

# Environmental Impact Assessment (Final)

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Project Number: 51274-001  
October 2017

## THA: Bangkok Mass Rapid Transit (Yellow Line) (Part 2 of 6)

Prepared by The Mass Rapid Transit Authority of Thailand.

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## Chapter 3

### Project Description

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#### 3.1 Design Concept of the MRT Yellow Line Project Details: Lat Phrao-Samrong Section

The MRT Yellow Line Project: Lat Phrao-Samrong Section has a design concept to provide the MRT service for passengers by independently manage and combine with the existing Bangkok mass transit system. The rail line would allow passengers fast and easy access to downtown and reduce traffic congestion on the Lat Phrao Road. The MRT Yellow Line Project: Lat Phrao-Samrong Section would have elevated track above the road median to mitigate the impact on buildings and environment. The project would provide park & ride buildings to encourage more people to use the MRT Yellow Line. There would be maintenance depot to manage the system independently. The location for park and ride buildings and depot would be selected mainly from government properties to mitigate the impact on land expropriation. The criteria for location of the buildings include connection to other mass transit systems and ease of travel between the building and the station.

From the above concept, there is a need to add/change the project details from the original feasibility study i.e.

- The acquisition and construction design of the depot
- The acquisition and design of Park and Ride buildings
- Change of project route
- Change of station location
- Change/add measures to mitigate the environmental impact and monitor the environmental quality

#### 3.2 Project Route

The MRT Yellow Line Project: Lat Phrao-Samrong Section is a Straddle Monorail with elevated structure along the route to connect with the MRT Blue Line Project at the Ratchada Station (Lat Phrao station of Blue Line) and other 3 lines of MRT Project i.e. The MRT Orange Line Project at Lam Sali intersection, the Airport Rail Link Project at Phat Rama IV interchange and the MRT Green Line Project: Bearing-Samut Prakan Section at the Samrong Station. The project route starting from the connection with the MRT Chaloen Ratchamongkhon line (Blue line first stage) at the Ratchada - Lat Phrao intersection along the Lat Phrao Road and elevated over Chalongsat expressway to Bang Kapi intersection, then turn right to the south along the Srinagarindra Road and connected to the MRT Orange Line Project at Lam Sali intersection. Next, the route will be elevated above Phat Rama IV interchange and connected to Suvarnabhumi Airport Rail Link and pass through Phatthanakan intersection, Si Nut intersection, Si

Udom Suk intersection, Si lam intersection to Si Thepha intersection. From there, the route will turn right again to the west along Thepharak Road pass through the connection with the MRT Green Line Project: Bearing-Samut Prakan Section at the Samrong Station and ended in the Poochaosamingprai Road area with a total distance of about 30 kilometers and consists of 23 stations, one depot at east of Si lam interchange, one Park and Ride buildings at empty space of Si lam interchange. The condition of the project area is shown in **Photo 3.2 - 1**. The project route and station locations of the MRT Yellow Line Project: Lat Phrao-Samrong Section is shown in **Figure 3.2 - 1**.

### 3.3 Project Components

The project components include the route, stations, Park and Ride buildings, depot and other facilities as follows.

- 1) The MRT Yellow Line Project: Lat Phrao-Samrong Section is an elevated monorail system starting from Ratchada Station to the the Samrong Station with a distance of about 30 kilometers.
- 2) The Project has 23 stations include Ratchada, Phawana, Chokchai 4, Lat Phrao 71, Lat Phrao 83, Mahat Thai, Lat Phrao 101, Bang Kapi, Lam Sali, Si Kritha, Phatthanakan, Kantan, Si Nut, Srinagarindra 38, Suan Luang Ro 9, Si Udom, Si lam, Si La Salle, Si Baring, Si Dan, Si Thepha, Thippawan and Samrong with the Ratchada Station connected to the MRT Blue Line, the Lam Sali Station connected to the MRT Orange Line, the Phatthanakan Station connected to the Airport Rail Link and the Samrong Station connected to the MRT Green Line.
- 3) One Park and Ride building located at the point of intersection of the Bang Na - Trat Road near the Si lam station with 2,800 cars parking space.
- 4) Depot located at the intersection between the Srinagarindra Road and the Bang Na - Trat Road near the Si lam Station with the area of 122 rais consisting of main maintenance shop, operation building, MRT lines control centers and other buildings.
- 5) Connection facilities such as Park and Ride buildings, parking area, passenger pick - up and drop-off area and so on.

### 3.4 The Routes and Design of Project Structure

#### 3.4.1 The Concept of Development along the Project Route.

The concept of development along the project route divided into 2 parts i.e. the concept of the MRT Yellow Line development and the concept of land development which focuses on land use summarized as follows:

- 1) In determining the MRT route, the consultant has made feasibility study of the MRT Project along the Lat Phrao Road connected to the Srinagarindra and the Thepharak Road to join with the MRT Green Line system at the Samrong Station. Therefore the study focuses mainly on this route. The original concept to use the Srinagarindra Road as part of the middle ring road



Beginning of Project



End of Project



Lat Phrao Road



Srinagarindra Road

Thepharak Road

Photo 3.2 - 1 Existing environmental condition of project area

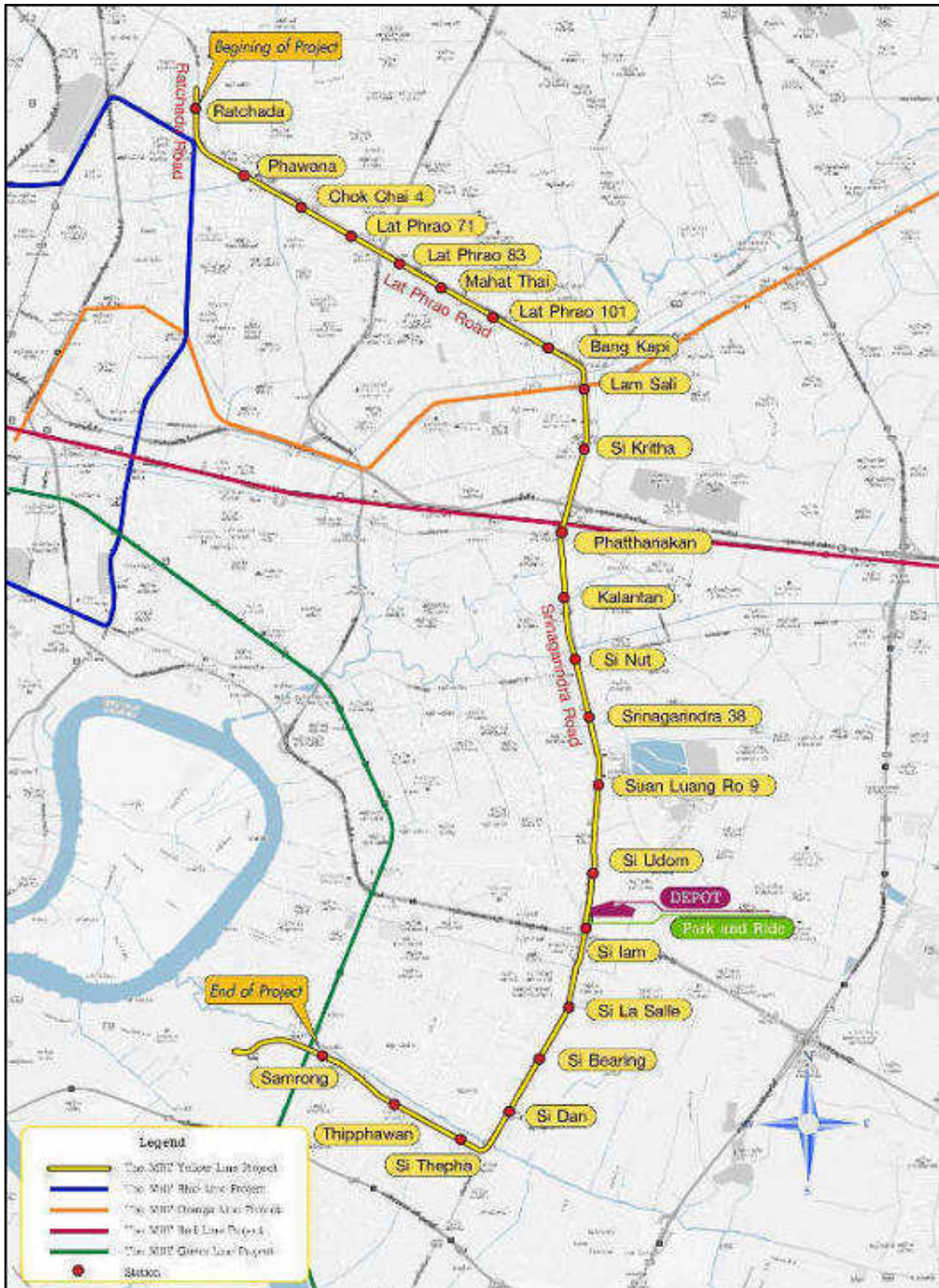


Figure 3.2 - 1 Location and stations of the Bangkok Mass Transit Yellow Line Project :  
Lat Phrao - Samrong Section

together with a new construction road has changed. Since the northern ring road is adjusted from the original route to build a new road to use the Lat Phrao Road and other roads in this area i.e. the Pradit Manutham Road and the Ram Inthra Road which can be served as part of the middle ring road and can be connected together.

The concept to develop a mass transit system to serve along the ring road has changed as well by the effort to develop a system with routes that serve as both the Radius Route and Circumferential Route to be able to cover wider areas. The number of passengers must be big enough to use almost all of the routes and the services must be well worth the investment and management systems since the routes of public transport must accommodate a large number of passengers and cover a reasonable long distance, i.e. the route with high population density. Most of these routes are Radius Route from the suburbs into downtown. To allow enough passengers to use the service, the route must be arranged along the circumferential direction as well.

These concepts of development make the MRT Yellow Line Project: Lat Phrao - Samrong Section seem like two Loop Lines connected together. However the appearance of such a route is the combination of the concepts described above. In addition, the route in eastern Bangkok (BKK) will be connected to the center of the community in the area which will allow connection of the routes in the eastern area of BKK and provide both radial and circumferential services.

In the future when a suburban rail system project and Long Distance Trains, connecting to mass transit systems in the Bangkok Metropolitan area and perimeter, Makkasan - Chachoengsao Line pass through the project route with elevated structure intersections. This study reviewed the details of the suburban rail system and found out that the suburban rail system had higher track than the Monorail system. In October 2008, the company coordinated with the consultant who studied the suburban rail project, to make collaboration on projects design for future connection.

2) The study on land use development for the MRT project are divided into two parts as follows.

The first part is the study of land use at present with connection to the future to forecast Trip Ends in base year and future years. The forecast of land use in the future is also divided into two aspects i.e. land use based on defined principle city plan and trend of population growth from the past. The study of land use in both aspects will be used to forecast Trip Ends in the current year (base year) and in future years. The studies carried out since the beginning of this project study.

The second part of the study is develop recommendations for land use in the Transit Oriented Development (TOD) with aim to support public transportation. The final goal is sustainability and the intermediate goal is to reduce traffic congestion. The study conducted with two major assumptions i.e.

- Public transportation allows ease of travel among various types of community centers. TOD development which focus on land use to create high density community/commercial center and allow ease of travel among various communities/ centers by public transportation such as buses, taxis and bicycles or even on foot will help us reach the goals. It will also help increase the number of passengers in the MRT system.

- The current City Planning Act and the BMA municipal law authorize the preparation of community plan. It is a specific plan to guide the development for various types of centers. This plan will contribute to easier development of TOD and attracts private sector who is interested to invest or co-invest. Small private enterprises join the activities and understand the goals of TOD.

### **3.4.2 Service Route of the MRT Yellow Line: Lat Phrao-Samrong Section**

The service route of the MRT Yellow Line is an elevated structure along the whole route of approximately 30 Kilometers. In general, the route is an elevated structure with the Top of Rail about 12 meters from the existing road level (level +12.00 MSL) and runs along the middle of the road above the road median. Only for some section with obstacles such as a tunnel or underpass, the route will run along the road side. The route raises to 21 to 24.50 meters above the existing road at the overpass above Ratchada - Lat Phrao intersection, Si Kritha interchange (future project of BMA) and across the route of the MRT Green Line Bearing-Samut Prakan Section. Details of the route are as follows.

#### **1) The Lat Phrao Road Section**

The route starts at the connection point with the MRT Chaloem Ratchamongkhon Line (First Phase of Blue Line) at the Ratchada Station by elevated 21 meters from the existing road to rise above the overpass of Ratchada -Lat Phrao intersection and go down to 14 meter above the existing road to Phawana Station (at km.1+481). From there the route goes down to 12 meter above the existing road to keep enough vertical gap when pass over the footbridge. The route passes the Chokchai 4 Station (at km.2+606) at 14 meter above the existing road before going down to the normal 12 meters and elevated to 14 meter at the Lat Phrao 71 Station (at km.4+211). Then go over Chalong Rat Expressway at the Lat Phrao 83 Station (at km.5+006), the Mahat Thai Station (at km.6+188), the Lat Phrao 101 Station (at km.7+022), and the Bang Kapi Station (at km.8+262) in front of Makro Lat Phrao branch. The route will run along the gap in the middle of the overpass at Bang Kapi intersection newly improved the structure at 18.5 meter above the existing road. The route passes in front of The Mall Bang Kapi and stay above the overpass of Bang Kapi intersection before turning right into Srinagarindra Road.

#### **2) The Srinagarindra Road Section**

When getting into Srinagarindra Road, the route is still at 17 meters above the existing road running along the middle of the road, passing across Khlong San Sap and above the overpass of Lam Sali intersection where BMA has a project to improve in the future. The route has the Lam Sali Station (at km. 9+411) which is a connection point to the MRT Orange Line Project. From there the route elevates to 24.50 meters above Si Kritha interchange (BMA future project) and there is the Si Kritha station (at km. 10+710). The route is elevated over Bangkok - Chonburi Motorway at the Rama 9 interchange then goes under the Airport Rail Link with the Phatthanakan Station (at km. 12 + 257) and the Kelantan Station (at km. 13 + 527). Next, the route will diverge to the right of the Srinagarindra Road; go across Khlong Prawet Burirom and the old canal Phra Khanong due to the construction to expand the bridge at the road median. After that, it will diverge back to the road median over the flyover crossing Si nut intersection before reaching the Si nut Station (at km. 15 + 124) which specifies a 16 meter high above the existing road. Next is the Srinagarindra 38 Station (at

km. 16 + 261) which is defined as a future station. The route will pass over the sky bridge to Seacon Square with the Suan Luang Ro 9 Station (at km. 17 + 411). Next it will diverge to the left of the Srinagarindra Road at km. 18 + 200 to avoid the tunnel at Si Udom intersection. The route will cross the overpass at Si Udom intersection before it reach the Si Udom Station (at km. 18 + 982), which specifies a 17 meters high above the existing road. The route will have a rail link to the depot separated from the main rail at km. 19 + 750 and the Si lam Station (at km.19 + 985). This area is set as the Park and Ride area using the empty space at Si lam intersection. The route in this section will be on the left of the Srinagarindra Road parallel to the overpass at the Bang Na-Trat Road and go under Buraphavithi Expressway. After that it will diverge back to the road median on the Srinagarindra Road at km. 20 + 800 and go over the overpass at Si La Salle intersection. The route support beams will be on the space between the overpass. The overpass is in line with Srinagarindra Road. The route will have the Si La Salle Station (at km. 21 + 421) near La Salle overpass, the Si Bearing Station (at km. 22 + 861) and the Si Dan Station (at km. 24 + 220) before it elevated above the overpass at Si Dan intersection. The overpass is in line with the Srinagarindra Road. The route will turn right into the Thepharak Road at Si Thepha intersection.

### 3) The Thepharak Road Section

After entering the Thepharak Road, the route will be at 14 meters above the existing road with the Si Thepha Station (at km. 25+331) and the Thippawan Station (at km. 26+951) in front of Thippawan Village Alley. After that the route will elevate to 21 meters over the existing road with the Samrong Station as a terminal station (at km. 28+691) before it pass over the MRT Green Line Project (Bearing-Samut Prakan section) and meet the Poochaosamingprai Road at km. 28+869.059, the end of the project.

The MRT Yellow Line Project with a distance around 30 kilometers can connect to 2 other MRT Line Projects and 2 projects in the future i.e.

- The MRT Blue Line (Ratchada Station)
- The future MRT Orange Line (Lam Sali Station)
- The Airport Rail Link (Phatthanakan Station)
- The future MRT Green Line (Samrong Station)

#### 3.4.3 Track Structure Design

In general, the elevated track structure design in the project must have beautiful look and support the running of monorail in 2 directions (2-Direction Guide way Beams) along the project route. The track structure will be placed in the middle of the road median as much as possible to mitigate the impact on the public, minimize land expropriation from design, and enhance fast and easy construction to reduce traffic congestion during the construction. The elevated track structure consists of 2 main parts i.e.

**1) Superstructure** Design the monorail track beam by specify the length and the size of the beam and design a set of Continuous Beam with a typical length of 25 meters and 5 continuous spans ( $5 \times 25 = 125$  meters) and the beam with a typical length of 29 meters and 5 continuous spans ( $5 \times 29 = 145$  meters) to reduce the amount of prop, foundation, pile and



bearings Use factory precast beam and assemble on the construction site to save construction time and better control of material quality as shown in **Figure 3.4.3 - 1** and **Figure 3.4.3 - 2**.

In case the track structure of typical length cannot be used, the consultant will design a track structure to support Continuous Beam with 2 to 5 spans with the length of 25, 29 and 35 meters as shown in **Figure 3.4.3 - 3**. If the track structure has to cross over the intersection and need to use a longer beam than a typical one, the extra-long beam of 40-60-40 meters as shown in **Figure 3.4.3 - 4** will be used in the project.

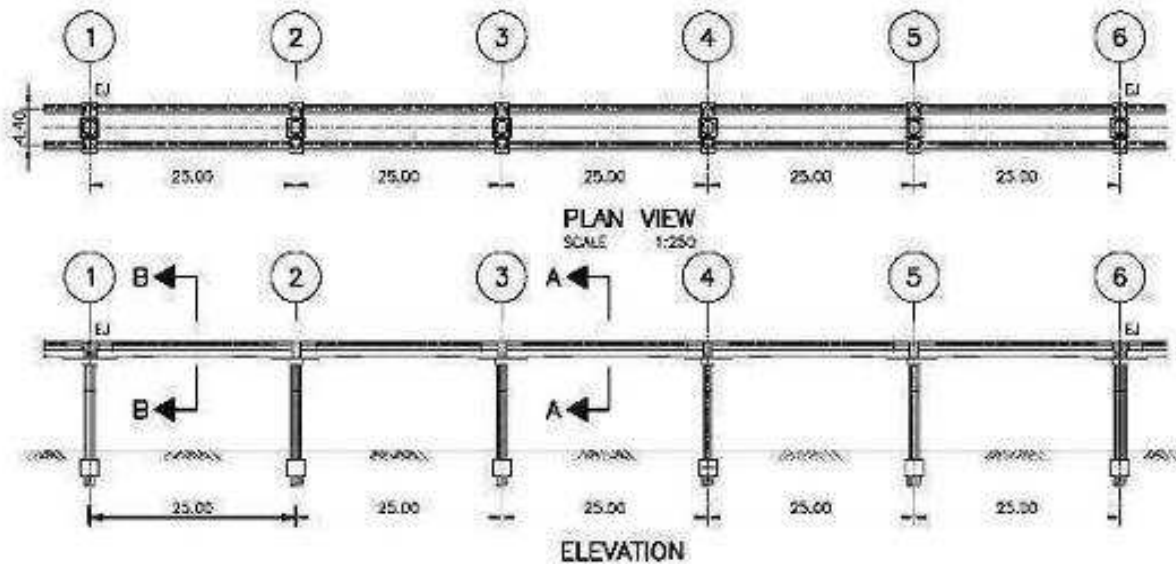


Figure 3.4.3 - 1 Typical track structure with the length of 125 m. (5x25 m.)

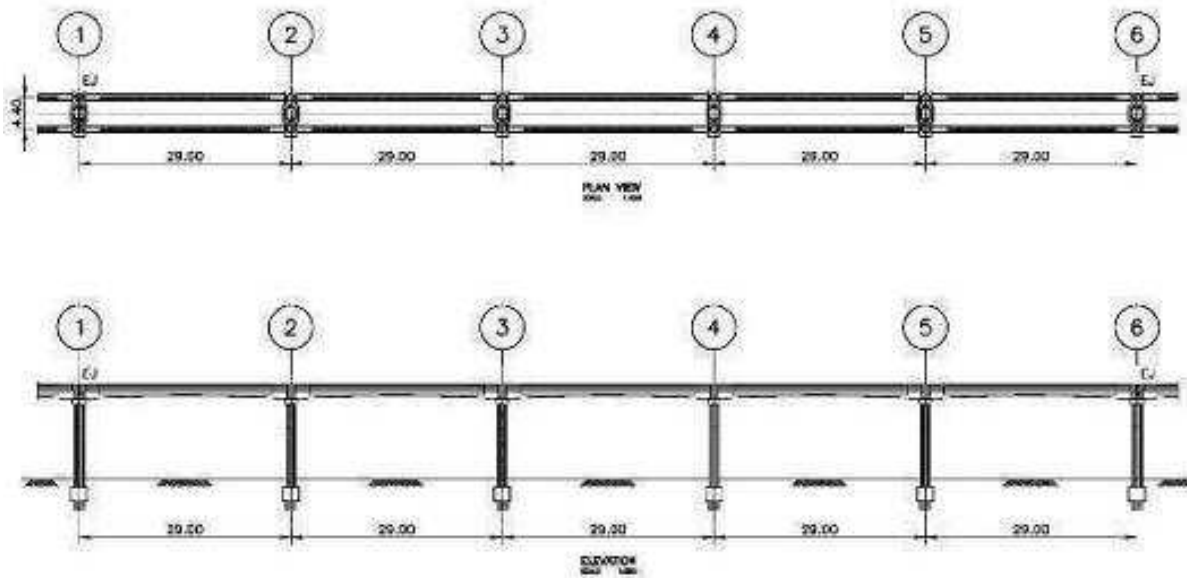


Figure 3.4.3 - 2 Typical track structure with the length of 145 m. (5x29 m.)

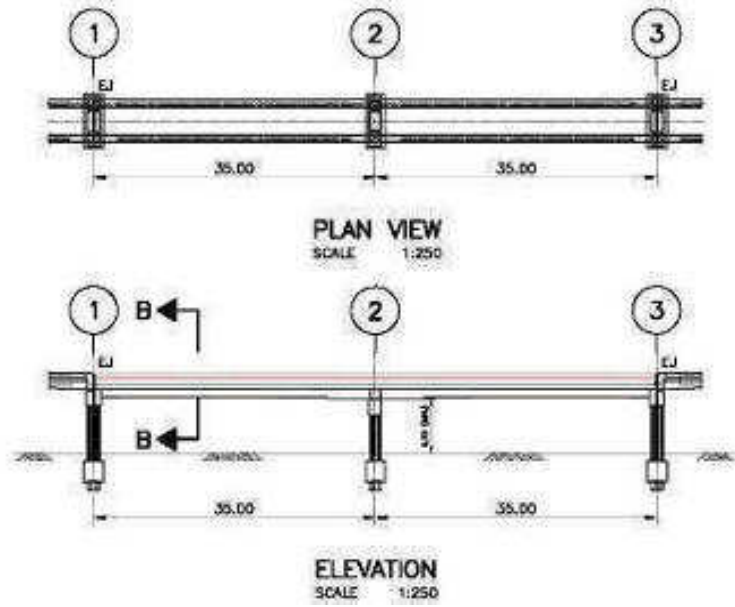


Figure 3.4.3 - 3 Track structure with the extra length of 35 m.

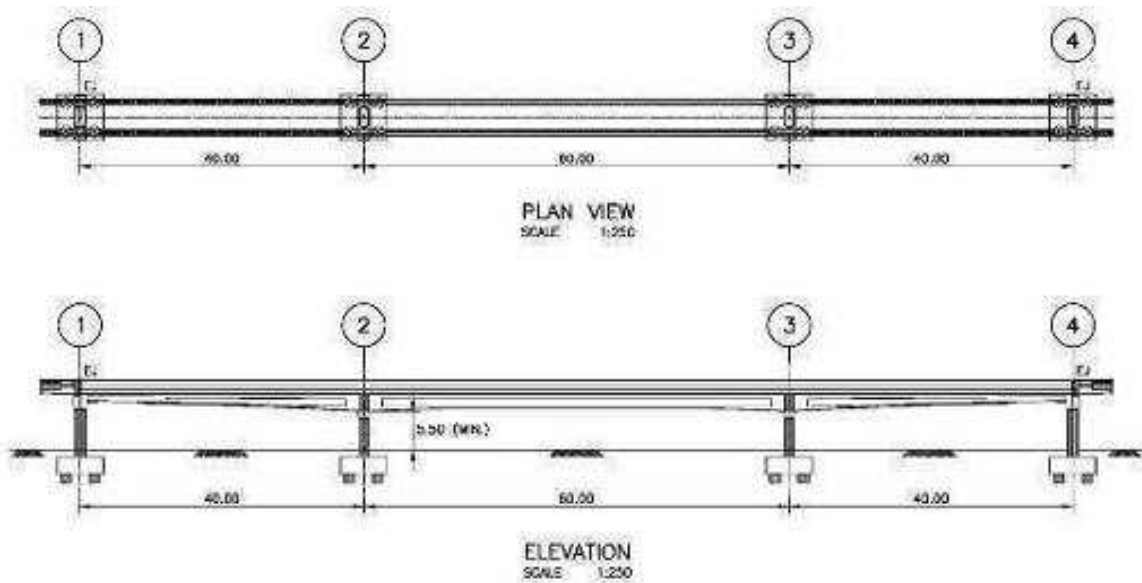


Figure 3.4.3 - 4 Track structure with the extra length of 40 and 60 m.

2) **Substructure** The pillars are positioned in accordance with the beams to support the monorail track structure and avoid the impact from public utilities relocation. The consultant considered using Bored pile and Barrette pile in the foundation by putting the pile tip into the second sand bed to support more safety load per metric tons and use fewer numbers of piles in the foundations. It can reduce the size of the foundation and reduce the differential settlement between the foundation of the track and the road. Various designs of pillar structure are used in this project i.e. single-pillar supporting two-way traffic directions in case the pillar can be placed on the road median, single pillar with eccentricity supporting two-way traffic directions, single pillar supporting one-way traffic direction or twin pillar structure or Portal Frame in case the pillar cannot be placed on the road median as shown in **Figure 3.4.3 - 5** to **Figure 3.4.3 - 8** and single pillar supporting extra-long beam for two-way traffic directions as shown in **Figure 3.4.3 - 10**.

If the middle of the road has a large plumbing placed under the surface more than 2.00 meters deep, in order to avoid relocation of the plumbing out of the pillar range, the consultant has designed a structure with single pillar on the foundation with 2 piles put across the plumbing to solve the problem as shown in **Figure 3.4.3 - 9**

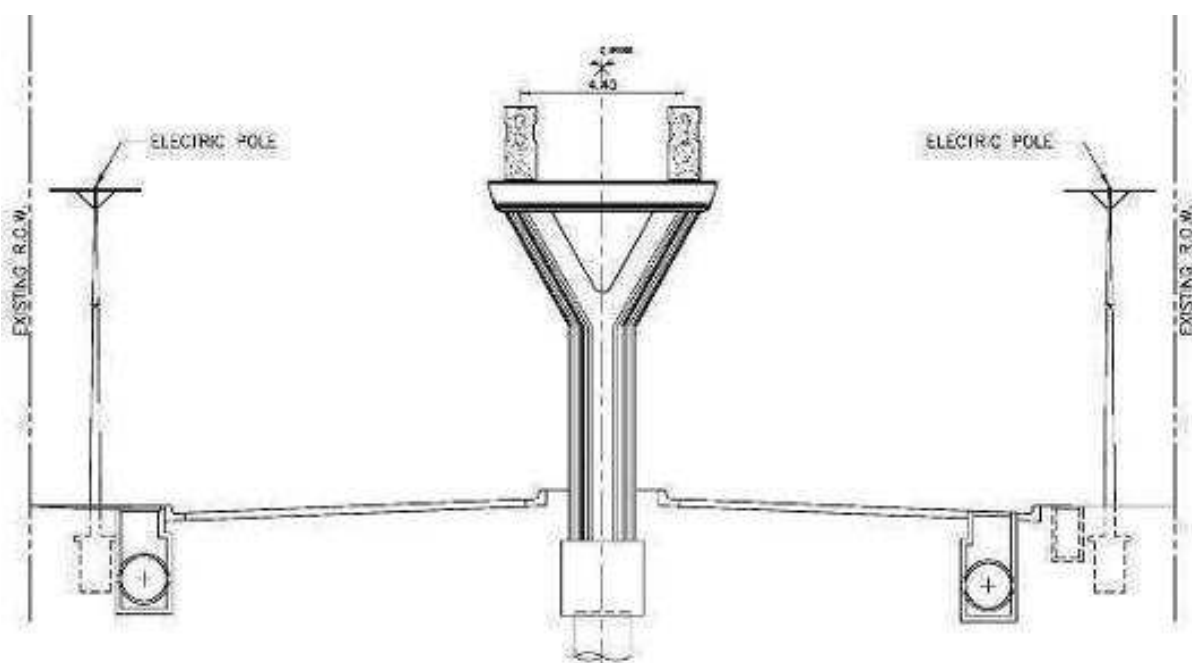


Figure 3.4.3 - 5 Single pillar structure supporting two-way traffic directions in case the pillar can be placed on the road median

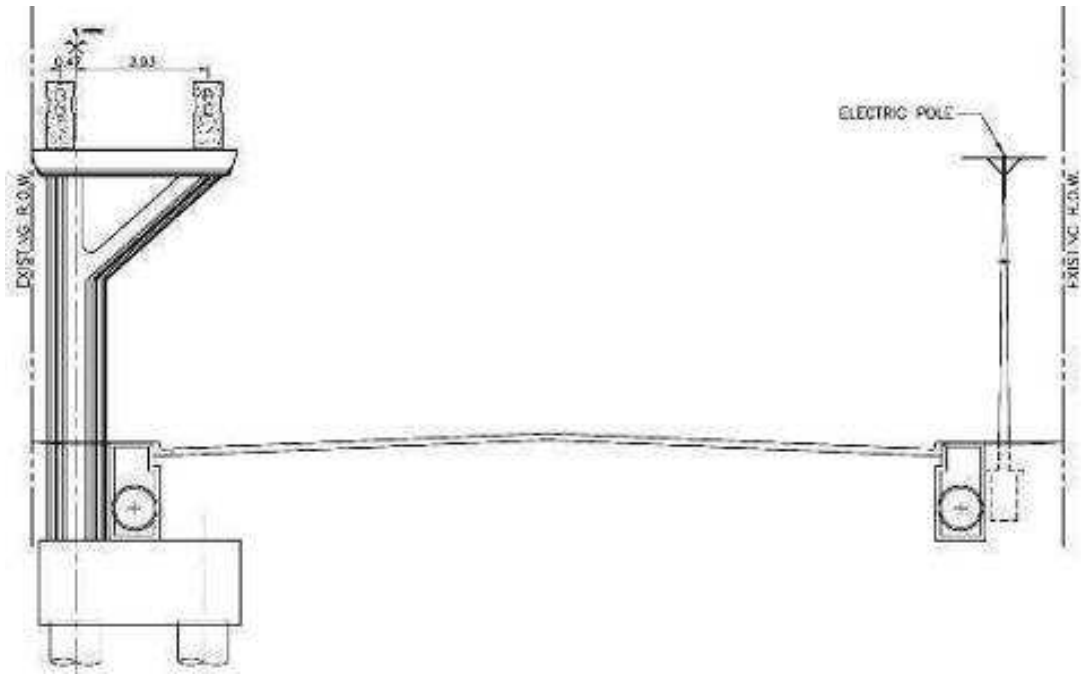


Figure 3.4.3 - 6 Single pillar structure with eccentricity supporting two-way traffic directions

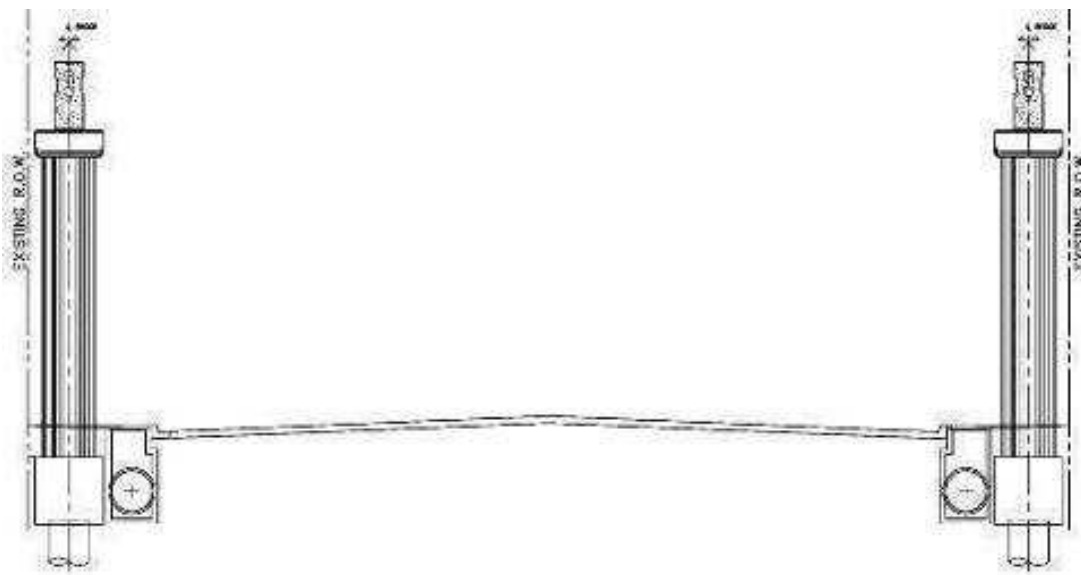


Figure 3.4.3 – 7 Single pillar structure supporting one-way traffic direction

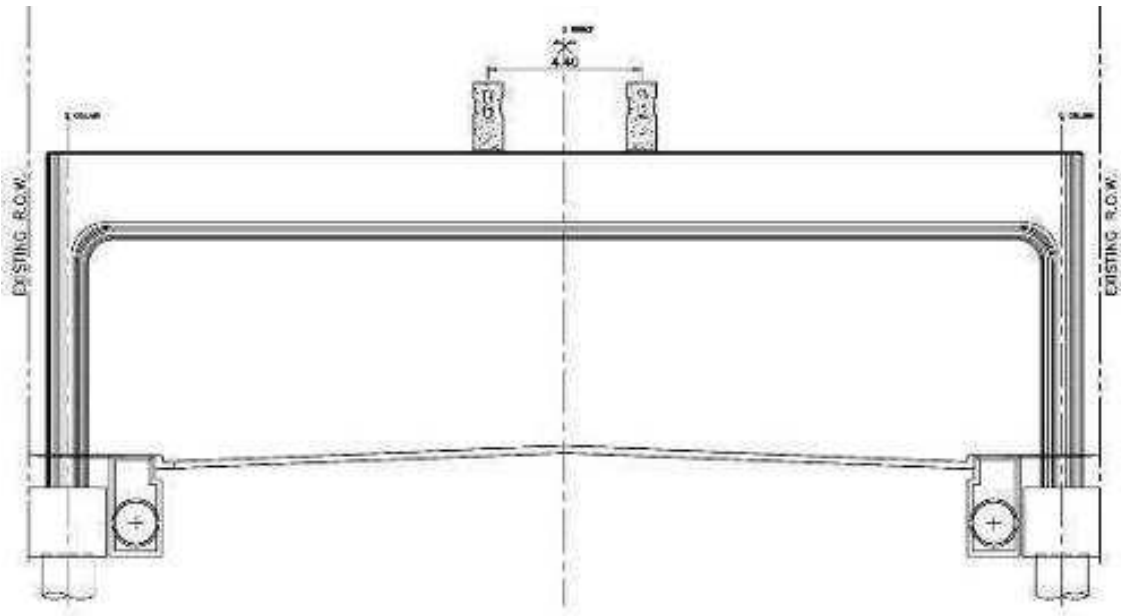


Figure 3.4.3 – 8 Twin pillar structure or Portal Frame in case the pillar cannot be placed on the road median

