Complete Streets

Joburg

a world class African city

TABLE OF CONTENTS

FOREWORD

In 2006 the City of Johannesburg developed and adopted a growth and development strategy, to align the long-term vision for the City with the short-term Integrated Development Planning process. The Joburg 2040 GDS is an aspirational strategy that defines the type of society the city aspires to achieve, by 2040. The strategy restates the City's resolve in confronting the past injustices created during Apartheid, working towards a democratic, non-racial, non-sexist and just City while simultaneously confronting present and future challenges as they emerge. Therefore, it contains:

- A vision and mission – which serves as a mental picture of Joburg, the city, by 2040;
- Principles – the values held by the City, as first articulated in the 2006 GDS;
- Outcomes – what the City seeks to achieve by 2040;
- Long-term outputs – the deliverables through which the City plans to achieve the desired outcomes; and
- Indicators – the measures through which the City plans to assess progress against its desired outcomes.

Four major outcomes define the Joburg 2040 GDS, namely:

- Outcome 1: Improved quality of life and development-driven resilience for all
- Outcome 2: Provide a resilient, liveable, sustainable urban environment – underpinned by infrastructure supportive of a low-carbon economy
- Outcome 3: An inclusive, job-intensive, resilient and competitive economy that harnesses the potential of citizens
- Outcome 4: A high performing metropolitan government that pro-actively contributes to and builds a sustainable, socially inclusive, locally integrated and globally competitive Gauteng City Region

A key concept expressed in GDS 2040, in line with Outcome 2, is that of *Liveability* and/or *Liveable Urbanism*. This concept relates to how an urban system can contribute to the physical, social and mental well-being and personal development of all its inhabitants. This can be achieved through the development of desirable spaces that offer and reflect cultural enrichment, encourage interaction and foster a sense of community.

The City's street system is by far the most prevalent communal space, hence it has an important role in creating a Liveable City. GDS 2040 recognises that car-oriented environments are not conducive to a sustainable and environmentally responsible City. This is due to the double edged negative impact of the monetary cost of fossil fuels, increasing at a rate much higher than that of incomes, and the pollution that results from their use.

GDS 2040 encourages the development of mass public transport systems as an alternative to car-oriented environments. The development of a street system that supports not only the movement of public transport vehicles, but also enables citizens from all user groups to access the public transport system safely and conveniently, is a key priority.

It is within this context that the City commissioned the development of a Guideline Manual that would recognise and promote the role of streets as both movement networks and agents of social cohesion.

This Document, *The City of Johannesburg Complete Streets Design Guideline Manual*, is the culmination of that process. It is a document that will guide the City in developing a street system that is in line with the concept of Liveability by encouraging the walking and cycling modes, caters for all users groups and encourages the use of public transport.

It is envisaged that this Design Guideline will serve as a starting point for a conversation between the City and its citizens as to how together we build movement spaces that are Liveable.

Introduction

1

1. INTRODUCTION

1.1 Why Complete Streets

In October 2010, the City of Johannesburg presented a report to the Mayoral Committee outlining a proposed new approach to ward based safety, with an emphasis on safer streets. The report highlighted the ineffectiveness of the previous approach of providing speed humps on roads within communities. It further outlined the features of the current street network that result in unsafe situations, such as:

- ☹ Lack of paved sidewalks or very limited areas for sidewalks;
- ☹ Conflict between pedestrians and private vehicular movement especially in the inner City of Johannesburg;
- ☹ Lack of street lighting which makes streets unsafe at night for pedestrians and road users;
- ☹ Poor storm water provision, open channels and blocked kerb inlets which exposes residents to risk of flooding and drowning;
- ☹ No dedicated cycling paths for cyclists;
- ☹ Potholes in the roads and holes in the pavement including open manholes;
- ☹ Unsynchronized and/or faulty traffic lights; and
- ☹ Lack of clear road markings and signage.

The new approach proposed was to conceptualise and begin to develop and re-develop the City's streets as *Complete Streets*. Complete Streets refers to roads designed to accommodate diverse modes, users and activities including walking, cycling, public transport, automobiles, nearby businesses and residents. Such street design helps create more multi-modal transport systems and more liveable communities.

The key features of complete streets are that they are designed for:

- ✓ **Safety**: Move people and goods safely
- ✓ **Access and Mobility**: Accommodate all street users, giving priority to the most energy– and space–efficient modes
- ✓ **Context**: Respond to neighbourhood character
- ✓ **Liveability**: Create a vibrant public realm with high–quality public spaces
- ✓ **Sustainability**: Contribute to a healthier and more sustainable environment
- ✓ **Visual Excellence**: Create coherent and harmonious streetscapes
- ✓ **Cost–Effectiveness**: Provide the greatest possible value to the public

1.2 Complete Streets Principles

- **Balance the needs of all users** of the public right-of-way by providing safe and convenient travel and access for cyclists, public transport users and operators, heavy vehicle and car drivers, and people of all ages and abilities.
- **Contribute to liveable communities by providing public open space that integrates amenities** including street trees and landscaping, street and sidewalk lighting, public transport facilities, street furniture, water features, and public art work.
- **Promote neighbourhood vitality** through infrastructural improvements that attract private investment and encourage pedestrian activity.
- Promote active living by **providing safe and attractive conditions for walking and biking**.
- **Provide safe and comfortable access for persons with disabilities.**
- Improve local air quality by reducing car use (emissions) and **incorporating trees and vegetation**.
- **Improve water quality through the integration of low impact development techniques** that both **reduce storm water runoff** and remove pollutants.
- **Promote the use of public transport modes** by improving the efficiency of public transport systems and creating safe, attractive walking environments.
- **Implemented through a coordinated approach** among City departments, and the leveraging of City assets and programs.
- Enhanced by encouraging adjacent new development to contribute Complete Street amenities through applicable city development standards and incentive programs.
- Within communities are designed to be integrated with a future comprehensive city-wide network of Complete Streets.

How to use the manual/ Implementation Strategy

2

2. HOW TO USE THE MANUAL/IMPLEMENTATION STRATEGY

2.1 Purpose of Document

The document comprises of information and concepts from various agencies and organisations faced with similar transportation issues. The City of Johannesburg acknowledges the existence of other practices and provides this document for those responsible for making professional engineering or other design decisions. It is not intended to replace the existing mandatory or advisory standards, nor the exercise of engineering judgment by registered professionals.

2.2 Complete Street Process

For the purpose of this Guide, the process used to achieve a Complete Street includes the following steps:

- Identify the Context/Land Use Character of the street.
- Identify the current modes of transportation appropriate for the area.
- Determine the Complete Street gaps —those design elements, facilities, and other transportation components that are necessary for a Complete Street.
- Determine Other Priorities.
- Identify the right-of-way width (for illustrative purposes only, this guide uses the narrowest rights-of-way for arterial and collector streets)and determine the appropriate number of vehicular, transit, and bike lanes. (Some of these lanes could be shared in certain instances.)
- Select the appropriate pedestrian and design elements and facilities.
- Refer to the checklist in **Annexure C** which can be used to check if a design meets the requirements of the Complete Streets guidelines

2.3 Implementation Strategy

2.3.1 Project Types

A strong implementation strategy is essential in the success of the Complete Streets concept. As such the following opportunities have been identified to implement the guidelines of this document:

2.3.2 Town Planning Applications

Township layout drawings articulate the vision for a community. They show the street, intersections, access points, development parcels (and associated land use), and open space for a new community. The township application is the first opportunity to identify streets that need to be given special attention (i.e. those within activity nodes and corridors). The defined typologies in the Complete Street Manual must assist in determining the function and land use context of a street. This determination should occur as early in the application review process as possible. All proposed streets should align with the cross-sections as proposed in the Complete Street Manual. Street design details will need to be determined at this Outline Plan stage.

2.3.3 Stand-alone Land Use Amendment Applications

Stand-alone rezoning applications are made when there is a desire to change the land use designation of a single parcel of land to accommodate a particular development type. During the review of this type of application, there is opportunity to ensure that right-of-way setback is preserved for the future design of the adjacent street. If

known, this is also an appropriate time to examine access considerations.

2.3.4 JPC Road Closure Applications

Road closure applications are typically submitted when there is a desire to consolidate unused public road right-of-way with an adjacent parcel of land. This is an opportunity for the City review team to ensure that publicly owned land for potential pedestrian connections, bicycle connections, and/or linear park space remains in the City's inventory.

2.3.5 Transportation Infrastructure Projects

Major transportation infrastructure projects are typically planned by the Transport Department, and designed and constructed by the JRA or JDA. Projects can include street and intersection improvements, corridor revitalization, interchange construction, pedestrian overpass construction, BRT, etc. This Complete Streets Guide should be at the front end of these projects during the planning and design stage.

2.3.6 Maintenance Program

There are opportunities to improve on these existing maintenance programs to better align with Complete Streets guidelines. For example, a street resurfacing (or overlay) project presents an opportunity to implement a road diet or introduce bicycle lanes by redesigning the road marking plans. Specific opportunities to provide complete street elements for these types of projects include:

- Restripe or slightly widen shoulder for bike lanes through intersections;
- Install sidewalks for pedestrians (both at intersections and to connect different approaches);
- Provide crosswalks;
- Add pedestrian refuges or islands;
- Install curb ramp upgrades/additions to comply with universal design standards
- Incorporate other complete street amenities.
- Traffic signal installation/upgrades:
  - Install pedestrian signal heads and countdown equipment;
  - Retime signals to allow for pedestrian phases and/or improve pedestrian safety;
  - Incorporate accessible pedestrian crossing signals;
  - Install curb ramp upgrades/additions to comply with requirements; and/or
  - Incorporate other complete street amenities or technologies.
- Pavement restriping (similar to maintenance projects):
  - Convert streets or use road diets to provide a full bike lane;
  - Reduce lane widths to provide a full bike lane;
  - Stripe pavement for a shoulder/edge lines on streets with curb and gutter (may be in conjunction with a street conversion or as a standalone maintenance project);
- Thoroughfare widening:
  - Widen street for striped bike lane;
  - Widen/pave shoulders to provide wider outside lane, paved shoulder, or striped bike lane;
  - Construct sidewalks; and/or
  - Incorporate other complete street amenities or technologies

Typologies

3

3. TYPOLOGIES

3.1 Current Functional Classification

In 2009, CoJ undertook a process to align its road classification system with the Road Infrastructure Strategic Framework for South Africa (RISFSA) Road Classification System, published by the National Department of Transport in 2008. The RISFSA system went beyond the traditional of defining road hierarchy as a trade-off between mobility and accessibility, by incorporating the following characteristics:

- Functionality;
- Traffic Volume;
- Public Transport;
- Geometry;
- Access Spacing;
- Pedestrians;
- Freight; and
- Traffic Calming.

The output of this alignment process was the re-classification of existing roads in each of the regions of the Regional Spatial Development Framework, and development of proposals for classification of future roads

3.2 Proposed Contextual Classification

In the Complete Streets concept streets are categorized into broader typologies that account for non-motorized road users (pedestrians, bicyclists, and public transport) as well as land use context and environmental factors. Such typologies complement the Complete Streets paradigm as they allow for a more comprehensive understanding of a street's existing and desired functions.

These guidelines propose new street typologies that provide greater nuance than is available through the traditional functional classification system, which defines roads exclusively by their function for automobiles.

RIFSA Classification	Complete Streets Considerations	New Typology	Pedestrians	Bicycles	Public Transport	Motor Vehicles	Goods Vehicles	Emergency Vehicles
Class 1	The primary function is high mobility, hence complete streets principles are applicable primarily in ensuring adequate provision of grade separated crossings for pedestrians and cyclists.	Motorway/ Primary Distributor						
Class 2	This class of road represents major arterials and have historically catered for need of motorised travel. In the context of Complete Streets, the following needs to be taken into account: • These route are the most direct linkages between home and work centres, hence cyclists are prone to use these routes. Consider providing Class II cycling facilities;. • Some of these roads have low income residential settlements adjacent to them, hence special attention needs to be provided to pedestrian crossing facilities and access to public transport stops; Where these roads form part of the Strategic Public Transport Network, public transport modes need to be given priority.	Arterial / Regional Distributor						
		BRT Trunk Route						
Class 3	Special care needs to be taken in separating motorised vehicles and pedestrians. Class III cycling facilities are appropriate.	District Distributor						

Legend

- Not required, or poor performance is acceptable (low quality or no facilities, high travel delay)
- Accommodated with variable standards (average quality facilities, average travel delay
- Accommodated with high standards (high quality facilities, low travel delay)

RIFSA Classification	Complete Streets Considerations	New Typology	Pedestrians	Bicycles	Public Transport	Motor Vehicles	Goods Vehicles	Emergency Vehicles
Class 4	Due to high number of pedestrians along these roads, Class III cycling facilities are more appropriate. In CBD areas: • On-street parking is important, hence special care needs to be taken when providing cylcing facilities adjacent to on-street parking. • Minimum sidewalk width is not appropriate due to high numbers of pedestrians and presence of other activities on the verge. In Industrial Areas Curb radii need to accommodate heavy vehicle turning movements, hence the presence of long crossing paths at intersections may not be avoidable.	CBD Road / Activity Street / Local Distributor/ Boulevard						
		Industrial Road						
Class 5	Speed reduction measures should be used to keep speeds within acceptable levels for the safe movement of pedestrians and cyclists	Residential Collector						
		Residential Street						
Class 6	Motorised vehicles are not permitted except for emergency vehicles in an emergency situation. Class I bicycle facilities to be provided.	NMT Route / Greenway/ Multi Use Pathway						

Design Elements

4

4. DESIGN ELEMENTS

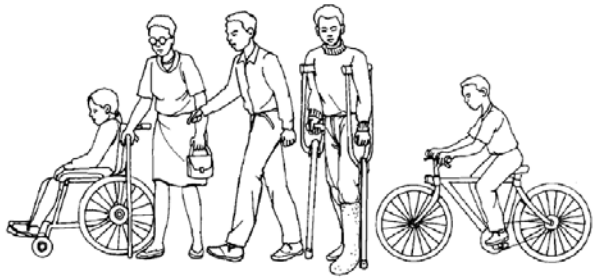
4.1 Pedestrians

4.1.1 Universal Design

Universal Design is a process which attempts to make any facility (or product) usable in comfort and safety by people with the widest range of abilities (physical or cognitive), sizes or shapes. It cannot be treated as an add-on item. Universal Design and Accessibility is required under the terms of the South African Constitution, the obligations placed on the country under the UN Charter on the Rights of People with Disabilities, as well as many national laws, such as the Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000).

The Department of Transport in South Africa recognises the following groups as people with categories of special needs:

- People with disabilities: defined in the Act as people with a physical, sensory or mental disability; which may be permanent or temporary.
- The aged: or elderly people. People over the age of 55 usually fall in this category.
- Pregnant women: usually taken as women in their last three months of pregnancy.
- Young children: this is usually defined as children between the ages of 0-14.
- Those who are limited in their movements by children: men and women accompanying young children.
- Signage passengers: People who are unable to read or who are unable to understand the language used on the signage. Tourists are also included as signage passengers.
- Female passengers: whilst safety and security affects all passenger groups and both genders, it should be noted that female passengers (together with People with Disabilities) are particularly at risk of crime and abuse.
- Load carrying passengers: people carrying bags, luggage, or goods of a size that means that they benefit from accessibility features. This is important to people on low incomes in South Africa. People travelling with bicycles are generally also included in this category.



Using the foregoing, it is essential to try to design intersections so they are understandable, safe, and as easy to use as possible to a wide range of users. This would include way finding and signage, safe segregation between pedestrians, cyclists, and vehicular traffic. There are legal requirements in terms of tactile paving and kerb ramps, which have to be adhered to, namely SANS 10400 & SANS 784.

Tactile paving enables people with sight impairments to move independently through an intersection. The kerb ramp (or raised

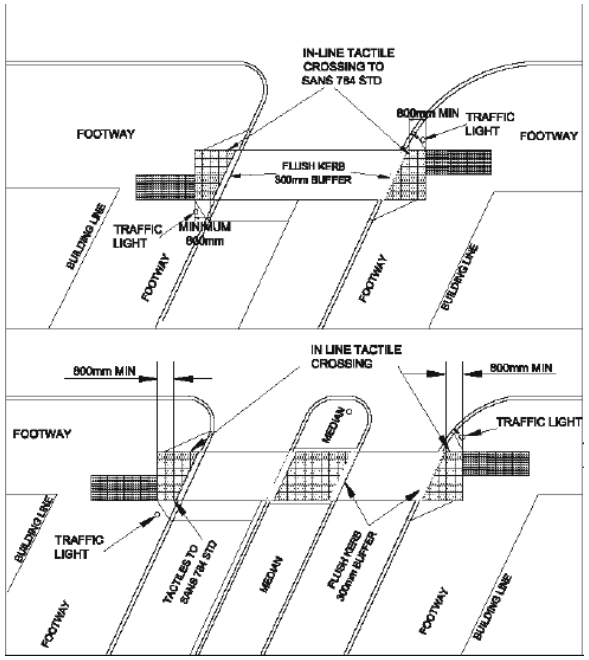
intersection) enables wheelchair users, people pushing prams, pushchairs or trolleys, people with wheeled items, and many other people with mobility impairments to cross comfortably. In terms of Universal Design it is also incumbent on designers to ensure the safety of all people using the intersection. This may include traffic calming methods, road signage, barrier kerbs, and possibly barriers and or guard rails. On a wide intersection, there may be a need to provide a safe refuge (island) in the intersection. It is also important to ensure that there is adequate lighting and uninterrupted sight-lines where possible.

All surfaces should be level, non-slip and free from pebbles or gravel and the like. Bold patterns, which could be confusing, should be avoided. Ideally street furniture (including seating, which is needed by a large proportion of society) should be placed away from the major pedestrian routes, but should be clearly identifiable from their surroundings.

Very careful consideration needs to be given to way finding and signage. For full accessibility to be achieved, it is vital that the concept of Universal Design and Accessibility is embraced by all stakeholders at all stages through the concept, design, build, operation and maintenance of any complete street project.

The National Department of Transport has developed the Pedestrian and Bicycle Facility Guidelines document as early as 2002. This document provides in-depth analysis and proposals for Universal Design, taking needs of special needs users such as the elderly, the young and the physically challenged. Refer to Annexure A.

More recently, the City of Tshwane has developed a set of typical detail drawings for Universal Design, through engineering firm GIBB (Pty) Ltd. Refer to Annexure B. The National Department of Transport has endorsed these drawings as they offer details that are complementary to the Pedestrian and Bicycle Facility Guideline.



4.1.2 Sidewalks

Walking is the most basic mode of transportation for people, therefore sidewalks should preferably be provided on both sides of all streets.

Considerations:

- Should provide comfort, safety, convenience and encourage walking.
- Should be continuous along desire lines, limiting the number of conflicts with other modes of transport.
- Must be designed to be universally accessible, especially to those with disabilities or special needs.
- Surfaces must be firm, smooth, non-slippery and stable.

Detached Sidewalk

Attached Sidewalk

The following are the sidewalk principles embedded in the Complete Streets Guide for the street palette:

- Separated sidewalks should be a minimum 1.5m wide (all classifications).
- Sidewalks in CBDs should be a minimum 2.0m wide for improved pedestrian safety (1.5m permitted on residential and industrial streets).
- Sidewalks should be provided on both sides of all street classifications (including most residential and industrial areas)
- Wider (≥2.0m) sidewalks should be provided along public transport routes and connections to public transport hubs.
- Wider (≥2.0m) sidewalks should be provided for connections to schools, within activity centres and near major pedestrian generators (e.g. stadiums).
- Sidewalks should be wider (>2.0m) to provide separation from traffic when
    - truck volumes are > 10% of total volume
    - design speed is >60 km/h
    - traffic volume is >20,000 vehicles per day. (Note: does not apply to industrial streets)
- Sidewalk width should be chosen based on surrounding land uses (higher density requires wider sidewalk).
- For sidewalks constructed at the base of the retaining wall (between the wall and the street), be sure to include additional sidewalk width (space to remove the discomfort of having to walk immediately next to the wall or curb). The additional sidewalk width required might need to vary by the height of the wall, with higher walls requiring more space and very low walls

requiring less. However, this distance should typically be at least 0.3m from the wall and, if the sidewalk must be back-of-curb due to space constraints. Generally a sidewalk next to a retaining wall should be at least 2.3m wide on avenues, boulevards, and parkways, not including the curb measurement.

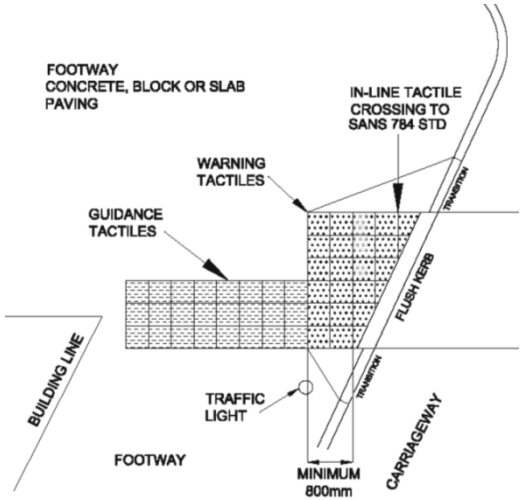
- For sidewalks constructed near the top of retaining walls, provide the same additional sidewalk width as described above, and (depending on the height of the wall) include a handrail at the top of the retaining wall
- Pedestrian-scaled lighting should be incorporated appropriate to the use of the street.
- Handrails and landings should be provided along steep grades.

4.1.3 Kerb Ramps

Enables wheelchair users, people pushing prams, pushchairs or trolleys, people with wheeled items, and many other people with mobility impairments to cross comfortably.

Considerations:

- Provide at all intersections and crossings.
- Provide tactile paving to guide people with sight impairments toward kerb ramps.
- Position the ramps in line with crossings and walkways, along the most direct path of travel.



4.1.4 Reduced Kerb Radii

A reduction in the kerb radius at an intersection would enable shorter crossing distances for pedestrians, while also promoting lower vehicle turning speeds.

Considerations:

- Impacts heavy vehicles turning, thus truck routes and adjacent land uses should be taken into consideration.
- Especially appropriate for CBD areas with high pedestrian volumes.
- Apply parking restrictions in the vicinity of the intersection to increase the effective turning radius available.
- Landscaping could be incorporated in the design, but should not inhibit sight lines.

4.1.5 Kerb Extensions / Bulb-outs

Kerb extensions would enable shorter pedestrian crossing distances and act as a choker, thereby reducing vehicular travel speeds.

Considerations:

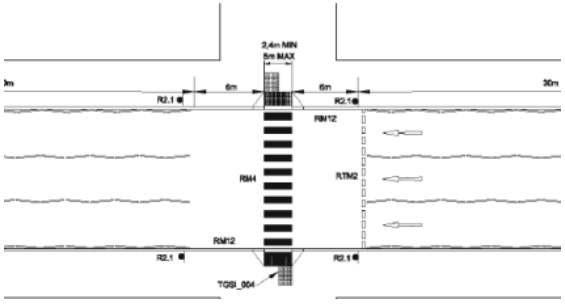
- Avoid encroachment onto bike lanes.
- Kerbs should be clearly demarcated.
- Vegetation should not impede sight lines.

4.1.6 Mid-block Pedestrian Crossings

Provided at location to support pedestrian desire lines.

Considerations:

- Ensure availability of stopping sight distance.
- Consider provision of a stop bar on multi-lane facilities.
- Restrict parking adjacent to crosswalk.
- Provide kerb extensions, not encroaching into cycle path.
- Use reflective materials on kerbs.
- Only provide unsignalized mid-block crosswalks on streets with sufficient gaps in the traffic stream.
- Provide wheelchair ramps or at-grade channels with curbs and medians.
- Provide a raised median pedestrian refuge on wide medians.
- Use zebra crosswalk markings for increased visibility.
- Construct a speed table where appropriate.
- Consider advance warning signs for vehicle traffic.
- Consider kerb extensions with illumination and warning signs on vehicular approaches to increase visibility.
- Provide special intersection paving treatments to break the visual uniformity of asphalt streets and highlight the crossings as an extension of the pedestrian realm.
- Consider providing special pavement stencils such as “Pedestrians Look Right” at crossings where vehicles approach from unexpected directions, such as along one-way streets, contra-flow lanes and BRT median lanes.
- Provide high-visibility crosswalks at locations with high pedestrian flows and/or identified as a hazardous location.
- Review the need for signalization based on warrants.

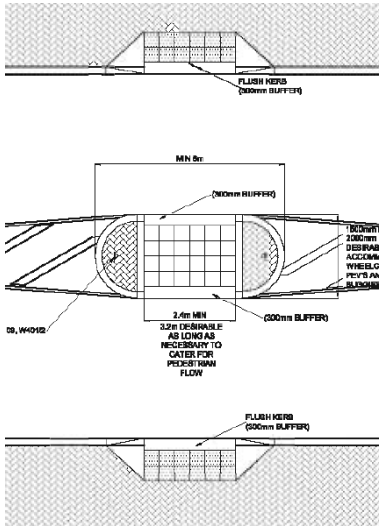


4.1.7 Refuge Islands

Provides refuge to pedestrians crossing a roadway either at an intersection or mid-block crossing.

Considerations:

- The island should extend through the crosswalk, serving as a guide to turning vehicles and creating space for signage.
- Provide a curb cut for wheelchair accessibility.
- Actuated pedestrian signals should have an accessible pedestrian push button in the median.

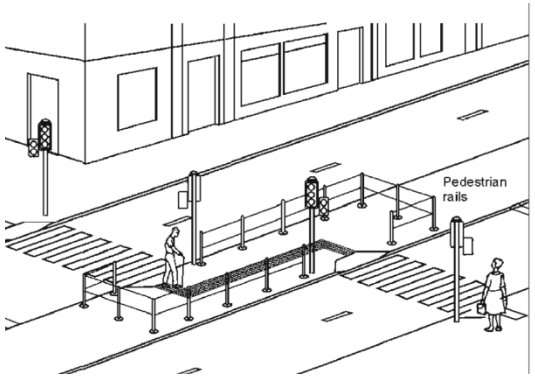


4.1.8 Split Pedestrian Crossovers

Pedestrians are channelled within a median with the use of railings to promote a staged crossing.

Considerations:

- Design it such that pedestrians enter the island at one end, walk in the direction of oncoming traffic, before crossing the second half of the street.
- Primarily used at mid-block locations.
- Could be used at signalized intersections to force a staged crossing in support of signal timing and/or coordination.
- Provide yield signs and markings in advance of crossing.



4.1.9 Pedestrian Grade Separation

Provided at locations with very high pedestrian volumes (such as modal transfer facilities), roads with high vehicular volumes and across freeways.

Considerations:

- Ramps should be universally designed and positioned to promote the use of the facility.
- Measures should be implemented to deter jaywalking, such as the provision of median barriers.
- A pedestrian over-pass is preferred above the provision of a culvert.
- The design should promote safety and security.
- Lighting should be provided.

4.2 Cyclists

4.2.1 Class I - Bicycle Roads

A bicycle road has an independent alignment in a cycle reserve.

Considerations:

- A 3.5m road width is desirable, but an absolute minimum of 2.5m could be considered.
- Provide 0.5m lateral clearance and at least 2.5m vertical clearance.
- Commuter and recreational routes where there is adequate space for greenway development.
- Preferably separated from pedestrians, but could be designed as multi-use pathways;
- Typically having grade separation at intersections;
- There are limited accesses and junctions, and cyclists are not required to behave as pedestrians rather than vehicles at junctions.
- Provide smooth pavement.
- Ensure connectivity through the development of a bicycle master plan.

4.2.2 Class II - Bicycle Ways

Provided within the road reserve of a street or road, either on- or adjacent to the carriageway.

Considerations:

- A 3.0m two-way lane width is desirable, but an absolute minimum of 2.5m could be considered;
- A 1.8m one-way lane width is desirable, but an absolute minimum of 1.5m could be considered;
- Provide 0.5m lateral clearance where no property access is present, otherwise 3.0m is required.
- There are limited accesses and junctions, and cyclists are not required to behave as pedestrians rather than vehicles at junctions.
- Ensure continuity of routes.
- Provide sufficient sight distance at intersections and accesses.
- Preferably separated from pedestrians, but could be designed as multi-use pathways;
- Provide smooth pavement.
- Ensure proper maintenance, especially pavement edges.
- Provide a smooth transition from pavement to gutter pan.

4.2.3 Class III - Bicycle Lanes

Specifically marked on the roadway pavement, usually unprotected.

Considerations:

- Provide on streets with an 80km/h posted speed limit, but preferably 60/70 km/h;
- Provision should be made for aerodynamic forces where heavy vehicle speeds exceed 70km/h. This is done by providing a separation distance between the roadway and cycle lane, varying from 0.5 to 2.2m.
- Not appropriate for use by young cyclists.
- Ensure proper maintenance, especially pavement edges.
- Provide a smooth transition from pavement to gutter pan.

The following minimum cycle lane widths apply:

Parking prohibited with kerbing or hard shoulder*	1.2 m
Roadway with unpaved shoulder or sloped drop-off	1.5 m
Parking permitted	1.8 m
Minimum width at junctions	1.5 m
Desirable width at junctions	1.8 m
Maximum width at junctions	2.0 m

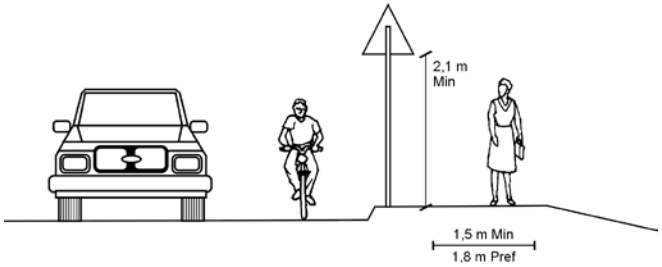
* Excludes gutter width

4.2.4 Class IV - Bicycle Routes

Accommodated on the roadway, shared with vehicular traffic and indicated by road signs only.

Considerations:

- Maximum vehicle speeds 50km/h, but preferably lower than 40 km/h;
- Desirable shared lane width of4.5 m, with an absolute minimum shared lane width of 4.2 m
- Provided on streets with low traffic volumes, no through traffic and no parallel parking;
- Not provided for use by young cyclists.
- Ensure proper maintenance, especially pavement edges.
- Provide a smooth transition from pavement to gutter pan.



4.2.5 Bicycle Parking

Bicycle parking can be classified into short-term parking serving visitors and customers (e.g. ribbon, spiral and freestanding racks) and long-term parking serving employees, students, residents, commuters and others expected to park more than two hours (e.g. lockers, check-in facilities, monitored parking, restricted access parking and personal storage).

Considerations:

- Provide weather protection.
- Clearly visible to pedestrians, alternatively sufficient signage should be provided towards bicycle facilities.
- Provide sufficient lighting and weather protection.
- In popular retail areas, two or more racks should be installed on each side of each block.
- Should be conveniently located near building entrances and close to transit stops.
- Should be grouped in lots not exceeding 16 spaces each.
- Provide bicycle ramps along stairways to promote accessibility.

4.2.6 Drainage Grates

Inappropriate drainage grates could adversely affect the operation of bicycle facilities.

Considerations:

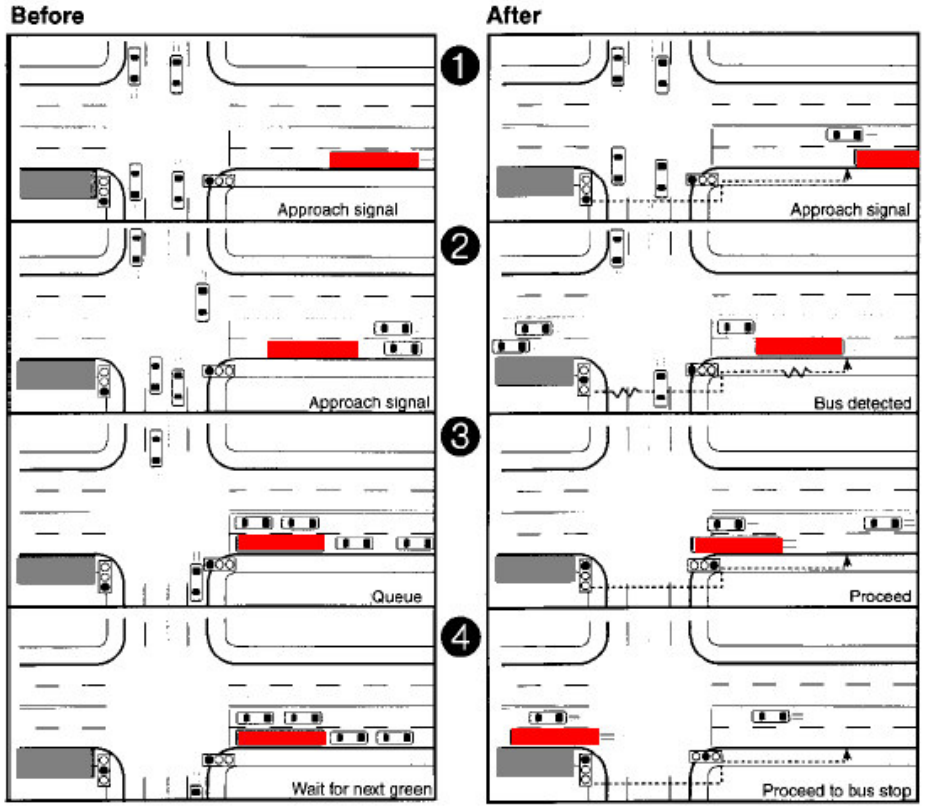
- Use bicycle-safe drainage grates which are narrow enough not to encroach onto bicycle kerb lanes.
- Drainage grate slots should be aligned perpendicular to bicycle travelled ways, avoiding bicycle wheels getting trapped in slots.
- As grates are slippery to cyclists, position them outside bicyclists' typical paths.
- Ensure surfaces are flush with the roadway.
- Avoid the collection of debris and ponding through regular maintenance.

4.3 Public Transport

4.3.1 Traffic Signal Priority

The most common public transport signal priority systems in use are passive priority (including adjust cycle length, split phases, area wide timing plans and bypass metered signals) and active priority (including phase extension, early start, special phase, phase suppression, unconditional pre-emption and conditional pre-emption.

In view of the limited budget available for maintenance of and provision of new infrastructure, traffic signal priority is often seen as a miracle solution which can provide good results at a very low cost.



Considerations:

- Traffic signal priority is not a cure-all for all types of delay.
- Higher public transport volumes warrant dedicated public transport right of way.
- The number of public transport vehicles that can receive active priority is limited.
- Operating conditions limit the application of signal priority measures.
- Signal priority is most effective in conjunction with measures such as queue bypass lanes.

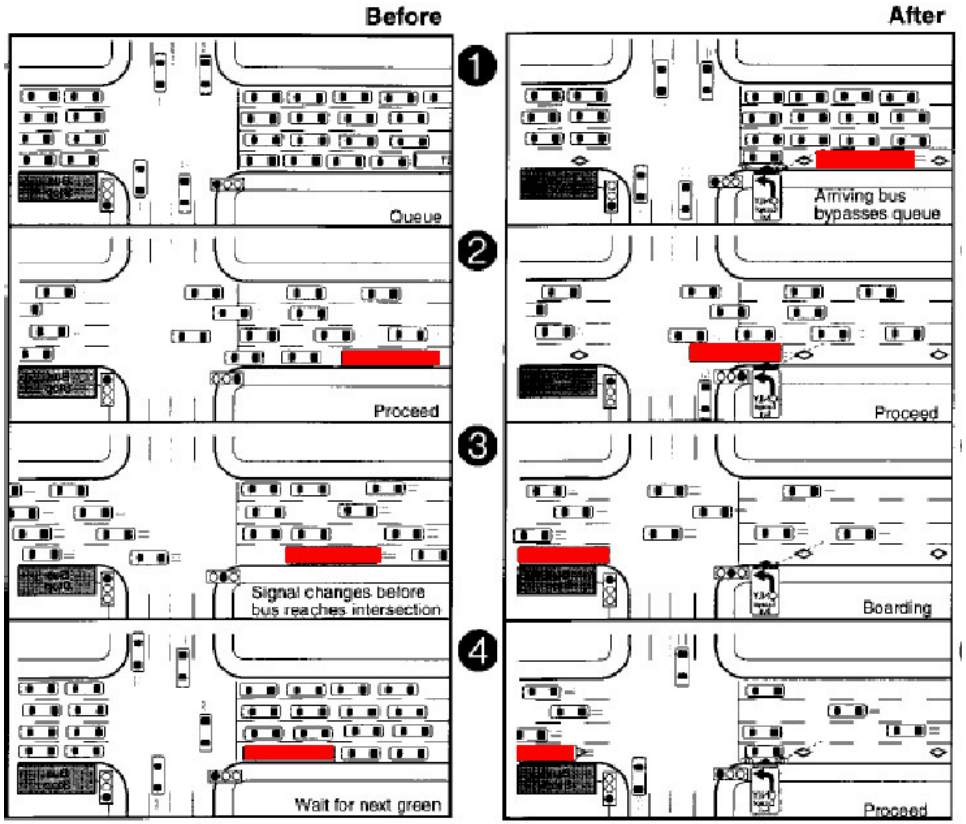
4.3.2 Exclusive Public Transport Lanes

Exclusive public transport lanes are travel lanes reserved for use by public transport or high occupancy vehicles (HOV) to bypass congested travel lanes. They can be operated throughout the day or only during peak times. The types of exclusive public transport lanes are:

- With-flow lanes
- Contra-flow lanes
- Bus Streets
- Bus ways
- Bus Rapid Transit

Considerations:

- The planning should only allow for the use of exclusive lanes by buses and recapitalised taxis with 18 seats or more. Metered taxis should not be allowed to make use of the public transport priority measures.
- Where demand results in high volumes of taxis, the potential to convert of some of these services to scheduled bus services should be investigated to reduce congestion on the route

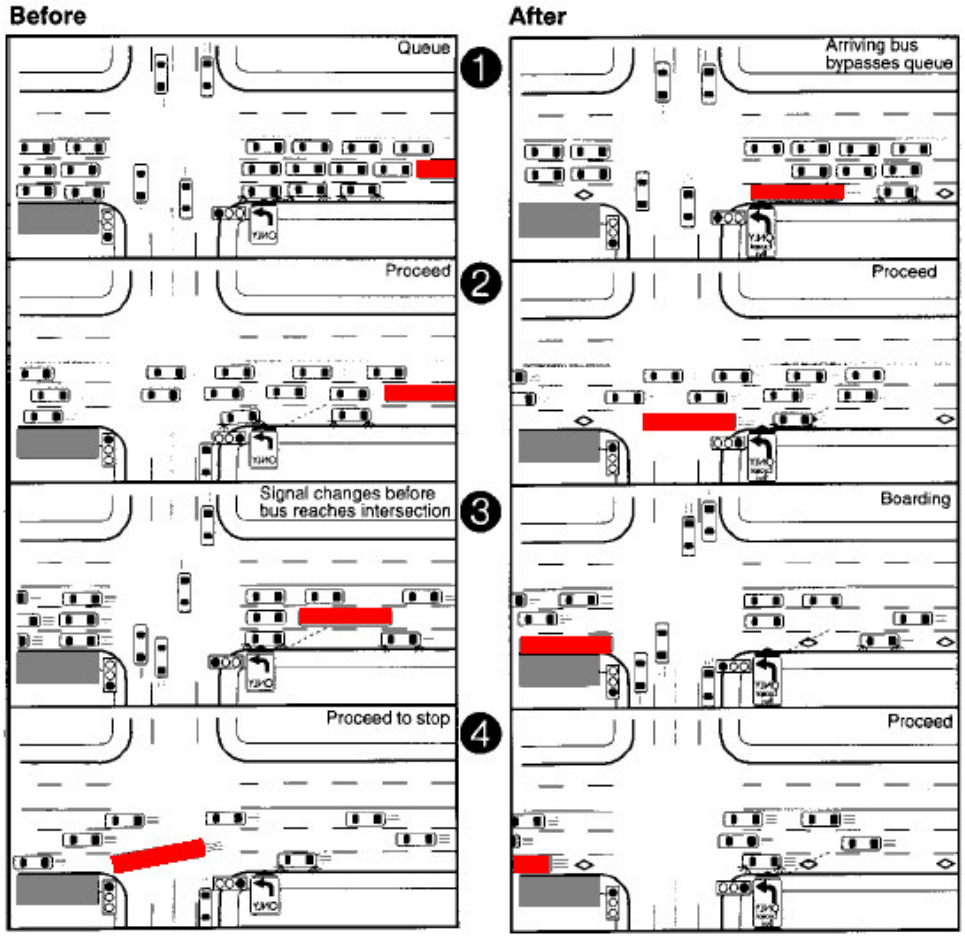


4.3.3 Queue Bypass

A queue bypass is a short lane used by public transport vehicles to bypass traffic queues at signalised intersections. The bypass lane is usually a left-turn lane that allows through travel for public transport vehicles only or a long off-line stop. If traffic signal priority is used, bypasses can also be created with right-turn lanes.

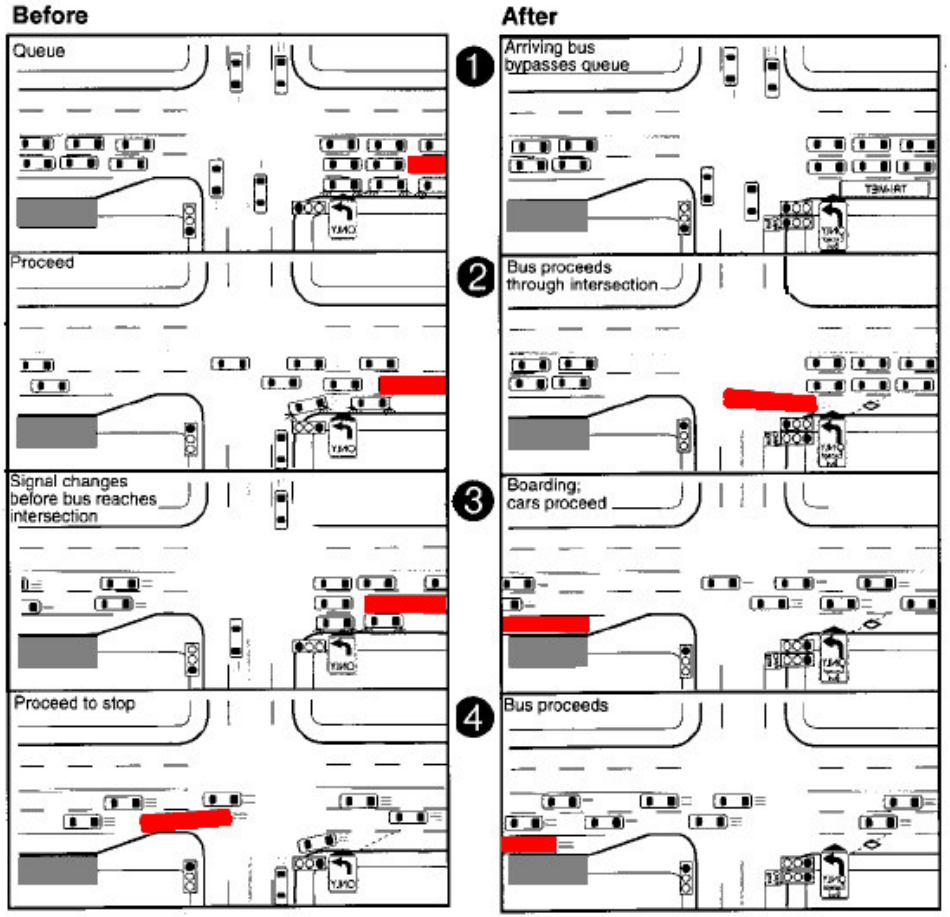
Considerations:

- Particularly applicable to intersection approaches with high through lane queue delay and low left turning volumes.
- This is deemed a cost effective solution that can make a significant difference to public transport travel time and should be implemented where possible, particularly at known bottlenecks.



4.3.4 Queue Jump

Queue Jump is used in conjunction with a Queue Bypass at the intersection approach. A queue jump allows a public transport vehicle to call for an early green phase that starts 2 – 3 seconds ahead of the normal green phase. This exclusive early green allows buses to proceed into the intersection and merge back into the mixed flow traffic lane in front of regular traffic.

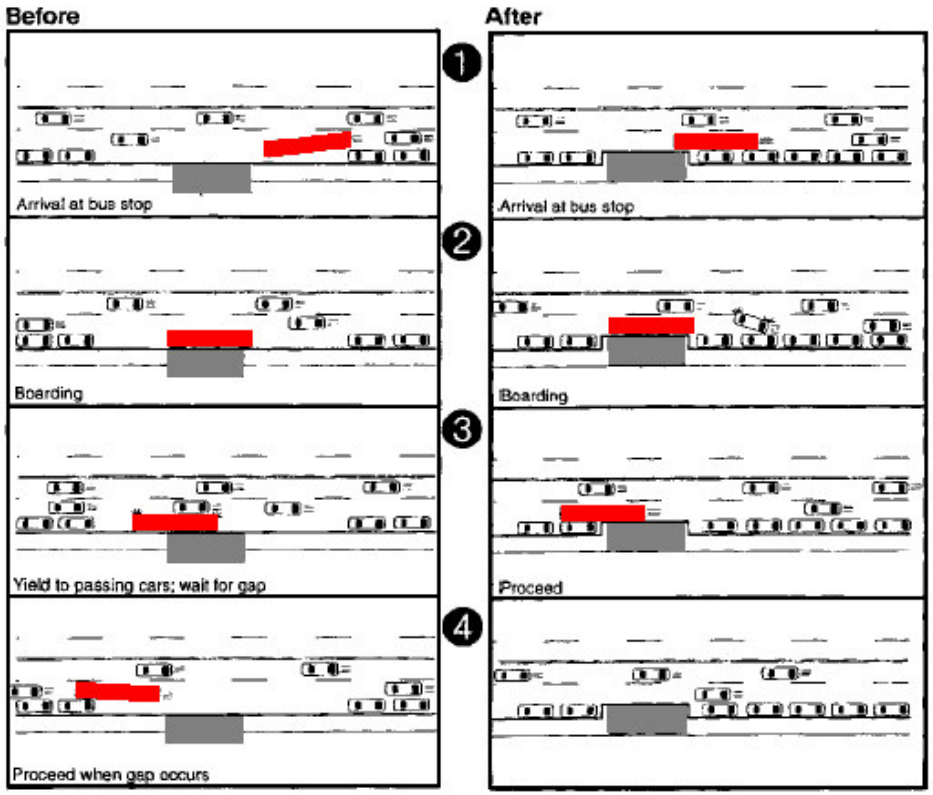


Considerations:

- Where a high number of public transport vehicles are expected to operate on the corridor in future, only a small percentage of vehicles would be able to make use of the signal to merge back into the traffic downstream of the intersection.
- Because the queue-bypass lanes are often shared with left turning traffic, it is likely that these vehicles might be ahead of the bus or taxi when the public transport signal occurs, causing the public transport vehicle to miss the signal.

4.3.5 Kerb Extensions

Public transport stops can either be in-line where public transport vehicles stop in the travelled lane or off-line where they pull out of the traffic flow into a layby. While offline stops reduce general vehicle delay by pulling the public transport vehicles out of the vehicle flow, they have a negative impact on the overall speed of the service because of re-entry delay.



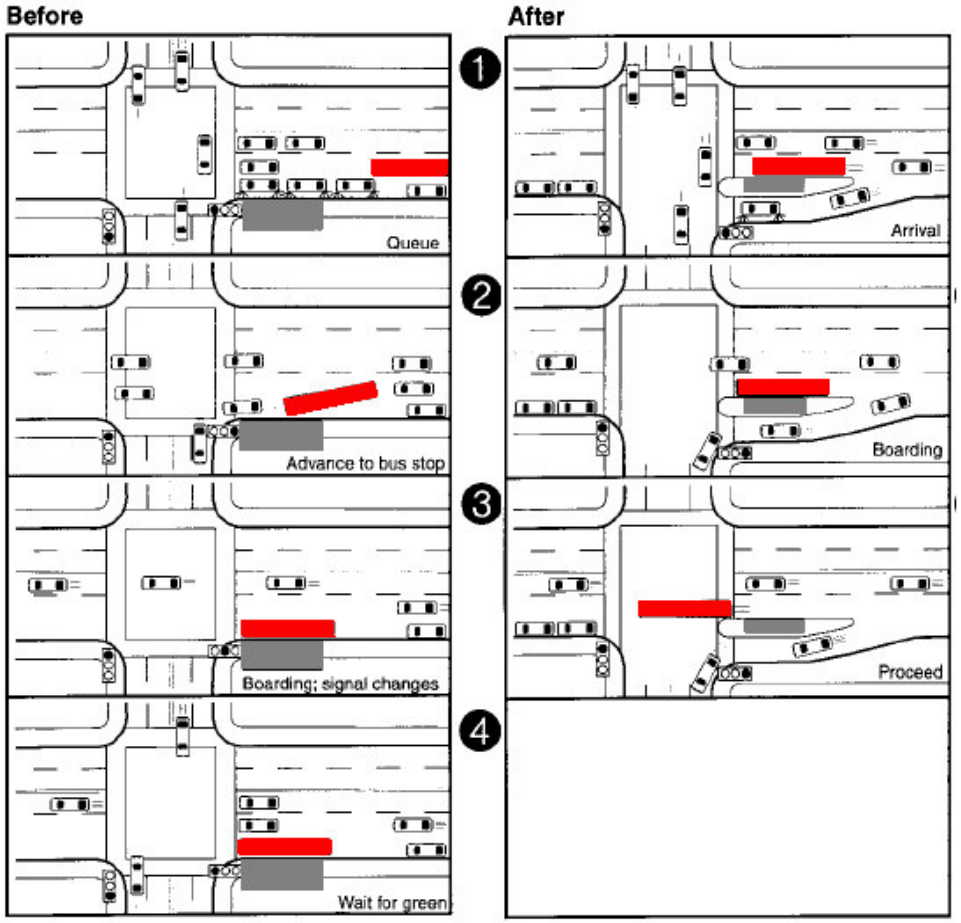
Considerations:

This solution should be considered where stops are planned where on-street parking occurs.

Because of the nature of most SPTN corridors (arterial roads) there is likely to be little or no on-street parallel parking.

4.3.6 Boarding Islands

Boarding islands allow buses to operate in a non-kerb travel lane without having to merge to the left lane to pick up or drop off passengers at the kerb. It is useful in areas with high side friction caused by left-turning vehicles waiting at a crosswalk, delivery vehicles, parking manoeuvres etc.



Considerations:

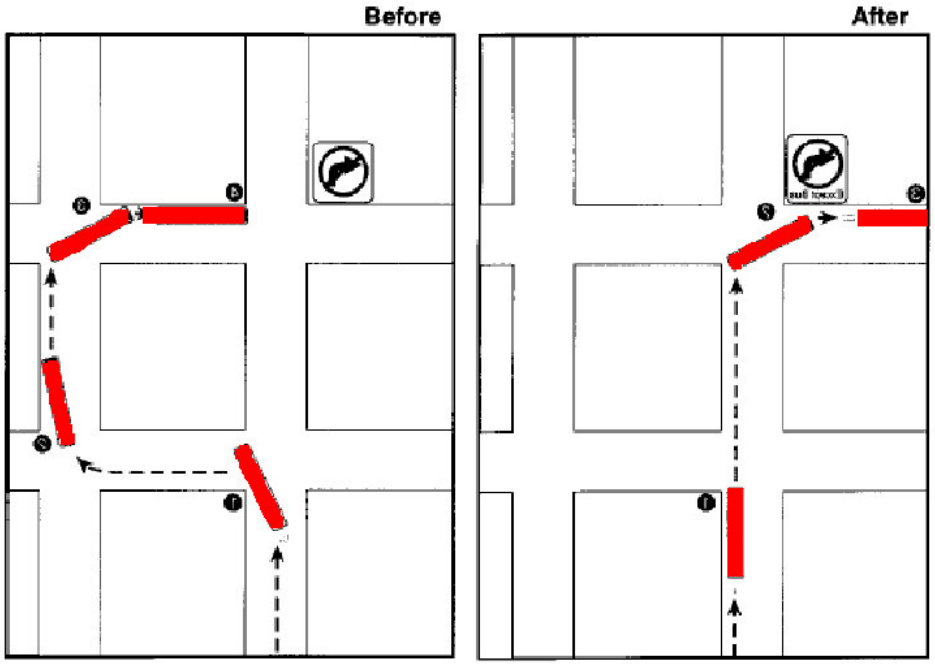
The roadway must have at least two travel lanes in each direction, with a significant difference between left- and right lane travel speed.

There must be significant right of way to accommodate the introduction of a boarding island

Passenger accessibility, comfort and safety, and the effect on all bus and car movements must be carefully considered.

4.3.7 Exemption from Turning Restriction

Public transport vehicles are exempted from turning restrictions designed to improve overall traffic flow, such as right-turn restrictions on arterial streets without turning lanes. At signalised intersections, special turning phases for public transport vehicles may be warranted to exempt these vehicles from turning restrictions,



Considerations:

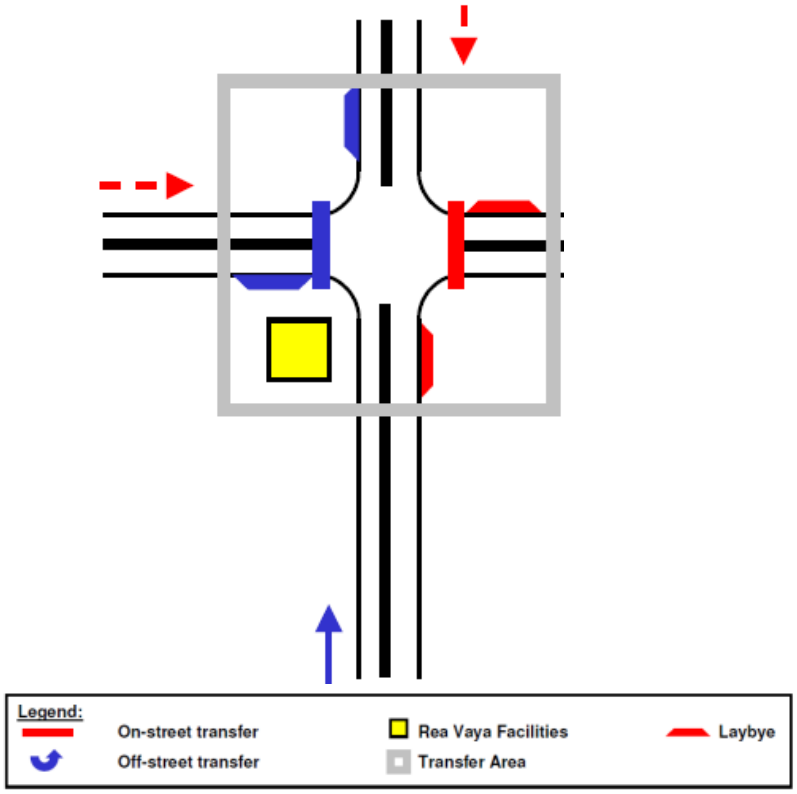
- Increases public transport operating speed by eliminating the need for detours.
- Only appropriate for intersections where turning restrictions are required due to congestion, and not because of traffic safety problems.
- Special public transport actuated turning phases may degrade intersection level of service.

4.3.8 On-Street Facilities

On-street facilities are used mainly by “through” services, which stop at these facilities to pick up or drop off passengers but remain on the route (as opposed to turning off it and into an off-street facility) and continue with the trip after stopping.

Considerations:

- Travel time is minimised.
- With lay-byes, vehicles need a gap to re-join the traffic stream, while with a stop in the street, public transport priority is provided since this eliminates waiting for a gap.
- Stops are spread out over a larger area, making it more difficult to secure
- Pedestrians have longer walking distances to transfer, in some cases crossing a street.

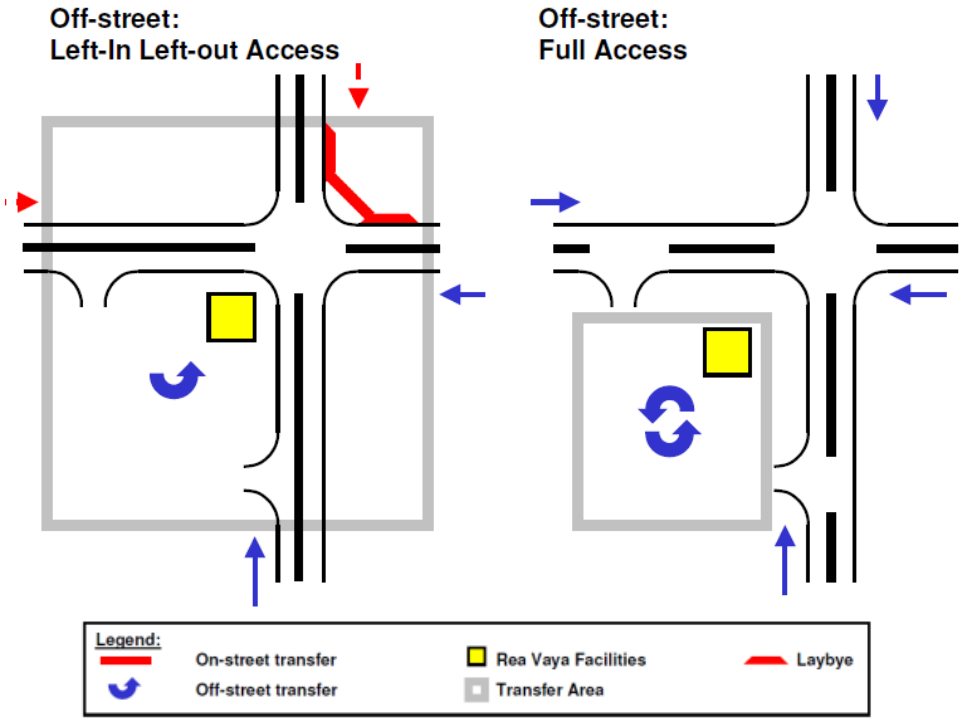


4.3.9 Off-Street Facilities

The design of off-street vehicle facilities depends on the extent of feeder services to be provided and the number of services starting and or terminating at the facility.

Considerations:

- Safety and security easier to control.
- More compact – convenient to public transport users – minimal walking distance between transfers and no street crossing is required
- Single off-street facility is easier to secure, manage and maintain.
- Vehicles need to enter the facility to drop off / pick up passengers, increasing travel distance and therefore travel time.
- Access requirements for public transport vehicles are in conflict with high volume movements on the major arterials on which the corridor is located.
- Left-in left out access cannot accommodate all movements (without making U-turns) – necessitating lay-byes across the road for those movements.
- Full signalised access cannot be provided in close proximity to the intersection without compromising traffic flow on the arterial.
- More expensive – larger areas are required to accommodate buses turning, and to provide access.



4.3.10 Public Passenger Transport Lay-byes

Lay-byes are typically located downstream of intersections to improve pedestrian safety and free flow of traffic.

