



Technical Assistance Consultant's Report

Project Number: 48356
March 2016

India: Supporting Sustainable Urban Transport I Aizawl City (Financed by the Technical Assistance Special Fund) Vol. 2 – Traffic and Road Safety Improvements (1 of 2)

Prepared by CDM Smith Inc. United States

For Public Work Department, Government of Mizoram
Urban Development Poverty Alleviation Department, Government of Mizoram
Aizawl Municipal Council, Government of Mizoram

This consultant's report does not necessarily reflect the views of ADB or the Government concerned, and ADB and the Government cannot be held liable for its contents. (For project preparatory technical assistance: All the views expressed herein may not be incorporated into the proposed project's design.

Asian Development Bank

Asian Development Bank,
Public works Department, Government of Mizoram

TA 8765 IND: Supporting Sustainable Urban Transport in Aizawl City

Final Report

VOLUME 2: TRAFFIC and ROAD SAFETY
IMPROVEMENTS

March 2016

CDM Smith



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1. INTRODUCTION

The main objective of the ADB TA project is to improve the urban development planning for urban transport in Aizawl City. As indicated in the Volume 1 report the TA project has two main components:

1. Identifying low-cost traffic management projects (physical and non-physical) which aim at improving the situation in Aizawl City in the short term (2-3 years);
2. Assessing the potential for medium to long-term (5-10 years) improvements in Aizawl's urban transport through investments in sustainable and eco-friendly transport systems.

In accordance with the project's requirements the consultant identified certain road-based traffic management measures for the city of Aizawl. The short term proposals focus on road and junction improvements, traffic signals, bus priorities and road safety measures.

The purpose of this stand-alone Volume 2 of the three reports is to highlight some of the existing conditions that warrant traffic management measures and provide concept designs of the proposals. The measures are presented here under: (i) short term measures, and (ii) medium term measures. The medium term measures would be integrated with the medium term public transport improvement proposals described in Volume 1.

The structure of Volume 2 is as follows:

Table 1-1: Document Structure

Section No	Section Title
1	Introduction
2	Approach – Short Term Measures
3	Details of Junction Improvements
4	Details of Corridor Improvements (Chanmari to Millennium Centre)
5	Approach – Medium Term Measures
6	Bus Priorities
7	Travel Demand Management Measures

2. APPROACH – SHORT TERM MEASURES

Selection of junctions: The available traffic data and traffic analysis as described in Vol 1 indicated the busiest junctions in Aizawl. Consultation with the counterpart agencies identified current problematic areas for traffic flow in Aizawl city. The junctions included in the short term measures are listed in Table 2.1.

Table 2.1: Junctions selected for Short Term Proposals

Jn. No.	Jn. Name	Jn. No.	Jn. Name
3	Bawngkawn (N-E)	22	Temple Sq.
4	Bawngkawn (S-W)	25	Raj Bhavan
7, 8, 9	Chanmari gyratory	26	Tennis club
10	Sumkhuma Point	31	Sikulpuikawn
11, 12	Millennium	18	Vaivakawn (W)
14	Israel Pt	19	Vaivakawn (E)
15	Bazar Bungkawn	27	Khatla (W)
20	Zodin	30	Khatla (E)

For junction numbers, please refer to Map 2-1

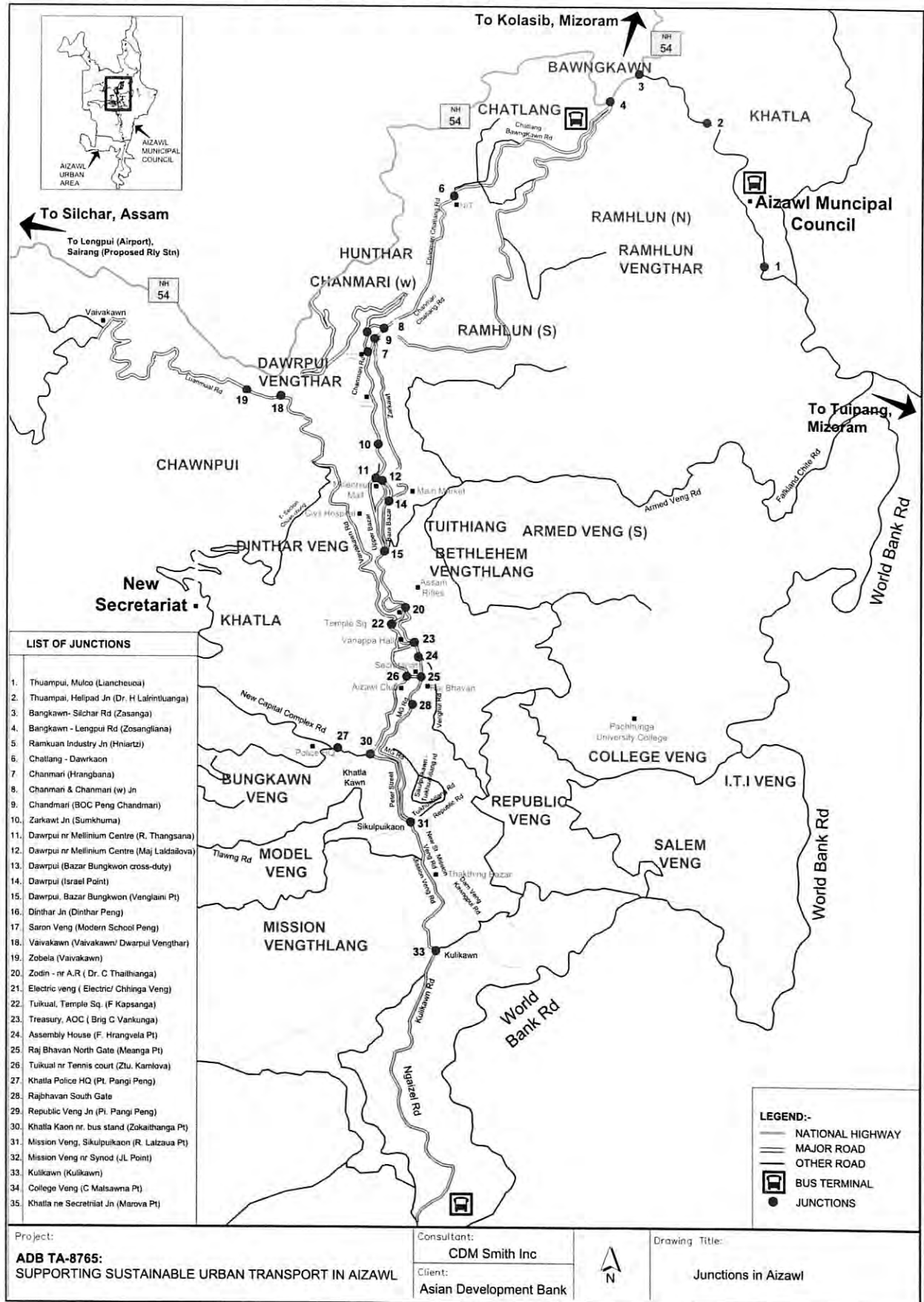
Traffic engineering approach: Relatively minor geometric redesigns of junctions, e.g. introduction and/or redesign of islands, turning lanes, road markings and signs, bus stop realignments, zebra crossings are generally adopted for the short term traffic management proposals. All of the junctions are designed so as to operate under police control as exists today. Dedicated and separate space for vulnerable users and motorized users within the existing right of way is provided (i.e. no widening of right of way is proposed). Generally lane widths of 3.0m are adopted for traffic lanes, though this may vary depending on the local conditions. Where feasible, existing footpaths are widened to the extent possible to provide wider footways for pedestrians.

Pedestrian crossings are provided at most intersections to highlight designated crossings and reduce tendency to cross informally. Pedestrian refuge islands are provided where feasible and they are integrated with traffic police points. To regularize turning movements and U-turns, many of the junctions are designed as traffic circles or mini-roundabouts. The central island is designed as over-runable in some cases considering the swept paths for larger vehicles.

Bus lanes and traffic signals: No bus priorities or traffic signals are assumed in the short term proposals as these will involve more complex design – they are expected to be included in the medium term proposals.

Road dimensions and base drawings: The concept proposals presented in this volume are based on the intersection and road section geometry layout as extracted from Google Earth and approximately scaled by way of field measurements carried out by the consultants, with some input and support from PWD staff.

Map 2-1: Major roads and Junctions in Aizawl city

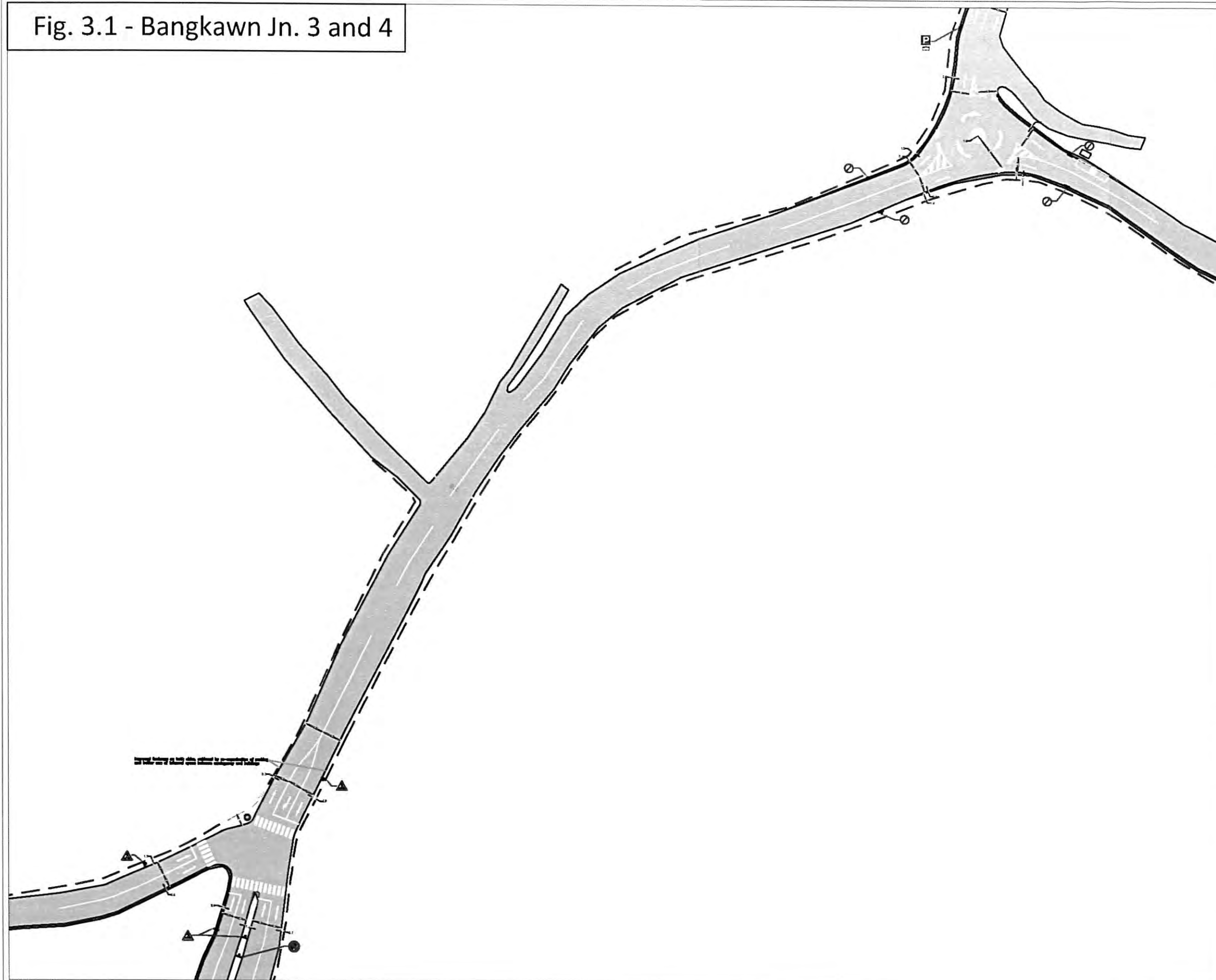


3. DETAILS OF JUNCTION IMPROVEMENTS

Junction designs are presented for the following junctions:

- Fig. 3.1 Bangkawn, 3 and 4 (whole section)
- Fig. 3.2 Bangkawn 3 (East Junction)
- Fig. 3.3 Bangkawn 4 (West Junction)
- Fig. 3.4 Chanmari Gyratory, Ramhlun Arm
- Fig. 3.5 Chanmari Gyratory, Chaltlang Arm
- Fig. 3.6 Chanmari Gyratory, Zarkawt Arm (Jn. 7)
- Fig. 3.7 Zarkawt Junction (south of Chanmari)
- Fig. 3.8 Sumkhuma Point, Zarkawt (Jn. 10)
- Fig. 3.9 Millennium Centre, 11 and 12
- Fig. 3.10 Israel Point, 14
- Fig. 3.11 Bazar Bunkawn (including junction with Armed Veng road), 15
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- Fig. 3.16 Sikulpuikawn, 31 – Proposal 1
- Fig. 3.17 Sikulpuikawn, 31 – Proposal 2
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- Fig. 3.19 Vaivakawn, 18
- Fig. 3.20 Vaivakawn, 19
- Fig. 3.21 Khatla, 27 and 30 (whole section)
- Fig. 3.22 Khatla, 27
- Fig. 3.23 Khatla, 30

Fig. 3.1 - Bangkawn Jn. 3 and 4



Legend:

- Property Line/ Building edge
- Existing Carriageway
- Police Control Point
- Non- Motorable User Path
- Proposed Footpath
- Island

Design Consultant:

**CDM
Smith.**

Client:

**Asian Development Bank
Government of Mizoram - PWD Department**

Project Name:

**ADB TA 8765:
Supporting Sustainable Urban Transport in Aizawl City**

Drawing Title:

Bangkawn Junction (Jn 03 & 04)

Designed: VP	Checked: VP
Drawn: CR	Approved: RG
Date: DEC-2015	Date: DEC-2015
Scale: 1 : 1000	
Drawing No.	REV NO.