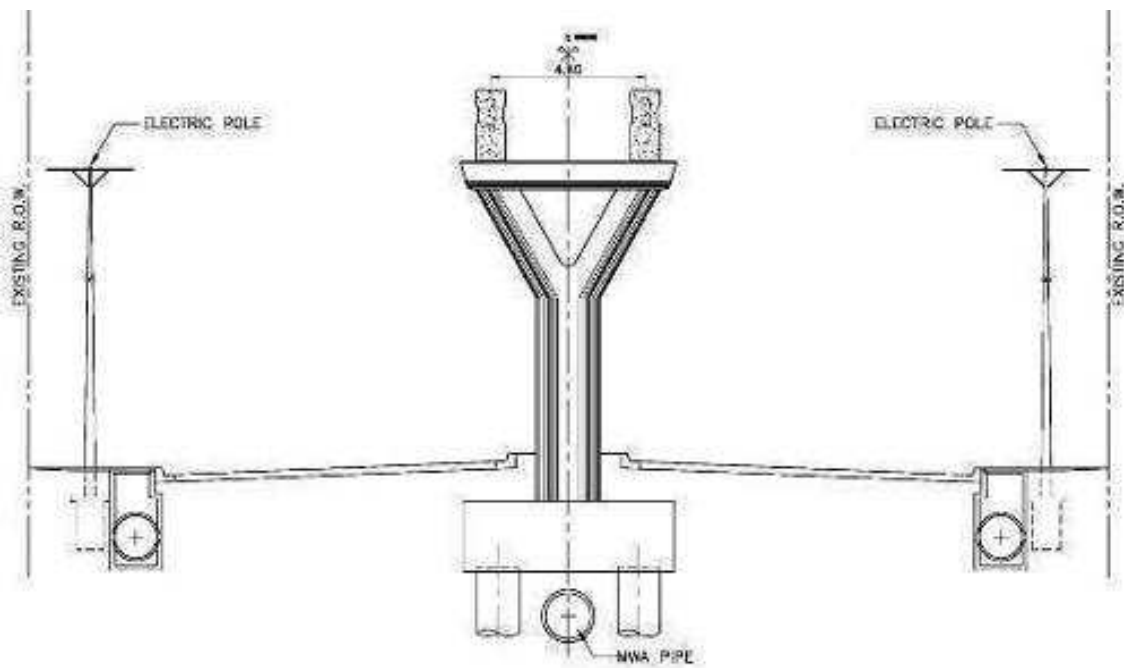


Figure 3.4.3 - 9 Single pillar structure on the foundation with 2 piles put across the tap water pipe at the road median

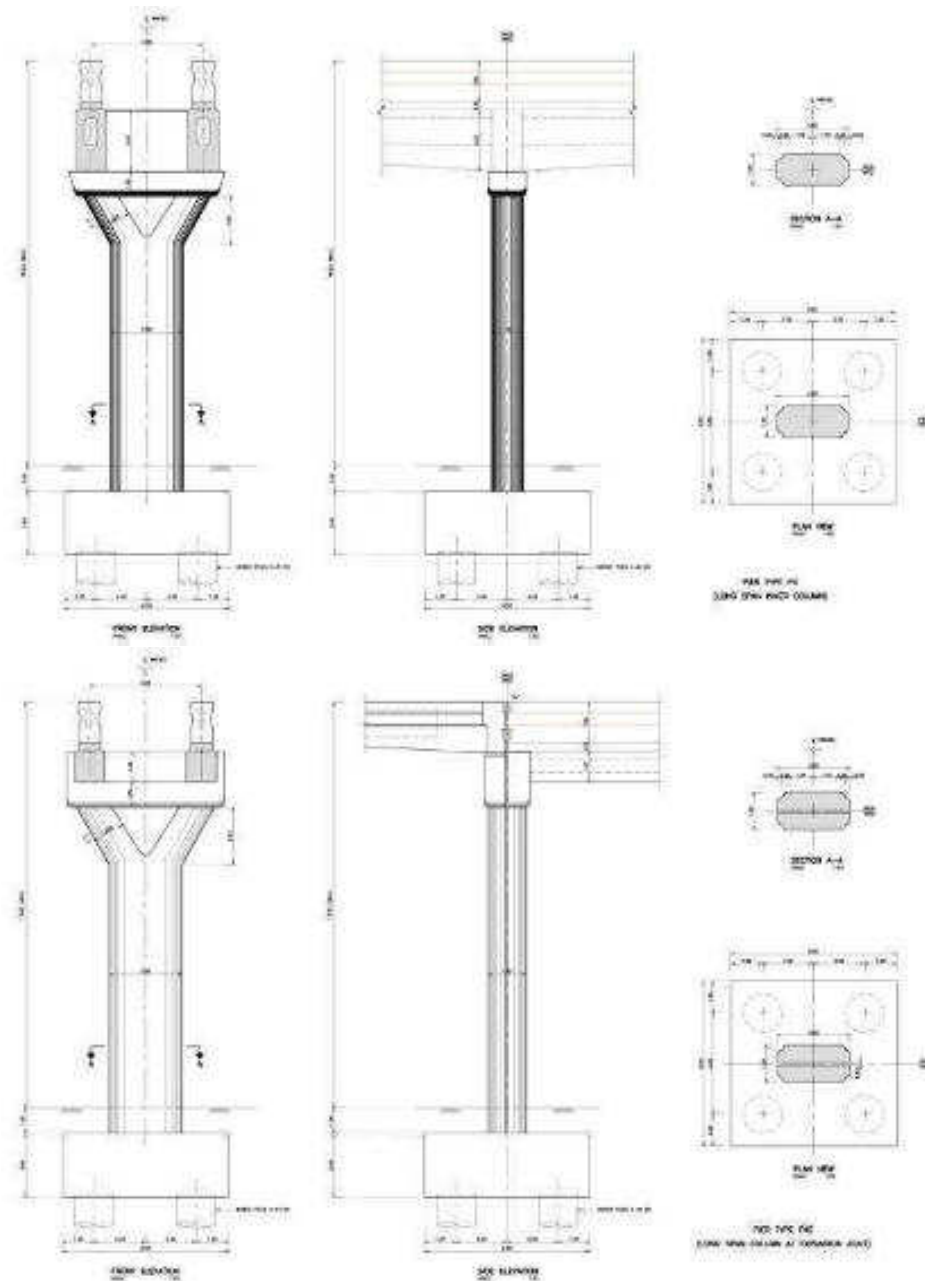


Figure 3.4.3 - 10 Single pillar structure supporting two-way traffic directions in case the long span column

### 3.4.4 Station Structure Design

Station structure design will be consistent with the whole architectural design. The structure design must be robust, safe, long-lasting and easy to maintain. The design is conducted according to international standards.

The station structure of the project is an elevated structure mainly along the road median in the middle of the road. The station building structure has pillar at every 25.00 - 27.50 meters, as appropriate for each station. The beam design will use pre-cast I-shaped or U-shaped beam (I - Girder). Then pour over with Cast-in-place Concrete Floor. The entrance and exit will be on both sides of the station. The building structure is reinforced concrete with pillars at every 6.00

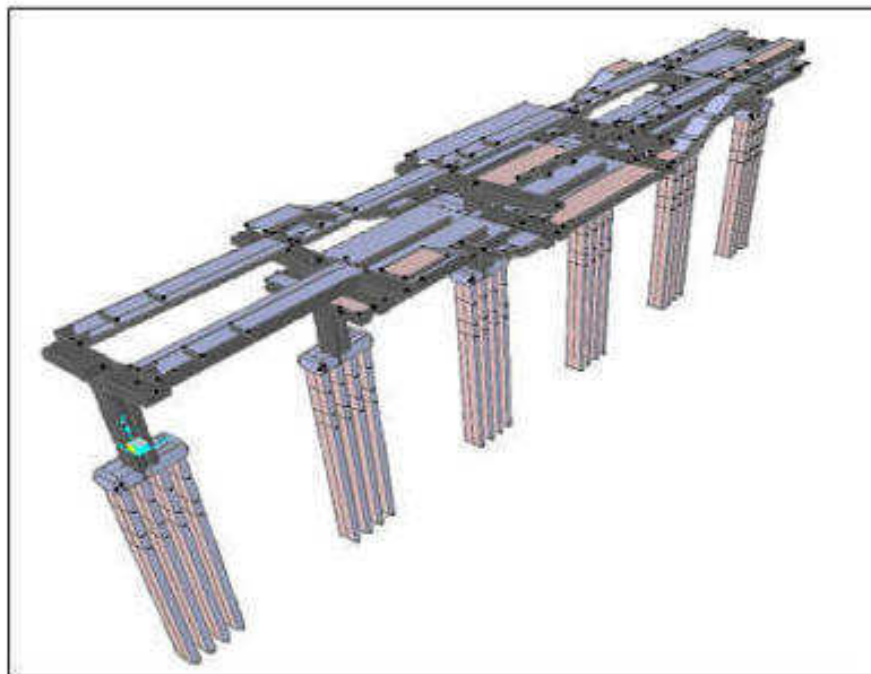
- 10.00 meter based on the condition of the area. The foundations will use bored piles to avoid impact on nearby area as shown in **Figure 3.4.4 - 1**.

### 3.4.5 Structure design of Park and Ride buildings and depot

The design will be consistent with the whole architectural design and coordinate with the experts on operation and train coach to collect complete information on design and functions. The structure design must be robust, safe, long-lasting and easy to maintain.

Structure of the Park and Ride buildings is flat floor with no beam to reduce the height of each floor which will be cost savings. The floor is designed as a Post-Tensioned slab Banded System. The length of the pillar is 8.00 - 10.00 meters based on the operation functions and conforms to the architectural design.

- Structure of the maintenance depot is designed as a prestressed concrete floor and reinforced concrete beams to accommodate the train coaches.



**Figure 3.4.4 - 1** The pillar foundation structure of station

## 3.5 MRT Station

### 3.5.1 Design Concept of MRT Station

The main idea of the design is to make the most efficient station with modern design to meet the requirements of the users and the line service. Design guidelines take into account the four guiding principles i.e.

#### 1) Design station for fast and easy to use

Design for fast and convenient travel to accommodate public passengers as much as possible by means of the followings.

- To determine the proper distance between stations to find the average travel distance and serve all the areas along the distance.

- Design the connection and transfer between stations or traveling system to be short, concise and optimal for fast transfer and adequate for passenger volume.
- Prioritize the areas, the relationship between areas, Paid and Unpaid area for an optimal quantity and position.
  - Design to reduce blind spot and cross circulation that may confuse the passengers.
  - Design direction signs that are beautiful, unique, and easy to remember, and find direction quickly.
  - Use computer program for monitoring and modeling the actual movement of the passengers.

## **2) Design with High Safety Standard**

Design with high safety standard or design for passengers' safety considers the following concepts.

- Enforce various specifications and safety standards that are recognized around the World in design such as NFPA 130, HCM 200 Standard and BS.
- Design to accommodate passengers with travel restrictions, such as people with disabilities, children and the elderly.
  - Design that takes into accounts the various disasters and passenger flow guidance under emergencies.
  - Design for Platform Screen Door that separate the track area and the platform to reduce the accidents.
  - Calculate length of time and emergency evacuation routes for passengers to meet safety standards.

## **3) Design to minimize the impact on environment and neighboring areas or reduce the exploitation of neighboring areas, residence, traffic and the surrounding environment.**

- Take into consideration the area, structure and design of the station to minimize land use and land expropriation.
  - Design station that does not reduce efficiency of travelling and traffic in the area.
  - Energy saving and energy consumptions in the station. Use energy-saving materials and simple straightforward structure to achieve the most cost-effective investment and minimal environmental impact.
  - Conserve guidelines from the original EIA as much as possible.

## **4) Design beautifully and include facilities that appeal to passengers.**

Design to increase satisfaction and encourages passengers to use the system more. The station is considered to be the first contact point to welcome the passengers. Design features, which are beautiful and preparing the area to increase the facilities can provide more services. The guidelines are as follows:

- Design the stations for facilities to connect to the ITF to facilitate travel to the station and from the station to the other mode of travel that is convenient and have minimal impact on the road surface.
- To consider the area for commercial development. Thus, increase other service areas and accommodate the passengers including areas for commercial which will attract passenger to use the station service more. Such areas must not prevent the normal use of the station.



- Design a station that is unique and functional. The design of the station gable roof represents the characteristics of tropical architecture, simple and effective for sun and rain shield, good ventilation not too leeward or dim and suitable for the tropical weather. Also easy to maintain and has a shape that conveys the movement and direction of travel.

The design considerations of the entrance-exit in this project are as follows:

- 1) Specify 4 entrance-exit according to the standards to cover the area / support the services.

- 2) The stairway width based on the safety standards (NFPA 130).

- 3) The passenger elevator between the road and the station to facilitate the disabled and the elderly.

- 4) The Office of Natural Resources and Environmental Policy and Planning require that the entrance-exit must not be on a sidewalk in order not to obstruct the traffic on the sidewalk.

- 5) leave a space around the entrance-exit from 1.5 meters to a maximum of 3.00 meters for the construction work.

- 6) The stations should have a design that is easy to remember so that the passengers will not be confused to use the service when they distributed across the city.

- 7) In case the entrance-exit is built on an empty space with no obstruction, the entrance-exit construction will be perpendicular extended from the station to increase the service area (Catchment area) with no building of entrance-exit back into the station.

- 8) Consider an empty space without any building first. If there is no empty space in the area, consider a small building next, and avoid expropriation of large buildings.

The main point is each entrance-exit must have at least one stairway and a pair of elevators for disabled passengers. The design of MRT entrance-exits are shown in **Figure 3.5.1 - 1**.

### 3.5.2 MRT Station Design

MRT Station is designed to avoid both underground and aboveground public utilities and maintain road surfaces as much as possible. In general, the design with single pillar structure located on road median. The distance between each station is around 800 - 1,000 meters. There are 2 types of structure i.e.

- 1) **Side Platform** Two sides with MRT in the middle. The general station is designed in this way since the construction is fast and use less space.

- 2) **Central Platform** The platform is in the middle and MRT runs on both sides. This type of station is more efficient than the first one but the construction is more difficult since the track must be diverted when entering the station.

The design of all 23 stations of the MRT Yellow Line Project: Lat Phrao - Samrong Section is determined by the restrictions or factors in the surrounding areas. The station designs of the project can be divided as follows.

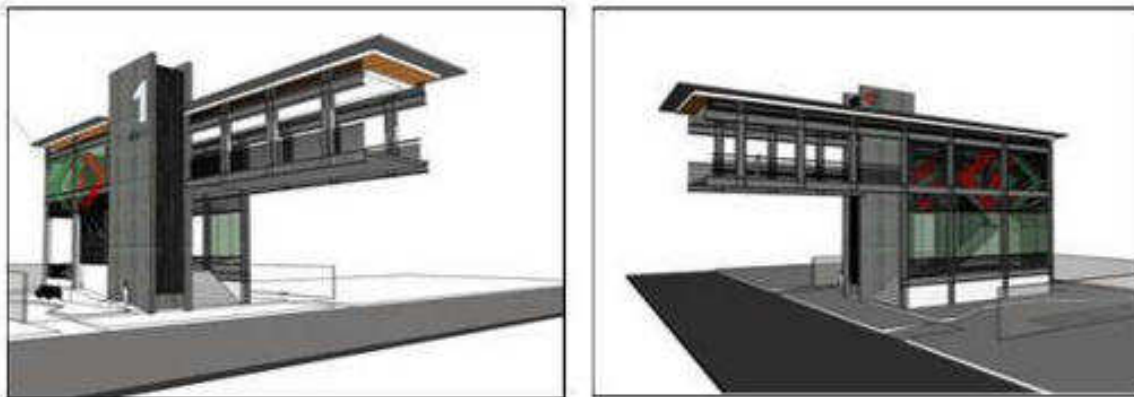
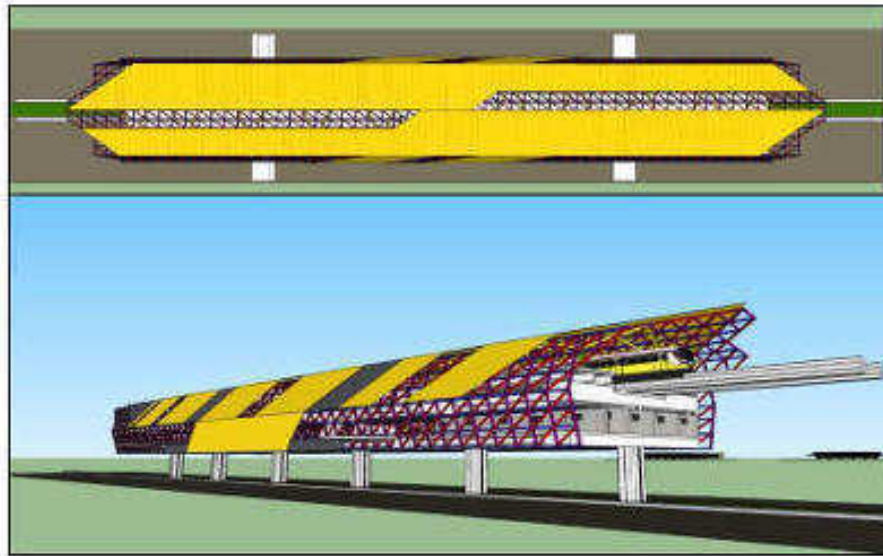


Figure 3.5.1 – 1 Entrance and exit of MRT Yellow Line Project : Lat Phrao - Samrong

#### 1) Station Design Type 1 : Side Platform 2 Stories

A station design with 2 separated platforms outside. The platforms flank 2 adjacent tracks with passengers' hall in the middle. There are two levels (Figure 3.5.2 - 1) the passenger level (Platform) size is 120.0 x 22.7 meters. The concourse level size is 139.0 x 22.7 meters. This is the most common design of the project. There are advantages, since the trains do not have to change direction when entering or leaving the station. The platform that separated into 2 sides makes better fire exit distribution for passengers. The weight of steel from the track support structure and the train will transfer to the single pillar structure which mainly on the middle of the road.

#### 2) Station Design Type 2 : Side Platform 3 Stories

A station design with 2 separated platforms outside. The platforms flank 2 adjacent tracks with passengers' hall in the middle, and intermediate level at the lowest level. There are 3 levels (Figure 3.5.2 - 2). The passenger level (Platform) size is 120.0 x 22.7 meters. The concourse level size is 120.0 x 22.7 meters and the intermediate level size is 120.0 x 22.7 meters. The project has this design in 4 stations. A station with extra high track due to engineering or technical restrictions could have additional space from one more platform. There are advantages, since the trains do not have to change direction when entering or leaving the station. The platform that separated into 2 sides makes

better fire exit distribution for passengers. The weight of steel from the track support structure and the train will transfer to the single pillar structure which mainly on the middle of the road.

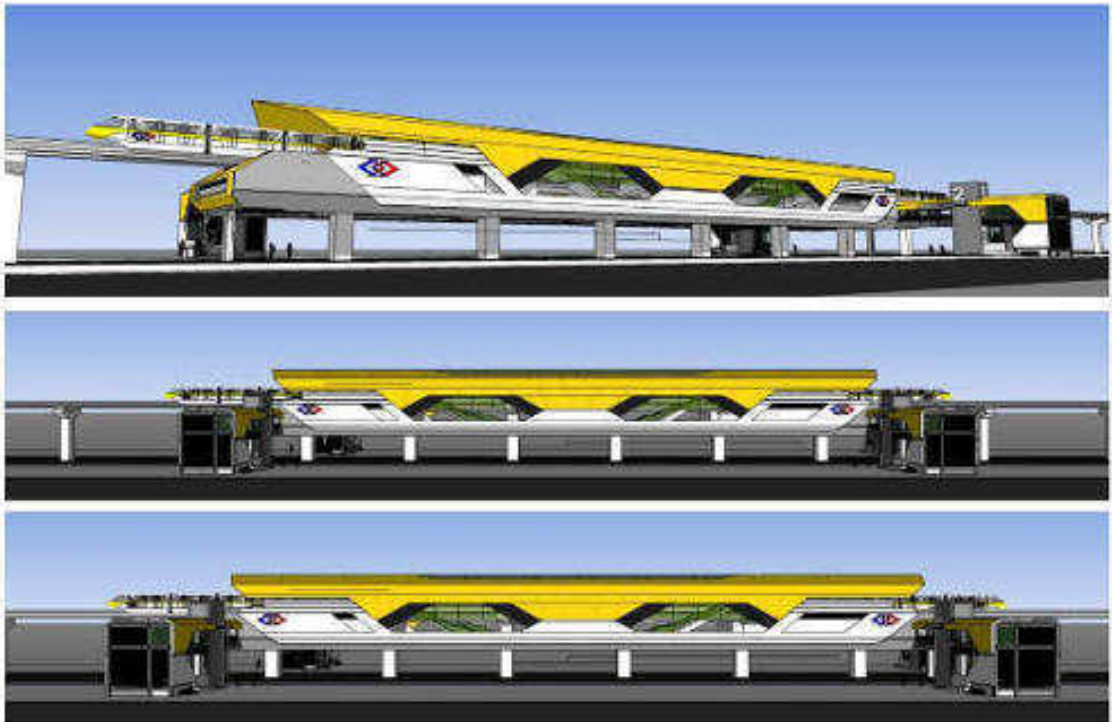
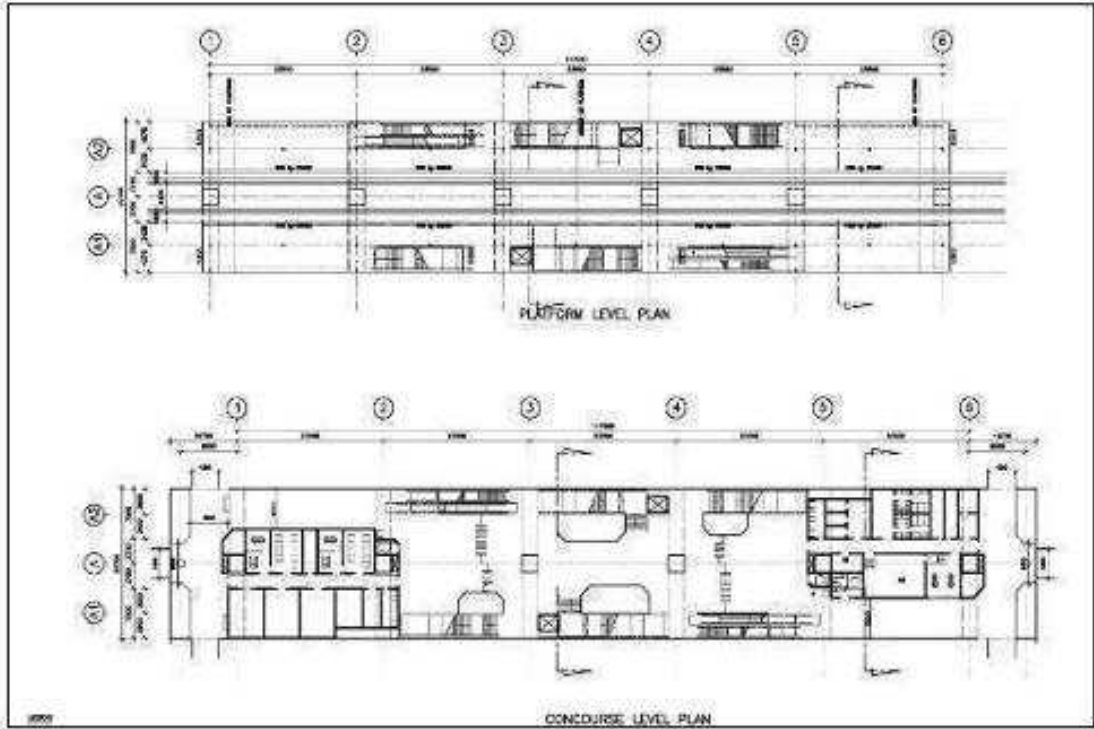


Figure 3.5.2 - 1 Typical of side platform, 2 stories

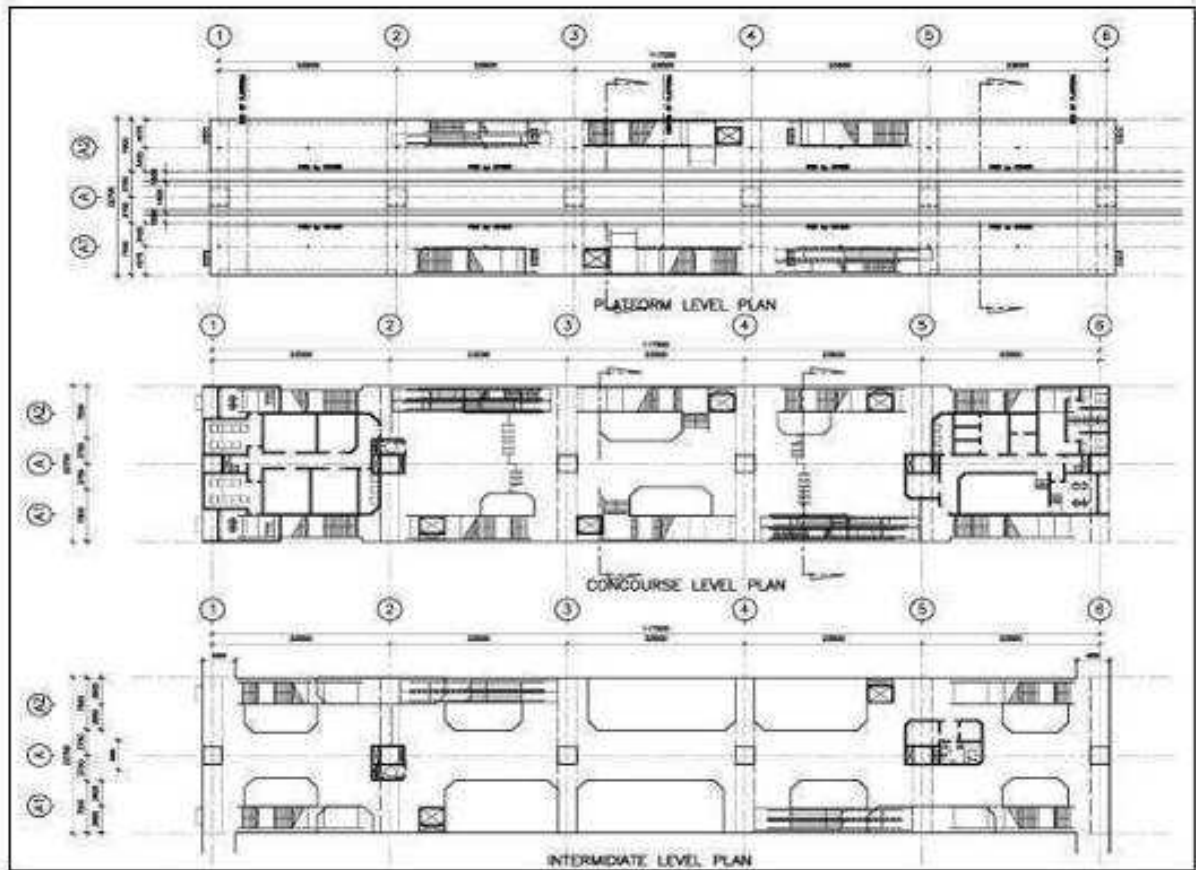


Figure 3.5.2 - 2 Typical of side platform, 3 stories

### 3) Station Design Type 3 : Central Platform

The station is designed with a central platform flanked by the railways which run separately. The passenger hall is in the middle under the platform with two floors (Figure 3.5.2 - 3). Passenger floor (Platform) with a size of 120.0 x 21.5 meters and ticketing floor (Concourse) with a size of 167.9 x 23.7 meters. Phatthanakan is the only station with special design due to the surrounding limitation. The advantage is the total space of the platform is less made the station narrower. Passengers can easily choose the route with less vertical travelling.

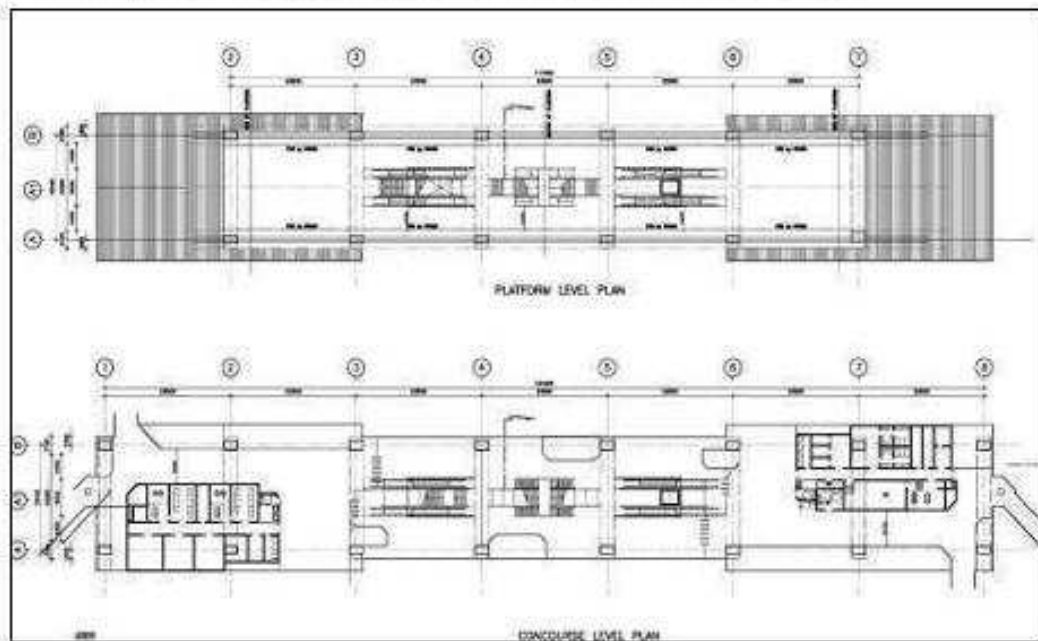


Figure 3.5.2 - 3 Typical of central platform

The entrances and exits design of the station. The details of each station are summarized as follows.

- 1) YL - 01 (Ratchada Station) is the departure station connected to the MRT Blue Line Project.  
Station location        On the Ratchadaphisek Road in front of Park and Ride buildings of MRT Blue Line with the connection distance of around 200 meters at Ratchada - Lat Phrao intersection.

Platform design of Side Platform 3 Stories

Entrance-exit station of 4 positions i.e.

- A) Near the bridge connecting to the parking building of the MRT Chaloem Ratchamongkhon Line
- B) Near Ratchadaphisek - Lat Phrao intersection
- C) Near the parking building of the MRT Chaloem Ratchamongkhon Line
- D) Near the parking building of the MRT Chaloem Ratchamongkhon Line

There is one elevator/ escalator on each side of the road to accommodate the passengers.

- 2) YL - 02 (Phawana Station) is a general station.  
Station location        On the Lat Phrao Road around the mouth of Phawana Alley (Lat Phrao 41).

Platform design        Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Phawana Alley (Lat Phrao 41)
- B) Near Lat Phrao 41/1 Alley
- C) Near Lat Phrao Drug Addiction Clinic 2
- D) Near Lat Phrao 44 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

- 3) YL - 03 (Chokchai 4 Station) is a general station.  
Station location        On the Lat Phrao Road in front of Chokchai 4 Shopping Center (Lat Phrao 53)

Platform design        Side Platform 3 Stories

Entrance-exit station of 4 position i.e.

- A) Near Lat Phrao 53 Alley
- B) Near Chokchai 4 Shopping Center
- C) Near Lat Phrao 58 Alley
- D) Near Lat Phrao 56 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

- 4) YL - 04 (Lat Phrao 71 Station) is an additional station from the original study  
Station location        On the Lat Phrao Road around the mouth of Lat Phrao 71 Alley

Platform design        Side Platform 3 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Lat Phrao 69 Alley

- B) Near Lat Phrao 71 Alley
- C) Near Lat Phrao 84 Alley
- D) Near Lat Phrao 80/3 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

- 5) YL - 05 (Lat Phrao 83 Station) is a general station.

Station location On the Lat Phrao Road between Lat Phrao 83 Alley

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Lat Phrao 83 Alley
- B) Near Apple Network (Thailand) Co., Ltd.
- C) Near Bank of Ayudhya PCL., Lat Phrao 102 branch
- D) Near Lat Phrao 98/1 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

- 6) YL - 06 (Mahat Thai Station) is a general station.

Station location On the Lat Phrao Road around Lat Phrao 95 Alley in front of  
Foodland Supermarket Co., Ltd. (Lat Phrao branch)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Foodland Supermarket Co., Ltd. (Lat Phrao branch)
- B) Near Lat Phrao Hospital
- C) Near Mitsubishi Car Service Center (Lat Phrao 122 Alley)
- D) Near Volvo Service Center near Lat Phrao 120 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

- 7) YL - 07 (Lat Phrao 101 Station) is a general station.

Station location On the Lat Phrao Road of Lat Phrao 101 Alley near Lat Phrao  
fresh-food market.

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Lat Phrao 101 Alley
- B) Near Lat Phrao 101/1 Alley
- C) Near Lat Phrao 128/3 Alley
- D) Near Lat Phrao 128/1 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

- 8) YL - 08 (Bang Kapi Station) is a general station.

Station location On the Lat Phrao Road around Macro near The Mall Bang Kapi

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Lat Phrao 113 Alley
- B) Near Lat Phrao 115 Alley
- C) Near Macro, Bang Kapi branch

D) Near Lat Phrao 142 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

9) YL - 09 (Lam Sali Station) is a station connected to the MRT Orange Line

Station location On the Srinagarindra Road around Lam Sali intersection (South side)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

A) Near Lam Sali intersection around Ramkhamhaeng 56 Alley

B) Near Krung Thai Bank around Lam Sali intersection

C) Near Nut & Screw Co Ltd

D) Near a small park around Lam Sali intersection

There is one elevator/ escalator on each side of the road to accommodate the passengers.

10) YL - 10 (Si Kritha Station) is a general station.

Station location On the Srinagarindra Road around Si Kritha intersection (South side) at the interchange construction site

Platform design Side Platform 3 Stories

Entrance-exit station of 4 positions i.e.

A) Near K-Quartz Car Care & Restaurant

B) Near Executive Super Cars Co., Ltd.