Considerations:

- Should be close enough to intersections to keep the walking distance to the minimum and to avoid pedestrians crossing at random points along the road.
- Must allow for 35-seater passenger vehicles, standard commuter buses and double-decker buses and should vary from 2.5m to 3m.
- Tapering should not be within 6m of a street corner, midblock pedestrian crossing or bridge.
- Should not infringe on minimum sidewalk width requirements, i.e. clear width of 1.8m.
- Appropriate signage and road markings shall be provided.
- Should be used as stops and not as holding areas, with a maximum stopping time of 3 minutes per vehicle.
- Storm water drainage should be provided.
- Passenger waiting areas should include a paved area, shelter, lighting, trees and refuse bins. Informal trader activities near or around the lay-byes should be allowed only if they are consistent with the relevant by-laws.
- Advertising on shelters could be considered.

Preferred Locations:

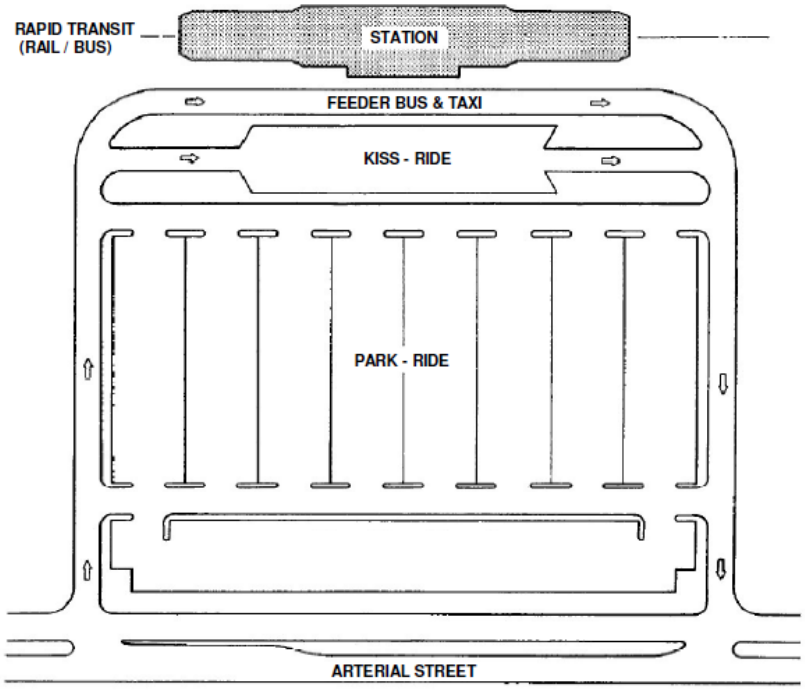
- Far-side of signalized intersections are the preferred locations for stops on main streets, avenues and boulevards.
- Near-side stops at unsignalized intersections under certain circumstances may be appropriate.
- Mid-block stop locations may be considered for avenues and boulevards, particularly if there are longer blocks or greater distances between signalized intersections. Include mid-block crossings appropriate to the context at these locations.
- Off-street stops, or in some cases bus pull outs, are typical for parkways due to the speeds and context. Pull-outs may be considered on boulevards, but are typically not preferred on avenues and main streets unless the stop is a staging point.
- Recommended spacing of 400 metres along transit routes.

4.3.11 Park and Ride Facilities

Park and Ride facilities should be located at transfer points where a large number of potential public transport users are located beyond easy walking distance to the transfer point or where they cannot be served effectively by a feeder service.

Considerations:

- Should only be provided where their provision would either save commuters travel time or expand the service catchment area.
- Reduce the need for feeder services and also permit wider spacing between transfer points, which in turn reduces travel time.
- Most successful when free or low-cost parking is offered, peak hour services headways are 10 minutes or less and at least 5 minutes of travel time is saved by commuters.
- Parking facilities could be free, incorporated in the public transport service fee or charged for separately.
- Outlying parking is likely to be more economical than feeder services when land costs are low and travel distances by feeder to the transfer point would be long.



Source: Levinson et. Al., 1975

4.4 Motor Vehicles

4.4.1 On-Street Parking

On-street parking can support adjacent land-uses in CBD areas and along activity streets. It can also provide a buffer between pedestrians and vehicles and promote lower operating speeds.

Considerations:

- Provide on streets with operating speeds less than 50km/h.
- Consider reducing the posted speed if there is no room between the parking lane and roadway.
- Angled parking is typically found along one-way streets but is generally not advantageous due to cross-section requirements and sight distance constraints.
- Back-in angled parking solves sight line problems and promotes loading activity.
- Bay widths are related to adjacent traffic lane widths.
- Traffic lanes wider than 3.3 m can have 2.1 m wide parking bays.

4.4.2 Loading Zones

Loading zones are designated for the loading of goods and passengers and are generally accommodated in the parking lane.

Considerations:

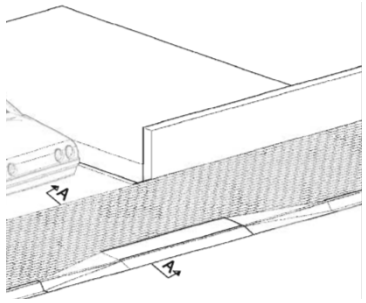
- Do not encroach onto the sidewalk.
- Provided on lower order streets, but not in residential areas.
- Should not impact pedestrian movements.
- Should not encroach onto bicycle lanes.
- Located away from intersections and crossings to improve sight lines.
- Use should be limited to a predefined duration and/or time period.
- Some trucks using the facility could intrude onto sidewalks or bike facilities.

4.4.3 Driveways

Motor vehicles turning into and exiting a driveway encroach onto the pedestrian realm. The design of such driveways should promote that motorists yield to pedestrians.

Considerations:

- Ramp the driveway up towards the sidewalk, carrying the sidewalk grade and surface material across the driveway.
- Reduce the driveway width and corner radii as much as possible
- Use a 15km/h design speed.
- Align driveways 90 degrees to the street.
- Provide stop/yield signs for exiting traffic where sight distance is limited.
- Consolidate driveways as far possible.
- Eliminate driveways if alternate access is provided.



4.4.4 Intersections

It is essential to try to design intersections so they are understandable, safe, and as easy to use as possible to a wide range of users. This would include way-finding and signage, safe segregation between pedestrians, cyclists, and vehicular traffic.

In terms of Universal Design it is also incumbent on designers to ensure the safety of all people using the intersection. This may include traffic calming methods, road signage, barrier kerbs, and possibly barriers and or guard rails.

Very careful consideration needs to be given to way-finding and signage. For full accessibility to be achieved, it is vital that the concept of Universal Design and Accessibility is embraced by all stakeholders at all stages through the concept, design, build, operation and maintenance of any complete street project.

Considerations:

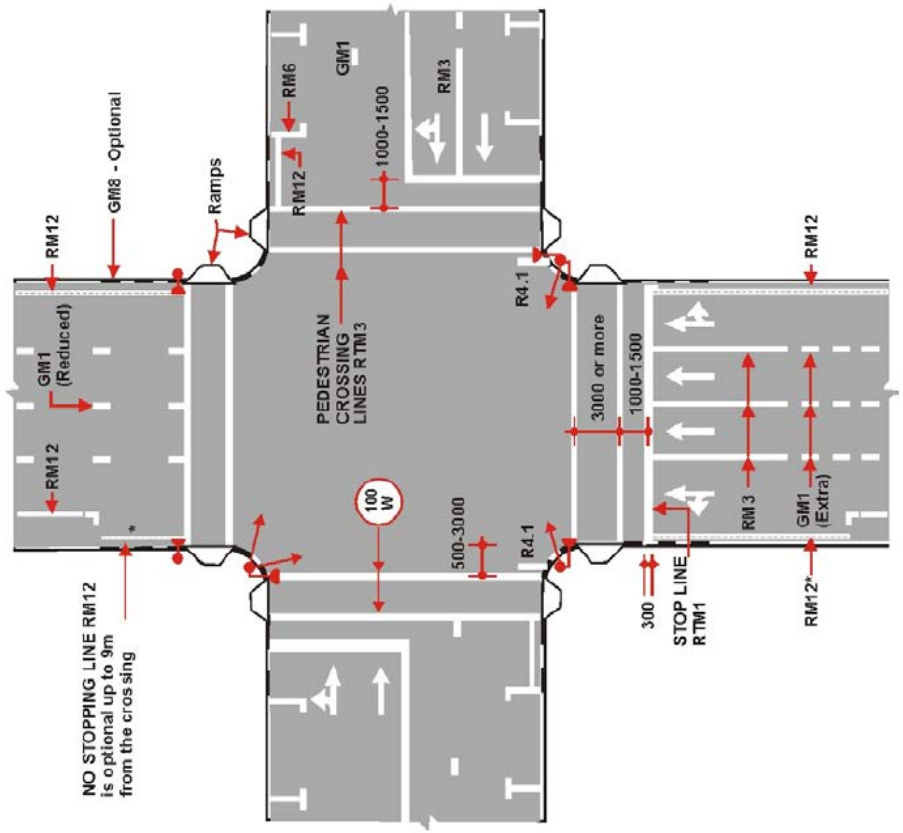
- Make intersections as small as possible.
- Limit opportunities for drivers to make sudden movements.
- Always provide the basic pedestrian and cyclist mobility and safety needs.
- Never reduce non-motorized facilities during intersection upgrades.
- Design intersections in such a way to be self-evident, so that road users only need to make one decision at a time.
- Square off skewed intersections, forcing motorists to make slower turns.
- Align approach and departure lanes.
- Use road treatments to reduce vehicular speed at intersections while maintaining operational efficiency where appropriate.
- Design left-turn slip lanes to shorten pedestrian crossing distances, decrease vehicular turning speeds and increase driver sight lines.
- Locate pedestrian crossings along desire lines.
- Reduce crossing distances where possible (especially for pedestrians and cyclists).
- Provide sufficient sight distance and lighting at pedestrian and bicycle crossings, weaving and merging areas.
- Install appropriate pedestrian and cyclist markings, signage, and signals.
- Design facilities so that pedestrians and bicyclists of all abilities, ages, and skills can navigate with ease.
- Separate cyclists from fast speeds and high volumes.
- Position bus stops to minimize transfer distances.
- Use design treatments to clarify who has the right-of-way.
- Use predictable signal phasing.
- Prioritize pedestrians, cyclists and transit over turning vehicles.
- Provide lead-time for the pedestrian signal phase, thereby allowing pedestrians to enter the crossing before motorists receive green, which promotes a reduction in conflicts between pedestrians and turning vehicles.
- Provide pedestrian countdown timers at locations with wide crossing distances and/or CBD areas associated with high pedestrian flows.

- Provide pedestrian scramble (Barnes dance) phases at locations where pedestrian volumes are exceptionally high.
- Minimize delay for all modes.
- Convert unused roadway to sidewalk or median island.
- Provide landscaping and use sustainable materials

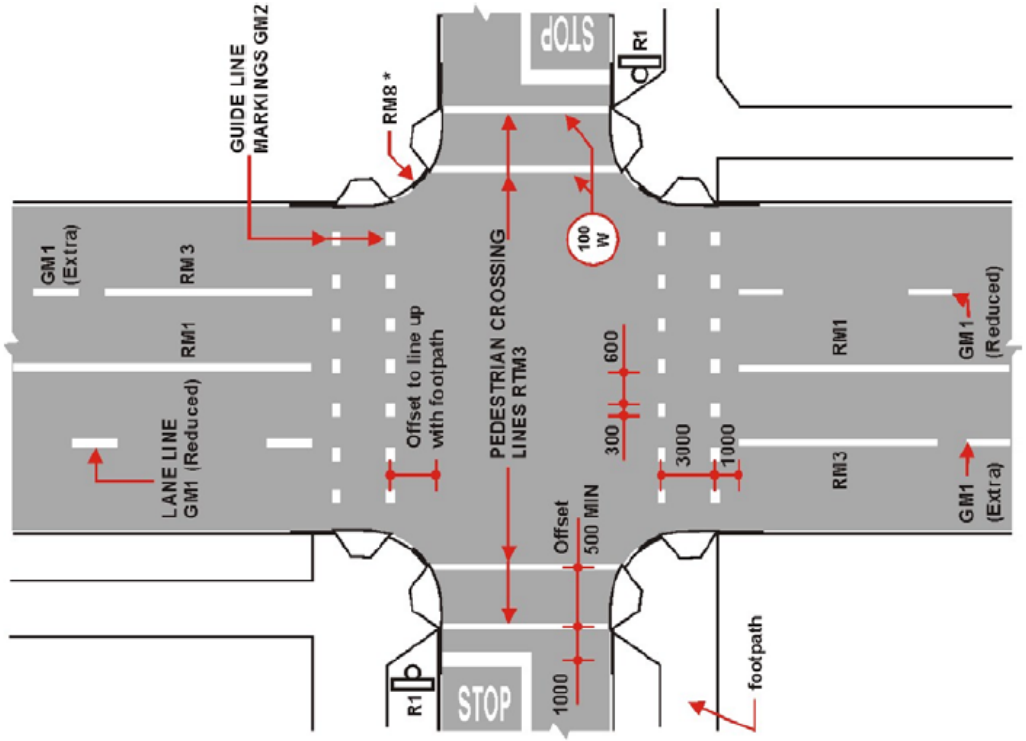
Design Standards:

- Intersections should typically have no more than 2%cross slope to the back of the crossing area. Exceptions may be necessary due to topography. Street crossings should be discouraged in steeply sloped areas (greater than 5%) and alternative crossings in less steeply sloped locations should be identified and clearly marked.
- When the sidewalk crosses driveways and alley approaches, maintain a maximum of 2% cross slope unless topography or other site specific conditions dictate a different approach for safety reasons.
- Audio crossing warnings or similar devices should be used at arterial intersections, particularly where major facilities are present, to help people with visual disabilities.
- Detectable warnings should be incorporated into the walkway or accessible route where it crosses a public street or alley, or higher usage driveways.

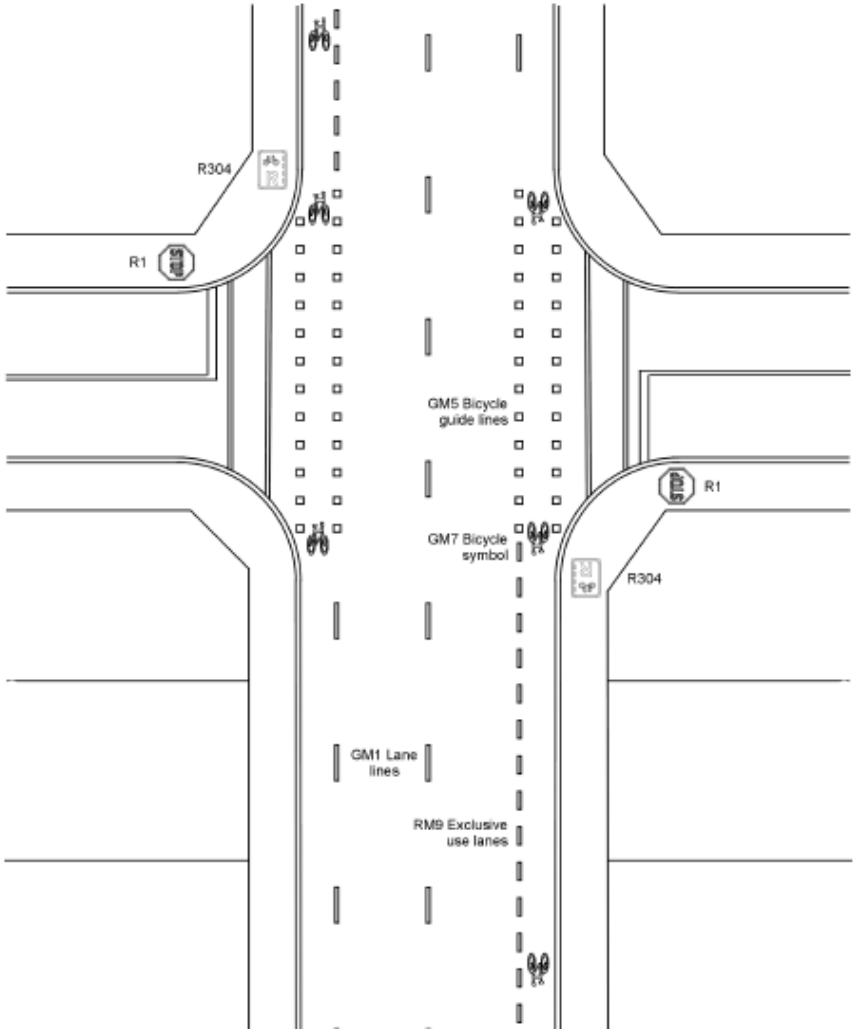
Common Signalized Intersection Treatments for Pedestrians



Common Stop-controlled Intersection Treatments for Pedestrians



Common Stop-controlled Intersection Treatments for Cyclists

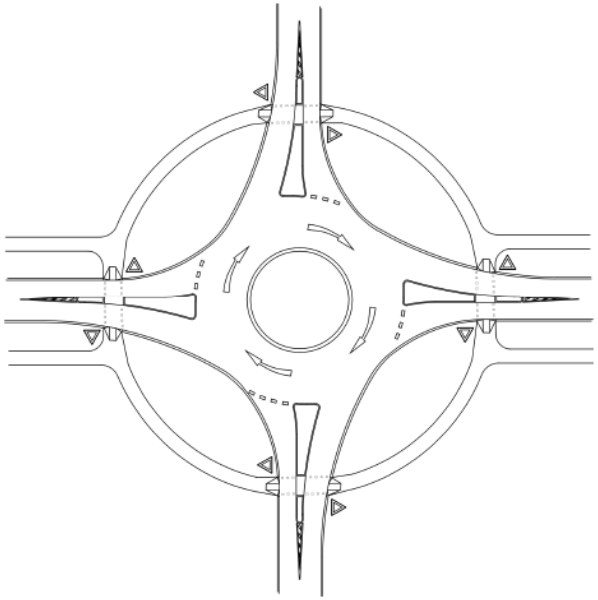


4.4.5 Traffic Circles

Traffic circles typically provide the same priority to all approaches of a junction, resulting in a random and/or continuous flow of vehicles. Motorists are furthermore indoctrinated to focus on approaching vehicles in order to take a gap in oncoming traffic.

Care should thus be taken to ensure other road users are clearly visible to motorists, by means of clearly signposted and demarcated crossings, separated from the influence sphere of the merge manoeuvre.

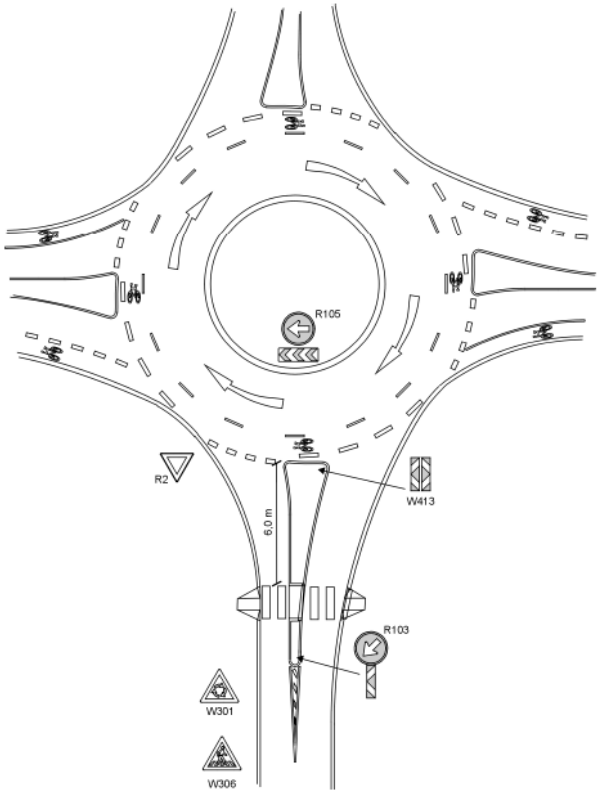
Furthermore, since motorists tend to drift within a lane whilst traversing the traffic circle, it would be advantageous to accommodate cyclists in a shared use pathway alongside the traffic circle and not make cyclists use the circulating lanes.



Considerations:

- Design approaches and exits to the lowest speeds possible.
- Design the roundabout as to encourage cyclists to control the circulating roadway.
- Provide sufficient signage, pavement markings, and geometric design elements to clearly indicate to all road users who have right-of-way.

Provide separated facilities for cyclists who wish not to navigate the roundabout on the roadway.



4.5 Road Verge

4.5.1 Roadside Buffer Area

All roads should preferably be designed with a buffer between the walkway and the roadway. In CBD areas and along activity streets the buffer is the 'utility zone' where streetlights, trees, seating, shelters and signs should be placed. Along arterial roads and within residential areas a continuous landscaped planted strip or 'Green Zone' is required to buffer pedestrians from motor vehicles.

Considerations:

- Even in constrained situations a narrow Green Zone should be included.
- Use of trees in the Green Zone creates a canopy that shades the walkway and street.
- Ideally the Green Zone should be a minimum of 1.5-1.8m for healthy tree growth.
- If attached to the kerb due to space limitations, provide an additional 400-600mm in width as an added buffer.

Roadway	Cycle Lane	Parallel Parking	Utility Zone	Pedestrian Zone	Building Zone	Building

4.5.2 Utilities

Substations, kiosks, cabinets and other public utility related structures are the 'hidden systems' necessary for operating a modern city, but are not always well-placed or aesthetically pleasing.

The challenge is to locate these components in a manner that meets operational requirements and make the walkways more inviting and safe for pedestrians.

Instead of being treated in a functional manner, without thought as to the possibilities of enriching the civic landscape, these elements can contribute positively if well-designed and colour matched.

Considerations:

- Electrical substations could be designed as high-quality units to become recognisable, positive elements of the street.
- Manhole covers, utility covers, kiosks, and cabinets should be placed to promote a well-ordered, integrated and logically positioned appearance.
- Vertical utilities such as street lighting, fire hydrants, and sign poles are best concentrated in the utility zone so as not to interfere with pedestrian movement.

4.5.3 Street Lighting

Street lights provide illumination for safety and way-finding purposes for pedestrians, cyclists and motor vehicles. Lighting is used to illuminate roadways, walkways, buildings, parking areas, landscapes, signs and advertising. Apart from being a practical consideration, the choice of light fixtures, type of lighting source and illumination patterns are also design elements.

Considerations:

- Streetlights must fit into the hierarchy appropriate to the desired status of the area. Not only to light the required area but also to promote an ambient streetscape and open space identity.
- The intensity of street light must be carefully balanced between the need to create a well-lit and safe public realm and the desire to create a dynamic and aesthetic evening environment marked by interplay of light and shadow.
- Streetlights must be located in the utility and green zones and/or median.
- Spacing must be uniform, with distance depending on illumination levels required.
- If the verge or median includes street trees, locate streetlights between the trees so the tree canopy does not interfere with lighting.
- Pedestrian lighting fixtures must be used to supplement streetlights on wider road reserves
- Sufficient lighting increases security and reduces opportunity for crime. The perception of safety is significantly affected by lighting.
- Sufficient lighting and glare control are critical to helping pedestrians, cyclists and motorists see each other and potentially dangerous situations.
- The colour of light is an important consideration. White-light such as metal-halide, fluorescent and LED sources are recommended for walkways, cycle paths and pedestrian areas.
- Fixtures must be durable, resistant to weather extremes, vandals and easily maintained

4.5.4 Street Furniture

Street furniture are the smaller-scale facilities that add functionality and make a walkway pedestrian friendly.

Street furniture ranges from rubbish bins to tree grates, shelters, benches, bollards drinking fountains, bicycle racks and signs. These are sited on walkways, or in parks, squares and other open spaces. Though relatively small in scale, if treated consistently, street furniture can contribute significantly to the overall order and appearance of Johannesburg.

Considerations:

- Street furniture should typically be fixed and must be consistent, uniform, attractively designed and comfortable.
- Only essential furnishings must be provided and they should be appropriately scaled to their use and surroundings. Durability and ease of maintenance are important in selection of street furniture.
- Furniture elements must be designed and developed as a single group, utilising a well-conceived palette of materials and colours. Materials and colours must be used consistently for all street furniture, with a variety of accents utilised to help create a ‘statement’ where required.
- Furnishings must be grouped as much as possible to avoid clutter.

BANNERS

Streetlights can provide attachments for banners as appropriate.

Special banners related to City events and occasions must be designed and mounted in a fashion that promotes easy installation and removal.

LITTER RECEPTACLES

Rubbish bins must be coordinated with seating and placed in areas of pedestrian activity such as, informal vending, along pedestrian routes, at bus, taxi stops and in parking areas. These elements must be placed in conjunction with other street furniture.

Rubbish bins must be weatherproof and fireproof, have removable inner linings to promote ease of emptying, and a controlled cover to contain smells and insects.

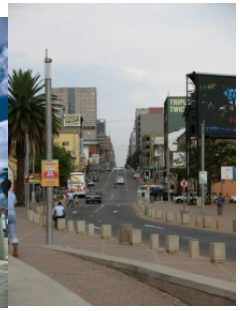
TREE GRATES

Tree grates must be designed or selected in relation to the overall furnishing system, and placed in a way that is integrated with the surrounding paving in a logical and tidy manner.

BOLLARDS

Bollards are used as barriers to control vehicular movement where appropriate. They are typically located along the kerb edge and should be at least 900mm high, properly mounted to ensure durability, and easily replaced if damaged.

Both permanent and removable bollards should be of the same style, and appropriate to the specific needs of the situation, such as a barrier or divider.



SEATING

Seating is essential to make walkways pedestrian-friendly where pedestrian activity occurs. Seating means benches, low walls, ledges and steps, and should be placed to take advantage of interesting views.

Placement strategies can be developed to address contrasting physical conditions such as sunlight/shade and a range of temporal conditions such as quiet/noisy, active/passive, formal/informal and enclosed/open.

Seating needs shade and should not be located in large exposed areas of pavement or adjacent to walls that trap and radiate heat or reflect large amounts of glare.

Seating must be coordinated with public transport stops and waiting areas.

PUBLIC ART AND SCULPTURE

The use of public art and sculpture is an expression of a society's way of life and values.

Art and sculpture help create small, easily identified nodes along streets and around squares assisting pedestrians and vehicles to mark their position while providing interest and variety along a route.

Art and sculpture of varying scales, materials and philosophical departures should continue to be commissioned and located at points of confluence to create places of interest and contribute to Johannesburg's unique identity.

TRAFFIC CONTROL AND WAY FINDING SIGNAGE

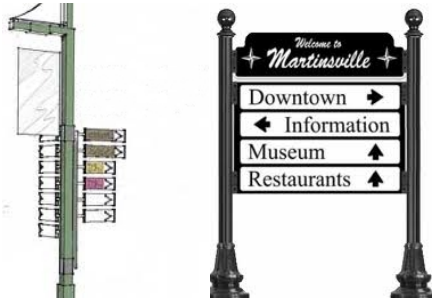
The number, type and location of signage play an important role in Johannesburg's urban environment but only essential signage should be provided.

The placement, shape, colour and graphic design of traffic control signs are legally controlled.

Street name signs must appear at every corner and provide a uniform appearance, utilising symbols rather than text where possible.

Colours and materials for different signs, signals and mounts must be consistent throughout, making it legible by pedestrians and drivers alike.

Signs must be grouped together and mounted on walls or other structures such as light poles or shelters, to minimise clutter and visual confusion.



4.5.5 Street Vendors

On many commercial streets, business owners want to use the space outside their premises to place tables, chairs, display wares or temporary signs. Informal trading is also commonplace in CBD areas.

The minimum width of walkways on commercial streets must be at least 4m to provide sufficient space for private streetscape amenities, public utilities and to ensure a clear and safe path of travel.

4.6 Surface Treatments

4.6.1 Pedestrian Facilities

The choice of paving material depends on the size of the walkway, the character and design intent of the street. The most common and economical choice of material is Concrete Paving, Brick Paving, a combination of Concrete and Brick Paving and Special Paving.

Considerations:

- The type, size, texture, and pattern of paving in pedestrian zones should be appropriate for the intended use of the area.
- Local designs, surface treatments and patterns should be given preference.
- Local African motifs and geometric patterns can provide a rich source of ideas.
- Surfacing can be interpreted and stylised to add a unique element to the City Streets of Joburg where suitable.

Old Style Interlocker

Grey interlocker

Charcoal crazy “e”

Red interlocker

GREY 200 X 100mm

GREY 200 X 150mm

Asphalt Sidewalk

Kerbed Asphalt Sidewalk

Grey interlocker with edge

Interlocker autumn blend

Concrete Sidewalk

Bus Shelter next to Sidewalk

100 X 100mm COBBLE

150 X 150mm deep groove

4.6.2 Bicycle Facilities

Bicycle facilities are typically accommodated either on the roadway or as a shared use pathway with pedestrians. In these instances the pavement treatments would be determined by the existing road infrastructure. In the event where new multi-use pathways are designed, or with the construction of bicycle roads, the following pavement designs would apply.

Design Guidelines:

- 15 mm Premix + 100 mm Crusher run base,
- 6 mm Chip and spray + 100 mm Crusher run base,
- 100 mm Concrete + 100 mm Gravel base (if required),
- Block/Brick paving + 50 mm River or similar sand + 100 mm Gravel base (if required),
- 100 mm Gravel stabilised with lime or bitumen emulsion

International Best Practices:

In an attempt to enhance the visibility of cyclists, coloured or tinted bicycle lanes or road shoulders have been installed before in South Africa by means of tinted asphalt. This is generally an expensive exercise and requires heavy plant machinery to mill, lay and compact the asphalt. Australian and USA road authorities implemented the StreetBond CL which is applied by means of the spray painting equipment similar to that used during conventional road marking. This

On-grade StreetBond CL Cycle Lane Application in Brisbane, Australia

On-grade StreetBond CL Cycle Lane Application in Boston, USA

City of Cape Town cycle lanes:

In December 2012, StreetBond application was implemented along Bree Street. Two colours were chosen to test its visibility and contrast, “Bike Path Green” was the preferred choice due to its durability, visibility and contracts during various weather conditions.

StreetBond CL Cycle Lane Application along Bree Street, Cape Town.

StreetBond CL skid resistance and visibility in rainy conditions along Bree Street, Cape Town.

4.7 Storm water Drainage

"*Low Impact Development (LID) is an approach to land development (or re-development) that works with nature to manage storm water as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat storm water as a resource rather than a waste product. There are many practices that have been used to adhere to these principles such as bio retention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements.*" - United States Environmental Protection Agency - http://water.epa.gov

This section highlights various treatments that may be applied within the road reserve to attenuate and/or re-use storm water runoff, in line with Low Impact Development principles. This approach would assist the City's storm water infrastructure in coping with peak storm events. References for further reading are provided in Chapter 8.

4.7.1 Bio retention Swales

Typical bio retention swales are created with longitudinal slopes between 1% and 4% in order to maintain flow capacity without creating high velocities, potential erosion of the bio retention or swale surface and safety hazard. Check dams can be used in steeper areas to flatten the longitudinal hydraulic grade.

The amount of pollutant removal in a Bio retention swale is dependent on the filter media, landscape planting species and the hydraulic detention time of the system. Pollutant removal is achieved through sedimentation, filtration of water through the filtration media and through biological processes

Benefits:

- Flow conveyance
- Storage
- Water quality retreatment
- Reduces amount of water taken down to rivers

Quantity:

Small to modest flows dependent on the swell cross section

4.7.2 Check Dams

The use of check dams in Swales and tree pits assists in controlling the flow rates and it increases the storage capacity.

Benefits:

- Flow control
- Storage capacity increase

Quantity:

Small to modest flows

4.7.3 Bio-retention Basins

The amount of pollutant removal is dependent upon the selection of the filtration media in the bio retention and on the relative magnitude of the extended detention component of the basin. Pollutant removal is achieved through sedimentation, filtration of water through the filter media and through biological processes.

Benefits:

- Flow control
- Water quality treatment

Quantity:

Small to modest flows dependent on the size

4.7.4 Porous Pavement

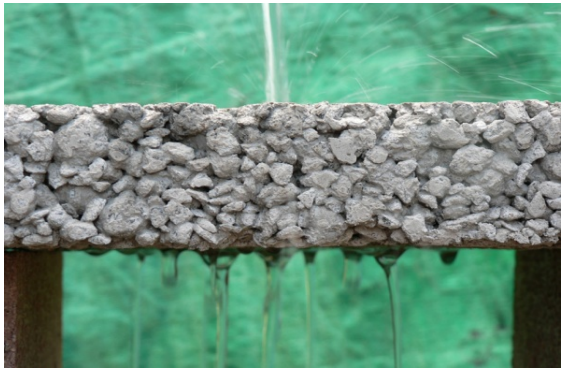
Porous paving is an alternative to conventional impermeable pavements with many storm water management benefits. These surfaces allow storm water to be filtered by a coarse sub-base, and may allow infiltration to the underlying soil.

A number of porous paving products are commercially available including:

- pavements made from special asphalts
- concrete grid pavements
- Concrete, ceramic or plastic modular pavements.

Benefits:

- Reduce peak storm water discharges
- Increase groundwater recharge
- Reduce area of land dedicated solely for storm water



4.7.5 Infiltration Trench

Where favourable soil conditions exist, infiltration can improve water quality increase groundwater recharge and reduce runoff volumes. Infiltration practices are particularly desirable in sub watersheds that seek to reduce runoff volumes to prevent combined sewer overflows.

Benefits:

- Flow conveyance
- Storage
- Water quality retreatment

Quantity:

Small to large flows

4.7.6 Tree Storm water Pits

Integration between landscaping and storm water management. The use of tree pits is an effective use of landscaping space in urban areas. Below the surface French drains can be placed to carry the excess water away.

Benefits:

- Flow conveyance
- Storage
- Water quality retreatment

Quantity:

Small flows

4.7.7 Litter Catchers

This can be retro fitted into storm water inlets to capture the litter that would get into the storm water drains. It would reduce chances for blockages in the current storm water.

Regular maintenance of a litter catcher is required to prevent blockages on the surface which decreases the flow capacity.

Benefits:

- Water quality retreatment

4.8 Landscape Planting

Street trees and other planting add colour, visual interest and a living texture to the streetscape. Landscape planting can soften the hard surfaces of streets and improve the quality of life.

4.8.1 Street Trees

Considerations:

- The most prominent of all street planting is the street tree.
- Wherever possible existing street trees must be retained.
- When selecting new street tree one must consider the City's recommended tree list, the aesthetic desire, climatic concerns, potential for disease and pests, maintenance requirements, space available for root growth, and the eventual size of the mature tree.
- On commercial streets, street trees compete with underground services for space which can limit the number and location of trees.
- Commercial street walkways must be at least 4m wide to accommodate both underground services and street trees.
- On arterial, commercial and larger residential streets, trees can be planted in medians. Medians typically need to be at least 2m wide to accommodate a mature street tree

4.8.2 Vegetation and Planting

Ecological principles within the public open space system should govern a low-maintenance landscape. Existing vegetation must be preserved as far as possible. Preserved trees can be supplemented with generous plantations of new trees and other vegetation. Introduced vegetation should be planted in clusters or groupings to provide a healthier microclimate, ecosystem and better overall aesthetic effect.

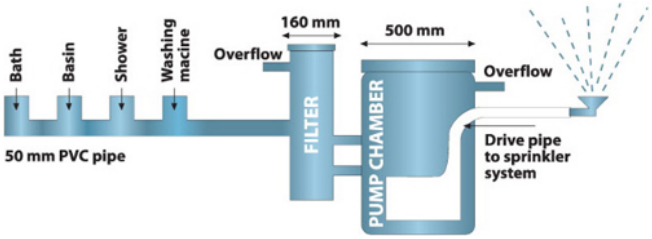
All introduced vegetation should be appropriate to its proposed location, use and planting conditions. Only hardy plants requiring minimal irrigation, fertilisers, or pesticides should be used in landscape designs. Due to high water and maintenance requirements, lawn should be utilised as sparingly as possible, with an alternative such as drought resistant groundcovers considered instead.

Vegetation should be combined with built and open spaces to create desirable microclimates. A diverse palette of well-shaded areas in the summer and warm, sunny niches in the winter is the ideal outcome. Microclimates help control winds, utilise transpiration to reduce ambient air temperatures, and to screen or filter air pollutants and noise.

4.8.3 Water Use

Developing a sustainable open space aesthetic that recognises the climate in which we live is a challenge. The public open space system must be water-wise in design and management, cognisant of new and developing technologies related to water consumption, detention, rain water catchment and grey water/treated waste water utilisation.

Storm water and wherever possible grey water are two potential water resources that can be harnessed to create and maintain Joburg's open space system. In Johannesburg, irregular and rapid downpour over short periods makes it difficult to store water for more productive uses when needed. Successful water management will require a comprehensive effort and an acknowledgement that storm drainage, flood control, water supply, water conservation and sewage treatment are all facets of a broad and integrated system.



Every building, street, parking lot and open space in Joburg should be designed to preserve water resources, harvest runoff, and mitigate flooding. As much rainwater as possible should be retained on site for as long as possible or allowed to percolate, helping to minimise peak flooding downstream while promoting utilisation of the resource for irrigating vegetation and filling water features. Rainwater harvesting for irrigation should be explored on an individual project basis, since small-scale solutions, which supplement treated waste and grey water, tend to be the most successful

4.8.4 Maintenance

No matter how carefully the public open space is designed, a certain level of maintenance and water will be required to ensure aesthetic appeal and a healthy local ecosystem.

The use of a dry-land aesthetic and the selection of drought and disease resistant plant species can help to minimise maintenance requirements and water use in Joburg City Streets

4.9 Gravel Roads Programme

The complete streets approach should be incorporated into future gravel roads upgrade projects. This would entail the identification of the community's specific transport needs and designing fit-to-purpose facilities.

There exists an unique opportunity to design streets for all road users from the onset, compared to the typical scenario where one is faced by retrofitting existing vehicular roads to serve other modes of transport. This allows for regional planning of new road infrastructure for each mode as well as developing a staged implementation program, either focussing on a particular mode of transport or specific road sections.

Considerations:

- Lower order streets should predominantly serve pedestrians.
- Footpaths should link pedestrians to public transport routes, either directly or along local streets.
- Encourage public transport use through provision of facilities along desire lines.
- Accommodation of storm water, utilities and landscaping in design.

4.10 On-Street Trading

This chapter considers how on-street trading can be incorporated into the City's Complete Street Design Guidelines. Demand for on-street trading space has gradually increased over the years in the City of Johannesburg. On-street trading creates an opportunity for small business development, however if unregulated, it meets many challenges particularly with regards to road safety.

The chapter will not include the following:

- Guidance on the design criteria for on-street trading stalls; and
- Determine what type of goods should be permitted/not permitted as part of on-street trading.

These issues will be handled by departments responsible for economic development in the City since these issues are more applicable to them.

The emphasis of this chapter will be on road safety issues for pedestrians, motorist and cyclists to avoid any potential accidents which may be caused by on-street trading. However the chapter will also be flexible enough to allow on-street trading for small business development without compromising on road safety issues.

The following are potential problems due to unregulated on-street trading:

- Impediments to pedestrian movements along sidewalks;
- Decreased accessibility to buildings and other amenities;
- Inability of emergency vehicles to freely move along streets when responding to emergency situations;
- Increased accident risk for both motorists and pedestrians due to obscuring of road signage;
- Creation of criminal havens along overcrowded streets, facilitating criminal activities such as “smash and grab”; and
- Compromised safety of motorists due to trading stall encroaching on roadway.

Therefore the following criteria should be evaluated when considering on-street trade facilities:

- Road safety;
- Pedestrian safety;
- Accessibility for pedestrians (sidewalk congestion);
- Attractiveness of street from a road user and adjacent property owner perspective;
- Criminality/Security of road users; and
- Sidewalk congestion.

4.10.1 Design Considerations

(a) Streets Approved for On Street Trading

Road Class	Description	Comment
Class 3	District Distributor	Introduction of Trading stalls in this type of road should be done with care due to high speeds (70-80km/h). A pedestrian walkway (excluding the stall) with a minimum width of 2.0m will be needed
Class 4	CBD Road/Activity Streets/local distributor/boulevard/ industrial roads	Consideration should be taken for pedestrians. A pedestrian walkway (excluding the stall) with a minimum width of 1,5m will be required
Class 5	Residential collectors/Residential streets	A sidewalk with a minimum width (excluding the stall) of 1.5m will be needed. Traffic calming measures should be introduced next to trading areas
Transit malls	Pedestrian only streets/linear markets	Streets closed for all vehicular traffic, except for local delivery, refuse collection and local access. Care should be taken that

Road Class	Description	Comment
		enough walkway is provided for pedestrians. A minimum of 2,5 – 3m walkway should be provided for pedestrians
Plaza or interrupted Malls	Several blocks of retail streets are exclusively designated for pedestrian use with cross streets left open to vehicle traffic	Care should be taken that enough walkway is provided for pedestrians. A minimum of 2,5 – 3m walkway should be provided for pedestrians
Continuous or exclusive mall	A multi block area which may include more than one street is exclusively designated for pedestrians but allow for local delivery, refuse collection and local access.	Care should be taken that enough walkway is provided for pedestrians. A minimum of 2,5 – 3m walkway should be provided for pedestrians
Underpass /overpass	Pedestrian only bridges or underpasses, in certain instances with access for cyclists	Not desirable, however should there be a need to provide on street trading, care should be taken that proper lighting is provided especially within underpasses. The safety of pedestrians is of prime importance

(b) Streets and Areas Where On Street Trading Should Be ProhibiteD

Road Class	Description	Comment
Class 1	Motorway/ primary distributor	Mobility Road, no trading should be allowed for traffic safety.
Class 2	Arterial/regional distributor. BRT Trunk Route	Mobility Road, generally no trading should be allowed for traffic safety. However, if there is adequate pedestrian protection and pedestrian safety will not be compromised, limited on-street trading should be allowed. But this should be supported by proper technical analysis of traffic safety by qualified practitioners like traffic engineers
Within 50 m from an intersection, slip lane, on/off ramp or interchange		To protect sigh distance
Where sidewalks are narrow than 1.5m		LOS declines rapidly with sidewalks narrower than 1.5m.
On any road with a design speed higher than 70km/h		For Safety reasons as speeds are too high

Road Class	Description	Comment
On any median less than 10m wide		To protect sight distances
Perpendicular to pedestrian crossings		To avoid blocking pedestrian walkways

(c) Safety

The following design criteria should be considered in order to evaluate safety when considering the design of on-street trading facilities.

- As discussed above, the location of on-street trading on the road class type where an appropriate service area should be considered. Higher order roads like Class 1, 2 and Class 3 distributors have high operating speeds which makes it unsafe to provide pedestrian pathways to accommodate on-street trading facilities. Class 4 to Class 5 collector roads operate at lower vehicle speeds and should be considered as appropriate and safe service areas to accommodate for on-street traders along pedestrian pathways.
- Areas with high accident rates should be identified and avoided.
- Speed differentials of pedestrians and vehicles should be considered. Areas where high vehicle speeds are evident in relation to low pedestrian speeds create unsafe areas of conflict. Thus areas of low operating speeds for both vehicles and pedestrians should be considered as a safety factor.

(d) Operational Conditions and Pedestrian Congestion

The following design criteria should be considered in order to evaluate operational conditions when considering the design of on-street trading facilities:

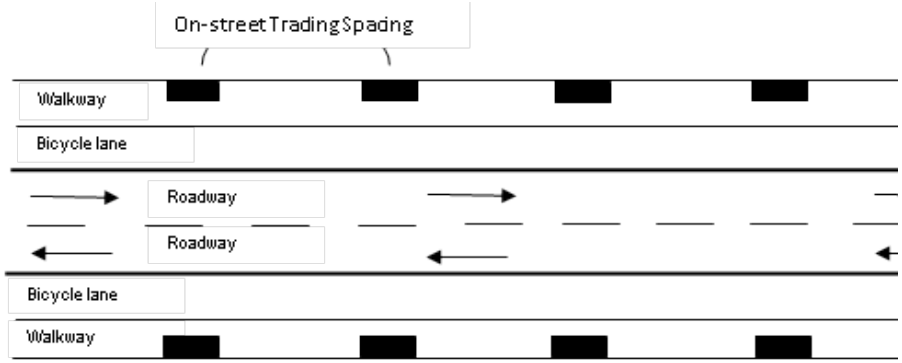
Appropriate pedestrian Levels of Service (LOS) should be used as a design guideline for the placement of each on-street trading facility in order to ensure for effective pedestrian flows. Pedestrian LOS is measured in terms of comfort (m^2/pedestrian) with regards to the ease at which a pedestrian can turn around or walk in a linear direction. Locations with an improved LOS) indicate that more space would be available to provide for on-street trading facilities. The following pedestrian cross flow LOS criteria based on the HCM 2010 should apply:

LOS	Average Space (ft^2/p)	Related Measures: Flow Rate (p/min/ft)[a]	Related Measures: Average Speed (ft/s)	Related Measures: v/c Ratio[b]	Comments
A	>60	≤5	>4.25	≤0.21	Ability to move in desired path, no need to alter movements
B	>40–60	>5–7	>4.17–4.25	>0.21–0.31	Occasional need to adjust path to avoid conflicts
C	>24–40	>7–10	>4.00–4.17	>0.31–0.44	Frequent need to adjust path to avoid conflicts
D	>15–24	>10–15	>3.75–4.00	>0.44–0.65	Speed and ability to pass slower pedestrians restricted
E	>8–15[c]	>15–23	>2.50–3.75	>0.65–1.00	Speed restricted, very limited ability to pass slower pedestrians
F	≤8[c]	Variable	≤2.50	Variable	Speeds severely restricted, frequent contact with other users

The location of on-street facilities in relation to the LOS of a pedestrian walkway should be seen as a measure of comfort. On-street trading locations are preferred where a LOS C or higher is obtained and where pedestrian densities are low. On-street trading facilities would thus have a minimal effect on pedestrian congest

(e) Functional Layout

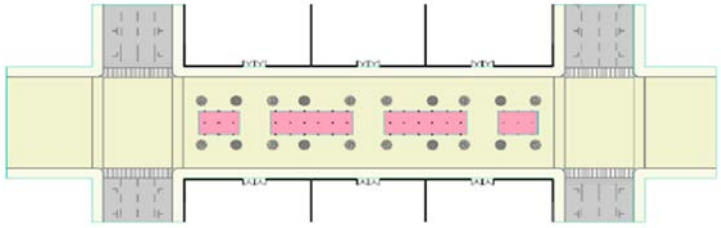
Based on safety considerations, operational conditions and pedestrian congestion, the following functional layout plan is proposed:



On-street stalls should be placed along the sidewalk at equal spacing. On-street stalls should not be placed in such a way that they become hazardous to pedestrians and cyclists. They should not protrude to bicycle and traffic lanes

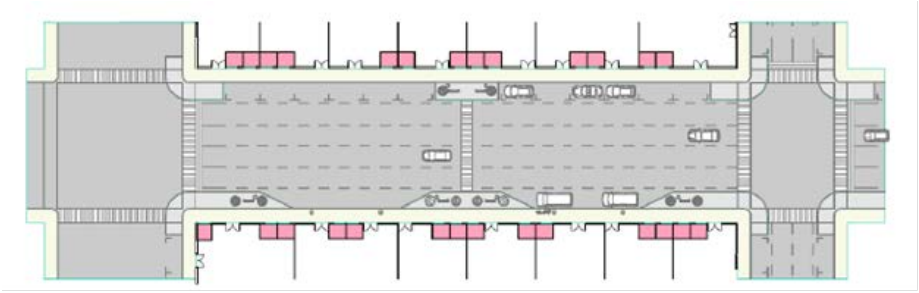
The functional location and layout should ensure road safety is maintained. On-street trading facilities should be located on the outer edge of the walkway. The pedestrian walkway and bicycle lane should be located between the road and on-street trading facility.

(f) Possible Typologies for On-Street Trading



Median Market suitable to streets with wider medians

3D view of median market



On-Street trading between sidewalk and buildings

(g) Other Considerations

Attribute	Guideline
Location	Sufficient spacing of approximately 5m must be provided between on-street trading facilities to provide effective circulation and increased effective walkway width;
Security	Stalls should not be designed in such a way that criminal activity can be facilitated. They should not be that close together or be placed dark at spaces.
Street Character	Stalls should seek to enhance the street amenities and local character
Environmental considerations	Care should be taken that trading zones areas are still attractive for walking and should not be placed in an disorderly way
Pollution and waste management	Wherever trading stalls are introduced, proper plans should be in place for waste management, pollution control and control of rodents
Uniformity	In general a standard design should be strived for all trading stalls throughout the City taking into consideration the type of goods to be sold, environmental considerations and safety However some precinct could modify such designs linked to the overall look and feel of the precinct
Economy	Trading stalls should minimize the use of space as much as possible to accommodate other street furniture like street lights, bollards, benches, etc. Again at all times a minimum width of 1.5m should be reserved for a pedestrian walkway.

Traffic Calming

5

5. TRAFFIC CALMING

5.1 Speed Control Measures

5.1.1 Bulb-outs

Description

Kerb extensions that narrow the roadway with at the intersection to slow the speed of motor vehicles and shorten the crossing distance for pedestrians and other road crossing users

General Dimensions

Depends on the width of the roadway and the desired or allowable turning radii

Location / Appropriate Application

Intersections with long pedestrian crossing distance and low truck or bus traffic

5.1.2 Median Islands

Description

Raised islands along the centreline of the roadway that narrows the roadway width to slow the speed of motor vehicles

Design Speed

40km/h – 80km/h

Location / Appropriate Application

Midblock, neighbourhood entrance, in coordination with crosswalk, at a curve known for high speeds

Minimum Spacing

Depends on the network design and the prevailing speed limits, unlikely to be homogeneous through the road

5.1.3 Speed Humps

Description

Rounded raised humps that extend across the roadway and slow the speed of oncoming motor vehicles

Design Speed

25 – 30km/h

General Dimensions

Length = 3m to 4.25m

Height = 80mm to 100mm

Location / Appropriate Application

Adequate sight stopping sight distance and signage,

Minimum Spacing

60m to 90m

5.1.4 Speed Tables

Description

Flat-topped raised platforms that extend across the roadway and they slow the speed of the oncoming motor vehicles

Design Speed

40km – 50km/h

General Dimensions

Length = 7m

Height = 80mm to 100mm

Location / Appropriate Application

Adequate sight stopping sight distance and signage,

Minimum Spacing

120m to 150m

5.1.5 Raised Crosswalks

Description

Flat-topped raised platforms that extend across the roadway from kerb ramp to kerb ramp that slow the speed of the oncoming motor vehicles and increase the visibility of roadway crossers including wheelchair users

Design Speed

40km – 50km/h

General Dimensions

Length = 7m

Height = 80mm to 100mm

Location / Appropriate Application

Adequate sight stopping sight distance and signage,

Minimum Spacing

60m to 150m

Flat-topped raised areas that cover the entire intersection, with ramps in all approaches ramp that slow the speed of the oncoming motor vehicles and increase the visibility of roadway crossers including wheelchair users

Design Speed

40km – 50km/h

General Dimensions

Height = 120mm

Ramps < 18% gradient

Location / Appropriate Application

Urban setting, where the loss of on-street parking associated with other traffic calming measures is considered unacceptable.

5.1.6 Raised Intersections

Description

5.1.7 Textured Pavements

Description

Roadway surfaces paved with brick, concrete, asphalt or any other material that slow the speed of motor vehicles

Design Speed

40km – 50km/h

Location / Appropriate Application

Urban setting, where the loss of on-street parking associated with other traffic calming measures is considered unacceptable

5.2 Volume Control Measures Summary

5.2.1 Chicanes

Description

Kerb extensions that alternate from one side of the roadway to another making the roadway “winding” and thereby slowing the speed and volume of the motor vehicles

Design Speed

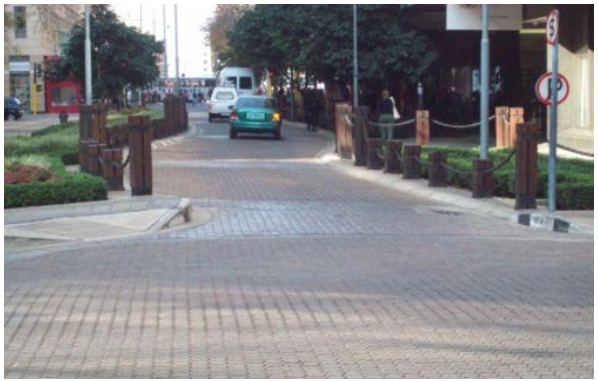
40km – 70km/h

General Dimensions

Based on the existing roadway dimensions and the desired alignment shift

Location / Appropriate Application

Kerb extensions placed near intersections and coordinated with on-street parking, median islands and other infrastructure within the road reserve.



5.2.2 Forced Turn Islands

Description

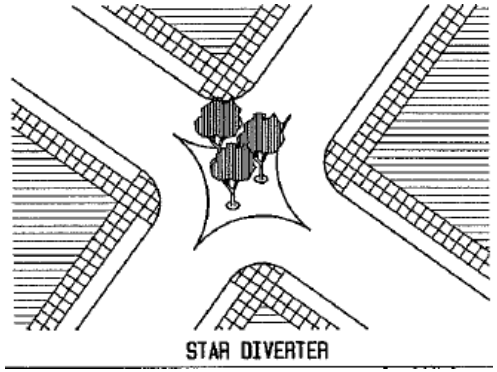
Traffic islands and other barriers installed at intersections to force turning movements and prevent through traffic

General Dimensions

Based upon the existing roadway dimensions and the desired turning radii

Location / Appropriate Application

Appropriate for avoiding “rat-running” traffic, the force turn movement to be away from the major routes. Barriers are installed at intersections.



5.2.3 Median Barriers

Description

Raised islands installed along the centreline of an intersection to block through and right turn movements

General Dimensions

Island Min. Width = 100mm;

Travel Lane Width = 300mm

Location / Appropriate Application

Barriers are installed at intersections and can coordinate with crosswalks. Can be used as crosswalk refuge and provide bicycle route openings.

5.2.4 Full Street Closure

Description

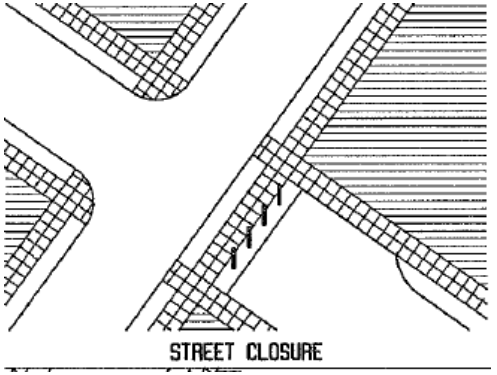
Barriers installed across a street to close the street and eliminate through traffic, usually leaving only sidewalks and/or bicycle lanes open.

General Dimensions

Varied

Location / Appropriate Application

Barriers may be installed at intersections or midblock



5.2.5 Half street closure

Description

Barriers that block traffic in one direction for a short distance in a two-way roadway to prevent through traffic

General Dimensions

Based on existing roadway and kerb dimensions

Location / Appropriate Application

Barriers are primarily installed at intersections or sometimes at midblock

5.2.6 Diagonal Diverters

Description

Barriers placed diagonally across an intersection that block through traffic. Can be utilized as bicycle or pedestrian lanes

Design Speed

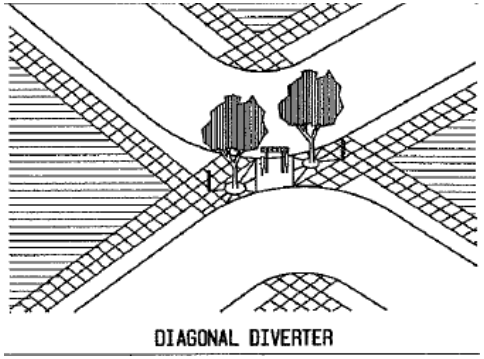
30km/h – 40km/h

General Dimensions

Based upon the existing roadway dimensions and the desired turning radii

Location / Appropriate Application

Barriers are installed at intersections.



5.2.7 Semi-Diverters

Description

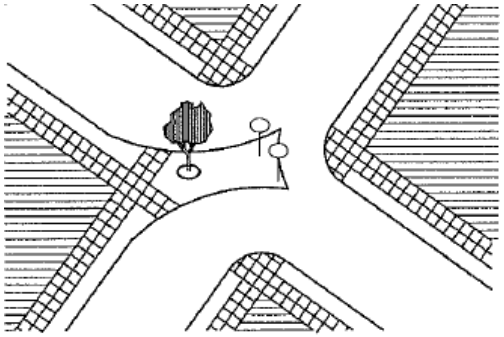
Half-closure sets staggered across an intersection to make through traffic circuitous rather than direct

General Dimensions

Based on existing roadway and kerb dimensions

Location / Appropriate Application

Barriers are primarily installed at intersections.