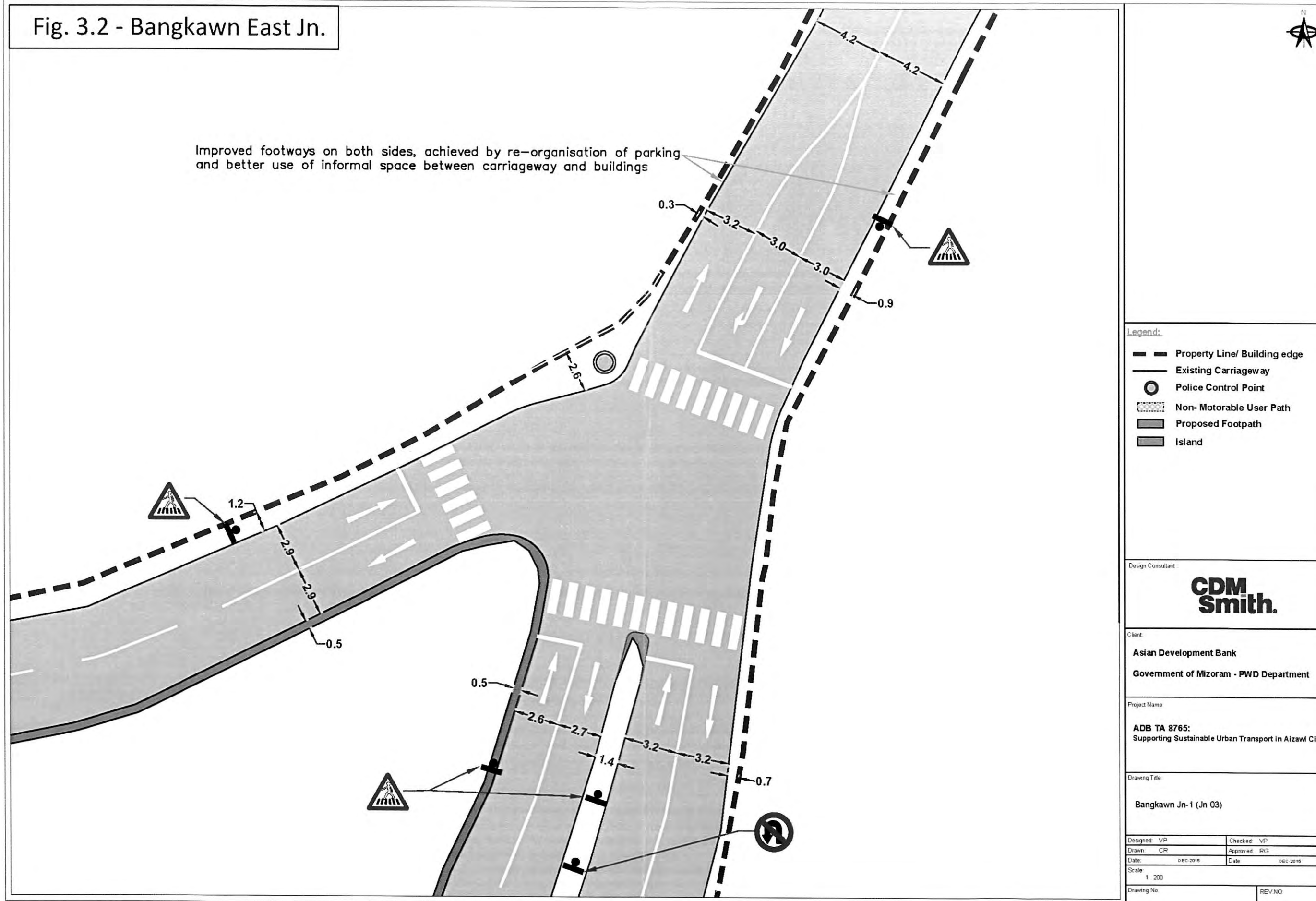
Junction No-3	Location: BANGKAWN EAST. JN. (Zasanga)
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • Eastern entrance to city on NH route • Poor vertical geometry and pavement condition • City buses towards AMC stop at junction • 2-lane approaches without scope for widening or restriping to 3-lanes • High pedestrian volumes • Pedestrians walking on carriageway due to poor or no footways • Stairs to lower levels at junction • On-street parking by motorcycles, loading vehicles and taxi drop-off • Plying of heavy vehicles between 7am-7pm • Longer dwell time of buses for passenger pick up • Access to church at the junction • Taxi stand very close to junction 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.2. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Redesign of the intersection to operate as a mini-roundabout with 17m inscribed circle diameter (ICD) and 7m circulating carriageway. • Restriction of parking and associated No-Parking sign boards on the roundabout approaches. • Widening of the existing footpath in the junction proximity by up to 0.5m. Where feasible the footpath widening will be integrated with steps/access to adjacent commercial/retail uses. • Redesign of both public and private stairs at or near junction to facilitate continuous and uninterrupted footway. • Retaining existing Taxi stand on the north arm. • Retaining existing bus stop on the east arm. • Retroreflective markings and signs. 	

Fig. 3.2 - Bangkawn East Jn.




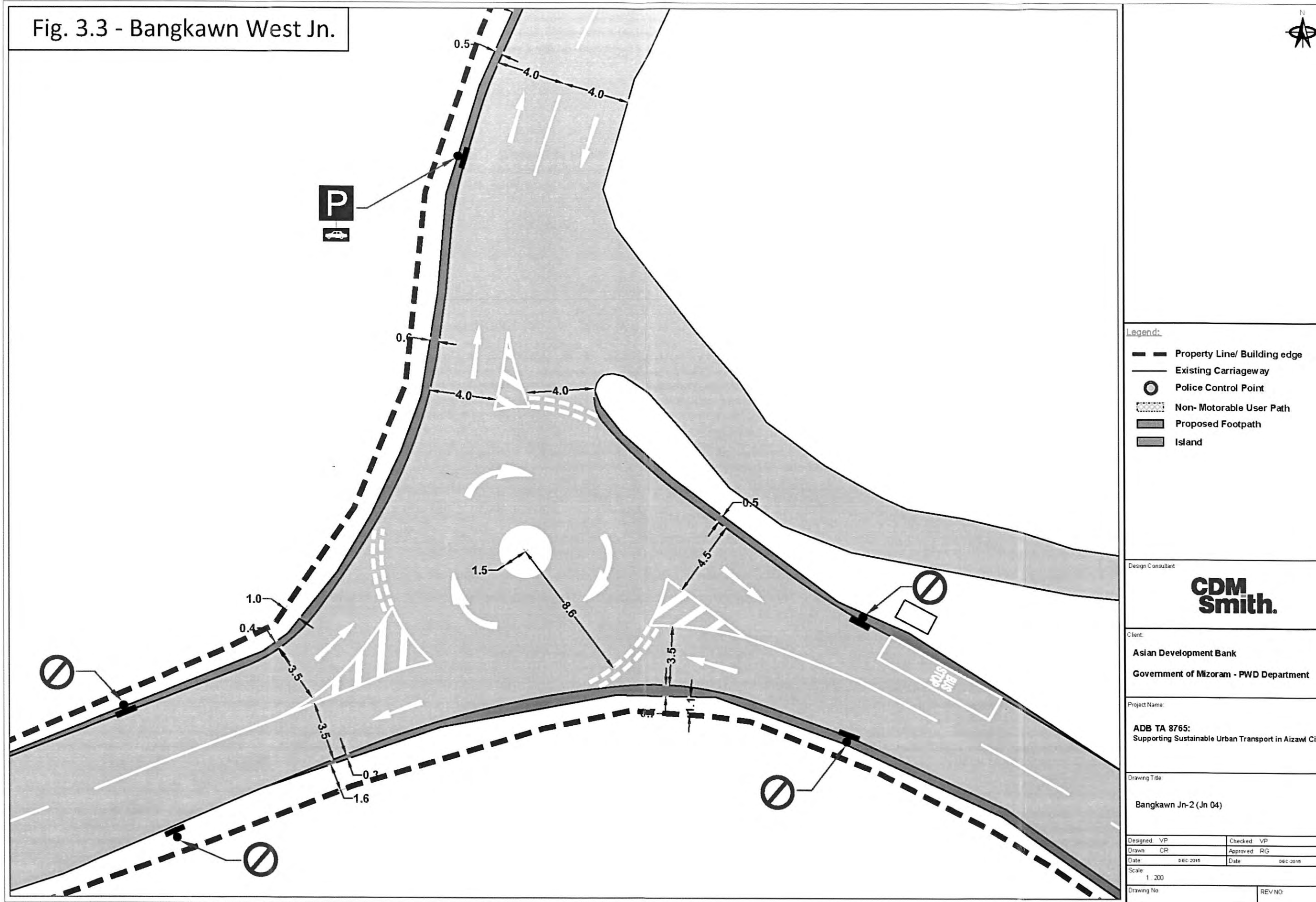
Junction No-4	Location: BANGKAWN WEST. JN. (Zosangliana)
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • Bottle-neck where roads from Ramhlun and Chaltang intersection at almost zero degrees at intersection • On a City bus route • Narrow road widths and 2-lane approaches • No scope for widening • High pedestrian volumes • Absence of footpath forcing pedestrians to walk on pavement • On-street parking by motorcycles, loading vehicles and taxi drop-off • Taxi stand on NH approach very close to intersection • Heavy vehicles during 7am-7pm • Vendors on south side of east west approaches 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.3. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Restriping the north-arm of the junction to include a 3-lane approach to facilitate a storage lane for the right turning NH traffic. • Provision of zebra crossings for pedestrian movements. • Extension of the nose of the median between Ramhlun Road and Chaltang Road approaches. • Widening/provision of footpath on the western side of Chaltang Road and Southern side of NH-54 opposite Bawngkawn Police Station. • Retroreflective markings and signs. 	

Fig. 3.3 - Bangkawn West Jn.




