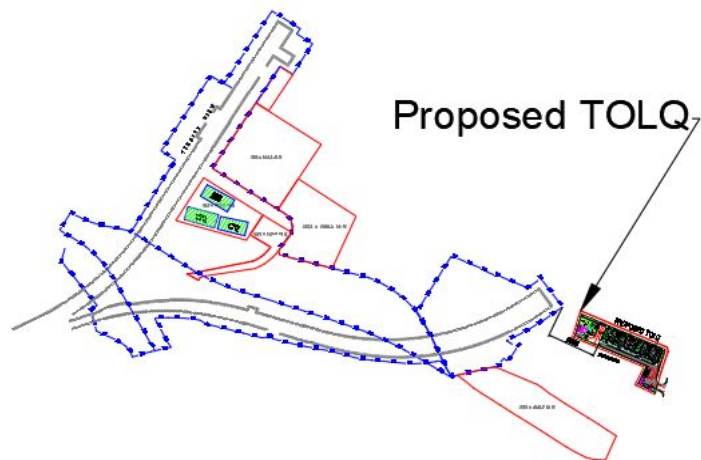
Planned Duration: 1 Month
Dormitory Plan: CTQ + Approved Dormitory

Phase 3	
Activities	Sub-Contractors
D-Wall Construction	KBGT (2 Team)
	Pumyang (2 Team)
Rebar	Chin Leong (2 Team)
Sewer	Patience
Soil Disposal and Excavation Works (TB9 /ML17/18)	KKL
Sewer	Patience
Ground Improvement Works (TB10/11 & Testing)	GCE (2 Team)
Steel Works	KORI (2 Team)
RC Works (TB06 / ML16)	Kian Hup
Waterproofing Works (TB06/ML16)	Maxbond
Ground Improvement Works (Gap grouting TB10/11)	Daedong / Sindong
Ground Improvement works (TB14)	KINC

Planned Duration: Full Swing
Dormitory Plan: TOLQ + Approved Dormitory

1. Provision of TLQ,CTQ and TOLQ.

	Phase 1	Phase 2	Phase 3
On site dormitory	TLQ	CTQ	TOLQ
Capacity	33	95	270
Status	Approved and In use	Erection in progress	Clearances for land use obtained, TOL application to SLA submitted. Pending BCA approval of submission.



2. Workers in the same work zones are segregated at their accommodation. Each Team work, stay, eat and play together.
3. BCA had guided earlier that if there are more than 100 workers in the submission, only 5 dormitory addresses were allowed. Based on latest BCA circular issued on 21 Jul 2020, there is now no cap to the number of workers but limit maximum of 10 dormitory addresses.

C886 - Workers Accommodation (Current Stage)

Dormitory Name	Company	Work Scope	No. of workers staying	Remarks
Redhill Close	Koh Brothers	1. Dwall Construction 2. CTQ Erection 3. Site Maintenance	94	Government Sourced Facility
C886 TLQ	Koh Brothers	1. Site Maintenance 2. Security	13+3	On site TLQ
	Pumyang			
G&W Dormitory	Koh Brothers	Dwall Construction	19	MOM Cleared Dormitory
KKL Factory	KKL	Soil Sieving and Disposal	17	MOM Cleared Dormitory
Sungei Tengah Lodge	Chin Leong	Rebar Cage Fabrication	41	MOM Cleared Dormitory

Redhill Close Room Allocation

Team	No. of workers	Allocated to numbers of room
Blue Team	18	3
Red Team	27	5
Black Team	49	9

1. Staggered arrival and departure time of each work zone.
2. Mode of transportation : Bus and lorry
3. Each work zone will have separate transport.
Intermixing of different work zone in one vehicle is prohibited.
4. Transportation for SP holders by company van.
5. Daily records of transport arrangements are kept for contact tracing purpose.