PARTIAL DIVERTER

Complete Street Templates

6

6. COMPLETE STREET TEMPLATES

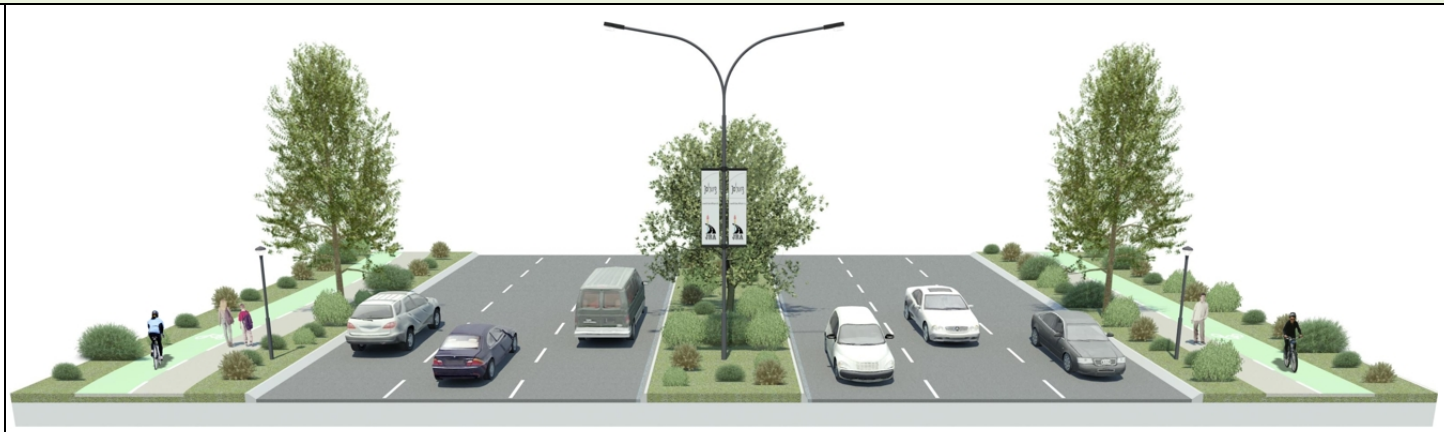
6.1 Summary of Design Elements

	REQUIREMENTS			TYPICAL FEATURES (use appropriate context sensitive standards for design)								
Complete Streets Typology	Intersection spacing	Access to property	Parking	Speed km/h	Intersection control	Typical cross section	Roadway / lane width	Road reserve width	Public transport stops and ped. xing.	Pedestrian footways (constructed)	Cycle lanes	Traffic Calming
Freeway / Primary Distributor	2.4 km (1.6 - 3.6 km)	Not allowed	No	100-120	Interchange	4 / 6 / 8 lane freeway	3.3 - 3.7m lanes	60-120m (60m)	No	No	No	No
Arterial / Regional Distributor	800m (±15%)	Not allowed*	No	80	Coordinated traffic signal, interchange	4 / 6 lane divided, kerbed	3.3 - 3.6m lanes	38-62m (40m)	Yes at intersections	Off road	Yes, on verge	No
District Distributor	600m (±20%)	Not allowed*	No	70	Coordinated traffic signal, roundabout	4 lane divided or undivided, kerbed	3.3 - 3.5m lanes	25-40m (30m)	Yes at intersections	Yes	Yes, on verge	No
BRT Trunk Route	500m	Not allowed	No	70	Coordinated traffic signal with bus priority, roundabout	2 lane BRT right-of-way in median, 2-4 mixed traffic lanes	3.3-3.5m lanes	30-40m	Only at BRT stations	Yes	Yes, on verge	No
(Main)CBD Road/ Activity Street/ Local Distributor / Boulevard	>150m	Yes (larger properties)	Yes if conditions allow	60	Traffic signal, roundabout or priority	4 lane, median at ped. xing., boulevard, CBD one-way	3.0-3.5m lanes	20-40 m (25m)	Yes at intersections or mid block	Yes	Yes, in road or on verge	Median for peds, curved roadway
Industrial Road	>150m	Yes	No	60	Traffic signal or priority	4 lane, median at ped. xing,	3.2-3.5m lanes	25-40m (30m)	Yes at intersections or mid block	Yes	Yes on verge	Median for pedestrrians
(Small) CBD Road/ Activity Street	>150m	Yes	Yes	40	Traffic signal or priority	2-4 lane plus parking	2.8-3.3m lanes	15-25 m (22m)	If applicable, anywhere	Normally yes	Yes, in road	Raised ped. Crossing
Residential Collector	>150m	Yes	Yes if appropriate	50	Roundabout, mini-circle or priority	2 l 3 lane undivided	6-9m roadway, < 3.3m lanes	16-30 m (20m)	Yes anywhere	Yes	Yes, in road or on verge	Raised ped, median, narrow lanes
Residential Street		Yes	Yes on verge	40	Mini-circle. priority or none	1 / 2 lane mountable kerbs	3-5.5 m roadway (two way)	10-16m (14m)	If applicable, anywhere	Not normally, pedestrians can use roadway	Use roadway	Yes, but should not be necessary
NMT Route / Greenway / Multi-use Pathway	500 m maximum	Yes	No vehicles	15	None, pedestrians have right of way	Surfaced/ Block Paving	3.0-5.0m	6m	If applicable, anywhere	Yes	Yes	Yes

6.2 Standard Cross-sections

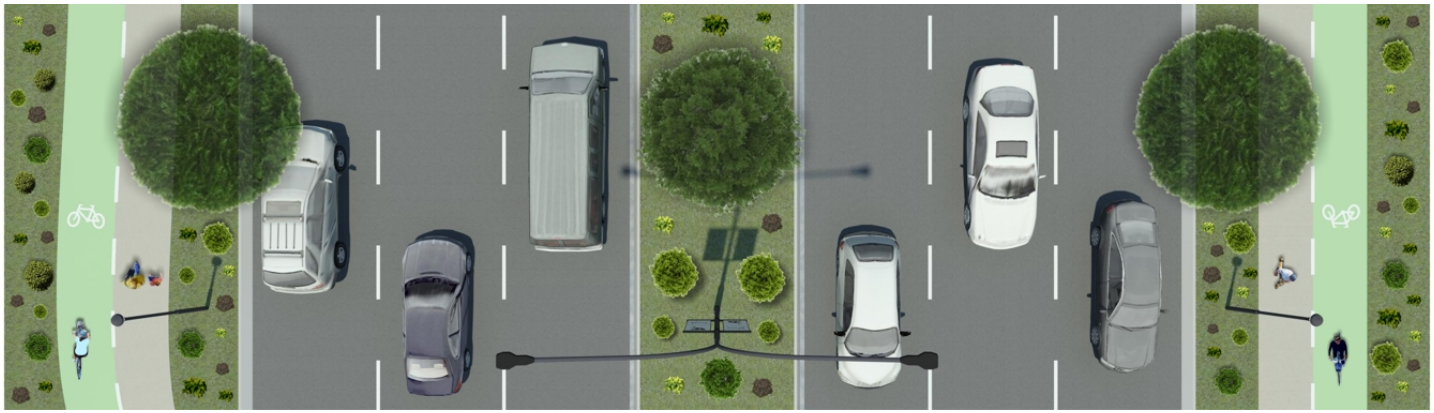
Arterial/Regional Distributor – 40m Road Reserve

STREET SECTION



	Shared Use Path			3 Lane Roadway	Median	3 Lane Roadway	Shared Use Path		
	Green Zone	3m	Green Zone	3.5m x 3 = **10.5m**	**4.2m**	3.5m x 3 = **10.5m**	Green Zone	3m	Green Zone

STREET PLAN



District Distributor – 30m Road Reserve

STREET SECTION Option 1

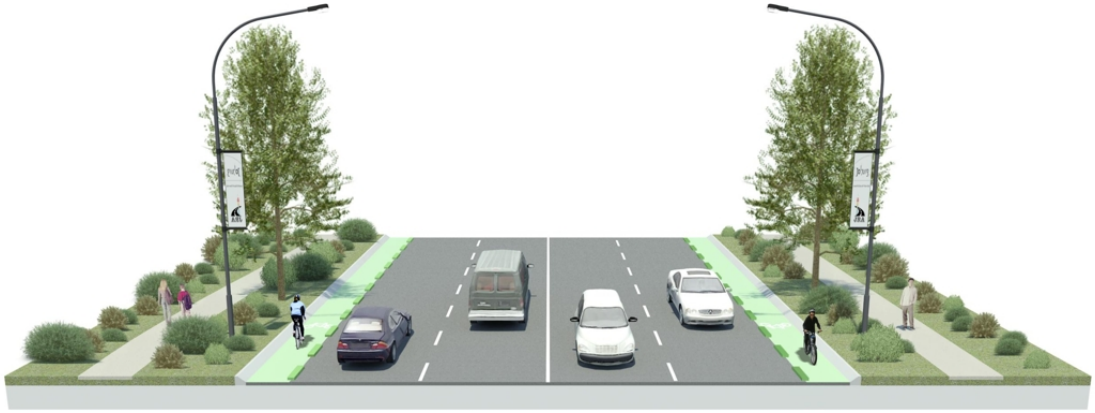
Green Zone	Walk -way / 1.5-1.8m	Green Zone	1.5-1.8m Cycle Lane	2 Lane Roadway	Median	2 Lane Roadway	1.5-1.8m Cycle Lane	Green Zone	Walk -way / 1.5-1.8m	Green Zone
				3.5m x 2= **7m**	**4.2m**	3.5m x 2= **7m**				

STREET SECTION Option 2

Green Zone	Shared Use Path	Green Zone	2 Lane Roadway	Median	2 Lane Roadway	Green Zone	Shared Use Path	Green Zone
	3m		3.5m x 2= **7m**	**4.2m**	3.5m x 2 = **7m**		**3m**	

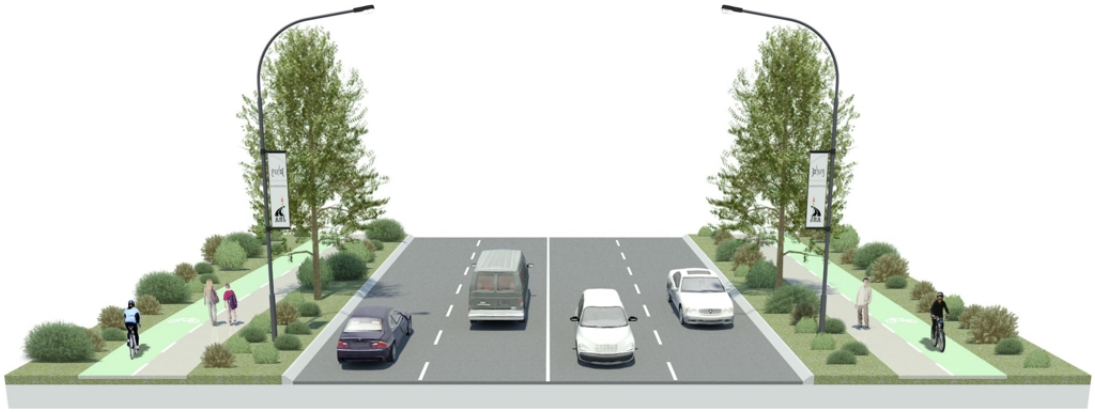
Boulevard/Local Distributor – 30m Road Reserve

STREET SECTION Option 1



		Green Zone	Walk-way 1.5-1.8m	Green Zone	1.5-1.8m Cycle Lane	2 Lane Roadway 3.5m x 2= **7m**	2 Lane Roadway 3.5m x 2= **7m**	1.5-1.8m Cycle Lane	Green Zone	Walk-way 1.5-1.8m	Green Zone	

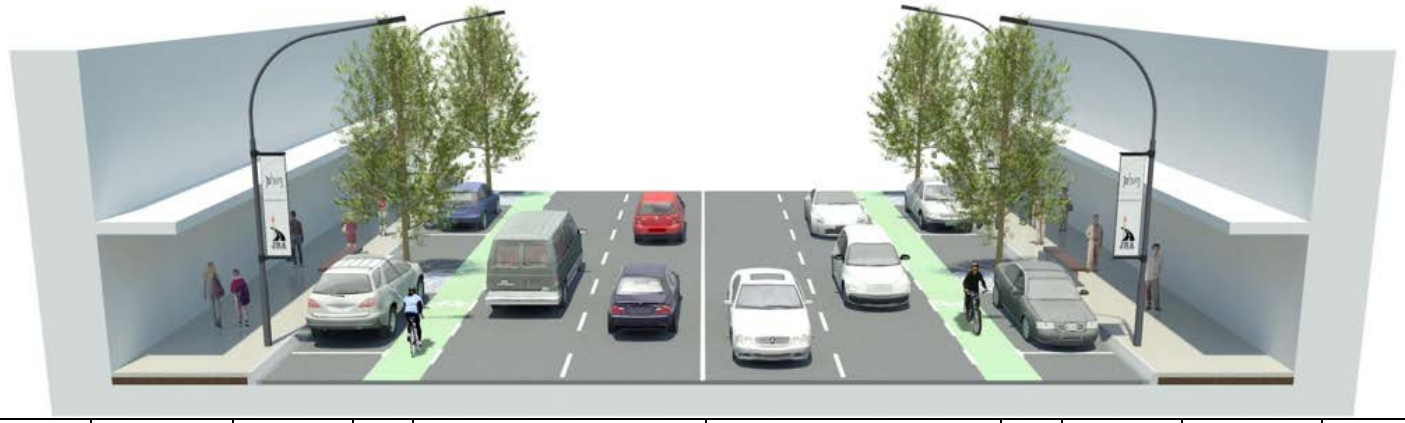
STREET SECTION Option 2



		Green Zone	Shared Use Path **3m**	Green Zone	2 Lane Roadway 3.5m x 2= **7m**	2 Lane Roadway 3.5m x 2= **7m**	Green Zone	Shared Use Path **3m**	Green Zone	

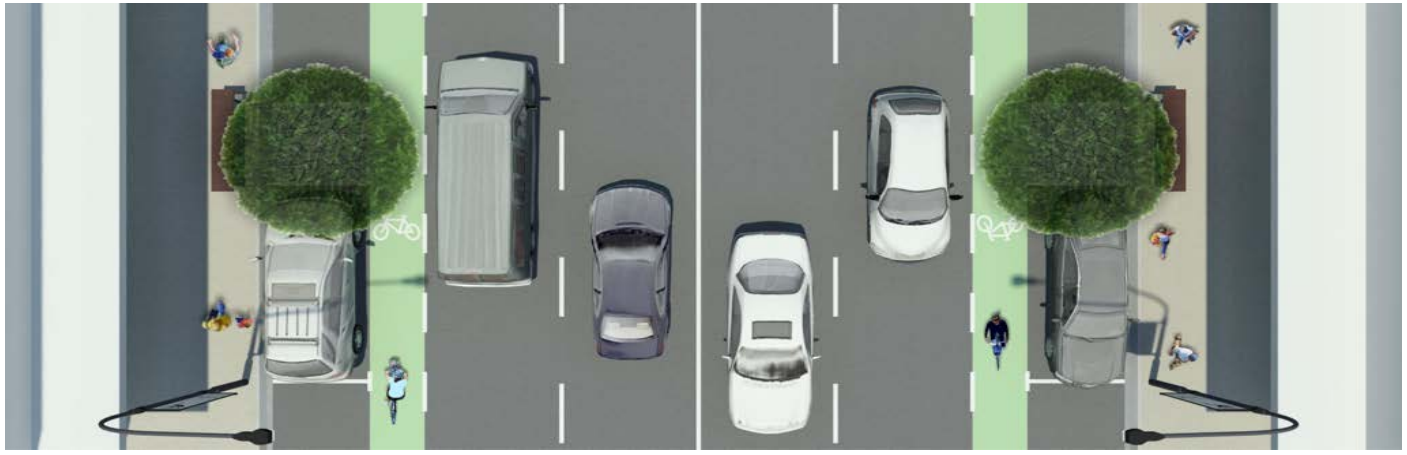
CBD Road/ Activity Street – 25m Road Reserve

STREET SECTION



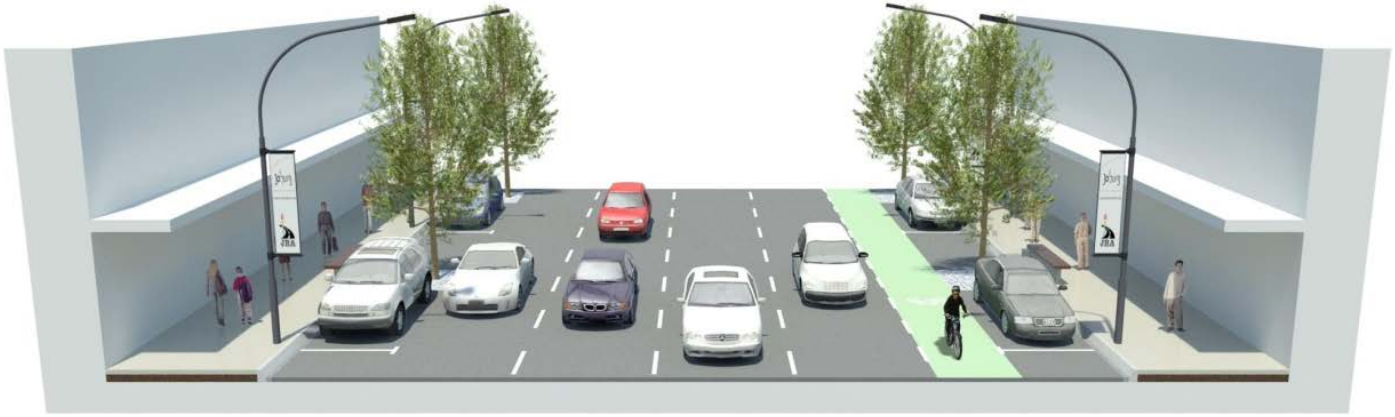
		Walkway	2.25m Parallel Parking	1.5 - 1.8m Cycle Lane	2 Lane Roadway	2 Lane Roadway	1.5 - 1.8m Cycle Lane	2.25m Parallel Parking	Walkway	
					3m x 2 = **6m**	3m x 2 = **6m**				

STREET PLAN



CBD Road/ Activity Street – 25m Road Reserve (One-Way)

STREET SECTION

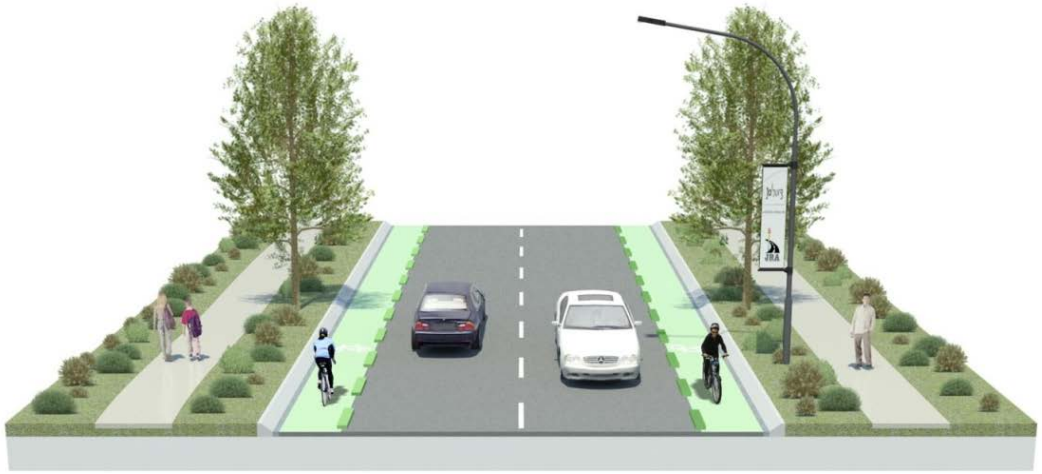


		Walkway	2.25m Parallel Parking	4 Lane One-Way Roadway 3m x 4 = **12m**	1.8 – 2 m Cycle Lane	2.25m Parallel Parking	Walkway	

STREET PLAN

Residential Collector – 20m Road Reserve

STREET SECTION



	Green Zone	Walk-way	Green Zone	1.5 - 1.8m Cycle Lane	Single Lane Roadway	Single Lane Roadway	1.5 - 1.8m Cycle Lane	Green Zone	Walk-way	Green Zone
		1.5-1.8m			3.5m	3.5m			1.5-1.8m	

STREET PLAN

Residential Street – 16m Road Reserve

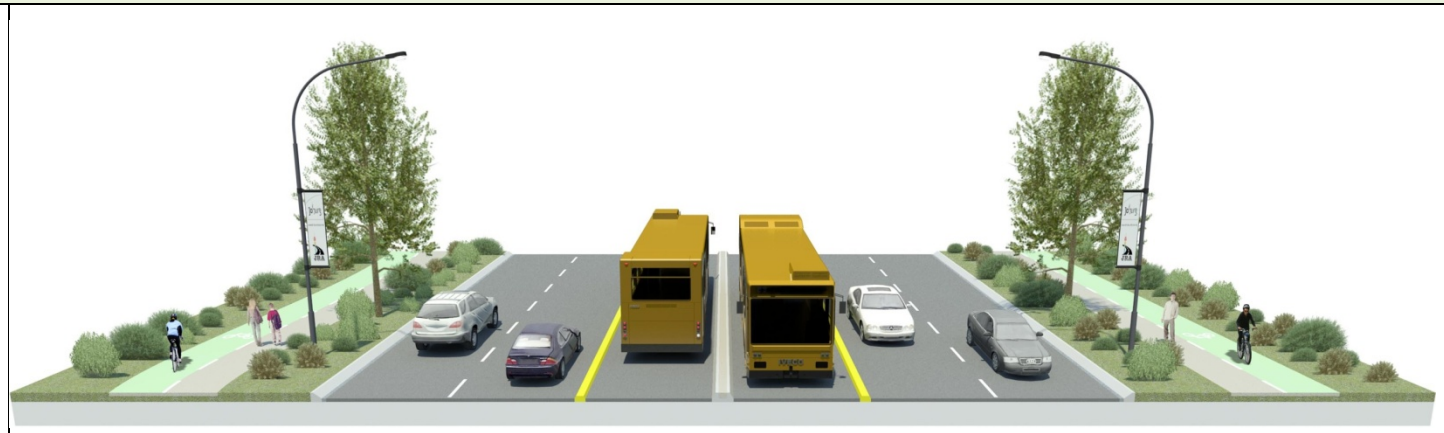
STREET SECTION

		Green Zone	Walk-way 1.2-1.5m	Green Zone	Single Lane Roadway 3m	Single Lane Roadway 3m	Green Zone	Walk-way 1.2-1.5m	Green Zone	

STREET PLAN

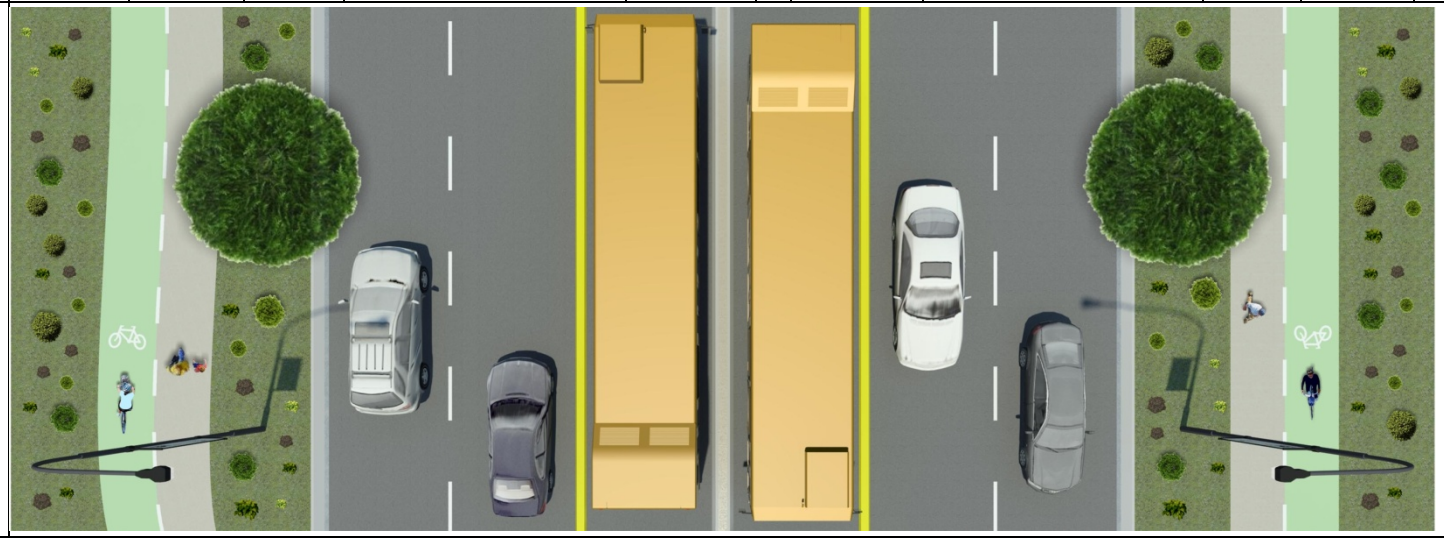
BRT Trunk Route – 40m Road Reserve

STREET SECTION



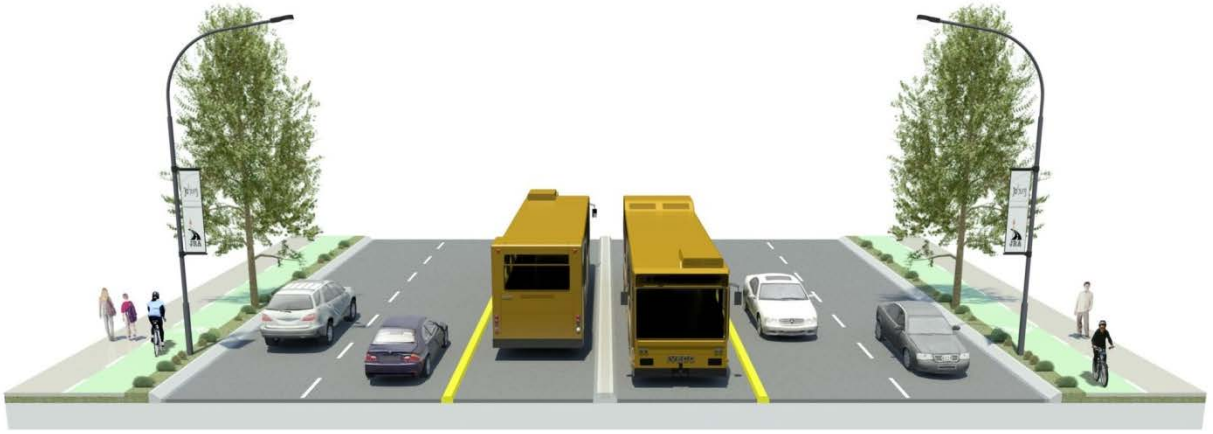
Shared Use Path			2 Lane Roadway	1 Bus Lane	Barrier	1 Bus Lane	2 Lane Roadway	Shared Use Path		
Green Zone	3m	Green Zone	3.5m x 2 = **7m**	**3.5m**		**3.5m**	3.5m x 2 = **7m**	Green Zone	3m	Green Zone

STREET PLAN



BRT Trunk Route – 30m Road Reserve

STREET SECTION



Shared Use Path	3 Lane Roadway	1 Bus Lane	Barrier	1 Bus Lane	2 Lane Roadway	Shared Use Path
3m with Green Zone	3.5m x 2 = **7m**	**3.5m**		**3.5m**	3.5m x 2 = **7m**	3m with Green Zone

STREET PLAN

Bibliography

7

7. BIBLIOGRAPHY

1. Better Streets, Better Cities: A guide to street design in urban India, Institute for Transportation and Development Policy, July 2011
2. Bicycle & Pedestrian Transportation Plan, City of Palo Alto
3. Complete Streets: Best Policy and Implementation Practices, American Planning Association, 2010
4. Complete Streets Chicago: Design Guidelines, Department of Transportation, 2013 Edition
5. Complete Streets Design Guidelines, Knoxville Regional Transportation Planning Organization, July 2009
6. Complete Streets Design Handbook, Philadelphia Mayor's Office for Transportation and Utilities, 2012
7. Complete Streets Implementation Action Plan, California Department of Transportation, 2010
8. Pedestrian and Bicycle Facility Guidelines, Department of Transport, August 2003
9. Sight Line: Designing Better Streets for People with Low Vision, Ross Atkin, 2010
10. Standard Construction Detail & Design Standards for Intersection Pedestrian Crossings, City of Johannesburg, November 2010
11. Strategic Public Transport Network: Guidelines for Implementation, Arcus Gibb, October 2005
12. Wisconsin Bicycle Facility Design Handbook, Wisconsin Department of Transportation, January 2004

ANNEXURE A

LIST OF DRAWINGS

STANDARD CONSTRUCTION DETAIL & DESIGN STANDARDS FOR INTERSECTION PEDESTRIAN CROSSINGS

DRAWING NO	DESCRIPTION	SHEET NUMBER
TGSI_001	WARNING AND GUIDANCE TACTILES GEOMETRY	SHEET 1 OF 1
TGSI_002	PEDESTRIAN RAMPS AT UNCONTROLLED INTERSECTION	SHEET 1 OF 1
TGSI_003	PEDESTRIAN RAMPS AT CONTROLLED INTERSECTION	SHEET 1 OF 1
TGSI_004	TACTILE OVERLAP, ANGULAR, CROSSING MEDIAN, NARROW FOOTWAY	SHEET 1 OF 1
TGSI_005	INSPECTION COVERS, ALIGNMENT AND INSET COVERS (BLOCKS)	SHEET 1 OF 2
TGSI_005	INSPECTION COVERS, ALIGNMENT AND INSET COVERS (SLABS)	SHEET 2 OF 2
TGSI_006	PROPOSED BRT TRUNK ROUTE CBD FOOTWAY TREATMENT (BLOCKS)	SHEET 1 OF 2
TGSI_006	PROPOSED BRT TRUNK ROUTE CBD FOOTWAY TREATMENT (SLABS)	SHEET 2 OF 2
TGSI_007	TYPICAL DETAIL OF FOOTWAYS	SHEET 1 OF 1
TGSI_008	STREET FURNITURE LAYOUT, FOOTWAY WIDTHS BETWEEN 2.95m AND 4.05m	SHEET 1 OF 1
TGSI_009	VEHICLE CROSSOVER	SHEET 1 OF 1
TGSI_010	RAISED ENTRY TREATMENT AND PEDESTRIAN CROSSING	SHEET 1 OF 3
TGSI_010	RAISED ENTRY TREATMENT AND PEDESTRIAN CROSSING	SHEET 2 OF 3
TGSI_010	RAISED ENTRY TREATMENT AT CROSSINGS	SHEET 3 OF 3
TGSI_011	PEDESTRIAN REFUGE ISLAND	SHEET 1 OF 2
TGSI_011	PEDESTRIAN REFUGE ISLAND	SHEET 2 OF 2
TGSI_012	TYPICAL DETAIL OF TREE PITS ON FOOTWAYS	SHEET 1 OF 1
TGSI_013	BASIC CYCLE PARKING LAYOUT OPTIONS FOR FOOTWAYS	SHEET 1 OF 1
TGSI_014	CONTROLLED STAGGERED PEDESTRIAN CROSSING	SHEET 1 OF 1
TGSI_015	YIELD CONTROLLED MIDBLOCK PEDESTRIAN CROSSING	SHEET 1 OF 2
TGSI_015	YIELD CONTROLLED MIDBLOCK PEDESTRIAN CROSSING	SHEET 2 OF 2
TGSI_016	YIELD CONTROLLED, RAISED, MID-BLOCK PEDESTRIAN CROSSING	SHEET 1 OF 1
TGSI_017	STANDARD RAISED TABLE DETAIL 1 (HRA)	SHEET 1 OF 2
TGSI_017	STANDARD RAISED TABLE DETAIL 2 (SETS)	SHEET 2 OF 2
TGSI_018	SHARED PEDESTRIAN AND BICYCLE FACILITY	SHEET 1 OF 1

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

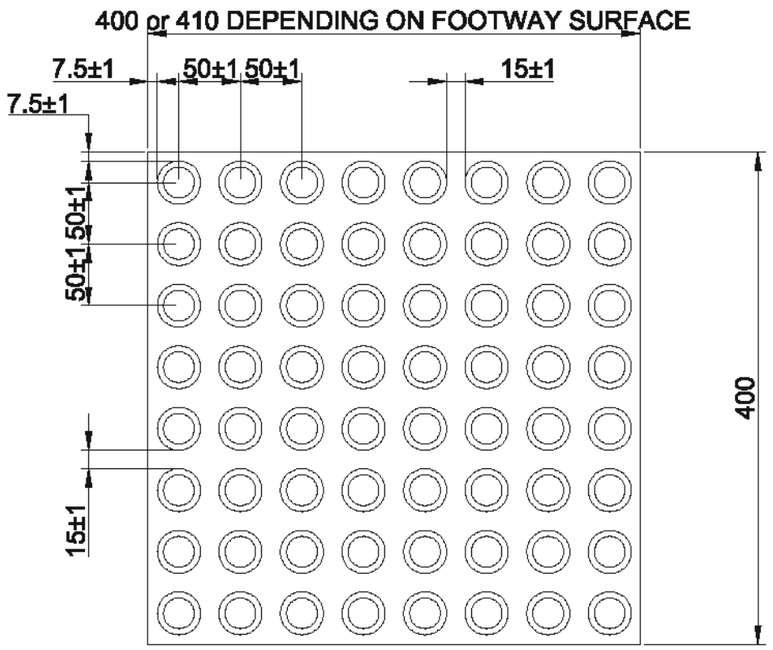
MANAGER: INFRASTRUCTURE PLANNING AND MANAGEMENT MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	DRAWING CHECKED RAYMOND_DIPPENAAR
MANAGER: INFRASTRUCTURE PROVISION MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTRUCTURE TRAFFIC ENGINEERING MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DETAILS

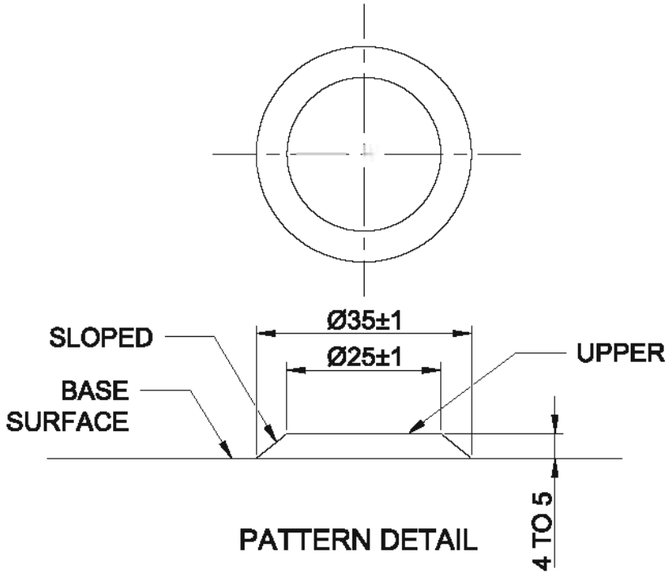
LIST OF DRAWINGS

DATE NOV2010	SCALE NTS
DRAWING NUMBER TGSI_000	
AMENDMENT NO: 0	
SHEET NUMBER 1/1	

WARNING TACTILES

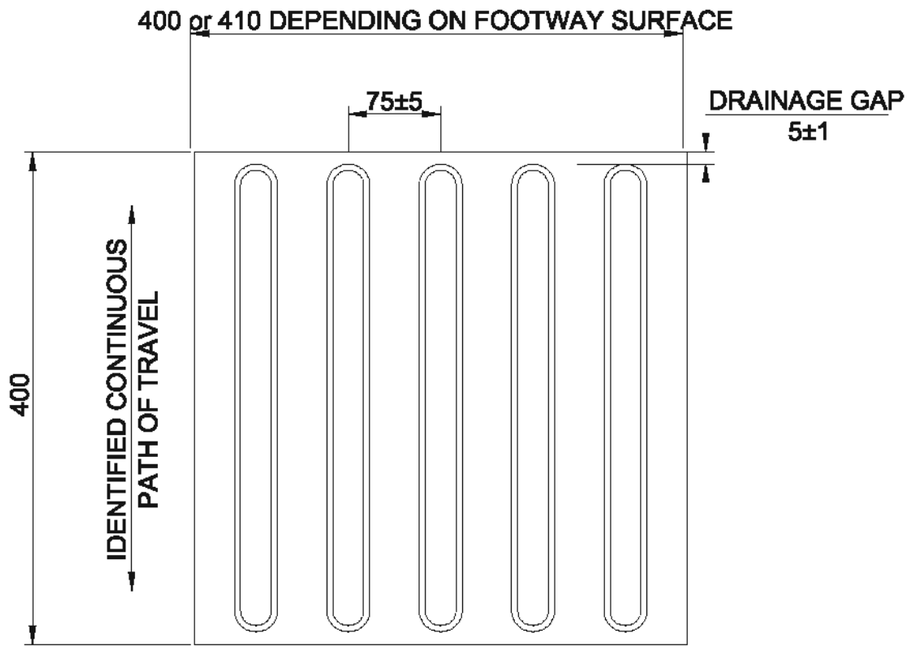


TOP VIEW

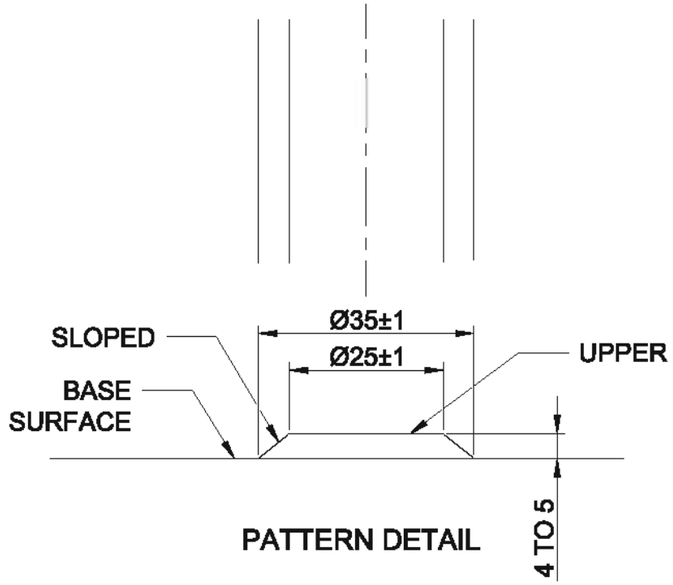


PATTERN DETAIL

GUIDANCE TACTILES



TOP VIEW



PATTERN DETAIL

NOTES

COLOUR:

TACTILES ARE NORMALLY AVAILABLE IN :

- GREY
- BUFF (YELLOW)
- CHARCOAL
- RED
- AND NATURAL STONE LIKE YORKSTONE OR GRANITE

LUMINANCE AND COLOR CONTRAST BETWEEN THE INSTALLED TACTILES AND THE SURROUNDING FOOTWAY AREA IS OF UTMOST IMPORTANCE AS THIS ASSIST PARTIALLY SIGHTED PEOPLE TO IDENTIFY THE PRESENCE OF THE TACTILE PAVING AND BE WARNED OF THE PRESENCE OF THE FLUSH DROPPED KERB

REF FOR DESIGN

SANS 784 P12-14
SEE SANS 784 APPENDIX F,P51 FOR LUMINANCE CONTRAST REQUIREMENTS AND MEASUREMENTS

DRAWING UNITS ARE IN (mm)

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

ARCUS GIBB ENGINEERING & SCIENCE

GIBB House
14 Eglin Road
Sunninghill
2191

P O Box 2700
Rivonia
2128

TEL: (011) 5184600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTRUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTRUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTRUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DETAILS

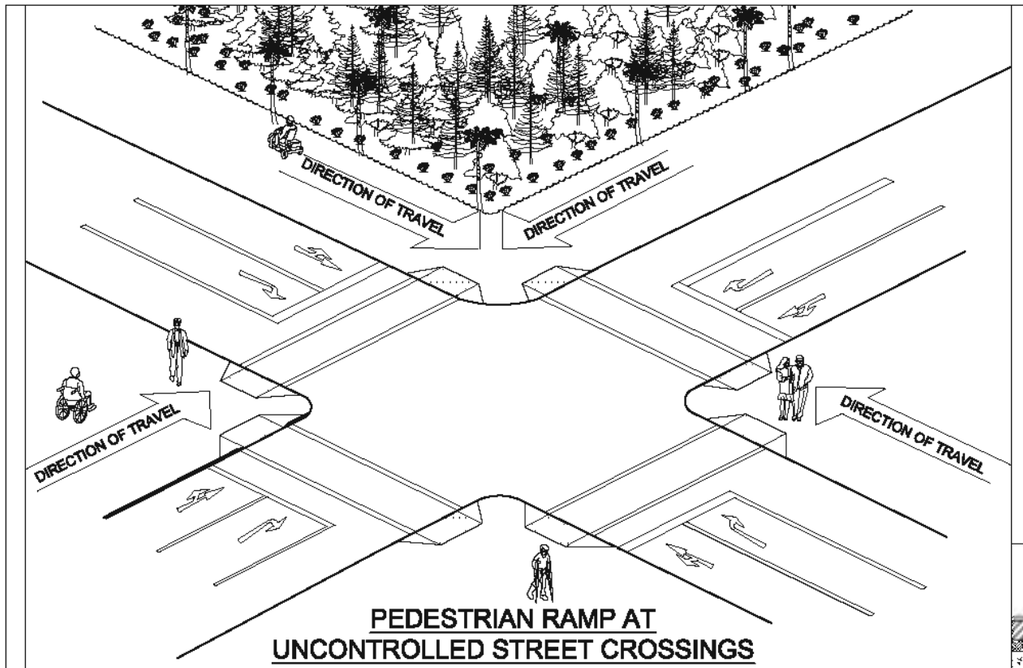
WARNING AND GUIDANCE TACTILE GEOMETRY

DATE	SCALE
NOV/2010	NTS

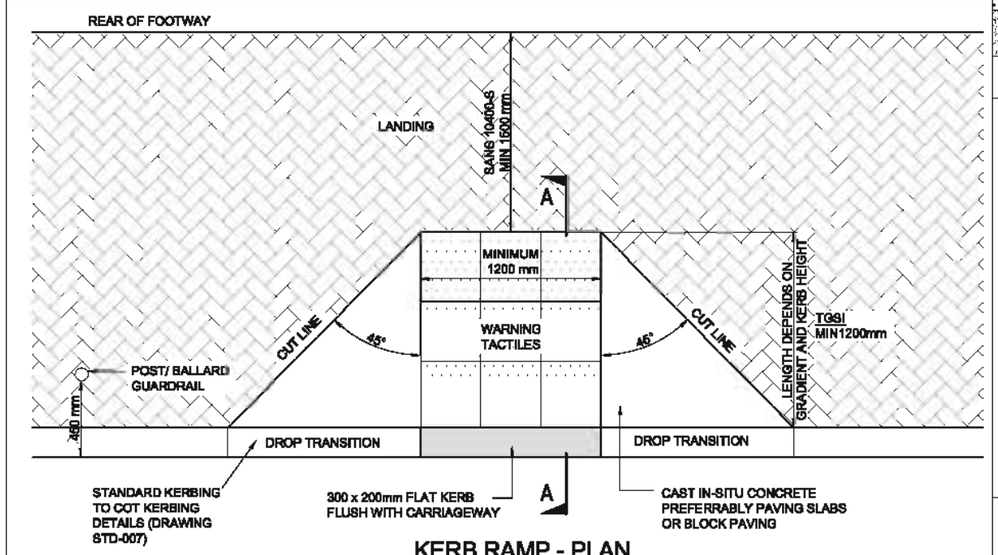
DRAWING NUMBER: TGSI_001

AMENDMENT NO: 0

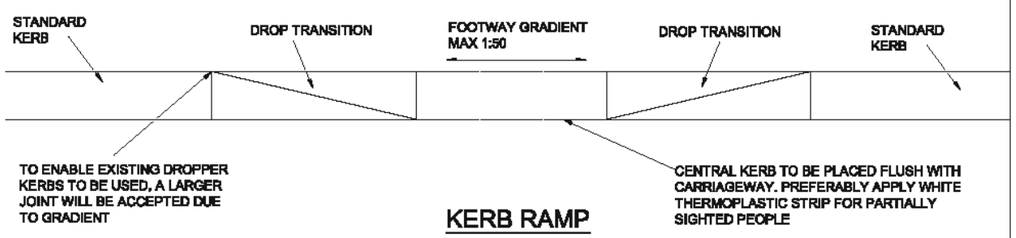
SHEET NUMBER: 1/1



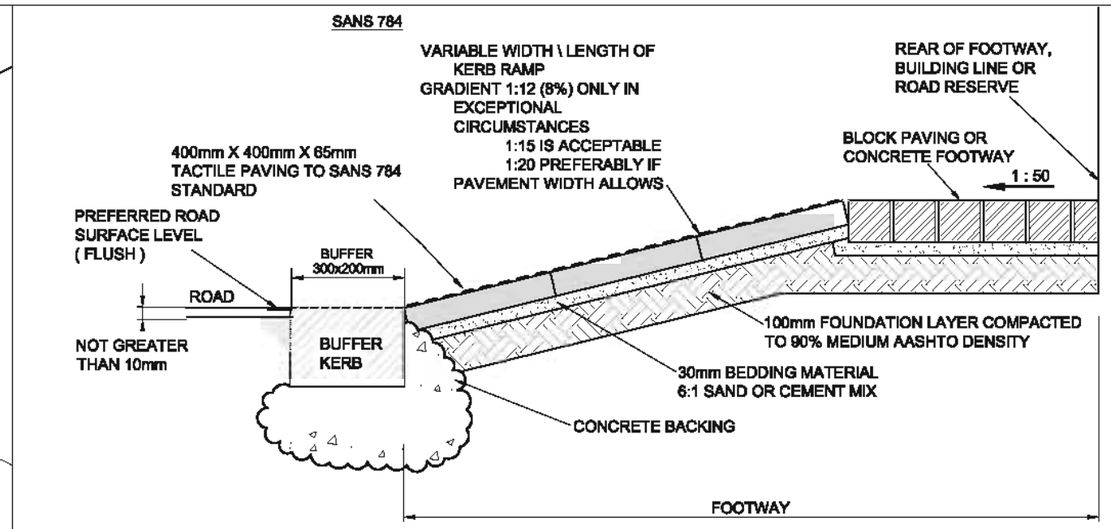
PEDESTRIAN RAMP AT UNCONTROLLED STREET CROSSINGS



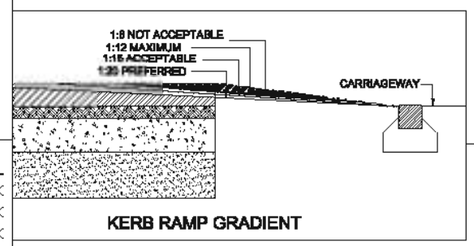
KERB RAMP - PLAN



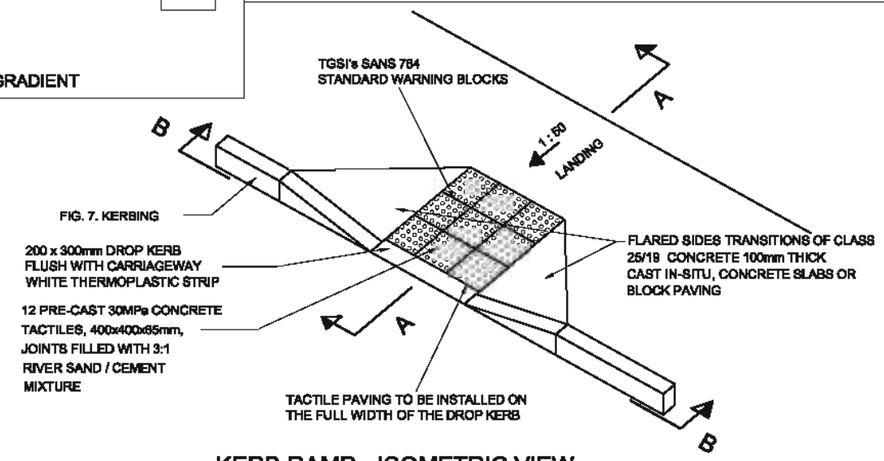
KERB RAMP FRONT ELEVATION (B - B)



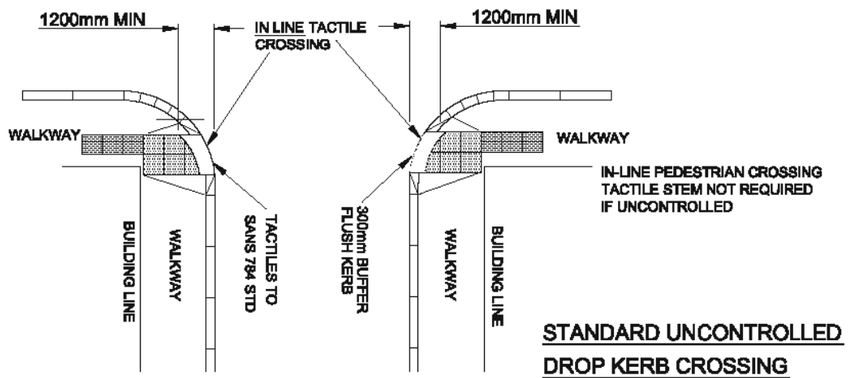
KERB RAMP SECTION A - A



KERB RAMP GRADIENT



KERB RAMP - ISOMETRIC VIEW



STANDARD UNCONTROLLED DROP KERB CROSSING

NOTES

SPECIFICATION OF PEDESTRIAN RAMPS AT STREET CROSSINGS

NOTE COT NR4 UNCONTROLLED CROSSINGS

- EG. SIDE ROAD JUNCTIONS
- RAISED CROSSINGS
- "ACCESS ROAD" CROSSOVERS

1. TACTILE PAVING MUST BE LAID AT EVERY CONTROLLED AND UNCONTROLLED CROSSING POINT, INCLUDING AREAS WHERE THE ROAD LEVEL HAS BEEN RAISED TO THE SAME LEVEL AS THE FOOTWAY

2. AT ALL PEDESTRIAN CROSSINGS THE TACTILE SURFACE MUST BE LAID "IN LINE" WITH THE ANGLE OF THE CROSSING NOT "IN LINE" WITH THE KERB LINE

3. DIFFERENT COLOURS OF TACTILE CAN BE USED AT DIFFERENT CROSSING POINTS TO HELP VISUALLY IMPAIRED BETWEEN CROSSING TYPES. TACTILES ARE NORMALLY AVAILABLE IN:

- BUFF (YELLOW)
- GREY
- RED
- CHARCOAL
- AND NATURAL STONE LIKE YORKSTONE OR GRANITE

NB: IT IS IMPORTANT TO NOTE THAT THE SIZE, SHAPE, LAYOUT AND DESIGN OF TACTILE DROP-CROSSINGS DIFFER IN RELATION TO CBD, RESIDENTIAL OR RURAL LOCATION AS WELL AS CONTROLLED CROSSING OR UN-CONTROLLED CROSSING

UNCONTROLLED CROSSING

eg: SIDE ROAD JUNCTIONS, RAISED CROSSINGS, ACCESS ROAD CROSSOVERS, SIGNAL JUNCTIONS WITHOUT PEDESTRIAN PHASES:

- BUFF OR DARK GREY TACTILE (WHICHEVER PROVIDES THE GREATEST CONTRAST TO SURROUNDING PAVING FULL WIDTH OF DROPPED KERB.
- AT CROSSING IN-LINE WITH PEDESTRIAN FLOW 1200mm DEPTH OF TACTILE. TACTILE STEM NOT REQUIRED.

WHERE TACTILE PAVING IS INTERRUPTED BY AN INSPECTION COVER, AN INSET COVER MUST BE INSTALLED WITH TACTILE PAVING LAID IN THE SAME DIRECTION.

CLOSE ATTENTION SHOULD BE PAID TO PAVEMENT MATERIALS SURROUNDING DROPPED KERBS. THE SAME PAVING MATERIAL SHOULD BE USED IN CREATING THE DROPPED KERB AS FOUND IN THE FOOTWAYS.

PROVIDE 600mm LEVEL STRIP IF ALGEBRAIC DIFFERENCE EXCEEDS 11%

ALGEBRAIC DIFFERENCE IN GRADIENTS NOT TO EXCEED 11%

KERB RAMPS

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194800 FAX: (011) 8075870

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

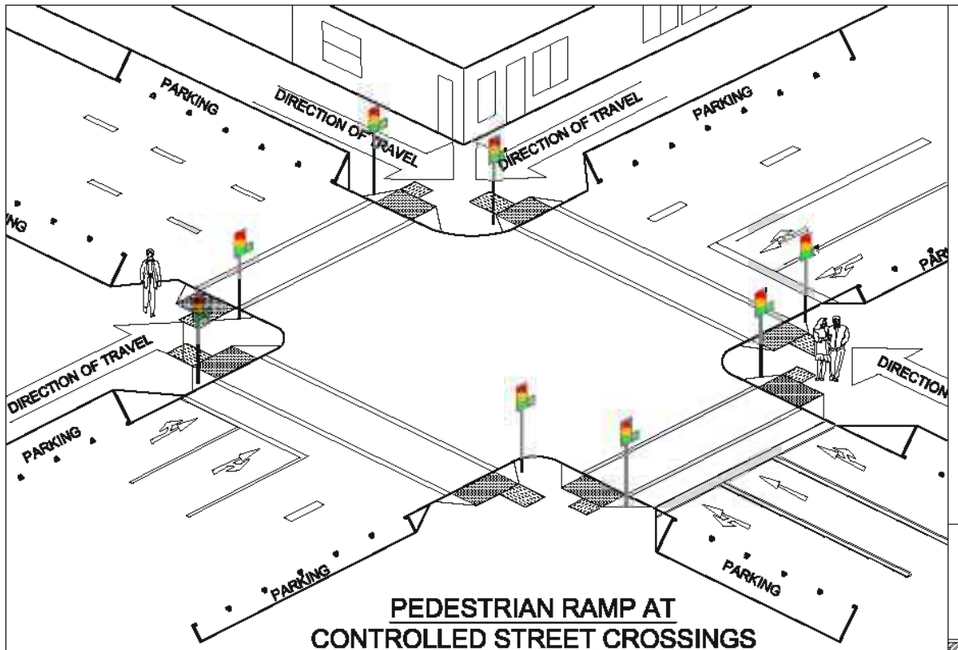
PEDESTRIAN RAMPS AT UNCONTROLLED INTERSECTIONS

DATE	SCALE
OCT2010	NTS

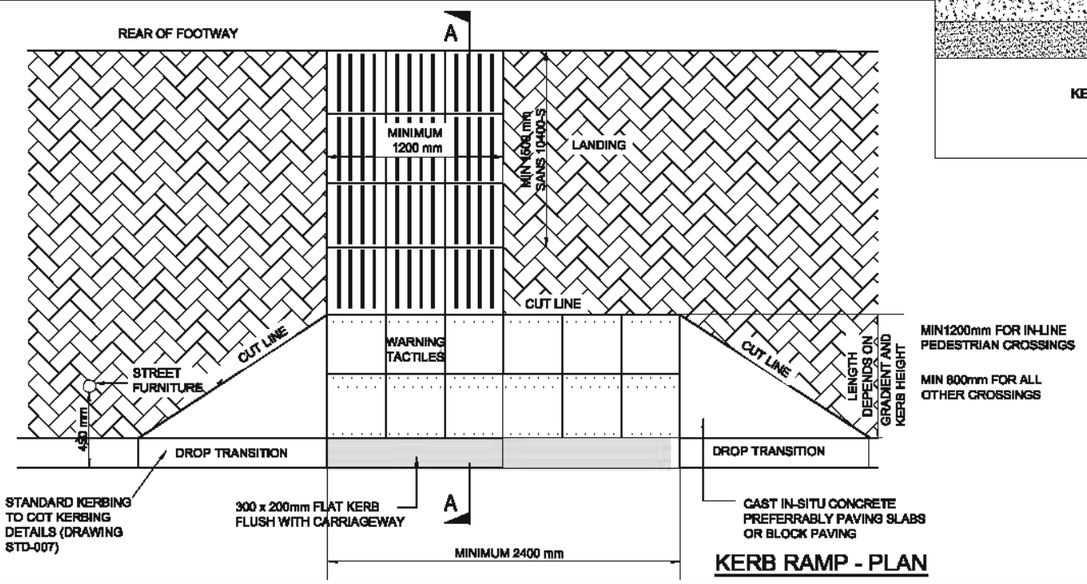
DRAWING NUMBER: TGSI_002

AMENDMENT NO: 0

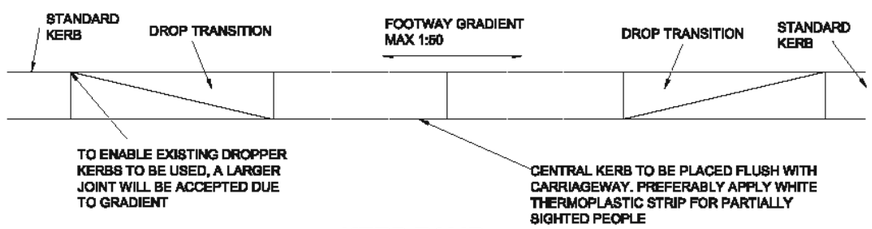
SHEET NUMBER: 1/1



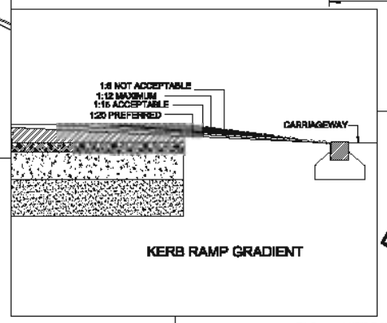
PEDESTRIAN RAMP AT CONTROLLED STREET CROSSINGS

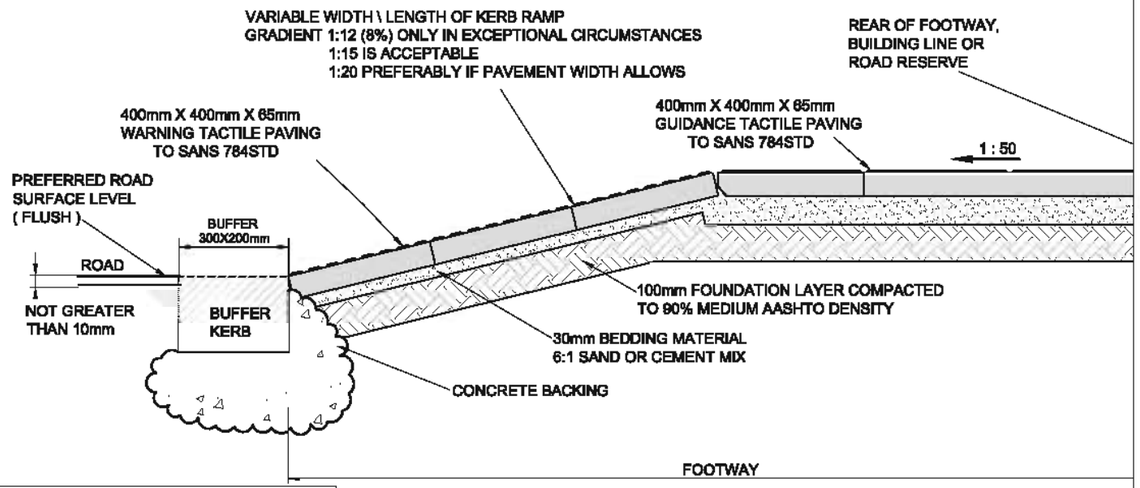


KERB RAMP - PLAN

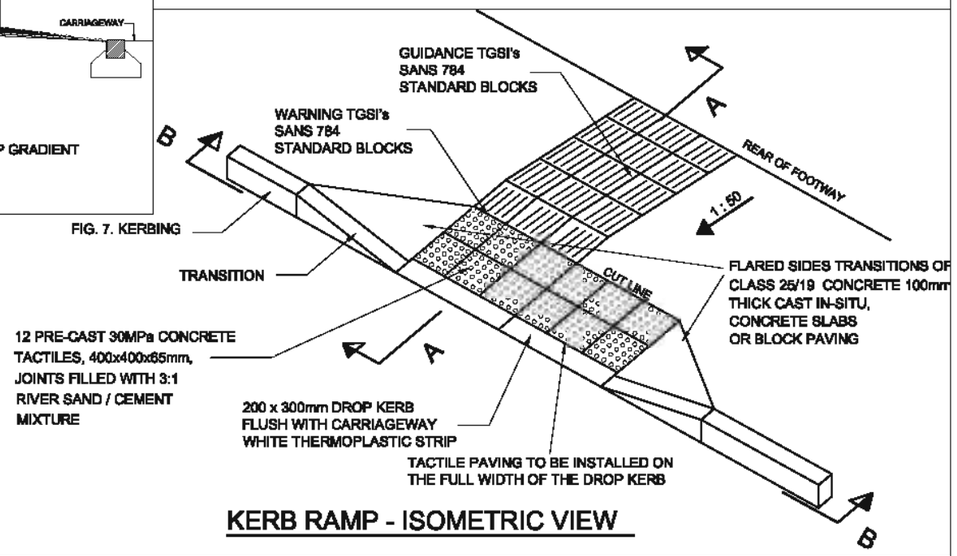


KERB RAMP FRONT ELEVATION (B - B)

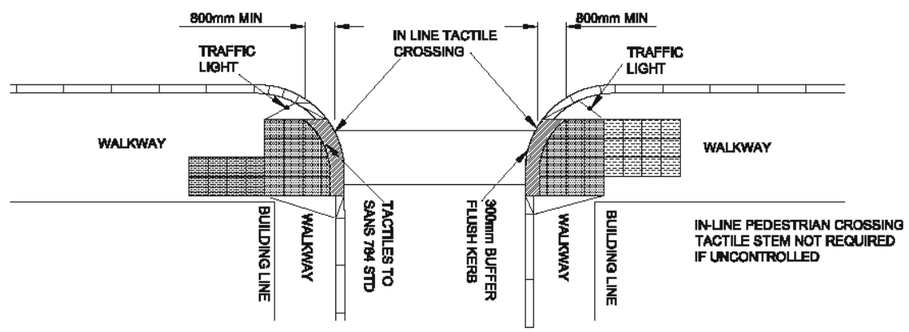




KERB RAMP - SECTION A - A



KERB RAMP - ISOMETRIC VIEW



STANDARD UNCONTROLLED DROP KERB CROSSING

NOTES

SPECIFICATION OF PEDESTRIAN RAMPS AT CONTROLLED STREET CROSSINGS

1. TACTILE PAVING MUST BE LAID AT EVERY CONTROLLED AND UNCONTROLLED CROSSING POINT, INCLUDING AREAS WHERE THE ROAD LEVEL HAS BEEN RAISED TO THE SAME LEVEL AS THE FOOTWAY
2. AT ALL PEDESTRIAN CROSSINGS THE TACTILE SURFACE MUST BE LAID "IN LINE" WITH THE ANGLE OF THE CROSSING NOT "IN LINE" WITH THE KERB LINE
3. DIFFERENT COLOURS OF TACTILE CAN BE USED AT DIFFERENT CROSSING POINTS TO HELP VISUALLY IMPAIRED BETWEEN CROSSING TYPES
4. WHERE THE FOOTWAY IS SO NARROW THAT A 1:12 GRADIENT IS NOT POSSIBLE (WHILE LEAVING 1.5m WIDTH LANDING), AN ALTERNATIVE ROUTE SHOULD BE IDENTIFIED. IF NECESSARY, THE FULL WIDTH OF THE FOOTWAY SHOULD BE LOWERED AND 1:12 RAMPS INSTALLED STRETCHING ALONG THE FOOTWAY.
5. MINIMUM WIDTH OF AN UNCONTROLLED DROP KERB IS 1.2m AND A CONTROLLED DROP KERB IS 2.4m WIDE.
6. STEM / TAIL WIDTH ON A CONTROLLED CROSSING IS 1.2m WIDE.
7. CONCRETE PAVING SLABS SHOULD BE LAID WITH COURSES AT A 90° ANGLE TO THE KERB AND WITH A MINIMUM OVERLAP BOND OF 150mm.
8. THE BONDING OF PAVING SHOULD BE CUT NEATLY AROUND UTILITY SERVICE COVERS AND STREET FURNITURE.