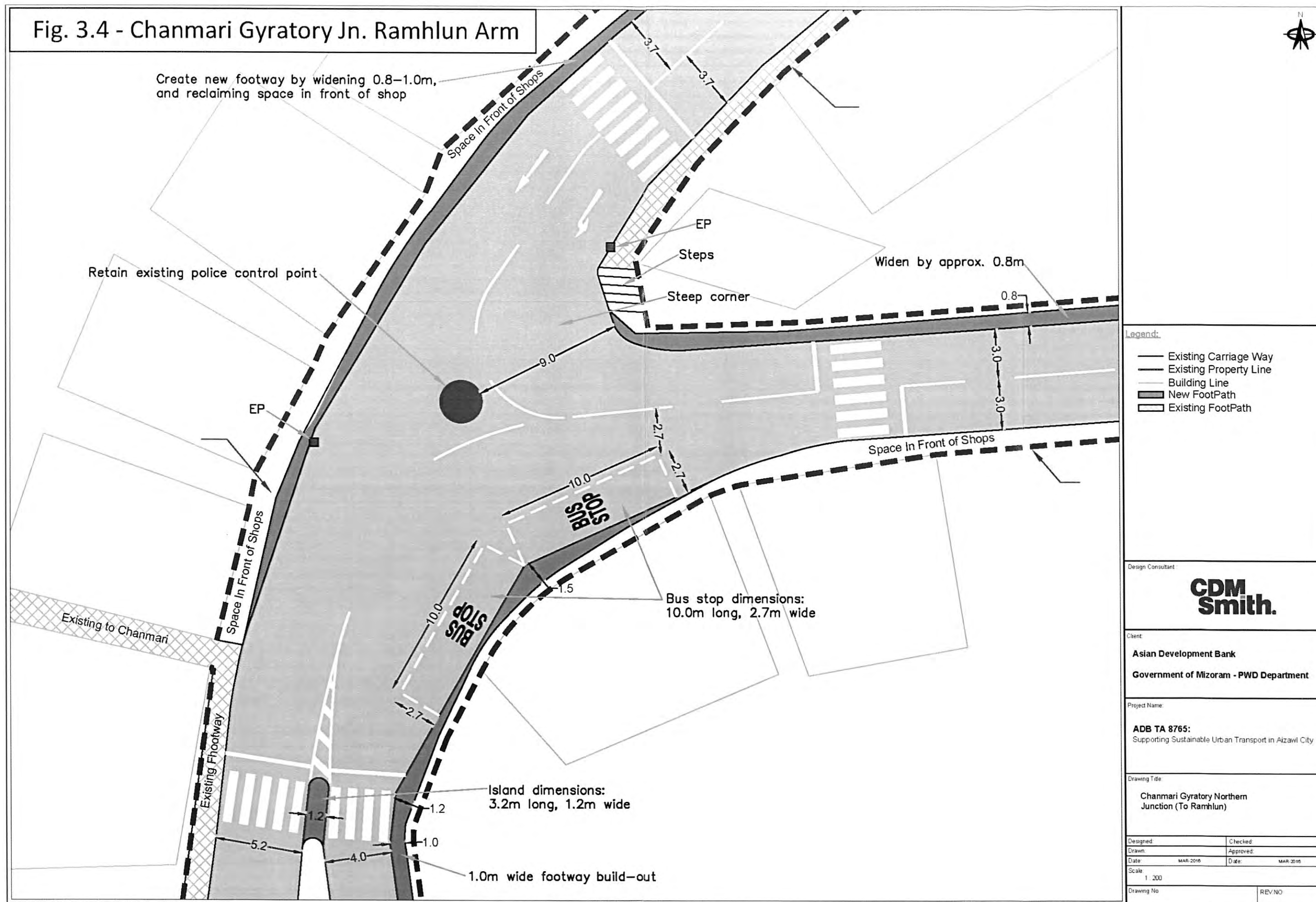
Junction No-8	Location: CHANMAARI GYRATORY, RAMHLUN ARM
<p>Existing Situation:</p> <ul style="list-style-type: none"> • Major junction where two arms of south-bound traffic meet. • Also an important bus and taxi halt. • One-way traffic movement southbound, plus sharp left turn north-eastwards towards Rahmlun (with two-way traffic on Ramhlun arm). • Absence of footways on east side, and no pedestrian crossings, though high pedestrian volumes. • Poor road profile, with steep slopes at either end of the junction. • Police traffic control point. 	
<p>Proposed Improvements:</p> <ul style="list-style-type: none"> • Details shown in Figure 3.4 below. <p>Main (short-term) proposals are:</p> <ul style="list-style-type: none"> • Maintain existing traffic movements, and retain existing police traffic control point. • Widened footways on both east and west sides – minor footway widening, and reclaim space from in front of shops. • Designated bus stops with bus bays marked and provision for two buses at a time • Formal zebra crossings provided at north and south ends of the junction. <p>For medium-term improvements, please refer to Chapter 6, Chanmari Gyrotory proposals.</p>	

Fig. 3.4 - Chanmari Gyrotory Jn. Ramhlun Arm




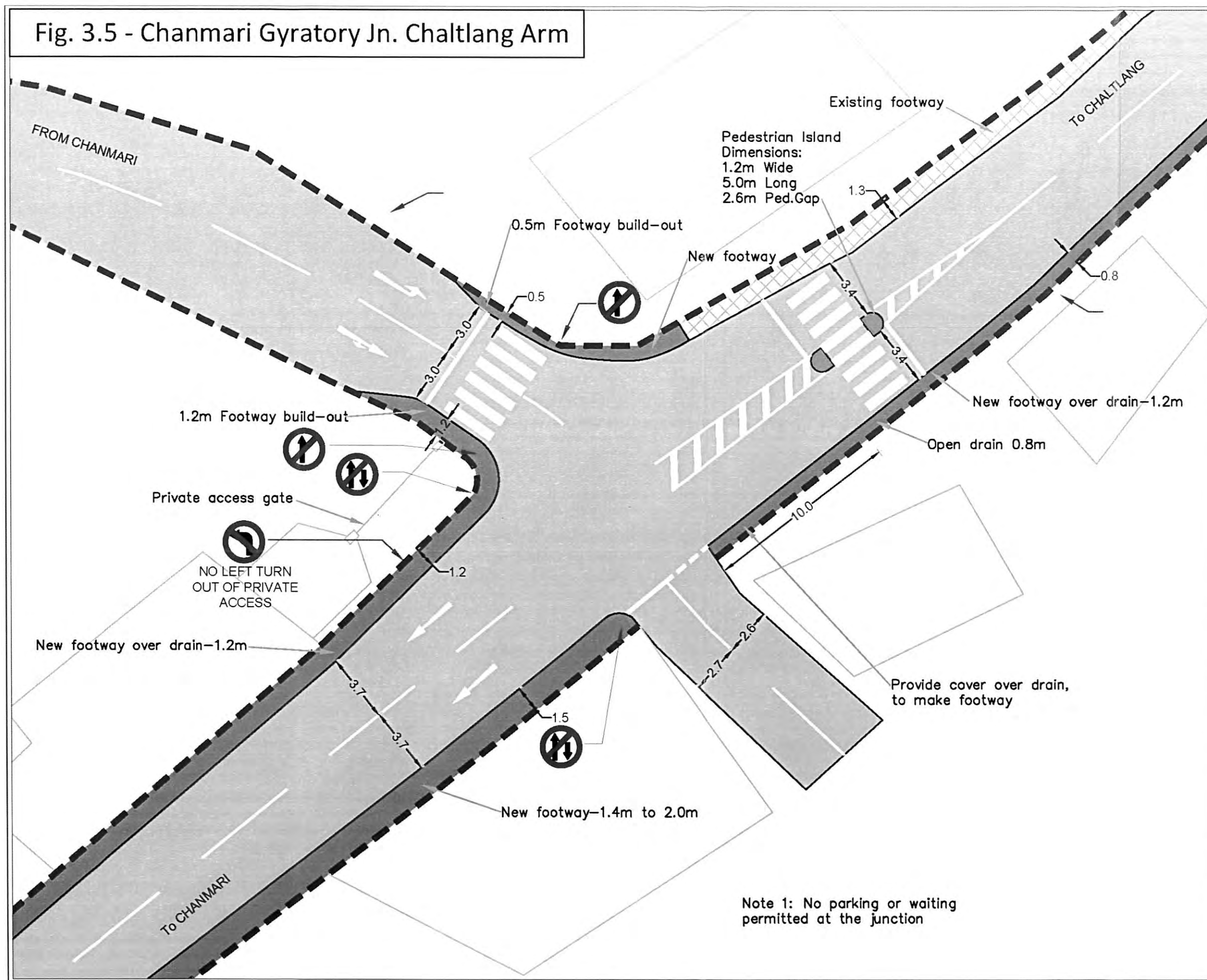
Junction No-9	Location: CHANMAARI GYRATORY, CHALTLANG ARM
<p>Existing Situation:</p> <ul style="list-style-type: none"> • Northern junction of the Chanmari Gyrotory, and main road leading to/from Chaltlang. • Four arms: west and south arms are one-way. • No road markings or pedestrian crossings, and limited footway provision. • Very difficult for pedestrians to cross at busy times. • Heavy traffic volumes at peak periods. • Buses pass through the junction north- and east-bound only. 	
<p>Proposed Improvements:</p> <ul style="list-style-type: none"> • Details shown in Figure 3.5 below. <p>Main short-term proposals include:</p> <ul style="list-style-type: none"> • Zebra crossings on two arms • Pedestrian refuge on north arm • Lane markings and diagonal hazard markings • Widened footways and footway build-outs at crossings. <p>For medium-term improvements, please refer to Chapter 6, Chanmari Gyrotory proposals.</p>	

Fig. 3.5 - Chanmari Gyratory Jn. Chaltlang Arm



Note 1: No parking or waiting permitted at the junction

Legend:

- Existing Carriage Way
- Existing Property Line
- Building Line
- New FootPath
- ▨ Existing FootPath
- Island

Design Consultant

CDM Smith.

Client

Asian Development Bank
Government of Mizoram - PWD Department

Project Name

ADB TA 8765:
Supporting Sustainable Urban Transport in Aizawl City

Drawing Title

Chanmari Gyratory Northern Junction (To Chaltlang)

Designed	Checked
Drawn	Approved
Date: MAR. 2016	Date: MAR. 2016
Scale: 1:200	
Drawing No.	REV. NO.


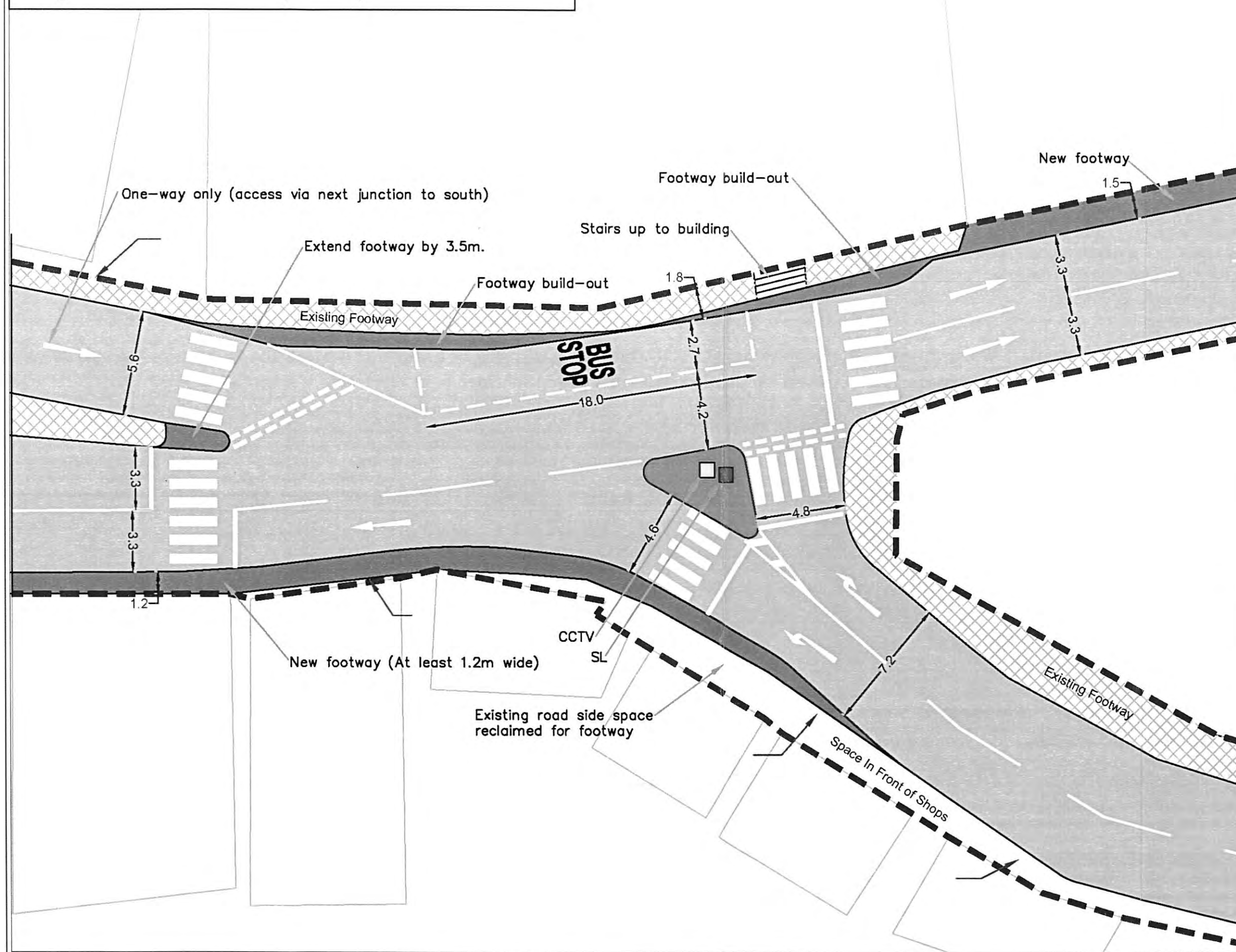
Junction No-7	Location: CHANMAARI GYRATORY, ZARKAWT ARM
<p>Existing Situation:</p> <ul style="list-style-type: none"> • Major junction on north-south corridor: also a busy location with college, church, market and shops. • Police control point. • Bus stop for south-bound buses, and parking demand for college and taxi stand. • No pedestrian crossings, and very limited footway width. • Heavily congested with slow moving traffic at peak periods. 	
<p>Proposed Improvements:</p> <ul style="list-style-type: none"> • Details shown in Figure 3.6 below. <p>Main short-term proposals include:</p> <ul style="list-style-type: none"> • Maintain existing traffic circulation, EXCEPT restrict right turn south-bound into High Field Road. (Alternative access is at Zarkawt junction 140m further south – see Figure 3-7). • Provide traffic island south of church. • Zebra crossings provided to the island, and also at south end of junction. • Existing taxi rank to be retained on east arm. • Footways widened on both east and west sides of junctions, including reclaiming space from in front of shops. • Formal bus stops to be marked out, long enough to accommodate two City Buses at a time (at least 18m long). <p>For medium-term traffic proposals at this junction, see Chapter 6, Chanmari Gyrotory proposals.</p>	

Fig. 3.6 - Chanmari Gyratory Jn. Zarkawt Arm



Legend:

- Existing Carriage Way
- Existing Property Line
- Building Line
- New FootPath
- ▨ Existing FootPath
- Island

Design Consultant

CDM Smith.