Transportation Plan

TEAM	RED Day Shift	RED Night Shift	BLUE Day Shift	BLUE Night Shift	Black Day Shift	Yellow Day Shift	Yellow Night Shift	Brown Day Shift	SP Holders
No of workers	17	10	11	7	30+13+6	8+3	3+3	17+6	11
Time (Arrival to Site)	0810	1955	0810	1955	0705	0720	1845	0830	-
Mode of transport	BUS (40 seater)	BUS (40 seater)	BUS (40 seater)	BUS (40 seater)	BUS(40 seater), 2 lorry	2 Lorry	2 Lorry	2Lorry	Office Van (12 seater)

Driver Name: WU LING
Fin No: 95314 7070
Date & Time: 24/07/2020

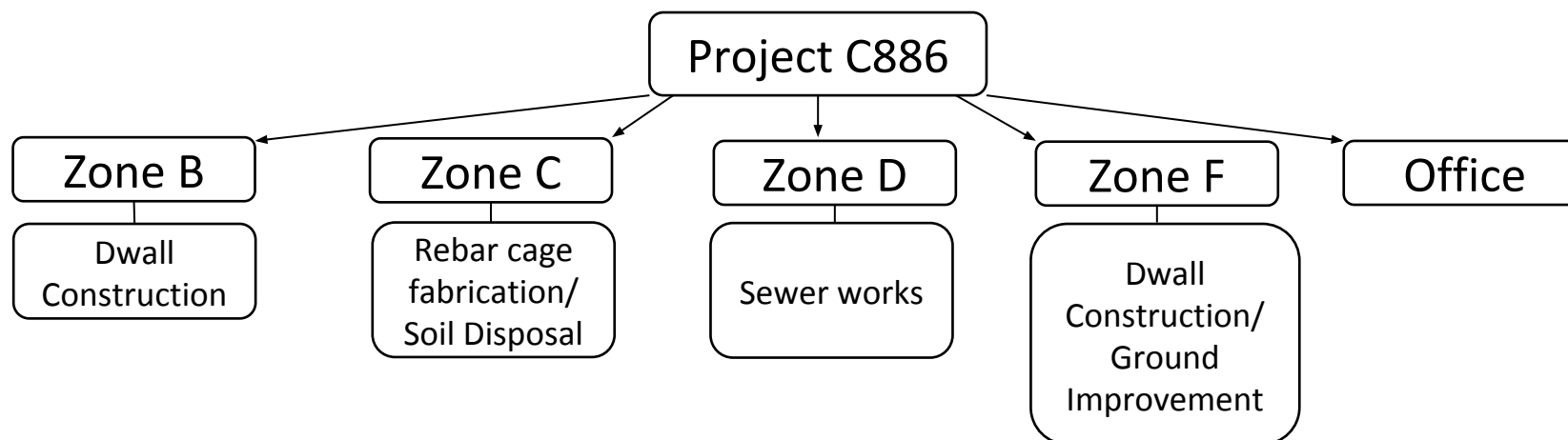
Team: Red
Phone No: 82999398
Vehicle number: PA 2582

Sl No	Name	Fin(last 4Digit)	Team	Sign
1	K. Kumar	9336	Red	K.S.
2	G. Sundarajan	9121	"	G.S.
3	P. Sathishkumar	2611	"	P.S.
4	P. Sankar	5577	"	P.S.
5	K. Anandhagan	2022	"	K.A.
6	G. Anandhagan	5601	"	G.A.
7	M. Prabhakaran	6070	"	M.P.
8	P. Prabhakaran	2191	"	P.P.
9	P. Kumar	3771	"	P.K.
10	V. Sankar	1071	"	V.S.
11	C. Chana	9761	"	C.C.
12	M. Kamran	3851	"	M.K.
13	T. Phak	4371	"	T.P.
14	K. Nattapong	6971	"	K.N.
15	P. Aporn	6811	"	P.A.
16	M. Rukunizaman	4261	"	M.R.
17	B. Odhayan	2161	"	B.O.