CONTROLLED CROSSINGS:
IE. - LIGHT CONTROLLED
- ZEBRA CROSSINGS

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5184600 FAX: (011) 8075870

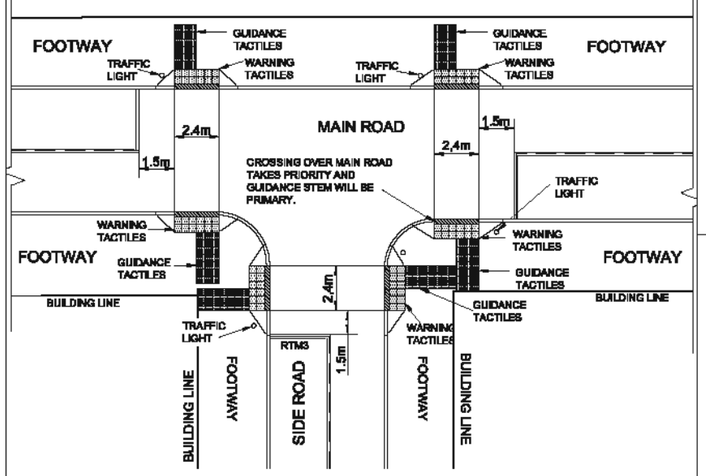
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	DRAWING CHECKED RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

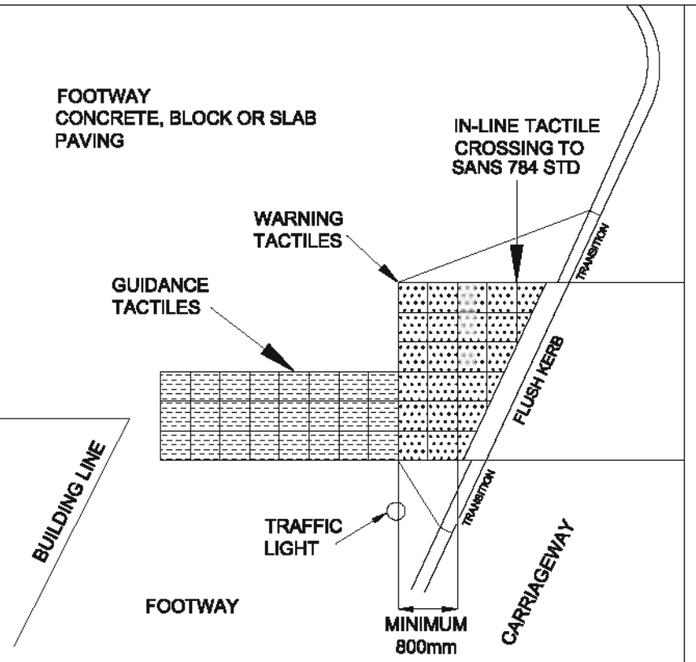
PEDESTRIAN RAMPS AT CONTROLLED INTERSECTIONS

DATE	SCALE
NOV2010	NTS

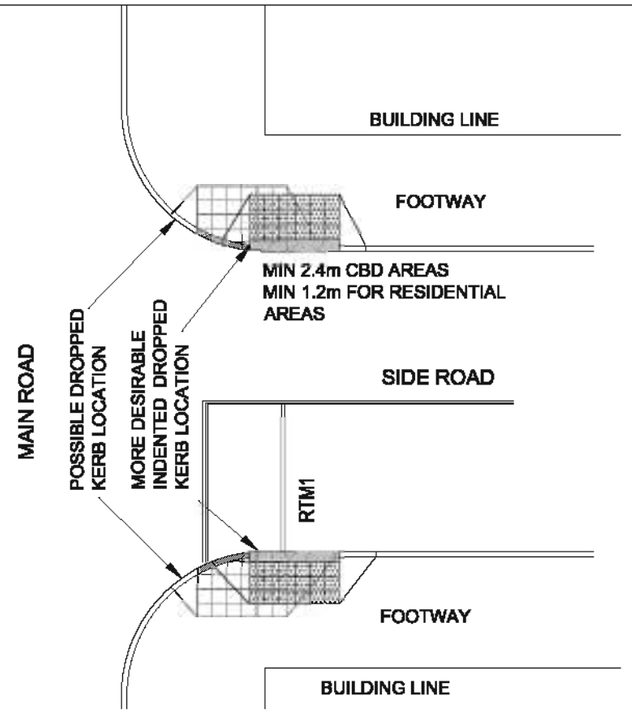
DRAWING NUMBER: TGSI_003
AMENDMENT NO: 0
SHEET NUMBER: 1/1



OVERLAPPING CONTROLLED CROSSING



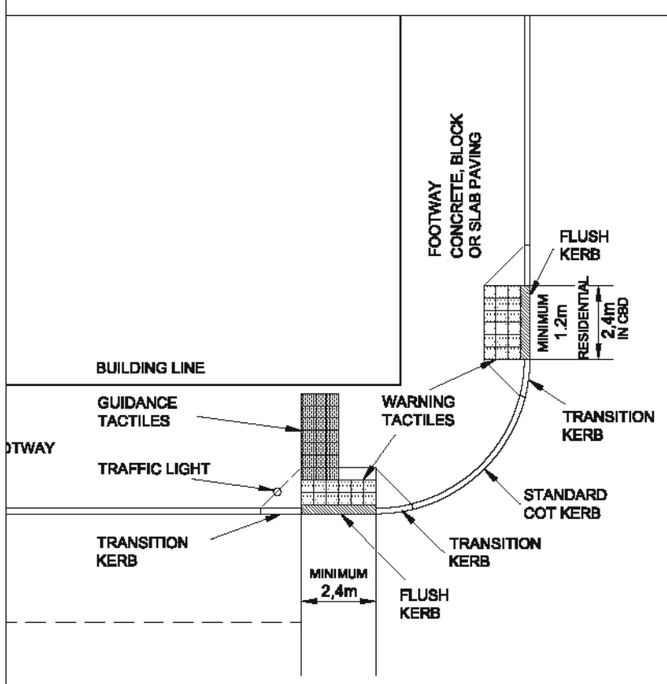
ANGULAR TREATMENT



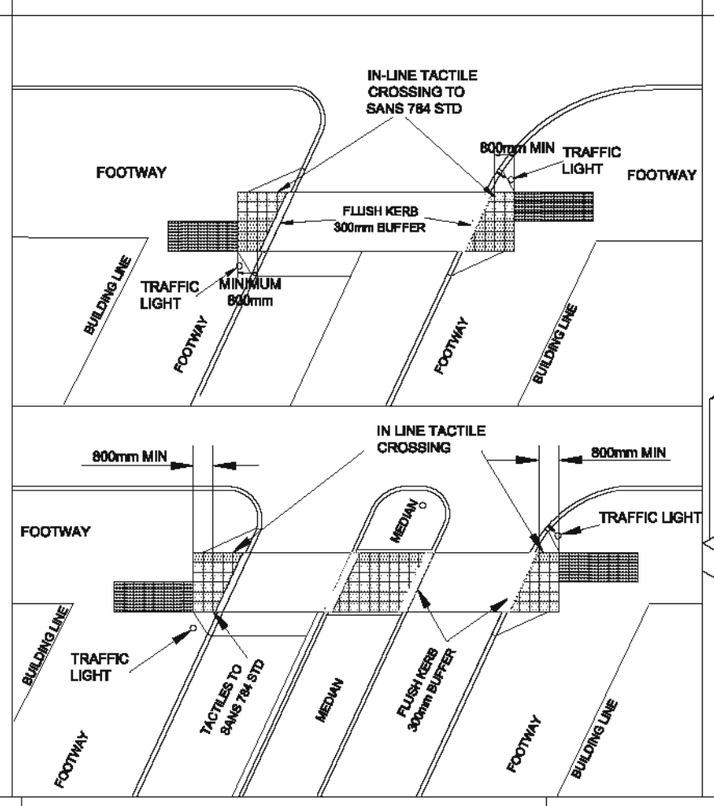
INDENTED SIDEROAD DROPED KERB

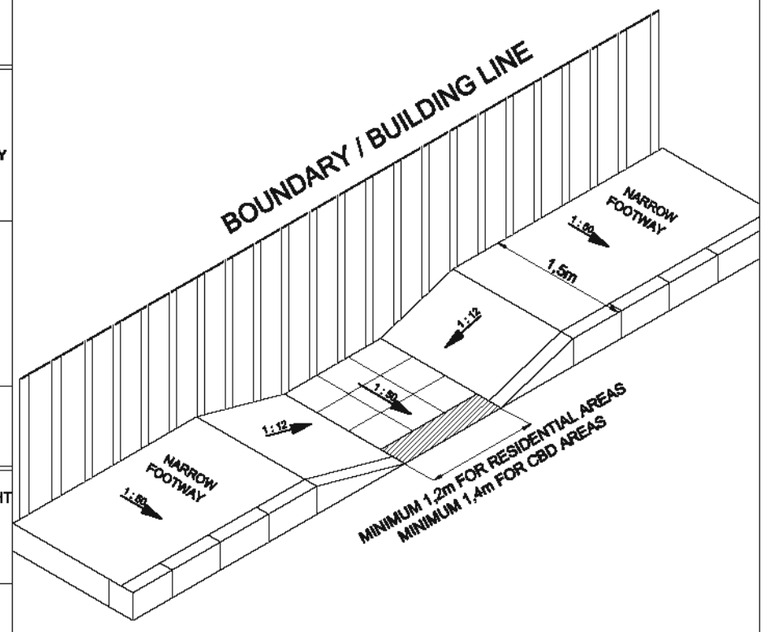
NOTES

1. IF A PAVEMENT IS SO NARROW THAT EVEN A 1:12 GRADIENT IS NOT POSSIBLE (WHILE LEAVING A 1.5m LEVEL FOOTWAY), THEN AN ALTERNATIVE ROUTE OR SOLUTION MUST BE IDENTIFIED. IF NECESSARY THE FULL WIDTH OF THE PAVEMENT COULD BE LOWERED WITH THE RAMPS RUNNING WITH THE FOOTWAY.
2. WHERE TWO OVERLAPPING STEMS OCCUR DUE TO JUNCTION GEOMETRY ON A MAIN ROAD AND A SIDE ROAD, THE STEM LEADING TO THE MAIN ROAD CROSSING SHOULD EXTEND OVER THE WHOLE FOOTWAY. THE STEM LEADING TO THE SIDE OF THE ROAD CROSSING SHOULD ONLY EXTEND FROM THE FLUSH KERB TO THE POINT WHERE IT INTERSECTS WITH THE OTHER STEM.
3. IN THE SCENARIO WHERE A TACTILE DROPPED KERB IS BEING RUN OVER REGULARLY BY VEHICLES IT MIGHT BE MORE CONVENIENT TO INDENT THE CROSSING. THIS WILL MORE LIKELY BE AN EASIER CONSTRUCTION, BETTER SHAPED RAMP SECTION AND SAFER DUE TO LIMITED VEHICLE RUN-OVER.
4. KERBING TO BE DONE TO COT STANDARD 007



UNCONTROLLED AND CONTROLLED CROSSING





NARROW FOOTWAY ACCESS

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

TACTILE OVERLAP
ANGULAR CROSSING
MEDIAN, NARROW FOOTWAY

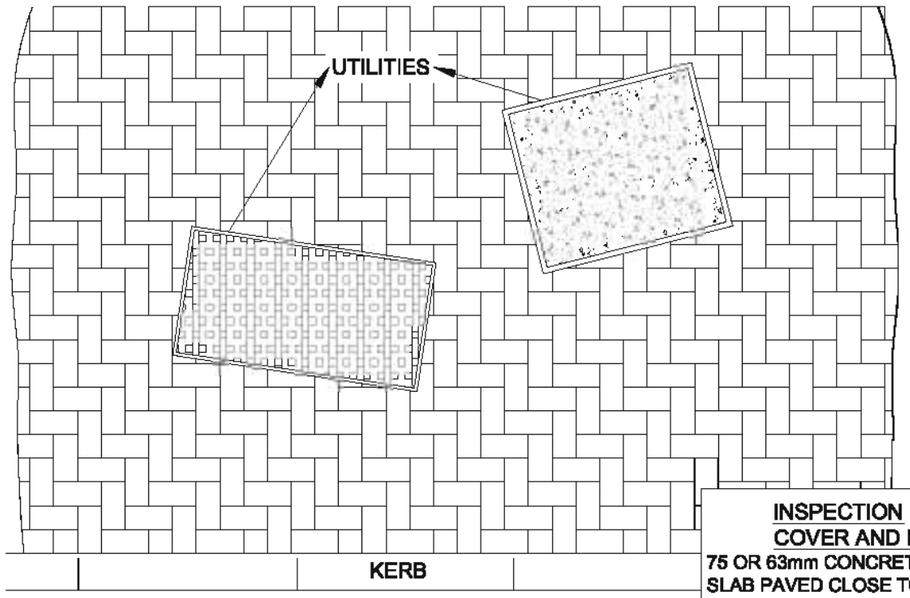
DATE	SCALE
NOV2010	NTS

DRAWING NUMBER
TSGI_004

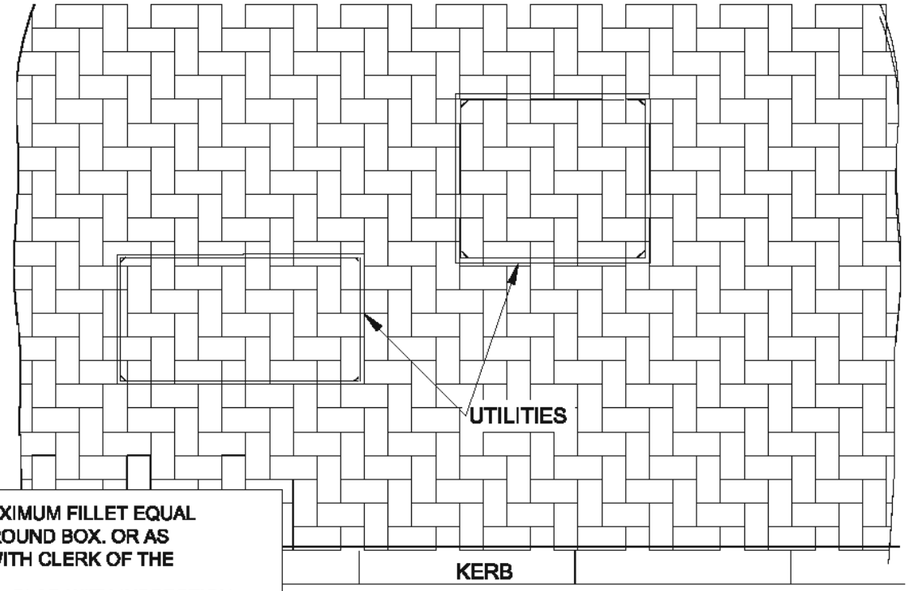
AMENDMENT NO:
0

SHEET NUMBER
1/1

STANDARD UTILITY BOXES



REALIGNED INSET UTILITY BOXES

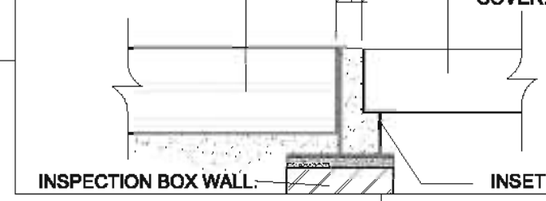


INSPECTION COVER AND FRAME

75 OR 63mm CONCRETE SLAB PAVED CLOSE TO NEW INSET COVER FRAME.

50mm MAXIMUM FILLET EQUAL SIDES AROUND BOX. OR AS GREED WITH CLERK OF THE WORKS

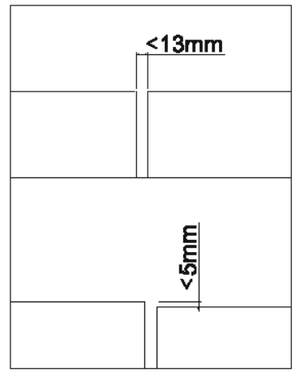
SLAB WITH INSPECTION COVER.



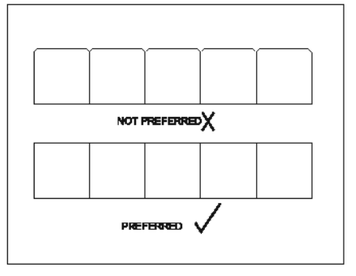
NOTES

1. IT IS EASIER AND NEATER TO CUT SLABS AGAINST A MANHOLE COVER THAT IS IN-LINE WITH THE SLABS.
2. MANY EXISTING INSPECTION COVERSTHAT ARE UP TO 5 DEGREES OUT OF ALIGNMENT CAN BE RESET ON THE EXISTING CHAMBER WALL.
3. GENERALLY, ANY MAJOR ALIGNMENT OF COVERS REQUIRE THE CONSENT OF THE UTILITY COMPANY IN QUESTION.
4. TO ALLOW CONTINUITY IN FOOTWAY SURFACE AND TO LIMIT THE CONFUSION THAT COULD OCCUR ON TACTILE CROSSINGS AS A RESULT OF INSPECTION COVERS INTRUDING ON THE TACTILE SURFACE, SPECIAL INSET COVERS SHOULD BE USED THAT ALLOWS THE PAVING BOND TO CONTINUE ACROSS THE MANHOLE COVERS.
5. SECTIONAL COVERS SHOULD BE USED TO EASE THE LIFTING OF COVERS WITH SLAB INSETS.
6. NB! TACTILE PAVING SHOULD BE "COMPLETE" TO BE EFFECTIVE.

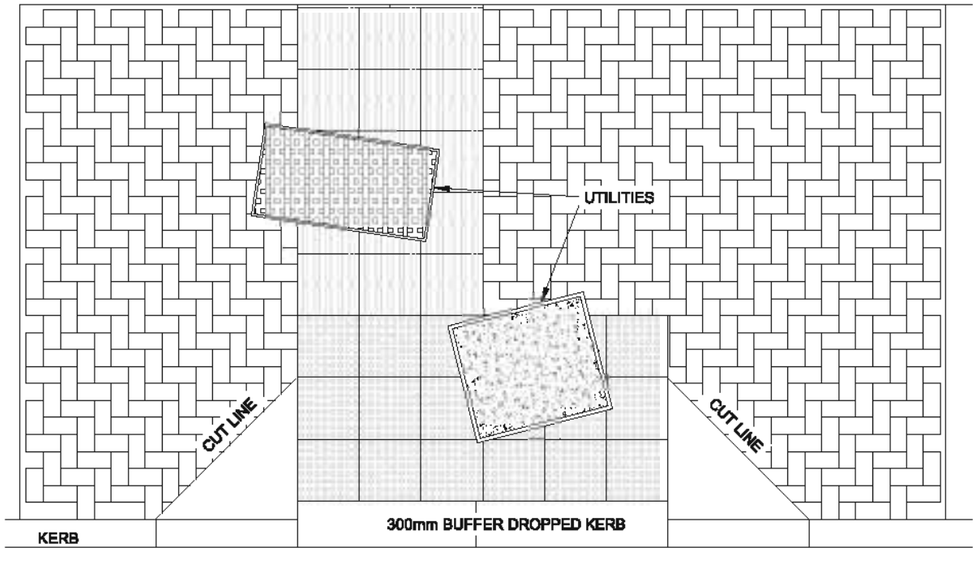
PAVING HORIZONTAL AND VERTICAL ALIGNMENT LIMITS



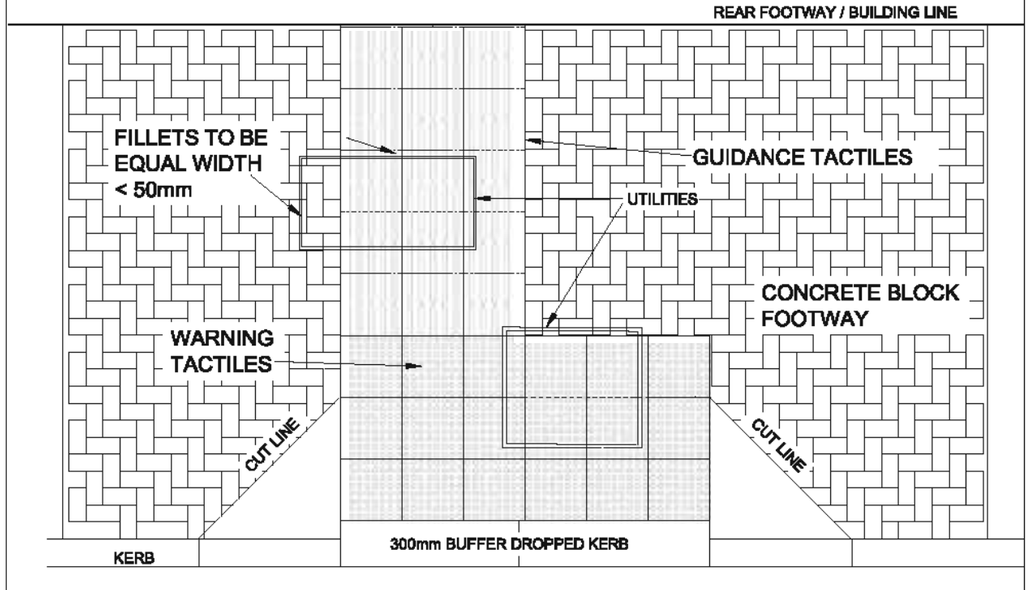
PAVING MATERIAL



TACTILE CROSSING WITH STANDARD UTILITY BOXES



TACTILE CROSSING WITH INSET UTILITY BOXES



AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075870

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

INSPECTION COVERS, ALIGNMENT AND INSET COVERS (BLOCKS)

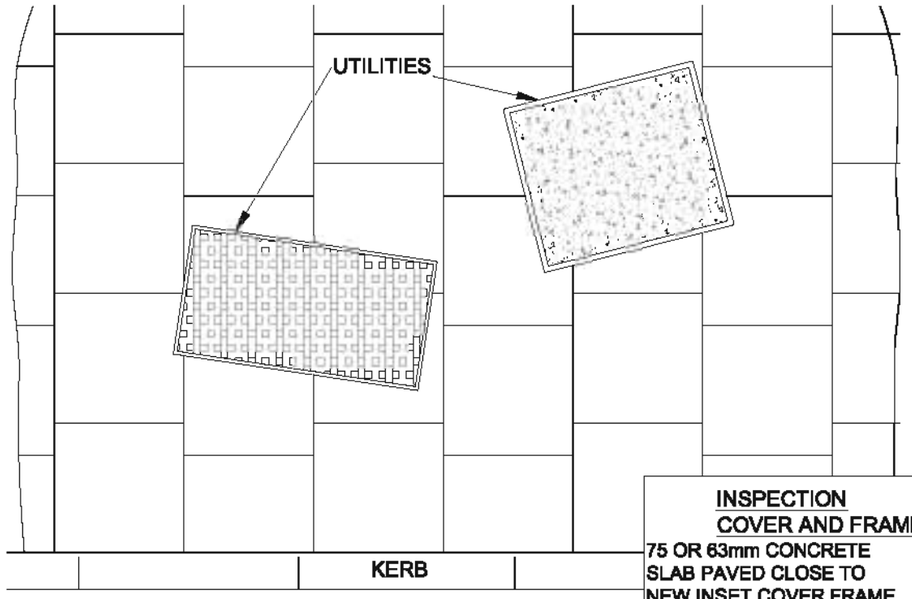
DATE	SCALE
NOV2010	NTS

DRAWING NUMBER: TGSI_005

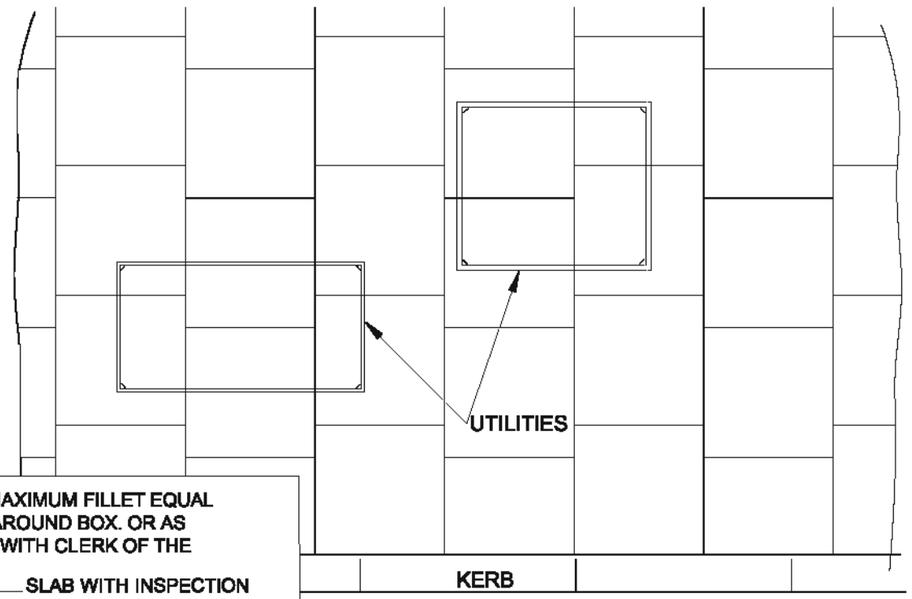
AMENDMENT NO: 0

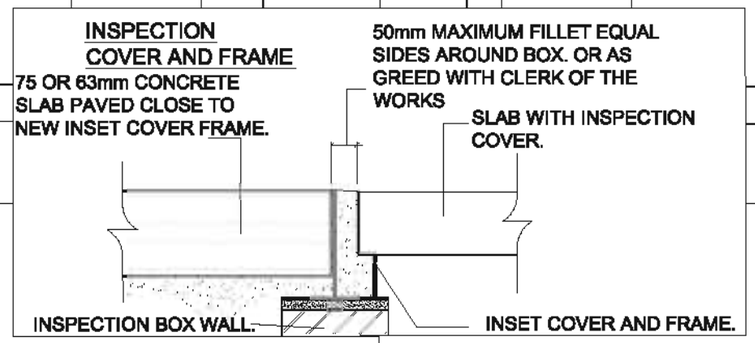
SHEET NUMBER: 1/2

STANDARD UTILITY BOXES



REALIGNED INSET UTILITY BOXES





NOTES

1. IT IS EASIER AND NEATER TO CUT SLABS AGAINST A MANHOLE COVER THAT IS IN-LINE WITH THE SLABS.

2. MANY EXISTING INSPECTION COVERSTHAT ARE UP TO 5 DEGREES OUT OF ALIGNMENT CAN BE RESET ON THE EXISTING CHAMBER WALL.

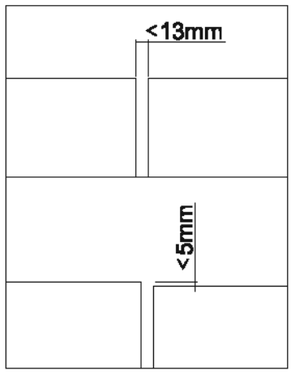
3. GENERALLY, ANY MAJOR ALIGNMENT OF COVERS REQUIRE THE CONSENT OF THE UTILITY COMPANY IN QUESTION.

4. TO ALLOW CONTINUITY IN FOOTWAY SURFACE AND TO LIMIT THE CONFUSION THAT COULD OCCUR ON TACTILE CROSSINGS AS A RESULT OF INSPECTION COVERS INTRUDING ON THE TACTILE SURFACE, SPECIAL INSET COVERS SHOULD BE USED THAT ALLOWS THE PAVING BOND TO CONTINUE ACROSS THE MANHOLE COVERS.

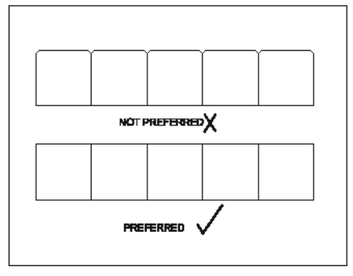
5. SECTIONAL COVERS SHOULD BE USED TO EASE THE LIFTING OF COVERS WITH SLAB INSETS.

6. NB! TACTILE PAVING SHOULD BE "COMPLETE" TO BE EFFECTIVE.

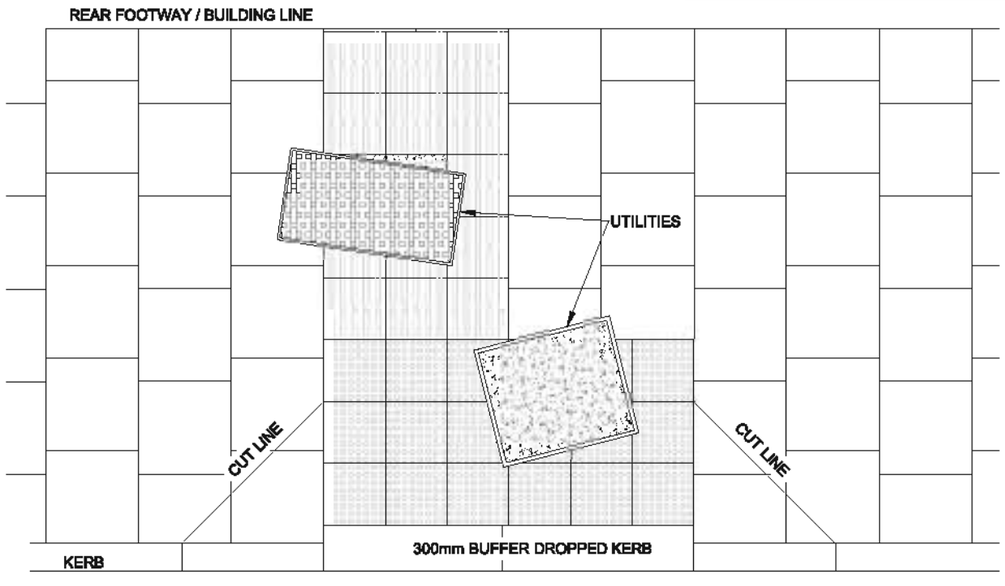
PAVING HORIZONTAL AND VERTICAL ALIGNMENT LIMITS



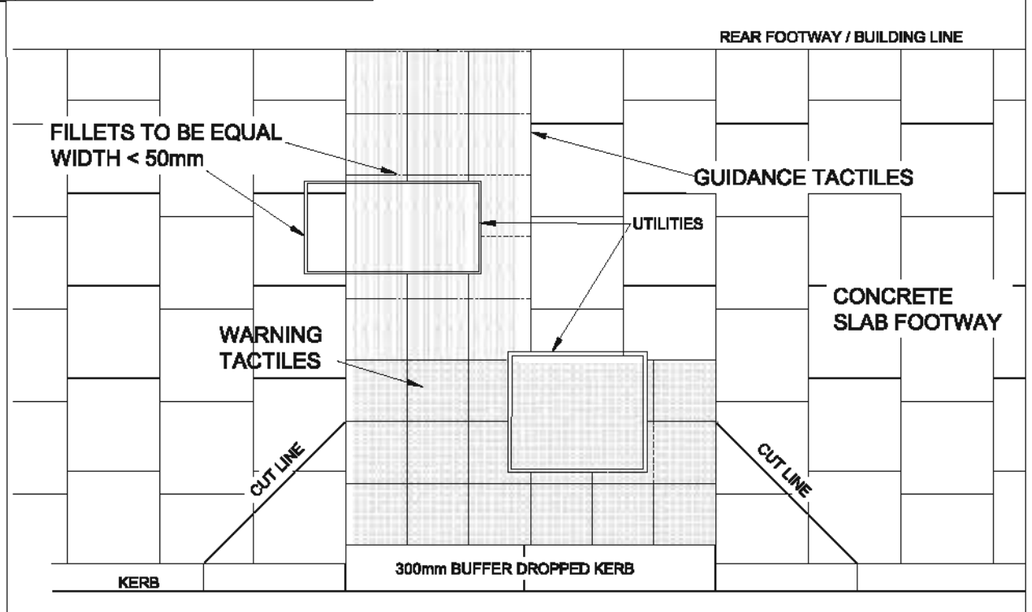
PAVING MATERIAL



TACTILE CROSSING WITH STANDARD UTILITY BOXES



TACTILE CROSSING WITH INSET UTILITY BOXES



AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN: THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

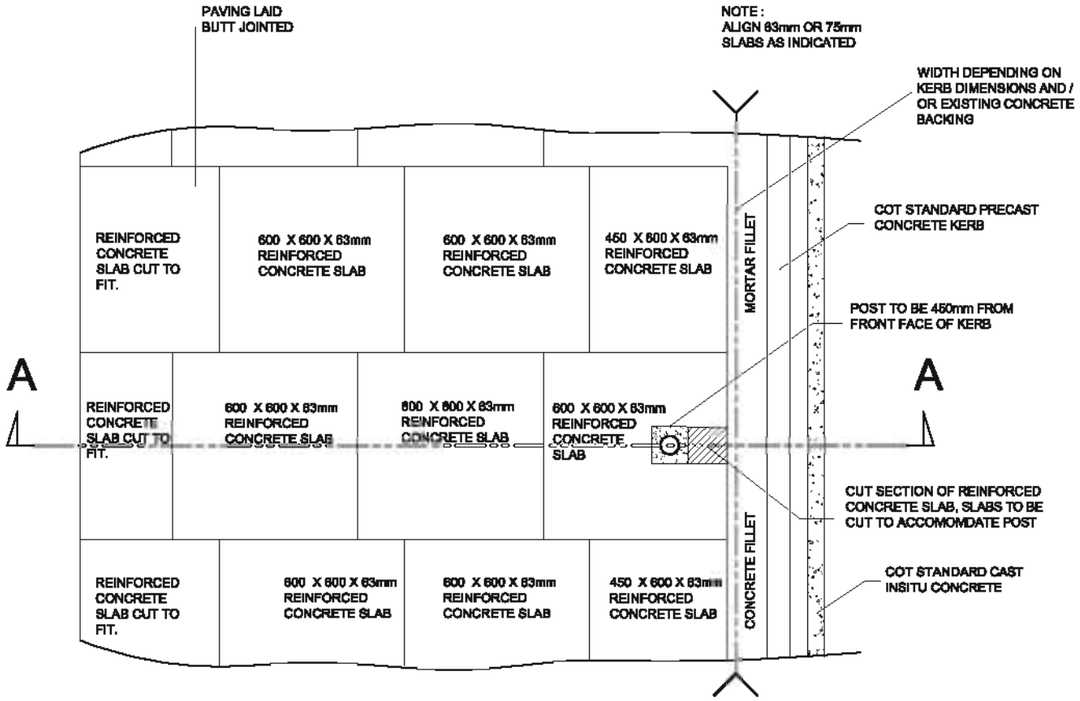
INSPECTION COVERS, ALIGNMENT AND INSET COVERS (SLABS)

DATE	SCALE
NOV2010	NTS

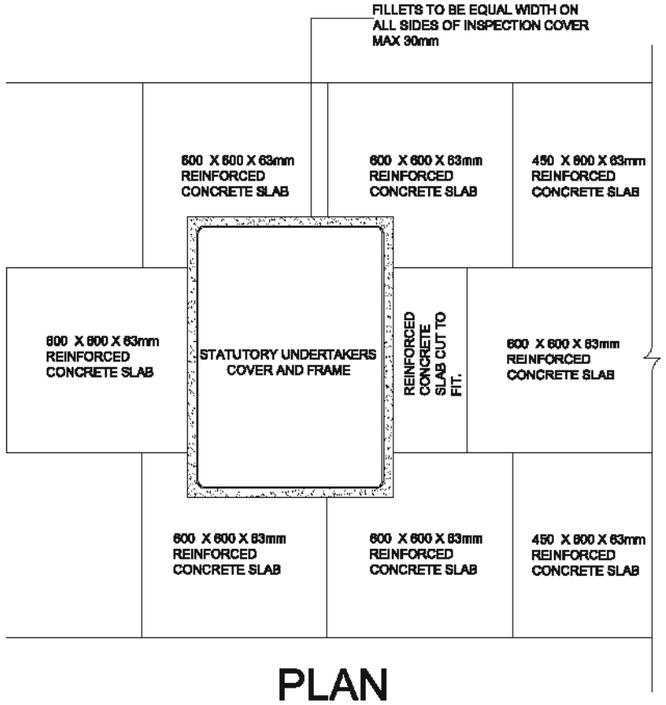
DRAWING NUMBER: TGSI_005

AMENDMENT NO: 0

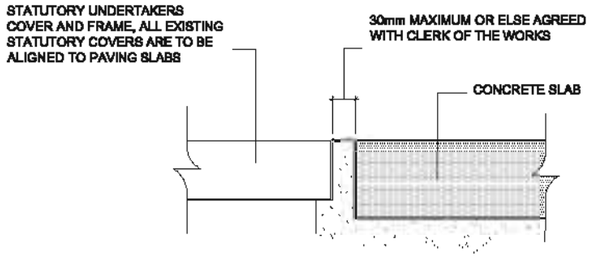
SHEET NUMBER: 2/2



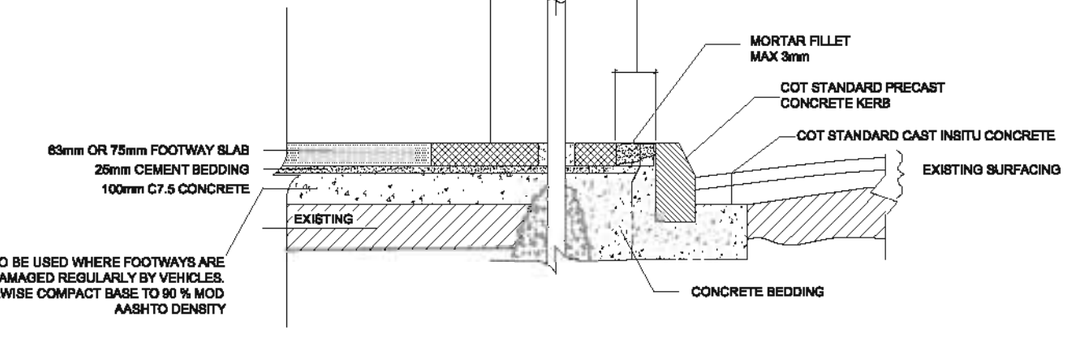
PLAN



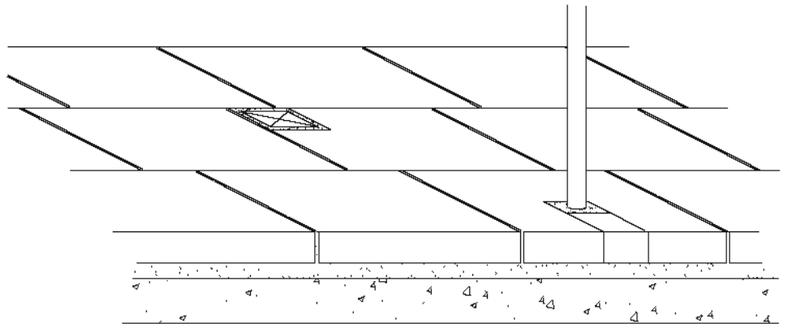
PLAN



INSET BOX



SECTION A-A



3D VIEW

NOTES

1. PAVING JOINTS ARE TO BE BUTT JOINTED AND TIGHT FILL
2. ALL PAVING (INCLUDING KERBSIDE STRENGTHENING) MUST BE LAID IN A 150mm STAGGERED BAND TRANSVERSE (90 DEGREES) TO THE KERBLINE
3. CONCRETE SLABS MUST BE LAID BUTT JOINTED WITH A COMPACTED MOD AASHTO 90% BASE UNDER A SAND-CEMENT BEDDING FOR REGULAR FOOT-WAYS OR CONCRETE BASE 100mm C7.5 UNDER A 6:1 SAND CEMENT BEDDING
4. CUTTING SLABS AROUND STREET FURNITURE MUST BE DONE IN A NEAT MANNER AND EQUAL QUANTITIES AROUND FURNITURE OR UTILITIES
5. MORTAR FILLET BEHIND ALL KERBS SHOULD BE UNIFORM. IF NEEDED, THESE SHOULD BE CUT AND NOT PICKED
6. MORTAR FILLET BEHIND GRANITE KERBS MAY BE MORE THAN 30mm TO ACCOMMODATE UNEVEN GRANITE KERB

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

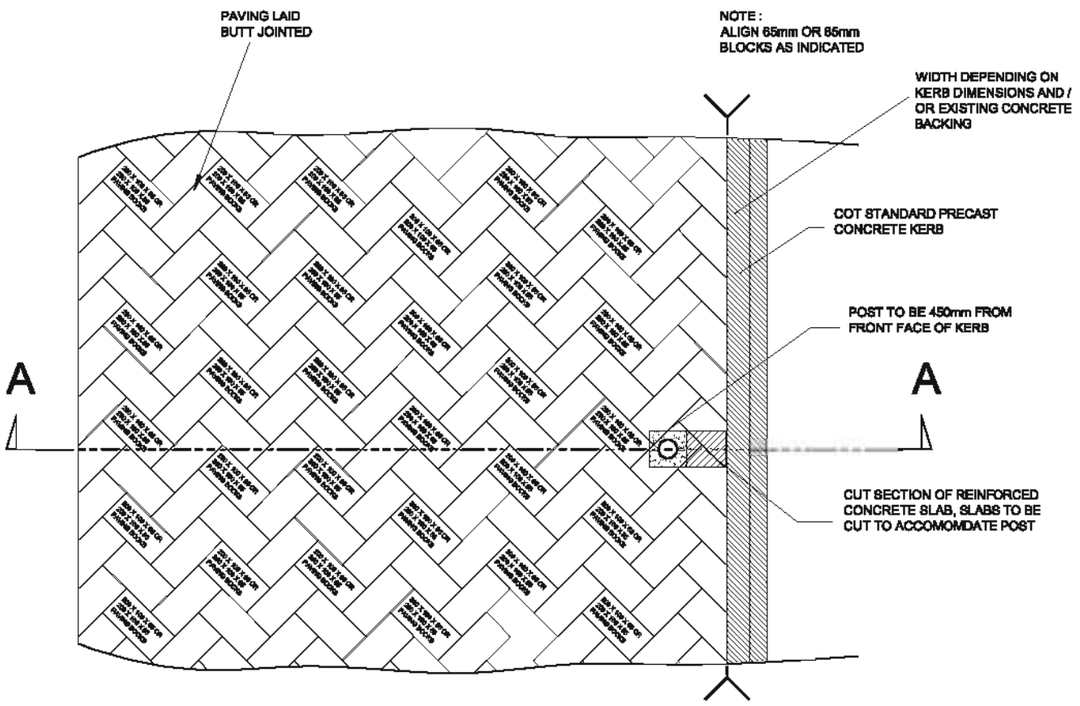
GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

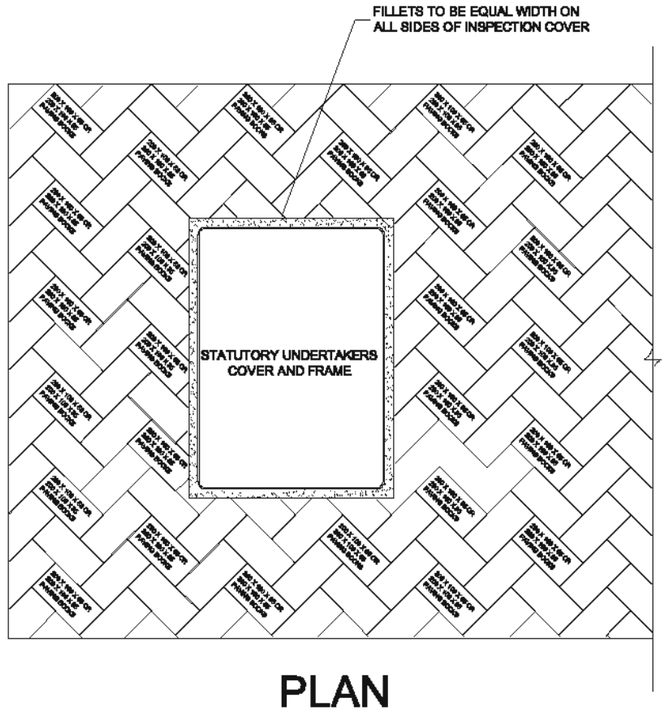
TYPICAL STANDARD DRAWINGS

PROPOSED BRT TRUNK ROUTE
CBD FOOTWAY TREATMENT
(SLABS)

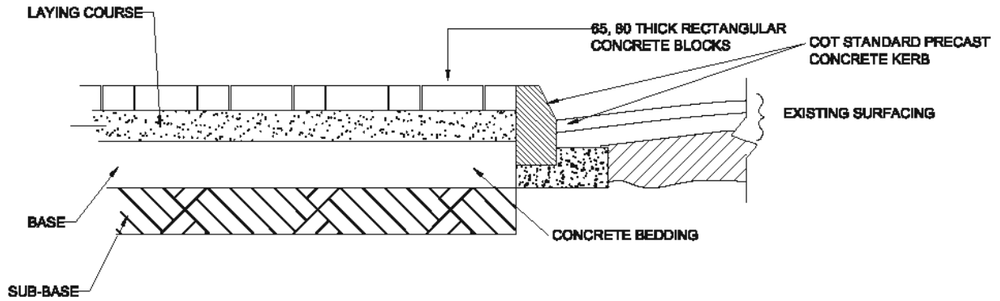
DATE: NOV2010
SCALE: NTS
DRAWING NUMBER: TGSI_006
AMENDMENT NO: 0
SHEET NUMBER: 1/2



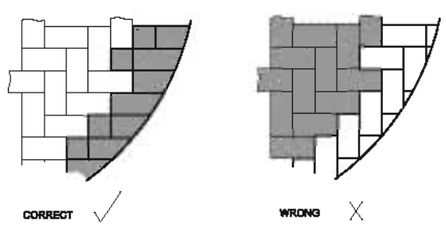
PLAN



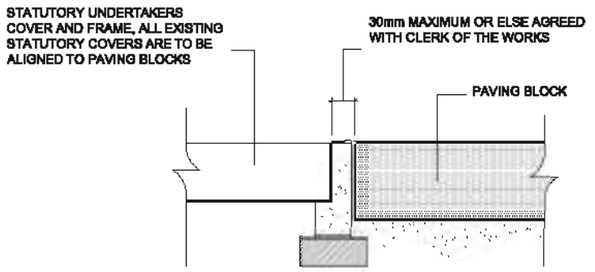
PLAN



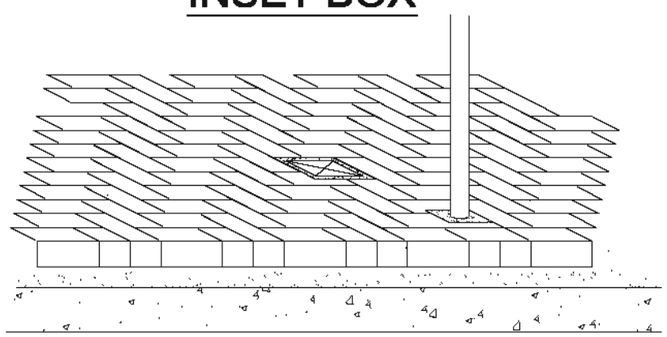
SECTION A-A



RADIUS - PAVING TREATMENT



INSET BOX



3D VIEW

NOTES

1. PAVING JOINTS ARE TO BE BUTT JOINTED AND TIGHT FILL
2. ALL PAVING (INCLUDING KERBSIDE STRENGTHENING) MUST BE LAID IN A 150mm STAGGERED BAND TRANSVERSE (90 DEGREES) TO THE KERBLINE
3. CONCRETE SLABS MUST BE LAID BUTT JOINTED WITH A COMPACTED MOD AASH TO 90% BASE UNDER A SAND-CEMENT BEDDING FOR REGULAR FOOT-WAYS OR CONCRETE BASE 100mm C7.5UNDER A 6:1 SAND CEMENT BEDDING
4. CUTTING SLABS AROUND STREET FURNITURE MUST BE DONE IN A NEAT MANNER AND EQUAL QUANTITIES AROUND FURNITURE OR UTILITIES
5. LAYING COURSE: THE LAYING COURSE SHOULD BE SUCH THAT, AFTER COMPACTION IT FORMS A NOMINALLY UNIFORM LAYER 50mm THICK BELOW THE BLOCKS. THE MATERIAL SHOULD BE SPREAD IN A LOOSE UN-COMPACTED LAYER TO APPROXIMATELY 2/3 OF THE REQUIRED FINAL THICKNESS. THIS LAYER SHOULD BE LIGHTLY COMPACTED BY MEANS OF THE VIBRATING PLATE COMPACTOR.
6. A FURTHER LAYER OF LOOSE MATERIAL SHOULD BE SPREAD AND SCREEDED TO CREATE A LOOSE SURFACE ON TO WHICH THE BLOCKS CAN BE PLACED.
7. JOINTS: SAND FILLED IN ACCORDANCE WITH SPECIFICATION AND STATED CODE OF PRACTICE.
8. BASE/SUB-BASE: 150mm THICK C20 WET LEAN CONCRETE BASE AND 150mm MINIMUM TYPE 1 GRANULAR FILL SUB-BASE.
9. PATTERN: IN GENERAL, BLOCKS WILL BE LAID IN EITHER A HERRING BONE AT EITHER 90° OR 45° TO THE FRONT OR BACK LINE.WHERE BLOCK PAVING IS USED IN CONJUNCTION WITH SMALL ELEMENT PAVING IN SMALL AREAS OF INFILL, FANS, ETC, IT IS INCLUDED IN THE METHOD OF MEASUREMENT FOR SUCH PAVING.
10. TRIMMING: BLOCKS SHOULD BE TRIMMED TO SHAPED WHERE THEY ABUTT BOUNDARIES, CHAMBERS, STREET FURNITURE ETC. WHERE TRIMMING IS NECESSARY PORTIONS OF LESS THAN ONE HALF OF AN ENTIRE BLOCK SHALL BE AVOIDED BY LOCALIZED ALTERATION OF THE BOND PATTERN AND TRIMMING OF INBOARD BLOCKS ADJACENT TO THE EDGE BLOCKS.

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

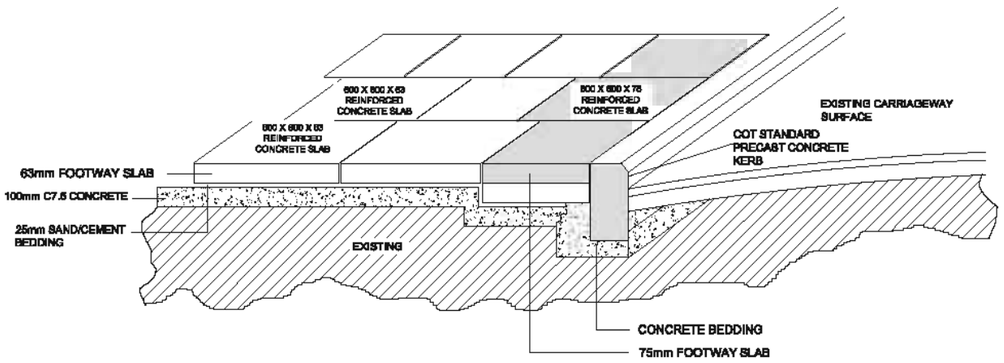
	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

PROPOSED BRT TRUNK ROUTE CBD FOOTWAY TREATMENT (BLOCKS)

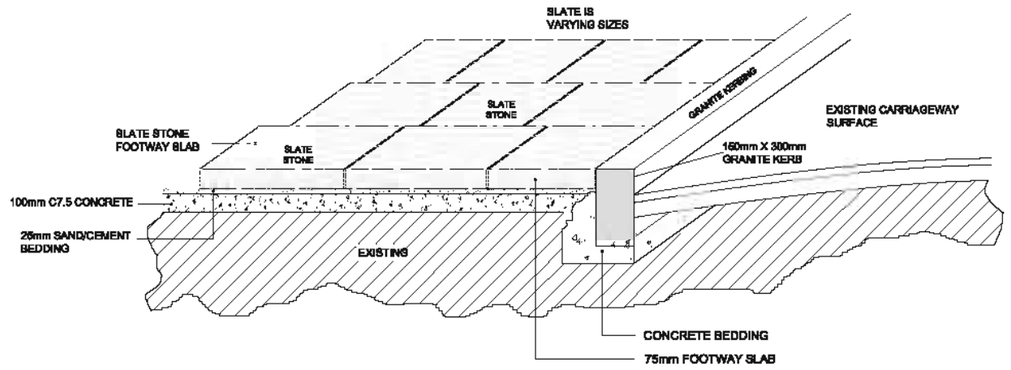
DATE: NOV2010
SCALE: NTS
DRAWING NUMBER: TGSI_006
AMENDMENT NO: 0
SHEET NUMBER: 2/2

REHABILITATION OF INNER CITY HERITAGE FOOTWAY TREATMENT

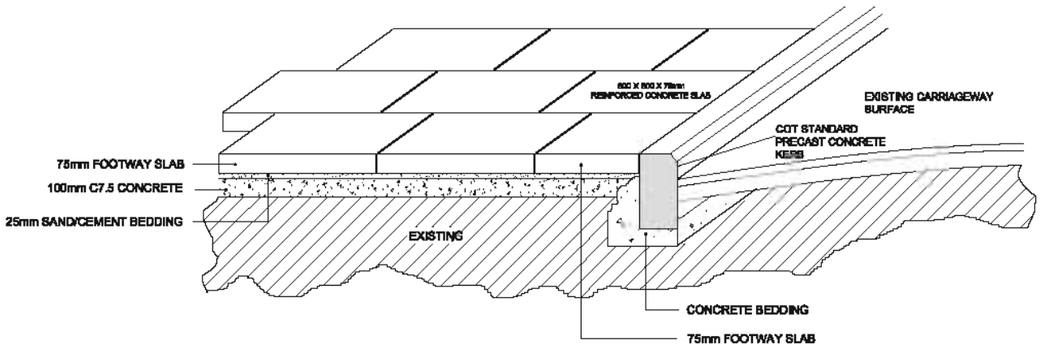


EDGE REINFORCED PAVEMENT DETAIL

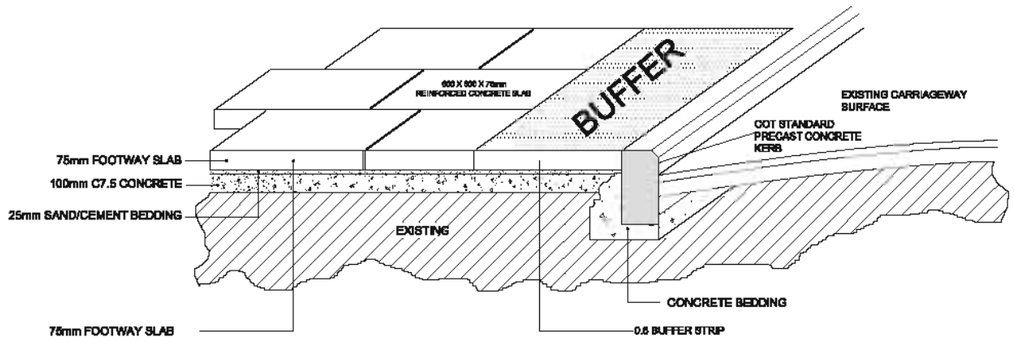
REHABILITATION OF INNER CITY HERITAGE FOOTWAY TREATMENT



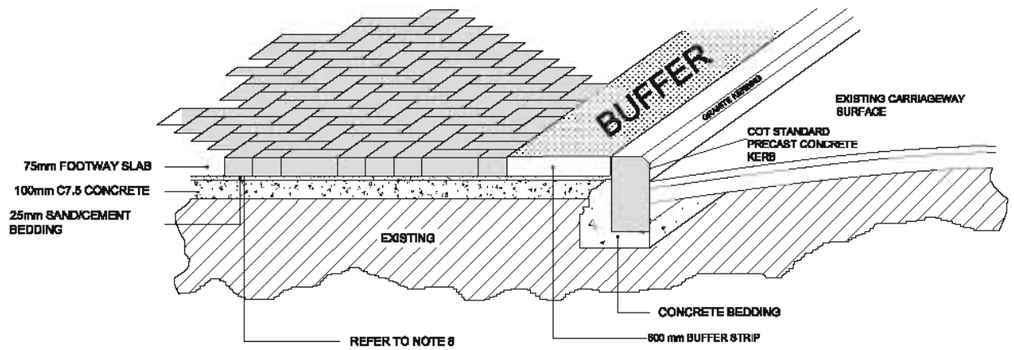
SLATE STONE PAVEMENT DETAIL



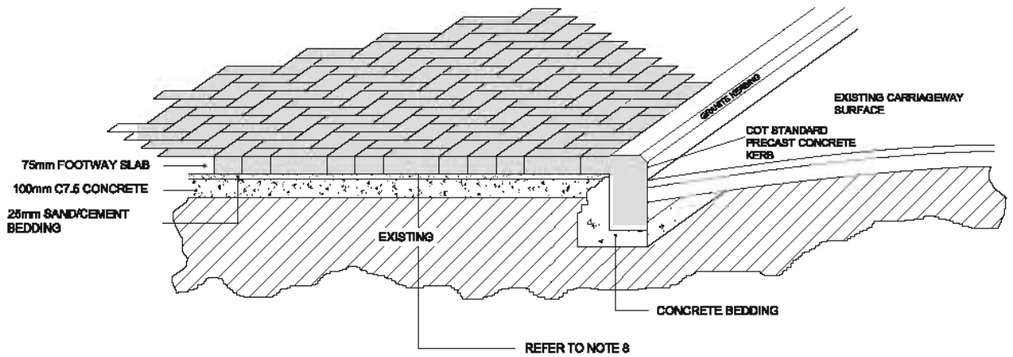
FULL REINFORCED PAVEMENT DETAIL



FULL REINFORCED PAVEMENT WITH BUFFER



STANDARD TSHWANE BLOCK PAVING WITH BUFFER



STANDARD TSHWANE BLOCK PAVING DETAIL

NOTES

1. OLD SLATE STONE (FROM THE SAME SITE) CAN BE RELAID IN SITU. PARTICULAR CARE MUST BE TAKEN ON PRODUCING NEAT FLUSH POINTING OF NO MORE THAN 10mm - 15mm
2. SECONDHAND IMPORTED SLATE STONE PAVING CAN ONLY BE USED WITH THE APPROVAL OF THE ENGINEER
3. NEW SLATE STONE PAVING MUST HAVE SOWN CUT EDGES WITH FLUSH POINTING (10-15mm) TO CREATE A SMOOTH FINISH
4. EXISTING GRANITE KERBS SHOULD BE RETAINED WHEREVER POSSIBLE, WITH THE SIZE OF NEW KERBS SHOULD BE CHOSEN TO MATCH LOCAL PRECEDENT
5. NEW GRANITE KERBS TO BE FIVE PICKED 150mm x 300mm x 900 - 1200mm LONG STANDARD TSHWANE KERB HEIGHTS TO BE MAINTAINED
6. WHEN GRANITE KERB USED OVER DROPPED KERB, MINIMUM 1 800mm FINE PICKED KERB, FLUSH WITH ROAD AT CROSSING
7. TRAFFIC SIGNALS, LIGHTING AND SIGN POSTS 450mm FROM KERB FACE
8. CONCRETE BLOCKS WILL BE RECTANGULAR AND EITHER 200 X 100 X 85 OR 200 X 100 X85.

