Revision 7
July 2025

B6 – Roadways Construction

We acknowledge the Gadigal of the Eora Nation as the Traditional Custodians of our local area.

CITY OF SYDNEY

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6.1 SCOPE

This Technical Specification addresses the construction of flexible and rigid road pavements and describes the requirements for the preparation for, and placement of, the various road pavement layers and general provisions for inspection, testing or other aspects of road work.

6.2 STANDARDS AND GUIDELINES

Unless stated otherwise in this Technical Specification, the approved drawings or elsewhere in the documents, the Works shall comply with the current edition of the relevant Australian Standards and/or TfNSW Standards.

Any variations or ambiguity between this Technical Specification, Australian Standards and other relevant documents shall be referred to the City's Representative for approval before proceeding with the Works.

The following table indicates the Australian Standards and TfNSW Standards applicable to this section.

This table is not exhaustive and may not include all standards which may apply to the work to be undertaken.

Sydney Streets Technical Specification B12: Road Opening and Restoration	
AS 1141	Methods of sampling and testing aggregates
AS 1160	Bituminous emulsions for pavement construction and maintenance of pavements
AS 1289	Methods of testing soils for engineering purposes
AS 1428.2	Design for access and mobility – Enhanced additional requirements – Buildings and facilities
AS 1428.4	Design for access and mobility – Tactile ground surface indicators for the orientation of people with vision impairment
AS 1478.1	Chemical admixtures for concrete, mortar and grout – Admixtures for concrete
AS 1672.1	Limes and limestones – Limes for building
AS 2758.1	Aggregates and rock for engineering purposes – Concrete aggregates
AS 2891	Methods of sampling and testing asphalt
AS/NZS 3582.1	Supplementary cementitious materials for use with Portland and blended cement – Fly ash
AS 3972	General purpose and blended cements
AS/NZS 4455.1-2	Masonry units, pavers, flags and segmental retaining wall units
AS 4456.1	Masonry units, segmental pavers and flags – Methods of test – Sampling for compliance testing
AS/NZS 4456.2	Masonry units, segmental pavers and flags – Methods of test – Assessment of mean and standard deviation
AS/NZS 4456.10	Masonry units, segmental pavers and flags – Methods of test – Determining resistance to salt attack

Sydney Streets Technical Specification B12: Road Opening and Restoration	
AS/NZS 4456.13	Masonry units, segmental pavers and flags – Methods of test. Determining pitting due to lime particles
AS/NZS 4456.5	Masonry units, segmental pavers and flags – Methods of test – Determining breaking load of segmental paving units
AS/NZS 4456.9	Masonry units, segmental pavers and flags – Methods of test – Determining abrasion resistance
BS EN 12878	British Standard: Pigments for the colouring of building materials based on cement and/or lime. Specifications and methods of test.
TfNSW QA 3051	Granular Base and Subbase materials For Surfaced Road Pavements
TfNSW QA 3071	Selected Material for Earthworks
TfNSW QA 3152	Aggregates for Asphalt
TfNSW QA 3153	Reclaimed Asphalt Pavement Materials
TfNSW QA 3154	Granulated glass aggregates
TfNSW QA 3201	Concrete Supply for Maintenance
TfNSW QA 3204	Preformed Joint Fillers for Concrete Pavement and Structures
TfNSW QA 3211	Cementitious Materials, Binders and Fillers
TfNSW R106	Sprayed Bituminous Surfacing (with Cutback Bitumen)
TfNSW R116	Heavy Duty Dense Graded Asphalt
TfNSW R83	Concrete Pavement Base
TfNSW T116	Unconfined compressive strength of remoulded road construction materials
TfNSW T160	Deflection measurement (Portable Beam)

6.3 MATERIALS

6.3.1 BASE AND SUBBASE MATERIALS

Coarse and fine aggregate components of the base and subbase materials shall comply with TfNSW QA Specification 3051 Granular Base and Subbase Materials for Surfaced Road Pavements.

DGB20 and DGS40 materials shall comply with AS 1289.3.6.1 and AS 1289.3.6.3 respectively.

Concrete pavement base course materials shall comply with AS 2758.1, provided that percentage SO3 by mass shall not exceed 0.1 per cent.

6.3.2 ASPHALT CONCRETE

Asphalt concrete shall be supplied, laid, sprayed and compacted in accordance with *AUS-SPEC 1144 Asphalt (Roadways) and TfNSW QA Specification R116. Heavy Duty Dense Graded Asphalt* Concrete should only be used with the consent of the City Representative.

6.3.2.1 SUSTAINABLE MATERIALS IN ASPHALT

The City prefers and encourages the use of recommended AAPA Reclaim Asphalt Pavement (RAP), and the use of warm-mix application, composed of:

– 30% RAP for base courses with the use of "a bitumen binder one class softer than otherwise specified which will compensate for the influence of hardened binder in the RAP, and produce asphalt mixes of comparable stiffness, fatigue resistance and deformation resistance to mixes manufactured with virgin materials." (AAPA, National Asphalt Specification, 2nd edition, 2004)
– 20% RAP for wearing courses and applications that will experience high shear forces with the City's approval. Further increase in RAP may be considered and approved by City's Representative where appropriate.

Further reduction in application temperatures is preferred and encouraged, and the City will consider semi-warm mix use in suitable applications.

Process temperatures provided by the European Asphalt Pavement Association (EAPA) define:

– Hot mix ranging from ~120 to 190°C
– Warm mix ranging from ~100 to 140°C
– Semi warm mix ranging from ~70 to 100°C
– Cold mix as unheated/ambient (~20°C).

Service Providers should design the RAP replacement in accordance with *AS 2150 Asphalt - A guide to good practice – Asphalt - A guide to good practice* (where relevant), and *AS 2758.5 Aggregates and rock for engineering purposes – Specification for aggregates for asphalt*. The Service Provider should also note that the City expects Service Providersto ensure adequate conditions for this replacement are met (i.e. that installation is varied where needed as aresult of material replacement). For example, changes to installation may include extending the application time or varying compaction rates. The final material must comply with the performance specifications outlined elsewhere in this and associated documents.

Materials	Property	Acceptance Criteria	Reference document
Coarse aggregates	Flakiness Index	35% maximum	AS 2758.5, AS 1141.15
	Wet Strength (10% fines)	150 KN minimum	AS 2758.5, AS 1141.22
	Los Angeles Abrasion	30% maximum	AS 2758.5, AS 1141.23
	PAF Value	45 minimum	AS 1141.40, AS 1141 42
Fine aggregates	All passing 4.75mm sieve	Clean, hard, durable and free from clay or organic matter	TfNSW 3152
Binder Class 170 or Class 320 or PMB	All relevant properties pertaining to Hot mix AC	Marshall mix design	AS 2008 and TfNSW 3252 for PMB

6.3.2.2 ASPHALT CONCRETE WARM MIX ASPHALT

Warm-mix asphalt technologies allow the producers of asphalt pavement material to lower the temperatures at which the material can be mixed, placed and compacted on the road. Reductions of 10°C to 20°C have been documented. Such drastic reductions have the obvious benefits of cutting fuel consumption and decreasing the production of greenhouse gases which is one of the key visions of the City.