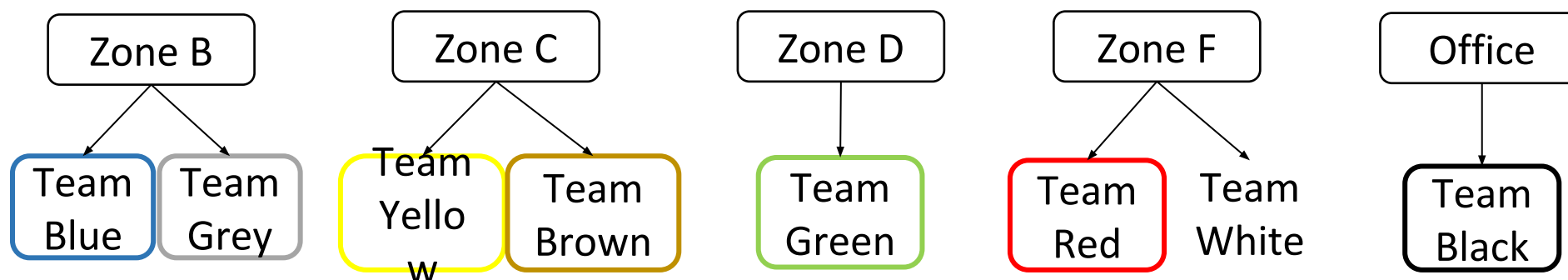


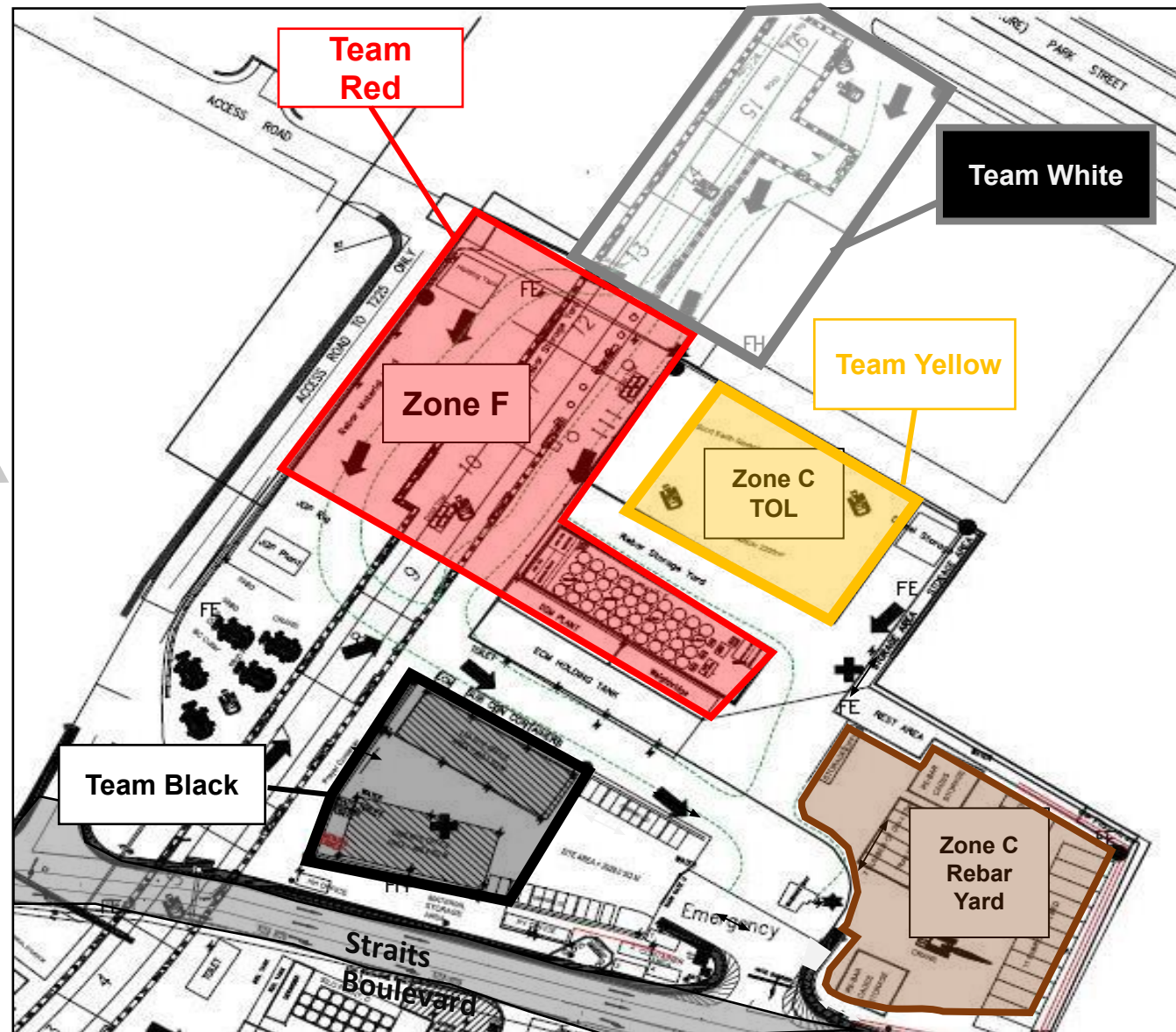
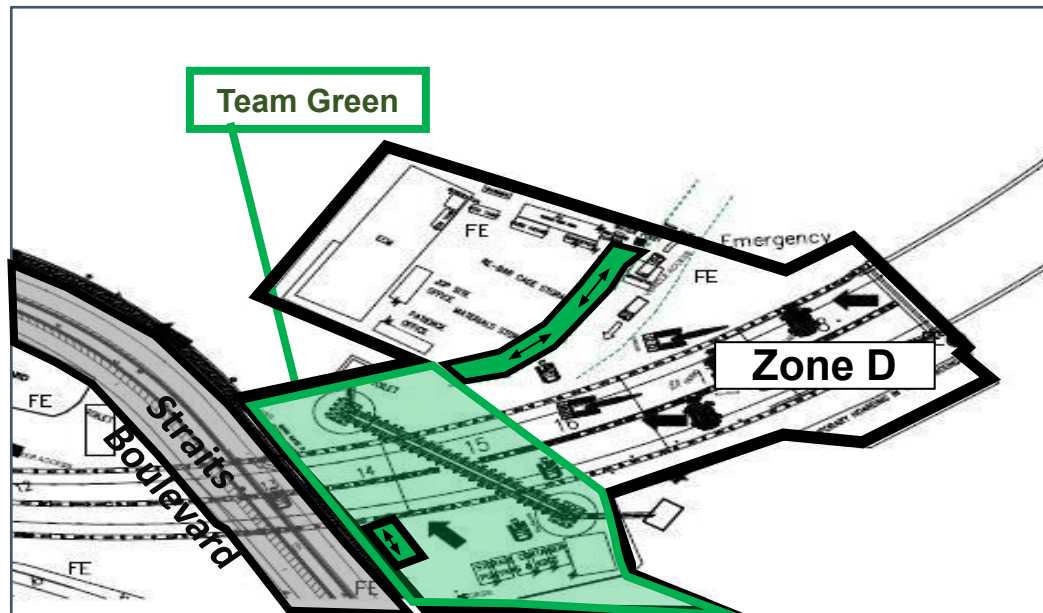