C) Near health park Krungthep Kreetha intersection

D) Near health park Krungthep Kreetha intersection

There is one elevator/ escalator on each side of the road to accommodate the passengers.

11) YL - 11 (Phatthanakan Station) is a station connected to the Airport Rail Link

Station location On the Srinagarindra Road at the road-rail intersection

Platform design Central Platform

Entrance-exit station of 4 positions i.e.

A) Near Hua Mak station (ARL)

B) Near McDonald's, MaxValu branch, Phatthanakan intersection

C) Near Srinagarindra 16 Alley

D) Near Srinagarindra 12 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

12) YL - 12 (Kelantan Station) is an additional station from the original study.

Station location On the Srinagarindra Road in front of Thanya Shopping Park and Baan Klang Muang Srinagarindra

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e..

A) Near Thanya Shopping Park

B) Near Khlong Ban Ma bridge

C) Near Khlong Ban Ma bridge

D) Near Baan Klang Muang Srinagarindra



There is one elevator/ escalator on each side of the road to accommodate the passengers.

13) YL - 13 (Si Nut Station) is a general station.

Station location On the Srinagarindra Road, Si Nut intersection (South side)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

A) Near Master Motor Services (Thailand) Co., Ltd., Srinagarindra branch

B) Near Siam car gas shop

C) Near shortcut on Sukhumvit 77

D) Near V-KOOL Service Center Srinagarindra (On-nut)

There is one elevator/ escalator on each side of the road to accommodate the passengers.

14) YL - 14 (Srinagarindra 38 Station) is an additional station from the original study.

Station location On the Srinagarindra Road around of Srinagarindra 38 Alley (near Krung Thai Bank)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

A) Near Srinagarindra 43 Alley

B) Near Srinagarindra 45 Alley

C) Near Srinagarindra 38 Alley

D) Near Majestic Home Thanavach Co., Ltd.

There is one elevator/ escalator on each side of the road to accommodate the passengers.

15) YL - 15 (Suan Luang Ro 9 Station) is a general station.

Station location On the Srinagarindra Road between Seacon Square and Paradise Park

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

A) Near Srinagarindra 51 Alley

B) Near Srinagarindra 53 Alley

C) Near Yuthaporn Development Co., Ltd.

D) Near Srinagarindra 42 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

16) YL - 16 (Si Udom Station) is a general station.

Station location On the Srinagarindra Road, Si Udom intersection (South side)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

A) Near Rao Pub Srinagarindra Road

B) Near Srinagarindra 63 Alley

C) Near Srinagarindra 58 Alley

D) Near Summit Honda Automobile Co., Ltd. (Udomsuk)

There is one elevator/ escalator on each side of the road to accommodate the passengers.

17) YL - 17 (Si lam Station) is a general station.

Station location On the Srinagarindra Road around Si lam interchange (North of Bang Na-Trat Road) with link to MRT depot and car park building of around 2,800 cars.

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Samut Prakan Highway District area
- B) Near Samut Prakan Highway District area
- C) Near the Bang Na-Trat Road overpass
- D) Near temple Si lam courtyard

There is one elevator/ escalator on each side of the road to accommodate the passengers.

18) YL - 18 (Si La Salle Station) is a general station.

Station location On the Srinagarindra Road, Si La Salle intersection (South side)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Huapla Chongnonsea Restaurant, Srinagarindra Road
- B) Near Shell gas station
- C) Near AP Nakarin Building
- D) Near Si La Salle pawnshop

There is one elevator/ escalator on each side of the road to accommodate the passengers.

19) YL - 19 (Si Bearing Station) is a general station.

Station location On the Srinagarindra Road, Si Bearing intersection (South side)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Si Darn 18 Alley
- B) Near Si Darn 16 Alley
- C) Near Si Darn 11 Alley
- D) Near Krung Thai Bank (Srinagarindra km.14 branch) around the mouth of Bearing Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

20) YL - 20 (Si Darn Station) is a general station.

Station location On the Srinagarindra Road near Si Darn intersection (North side)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near golf driving range opposite Si Darn 1 Alley
- B) Near Si Darn 2 Alley
- C) Near J L Marble Granite Co., Ltd.
- D) Near Si Darn 1 Alley

There is one elevator/ escalator on each side of the road to accommodate the passengers.

21) YL - 21 (Si Thepha Station) is a general station.

Station location On the Thepharak Road near Si Thepha intersection (West side)

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Attasit Alley
- B) Near Rewat 1 Alley
- C) Near Nattapon Pradubyon
- D) Near Rinrada Apartment

There is one elevator/ escalator on each side of the road to accommodate the passengers.

22) YL - 22 (Thippawan Station) is a general station.

Station location On the Thepharak Road, mouth of Thippawan Village Alley

Platform design Side Platform 2 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Chularat 2 Clinic
- B) Near Thippawan Village Alley
- C) Near Siam Union Sahamit Co., Ltd.
- D) Near Thanatarn Paper Co., Ltd.

There is one elevator/ escalator on each side of the road to accommodate the passengers.

23) YL - 23 (Samrong Station) is a station connected to the MRT Green Line

Station location On the Thepharak Road near Thepharak fresh-food market

Platform design Side Platform 3 Stories

Entrance-exit station of 4 positions i.e.

- A) Near Thepharak 4 Alley
- B) Near Thepharak - Sukhumvit intersection (Opposite Samrong Ruamkij LP)
- C) Near Thepharak - Sukhumvit intersection (Samrong Nuea police station)
- D) Near Thepharak fresh-food market

There is one elevator/ escalator on each side of the road to accommodate the passengers.

### 3.5.3 Station location

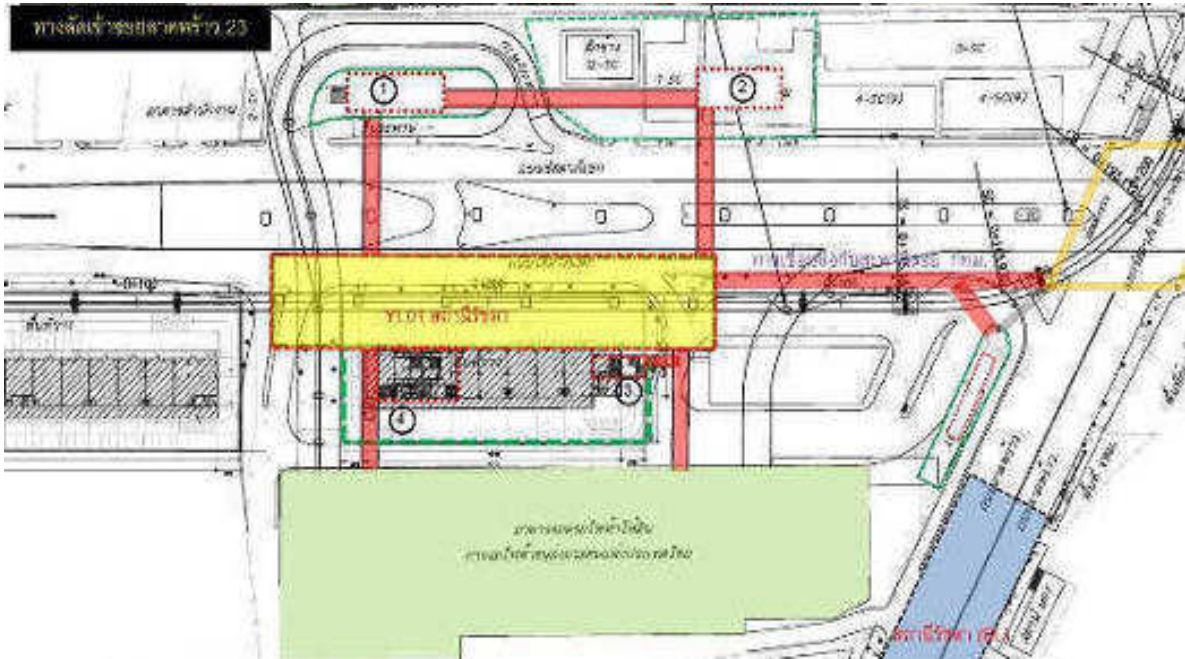
The Project has considered having a total of 23 stations within a distance of 30 Kilometers. The naming of each station is associated with the name of the road or landmark that the station located. The station locations of the MRT Yellow Line Project: Lat Phrao-Samrong Section is shown in **Table 3.5.3 - 1**. Details of the station locations are as follows.

**Table 3.5.3-1 Station Locations of the MRT Yellow Line Project: Lat Phrao-Samrong section.**

Station No.	Station name	Km.	Distance between station (m.)	Type of station
YL - 01	Ratchada	0+000		2
YL - 02	Phawana	1+341	1,341	1
YL - 03	Chok Chai 4	2+606	1,292	1
YL - 04	Lat Phrao 71	4+211	1,605	2
YL - 05	Lat Phrao 83	5+006	795	1
YL - 06	Mahat Thai	6+188	1,112	1
YL - 07	Lat Phrao 101	7+023	904	1
YL - 08	Bang Kapi	8+262	1,240	1
YL - 09	Lam Sali	9+411	1,149	1
YL - 10	Si Kritha	10+710	1,299	2
YL - 11	Phatthanakan	12+257	1,547	3
YL - 12	Kalantan	13+527	1,270	1
YL - 13	Si Nut	15+124	1,597	1
YL - 14	Srinagarindra 38	16+261	1,137	1
YL - 15	Suan Luang Ro 9	17+411	1,150	1
YL - 16	Si Udom	18+982	1,571	1
YL - 17	Si lam	19+985	1,003	1
YL - 18	Si La Salle	21+421	1,436	1
YL - 19	Si Bearing	22+861	1,440	1
YL - 20	Si Dan	24+220	1,359	1
YL - 21	Si Thepha	25+331	1,111	1
YL - 22	Thippawan	26+951	1,620	1
YL - 23	Samrong	28+691	1,740	2

Remark : Type 1 = Side Platform, 2 Stories  
 Type 2 = Side Platform, 3 Stories  
 Type 3 = Central Platform

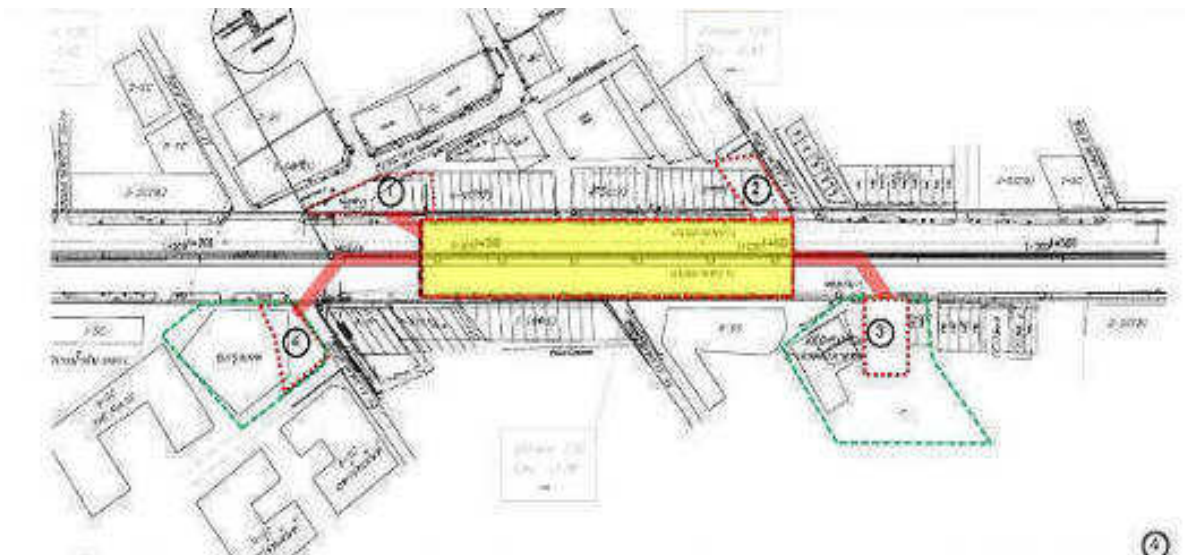
### 1) YL - 01 Ratchada Station



Location Located near Lat Phrao Park and Ride building. On the side of the building is a large open space. The nearby landmark is Lat Phrao Park and Ride building. It is a medium density residential community and can be connected to the MRT Chaloem Ratchamongkhon Line Project.

To go to the station The Lat Phrao Road, the Ratchadaphisek Road, MRT Chaloem Ratchamongkhon Line (Ratchada Station)

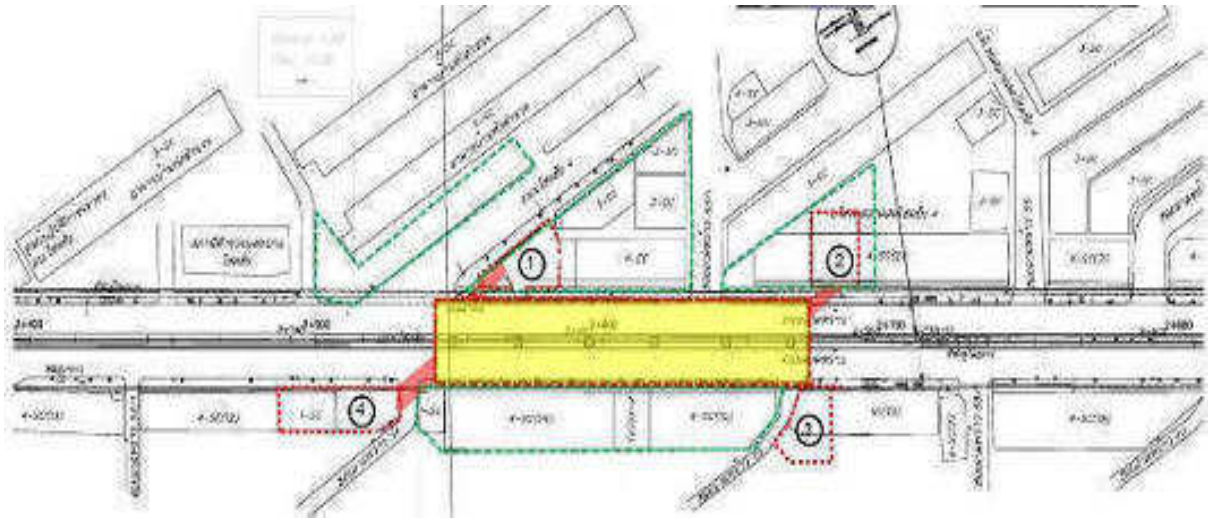
### 2) YL - 02 Phawana Station



Location Located near Lat Phrao 41 Alley or Phawana Alley, Bangkok Bank, The Pulse Condominium, Shell gas station, Pibool Uppatham School. The station is on the middle of the Lat Phrao Road with medium density residential community.

To go to the station Lat Phrao 41 Alley or Phawana Alley and the Lat Phrao Road.

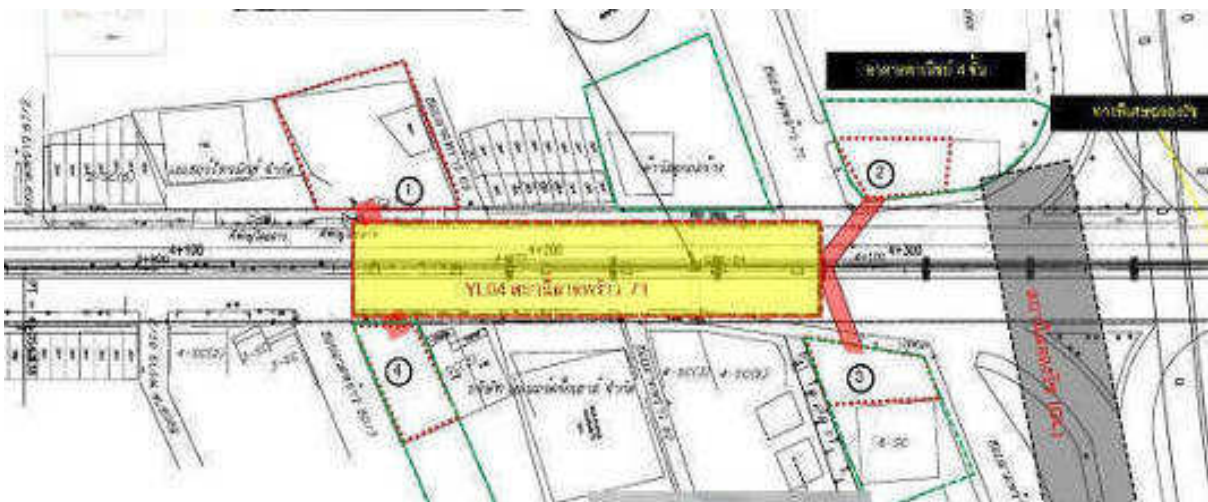
### 3) YL - 03 Chok Chai 4 Station



Location Located on the middle of the Lat Phrao Road near Chokchai 4 Alley, Sap Chan Phan Market, and Chokchai 4 police station with medium density residential community.

To go to the station Chokchai 4 Alley and the Lat Phrao Road

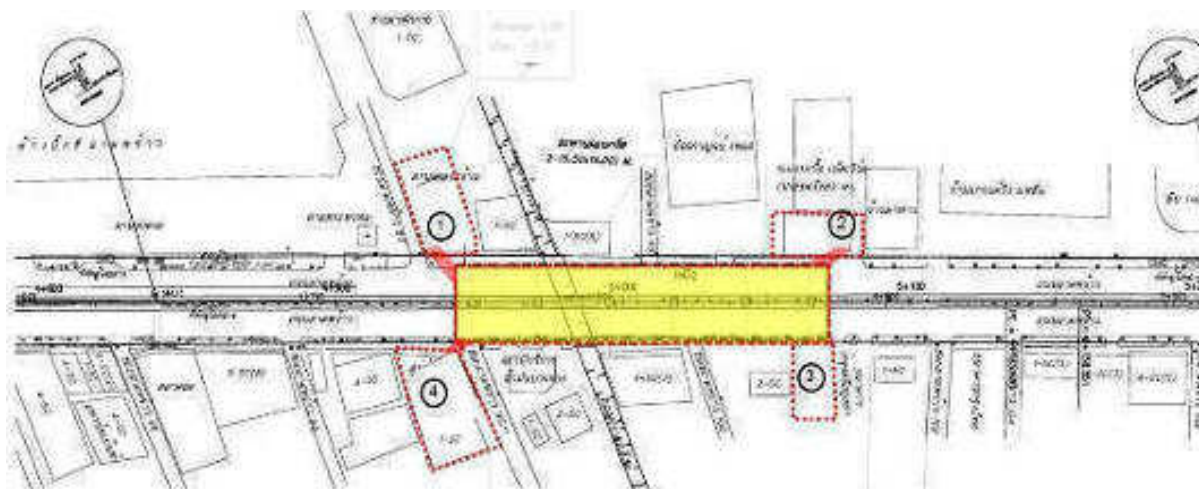
### 4) YL - 04 Lat Phrao 71 Station



Location Located near Lat Phrao 71 Alley, Bodindecha 3 School near the Praditmanutham Road and Chalong Rat Expressway. The station is on the middle of Lat Phrao road beside an empty plot of land with medium density residential community.

To go to the station Lat Phrao 71 Alley, Lat Phrao 82 Alley, Lat Phrao 80 Alley, the Praditmanutham Road and Chalong Rat Expressway.

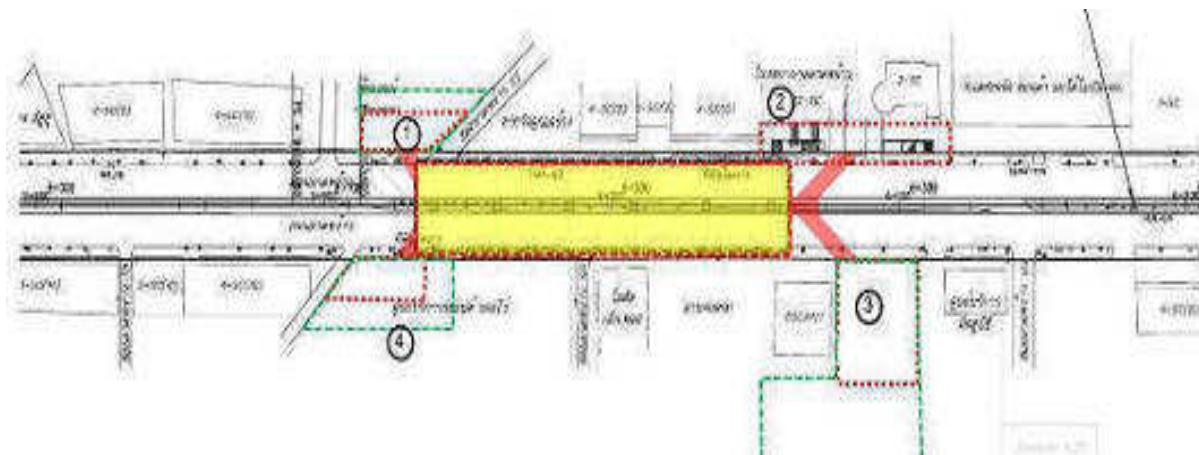
### 5) YL - 05 Lat Phrao 83 Station



Location Located near Imperial World Lat Phrao Department Store near Lat Phrao 83 Alley, opposite Lat Phrao 94 Alley. The station is on the middle of the Lat Phrao Road with medium density residential community.

To go to the station The Lat Phrao Road, Lat Phrao 83 Alley, Lat Phrao 94 Alley, the Praditmanutham Road and Chalong Rat Expressway.

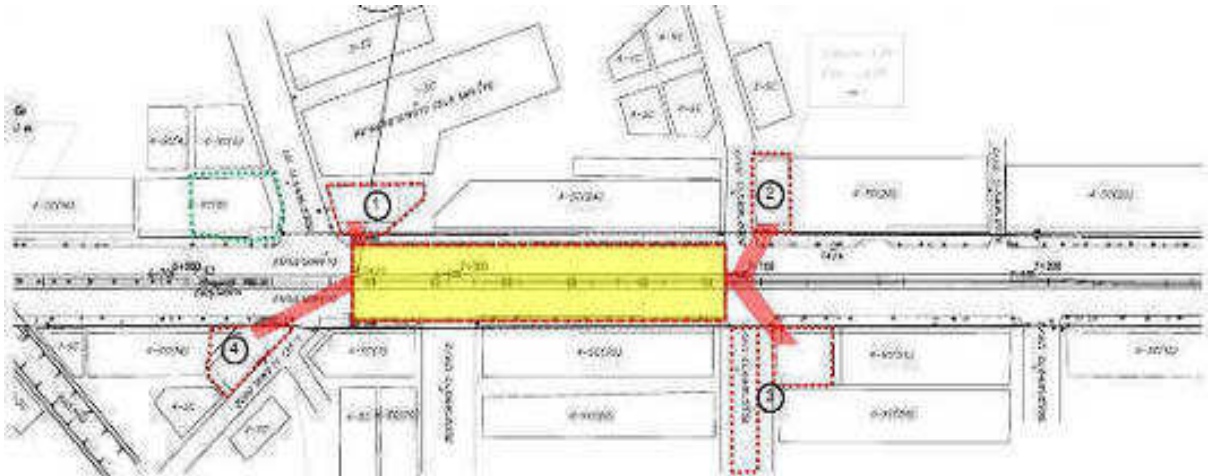
### 6) YL - 06 Mahat Thai Station



Location Located near Lat Phrao Hospital and Foodland Supermarket, Volvo Service Center, Lotus Express, Mitsubishi Car Service Center. The station is on the middle of Lat Phrao Road with medium density residential community.

To go to the station The Lat Phrao Road, Lat Phrao 95 Alley, Lat Phrao 120 Alley, Lat Phrao 122 Alley (Mahat Thai Alley) this can be connected to Ramkhamhaeng Road.

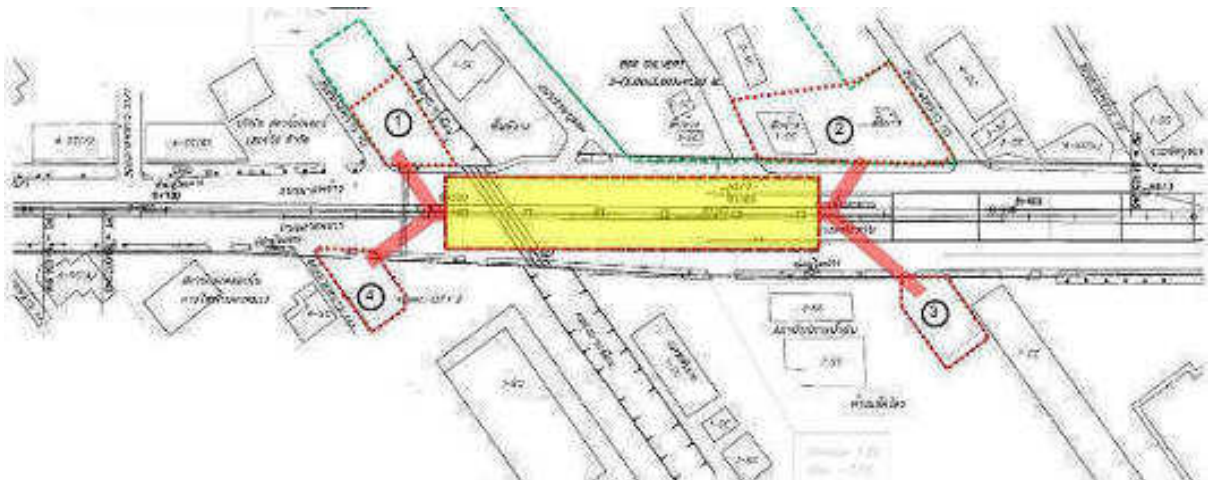
### 7) YL - 07 Lat Phrao 101 Station



Location Located near Makro and The Mall on the middle of the Lat Phrao Road at the foot of a flyover beside an empty plot of land with medium density residential community.

To go to the station The Lat Phrao Road

### 8) YL - 08 Bang Kapi Station

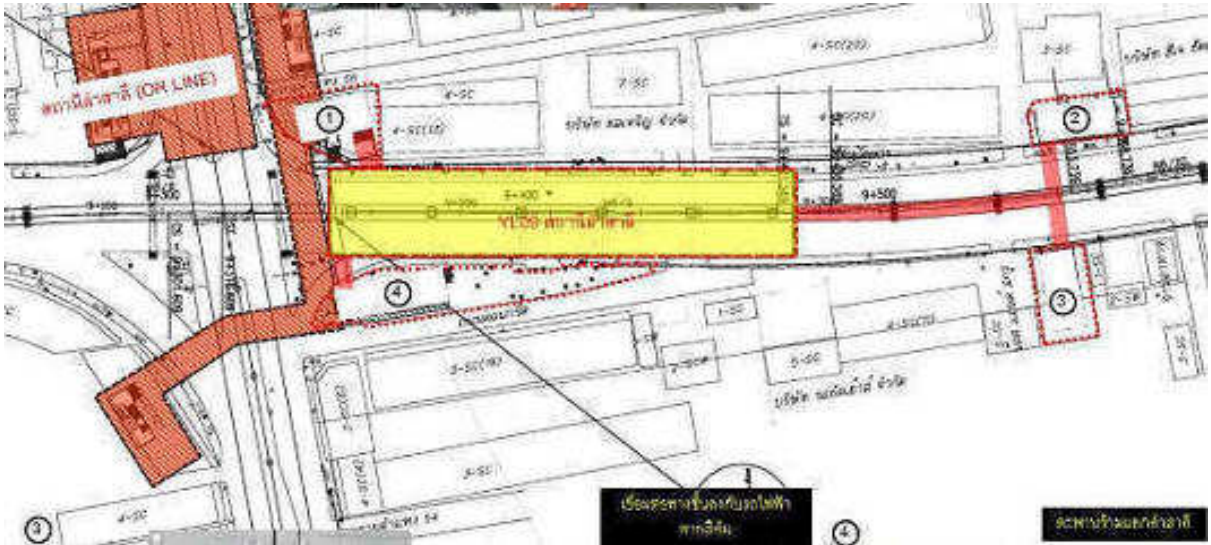


Location Located near Makro, Tawanna City 1 and 2, The Mall, MEA Substation Khlong Chan, Santi Housing, Rattana Bundit University, Happy Land Housing and Khlong Saen Saep Pier. The station is on the middle of the Lat Phrao Road at the foot of a flyover beside an empty plot of land with medium density residential community.

To go to the station The Lat Phrao Road, Lat Phrao 113 Alley, Lat Phrao 115 Alley and Lat Phrao 117 Alley.



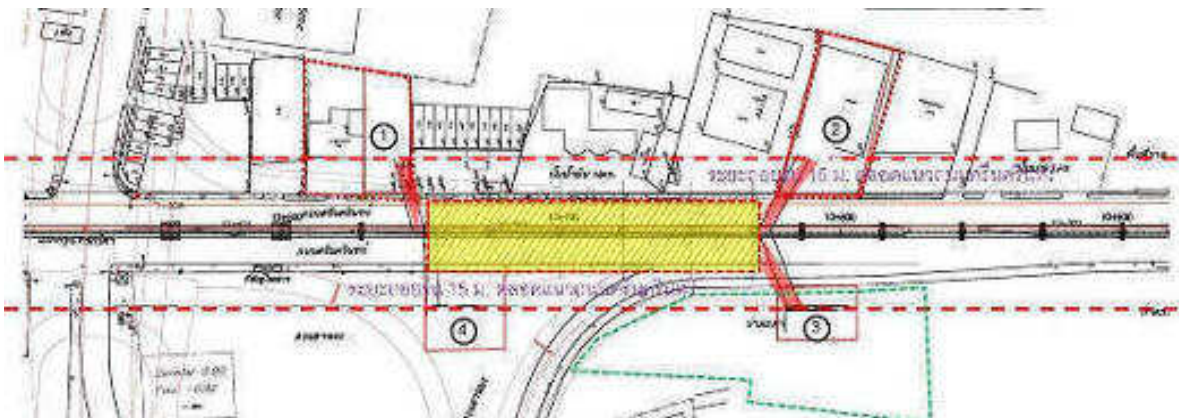
### 9) YL - 09 Lam Sali Station



Location An Interchange Station with Lam Sali Station of the MRT Orange Line Project (underground) located near Lam Sali intersection. The station is on the intersection of Srinagarindra and Ramkhamhaeng Road with medium density residential community.

To go to the station Lam Sali intersection, Bang Kapi intersection, Ramkhamhaeng Road and the Srinagarindra Road.

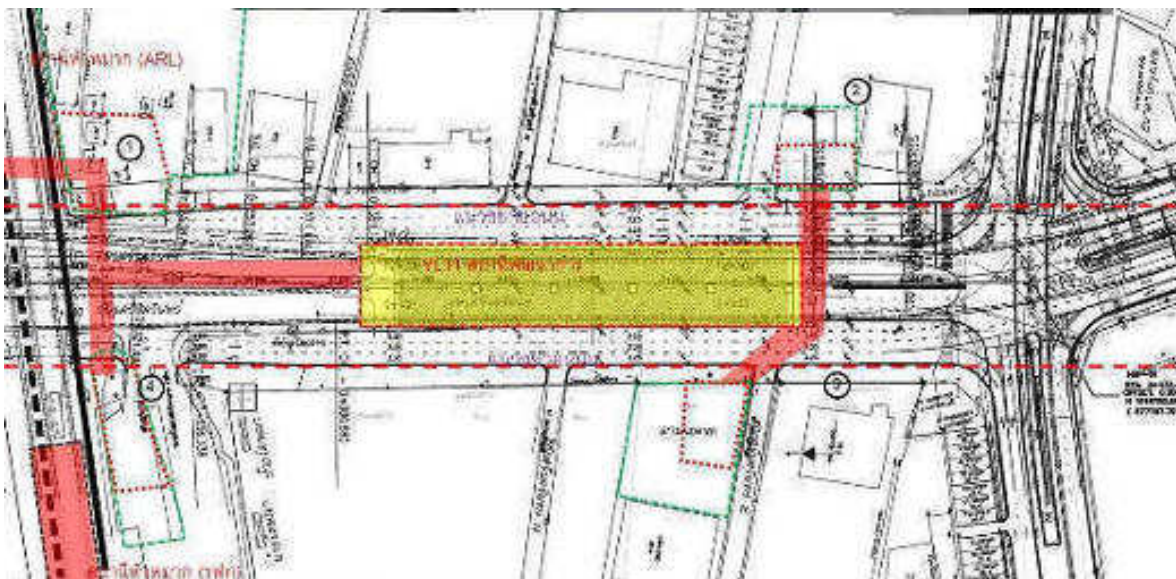
### 10) YL10 – Si Kritha Station



Location Located on the Srinagarindra Road at Hua Mak and the Krunghthep Kreetha Road intersection where traffic may spread in several directions. Beside the station is a big plot of green area. The nearby landmarks i.e. Samitivej Hospital Srinagarindra and Nakarin Theatre with low residential density community. Along the route are private enterprises, offices and residential tall buildings. The surrounding area is mostly green area yet to be developed. The Srinagarindra Road inbound traffic to the city is quite dense.

To go to the station The Srinagarindra Road, Hua Mak intersection and Krunghthep Kreetha Road.

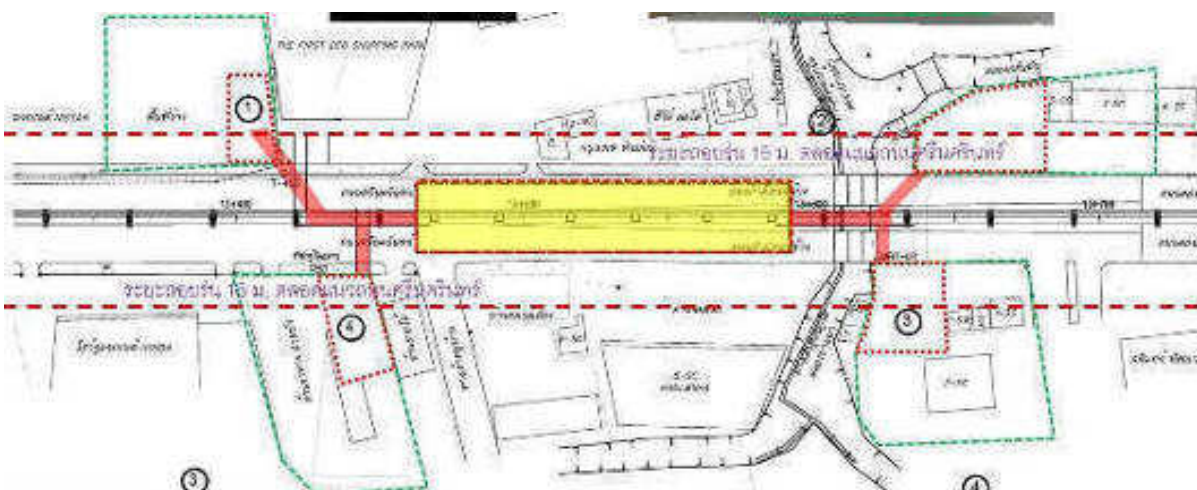
### 11) YL - 11 Phatthanakan Station



Location An Interchange Station located on the Srinagarindra Road at motorway intersection. It can be connected to Airport Rail link at Hua Mak Station and make travel into town or off to Suvarnabhumi International Airport easy. Beside the station is a large green area. The nearby landmarks i.e. Hua Mak Railway Station and Hua Mak School with a few residential communities. The surrounding area is mostly green area yet to be developed. The Srinagarindra Road inbound traffic to the city is quite dense.