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

ARCUS GIBB ENGINEERING & SCIENCE

GIBB House
14 Eglin Road
Sunninghill
2191

P O Box 2700
Rivonia
2128

TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

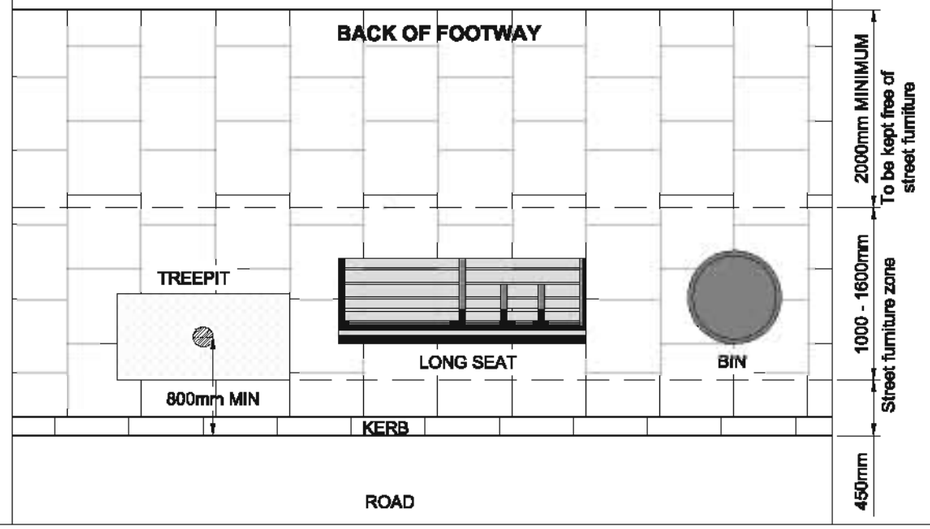
TYPICAL DETAIL OF FOOTWAYS

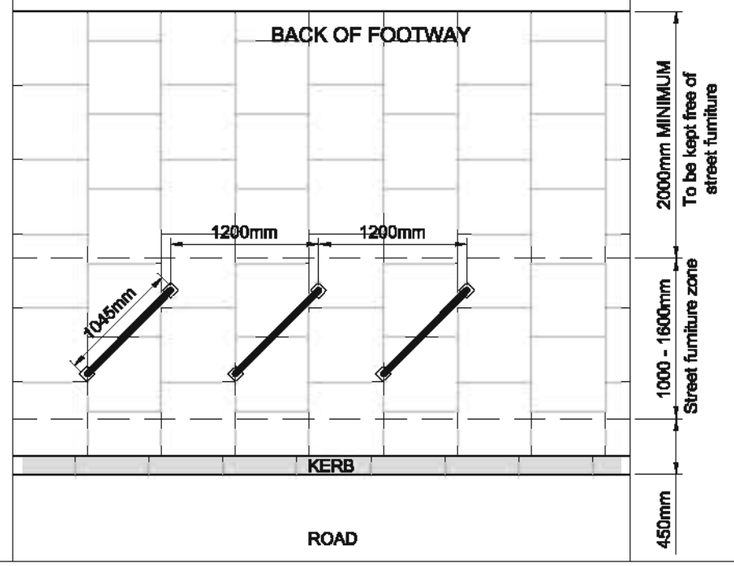
DATE	SCALE
NOV2010	NTS

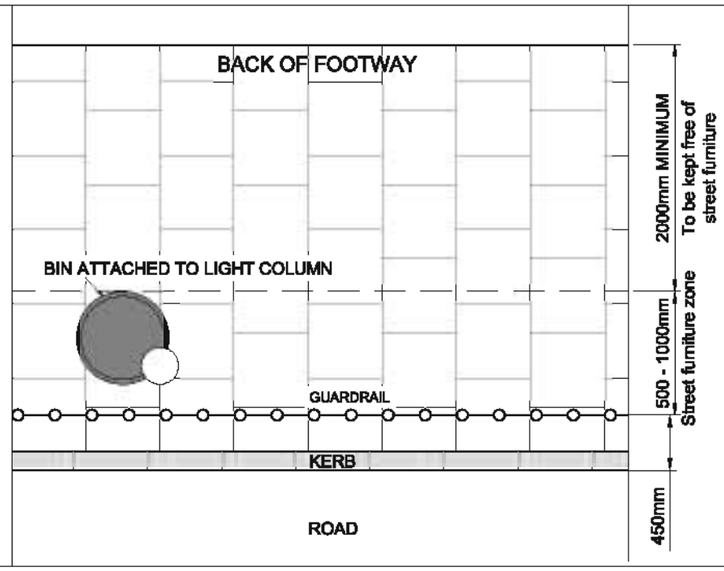
DRAWING NUMBER: TGSI_007

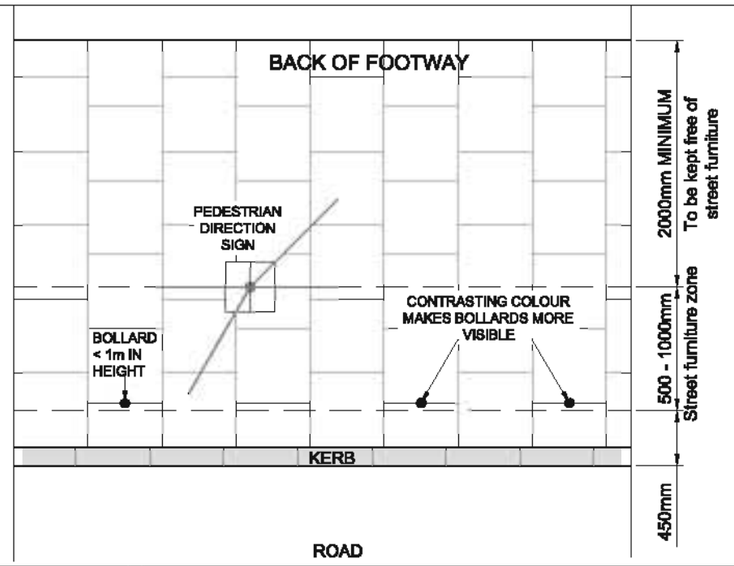
AMENDMENT NO: 0

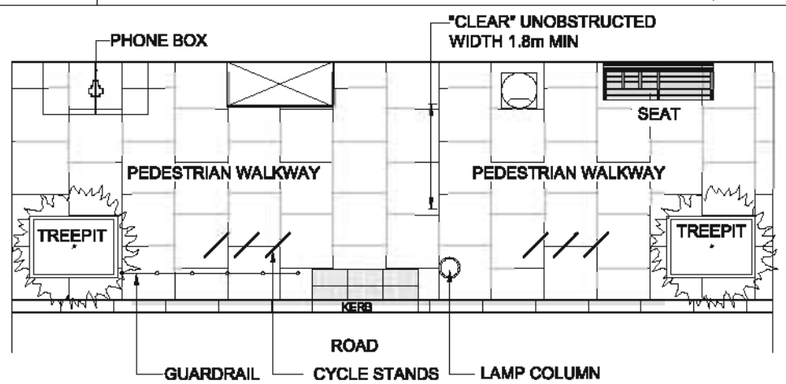
SHEET NUMBER: 1/1



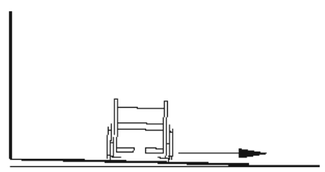




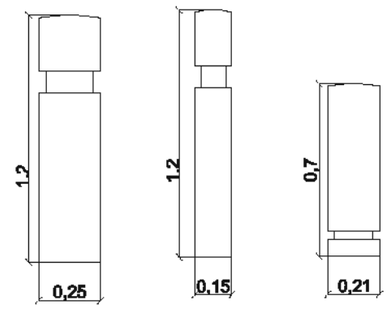




FOOTWAY CROSS SECTION



MAX. GRADIENT 1:50



BASIC BOLLARD DETAIL

NOTES

1. CLEAR FOOTWAY IS NOT THE DISTANCE FROM THE KERBLINE TO THE BOUNDARY / RESERVE. IT IS THE UNOBSTRUCTED PATHWAY WIDTH WITHIN THE FOOTWAY
   - IDEALLY 1.8m MIN WIDTH NEEDED FOR TWO ADULTS PASSING.
   - 3m MIN WIDTH NEEDED FOR A BUSY PEDESTRIAN STREET. GREATER WIDTHS ARE PREFERRED.
   - IF LESS THAN 1.5m WIDE, AN ACCESSIBLE ROUTE SHALL BE PROVIDED WITH PASSING SPACES OF 1.5m BY 1.5m (MINIMUM) AT INTERVALS NOT EXCEEDING 5m OR AN INTERSECTION OF TWO WALKING SURFACES WHICH PROVIDE A T-SHAPE. (SANS 784)
2. KEEP THE FOOTWAY WIDTHS VISUALLY FREE OF CLUTTER LIKE STREET FURNITURE, SIGN POSTS ETC. CLEAR SIGHT LINES ARE REQUIRED. COMBINING STREET FURNITURE ASSISTS.
3. WIDER FOOTWAYS ARE REQUIRED AT INTERSECTIONS, ENTRANCES, BUS STOPS, STATIONS ACCESSES ETC.
4. TRIPS : OPENINGS IN THE GROUND SURFACE SHALL NOT EXCEED 13mm IN DIAMETER AND WHERE THE OPENING IS ELONGATED, THE LONG DIMENSION SHALL BE PLACED PER PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL. (SANS 784)
5. VERTICAL CHANGE IN LEVEL BETWEEN TWO FLOOR SURFACES SHALL NOT EXCEED 5mm. (SANS 784)
6. CABLES (FIXED OR LOOSE), GRASS, GRAVEL SAND AND OTHER RAISED OR LOOSE FINISHES SHALL NOT FORM PART OF AN ACCESSIBLE ROUTE. (SANS 784)
7. BOLLARDS ARE USED TO CONTROL THE MOVEMENT OF PEDESTRIANS TO FOLLOW A DESIGNED ROUTE BUT SHOULD BE AVOIDED IF POSSIBLE, AS THEY CAN CLUTTER STREETS AND INTERSECTIONS AND LIMIT FREEDOM TO MOVE, TAKE UP SPACE ON FOOTWAYS AND CAN INCREASE THE DISTANCE TO BE TRAVELED.
   - VISIBILITY THROUGH RAILINGS IS IMPORTANT. BOLLARDS ARE USED TO IDENTIFY THE EDGE OR END OF A ROAD OR WALKWAY AND CAN BE USED TO STOP VEHICLES TO ENTER OR DRIVE UP ONTO A SECTION OF FOOTWAY. A ROW OF BOLLARDS ALSO CLUTTER THE STREET, REDUCE FOOTWAY WIDTH BOLLARDS MUST NEVER BE LINKED BY ANY CHAIN DUE TO THE HAZARD TO VISUALLY IMPAIRED PEOPLE.

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

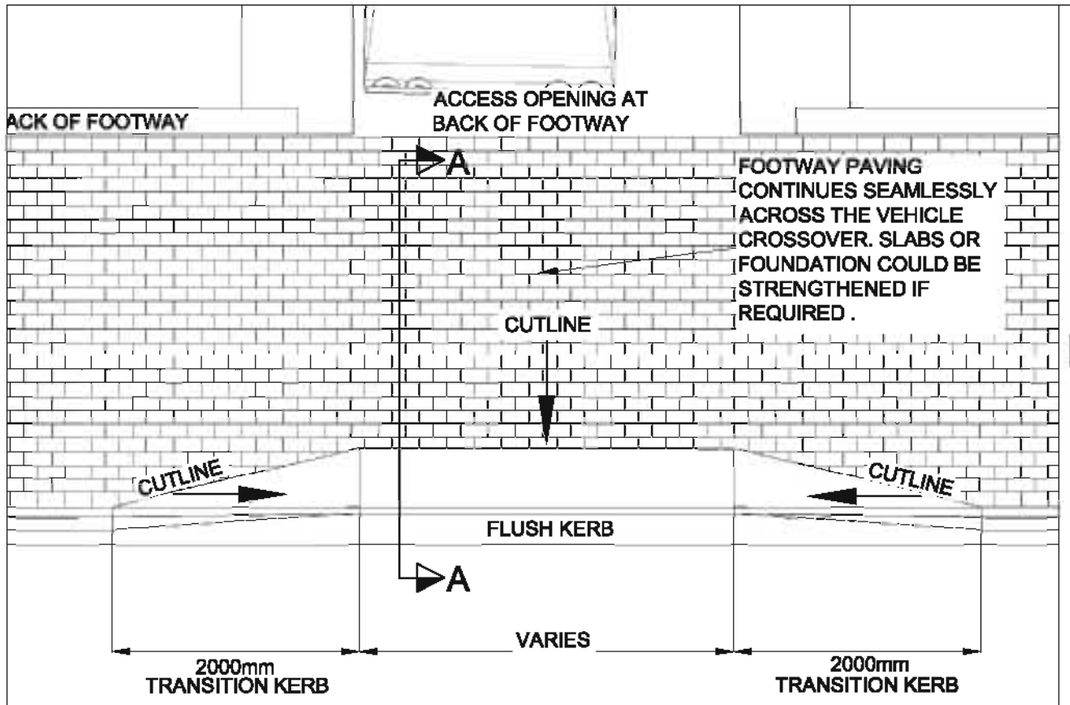
	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTRUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTRUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTRUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

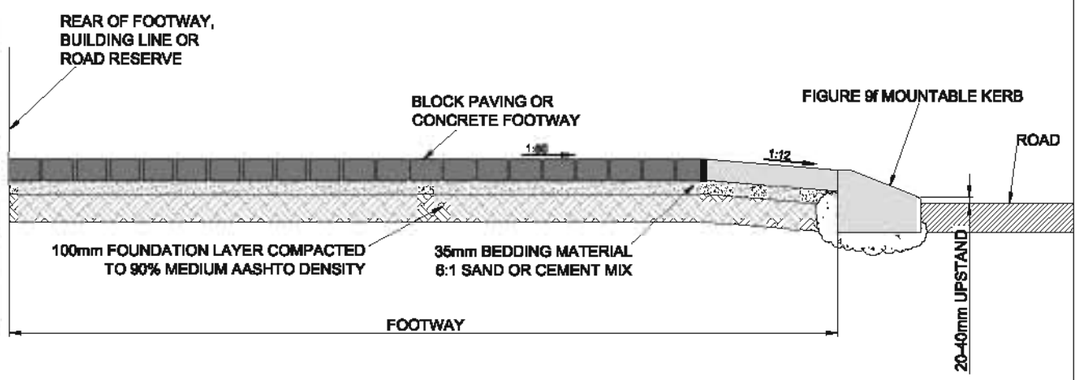
STREET FURNITURE LAYOUT
FOOTWAY WIDTHS BETWEEN
2.95m AND 4.05m

DATE	SCALE
NOV2010	NTS

DRAWING NUMBER: TGSI_008
AMENDMENT NO: 0
SHEET NUMBER: 1/1



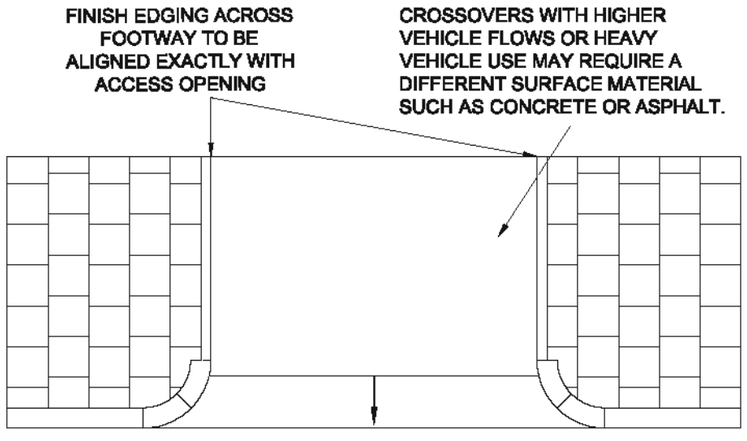
CROSSOVER / FOOTWAY - PLAN VIEW



CROSSOVER - SECTIONAL VIEW A-A

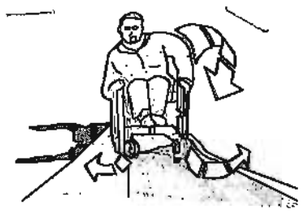
NOTES

1. CROSSOVERS ALLOWS ACCESS OF VEHICLES TO PROPERTIES, BUSINESSES, DEVELOPMENT ETC. ACROSS A FOOTWAY.
2. DESIGN MUST HAVE A LEVEL AREA TO THE REAR OF THE FOOTWAY. (1.3 m MIN LANDING)
3. CROSSOVERS SHOULD BE LEVEL WITH THE FOOTWAY TO PROVIDE A CONVENIENT LEVEL SURFACE FOR PEDESTRIANS INCLUDING DISABLED PERSONS.
4. THE FORCES OF GRAVITY TEND TO PULL THE WHEELCHAIR, PUSHCHAIR (OR THE PERSON WITH WALKING AIDS) TOWARDS THE KERB OR LOWER PATHWAY EDGE.
5. FOR PEOPLE USING WHEELCHAIRS, THE PUSHING FORCES REQUIRED TO COUNTERACT THESE EFFECTS WILL BE DIFFERENT ON EACH WHEEL RIM, SMALL ON THE HIGH SIDE AND LARGE ON THE LOW SIDE OF THE PATHWAY. FORWARD MOMENTUM TOWARDS THE KERB MAY REQUIRE UNEQUAL HAND BRAKING ON THE WHEELS, LEADING TO POSSIBLE LOSS OF CONTROL AND BALANCE.
6. THE FIGURE INDICATES THE EFFECT OF COMPOUND SLOPES ON PEOPLE WITH SPECIAL NEEDS, PARTICULARLY THE MOBILITY IMPAIRED. WHEN TRAVELING OVER A NON-PLANAR SURFACE, SUCH AS THE EDGE OF A DRIVEWAY APRON WHERE A FLARED SIDE CHANGES SLOPE IN BOTH DIRECTIONS, THE FRONT WHEEL OF A WHEELCHAIR, PUSHCHAIR OR MOBILITY AID (WALKING STICK, CRUTCHES) CAN LOSE CONTACT WITH THE SLOPING SURFACE, WHICH CAN LEAD TO A LOSS OF BALANCE AND CONTROL.

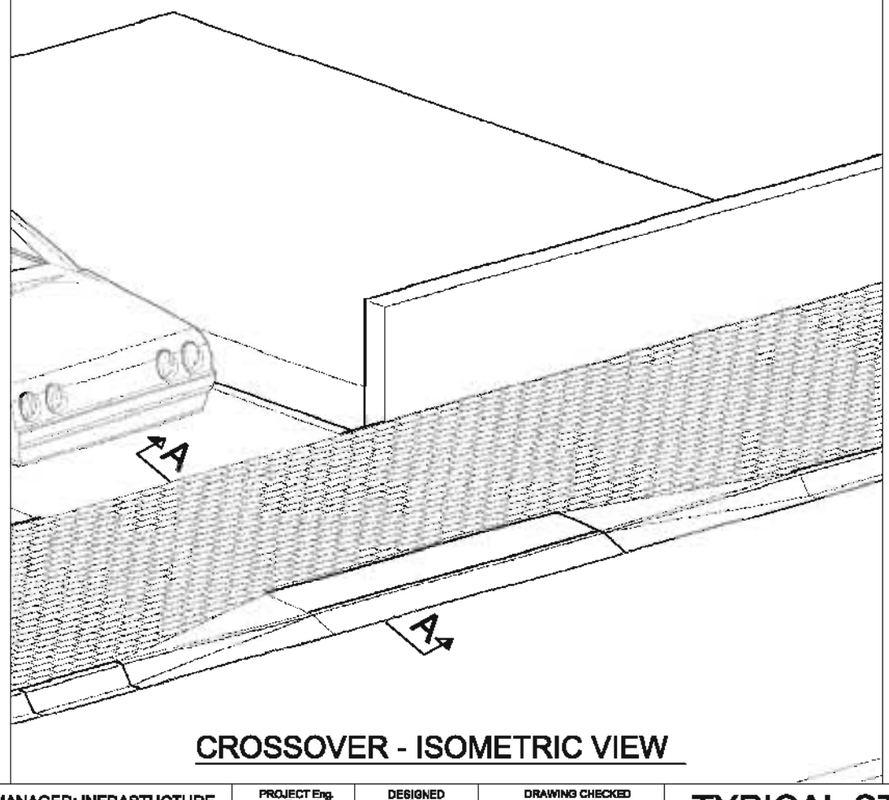


CROSSOVER - PLAN VIEW

GRAVITATIONAL FORCE ON SLOPE



SEE NOTES 4 - 6



CROSSOVER - ISOMETRIC VIEW

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

ARCUS GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	DRAWING CHECKED RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

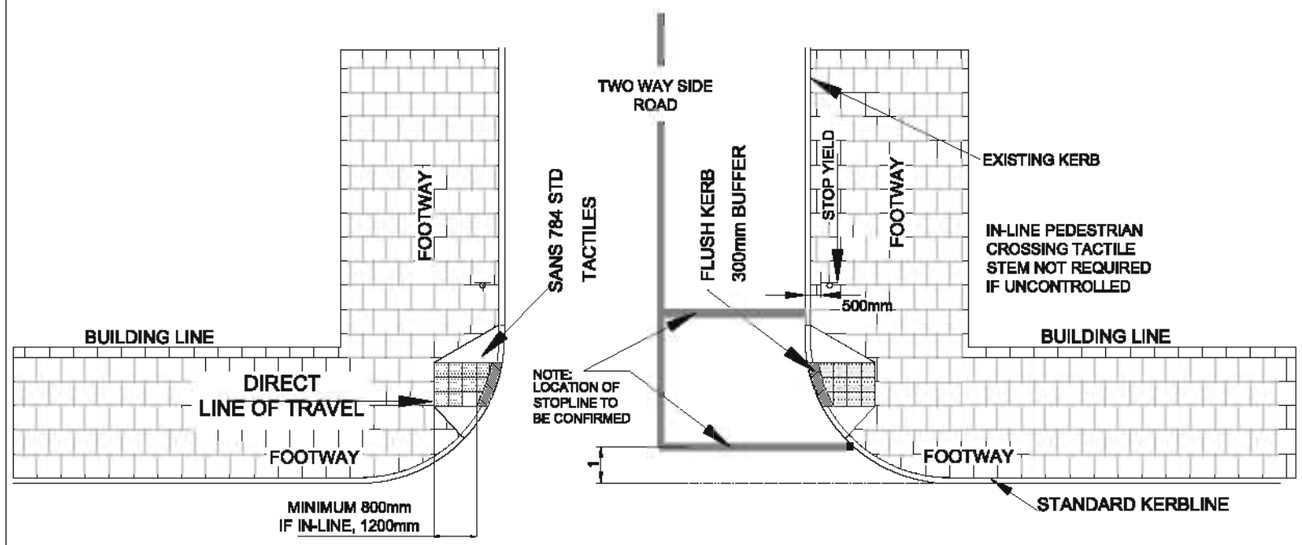
VEHICLE CROSSOVER

DATE	SCALE
NOV2010	NTS

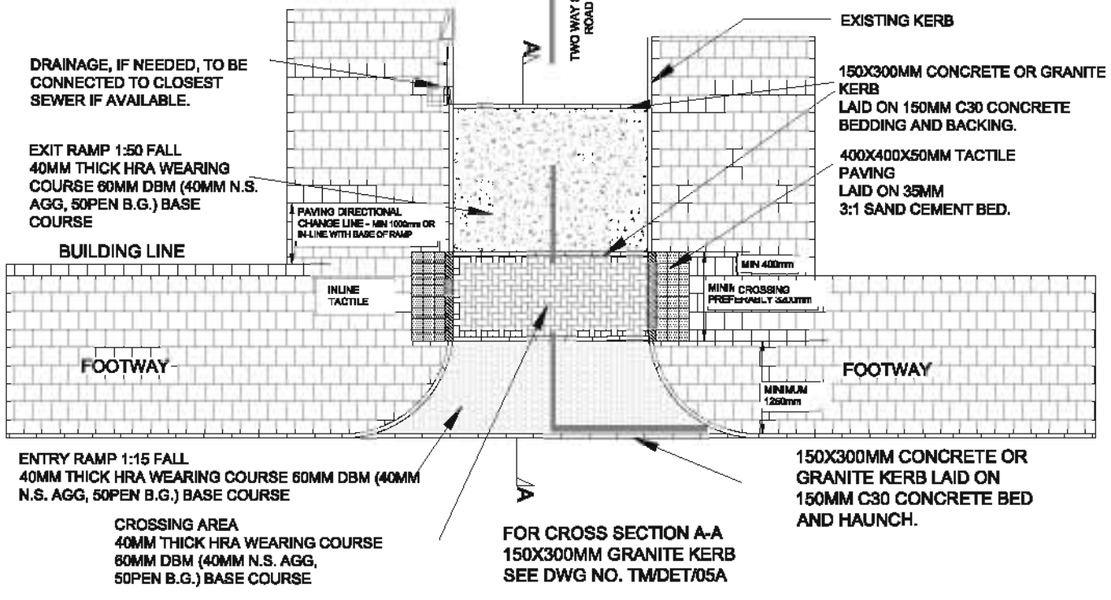
DRAWING NUMBER: TGSI_009

AMENDMENT NO: 0

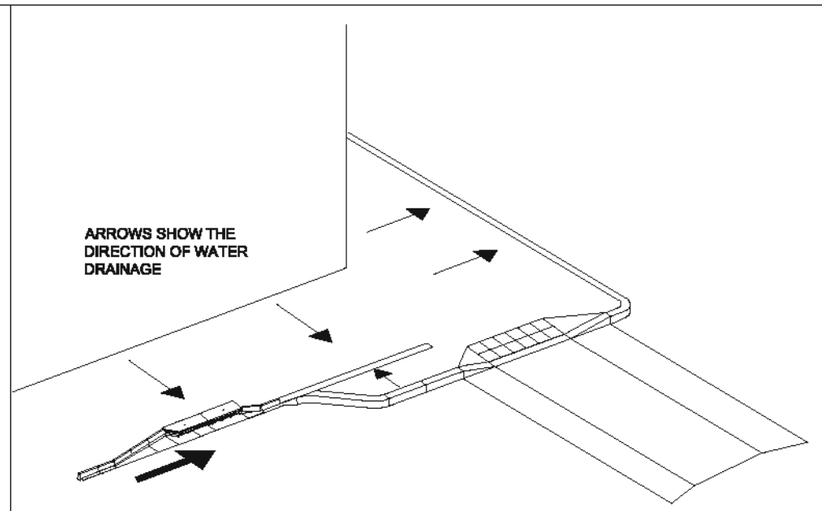
SHEET NUMBER: 1/1



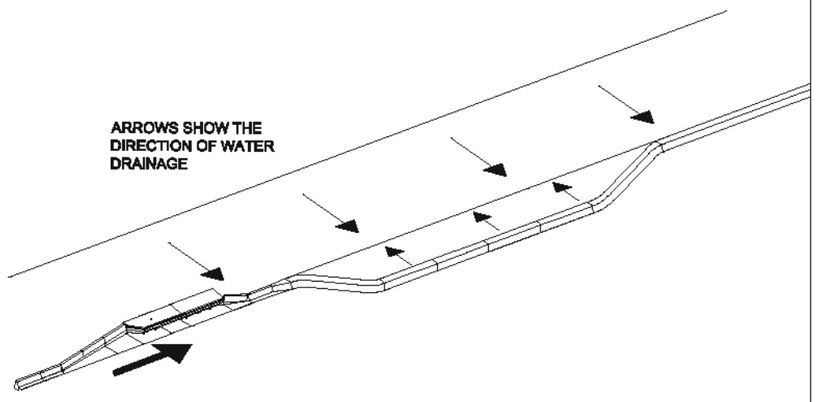
STANDARD UNCONTROLLED DROP KERB CROSSING



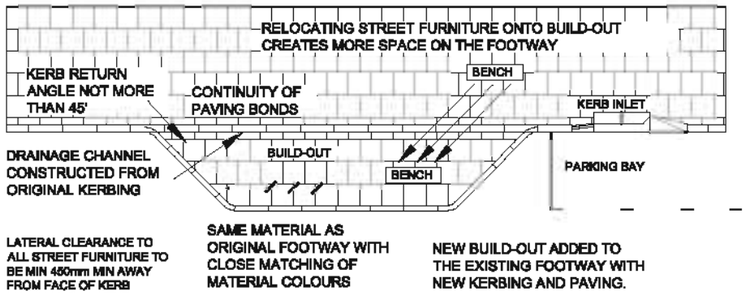
STANDARD ENTRY TREATMENT WITH FLUSH CROSSING



DRAINAGE DIRECTIONS



DRAINAGE DIRECTIONS



BUILD - OUT

NOTES

1 DRAINAGE CHANNELS IN THE FOOTWAYS CAN BE CONSTRUCTED IN SEVERAL WAYS, PROVIDING A SMART DEL`INEATOR BETWEEN NEW AND OLD FOOTWAY. POSSIBLE MATERIALS INCLUDE CONCRETE PAVING, ORIGINAL GRANITE KERBS, FLUSH GRANITE SETS OR A CONCRETE CHANNEL.

2 BUILD-OUTS SHOULD BE CONSTRUCTED OF THE SAME MATERIALS AS THE ORIGINAL FOOTWAY, WITH CONTINUITY OF PAVING BONDS AND CLOSE MATCHING OF MATERIALS COLORS.

3 THE KERB 'RETURN' ANGLE SHOULD BE NO MORE THAN 45 DEGREES TO EASE VEHICLE ACCESS TO KERB-LINE PARKING AND TO ALLOW EASIER CARRIAGEWAY CLEANING AND DRAINAGE.

4 FOOTWAY BUILD-OUTS CAN BE USED TO NARROW A SIDE ROAD, PROVIDE MID-BLOCK CROSSING OR FOR A BUS BOARDER

5 NARROWING THE ROAD HAS A TRAFFIC CALMING EFFECT AND RESULTS IN SHORTER CROSSING DISTANCES FOR PEDESTRIANS.

6 BUILD-OUTS CAN BE USED TO RE-ALIGN THE ROAD TO ACHIEVE A PERPENDICULAR ANGLED INTERSECTION.

7 BUILD-OUTS CAN EITHER BE SYMMETRICAL BOTH SIDES OF THE CARRIAGEWAY OR ASYMMETRICAL.

8 IF DRAINAGE IS NOT REQUIRED REMOVE EXISTING KERB, NEW CONCRETE BLOCK PAVING TO BE LAID MATCHING EXISTING OVERLAP BOND KERB.

9 WHEN CONSTRUCTION BUILD-OUTS AN EXISTING INFRASTRUCTURE, THE KERB OF NEW BUILD-OUTS ARE OFTEN HIGHER THAN THE EXISTING KERB, UNLESS THE ROAD IS RECONSTRUCTED WITH A NEW CHAMBER.

10 WATER RUNS BACK AWAY FROM THE NEW KERB AS IN THE FIGURES AND GUIDED TO THE APPROPRIATE DRAINAGE POINT WITHOUT PONDING.

11 NEW DRAINAGE GULLIES ARE OFTEN REQUIRED AND WILL DEPEND ON THE LEVELS OF THE SURROUNDING AREA.

12 RAISED ENTRY TREATMENT. PARTIAL RAISING OF ROAD LEVEL AS WELL AS PARTIAL DROP OF PEDESTRIAN RAMP IS ALSO POSSIBLE TO DECREASE RAMP GRADIENT IF NECESSARY

ADVANTAGES OF SYMMETRICAL BUILD-OUTS

- BETTER VISIBILITY FOR PEDESTRIANS ON 2-WAY ROADS.
- MORE AESTHETICALLY ACCEPTABLE.
- MAINTAINS SYMMETRY OF ROAD.

ADVANTAGES OF PARTIAL DROP KERB, PARTIAL ROAD HUMP AND SINGLE BUILD-OUT.

- CHEAPER CONSTRUCTION AND DRAINAGE
- MORE ROOM FOR STREET FURNITURE AND BUILD-OUTS
- BETTER FOR ENFORCING BANNED TURNS

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

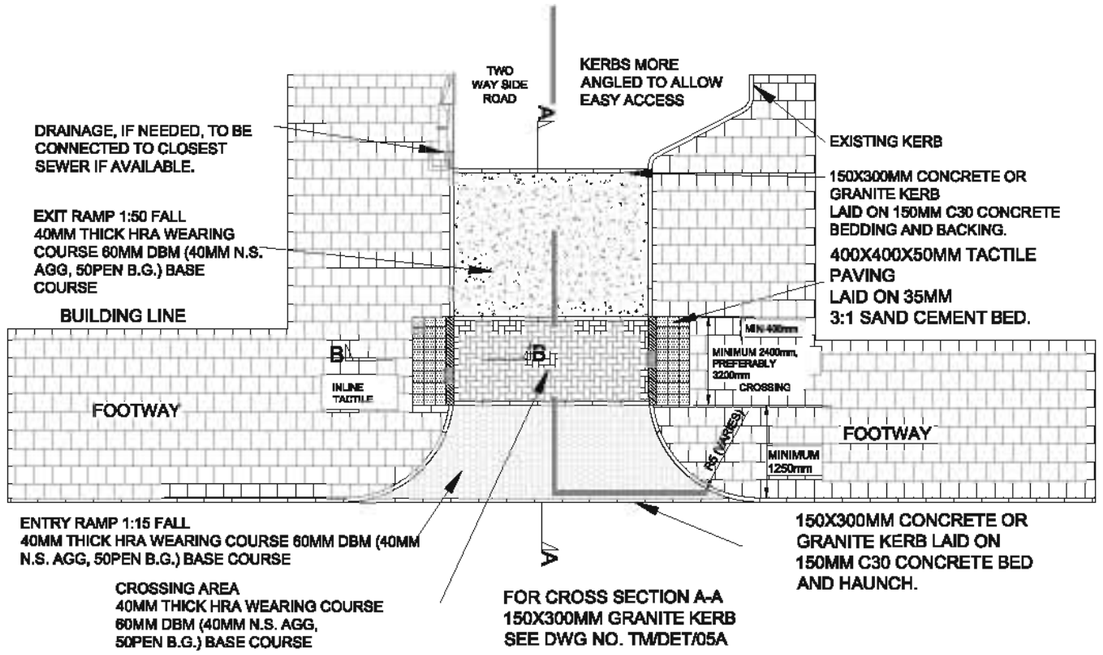
ARCUS GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT ENG.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

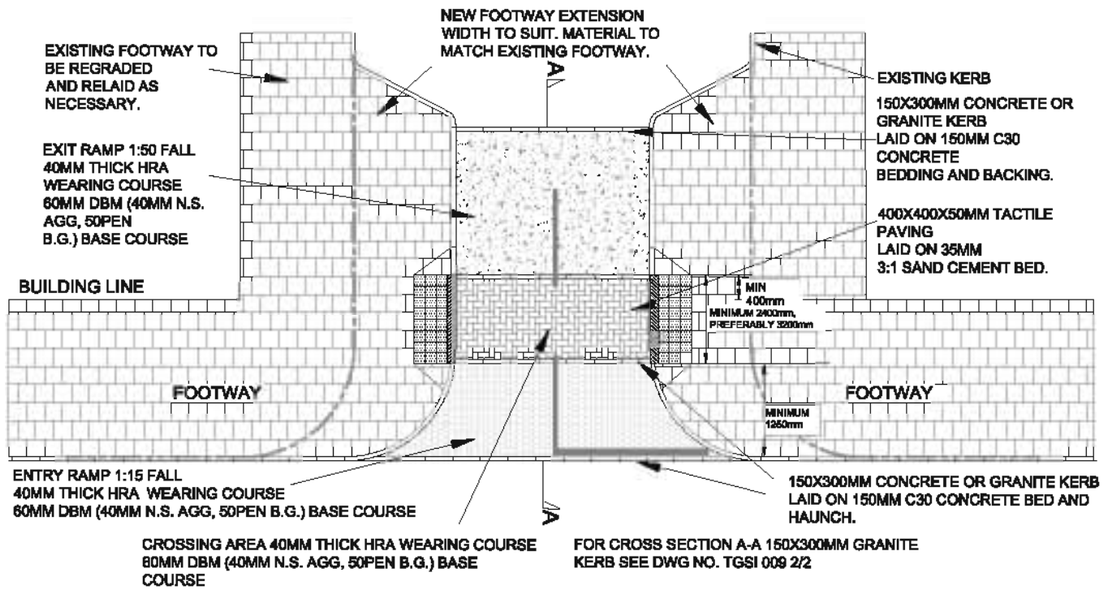
TYPICAL STANDARD DRAWINGS

RAISED ENTRY TREATMENT AND PEDESTRIAN CROSSINGS

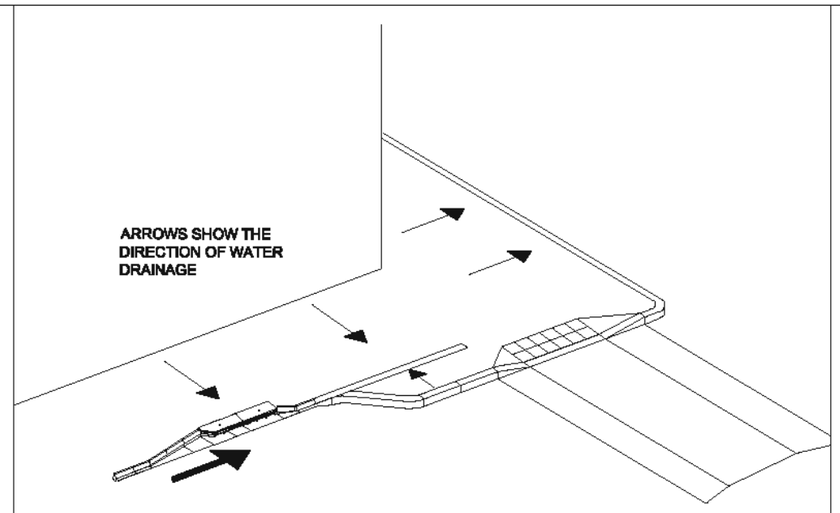
DATE: NOV2010
SCALE: NTS
DRAWING NUMBER: TGSI_010
AMENDMENT NO: 0
SHEET NUMBER: 1/3



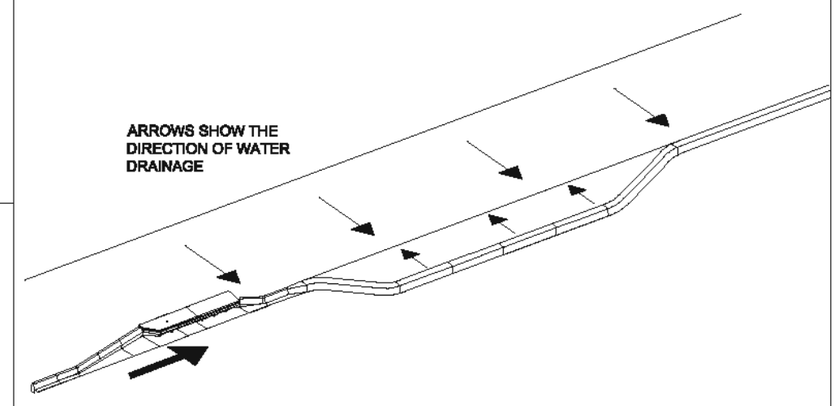
RAISED ENTRY TREATMENT WITH FLUSH CROSSING & PAVEMENT EXTENSION



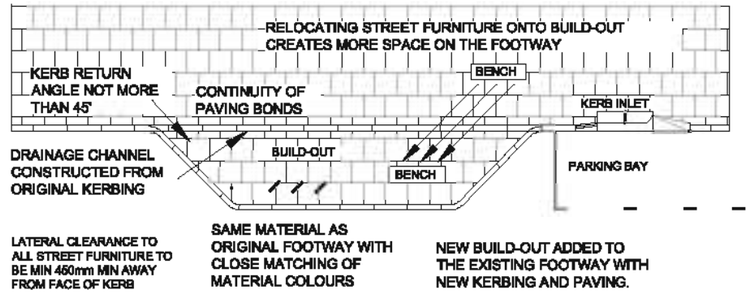
RAISED ENTRY TREATMENT WITH FLUSH CROSSING & TWO PAVEMENT EXTENSIONS



DRAINAGE DIRECTIONS



DRAINAGE DIRECTIONS



BUILD - OUT

NOTES

1. DRAINAGE CHANNELS IN THE FOOTWAYS CAN BE CONSTRUCTED IN SEVERAL WAYS, PROVIDING A SMART DEL'INEATOR BETWEEN NEW AND OLD FOOTWAY. POSSIBLE MATERIALS INCLUDE CONCRETE PAVING, ORIGINAL GRANITE KERBS, FLUSH GRANITE SETS OR A CONCRETE CHANNEL.
2. BUILD-OUTS SHOULD BE CONSTRUCTED OF THE SAME MATERIALS AS THE ORIGINAL FOOTWAY, WITH CONTINUITY OF PAVING BONDS AND CLOSE MATCHING OF MATERIALS COLORS.
3. THE KERB 'RETURN' ANGLE SHOULD BE NO MORE THAN 45 DEGREES TO EASE VEHICLE ACCESS TO KERB-LINE PARKING AND TO ALLOW EASIER CARRIAGEWAY CLEANING AND DRAINAGE.
4. FOOTWAY BUILD-OUTS CAN BE USED TO NARROW A SIDE ROAD, PROVIDE MID-BLOCK CROSSING OR FOR A BUS BOARDER
5. NARROWING THE ROAD HAS A TRAFFIC CALMING EFFECT AND RESULTS IN SHORTER CROSSING DISTANCES FOR PEDESTRIANS.
6. BUILD-OUTS CAN BE USED TO RE-ALIGN THE ROAD TO ACHIEVE A PERPENDICULAR ANGLED INTERSECTION.
7. BUILD-OUTS CAN EITHER BE SYMMETRICAL BOTH SIDES OF THE CARRIAGEWAY OR ASYMMETRICAL.
8. IF DRAINAGE IS NOT REQUIRED REMOVE EXISTING KERB, NEW CONCRETE BLOCK PAVING TO BE LAID MATCHING EXISTING OVERLAP BOND KERB.
9. WHEN CONSTRUCTION BUILD-OUTS AN EXISTING INFRASTRUCTURE, THE KERB OF NEW BUILD-OUTS ARE OFTEN HIGHER THAN THE EXISTING KERB, UNLESS THE ROAD IS RECONSTRUCTED WITH A NEW CHAMBER.
10. WATER RUNS BACK AWAY FROM THE NEW KERB AS IN THE FIGURES AND GUIDED TO THE APPROPRIATE DRAINAGE POINT WITHOUT PONDING.
11. NEW DRAINAGE GULLIES ARE OFTEN REQUIRED AND WILL DEPEND ON THE LEVELS OF THE SURROUNDING AREA.
12. RAISED ENTRY TREATMENT. PARTIAL RAISING OF ROAD LEVEL AS WELL AS PARTIAL DROP OF PEDESTRIAN RAMP IS ALSO POSSIBLE TO DECREASE RAMP GRADIENT IF NECESSARY

ADVANTAGES OF SYMMETRICAL BUILD-OUTS

- BETTER VISIBILITY FOR PEDESTRIANS ON 2-WAY ROADS.
- MORE AESTHETICALLY ACCEPTABLE.
- MAINTAINS SYMMETRY OF ROAD.

ADVANTAGES OF PARTIAL DROP KERB, PARTIAL ROAD HUMP AND SINGLE BUILD-OUT.

- CHEAPER CONSTRUCTION AND DRAINAGE
- MORE ROOM FOR STREET FURNITURE AND BUILD-OUTS
- BETTER FOR ENFORCING BANNED TURNS

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

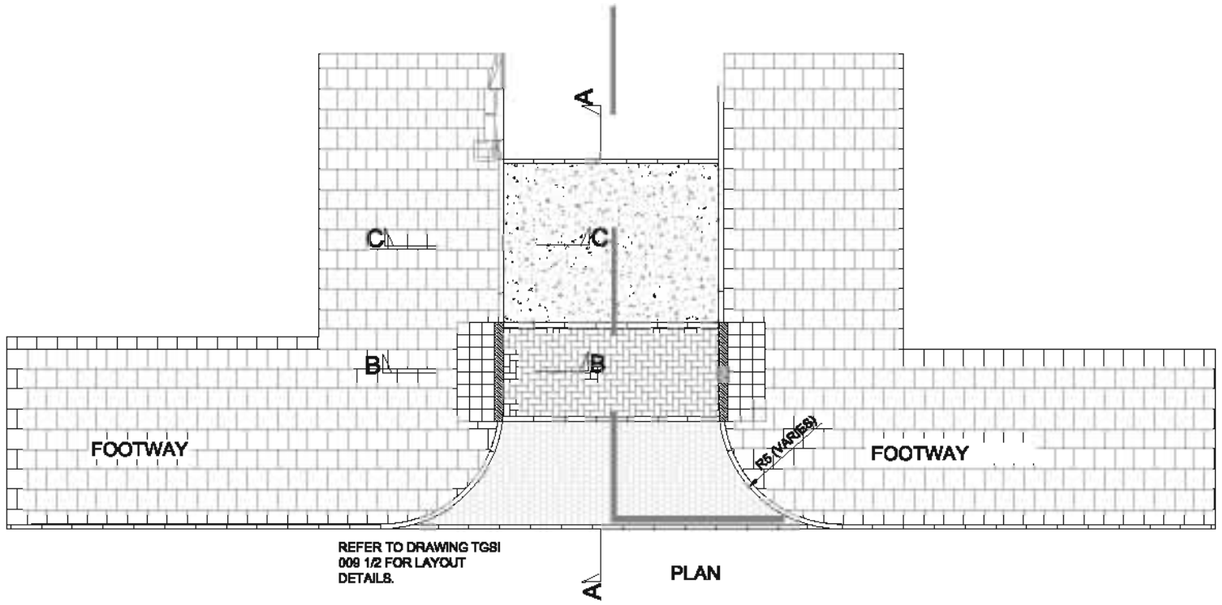
	PROJECT ENG.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN: THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

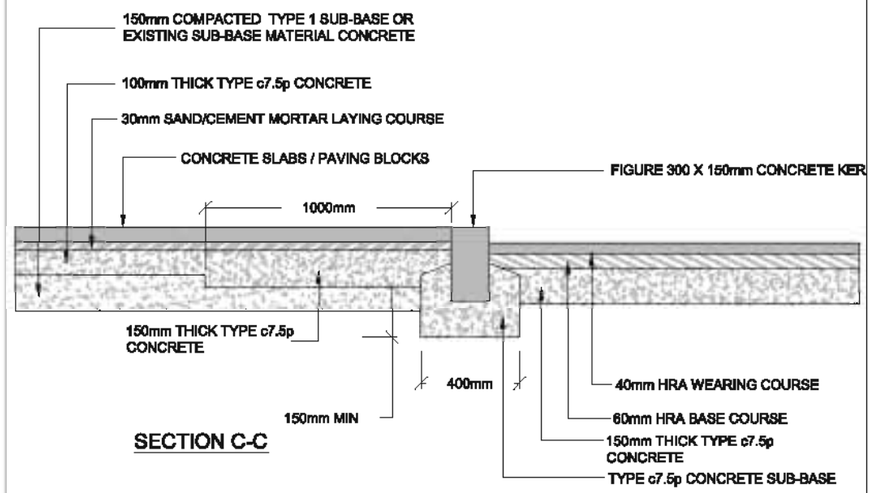
RAISED ENTRY TREATMENT AND PEDESTRIAN CROSSINGS

DATE: NOV2010
SCALE: NTS
DRAWING NUMBER: TGSI_010
AMENDMENT NO: 0
SHEET NUMBER: 2/3

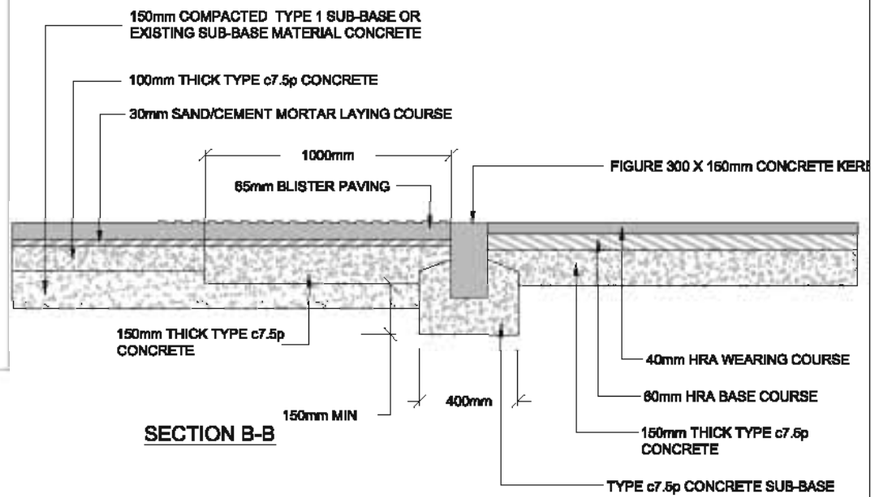
STANDARD ENTRY TREATMENT WITH FLUSH CROSSING



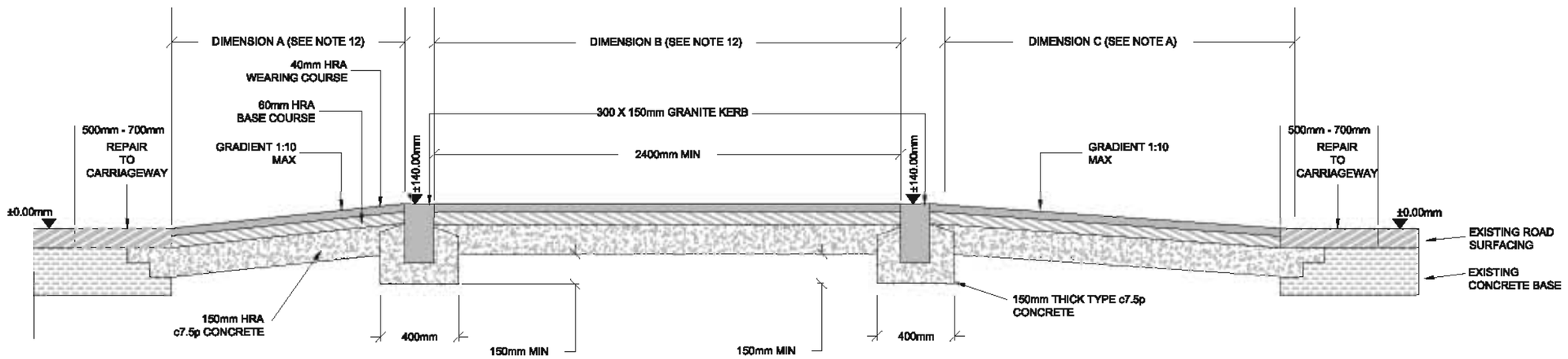
LAYOUT PLAN



SECTION C-C



SECTION B-B



SECTION A-A

NOTES

1) DRAINAGE CHANNELS IN THE FOOTWAYS CAN BE CONSTRUCTED IN SEVERAL WAYS, PROVIDING A SMART DEL`INEATOR BETWEEN NEW AND OLD FOOTWAY. POSSIBLE MATERIALS INCLUDE CONCRETE PAVING, ORIGINAL GRANITE KERBS, FLUSH GRANITE SETS OR A CONCRETE CHANNEL.

2) BUILD-OUTS SHOULD BE CONSTRUCTED OF THE SAME MATERIALS AS THE ORIGINAL FOOTWAY, WITH CONTINUITY OF PAVING BONDS AND CLOSE MATCHING OF MATERIALS COLORS.

3) THE KERB 'RETURN' ANGLE SHOULD BE NO MORE THAN 45 DEGREES TO EASE VEHICLE ACCESS TO KERB-LINE PARKING AND TO ALLOW EASIER CARRIAGEWAY CLEANING AND DRAINAGE.

4) FOOTWAY BUILD-OUTS CAN BE USED TO NARROW A SIDE ROAD, PROVIDE MID-BLOCK CROSSING OR FOR A BUS BOARDER

5) NARROWING THE ROAD HAS A TRAFFIC CALMING EFFECT AND RESULTS IN SHORTER CROSSING DISTANCES FOR PEDESTRIANS.

6) BUILD-OUTS CAN BE USED TO RE-ALIGN THE ROAD TO ACHIEVE A PERPENDICULAR ANGLED INTERSECTION.

7) BUILD-OUTS CAN EITHER BE SYMMETRICAL BOTH SIDES OF THE CARRIAGEWAY OR ASYMMETRICAL.

8) IF DRAINAGE IS NOT REQUIRED REMOVE EXISTING KERB, NEW CONCRETE BLOCK PAVING TO BE LAID MATCHING EXISTING OVERLAP BOND KERB.

9) WHEN CONSTRUCTION BUILD-OUTS AN EXISTING INFRASTRUCTURE, THE KERB OF NEW BUILD-OUTS ARE OFTEN HIGHER THAN THE EXISTING KERB, UNLESS THE ROAD IS RECONSTRUCTED WITH A NEW CHAMBER.

10) WATER RUNS BACK AWAY FROM THE NEW KERB AS IN THE FIGURES AND GUIDED TO THE APPROPRIATE DRAINAGE POINT WITHOUT PONDING.

11) NEW DRAINAGE GULLIES ARE OFTEN REQUIRED AND WILL DEPEND ON THE LEVELS OF THE SURROUNDING AREA.

12) THE LENGTH OF DIMENSIONS A,B,C VARIES DEPENDING ON SITE LEVELS FOOTWAY WIDTHS AND CORNER RADIUS.

ADVANTAGES OF SYMMETRICAL BUILD-OUTS

- BETTER VISIBILITY FOR PEDESTRIANS ON 2-WAY ROADS.
- MORE AESTHETICALLY ACCEPTABLE.
- MAINTAINS SYMMETRY OF ROAD.

ADVANTAGES OF PARTIAL DROP KERB, PARTIAL ROAD HUMP AND SINGLE BUILD-OUT.