Warm mix asphalt shall be manufactured with the aid of appropriate additives so that the workability and durability of the asphalt mix remains intact. The quality of the warm mix asphalt must meet the current Australian Standard.

The use of other approved sustainable material such as proprietary product TonerPave is encouraged on base course and wearing course.

6.3.2.3 EME2 (High Modulus Asphalt Concrete)

The use of EME2 is encouraged in new pavement applications where high stiffness, superior resistance to water sensitivity, and resistance to plastic deformation are desired. When placed on a well-supported pavement, the material provides excellent fatigue resistance.

The asphalt mix shall be designed to ensure adequate skid resistance for temporary traffic. If the surface exhibits flushing after rolling, gritting shall be applied to improve skid resistance. Skid resistance testing shall be conducted as required to confirm the suitability of the surface for temporary use.

The asphalt and bitumen industry standards for EME2 support the use of 15/25 and 10/20 penetration grade binders. The asphalt mix shall incorporate 10/20 or 15/25 hard penetration bitumen to achieve the required modulus and wheel tracking performance.

Structural considerations

Resistance to Permanent Deformation: EME2 shall exhibit high resistance to permanent deformation and provide significantly greater stiffness than conventional base layer mixes, particularly at elevated temperatures.

Fatigue Resistance: The mix shall have a high binder content to enhance fatigue resistance and ensure long-term durability under repeated loading.

Property	Specification Requirement
Laboratory Air Voids (%)	Max 6%
TSR (Freeze/ Thaw) (%)	Min 80%
Deformation Resistance @ 60°C and 60,000 passes(mm)	Max 4 mm
Deformation Resistance @ 60°C and 10,000 passes(mm)	Max 2 mm
Flexural stiffness at 50 ± 3 με, 15°C and 10 Hz (Mpa)	Min 14,000 Mpa
Fatigue resistance at 20°C, 10 Hz and 1 million cycles	Min 150 με
Resilient modulus at 25°C and 5.0 ± 0.5% voids (Mpa)	N/A

6.3.3 STONE SETTS

6.3.3.1 BLUESTONE

Bluestone pavers with a preferred size of 225 mm x 115 mm x 80 mm, shall be used for trafficable areas within CBD.

Laying pattern

Unless otherwise specified by the City's Representative, Bluestone pavers for road pavements shall be placed in accordance with the standard drawing

Bluestone

Property	Test Standard	Performance Criteria
Compression strength (dry/saturated)	ASTM C170/C170M	100MPa (soaked)
Water absorption	ASTM C97/C97M	< 1.8% by weight
Bulk density	ASTM C97/C97M	> 2500kg/m^3
Flexural strength (dry and saturated)	ASTM C880/C880M	14MPa (soaked)
Resistance to salt attack	AS/NZS 4456.10	Durability Class A
Coefficient of thermal expansion	ASTM E831	< 0.0000064 mm/mm/°C
Abrasion resistance	ASTM C1353	19 Ha
Slip Resistance Classification of new surfaces Wet pendulum test method at manufacture	SA HB 198:2014 (Table 3B)	P5 for slopes steeper than 1:14 and minimum P4 for slopes up to 1:14 after 1000 cycles of accelerated wear test
Dimensional stability	Draft SAA method	< 0.1% (Wet-dry, hot-cold)
Secondary minerals content (petrographic)	AS 1141.26	< 2%
Breaking load	AS/NZS 4456.5	Characteristic Breaking load, min 6.0 kN
Dimensional deviation	-	Tolerance of +/- 5 mm for length and width, thickness shall be 80 mm
Finish	-	Bush hammered

The testing authority shall be NATA-approved.

6.3.3.2 MORTAR FOR STONE SETTS

For new stone paving, mortar shall be prepared using Portland cement, siliceous coarse sand (free from clay and organic material), and pure uncontaminated drinkable water are to be used to prepare mortar paste for stone setts. The mortar bed for stone setts shall be no more than 30mm and shall have sufficient moisture for compaction and curing. Machine mix mortar shall be used with 1 part cement and 3 parts sand. Curing shall be allowed for 21 days.

A latex mortar admixture such as Laticrete or an approved equivalent shall be used over a concrete base and mortar bed. Modified mortar (3:1 Sand: Cement) shall be prepared by mixing Laticrete 226 Thick Bed Mortar with Laticrete 3701 Mortar Admix, in accordance with the manufacturer's specifications.

For the reinstatement of existing stone setts, a high early strength rapid-set mortar shall be used, capable of achieving a minimum compressive strength of 20 MPa within an hour to minimise disruption and ensure early load bearing capacity.

6.3.4 UNIT PAVERS

Where unit pavers are to be used for segmental pavement construction, the details shall be submitted to the City's Representative for approval. Testing results, from a nominated NATA-registered laboratory, shall comply with the requirements of *AS 4455 Masonry units and segmental pavers*.

6.3.4.1 CONCRETE PAVING UNITS

80 mm thick Type A concrete segmental pavers can be used for trafficable areas outside the CBD.

The materials and manufacture of concrete paving units shall comply with the requirements of AS/NZS 4455.Recycled pavers may be used provided they meet all the criteria.

Refer to Section 6.2 Standards and Guidelines for sampling, measurement of breaking load, flexural strengthand determination of tactile indicator tiles, slip/skid and abrasive resistance.

Refer to **Table 1** for dimensional tolerances, characteristic of breaking load, slip/skid and abrasive resistance and flexural strength.

Surface coatings

Surface coatings shall not be applied to concrete paving units without the prior written approval of the City's Representative.

Appearance

Concrete paving units shall be sound, firm, dense, dimensionally stable and consistent, with a smooth unblemished upper surface and with unrumpled units having unbroken arises, chamfer or radius as specified evenly all round. Units which exhibit cracking, 'boniness' or are considered by the City's Representative to be excessively porous, brittle or friable shall be liable to rejection. Paving unit colours shall be uniform and shall match that of approved sample units over the full area of the pavement.