To go to the station The Srinagarindra Road, the Phatthanakan Road and MRT Airport Rail Link, Hua Mak Station.

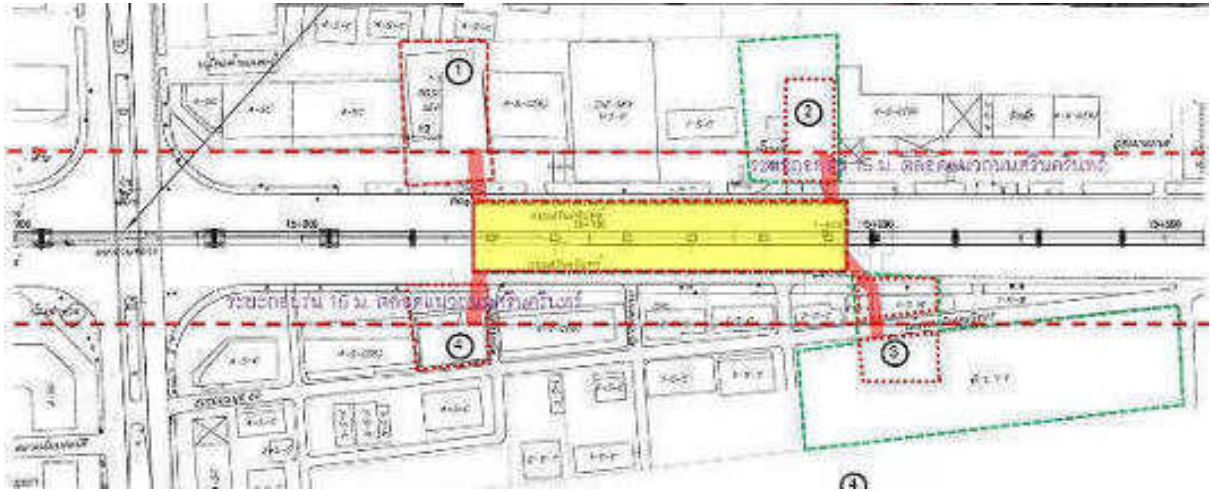
### 12) YL - 12 Kalantan Station



Location A newly proposed station located on the Srinagarindra Road. The nearby landmarks i.e. Thanya Shopping Park and Triam Udom Suksa Phatthanakan School with high residential density. The Srinagarindra Road inbound traffic to the city is quite dense.

To go to the station The Srinagarindra Road, the Phatthanakan Road

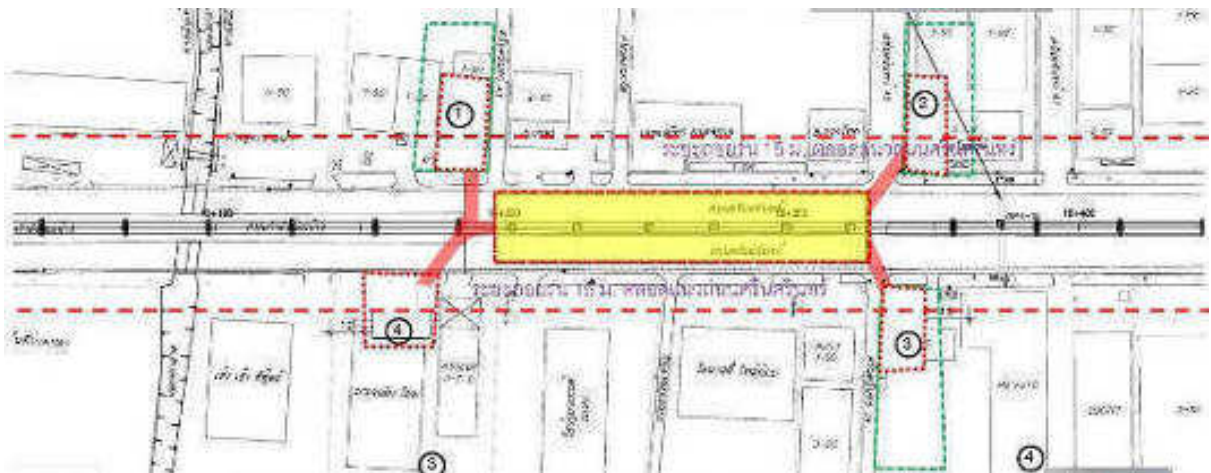
### 13) YL - 13 Si Nut Station



Location Located on the Srinagarindra Road at On-nut intersection. On the Srinagarindra Road there are private company, office buildings and many showrooms with low residential density.

To go to the station The Srinagarindra Road, the On-nut Road

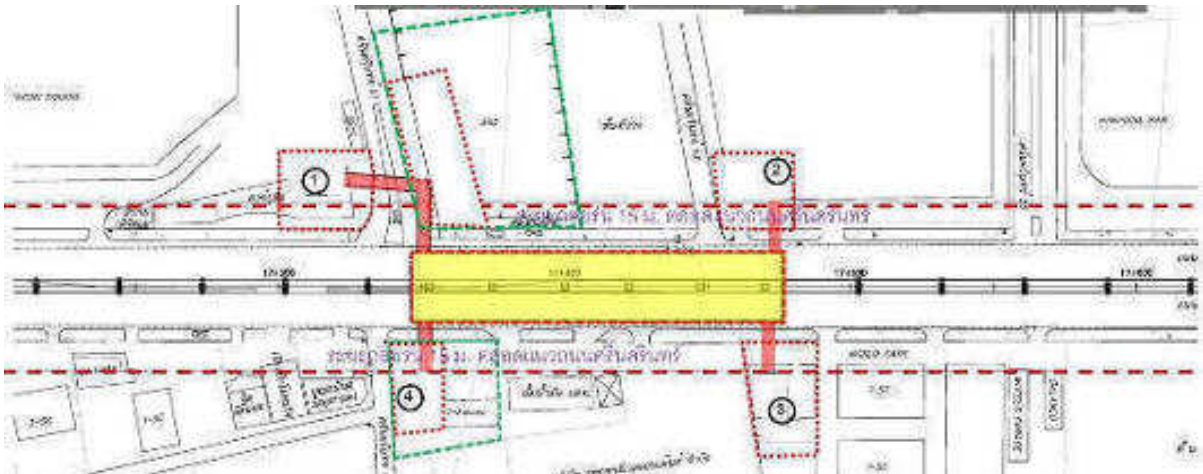
### 14) YL - 14 Srinagarindra 38 Station



Location A newly proposed station located on the Srinagarindra Road. The surrounding area has Isuzu Showroom and private company office buildings with high residential density. The Srinagarindra Road inbound traffic to the city is quite dense.

To go to the station The Srinagarindra Road, Srinagarindra 38 Alley, Srinagarindra 45 Alley and Srinagarindra 47 Alley.

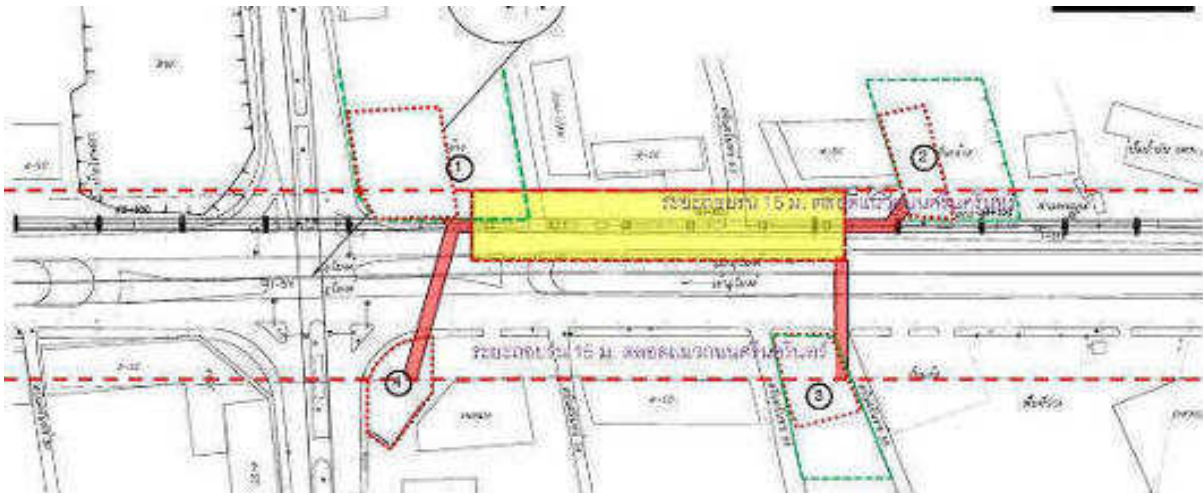
### 15) YL - 15 Suan Luang Ro 9 Station



Location Located on the Srinagarindra Road between the On-nut Road and the Udomsuk Road intersections. The nearby landmarks i.e. Suan Luang Ro 9, Seacon Square, Paradise Park, Dusit Thani College, Par 3 Srinagarindra Golf, Japanese Language School and four-star hotels to accommodate travelers on route to Suvarnabhumi International Airport with low residential density. Most are housing projects, private companies and several office buildings.

To go to the station The Srinagarindra Road, Srinagarindra 51 Alley, Srinagarindra 53 Alley (Connected to Suan Luang Ro 9 Public Park).

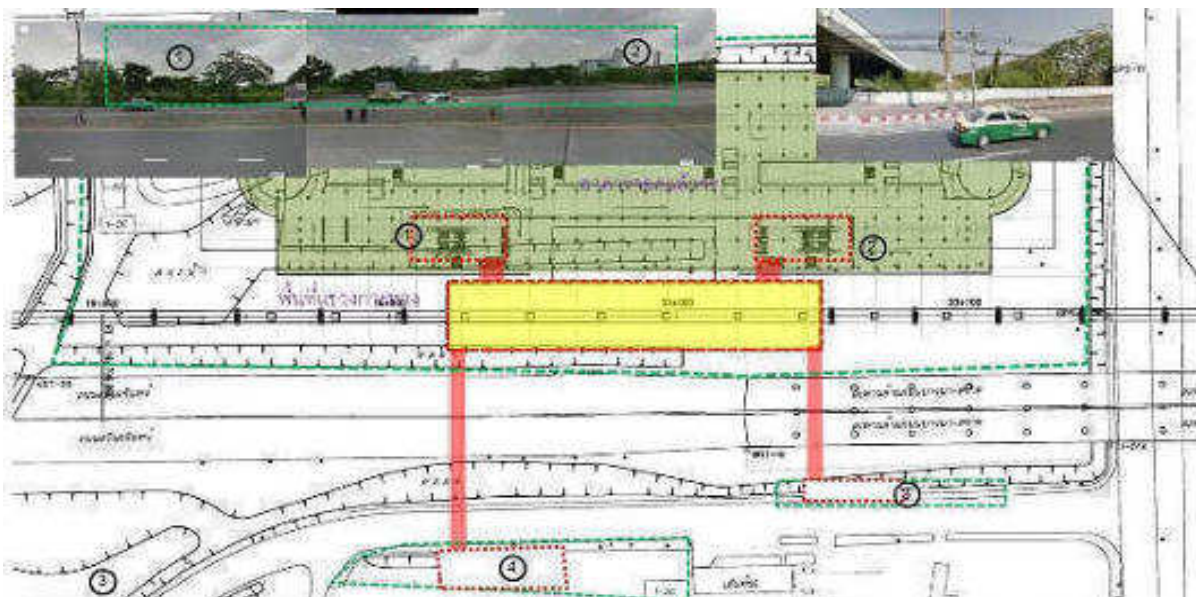
### 16) YL - 16 Si Udom Station



Location Located on the Srinagarindra Road at the Udomsuk Road intersection (Sukhumvit 103 Alley). The nearby landmarks i.e. Novotel Bangkok Bangna Hotel, Premier Place office buildings, private companies, car service center, with low residential density.

To go to the station The Srinagarindra Road, the Udomsuk Road (Sukhumvit 103 Alley), Srinagarindra 54 Alley, Srinagarindra 56 Alley, Srinagarindra 58 Alley and Srinagarindra 63 Alley.

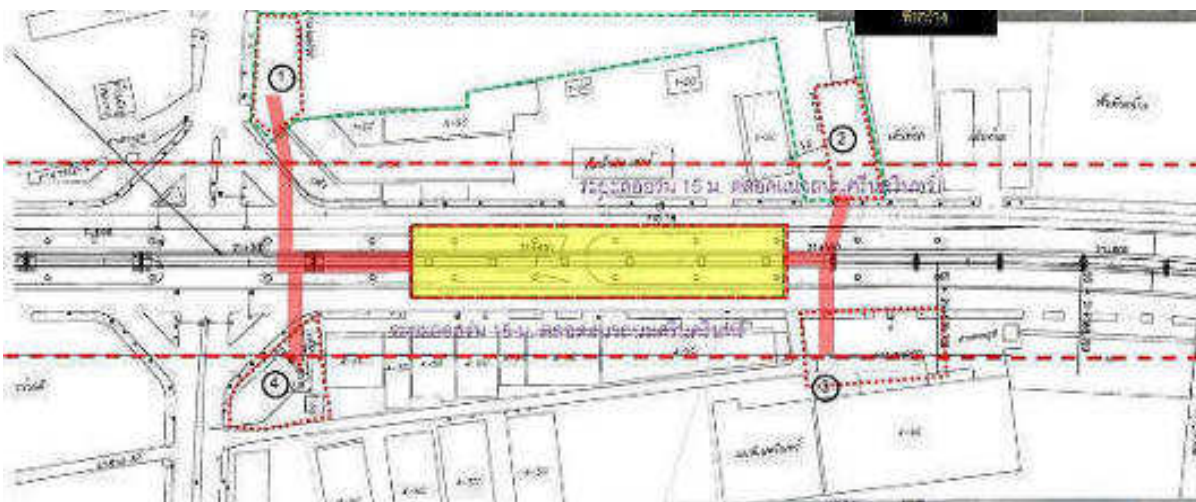
### 17) YL - 17 Si lam Station



Location Located on the Srinagarindra Road at the Bang Na-Trat Road intersection in the area of Samut Prakan Highway District opposite Si lam Anusorn School and Temple Si lam near Ring Road Buraphavithi which accommodate Eastern Region. The nearby landmarks i.e. Wat Si lam, showrooms, private company office buildings and Thainakarin Hospital. Close to the station is a desolate green area yet to be developed. There is hardly any community housing.

To go to the station The Srinagarindra Road, the Bang Na-Trat Road, Ring Road Buraphavithi which accommodate the Eastern Region.

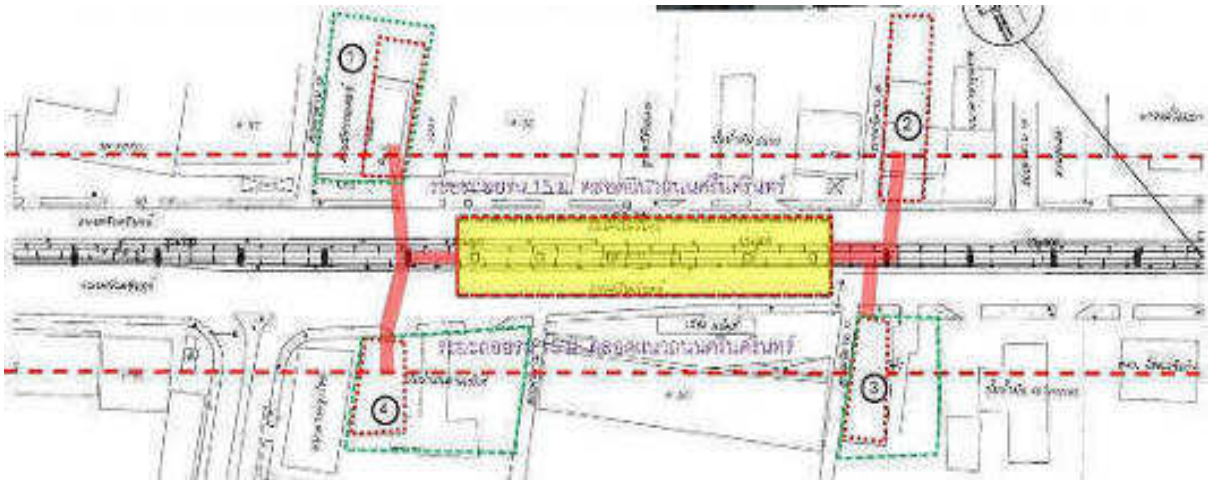
### 18) YL - 18 Si La Salle Station



Location Located on the Srinagarindra Road at the La Salle Road intersection (Sukhumvit 105 Alley) the nearby landmarks i.e. Sikarin Hospital, Premier Place, La Salle Driving Range and Bay Hotel Suvarnabhumi Airport.

To go to the station The Srinagarindra Road, La Salle Alley (Sukhumvit 105 Alley)

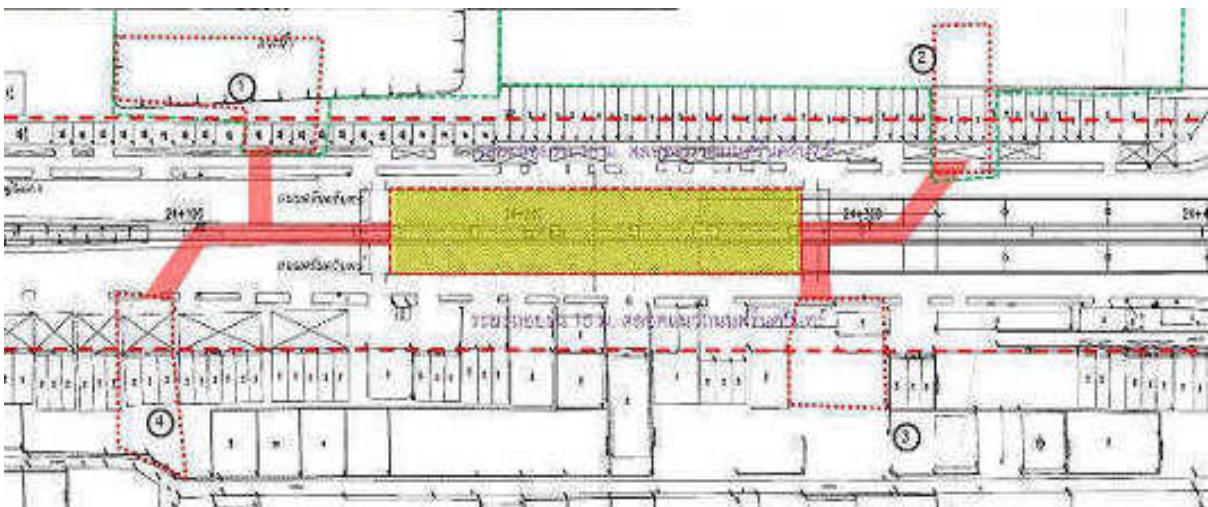
### 19) YL - 19 Si Bearing Station



Location Located on the Srinagarindra Road at Bearing Alley intersection (Sukhumvit 107 Alley) the nearby areas are residential area, hotels, entertainment spots, private enterprise, car show room and gas station.

To go to the station The Srinagarindra Road and Bearing Alley (Sukhumvit 107 Alley).

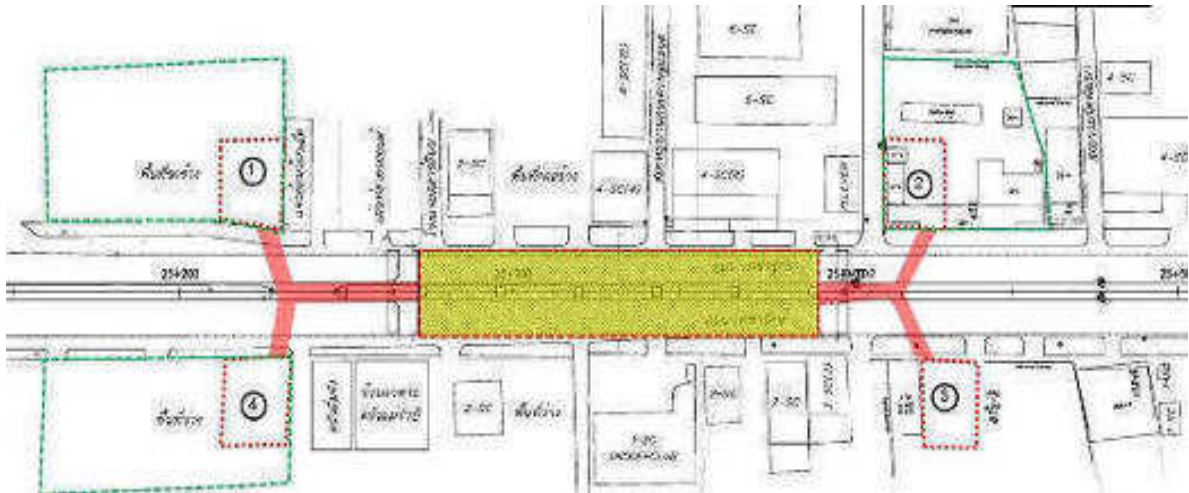
### 20) YL - 20 Si Dan Station



Location Located on the Srinagarindra Road near the Wat Dan Samrong Road and the Wat Nam Daeng Road, Khlong Samrong, golf driving range, shopping center, Foodland Supermarket, office buildings around Aek-Pailin shopping center, office buildings with low residential density. The nearby area has a desolate green area yet to be developed.

To go to the station The Srinagarindra Road, Wat Dan Samrong Alley.

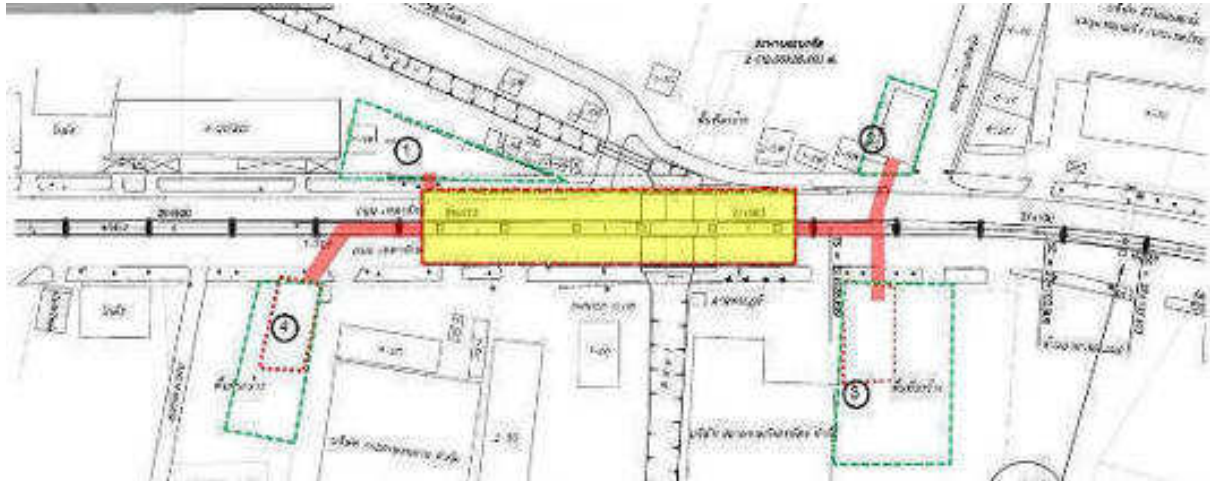
## 21) YL - 21 Si Thepha Station



Location Located on the Thepharak Road in front of Rinrada Health Club near Thepharak and Srinagarindra intersection. Along both sides of the road are private shop houses with low residential density. The nearby area has condominiums and office buildings.

To go to the station The Srinagarindra Road and the Thepharak Road

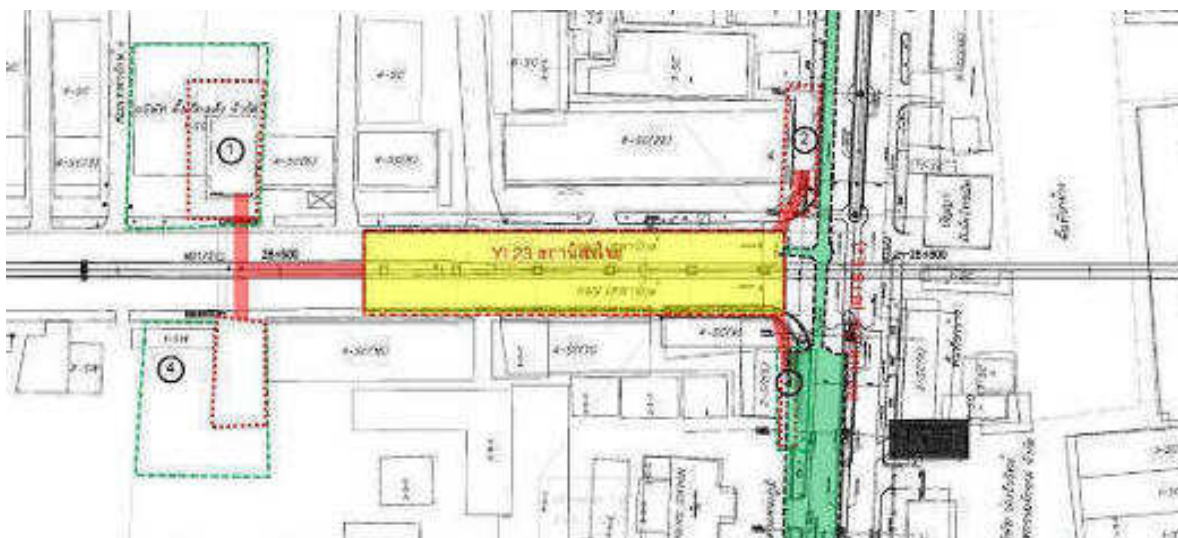
## 22) YL - 22 Thippawan Station



Location Located on the Thepharak Road around Thippawan Alley. Along both sides of the road are private shop houses with low residential density. The nearby area has condominiums, office buildings and paper mill. The landmarks are Chularat Hospital and Thai Taekwondo Institute.

To go to the station The Thepharak Road, alley to Thippawan Village.

### 23) YL - 23 Samrong Station



Location Located on the beginning of the Thepharak Road at the Sukhumvit Road intersection. Along both sides of the road are private shop houses with low residential density. The nearby area has condominiums, office buildings, department store and Matthayom Dan Samrong School with connection to the MRT Green Line Project extension Bearing - Samut Prakan Section.

To go to the station The Thepharak Road, the Sukhumvit Road and MRT Green Line extension Bearing - Samut Prakan Section.

## 3.6 Intermodal Transit Facility (ITF)

### 3.6.1 Core components in ITF

The primary purpose of Intermodal Transit Facility is to facilitate the movement of passengers to other modes of transportation. The facilities designed for interchanges include:

- 1) Park & Ride Buildings
- 2) Parking areas
- 3) Pick up and Drop off areas
- 4) Waiting Lot for bus riders
- 5) Waiting Lot for taxis
- 6) Waiting Lot for motorcycles
- 7) Motorcycle Parking Lots
- 8) Bicycle Parking Lots

The numbers and locations of facilities vary from station to station depending on volume of users and the surroundings.

Design principles for (ITF) are as follows:

- 1) Not impede the flow of traffic
- 2) Allow easy access for passengers including the disabled and the elderly
- 3) Make plans based on the study of passenger traffic and modes of transportation in each local station.



Analysis of passengers' needs is going to be conducted in some surrounding areas. The accessible routes to some stations are connected with large facilities such as bus terminals, or van terminals so they might serve as major interchanges. The aspect of appropriateness needs to be taken into consideration case by case. The development suggestions for ITF are shown in **Table 3.6.1 - 1**

**Table 3.6.1 - 1 Suggestions and Possibility for Developing Intermodal Transit Facility to stations**

Stations	Need Analysis and modes of transportation	Suggestions for ITF
YL - 01 Ratchada	<ul style="list-style-type: none"> <li>The majority of passengers have always wanted the link between Monorail and subway (Blue line) since the operation started and the demand will tend to increase in the future</li> <li>The second most passengers include bus riders who have used Skytrain service since the operation started and the number of passengers tend to be constant</li> <li>Third, the highest number of passengers are on foot to use Monorail and subway and the demand will tend to increase in the future.</li> </ul>	<p>ITF should focus on the link between the subway and buses including other types of hired vehicles such as taxis and vans. Private cars can use Park and Ride at Latphrao Station</p> <ul style="list-style-type: none"> <li>4 spaces for rental cars</li> <li>6-8 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 02 PHAWANA	<ul style="list-style-type: none"> <li>The majority of passengers use public transportation from minor roads or Soi to take Monorail.</li> <li>The second most passengers are on foot</li> </ul>	<p>ITF is mainly linked to public transportation and Kiss and Ride</p> <ul style="list-style-type: none"> <li>4 spaces for rental cars</li> <li>2-4 spaces for buses</li> <li>4-6 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 03 CHOKCHAI 4	<ul style="list-style-type: none"> <li>The majority of passengers use public transportation from minor roads or Soi to take Monorail.</li> <li>The second most passengers are on foot.</li> </ul>	<p>ITF is mainly linked to public transportation and Kiss and Ride</p> <ul style="list-style-type: none"> <li>4-6 spaces for rental cars</li> <li>4-6 spaces for buses</li> <li>6 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 04 LATPHRAO 71	<ul style="list-style-type: none"> <li>The majority of passengers use public transportation from minor roads or Soi to take Monorail.</li> <li>A lot of students use service at this station. Some spaces for school buses to pick up the students should be available.</li> </ul>	<p>ITF is mainly linked to public transportation and Kiss and Ride</p> <ul style="list-style-type: none"> <li>4 spaces for rental cars</li> <li>4-6 spaces for buses</li> <li>8 spaces for private cars, taxis, and school buses</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 05 LATPHRAO 83	<ul style="list-style-type: none"> <li>Most passengers use cars and public transportation including taxis, pick up trucks, and buses to take Monorail</li> <li>Some passengers who drive their own cars also use Skytrain</li> </ul>	<p>ITF is mainly linked to small public vehicles, Kiss and Ride, Park and Ride</p> <ul style="list-style-type: none"> <li>4 spaces for rental cars</li> <li>4-5 spaces for buses</li> <li>10 spaces for taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>

**Table 3.6.1 - 1 Suggestions and Possibility for Developing Intermodal Transit Facility to stations (Cont'd)**

Stations	Need Analysis and modes of transportation	Suggestions for ITF
YL - 06 MAHATTHAI	<ul style="list-style-type: none"> <li>• Most passengers use cars and public transportation including taxis, pick up trucks, and buses to take Monorail</li> <li>• Some passengers who drive their own cars also use Skytrain</li> </ul>	<p>ITF is mainly linked to public transportation and Kiss and Ride</p> <ul style="list-style-type: none"> <li>• 4 spaces for rental cars</li> <li>• 5 spaces for buses</li> <li>• 6-8 spaces for private cars and taxis</li> <li>• Pick up and Drop off zone for motorcycles</li> </ul>
YL - 07 LATPHRAO 101	<ul style="list-style-type: none"> <li>• The majority of passengers use buses to get to Skytrain station and the number of passengers tend to increase in the future.</li> <li>• Some passengers use rental vehicles to get to Skytrain station and there are a large number of them.</li> <li>• Some passengers are on foot.</li> </ul>	<p>ITF is mainly linked to public transportation and Kiss and Ride</p> <ul style="list-style-type: none"> <li>• 2-4 spaces for rental cars</li> <li>• 6 spaces for buses</li> <li>• 6 spaces for private cars and taxis</li> <li>• Pick up and Drop off zone for motorcycles</li> </ul>
YL - 08 BANGKAPI	<ul style="list-style-type: none"> <li>• The majority of passengers use buses to get to Skytrain station and the number of passengers tend to increase in the future.</li> <li>• Some passengers use rental vehicles to get to Skytrain station and there are a large number of them.</li> <li>• Some passengers use motorcycle taxis.</li> <li>• Some passengers are on foot.</li> </ul>	<p>ITF is mainly linked to all types of public transportation including buses, micro vehicles, and Kiss and Ride for motorcycles.</p> <ul style="list-style-type: none"> <li>• 2-4 spaces for rental cars</li> <li>• 8-10 spaces for buses</li> <li>• 6-10 spaces for private cars and taxis</li> <li>• Pick up and Drop off zone for motorcycles</li> </ul>
YL - 09 LAM SALI	<ul style="list-style-type: none"> <li>• The majority of passengers use buses to get to Skytrain station and the number of passengers tend to increase in the future.</li> <li>• The second most passengers use rental vehicles to get to Skytrain station and there are a large number of them.</li> <li>• Next, some passengers drive to the station.</li> <li>• Some passengers are on foot.</li> </ul>	<p>ITF is mainly linked to all types of public transportation including buses, micro vehicles, and Kiss and Ride</p> <ul style="list-style-type: none"> <li>• 2-4 spaces for rental cars</li> <li>• 6-10 spaces for buses</li> <li>• 6-10 spaces for private cars and taxis</li> <li>• Pick up and Drop off zone for motorcycles</li> </ul>
YL - 10 SRI KRITHA	<ul style="list-style-type: none"> <li>• The majority of passengers use cars and public transportation including taxis, pick up trucks, and buses to take Monorail.</li> <li>• Some passengers are on foot.</li> <li>• Some passengers take motorcycles to the station.</li> </ul>	<p>ITF is mainly linked to all types of public transportation including buses, micro vehicles, and Kiss and Ride</p> <ul style="list-style-type: none"> <li>• 2-6 spaces for rental cars</li> <li>• 4 spaces for buses</li> <li>• 8-10 spaces for private cars and taxis</li> <li>• Pick up and Drop off zone for motorcycles</li> </ul>
YL - 11 PHATTANA- KARN	<ul style="list-style-type: none"> <li>• The majority of passengers need to transit from Monorail to Red line since the operation started and the demand will tend to increase in the future</li> <li>• Most passengers use buses and rental vehicles to the station.</li> <li>• Some passengers are on foot.</li> </ul>	<p>ITF is mainly linked to the Red Line, and rental vehicles such as taxis and vans</p> <ul style="list-style-type: none"> <li>• 2-6 spaces for rental cars</li> <li>• 4-8 spaces for buses</li> <li>• 8-10 spaces for private cars and taxis</li> <li>• Pick up and Drop off zone for motorcycles</li> </ul>

**Table 3.6.1 - 1 Suggestions and Possibility for Developing Intermodal Transit Facility to stations (Cont'd)**

Stations	Need Analysis and modes of transportation	Suggestions for ITF
YL - 12 KALANTON	<ul style="list-style-type: none"> <li>Passengers use all modes of transportations in more or less the same number.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2-6 spaces for rental cars</li> <li>6-8 spaces for buses</li> <li>8-10 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 13 SRI NUT	<ul style="list-style-type: none"> <li>The majority of passengers use cars and public transportation including taxis, pick up trucks, and buses to take Monorail</li> <li>Next, some passengers drive to the station</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2-6 spaces for rental cars</li> <li>4-6 spaces for buses</li> <li>4-10 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 14 SRINAGARINDRA 38	<ul style="list-style-type: none"> <li>The majority of passengers use buses to get to Skytrain station and the number of passengers tend to increase in the future.</li> <li>Second, some passengers drive to the station.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>4 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 15 SUAN LUANG RO 9	<ul style="list-style-type: none"> <li>The majority of passengers are on foot. (they might have parked at the two nearby shopping malls about 200 - 300 metres away)</li> <li>The second most passengers use public transportation including buses from minor roads as a connection to the stations.</li> </ul>	ITF is designed for pedestrians and linked to rental vehicles. MRTA might sign a contract to Seacon Square and Paradise Park for the development of Park and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>4 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 16 SI UDOM	<ul style="list-style-type: none"> <li>The majority of passengers use buses and rental vehicles to get to Skytrain station and the number of passengers tend to increase in the future.</li> <li>Second, some passengers drive to the station.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>4 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 17 SI IAM	<ul style="list-style-type: none"> <li>The majority of passengers drive to the station. Passengers use all modes of transportations in more or less the same number.</li> </ul>	ITF is mainly linked to buses, and Park and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>2 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 18 SI LASALLE	<ul style="list-style-type: none"> <li>Passengers use all modes of transportations in more or less the same number.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>2 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 19 SI BEARING	<ul style="list-style-type: none"> <li>Passengers use all modes of transportations in more or less the same number.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>2 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 20 SI DAN	<ul style="list-style-type: none"> <li>Passengers use all modes of transportations in more or less the same number.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>2 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>

**Table 3.6.1 - 1 Suggestions and Possibility for Developing Intermodal Transit Facility to stations (Cont'd)**

Stations	Need Analysis and modes of transportation	Suggestions for ITF
YL - 21 SI THEPHA	<ul style="list-style-type: none"> <li>The majority of passengers use buses and rental vehicles to get to Skytrain station and the number of passengers tend to increase in the future.</li> <li>Some passengers are on foot.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>2 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 22 THIPPHAWAN	<ul style="list-style-type: none"> <li>The majority of passengers use buses and rental vehicles to get to Skytrain station and the number of passengers tend to increase in the future.</li> <li>Some passengers are on foot.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>2 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>
YL - 23 SAMRONG	<ul style="list-style-type: none"> <li>The majority of passengers use buses and rental vehicles to get to Skytrain station and the number of passengers tend to increase in the future.</li> <li>The majority of passengers drive to the station.</li> </ul>	ITF is mainly linked to buses, and Kiss and Ride <ul style="list-style-type: none"> <li>2 spaces for rental cars</li> <li>2 spaces for buses</li> <li>4 spaces for private cars and taxis</li> <li>Pick up and Drop off zone for motorcycles</li> </ul>

### 3.6.2 Intermodal Transit Standard

#### 3.6.2.1 Intermodal Transit Facility (ITF) at grade

For intermodal transit to car or motorcycle transporters at a roadside, the route taken by the public and passengers leaving the boarding and alighting area for other modes of transportation are categorized as follows:

##### 1) For general public and pedestrian passengers

- The route should be in a short distance with smooth surface. For sloped surfaces, stairs should be built. The footpath should access all areas and in the shortest distance.
- The route shouldn't intersect any roads, Sois, or private areas. If it is inevitable, try to minimize it.
- The minimum width of the footpath should be 1.50 metres so the pedestrians can walk in both directions more freely.
- Facilities for the disabled such as Detectable Warning Tile, Slope 1:12, Traffic light and sound systems for pedestrian crossings etc. should be made available.
- Signage should be visible to pedestrians.
- Safety barriers should be placed in footpath parallel/ next to a road, at or near the intersection for vehicles so as to prevent passengers from falling due to crowding or car accidents
- For the passengers who take public transportation such as buses or vans to Skytrain: Drop Off areas and a bus stop at curbside on a public road should be arranged.