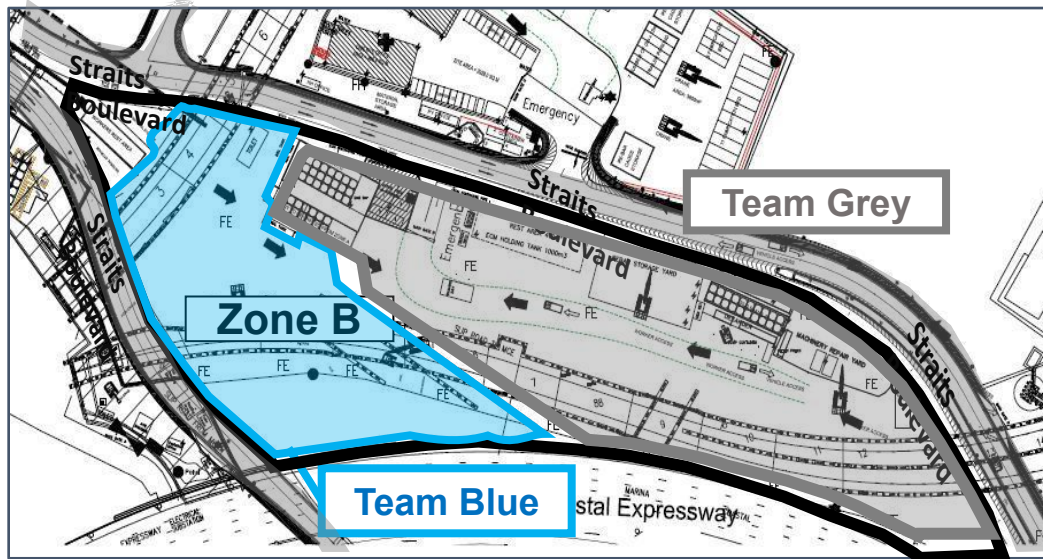
1. Worksite Segregation

- Project site is divided into different work zones.