Laying pattern

Unless otherwise specified by the City's Representative, concrete pavers for road pavements shall be placed in accordance with the drawing and specification and shall be in accordance with the requirements for the appropriate road application as shown in **Table 1**

Table 1

Application	Characteristic breaking load(1) (kN)	Characteristic flexural strength (MPa)	Min Thickness (mm)	Dimensional deviations (Category from AS/NZS 4455)(2)	Slip resistance (co-efficient of friction)	Abrasion resistance (mean abrasion index)
Roads – Traffic Categories						
Light to Medium	6	3	80	DPB2	0.4	5
Medium to Heavy	6	3	80	DPB2	0.4	5
Industrial Pavements(2)	10	4	80	DPB3	0.4	7

Notes on **Table 1**

– At 28 days for concrete paving units.
– The resultant joint width is a combination of paver dimensional deviation and laying procedures.

– For shared zone slip resistance meet a minimum classification of P5 for slopes steeper than 1:14 and P4 for slopes up to 1:14, after 1000 cycles of accelerated wear testing

6.3.4.2 BEDDING SAND

Bedding material shall be clean washed sand of a grading complying with the limits prescribed in **Table 2** below:

Table 2

AS Sieve Size (mm)	Percentage Passing by Mass
9.500	100
4.750	95–100
2.360	80–100
1.180	50–85
0.600	25–60
0.300	10–30
0.150	5–15
0.075	0–10

6.3.4.3 JOINTING SAND

Jointing sand shall be free of deleterious quantities of soluble salts and other contaminants which would cause surface staining. Sand used for bedding is not suitable for joint filling.

Material for filling unbound joints shall be sand of a grading complying with the limits given in **Table 3** below:

Table 3

AS Sieve Size (mm)	Percentage Passing by Mass
2.360	100
1.180	90–100
0.600	60–90
0.300	30–60
0.150	15–30
0.075	5–10

6.3.4.4 EXPANSION JOINTING

Expansion joint material shall be 10mm thick self-expanding cork filler complying with the requirements of the standard specification unless specified otherwise by the City's Representative.

Engineer's drawings showing jointing details with spacing shall be provided to the City for each project.

6.3.4.5 BEDDING MORTAR AND SLURRY FOR PAVERS

All mortar for the pavers is to comply with AS 3700 Masonry Structures and is to be a 3:1 (river sand) cement semi-dry mix. The minimum compressive strength of the mortar mix shall be no less than 15 MPa at seven (7) days. All components shall be measured by means of calibrated containers

Modified mortar (3:1 Sand:Cement) shall be used, prepared by mixing Laticrete 226 Thick Bed Mortar with Laticrete 3701 Mortar Admix, in accordance with the manufacturer's specifications or an approved equivalent

Trial mixes of mortar bedding material must be carried out and tested before the commencement of the Works to adequately select a mix that meets the strength requirement. Strength-test report shall be provided to the City's Representative upon request for approval, in accordance with B3: Concrete Works Construction.

All mortar for the pavers is to comply with AS 3700 Masonry Structures and is to be a 3:1 (river sand) cement. A slurry mix is to be applied on top of this bedding, with a latex additive before laying of pavers to increase bond and compressive strength. The mortar minimum thickness shall be 25 mm and the maximum 30 mm. The amount of mix shall not exceed the quantity required to lay pavers within 45 to 60 minutes, depending on climate conditions.

The bonding slurry shall consist of one (1) part fine-washed sand and six (6) parts Portland Type A cement by volume mixed by hand or mixer while adding water to ensure a smooth, homogenous consistency and free of lumps.

Bonding slurry shall be applied to concrete base and on top of mortar mix.

6.3.5 CONCRETE

Refer to B3: Concrete Works Construction.

6.3.6 PAINT FOR ASPHALT

The paint for asphalt shall be a cement modified, acrylic polymer and aggregate blend developed specifically for use over asphalt.

The paint shall have superior adhesion, flexibility and abrasion resistance as well as chemical resistance. It shallconform to the following characteristics:

Characteristic	Test Specification	Result
Solids by Volume	ASTM D-2697	66.8%
Solids by Weight	ASTM D-2369	80.1%
Density	ASTM D-1475	1.75 kg/l
Flash Point	ASTM D-3278	93°C
Percentage Pigment (by weight including cement)	ASTM D-3723	62 +/- 2%
Sheen	ASTM D-523	< 3 @ 85°

6.3.7 INLAID THERMOPLASTIC PAINT

The inlaid thermoplastic paint shall be performed in the specified colour and pattern. The thermoplastic material shall have a thickness of 2-3 mm, and consist of colour-pigmented plastic film with imbedded reflective glass spheres, uniformly distributed throughout the entire cross-sectional area.

6.3.8 RECYCLED MATERIAL

For specifications for recycled materials, refer to Section 6.3.2.1 Sustainable Materials in Asphalt.

6.3.9 RUBBER OR PLASTIC MATERIALS

Rubber or plastic speed cushions, humps, lane separators, and similar bolt-down traffic control devices shall not be installed within trafficable areas of the road reserve unless all of the following conditions are met:

– The installation is intended as a temporary measure, not exceeding six (6) months in duration;
– The device is to be installed in a low-speed environment, typically not exceeding 40 km/h;
– Written approval has been obtained from the City's Representative prior to installation.

All such installations shall be designed and constructed in accordance with the requirements of the Austroads Guide to Traffic Management – Part 8: Local Area Traffic Management and relevant Australian Standards.

6.3.10 SAMPLING AND TESTING OF COURSE MATERIAL

Materials for soil, coarse aggregates and fine aggregates shall comply with *AS 1141*. All tests shall be conducted by a NATA-accredited testing authority. Testing shall be carried out in accordance with *AS 2891*.

6.3.11 SAMPLING AND TESTING OF BEDDING MIX

Trial mixes of mortar bedding material must be carried out and tested before the commencement of works to adequately select a mix that meets the strength requirement. Strength testing reports must be provided to the City's Representative for approval.

A slurry mix is to be applied on top of this bedding, with a latex additive before laying of pavers to increase bond and compressive strength.

6.4 CONSTRUCTION

6.4.1 ROAD CLASSIFICATION

6.4.1.1 MEDIUM TO HEAVY TRAFFIC

The City considers medium to heavy traffic to be:

– 15,000–25,000 vpd (vehicles per day)
– 500–1,500 hvpd (heavy vehicles per day)
– 60km/hr–80km/hr speed limit
– Roads with design traffic equal to or exceeding 1 x 10^7 Equivalent Standard Axle (ESA).

6.4.1.2 LIGHT TO MEDIUM TRAFFIC

The City considers light to medium traffic to be:

– < 15,000 vpd (vehicles per day)
– < 500 hvpd (heavy vehicles per day)
– ≤ 60km/hr speed limit
– Roads with design traffic less than 1 x 10^7 ESAs.

6.4.2 PREPARATION OF SUBGRADE

Refer to Section 2.6.5 in B2: Earthworks Construction for preparation of subgrade.