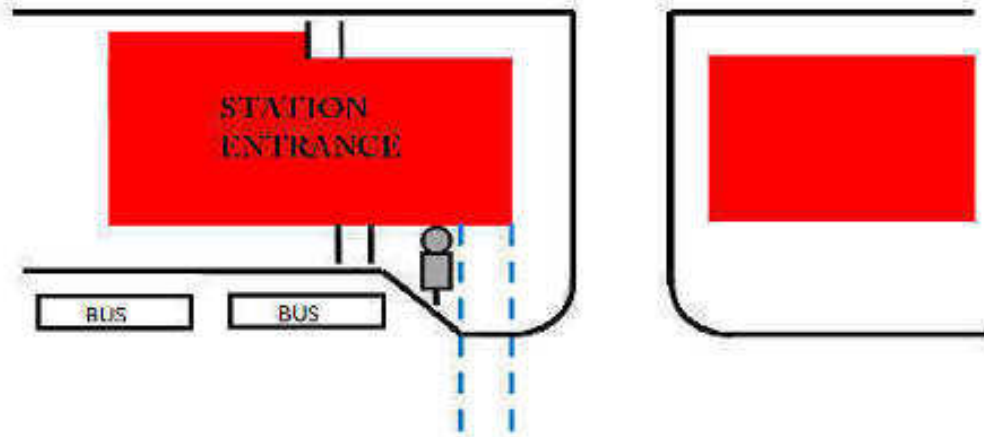


Figure 3.6.2 – 1 Example of Bus Stop and walkway for MRT passengers

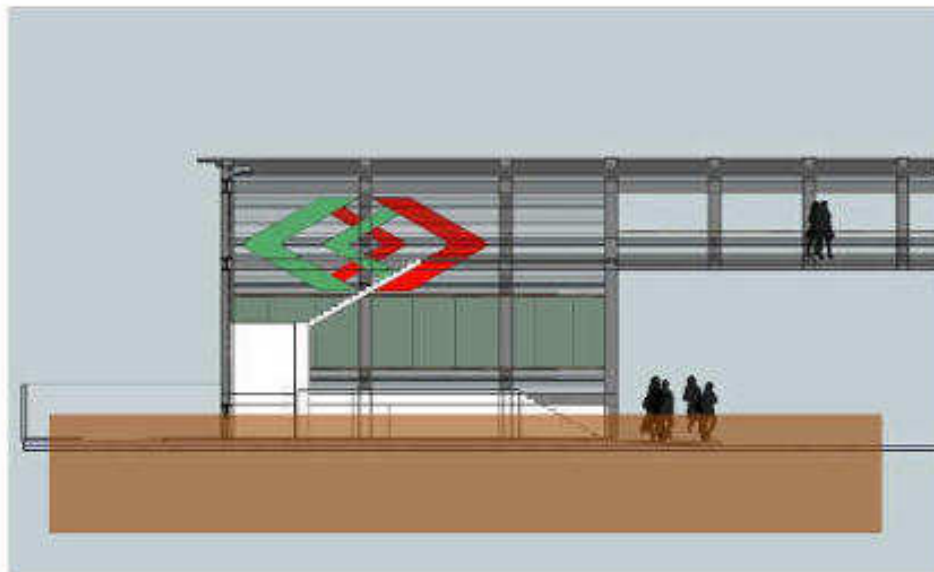


Figure 3.6.2 - 2 Example of MRT station Entrance

## 2) Vehicles

- The facilities should be provided at a waiting zone for buses.
- Pick up and drop off zones away from main roads should be provided for motorcycle users and car passengers to avoid impeding traffic.
- Cars, vans, or motorcycles awaiting for Skytrain passengers need to use ROW zone.
- Bicycle parking spaces and theft prevention should be made available.
- Drop off zone or Kiss and Ride at the entrances for car and taxi passengers should be organized. It should also include facilities for the by bicycle passengers and the disabled such as bike parking spaces , theft prevention equipments , sloped surface and guiding paths for the disabled.

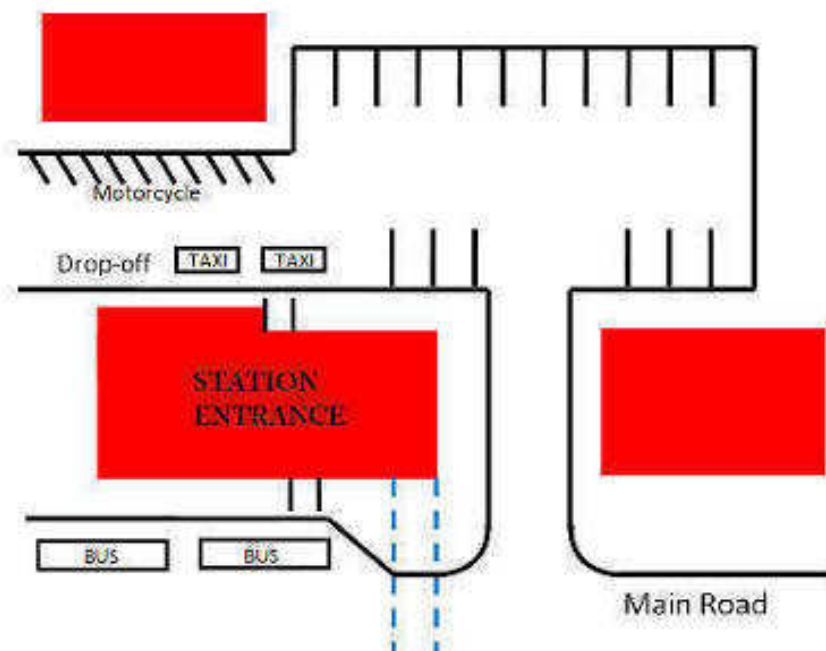


Figure 3.6.2 - 3 Example of passengers Drop off at MRT station

### 3.6.2.2 Interchange Between Stations

Factors taken into consideration for the design of interchanges are as follows:

#### 1) Types of station whether it is elevated or at Grade

1.1 For elevated stations, the connectivity should be done above the road by Sky walk network between Unpaid areas of both stations. An interchange should be at the end of station on Concourse for more flexible connectivity. Sample interchange from boarding and alighting area to Sky Walk is shown in Figure 3.6.2 - 4



Figure 3.6.2 - 4 Example of MRT station entrance-exit connect to sky walk

1.2 At Grade, the podium at the end of elevated stairs should be designed as hall, with shelters for the passengers. The height of podiums for each station should be the same so the disabled can commute conveniently.



Figure 3.6.2 - 5 Example of MRT station Entrance-Exit on ground connect to subway station

### 3.6.2.3 The connectivity from boarding and alighting zone with surrounding buildings

The issues needed to take into consideration when designing link between Skytrain station and surrounding buildings are as follows:

- 1) The link entrance to the buildings cannot be used as the main route for evacuation.
- 2) Skytrain station and surrounding buildings can be opened and closed independently.
- 3) During operating hours, the evacuation route and the route for the disabled must be in service .
- 4) The structure of boarding and alighting route and the link should be made separate from the building. If structure is in the building, fire compartment with fire endurance rate that meets safety standard should be designed for both parts of structures.
- 5) Signage for directions, information, and exit routes is in accordance with MRTA's standard.
- 6) The elevated route at the end of station exiting Concourse should be in an appropriate distance not exceeding safety standard.

A sample interchange between station and a neighboring bulding is shown in **Figure 3.6.2 - 6**

### 3.6.2.4 The general public's usage of footbridge

Footbridge should be designed so that general public can cross to the other side of the road without payment gat as shown in **Figure 3.6.2 - 7 and Figure 3.6.2 - 8**



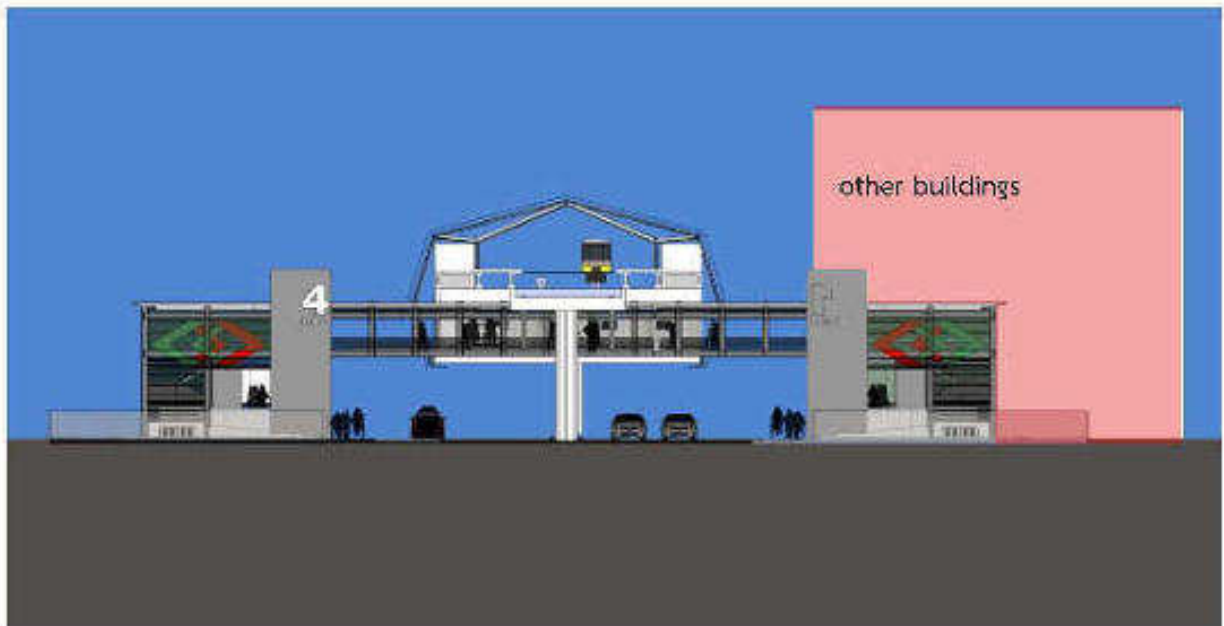


Figure 3.6.2 - 6 Example of MRT station entrance-exit connect to other buildings

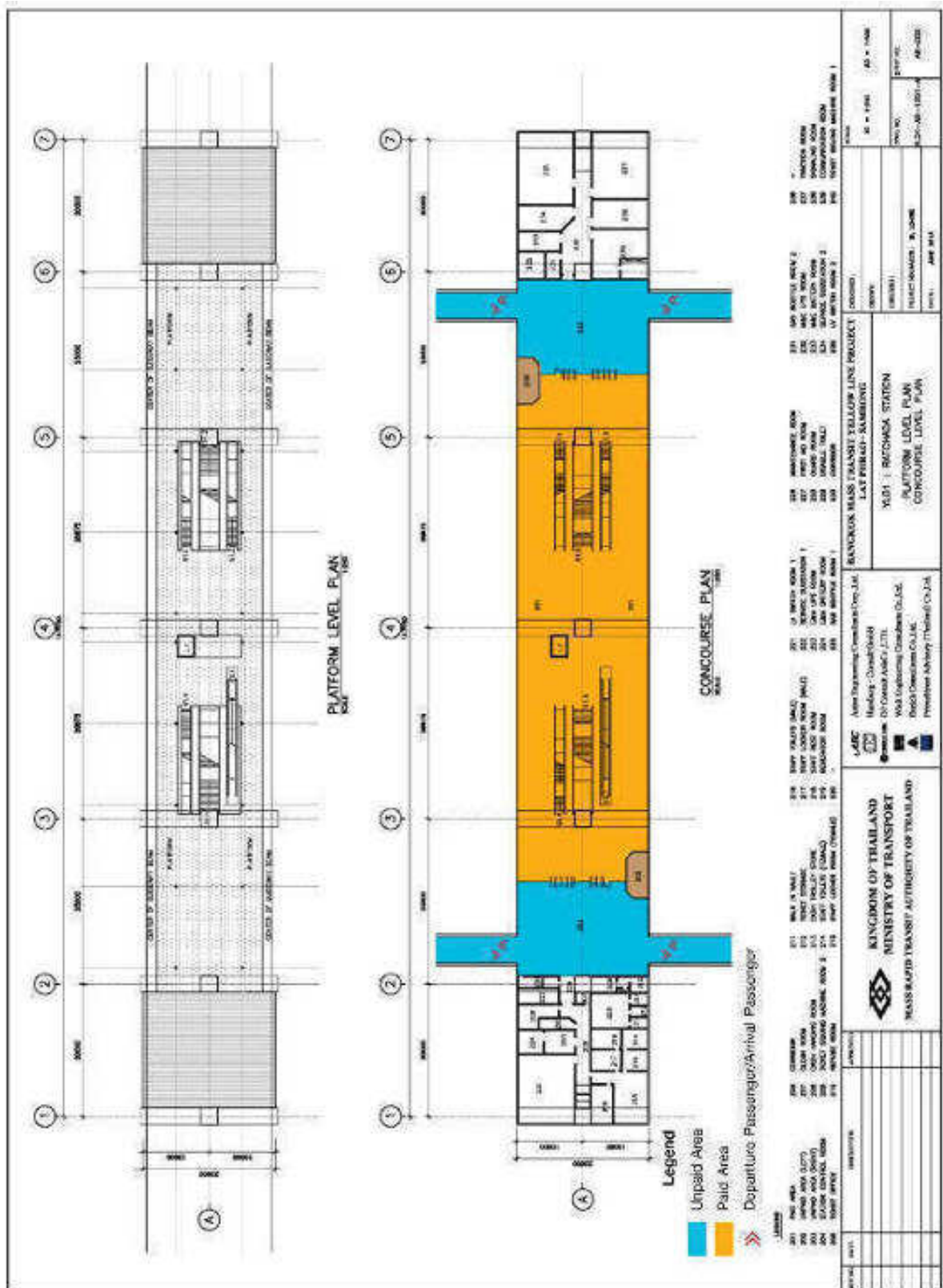


Figure 3.6.2 - 7 Type 1 Central Platform Level Plan / Central Concourse Level Plan

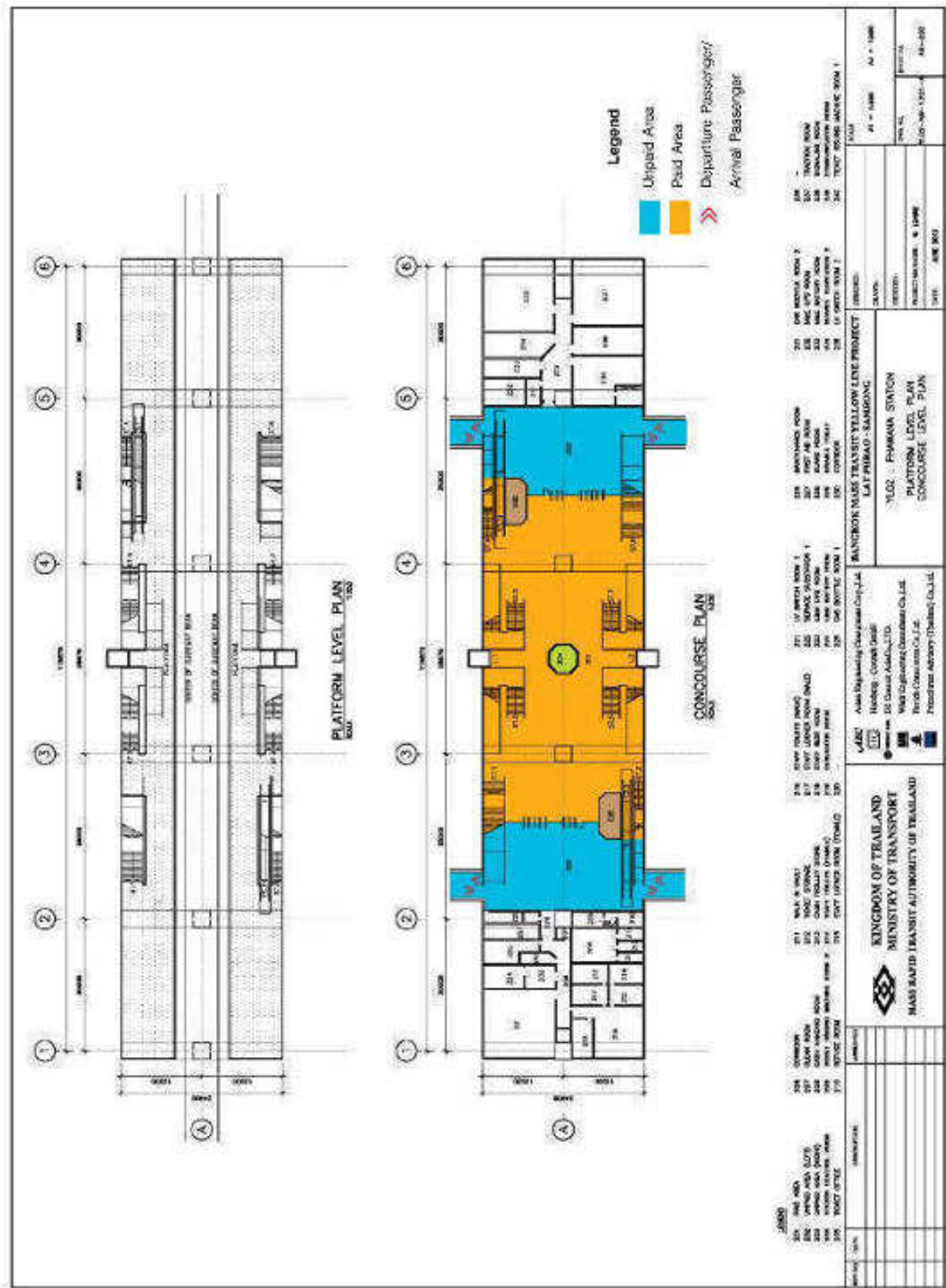


Figure 3.6.2 - 8 Type 2 Side Platform Level Plan / Central Concourse Level Plan

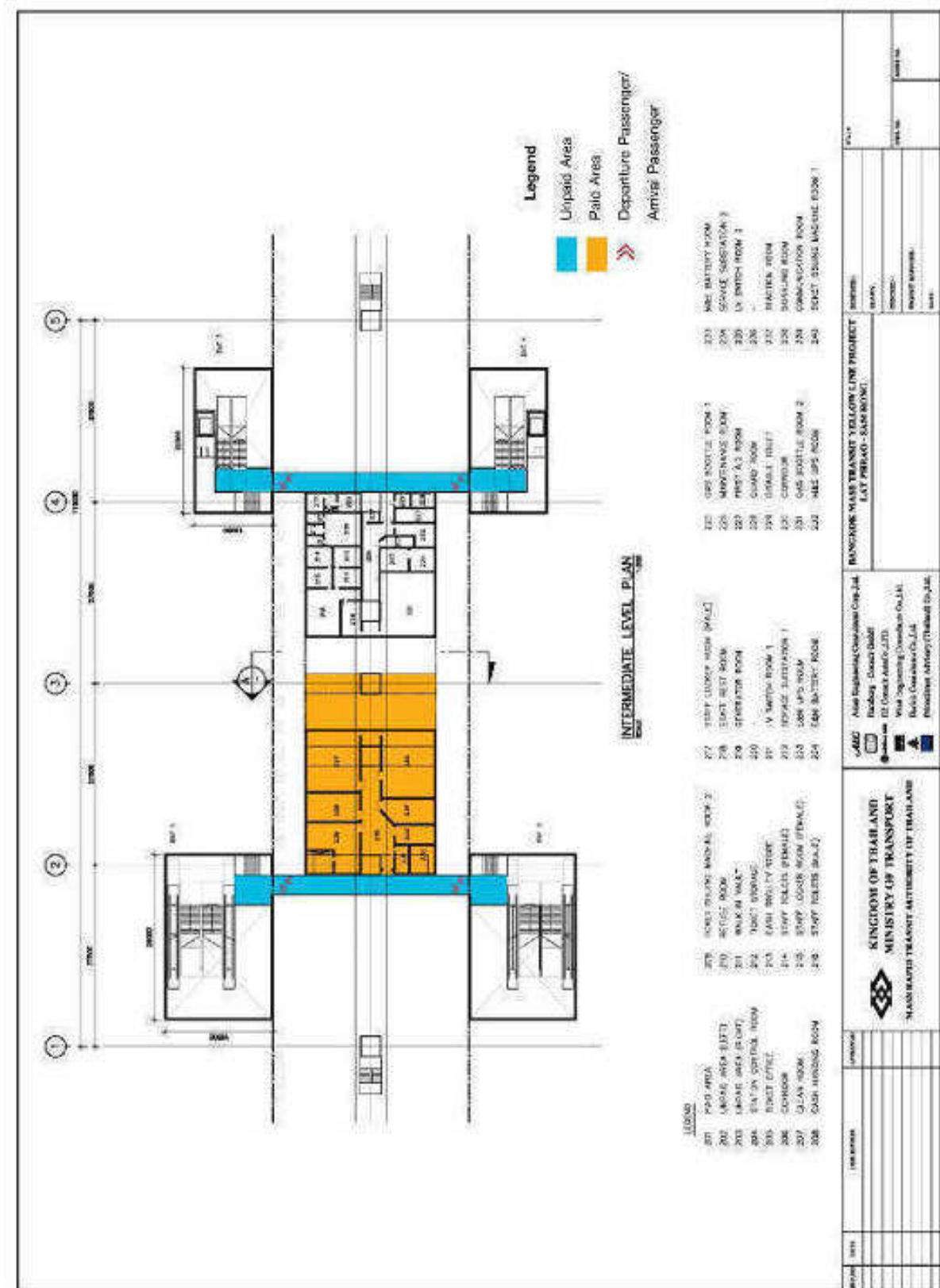
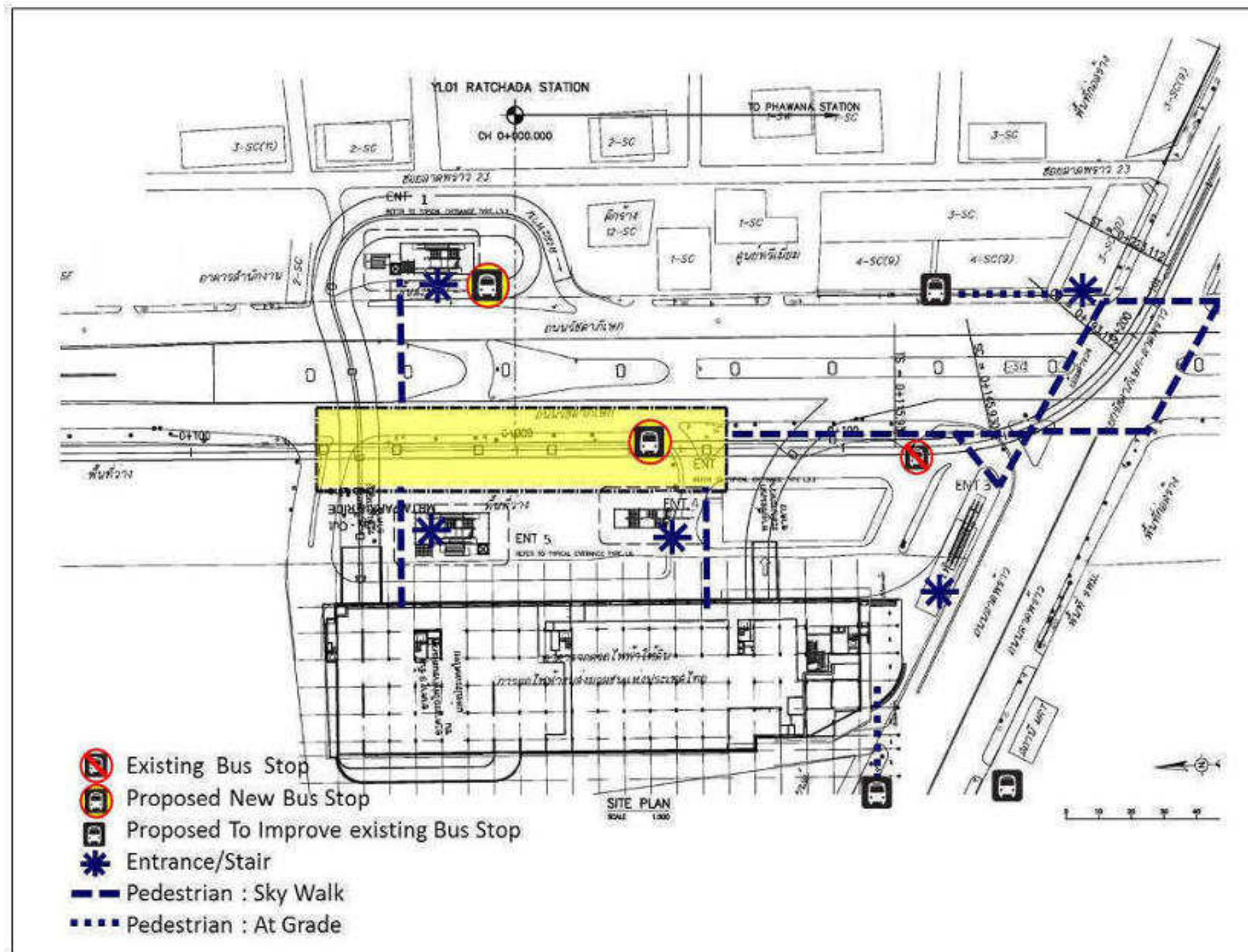


Figure 3.6.2 – 9 Type 3 side platform level plan / side concourse level plan

3.6.3 Design for connection to the train station.

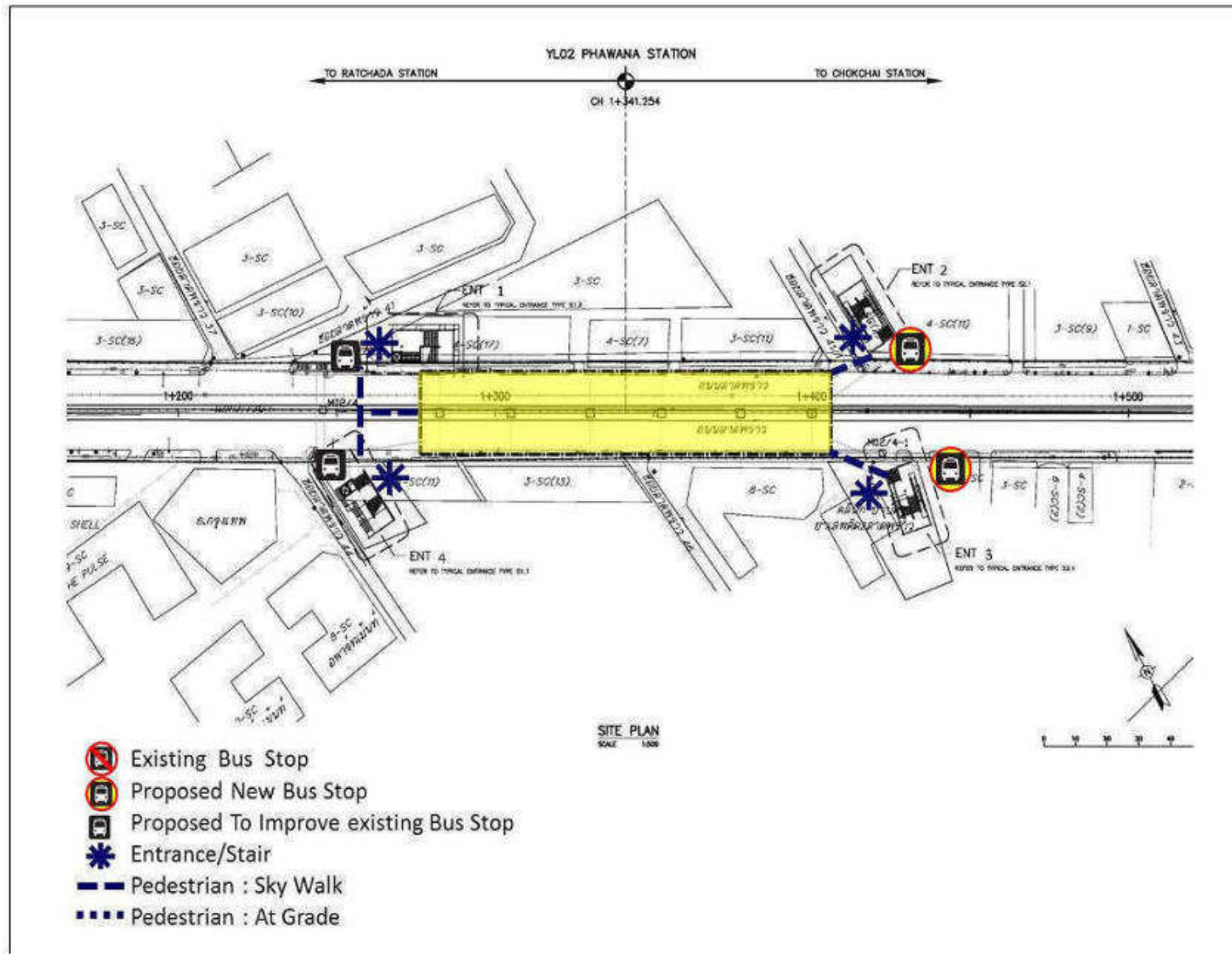
1) YL - 01 Ratchada Station



- Proposing of New location of bus stop/Improving of walk way connecting to the original bus stop
- Considering location/place for Kiss and Ride/ Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance exit.
- Connecting with Park & Ride (Blue Line Existing), proposing connecting way with BMA flyover

The design connecting of Ratchada Station (YL - 01) with MRT Blue Line at Lat Phrao Station at underground level and inside MRT Blue Line Park&Ride Building is an elevated walk way (Sky Walkway), and improving of walk way at grade to connect with the original bus stop which is proposed to improve at 2 points. Moreover, at Ratchada Station (YL - 01), two new location of bus stop are proposed near No. 1 entrance exit and at station area. There is also an original bus stop.

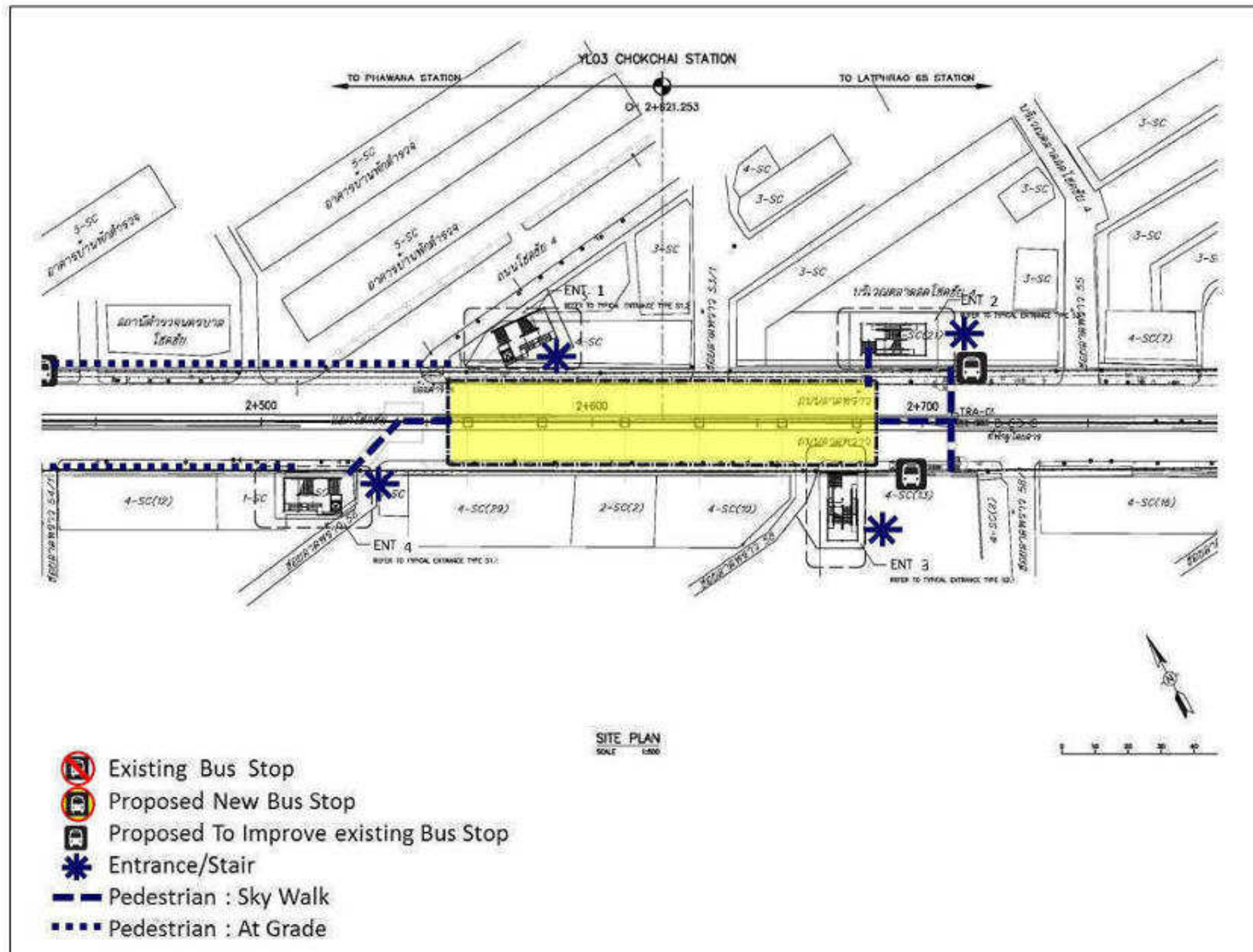
## 2) YL - 02 Phawana Station



- Proposing of New location of bus stop
- Improving of connecting walk way to the original bus stop
- Considering location/place for Kiss and Ride/Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit.