- CHEAPER CONSTRUCTION AND DRAINAGE
- MORE ROOM FOR STREET FURNITURE AND BUILD-OUTS
- BETTER FOR ENFORCING BANNED TURNS

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194800 FAX: (011) 8075670

	PROJECT ENG.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

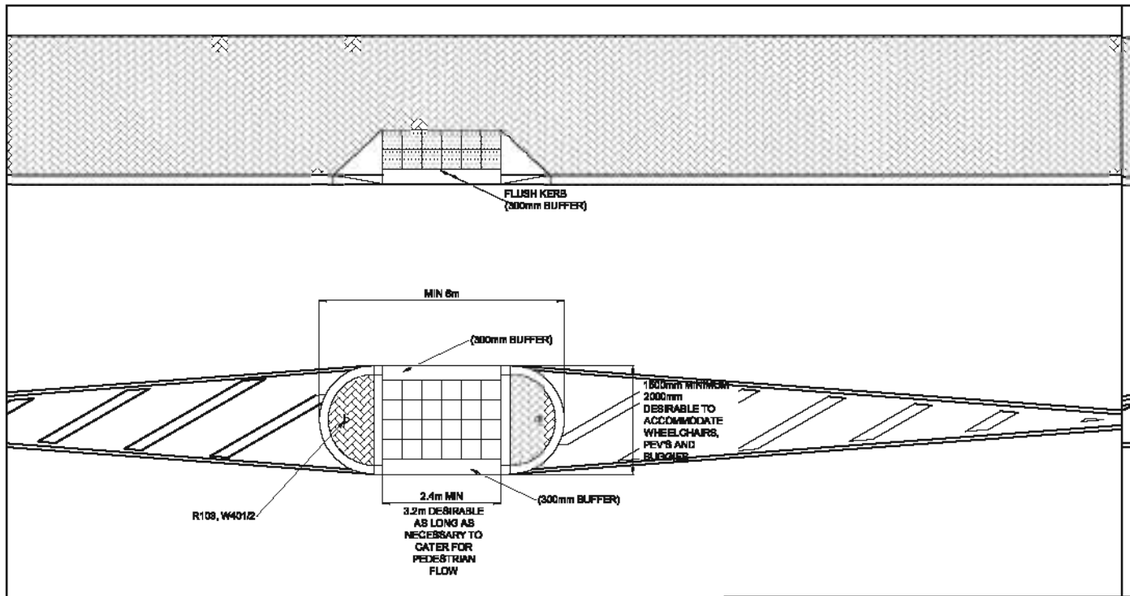
RAISED ENTRY TREATMENT AT CROSSINGS

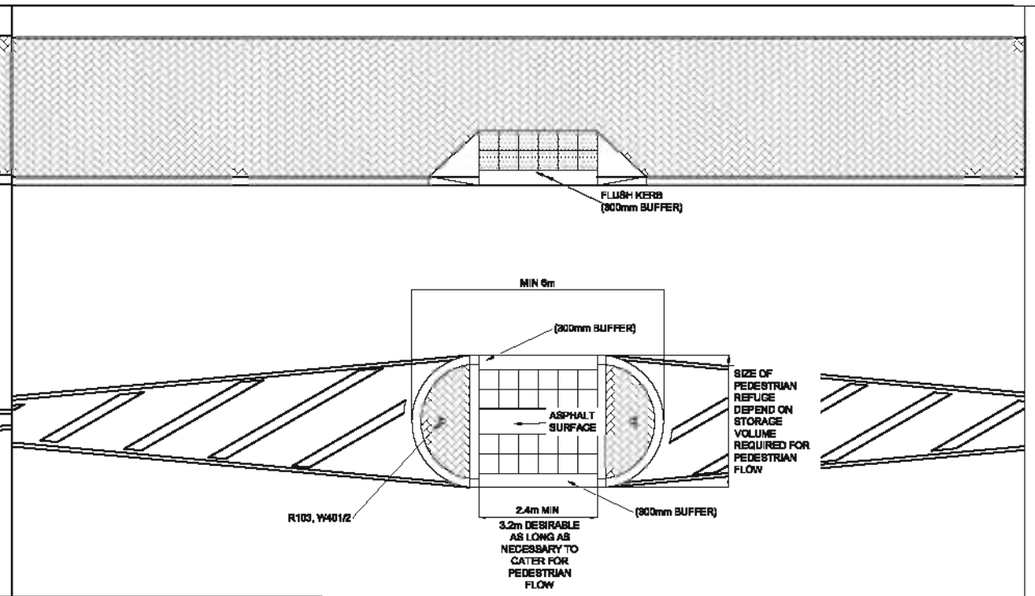
DATE	SCALE
NOV2010	NTS

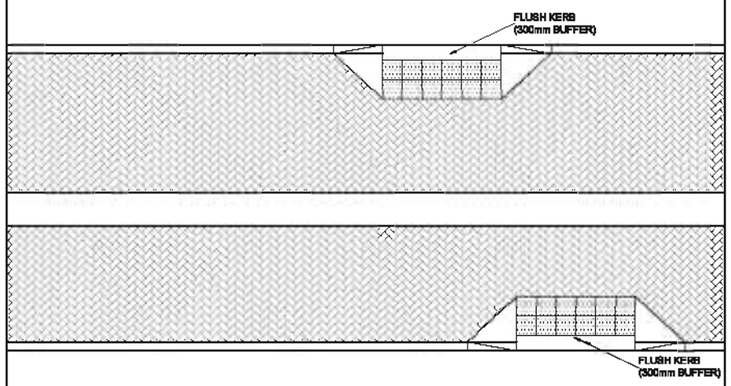
DRAWING NUMBER: TGSI_010

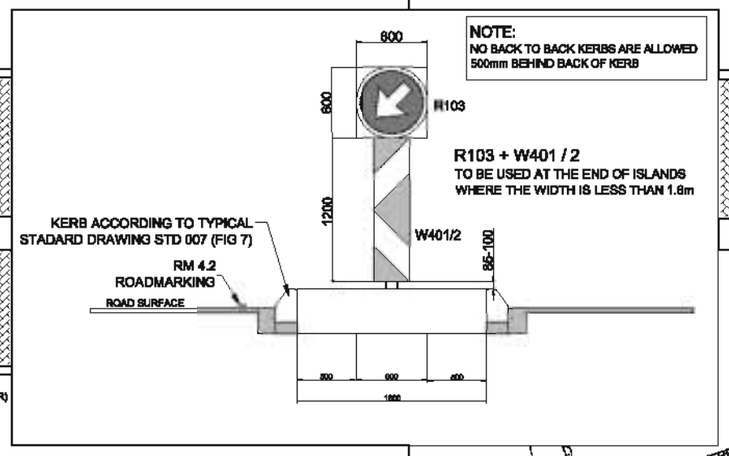
AMENDMENT NO: 0

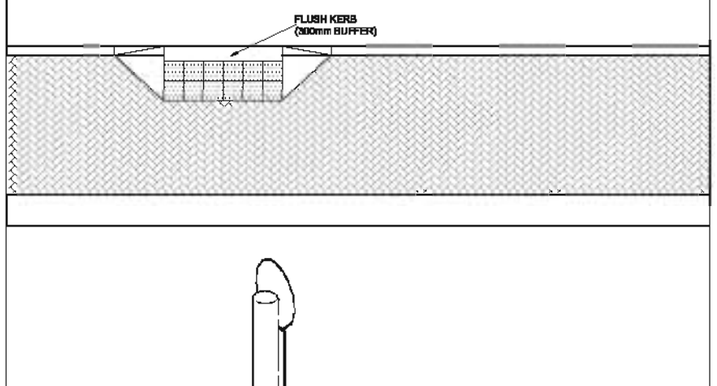
SHEET NUMBER: 3/3

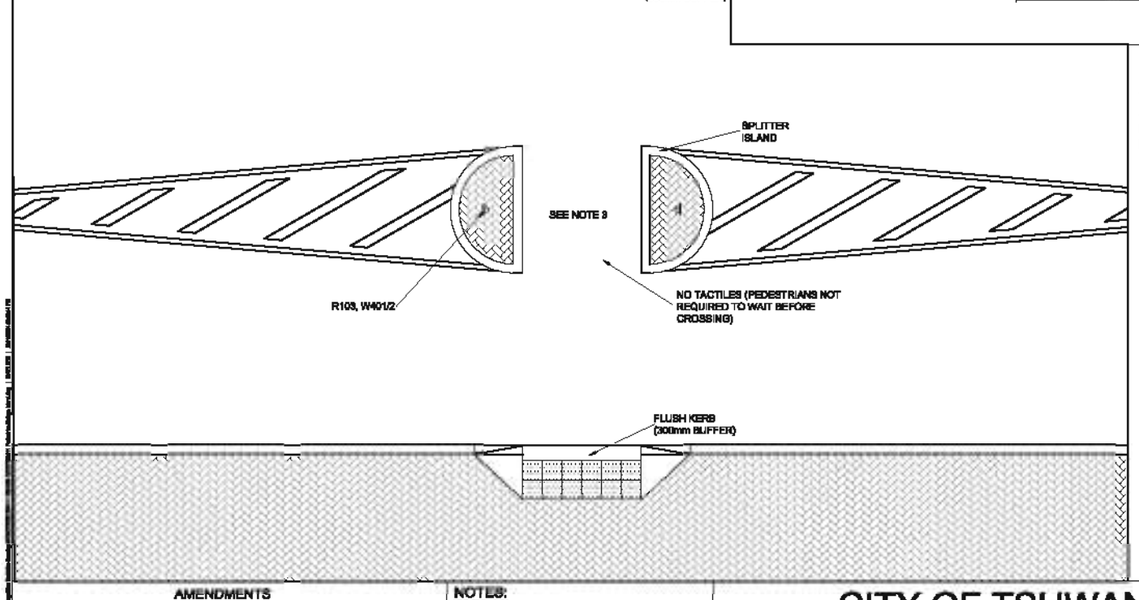


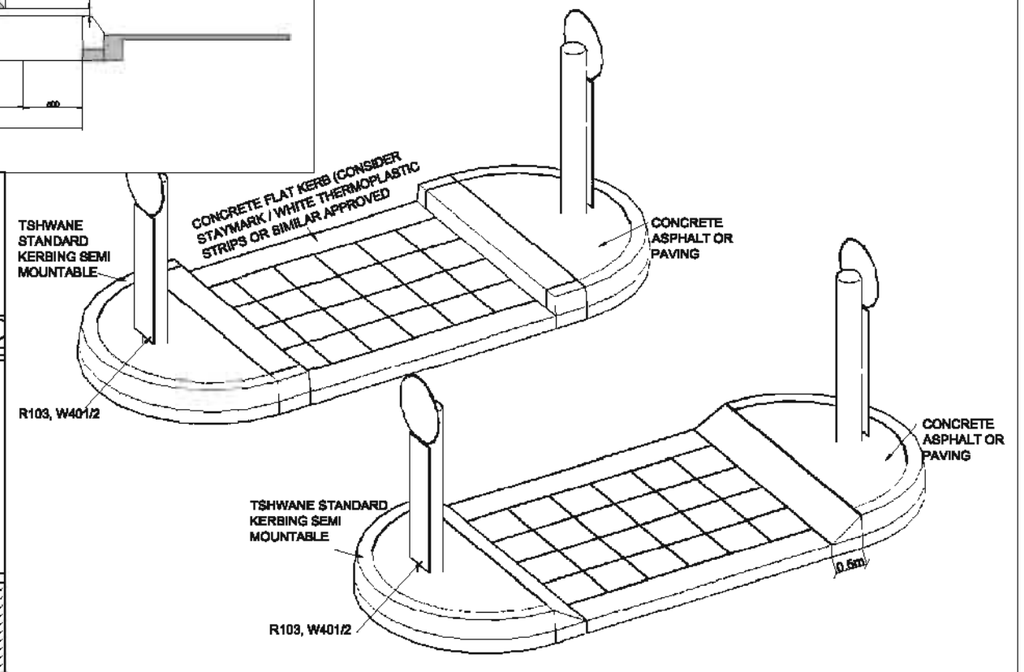












NOTES

1. LAYOUT APPLIES EQUALLY TO CONTROLLED / UNCONTROLLED CROSSINGS
2. LAYOUT ON ISLAND DEPEND ON WIDTH AND OTHER FEATURES
3. IF REFUGE IS NOT INTENDED AS AN AREA FOR PEDESTRIANS TO WAIT, AS IN THE CASE OF A SPLITTER ISLAND, THEN THE TACTILE SURFACE SHOULD NOT TO BE INSTALLED
4. WHERE REFUGE ISLAND IS LESS THAN 2m IN WIDTH, TACTILES SHOULD BE LAID ACROSS THE FULL WIDTH
5. WHERE REFUGE IS 2m AND MORE IN WIDTH, TWO ROWS OF TACTILE SURFACE 800mm DEEP SHOULD BE PROVIDED
6. PEDESTRIAN REFUGE ISLANDS CAN BE INSTALLED TO IMPROVE CROSSING FACILITIES WHERE CARRIAGEWAYS ARE MORE THAN 8.5m WIDE AND CAN ALSO BE INSTALLED AS A TRAFFIC CALMING MEASURE.
7. CONSIDER THE INSTALLING OF LIGHTING OVER THE PEDESTRIAN REFUGE TO IMPROVE SAFETY AFTER DARK
8. REFERABLE MINIMUM WIDTH OF REFUGE IS 1.8m TO ACCOMMODATE WHEELCHAIRS, PEV'S AND BUGGIES. THE PEDESTRIAN REFUGE SHOULD BE MADE AS LONG AND AS WIDE AS IS NECESSARY TO CATER FOR PEDESTRIAN FLOW. (MIN 1.5m WITH.)

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

CITY OF TSHWANE

SERVICE DELIVERY

DR. L. POTGIETER Pr. Eng
STRATEGIC EXECUTIVE OFFICER:

P.O. BOX 1409
PRETORIA
0001

ROADS AND STORMWATER

MR. B.B. MABIZELA
GENERAL MANAGER

P.O. BOX 1409
PRETORIA
0001

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

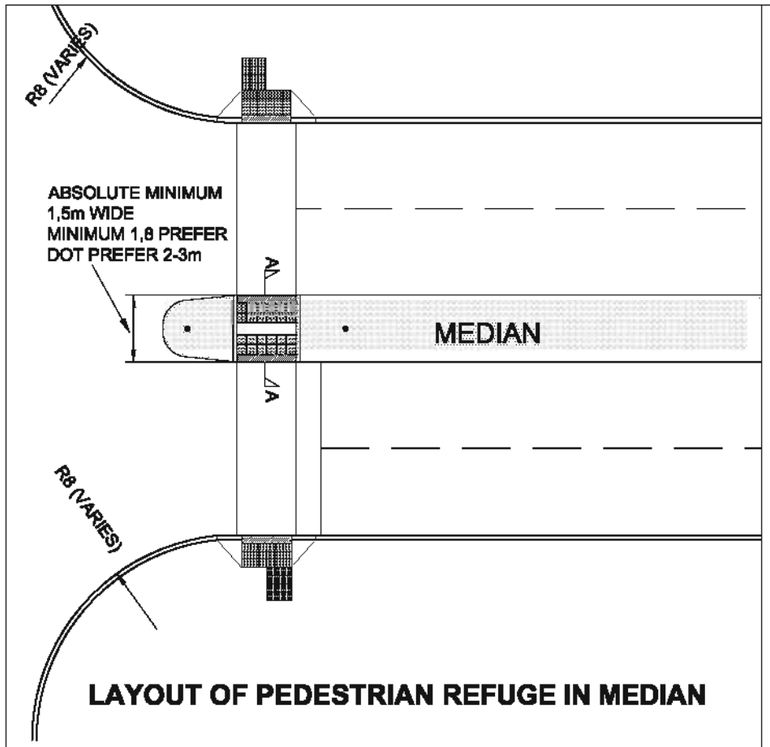
UNCONTROLED PEDESTRIAN REFUGE ISLAND

DATE	SCALE
NOV2010	NTS

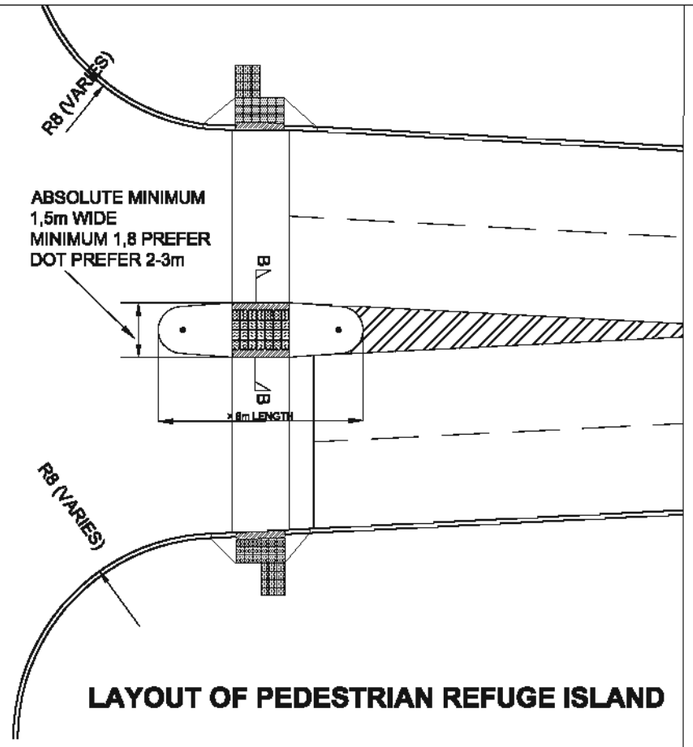
DRAWING NUMBER
TGSI_011

AMENDMENT NO:
0

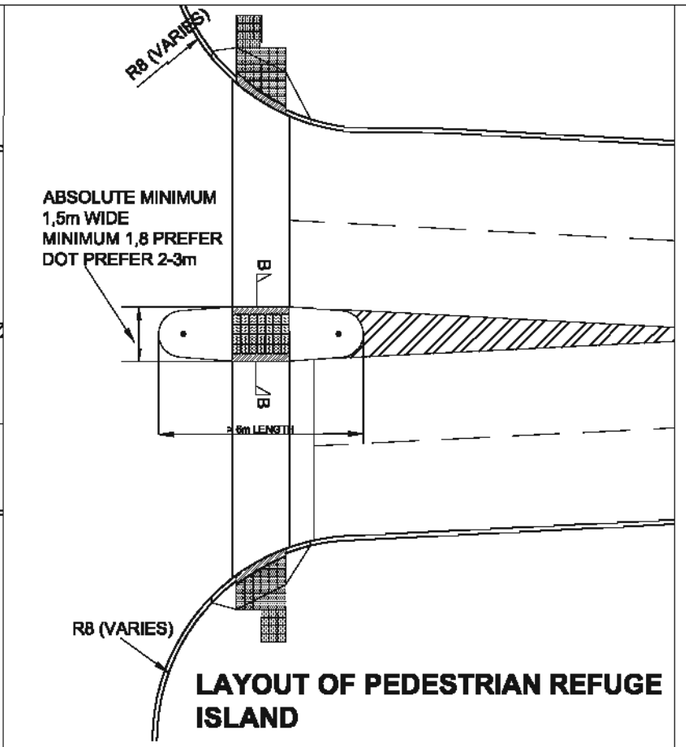
SHEET NUMBER
1/2



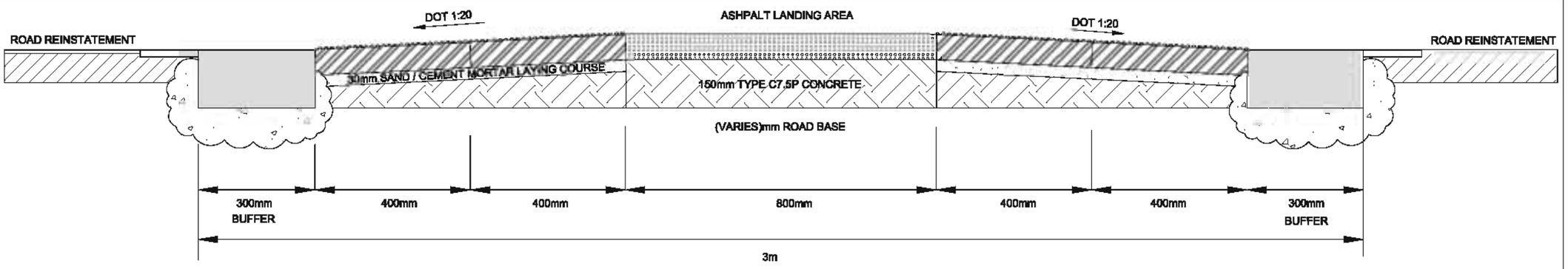
LAYOUT OF PEDESTRIAN REFUGE IN MEDIAN



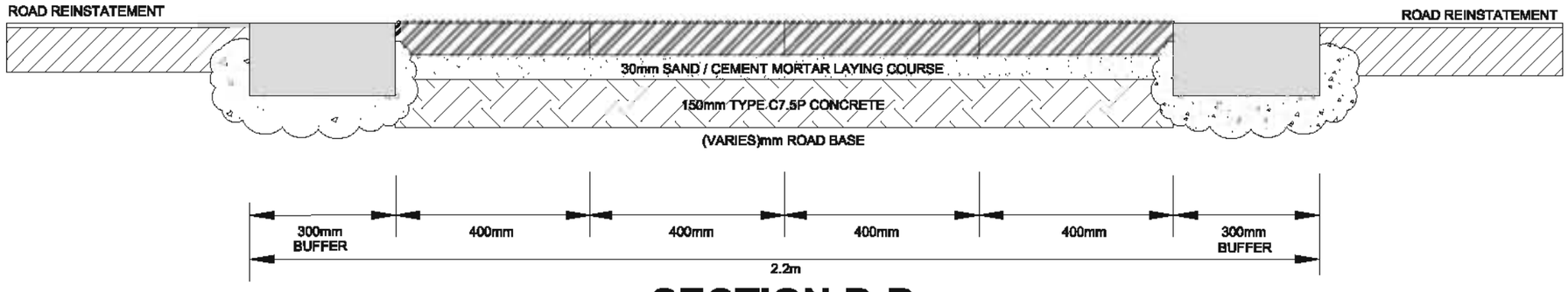
LAYOUT OF PEDESTRIAN REFUGE ISLAND



LAYOUT OF PEDESTRIAN REFUGE ISLAND



SECTION A-A



SECTION B-B

NOTES

1. LAYOUT APPLIES EQUALLY TO CONTROLLED / UNCONTROLLED CROSSINGS
2. LAYOUT ON ISLAND DEPEND ON WIDTH AND OTHER FEATURES
3. IF REFUGE IS NOT INTENDED AS AN AREA FOR PEDESTRIANS TO WAIT, AS IN THE CASE OF A SPLITTER ISLAND, THEN THE TACTILE SURFACE SHOULD NOT TO BE INSTALLED
4. WHERE REFUGE WIDTH IS LESS THAN 2m WIDTH, TACTILES SHOULD BE LAID ACROSS THE FULL WIDTH
5. WHERE REFUGE IS 2m AND MORE IN WIDTH, TWO ROWS OF TACTILE SURFACE 800mm DEEP SHOULD BE PROVIDED
6. PEDESTRIAN REFUGE ISLANDS CAN BE INSTALLED TO IMPROVE CROSSING FACILITIES WHERE CARRIAGEWAYS ARE MORE THAN 8.5m WIDE AND CAN ALSO BE INSTALLED AS A TRAFFIC CALMING MEASURE.
7. CONSIDER THE INSTALLING OF LIGHTING OVER THE PEDESTRIAN REFUGE TO IMPROVE SAFETY AFTER DARK
8. PREFERABLE MINIMUM WIDTH OF REFUGE IS 1.8m TO ACCOMMODATE WHEELCHAIRS, PEV'S AND BUGGIES. THE PEDESTRIAN REFUGE ISLANDS SHOULD BE MADE AS LONG AND AS WIDE AS IS NECESSARY TO CATER FOR PEDESTRIAN FLOW. (MIN 1.5m WIDTH.)

PEDESTRIAN AND BICYCLE FACILITY GUIDELINES

- REFUGE ISLANDS SHOULD PREFERABLY BE CONSTRUCTED WITH KERBS, BUT MAY ALSO BE PAINTED. MOUNTABLE KERBS SHOULD BE USED, EXCEPT IF THERE IS A NEED TO PREVENT PARKING ON AN ISLAND.
- THE WIDTH OF THE WALKWAY SHOULD BE A MINIMUM OF 1,5m, BUT PREFERABLY NOT LESS THAN 2m.
- THE WIDTH OF THE REFUGE ISLAND OR MEDIAN SHOULD NOT BE LESS THAN 2m, BUT PREFERABLY NOT LESS THAN 3m, TO ACCOMMODATE PEDESTRIANS, PERSONS IN WHEELCHAIRS AND CYCLISTS. WIDER WIDTHS MAY BE REQUIRED WHERE LARGE VOLUMES OF PEDESTRIANS MUST BE ACCOMMODATED.

MEDIANS

- RAISED ISLANDS IN CROSSINGS SHOULD BE CUT THROUGH LEVEL WITH THE STREET OR HAVE KERB RAMPS AT BOTH SIDES AND A LEVEL AREA AT LEAST 1200mm LONG IN THE PART OF THE ISLAND INTERSECTED BY THE CROSSINGS.

THE PROVISION OF A REFUGE ISLAND AT A MIDBLOCK PEDESTRIAN CROSSINGS ON MULTI-LANE ROADS

- SIMPLIFIES THE ROAD CROSSING TASK CONSIDERABLY, AND
- ENCOURAGE MORE PEDESTRIANS TO USE THE CROSSING.

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

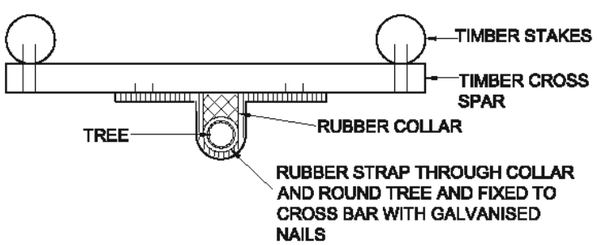
PEDESTRIAN REFUGE ISLAND

DATE	SCALE
NOV2010	NTS

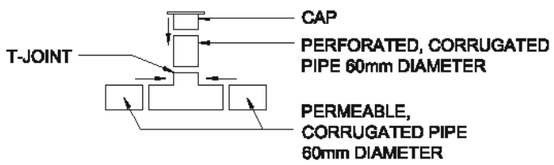
DRAWING NUMBER: TGSI_011

AMENDMENT NO: 0

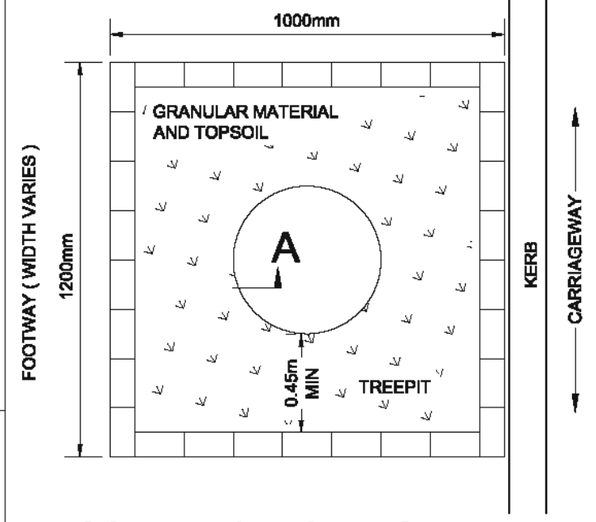
SHEET NUMBER: 2/2



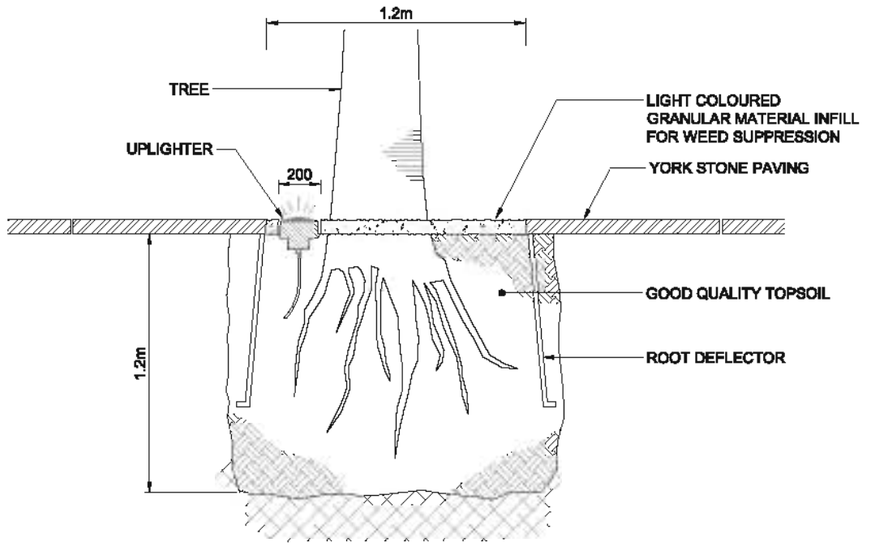
TREE STAKE AND TIE DETAIL (OPTION 2) PLAN VIEW



IRRIGATION INLET DETAIL EXPLODED VIEW



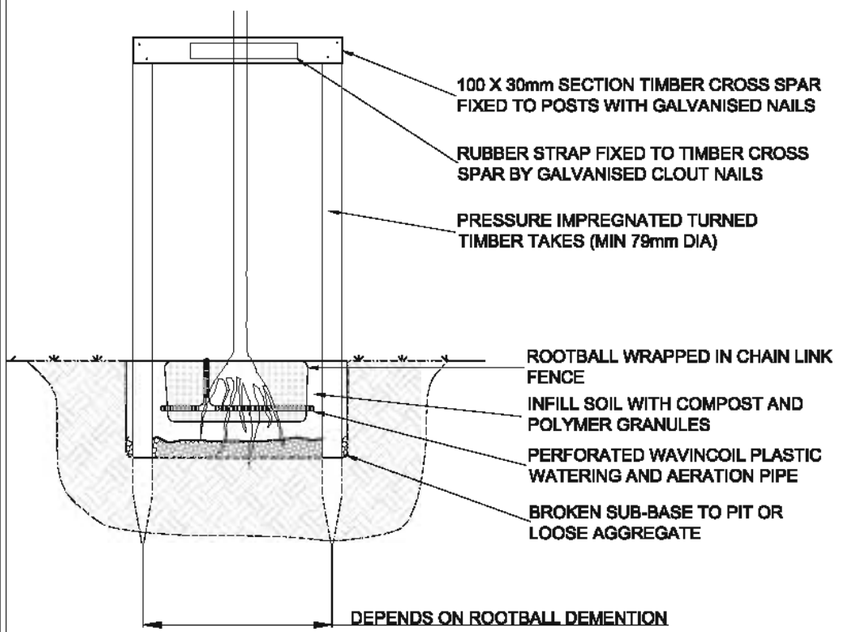
SQUARE / RECTANGULAR TREEPIT

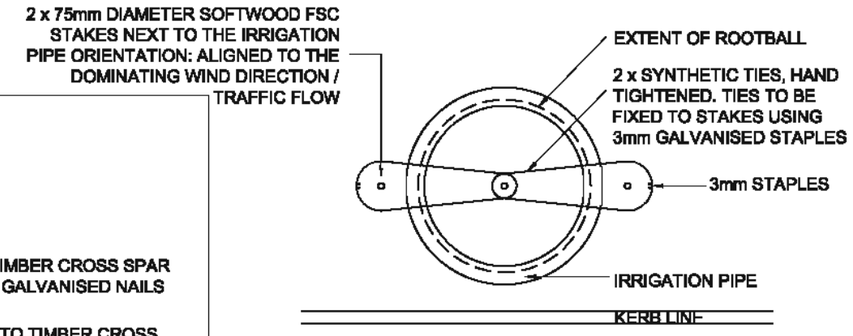


TREEPIT STANDARD CROSS SECTION DETAIL

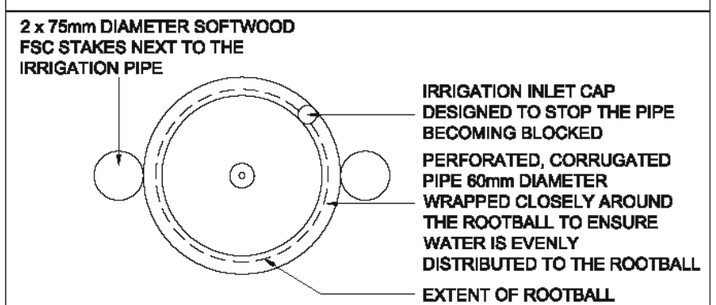
NOTES

1. TREE PIT DESIGN CAN BE ALTERED ACCORDING TO THE TREE SPECIES AND AESTHETIC CONSIDERATIONS
2. PREFERRED TREE PIT DIMENSIONS ARE 1m x 1m x 1m WITH AN ABSOLUTE MINIMUM OF 0.6m x 0.6m x 0.6m.
3. ROOT DEFLECTORS MUST BE USED IN THE TREE PIT TO PREVENT THE ROOTS FROM GROWING IMMEDIATELY BELOW THE FOOTWAY CAUSING DAMAGE TO THE PAVING.
4. MINIMUM CLEAR, LEVEL FOOTWAY WIDTH OF 1.5m SHOULD BE LEFT BETWEEN PIT EDGE AND BACK OF FOOTWAY.
5. A WATER PIPE FOR WATERING MUST BE ADDED TO EVERY NEW PIT.
6. SOIL FALLING INTO THE PIT SHOULD BE KEPT LEVEL WITH THE FOOTWAY BY TOPPING UP AFTER SETTLING HAS OCCURRED.
7. THE TREE SHOULD BE CENTRED IN THE PIT.
8. UNLESS SPECIAL ARRANGEMENTS ARE MADE FOR CONTINUAL MAINTENANCE, TREE GRILLS ARE NOT TO BE USED AS THEY ARE DIFFICULT TO KEEP FROM LITTER AND NEEDS TO BE ADJUSTED AS THE TREE GROWS.
9. KERBS AND UP STANDS AROUND TREE ARE NOT TO BE USED. PEOPLE ARE LIKELY TO TRIP OVER THEM AND THEY TEND TO FILL WITH RUBBISH.
10. TREES MUST BE RELATED TO THE WIDER TOWNSCAPE CONTEXT.
11. THE LIKELY SIZE OF THE FULLY GROWN TREE HAS TO BE CONSIDERED WHEN DECISIONS ON SPECIES AND LOCATION ARE MADE.
12. UNDERGROUND SERVICES NEEDS TO BE CONSIDERED WHEN CHOOSING A TREE AS WELL AS LOCATION.
13. TREES MUST NOT BE PLANTED WHERE THEY OBSCURE LAMPPOSTS, STREET SIGNS, CCTV CAMERAS OR SIGHT LINES AT JUNCTIONS AND PEDESTRIAN CROSSINGS.

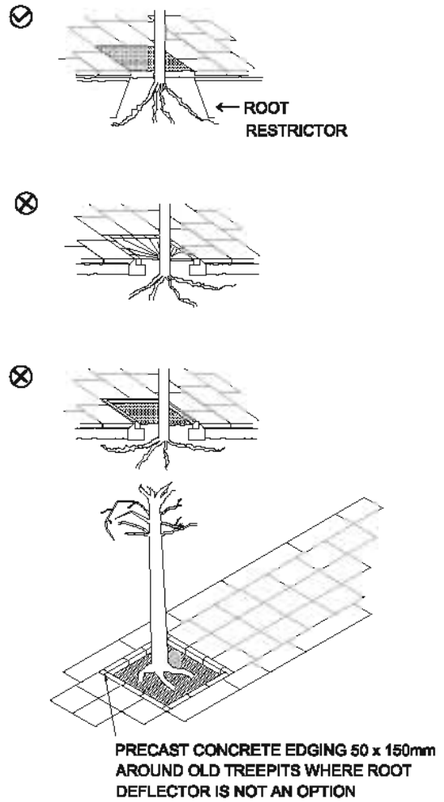




TREE STAKE AND TIE DETAIL (OPTION 1) PLAN VIEW



IRRIGATION PIPE DETAIL PLAN VIEW



AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

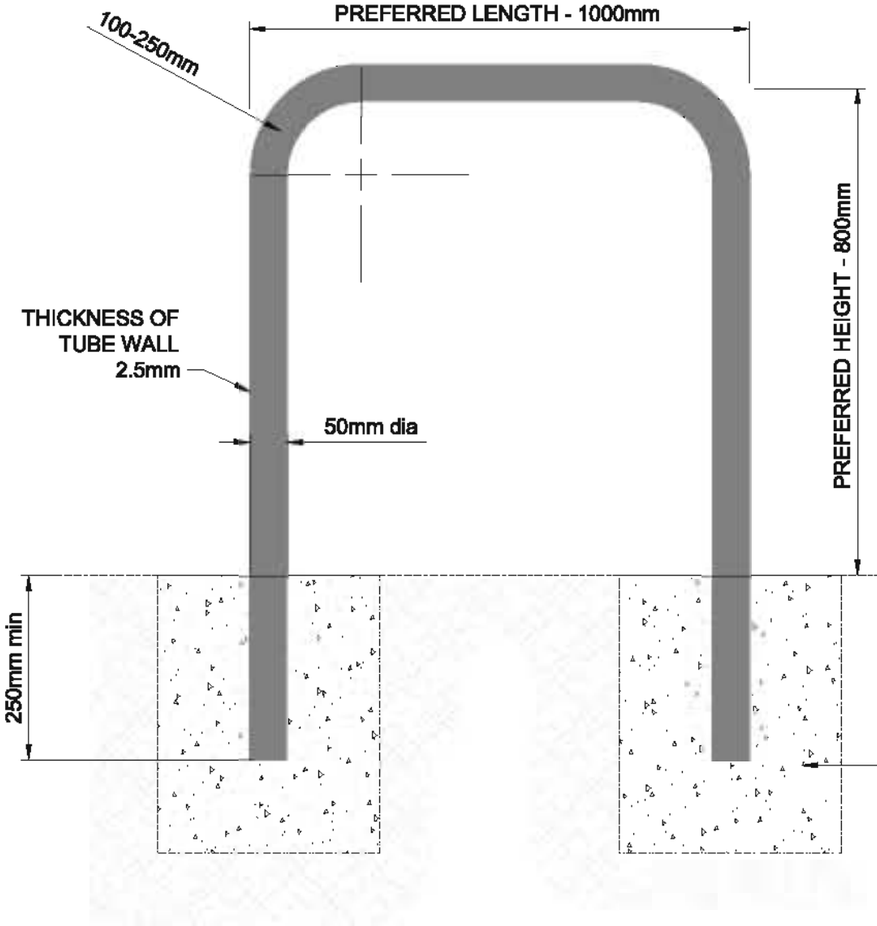
	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

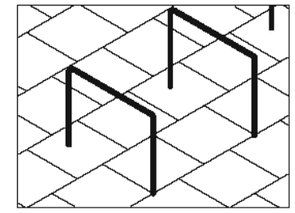
TYPICAL DETAIL OF TREE PITS ON FOOTWAYS

DATE	SCALE
OCT2010	NTS

DRAWING NUMBER: TSGI_012
AMENDMENT NO: 0
SHEET NUMBER: 1/1

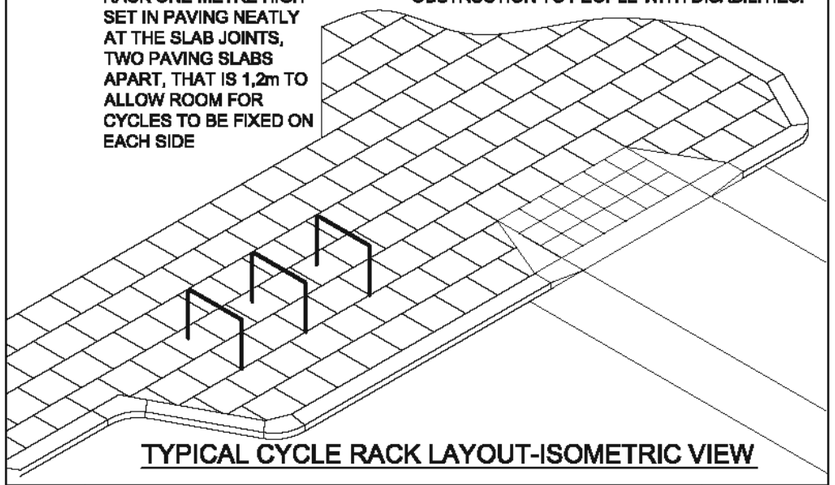


DETAIL OF CYCLE RACK

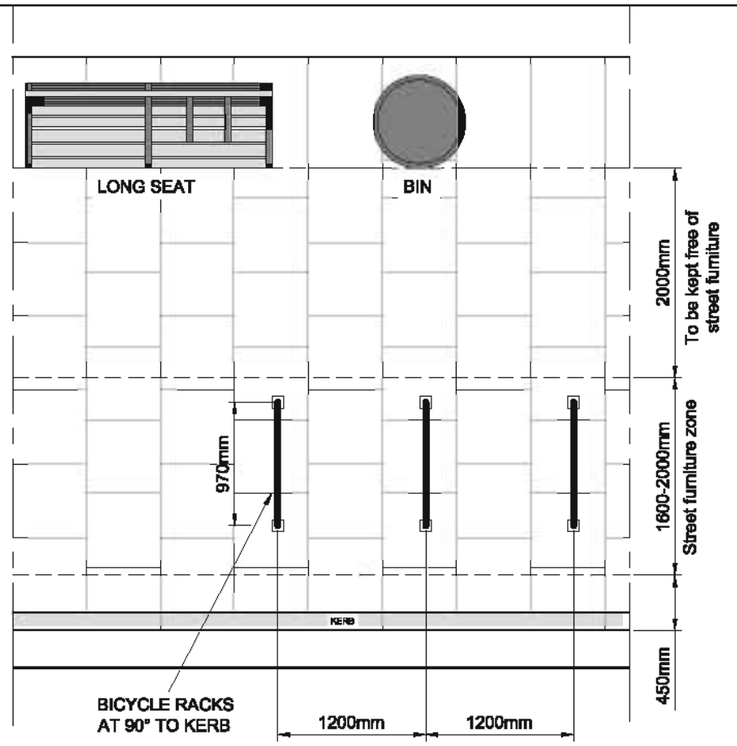


- CYCLE RACKS ARE TO BE OF THE SIMPLEST SHAPE AND STYLE: A STRAIGHTFORWARD BENT TUBE PAINTED BLACK , TO BE SET COLOUR CO-ORDINATED WITH OTHER STREET FURNITURE AND BE SET NEATLY INTO THE PAVING COURSE.
- SPECIAL SIGNS SAYING WHAT THE RACKS ARE INTENDED FOR ARE NOT REQUIRED.
- THE RACKS SHOULD BE POSITIONED AWAY FROM THE MAIN LINES OF PEDESTRIAN MOVEMENT, FOR EXAMPLE ON A PAVING NIB, WHERE THEY WILL NOT CAUSE AN OBSTRUCTION TO PEOPLE WITH DISABILITIES.

- SIMPLY SHAPED CYCLE RACK ONE METRE HIGH SET IN PAVING NEATLY AT THE SLAB JOINTS, TWO PAVING SLABS APART, THAT IS 1,2m TO ALLOW ROOM FOR CYCLES TO BE FIXED ON EACH SIDE



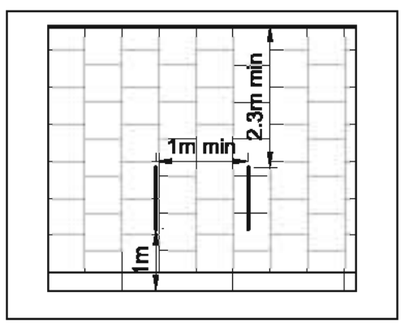
TYPICAL CYCLE RACK LAYOUT-ISOMETRIC VIEW



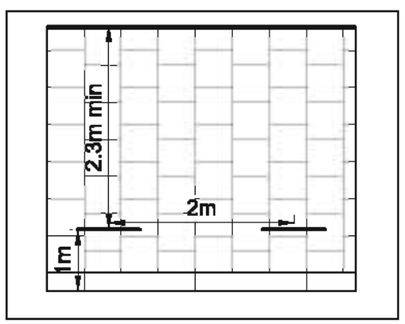
TYPICAL CYCLE RACK LAYOUT-PLAN VIEW

NOTES

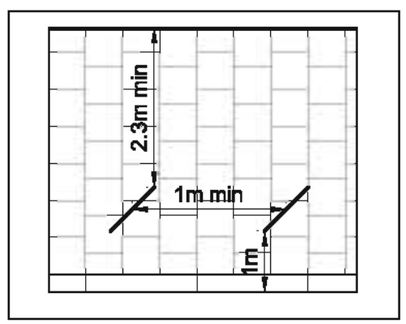
1. PROVIDING CYCLE PARKING NEAR SHOPS, LEISURE FACILITIES, COMMUNITY CENTRES, TRANSPORT HUBS, ACTIVELY ENCOURAGES CYCLE USE.
2. CARE MUST BE TAKEN TO ENSURE CYCLE STANDS WITH PARKED CYCLE BICYCLES DO NOT BLOCK WALKWAYS OR OBSTRUCT MOVEMENT.
3. ARRANGEMENT OF CYCLE STANDS DEPEND ON FOOTWAY WIDTH (SEE DIAGRAMS).
4. ALLOW FOR WHEEL (AND HANDLEBAR) OVERHANG OF ROUGHLY 0.5m EITHER SIDE OF (AND PARALLEL TO) A CYCLE STAND.
5. STAND CAN BE ARRANGED PARALLEL (PREFERRED) ECHELON OR PERPENDICULAR TO THE KERB DEPENDING ON THE WIDTH OF FOOTWAY AVAILABLE. SEE DIAGRAMS FOR MINIMUM DIMENSIONS WITHIN THE FOOTWAY.
6. IF THE BEST LOCATION FOR CYCLE STANDS IN ON PRIVATE LAND, TRY TO NEGOTIATE WITH THE OWNERS WITH THE OWNERS, WITH ALL COSTS AND MAINTENANCE COVERED BY THE COUNCIL.



"PERPENDICULAR" CYCLE STANDS



"PARALLEL" CYCLE STANDS



"ECHELON" CYCLE STANDS

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTRUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTRUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTRUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

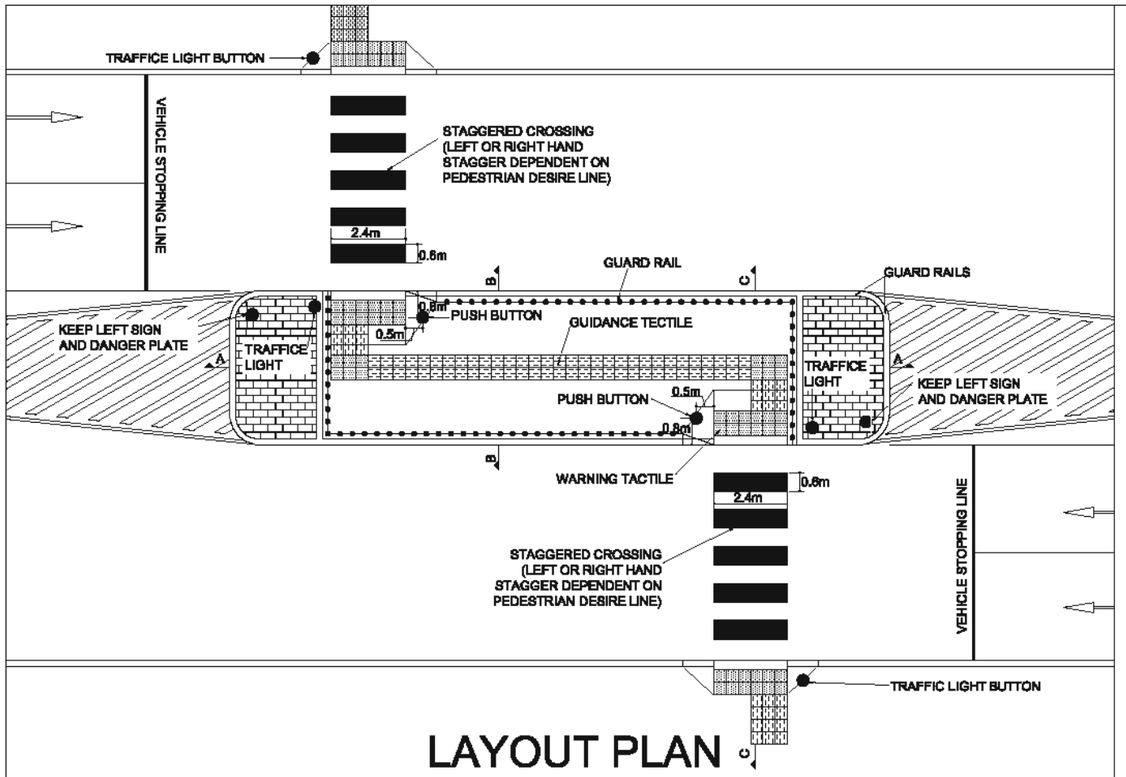
BASIC CYCLE PARKING LAYOUT OPTIONS FOR FOOTWAYS

DATE	SCALE
NOV2010	NTS

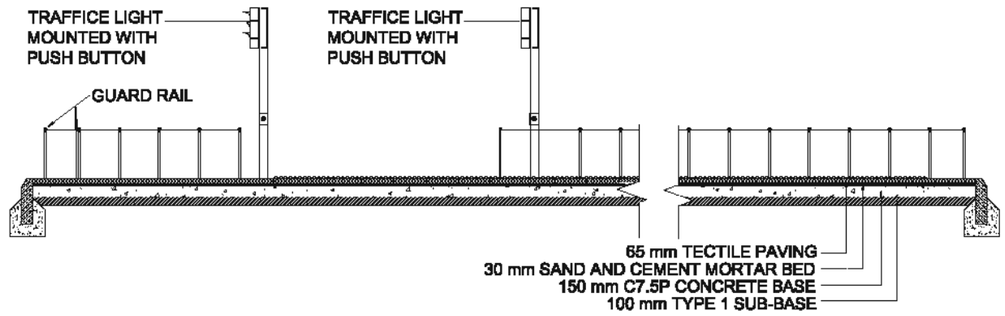
DRAWING NUMBER
TSGI_013

AMENDMENT NO:
0

SHEET NUMBER
1/1



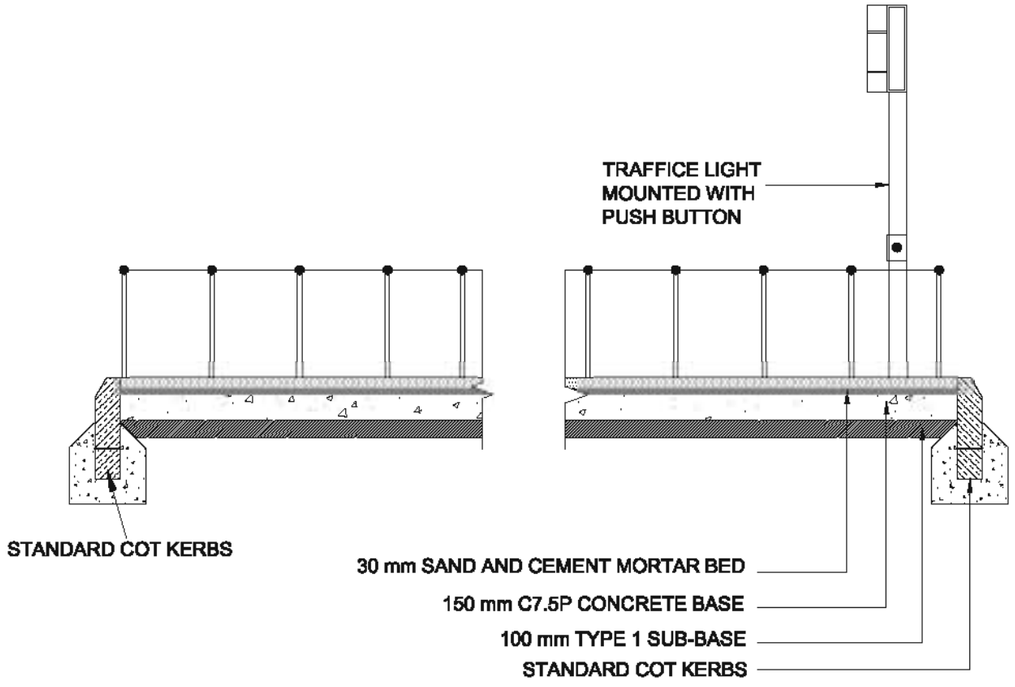
LAYOUT PLAN



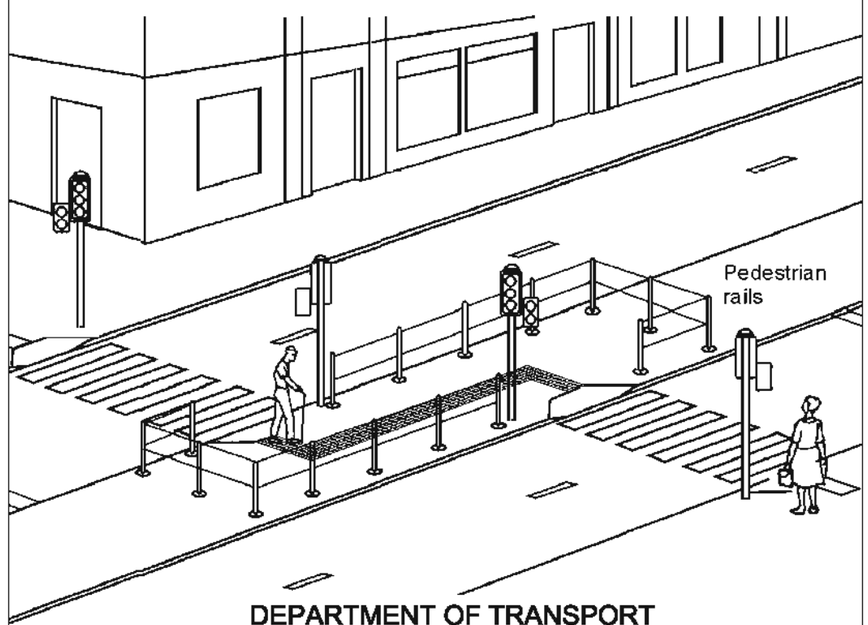
SECTION A-A

NOTES

1. WHERE GUARDRAILS ARE PROVIDED ON ISLAND AT STAGGERED CROSSINGS, THE TACTILE SURFACE NEED TO BE INSTALLED TO A DEPTH OF 800mm BEHIND THE 300mm BUFFER DROP-KERBS ON BOTH-SIDES.
2. IT IS IMPORTANT THAT THE SIGNAL POLES WITH PUSHBUTTONS ARE INSTALLED IN LINE WITH THE GUARDRAILS AND CLOSE TO THE EDGE OF THE TACTILE PAVING TO ENABLE VISUALLY IMPAIRED PEOPLE TO LOCATE THE BUTTON EASILY.
3. WHEN DESIGNING CONTROLLED PEDESTRIAN CROSSING, STRAIGHT ACROSS ARRANGEMENTS ARE MORE SYMPATHETIC TO CREATING UNCLUTTERED STREETSCAPES THAN STAGGERED CROSSING (WITH TWO INDEPENDENT CROSSING OVER EACH HALF OF EACH HALF OF THE CARRIAGEWAY) AND SHOULD BE THE DESIRED SOLUTION. STAGGERED CROSSINGS REQUIRE A PEDESTRIAN HOLDING PLACE IN THE CENTER OF THE CARRIAGE, WHICH IS EITHER DEFIED BY KERBS OR PEDESTRIAN GUARD RAILING AND CAN ALSO MEAN ADDITIONAL STREET FURNITURE SUCH AS SIGNAL POLES.
4. WHERE CROSSING DISTANCE ARE GREATER THAN 15m,THE USE OF STAGGERED CROSSING CANNOT BE VOIDED WITHOUT CREATING EXTENDED VEHICLE STOPPING TIME TO ALLOW PEDESTRIANS TO WALK ACROSS THE ROAD IN ONE MOVEMENT. TO ACHIEVE STRAIT-ACROSS CROSSING, DESIGN TEAMS SHOULD CONSIDER ANALYSIS OF SIGNAL TIMELINE OVER A SECTION OF HIGHWAY TO CREATE EVEN FLOWS OF TRAFFIC, PREVENTING CONGESTION AT ANY ONE CROSSING
5. WHEN STAGGERED CROSSINGS ARE UNAVOIDABLE, DESIGN MUST BE AS SIMPLE AND UNCLUTTERED AS POSSIBLE WITH THE LAYOUT OF STAGGER SUCH THAT PEDESTRIANS ON THE ISLAND FACE ON-COMING TRAFFIC.
6. CARRIAGEWAY DRAINAGE GULLIES SHOULD BE LOCATED AWAY FROM THE PEDESTRIAN ROUTE ACROSS THE CROSSING AND OUTSIDE ANY AREA ENCLOSED BY STUDS.CARRIAGEWAY FINISHED LEVELS MUST ENABLE SURFACE WATER TO DRAIN AWAY FROM THE CROSSING POINT TO PREVENT POUNDING AT DROPPED KERBS.
7. DESIGN TEAMS MUST ENSURE THAT THERE IS SUFFICIENT STORAGE SPACE ON THE FOOTWAY ADJACENT TO THE CROSSING TO PERMIT WAITING PEDESTRIAN TO STAND WITHOUT OBSTRUCTING THE FREE MOVEMENT OF OTHER PEDESTRIANS. THIS CAN USUALLY BE ACHIEVED BY USING A 5m CROSSING WIDTH ON FOOTWAYS 2m TO 3m WIDE.
8. SIGNAL POLES MUST BE POSITIONED TO PROVIDE A MINIMUM LATERAL CLEARANCE OF 450mm FROM ALL SIGNAL EQUIPMENT TO KERB FACE.