6.4.3 PREPARATION OF BASE COURSE LAYERS

Preparation of base course layers shall comply with *TfNSW R71 Construction of Unbound and Modified PavementCourse*. Where base course is specified to be bound such as cement-stabilised, the Works shall comply with *TfNSW R73 Construction of Plant Mixed Heavily Bound Pavement Course.*

NOTE: Bound or stabilised materials are not to be used unless authorised by the City's Representative and supported by calculation of additional asphalt concrete layer thickness to address reflective cracking. Both bound and unbound pavement courses shall comply with the compaction requirements as per the table below:

Compaction Requirements Layer	Minimum Compaction (Standard Maximum Dry Density)
DGS 40 Subbase	100%
DGB 20 Base	100%

6.4.4 FLEXIBLE ROAD PAVEMENT

6.4.4.1 FLEXIBLE ROAD PAVEMENT STRUCTURE, MATERIAL TYPES AND MINIMUMLAYER THICKNESSES

For new road construction works, refer to the standard drawings for detail.

6.4.4.2 REINSTATEMENT OF FLEXIBLE ROAD PAVEMENT

Reinstatement of asphalt road pavement shall match the existing layer thicknesses or those specified on the standard drawing, whichever is thicker. The asphalt surface shall be reinstated to the original level or the level on the approved design drawing or as directed by the City's Representative.

6.4.5 RIGID ROAD PAVEMENT

The concrete shall be supplied, placed, compacted and tested as described in B3: Concrete Works Construction. Note that A/C material supply and placement shall comply with flexible road pavement as outlined above.

6.4.5.1 RIGID ROAD PAVEMENT STRUCTURE, MATERIAL TYPES AND MINIMUM LAYER THICKNESSES

For new road constructions, refer to the standard drawings for detail.

6.4.5.2 REINSTATEMENT OF RIGID ROAD PAVEMENT

Reinstatement of concrete road pavement shall match the existing layer thicknesses or those specified on the standard drawing, whichever is thicker. The concrete surface shall be reinstated to the original level or the level on the approved design drawing or as directed by the City's Representative.

Grout steel dowels shall be epoxied into the adjacent concrete and reinforcement provided to prevent the reinstated concrete from subsidising or cracking. Refer to the standard drawings for details. Refer to B12 Road Opening and Restoration.

6.4.5.3 CONCRETE ROAD PAVEMENT JOINTS

Joints shall be constructed and located as detailed on the drawings. Joints shall be straight and plumb. Unless otherwise detailed on the drawings, transverse expansion and contraction joints shall be normal to the longitudinal joints, and continuous from edge to edge of the pavement throughout all paving slabs that are connected in a single paved area.

Where kerbs are cast as part of the paving slab, joints of the same type shall continue through the kerb sections on the same alignment as those in the paving slab.

6.4.5.3.1 LONGITUDINAL CONSTRUCTION JOINTS

Longitudinal construction joints shall be provided at the locations shown on the drawings or where directed by the City's Representative. There will normally be no more than one longitudinal joint along each road segment. The joints shall be parallel to the kerb line and formed by laying and compacting the concrete up to a solid bulkhead.

Joint sealer shall be silicone sealant, preformed elastomeric strips or preformed self-expanding cork strips as detailed on the standard drawings.

Galvanised N12 dowels, 600mm long at 500mm centres, are to be centrally placed perpendicular to joint. The top surface of longitudinal construction joints shall be smooth across the joint.

6.4.5.3.2 TRANSVERSE CONSTRUCTION JOINTS

Transverse construction joints shall be provided only at a discontinuity in the placement of concrete determined by the Service Provider's operations.

Transverse construction joints shall be constructed square to the kerb line and formed by either timber formwork or by cutting the previously placed concrete back to form an even, fully compacted vertical face up to which the new concrete can be abutted.

Galvanised N12 dowels, 600mm long at 500mm centres, are to be centrally placed perpendicular to joint. All cut material and any loose material on this face shall be removed. The top surface of transverse construction joints shall be smooth across the joint.

6.4.5.3.3 TRANSVERSE EXPANSION JOINTS

Transverse expansion joints are to be formed at approximately 20m spacings and laid square to both gutter and/or longitudinal construction joints.

The joints are to be formed with minimum R24 galvanised dowel bars, 450mm long at 450mm centres, capped and with a bond-breaking compound at one end and an AFX10125 Ableflex Joint Board, complying with *TfNSW 3204,* and joint sealant installed in accordance with Specification *TfNSW R83* or otherwise approved by the City's Representative.

6.4.5.3.4 TRANSVERSE CONTRACTION JOINTS

Transverse contraction joints shall be constructed normal to the control line and to the dimensions and details shown on the drawings.

Where necessary, the joint may be skewed to a maximum 1 in 12 to accommodate construction joints and slab anchors. Bays between transverse expansion joints shall be divided into four (4) separate bays by sawcuts at 5m spacings. The sawcuts shall be 45mm deep, or 1/3-1/4 of the slab thickness and cut square to both the kerb line and the longitudinal construction joint.

6.4.5.3.5 LONGITUDINAL CONTRACTION JOINTS

Longitudinal contraction joints shall be constructed continuously along the centreline of non-reinforced rigid pavement. The joints on the concrete shall be sawcut to an adequate depth. The depth should be typically 1/3 the depth of the slab. The sawing should be done late enough to avoid

ravelling of the new concrete, but soon enough so that random cracking does not begin to occur. The sawcut joints shall be filled with backing rod and seal.

6.4.5.3.6 SAWN CONTRACTION JOINTS

Sawn contraction joints shall be constructed by cutting a groove in the hardened concrete. If uncontrolled cracking of concrete occurs, concrete placing shall be suspended. Sawcuts shall be at least 45mm deep or at such greater depth as detailed on the drawings and of uniform width in the range 3mm to 5mm for the full depth of the cut. The line of the transverse contraction joint shall be without any discontinuities. No edge shall deviate from a 3m straight edge by more than 10mm. The surface of the transverse contraction joint shall not exhibit more than 5mm of vertical or horizontal edge ravelling. The length of edge ravelling shall not be more than 300mm in any 1m length of joint on each edge. Saw debris shall be washed from the joint and pavement immediately after sawing.

The time of sawing shall vary between 6 and 24 hours after initial paving, depending on existing and anticipated weather conditions, to prevent the uncontrolled cracking of the pavement. Sawing of the joints shall commence as early as possible, commensurate with the concrete having hardened sufficiently to permit cutting the concrete without excessive chipping, spalling or tearing. The sawn faces or joints will be inspected for undercutting or washing of the concrete due to early sawing. If this action is sufficiently deep to cause structural weakness or excessive cleaning difficulty, the sawing operation shall be delayed, and resumed as soon as the sawing can be continued without damaging the concrete slab. Nevertheless, all sawing will be completed no later than 24 hours after placement of the concrete. The joints shall be sawn, if the concrete is sufficiently hard, in the sequence of the concrete placement, initially at every fourth joint, then at the intermediate intervals.