The design connecting of Phawana Station (Y - 02) is an elevated walk way (Sky Walkway), connecting with the original bus stop proposed to improve 2 points and connecting with the two new proposed bus stops; near No. 2 and No.3 entrance-exit. Parking Lot for motorcycle and bicycle at every entrance exit path are also proposed.

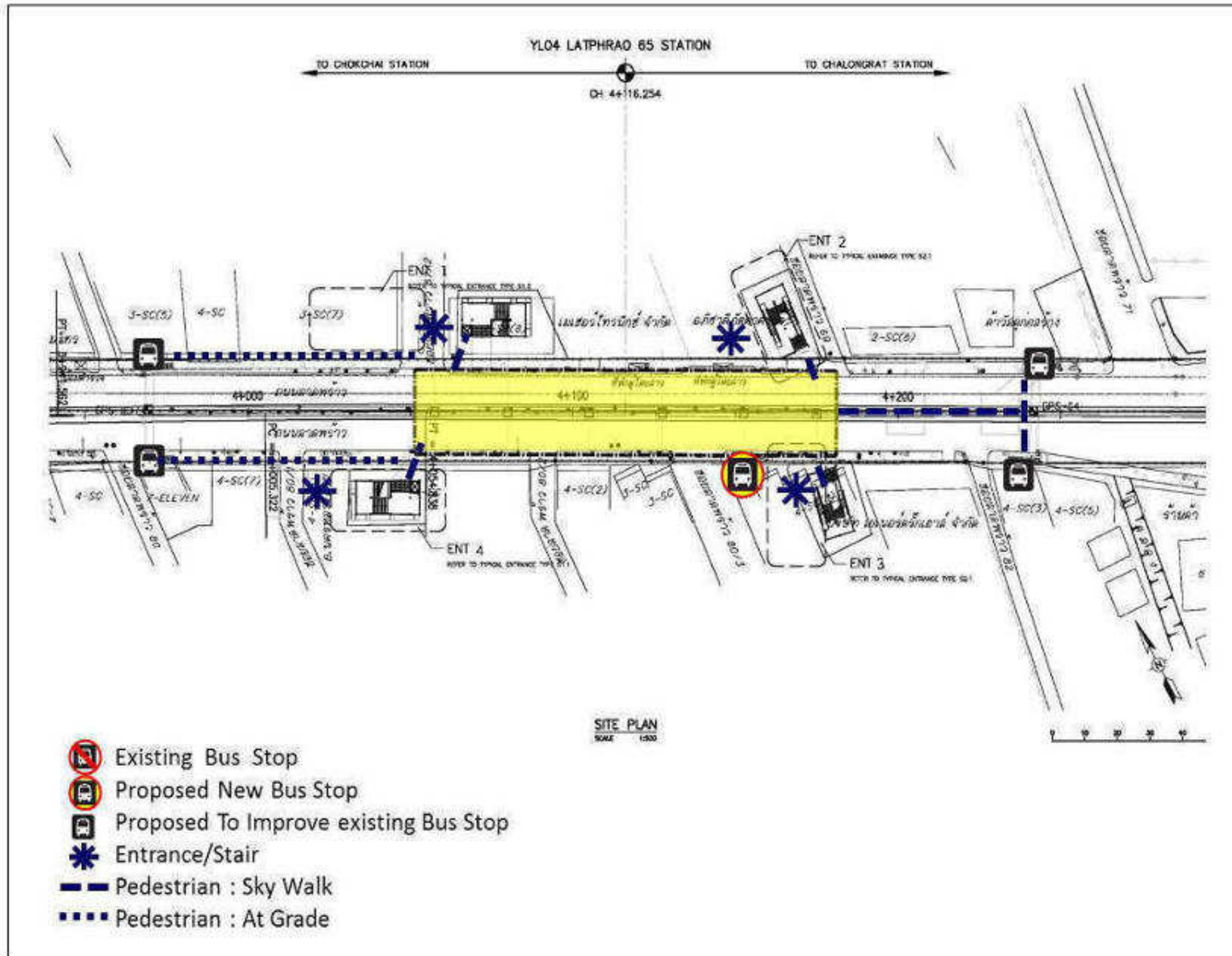
3) YL - 03 Chok Chai 4 Station



- Improving of connecting walk way to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at every entrance-exit.

The design connecting of Chokchai Station (YL - 03) is an elevated walk way (Sky Walkway), connecting with the original bus stop which is proposed to improve at 2 points and connecting with the two new proposed bus stops near No. 2 and No.3 entrance-exit, and also improving of walk way at grade to connect to the original bus stop.

4) YL - 04 Lat Phrao 71 Station

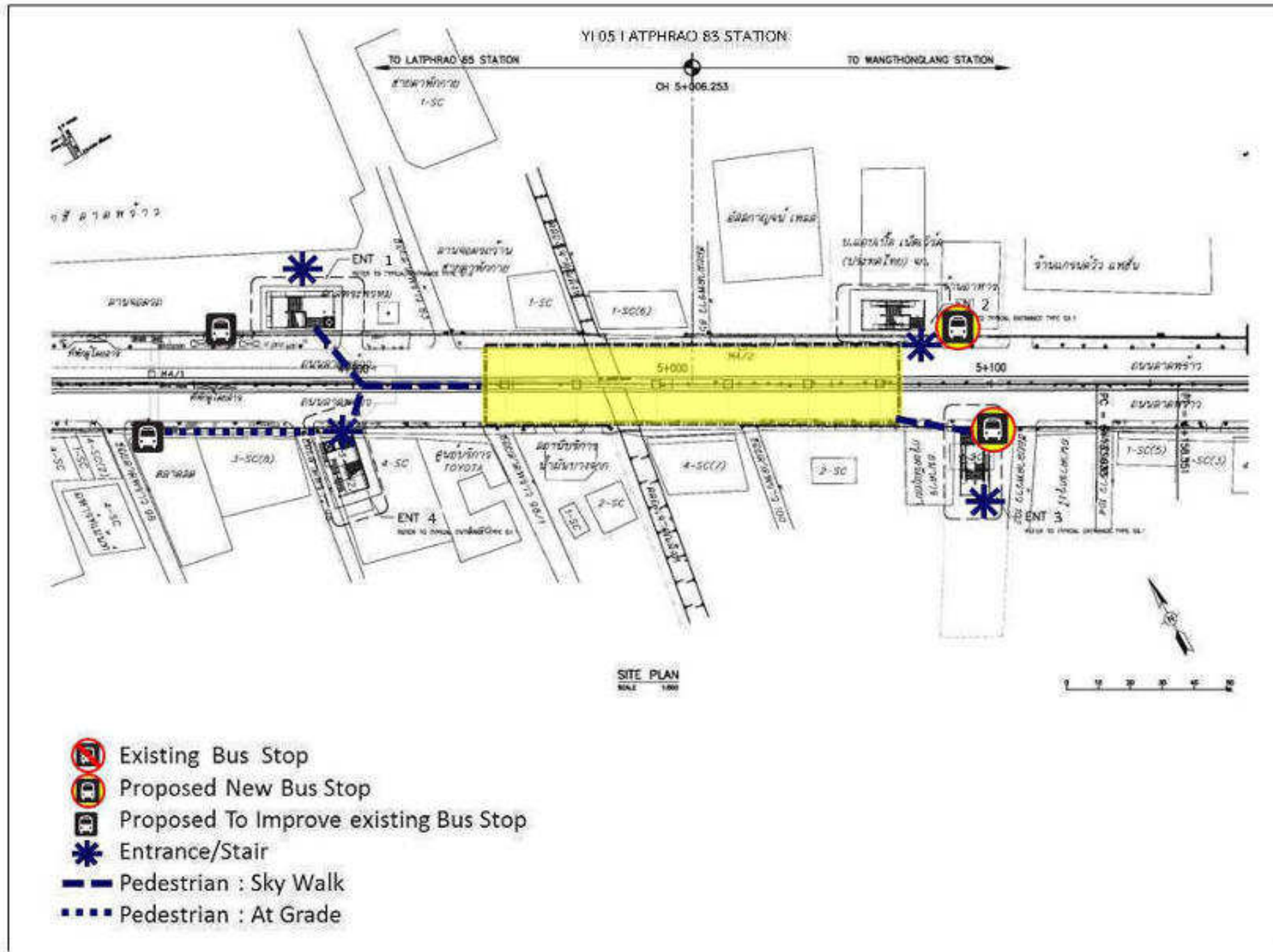


- Proposing new location of bus stop near No. 2 entrance exit.
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit
- Connecting with station of Bangkok MR Grey line

The design connecting of Lat Phrao 71 Station (YL - 04) is an elevated walk way (Sky Walkway), connecting with the original bus stop which is proposed to improve at 2 points and improving of walk way at grade from No. 4 and No.2 entrance-exit, and also improving of walk way at grade to connect to the original bus stop. Moreover, one more new location of bus stop near No.3 entrance-exit is proposed.



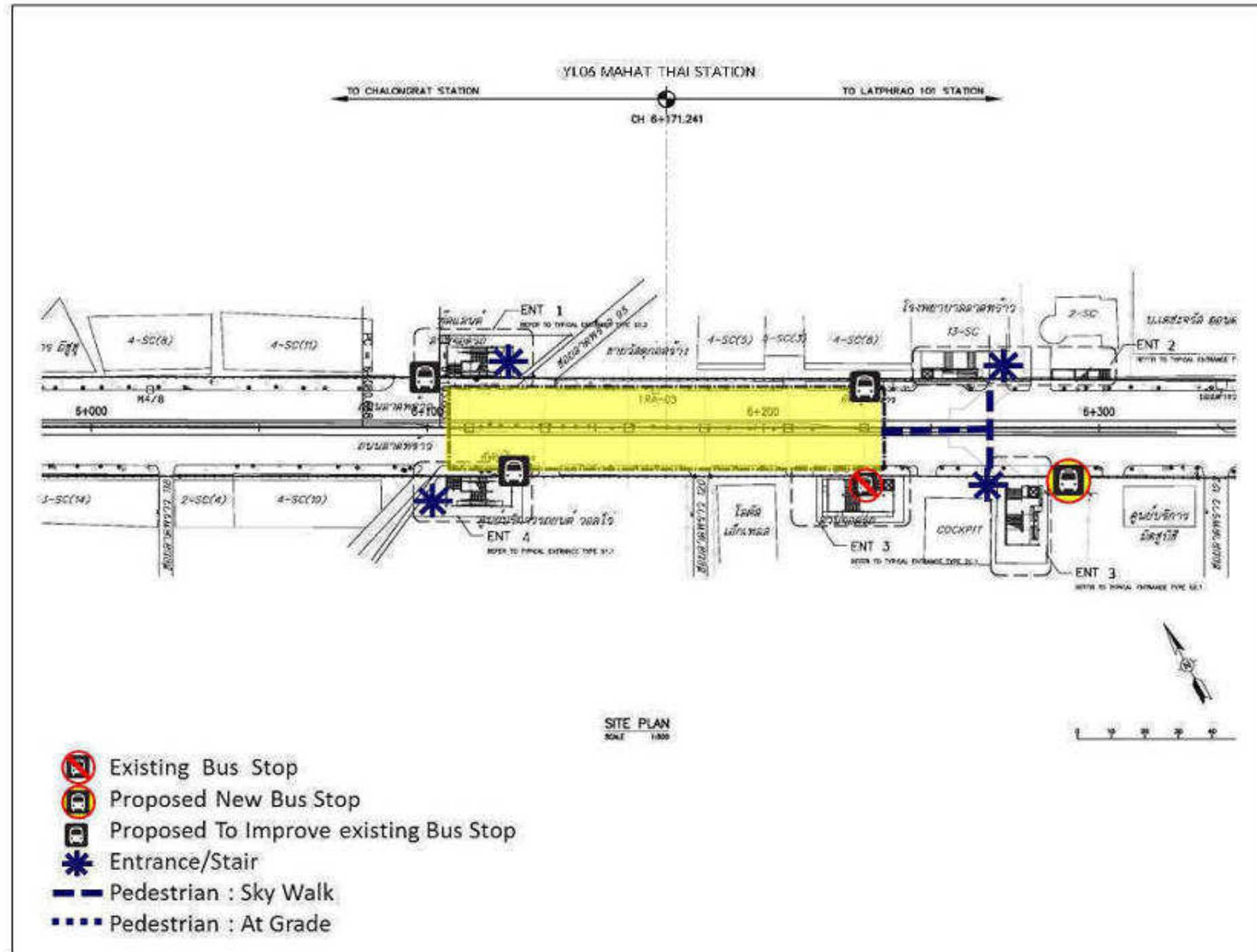
5) YL - 05 Lat Phrao 83 Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Lat Phrao 83 Station (YL - 05) is an elevated walk way (Sky Walkway), connecting with No. 3 and No.4 entrance-exit, and with the new bus stop near No.2 entrance-exit. The proposed improvement original bus stop is an improving of walk way at grade. Moreover, one more new location of bus stop near entrance-exit is proposed.

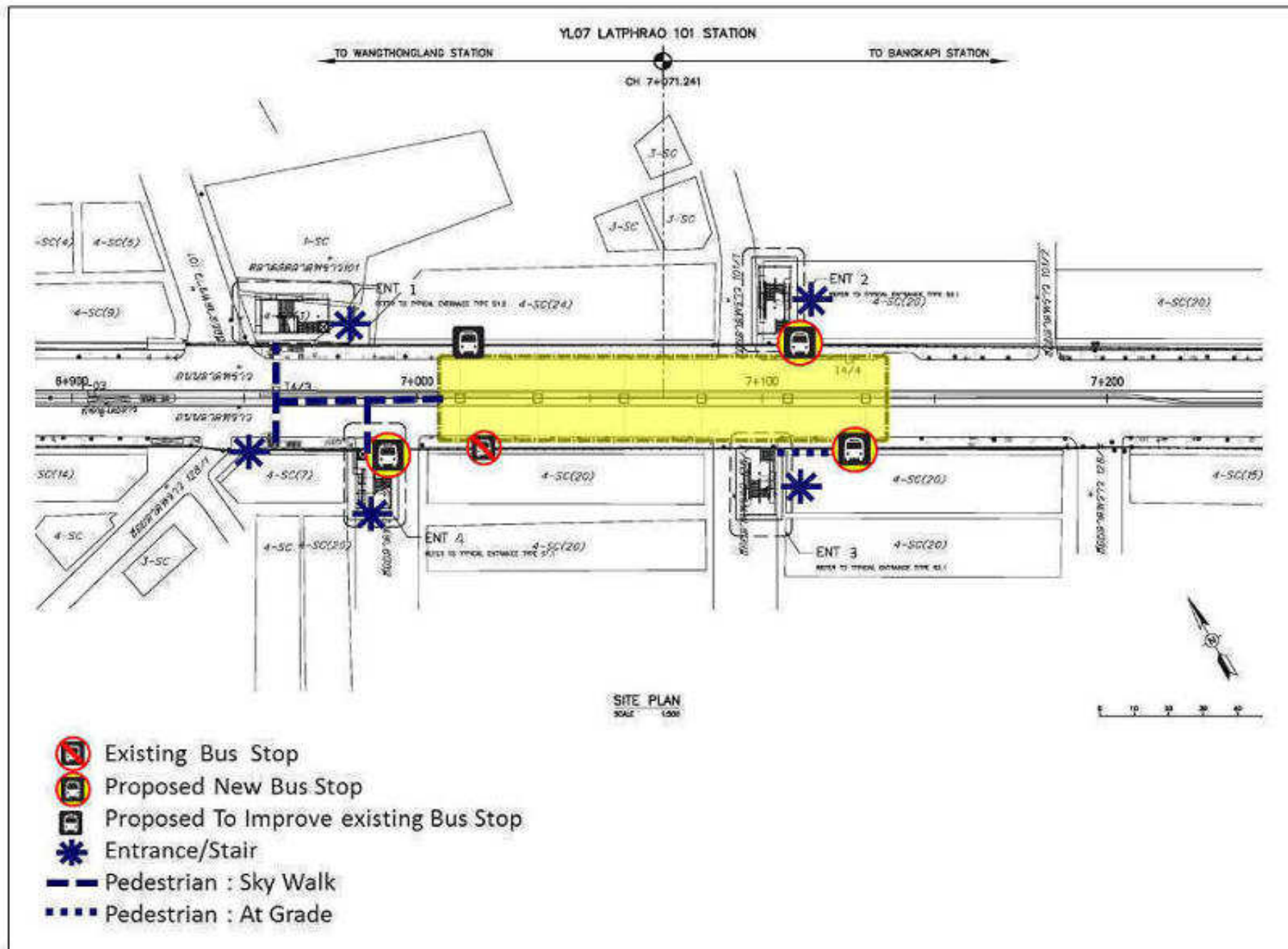
6) YL - 06 Mahat Thai Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Mahat Thai Station (YL - 06) is an elevated walk way (Sky Walkway) connecting with No. 3 entrance-exit. The three points of proposed improvement original bus stop are an improving of walk way at grade. Also, the new location of bus stop near No. 3 entrance exit is proposed. The original bus stop is also at No. 3 entrance exit.

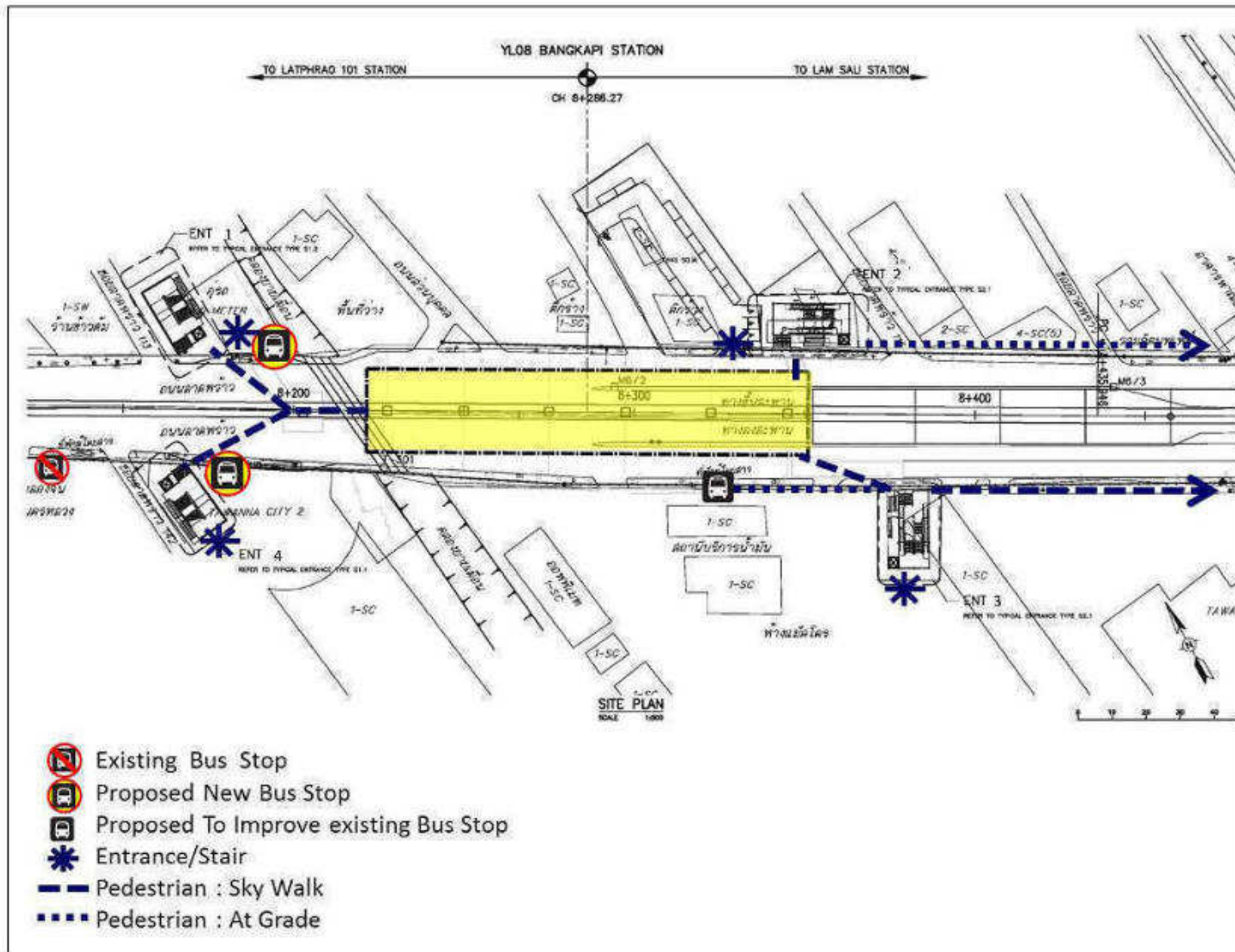
7) YL - 07 Lat Phrao 101 Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Loc. for Motorcycle
- Parking Loc. for motorcycle and bicycle at entrance exit

The design connecting of Lat Phrao101 (YL - 07) is an elevated walk way (Sky Walkway) connecting with the new location of bus stop near the No. 4 entrance-exit and improving the walk way at grade connecting to the proposed improvement original bus stop. And two new locations of bus stop near No. 2 and No. 3 entrance-exit. The original bus stop is also at No. 4 entrance-exit.

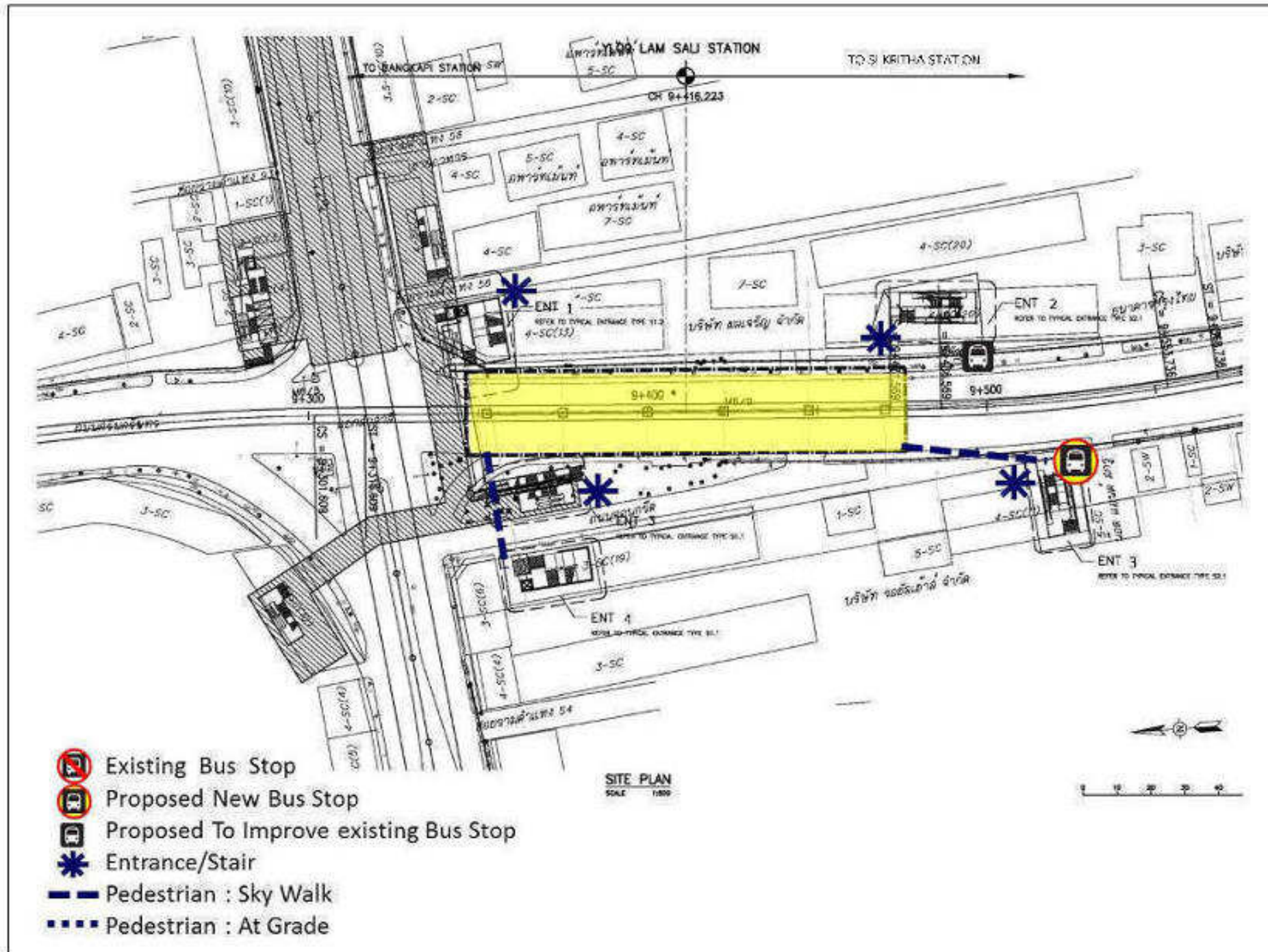
8) YL - 08 Bang Kapi Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance exit

The design connecting of Bang Kapi Station (YL - 08) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving walk way at grade connecting to the proposed improvement original bus stop. Two new locations of bus stop near No. 4 entrance-exit. There is also the original bus stop at No 4. Entrance-exit.

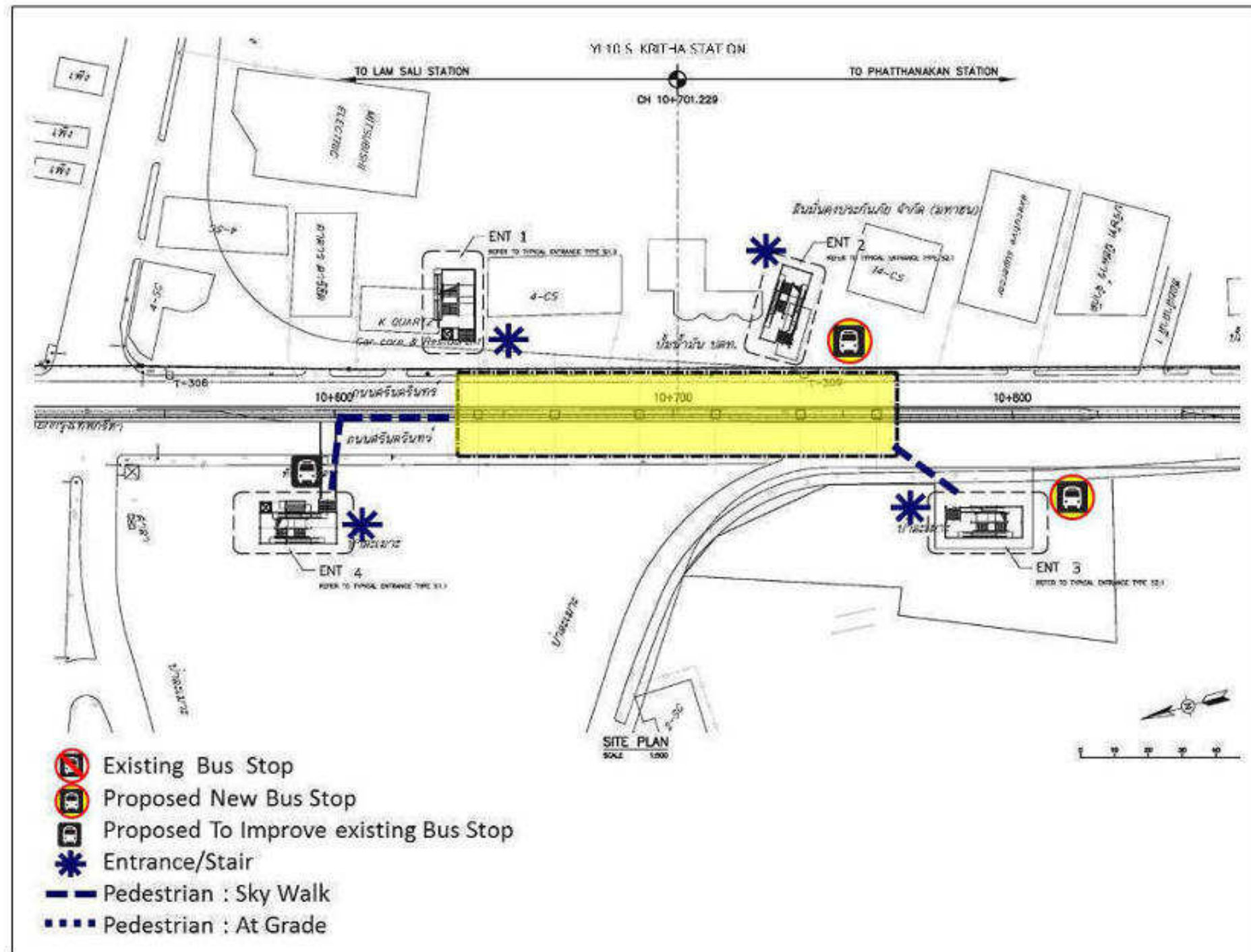
9) YL - 09 Lam Sali Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit
- Connecting at grade level with the station of MRT Orange Line

The design connecting of Lam Sali Station (YL - 09) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving walk way at grade connecting to the proposed improvement: original bus stop near No. 2 entrance-exit. One more new bus stop near the No. 3 entrance-exit is proposed

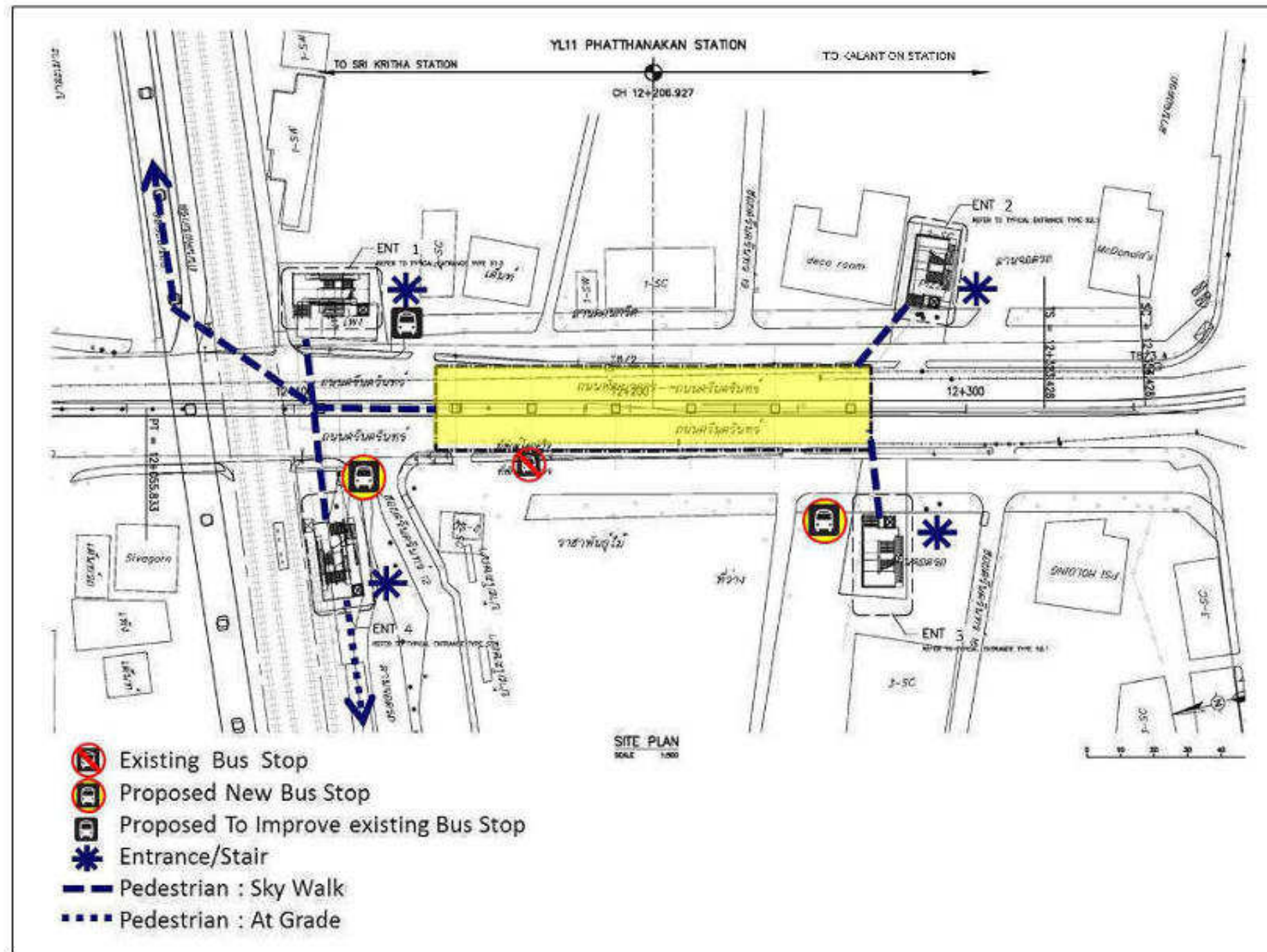
10) YL - 10 Si Kritha Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Rice Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance exit.

The design connecting of Si Kritha Station (YL - 10) is an elevated walk way (Sky Walkway) connecting with No. 3 and No. 4 entrance-exit which will improve walk way at grade connecting to the proposed improvement: original bus stop near No. 4 entrance-exit. Two new locations of bus stop near No. 2 and No. 3 entrance-exit are proposed.