SECTION B-B



DEPARTMENT OF TRANSPORT
PEDESTRIAN AND BICYCLE FASILITY GUIDELINES
FIGURE 2.9: STAGGERED MIDBLOCK PEDESTRIAN CROSSING

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

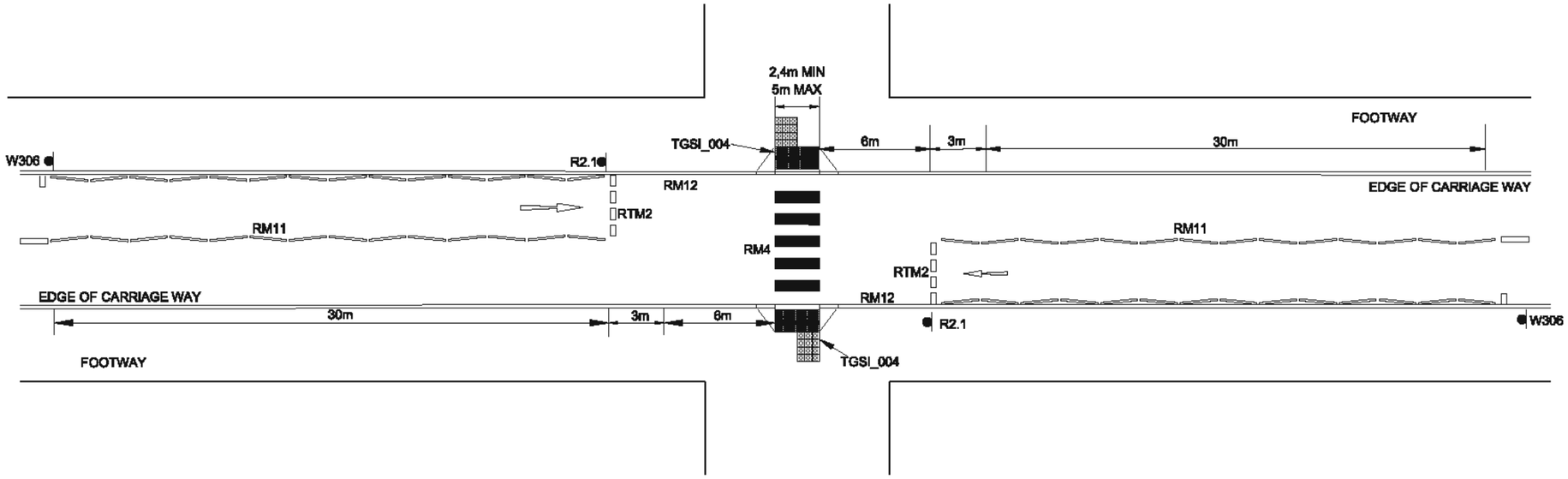
	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTRUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTRUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTRUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

ROADS AND STORMWATER

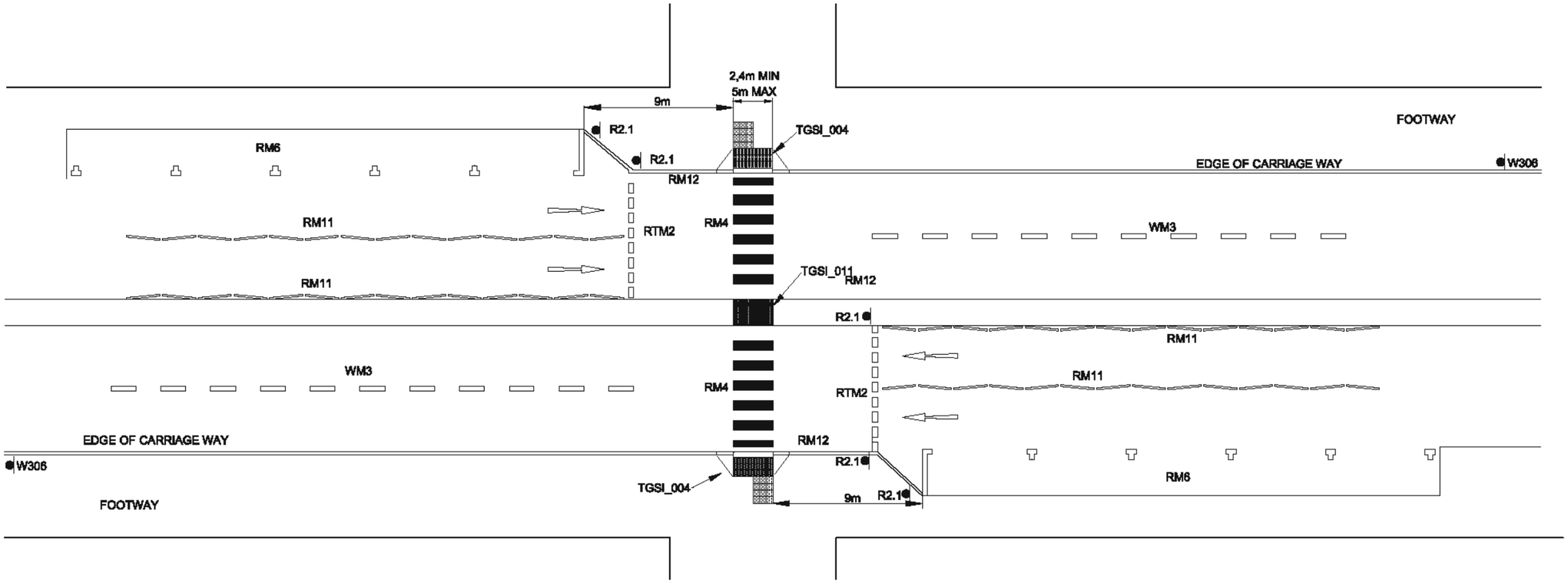
CONTROLLED STAGGERED PEDESTRIAN CROSSING

DATE: OCT2010
SCALE: NTS
DRAWING NUMBER: TGSI_014
AMENDMENT NO: 0
SHEET NUMBER: 1/1

NOTES



YIELD-CONTROLLED MIDBLOCK CROSSING - TWO WAY STREET (SINGLE LANE)



YIELD-CONTROLLED MIDBLOCK CROSSING - PARKING ALLOWED WITH EXTENDED SIDEWALK

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB ENGINEERING & SCIENCE

GIBB House
14 Eglin Road
Sunninghill
2191

P O Box 2700
Rivonia
2128

TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTRUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTRUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTRUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

ROADS AND STORMWATER

YIELD CONTROLLED MIDBLOCK PEDESTRIAN CROSSING

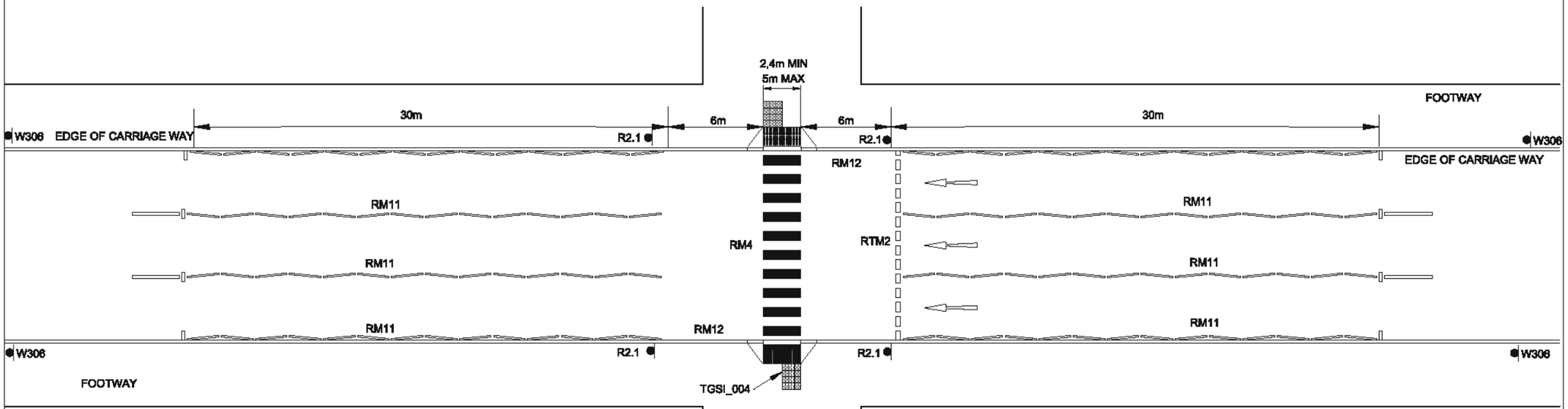
DATE	SCALE
OCT2010	NTS

DRAWING NUMBER: TGSI_015

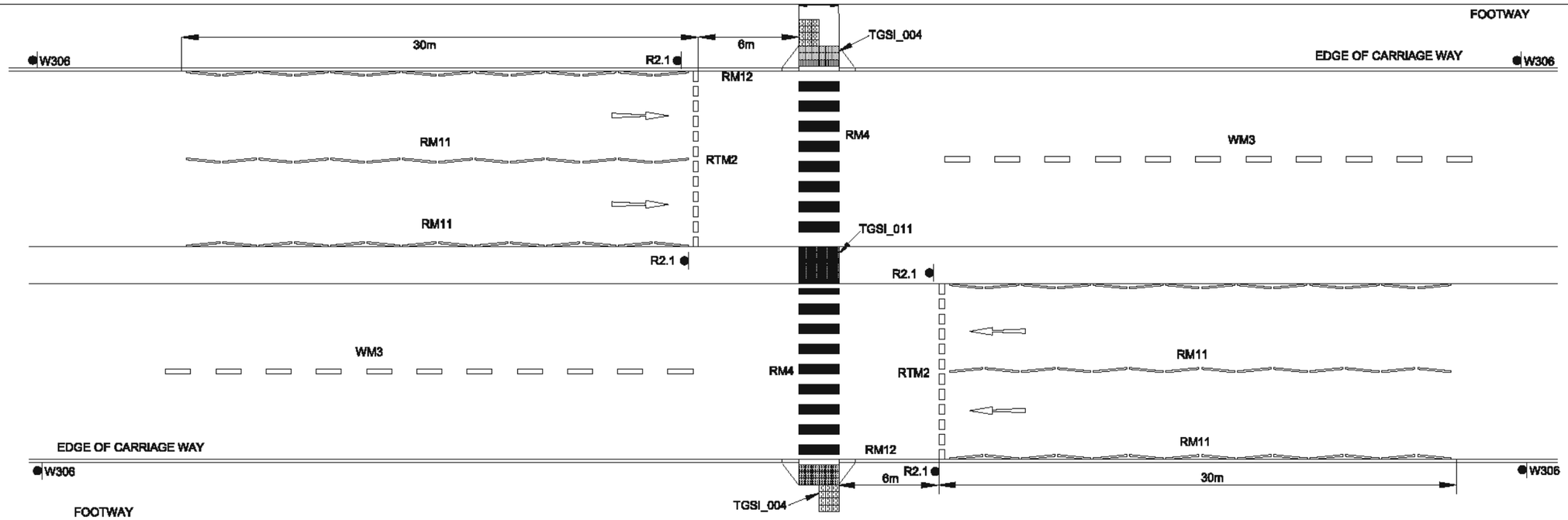
AMENDMENT NO: 0

SHEET NUMBER: 1/2

NOTES



YIELD-CONTROLLED MIDBLOCK CROSSING - ONE WAY STREET



YIELD-CONTROLLED MIDBLOCK CROSSING - TWO WAY STREET WITH CENTRAL REFUGE

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT Eng.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTRUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTRUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN: THINUS_VENTER
MANAGER: INFRASTRUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES: GIBB

ROADS AND STORMWATER

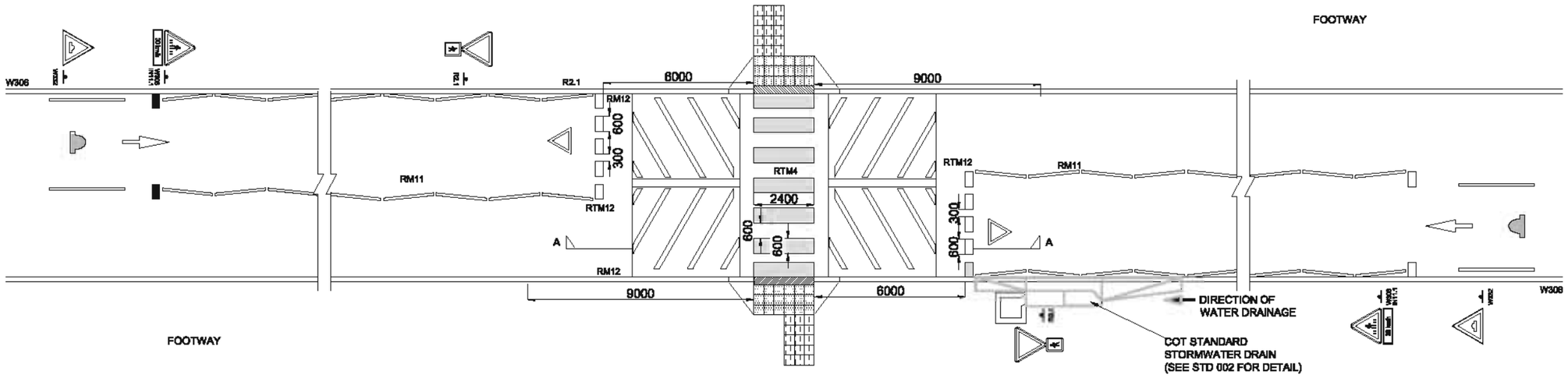
YIELD CONTROLLED MIDBLOCK PEDESTRIAN CROSSING

DATE	SCALE
OCT2010	NTS

DRAWING NUMBER: TGSI_015

AMENDMENT NO: 0

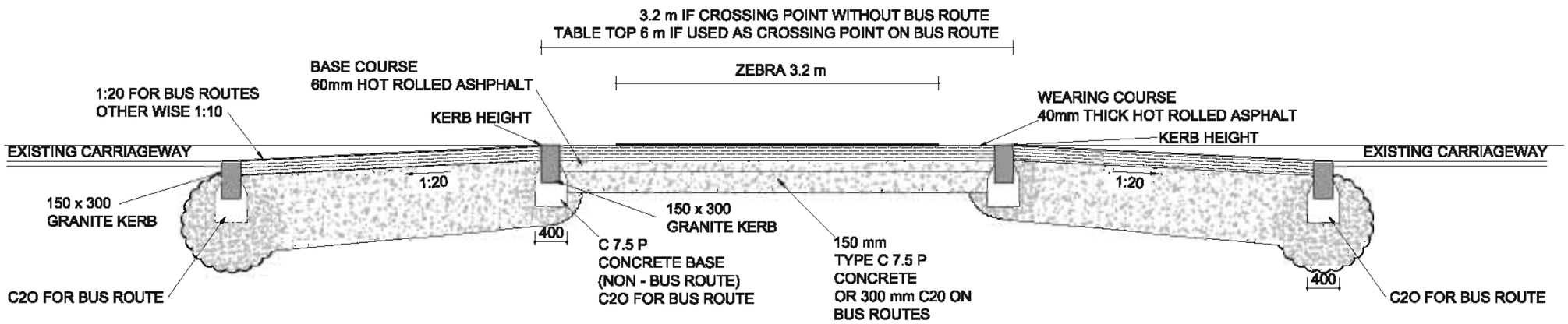
SHEET NUMBER: 2/2



PLAN LAYOUT

NOTES

1. NB - LAYER CONSTRUCTION AND MATERIAL STRENGTH AND THICKNESS DEPEND ON ROUTE, VEHICLE SIZES AND QUANTITIES, BUS ROUTES ALONG THE ROUTE ETC.



CROSS SECTION A-A

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

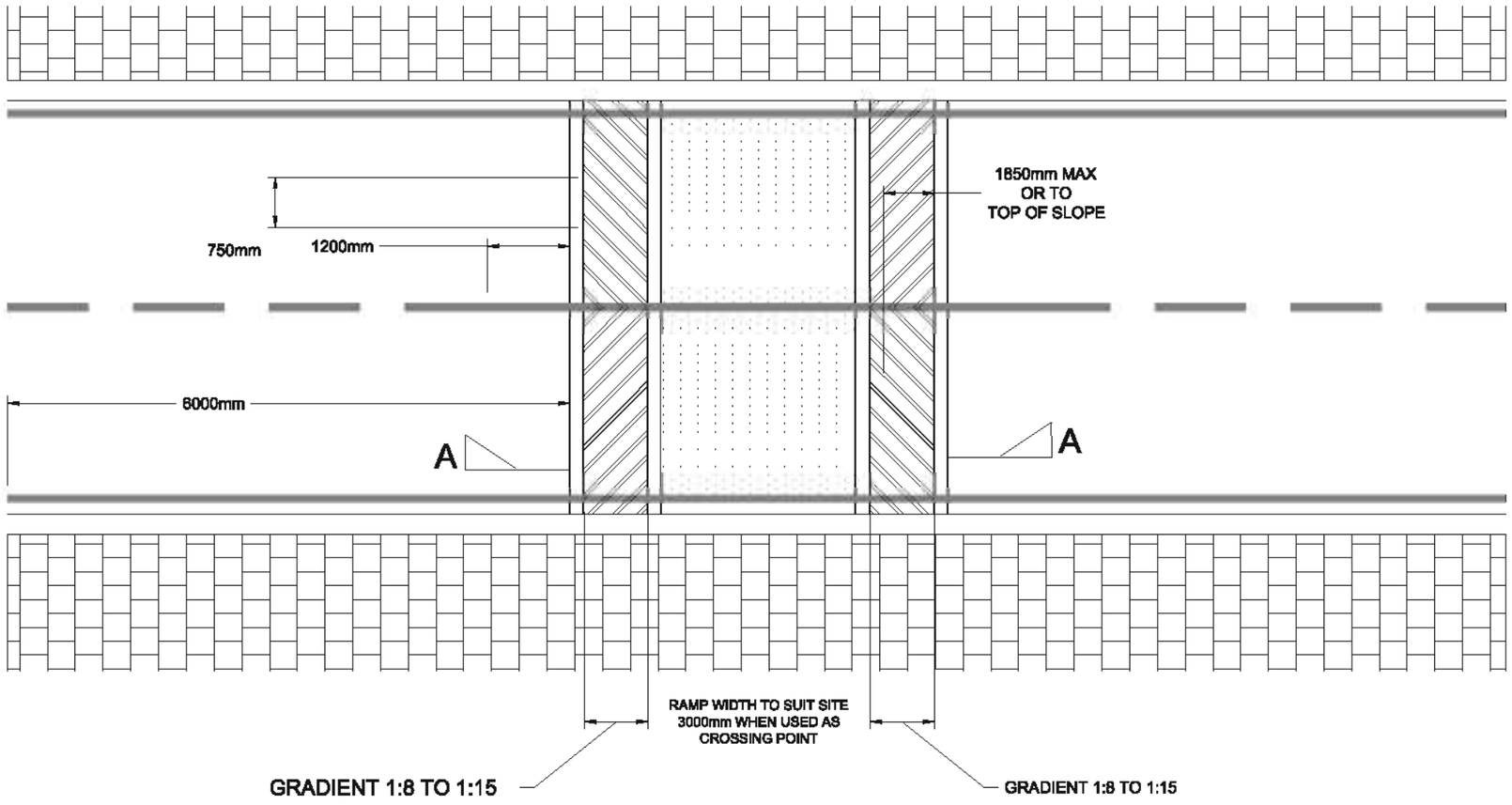
GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

	PROJECT ENG.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

YIELD CONTROLLED RAISED,MID-BLOCK PEDESTRIAN CROSSING

DATE: NOV2010
SCALE: NTS
DRAWING NUMBER: TGSI_016
AMENDMENT NO: 0
SHEET NUMBER: 1/1



PLAN OF SPEED HUMP

NOTES

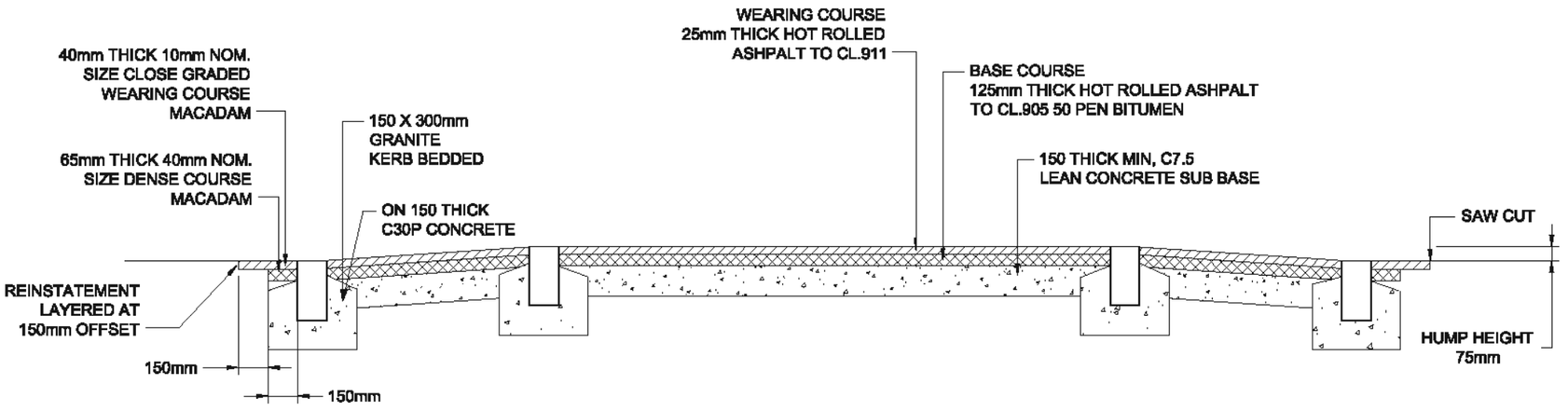
CUSHION MATERIAL

I) 25mm THICK HOT ROLLED ASPHALT TO BS594 CL.911 WEARING
COURSE 75mm THICK HOT ROLLED ASPHALT TO BS594
CL.905 BASE COURSE

II) 200X100X85mm CONCRETE BLOCKS LAID ON 50mm SHARP SAND
HERRINGBONE PATTERN.

III) 100X100X100mm DRESSED GRANITE SETTS BEDDED ON 150 THICK
C30P CONCRETE, 10mm FLUSH POINTED. (NO LEAN CONCRETE
SUB BASE)

WHITE DRAGONS TOOTH MARKING TO INDICATE DIRECTION OF TRAVEL
OVER THE HUMP.
RAMP GRADIENTS TO BE 1:15 WHERE POSSIBLE (1:8 MAX, 1:15 MIN)
VARIATION OF SPEED HUMP TSR DIA. 1061



SECTION AA - THROUGH FLAT TOP HUMP - ASPHALT

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

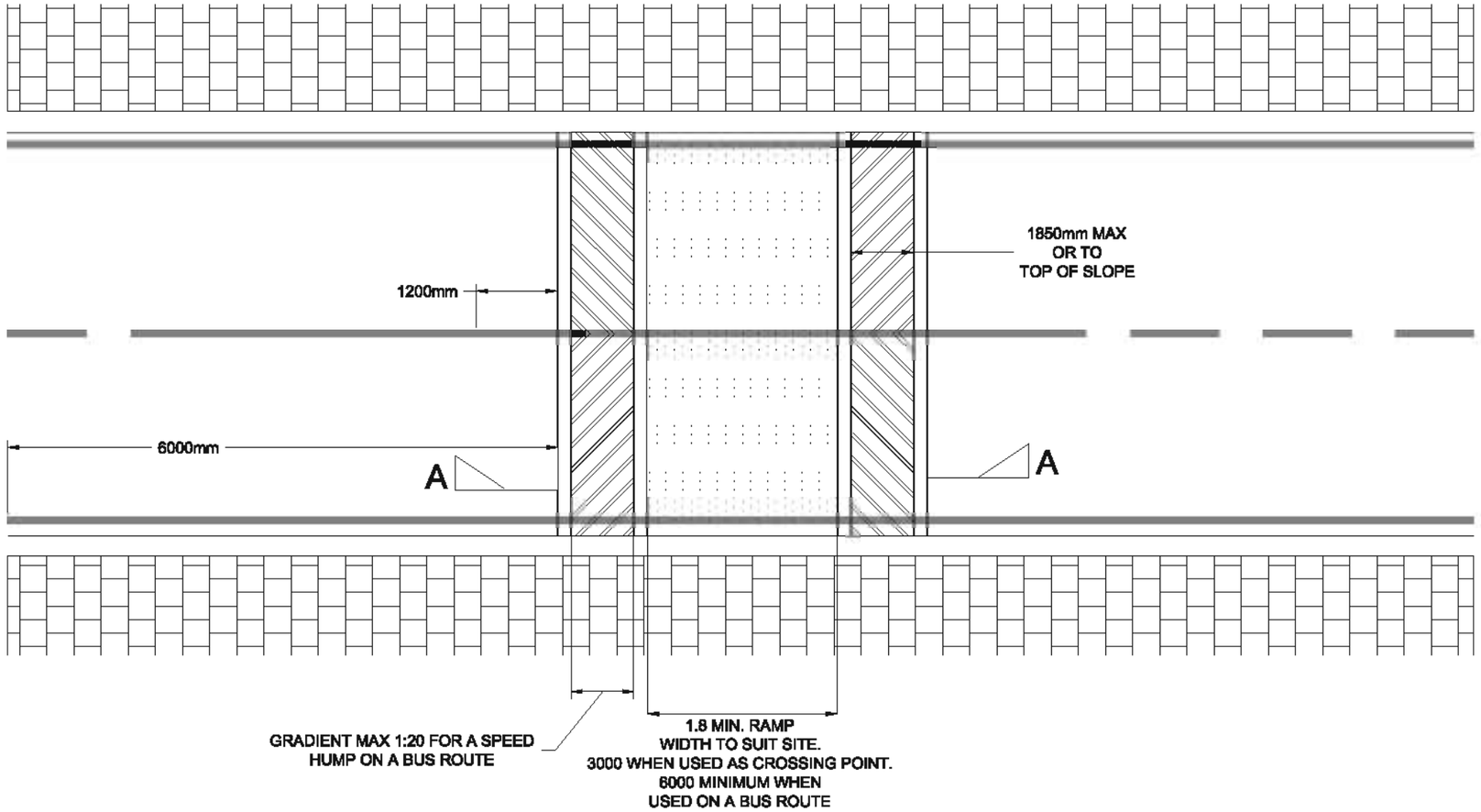
GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194800 FAX: (011) 8075670

	PROJECT ENG.	DESIGNED	DRAWING CHECKED
MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	FRANO_COMBRINCK	FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

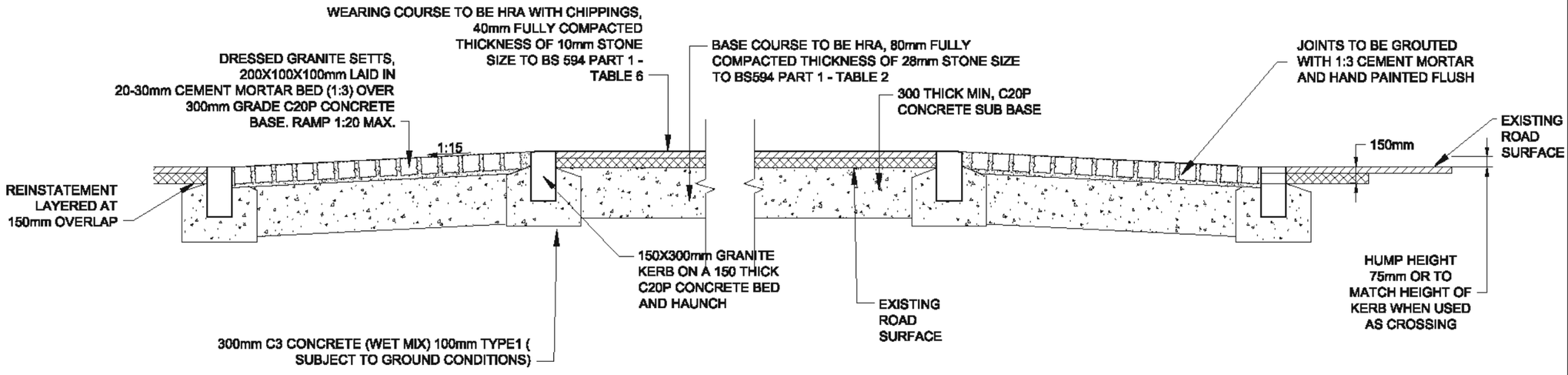
TYPICAL STANDARD DRAWINGS

STANDARD RAISED TABLE DETAIL 1 (HRA)

DATE / DATE
SCALE / SCALE
DRAWING NUMBER: TGSI_017
AMENDMENT NO.: AMENDMENT
SHEET NUMBER: 1/2



PLAN OF SPEED HUMP



SECTION THROUGH FLAT TOP HUMP - ASPHALT

NOTES

HUMP MATERIAL

I) 40mm THICK HOT ROLLED ASPHALT TO BS594 - TABLE 6 WEARING COURSE AND 80mm THICK HOT ROLLED ASPHALT TO BS594 - TABLE 2 BASE COURSE

II) 200X100X100mm DRESSED GRANITE SETTS LAID IN STRETCHER BOND PATTERN BEDDED ON 20-30 MORTAR BED OVER A 300 THICK C20P CONCRETE ROAD BASE, 10mm FLUSH POINTED. (NO LEAN CONCRETE SUB BASE)

ROAD MARKING

WHITE DRAGONS TOOTH MARKING TO INDICATE DIRECTION OF TRAVEL OVER THE HUMP.LINE MARKING TO TSR DIA. 1061 RAMP GRADIENTS TO BE 1:20 FOR BUS ROUTES

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

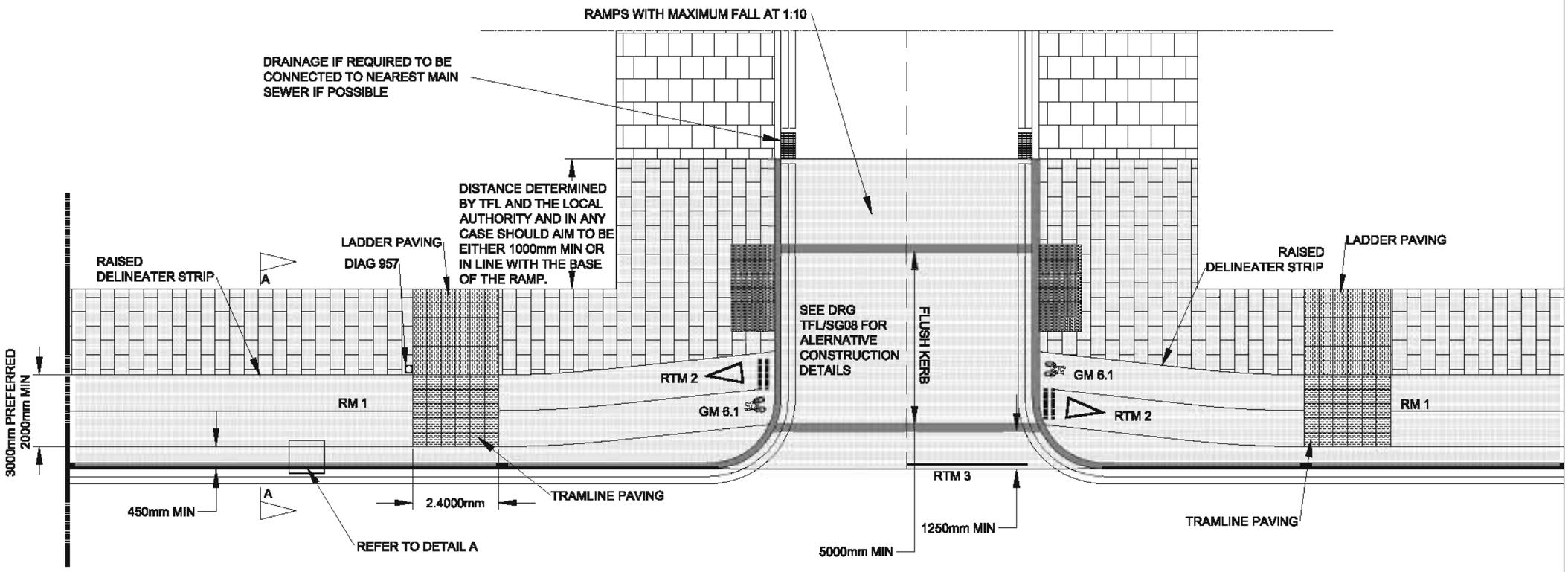
GIBB
ENGINEERING & SCIENCE
GIBB House
14 Eglin Road
Sunninghill
2191
P O Box 2700
Rivonia
2128
TEL: (011) 5194600 FAX: (011) 8075670

MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	DRAWING CHECKED RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	PROJECT Eng. FRANO_COMBRINCK	DESIGNED FRANO_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

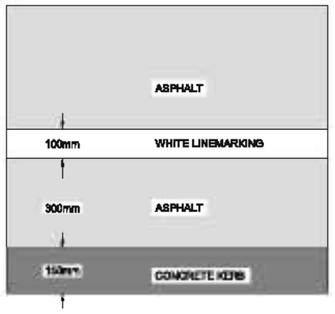
TYPICAL STANDARD DRAWINGS

STANDARD RAISED TABLE DETAIL 2 (SETS)

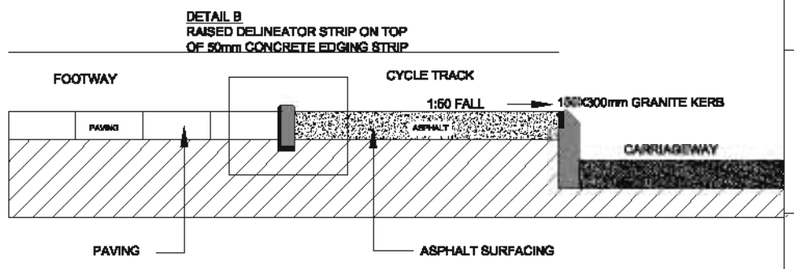
DATE / DATE
SCALE / SCALE
DRAWING NUMBER: TGSI 017
AMENDMENT NO: AMENDMENT
SHEET NUMBER: 2/2



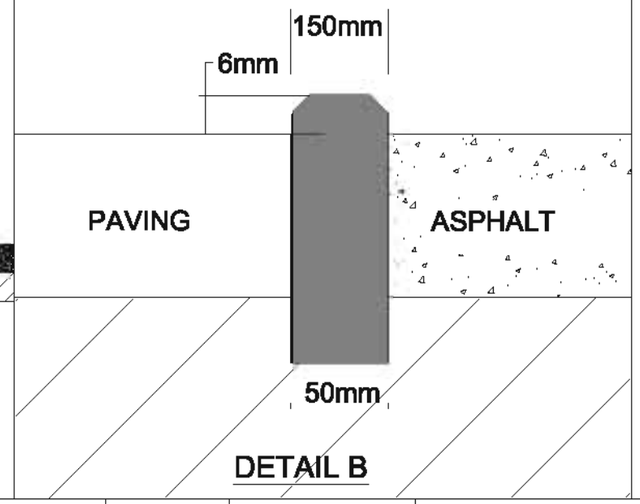
PLAN LAYOUT



DETAIL A



SECTION A-A



DETAIL B

NOTES

1. ALL PAVING TO BE LAID ON A 150mm THICK TYPE c7.5p CONCRETE SUB BASE EXTENDING 1000mm FROM BACK OF KERB UNLESS OTHERWISE SPECIFIED. THE REMAINING AREA OF FOOTWAY TO BE LAID ON 100mm THICK TYPE c7.5p CONCRETE SUB BASE UNLESS OTHERWISE STATED. ALL CONCRETE FLAGS AND TACTILE PAVING TO BE BEDDED ON A 30mm SAND/CEMENT MORTAR MIX, BUTT JOINTED, WITH DRY SAND BRUSHED INTO JOINTS. RESIDENT ENGINEER SHOULD BE ADVISED WHERE THE PREFERRED DEPT OF CONSTRUCTION CANNOT BE ACHIEVED ON SITE.
2. CONCRETE FLAGS TO BE LAID WITH COURSES SET AT 90° TO KERB AND A MINIMUM OVERLAP BOND OF 150mm.
3. THE BONDING OF PAVING TO BE CUT AROUND UTILITY SERVICE COVERS UNLESS DIRECTED BY THE RESIDENT ENGINEER.
4. CONCRETE FLAGS SHOULD NOT BE CUT SO THAT A WIDTH LESS THAN 300mm REMAINS. PREVIOUS COURSES SHOULD BE CUT TO DISTRIBUTE EVENLY OVER WIDTH.
5. GRANITE KERBS TO BE FINE PICKED 150mm X 300mm 900-1200mm LONG. STANDARD KERB HEIGHT TO BE 150mm ABOVE CARRIAGEWAY. FLUSH KERBS TO BE FINE PICKED SILVER GREY.
6. EXISTING UTILITY SERVICE COVERS IN PAVED AREAS TO BE REPLACED WITH RECESSED COVERS AND INFILLED WITH MATCHING PAVING. COVERES TO BE ADJUSTED TO SUIT ON SITE AS DIRECTED BY THE RESIDENT ENGINEER.(REF DWGS TFL/SG21 & SG22)
7. LATERAL CLEARANCE TO ALL STREET FURNITURE TO BE 450mm MINIMUM FROM FACE KERB.
8. ALL WORK TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENTS OF THE MANUAL HANDLING OPERATIONS REGULATIONS 1992 (AS AMENDED IN 2002)

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

NOTES:

ARCUS GIBB ENGINEERING & SCIENCE

GIBB House
14 Eglin Road
Sunninghill
2191

P O Box 2700
Rivonia
2128

TEL: (011) 5194600 FAX: (011) 8075670

MANAGER: INFRASTUCTURE PLANNING AND MANAGEMENT MANAGER:	PROJECT Eng. FRAND_COMBRINCK	DESIGNED FRAND_COMBRINCK	DRAWING CHECKED RAYMOND_DIPPENAAR
MANAGER: INFRASTUCTURE PROVISION MANAGER:	PROJECT Eng. FRAND_COMBRINCK	DESIGNED FRAND_COMBRINCK	DRAWN THINUS_VENTER
MANAGER: INFRASTUCTURE TRAFFIC ENGINEERING MANAGER:	PROJECT Eng. FRAND_COMBRINCK	DESIGNED FRAND_COMBRINCK	CIVIL DRAUGHTING SERVICES GIBB

TYPICAL STANDARD DRAWINGS

SHARED PEDESTRIAN AND BICYCLE FACILITY

DATE	SCALE
OCT2010	NTS

DRAWING NUMBER: TGSI_018

AMENDMENT NO: 0

SHEET NUMBER: 1/1

ANNEXURE B

LIST OF POTENTIAL DESIGN ELEMENTS

	Yes	No
Pedestrians		
Universal Design		
Sidewalks		
Kerb Ramps		
Reduced Kerb Radii		
Kerb Extensions / Bulb-outs		
Mid-block Pedestrian Crossings		
Refuge Islands		
Split Pedestrian Crossovers		
Pedestrian Grade Separation		
Cyclists		
Class I - Bicycle Roads		
Class II - Bicycle Ways		
Class III - Bicycle Lanes		
Class IV - Bicycle Routes		
Bicycle Parking		
Drainage Grates		
Public Transport		
Traffic Signal Priority		
Exclusive Public Transport Lanes		
Queue Bypass		
Queue Jump		
Kerb Extensions		
Boarding Islands		
Exemption from Turning Restriction		
On-Street Facilities		
Off-Street Facilities		
Public Passenger Transport Lay-byes		
Park and Ride Facilities		
Motor Vehicles		
On-Street Parking		
Loading Zones		
Driveways		
Intersection Treatments		
Traffic Circle Treatments		
Road Verge		
Roadside Buffer Area		
Utilities		
Street Lighting		
Street Furniture		
Street Vendors		
Surface Treatments		
Pedestrian Facilities		
Bicycle Facilities		
Storm water Drainage		
Bio-retention Swales		
Check Dams		
Bio-retention Basins		

Porous Pavement		
Infiltration Trench		
Tree Storm water Pits		
Litter Catchers		
Landscape Planting		
Street Trees		
Vegetation and Planting		
Water Use		
Maintenance		
Gravel Roads Programme		

LIST OF POTENTIAL TRAFFIC CALMING MEASURES

	Yes	No
Speed Control Measures		
Bulb-outs		
Median Islands		
Speed Humps		
Speed Tables		
Raised Crosswalks		
Raised Intersections		
Textured Pavements		
Volume Control Measures		
Chicanes		
Forced Turn Islands		
Median Barriers		
Full Street Closure		
Half street closure		
Diagonal Diverters		
Semi-Diverters		

LEGEND
GREEN ZONE
CYCLE LANE
SIDE WALK

CYCLE LANE
3500
3500
3500
GREEN ZONE
3500
3500
3500
3100
R 10m
GM6.1
GM1.2
GM1.3
RM3
WM7.2
WM7.3
WM7.3
WM7.5
RM8.2
RM8.3
RM8.3
RM8.5
100 W
200 W
200 W
WM2.3
RTM1
RTM3
4800
100 W
3300
3500
3500
3500
GREEN ZONE
40m ROAD RESERVE
CYCLE LANE
GM6.1
GM1.2
SHARED PAVED AREA FOR PEDESTRIANS AND CYCLISTS
SIDE WALK
3100
3500
3500
3500
RM8.2
RM8.3
RM8.3
RM8.5
RM3
GM4.1
WM2.3
GM1.3
SIDE WALK
WM7.2
WM7.3
WM7.3
WM7.5
GM1.2
GM1.2

Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

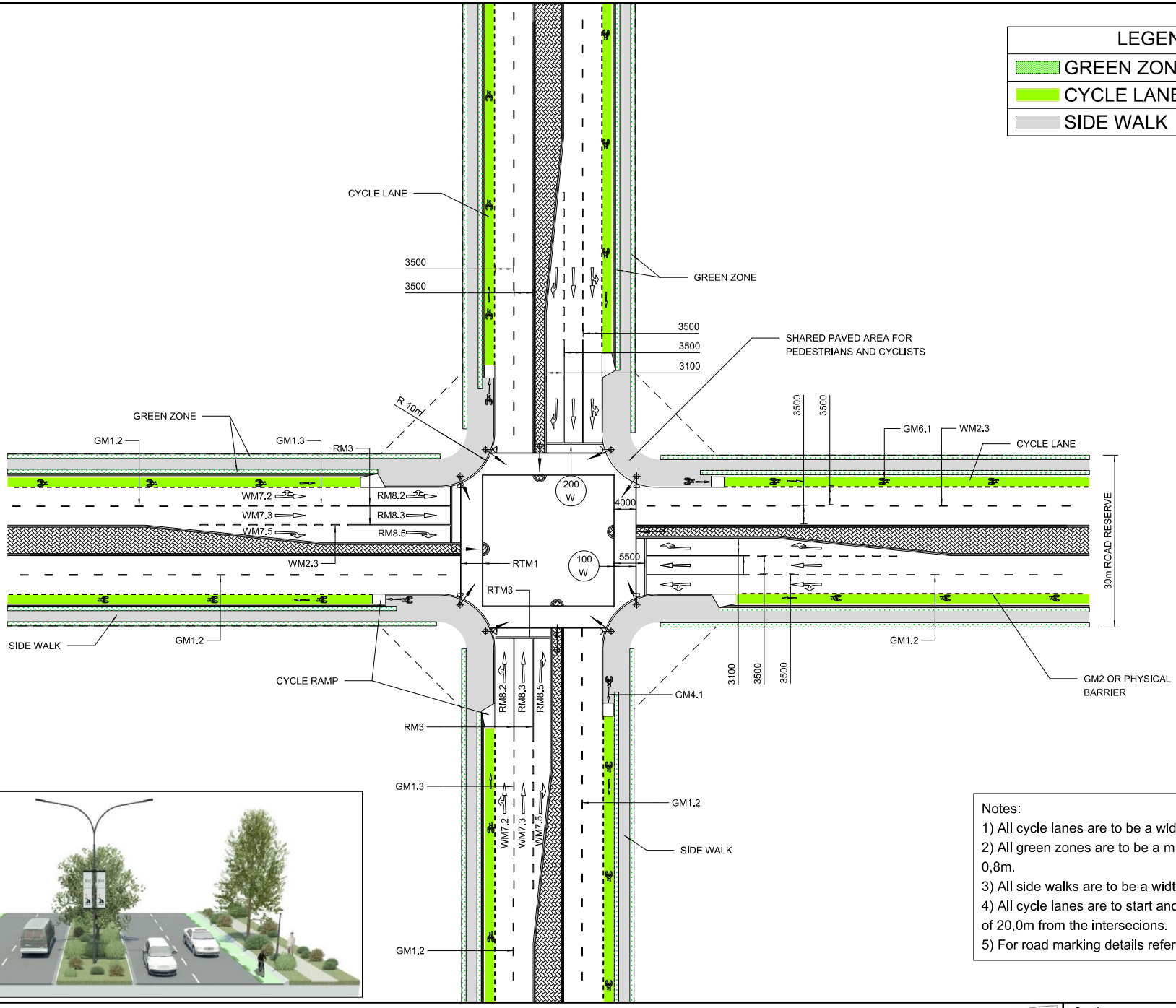
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT: ARTERIAL/REGIONAL DISTRIBUTOR - 40m ROAD RESERVE

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS001



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

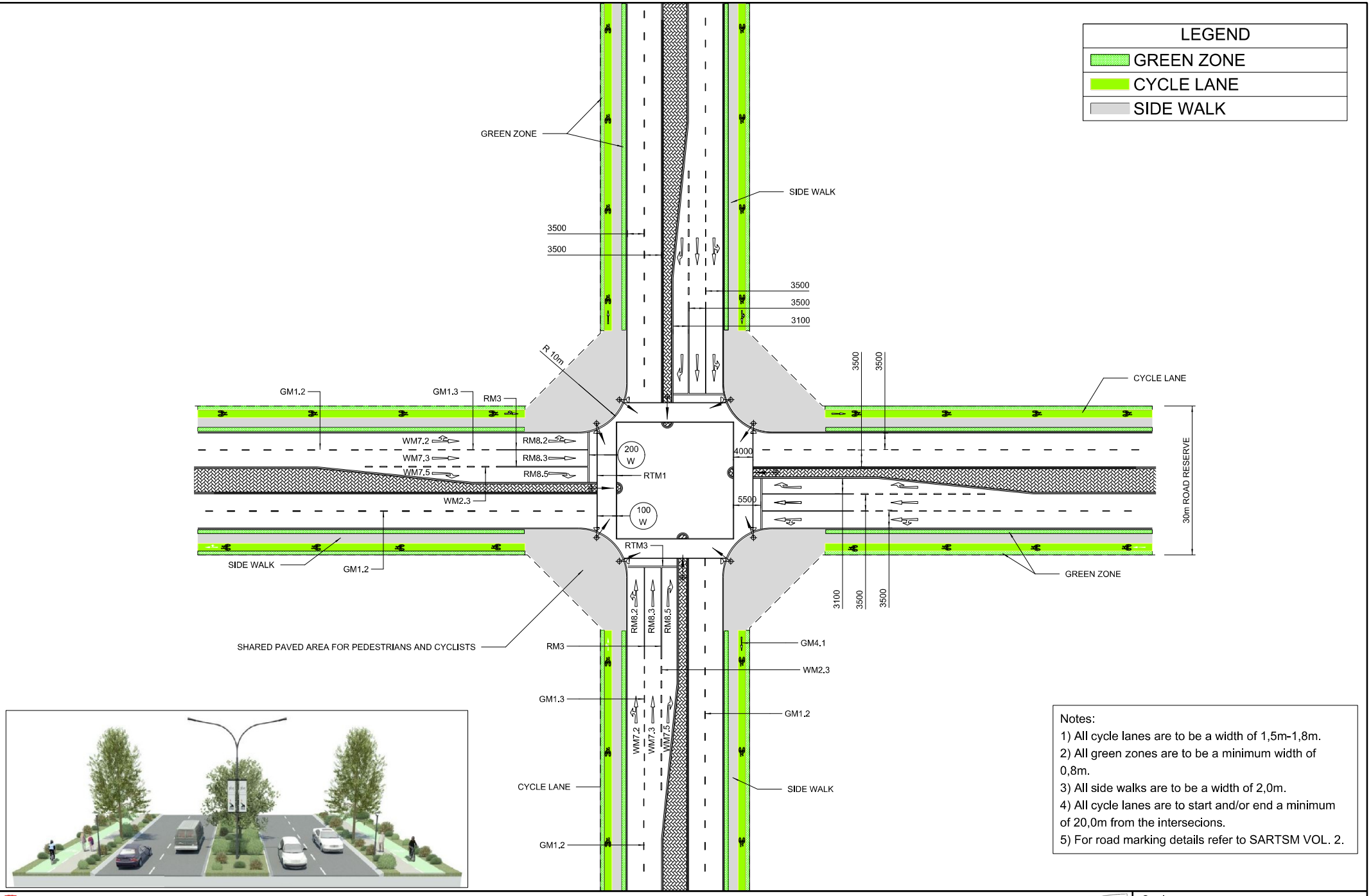
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : DISTRICT DISTIBUTOR - 30m ROAD RESERVE (OPTION 1)

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS002



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

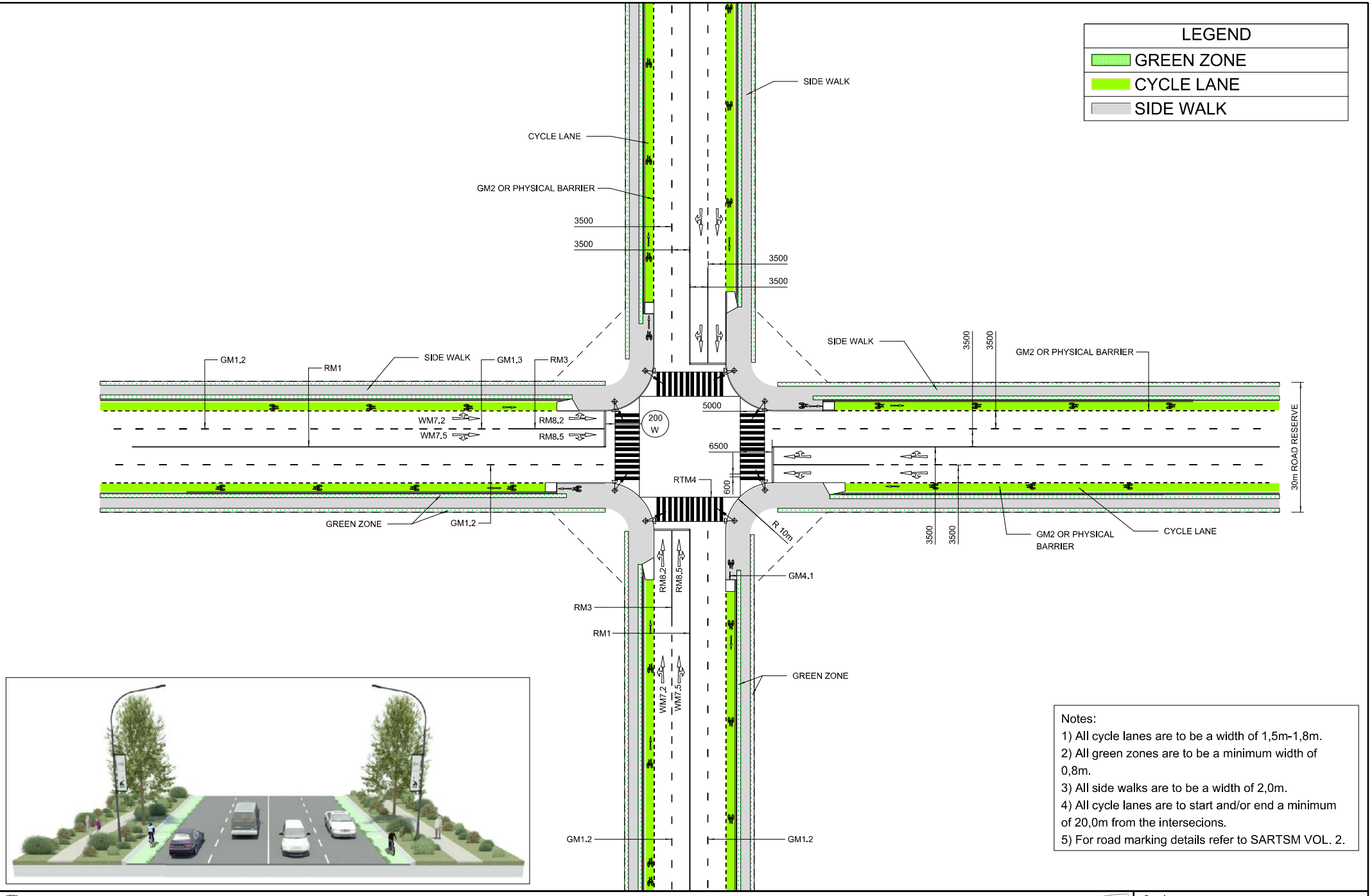
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : DISTRICT DISTIBUTOR - 30m ROAD RESERVE (OPTION 2)

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS003



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

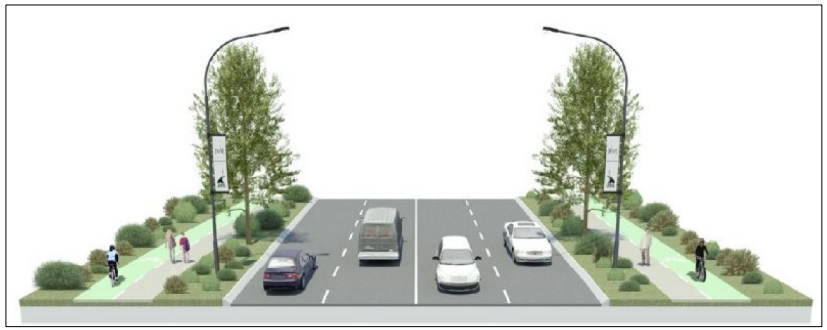
JRA

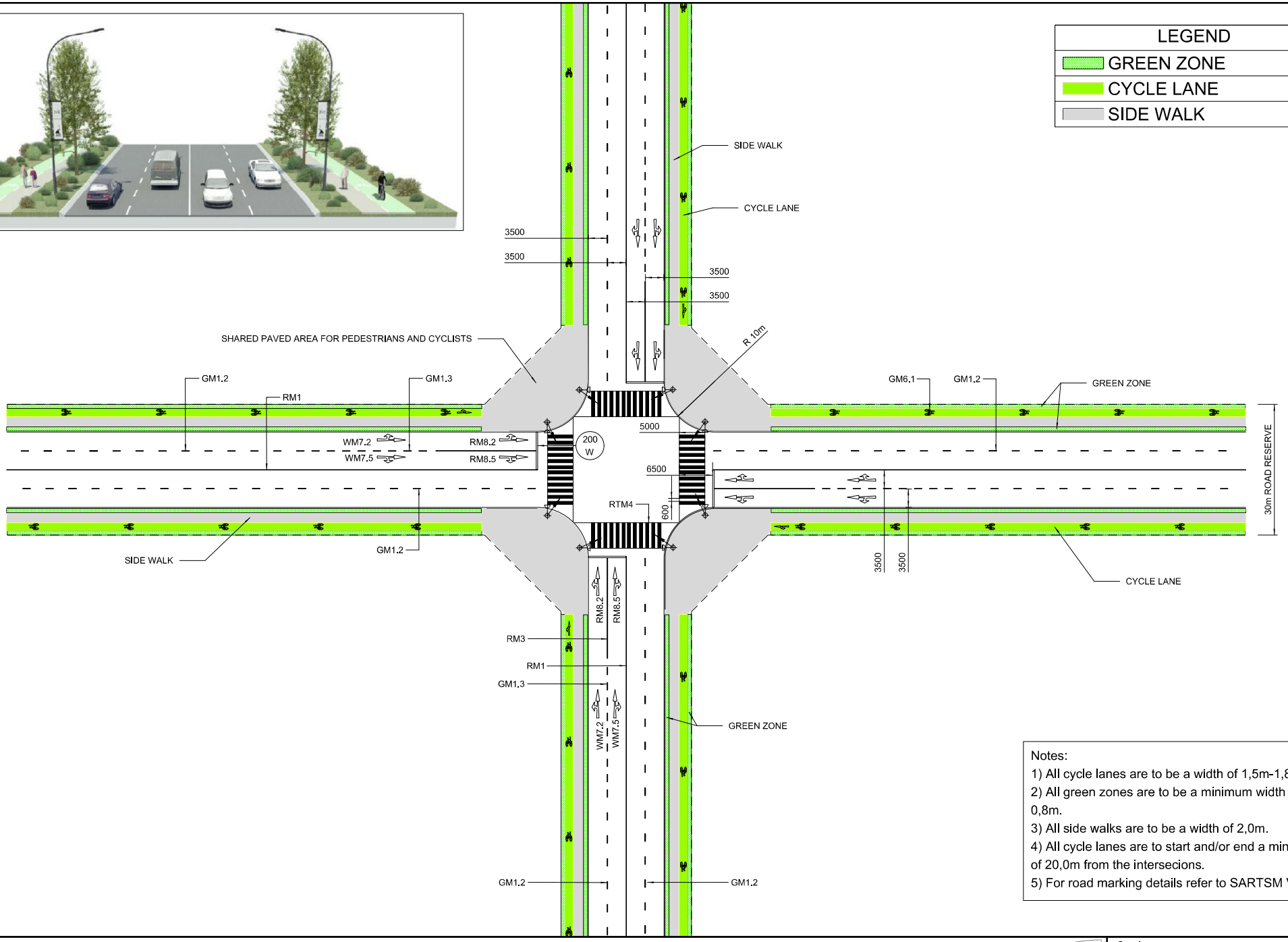
COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : BOULEVARD/LOCAL DISTIBUTOR - 30m ROAD RESERVE (OPTION 1)

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS004





Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

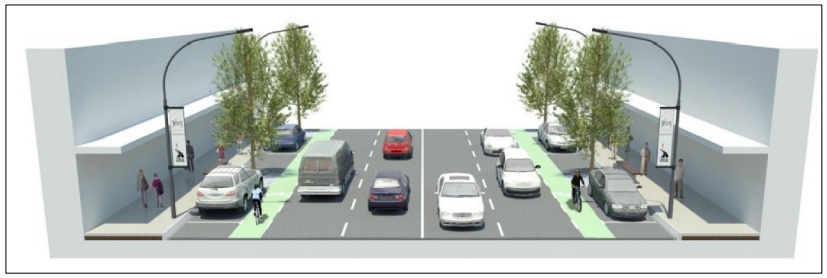
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : BOULEVARD/LOCAL DISTIBUTOR - 30m ROAD RESERVE (OPTION 2)

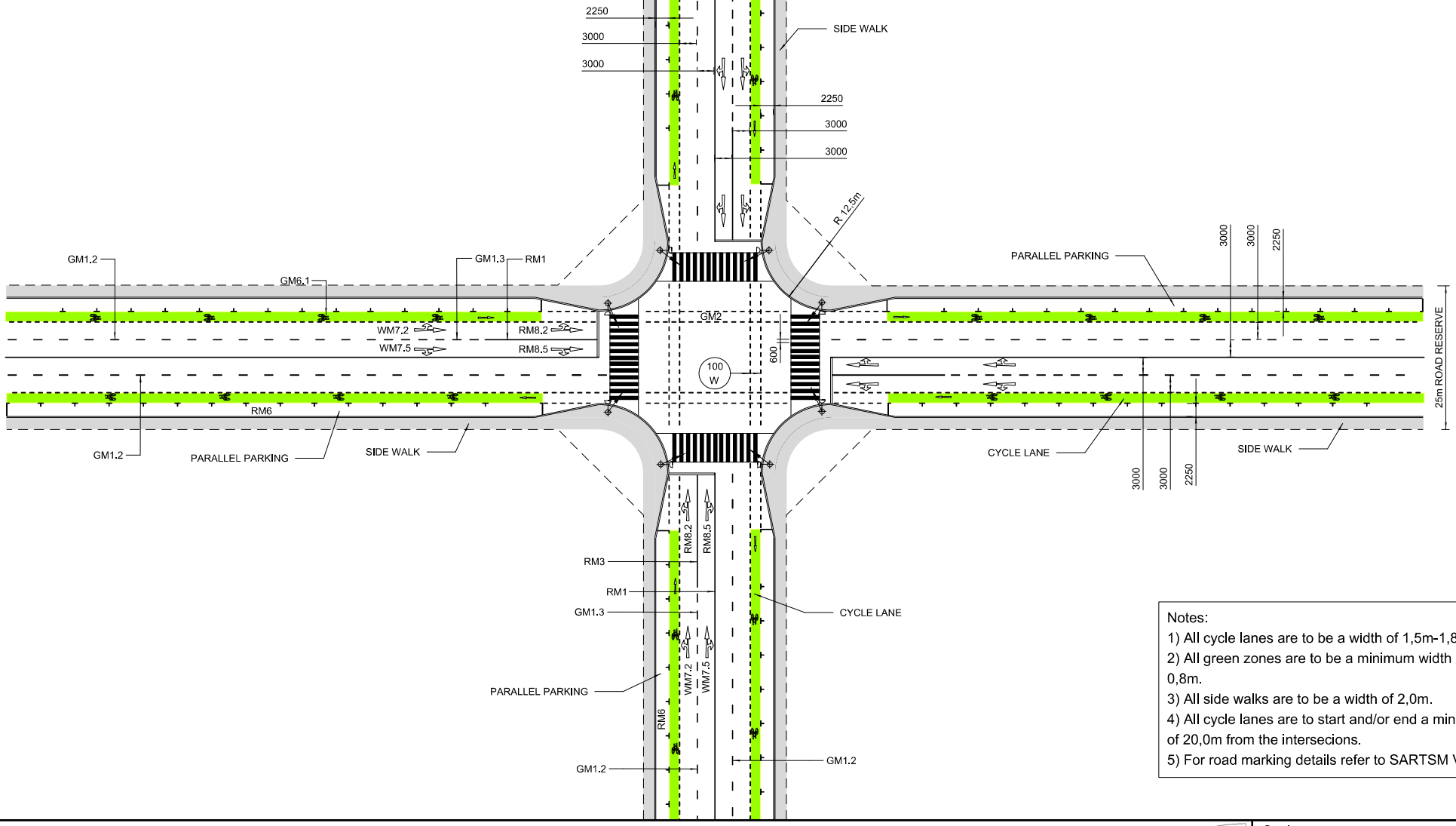
Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS005