Client

Asian Development Bank
Government of Mizoram - PWD Department

Project Name

ADB TA 8765:
Supporting Sustainable Urban Transport in Aizawl City

Drawing Title

Chanmari Gyratory Southern Junction (To Zarkawt)

Designed	Checked
Drawn	Approved
Date: MAR-2016	Date: MAR-2016
Scale: 1:200	
Drawing No.	REV/NO


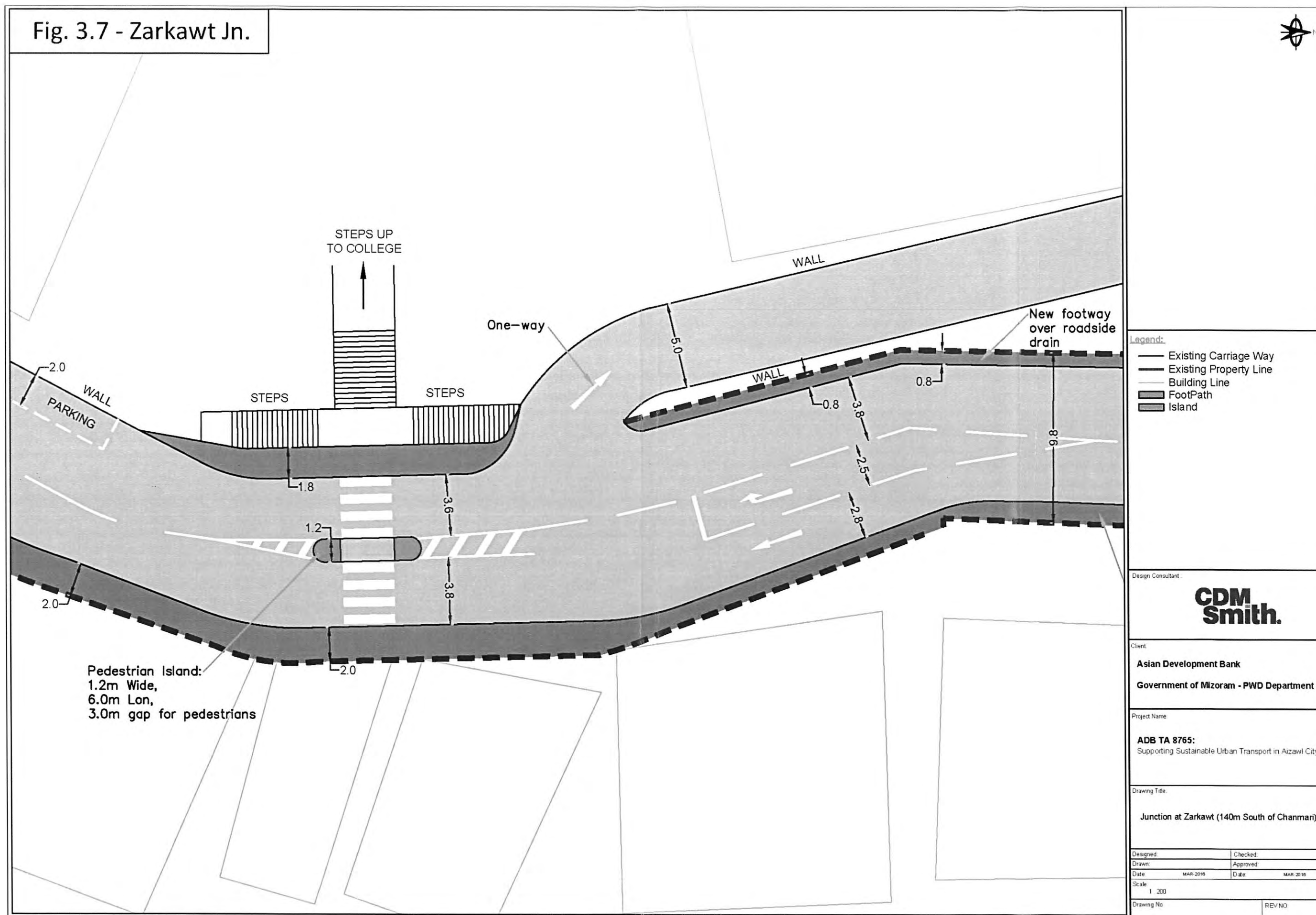
Junction No-11 & 12	Location: ZARKAWT JUNCTION (SOUTH OF CHANMARI)
<p>Existing Situation:</p> <ul style="list-style-type: none"> • Minor junction about 140m south of Chanmari Church, on main n-s corridor. • Important pedestrian crossing, with High School on west side (see photo). • Extensive on-street parking and no footways either side of the road. • Very congested at peak periods, with traffic tailing back from junctions. 	
<p>Proposed Improvements:</p> <ul style="list-style-type: none"> • Details shown in Figure 3.7 below. <p>Main short-term proposals include:</p> <ul style="list-style-type: none"> • Provide 2m wide footway on east side, and a footway build-out at zebra crossing on the west side. • Provide narrow (0.8m) footway over roadside drain on west side in front of shops. • Road up to High Field Road to be made one-way only, westbound (i.e. up the hill). • This road to be the alternative route to High Field Road from Chanmari, to remove the right turn at Chanmari Gyratory (see previous junction proposals). • Right turn waiting lane to be provided, south-bound. • On-street parking to be permitted where carriageway width allows, in designated parking bays. 	

Fig. 3.7 - Zarkawt Jn.




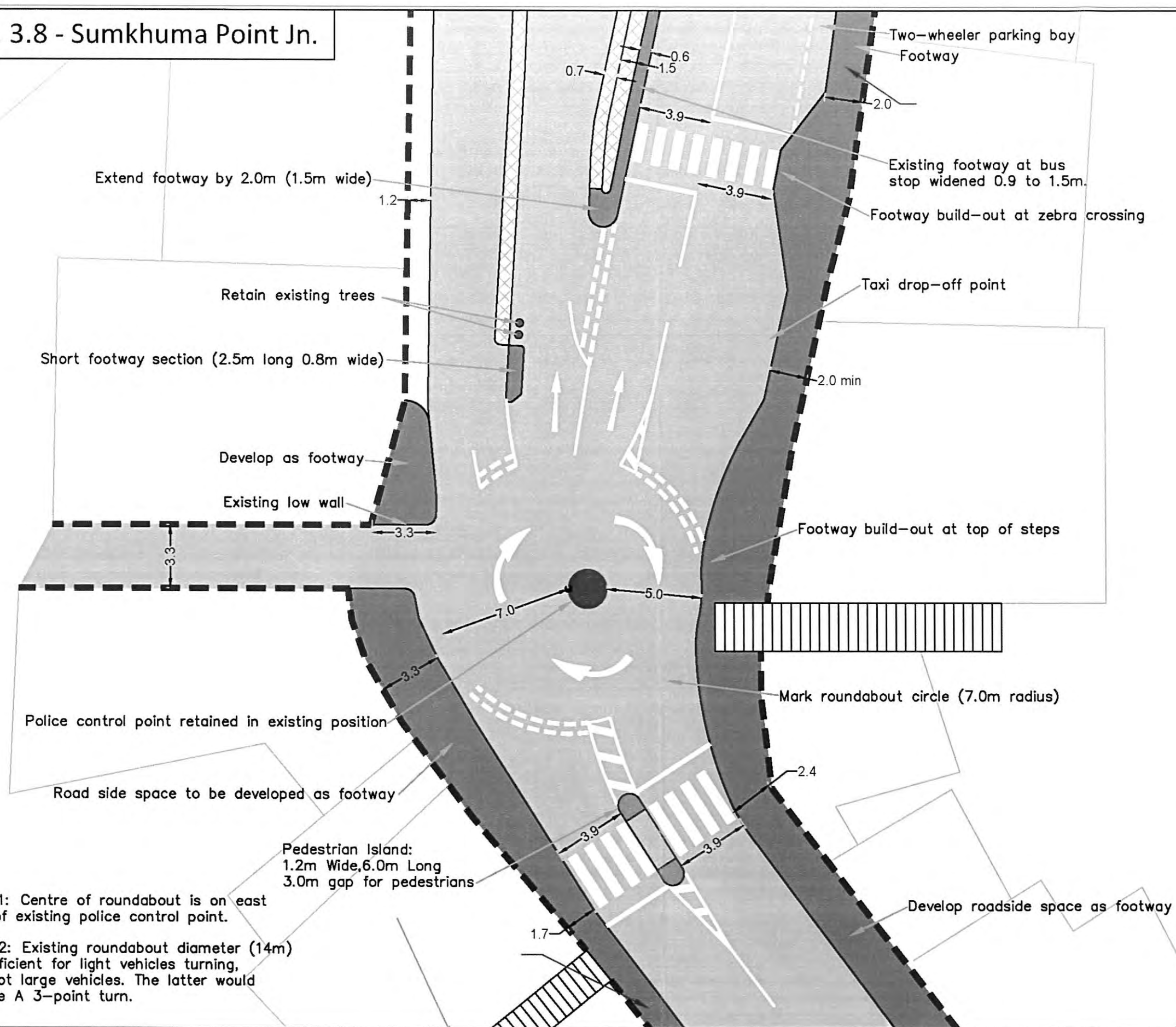
Junction No-10	Location: SUMKHUMA POINT, ZARKAWT
<p>Existing Situation:</p> <ul style="list-style-type: none"> • Major junction on n-s corridor, with five arms. One arm leads up to Chief Minister's Office. • Also a very busy pedestrian crossing point, with stairs down to lower Bazar Bunkawan Road. • Difficult road geometry due to three roads entering junction side by side. • Bus stop on north arm to Chanmari. • Extensive on-street parking of two-wheelers and loading vehicles. • No footways or ped crossings. • No lane markings. • Traffic police control point. 	
<p>Proposed Improvements:</p> <ul style="list-style-type: none"> • Details shown in Figure 3.8 below. <p>Main short-term proposals include:</p> <ul style="list-style-type: none"> • Maintain existing traffic police control point. • Introduce mini-roundabout road markings. • Note: roundabout diameter is only 14m, which is not sufficient for large vehicles (buses, trucks) – the larger vehicles will need to make 3-point turns, as at present. • Centre of roundabout is on the west side of traffic police control point. (i.e. the police control point is off-centre). • Provide footway build-out on east side, at edge of roundabout (maintaining the 7m radius) • Pedestrian refuge on south arm, and zebra crossing on north and south arms. • Footway build-out at zebra crossing to bus stop on north arm. • Widened footway on west side. • No parking permitted within junction area or approaches to junction. • Road markings to be provided, including designated places for parking. • Bus stop to be long enough for two City Buses at a time (i.e. at least 18m long). Footway to be widened at bus stop from 0.9m to 1.5m. 	

Fig. 3.8 - Sumkhuma Point Jn.