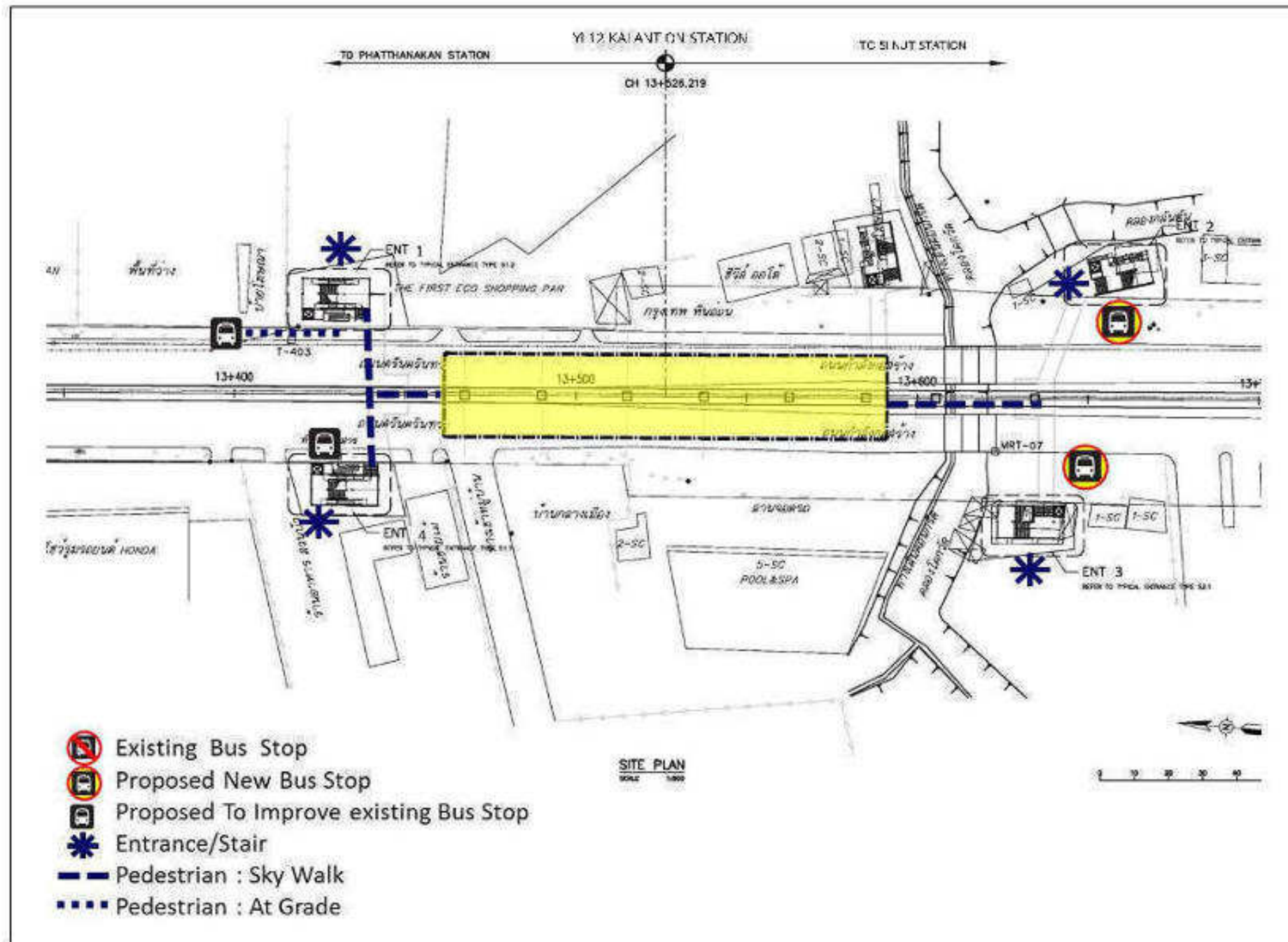
11) YL - 11 Phatthanakan Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit
- Connecting with the elevated electric railway station (Airport Rail Link)

The design connecting of Phatthanakan Station (YL - 11) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and connecting of Airport Rail Link Station which will improve the walk way at grade connecting to the proposed improvement original bus stop near No. 1 entrance-exit. Two new locations of bus stop near the No. 3 and No. 4 entrance exit are proposed. Also there is an original bus stop at No.1 entrance exit.

12) YL - 12 Kalantan Station

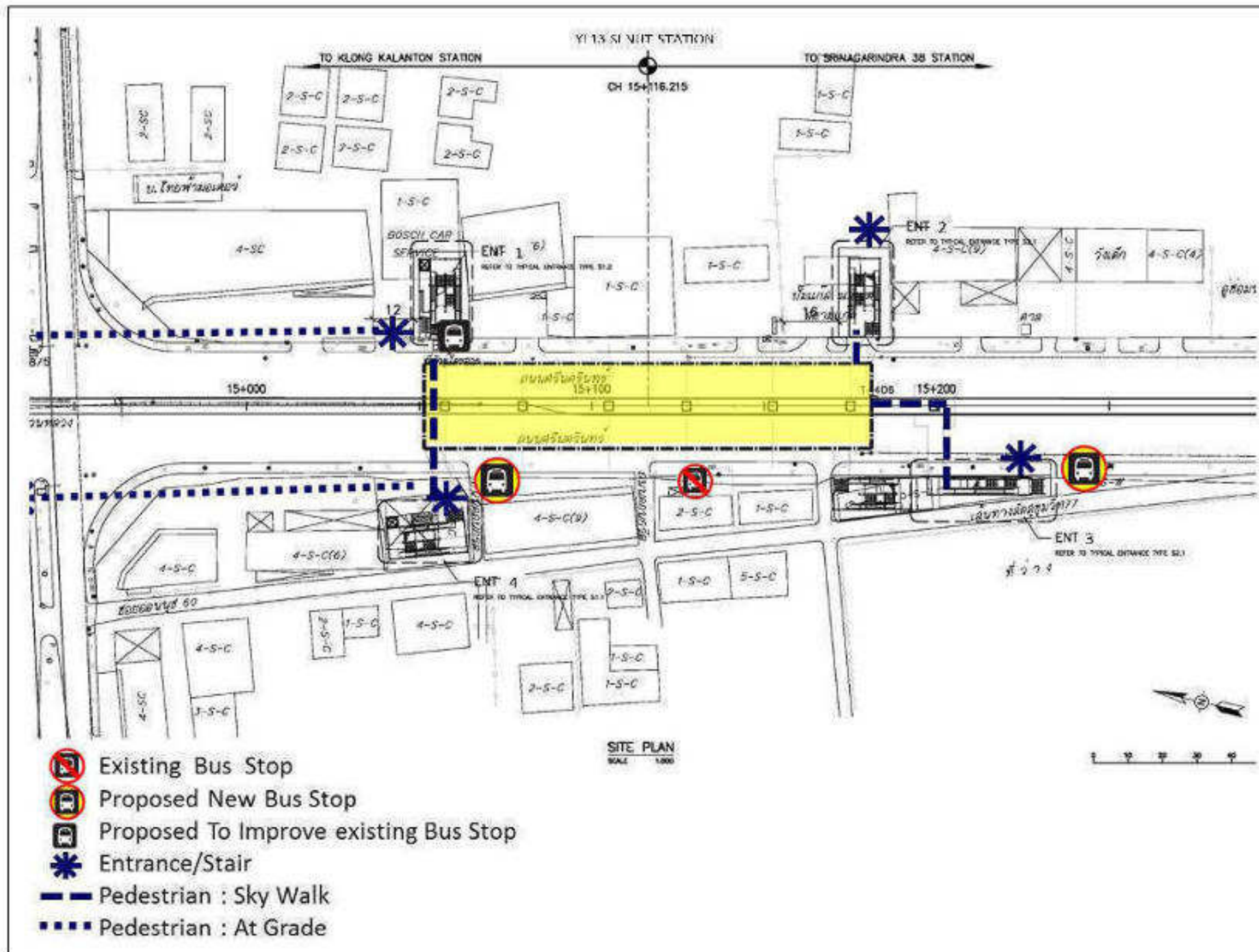


- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking lot for motorcycle and bicycle at entrance-exit

The design connecting of Kalantan Station (YL 12) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving of walking way at grade connecting to the proposed improvement original bus stop near No. 1 entrance-exit. Two new locations of bus stop near No. 2 and No. 3 entrance-exit are proposed.



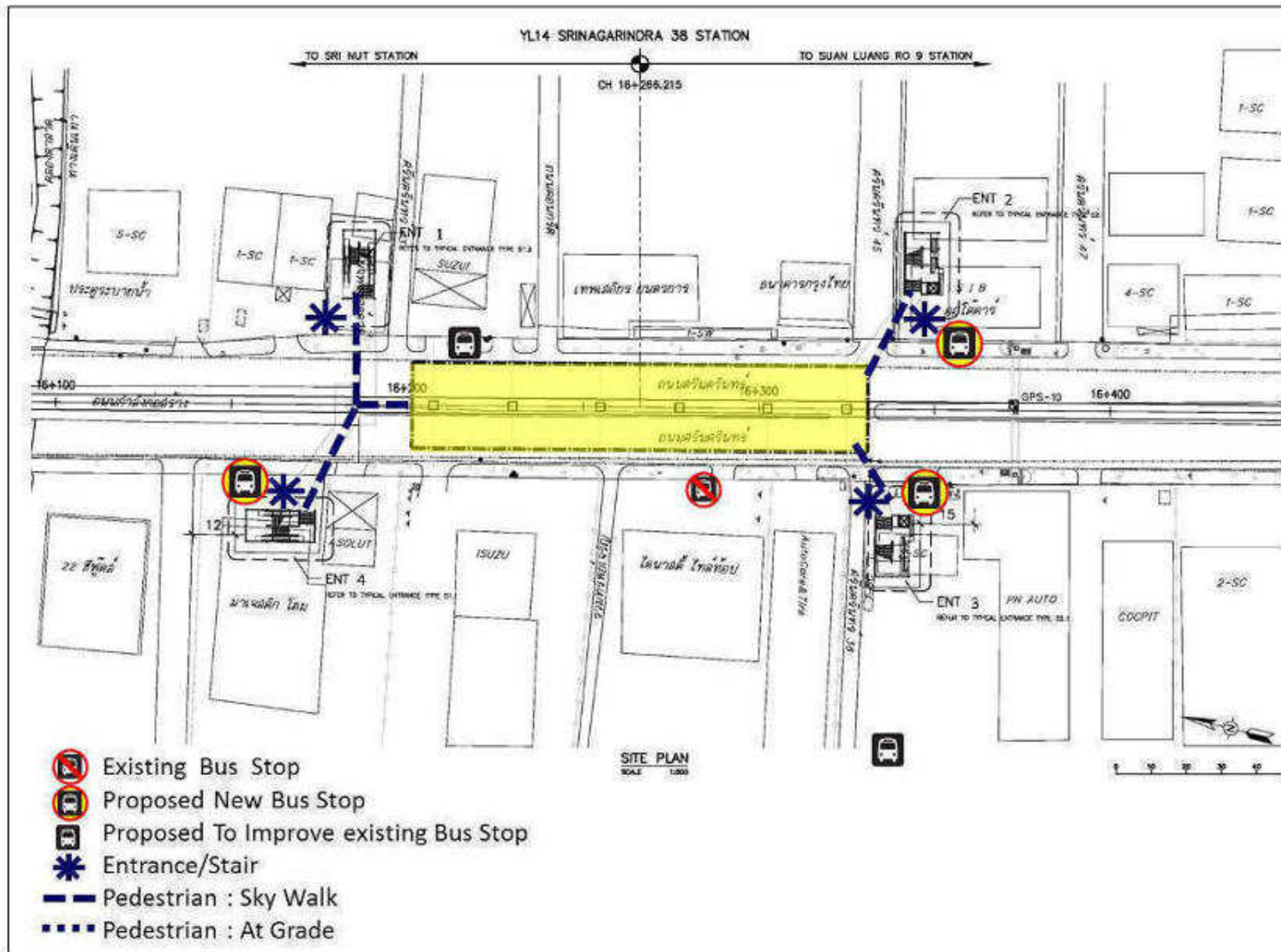
13) YL - 13 Si Nut Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Si Nut Station (YL - 13) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving of walking way at grade connecting to the proposed improvement original bus stop. Two new locations of bus stop near No. 3 and No. 4 entrance-exit are proposed. Also there is an original bus stop at No.3 entrance-exit.

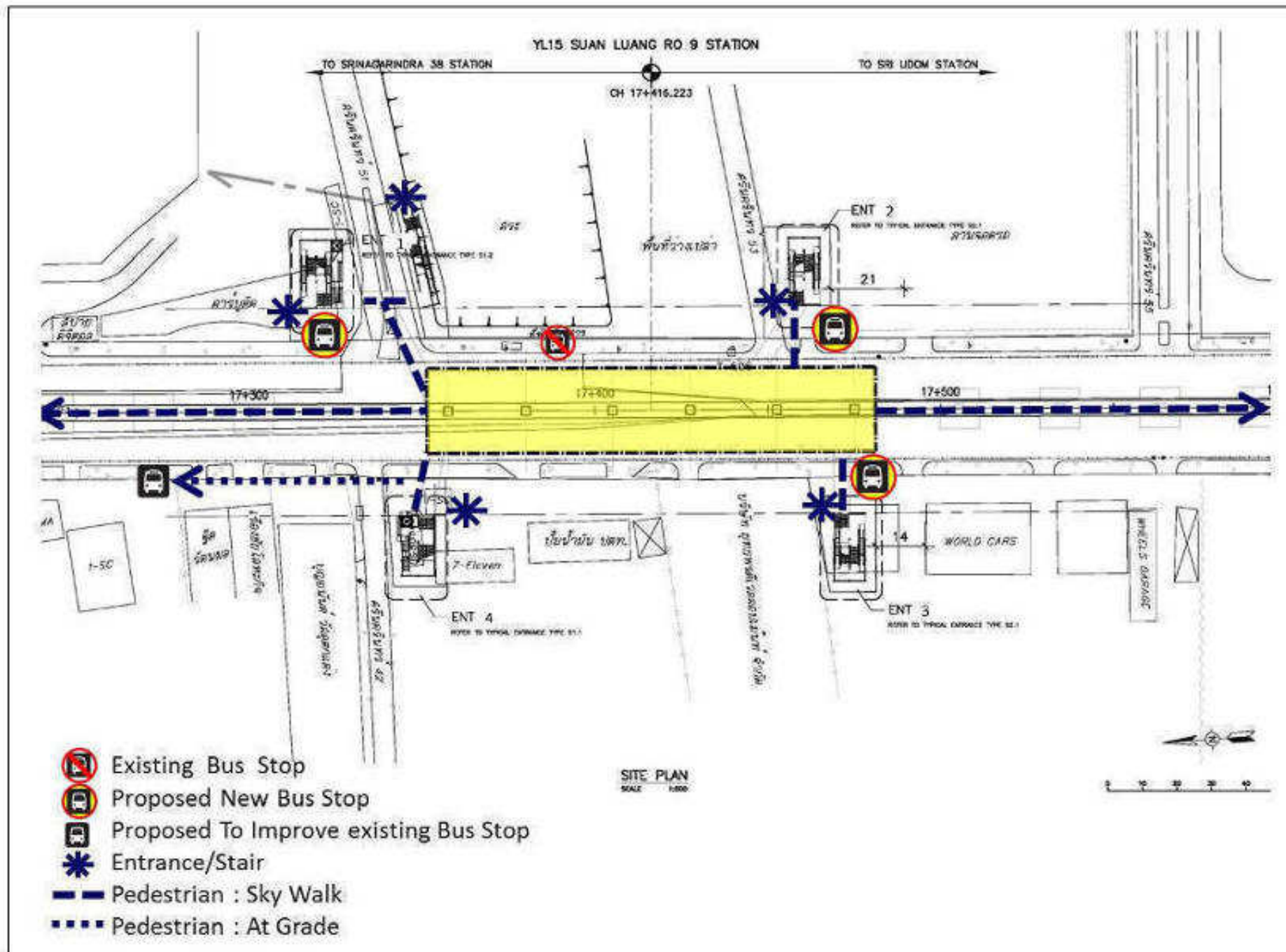
14) YL - 14 Srinagarindra 38 Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Srinagarindra 38 Station (YL - 14) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving of walking way at grade connecting to the proposed improvement original bus stop. Three new locations of bus stop near No. 2, No. 3 and No.4 entrance-exit are proposed. Also there is an original bus stop at No.3 entrance exit.

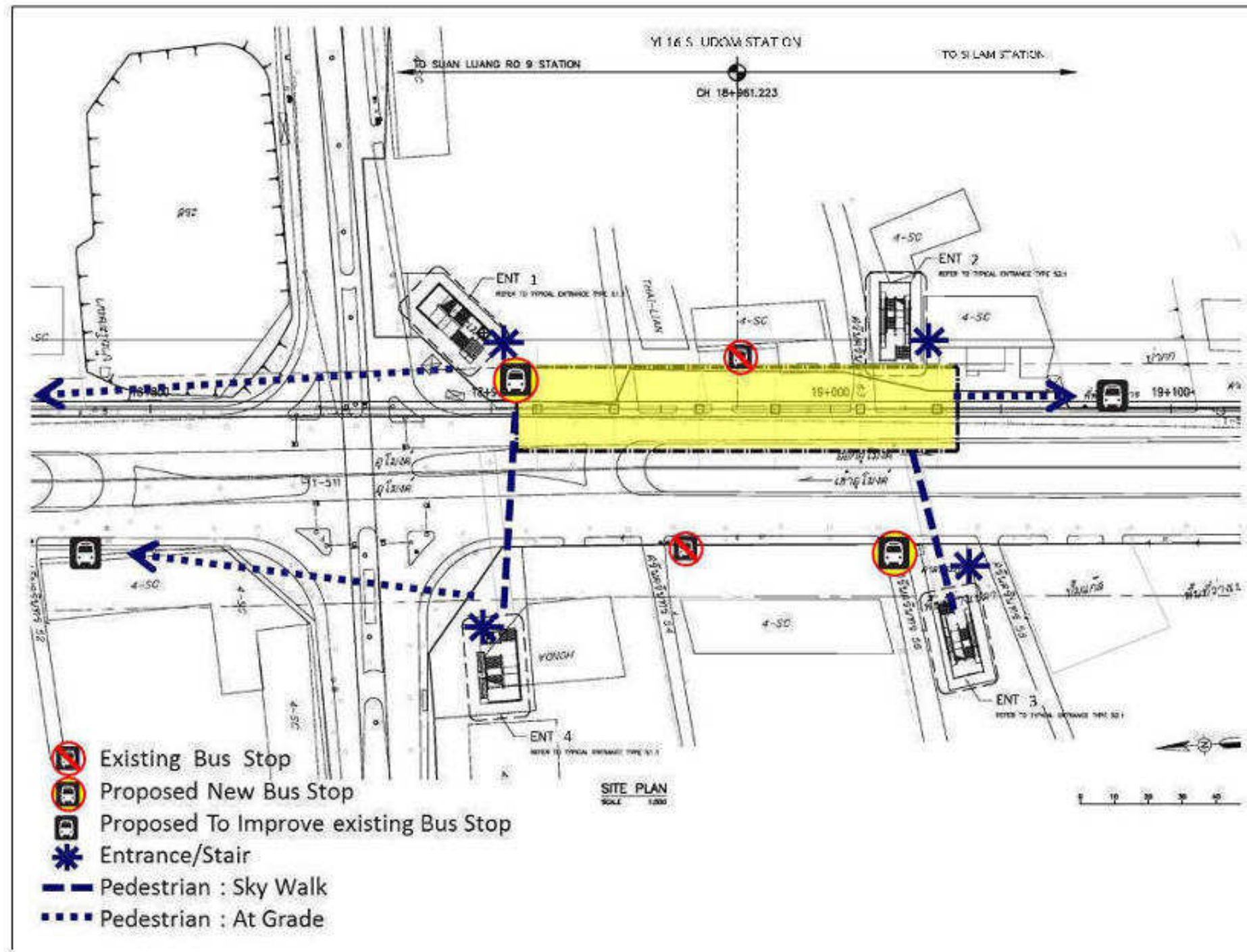
15) YL - 15 Suan Luang Ro 9 Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Suan Luang Ro 9 Station (YL - 15) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving of walking way at grade connecting to the proposed improvement original bus stop. Three new locations of bus stop near No. 2, No. 3 and No.1 entrance-exit are proposed. Also there is an original bus stop at No.1 entrance-exit.

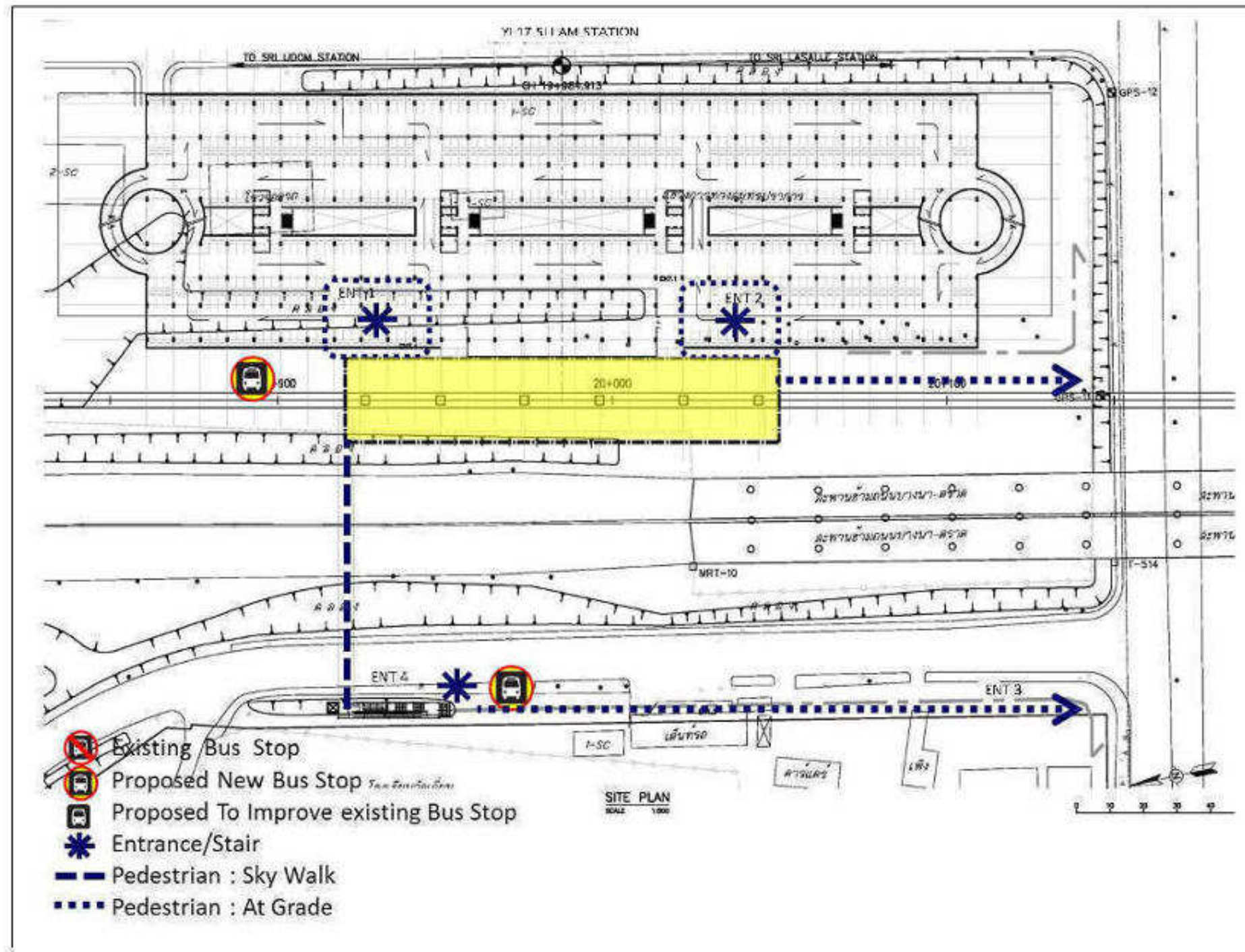
16) YL - 16 Si Udom Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Si Udom Station (YL - 16) is an elevated walk way (Sky Walkway) connecting with No. 3 and No. 4 entrance-exit, and improving walk way at grade connecting to the proposed improvement original bus stop near No. 4 entrance-exit. Two new locations of bus stop near No. 3 and No. 1 entrance-exit are proposed. Also there is two original bus stops.

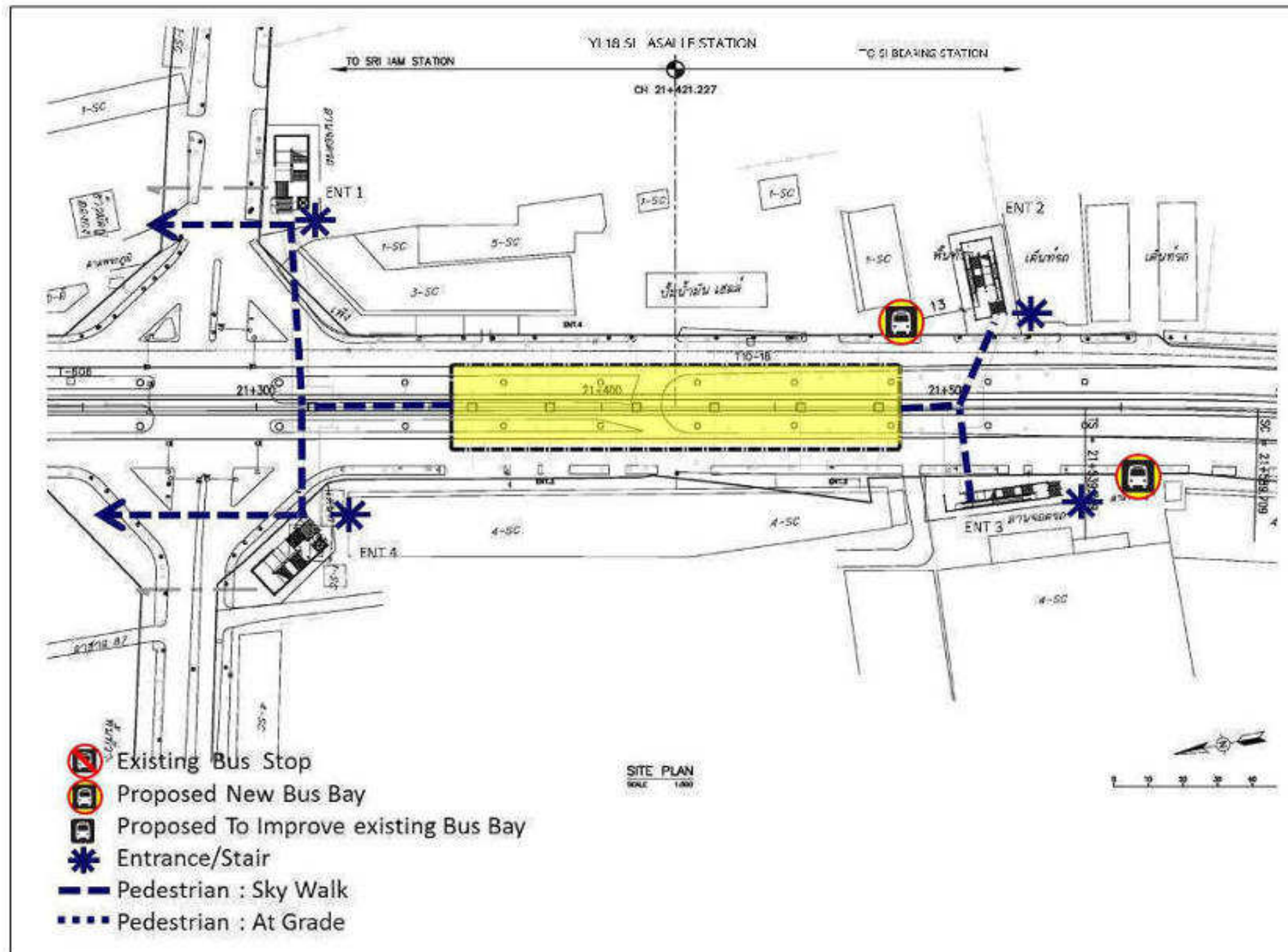
17) YL - 17 Si lam Station



- Proposing new location of bus stop
- Improving of walk way to connect to the original bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit
- Connecting to Park & Ride Building of the project

The design connecting of Si lam Station (YL - 17) is an elevated walk way (Sky Walkway) connecting with No. 4 entrance-exit, and improving walk way at grade connecting to the intersection. Two new locations of bus stop near No. 4 entrance-exit and Park&Ride Building are proposed.

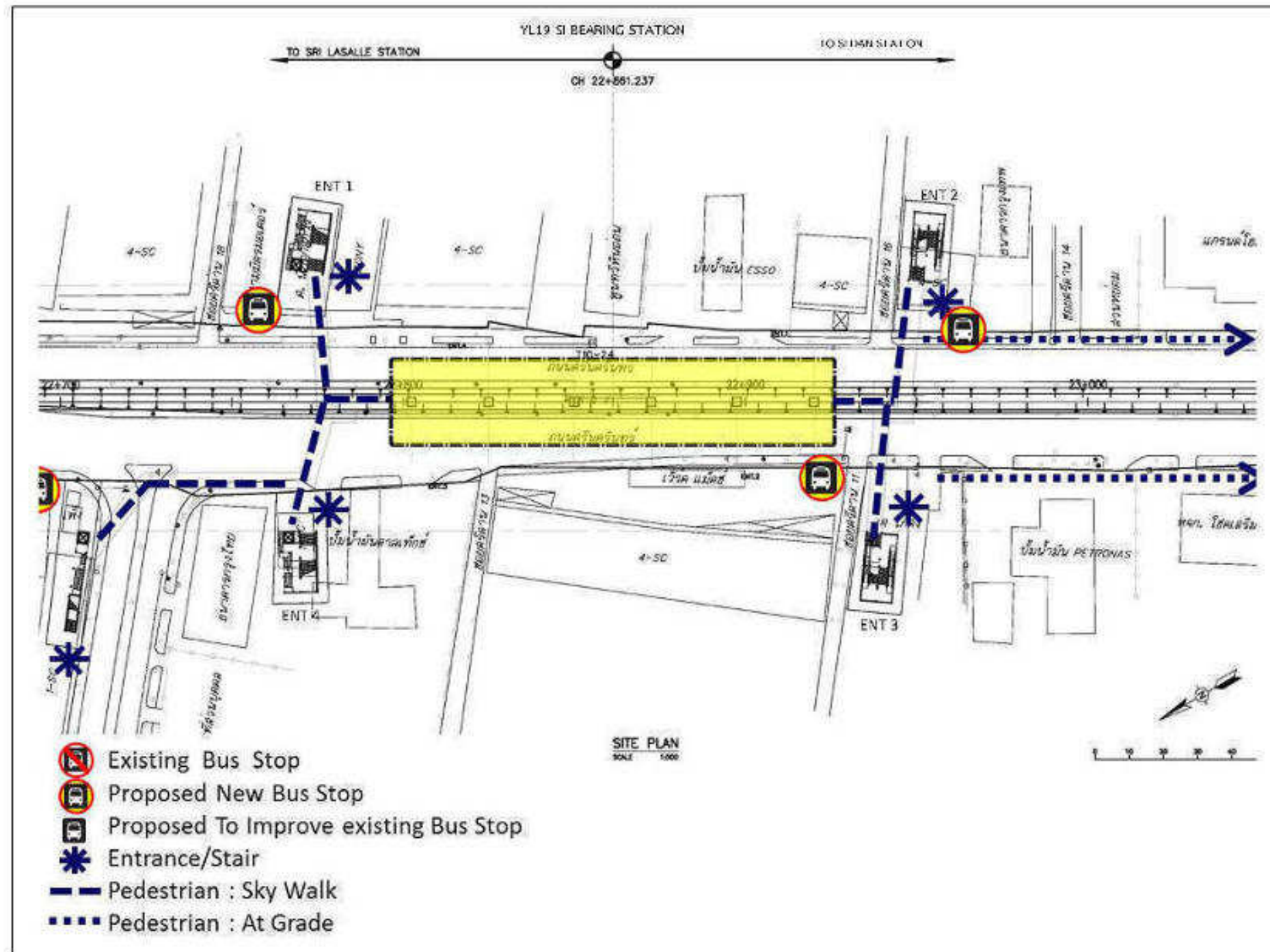
18) YL - 18 Si La Salle Station



- Proposing new location of bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Si La Salle Station (Y - 18) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit. Two new locations of bus stop near No. 2 and No. 3 entrance-exit are proposed.

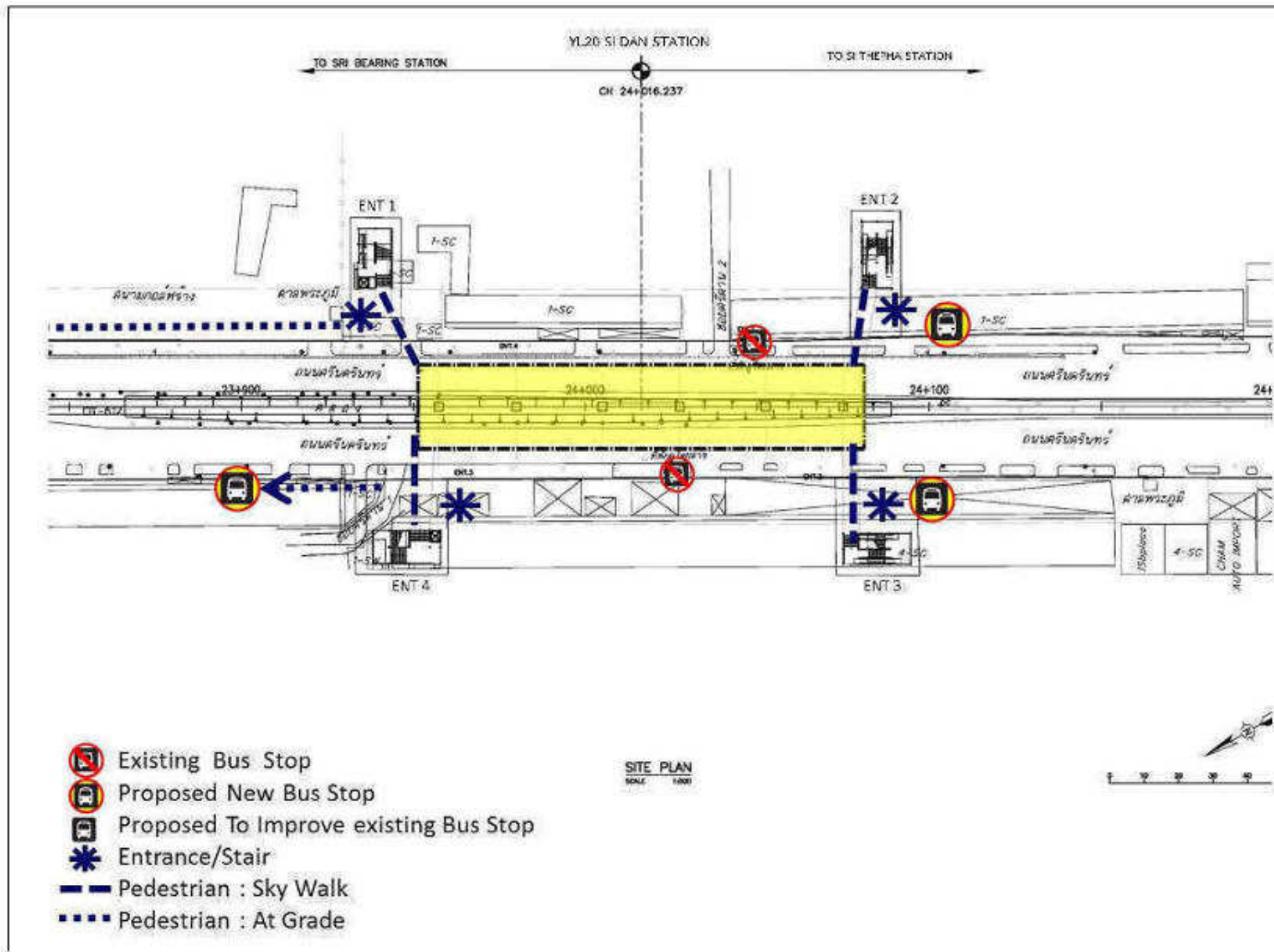
19) YL - 19 Si Bearing Station



- Proposing new location of bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking lot for motorcycle and bicycle at entrance-exit

The design connecting of Si Bearing Station (YL - 19) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving walk way at grade connecting to the original bus stop. Four new locations of bus stop are proposed.