Before sawing a joint, the concrete shall be examined closely for cracks, and the joint shall not be sawn if a crack has occurred near the location chosen for a joint. Sawing shall be discontinued if a crack develops ahead of the sawcut. Immediately after each joint is sawn, the sawcut and adjacent concrete surface shall be thoroughly flushed with water until all waste from sawing is removed from the joint, and the joint caulked with plastic or rubber tubing or suitable ‘tee’-shaped extrusion which will remain in place and prevent the entry of foreign material into the joint.

6.4.5.3.7 JOINT TOLERANCES

The line of joints in the concrete base shall not deviate from a 3m straight edge placed along the joint by more than 10mm. The distance between kerb and longitudinal construction joints shall not vary by more than 100mm over the length of the joint, unless approved by the City’s Representative.

6.4.5.3.8 JOINT SEALING

All concrete base joints are to be sealed in accordance with *TfNSW QA Specification R83 Concrete PavementBase.*

6.4.6 CONSTRUCTION OF STONE ROADS

Prior to installation of stone setts, the Service Provider must note the following:

- The boundaries of all four sides of stone setts paving shall be tied into the base
- Concrete gutter poured separately to reinforced base on which stone setts are laid shall be reinforced to limit movement
- Stone setts shall be laid in bays which contain joints
- Curing should be a minimum 14 days for the slab and 21 days for the cobbles/setts
- Low-shrinkage concrete shall be used for slab
- Only the area that is capable of being done within the time limits of the materials (mortar or grout) shall be prepared
- Grout shall be installed full depth
- A steel plate shall be used to ensure that curing occurs before traffic loading is reintroduced
- Coloured oxide shall be used to eliminate colour variance

– Mortar joints as follows shall be used where applicable and subject to the approval by the City's Representative:
  - Construction joints – 15mm
  - Between setts – 1mm -3mm
  - Edge joints – 30mm–40mm.

6.4.6.1 LAYING OF STONE SETTS IN GENERAL

Preparation of subgrade

Refer B2 Earthworks Construction for preparation of subgrade.

Working with concrete and mortar

Setts need to be laid onto a full bed of mortar over a reinforced concrete base at least 200mm thick. Refer to thestandard drawings for details. For a mortar bed, mix 3 parts sharp sand with 1 part cement.

Modified mortar (3:1 Sand:Cement) shall be used, prepared by mixing Laticrete 226 Thick Bed Mortar with Laticrete 3701 Mortar Admix, in accordance with the manufacturer's specifications or an approved equivalent

Laying procedures – pattern

The laying patterns must be approved by the City's Representative prior to installation on site. For general laying pattern & procedure, refer to the standard drawings and B5 Footways Construction.

Laying of stone setts with mortar additive such as LATICRETE or equivalent

Mortar additive shall be used as approved by the City's Representative and laid as per manufacturer's instruction and guidelines.

Jointing

For cement mortar jointing, mix a mortar comprising three (3) parts soft or building sand and one (1) part cement to a consistency that is very wet, like that of a pea soup. Spread over the pre-wetted setts and sweep into the joints using a stiff brush. The excess shall be swept off, repeating the sweeping until as much as possible of the mortar is removed, and eventually switching to a soft brush to remove the finer particles. The surface needs to be gently sprayed with clean water throughout to help with the cleaning.

Once the joints are filled, smooth it using the blade of a pointing trowel or a special pointing bar that will give a flat or semi-round profile to the joint. Cement mortar jointed setts should be kept free of foot traffic for at least three (3) days and vehicles are best kept off the paving for at least seven (7) days, and preferably longer.

6.4.6.2 ONSITE QUALITY CONTROL

For thoroughness of mixing, ensure that the mortar bed mix is of a consistent cement colour. No grains of sand shall be left without a cement coating. Failure to meet this acceptance criterion may result in rejection of the mix.

6.4.7 CONSTRUCTION OF ROADS WITH UNIT PAVERS

6.4.7.1 SUBGRADE PREPARATION

Refer to B2 Earthworks Construction for preparation of subgrade.

6.4.7.2 SUBBASE

Subbase materials shall be DGB20 unless specified otherwise. Granular subbase material shall comply with

TfNSW QA Specification 3051 Granular Base and Subbase Materials for Surfaced Road Pavements.

6.4.7.3 BASE

The base shall be constructed to the specified thickness and depth below the finished surface level, and to the design grade and crossfalls of the finished surface, as shown on the drawings and in accordance with B3: Concrete Works Construction.

The base course shall extend in width to at least the rear face of kerb. The finished surface of the base course for road pavements to be overlaid with segmental paving shall be trimmed to within ±10mm of design levels. The deviation from a 3m long straight edge placed anywhere and laid in any direction on the top surface of the base course for all segmental paving shall not exceed 5mm.

Sand bedding material shall not be used as a levelling material to compensate for base finishing outside the above tolerances. The finished surface of the base shall drain freely without ponding. The finished base shall be subject to the approval of the City's Representative.

6.4.7.4 EDGE RESTRAINTS

Edge restraints in the form of kerb and/or gutter or edge strips shall be constructed along the perimeter of all segmental paving as shown on the drawings. Concrete kerb and/or gutter and edge strips shall be constructed in accordance with B3 Concrete Works Construction and B4 Kerb and Gutter Construction.

Faces of edge restraints abutting paving units shall be vertical. Alternatively, silicone joint filler shall be applied between the paving unit and edge restraint. Edge restraints shall be supported on the compacted base and/ or subbase of the thickness as shown on the drawings.

Unless otherwise shown on the drawings, contraction joints 20mm deep shall be formed every 5m of the edge restraint length.

6.4.7.5 SAND BEDDING COURSE

Bedding sand shall be non-plastic and shall be free of deleterious quantities of soluble salts and other contaminants which may cause or contribute to efflorescence. Bedding sand shall be of uniform moisture content when spread. It shall be covered when stored on site to protect it from rain penetration.

Where cement stabilised bedding is specified, 4 per cent to 6 per cent of cement by volume is to be thoroughly and evenly mixed in with the bedding sand prior to spreading. The volume of mixed material shall not exceed that required for the area of paving units to be laid in a period of four (4) hours. Adequate precautions shall be taken to protect the sand-cement mixture from adverse weather conditions.