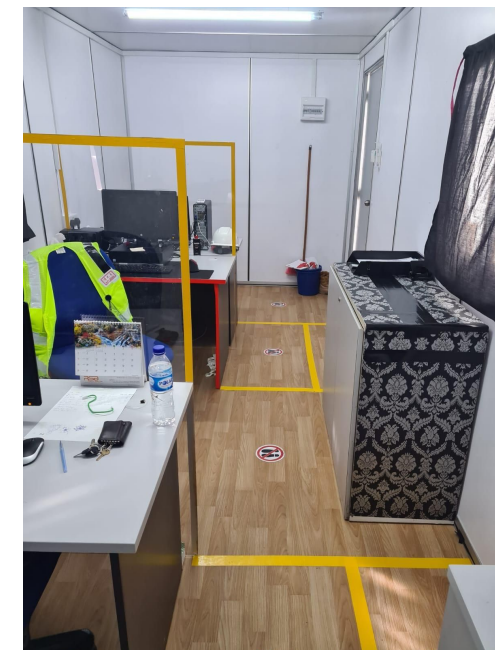
- Each work zones is further divided into different teams based on type of activities and subcontractors.





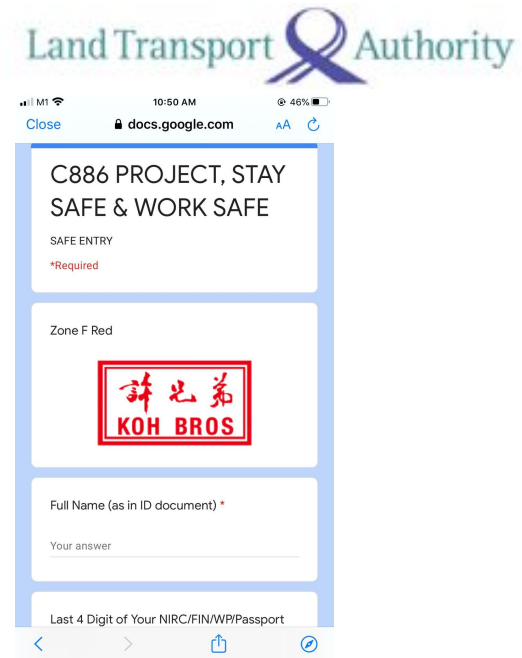
2. Facilities to be provided at each work zones

- Ensuring no contact between each work zones
 - Each work zone will have own dedicated rest area & water point & provided with dedicated facilities (eg. Toilet)
 - Containers provided for site staff who can only stay on respective zone and not allow to back in office area
 - Sick Bay and Isolated room/ container prepared for every work zone in case of emergency



3. Site/ Zone Entry Monitoring system




- Safe Entry NRIC system implemented at the entrances of the work site
- Additional: QR codes to record for health monitoring of all personnel before entering main entrance and **each work zone**
- Dedicated drop off point and access for each zone
- Provided with sanitizer and insect repellent at various location




4. Team Identification

- Physical boundary of each work zones to prevent cross interaction and unauthorized entry (eg. Temporary hoarding)
- Differentiate by work zone: Color code on vest
- Differentiate by accommodation: Color code on helmet



	Transient daily (LTA/QPS/Main Con./IM Staff)
	Transient daily (Worker)
	Stay-in workers (TLQ)

5. Staggered working hours / lunch break / rest hours

Team	Working Timing (Day Shift)	Working Timing (Night Shift)
Black	07:30 AM to 06:30 PM	07:30 PM to 06:30 AM
Yellow	07:30 AM to 06:30 PM	07:30 PM to 06:30 AM
Green	07:30 AM to 06:30 PM	07:30 PM to 06:30 AM
Grey	07:30 AM to 06:30 PM	07:30 PM to 06:30 AM
Red	08:30 AM to 07:30 PM	08:30 PM to 07:30 AM
Blue	08:30 AM to 07:30 PM	08:30 PM to 07:30 AM
Brown	08:30 AM to 09:30 PM	NIL
White	08:30 AM to 07:30 PM	NIL