Legend:

- Existing Carriage Way
- Existing Property Line
- Building Line
- FootPath
- Island

Design Consultant:

**CDM
Smith.**

Client:

Asian Development Bank
Government of Mizoram - PWD Department

Project Name:

ADB TA 8765:
Supporting Sustainable Urban Transport in Aizawl City

Drawing Title:

Sumkhuma Point (Jn. 10)

Designed	Checked
Drawn	Approved
Date: MAR 2016	Date: MAR 2016
Scale: 1:200	
Drawing No.	REV/NO.

Note 1: Centre of roundabout is on east side of existing police control point.

Note 2: Existing roundabout diameter (14m) is sufficient for light vehicles turning, but not large vehicles. The latter would require A 3-point turn.


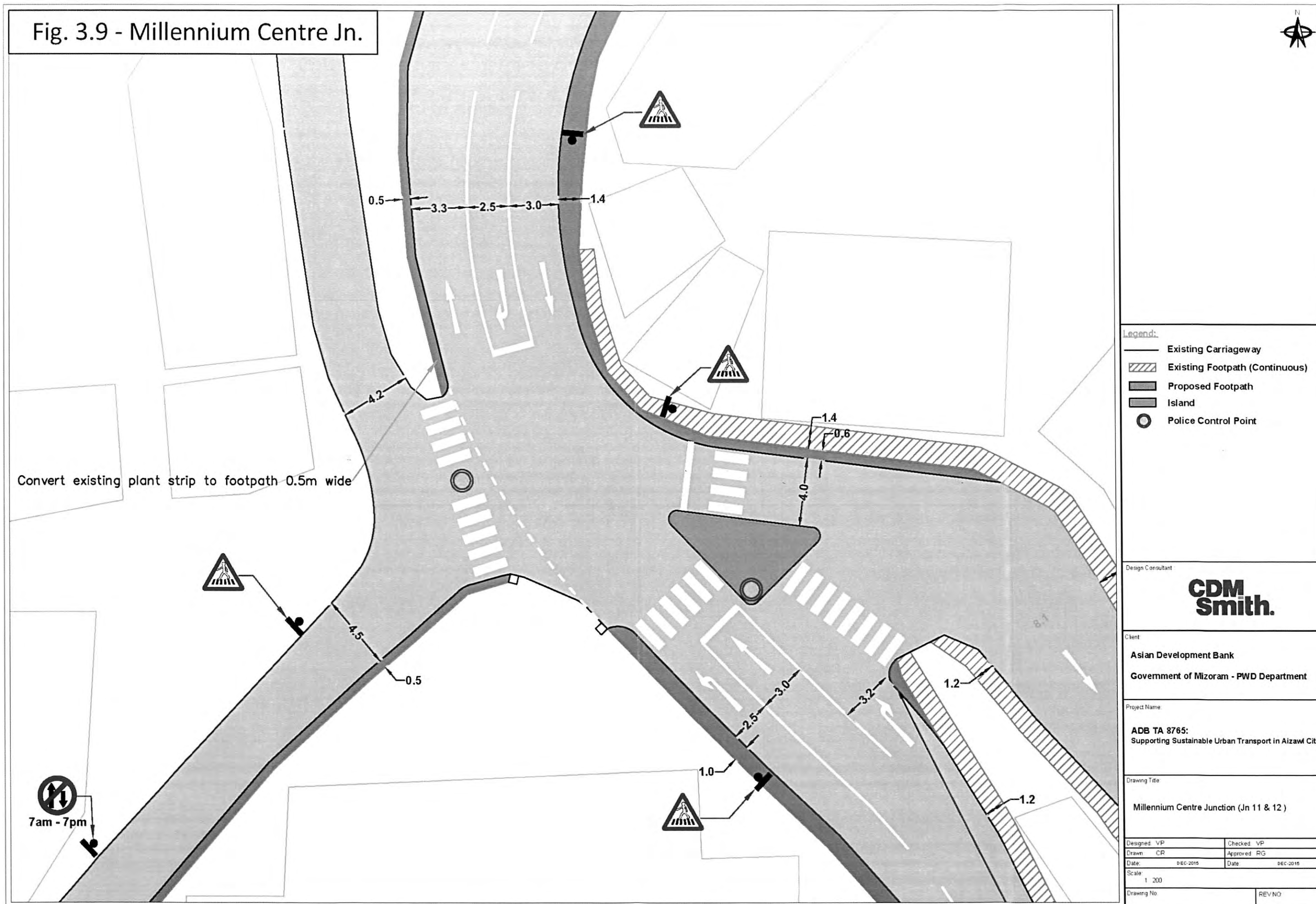
Junction No-11 & 12	Location: MILLENNIUM CENTRE
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • A major land mark center • Bottle-neck where 5 legs meet at the intersection • Narrow entrance and exist to the Parking Lot at the intersection • Limited road width on two of the minor arms not sufficient for 2-lane carriageway • One of the arm at very acute angle to the main road • Two traffic police control points at the intersection 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.9. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Provision of a bigger channelizing island around existing police control point. • Relocation of existing Police Control Point inside the island. • Provision of dedicated lane for vehicles accessing the Millennium Center parking. • Widening of existing footpath on the north side Bara Bazar opposite to the Millennium Center parking entrance. • Conversion of narrow approach road on the western periphery of the Millennium Center to one-way operation (entry into intersection restricted) between 7am-7pm. • Provision of a footpath along the Upper Bara Bazar Road on the eastern side of Millennium Center. • Conversion of existing plant strip to footpath on the north approach. • Retaining the existing storage lane on the north arm. • Retroreflective signs and road markings. 	

Fig. 3.9 - Millennium Centre Jn.




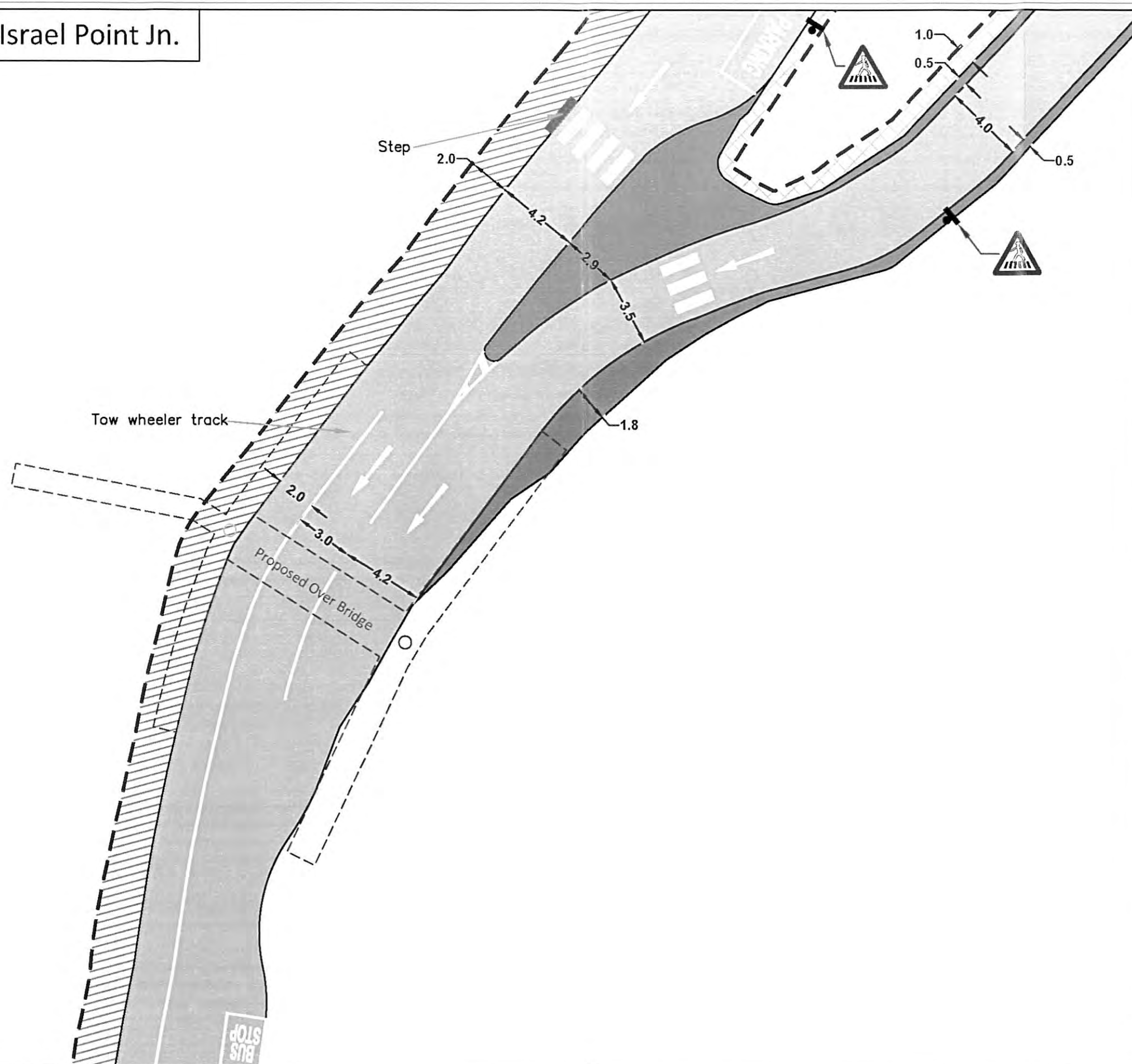
Junction No-5	Location: ISRAEL Pt
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • Important Commercial Centre • Two one way roads coming from Millennium Centre and Chanmari (Via Zarkawt Lower Bazar) merge at this Junction. • Bus operates along the lower Bazar road. • High Pedestrian Volumes due to extensive commercial activities. • On-street parking by motorcycles, loading vehicles and Taxi drop-off • Footpaths are present on one side of the road but not sufficient • Taxi Stand very Close to Junction • Proposed footbridge located at this intersection. 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.10. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Provision of channelizing island between the two merging traffic streams. • Provision of pedestrian crossings across the island. • Restriping the downstream approach to allow a 2m two-wheeler lane adjacent to the 2m footpath. • Relocation of existing bus stop to downstream to integrate with proposed Over Bridge constructing. Provision of bus bay. • Widening existing footpath on either sides of Zion Street by up to 0.5m. • Provision of a step at the end of pedestrian crossing on the Bara Bazar footway. • Retroreflective signs and road markings. 	

Fig. 3.10 - Israel Point Jn.



Legend:

- Property Line/ Building edge
- Existing Carriageway
- Existing FootPath (Continuous)
- Non- Motorable User Path
- Proposed Footpath
- Island

Design Consultant

**CDM
Smith.**

Client

**Asian Development Bank
Government of Mizoram - PWD Department**

Project Name

**ADB TA 8765:
Supporting Sustainable Urban Transport in Aizawl City**

Drawing Title

Israel Point (Jn 14)

Designed: VP Checked: VP

Drawn: CR Approved: RG

Date: DEC 2015 Date: DEC 2015

Scale
1:200

Drawing No. REV NO.