The sand bedding course shall be spread in a single uniform layer and screeded in a loose condition to the nominated design profile and levels plus that necessary to achieve a uniformly thick nominal 20mm to 25mm layer following final compaction of the segmental paving. Any depressions in the screeding sand exceeding 5mm shall be loosened, raked and rescreeded before laying paving units. Depressions for the manual placing of paving units in the bedding sand shall be maintained at a uniform loose density. For mechanised laying, the bedding sand shall be uniformly and firmly, but not fully, compacted. Compaction screeded sand left overnight or subject to rain shall be checked for level and rescreeded where necessary before paving units are placed. The sand shall not be screeded more than 2m in advance of the laying face at the completion of work on any day.

6.4.7.6 LAYING PAVING UNITS

The laying patterns must be approved by the City's Representative prior to installation on site. For general laying procedure refer to the standard drawings and B5 Footways Construction.

6.4.7.7 BEDDING COMPACTION

After laying the paving units, the sand bedding shall be fully compacted and the surface brought to design levels and surface profiles by not less than two (2) passes of a high-frequency, low-amplitude plate compactor which covers at least 12 units. Compaction shall continue until lipping between adjoining units has been eliminated.

Any units which are structurally damaged during bedding compaction shall be removed and replaced. The pavement shall then be recompacted for at least 1m surrounding each replacement unit.

The paving operations shall be arranged so that the use of the plate compactor proceeds progressively behind the laying face without undue delay, and such that compaction is completed prior to cessation of construction activity on any day. Compaction shall not be attempted within 1m of the laying face except on completion of the pavement against an edge restraint.

The finished surface level shall not vary from the design level at any point laid in any direction by more than 5mm. Notwithstanding this, the finished surface of the segmental paving, including where the paving abuts an edge restraint other than a drainage inlet, shall not deviate from the bottom of a 3m straight edge laid in any direction, except at grade changes, by more than 5mm.

All compaction shall be complete and the pavement shall be brought to design profiles before spreading or placing sand filling in the joints.

6.4.7.8 FILLING JOINTS

As soon as practical after bedding compaction, and in any case prior to termination of work on any day, dry sand for joint filling shall be spread over the pavement and the joints filled by brooming. To ensure complete filling of the joints, both the filling sand and paving units shall be as dry as practical when sand is spread and broomed into the joints.

Note that sand shall be covered when stored on site to protect it from rain penetration. The pavement shall then receive one or more passes of a plate compactor and the joints then refilled with sand, with the process then repeated sufficiently to ensure that the joints are completely filled.

6.4.7.9 OPENING TO TRAFFIC

As soon as practical after the filling of joints, construction vehicles may use the pavement, and should be encouraged to traverse the greatest possible area of pavement to assist in the development of 'lock-up'. Excess joint filling sand shall be removed prior to opening to traffic. The pavement shall then be inspected by the Service Provider at regular intervals up until the expiration of the Defects Liability Period to ensure that all joints remain completely filled.

6.4.8 CONSTRUCTION OF ROAD THRESHOLD

The service provider shall follow the Technical Specification and standard drawings for the construction of roadway threshold. The general installation procedures shall be as follows:

- Immediately prior to installation, thoroughly clean the designated locations of all dirt, loose stone and other debris to the satisfaction of the City's Representative
- Mill A/C as indicated in the approved plans or standard drawings
- For asphalt threshold components:
  - Spray a layer of binder across the road and heat it to bond the road and the new asphalt. (note: the designated locations shall be tacked, i.e. rate of application as per *AS 1160* and special care shall be taken to avoid spraying the bituminous tack coat on adjacent kerbs, driveways

andmiscellaneous structure. Unless otherwise directed by the City's Representative, the tack coat is to be applied to provide a uniform application rate of between 0.1L/m^2 and 0.2L/m^2. The Service Provider shall be responsible for all clean up should such overspray occur)

- Once the binder is heated and ready for asphalt, tip the fresh asphalt onto the road surface and spread the asphalt as evenly as possible using rakers
- Use the small steel roller to compress and flatten the asphalt
- Tip the second layer of fresh asphalt to form the shape (grade) of the threshold as per the standarddrawing and specification and compress as appropriate to maintain the configuration
- Allow the asphalt to harden for reflective markings and for erection of other traffic control signs as per the drawing and specification
- Apply stamped pattern and colouring as specified in the approved plan and line markings.

– For concrete threshold components, refer to B3 Concrete Works Construction

– For paver infill threshold components, refer to Section 6.3.4 Unit Pavers of this Technical Specification.

6.4.9 STAMPED ASPHALT (NOT TO BE USED)

6.4.10 PAINT FOR ASPHALT

The paint shall be in accordance with the manufacturer's recommendations.

Sufficient masking shall be used to ensure that the surface products are applied only where specified.

6.4.11 INLAID THERMOPLASTIC PAINT

6.4.11.1 SURFACE IMPRINTING

The imprinted pattern in the asphalt shall be created in accordance with the design drawings. Patterning shall begin only after the asphalt has reached its final compacted density and while there is still sufficient heat in the asphalt to permit imprinting.

Alternatively, imprinting can be carried out at a later stage, on existing asphalt (no older than two (2) years), by applying heat to the asphalt surface to make the upper portion of the asphalt surface pliable enough to accept the imprint of the template. For proper imprinting success, the asphalt pavement must be adequately heat soaked (softened) to a depth of at least 6mm, without burning the asphalt. The asphalt surface temperature shall not exceed 163°C. Regular monitoring of the surface treatment during heating is recommended to prevent overheating.

If during the reheating process the surface is overheated and begins to emit black smoke, work shall stop immediately. All damaged pavement shall be replaced, prior to stamping continuing.

Patterning shall be achieved using plate compactors and shall be of a consistent depth of 3mm.

6.4.11.2 INSTALLATION AND BONDING OF PRE-FORMED THERMOPLASTIC PANELS

The thermoplastic shall be applied only in dry conditions. The thermoplastic shall be placed on the clean, dry asphalt in the imprinted pattern, prior to application of heat. Once the thermoplastic is in place, heat shall be applied using a reciprocal infrared heater. The asphalt surface temperature shall not exceed 163°C. If smoke is visible, that is an indication that the asphalt and/or the thermoplastic material is burning. Apply sufficient heat to liquefy the thermoplastic. This is achieved when the joints of the thermoplastic panels flow together. Bonding of the thermoplastic material to the asphalt surface can be monitored by carefully lifting a corner of the thermoplastic material before it

completely cools. If asphalt is attached to the base of the thermoplastic material sufficient heat was applied. If not reapply heat.