Team	Meal Time (Lunch)	Break Time (Day Shift)	Meal Time (Dinner)
Black	11:30 AM to 12:30 PM	02:45 PM to 03:15 PM	NIL
Yellow	11:30 AM to 12:30 PM	02:45 PM to 03:15 PM	NIL
Green	11:30 AM to 12:30 PM	02:45 PM to 03:15 PM	NIL
Grey	11:30 AM to 12:30 PM	02:45 PM to 03:15 PM	NIL
Red	12:45 PM to 01:45 PM	03:30 PM to 04:00 PM	NIL
Blue	12:45 PM to 01:45 PM	03:30 PM to 04:00 PM	NIL
Brown	12:45 PM to 01:45 PM	03:30 PM to 04:00 PM	06:00 PM to 06:45 PM
White	12:45 PM to 01:45 PM	03:30 PM to 04:00 PM	NIL



- Food delivery arranged for workers every day

1. Download and register FWMOM Care, TraceTogether and SGWorkPass



2. Report health status and address daily in FWMOMCare
3. Workers are required to pass the COVID safe training course before allowing to enter site
4. Temperature screening before leaving accommodation and before entering the site.



5. Challenges overcome for safe work force during early resumption
- a) Upon getting first BCA approval for resumption of work on 15 June, workers access code status remain red despite compliance with all requirements. Access code turns green on 20 June.
 - b) Some subcontracted works had to be carried out by KB own workers while waiting for the subcontractors' workers to become available (pending clearing of dormitories, etc.).



1. Daily reminders to workers on safe management measures, in pre-task talk for each work zones.

- ✓ Safe distancing at least 1m between each other at all time
- ✓ Maintain good hygiene and wash hand properly with soap/sanitizer
- ✓ Temperature reporting in apps (MOMCARE)
- ✓ Report to immediate supervisor when sick or unwell

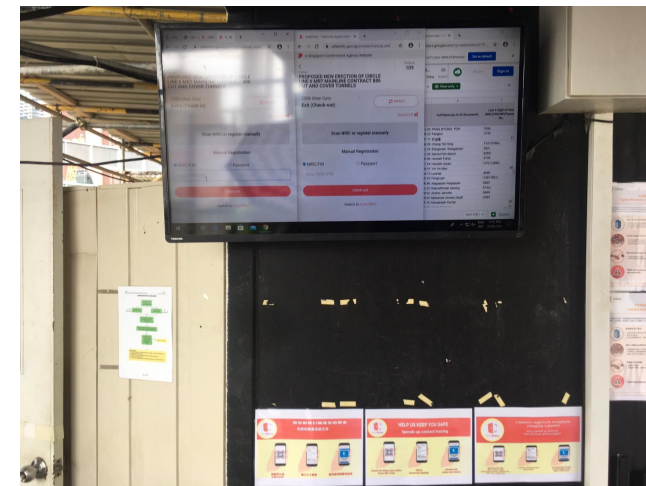
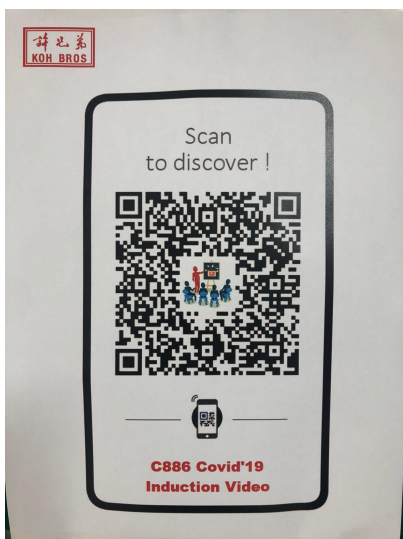
2. SDOs are deployed to each work zones to enhance safe management measures.