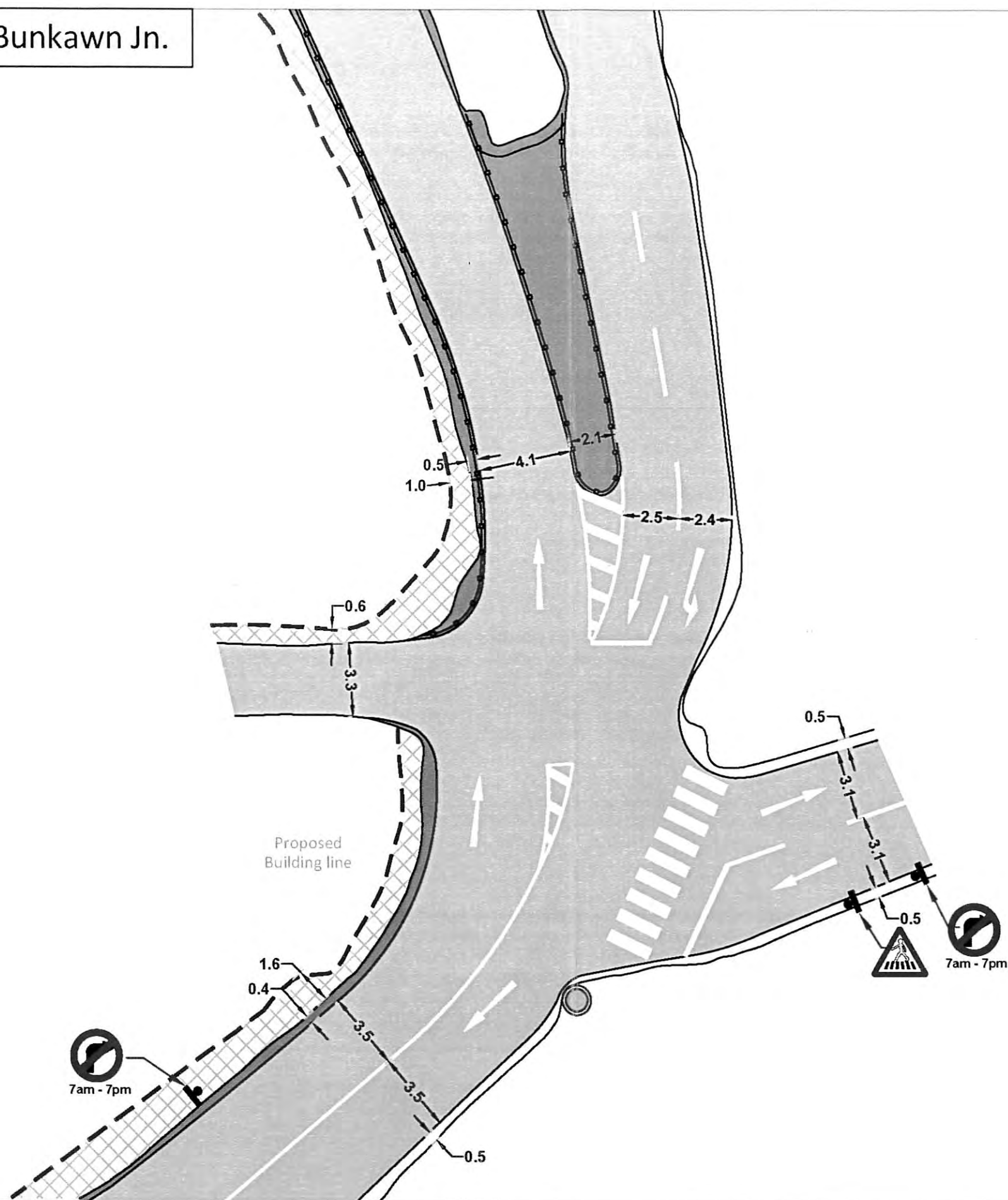
Junction No-14	Location: BAZAR BUNKAWN (Venglaini Pt)
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • One of the very congested points • Two of the arms very limited road width • On a City bus route • Very high pedestrian volumes • On-street parking by motorcycles, loading vehicles and taxi drop-off • Existing 30kph speed limit on this section • Proposed footbridge located at this intersection. 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.11. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Provision of a raised median preferably with guard railing under the proposed foot bridge between Bara bazar approaches. Informal crossings under proposed footbridge to be restricted. • Widening existing footpath on the western side of intersection area. • Provision of right turning lane for traffic turning right from Bara Bazar Road into Saron Veng Road. • Edge Striping on Saron Veng Road to delineate a narrow shoulder for pedestrians. • Retroreflective signs and road markings. 	

Fig. 3.11 - Bazar Bunkawn Jn.



Legend:

- Property Line/ Building edge
- Existing Carriageway
- ▨ Non-Motorable User Path
- Island
- Island
- Police Control Point
- Guard Rail (Tentative)

Design Consultant

**CDM
Smith.**

Client

**Asian Development Bank
Government of Mizoram - PWD Department**


Project Name

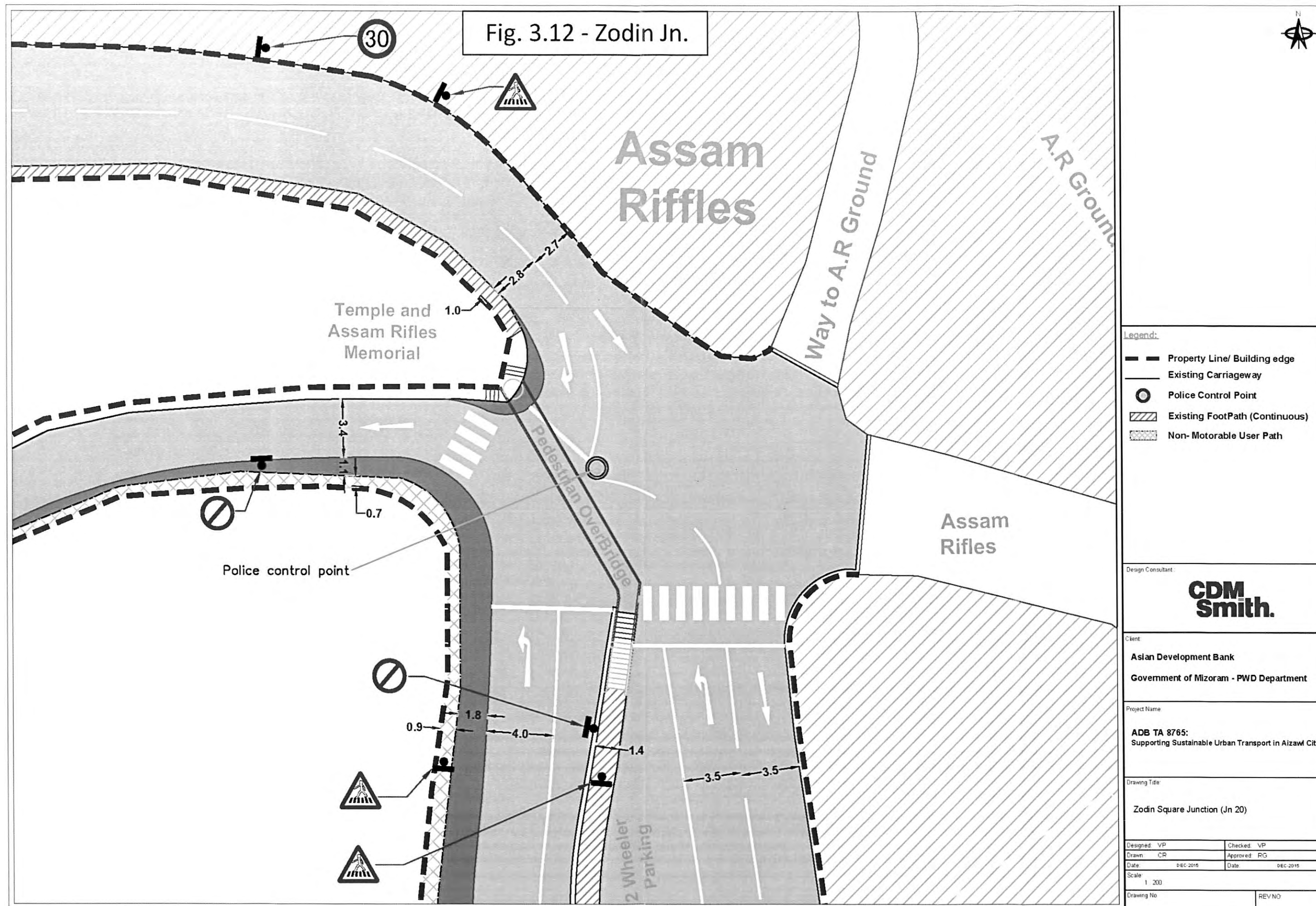
**ADB TA 8765:
Supporting Sustainable Urban Transport in Aizawl City**

Drawing Title

Bazar Bunkawn Jn. (Jn 15)

Designed: VP	Checked: VP
Drawn: CR	Approved: RG
Date: DEC-2015	Date: DEC-2015
Scale: 1:200	
Drawing No:	REV NO:

Junction No-20	Location: ZODIN SQ. (Dr. C. Thaithianga Pt)
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • 3 legs are one way roads and only road from Raj Bhavan is 2 way. • Acts as the only point for taking a U Turn along the N-S corridor • Entrance to AR Football ground is at this junction • Existing foot over bridge for pedestrian • 2 wheelers are parked at the Junction • 2-lane approaches without any scope for widening or restriping • Proposed Multilevel car parking is located close to this location 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.12. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Widening of footpath on the western side of Temple Square-to-Zodin road. • Widening of footpath on the southern side of Canteen Kual Road. • Redesign of corner radius between the two Canteen Kual approaches to facilitate added pedestrian storage area. • Restriping the Temple-to-Zodin one way approach to allow for a single 4m travel lane. • Provision of No Parking and Pedestrian Crossing Signs. • Provision of Pedestrian Crossing near Assam Rifles Gate and on Canteen Kual Road (departing approach). • Retroreflective signs and road markings. 	