6.4.12 SPECIAL REQUIREMENTS

The Service Provider may be required to take levels on top of the finished base course surface or milled-down surface prior to laying of the asphalt layer (two points at the edges and one point at the crown across the width of the pavement) and at 15m intervals along the length of the road. After laying the asphalt, the Service Provider shall again take levels on the same points and in a similar manner. The difference of the two levels shall determine the thickness of the asphalt surfacing. Any deviation from the designed grade and level shall have to be rectified by the Service Provider at their own cost. The cost of taking levels shall be borne by the Service Provider.

6.4.13 TRENCH CUT FOR INSTALLATION OF SERVICES AND TEMPORARY ROAD RESTORATIONS WORKS

All trenches cut for installation of services are to be restored to their existing road surface level and configuration. Refer to the standard drawings for temporary road restorations.

The general procedure for road cuts and trench restoration outlined below is to be followed unless otherwise specified by the City's Representative:

- Sawcut or mill existing pavement to the width of the proposed trench. Refer to B2: Earthworks Construction for sawcutting. The width of the trench will be agreed on site with the City's inspector.
- Remove existing asphalt/concrete, stone setts or unit pavers between sawcuts using an appropriate device and as per the methodology approved by the City's Representative.
- Excavate trench and install service(s) without damaging the edges of the remaining asphalt or concrete. Refer to B2: Earthworks Construction for excavation for trenches.
- Place and compact the pipe zone area with approved select fill or other material to be approved by the City's Representative and level the surface above the pipe zone. Refer to B12: Road Opening and Restoration for specifications, compaction materials and tolerances.
- The service provider shall provide subsoil drain where excavation is below the bed rock's surface levels. The subsoil drain shall be wrapped in geotextile and connected to the nearest stormwater pit.
- Backfill the trench from the top of the pipe zone to road formation or subgrade level in accordance with B12: Road Opening and Restoration.
- Following compaction and formation of subgrade, the trench has to be restored back to the original road surface level as per the trench restoration standard drawings for specific roads. Where standard restoration drawings are not available, the restoration shall follow the existing road configuration. Refer to the standard drawings for temporary road restoration for flexible and rigid pavements and the same shall follow for unit pavers or stone setts. All restorations shall be in accordance with B12: Road Opening and Restoration.
- Temporary restorations responsibility lies with the service provider and The City does not manage these works and cannot accept liability for any inadequate workmanship.

6.4.14 PERMANENT RESTORATION OF ROADWORKS

All permanent restorations shall be in accordance with B12: Road Opening and Restoration.

The City's Representative, following the completion of temporary road restoration works, shall closely monitor the performance and characteristics of the road for approximately six (6) months before proceeding on permanent restoration works. If the road has settled to a degree and warrants permanent restorations, the standard drawings and specifications are to be followed for specific road types as mentioned below:

- Flexible Pavement
- Rigid Pavement
- Stone Setts/Stone Road
- Unit Paved Road.

6.4.15 DRY ROLLED CONCRETE/SANDSTONE BALLAST

The City prefers to reinstate dry-rolled concrete/sandstone ballast surfaces with flexible road pavement configuration including the replacement of base course layers with a lean mix concrete having a 28-day compressive strength of 5MPa (with fly ash).

6.4.16 SITE TESTING EQUIPMENT

The road formation to be proof rolled with a minimum 10-tonne 3-point roller or alternative method to the City's satisfaction. All testing equipment is to be approved by the City's Representative before use.

6.5 QUALITY

6.5.1 HOLD AND WITNESS POINTS FOR FLEXIBLE PAVEMENT

1. Process Held	Use of each type or source of granular pavement material. (Section 6.3.1)
Submission Details	At least three (3) working days before each granular pavement material is proposed for use, the Service Provider shall submit all test results demonstrating conformance of materials
Release of Hold Point	The City's Representative will consider the submitted documents and may carry out surveillance and audit, prior to authorising the release of the Hold Point
2. Process Held	Sub-grade preparation and placement of overlaying base, subbase or select material layers. (Section 6.3.1)
Submission Details (CBR. DCPT and compaction test results such as dry density and per cent of moisture content)	At least one (1) day before the proposed overlay of base, subbase or select material layers, the Service Provider shall submit all test and survey results demonstrating conformance of the layer for material properties, compaction, level, surface trim and width
Release of Witness Point	The City's Representative will consider the submitted documents and shall carry out surveillance and audit to witness the compliance requirements of subsequent pavement layers, prior to authorising the release of the Hold Point
3. Process Held	(Section 6.4.4)
i) Preparation of subgrade (Provide photographic evidence including the methodology and other related documents)	Attend site to test roller pass, water truck and/or Benkelman beam test to TfNSW T160. The road formation to be proof rolled (at least 5 passes) with minimum 10 tonne 3-point roller (or alternative method to the City's satisfaction). Check level prior to placing of subbase material.

ii) Preparation of subbase (Provide photographic evidence including the methodology and other related documents)	Attend site to test roller pass, water truck and/or Benkelman beam test to TfNSW T160. The road formation to be proof rolled (at least 5 passes) with minimum 10 tonne 3-point roller (or alternative method to the City's satisfaction). Check level prior to placing base material.
iii) Preparation of base early stage (Provide photographic evidence including the methodology and other related documents)	Attend site to test roller pass, water truck and/or Benkelman beam test to TfNSW T160. The road formation to be proof rolled (at least 5 passes) with minimum 10 tonne 3-point roller (or alternative method to the City's satisfaction). Check level prior to placing asphalt.
4. Process Held	Delivery of materials for priming, primer sealing or sealing to be used in the works Sprayed bituminous surfacing work for each work location
Submission Details	At least three (3) working days prior to proposed priming, primer sealing or sealing, the Service Provider shall submit all test results demonstrating conformance of the materials proposed At least one (1) working day prior to the proposed sprayed bituminous surfacing works the Service Provider shall submit primer, primer binder, binder, aggregate lot details and target application rates and notification that the prepared surface to accept the sprayed bituminous surfacing is ready for inspection
Release of Witness Point	The City's Representative will consider the submitted documents and may carry out sampling, testing and audit, prior to authorising the release of the Hold Point The City's Representative will consider the submitted documents and shall inspect the prepared surface and may carry out calculations and audit, prior to authorising the release of the Hold Point
5. Process Held	Binder application
i) Final stage of base course: Base surface dry, clean and free from deleterious material and ready for priming.	Attend site to inspect materials for priming, primer sealing or sealing
ii) Surface uniformly covered with a fine sprayed coat of bituminous emulsion as per approved rate of application (Provide photographic evidence including the methodology and other related documents)	Attend site following application of tack coat
6. Process Held	Use of each asphalt nominated mix in the works
Submission Details	At least 10 working days prior to proposed commencement of asphalt works, the Service Provider shall submit all designs, test results, certificates and other documentation that demonstrate conformance of the asphalt with the Technical Specification requirements for each asphalt mix proposed to be used