- ✓ Number of SMO = 2
- ✓ Number of work zones = 8
- ✓ Current workforce (SP/WP) = 156
- ✓ Number of SDO = 8



1. Contactless safety induction video

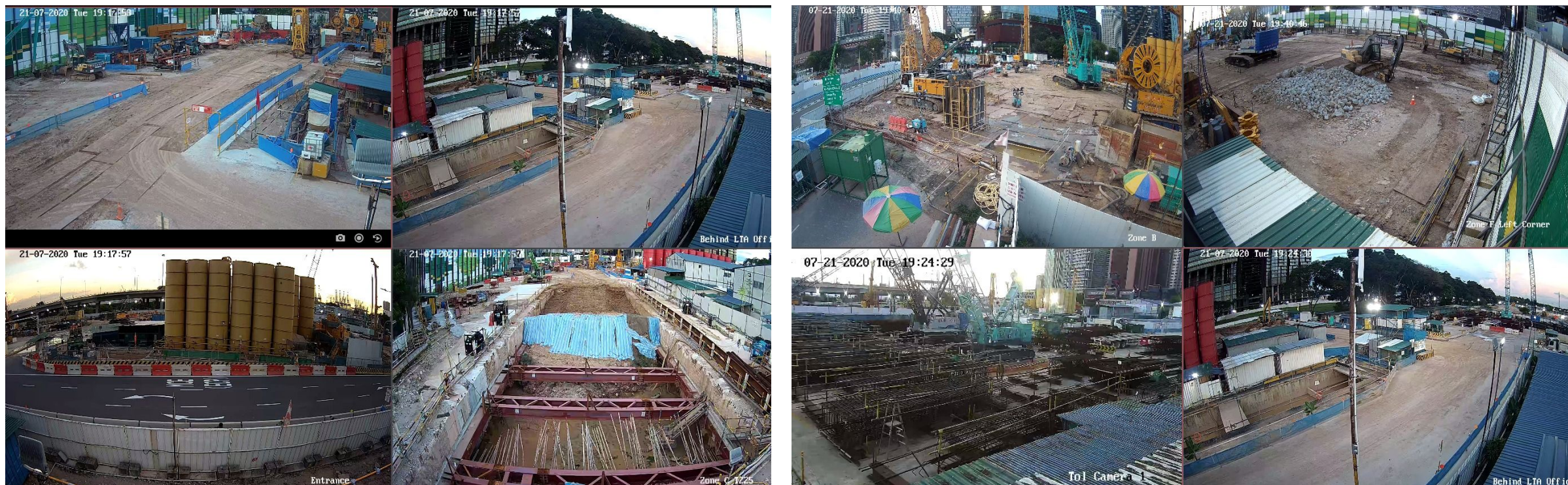
- QR codes for safety induction video on COVID safe measurement implemented on site for all personnel to strictly comply
- TV installed at entrance for playing safety induction video (Languages: Chinese, English, Tamil, Bangladesh).



- TV monitor installed at entrance to monitor safe entry check in process

2. Inspection

- Main contractor's PIC will be assigned to every work zones.
- Utilise CCTV for supervision and inspection purpose.