LEGEND
GREEN ZONE
CYCLE LANE
SIDE WALK



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

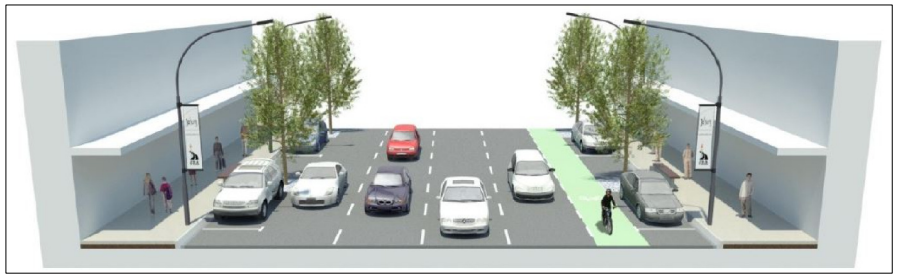
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : CBD & ACTIVITY STREET - 25m ROAD RESERVE

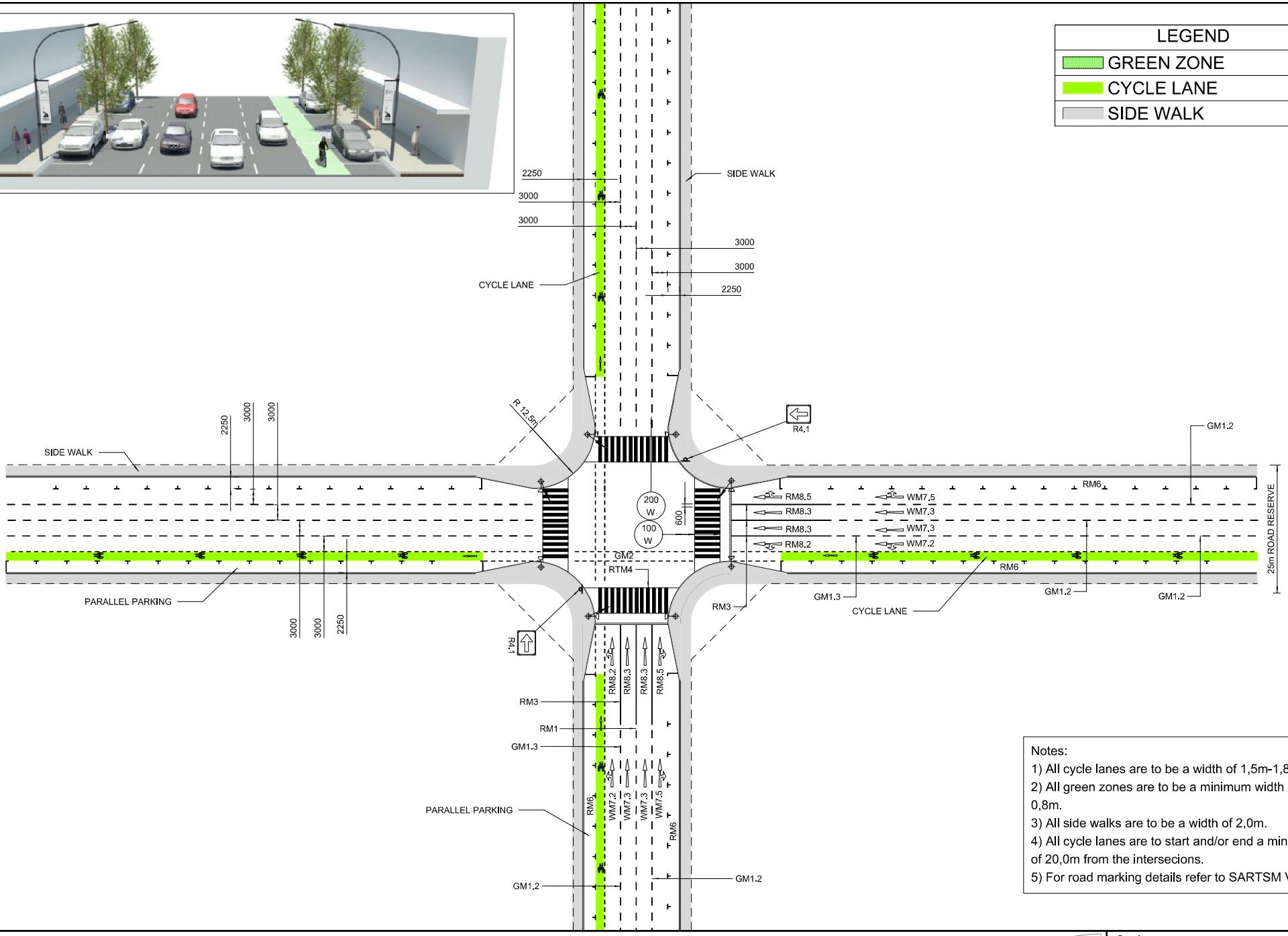
Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS006



LEGEND
GREEN ZONE
CYCLE LANE
SIDE WALK



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : CBD & ACTIVITY STREET - 25m ROAD RESERVE (ONE WAY)

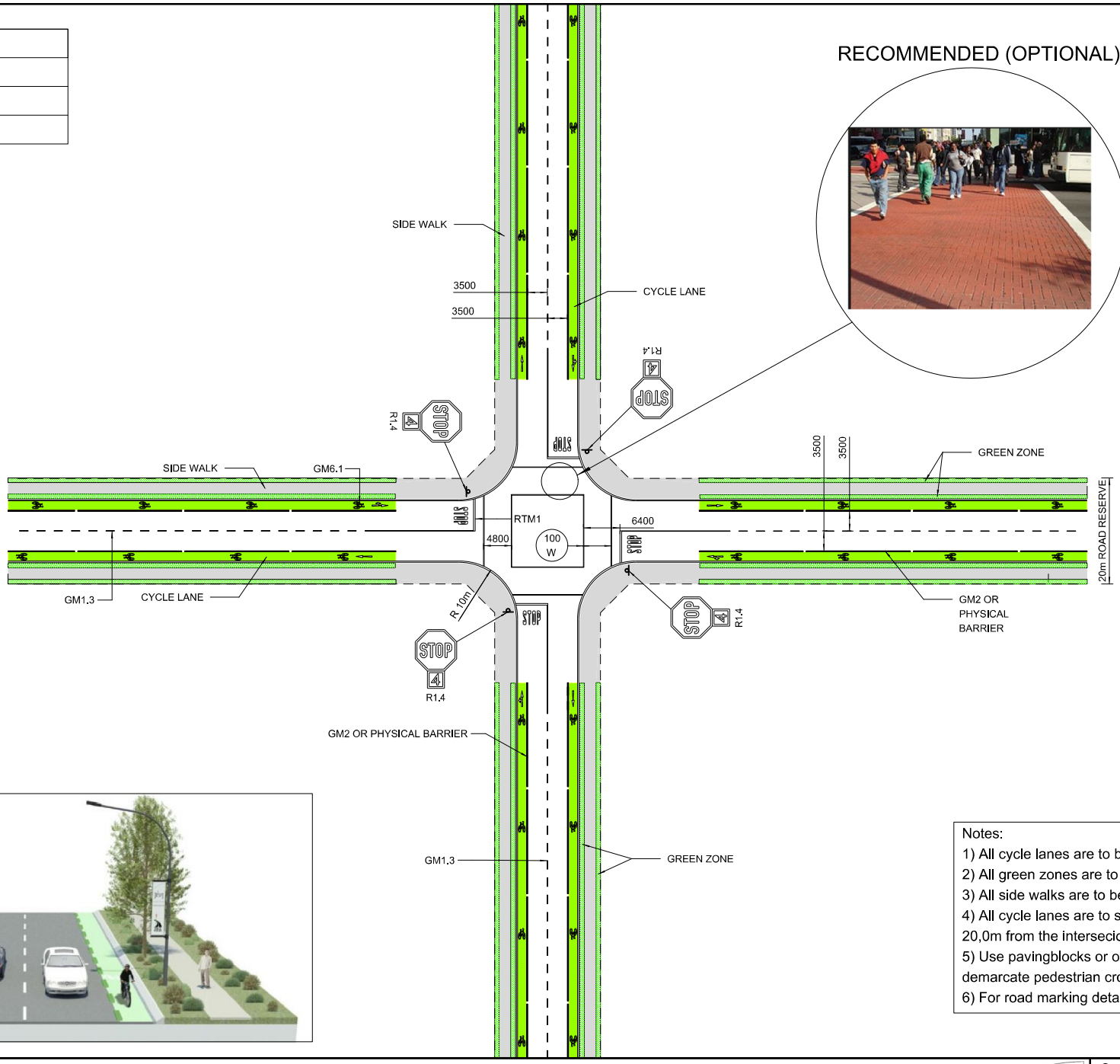
Joburg
a world class African city

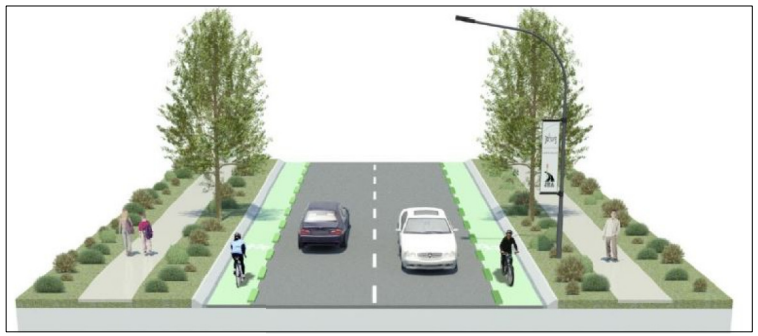
Scale
1:1000

Drawing No
JRA-SD-CS007

LEGEND
GREEN ZONE
CYCLE LANE
SIDE WALK

RECOMMENDED (OPTIONAL)





Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) Use pavingblocks or other textured treatment to demarcate pedestrian crossing (refer to recommended).
6) For road marking details refer to SARTSM VOL. 2.

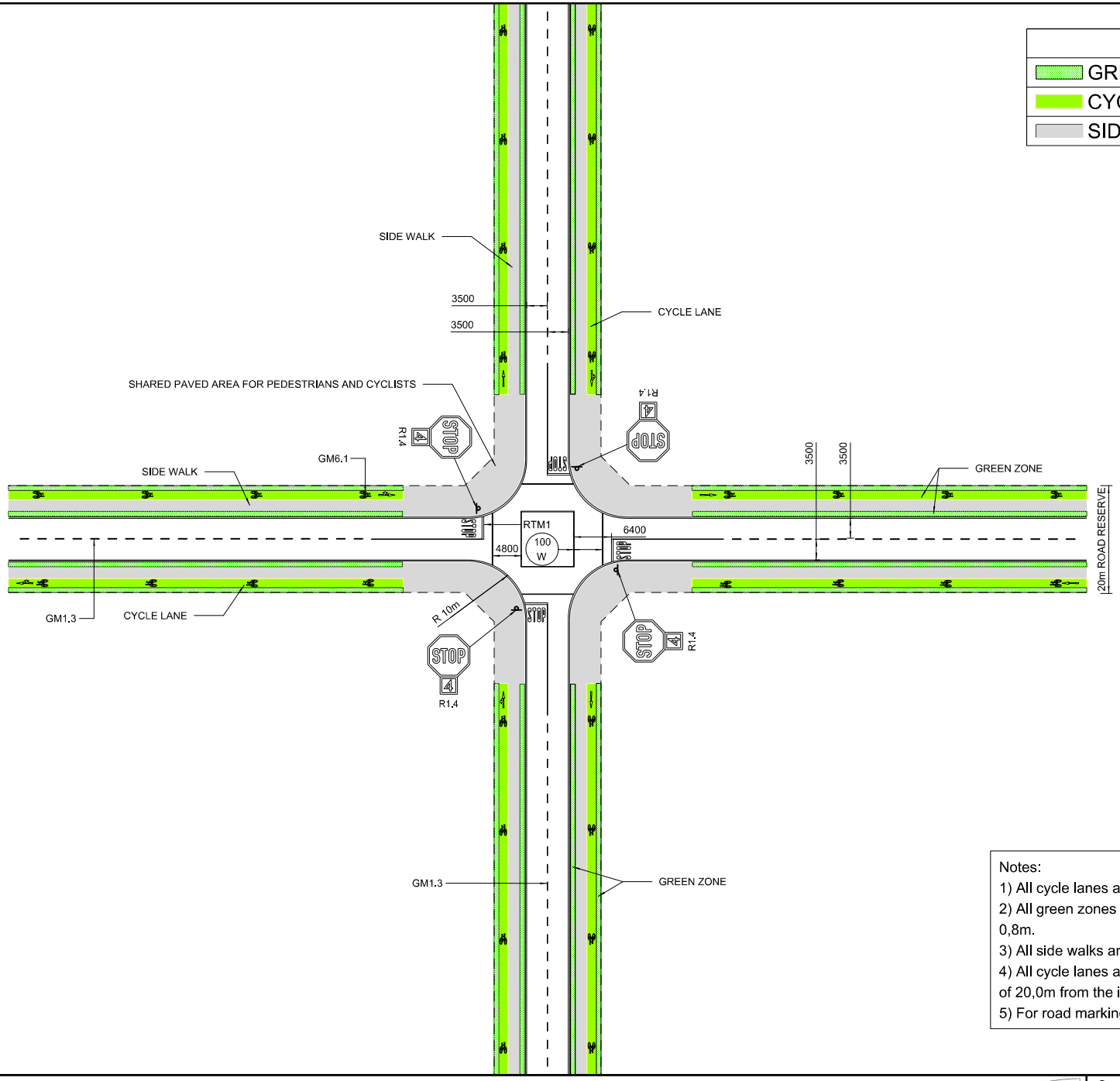
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : RESIDENTIAL COLLECTOR - 20m ROAD RESERVE

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS008



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

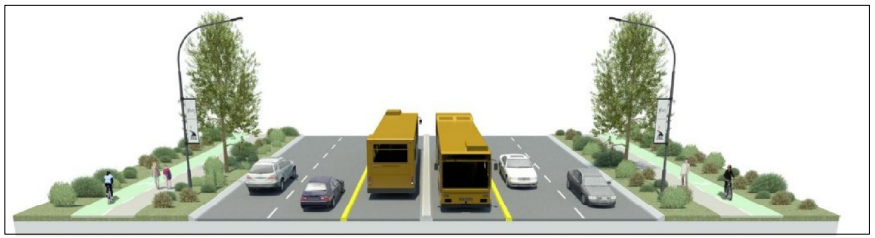
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT- LOCAL DISTRIBUTOR - 20m ROAD RESERVE

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS009



LEGEND
GREEN ZONE
CYCLE LANE
SIDE WALK

GREEN ZONE
SIDE WALK
3500
3500
3500
3500
3100
R 10m
3000
2800
2700
GM1.2
GM1.3
RM3
WM7.2
WM7.4
RM8.2
RM8.4
200 W
100 W
RTM1
RTM3
6200
7700
CYCLE LANE
SIDE WALK
GM1.2
GREEN ZONE
SHARED PAVED AREA FOR PEDESTRIANS AND CYCLISTS
RM8.2
RM8.3
RM8.5
RM3
GM4.1
WM2.3
GM1.3
GM1.2
WM7.2
WM7.3
WM7.5
CYCLE LANE
SIDE WALK
GM1.2

Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.

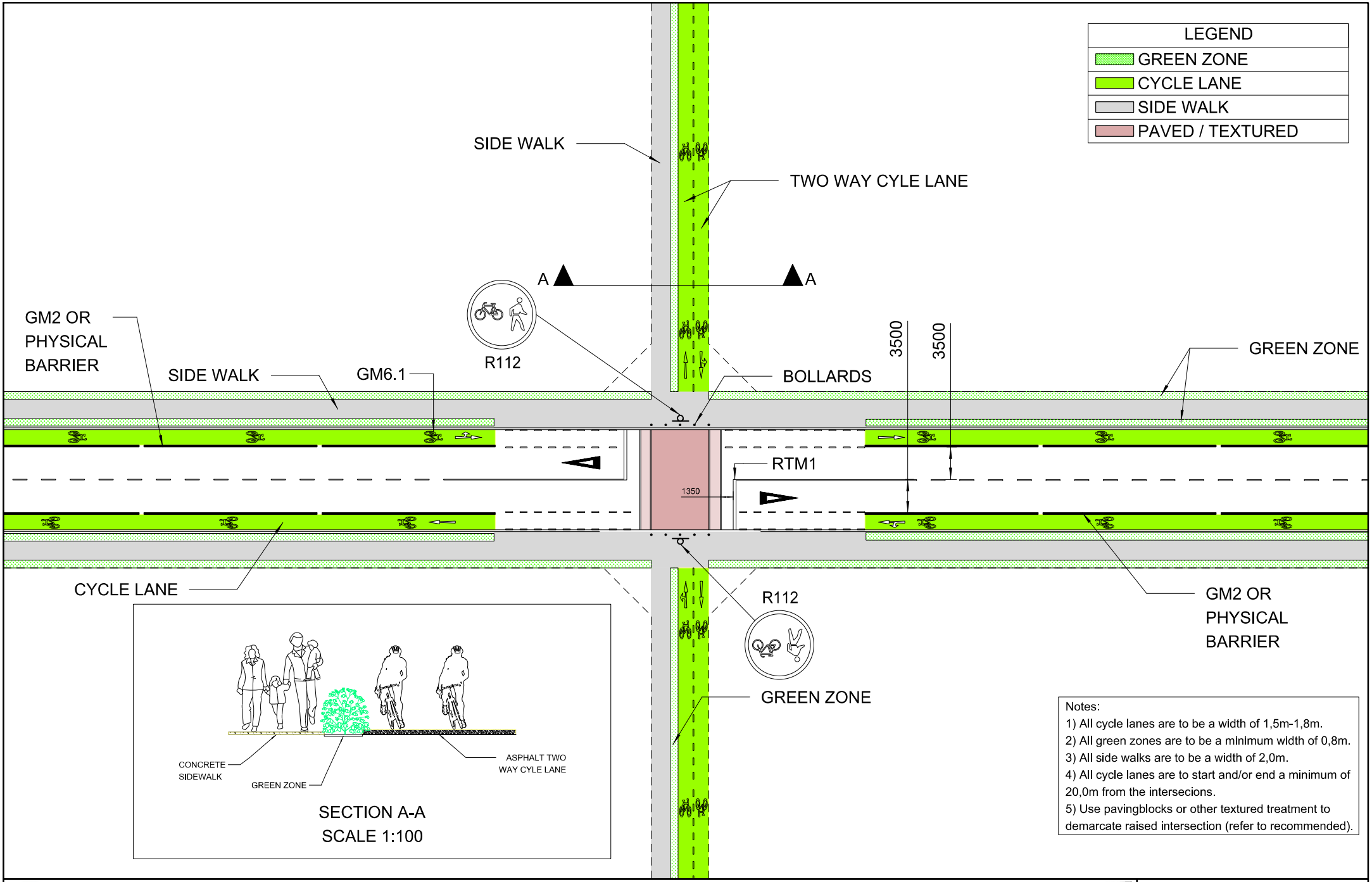
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT - BRT TRUNK ROUTE - 40m ROAD RESERVE

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS010



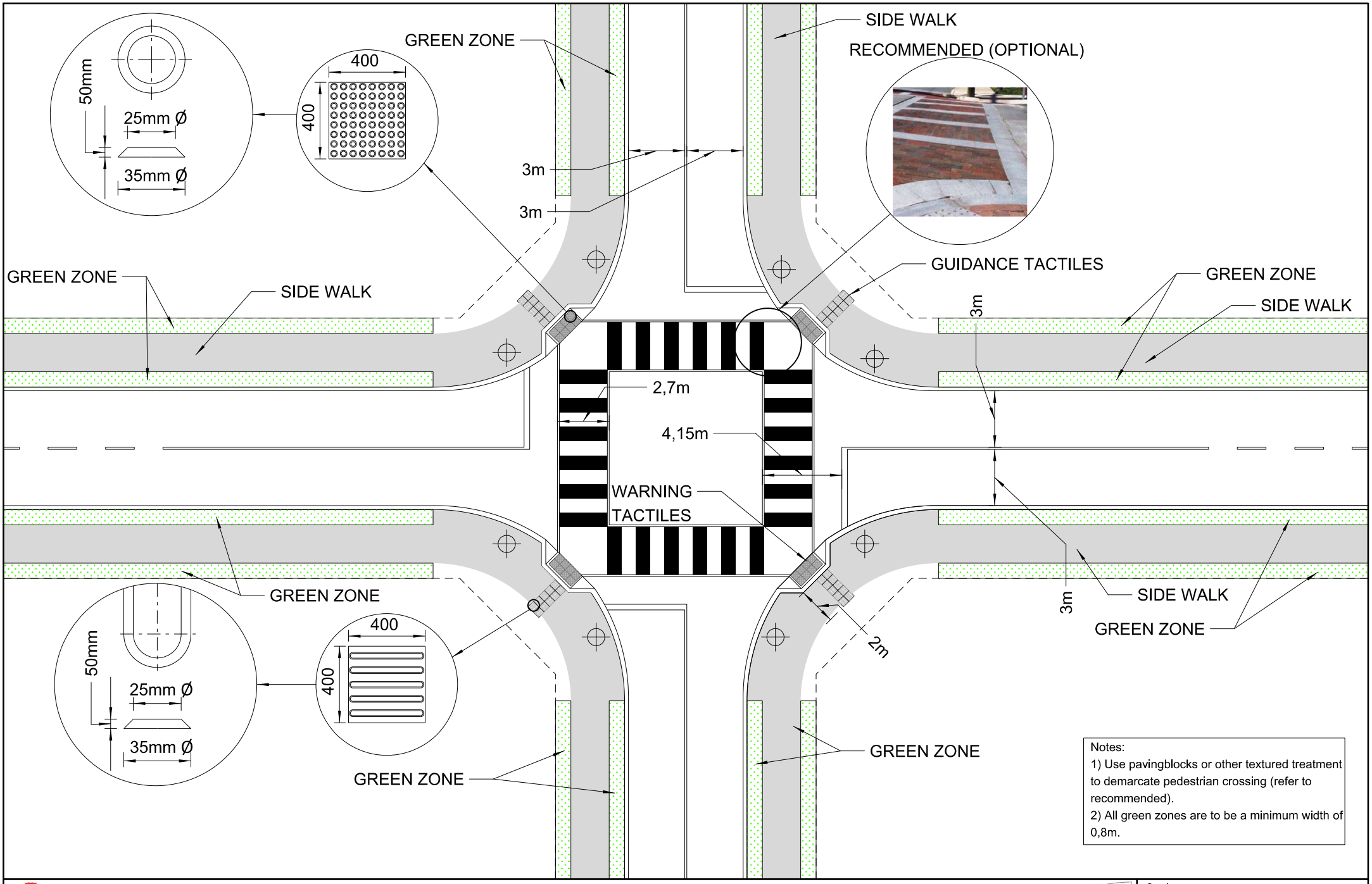
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT- NMT ROUTE / GRENWAY / MULTI-USE PATHWAY

Joburg
a world class African city

Scale
1:500

Drawing No
JRA-SD-CS011



Notes:
1) Use pavingblocks or other textured treatment to demarcate pedestrian crossing (refer to recommended).
2) All green zones are to be a minimum width of 0,8m.

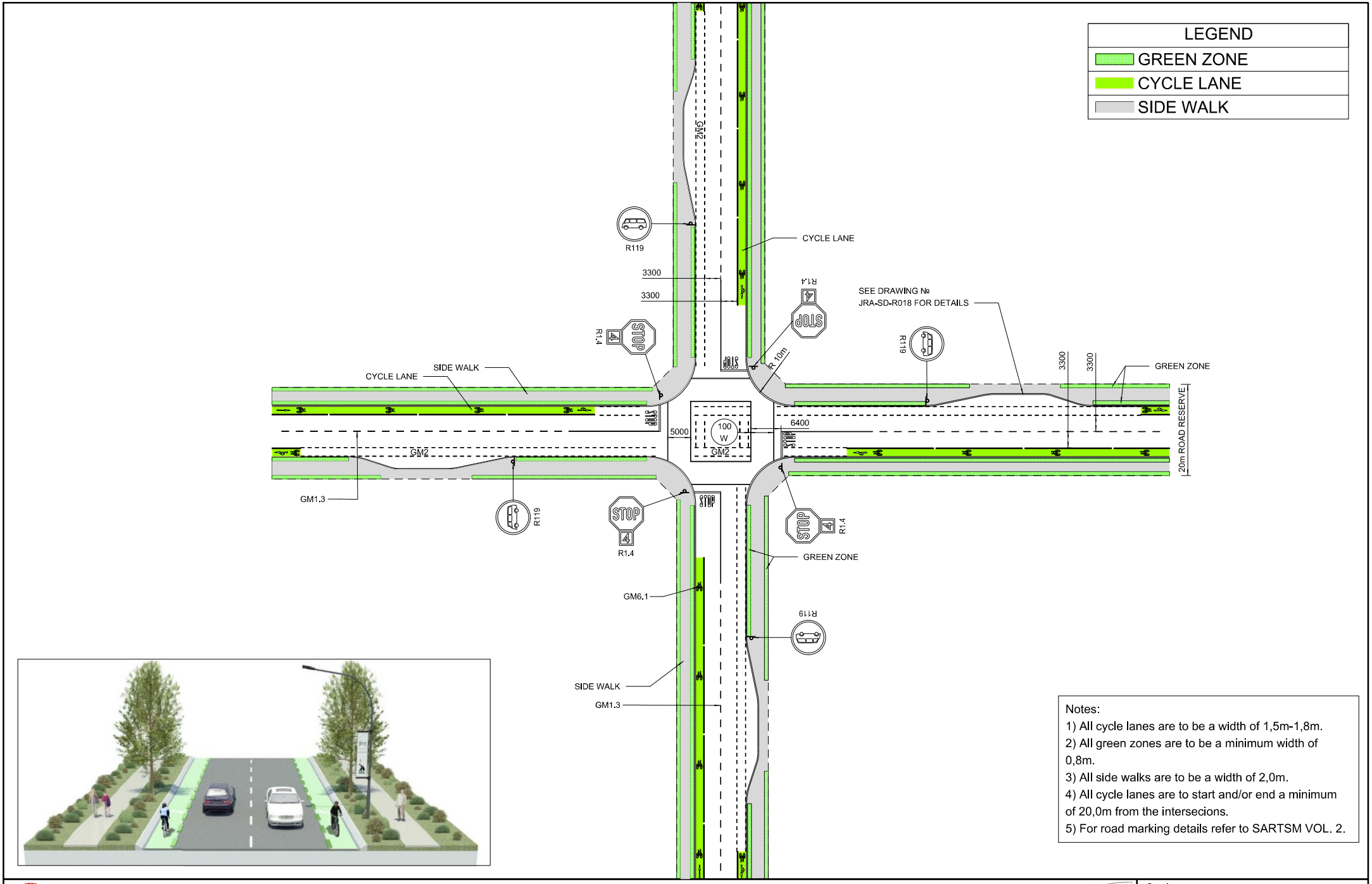
JRA

COMPLETE STREET DESIGN GUIDELINE
WARNING AND GUIDANCE TACTILES

Joburg
a world class African city

Scale
1:250

Drawing No
JRA-SD-CS012



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT- LOCAL DISTRIBUTOR - 20m ROAD RESERVE

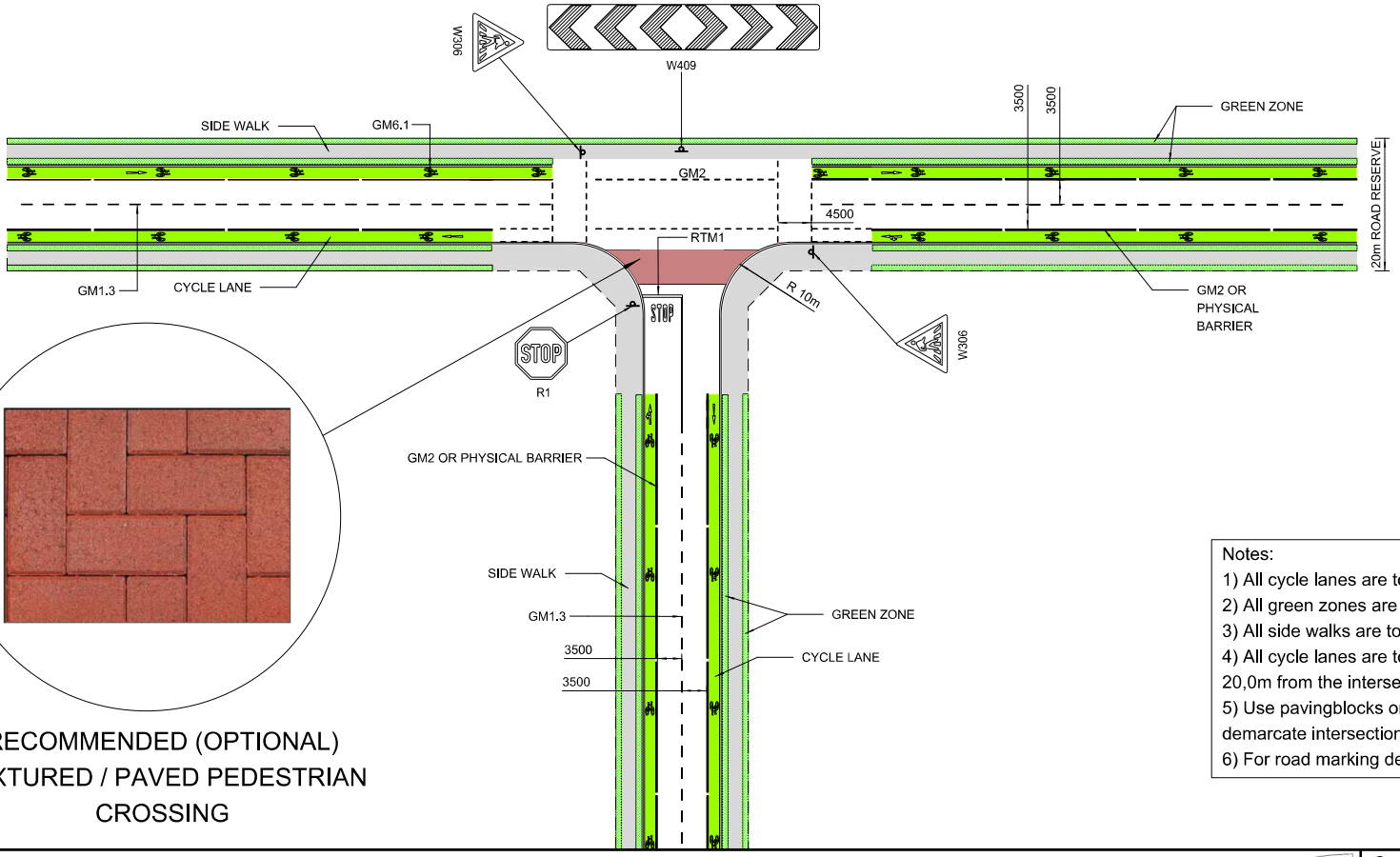
Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS013

LEGEND
GREEN ZONE
CYCLE LANE
SIDE WALK
PAVED / TEXTURED

RECOMMENDED (OPTIONAL) TEXTURED / PAVED INTERSECTION



RECOMMENDED (OPTIONAL) TEXTURED / PAVED PEDESTRIAN CROSSING

Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) Use pavingblocks or other textured treatment to demarcate intersection (refer to recommended).
6) For road marking details refer to SARTSM VOL. 2.

JRA

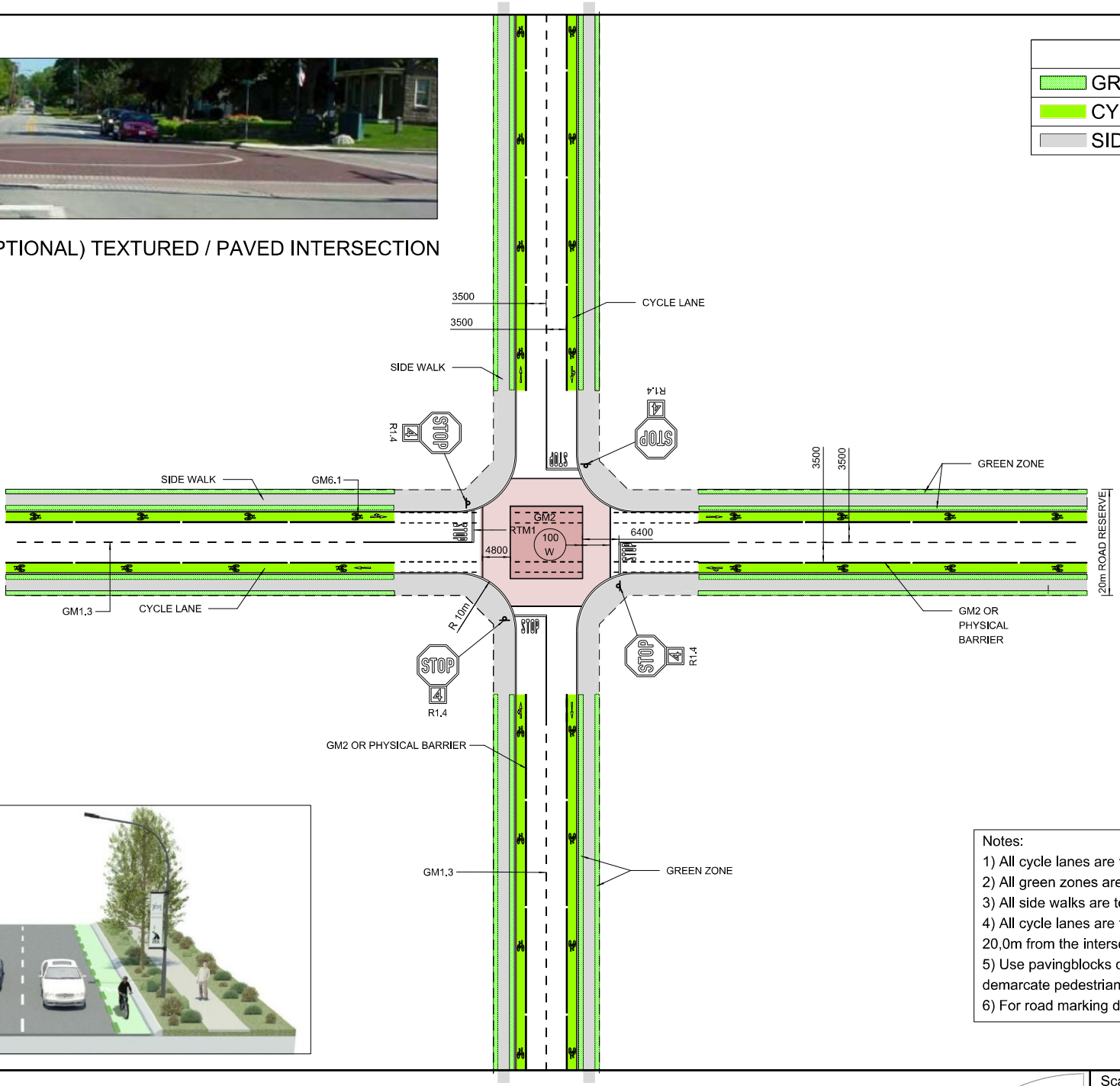
COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT- T -JUNCTION

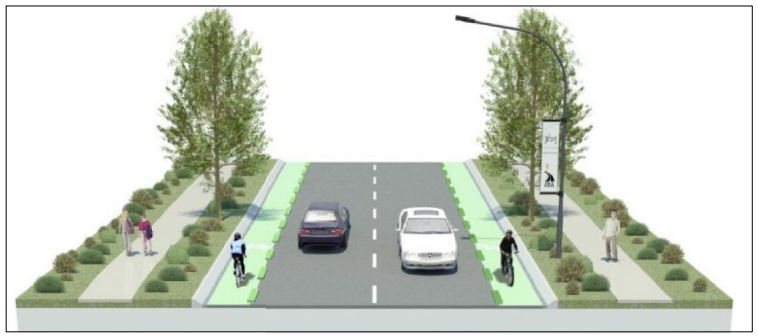
Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS014

RECOMMENDED (OPTIONAL) TEXTURED / PAVED INTERSECTION





Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) Use pavingblocks or other textured treatment to demarcate pedestrian crossing (refer to recommended).
6) For road marking details refer to SARTSM VOL. 2.

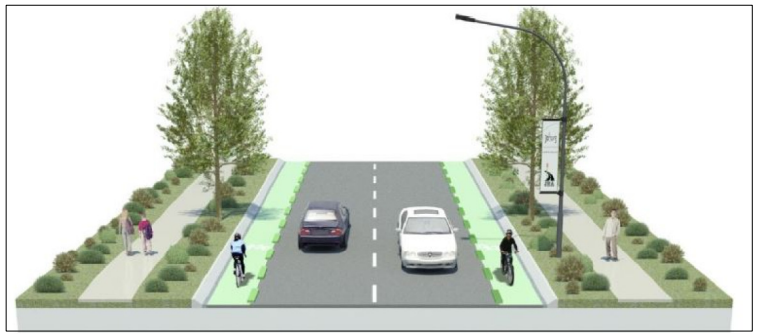
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT - PAVED INTERSECTION

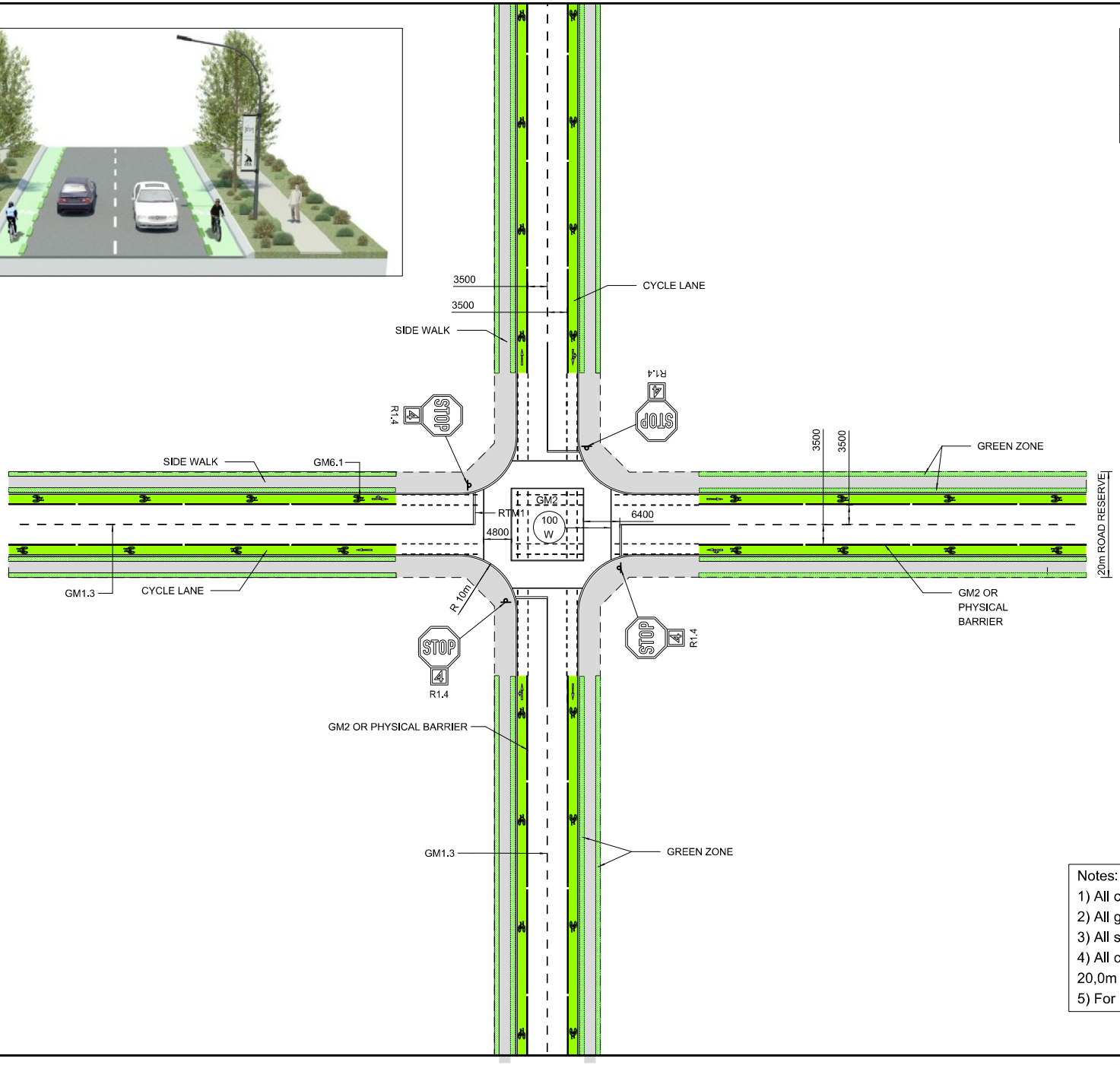
Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS015



LEGEND
GREEN ZONE
CYCLE LANE
SIDE WALK



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

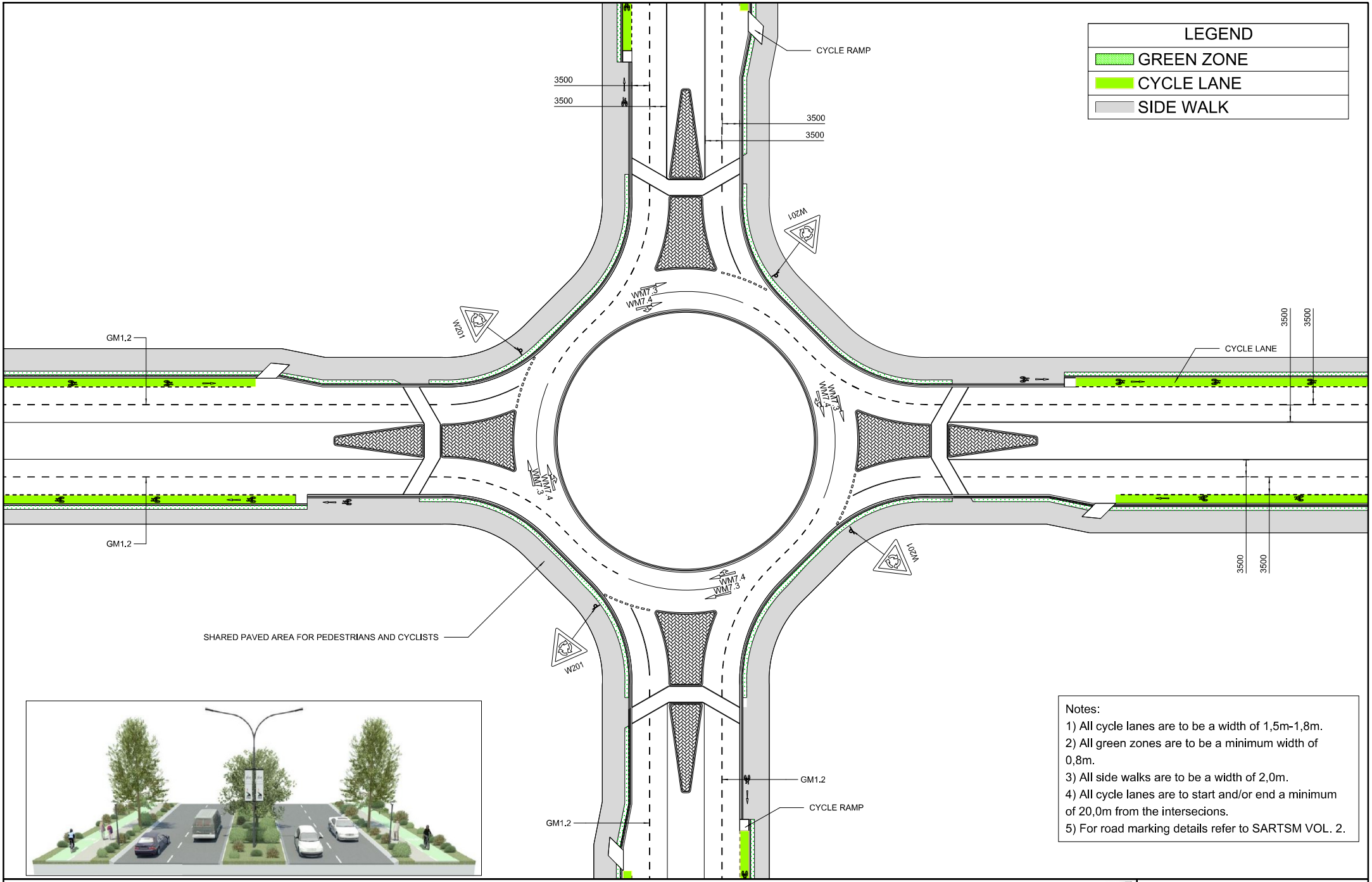
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT - RESIDENTIAL STREET

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS016



Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

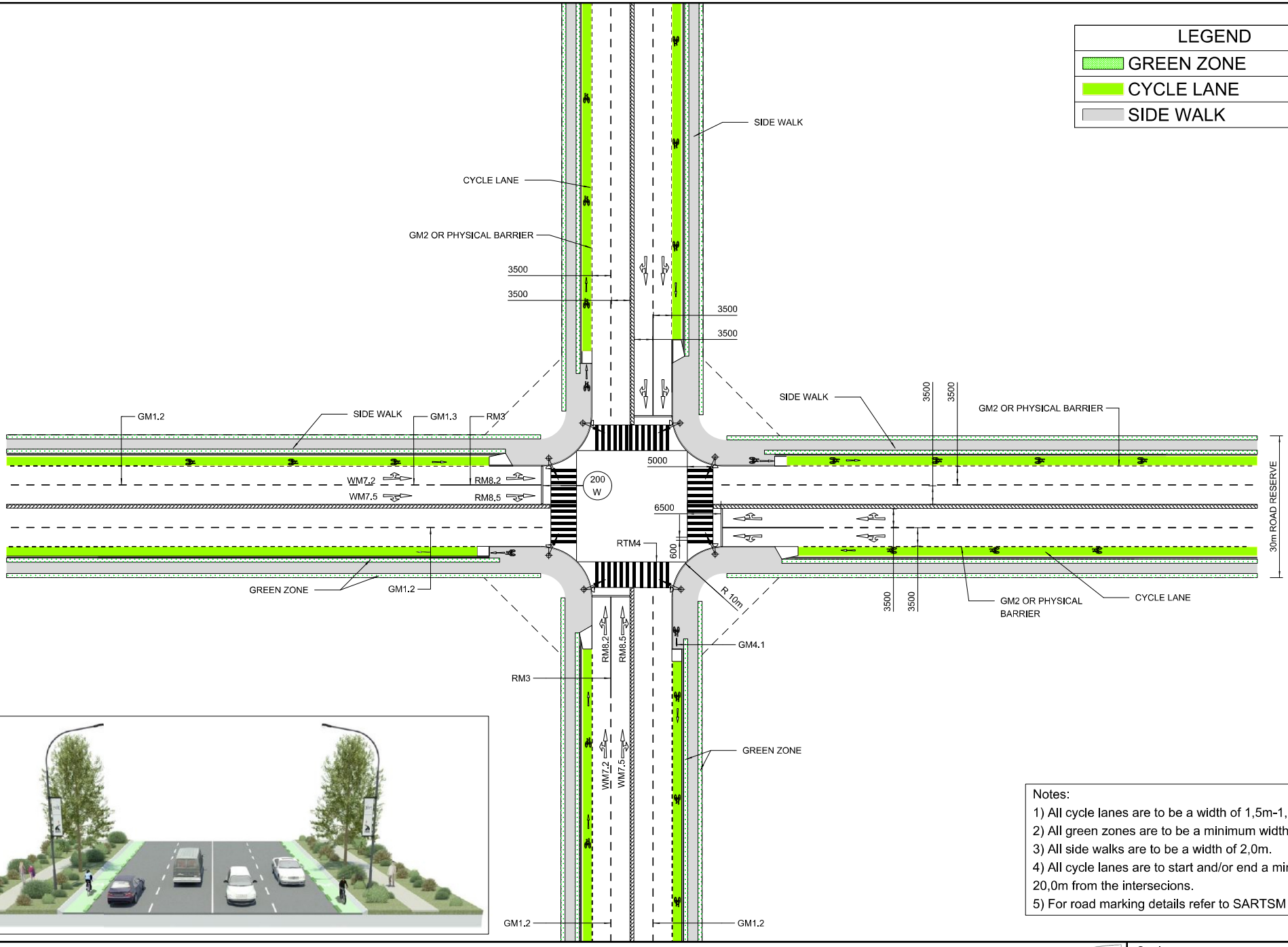
JRA

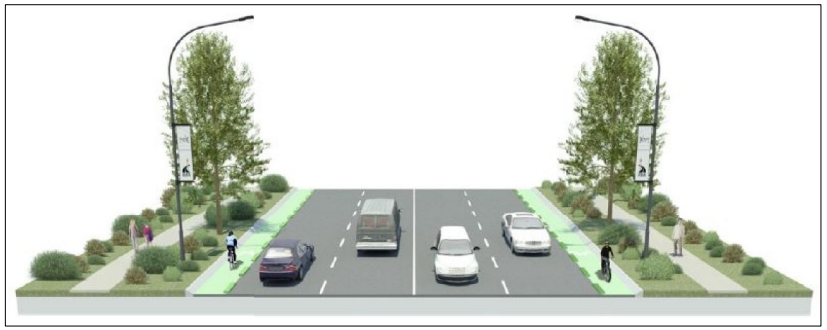
COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : DISTRICT DISTIBUTOR - 30m ROAD RESERVE (CIRCLE)

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS017





Notes:

1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

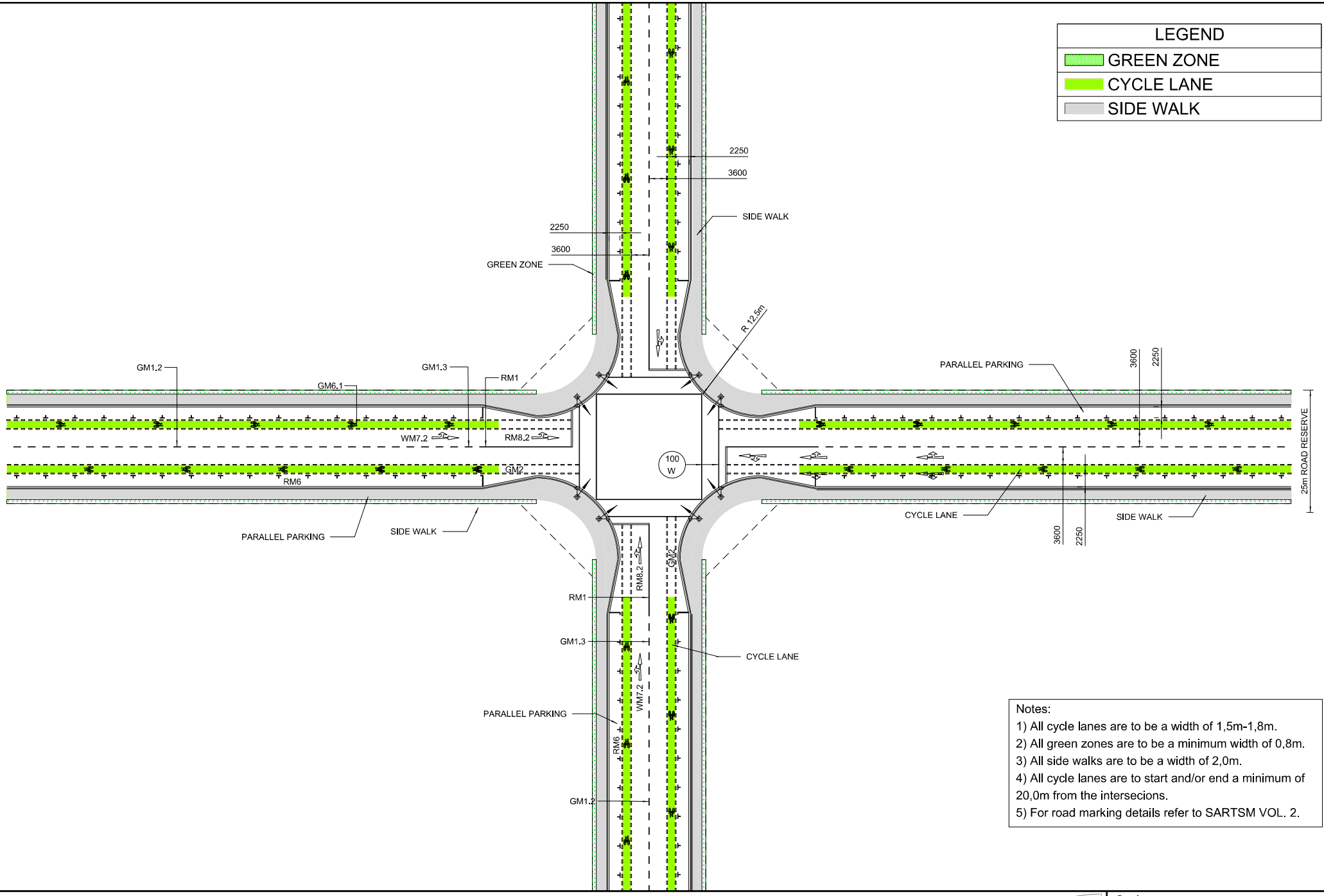
JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT - DISTRICT DISTRIBUTOR - 30M ROAD RESERVE

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS018



Notes:

1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

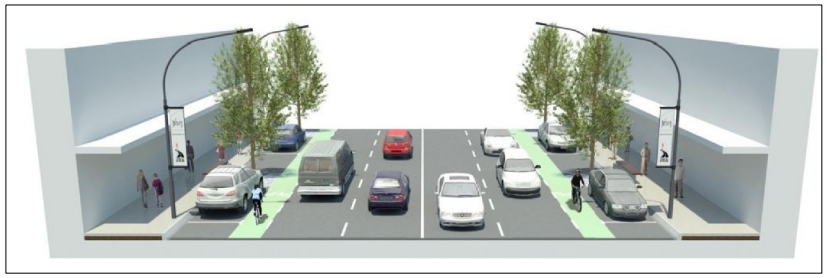
JRA

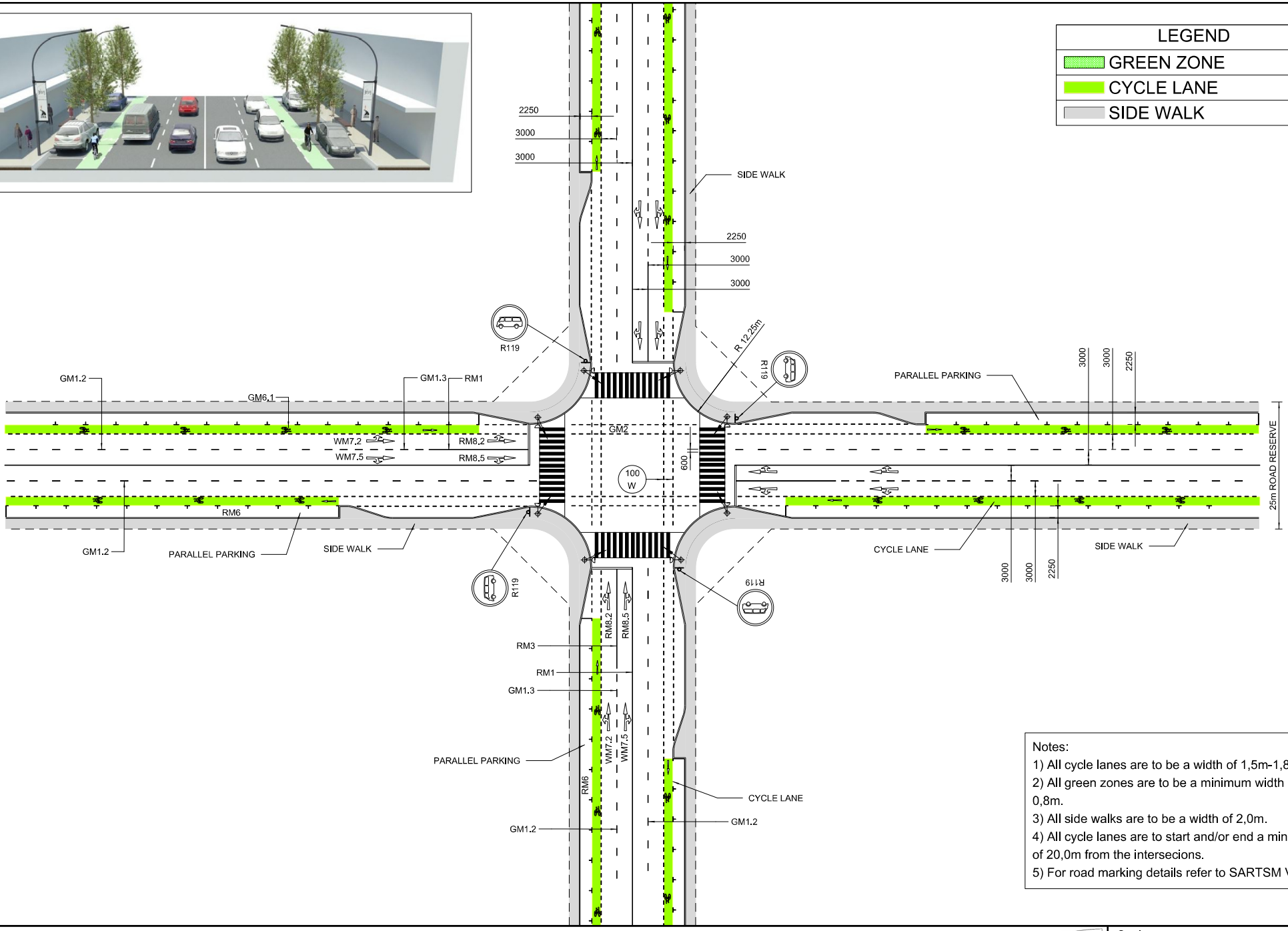
COMPLETE STREET DESIGN GUIDELINE
INTERSECTION TREATMENT : CBD & ACTIVITY STREET - 25m ROAD RESERVE

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS019





Notes:
1) All cycle lanes are to be a width of 1,5m-1,8m.
2) All green zones are to be a minimum width of 0,8m.
3) All side walks are to be a width of 2,0m.
4) All cycle lanes are to start and/or end a minimum of 20,0m from the intersecions.
5) For road marking details refer to SARTSM VOL. 2.

JRA

COMPLETE STREET DESIGN GUIDELINE
INTERSECTION DESIGN : CBD & ACTIVITY STREET - 25m ROAD RESERVE

Joburg
a world class African city

Scale
1:1000

Drawing No
JRA-SD-CS020