20) YL - 20 Si Dan Station

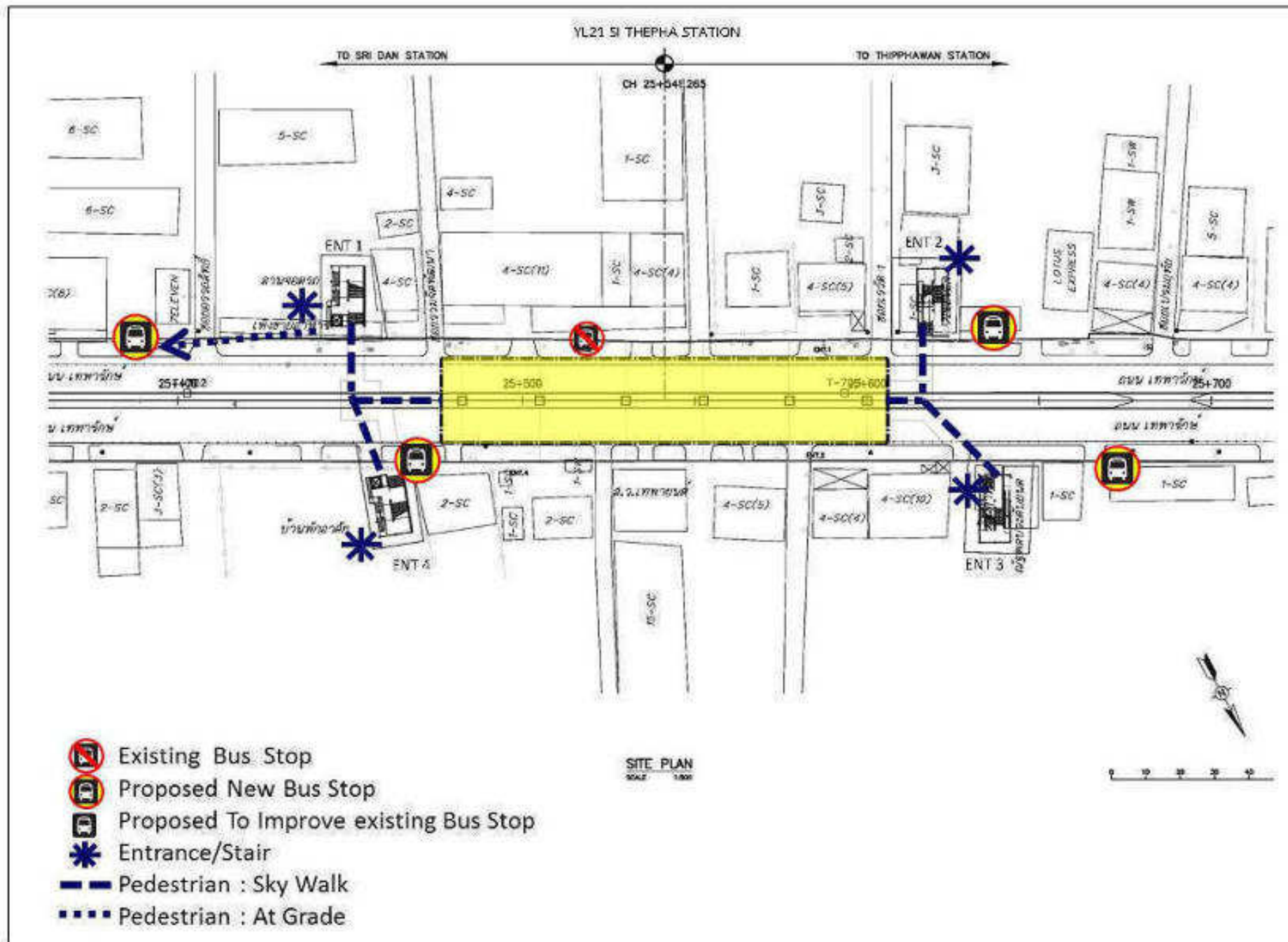


- Proposing new location of bus stop
- Improving of walk way to connect to the bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance exit

The design connecting of Si Dan Station (YL - 20) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving walk way at grade connecting to the original bus stop. Three new locations of bus stop near No.2, No.3 and No. 4 entrance-exit are proposed. Also there is two original bus stops.



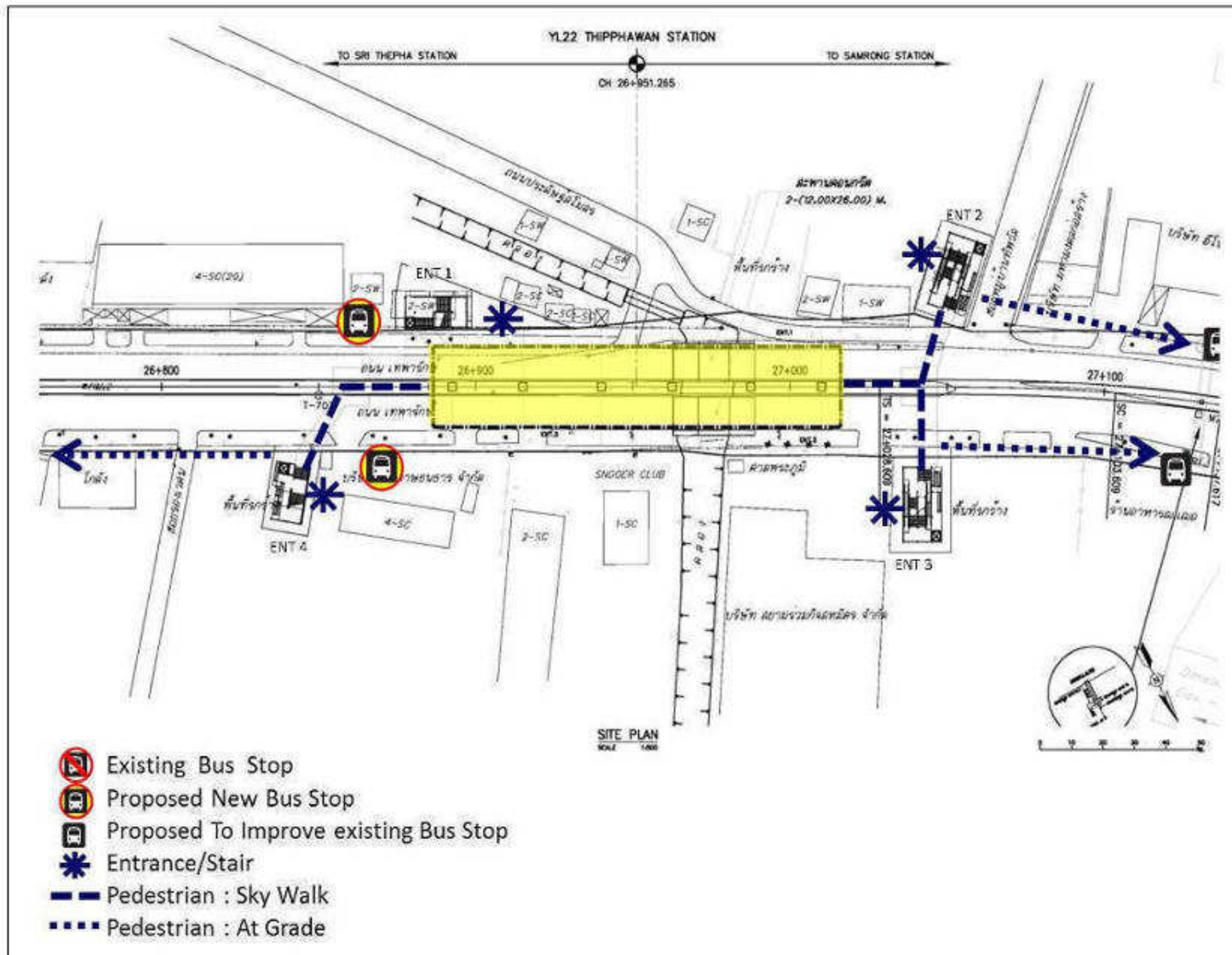
21) YL - 21 Si Thepha Station



- Proposing new location of bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Si Thepha Station (YL - 21) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit. Four new locations of bus stop are proposed. Also there is an original bus stop.

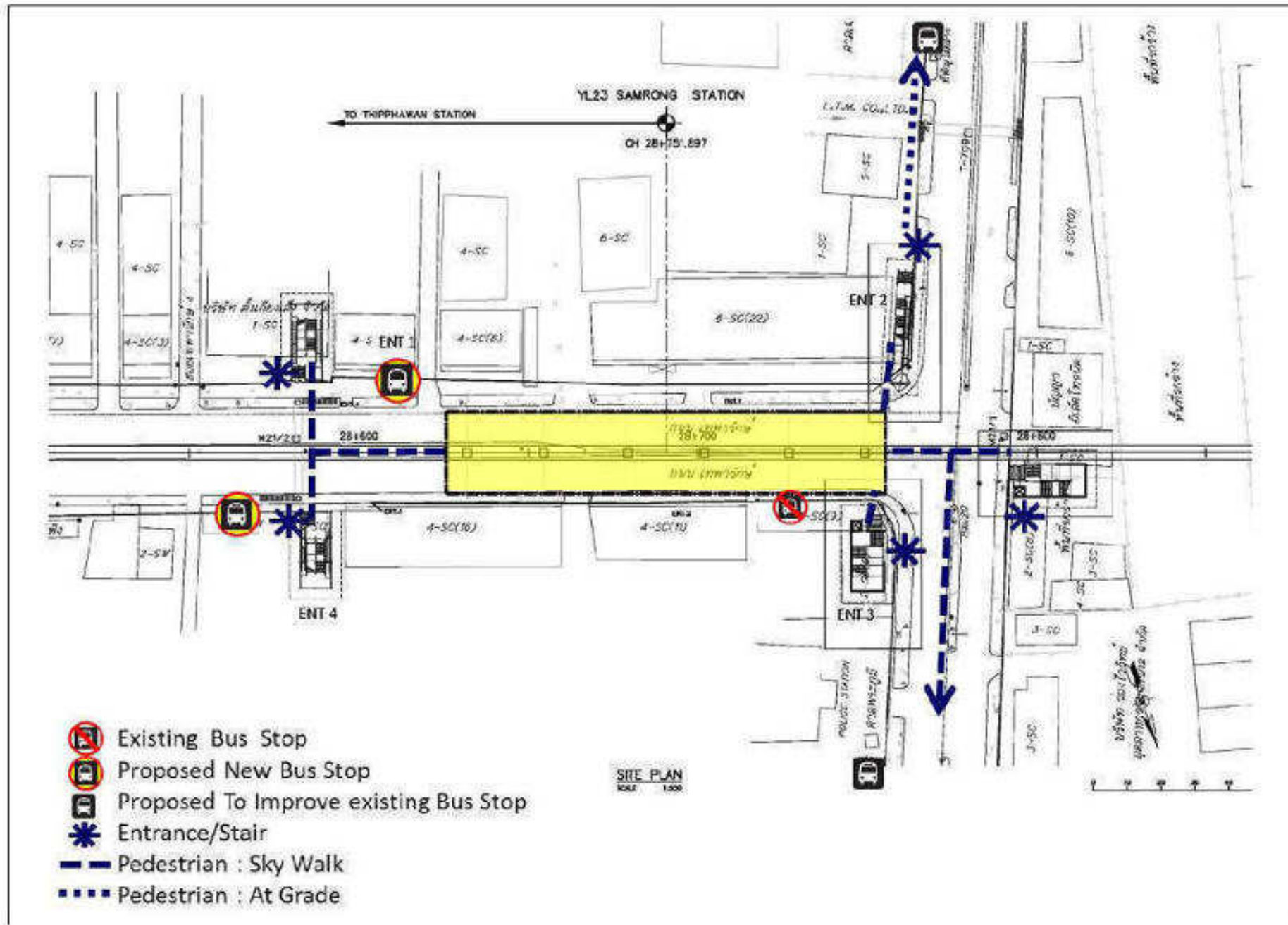
22) YL - 22 Thippawan Station



- Proposing new location of bus stop
- Improving of walk way to connect to the bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking Lot for motorcycle and bicycle at entrance-exit

The design connecting of Thippawan Station (Y - 22) is an elevated walk way (Sky Walkway) connecting with all of four entrance exit, and improving walk way at grade connecting to the original bus stop. Two new locations of bus stop near No.1, and No. 1 entrance-exit are proposed.

23) YL - 23 Samrong Station



- Proposing new location of bus stop
- Improving of walk way to connect to the bus stop
- Considering location/place for Kiss and Ride Waiting Lot for Motorcycle
- Parking lot for motorcycle and bicycle at entrance-exit
- Connecting with the station of MRT Green Line Extension Project

The design connecting of Samrong Station (YL - 23) is an elevated walk way (Sky Walkway) connecting with all of four entrance-exit, and improving walk way at grade connecting to the proposed improvement original bus stop. Two new locations of bus stop near No.4, and No. 1 entrance-exit are proposed. Also there is an original bus stop.

### 3.6.4 Intermodal stations to other modes of public transportation

The four intermodal transit stations for the Yellow Line Sky Train: Latphrao - Samrong are as follows:

1) Ratchada station (YL - 01) is an interchange to the Blue line at Latphrao at Grade level near Ratchada/Latprao. Both stations are connected by route in the Blue Line's car park building since Ratchada Station is paralled to the car park building and linked to Concourse and Intermediate with two connecting areas with the Blue Line parking building. The Sky Walkway's distance is about 30 metres with 4.25 metre width. Moreover, the passengers from Latprao can use the footbridge at Ratchada/Latprao Junction to the boarding and alighting area which can reduce the cost of construction for Ratchada Station(YL-01) as shown in **Figure 3.6.4 - 1**

2) Lam Sali Station (YL - 09) is an interchange to the Orange Line at Lam Sali Station at Grade level near Lam Sali Junction. The connectivity between stations is by sharing stairs and escalators with the Orange Line. The connecting distance is about 80 metres as shown in **Figure 3.6.4 - 2**

3) Phattanakarn Station (YL - 11) is an interchange to Airport Rail Link (ARL) at Hua Mak Station. The Sky Walkway is linked from Phattakarn Station to the Concourse of ARL. The Sky Walkway's distance is about 160 metres with 4.25 metre width. To facilitate the passengers, the walkway at Grade from Phattanakarn to Hua Mak(MRTA) was designed. The link to Srinagarindra Road and parking lots can be shared as shown in **Figure 3.6.4 - 3**

The Sky Walk to Hua Mak's Airport Rail Link is elevated crossing MRTA's eastern railways and inclined to the structure of runway between foundation posts at Hua Mak Station. The Vertical Clearance between rail curb and the Sky Walkway at Grade is 7.70 metres which is in accordance with the provisions by MRTA that speculated the minimum of Vertical Clearance at 5.50 metres so that the locomotive can run smoothly as shown in **Figure 3.6.4 - 4**

4) Samrong Station (YL - 23) is an interchange to the Green Line an extension for Bearing-Samutprakarn at Samrong Station near Suthepha Junction (Sukhumvit-Thepharak). Sky Walkway connects two stations. The two links are at Number 3 entrance which links to Concourse of Green Line an extension for Bearing-Samutprakarn at Samrong Station and Number 2 entrance links to Sky Walkway. Both links are in the distance of 10 - 15 metres and the width is about 4.25. The project runs along foundation posts so it does not affect the footpath as shown in **Figure 3.6.4 - 5**

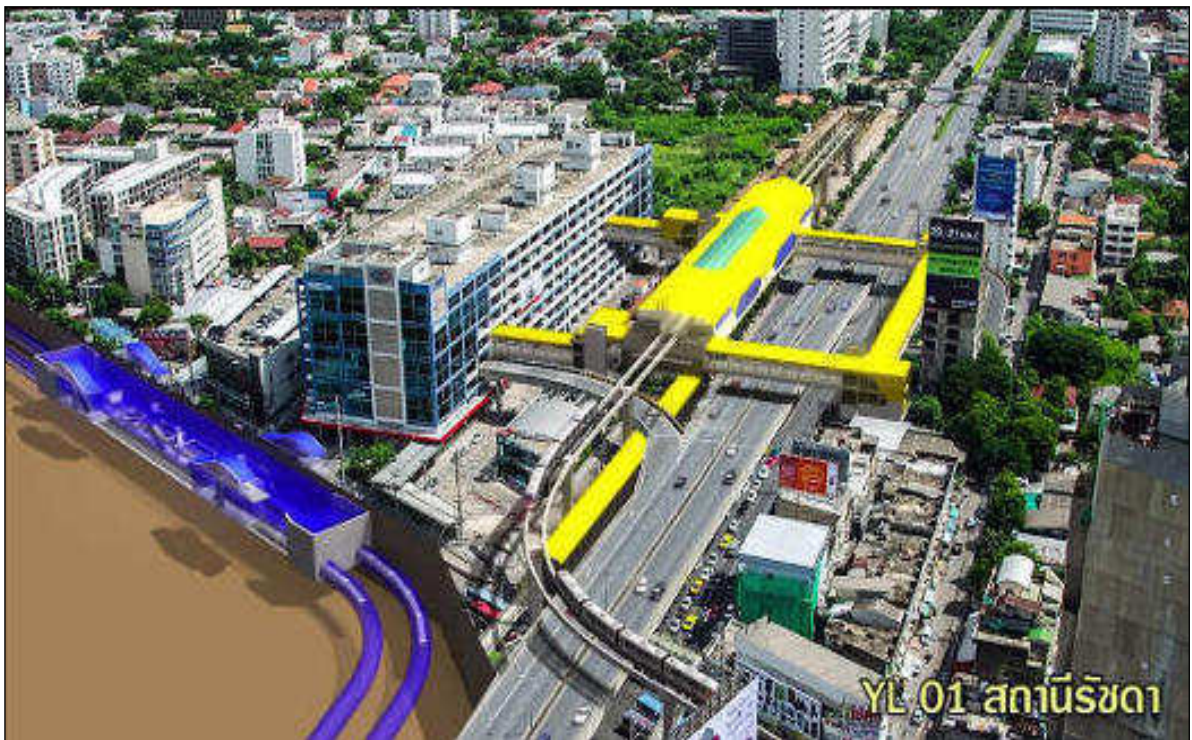
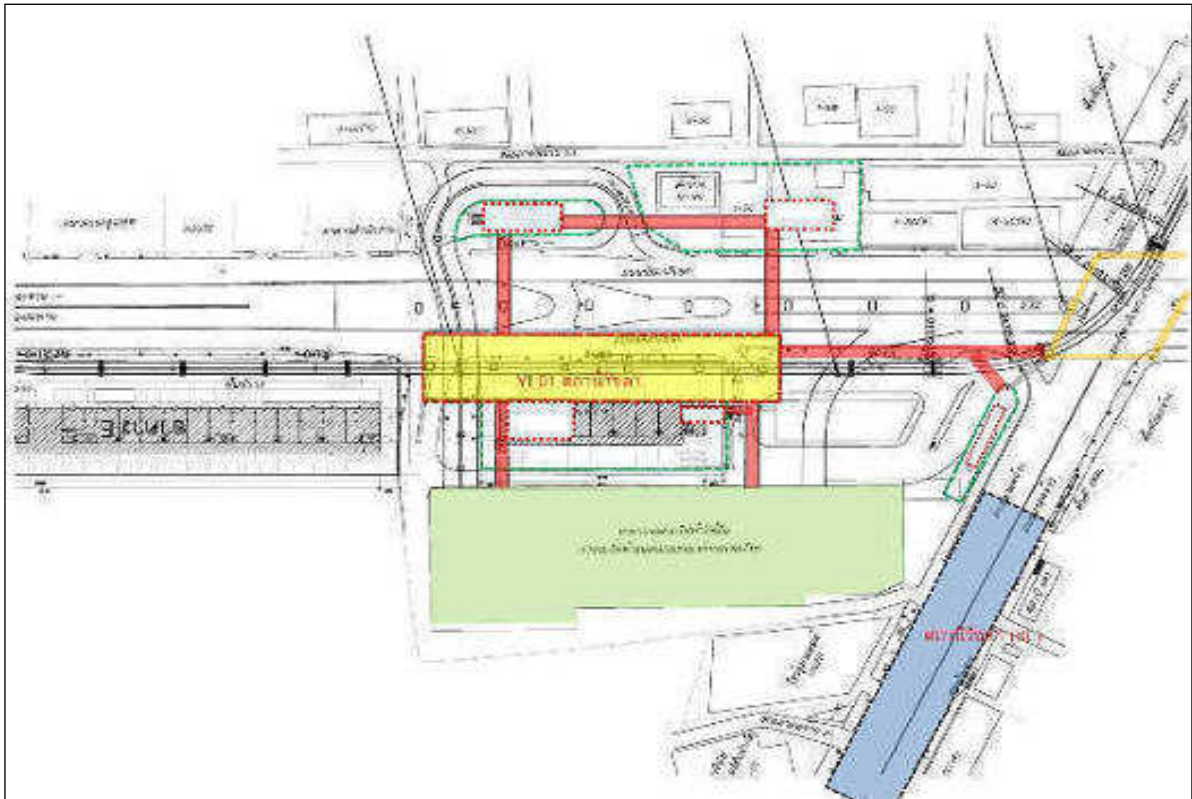


Figure 3.6.4 - 1 Ratchada station (YL - 01) connect to MRT Blue Line

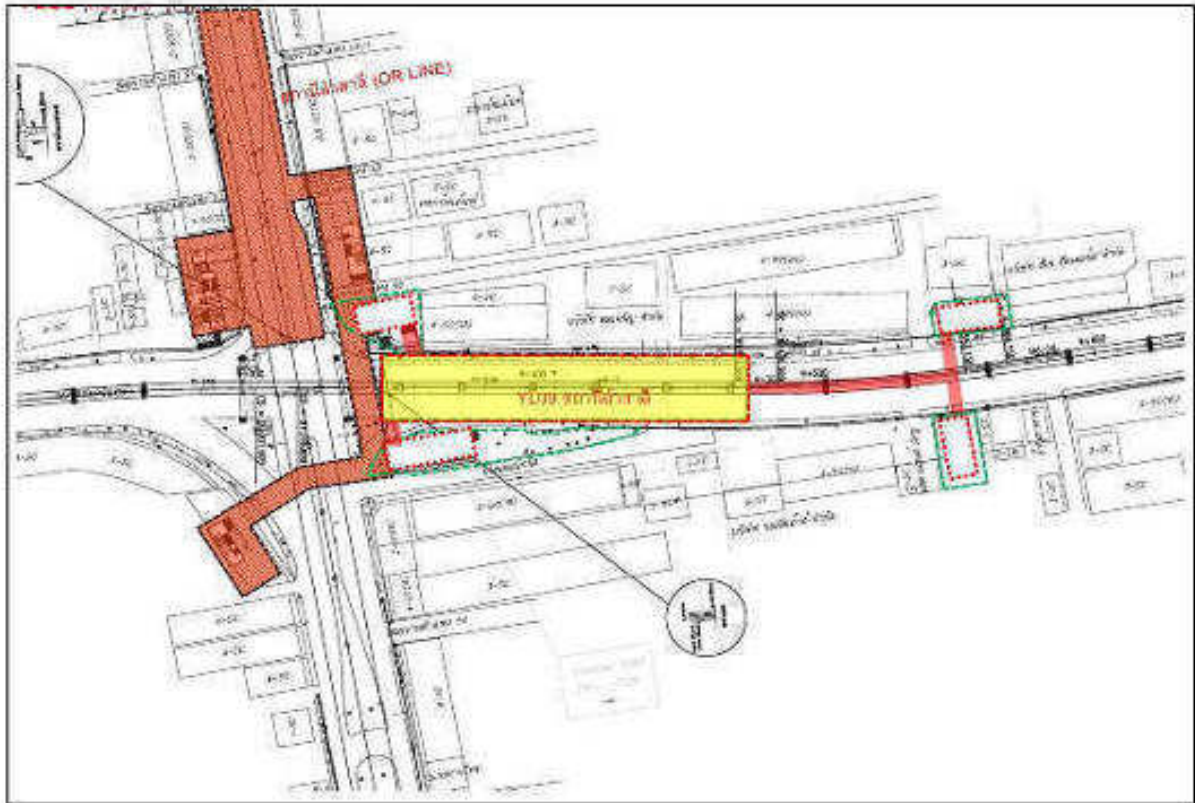


Figure 3.6.4 - 2 Lam Sali station (YL - 09) connect to MRT Orange Line Project

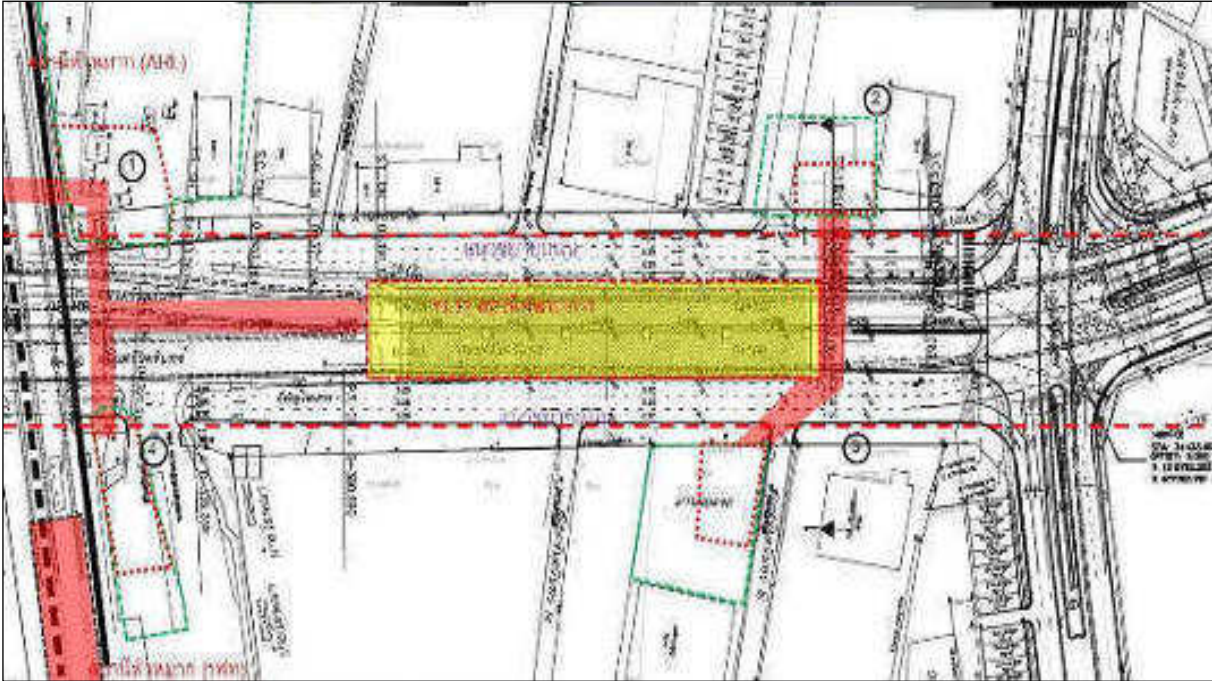


Figure 3.6.4 - 3 Phatthanakan station (YL - 11) connect to Airport Rail Link

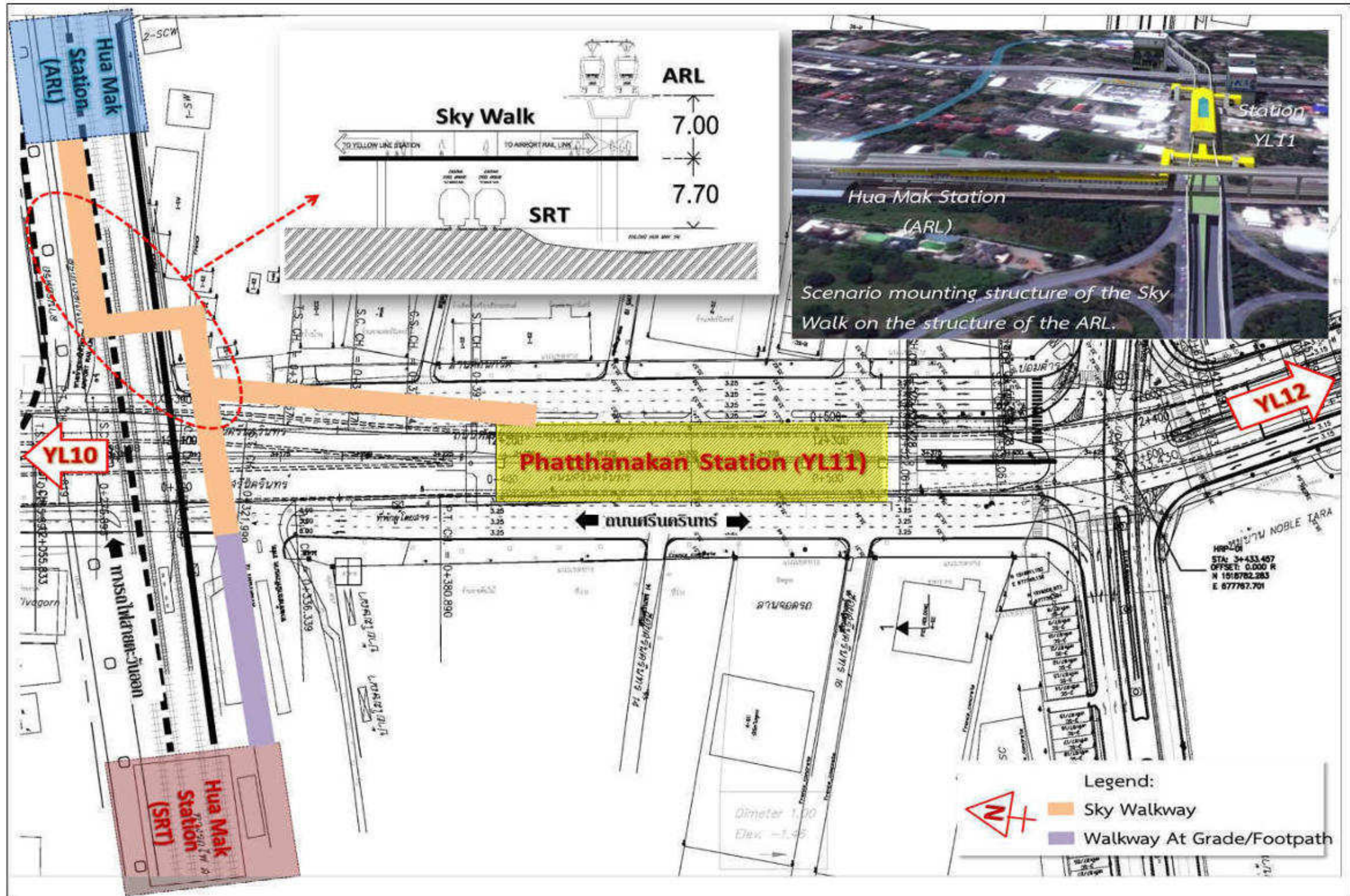


Figure 3.6.4 - 4 Sky walk location at Phatthanakan station (YL - 11) connect to Airport Rail Link station and Hua Mak railway station



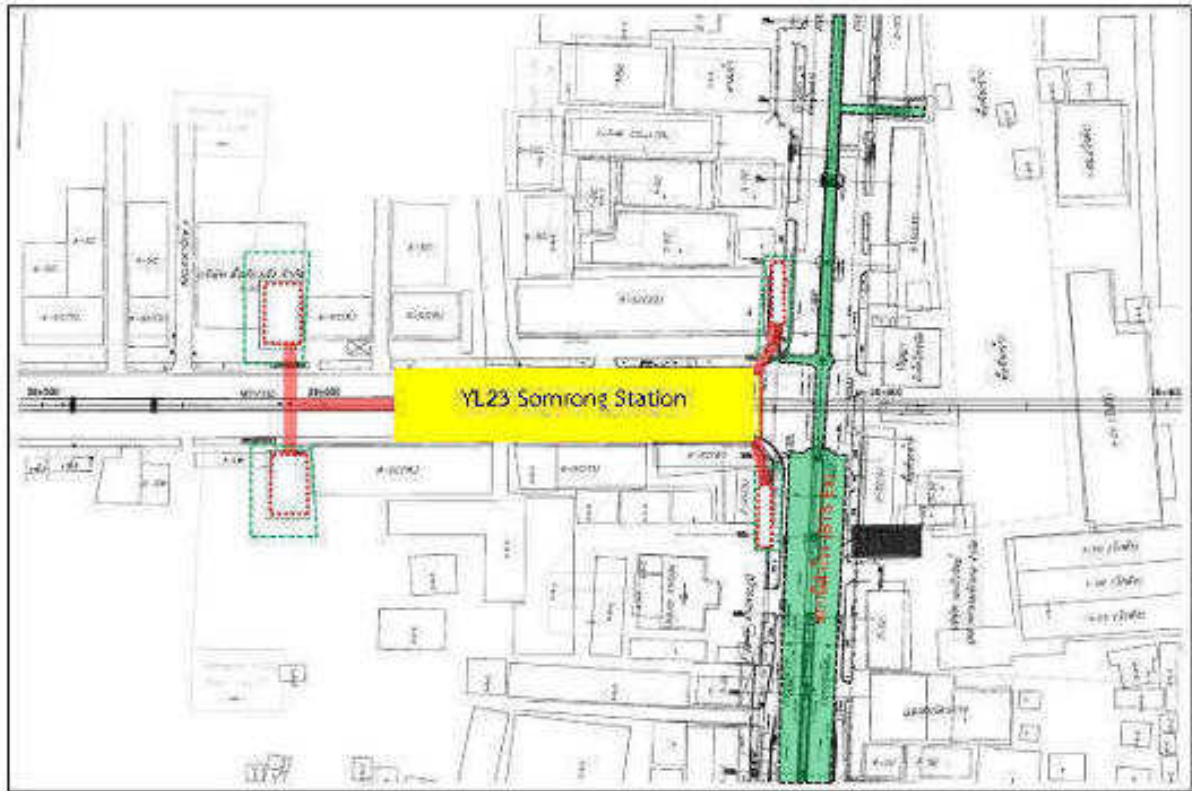


Figure 3.6.4 – 5 Samrong station (YL - 23) connect to MRT Green Line (Extension) : Bearing – Samut Prakan