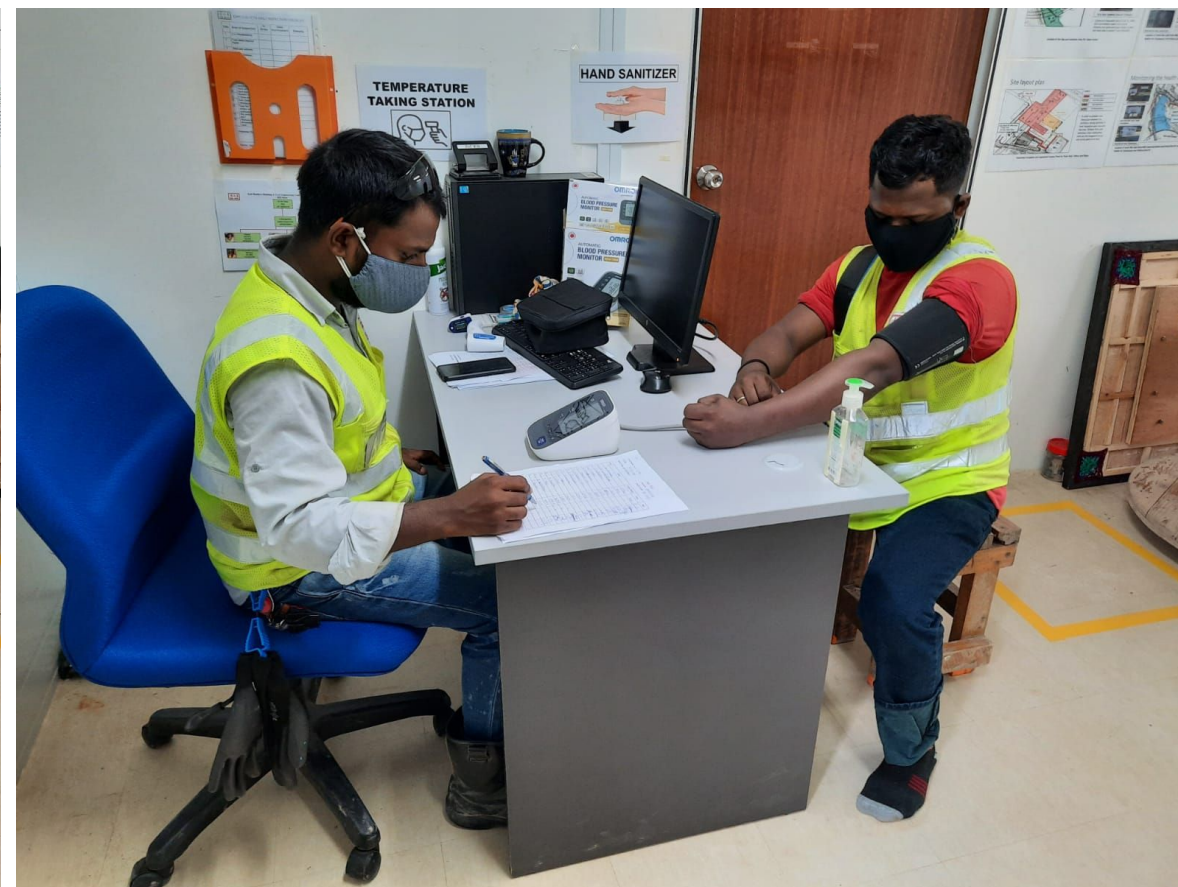


3. Temperature screening , blood oxygen and heart rate monitoring for TLQ workers.

Koh Brothers Building and Civil Engineering Contractor (Pte.) Ltd.
Project: CBR, Construction of Cut and Cover Tunnel at Marina Bay Area, CCL6
TLQ Daily Health Monitoring

Date: 22-07-2022

S/No	Name	WBC/PM (per 4 digits)	Temperature	Sat Blood Oxygen Level	Heart/ Pulse Rate	Temperature	Sat Blood Oxygen Level	Heart/ Pulse Rate
1	ANUPRIAN SEKAR	314M	37.2	95	50			
2	ANIRAJA RATHINANTHI	538L	36.5	95	50			
3	MURUGESAN NALLATHAMBI	218P	37.5	95	60			
4	GOVINDARAJ VERRAMAN	630K	37.5	94	75			
5	UDON NAIR	519P	36.5	94	60			
6	ELANDOVAN THANGAMANI	262K	36.5	94	80			
7	GANESAN ARUNJANAN	820P	36.5	94	55			
8	ULLAH ASAD	472W	36.5	94	65			
9	MANAVAN ARUL	162P	36.5	94	75			
10	S. RAMACHANDRAN	855T	36.5	95	65			
11	ARJUNGAN MANIVANGATI	618P	36.5	94	75			
12	GOVINDASAMPAYAKAMANI	202P	36.4	95	55			
13	SELVARAJ VADIVEL	800K	37.1	92	70			
14	NALLU SARAVANAN	901L	36.5	94	65			
15	POHUSAMY SETTU	657P	37.2	95	75			
16	MANMARAN BABU	404K	36.5	94	70			
17								
18								
19								
20								



- Although we could start, but process is still very slow.
- Koh Brothers has started physical works at 6 of 7 projects.
- Productivity has dropped (only about 20% of pre-COVID level of productivity)
- Trying to adapt and adjust to the 'new normal'
- Increased cost and time due to additional COVID measures

*Thank
you*