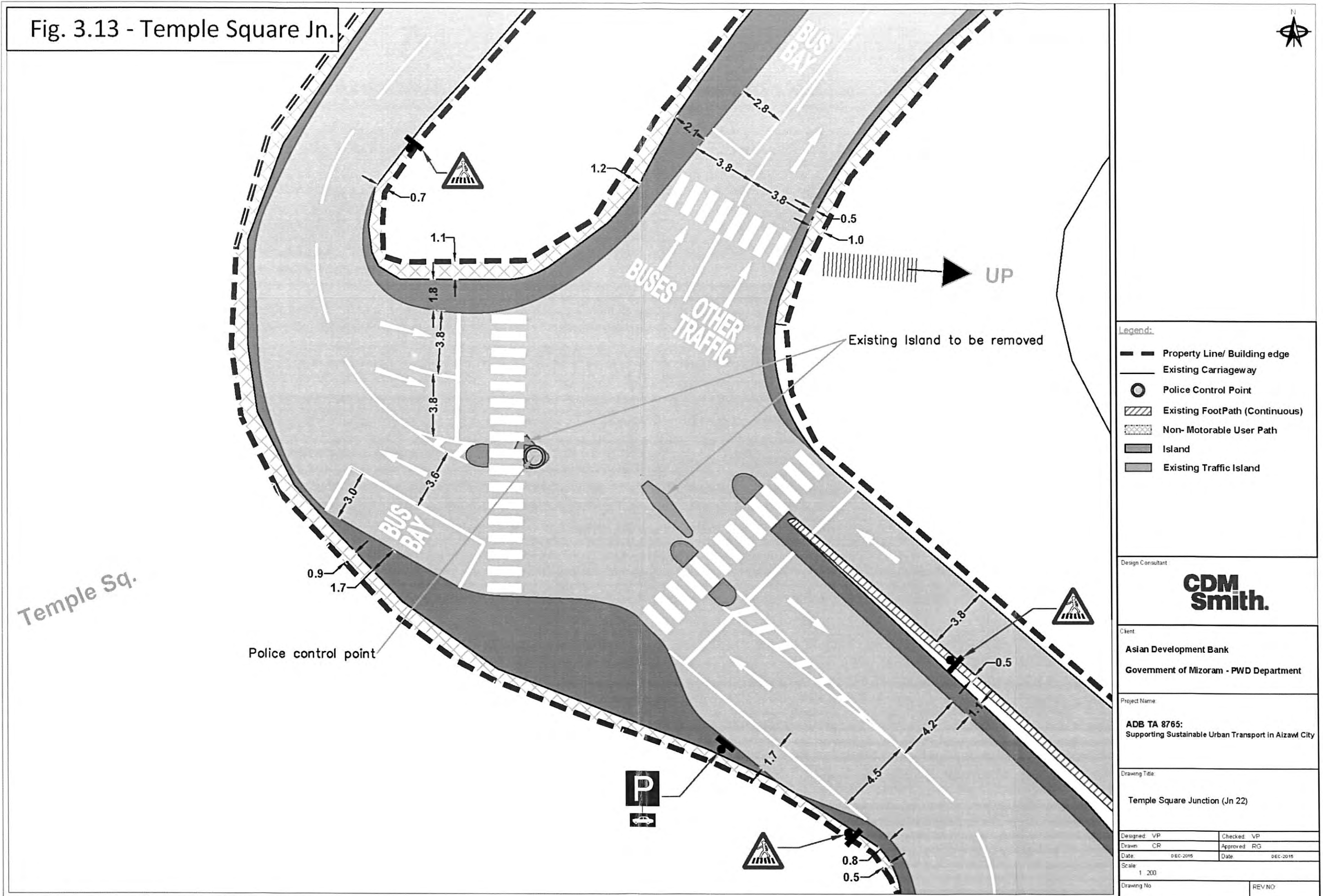

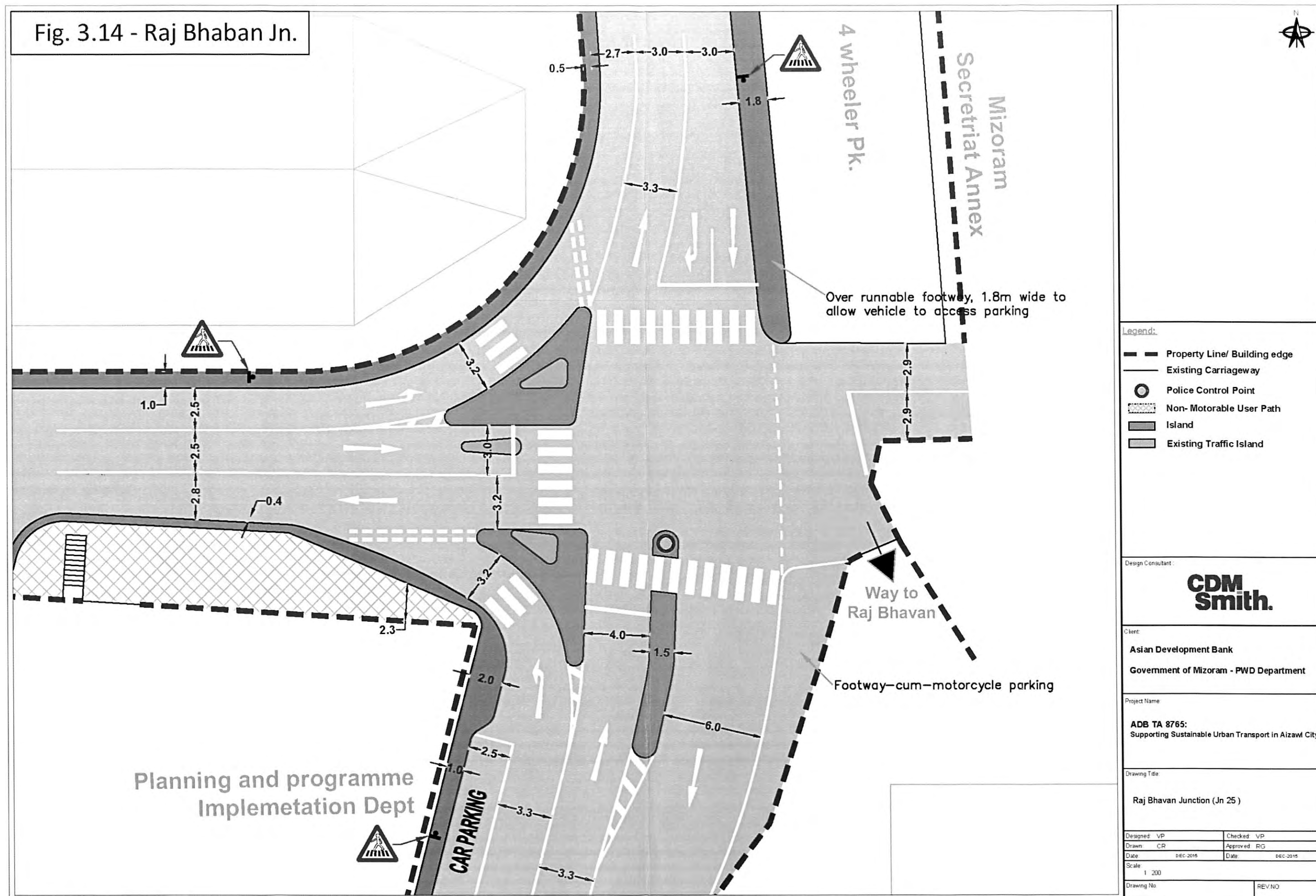
Junction No-22	Location: TEMPLE SQ. (Dr. F. Kapsanga Pt)
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • West bound traffic towards Vaivakawn deviates from N-S axis at this Junction • On a city bus route • 4 Legged Junction (2 are one way and 2 are two way) • Taxi Stand is located at the junction in front of Temple Church • No pedestrian facilities along the road or for crossing. 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.13. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Removal of existing islands and police control point. • Provision of new Pedestrian refuge islands, including a police control point in the intersection • Provision of new pedestrian Zebra Crossings. • Restriction of Taxi Parking area and provision of larger public space created by widening the footway on the Temple Square side. • Provision of bus bays and shelter along Temple Square side for Vivakawn destined buses. • Removal of Parking and Provision of bus-bays with shelters towards Zodin Square approach road. • Provision of new footpath north side of east approach to the intersection. • Provision of a traffic lane for other traffic on Zodin Square approach adjacent to bus bay. • Retroreflective signs and road markings. 	

Fig. 3.13 - Temple Square Jn.



Junction No-25	Location: RAJ BHABAN (Meanga Pt)
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • 3 armed Junction located in proximity of Assembly hall and Raj Bhavan. • High Security zone • Road from West (i.e. from Tennis Court) connects the N-S corridor at a steep angle. • Absence of adequate footpaths forcing pedestrians to walk on pavement • Many government offices are located in the vicinity • On a city bus route • Road width is relatively good 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.14. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Redesign of the existing channelizing islands with larger islands. • Provision of pedestrian refuge island and short median on south approach. • Restriping the carriageway on the north approach to allow acceleration lane for left turn vehicles from Tennis Court towards Treasury Square. • Retaining storage lane for vehicles turning right from Treasury Square towards Tennis Court. • Provision of new pedestrian zebra crossings at intersection. • Widening and/or provision of footpath on intersection approaches. • Provision of 1.8m, over runnable footway to access parking for offices on the eastern side opposite to Treasury Square. • Provision of footway-cum-motorcycle parking at the Raj bhavan Gate Corner. • Retaining existing parking in front of Planning and Programme Implementation Department. • Retroreflective signs and road markings. 	




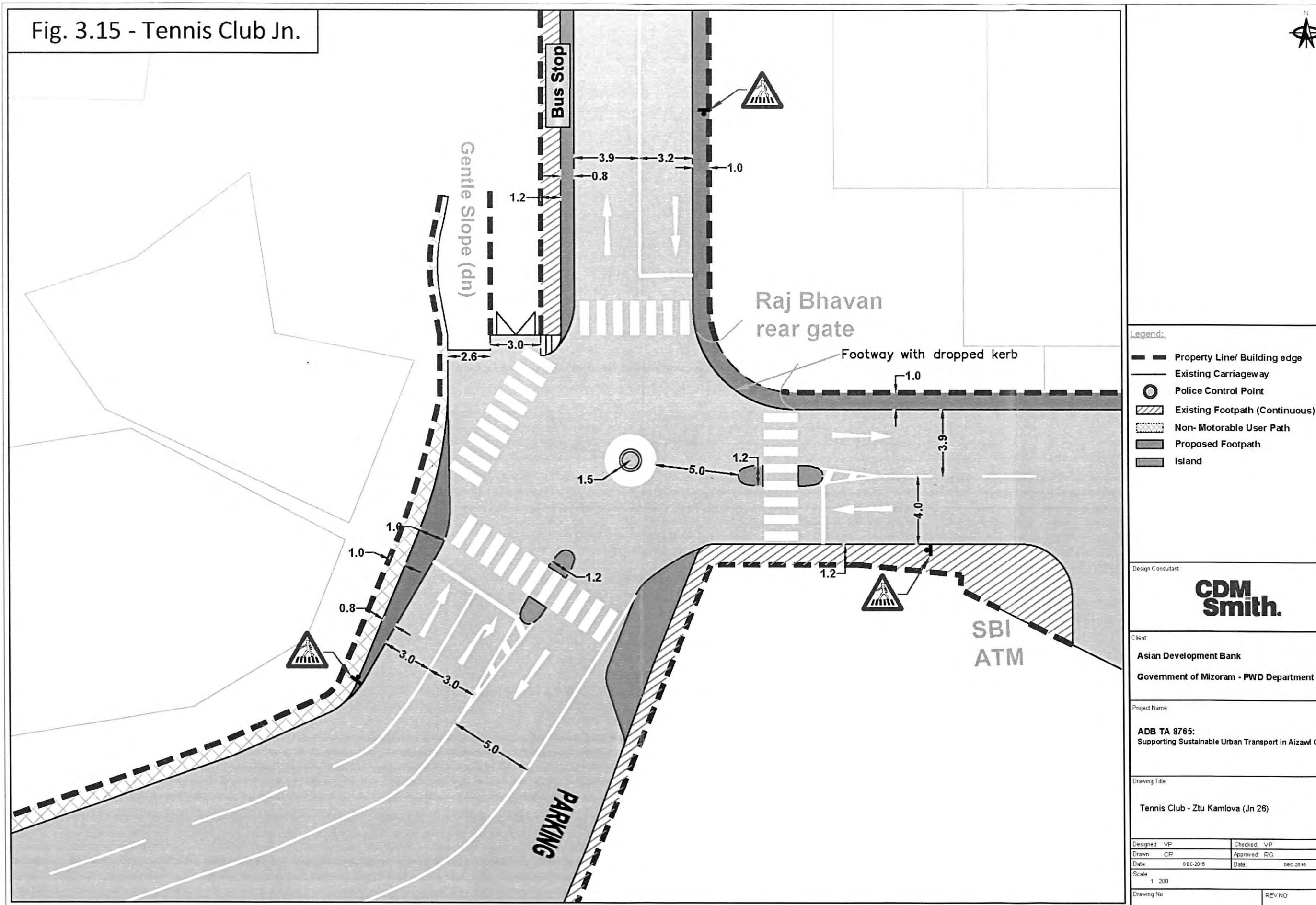
Junction No-26	Location: TENNIS CLUB (ZTU Kamlova)
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • Traffic from Khatla deviates towards N-S Corridor through this junction • Absence of adequate footpaths forcing pedestrians to walk on pavement • Taxi Stand is located close to the Junction • On Street parking in front of Aizawl club, which leads to congestion • Located on a City bus route • Rear Entrance of Assembly hall 	
<p>Proposed Improvements:</p> <p>Schematic improvements at the intersection is presented in the Figure 3.15. Highlights of the proposed intersection improvements are shown below:</p> <ul style="list-style-type: none"> • Provision of pedestrian refuge islands on east and south approaches. • Provision of island to delineate Taxi parking stand on the south approach. • Widening of footpath on the intersection approaches to form about 1.0m wide footways. • Retaining existing Bus stop on the north approach. • Retaining existing Police Control Point. • Restriping south approach to a three-lane wide approach to allow a dedicated lane for right turning vehicles towards Raj Bhavan junction. • Retroreflective signs and road markings. 	

Fig. 3.15 - Tennis Club Jn.



- Legend:**
- Property Line/ Building edge
 - Existing Carriageway
 - Police Control Point
 - Existing Footpath (Continuous)
 - Non-Motorable User Path
 - Proposed Footpath
 - Island


Design Consultant
CDM Smith.

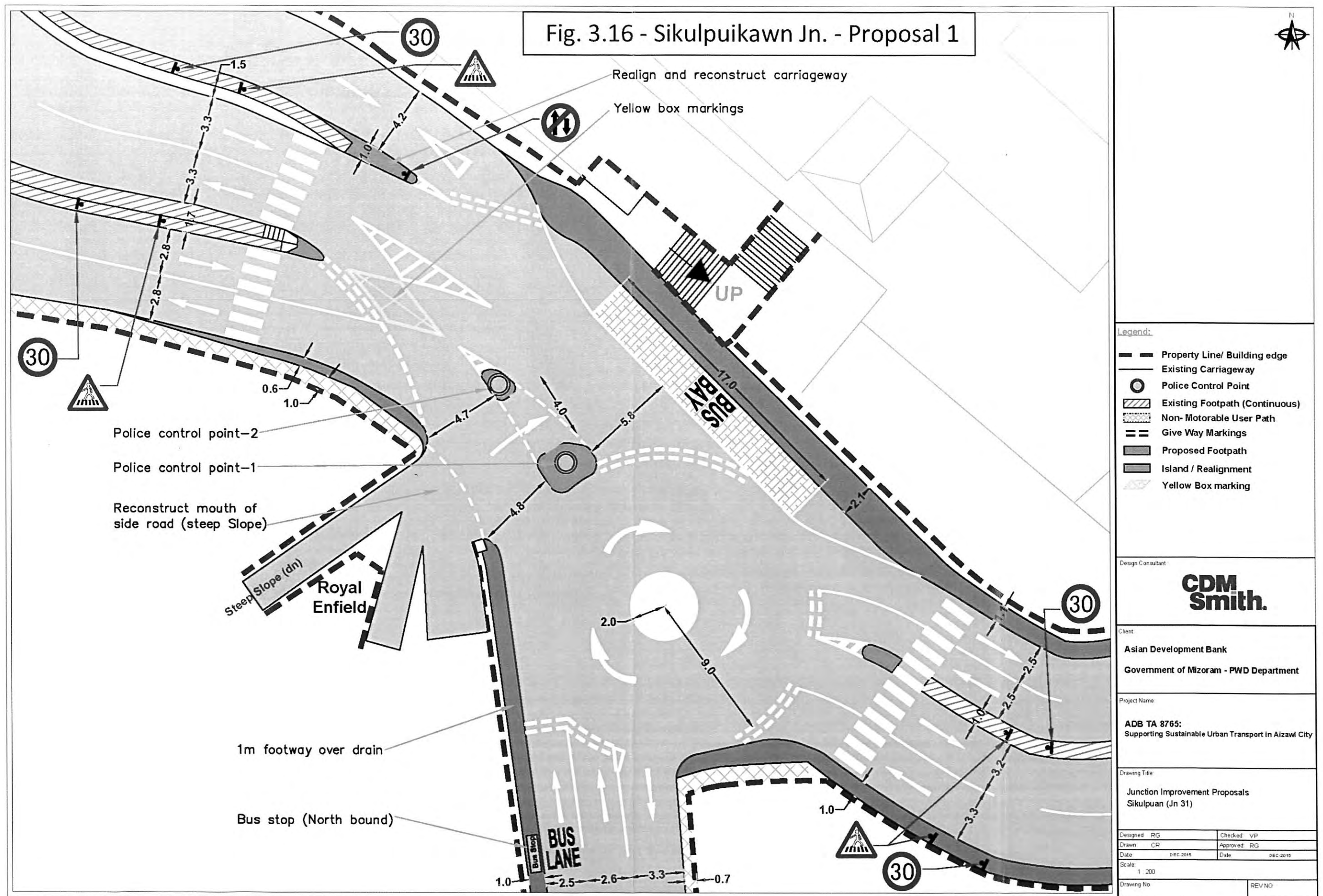
Client
Asian Development Bank
Government of Mizoram - PWD Department