Release of Witness Point	The City's Representative will consider the submitted documents and may carry out testing, calculations and audit, prior to authorising the release of the Hold Point
7. Process Held	Placement of overlaying asphalt layers and surface course (Section 6.3.2)
Submission Details	At least one (1) working day before proposed overlay of asphalt layers the Service Provider shall submit all test and survey results demonstrating conformance of the layer for material properties, in situ voids, level and width
Release of Witness Point	The City's Representative will consider the submitted documents and may carry out surveillance and audit, prior to authorising the release of the Hold Point.
8. Process Held	
i) Laying of asphalt on the base surface and surface course (Provide photographic evidence including the methodology and other related documents)	Attend site to inspect laying of asphalt with no segregation allowed or to accumulate along the sides of the receiving hopper. Attend site during laying of surface course.
ii) Survey	Survey as outlined in Section 6.4.10 and as directed by City's Representative.
iii) Cleanliness of road surface prior to opening to traffic	Attend site prior to being opened to traffic.

6.5.2 HOLD AND WITNESS POINTS FOR RIGID PAVEMENT

The same hold and witness points determined for flexible pavement will be applicable for rigid pavement up to the base level and the rest, i.e. from base to surface level, are to be followed as per the table below.

1. Process Held	Production of concrete for concrete paving. (Section 6.4.5)
Submission Details	At least 20 working days prior to the commencement of concrete paving, the Service Provider shall submit details of the proposed methods of handling, storing and batching materials for concrete, details of proposed mixers and methods of agitation, mixing and transport
Release of Witness Point	The City's Representative will review the submitted details, prior to authorising the release of the Hold Point
2. Process Held	Preparation of formwork and placement of re-bar for the base course layer (Section 6.4.5).
Submission Details (Photographic evidence including the methodology and test results of re-bar)	The City's Representative shall attend the site and witness the placement of re-bar and joints as per the drawing and specification

Release of Hold Points	The City's Representative will approve the formwork and re-bar prior to authorising the release of the Hold Point
3. Process Held:	Placement of concrete for paving. (Section 6.4.5)
Submission Details: (Photographic evidence of concrete pour including the methodology and test results of concrete)	Following inspection of re-bar placement, the Service Provider shall collect three (3) sets of cylinders in the presence of the City's Representative and send it to a NATA-registered laboratory for testing the compressive strength of the concrete
Release of Hold Point:	The City's Representative shall inspect the finished concrete surface, prior to authorising the release of the Hold Point
4. Process Held	Attend site to witness pouring of concrete for concrete paving (Section 6.4.5)
5. Process Held	Attend site to inspect sealing of joints Sealing of Joints. (At least two (2) days' notice is to be provided to the City's Representative.
6. Process Held:	Removal and disposal of non-conforming concrete. (Section 6.4.5)
Submission Details:	At least two (2) working days prior to commencement of work, the Service Provider shall submit details of the equipment and methods proposed for removal and disposal of concrete paving
Release of Hold Point:	The City's Representative will review the submitted details, prior to authorising the release of the Hold Point

Note: A/C shall comply with flexible pavement.

6.5.3 HOLD AND WITNESS POINTS FOR UNIT PAVERS/STONE SETTS

The hold and witness points for unit pavers/stone setts shall be the same as rigid pavement up to the top of concrete base.

1. Process Held	Commencement of paver placement (Section 6.4.6 and 6.4.7)
Submission details (i.e. test results for breaking load, slip/skid resistance and abrasive resistance and others)	At least five (5) working days prior to ordering segmental paving units, the Service Provider shall submit two (2) samples of each paver type and test results for each paver type stating source of paver and demonstrating conformance to Table 1.
Release of Hold Points	The City's Representative will examine each paver type and associated documentation prior to authorising the release of the Hold Point
2. Process Held	Commencement of bedding sand placement or mortar (Section 6.4.6 and 6.4.7)
Submission details	Survey top of concrete base for conformity with design levels. Submit survey result.
Release of Hold Points	The City's representative will consider the submitted documents and may carry out surveillance and audit, prior to authorising the release of the Hold Point.

3. Process Held	Finish surface prior to applying jointing sand (Sections 6.4.6 and 6.4.7)
Submission details	Two days' notice prior to the completion of surface levels.
Release of Hold Point	City's Representative to approve levels.
4. Process Held	Attend site for each phase from bed preparation to installation of unit pavers/ stone setts.

6.5.4 LIMITS AND TOLERANCES

6.5.4.1 UNIT PAVERS ROADS

Item	Activity	Tolerances
1.	Base a. Surface Level	Finished level of base for road pavements to be within +10mm or -10mm of design levels Finished level of base other than for road pavements to be within ±10mm of design levels The top surface of the base for all segmental paving shall not deviate from a 3m straight edge, laid in any direction, by more than 5 mm
2.	Laying Paving Units a. Joint widths	No more than 10 per cent of joints along any 10 metre line of joints along a major axis of the laying pattern shall have widths outside the range 2mm to 4mm
3.	Completed Segmental Paving a. Surface level	Finished surface level of pavers shall not vary from design levels by more than ±5 mm Finished surface of pavers shall not deviate from a 3m straight edge, laid in any direction, by more than 5mm

6.6 REVISION REGISTER

Revision	Clause	Description of Revision	Authorised By	Date
Rev. 6	Overall	References to "Roads and Maritime Services" or "RMS" changed to "Transport for NSW" or "TfNSW" respectively.	SA	Aug-23
	Table 1	Characteristic Breaking Load value of 5 kN for Light to Medium and Medium to Heavy changed to 6 kN		
	6.4.13	New dot point added "Temporary restorations responsibility lies with the service provider and The City does not manage these works and cannot accept liability for any inadequate workmanship."		

Revision	Clause	Description of Revision	Authorised By	Date
Rev 7	6.3.2.1	RAP in wearing course increased from 15% to 20% in line with TfNSW R116	SA	Jul-25
	6.3.2.3	A section has been included to specify that EME2 shall be used for new pavement applications.		
	6.3.3	Porphyry stone set has been removed and replaced with Bluestone paving as the approved material for paving in CBD area.		
	6.3.4	The section relating to the use of Fired Clay Paving has been removed		
	6.3.3.1, 6.3.4.6 & 6.4.6.1	Mortar mix detail updated		
	6.3.9	A section has been included to specify that rubber or plastic materials shall not be used in trafficable areas.		
	6.4.5.3.3	Dowel bar size has been updated from R28 to a minimum of R24.		
	6.4.6.1	Section updated		
	6.5.4.2	Section removed due to Bluestone pavers replacing square stone setts		

CITY OF SYDNEY