Project Name
ADB TA 8765:
Supporting Sustainable Urban Transport in Aizawl City

Drawing Title
Tennis Club - Ztu Kamlova (Jn 26)

Designed: VP	Checked: VP
Drawn: CR	Approved: RG
Date: DEC-2015	Date: DEC-2015
Scale: 1:200	
Drawing No:	REV NO:

Junction No-31	Location: SIKULPUIKAWN (R Lalzaaua Pt)
<p>Existing Situation:</p> <p>The following features highlight the existing situation at the intersection that warranted improvements.</p> <ul style="list-style-type: none"> • 7 legged Junction. All legs of varying widths and all are two way roads • 3 policeman control the traffic movement during peak time • All roads are meandering and connecting different levels of the contour. • Located on a City bus route • 2-lane approaches without scope for widening or restriping to 3 lanes • Absence of adequate footpaths forcing pedestrians to walk on pavement 	
<p>Proposed Improvements:</p> <p>Two alternative designs for intersection redesign. Schematic improvements at the intersection is presented in the Figure 3.16 and Figure 3.17. Highlights of the proposed intersection improvements under both options are shown below:</p> <ul style="list-style-type: none"> • Option 1 <ul style="list-style-type: none"> ○ Traffic roundabout operation with an Inscribed Circle diameter of about 9m and Circulating width of about 7m. ○ Provision of two Police Control Points including existing control point with bigger islands around them. ○ Extension of median noses on either sides of M.G. Road. ○ Restriction of vehicles departing on Tuikhuahtlang Road. ○ Provision of 1m footway-over-drain on west side of Mission Veng Road. ○ Widening existing footpaths on College Side and Provision of Bus Bay and Shelters for two buses. ○ Yellow box markings. ○ Provision of new Pedestrian Zebra Crossings. ○ Reconstruct mouth of side road (Steep Slope). ○ Retroreflective signs and road markings. • Option 2 <ul style="list-style-type: none"> ○ Elliptical roundabout operation around existing Police Control point. ○ Extending median nose of Tuikhuahtlang Road, at west and east approaches. ○ Provision of new pedestrian crossings with pedestrian refuges. ○ Provision of 1m footway-over-drain on west side of Mission Veng Road. ○ Widening existing footpaths on College Side and Provision of Bus Bay and Shelters for two buses. ○ Reconstruct mouth of side road (Steep Slope). ○ Restriction of vehicles departing on Tuikhuahtlang Road. ○ Retroreflective signs and road markings. 	



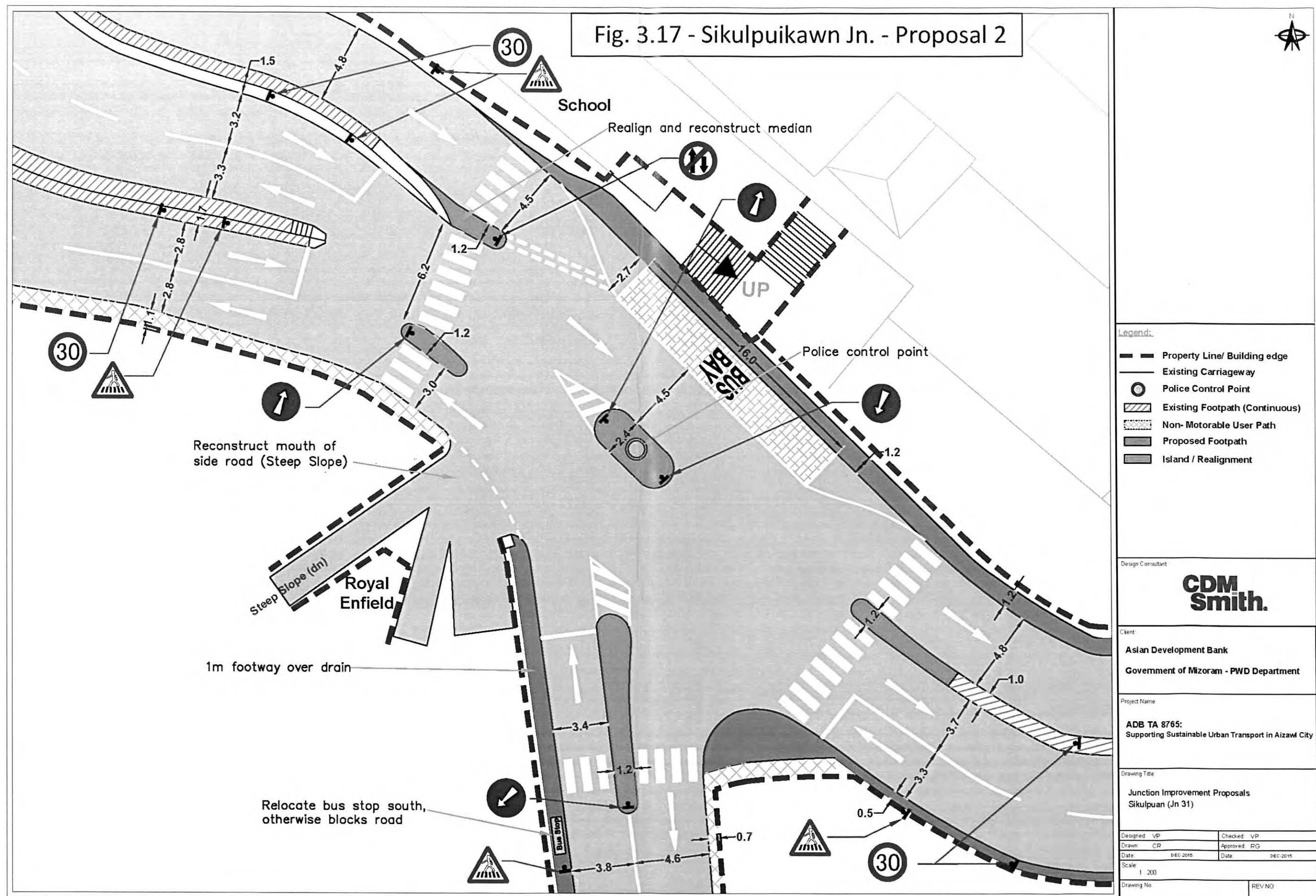
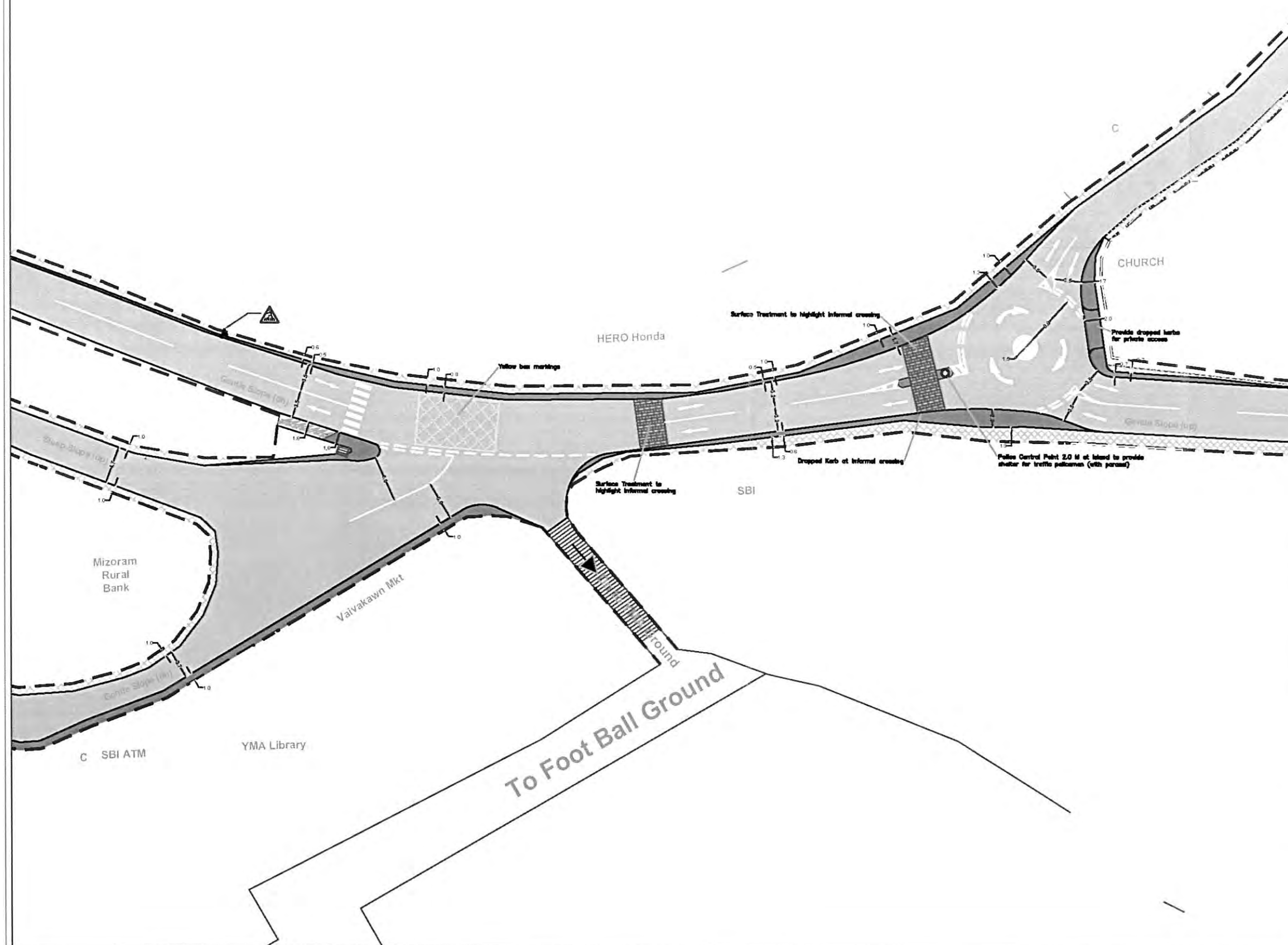


Fig. 3.18 - Vaivakawn Jn.



Legend:

- Property Line/ Building edge
- Existing Carriageway
- Police Control Point
- ▨ Non- Motorable User Path
- ▩ Proposed Footpath
- ▩ Island
- ▨ Informal Crossing

Design Consultant

**CDM
Smith.**

Client:

**Asian Development Bank
Government of Mizoram - PWD Department**

Project Name:

**ADB TA 8765:
Supporting Sustainable Urban Transport in Aizawl City**

Drawing Title:

**Junction Improvement Proposals
Vaivakawn Junction (Jn 18 & 19)**

Designed: VP	Checked: VP
Drawn: CR	Approved: RG
Date: DEC-2015	Date: DEC-2015
Scale: 1:500	
Drawing No:	REV NO: