NORTH SYDNEY COUNCIL

INFRASTRUCTURE SPECIFICATION FOR

ROADWORKS, DRAINAGE AND MISCELLANEOUS WORKS

2022

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ROADWORKS, DRAINAGE AND MISCELLANEOUS CIVIL WORKS

SECTION 1 APPLICATIONS OF SPECIFICATION

This Specification shall apply to work carried out on assets, which are under or will revert to the ownership, care, control or management of NORTH SYDNEY COUNCIL in connection with:

A. Work carried out by Contractors, subcontractors, suppliers etc. engaged or employed by Council for such work, whether by Contract, Purchase Order or other means.

B. Maintenance work and Capital Works carried out by Council's direct labour organisation.

C. Work carried out by, or on behalf of, third parties on existing roads, footpaths and other assets belonging to Council and/or the maintenance, reinstatement or creation of such assets or facilities which belong to or will revert to the ownership, care, control or management of Council.

1.01 COUNCIL REPRESENTATIVE

For the purposes of this Specification the Council Representative is defined as:

A. In the case of work carried out by Contractors, subcontractors, suppliers etc. engaged or employed by Council, the Council Representative shall be the person nominated in writing to the respective contractor, subcontractor or supplier etc. as exercising the role of the Council Representative. If a Superintendent is appointed pursuant to a contract between Council and a contractor, subcontractor or supplier etc. the Council Representative shall be the Superintendent.

B. In the case of maintenance work and Capital Works carried out by Council's direct labour organisation, the Council Representative shall be the delegated officer of Council.

C. In the case of works carried out by, or on behalf of, third parties on existing roads, footpaths and other assets belonging to Council and/or the maintenance, reinstatement or creation of such assets or facilities which belong to or will revert to the ownership, care, control or management of Council, the Council Representative shall be an Engineer or other professional accredited appropriately under the E.P. & A. Act.

1.02 THE PARTIES CARRYING OUT THE WORK

Where this Specification requires that materials, plant, equipment and/or labour shall be provided and/or expresses or implies that work shall be carried out or provided or that activities shall be carried out, the party responsible for providing the materials, plant, equipment and/or labour and carrying out the work shall be:

A. In the case of work carried out in accordance with "1 A" above, the party shall be the contractor, subcontractor, supplier etc.;

B. In the case of maintenance work and Capital Works carried out in accordance with "1 B" above the party shall be the respective Council employee responsible for such duties;

C. In the case of works carried out in accordance with "1 C" above the party shall be the owner of the third-party Works associated with or carried out in connection with the respective work;

except in cases where it is clearly stated that respective goods, services etc. shall be provided by the Council Representative or NORTH SYDNEY COUNCIL.

In each case, the work carried out shall include the supply of all materials, plant, equipment and labour required for the work.

1.03 DESIGNATION OF MATERIALS

Terms and/or trade names used to designate items or materials in the Documents are intended to define the quality and general description of such items or materials and are not intended to imply that they must be manufactured and/or supplied by specific firms.

Items or materials supplied under alternative brand names or provided by alternative suppliers may be substituted if, in the opinion of the Council Representative, the quality is not less that designated. In determining the suitability of alternatives, the Council Representative will consider the basic material used in manufacturing the item or the finished material, the quality of finish, durability and appearance (where considered appropriate). The Council Representative will also determine whether an item or material proposed as an alternative is manufactured from basic materials and to a standard of workmanship which is suitable for its purpose and is consistent with the nature and character of the Works.

1.04 DESCRIPTIONS OF THE WORKS AND OF WORK TO BE CARRIED OUT

The Drawings and the Specification represent generally the forms, dimensions and descriptions of work to be carried out.

The Specification sections are set out to "trades" or "classes of work" and shall apply individually and severally to all aspects of work required for construction of any item or section of the Works.

Notwithstanding that some sections of the Specification or Drawings describe discrete or specific items of work or parts of the Works; the work shall comply with the more general requirements of other sections in so far as they are applicable. Any requirement therein shall be taken together with other documents describing the work, and any ambiguity discrepancy or inconsistency shall be determined as required by the Council Representative.

Specification refers to this Specification and Council's current Public Domain Style Manual and Design Codes (both of these documents are available for download at www.northsydney.nsw.gov.au.

SECTION 2 COMPLIANCE WITH STANDARDS

Unless stated otherwise in this Specification, the Drawings or elsewhere in the Documents, work shall comply with the current edition of the relevant Australian Standards and/or RMS Standards.

Any variations or ambiguity between Specifications and other Documents and Australian Standards shall be referred to the Council Representative for decision before proceeding with the work.

The following tables indicate which Australian Standards and/or RMS Standards may be applicable to each class of work. These tables are not exhaustive and may not include all Standards which may apply to the work to be undertaken.

PROVISION FOR TRAFFIC	
AS 1742.3 plus Associated Handbooks	Traffic Control Devices for Works on Roads

FILLING	
AS 1289.5.2	Soil Compaction and Density Tests
R44	Earthworks (Cut, Fill, Imported Fill and Imported Selected Fill)

CONCRETE WORKS	
AS 3600	Concrete Structures
AS 1012	Methods of testing Concrete
AS 1302	Steel Reinforcing Bars for Concrete
AS 1303	Steel Reinforcing Wire for Concrete
AS 1304	Welded Wire Reinforcing Fabric for Concrete
AS 3972	Portland and Blended Cements
AS 1379	Specification and Supply of Concrete
AS 3610	Formwork for Concrete
AS 2758.1	Concrete Aggregates

KERBS, GUTTERS, FOOTPATHS AND MEDIANS	
AS 2876	Concrete Kerbs and Channels (Gutters) - Manually or Machine Placed
R15	Kerbs and Gutters

ROADWORKS AND HARDSTANDINGS	
AS 1289	**Methods of testing soils for Engineering Purposes**
R116	Asphalt (Dense Graded and Open Graded)
R106	Sprayed Bituminous Surfacing (with Cutback Bitumen)
R107	Sprayed Bituminous Surfacing (with Polymer Modified Bitumen)

PAVING BRICKS, COBBLESTONES AND INTERLOCKERS	
AS 4455	Masonry Units and Segmental Pavers
AS 4456	Masonry Units and Segmental Pavers - Methods of Test

STEELWORK	
AS 4100	Steel Structures
AS 1554	Structural Steel Welding
AS 1627	Metal Finishing - Preparation and Pre-Treatment of Metal Surfaces
AS 1657	Fixed Platforms, Walkways, Stairways and Ladders - Design Construction and Installation
AS 2312	Guide to the Protection of Iron and Steel against Exterior Atmospheric Corrosion
AS 1111	ISO Metric Hexagon Commercial Bolts and Screws
AS 1112	ISO Metric Hexagon Nuts, Including Thin Nuts, Slotted Nuts and castle Nuts
AS 1163	Structural Steel Hollow Sections
AS 1214	Hot Dipped Galvanised Coatings on Threaded Fasteners
AS 1252	High Strength Steel Bolts with Associated Nuts and Washers for Structural Engineering
AS 1397	Steel Sheet and Strip -Hot-Dipped Zinc Coated or Aluminium/Zinc Coated
AS 1553	Covered Electrodes for Welding
AS 1553.1	Low Carbon Steel Electrodes for Manual Arc Welding of Carbon Steels and Carbon-Manganese Steels
AS 1553.2	Low & Intermediate Alloy Steel Electrodes for Manual Metal Arc Welding of Carbon Steels and Low and Intermediate Alloy Steels
AS 1167.2	Welding and Brazing - Filler Metal for Welding
AS 1858	Electrodes and Fluxes for Submerged Arc Welding
AS 1594	Hot-Rolled Steel Flat Products
AS 2214	Certification of Welding Supervisors - Structural Steel Welding
AS 3678	Structural Steel Hot Rolled Plates, Floorplates and Slabs
AS 3679	Structural Steel

PROTECTIVE COATING	
AS 2312	Guide to the Protection of Iron and Steel against Exterior Atmospheric Corrosion
AS 3750	Paints for Steel Structures
AS 1580	Paints and Related Materials - Methods of Testing
AS 4025	Paints for Equipment including Ships

BRICKWORK AND BLOCKWORK	
AS 1617	Refractory Bricks and Shapes
AS 3972	Portland and Blended Cements
AS 1672.1	Limes for Building

STORMWATER DRAINAGE	
AS 4058	Precast Concrete Pipes - Pressure and non-Pressure
AS 1741	Vitrified Clay Pipes and Fittings with Flexible Joints - Sewer Quality
AS 1646	Elastomeric Seals for Waterworks Purposes
AS 1597	Precast Reinforced Concrete Box Culverts
R11	Stormwater Drainage
R16	Precast Reinforced Concrete Box Culverts
R23	UPVC Pipes

SUBSOIL DRAINS	
R32	Sub-surface Drainage Materials
R33	Trench Drains

LANDSCAPING	
AS 4454	Compost, Soil Conditioners and Mulches
AS 1289	Methods of Testing Soils for Engineering Purposes

SECTION 3 SCHEDULES OF TECHNICAL DATA

Unless shown otherwise on the Drawings or in other documents the following Technical data shall apply to the respective work.

3.01 FILLING

Material to be used for filling shall comply with the following properties.

FILLING MATERIAL	
Liquid Limit	Maximum 40%
Plasticity Index	Maximum 20
Soaked California Bearing Ratio (CBR) (material passing 19mm sieve 90% modified compaction)	Minimum 15%
P.I. x % passing 0.425mm	Maximum 600

GRADING	
SIEVE SIZE (mm)	% PASSING
75.0	100
37.5	73 - 100
19.0	57 - 100
4.75	30 - 100
2.36	20 - 100
0.425	10 - 70
0.075	5 - 30

Compaction of filling at optimum moisture content shall be 98% Standard maximum Dry Density.

3.02 CONCRETE

Concrete shall comply with the following properties.

CEMENT CONTENT AND WATER CEMENT RATIO		
COMPRESSIVE STRENGTH AT 28 DAYS (F'c) MPa	MINIMUM CEMENT CONTENT kg/m3	MAXIMUM WATER/CEMENT RATIO
32	380	0.60
25	340	0.60
20	300	0.60
10	220	0.75

CONCRETE STRENGTH	
ELEMENT	MINIMUM COMPRESSIVE STRENGTH (F'c)
Vehicle Crossing	32 MPa
Footpath	32 MPa
Kerb and Gutter	32 MPa
Median	32 MPa
Stormwater Manholes (including covers)	32 MPa
Stormwater anchor blocks, encasement etc.	25 MPa

3.03 KERBS GUTTERS FOOTPATHS AND MEDIANS

The foundation under all Kerbs, Gutters, Footpaths and Medians shall be compacted to 95% Standard maximum Dry Density.

3.04 ROADWORKS AND HARDSTANDINGS

Roadworks and hard standings shall comply with the following properties.

COMPACTION REQUIREMENTS	
LAYER	MINIMUM COMPACTION (STANDARD MAXIMUM DRY DENSITY)
Subgrade	100%
Subbase	100%
Base course	100%

3.05 STORMWATER DRAINAGE

Bases for Precast Concrete Box Drains shall be 32 MPa concrete reinforced with SL72 reinforcing wire mesh.

SECTION 4 PRELIMINARIES

4.01 COORDINATION WITH COUNCIL REPRESENTATIVE AND NORTH SYDNEY COUNCIL

The party carrying out the work shall co-ordinate activities and co-operate with the Council Representative to ensure that the work proceeds to their mutual satisfaction.

If the work requires some prior work to be completed by NORTH SYDNEY COUNCIL, the Council Representative shall be notified of any requirements no less than seven days before such completion is needed but in sufficient time for the Council Representative to notify Council and for Council to have the work completed.

The Council Representative shall notify Council of any such requirements within four (4) working days of receiving notification from the party carrying out the work.

4.02 PROVISION FOR TRAFFIC

Prior to commencing any work on the site, a formal Risk Assessment of the impacts of the proposed work on traffic and pedestrian flow shall be carried out and documented in accordance with WHS & R and other relevant requirements.

Based on this risk assessment a Traffic Management Plan shall be developed. The Traffic Management Plan shall include drawings showing the positions of all warning signs and traffic control devices and the directions of traffic flow through and/or around the site for each stage of the work. The Traffic Management Plan shall be certified by a person who has passed an RMS approved Traffic Control course. Proof of the certifier's qualifications and authority shall be forwarded to the Council Representative.

The risk assessment and Traffic Management Plan shall be forwarded to the Council Representative at least fourteen (14) days prior to any work commencing on the site.

Approval of the proposed Traffic Management Plan shall be obtained from the RMS, Police and the relevant road Authority prior to implementing the plan. If the Council Representative or any of the approving authorities considers that the extent or arrangement of signs and control devices shown or other aspects of the Traffic Management Plan is inadequate, a new Traffic Management Plan shall be submitted, amended to satisfy the relevant requirements.

The approved Traffic Management Plan shall be implemented in accordance with the current edition of the relevant Australian Standard. Control signs, temporary safety fencing and all safety facilities shall be installed as shown and shall be maintained during each stage of the work.

In addition to the current edition of the relevant Australian Standard a minimum of one sandbag (or similar) shall be placed on every barricade. Also, as a minimum, the appropriate operational safety lighting shall be placed on every second barricade or parawebbing post.

The implementation of the Traffic Management Plan shall be monitored daily and if it is found to be inadequate immediate steps shall be undertaken to correct any faults or failures of the implementation. If the Council Representative deems it necessary, a revised Traffic Management Plan shall be submitted. Any revisions to the Traffic Management Plan are subject to the same approvals as the original Traffic Management Plan.

If the Council Representative advises that he is of the opinion that a danger exists due to the inadequacy of warning signs, barricades or other safety devices or due to procedures for control of traffic, supplementary signs, barricades or safety devices and/or procedures as necessary shall be put in place immediately to overcome the danger.

Access for property owners in the vicinity of the site shall be maintained at all times and all owners whose access is interrupted by work shall be consulted prior to work commencing. Any interruptions shall be minimised, and essential interruptions shall be allowed only at times acceptable to the owners.

4.03 PROVISION FOR TREES

Prior to commencing any work on the site, a Management plan of the impacts of the proposed work on existing trees shall be developed. The Management Plan shall outline the condition of all the trees on site and how each tree will be protected during the construction period.

The risk assessment and Management Plan shall be forwarded to the Council Representative at least fourteen (14) days prior to any work commencing on the site.

If the Council Representative considers that the extent control devices shown or any other aspects of the Management Plan are inadequate, a new Management Plan shall be submitted, amended to satisfy the relevant requirements.

4.04 SITE SAFETY

The implementation of the Management Plan shall be monitored daily and if it is found to be inadequate immediate steps shall be undertaken to correct any faults or failures of the implementation. If the Council Representative deems it necessary, a revised Management Plan shall be submitted. Any revisions to the Management Plan are subject to the same approvals as the original Management Plan.

All traffic control shall be in accordance with either the current version of AS1742.3 and its associated handbooks or the RMS document "Traffic Control at Work Sites". Plans modified from these two documents shall contain a reference to the standard plan on which they are subsequently based upon.

Where the works to be undertaken are likely to affect vehicular traffic, the Police Area Traffic Branch are to be contacted for their approval prior to works being carried out.

Where the works to be undertaken are likely to affect vehicular traffic within 100m of any set of traffic lights or on one of the roads listed below, a Road Occupancy or a Road Development Permit shall be obtained from the RMS prior to commencing work on site.

- Falcon Street – Pacific Highway to Military Road
- Military Road – Falcon to MacPherson Streets
- Pacific Highway – Harbour Bridge to Christie Street
- Berry Street – Pacific Highway to Arthur Street
- Arthur Street – Berry to Mount Streets
- Miller Street – Falcon Street to Suspension Bridge
- Pedestrian and vehicular access to private properties shall be maintained wherever possible. Where property access is affected, a minimum of 48 hours written notice must be given to residents.
- Responsibility for the safety of pedestrians and other road users' rests with the permit holder from the commencement of work until permanent restoration of the roadway and/or footpath is undertaken.
- All traffic control shall always be available on-site.
- Traffic controllers must have appropriate and current traffic control certification. Appropriately certified personnel must only make selection of and modification to Traffic Control Plans to meet the requirements of the site location.

Typical Traffic Control for minor short-term work on footpaths and road pavements are shown in the standard forms - refer to Section 22 of this Specification.

The contractor shall provide evidence that a service investigation has taken place to the Council Representative prior to commencement of excavation works.

As part of the site safety audit, the contractor shall notify the residents of the impending works in accordance with the Council Representative's Notification Procedures shown in the Standard Forms. A copy of a typical notification letter for minor works is included with the standard forms – refer to Section 24 of this Specification.

Additionally, as part of the site safety audit, the contractor shall complete a site-specific risk assessment report prior to the commencement of works. This report shall be available on site for the inspection by the Council Representative.

4.05 INSPECTION DURING MANUFACTURE

Materials and equipment covered by this Specification may be subject to inspection by the Council Representative at any time during construction at the manufacturer's works or those of his sub-contractors.

Should the Council Representative so direct, no materials or equipment shall be dispatched by manufacturers or suppliers until notification, by the Council Representative, in writing that the inspection requirements have been satisfied.

4.06 INSPECTION, TESTING & REPORTING GENERALLY

All inspection and testing necessary to ensure that the work is carried out in accordance with this Specification shall be carried out as the work proceeds, including all tests referred to in the Specifications or Drawings.

The Council Representative may waive requirements for testing of specific items of work or materials in cases where, in the opinion of the Council Representative, the work is seen as complying with the requirements of the Specification and further testing is not justified. However, no waiver shall apply unless provided in writing by the Council Representative and any waiver shall only apply to the specific item of work set out in the written advice from the Council Representative.

The results of all inspections and tests shall be provided to the Council Representative as soon as practicable.

4.07 QUALITY ASSURANCE TESTING & REPORTING

Prior to commencing work on site or ordering any materials, a documented plan for Quality Assurance inspection, testing and reporting shall be submitted to the Council Representative.

The plan submitted to the Council Representative shall include the names and positions of staff responsible for managing Quality Assurance for work covered by this Specification and shall include sample forms for inspection, testing and reporting the results of tests for both materials and workmanship.

Acceptance or rejection by the NORTH SYDNEY COUNCIL, it's agents, or the Council Representative, of inspection or test certificates provided under the Quality Assurance procedures shall in no way relieve the responsible party from fulfilling all or any of their obligations under the Specification.

Tests and test certificates carried out or provided pursuant to the Specification generally and which have been included in support of Quality Assurance programme shall have the same effect (if any) on obligations as if they were carried out independently of the Quality Assurance programme.

4.08 MATERIALS/WORK DESIGNATED FOR Q.A. REPORTING

The responsible party is encouraged to make use of the Quality Assurance programme which is implemented for the Works, by designating a broad range of materials and workmanship and providing corresponding inspection and test reports regularly to the Council Representative, as evidence of compliance of the work with the requirements of the Specification.

The minimum requirements of materials and work to be inspected, tested and reported upon, under the Q.A. reporting programme for this Specification, are as follows:

Materials:
- Backfilling materials
- Pipes, rubber rings & jointing compounds
- Concrete
- Road sub-base and base materials.

Workmanship: Formwork ready for inspection
Pipes laid ready for inspection
Compaction of backfill
Compaction of sub-grade, sub-base, base and base courses for roads, hard standings and other pavements.

4.09 ENVIRONMENTAL MANAGEMENT

Prior to commencing any work on the site, a formal Risk Assessment of the impacts of the proposed work on the environment shall be carried out and documented in accordance with EPA and other relevant requirements.

Based on this risk assessment an Environmental Management Plan shall be developed. The Environmental Management Plan shall be developed in accordance NORTH SYDNEY COUNCIL guidelines and the requirements of the EPA and other relevant authorities. The Environmental Management Plan shall include drawings showing the positions of all environmental control devices for each stage of the work.

The risk assessment and Environmental Management Plan shall be forwarded to the Council Representative at least fourteen (14) days prior to any work commencing on the site. If the Council Representative or any of the approving authorities considers that the extent or arrangement of environmental control devices shown or other aspects of the Environmental Management Plan is inadequate, a new Environmental Management Plan shall be submitted, amended to satisfy the relevant requirements.

The Environmental Management Plan shall be implemented in accordance with the requirements of the EPA and other relevant authorities. Environmental control devices shall be installed as shown and shall be maintained during each stage of the work.

The implementation of the Environmental Management Plan shall be monitored daily and if it is found to be inadequate immediate steps shall be undertaken to correct any faults or failures of the implementation. If the Council Representative deems it necessary, a revised Environmental Management Plan shall be submitted.

If the Council Representative advises that he is of the opinion that a danger exists due to the inadequacy of environmental control devices or due to procedures for control of environmental risks, supplementary environmental control devices and/or procedures as necessary shall be put in place immediately to overcome the danger.

All requirements as set out by the appropriate regulations including the Clean Waters Act, the Environmental Protection Authority and Local Government shall be met.

4.10 WORK HEALTH AND SAFETY MANAGEMENT

Prior to commencing any work on the site, a formal Risk Assessment covering all potential impacts to the health and safety of workmen and the public shall be carried out and documented in accordance with WorkCover guidelines.

Based on this risk assessment a WHS & R Management Plan shall be developed. The WHS & R Management Plan shall be developed in accordance with WorkCover guidelines and the requirements of the Construction Safety Act and other relevant requirements.

The risk assessment and WHS & R Management Plan shall be forwarded to the Council Representative at least fourteen (14) days prior to any work commencing on the site. If the Council Representative considers that the WHS & R Management Plan is inadequate, a new WHS & R Management Plan shall be submitted, amended to satisfy the relevant requirements.

The Management Plan submitted shall include the names of managers, supervisors and field staff responsible for maintaining compliance with the Plan and all relevant legislative requirements. Details of training, certificates and/or qualifications for all such personnel shall be included.

The plan submitted shall include for at least one ganger or supervisor who is employed on the site full time to be responsible for ensuring that all requirements of the Plan and all relevant legislative requirements are implemented. The plan shall allow for periodic reports to be submitted to and countersigned by the relevant Manager. These reports shall be submitted regularly to the Council Representative.

Neither the submission of an WHS & R plan nor its acceptance by either the Council Representative or NORTH SYDNEY COUNCIL shall in any way relieve any other party of their WHS & R obligations.

4.11 PARKING METERS – GENERAL INFORMATION FOR ON-STREET PARKING INFRASTRUCTURE

Where a work site is adjacent to an existing parking meter zone, it is to remain operational. The following requirements to access the parking meters must be maintained. Therefore, the following clearances must always be complied with:

a. Face of meter (at coin slot) – 1m minimum,
b. Rear of meter - 300mm minimum,
c. Both sides of meter - 500mm minimum,
d. The above clearances may be subject to the width of the footpath and/or adjacent structure to the meter.
e. Height clearance - 2m above ground level minimum,
f. Customers must have clear and safe access to the face of the meter.

Figure: Parking Meter – clearance details, for hoarding or other structures

All parking meter bay numbers and line markings must always remain clearly legible. Where bay numbers are on the top of the kerb or footpath and are obscured by the hoarding, building materials or other obstruction, the bay numbers must be cleared to maintain their visibility.

Should the applicant/developer/contractor require the removal/relocation/temporary bay changes of existing parking meters and associated meter infrastructure, the application and the plans must include the street address of work site, street name, meter ID and parking space/bay numbers in relation to the proposed works and/or temporary/permanent driveways for the entire site for assessment.

All costs related to meters and associated meter infrastructure including signage and parking bay line markings shall be paid in full to Council prior to the changes being made to existing meter infrastructure.

Exception is when the applicant/developer/contractor has been given pre-approval from Council and modification or temporary changes to the infrastructure is underway.

4.12 PARKING METER ZONE - MODIFICATION/ADJUSTMENT TO THE ON-STREET PARKING INFRASTRUCTURE

Works being carried out in the location or vicinity of Council's on-street parking infrastructure shall ensure parking meters and in-ground sensors are not damaged and shall be either protected or removed in accordance with the requirements of this section of the Specification.

Council's on-street parking infrastructure includes parking meters, parking sensors, meter configuration (meter software is designed to match street signage restrictions), signage plates/poles and line-marking.

4.12.1 CRITICAL NOTE

Parking sensors are located in-ground and generally in the centre of the parking meter space/s where they can generally be seen from the road. They contain long life batteries and have the potential to **explode** if they are tampered with or pierced with force (any battery may explode if drilled or hammered regardless of the battery type).

4.12.2 GENERAL

Sensors are mostly visible from the surface and are listed on **Dial Before You Dig**.

The minimum safe work distance from an existing sensor when operating heavy machinery, drilling, sawing, or other similar activity is one (1) linear metre.

If the proposed work is less than one (1) linear metre of an active sensor, the sensor must be removed by Council's meter contractor. Please contact Council's Parking Meter Team on (02) 9936 8100.

4.12.3 SENSOR REMOVAL/REPLACEMENTS/PROTECTION

Sensors must be arranged to be removed by the Council (at the applicant/developer/contractor's expense) if the heavy works are within one (1) linear metre of an active sensor.

Notice of seven (7) business days or greater must be provided to the Council to arrange removal at a standard fee. A higher urgent fee will be applied for all urgent requests of less than seven (7) business days' notice and minimum of 3 business days' notice.

Failure to comply with this requirement will result in the applicant/developer/contractor being penalised and required to pay penalties and additional fees for the urgent removal and the replacement of the damaged sensor.

Refer to Fees & Charges on the Council's website portal. Search for 'meter' or 'sensor' for the cost to undertake the following works:

a. Sensor Removal & Replacement
The Council's Parking Meter team require **seven (7) business days' notice or greater**, to schedule a meter contractor to remove a sensor(s).

b. Urgent Sensor Removal & Replacement,
This fee is applied when there is **less than seven (7) business days' notice or minimum 3 business days' notice.**

c. Special Conditions if sensors remain in the road
Where heavy works are not affecting the roadway and/or work are NOT WITHIN one (1) linear metre of active sensors, YET the heavy vehicles/equipment will be parked/stored within the parking spaces:

Applicants/developers/contractors must not place heavy equipment and materials, drive plant and vehicles with metal tracks directly on top of visible sensor/s at any time. If this cannot be avoided, the sensor/s must be removed by Council's meter contractor. Please contact Council's Parking Meter Team 02 9936 8100.

Failure to comply with this requirement will be required to pay penalties and additional fees for the urgent removal and the replacement of the damaged of the sensor.

4.12.4 ON-STREET PARKING INFRASTRUCTURE CHANGE - SIGNAGE/METER

'Signage changes' relates and affects street signage blades, poles, line marking and parking meter bay/space numbers.

Signage changes affect parking meters, sensors, bay numbers and bay numbering sequences, parking meter contractors (i.e., cash collection and technicians), Parking Service Officers and the general public. To ensure a smooth changeover and reduce customer confusion, the applicant/developer/contractor shall undertake the following measures:

a. **Meter configuration and bagging**
Provide the Council's Parking Meter team with early notice so that the parking meter configuration and meter contractor can be scheduled and coordinated. *Note Meters can only be turned off and/or removed by the Council.*

At the approval of Council's Project Manager and/or Meter Team, the applicant/developer/contractor will be requested to securely cover and/or add further protection such as batten/rug or blanket/other around the meter (the full body of the meter including the bolts when exposed, due to security matters).

b. **Pre and post works** – includes **meter line-marking and bay numbers** – Where new line-marking is required, at the approval of Council's Project Manager and or Meter Team, the applicant/developer/contractor will be requested to either reapply line marking with white thermoplastic lines in the agreed location; or repaint the line marking with white paint temporarily in the original locations as best as possible.

Leading up to completion of works:

i. The location of the **permanent line marking** shall be set out for approval by the Project Manager or the Meter Team. The Parking Meter Team are required to review **signage and pre-existing parking bay/space** lengths prior to new line marking.

ii. The **meter bay/space numbers** are managed by the Council's Parking Meter Team & Works Section Staff.

iii. **Poles & Signs** - when existing poles and signage are removed and reinstalled, the applicant/developer/contractor shall ensure the poles and signs are stored safely during the works and reinstalled in the same locations.

iv. **Post works,** outlined in the above site inspections ensure that standard length of bays/spaces and bay number sequencing are checked, corrected, and maintained. Standard length of meter bay/spaces as follows:
- Internal or closed ended spaced shall be minimum 6m.
- Open ended meter bay/spaces shall be minimum 5.4m

v. Upon approval, the line marking that separates the parking bays/spaces are to be marked using thermoplastic paint as per standard drawing S301A, S301B and S301C.

vi. If the nature of the road works is not changing the parking zone/kerb line configuration, the Parking Meter Team are required to review site prior to line marking as above.

vii. The applicant/developer/contractor shall advise the Project Manager or Meter Team when Council approved works are close to completion so that work can be coordinated with the Council's Street Signage and Meter teams.

c. **Footpath level changes:** Where footpath levels are changing by more than 200mm, the applicant/developer/contractor shall provide for a new concrete footing in accordance with standard drawings S302 to S306 . The Council's Meter team will be able to adjust the height of the meter where height changes are less than 200mm. Changes to the footpath levels greater than 200mm will either require meter adjustments or meter relocations - all costs for adjustment and/or relocations shall be borne by the applicant/developer/contractor – refer to Fees & Charges on the Council's website portal then search for 'meter'.

d. **Footpath and Kerb replacement** generally removes the line marking and bay numbers (bay/space number pads are painted/thermoplastic on paving or generally aluminium pads applied on kerb). Therefore, line marking, and bay numbers will need repairing or replacing at the end of the project. See item 4.12.4 b. above.

i. **Parking meter clearance** – This is the ideal clearance requirements when a parking meter zone remains available to some of the parking metered spaces. See item 4.11 above.

ii. **Meter base or bolts exposed** – For security reasons, the parking meter footing and bolts should not be exposed during the works. If there is repaving and the bolts can be seen, the applicant/developer/contractor shall cover up the bolts with sandbags or fully covered in plastic from top of meter to base.

iii. **Meter removal/relocation** – A parking meter shall be removed or relocated if there will be major changes to the footpath. Council's Meter Team will coordinate the works when the application is made, and costs have been paid by the applicant. The meter should be reinstalled to its original location where possible. The meter location should be noted and marked on the roadway or opposite side of the street before removal if it is to be reinstalled at a later date.

iv. **New paving + new meter footing** – when a meter is removed due to major works or change in levels, the Contractor shall install a suitable footing as per standard drawings S302 to S306.

v. **Grass verge – platforms – meter requirement -a**ll meters in grass verges are to have a concrete platform around the meter in accordance with Standard Drawing S306.

All works associated with parking meters shall be coordinated with the Council's Project Manager/Superintendent and the Parking Meter Team.

SECTION 5 SITE PREPARATION

5.01 GENERAL

All existing foundations, concrete slabs on ground and other structures or obstructions on the site shall be demolished except for specific structures which are designated herein or on the drawings as to remain.

In the case of structures designated to remain on site, damage thereto during construction of the works shall be made good to the satisfaction of the Council Representative.

All existing services are to be located and if necessary disconnected prior to commencing site preparation and there shall be no damage to water, drainage, electricity, telephone, gas, parking meter or other services which are in use or are required by the owners of the services.

All waste/debris etc. from the site shall be disposed of to a legal dump site. The Council Representative may seek written confirmation that all waste/debris etc has been disposed of accordingly. All waste/debris etc that is recyclable shall be recycled or sent to a suitable site for recycling.

5.02 REMOVAL OF TOPSOIL AND VEGETATION

Topsoil and vegetation shall be removed, stumps grubbed out and the holes backfilled and compacted as specified under backfill, except in cases where the area is to be generally excavated to a level below the stumps. All trees that are to be removed shall be undertaken in accordance with the Workcover code of practice for Amenity Tree Workers.

Areas designated in the documents as not to be cleared, trees which must be preserved, and natural surfaces which are to remain as natural surfaces at completion of the Works, shall be protected from damage during demolition and throughout the course of the work.

Topsoil suitable for use in landscaping may be stockpiled on site for later use if there is sufficient room on site and landscaping is included in the Works or if landscaping by others is proposed. Stockpiles shall be maintained tidy. Silt and soil shall be prevented from washing down on the site, onto surrounding areas, or into drains, etc. Stockpiles shall not be located within the root zone of any trees that are to be retained

Topsoil or other material remaining in stockpiles at the conclusion of the Works shall be compacted, trimmed and grassed in accordance with the Landscape Works section of this Specification. Surplus topsoil shall be removed from site and disposed of as for disposal of waste/debris etc described in the GENERAL section above.

5.03 SILTATION

Siltation and sediment control devices shall be installed to all areas which may be subject to erosion – refer to standard drawings S501 to S5011 for minimum requirements.

All requirements as set out by the appropriate regulations including the Clean Waters Act, the Environmental Protection Authority and Local Government shall be met in regard to the control of sediment and siltation that would otherwise run off the site.

5.04 PROTECTION OF EXISTING TREES

Existing trees specified or shown on the drawings as not to be removed shall be protected from all damage during the currency of the work. Clarification shall be sought from the Council Representative as to the status of those trees not specified or shown as not to be removed on the drawings prior to the commencement of work.

Bulk materials and harmful materials including oil, waste concrete, clearings, boulders and the like shall not be stored, stockpiled, dumped or otherwise placed under or within 1.5m of the tree's trunk. Spoil from excavations shall not be placed against tree trunks, even for short periods and wind-blown materials such as cement shall be prevented from harming trees and plants.

Stays, guys and the like shall not be attached to trees and tree bark shall not be damaged in any way.

When working near trees topsoil shall not be removed from within the drip line of trees unless otherwise specified. If it is necessary to excavate within the drip line, hand methods shall be utilised such that root systems are preserved intact where possible. The duration of open excavations under tree canopies shall be negotiated with the Council Representative at the time of the excavation.

Tree roots exceeding 80mm nominal diameter shall not be cut. Where it is necessary to cut tree roots, a saw or similar means shall be used such that the cutting does not unduly disturb or rock the remaining root system.

Backfill is to be placed in layers, each of 150mm maximum depth, compacted to a dry density similar to that of the surrounding soil. Backfill around tree trunks or over the root zone shall not be above the original ground surface unless agreed to by the Council Representative. Immediately after backfilling, the root zone surrounding the tree shall be thoroughly watered.

Protective barriers consisting of a minimum of steel star pickets at 1m centres with 1m high barrier mesh, may be required to protect the trunks from damage.

SECTION 6 EXCAVATION

6.01 GENERAL

Excavation shall be to the lines and levels shown in the Drawings unless directed otherwise by the Council Representative. Excavating plant and equipment shall be capable of performing the work to the satisfaction of the Council Representative.

If, in the opinion of the Council Representative, an appropriate area exists on the site suitable material may be stockpiled and used for backfilling, provided that excess stockpiled material is disposed of when all backfilling is completed.

Surplus excavated material or material classified as unsuitable for use as fill elsewhere on the site shall be disposed of to a legal dump site.

Excavations shall be trimmed to line and level by machine and/or by hand as necessary to produce profiles to the accuracy required by the Drawings and/or Specification.

Over excavations in rock shall be backfilled with mass concrete of a strength similar to the rock.

In the case of excavations for roadworks and/or hardstandings, the area shall be compacted to the standard specified in the relevant section of the Specification unless shown otherwise in the Drawings.

Surface drains shall be constructed and maintained around and within the site to control surface water and keep excavations dry. Sumps shall be provided in low areas to collect water which cannot be controlled by drains.

Silt traps shall be provided to prevent the discharge of silt or debris to other property, into the environment or into creeks, rivers, public drains or sewers.

Silt traps and sumps shall be pumped out continuously while ever water is present. Material in excavations softened or damaged by flowing or ponded water shall be removed and reinstated as for over excavations.

6.02 SAWCUTTING

Should excavation be required in an area of concrete or asphalt, nominal sawcuts shall be made in the surface prior to excavation.

In the case of excavations for drainage Works, sawcuts shall be provided on both sides of the trench. For kerb and/or gutter Works, sawcuts shall be provided around the perimeter of the area of pavement to be reinstated. Medians shall be sawcut on the face of new median kerb alignment.

6.03 EXCAVATION FOR FOUNDATIONS

The exposed surface at the bottom of each excavation shall be adequately protected from disturbance by other operations or by ground water or stormwater. Care shall be taken to avoid disturbance to adjacent material during removal of any foundation material which has been disturbed, allowed to deteriorate or otherwise made unsuitable. Material removed shall be replaced by selected material compacted as directed by the Council Representative.

Where footings are to be founded on rock, the rock surface shall be fully exposed to the depth and slope shown in the Drawings, shaped to conform with the shape of the footings and left in a roughened condition. Any pockets of unsuitable material in the bearing surface shall be removed and the pockets filled with mass concrete of a strength similar to the rock.

Excavations shall be kept free from water until concrete is placed and formwork is removed, and until all concrete below water level is sufficiently set or protected.

6.04 SHORING

Where necessary, excavations shall be supported and temporary supports provided to protect adjacent property, services and other permanent construction, and to provide safe working conditions in and about the excavations.

Temporary supports shall be designed and constructed in accordance with the structural and safe working requirements of the relevant local and statutory authorities. Working Drawings for temporary supports, conforming with all relevant requirements shall be submitted to the Council Representative at least two weeks before it is intended to erect the supports.

Temporary supports shall be removed from the excavations and excavations backfilled as construction progresses. Removal shall be affected in such a way as not to damage any foundation or finished concrete.

6.05 UNDERGROUND SERVICES AND BUILDINGS

Existing buildings and underground services including telephone, redundant parking meter cables, electricity, water supply, stormwater, sewage, drainage, gas lines and traffic detectors shall be protected as required by the owner of the respective services.

It shall be deemed that inquiries have been made with all authorities likely to have services in the area and buildings in the area have been inspected and allowance has been made for all necessary protective works. Prior to the commencement of any Excavation work documentary evidence shall be submitted to the Council Representative in order to verify that such inquiries have been made and all necessary precautions have been taken and the temporary works are in place.

Information provided by NORTH SYDNEY COUNCIL regarding services on the site or regarding adjacent buildings is provided as a guide only and does not relieve the responsible parties of their responsibility to inform themselves as to conditions on, under or around the site.

In cases where services including drainage pipes are encountered during excavation, the Council Representative shall be immediately notified, and he may issue instructions as to what protection and/or concrete encasement is to be provided.

Exploratory hand excavations shall be carried out in all areas where services may be encountered and excavation around services shall be by hand as necessary to avoid damage to the services.

6.06 CONDITIONS BELOW GROUND

If rock or artificial obstructions are encountered the Council Representative may permit modifications to details to mitigate some of the additional cost of excavating in rock or removing obstructions. Requests to amend details will only be considered if such amendments do not adversely affect the structural strength, stability or the usefulness of the Works.

If water is encountered, such sections of the site shall be dewatered as necessary to permit work to proceed as required or such other measures as may be authorised by the Council Representative shall be undertaken.

6.07 TREE ROOTS

Where excavation must be made in the vicinity of existing trees and tree roots are likely to be encountered, provisions must be made for all roots to be pruned in accordance with AS4373-2007. This means a clean smooth cut with a saw or other approved tree pruning implement and may entail the use of a qualified arborist if any roots greater than 80mm diameter are encountered.

6.08 BACKFILLING

All timbering, bracing and rubbish of all descriptions shall be removed before or as backfill is placed.

Backfilling shall not commence until the Council Representative has been notified and, if he deems necessary, has inspected the work.

Suitable granular materials only shall be used for backfill, except that non-granular materials such as silt and clay may, at the Council Representative's discretion, be used for the upper 300 mm of backfill around exterior walls and foundations.

All spaces excavated for foundations and not occupied by permanent work shall be backfilled to the surface of the surrounding ground and compacted as specified or as directed by the Council Representative.

Backfill on all sides of piers and walls shall be carried up at the same level until ground surface is reached. No backfill shall be placed against any abutment or wall until 14 days after placing the concrete unless authorised by the Council Representative.

Selected material surplus from excavations may be used for backfilling trenches if permitted by the Council Representative.

6.09 COMPACTED FILL

Areas to be filled shall be prepared, trimmed and finished as provided under the EXCAVATION section of this Specification. Fill shall not be brought into fill areas until the Council Representative has been notified and, if he deems necessary, has inspected the prepared areas.

Preparation shall include the removal of all topsoil, vegetation, debris, construction rubbish or materials or existing obstructions which would create soft or hard spots under the fill such as to prevent even compaction of the fill.

6.10 FILLING AND BACKFILLING MATERIAL

Fill material shall be as specified in the Drawings or in Project Specific Specifications.

Backfill material shall be a selected predominately granular material which is capable of being compacted to the necessary densities using equipment which is available on site and can work the material in close proximity to trench walls, adjacent structures and the like.

If crushed and re-cycled concrete is used for fill and/or backfill, it shall comply with the description of the appropriate Class of material in the Section RE-CYCLED MATERIALS FOR FILLING AND BASES in this Specification.

6.11 COMPACTION OF FILL AND BACKFILL

Material shall be spread in layers extending the full width of the excavation and each layer shall be compacted at optimum moisture content to achieve the specified density. The finished thickness of each layer (after compaction) shall be not greater than 150 mm.

Compaction shall be controlled by conducting field density and laboratory compaction tests on the filling material as the compaction progresses. All testing is to be carried out by a NATA registered laboratory. The results of the density testing must be submitted to the Council Representative.

Settlements of excavations, fill and backfill which occur during construction shall be filled, compacted and trimmed as they occur. Soft spots or unsound areas shall be dug out as soon as they occur, and the space filled with sound material properly compacted to a condition equivalent to the surrounding sound material.

In the case of embankments, fill shall be placed and compacted not less than 0.75m beyond the line of the face of the batter and shall be cut back to the correct line and level when the embankment is completed.

SECTION 7 CONCRETE WORKS

7.01 CONCRETE QUALITY

7.01.01 Ready Mixed Concrete

Ready mixed concrete shall be produced in accordance with the requirements of the current edition of the relevant Australian Standard and shall be obtained from a supplier capable of complying with the said standard.

7.01.02 Site Mixed Concrete

Site mixed concrete shall comply with the current edition of the relevant Australian Standard. The methods of batching, mixing and transportation shall be to the satisfaction of the Council Representative.

7.01.03 Mix Design

The mix proportions of the various types of concrete shall be submitted to the Council Representative at least seven days before the concrete is placed. The concrete shall conform to the following requirements:

* Portland cement shall be type GP unless otherwise shown on the drawings;

* Aggregates shall comply with the current edition of the relevant Australian Standard as applicable and their maximum size shall be as shown on the Drawings or;

* Mixing water shall be free from substances deleterious to concrete or steel;

* Characteristic compressive strength F'c and slump, shall be as shown on the Drawings. If not shown on the Drawings, the slump shall be the minimum necessary for the proper placing and compaction of the concrete;

* Chemical admixtures shall not be used, unless specified. If it is proposed to use admixtures they must be in accordance with the current edition of the relevant Australian Standards and the Council Representative must be notified of the intention to use such admixtures. The Council Representative may refuse permission for the use of admixtures if, in the opinion of the Council Representative, they may be detrimental to the quality, finish or durability of the Works.

7.02 MATERIAL STORAGE

Cement shall be stored in weather-tight buildings, bins or silos, and protected from dampness and contamination. Bags of cement shall be so stacked as to allow earlier deliveries to be used first. Any cement which is lumpy or has otherwise deteriorated during storage shall not be used.

Aggregate stockpiles shall be arranged in a manner which will prevent intermixture with other types of aggregate and contamination by other materials. Moisture content shall be uniform when the aggregates are used.

7.03 SAMPLING AND TESTING

Samples of concrete shall be taken for project control testing and tests carried out as described in the current edition of the relevant Australian Standard.

The sampling and the making, curing, capping and testing of test specimens shall be in accordance with the current edition of the relevant Australian Standard and shall be carried out by a NATA registered laboratory. If these services are not available, the Council Representative must be satisfied that the personnel carrying out the tests are competent to do this work.

The laboratory test certificates shall be forwarded to the Council Representative.

Acceptance criteria shall be as defined in the current edition of the relevant Australian Standard.

7.04 FORMWORK

7.04.01 General

At least 24 hours' notice shall be given to the Council Representative when the formwork is ready for inspection. If the Council Representative considers that any formwork or falsework may be inadequate for its intended purpose, concrete shall not be placed in the formwork until the Council Representatives satisfied as to the adequacy of the formwork or falsework.

Should any formwork be displaced during concreting or within the period specified for the retention of formwork, the concrete shall be removed between such limits as the Council Representative may determine, construction joints shall be formed, and the section of work shall be reconstructed.

Forms shall be chamfered for re-entrant angles and filleted for corners, the face of the bevel in each case, unless otherwise shown or specified having a width of 25mm.

Concrete work which does not comply with the Specification or which has other defects due to inadequacy of formwork, shall be removed and replaced, or the defects shall be rectified as directed by the Council Representative.

7.04.02 Joints in Forms

Where form joints have been shown on the Drawings these shall be included in the formwork design and shall be shown on the formwork shop drawings. If other joints, such as construction joints, are required details shall be submitted to the Council Representative at least 7 days prior to their construction.

Surfaces which will be exposed to view shall be formed with an approved grade of plywood sheeting. Sheeting may be thick sheets without support between studs or thinner sheets may be used as a surfacing layer over the formwork. In either case, joints between sheets, surface defects and holes shall be filled and smoothed before treatment with form release agent.

Joints in formwork, blockout pieces and formwork supports shall be constructed so as to permit easy removal and stripping despite any swelling which might occur when the formwork is in place.

All form joints shall be sufficiently tight to prevent the leakage of fines from the concrete. Joints between form panels, stop ends, bottoms of walls and column forms shall be sealed with strips of formed polyurethane or by other appropriate means. Any indications of leakage in the finished concrete will render that concrete liable to rejection.

7.04.03 Form Bolts and Ties

Bolts and ties, if shown on the Drawings, shall be located as shown. Coil ties and she-bolts shall not be used without cones. For all exposed surfaces form bolts and ties will be set in a regular pattern so as to give an even appearance upon stripping. This pattern shall be submitted to the Council Representative at least 7 days prior to the formwork being erected. Snap ties shall not be used except for minor work not subject to substantial loading. Holes left by ties, she-bolts or other form fixings shall be plugged with cement mortar and finished flush with the concrete surface.

7.04.04 Treatment of Formed Surfaces

All form faces shall be treated prior to placing concrete with a suitable release agent. The release agent shall be applied uniformly without runs or puddles and shall be kept off reinforcement and construction joint surfaces. Removable portions of formwork ties and bolts shall be greased.

7.04.05 Cleaning of Forms

All dust, debris, rust or other stains shall be removed from the interior of the forms before concrete is placed. Readily removable panels which permit cleaning and inspection immediately before placing of concrete shall be provided at bottoms of all wall and column forms.

7.04.06 Removal of Forms

Removal of formwork shall be affected in such a manner as will not damage the concrete or affect the safety of the structure.

For concrete made with Type GP cement the stripping times shall generally not be less than seven days. All cantilevers and suspended slabs shall remain propped for at least 28 days.

Reduced stripping times may be allowed if undisturbed shores are incorporated in the formwork or if evidence is furnished that the concrete has sufficient strength to support safely its own weight and superimposed loads.

Walls shall not be erected, nor any permanent loads placed on suspended slabs or beams until at least one week after the removal of supporting formwork and props.

7.04.07 Forming Below Ground Level

Side forms may be omitted below grades where soil conditions are such as will allow the correct shapes and sizes to be cast. The sizes of members shall, however, be increased as required to provide the additional cover of 50mm. Unless otherwise specified or shown on the Drawings, filling used as formwork below slabs or other structural concrete, shall be thoroughly compacted. Unless otherwise specified or shown on the Drawings, filled or excavated surfaces on which concrete will be cast shall be blinded with quarry dust, sand or weak concrete and covered with approved waterproof sheeting.

7.04.08 Off-Form Finishes

Formwork shall comply to standards specified on the Drawings or in other Documents. The Council Representative shall be notified as to how any repairs to defective concrete are to be carried out. After agreement by the Council Representative as to how repairs are to be affected the repairs shall be carried out without delay.

7.05 REINFORCEMENT

7.05.01 General

The reinforcement shall comply with the current edition of the relevant Australian Standards.
The grade and origin of all reinforcement shall be readily identifiable and test certificates shall be furnished to the Council Representative, if so, directed by the Council Representative.

Reinforcement shall not be spliced, welded or bent on site unless specifically shown on the Drawings.

The Council Representative shall be notified at least 24 hours before the reinforcement is completely fixed and ready for inspection. Reinforcement shall be maintained in the specified positions until the pouring of concrete is completed.

7.05.02 Storage and Cleaning

Reinforcement shall be stored clear of the ground and working areas and shall be protected from deterioration due to exposure. When concrete is placed, the reinforcement shall be clean and free from mill scale, loose rust, mud, oil, grease and/or other harmful matter.

7.05.03 Placing and Fixing

Reinforcement shall be accurately fixed in the positions shown on the Drawings and shall be securely held off the forms by suitable supporting chairs and by wiring together at all intersections with at least 1.6 mm dia. annealed wire.

Reinforcement shall not be held in position by bare steel supports or wires which extend to the concrete surface, nor by pieces of wood, brick, stone or other improvisations.

Reinforcement shall be supported at such intervals as will prevent excessive bending or displacement under construction foot traffic. Special stools extending above the reinforcement shall be provided to support planks for barrow runs and pipes for pumped concrete.

The cover shall be the minimum distance between the outside of any reinforcement including fitments and tie wires and the nearest concrete surface.

7.06 CORE HOLES AND EMBEDMENTS

Prior to pouring concrete all core and embedment requirements for all trades shall be installed.

In the case of core holes or embedments not shown on the Drawings, or where temporary openings are required for construction purposes, appropriate details shall be submitted to the Council Representative at least 7 days prior to their construction.

Reinforcing bars may generally be slightly moved to clear core holes and embedments, but they shall not be cut, nor shall any cores be cut in hardened concrete, without the Council Representative's permission.

Where reinforcing mesh must be cut, additional reinforcing bars of at least equal strength to the cut reinforcement shall be placed at each side of the core hole or embedment.

7.07 CONCRETE WORKMANSHIP

7.07.01 General

The Council Representative shall be notified of the intention to pour concrete at least 24 hours before commencing the work. Concrete shall not be placed in any section until the Council Representative has been notified and, if he deems necessary, has inspected the formwork and reinforcement.

All concreting shall be carried out in good light and weather conditions, under the supervision of a capable foreman.
Concrete placement shall not be commenced if excess water has not been removed from forms or excavations or if, the weather conditions could adversely affect the concrete.

Concrete shall not be placed under such conditions as will not allow the specified standard of concrete to be attained or if it is necessary to increase the specified maximum slump in order to produce a dense concrete mass free from air bubbles or other defects.

7.07.02 Transporting and Placing

Concrete shall be transported to its final position in a manner which will prevent segregation, contamination, or loss of materials.

Concrete shall be deposited as near as practical to its final position. Working it along the forms with vibrators will not be permitted.

Concrete shall not be freely dropped from a height greater than 1.5m.

In the construction of walls or other deep sections the concrete shall be placed and compacted in successive layers not exceeding 1.0m in depth.

The concrete placing shall be carried out continuously between construction joints and the rate of placing shall not be less than required to maintain a plastic concrete edge and to prevent the formation of cold joints.

7.07.03 Compaction

The concrete shall be thoroughly compacted by means of suitable mechanical vibrators to form a solid concrete mass free from honeycombing and air bubbles and with uniform solid surfaces.

Internal vibrators shall be used systematically at uniformly spaced points not further apart than twice the radius of visible vibration effect. Vibrators shall not be allowed to draw fines from the surrounding concrete or to damage partially hardened concrete. Vibrators shall not be allowed to be stationery in one position for more than 30 seconds.

7.08 EMERGENCY MEASURES

Where delays occur in concrete placing, a concrete batch may be held in the mixer or agitator for a period of up to 1 hour in suitable weather conditions.

Concrete to which the initial mixing water was added more than 1 hour, or which has been discharged from the mixer or agitator more than 30 minutes prior to placing, shall not be used in the work.

The addition of water to partially hardened concrete or re-tempering will not be permitted.

Where concrete placing is delayed until the concrete is in danger of taking its initial set, the line of stoppage shall be formed into a construction joint. If the stoppage occurs in a position considered unsuitable for a construction joint the concrete shall be removed from the forms back to a suitable location.

7.09 JOINTS

Construction joints shall be formed in locations and to details shown on the Drawings.

Where construction joints are not shown on the drawings, but are requested, the proposal shall be submitted to the Council Representative at least 7 days prior to the joint being constructed.

Before fresh concrete is placed against hardened concrete, the joint surfaces on the hardened concrete shall be thoroughly roughened and cleaned so that all loose or soft material, all foreign matter and all laitance are removed. Immediately before concrete placement, the forms near the joint shall be re-tightened and the joint surfaces shall be saturated with water. The free water shall be removed, and the joint surfaces shall be coated with neat cement slurry. The slurry shall not be allowed to dry out before placing the fresh concrete.

Dowels and tiebars shall be prepared and placed across joints where indicated on the Drawings. They shall be correctly aligned and securely held parallel to the surface of the finished slab, during placing and finishing operations. The spacing and vertical location of dowels and tiebars shall be as specified in the Drawings. The following tolerances shall not be exceeded:

* Horizontal location - half the diameter of the dowel or tiebar.

* Vertical location - dowels: half the diameter of the dowel; tiebars: 10mm.

Tiebars in longitudinal joints shall be omitted when the centre of the tiebar would be within 200mm (horizontally) of a transverse joint.

The method used to hold dowels in position shall be sufficiently rigid to ensure that individual dowels do not deviate by more than 3 mm in 300 mm from their specified alignment.

All dowels and tiebars shall be clean and free of oil, grease, loose rust and other foreign material when the concrete is placed to permit maximum bonding with the concrete for the unpainted portion of dowels. At construction joints the unpainted ends of dowels shall be installed in the first-placed slab. The portion of each dowel intended to move in the concrete shall be painted or coated with a suitable bond breaking compound prior to placing concrete.

7.10 CONCRETE CURING AND PROTECTION

Freshly cast concrete shall be protected from premature drying, excessively hot or cold temperatures, rain, wind and damage from other causes. In extreme temperatures special protection shall be provided as necessary.

All exposed concrete surfaces shall be cured either by ponding, covering with an impermeable membrane in close contact with moistened concrete, or by applying a suitable curing compound in accordance with the Manufacturer's recommendations. The Council Representative shall be notified of the intention to use a curing compound. Curing compounds will not be permitted on the surface of construction joints, where subsequent finishes are to be applied, or where they could detract from the appearance of the finished concrete.

Curing shall commence immediately after initial set of the concrete and shall continue for a period of at least seven days. If formwork is removed during the curing period, the exposed surfaces shall be cured for the remainder of the period.

In hot weather, rapid drying out after the curing period shall be prevented by wetting as necessary.

All finished concrete surfaces shall be protected from damage due to construction traffic, excessive loading or other causes.

7.11 DEFECTIVE CONCRETE

All concrete shall be subject to inspection by the Council Representative after the stripping of formwork and before any patching or finishing work has commenced.

Should any concrete be rejected, the whole of the concrete shall be removed between such limits as the Council Representative may decide and replaced with acceptable concrete.

Remedial work shall be carried out as soon as practical after removal of forms and inspection.

The Contractor shall submit to the Superintendent detailed work method statements for any rectification work required, prior to the work being carried out.

7.12 SURFACE FINISHES

Surface finishes shall be as shown on the drawings or as follows:

7.12.01 Floated Finish to All Visible Surfaces

After the concrete has been placed, struck off, consolidated and levelled, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float. The surface shall then

be consolidated with power-driven floats. Hand floating with wood or corked-face floats shall be used in locations inaccessible to the power-driven machine. Trueness of surface shall be re-checked at this stage with a three-metre straight edge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to the required tolerance. The slab shall then be re-floated immediately to a uniform smooth, granular texture.

7.12.02 Broomed Finish

Slabs shown on the drawings as broomed finish shall be given a coarse transverse scored texture by drawing a broom or hessian belt across the surface. This operation shall follow immediately after floating. Edges of slabs and joints shall be ironed and bevelled with a suitable handheld tool.

7.12.03 Floors and Wearing Surfaces

Floors and surfaces which are specified as non-slip concrete finish shall be machine floated as for the "Floated Finish to All Visible Surfaces" section of this Specification, except that final floating shall commence when initial set is well advanced, but the concrete is sufficiently plastic for traces of cement paste to be worked up to the surface. Floating shall continue until the surface is hard and able to be walked on without showing any footmarks, and some coarse aggregate is just visible at the surface.

A sample area shall be prepared for inspection by the Council Representative and to train their workmen, if necessary, in when to start and finish floating. The sample area shall be a slab surface which, in the opinion of the Council Representative, is away from general traffic.

The surface of the concrete shall be finished to true planes within 6mm in 3m, as determined by a 3m straightedge placed anywhere on the slab in any direction.

Unless shown otherwise on the Drawings, surface finishes shall be as follows:

WORK	REQUIRED FINISH
VEHICLE CROSSING	COVE TROWEL
FOOTPATH	COVE TROWEL
KERB AND GUTTER	STEEL TROWEL
KERB RAMP	COVE TROWEL
MEDIAN	KERB – STEEL FLOAT TOP – COVE TROWEL

SECTION 8 KERBS, GUTTERS, FOOTPATHS, AND MEDIANS

8.01 GENERAL

All works executed under this part of the Specification shall be constructed in straight lines or curves, without local irregularities, true to the alignment and grade shown on the Drawings and in accordance with the standard Drawings.

Gutters shall be cast in place either by slip forming or by conventional methods of setting up forms and placing concrete. They shall be formed as separate integral kerb and gutter for flexible pavements, but for concrete pavements they may be formed separately or formed integrally with the base or shoulder slab.

Where the gutters are constructed separately from a concrete shoulder slab, they shall be tied to the shoulder slab by steel tie bars, as detailed on the Drawings.

Where the gutters are formed before a concrete shoulder slab, the tie bars shall be inserted into holes formed or drilled into the face of the concrete after seven (7) days and bonded with epoxy concrete binder or other suitable methods.

Where the gutters are constructed integrally with a concrete base slab and of the same material as the base slab, a joint is not required. The profile of the gutter shall be as shown on the Drawings.

Where the gutters are formed adjacent to concrete base slabs already in place tie bars shall be inserted into the edge face of the existing slab to positions and dimensions shown on the Drawings and bonded with epoxy concrete binder or other suitable methods.

Where kerbs are constructed separately from the concrete base slab, they shall be dowelled to the base slab by steel tie bars, to dimensions shown on the Drawings or inserted into holes drilled into the base slab and bonded with epoxy binder or other suitable methods.

Where kerbs and/or gutters are to be constructed against an existing flexible pavement a sawcut shall be made into the existing pavement 600mm off the gutter lip. The pavement shall be reinstated to a depth of 50mm adjacent the new gutter. For the construction of median kerbs, a sawcut shall be made on the edge of kerb line.

Medians shall be keyed into the existing pavement as per the standard Drawing.
The median may, at the Council Representative's discretion, be bonded to the pavement using a suitable epoxy product in accordance with the manufacture's recommendations.

Full details of the methods to be used shall be submitted to the Council Representative at least 7 days prior to commencement of construction of the base.

Footpaths shall be constructed to the details shown on the Drawings and in accordance with the CONCRETE WORKS section of this Specification.

8.02 FOUNDATION

The foundation shall have a smooth uniform surface compacted so that the relative compaction is as specified on the Drawings or in other Documents.

8.03 FORMWORK

Forms shall be designed and constructed as per the FORMWORK section of the CONCRETE WORKS section of this specification.

8.04 CONCRETE FINISH

Concrete finish shall be as per the SURFACE FINISHES section of the CONCRETE WORKS section of this specification.

Slip formed kerb and/or gutters shall have the same standard of finish as specified for gutters constructed using conventional forms.

8.05 JOINTS

Expansion joints 10mm in width for the full depth of the kerb and/or gutter, shall be constructed at 6m intervals and where the gutter abuts gully pits, vehicle crossings, fences, building walls or retaining walls. In the case of concrete pavements, the joints shall coincide with transverse joints in the concrete base. Expansion joints shall consist of a suitable preformed joint filler.

Contraction joints 55mm to 65mm deep shall be constructed in footpaths at intervals matching the width of the footpath slab or a maximum of 2m. They shall not be greater than 3mm wide. Expansion joints 10mm in width shall be placed at every third contraction joint or at a maximum of 6m spacing.

All joints shall be perpendicular to the top face of the kerb and/or gutter line in both the vertical and horizontal planes.

8.06 DRAINAGE OUTLETS

Wherever holes for drainage are to be made through the kerb, UPVC kerb entry adaptors of the required size shall be provided, and they shall be fitted into the kerb forms in a workmanlike manner so as to ensure a neat appearance at the face of the kerb. Prior to placing kerbing and guttering, investigations shall be made to find out if additional holes for drainage are required, and where such holes are found to be necessary, they shall be provided.

8.07 CURING AND PROTECTION

The curing and protection of freshly placed concrete shall be as per the CONCRETE CURING AND PROTECTION section of the CONCRETE WORKS section of this specification.

8.08 TOLERANCES

Unless otherwise specified, the finished levels of concrete structures not adjacent to road pavements shall not vary more than 25mm from the specified levels. In the case of kerbs, gutters, drainage pits and other structures adjacent to road pavements, the finished concrete shall not vary more than 10mm from the specified levels and alignment. Kerbs and gutters shall not deviate from level or alignment by more than 5mm from a straight edge 3 metres long, subject to any necessary allowances on vertical and horizontal curves.

SECTION 9 ROADWORKS AND HARDSTANDINGS

9.01 GENERAL

The extent and description of work is provided in the Drawings, including the depth of courses of base and wearing surfaces.

Preparation of sub-grade, materials and placing of the various courses, and general provisions for inspection and/or testing or other aspects of the work shall comply with this section of the specification as applicable.

9.02 PREPARATION OF SUB-GRADE

For the purposes of this clause, the sub-grade is the surface and material below the surface upon which the first sub-base course or base course will be laid.

The site shall be trimmed to levels ready to receive the sub-base courses or base course over the entire area to be surfaced. Backfill to trenches and structures shall be consolidated and trimmed to grade and filter layers, if any, in place.

Low areas shall be filled with selected material and compacted to a density at least equal to the surrounding area.

The whole area shall be compacted to a depth of not less than 150mm to an in-situ density as specified on the Drawings or in other Documents. All compaction and testing shall be carried out in accordance with the current edition of the relevant Australian Standard. All test results shall be submitted to the Council Representative prior to commencing work on subsequent layers.
Areas shall be re-trimmed if necessary, after compaction.

If it is not possible to attain the specified compaction, the area shall be scarified to a depth of 200 mm and recompacted to the required density.

Immediately after the area has been trimmed and compacted the area shall be proof rolled. Proof rolling shall be undertaken using a minimum 12 tonne static roller a loaded bogie axle tipping truck. The proof rolling shall be carried out in the presence of the Council Representative or his delegate.

If, in the opinion of the Council Representative, the proof rolling reveals soft spots or other unsatisfactory areas these areas shall be removed and replaced in accordance with the requirements of this Specification. The removal of the subject areas may be waived if it can be demonstrated that the area in question complies with the requirements of the Specification.

9.03 CRUSHED ROCK SUB-BASE AND BASE COURSES

Only one class of sub-base or base course material from the one source shall be placed per layer and/or section of the work. Mixing of different classes of sub-base or base course materials or the mixing of the same class of base material from different sources will not be permitted.

The classification and nature of base materials are designated as follows:

Classification	Nature
DGB20	20 mm nominal size densely graded crushed rock base
DGS40	40 mm nominal size densely graded crushed rock sub-base
Lime Treated Crushed Rock	20 mm nominal size densely graded crushed rock lime treated

The details of the base materials which are proposed to be supplied along with the plant and methods which are intended to be used for obtaining and mixing of different materials, if applicable, shall be submitted to the Council Representative.

No materials shall be delivered until the Council Representative has received the information relating to the source of supply and the plant and methods to be used in obtaining the material.

Added fine material, if required, shall be mixed by blending it uniformly with the crushed rock prior to delivery. The Council Representative shall be advised of the nature, source of supply and the quantity of any added fine material prior to carrying out the work. The properties of any class of crushed rock when compacted in the pavement shall be within the limits for that class set out in following table if it is tested in accordance with the procedures specified in the relevant RMS Test Method.

Table 3
Crushed Rock Property Limits

Test Method	Property	Class DGB20 Base	Class DGS20 Sub-base	Class GMB20 Base
T106	Percent Passing 26.5 mm sieve	100	100	100
	Percent Passing 19.0 mm sieve	95-100	95-100	95-100
	Percent Passing 13.2 mm sieve	75-90	70-90	70-90
	Percent Passing 6.7 mm sieve	55-75	50-75	50-75
	Percent Passing 2.36 mm sieve	35-55	30-55	35-55
T107	A. Ratio	40-60	38-62	35-60
	B. Ratio	40-60	38-62	35-60
	C. Ratio	40-60	38-62	30-60
T108	Liquid Limit if non-plastic	20 max.	23 max.	20 max.
T109	Plastic Limit (if plastic)	20 max.	20 max.	20 max.
T109	Plasticity Index	6 max.	12 max.	6 max.
T114	Maximum Dry Compressive Strength	1.7 MPa min.	1.0 MPa min.	
T215	Aggregate Wet Strength	100 kN min.	100 kN min.	100 kN min.
T213	Particle Shape by Proportional Caliper % Mis-shapen (2:1)	35 max.	40 max.	30 max.
T215	Percent Variation	35 max.	35 max.	35 max.

in Strength
(Dry/Wet)/Dry

The requirements stated in Table 3 are after any pre-treatment deemed necessary. Samples taken prior to compaction in the pavement may require pre-treatment by procedures such as those described in the current relevant RMS Test Methods prior to the commencement of the specified tests. The tests assume that the density of all fractions of the pavement material is approximately 2.65 g/ml. Materials containing fractions having a density outside the range 2.50 to 2.85 g/ml will be individually investigated and assessed by the Council Representative.

The maximum value of the Liquid Limit may be increased to 23 for non-plastic crushed rock, provided that the value determined is not influenced by the presence of adverse constituents.

After being subject to pre-treatment comprising two cycles of compaction, or to artificial weathering, the Plasticity Index shall not exceed 6 for Class DGB material or 12 for Class DGS material, and it shall not increase by more than 3 from that of the sample prior to pre-treatment.

After soaking in water at 65 degrees Celsius for up to ten days the Plasticity Index shall not exceed 6 for Classes DGB and GMB material or 12 for Classes DGS and GMS material, and it shall not have increased by more than 3 from that of an equivalent portion of the sample tested without the soaking.

The minimum Aggregate Wet Strength for crushed slag shall be 80 kN.

When tested in accordance with the current relevant RMS Test Method in a saturated but surface dry condition after soaking in water for 24 hours, the 10 percent Fines Value of that portion of the sample passing the 19.0 millimetre sieve and retained on the 9.5 millimetre sieve shall not vary by more than 35 percent from that of an equivalent portion of the sample tested dry without soaking.

9.04 CRUSHED OR RIPPED SANDSTONE SUB-BASE COURSES

Crushed sandstone shall be obtained only from quarries or other sources which have been nominated to the Council Representative and the Council Representative has granted permission in writing for the Quarry or other source to be used.

If required by the Council Representative, samples of material obtainable from a nominated Quarry or other source shall be provided to the Council Representative, together with certificates issued by a NATA registered laboratory, establishing that the material complies with this Specification.

Sandstone shall be crushed or ripped from sound clean sandstone free of overburden, clay seams, shale or other deleterious materials and shall conform to the following minimum requirements:

When tested to AS1289.C4.1-1997, linear shrinkage shall not exceed 5%;
The CBR shall be not less than 30%;
Particle size grading shall be as shown in the following table:

NOMINAL SIZE (mm)	PERCENTAGE PASSING (%)
75.00	85-100
53.00	75-100
37.50	65-100
26.50	57-94
19.00	50-88
9.50	37-76

NOMINAL SIZE (mm)	PERCENTAGE PASSING (%)
4.75	27-65
2.36	20-52
1.18	15-42
425 Fm	10-28
75 Fm	5-17
2 Fm	0-5

9.05 SAMPLES FOR TESTING

The Council Representative shall be supplied with samples of base and Subbase materials proposed for use at least 28 days prior to delivery of materials or commencement of construction of the pavement base.

Samples of 50 kg mass will be required, but the Council Representative may require additional samples.

Materials used shall conform to the samples.

9.06 SPREADING, COMPACTION AND TRIMMING

Materials shall be supplied on site with a moisture content, uniformly distributed, within the range 60 percent to 90 percent of the optimum moisture content for compaction as determined by the current relevant RMS Test Method. Material shall be spread in uniform layers with final compacted thicknesses as shown in the Drawings. Final compacted thicknesses of individual layers shall not exceed 150mm.

Spreading shall be undertaken by a method which will ensure segregation does not occur and movement of material is kept to a minimum.

Each layer shall be uniformly compacted over its entire area and depth.

Compaction to the specified density over each section of the work shall be achieved within 24 hours of the material being placed.

During spreading and compaction the moisture content of the material, shall be maintained at between 60 percent and 90 percent of the optimum moisture content as determined by the current relevant RMS Test method. Material containing excessive moisture shall not be compacted until it has dried out to the specified moisture content.

During compaction, the surface shall be trimmed, and material added where necessary to produce a tight dense surface parallel with the finished wearing surface.

Any base material placed that has attained the specified compaction but subsequently becomes wet or damaged shall be dried out and uniformly recompacted and re-trimmed to the required density and tolerances in accordance with this clause.

The top of the upper base layer shall be trimmed and compacted to produce levels which do not vary from the levels shown on the Drawings by more than the following:

Base layer which is to have a sprayed seal wearing surface: plus, or minus 15 mm

Base layer which is to have an asphaltic concrete wearing surface: plus 10 mm and minus 20 mm

The top surface of the upper base layer shall also not deviate from the bottom of a 3 metre straight edge, laid in any direction, by more than 7 millimetres in the case of a base layer which is to have a sprayed seal wearing surface and by not more than 10 millimetres in the case of a base layer which is to have an asphaltic concrete wearing surface. Any irregularities in excess of the tolerances stated above shall be corrected by loosening the surface, removing or adding base material as required and re-trimming and re-compacting the area. In no case shall quarry dust or other fine materials be used to build up depressions.

Immediately after the area has been trimmed and compacted the area shall be proof rolled. Proof rolling shall be undertaken using a minimum 12 tonne static roller and a loaded bogie axle tipping truck. The proof rolling shall be carried out in the presence of the Council Representative or his delegate.

If, in the opinion of the Council Representative, the proof rolling reveals soft spots or other unsatisfactory areas these areas shall be removed and replaced in accordance with the requirements of this Specification. The removal of the subject areas may be waived if it can be demonstrated that the area in question complies with the requirements of the Specification.

A primer seal may be applied over the base layer as protection provided that the primer seal is applied in accordance with procedures outlined by the relevant RMS Form.

9.07 TRAFFIC LIMITATIONS ON BASES

Only vehicles and equipment essential for the construction of the base layer shall be permitted to travel over the section of base under construction.

Only vehicles and equipment complying with the Load Limits of the current Local Government Act will be permitted to travel over completed sections of the pavement base.

9.08 ASPHALTIC CONCRETE MIXES

After application of the tack coat asphaltic concrete shall be laid in two courses to make up the total compacted thickness shown in the drawings. The base course and the surface course shall be as described in the Drawings.

Should it become necessary to apply a thin corrective surface course to achieve the specified tolerances on surface finish, then such a course shall comprise dense grade asphaltic concrete with 5-millimetre nominal size aggregate of the type appropriate for the section of pavement requiring correction.

9.09 PLACING ASPHALTIC CONCRETE

Tack coats and asphaltic concrete shall be delivered spread and compacted as described in the current relevant RMS specification.

Bitumen shall be removed from and damage to kerbs or other work damaged or defaced during construction or paving to road areas and hard standings shall be made good.

Contractors shall protect all existing trees from heat damage caused from the exhaust stacks of their equipment.

SECTION 10 CONCRETE INTERLOCKER PAVING

10.01 GENERAL

All surfaces and pavement structures executed under this part of the Specification shall be constructed true to the line, levels, and grades, without local irregularities, as shown on the Drawings and in accordance with the relevant standard drawings.

All pavement shall be finished to lines and levels that ensure positive drainage at all drainage outlets and channels.

10.02 EXCAVATION

Any existing concrete or asphalt footpath areas shall be excavated as per the EXCAVATION Section of this Specification.

Any soft or damp patches shall be removed and replaced with suitable fill material and the whole area compacted in accordance with the FOUNDATION section of the KERBS, GUTTERS, FOOTPATHS AND MEDIANS section of this Specification.

10.03 BASE COURSE

Interlocking pavers shall have a reinforced concrete base. The base shall be constructed in accordance with the CONCRETE WORKS section of this Specification and the relevant standard Drawing.

10.04 BEDDING SAND

Bedding sand shall be a well-graded sand passing a 4.75mm sieve and be suitable for concrete manufacture. The sand shall be of uniform moisture content between 4-8% when spread and shall be protected against rain when stockpiled on site prior to spreading. Saturated sand shall not be used.

The bedding sand shall comply with the following grading limits:

Sieve Size(mm)	% Passing
9.52	100
4.75	95 - 100
2.36	80 - 100
1.18	50 - 85
0.600	25 - 60
0.300	10 - 30
0.150	5 - 15
0.075	0 - 10

The bedding sand shall be free of soluble salts or other contaminants likely to cause efflorescence or lead to reduced skid resistance.

The sand bedding shall be spread loose in a uniform layer, to a depth of approximately 20mm.
The sand bedding shall be screeded in a loose condition to a level such that, after compaction, the pavers shall be at the correct levels and profiles.

The spread sand shall be carefully maintained in a loose condition and protected against pre-compaction both prior to and following screeding. Any pre-compacted sand or screeded sand left overnight shall be loosened before further paving units are placed. The sand bed shall not be screeded in advance of the laying face to an extent to which paving will not be completed on that day.

Screeded sand must be fully protected against accidental pre-compaction, including compaction by rain or dew. Any screeded sand which is pre-compacted prior to laying of units shall be removed and brought back to profile in a loose condition.

10.05 PAVING UNITS

Paving units shall comply with the current edition of the relevant Australian Standard or the CMAA Specification for Concrete Segmental Paving Units (MA20).

Interlocking paving blocks shall be as specified on the Drawings or in other Documents.

10.06 LAYING PATTERN

Interlocking pavers shall be layed in a "Herringbone" laying pattern with a header course around all outside edges.

10.07 METHOD OF LAYING

Paving units shall be placed on the uncompacted screeded sand bed to the nominated laying pattern, with care being taken to maintain the specified bond throughout the works. Paving units shall be placed such that all joints are correctly aligned.

The first row shall abut an edge restraint and shall be laid at a suitable angle to the edge restraint to achieve the required visual orientation of paving units in the completed pavement.

The size of the gaps between individual paving units and edge restraints, kerbs, etc, shall be 1-2mm.

In each row all full units shall be aligned first. Closure units shall be cut and fitted subsequently. Closure units shall be cut by power saw, or other appropriate method. The cut shall be clean, and the paver must butt up against the respective edge.

To fill spaces between 25 and 50mm wide, a coloured concrete (to match the paving block) shall be used, having a 1:2:4 cement, sand, coarse aggregate mix. The normal aggregate size shall not exceed one third the smallest dimension of the infill space. For smaller spaces, dry packed mortar shall be used.

Except where it is necessary to correct any minor variations occurring in the laying bond, the paving units shall not be hammered into position. Where adjustment of position is necessary, care shall be taken to avoid premature compaction of the sand bedding.

Workmen shall use planks to avoid disturbing pavers prior to compaction if it is necessary to work over uncompacted pavers. No other traffic shall be allowed on pavers prior to compaction.

Infill paving for aesthetic utility lids shall be placed to match with the alignment of the footpath-paving units. The infill-paving units shall be epoxied to prevent any future displacement.

10.08 SERVICE BOXES, AREA LIGHTS, POLES, ETC.

Traffic facilities such as parking and traffic signs, parking meters, and public facilities such as garbage bins, seats and area lights shall have the block paving cut in around so that the block paving is of a tight fit where no sand or blocks can be easily removed and it is safe for pedestrian usage.

All existing public utility service boxes shall be reset to suit any new levels. The respective utility authority shall be liaised with for any adjustments to any public utility service boxes.

A 200 x 200mm wide strip shall be filled with coldmix or filter pave, as directed by the Council representative, adjacent to any Electricity pole.

10.09 JOINTS

Expansion joints 10mm in width shall be constructed at the interface of the paving blocks and concrete or asphalt footpath pavements and/or any paving that may exist on private properties.

Expansion joints shall consist of a preformed joint filler in accordance with the current relevant RMS standards.

10.10 COMPACTION

The paving units shall be compacted to achieve consolidation of the sand bedding (approximately 10mm settlement) and brought to design levels and profiles by not less than two passes of a high frequency, low amplitude mechanical flat plate vibrator having a plate area sufficient to cover a minimum of 12 paving units.

Compaction shall proceed as closely as possible following laying and prior to the application of any traffic.

Compaction should not be attempted within one metre of the laying face. Compaction shall continue until lipping has been eliminated between adjoining units.

All work to within one metre of the laying face must be left fully compacted at the completion of each days laying.

Any units which are structurally damaged during compaction shall be immediately removed and replaced.

10.11 FILLING JOINTS

After compaction of the paving blocks and prior to the termination of work on that day and prior to the application of any construction traffic, sand for joint filling shall be spread over the pavement.

The joint filling sand shall be a well graded sand passing a 2.36mm sieve and be suitable for concrete manufacture. The joint filling sand shall be as dry as practicable when spread.

The joint filling sand shall comply with the following grading limits:

Sieve Size (mm)	% Passing
2.36	100
1.18	90 - 100
0.600	60 - 90
0.300	30 - 60
0.150	15 - 30
0.075	5 - 10

The joint filling sand shall be free of soluble salts or other contaminants likely to cause efflorescence or lead to reduced skid resistance.

The filling sand shall be broomed to fill the joints and the pavement recompacted to achieve compaction of the joint filling sand. As the work proceeds joints shall be checked for adequacy of filling and any shortfall shall be made good prior to further compaction taking place. Any excess surface sand shall be removed promptly from the surface of the paving blocks.

10.12 EDGE RESTRAINT

Adjacent to free edges where paving blocks do not adjoin a hard paved surface, a mass concrete edge restraint shall be provided. The concrete shall be finished at a level 35mm above the base of the block and shall be a minimum thickness of 100mm and depth of 200mm.

The adjacent ground shall be graded to meet the top of the paving.

SECTION 11 STEELWORK

11.01 MATERIALS - GENERAL

If requested by the Council Representative, copies of mill test certificates shall be provided for all materials showing chemical and mechanical properties. If mill test certificates are not available tests shall be carried out as directed by the Council Representative in order to establish that the material is suitable for use in the Works.

Unless otherwise shown on the Drawings, materials shall be of the following grades:

Plates, Universal Beams & Columns, Sections	Grade 250
Welded Beams & Columns	Grade 300
Rectangular hollow sections	Grade C350
Circular hollow sections	Grade C350

11.02 SHOP DRAWINGS

Shop drawings shall be prepared from the Working Drawings in such detail as necessary for the complete fabrication, assembly and erection of the structural steelwork to ensure correct fit-up and matching of steelwork to all other work.

Each shop drawing shall be clearly cross-referenced to the corresponding Working Drawing.

Shop drawings shall show all marking of members, material sizes, dimensions, holing and the location, type and size of welds and bolts. Procedures for shop and site assembly, including the torque requirements and tightening method for high-strength bolts, and requirements for surface preparation and protective coating shall be noted on the shop drawings.

Minor modifications of details may be suggested to suit the particular shop and site procedures. Such modifications shall be subject to the general agreement of the Council Representative before inclusion in the shop drawings.

The practicability of all design details shall be checked in regard to fabrication and erection and any amendments considered necessary for the proper execution of the work shall be proposed. These proposed amendments shall be subject to the agreement of the Council Representative.

11.03 DIMENSIONS

All work shall be fabricated to the actual dimensions required on site and all dimensions shall be verified on the site prior to proceeding with the work.

11.04 FABRICATION

Fabrication shall be carried out to recognised standards of good practice and shall comply with the requirements of the current edition of the relevant Australian Standard, except as otherwise specified.

On completion of fabrication, tolerances shall in accordance with the current edition of the relevant Australian Standard unless otherwise specified or shown on the Drawings.

Cut edges shall be free of gouges, burrs and other defects that would adversely affect the serviceability of the steelwork or detract from the finished appearance. All burrs, fins and raggedness left by sawing, punching, shearing, cropping or flame cutting shall be removed before assembly.

Mechanically guided flame cutters may be used for stripping wide plates to required widths and for cutting a number of similarly shaped pieces simultaneously.

Re-entrant corners shall be shaped notch-free to a radius of at least 11 mm.

11.05 BOLT HOLES

Holes for bolts shall generally not be more than 2 mm larger in diameter than the bolt. Holes for anchor bolts shall not be more than 6 mm larger in diameter than the anchor bolt, unless otherwise shown on the Drawings.

The bolt pitch, and edge distances, shall conform with the requirements of the current edition of the relevant Australian Standard.

The surface around holes shall be smooth and free of burrs, fins and other defects that may prevent solid seating of contact surfaces.

Holes shall be drilled to size or punched 3 mm under size and reamed to size. Holes shall not be punched full size without the prior agreement of the Council Representative. The region around holes punched full size shall be flat before assembly. Dressing around such holes by appropriate means shall be permitted.

11.06 SPLICES AND JOINTS

Where available stock lengths of steel are shorter than the required length of member, splicing by complete penetration full section butt welds may be permitted as directed by the Council Representative.

Welded splices in compound members shall be staggered, and the component plates and sections spliced before compounding.

Critical field splices and joints shall be mated in the shop on completion of fabrication to ensure satisfactory fit when erected.

Should field splices and joints, whether bolted or welded, in addition to those shown on the Working Drawings be proposed or required, or in different locations, such connections shall be by agreement with the Council Representative in respect to design, procedure and workmanship.

11.07 WELDING

11.07.01 General

All welding shall be carried out by electric metal-arc processes in accordance with the current edition of the relevant Australian Standard.

Welding plant and equipment shall be of a standard acceptable to the Superintendent and shall be operated in accordance with the manufacturer's instructions.

Electrodes and other welding consumables shall be stored and used as recommended by the manufacturer. Covered electrodes for manual arc welding and fluxes for automatic and semi-automatic welding that have been wet or dampened shall not be used whether they have been re-dried or not.

When welding heavy sections and in other special applications and conditions, low hydrogen electrodes may be used subject to the conditions of the current edition of the relevant Australian Standard. Low hydrogen electrodes shall be employed if so directed by the Council Representative.

11.07.02 Welding Details

All welding shall comply with details shown on working drawings or, if no details are shown, as directed by the Council Representative.

11.07.03 Welding Personnel

All welding shall be carried out under the supervision of a person who holds a welding supervisors' certificate in structural welding in accordance with the current edition of the relevant Australian Standard, or other qualifications acceptable to the Council Representative.

The qualifications of welders shall comply with the current edition of the relevant Australian Standard. Evidence acceptable to the Council Representative that welders are qualified for the procedures they will be carrying out shall be provided. The Council Representative may elect to observe qualification and procedure tests prior to their employment in the work.

11.07.04 Welding Procedures

Details of welding procedures shall be provided to the Council Representative as part of the shop drawings and such procedure tests as the Council Representative may require in accordance with the current edition of the relevant Australian Standard shall be carried out prior to their employment in the work.

Preparation of edges to be welded shall be carried out by mechanical means or machine flame cutting. Manual flame cutting shall only be used if permitted by the Council Representative and provided that the cut surfaces are ground to the satisfaction of the Council Representative.

The procedure and sequence of welding shall be such that distortion and restraint are minimised. When, in the opinion of the Council Representative, welding is likely to result in excessive shrinkage stresses or distortion, a complete programme for the welding sequences to be used shall be prepared. When excessive distortion is evident, it shall be corrected to the satisfaction of the Council Representative.

When site welding is to be employed, the assembly of steelwork shall be planned in sections to permit a maximum amount of welding to be completed on the ground. The work shall be planned in a manner to limit overhead welding as much as possible.

Areas to be site welded shall be left uncoated for a distance of at least 50 mm from the weld line unless the coating is a "weld through" type primer.

No welding or flame cutting shall be carried out while a member is in a state of stress without the prior permission of the Council Representative.

11.08 BOLTED JOINTS

11.08.01 Washers

At least one washer shall be placed under the bolt head or nut, whichever is to be rotated when tightening. Taper washers shall be used where the surface under the bolt head or nut is not perpendicular to the axis of the bolt.

11.08.02 Mild Steel Bolts

Unless otherwise noted on the Drawings, commercial grade mild steel bolts shall be used only for anchor bolts and purlin and girt connections.

Mild steel bolts, washers and nuts shall comply with the current edition of the relevant Australian Standard.

11.08.03 High Strength Bolts

High strength bolts, nuts and washers and bolting procedures shall comply with the current edition of the relevant Australian Standard. Where hot-dip galvanised bolts are required, the nuts shall be provided with supplementary lubrication as specified in the current edition of the relevant Australian Standard.

11.08.04 Protective Treatment

The protective treatment to be applied to bolts shall be as shown on the Drawings.

Contact surfaces of friction-type bolted joints may be primed with inorganic zinc silicate coating prior to installation of the bolts but shall be free of any other type of paint.

11.09 DELIVERY AND STORAGE

11.09.01 Identification

Before dispatch to site each separate member shall be distinctly marked in accordance with the marking diagram of the shop drawings. The mark numbers may be painted but shall also be stamped on the member in characters at least 13 mm high. The members shall also carry orientation marks required for assembly and erection.

All bolts, nuts, washers and other small items shall be properly labelled for easy identification and each shipment of steel shall contain the bolts, nuts and washers required for the erection of that shipment.

Where practicable, loose pieces for connections shall be securely attached to the members at or adjacent to the point of connection.

11.09.02 Handling and Storage

Steelwork shall be handled, transported and stored in a manner that will not cause permanent deformation nor result in excessive damage to the protective coating. Members damaged during handling and storing shall be liable to rejection.

Repairs to damaged steel and coating shall be carried out to the satisfaction of the Council Representative.

Steelwork delivered to the site shall be stored clear of the ground and separated from other steelwork items until erected.

Bolts, nuts, washers and other small pieces shall be kept in grit free containers and stored in weather-proof premises.

11.10 ERECTION

11.10.01 General

An erection procedure shall be adopted such that all members can be placed and fixed in position without distortion.

During erection steel members shall not be cut, welded or drilled without the prior agreement of the Council Representative. Drifting shall only be used for bringing parts into position but not to match unfair holes nor to enlarge holes or otherwise distort metal.

Bracing, guying and other temporary members to facilitate erection shall be provided and shall be affixed in a manner that does not deform or deface permanent steelwork.

Upon completion of erection all temporary bracing, erection bolts and the like shall be removed, and the permanent steelwork made good to the satisfaction of the Council Representative.

Tolerances for setting out and erection of steelwork shall be in accordance with the current edition of the relevant Australian Standard.

No final tightening of bolts or permanent welding shall be carried out until sufficient members have been erected to enable the work to be aligned, levelled and plumbed as specified.

11.10.02 High Strength Bolted Joints

High strength bolts shall be installed in accordance with the current edition of the relevant Australian Standard. Bolts shall be tightened by the part-turn method. Bolts and nuts shall be location marked to check that the correct rotation from the snug tight position has been obtained.

Facilities shall be provided so that all joints can be inspected by the Council Representative both before and after tightening of the bolts.

As bolts are finally tightened, they shall be marked with paint or other indelible marker to ensure that the work is systematically carried out and to facilitate inspection by the Council Representative.

11.11 ATTACHMENT TO CONCRETE FOUNDATIONS

Steelwork supported by concrete or masonry shall be bedded on cement grout. Unless otherwise specified, the grout shall consist of a Portland cement/sand mortar having a minimum compressive strength of 25 MPa at 28 days.

The steelwork shall be set up on steel packing or on levelling nuts on the anchor bolts. Grouting shall not be commenced until sufficient steelwork has been aligned, levelled and plumbed, adequately braced and secured by permanent fastenings. Grouting shall not commence until permitted by the Council Representative.

Immediately before grouting, the space under the steel shall be thoroughly cleaned and wetted and left free of excess moisture.

Grout shall be placed by either of the following two alternatives:

A The grout shall be mixed as dry as possible and shall be worked under the steel by thoroughly ramming with a blunt tool; or

B Suitable fluid grout shall be pumped under pressure. Holes shall be provided in the steelwork as required for grout injection and air bleed-off.

Side forms shall be provided to retain grout. The space to be grouted shall be completely filled with mortar. Exposed grout edges shall be splayed and neatly finished. The edges shall be cured for at least three days by covering with sand, kept continually moist or by use of an approved curing compound.

When non-shrink grout is specified, the work shall be performed using an appropriate pre-mixed grout. Details of the proposed grout shall be submitted to the Council Representative prior to carrying out the work. Preparation of

surfaces, mix proportions, application procedures and curing shall be in strict accordance with the manufacturer's instructions.

SECTION 12 PROTECTIVE COATING FOR STEELWORK

12.01 GENERAL

Protective coating shall be carried out in accordance with the principles of the current edition of the relevant Australian standard. Coating materials, surface preparation and methods of application shall, except where specifically varied by this Specification, be in accordance with the current edition of the relevant Australian standards and in accordance with the coating manufacturer's recommendations.

To ensure compatibility of the layers of a coating system, the coating material used in all layers shall be provided by the same manufacturer.

Before commencing preparation for coating, the name of the protective coating applicator and full details of the coating systems proposed to be used on the several parts of the works, shall be submitted to the Council Representative, including manufacturer's descriptions and recommendations for surface preparation and for application.

12.02 PREPARATION AND APPLICATION CONDITIONS

All preparation for, and application of coatings (except hot dip galvanising) shall be carried out in dry conditions with a steel temperature not less than 3EC above the dew point.

Surfaces prepared for coating shall be cleaned of dust and coated as soon as practicable.

The application of paint to blast cleaned surfaces shall be commenced within four hours of completion of blast cleaning and shall be completed on that day and before dew point is reached.

Under no circumstances shall paint or primer be applied over moisture on the surface of the metal. Should rain fall during or after cleaning, but before the application of paint or primer, the whole of the surface in question shall be re-cleaned. The Council Representative may prohibit the continuation of painting if, in his opinion, rain is likely to fall within two hours of painting. Paint shall not be applied during damp or foggy conditions.

Effective controls shall be established to preclude operations in unsuitable weather conditions. Work shall not be performed on surfaces wetted or likely to become wetted after blasting and before coating, when the relative humidity exceeds 90%, or when the metal surface temperature exceeds 50EC or is lower than 10EC.

All coating operations shall be performed in a neat and workmanlike manner by personnel with proven experience in the field. Each coating shall be uniform, free from runs and sags, and shall be allowed to dry and/or cure in accordance with the manufacturer's instructions.

Such measures as are necessary shall be taken to obviate health hazards arising from the use of paints and coating materials and to satisfy all requirements within the trade. Such equipment and measures as are necessary for the adequate protection of adjacent structures, permanent plant and equipment against damage or disfigurement during both cleaning and coating operations shall be taken. At the completion of the work, all paint spots, stains, etc. shall be removed so as to leave the site and all adjacent structures in a clean condition acceptable to the Council Representative.

Where the installation of plant, flooring and/or similar items will prevent surfaces from being satisfactorily coated after erection, the surfaces that will be inaccessible shall be finish coated prior to erection, or while still accessible for purposes of coating.

12.03 PROTECTION AND REPAIRS

Coated steelwork shall be protected during transport, storage and erection to prevent damage to the coating. Protection should include, but not be limited to, use of cloth slings, padding and blocking during transport and storage, and storage clear of the ground and of adjacent stored members.

All damaged areas of coating shall be made good to the satisfaction of the Council Representative. All areas to be repaired shall be thoroughly degreased. Generally, repairs shall include surface preparation, priming and top coating as required for the original coating. Damaged areas of zinc primed coating systems, shall be cleaned back to bright metal and spot-primed immediately with organic zinc rich primer, dry film thickness 100 Microns. Damaged areas of hot dip galvanised steel shall be reinstated by lightly spot-blasting (or sanding with abrasive discs) the damaged areas, and spot-primed with organic zinc rich primer to achieve a dry film thickness of 0.1 mm. Where the coating system includes top coats, these shall then be applied or reinstated over the patch primed area.

12.04 SURFACE PREPARATION

Preparation for hot dip galvanising shall consist of removal of paint, oil, grease, welding slag and spatter, followed by pickling to remove mill scale and rust. Pickling shall be carried out in the galvanising workshop. Preparation for other coatings shall consist of power tool cleaning or abrasive blast cleaning, depending on the type of coating to be used or as shown on the Drawings.

All areas of the surfaces which are to be blast cleaned and which show any trace of oil or grease shall be degreased using an appropriate cleaning agent prior to blasting to avoid recycling of these contaminants during the blast cleaning operations.

Abrasive blast cleaning shall be carried out by sand or grit blasting using compressed air nozzles. Metallic abrasive, if used, shall be sharp and hard and free from dust. Acceptable materials will be cast iron grit or cut wire. Sand abrasive, if used, shall be substantially free from dust and clay and completely free of salt.

The specified blast cleaning standard shall be deemed to be the absolute minimum requirement for a particular item and coating specification. All surfaces to be coated shall be dry abrasive blast cleaned and wet blasting will not be permitted. Surface profile height after blasting shall be within the range 0.025 to 0.040 mm.

All abrasive blast cleaned surfaces shall be kept free from contamination and to this end, operators should be equipped with gloves. Areas inadvertently contaminated with bare hands shall be re-cleaned as specified or carefully wiped with an appropriate solvent.

Where a surface shows discolouration within a short time after blast cleaning, the surface shall be thoroughly washed with fresh water, dried and re-blasted. If necessary, the procedure shall be repeated.

12.05 APPLICATION OF COATINGS

Unless otherwise specified, all primers and subsequent coats used throughout the Works shall be applied according to the manufacturer's recommendations, and to the satisfaction of the Council Representative.

Mixing, thinning and application instructions as nominated by the coating manufacturer shall be absolutely adhered to and no other addition to the mixed coating shall be used.

Immediately after blasting operations and before the commencement of coating, all surfaces shall be air blown with clean dry air or efficiently brushed down with fibre bristles giving particular attention to corners, intersections and horizontal areas where settlement of dust would be most likely to occur.

Unless specified, all prime coats shall be applied in the applicator's own workshop.

Where spraying of zinc based and similar high solids type paints is to be carried out, the pressure pot shall be fitted with an efficient agitator which shall be in constant use during the application of the coating.

An efficient air line filter shall be fitted as close as possible to the pressure pot to eliminate line condensation and oil in air supply to the spray gun. All equipment, including receptacles, shall be to the Council Representative's satisfaction.

All unpainted machined steel surfaces of sliding bearing plates, rockers or rollers shall be given two coats of an appropriate inhibitive grease to prevent corrosion.

12.06 HOT DIP GALVANISING

Detailing of all hardware to be galvanised shall conform to the procedures set out in the current edition of the relevant Australian Standard. All units to be galvanised shall be fabricated in sections suitable for the galvanising baths and galvanised after fabrication. Where modifications, drain holes, etc. are required for galvanising, they shall be detailed on the shop drawings.

All steelwork and metalwork specified to be galvanised shall be hot dip galvanised to comply with the current edition of the relevant Australian Standard to provide a minimum of 600 g/m2 zinc coating.

Care must be taken to ensure that the threads of nuts and/or bolts are protected to eliminate the necessity for re-cutting.

Where galvanised surfaces are affected by welding, the surfaces shall be thoroughly cleaned and zinc-sprayed to a minimum thickness of 0.1 mm.

Where practicable, all galvanising is to be carried out after fabrication.

Galvanised surfaces shall be free from uncoated spots. The zinc coating shall be free from blisters, flux, black spots, dross and projections which will interfere with the proper use of the article and from other defects not consistent with good galvanising practice.

12.07 CHROME PLATING

Where chromium (chrome) plating is specified it shall be in accordance with the current edition of the relevant Australian Standard.

Steelwork is to be heavily coppered, nickel-plated to a depth of at least 0.050 mm and overlaid with chromium plating to a depth of 0.012 mm then buff-polished to a lustrous finish.

Copper and brass are to be nickel-plated and then chromium plated as specified for Steelwork.

12.08 PRIMING

Unless other finishes are specified, or the member is to be encased in concrete, all steelwork shall be shop-primed before delivery to site.

All surfaces to be shop-primed shall be thoroughly cleaned. Rust mill scale and welding slag shall be removed and the surface thoroughly dried.

Immediately after cleaning and drying, the surfaces shall be completely covered by a coat of anticorrosive red oxide zinc phosphate primer suitable for application on metal surfaces. The primer may be applied by brushing and/or dipping.

12.09 SURFACES NOT TO BE COATED

The following surfaces and materials shall not be blasted or coated unless specified, indicated on the drawings or otherwise directed by the Council Representative:

* areas to be field welded shall be masked after blasting to leave a 50 mm unprimed margin. A further 50 mm of primer shall be masked before top coating to facilitate final touch-up of field welds

* mating surfaces of friction grip connections shall not be coated except where galvanising or an inorganic zinc silicate prime coat is required

* metalwork to be embedded in concrete shall be cleaned of grease, paint and loose rust before embedment, and shall not be coated unless required to be galvanised, except that surface preparation and priming shall extend to a line not less than 50 mm below the surface of the concrete.

12.10 CONNECTIONS

Generally, completed welded or bolted connections shall be degreased, prepared, primed and top coated, where applicable, with the coating system required for the steelwork. Where galvanising or inorganic zinc silicate primer is used, only hot dip galvanised bolts, nuts and washers shall be used in bolted joints. Welded joints in galvanised or inorganic zinc silicate primed steelwork shall be blast cleaned Class 2 1/2 and reprimed with organic zinc rich primer. If top coating is required, the galvanised surfaces of joints shall be degreased as necessary and etch primed before top coating.

Bolted connections in galvanised or inorganic zinc silicate primed steelwork shall be prepared and coated as specified for repairs.

12.11 INSPECTION

Work may be inspected by the Council Representative or his nominated inspector at each stage of the coating operation, i.e. after blasting, prior to each coat and after final topcoat application. Where so specified, by the Council Representative, application of coatings shall not proceed until each previous operation has been inspected by the Council Representative or his nominated inspector.

A list of work and procedures shall be submitted to the Council Representative prior to any coatings being applied. All coats are to be applied in strict accordance with the manufacturer's recommendations and as set out in the coating specification.

The coating manufacturer’s technical representative shall be available for consultation and to inspect work, both on-site and in the applicator's workshop, in conjunction with the Council Representative or his nominated inspector. The procedure associated with surface preparation and the application of each coating shall in the first instance be carried out in the presence of the Applicator, the Technical Representative of the coating manufacturer and the Council Representative or his nominated inspector.

Inspection will be carried out in accordance with the recommendations of the current edition of the relevant Australian Standard.

For the purpose of inspection, the Council Representative shall be given five (5) days written notice of the intention to apply the paint coats to the steelwork. The Council Representative shall be given all assistance required during the inspection to permit examination.

Wet paint and dry film thickness gauges shall be provided and operated to ensure the correct thickness of each coat and of the full paint system.

The dry paint film thickness gauge shall be suitably calibrated and regularly checked against a known standard to ensure its accuracy.

Surface profile, coating thicknesses and coating adhesion will be checked by the Council Representative or his nominated inspector using the following methods:

* surface profile will be measured by visual examination and comparison with profile standards or by use of a Surface Profile Gauge

* wet film coating thicknesses, dry film coating thicknesses and adhesion shall be measured in accordance with the current edition of the relevant Australian Standard.

If these film thicknesses, adhesion, profile and the like are not in accordance with the Specification or the coating manufacturer's published data, the surfaces concerned shall be cleaned back to bright metal and recoated.

12.12 COATING MATERIALS

Materials used in protective coatings shall be in accordance with the following:

* inorganic zinc silicate coating shall consist of zinc powder in a self-curing inorganic medium. Materials shall comply with the requirements of the current edition of the relevant Australian Standard.

* organic zinc rich primer shall consist of powdered zinc in an epoxy base and curing agent and shall comply with the requirements of the current edition of the relevant Australian Standard.

* etch primers for galvanised items shall consist of zinc tetroxy-chromate pigment in a polyvinyl butyl resin binder and a catalyst component containing phosphoric acid, with a volatile solvent vehicle

* high-build vinyl coating shall consist of vinyl resin binder and volatile solvent with pigment to suit

* micaceous iron oxide coating shall consist of micaceous iron oxide pigment with or without aluminium or red iron oxide pigment to distinguish between coats, carried in an alkyd resin binder complying with the current edition of the relevant Australian Standard.

Unless otherwise specified hot dipped galvanised surfaces shall not receive further protective coating except in cases where the galvanising has been damaged, in which case they shall be repaired as directed by the Council Representative.

SECTION 13 BRICKWORK AND BLOCKWORK

13.01 BRICKS

Bricks shall conform to the current edition of the relevant Australian Standard. They shall be sound, hard and well burnt, of uniform shape and size with unbroken arises, nominal size 230 x 110 x 76 m. Clinkers or callows shall not be used.

Sample bricks representing those intended for use in the work shall be submitted to the Council Representative prior to ordering the bricks. Samples which meet the requirements of the Specification and Drawings shall be retained on site in good condition. Only bricks equal to the retained samples shall be used in the works.

Dumping of bricks is prohibited.

13.02 CONCRETE MASONRY BLOCKS

Concrete blocks shall be 400 mm long x 200 mm high x 100mm thick, hollow concrete masonry conforming to the requirements of the current edition of the relevant Australian Standard. Half blocks and smaller blocks shall be used as required for particular dimensions. Where it is unavoidable that blocks be cut, they shall be cut with an abrasive saw to give a neat finish.

13.03 STRUCTURAL BLOCK WORK

Structural walls and other work shown in the Drawings as manufactured from concrete filled and reinforced "hollow concrete blocks" or other form of masonry shall be constructed to details shown in the Drawings.

Concrete used to grout the cavities in the blocks shall have 10mm maximum sized aggregate and cement and water content designed to provide F'c 35 MPa unless shown otherwise in the Drawings. An appropriate plasticising agent may be used to delay initial set and facilitate the consolidation of the concrete in horizontal and vertical cavities. If a plasticising agent is proposed details shall be submitted to the Council Representative at least 5 (five) working days before its intended use.

Joints between blocks shall be sufficiently mortared or sealed to prevent loss of grout. In the case of curved walls laid dry, blocks shall be profiled so that the perpends meet neatly on both faces to prevent grout loss.

If necessary, to prevent stains or disfiguring from minor grout or water loss at faces which are exposed when the wall is completed, joints shall be sealed from inside the cavities.

Grouting shall be carried out as the blocks are laid and grout shall be well consolidated into all cavities. Pencil vibrators and/or hand rodding shall be used if necessary, to achieve a dense grout matrix in difficult areas and/or cavities which are reinforced.

Generally, not more than two courses shall be laid without grouting. In cases where it is demonstrated that more than two courses can be grouted satisfactorily, the Council Representative may permit more than two courses to be laid prior to grouting.

SECTION 14 STORMWATER DRAINAGE

14.01 MATERIALS

14.01.01 Pipes

Reinforced concrete, Vitrified clay and/or Polyethylene pipes shall comply with the requirements of the current edition of the relevant Australian Standard. Pipes shall be of the class shown on the drawings.

Rubber joint rings for use with reinforced concrete or vitrified clay pipes shall comply with the requirements of the current edition of the relevant Australian Standard.

Reinforced concrete pipes shall be steel reinforcement only (fibre reinforcement is not acceptable).

14.01.02 Precast Reinforced Concrete Box Culverts

Precast reinforced concrete box culverts shall comply with the requirements of the current edition of the relevant Australian Standard.

14.01.03 Selected Backfill

Selected backfill shall comply with the requirements of the FILLING section of this Specification.

14.01.04 Concrete

Concrete, reinforcement and formwork for drainage structures shall comply with the requirements of the CONCRETE section of this Specification.

14.01.05 Cement Mortar

Cement mortar shall comply with the requirements of the current edition of the relevant Australian Standard.

14.02 PRECAST CONCRETE BOX DRAINS

Precast concrete box drains shall be in accordance with the current edition of the relevant Australian Standard and/or RMS Standard Form.

The base of Precast Concrete Box Drains shall be cast in-situ Reinforced concrete to the line, level and grade as shown on the Drawings.

The box section shall be positioned true to line, the invert level of the section true to level and grade as shown on the Drawings and the sections closely butted together. A thin layer of mortar, one (1) part cement to three (3) parts sand, shall be used on the sections prior to placing the sections together.

The maximum permissible tolerance shall not exceed 10mm above or below true grade nor 20mm to either side of the true alignment, for any two points 8m apart. Moreover, no portion of the work shall depart more than 10mm from true level, as determined from the nearest convenient benchmark which shall be indicated by the Council Representative.

Any culvert or culverts not laid within these tolerances shall be lifted and relaid so that the gradient and alignment are within the specified tolerances.

In all cases care shall be taken with laying so that the interior of the box sections have a neat, smooth and uniform surface at the joints and the interior surfaces of the sections shall be cleaned of any excess mortar after jointing. The

joints shall be protected from rapid drying by covering with wet bags for at least three (3) days after placing or alternatively by the application of an approved curing compound.

Trenches at the sides of box drains shall be carefully packed and solidly compacted at the sides with sand or metal dust in uniform layers which shall be carried up to the top of the precast section all to the satisfaction of the Council Representative.

14.03 REINFORCED CONCRETE PIPE DRAINS

14.03.01 Description of Pipe

The class and size of pipes shall be as shown in the Drawings. Unless shown otherwise, all pipes shall be manufactured for rubber ring jointing and shall be supplied complete with rings suited to the pipe manufacturer's details.

The size, class, manufacturer's name and date of manufacture shall be indelibly marked on the obvert of every pipe. The markings shall be large, durable and distinctive enough to be read easily during CCTV scanning some years after the pipe has been put into service.

14.03.02 Pipe Bedding

The material used for bedding of pipes shall be approved granular material having a high permeability and a high stability when saturated; and be free of organic matter and coarse material retained on a 2.36mm sieve.

Samples of the types of materials intended to be used shall be submitted to the Council Representative prior to their use.

No bedding material shall be placed until the excavation has been inspected by the Council Representative. After inspection by the Council Representative bedding material shall be placed and compacted so that the bottom of the trench is at the correct level for pipe laying.

14.03.03 Method of Laying

Before pipes are laid all dirt and foreign material that may have entered the pipe shall be removed and the outside of spigots and inside of sockets thoroughly cleaned of foreign matter.

The pipes shall be laid and jointed accurately to lines, gradients and levels shown on the plans. All pipes shall be laid in such a manner that pipe barrels have solid bearing throughout their length.

The maximum permissible tolerance in any single length of pipe shall not exceed 10mm above or below true grade, nor 10mm to either side of the true alignment and the maximum departure from the grade shall not exceed 20mm between any two points 8 metres apart. No portion of the work shall depart more than 10mm from true level.

Any pipe or pipes not laid within these tolerances shall be lifted and relaid so that the gradient and alignment are within the tolerance specified.

Laying shall commence at the low points of the pipeline and proceed uphill.

The space between abutting ends of pipes shall not exceed one-half (1/2) per cent of the diameter of the pipe. Where bandage joints or spigot and socket pipes are used, small recesses 150mm long shall be left under pipe joints to permit jointing, or in the case of spigot and socket pipes to allow the barrels to bear evenly on the foundation for their full length.

Where two or more lines of pipe are to be laid side by side, the space between the lines of pipe shall be not less than 300mm unless otherwise specified or shown on the Drawings.

All open ends of pipeline stubs shall be baulked and closed off before backfilling commences.

If required by the Council Representative everything necessary shall be provided to demonstrate that no obstructions or defects exist in the pipeline after backfilling. Any obstruction or other defect shall be removed to the satisfaction of the Council Representative.

14.03.04 Method of Jointing

Rubber ring joints for concrete pipes shall be formed by placing the rubber ring evenly over the spigot end of the pipe and rolling it into the socket, care being taken to ensure that the joint is free from dirt or other obstructions and that the rubber ring is placed evenly in the joint. Rubber ring joints shall be fitted in the manner described by the manufacturer.

Where precast collars or spigot and socket pipes are used, joints may be made with cement mortar or an appropriate bituminous filler. Where possible, the joint immediately adjacent to a pit and/or a headwall shall not be made until after the pit or headwall is constructed.

In all cases care shall be taken that the interior of pipes are cleaned of any excess jointing material after jointing. Mortar joints shall be protected from the sun, and if necessary, covered with earth or wet bags to prevent rapid drying of the mortar for at least three (3) days after placing or alternatively by the application of an appropriate curing compound.

All holes provided in concrete pipes for lifting or handling purposes shall be plugged with concrete bungs supplied by the manufacturer and are to be rammed home. The Council Representative may require the installation of bungs using a bitumen paint. All holes shall be plugged to the satisfaction of the Council Representative prior to the backfilling of trenches.

14.03.05 Methods of Testing

Copies of the following shall be submitted to the Council Representative.

(i) DVD's of Close circuit television video inspection carried out on all pipeline works after the lines have been backfilled and the backfill completely compacted and after any overlying earthworks and/or roadworks have been completed

All CCTV inspections submitted shall comply with the requirements of the STORMWATER CCTV INSPECTIONS section of this Specification

In the event of joints or pipes being damaged during backfilling or other subsequent work, the damaged pipes shall be removed and replaced.

(ii) Works as executed levels on the invert of the constructed pits and on the inverts of any inlet or outlet pipes.

14.04 DRAINAGE STRUCTURES

Drainage Structures such as gully pits, junction chambers etc. shall be constructed in the locations and of the type as shown on the Drawings.

Lintels shall be laid with the top of the lintel flush with the top of the adjacent Kerb. A transition of at least 2 metres long between the Kerb and Gutter and either end of the lintel shall be installed after the Lintel has been installed.

For junction chambers set in roadways, footpaths, medians or grass verges the covers shall finish flush with the surrounding surface. For junction chambers set in embankments the cover shall be laid horizontally and the surrounding ground shaped to suit the position of the cover.

SECTION 15 SUBSOIL DRAINS

15.01 PIPES

Pipes for subsoil drains shall be 100mm diameter "socked" corrugated black high-density polyethylene unless noted otherwise in the Documents. Unless otherwise specified, pipes shall be 100mm diameter.

15.02 FILTER MATERIAL

Filter material shall be coarse sand or crushed stone complying with one of the gradings in the following Table.

Where subsoil drains are laid in or adjacent to areas to be planted the pH of the filter material shall be in the range 6-7.

TABLE 4

AS Sieve Size (mm)	Percentage Passing by Mass		
	Fine Filter	Coarse Filter	Combined Filter
26.5		100	100
19.0		90-100	95-100
9.5	100	65-85	80-95
4.25	90-100	-	65-80
2.36	70-90	-	45-65
1.18	-	15-30	25-45
0.60	-	0- 2	12-20
0.30	7-16		3- 8
0.15	0- 4		0- 2
0.075	0- 2		

15.03 TRENCHES

The standard width of trench shall be in accordance with Drawing S207. Where invert levels are not specified the minimum depth to pipe invert shall be 1m.

Unless otherwise detailed or directed, trenches for longitudinal drains shall be located so that the pipe centre line will be 150mm from edge of pavement or behind back of kerb as the case may be.

15.04 BEDDING, LAYING AND JOINTING

Unless otherwise detailed or permitted, the minimum grade of pipes shall be 1%. Corrugated polyethylene pipes shall be laid with one line of slots at the bottom.

The trench shall be lined with a suitable geotextile material prior to the placement of the pipe and filter material. Sufficient geotextile material shall be placed in order that the geotextile material can be laid over the top of the filter material at the completion of the backfilling.

Filter materials shall be placed so as to avoid segregation. Filter material shall be compacted in maximum layers of 300mm using a suitable mechanical plate vibrator.

Pipes shall be jointed in accordance with manufacturer's instructions.

The top 75mm of the filter medium below pavement, topsoil or other specified finish shall be fine filter material. In planting beds extend fine filter to finished surface of topsoil.

SECTION 16 RE-CYCLED MATERIALS FOR FILLING AND BASES

16.01 MATERIALS GENERALLY

Crushed re-cycled materials for filling, backfilling, base courses etc, shall be crushed from clean hard and durable concrete. It may be blended with crushed brick, roof tiles ceramic tiles or selected sound rock but the proportion of materials other than concrete shall not exceed the limits set out in the table below

Prior to any crushed re-cycled materials being ordered from the suppliers, a certificate from a NATA registered testing laboratory shall be submitted to the Council Representative setting out the percentages of materials other than crushed concrete included in the proposed blended material, the Class of the material as set out herein, the particle size grading and the strength and plasticity index properties.

Each material Class shall comply with the following table:

PROPERTY	TEST METHOD	MATERIAL CLASS					
		A 1	A 2	B	C	D	E
		Road Base		Paver Base	General Filling	Bulk Filling	Drainage Medium
GRADING - Sieve sizes (mm)	AS 1141.11	Percentage Passing each size					
150.0						100	
53.0						80-100	100
37.5			100			70-90	70-95
26.5		100	100			60-80	55-80
19.0		95-100	85-100				
13.2		70-90	70-90		100	40-70	20-45
6.6		50-70	50-70	100	70-100	30-60	10-25
4.75				80-100			
2.36		35-55	35-55	50-80	40-65	20-50	0-2
0.425		10-30	10-30	10-30	10-30	10-35	0
0.075		5-15	5-15	5-20	40-65	5-20	
INDEX PROPERTIES (Max)							
Liquid limit %	AS1289 .3.1.1 & .3.2.1	27	25	30	30	35	Not Applicable
Plasticity Index %		8	8	12	15	15	
% passing 0.425 mm x PI		180	180	240	300	400	
STRENGTH PROPERTIES							
Wet Strength (kN) (Min)	AS 1141.22	70	50	50	50	50	50
Wet/Dry Strength variation (Max)		35	40	60	70	70	50
Maximum Dry Compressive Strength (MPa) (Min)	T114	1.7	1.0	1.0	0.7	0.7	1.0
Unconfined Compressive Strength (MPa) (Max)	AS 1141.51	1.5	1.5	1.5	Not Applicable		
PARTICLE SHAPE							

PROPERTY	TEST METHOD	MATERIAL CLASS					
		A 1	A 2	B	C	D	E
		Road Base		Paver Base	General Filling	Bulk Filling	Drainage Medium
Misshapen (% Max)	AS 1141.14	35	35	35	50	50	35
OTHER MATERIAL (% Max by mass)							
Asbestos	T276	0	0	0	0	0	0
Wood, organics, plastic, plaster		0.2	0.2	0.2	0.2	0.2	0.2
Metal, glass, ceramics, asphalt		3	4	5	10	10	5
Clay brick, tile, crushed rock, masonry brick			5	10	10	10	5
Total other than concrete, brick and asphalt		3	4	5	10	10	5

16.02 ALTERNATIVE SPECIFICATIONS

Crushed re-cycled concrete materials may be supplied to alternative specifications if shown on the drawings and/or described in Project Specific Specifications included in the Contract for special applications. Re-cycled concrete may be shown or specified as stabilised with varying quantities of lime or Portland Cement or other materials designed to give it special properties.

In these instances a certificate from a NATA registered testing laboratory shall be submitted to the Council Representative setting out the percentages of materials other than crushed concrete included in the proposed blended material, the particle size and grading and any other particulars deemed necessary by the Council Representative to establish that the material complies with the alternative Specification.

16.03 BACKFILL FOR TRENCHES

When selecting a class of material for backfilling trenches, due regard shall be had for the width of the trench and the method of compacting the backfill.

Narrow trenches which will be compacted by a packer with a small footprint will generally require a smaller maximum particle size, whereas when backfilling a wide trench which can be compacted with a vibrating roller, particle size corresponding to Class C - General Filling could be more appropriate.

The Council Representative will advise as to whether, in his view, the proposed material is not suitable for use in the work or does not comply with the requirements of the Contract.

SECTION 17 TIMBER FENCES

17.01 GENERAL

All timber is to be dressed all round and shall be hardwood with a minimum Stress Grade of F17. The spacing of the posts will be not greater than three metres (3m).

Timber shall be primed prior to fixing and treated against white ants, termites, rot, and other pests.

Posts shall be plumb and embedded in sufficient concrete to ensure the structural adequacy of the post. Where the posts are into a sandstone retaining wall, they are to be plumb and embedded into the existing penetration of the sandstone block. The post shall be grouted into position.

All structural fixings to the posts are to be galvanised. For Heavy Duty Ordinance fences the galvanised cover straps shall be 50mm wide and 450mm in length. The gauge of the strap will be 1.5mm thick. The strap shall be securely nailed to the posts and rails using enough suitably sized galvanised nails to ensure structural adequacy.

Light Duty Fences shall have the top rail secured to the post using galvanised 75mm nails fixed into the post. There shall be a galvanised metal strap 40mm wide by 1.5mm thick and 450mm long. The strap shall be securely nailed to the posts and rails using enough suitably sized galvanised nails to ensure structural adequacy.

Fences shall be painted using premium quality enamel paints, delivered on site in sealed containers. All fences are to be painted the colour specified on the Standard Drawings.

SECTION 18 LANDSCAPING

18.01 SOILS - GENERAL

All soils required as part of the contract shall be to the depths and levels shown in Drawings. The soil composition shall be as detailed under soil composition, unless otherwise directed by the Council Representative.

Organic Garden Mix:	shall be used for all massed planted areas, garden beds and specimen tree planting.
Planter Box Mix:	shall be used for all contained planter beds.
Topsoil Mixture:	shall be used for all new and re-instated turfed areas.
Structural Soil:	shall be used for all new trees in paved areas

18.02 SOIL COMPOSITION

18.02.01 Organic Garden Mix:

50% Black Soil
20% Coarse Sand
30% Organics containing:
Composted Sawdust
Composted Pine Bark
Spent mushroom Compost
Spent Coffee Grounds
Composted Organics

18.02.02 Planter Box Mix:

30% Black Soil
10% Graded Ash
10% D/W Coarse Sand
10% Nepean Sand
20% Composted Hardwood Sawdust
10% Humus
10% Composted Topsoil

18.02.03 Native garden mix:

A low phosphorus native mix blended from;
soil
coarse sand
composted sawdust

18.02.04 Crushed sandstone mix:

Crushed sandstone is to be yellow-brown mix and conform to the following particle size distribution;

Particle Size Distribution	%Passing AS Sieve
100mm	100
75mm	100
53mm	91
37.5mm	81
26.5mm	7
19.0mm	61
63.7mm	48
2.36mm	45

18.02.05 Topsoil Mixture:

Definitions

Topsoil: General purpose soil to the current edition of the relevant Australian Standard.

Topsoil shall mean soil which contains organic matter, supports plant life, is free from unwanted matter such as stones over 25mm diameter, clay lumps, weeds, tree roots, sticks, rubbish, materials toxic to plant growth and the like.

Topsoil Mixture:	Four (4) parts by volume of topsoil and one (1) part of compost, as specified in COMPOST, thoroughly mixed before placing.
Topsoil type in topsoil mixture:	Sandy Loam.
Sandy Loam:	Sandy loam shall be sand 75%, silt 10%, clay 10%, organic matter 5%, and PH value within a range of 5.5 to 7.0 with salt content (measured oven dry) 0.1% maximum.
Topsoil Texture:	Coarse (light) to medium, as defined in the current edition of the relevant Australian Standard.
Topsoil Types:	Comply with the following table.

Composition % by Mass	Test Method	(By Texture) Medium Sandy Loam
Sand		80%
Silt		10%
Clay		10%
Organic Matter	AS1289.D1.1	5%
Salt Content	AS1871.5	under 0.6%
Reaction	AS1289.D3.1	Table B1
PH Range		5.5 - 7%

18.02.06 Structural Soil:

Benedicts Sand & Gravel 40mm Structural Soil Mix or approved equivalent. Compacted to supplier's recommendation.

18.03 MULCHES - GENERAL

Mulches shall be free of deleterious and extraneous matter, including soil, weeds, rocks, twigs and the like. All mulches required shall be to the depths and levels shown in the Drawings and their composition shall be in accordance with that referred to in the Drawings and detailed in Mulches Composition unless otherwise directed by the Council Representative.

(a) Leaf litter: shall be used for all mass planted areas, garden beds, and specimen tree planting.

(b) Pine Bark: shall be used for all contained planting areas.

(c) Decomposed Granit: shall be used for all areas adjacent to paved footpaths

18.04 MULCHES - COMPOSITION

(a) Leaf Litter

Suitable vegetative material (which may include leaf matter and tree loppings from Eucalyptus, Tristania, Pinus or other suitable species, but not privet, camphor laurel, coral tree, poplar, willow, or noxious weeds), processed through a chipper to pieces not larger than 75 x 50 x 15mm.

(b) Pine Bark

Horticultural grade equivalent to Australian Native Landscapes Specifications, graded to 25mm.

(c) Decomposed Granite

Equivalent to Australian Native Landscapes Decomposed Granite Pink Specification, graded less than 5mm.

18.05 COMPOSTS - GENERAL

Any composts required shall be in accordance with Compost Description and where a specific type of compost is indicated in the Drawings it shall be in accordance with the relevant types listed below, unless otherwise directed by the Council Representative.

18.06 COMPOSTS - COMPOSITION

Well rotted vegetative material or animal manure, or other approved material, free from harmful chemicals, grass and weed growth, and with a neutral pH value. If required, a certificate of compost pH value shall be provided to the Council Representative.

(a) Mushroom Compost

Shall be spent mushroom compost typical of the compost used throughout the mushroom growing industry with a neutral pH value free from grass and weed growth.

(b) Composted Sawdust

Shall be typical of that used in the Nursery Industry as an admix for potting mix. It shall have been treated in accordance with NSW Department of Agriculture guidelines leached for a minimum of 12 weeks with a pH restricted to a range of 6 - 6.5.

(c) Pine Bark Fines

Shall be recovered from the screening process of pine bark. They shall not be recent screenings but aged to the point of partial breakdown so that if wet they do not float.

(d) Composted Manure

Shall be aged and composted with no toxic components, free from seeds and reproductive parts of weeds.

18.07 PLANTS

Plants shall be vigorous, well established, hardened off, of good form consistent with species or variety, not soft or forced, free from disease and insect pests, with large healthy root systems and no evidence of having been restricted or damaged. Trees shall have a single leading shoot.

All new trees and plants are to conform to the NATSPEC guide or Australian Standard AS2303:2018 – Tree Stock for Landscape Use.
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(a) Substitutions:

No substitutions to either plant size or species shall be made, unless otherwise directed by the Council Representative.

(b) Replacements:

Sufficient quantities of plants shall be ordered to allow for plant failures. Any plants which fail or are damaged during the work shall be replaced with plants of the same specific type, quality and size, unless otherwise directed by the Council Representative.

(c) Warranty:

A warranty from the supplier shall be provided to the Council Representative attesting that the plants are true to the specified species and type, and free from diseases, pests, weeds, and the like.

(d) Storage:

Wherever possible plants shall be planted immediately after delivery to the site. If this is not possible, they are to be kept in good condition by appropriate storage methods in order to prevent theft, drying out or damage from any cause including, but not limited to, frost, wind, sun, vermin, animals and the like.

18.08 PLANTING

Planting shall only be carried out after subgrade preparation as shown in the Drawings has been completed and any required soil spreading has been carried out. Planting shall be completed in accordance with the relevant Drawings and be completed by, or under supervision of, a suitably qualified (minimal level III) Arborist/Horticulture personnel.

All trees planted within a tree grate shall be planted centrally within that tree grate. Any tree not planted centrally shall be replaced by the contractor at the contractor’s own expense.

18.09 SOIL SPREADING

(a) Mass Planted Areas

Planting soil shall be spread and progressively tamped in order to avoid later subsidence. The spread soil shall be thoroughly watered to prevent voids. The surface shall be raked over lightly to attain finished profiles. The surface of the planting soil shall be finished at a level which allows the surface of the 75mm thickness of mulching material to be at the same level as adjacent finished levels.

(b) Turf Areas

The specified planting soil shall be spread on the prepared subgrade, consolidated to avoid later subsidence and raked over lightly to obtain the finished profile. Planting soil shall finish at the same level as adjacent finished surfaces.

18.10 MULCH SPREADING

Mulch shall be spread and rolled so that after settling, or after rolling, it is:

Smooth and evenly graded between design surface levels;
Flush with adjacent finished levels;
Of the required depths, and
Sloped towards the base of plant stems in plantation beds, but not in contact with the stem.

18.11 TURFING - GENERAL

Turf shall be obtained from a specialist grower of cultivated turf. Only turf of even thickness and free from weeds and other foreign matter shall be used. A warranty from the grower certifying that the turf is free of weeds or other foreign matter shall be provided to the Council Representative.

(a) Preparation

Subgrade preparation and soil requirements shall be as specified in the Drawings.

(b) Species

Species shall be as specified in the Drawings.

(c) Laying

The turf shall be laid as follows:

In "stretcher pattern" with the joints staggered and close butted Parallel with the long sides of level areas, and with contours on slopes.

To finish flush, after tamping, with adjacent finished surfaces of ground, paving surfaces, edging or garden beds.

(d) Rolling

After turf has been laid, it shall be rolled along the stretcher pattern using a minimum roller weight 100kg to a maximum 500kg weight, ensuring levels shall finish at the existing adjacent finished surface levels.

(e) Watering

Turf shall be watered immediately after laying. Watering shall be sufficient to moisten the topsoil to its full depth.

18.12 IRRIGATION

Irrigation for roadside planter boxes shall be a low volume system using 200mm diameter polythene pipe with drippers connected by "Multiflex Riser Tube" or equivalent. Drippers are to rate at 4 litres per hour and a minimum of two drippers per square metre of planting shall be installed.

18.13 LANDSCAPE MAINTENANCE PERIOD

The landscape maintenance period shall vary according to the scope of works carried out. The table below indicates the minimum required time for landscape maintenance and establishment. Landscaped areas shall be maintained until, in the opinion of the Council Representative, all plants, turf etc are well established.

Landscape Maintenance will include the following activities; watering, weeding, prevention/treatment of pests & diseases, pruning to induce appropriate form & to remove dead/damaged tissue, fertilizing, mulching or any other horticultural activity to ensure the health & survival of the Landscape

Value of Landscaping Works	Minimum Maintenance Period (Months)
Below $4,999	1
$5,000 - $14,999	2
$15,000 - $29,999	3
$30,000 and over	4

Frequency of maintenance visits will be in accordance with the following table, unless directed otherwise.

Summer	Spring/Autumn	Winter
Twice Weekly	Weekly	Fortnightly

At the end of the maintenance period any plants that have died or do not conform to 19.07 shall be replaced at the contractor's own expense.

18.14 TRESS MAINTENANCE

Upon completion of each tree installation, all following works shall be undertaken as required and completed to the standard specified. All Arboricultural/horticultural works should be completed by, or under supervision of, a suitably qualified (minimal level III Arborist/Horticulture) horticulturalist. All other related works should be similarly completed by an appropriately qualified and licensed contractor.

Rubbish / Litter
No form of litter or debris shall be present.

Weeding
All weeds removed by hand unless practically unable to, in which case they are to be treated using the most effective method and always using products to the manufacturer's specification. Any chemical application should only be undertaken by appropriately qualified persons. Treated weed' remnants are to be removed from site.

Pruning
Remove any dead or dying limbs. All pruning shall be in accordance with Australian standards for amenity tree pruning. For pruning and or ongoing maintenance of advance trees, inspections and reporting on health of the existing trees is to be undertaken by nominated AQF Level 5 Arborist.

Trees
Any significant tree works required or desired (major pruning etc.) should be specified through a council's Arborist before being undertaken.

Pest and disease management
All pests and diseases are to be identified and treated with the most appropriate and current recommended method. Any diseased or infested vegetation which does not show a positive response to treatment is to be removed and replaced with the same species of compatible size (if possible).

Replacement plantings
All dead / dying trees are to be replaced with same species - within one month.

Watering
Generally, ensure all trees are watered a minimum of once every 3 – 4 days during the establishment. Please refer to the below watering programme for guidelines.

Fertilising
Apply a general multipurpose slow release fertiliser every 6 months. Supplement with Seasol or equivalent every 3 months, in particular around advanced trees.

Mulching
Re-mulch as necessary to maintain mulched areas to the specified depths. Replace mulch as required.

18.14.01 WATERING PROGRAM TO ESTABLISH NEW TREES

1. **Water trees on arrival**
   Water trees immediately after unloading at the rate of 50% of the rootball volume,
   e.g. 50L for 100L trees, 250L for 500L trees. If trees are not planted straight away, water – very slowly, to ensure it penetrates - at the rate of 25% of rootball volume daily until planted.

2. **Water trees immediately after planting**
   As soon as trees have been planted, water in at the rate of 50% of rootball volume to ensure the rootball is fully ‘wetted-up’.

3. **Application rates**
   After planting, water trees, per application, at the rate shown in the table below.

Planted container Size	**Free draining soils**	**Heavy/clay soils** (Check drainage regularly)
100L	20L	15L
150L	30L	20L
200L	40L	30L

4. **Duration of watering**
Continue watering as indicated in the table below. Always irrigate for Period 1 and add Period 2 if Period 1 ends in Spring or Summer months.

Container size at planting	Period 1 - Basic Irrigation (Minimum)	Period 2 Extended Period (Preferred)
75L-200L	0-6 months	7-12 months
200L-300L	0-6 months	7-12 months
400L-500L	0-12 months	13-24 months

5. **Watering frequency.**
Irrigate at the frequency shown in the table below;

Time of year	Watering Frequency		
	1st month	2nd and 3rd month	Beyond 3rd month
Sep- Feb	4 x per week* (e.g. Mon/Wed/Fri/Sat)	3 x per week* (e.g. Mon/Wed/Fri)	2 x per week (e.g. Mon/Thu)
Mar-May	3 x per week* (e.g. Mon/Wed/Fri)	2 x per week* (e.g. Mon/Thu)	1 x per week*
Jun-Aug	2 x per week* (e.g. Mon/Thu)	1 x per week*	1 x per fortnight*

*Delete a watering if rainfall in the 48 hours prior to the scheduled watering exceeds 50mm

18.15 TRUNK GUARDS

Trunk guards shall be Arborguard Sapling Protector 230mm high or approved equivalent. Guards shall be used on all new trees in accordance with the Standard Drawing S602.

18.16 RESTORATION OF TREE SURROUNDS

Restoration of existing tree surrounds shall be in accordance with Standard Drawing S607. The contractor shall remove the surrounding paving blocks, prune existing tree roots, and reinstate paving. It is anticipated that an average area of 20 sq.m of uneven paving shall require temporary removal and reinstatement. Removed paving shall be neatly stockpiled on site for later use and appropriately barricaded to adequately protect the public. The paving shall be relayed in accordance with Section 10 of this Specification. Tree site surface shall be treated with porous rubberised material of minimum 40mm thickness as specified by the Council Representative. The porous material shall be FiltaPave or approved material as per detail on page 46 of the Public Domain Style and Design Codes.

18.17 TREE ROOT PRUNING

All tree root pruning will comply with the following conditions;

- Roots to be pruned in accordance with AS4373-2007. This means a clean smooth cut with a saw or other approved tree pruning implement.
- No roots are to be cut within the tree site without prior approval of Council Representative.
- No roots with a diameter greater than 80mm are to be cut without prior approval of Council Representative.
- Where more than 2 roots greater than 75mm need to be cut, prior approval must be obtained.

Where a tree fails & Council can demonstrate that roots were pruned by a contractor, contrary to the above compensation may be sought

18.18 RAINGARDENS

18.18.1 Lining Materials

- **Unreinforced Polypropylene**

Unreinforced polypropylene lining shall be a minimum thickness of 0.5mm and be supplied free of defects. The liner shall be generally supplied in large enough sheets/rolls to suit the raingarden area and minimise joints.

All joints and seams shall be joined using plastic welding methods, in accordance with the polypropylene supplier's recommendations.

The liner shall be transported and stored on site in a manner to ensure that the liner is not damaged prior to installation.

- **Shotcrete**

Shotcrete lining shall be pre-mixed sprayed concrete placed using high pressure equipment.

Sprayed concrete shall be supplied and placed as per Section B3 Concrete Works.

18.18.2 Drainage Layer

The drainage layer shall comprise a no fines drainage gravel and be in accordance with the following particle distribution:

Particle size	% Retained
> 7mm	0
4 – 7mm	> 70%
2 – 4mm	< 20%
< 2mm	0

18.18.3 Transition Layer

The transition layer shall comprise coarse washed river sand or recycled crushed glass equivalent and be in accordance with the following:

- 90% particles retained above 0.25mm; and
- Saturated hydraulic conductivity > 250mm/hr.

18.18.4 Bio Filtration Layer

The bio-filtration layer shall comprise a sandy loam mix in accordance with the FAWB guidelines and the following:

- Saturated hydraulic conductivity between 100mm/hr and 250mm/hr;
- Particle distribution

Description	Proportion	Grading
Clay and Silt	< 3%	< 0.05mm
Very Fine Sand	5 - 30%	0.05 - 0.15mm
Fine Sand	10 - 30%	0.15 – 0.25mm
Medium to Coarse Sand	40 - 60%	0.25 – 1.0mm
Coarse Sand	7 - 10%	1.0 – 2.0mm
Fine Gravel	< 3%	2.0 – 3.4mm

- Total clay and silt content ≤3%;
- Organic content shall be < 5%;
- pH (1:5) in water 5.5 – 7.5;
- Electrical conductivity (EC) < 1.2dS/m;
- Total nitrogen < 1000mg/kg; and
- Orthophosphate (PO_4^3) < 80mg/kg.

18.18.5 Gravel Mulch

The gravel mulch shall be a washed aggregate between 10 and 20mm in diameter as specified in the drawings or by the City's Representative.

18.18.6 Submerged Zone Layer

The submerged zone shall comprise a mix of the following:

- No fines drainage gravel;
- 5% organic mulch (sugar cane mulch); and
- 5% hardwood chips (not treated).

The gravel within the submerged layer shall be in accordance with the following particle distribution:

Particle size	% Retained
> 7mm	0
4 – 7mm	> 70%
2 – 4mm	< 20%
< 2mm	0

SECTION 19 DECORATIVE LIGHTS

19.01 OCTAGONAL AND HERITAGE LIGHTS

Grout packing shall be provided between the concrete footing and the base plate of the light pole to achieve a vertical alignment when erecting the pole. The grout pack shall have a minimum strength of 32MPa at 7 days. **The maximum tolerance for vertical misalignment shall be 30mm from the vertical.**

Where the Council is responsible for the supply of all light poles, accessories, bolts, nuts and post top fixtures. Light poles and their accessories are normally delivered to the Council's Depot located at 187 Ernest Street, Cammeray. The contractor is responsible for the safe pick up of the items and their delivery to the designated construction site. The contractor shall take all precautions not to the damage the light poles during transportation, delivery, on-site storage and installation. Any damaged caused to the light poles during and after pick-up from the Council's Depot shall be borne by the contractor.

19.02 MULTI-FUNCTION POLE FOOTING

The Contractor shall carry out a Dial Before You Dig enquiry prior to any excavation on site.

The Contractor shall carry out exploratory excavations at the locations of the proposed Multi-Function Pole (MFP) footings to expose the underground utility services. The Contractor shall allow 3 full working days per MFP footing for the Superintendent to inspect the excavation, agree on the type of footing to be installed (and hence the type of holding down bolts to be used) or refer to Council's structural designer to design an alternative footing to suit the layout of the services or obstructions.

The Contractor shall lay an orange 50mm electrical conduit and white 50mm communications conduit with draw wires and pits to the relevant Standards. These conduits shall turn up into the MFP footings as shown on the HUB Street Equipment drawings. Generally, these conduits will extend along the length of the new kerb and gutter.

The Contractor shall carry out all the temporary works necessary to install the MFP footings with traffic lights in the same position as the existing traffic light poles. This includes all the necessary liaison, submissions and approvals from the Roads and Traffic Authority.

The Contractor shall provide the Superintendent "as built" diagrams of these conduits with dimensions and depths.

SECTION 20 PRECAST CONCRETE PAVING

20.01 GENERAL

In accordance with the Council's current Public Domain Style Manual and Design Codes, Precast Concrete paving has been designated in the Village Centre / Activity Strips, Special Area St Leonards, Special Area Bradfield Park. Precast Concrete paving shall be used for the following applications:

- Footpath – including main body paving and tree surrounds
- Kerb Ramps – including wings, straight flat units and main body paving
- Vehicle Crossings
- Raised laneways at intersections

Precast concrete pavers shall be laid on a standard mortar bed with the exception of vehicle crossings and raised laneways where a special product (i.e. Parex System) shall be utilised which enhances the curing time to a maximum of 24 hours and minimises shrinkage to allow vehicle crossings and laneways to be reopened within an acceptable timeframe (between 24-48 hours maximum).

20.02 PRECAST CONCRETE PAVER DELIVERY

Where the precast concrete pavers are to be supplied by the Council the Contractor shall offload the pallets on site and stack the pallets in a safe manner. This includes any necessary traffic and pedestrian controls and/or temporary fencing at the delivery site.

20.03 LAYING OF PRECAST CONCRETE PAVERS

All footpath precast concrete pavers shall be laid on a mortar bed over a reinforced concrete base and shall be butt jointed with the exception of vehicle crossings and raised laneway intersections where precast pavers are specified in the Public Domain Manual. Precast concrete pavers on vehicle crossings and raised laneway intersections shall be laid with joint widths within 3-5mm and shall be laid on a high strength non shrinkage bedding using Parex Streetscape System products as outlined under Section 20.06

Contractors shall limit wastage to 5% of the total finished precast concrete pavers pavement areas. The Contractor shall be liable for the cost of supply and delivery of any precast concrete paver wastage in excess of 5%.

20.04 PRECAST CONCRETE PAVING REINFORCED CONCRETE BASE

All footpath precast concrete pavers shall be laid on a 130mm thick reinforced (single layer SL82) Concrete (32Mpa) base in accordance Section 7 of this manual.

In agreement with the Councils Representative, the reinforcing mesh can be substituted with fibre reinforcement (Novomesh 950, Bar Chip or approved equivalent) dosed at a rate equivalent to that of the specified steel reinforcement.

20.05 PRECAST CONCRETE PAVERS BEDDING MORTAR FOR FOOTPATHS

Generally, all footpath paving shall be butt jointed and laid on a wet mortar bedding with a 20-40mm compacted thickness (with the exception of vehicle crossings and raised laneways at intersections). The wet mortar bedding shall have a similar cement:water ratio to that used in "brickie's mortar". The wet mortar bedding shall be 'Sydney Sand' at 4:1 sand to cement ratio.

The sand used in the jointing mortar shall be "Sydney Sand", not river sand.

20.06 PRECAST CONCRETE PAVERS BEDDING AND MORTAR JOINTING FOR VEHICLE

CROSSINGS AND RAISED LANEWAY INTERSECTIONS

All vehicle crossings and raised laneway intersections, where precast pavers are specified in the Public Domain manual, shall have joint widths within the range of 3-5mm.

A high strength non shrinkage grout shall be utilised on all vehicle crossings and laneways. The recommended product is Parex Streetscaping Systems or approved equivalent. The product consists of three different solutions:

- Priming - Parex Bond Primer
- Mortar bed - Parex Streetscape FBC (fine bedding concrete)
- Joint Mortar – Lanko 702 Structural Grout

Parex products shall be used in strict conformity with the manufacturer's recommendation. Use of this product shall be subject to special training/demonstration by the manufacturer prior to application. Proof of training shall be provided to Council prior to application.

20.07 PRECAST CONCRETE PAVERS POLYURETHANE JOINTING

A polyurethane joint sealant shall be applied at all interfaces of sandstone paving with the following:

- all adjoining footpath pavements,
- concrete kerb ramps,
- the back of kerbs,
- vehicle crossings,
- property building lines/boundaries, and
- around utility pits.

The polyurethane joint sealant shall be Sonolastic NP1 by BASF Construction Chemicals Australia Pty Ltd, 11 Stanton Road, Seven Hills, NSW, 2147 (Tel 02-8811 4200) or approved equivalent. The colour of the polyurethane joint sealant shall match the paving colour

These joints shall nominally be 10mm wide x 10mm deep.

Joints shall be prepared, primed, sealed and cured to the manufacturer's specifications.

20.08 PRECAST CONCRETE PAVER SEALING

The Contractor shall seal all Precast Concrete pavers using Techni-Clean Dry Treat Proof sealant according to the manufacturer's requirements or approved equivalent. The sealant shall be applied in two coats.

All precast concrete pavers shall be thoroughly cleaned and washed down prior to the application of any sealant

SECTION 21 PAVEMENT MARKINGS

21.01 GENERAL

The work to be executed under this part of the Specification consists of the setting out, supply, and application of solvent based pavement paint and thermoplastic - cold applied marking material, raised pavement markers, pavement spotting and removal of pavement marks. The work shall be carried out in accordance with the current edition of the relevant RMS Specification and standard drawing S301. This RMS Specification shall define the pavement marks.

SECTION 22 GRANITE PAVING

22.01 GENERAL

In accordance with the Council's current Public Domain Style Manual and Design Codes, granite paving has been designated in the North Sydney CBD and Education Precinct. Granite paving shall be used for the following applications:

- Kerb – including straight units and all kerb returns
- Footpath – including main body paving and tree surrounds
- Kerb Ramps – including wings, straight flat units and main body paving
- Vehicle Crossings and Laybacks
- Raised laneways at intersections

Granite shall be laid on a standard mortar bed with the exception of vehicle crossings and raised laneways where a special product (i.e. Parex System) shall be utilised which enhances the curing time to a maximum of 24 hours and minimises shrinkage to allow vehicle crossings and laneways to be reopened within an acceptable timeframe (between 24-48 hours maximum).

All granite materials shall be sourced from Urbanstone or approved equivalent.

22.02 GRANITE DELIVERY

Granite will be supplied in robust timber pallets and packaging. Sample pallets are available for inspection at the Council's depot or the manufacturer's site. Inquiries may be made with Urbanstone for more information.

22.03 LAYING OF GRANITE PAVERS

All footpath granite pavements shall be laid on a mortar bed and shall be butt jointed with the exception of vehicle crossings and raised laneway intersections. Granite on vehicle crossings and raised laneway intersections shall be laid with joint widths within 3-5mm and shall be laid on a high strength non shrinkage bedding using Parex Streetscape System products as outlined under Section 22.06

Granite kerb units and granite lintels shall be laid on a concrete base and mortar bed.

Contractors shall limit wastage to 5% of the total finished granite pavement areas. The Contractor shall be liable for the cost of supply and delivery of any granite wastage in excess of 5%.

22.04 GRANITE PAVING REINFORCED CONCRETE BASE

All footpath granite pavers shall be laid on a 130mm thick reinforced (single layer SL82) Concrete (32Mpa) base in accordance Section 7 of this manual.

In agreement with the Councils Representative, the reinforcing mesh can be substituted with fibre reinforcement (Novomesh 950, Bar Chip or approved equivalent) dosed at a rate equivalent to that of the specified steel reinforcement.

22.05 GRANITE PAVEMENTS BEDDING MORTAR FOR FOOTPATHS

Generally, all footpath paving shall be butt jointed and laid on a wet mortar bedding with a 20-40mm compacted thickness (with the exception of vehicle crossings and raised laneways at intersections). The wet mortar bedding shall have a similar cement:water ratio to that used in "brickie's mortar". The wet mortar bedding shall be 'Sydney Sand' at 4:1 sand to cement ratio.

The sand used in the jointing mortar shall be "Sydney Sand", not river sand.

22.06 GRANITE PAVEMENTS BEDDING AND MORTAR JOINTING FOR VEHICLE CROSSINGS AND RAISED LANEWAY INTERSECTIONS

All vehicle crossings and raised laneway intersections shall have joint widths within the range of 3-5mm.

A high strength non shrinkage grout shall be utilised on all vehicle crossings and laneways. The recommended product is Parax Streetscaping Systems or approved equivalent. The product consists of three different solutions:

- Priming - Parax Bond Primer
- Mortar bed - Parex Streetscape FBC (fine bedding concrete)
- Joint Mortar – Lanko 702 Structural Grout

Parex products shall be used in strict conformity with the manufacturer's recommendation. Use of this product shall be subject to special training/demonstration by the manufacturer prior to application. Proof of training shall be provided to Council prior to application.

22.07 GRANITE PAVEMENTS POLYURETHANE JOINTING

A polyurethane joint sealant shall be applied at all interfaces of sandstone paving with the following:

- all adjoining footpath pavements,
- concrete kerb ramps,
- the back of kerbs,
- vehicle crossings,
- property building lines/boundaries, and
- around utility pits.

The polyurethane joint sealant shall be aluminium grey coloured Sonolastic NP1 by BASF Construction Chemicals Australia Pty Ltd, 11 Stanton Road, Seven Hills, NSW, 2147 (Tel 02-8811 4200) or approved equivalent.

These joints shall nominally be 10mm wide x 10mm deep.

Joints shall be prepared, primed, sealed and cured to the manufacturer's specifications.

22.08 GRANITE PAVEMENT SEALING

The Contractor shall seal all granite pavements using Techni-Clean Dry Treat Proof sealant according to the manufacturer's requirements or approved equivalent. The sealant shall be applied in two coats.

All granite pavements shall be thoroughly cleaned and washed down prior to the application of any sealant.

SECTION 23 RETENTION AND ROAD BARRIERS WORKS

23.01 GENERAL

This section applies to the following types of retaining wall and safety barrier rectification works which are of a typical nature.

- Reinforced Soil RW (Medium to High Walls)
- Sandstone Block RW (Low Height Walls)
- RC Blockwork RW (Medium Height Walls)
- Rock Face Stabilisation
- Wire Rope Barrier (Non-Rigid)
- Steel Rail Barrier (Rigid)

All materials and workmanship shall be in accordance with the relevant and current SAA codes, with the By-Laws and Ordinances of the relevant Building Authorities and this Infrastructure Specification except where varied by relevant drawings and specification notes issued from time to time.

All setout dimensions and levels (where provided) shall be verified by the contractor on site before work commences and drawings shall not be scaled for dimensions.

Before undertaking any work, the location of all existing services which may affect the work shall be established by the contractor and existing services shall be protected during the works.

23.02 CONCRETE

All materials and workmanship shall be in accordance with AS36000 Exposure Cat B1

Shotcrete shall have a minimum strength of 32 MPa (400 kg/m3 min cement). Minimum cover to reinforcement shall be 600mm UNO.

All other concrete specified shall have a strength of 25 MPa + 80mm slump + 20mm maximum aggregate size.

Shotcrete finish have a colour finish as ‘mock rock’ and shall match adjacent rock colour and texture.

23.03 GROUND ANCHORS

Ground anchors are to be permanent anchors with a service life of 100 years.

The contractor shall load test a select number of anchors (to be nominated by the Superintendent) by proof loading to 1.25 safe working load (SWL). All failed anchors shall be replaced by the contractor to the satisfaction of the Superintendent at no cost to the Council.

Grouting of the ground anchors shall be carried out in accordance with the Concrete Institute of Australia – Recommended Practice and grout mix shall have a water/cement ratio not exceeding 0.45 by weight.

Ground anchor details shown on supplied drawings are shown indicative only in terms of length and bond strength. The contractor is responsible

The contractor is responsible for the final design and installation of the ground anchors to achieve the required SWL.

The ground anchors shall be designed and constructed as for the safe working loads as shown on the drawings. Lengths shown are for tender purposes only. The contractor is to select and engage a geotechnical engineer to certify the design and supervise the installation of ground anchors. costs of engaging the geotechnical engineer are to be bourne by the contractor.

The contractor shall fabricate and install the ground anchors in a safe manner, without interfering with or damaging existing services or structures, using methods complying with the requirements of all Australian standards, authorities and statutory requirements for materials, construction, fabrication and erection.

The contractor shall position anchors to avoid all existing services and obstructions. Exact proposed anchor positions should be submitted to the engineer for approval once all existing services and obstructions have been located.

Details given on the drawings are the minimum requirements considered necessary for the desired capacities of the anchors. the contractor is responsible for the design, supply, installation and proper performance of the anchors.

The ultimate load capacity of the anchors shall be: 1.8 x safe working load (SWL)

The grout mix shall have a water:cement ratio of no greater than 0.45 by weight.

Corrosion protection shall be provided to all ground anchors by way of hot dip galvanising (600gms/m2)

The proof stressing operation shall be carried out under the direction of an experienced and competent supervisor.

The proof stressing shall be as follows:

Test Load = 1.33 x SWL and held as specified in the technical specification.

Anchors must not extend beyond the road reserve boundary and onto private land.

Unless noted otherwise on the drawings, all ground anchors shall be permanent anchors.

23.04 DESIGN LOAD PARAMETERS

- barrier parameter design forces are shown on the drawings.
- footings on natural ground or compacted fill at 150kPa safe bearing pressure or rock at 800 kPa UNO.
- retaining walls have been designed for the following parameters:

$k_a = 0.40$	density = $20kn/m^3$	
surcharge:	footpaths:	5.0 kPa
	roads:	12.5 kPa

- all retaining walls are to be adequately drained i.e. no hydrostatic pressure

23.05 SANDSTONE MASONRY

All materials and workmanship to comply with as 3700.

Sandstone blocks shall be sound and durable. Existing blocks may be used subject to approval by the Superintendent.

Mortar to be 1 : $^1/_{10}$: 3 proportions (cement : lime : sand)

23.06 STRUCTURAL STEEL

All materials and workmanship to comply with as 4100.

All welds to be 6mm continuous fillet welds UNO.

All bolts, washers & nuts to be grade 8.8/s galvanised.

Finish: Hot dip galvanise 600 gms/m^2 coating mass plus a high build epoxy first coat equivalent to system designation HDG 600 p3 in table 5.3 of AS/NZS 2312. Colour of first coat to be selected by the

Superintendent.

For member sizes refer to drawings.

23.07 WIRE ROPES

Wire ropes are to be 19mm diameter, pre-stretched ropes consisting of 3 x 7 coreless construction generally complying with BS.302: Part 1 and with a minimum breaking strength of 177 KN.

The wires in the rope shall conform to BS.2763, 3mm, Grade 1370, and finally zinc coated.

The minimum breaking load of each rope fitting at the terminals shall be 167 KN. The contractor is to provide all fittings.

23.08 PROPRIETARY GUARDRAILS

The contractor shall design, supply and install proprietary guardrails, including terminals and footings to the requirements outlined by AS/NZS 3845, NSW Roads and Marine Authority and Council.

Design loading to be test level 0 (AS/NZS 3845)

Members shall be hot dip galvanised as follows:

Guardrails:	780 g/m^2 (total both sides)
Posts:	1000 g/m^2 (total both sides)

Guardrails are to be formed in plan to radius to suit existing kerb/footpath setout.

Upon completion, the contractor shall paint the guardrails and posts to a select colour as directed by the Superintendent.

SECTION 24 STANDARD FORMS

Form No.	Description
F101	Concrete Sampling and Testing
F102	Compaction Test Results
F104	Landscaping Maintenance Notice
F106	Civil Works Site Inspection Forms
F107	Sample Notification Letter to Residents
F108	Sample RMS Traffic Control Plans for minor works
F109	Standard Drainage Pit Inspection Form

F101 - CONCRETE SAMPLING AND TESTING

CONCRETE SAMPLING AND TESTING

JOB _____

CONCRETE SUPPLIER _____

WEATHER CONDITION _____

BATCHING DATE _____ BATCHING TIME _____ BATCH LOCATION IN WORKS _____

SPECIFIED F'c _____ MPa

BATCH/TRUCK NUMBER AND CAPACITY	QUANTITY USED IN POUR	SAMPLE ID	NAME OF SAMPLER	SAMPLING LOCATION	DATE OF SAMPLING	TIME OF SAMPLING	SLUMP OF SAMPLE (mm)	CYCLINDER STRENGTH (MPa) 3 DAY	7 DAY	28 DAY

F102 - COMPACTION TEST RESULTS

COMPACTION TEST RESULTS

JOB _____

TESTING AUTHORITY _____

TRENCH - PERTH PENETROMETER TEST AS 1289.F3.3

DATE	LOCATION	RESULTS

PAVEMENT - STANDARD COMPACTION TEST AS 1289.5.1.1
- SAND REPLACEMENT METHOD AS 1289.5.3.1

DATE	LOCATION	DENSITY LAB	DENSITY FIELD	% STANDARD COMPACTION

F104 - LANDSCAPING MAINTENANCE NOTICE

LANDSCAPING HANDOVER FORM

This form is to be completed by EPS and forwarded to OSES whenever EPS carry our work with a landscaping component that will become the responsibility of OSES to maintain.

LOCATION OF WORK:

Contractor: _____

Contract Number: _____

Landscape Component
- ☐ Turf
- ☐ Trees
- ☐ Garden Beds
- ☐ Other, specify: _____

Landscaping completed on: _____

Maintenance period: _____

Handover date: _____

Superintendent's Representative: _____ Date: _____

Sent to: _____

INITIAL INSPECTION		
DATE	**DEFECTS/COMMENTS**	**INSPECTED BY**

SECOND INSPECTION		
DATE	**DEFECTS/COMMENTS**	**INSPECTED BY**
THIRD INSPECTION		
DATE	**DEFECTS/COMMENTS**	**INSPECTED BY**
FOURTH INSPECTION		
DATE	**DEFECTS/COMMENTS**	**INSPECTED BY**
FINAL INSPECTION		
DATE	**DEFECTS/COMMENTS**	**INSPECTED BY**

F107 - SAMPLE NOTIFICATION LETTER TO RESIDENTS

<Contractor Logo (Optional)>

NOTICE OF WORKS

<Type of Works>

<Location of Works>

<Date>

Dear Resident,

Council's Contractor, **<Contractor Name>**, will soon be commencing planned improvement works on **<Location of Works>.** These works will consist of **<Description of Works>**.

The expected commencement date is **<Date>**, weather and other factors permitting. Works are scheduled to be completed within **<Duration> weeks** (weather and other factors permitting).

All vehicles must be removed from the work site area, to ensure that no delays to the works are caused. Vehicles left parked in the works area may be towed away to allow work to proceed.

All steps will be taken to maintain pedestrian and vehicular access whilst work is in progress. There may be short periods of time where access will be unavailable, e.g. during excavation or when concrete is being placed. There will be **traffic diversions** in place at times, however, **local traffic and customers will be provided access** by dedicated traffic control personnel. We appreciate your patience and co-operation during the upgrade works.

If you have any questions regarding these works please contact **<Contractors representative>** from **<Contractor Name>**, on **<Phone Number>**.
Any additional enquiries in relation to the works should be directed to Council's Project Manager, <Council PM Name>, on **<Phone Number>** or **<Email Address>**

Council and the contractor appreciate your cooperation and understanding for the duration of these works

Yours faithfully,

<Contractor Name>

NIGHT WORKS NOTICE

<Insert Contractor Logo>

<Location STREET, SUBURB>

<Date>

Dear Resident,

Council's Contractor, **<Contractor Name>**, will soon be commencing planned improvement works on **<Location STREET>.** These works will be **carried out at night** and consist of:

- **<Description of Works>**
- **<Description of Works>**

The expected commencement date is **<DAY, DATE>**, weather and other factors permitting. Works are scheduled to be completed within **<Duration WEEKS>**.

Council requests that all vehicles be moved from the area, indicated by barricading and the special Works Zone signage, to ensure that there are no delays to the works. Vehicles left parked in the works area may be towed away to allow work to proceed.

All steps will be taken to maintain pedestrian and vehicular access whilst work is in progress. There may be short periods of time where access will be unavailable, e.g. during excavation or when concrete is being placed. There may be **traffic diversions** in place at times, however, **local traffic and customers will be provided access** by dedicated traffic control personnel.

If you have any questions regarding these works please contact **<Contractors representative>** from **<Contractor Name>**, on **<Phone Number>**. Any additional enquiries in relation to the works can be directed to Council's Project Manager, **<Council PM Name>**, on **<Phone Number>** or **<**PM NAME@northsydney.nsw.gov.au **>**

Council and the contractor appreciate your patience and co-operation during these works.

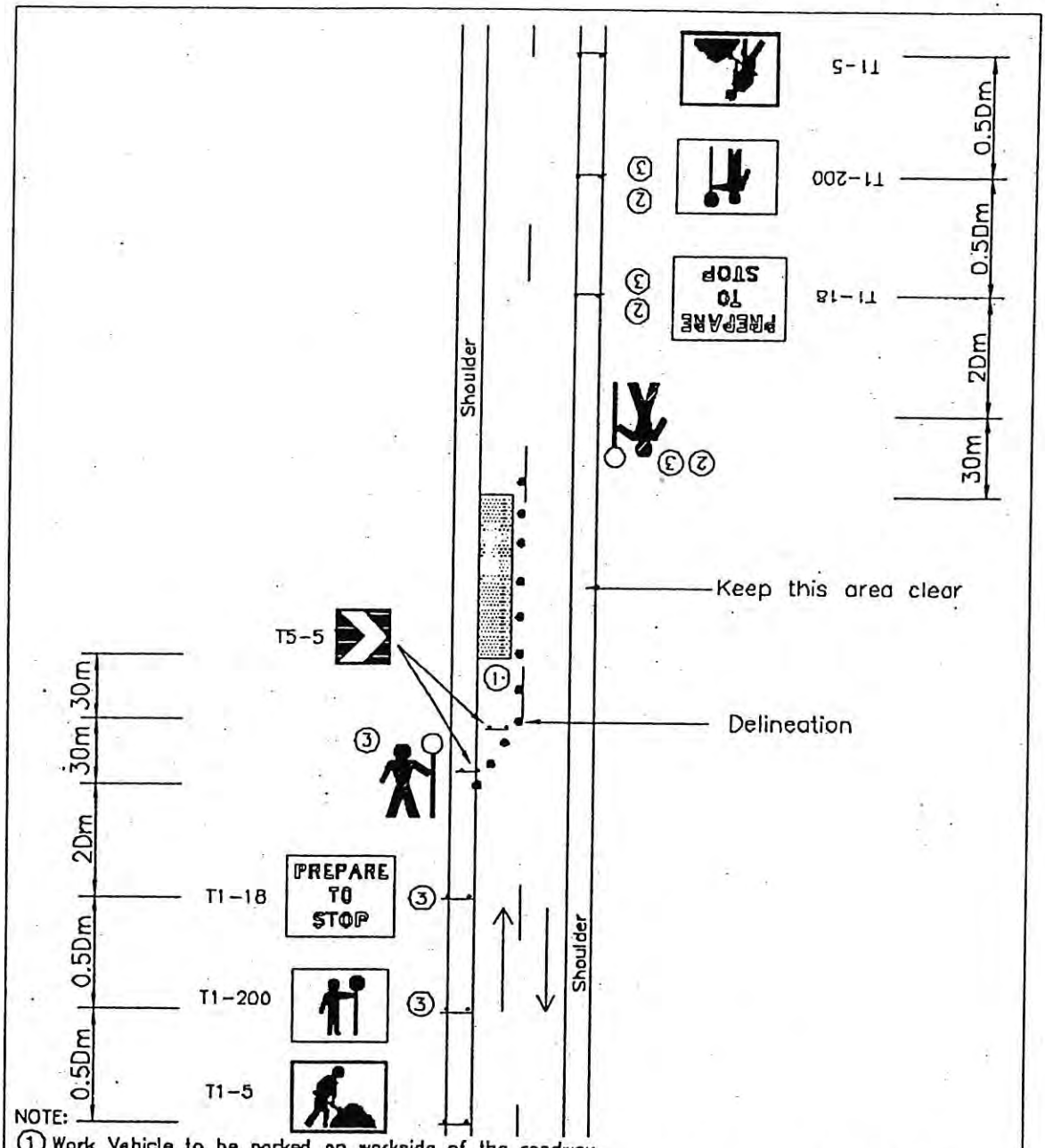
Yours faithfully,

<Contractor Name>

< Insert location map and/or typical images WITH descriptions if appropriate >

<Location STREET, SUBURB>

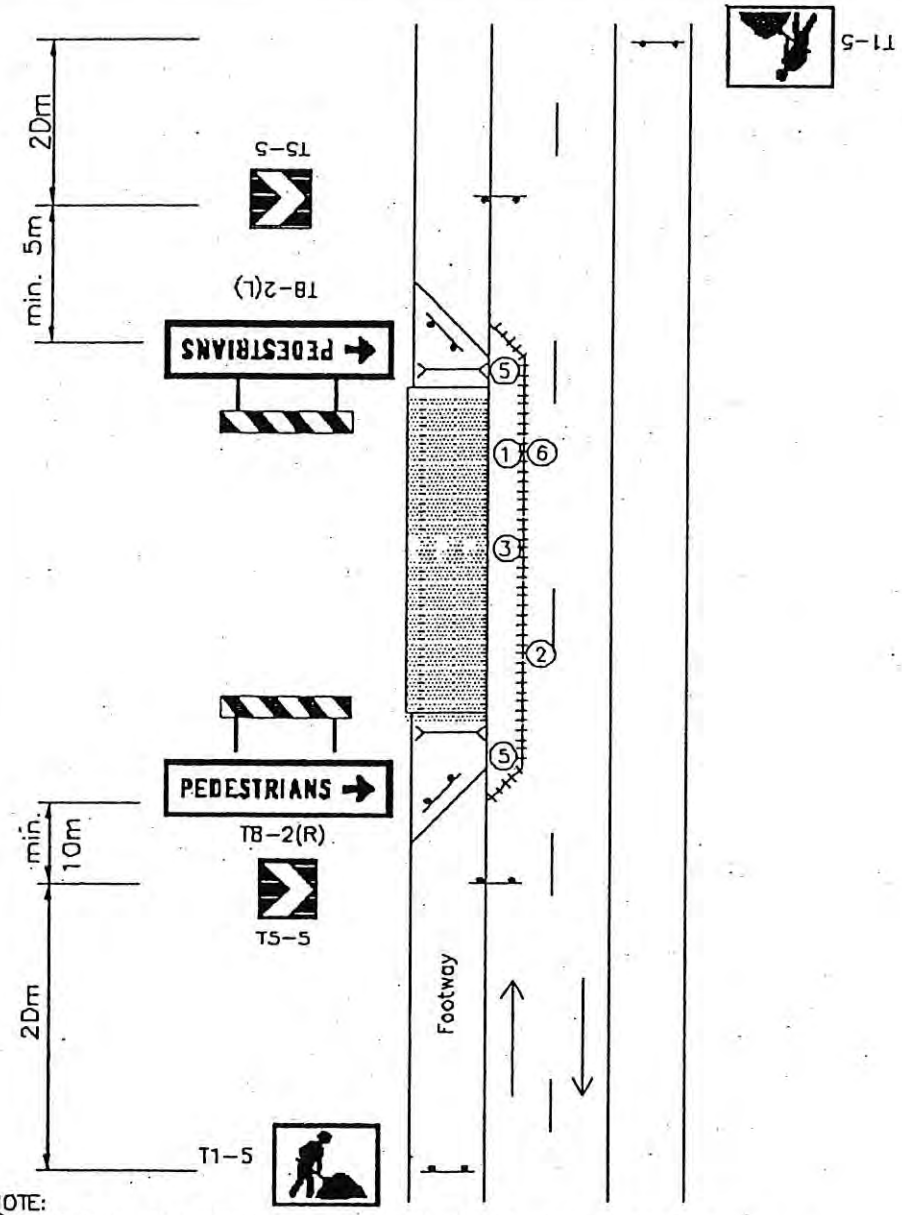
F108 - SAMPLE RMS TRAFFIC CONTROL PLANS FOR WORKS CONSIDERED AS MINOR



SHORT TERM WORK (UP TO ONE DAY)
2 LANE / 2 WAY
ADT < 6,000

T000084

TCP 84



NOTE:
(1) Prohibit vehicles stopping along the length of narrowed carriageway.
(2) Provide a minimum traffic lane width of 3.0m (desirable 3.5m).
(3) Provide a minimum clear width of 1.2m (desirable 2.0m) for pedestrian traffic.
(4) Arrange vehicular access across the work area using portable barriers or plastic mesh fencing.
(5) Provide a temporary ramp for prams and a safe path for pedestrians
(6) Ensure that the requirements of *Traffic Control at Work Sites*, Section 3.6, *Safe clearances between workers and through traffic*, are met for the pedestrians.

SHORT TERM WORK
ALL ROADS
WORK OCCUPYING THE FULL WIDTH OF A FOOTWAY

T000061

TCP 61

SECTION 25 STANDARD DETAIL DRAWINGS

The following Standard Detail Drawings shall apply to work carried out in accordance with this STANDARD SPECIFICATION. Unless shown otherwise on other drawings provided by the Principal, details of the works shall comply with the following detail drawings provided herein.

S100 SERIES - FOOTPATH & ROAD WORKS

S200 SERIES - DRAINAGE WORKS

S300 SERIES - PARKING METER DRAWINGS

S400 SERIES - PAVING DRAWINGS

S500 SERIES - SEDIMENT CONTROL DRAWINGS

S600 SERIES - LANDSCAPING DRAWINGS

S700 SERIES - FENCE DRAWINGS

S800 SERIES - MISCELLANEOUS

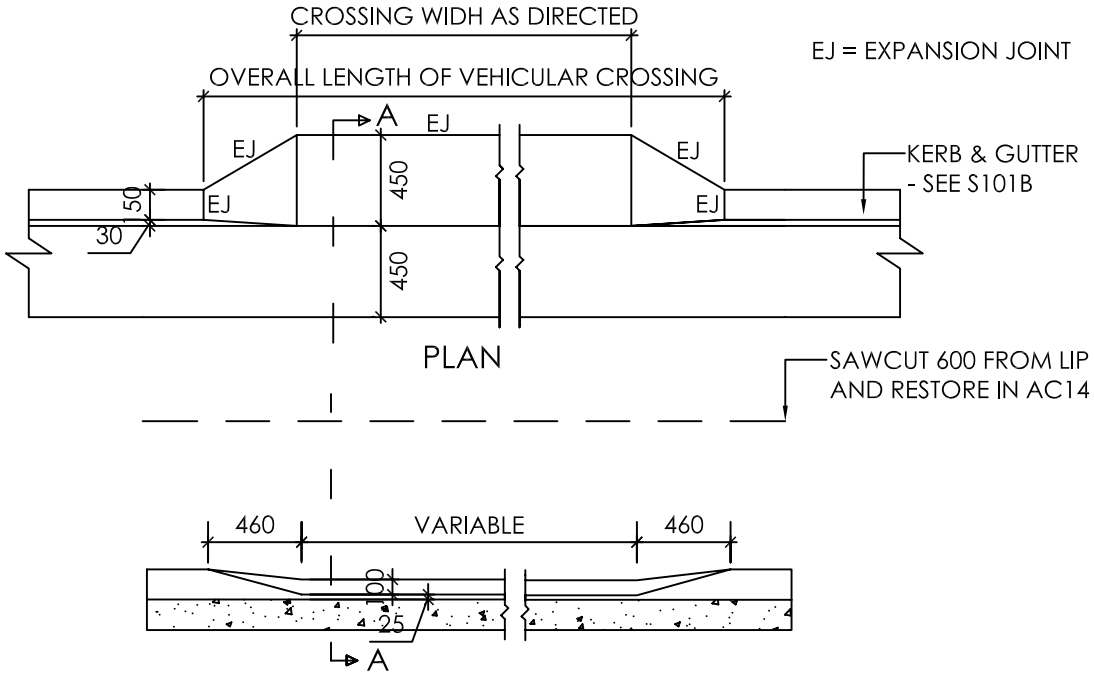
S900 SERIES – RMS TYPE PEDESTRIAN FENCING

S1000 SERIES – RMS W-BEAM STEEL GUARD RAIL SYSTEM

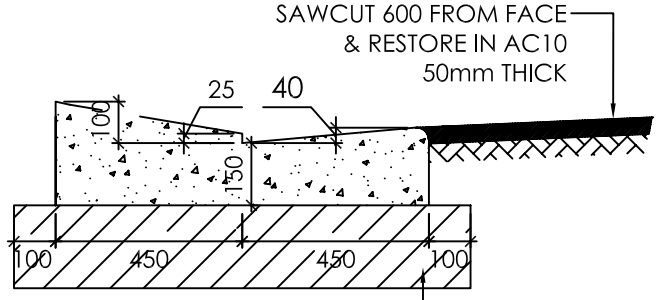
FOOTPATH & ROAD WORKS DRAWINGS

S100 SERIES

DRAWING NO	DESCRIPTION
S101A	STANDARD VEHICULAR CROSSING AND LAYBACK DETAIL
S101B	STANDARD KERB AND GUTTER DETAIL
S102	VEHICULAR CROSSING PROFILES
S103	CONCRETE DISH CROSSING
S104A	STANDARD FOOTPATH DETAIL
S104B	ARTICULATED FOOTPATH FOR ROOTS UNDER CONCRETE PATHS
S106	KERB RAMP CONFIGURATION
S107	STANDARD SPLITTER ISLAND DETAIL
S108	PEDESTRIAN REFUGE
S109	STANDARD SANDSTONE/TRACHYTE KERB AND GUTTER DETAILS
S110A	THRESHOLD TYPE 1
S110B	THRESHOLD TYPE 2
S110C	THRESHOLD TYPE 3 (PEDESTRIAN CROSSING)
S110D	THRESHOLD TYPE 4 (FLUSH)



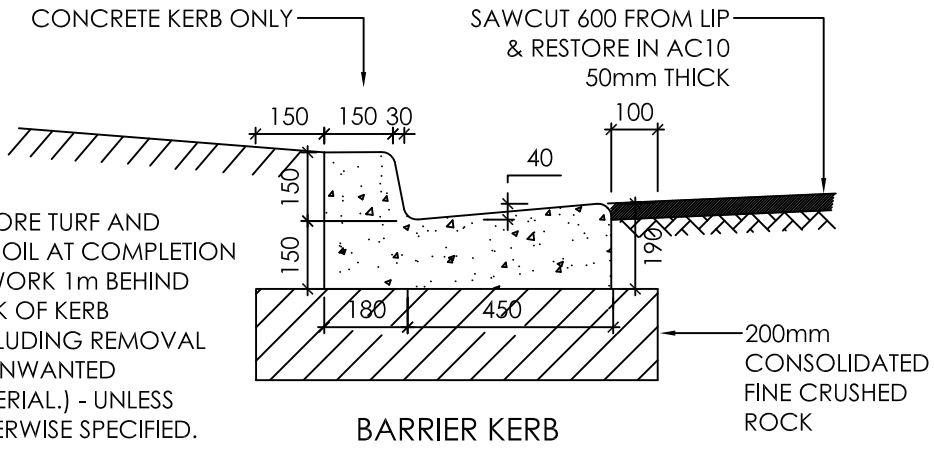
THIS DRAWING IS TO READ IN CONJUNCTION WITH S101B



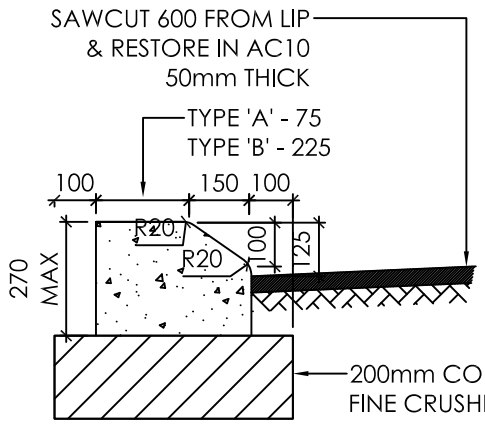
SPECIFICATIONS.

1. SLAB THICKNESS AND REINFORCEMENT
   RESIDENTIAL: SINGLE DWELLING – 130MM SL72 REO MESH
   MULTIPLE DWELLING – 180MM SL72 REO MESH.
   COMMERCIAL: 180MM SL92 REO MESH. (TO BE LOCATED WITH 40MM COVER FROM BOTTOM OF SLAB).
   ALL CONCRETE F'c32 MPA.
2. BASE COURSE
   CONSOLIDATED FINE CRUSHED ROCK TO COUNCILS SPECIFICATION
3. CONCRETE FINISH
   A. ALL EDGES SHALL BE TOOL FINISHED WITH 12MM RAD 50MM WIDE EDGING TOOL.
   B. GUTTER & LAYBACK SHALL BE FINISHED WITH A STEEL TROWEL.
   C. DRIVEWAY SLAB TO BE FINISHED WITH A WOOD FLOAT.
4. EXPANSION JOINTS
   EXPANSION JOINTS SHALL BE PLACED AT 6M INTERVALS AND AT OUTSIDE ENDS OF WINGS
5. CONTRACTORS SHALL CONFORM TO COUNCILS STANDARD CONDITIONS OF APPROVAL FOR CONSTRUCTION OF VEHICULAR CROSSING/CONCRETE FOOTPATHS AND TO LINE LEVEL AND GRADE FIXED BY COUNCIL
6. SITE OF WORK:
   DURING AND ON COMPLETION OF WORK, ALL EXCAVATED MATERIAL FROM THE SITE SHALL BE REMOVED AND THE SITE KEPT IN A CLEAN, SAFE AND TIDY CONDITION TO THE SATISFACTION OF COUNCIL'S ENGINEER.
7. ALL PLAN DIMENSIONS ARE IN MILLIMETRES. UNLESS OTHERWISE NOTED.
8. AC10MM ADJUSTMENT:
   PROVIDE 600mm WIDE AC10 CORRECTION COURSE LAYER 50MM THICK AS SHOWN.

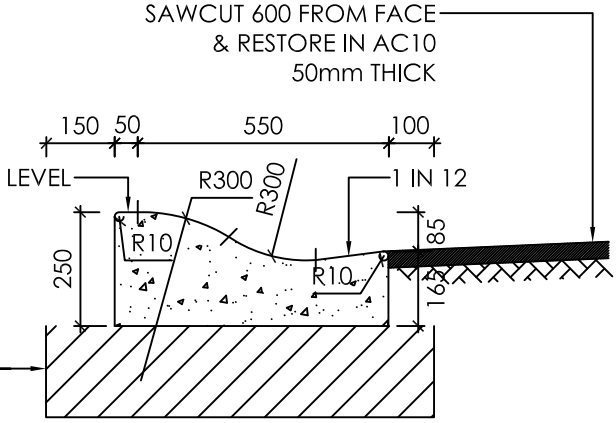
APPROVED: COUNCIL ENGINEER DATE: 01/04/06	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STANDARD VEHICULAR CROSSING AND LAYBACK DETAIL	SCALE NOT TO SCALE DRAWING NO. S101A



BARRIER KERB



MOUNTABLE KERB

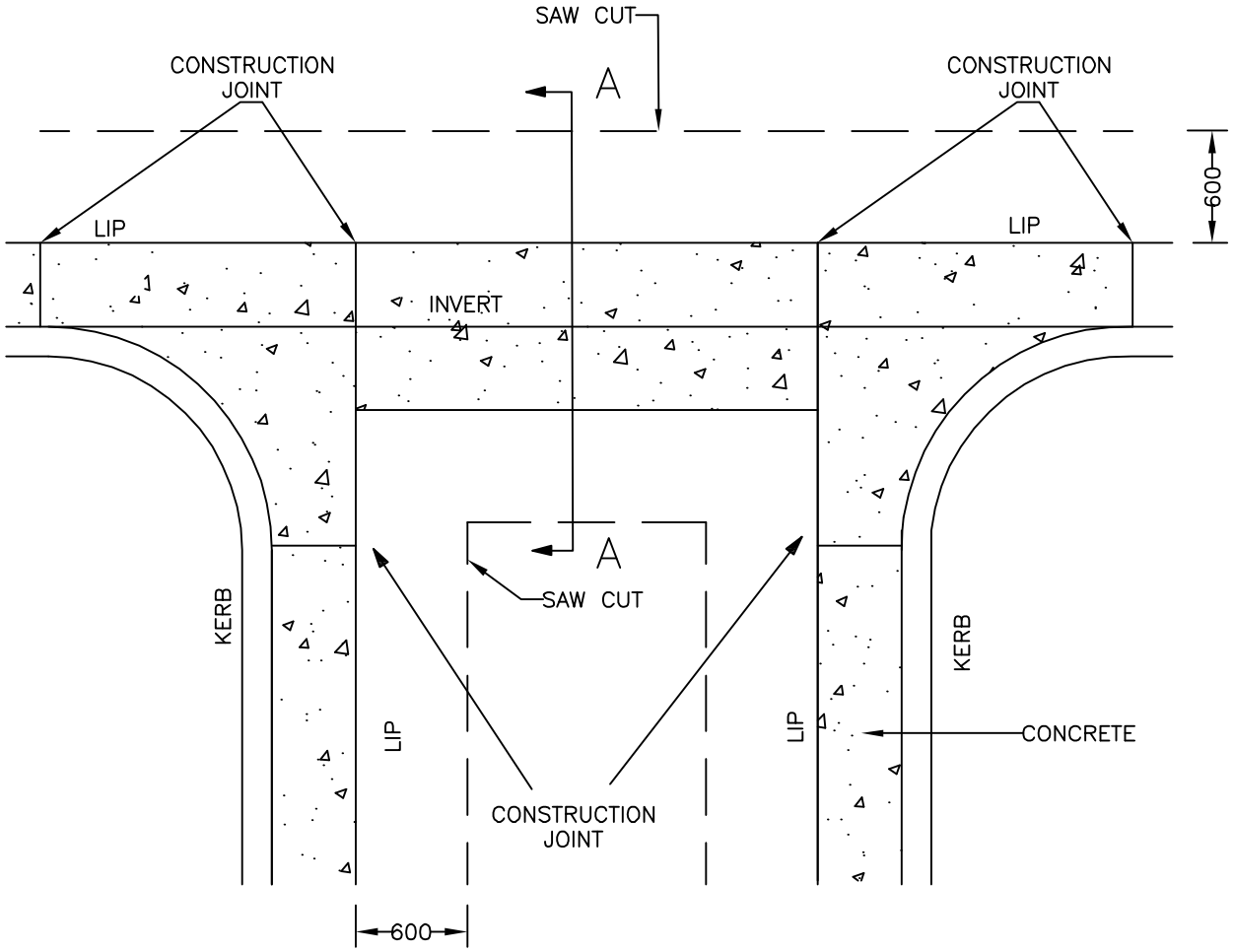


ROLL KERB

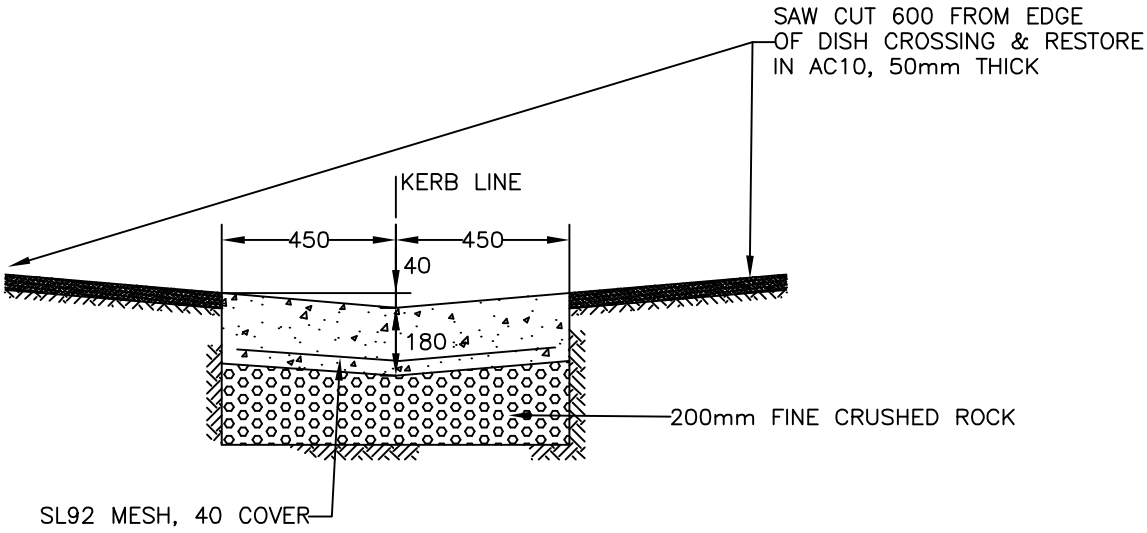
SPECIFICATIONS.

1. BASE COURSE
   CONSOLIDATED FINE CRUSHED ROCK TO COUNCILS SPECIFICATION
2. CONCRETE FINISH
   A. ALL EDGES SHALL BE TOOL FINISHED WITH 12mm RAD 50mm WIDE EDGING TOOL.
   B. GUTTER & LAYBACK SHALL BE FINISHED WITH A STEEL TROWEL.
   C. DRIVEWAY SLAB TO BE FINISHED WITH WOOD FLOAT.
3. EXPANSION JOINTS
   EXPANSION JOINTS SHALL BE PLACED AT 6m INTERVALS
4. CONTRACTORS SHALL CONFORM TO COUNCILS STANDARD CONDITIONS OF APPROVAL FOR CONSTRUCTION OF VEHICULAR CROSSING/CONCRETE FOOTPATHS AND TO LINE LEVEL AND GRADE FIXED BY COUNCIL
5. SITE OF WORK:
   DURING AND ON COMPLETION OF WORK, ALL EXCAVATED MATERIAL FROM THE SITE SHALL BE REMOVED AND THE SITE KEPT IN A CLEAN, SAFE AND TIDY CONDITION TO THE SATISFACTION OF COUNCIL'S ENGINEER.
6. ALL PLAN DIMENSIONS ARE IN MILLIMETRES. UNLESS OTHERWISE NOTED.
7. AC10mm ADJUSTMENT:
   PROVIDE 600mm WIDE AC10 CORRECTION COURSE LAYER 50mm THICK AS SHOWN.
8. RESTORATION OF TURF
   RESTORE TURF & TOPSOIL AT COMPLETION OF WORK UP TO 1M BEHIND BACK OF KERB (REMOVE UNWANTED MATERIAL).

APPROVED: COUNCIL ENGINEER DATE: 01/04/06	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STANDARD KERB AND GUTTER DETAIL	SCALE NOT TO SCALE DRAWING NO. S101B



DISH CROSSING PLAN



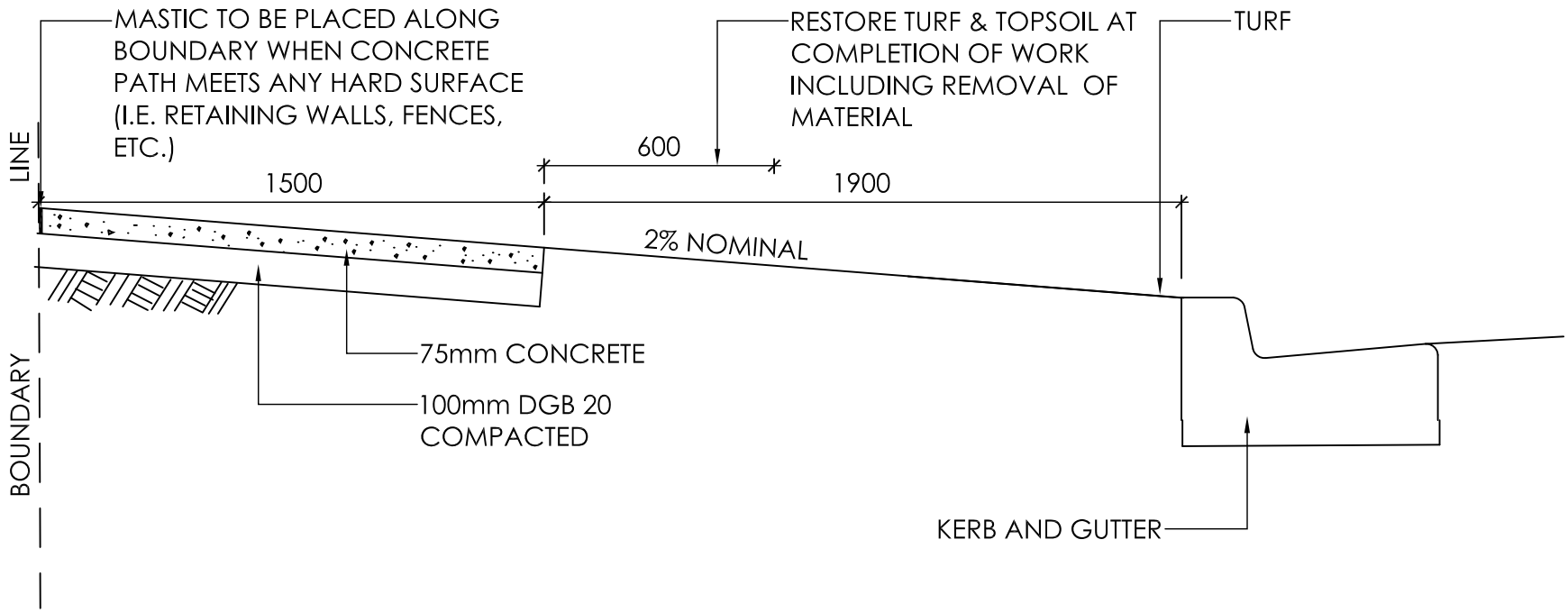
DISH CROSSING TYPICAL SECTION A–A

APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL CONCRETE DISH CROSSING	SCALE N.T.S DRAWING NO. S103

APPROVED:

COUNCIL ENGINEER

DATE: 01/04/06



NOTES:

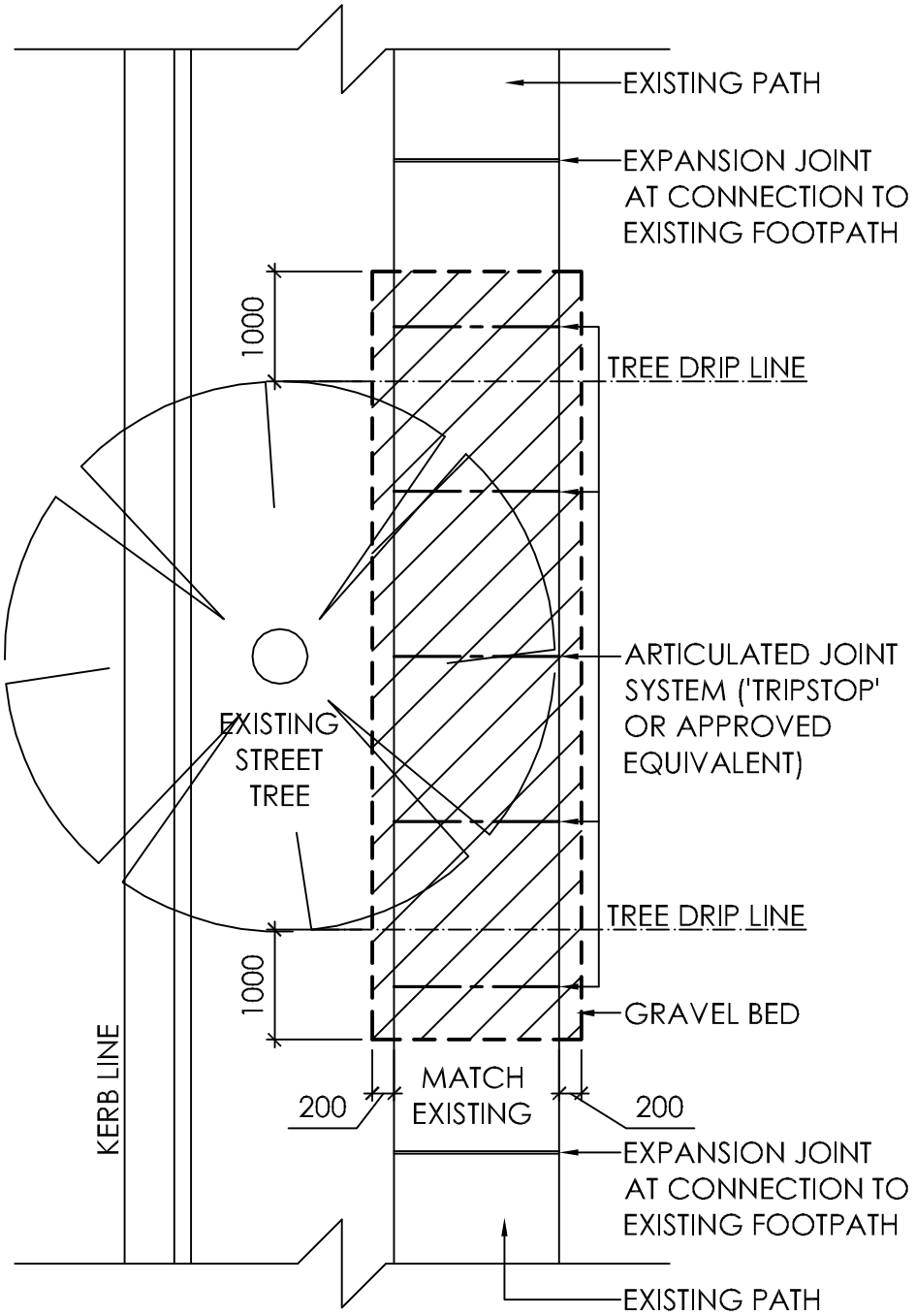
1. FOOTPATH WIDTH 1500mm OR AS OTHERWISE SPECIFIED.
2. TURF TO BE SELECTED BUFFALO OR COUCH AS DIRECTED.
3. TOPSOIL AS PER SECTION 19 OF COUNCIL'S SPECIFICATION.
4. AT FOOTPATH CROSSING, FOOTPATH TO BE CONSTRUCTED AS PER COUNCIL STANDARD VEHICULAR CROSSING, KERB AND GUTTER DETAIL DRAWING No S101
5. FOR FOOTPATH PAVERS REFER TO DRAWING No. S401A.
6. FOOTPATH TO BE CONSTRUCTED IN ACCORDANCE WITH COUNCIL SPECIFICATION.
7. CONSTRUCTION JOINTS EVERY 1.5m.
8. EXPANSION JOINTS EVERY 6m USING BITUMEN IMPREGNATED PREFORMED JOINTING MATERIAL.
9. CONCRETE SURFACE SHALL BE FINISHED ACCORDING TO THE SPECIFICATION.
10. TO BE READ INCONJUNCTION WITH STANDARD TURFING DETAIL S603

NORTH SYDNEY COUNCIL

STANDARD CONCRETE FOOTPATH DETAIL

SCALE N.T.S

DRAWING NO. S104A



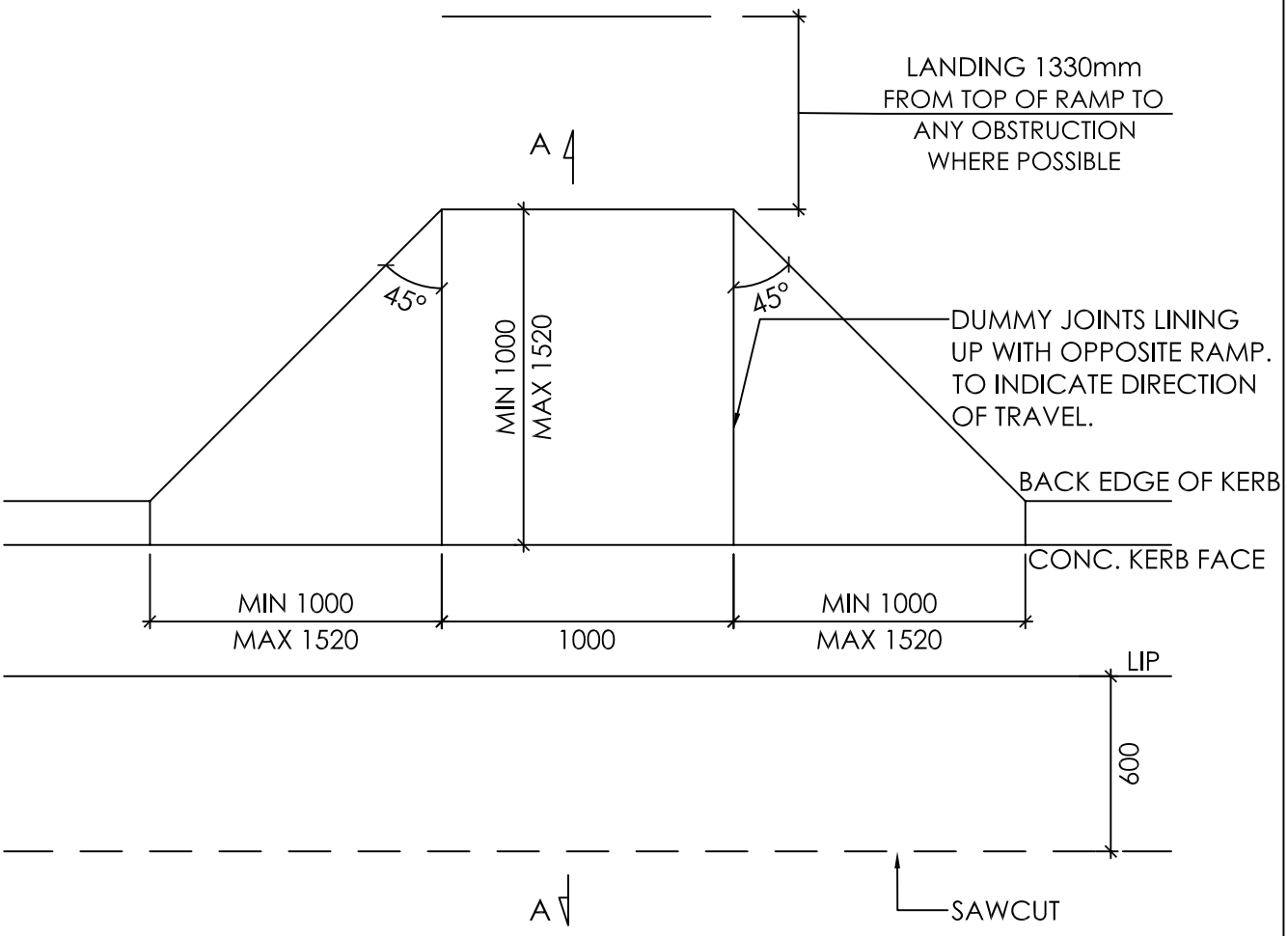
NOTES:

1. GRAVEL BED TO EXTEND MINIMUM 1000 PAST DRIP-LINE OF TREE AND MINIMUM 200 EITHER SIDE OF PATH. GRAVEL BED INSTALLED TO ALLOW EASE OF ROOT TRAVEL BELOW CONCRETE PATH. MATERIAL TO BE NOMINAL 5MM ROUNDED STONE/GRAVEL, UNIFORMLY GRADED. MINIMUM 100MM THICKNESS.
2. ARTICULATED JOINT SYSTEM ('TRIPSTOP' OR APPROVED EQUIVALENT) AT CENTRES TO MATCH PATH WIDTH. MINIMUM FIVE JOINTS OR EXTEND ONE FULL PANEL PAST DRIP-LINE OF MATURE TREE.
3. FOR LOCATIONS WITH EXISTING STREET TREES, ARBORIST TO BE CONSULTED TO CHECK ROOT SYSTEM BEFORE INSTALLATION OF PATH. ROOT TRIMMING OR PRUNING IS ONLY TO BE CARRIED OUT BY COUNCILS ARBORIST.
4. STANDARD DOES NOT APPLY TO HIGHLY SIGNIFICANT TREES. CONTACT COUNCILS TREE MAINTENANCE SUPERVISOR - 9936 8100 FOR SPECIAL REQUIREMENTS AT THESE LOCATIONS.
5. REFER TO S104A FOR STANDARD FOOTPATH DETAILS
6. REFER TO WWW.TRIPSTOP.NET FOR SUPPLIER LOCATIONS AND INSTALLATION REQUIREMENTS
7. ALL DIMENSIONS IN MILLIMETERS UNLESS SPECIFIED OTHERWISE.

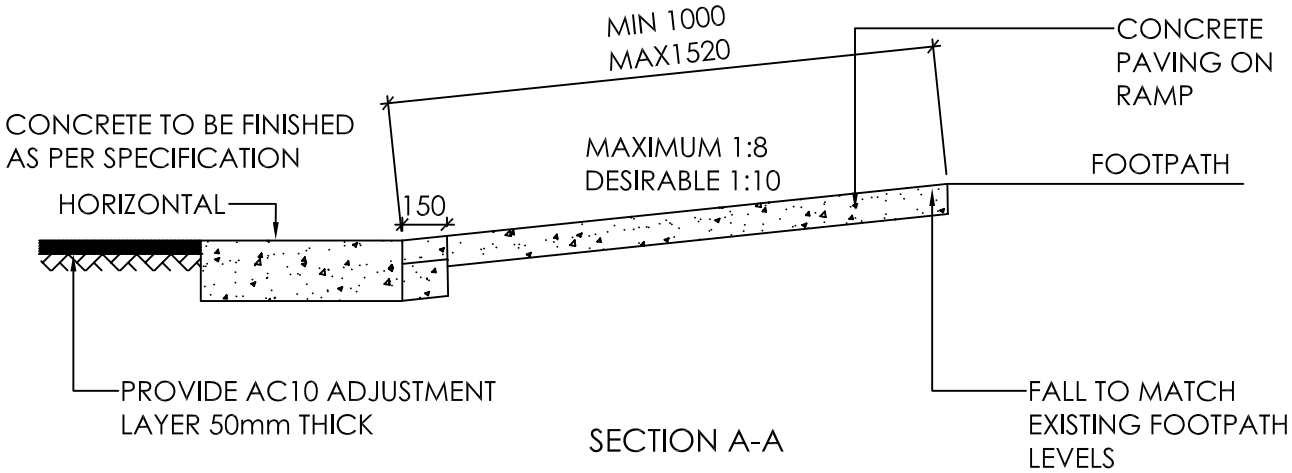
APPROVED: COUNCIL ENGINEER DATE: 01/05/10	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL ARTICULATED FOOTPATH FOR ROOTS UNDER CONCRETE PATHS	SCALE N.T.S DRAWING NO. S104B

ALL KERB RAMPS SHALL BE CONSTRUCTED IN CONCRETE

CJ REFERS TO CONSTRUCTION JOINT.
NOTE: FOR RAMPS GREATER THAN 1520MM, MAXIMUM GRADE IS 1 IN 14



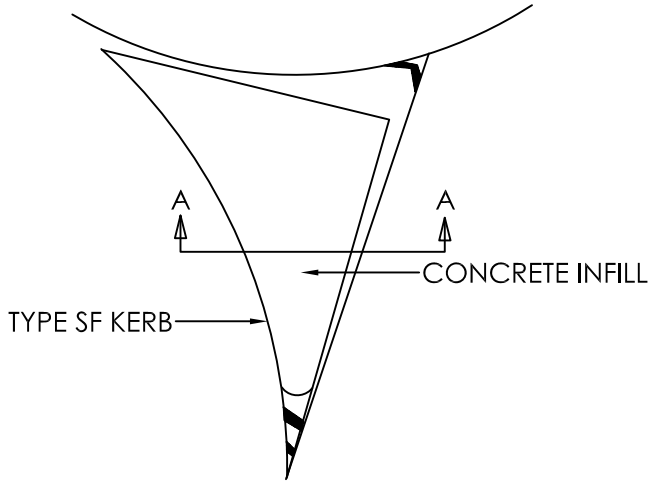
KERB RAMP



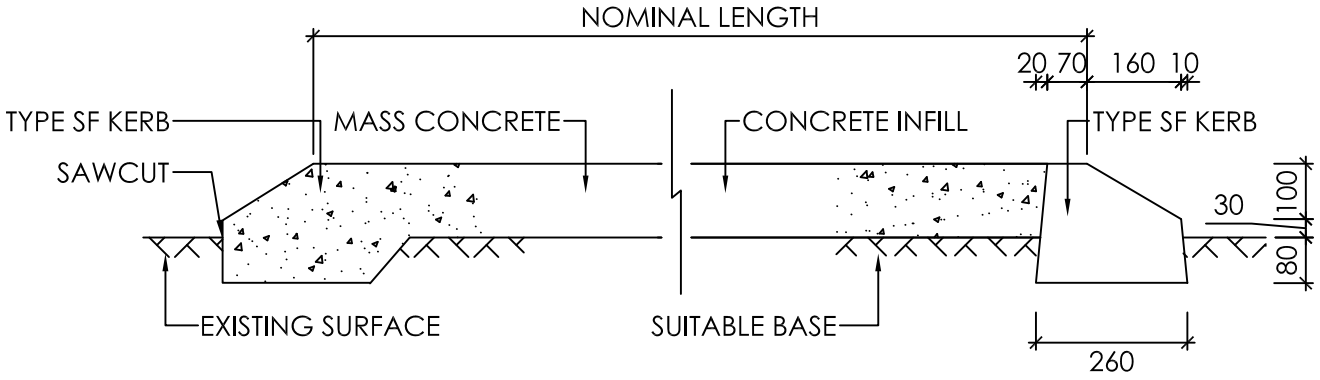
SECTION A-A

* ALL DIMENSIONS ARE IN MILLIMETERS

APPROVED: COUNCIL ENGINEER DATE: 01/05/06		NORTH SYDNEY COUNCIL STANDARD KERB RAMP	SCALE N.T.S DRAWING NO. S106



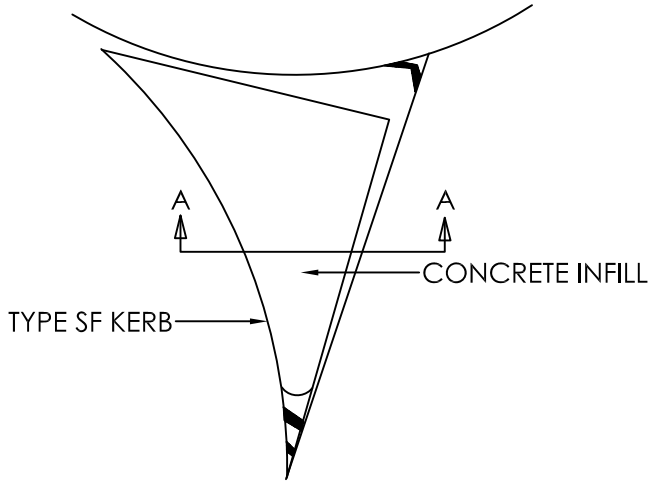
TYPICAL SPLITTER ISLAND
PLAN



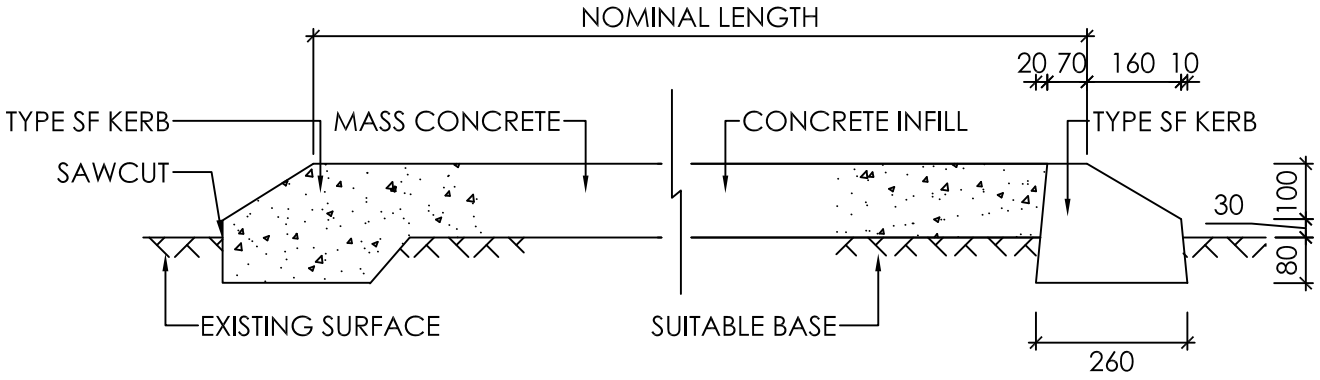
SECTION A-A

- ALL DIMENSIONS IN MILLIMETRES
- EVERY 6mm EXPANSION JOINTS SHALL BE PLACED 20mm BELOW FINISHED SURFACE LEVEL IN TYPE SF KERB. A CONSTRUCTION JOINT SHALL BE LOCATED DIRECTLY OVER JOINT.
- ALL EXPOSED EDGES TO BE ROUNDED TO 20mm RADIUS.
- CONCRETE TO HAVE A 28 DAY STRENGTH OF 32 MPA
- CONCRETE CYLINDER TEST IS TO BE CARRIED OUT AS PER DOCUMENTS & STANDARDS FORM F101.
- CONCRETE CYLINDER TEST IS TO BE CARRIED FINISHED AS PER SPECIFICATION.

APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL TYPICAL SPLITTER ISLAND PLAN	SCALE NOT TO SCALE DRAWING NO. S107



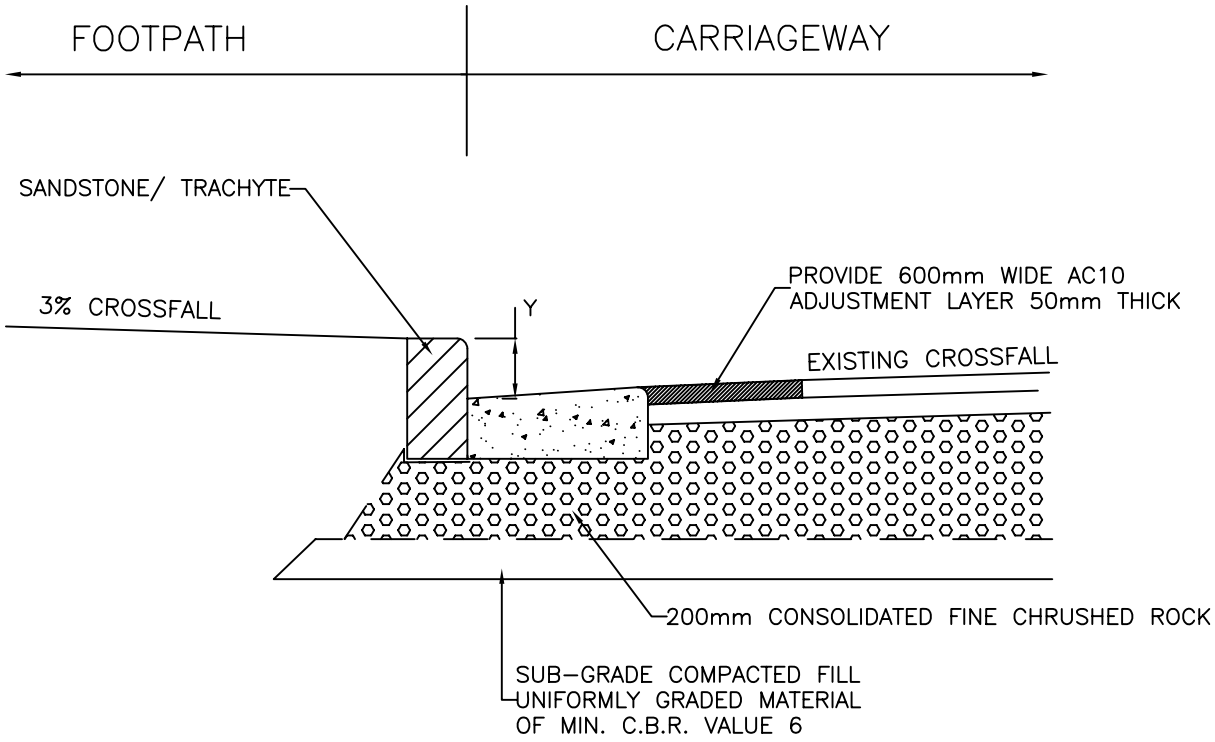
TYPICAL SPLITTER ISLAND
PLAN



SECTION A-A

- ALL DIMENSIONS IN MILLIMETRES
- EVERY 6mm EXPANSION JOINTS SHALL BE PLACED 20mm BELOW FINISHED SURFACE LEVEL IN TYPE SF KERB. A CONSTRUCTION JOINT SHALL BE LOCATED DIRECTLY OVER JOINT.
- ALL EXPOSED EDGES TO BE ROUNDED TO 20mm RADIUS.
- CONCRETE TO HAVE A 28 DAY STRENGTH OF 32 MPA
- CONCRETE CYLINDER TEST IS TO BE CARRIED OUT AS PER DOCUMENTS & STANDARDS FORM F101.
- CONCRETE CYLINDER TEST IS TO BE CARRIED FINISHED AS PER SPECIFICATION.

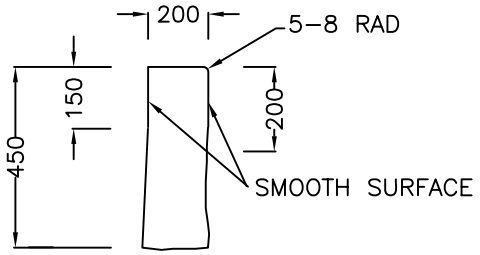
APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL TYPICAL SPLITTER ISLAND PLAN	SCALE NOT TO SCALE DRAWING NO. S107



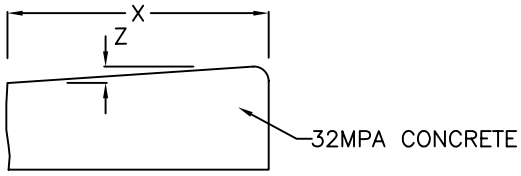
NOTE:

EXPANSION JOINTS IN CONCRETE AT 5m INTERVALS

X	300	450
Y	100	150
Z	30	40



SANDSTONE / TRACHYTE



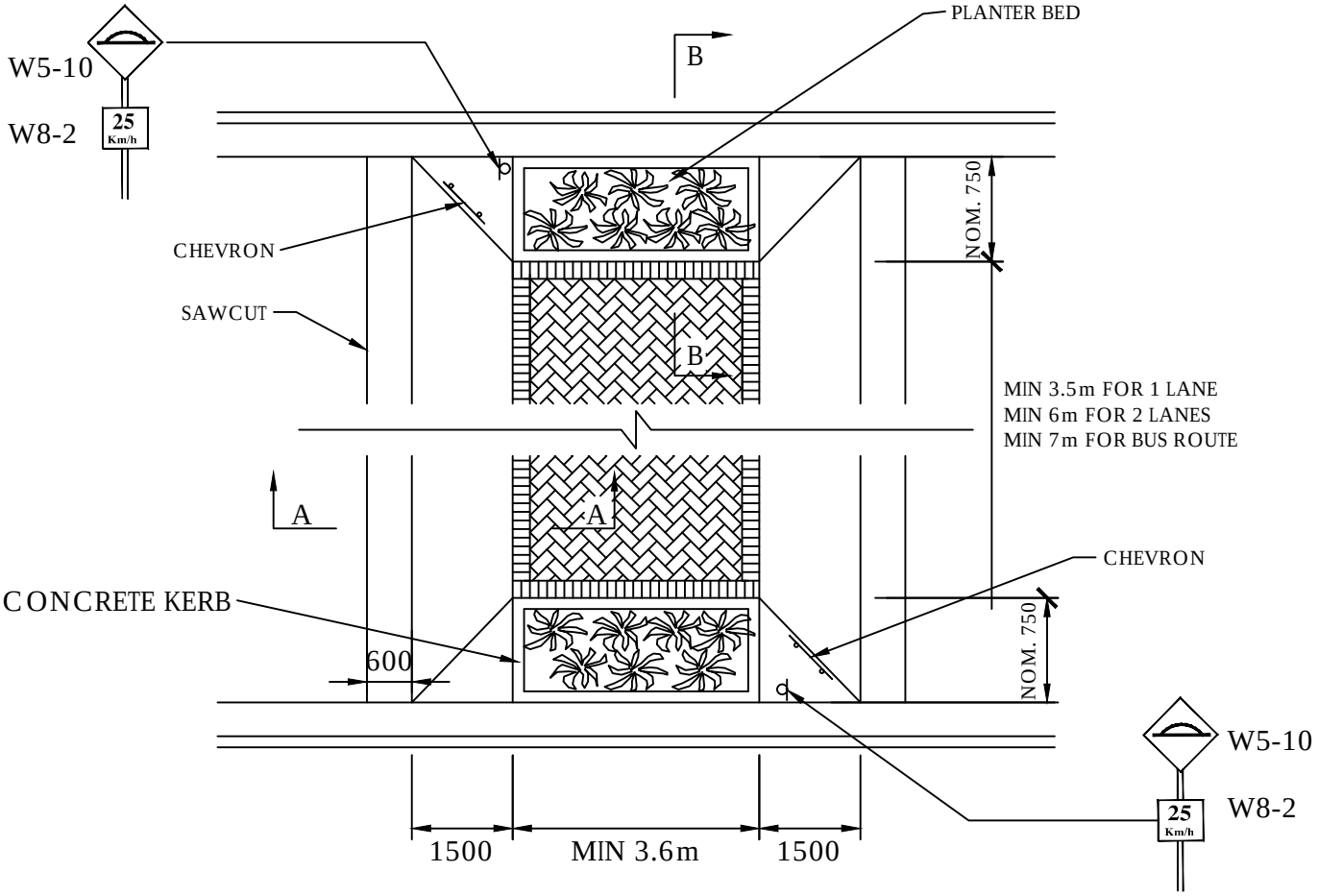
CONCRETE GUTTER

NOTES:

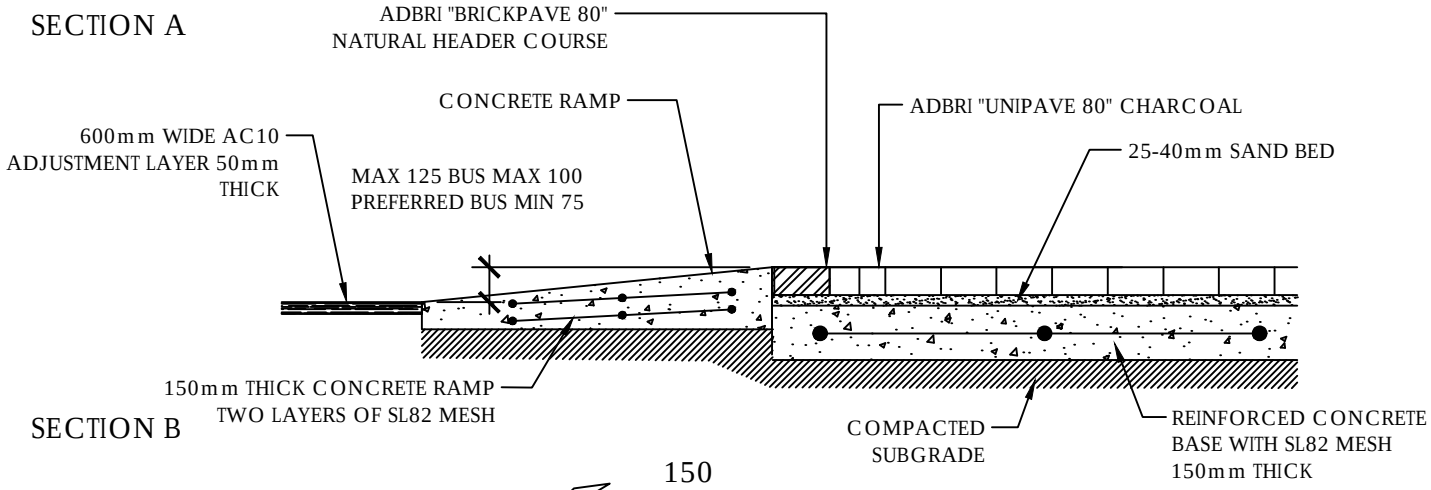
1. BASE COURSE:
   APPROVED CONSOLIDATED FINE CRUSHED ROCK TO R.T.A. SPEC. SHALL BE PROVIDED TO A DEPTH OF 200mm UNLESS OTHERWISE ADVISED (IN WRITING) BY COUNCILS ENGINEER
2. SITE OF WORK:
   DURING AND ON COMPLETION OF WORK ALL EXCAVATED MATERIAL FROM THE SITE SHALL BE REMOVED AND THE SITE KEPT IN A CLEAN, SAFE AND TIDY CONDITION TO THE SATISFACTION OF COUNCILS ENGINEER

APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STANDARD SANDSTONE/TRACHYTE KERB AND GUTTER DETAILS	SCALE NOT TO SCALE DRAWING NO. S109

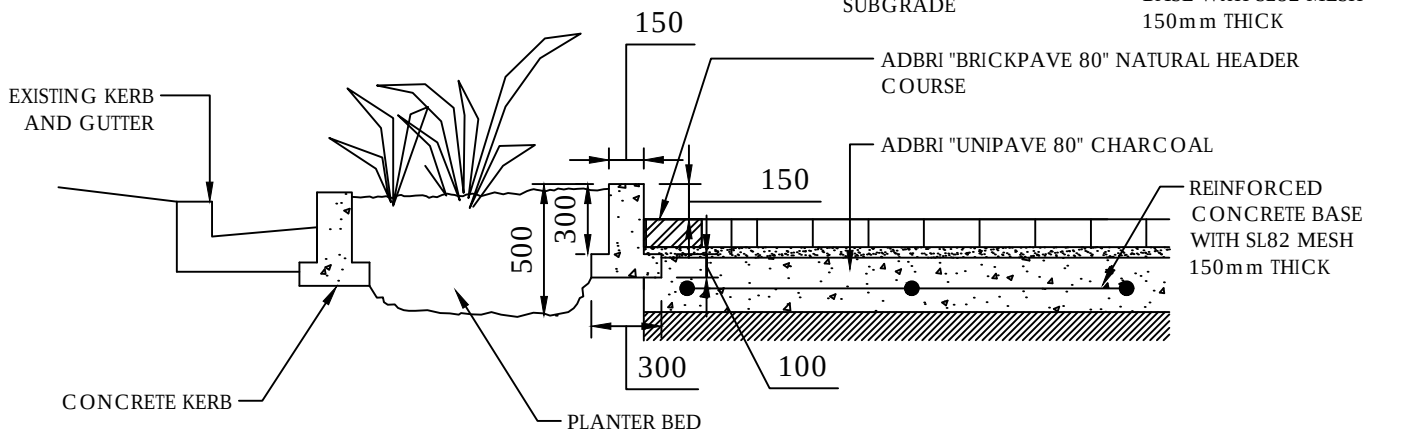
PLAN



SECTION A

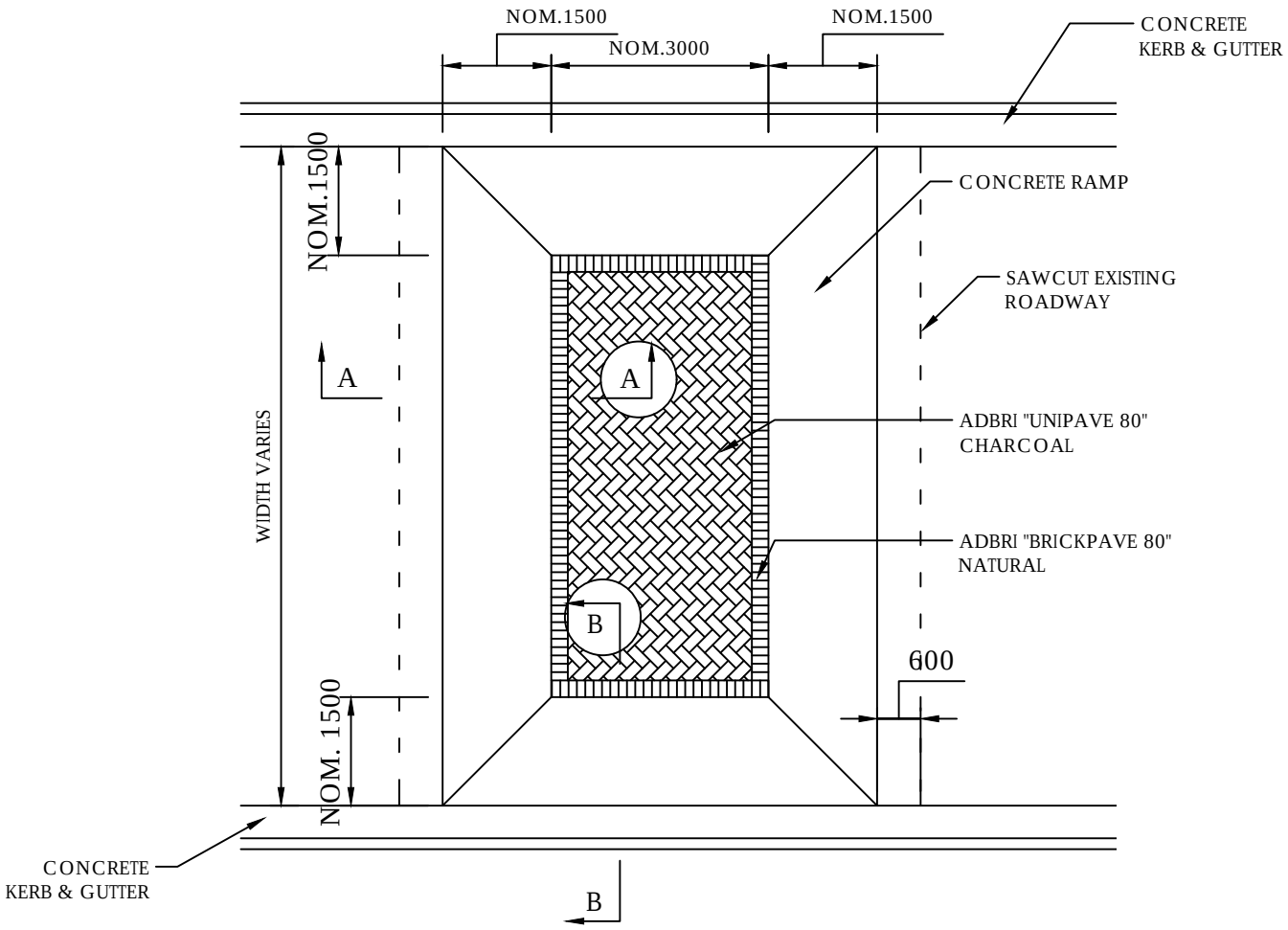


SECTION B

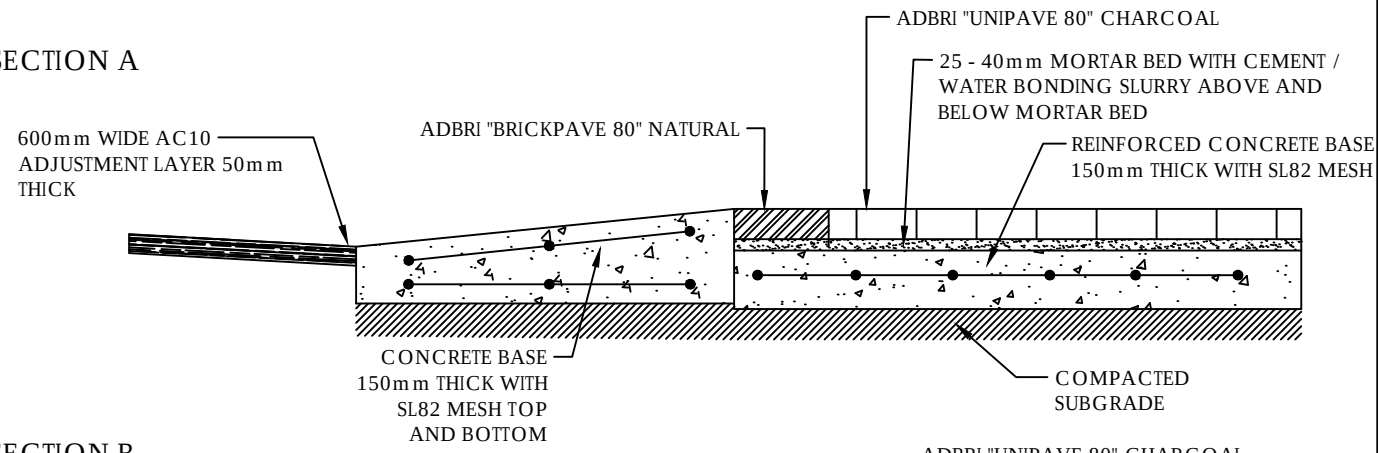


APPROVED: COUNCIL ENGINEER DATE: 04/03/18		NORTH SYDNEY COUNCIL THRESHOLD TYPE 1	SCALE NOT TO SCALE DRAWING NO. S110A

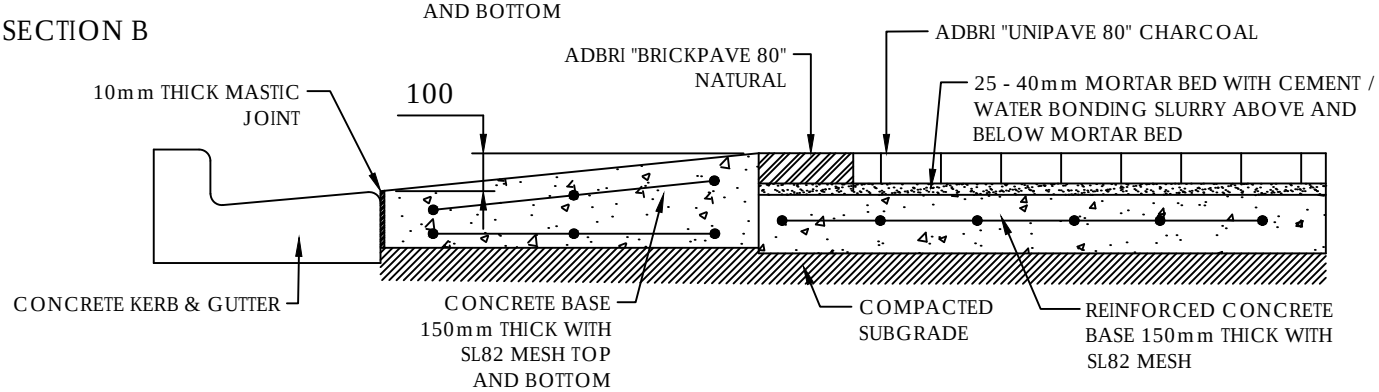
PLAN



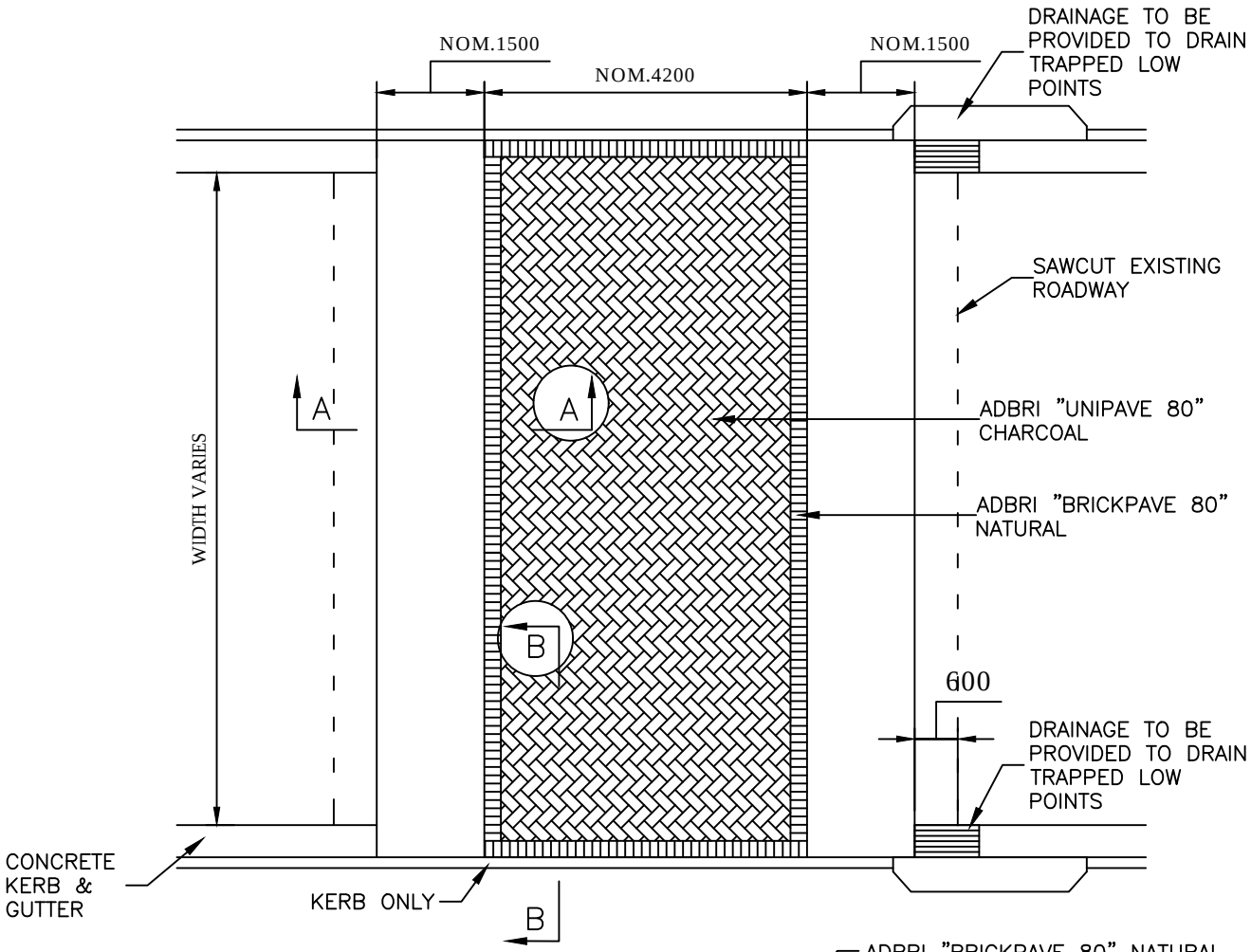
SECTION A



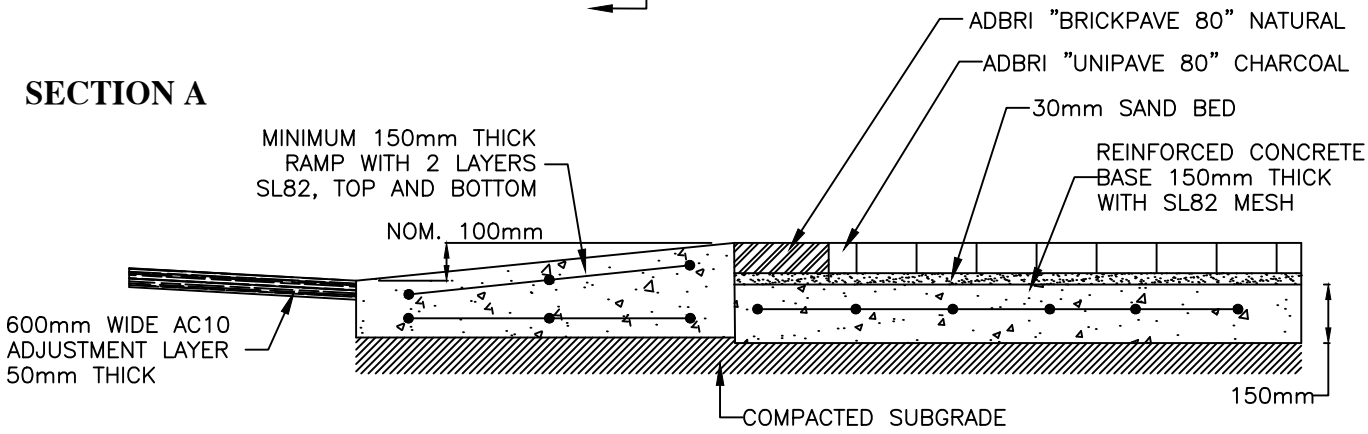
SECTION B



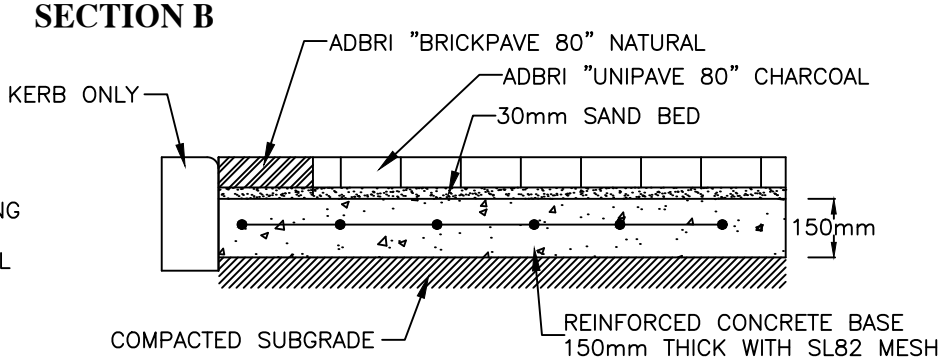
APPROVED: COUNCIL ENGINEER DATE: 16/03/20	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL THRESHOLD TYPE 2	SCALE NOT TO SCALE DRAWING NO. S110B



SECTION A



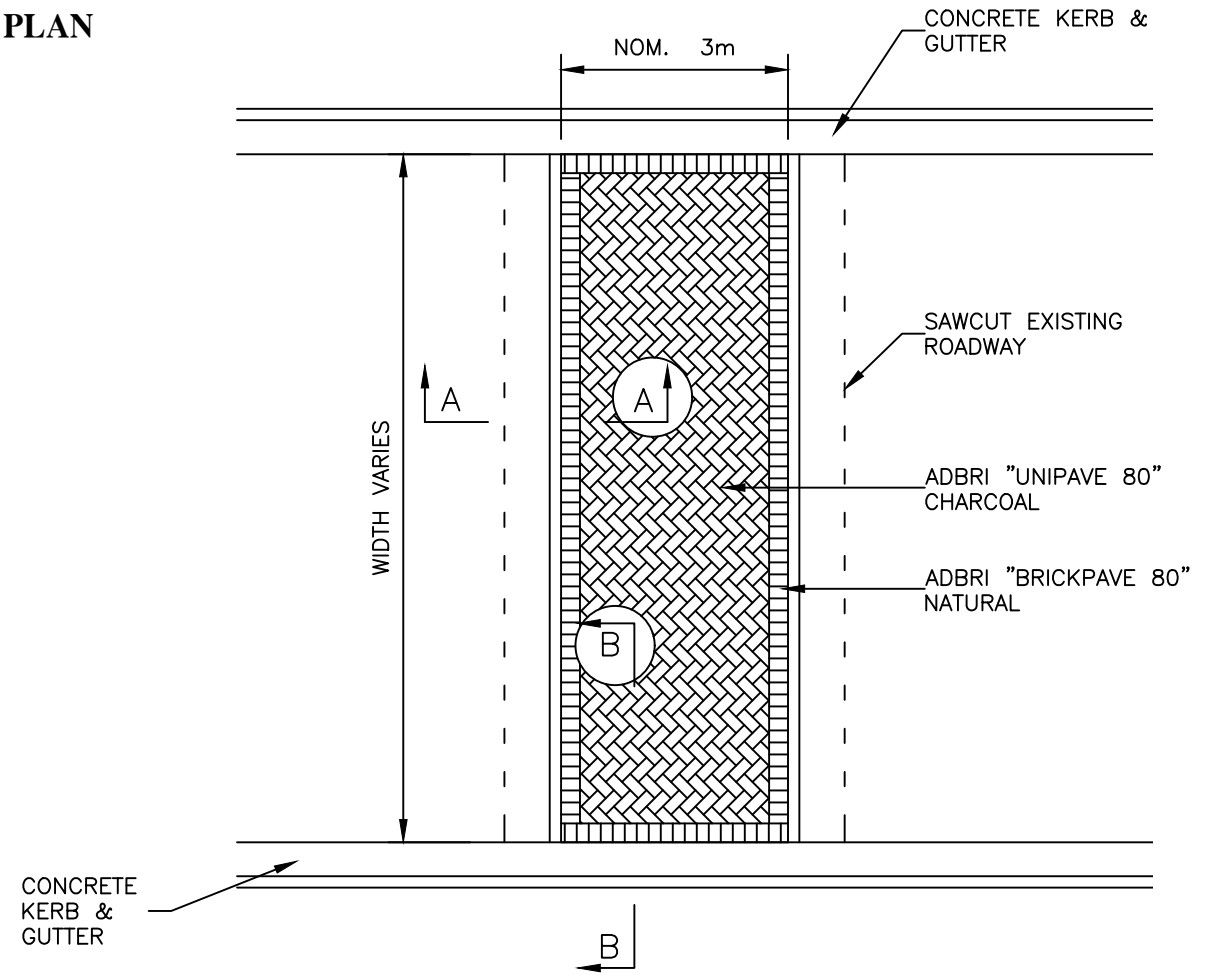
SECTION B



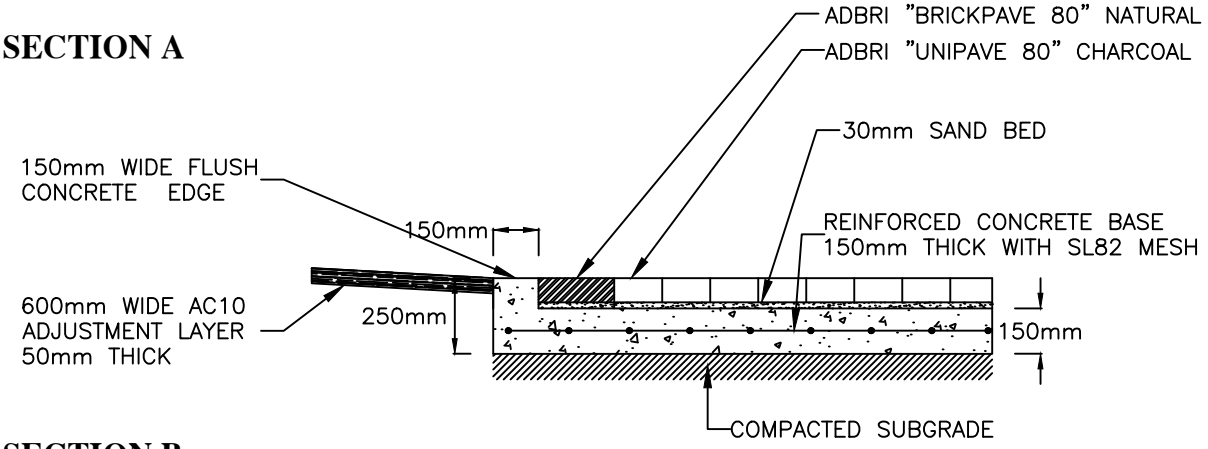
NOTE:
1. GUTTER BRIDGES ARE NOT TO BE USED TO DRAIN TRAPPED LOW POINT
2. PEDESTRIAN CROSSING LINEMARKING AND SIGNAGE TO BE IN ACCORDANCE WITH RMS TECHNICAL DIRECTION

APPROVED: COUNCIL ENGINEER DATE: 16/03/20		NORTH SYDNEY COUNCIL THRESHOLD TYPE 3 (PEDESTRIAN CROSSING)	SCALE NOT TO SCALE DRAWING NO. S110C

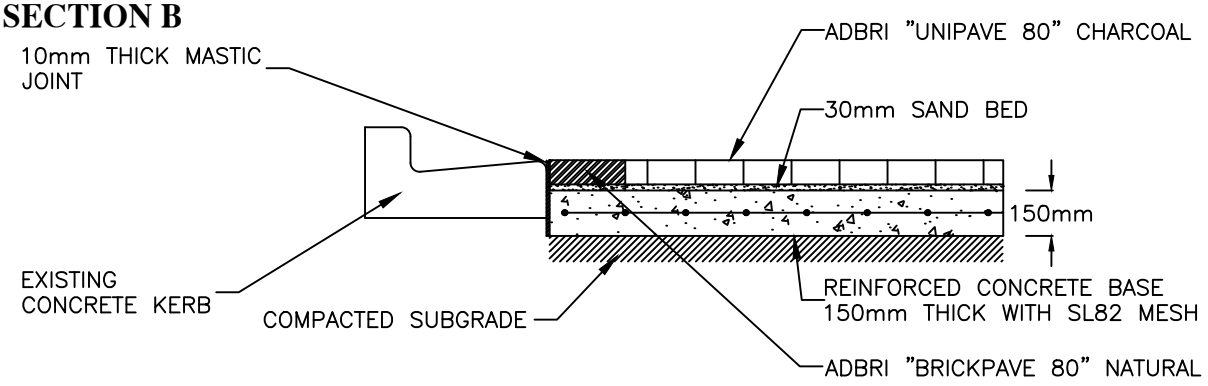
PLAN



SECTION A



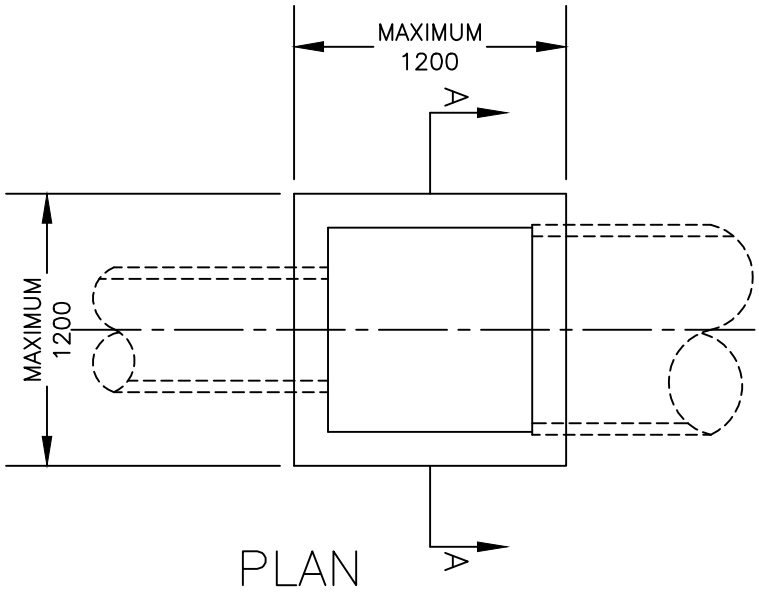
SECTION B



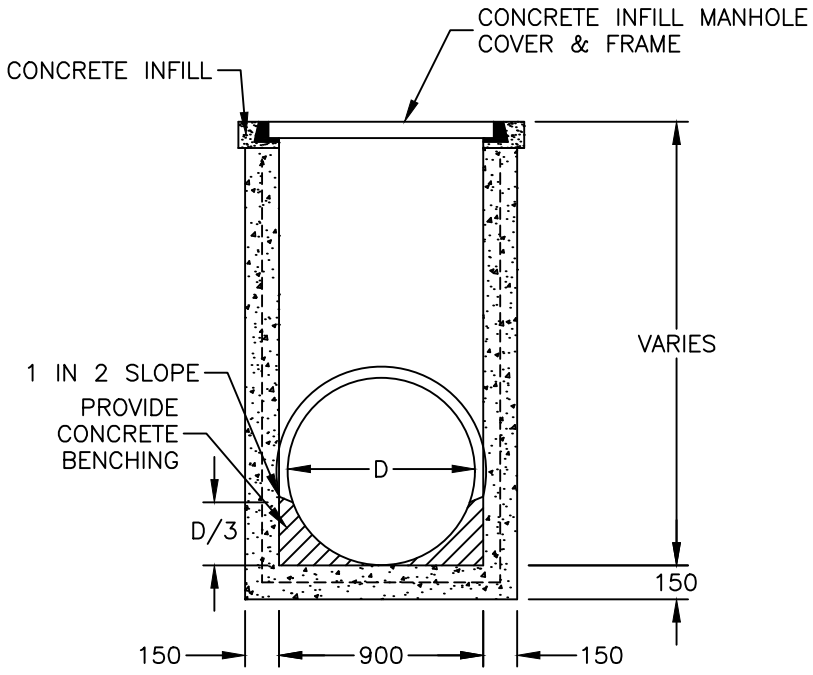
APPROVED: COUNCIL ENGINEER DATE: 16/03/20	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL THRESHOLD TYPE 4 (FLUSH)	SCALE NOT TO SCALE DRAWING NO. S110D

DRAINAGE WORKS
DRAWINGS
S200 SERIES

DRAWING NO	DESCRIPTION
S201	STANDARD JUNCTION PIT
S202	HAUNCHED JUNCTION PIT
S203	STANDARD GRATED GULLY PIT WITH EKI
S204	HAUNCHED GRATED GULLY PIT WITH EKI
S205	STANDARD SADDLE PIT
S206	STANDARD STEP IRON DETAIL
S207	TYPICAL BACKFILL CROSS–SECTION
S208	PIPE SIZES AND TRENCH DETAILS



PLAN

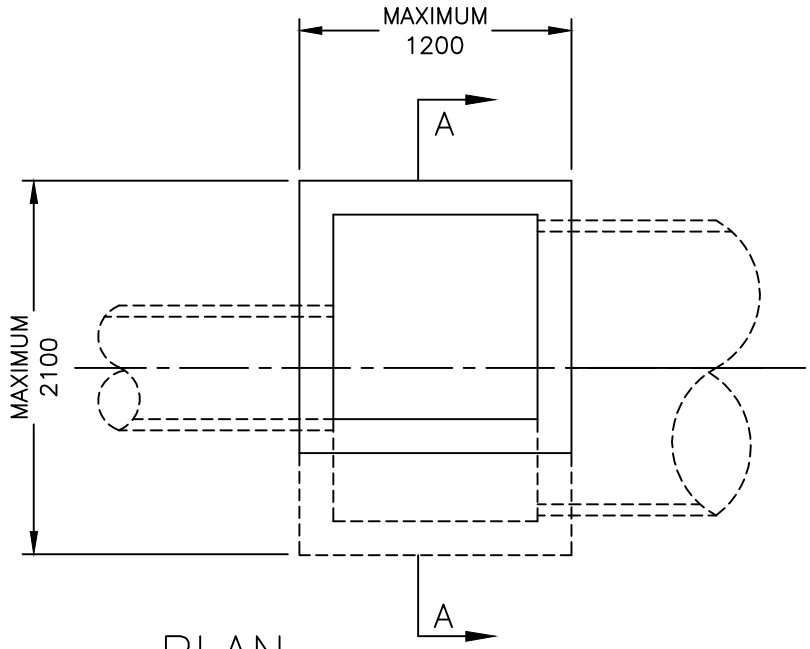


SECTION A–A

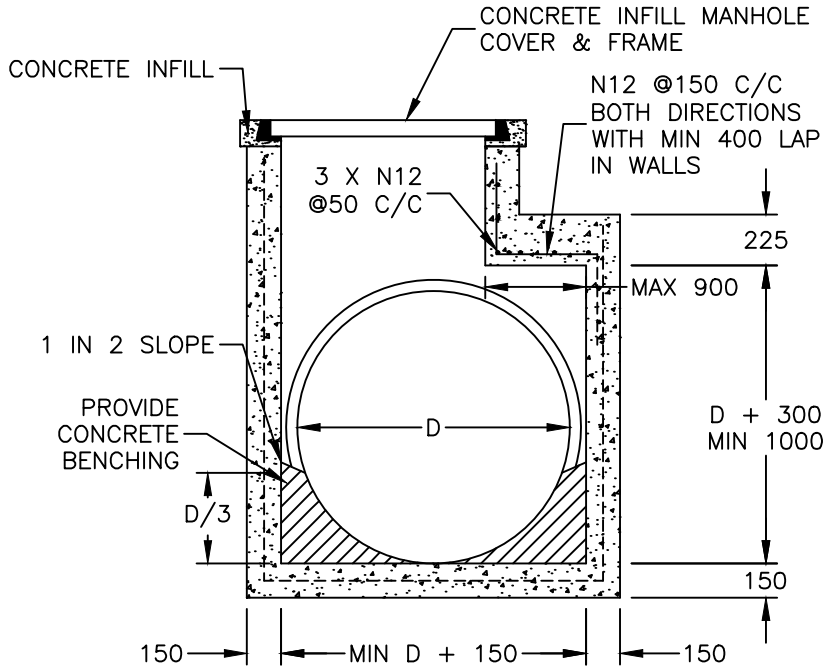
NOTES:

1. MAXIMUM PIPE ø IS 825mm
2. COMPRESSIVE STRENGTH Fc FOR CAST IN SITU CONCRETE TO BE MINIMUM 32 MPa AT 28 DAYS
3. COVER TO BE CONCRETE INFILL GATIC 301C99D OR APPROVED EQUIVALENT
4. PROVIDE SL82 MESH CENTRALLY PLACED TO WALLS AND BASE FOR ALL PITS ≥ 1500 DEEP. MINIMUM 50 COVER. RETURN MESH MIN 300 INTO BASE AND SIDES.
5. PIT NOT TO EXCEED 2500 IN DEPTH
6. STEP IRONS TO BE PROVIDED FOR PITS GREATER THAN 1200 DEEP REFER TO S206.
7. ALL PIPES SHALL BE AS SPECIFIED ON PLANS AND SHALL BE STEEL REINFORCED
8. PROVIDE A 2m LENGTH SLOTTED AG–PIPE WITH FILTER SOCK AT THE UPSTREAM END OF THE PIT.
9. ALL PITS ARE TO BE CAST IN–SITU UNLESS DIRECTED OTHERWISE

APPROVED: COUNCIL ENGINEER DATE: 17/03/20	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STANDARD JUNCTION PIT	SCALE N.T.S DRAWING NO. S201



PLAN



SECTION A–A

NOTES:

1. MAXIMUM PIPE ø IS 1500mm
2. MAXIMUM SKEWED PIPE ø IS 750mm @ 45°
3. COMPRESSIVE STRENGTH Fc FOR CAST IN SITU CONCRETE TO BE MINIMUM 32 MPa AT 28 DAYS
4. COVER TO BE CONCRETE INFILL GATIC 301C99D OR APPROVED EQUIVALENT
5. PROVIDE SL82 MESH CENTRALLY PLACED TO WALLS AND BASE FOR ALL PITS ≥ 1500 DEEP. MINIMUM 50 COVER. RETURN MESH MIN 300 INTO BASE AND SIDES.
6. PIT NOT TO EXCEED 2500 IN DEPTH
7. STEP IRONS TO BE PROVIDED FOR PITS GREATER THAN 1200 DEEP REFER TO S206.
8. ALL PIPES SHALL BE AS SPECIFIED ON PLANS AND SHALL BE STEEL REINFORCED
9. PROVIDE A 2m LENGTH SLOTTED AG–PIPE WITH FILTER SOCK AT THE UPSTREAM END OF THE PIT.
10. ALL PITS ARE TO BE CAST IN–SITU UNLESS DIRECTED OTHERWISE

APPROVED: COUNCIL ENGINEER DATE: 17/03/20	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL HAUNCHED JUNCTION PIT	SCALE N.T.S DRAWING NO. S202

APPROVED:

COUNCIL ENGINEER

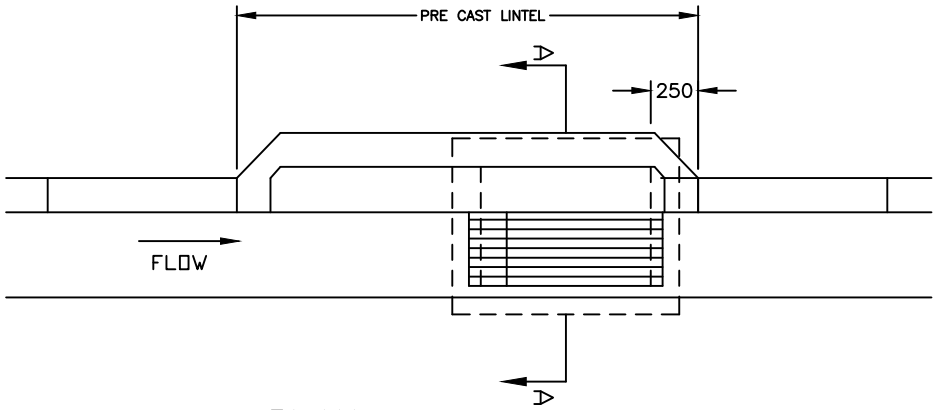
DATE: 17/03/20

NORTH SYDNEY COUNCIL

STANDARD GRATED GULLY PIT WTIH PRE-CAST EKI

SCALE N.T.S

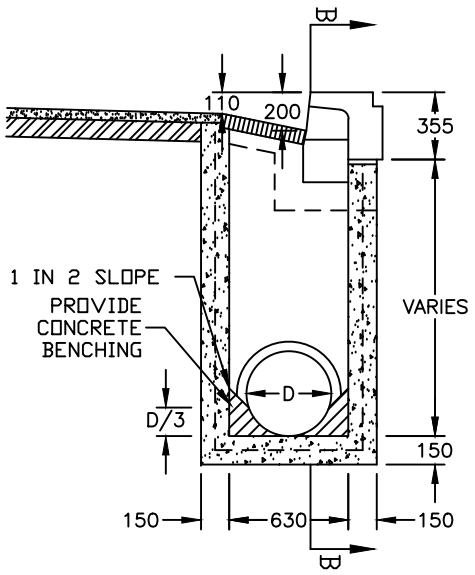
DRAWING NO. S203



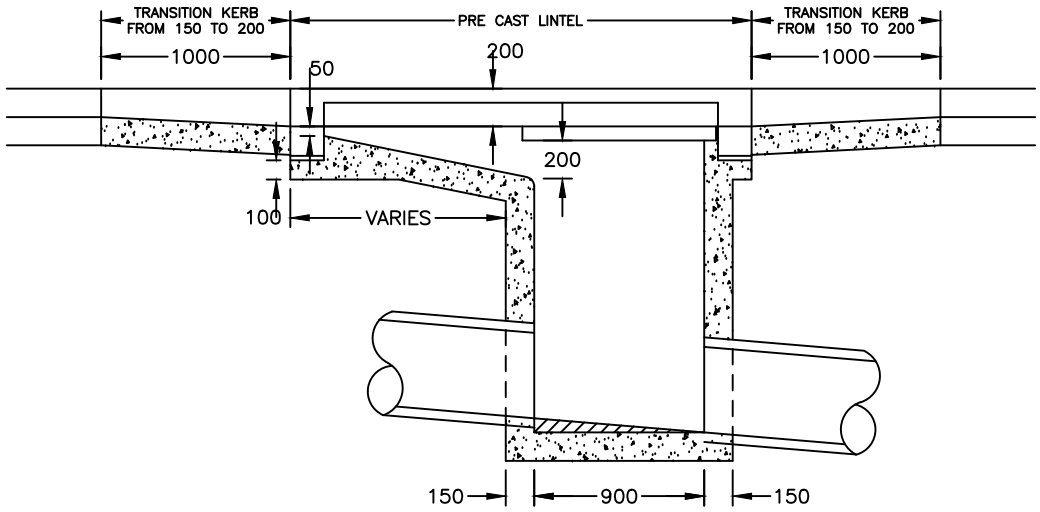
PLAN

NOTES:

1. MAXIMUM PIPE ø IS 600mm
2. COMPRESSIVE STRENGTH Fc FOR CAST IN SITU CONCRETE TO BE MINIMUM 32 MPa AT 28 DAYS
3. COVER TO BE WELDLOK GG50D OR APPROVED EQUIVALENT
4. PROVIDE SL82 MESH CENTRALLY PLACED TO WALLS AND BASE FOR ALL PITS ≥ 1500 DEEP. MINIMUM 50 COVER. RETURN MESH MIN 300 INTO BASE AND SIDES.
5. PIT NOT TO EXCEED 2500 IN DEPTH
6. STEP IRONS TO BE PROVIDED FOR PITS GREATER THAN 1200 DEEP REFER TO S206.
7. ALL PIPES SHALL BE AS SPECIFIED ON PLANS AND SHALL BE STEEL REINFORCED.
8. PROVIDE A 2m LENGTH SLOTTED AG-PIPE WITH FILTER SOCK AT THE UPSTREAM END OF THE PIT.
9. ALL PITS ARE TO BE CAST IN-SITU UNLESS DIRECTED OTHERWISE



SECTION A-A



SECTION B-B

APPROVED:

COUNCIL ENGINEER

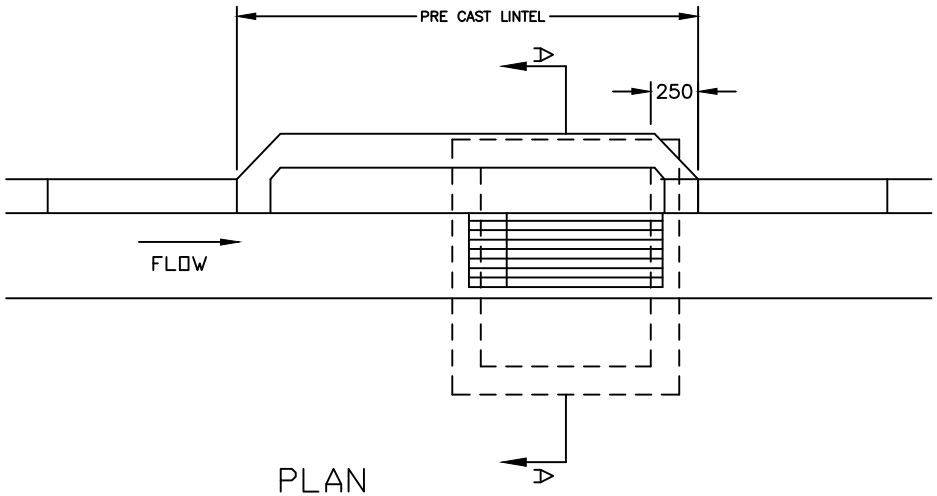
DATE: 17/03/20

NORTH SYDNEY COUNCIL

HAUNCHED GRATED GULLY PIT WTIH PRE-CAST EKI

SCALE N.T.S

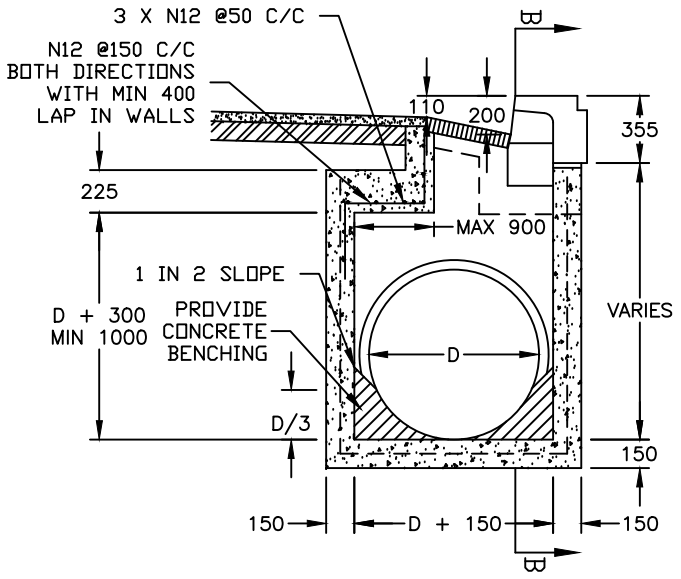
DRAWING NO. S204



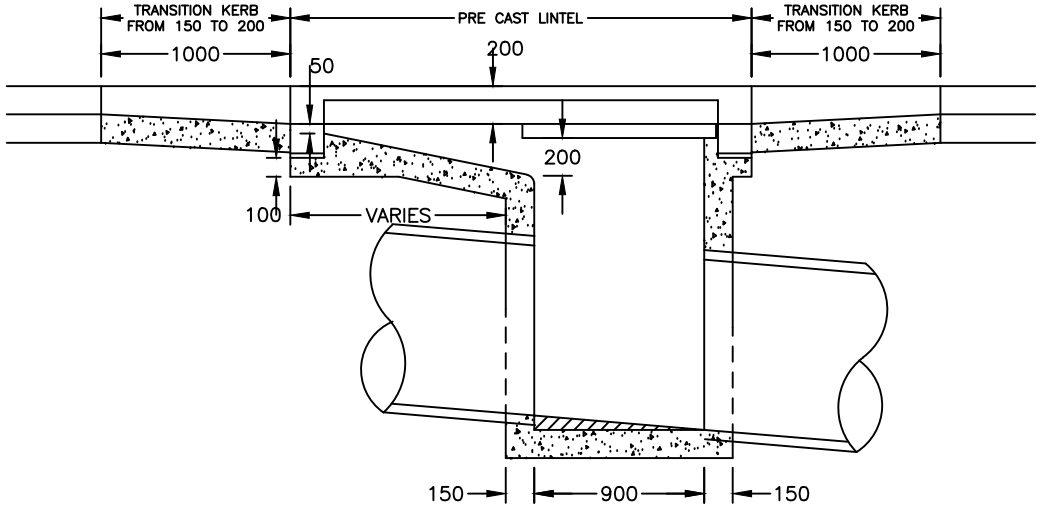
PLAN

NOTES:

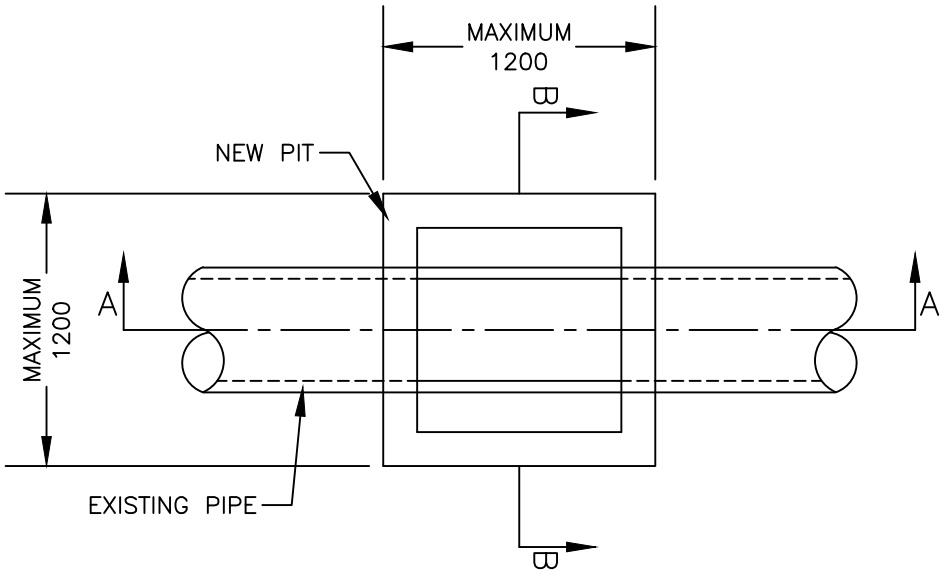
1. MAXIMUM PIPE ø IS 1200mm
2. COMPRESSIVE STRENGTH Fc FOR CAST IN SITU CONCRETE TO BE MINIMUM 32 MPa AT 28 DAYS
3. COVER TO BE WELDLOK GG50D OR APPROVED EQUIVALENT
4. PROVIDE SL82 MESH CENTRALLY PLACED TO WALLS AND BASE FOR ALL PITS ≥ 1500 DEEP. MINIMUM 50 COVER. RETURN MESH MIN 300 INTO BASE AND SIDES.
5. PIT NOT TO EXCEED 2500 IN DEPTH
6. STEP IRONS TO BE PROVIDED FOR PITS GREATER THAN 1200 DEEP REFER TO S206.
7. ALL PIPES SHALL BE AS SPECIFIED ON PLANS AND SHALL BE STEEL REINFORCED.
8. PROVIDE A 2m LENGTH SLOTTED AG-PIPE WITH FILTER SOCK AT THE UPSTREAM END OF THE PIT.
9. ALL PITS ARE TO BE CAST IN-SITU UNLESS DIRECTED OTHERWISE



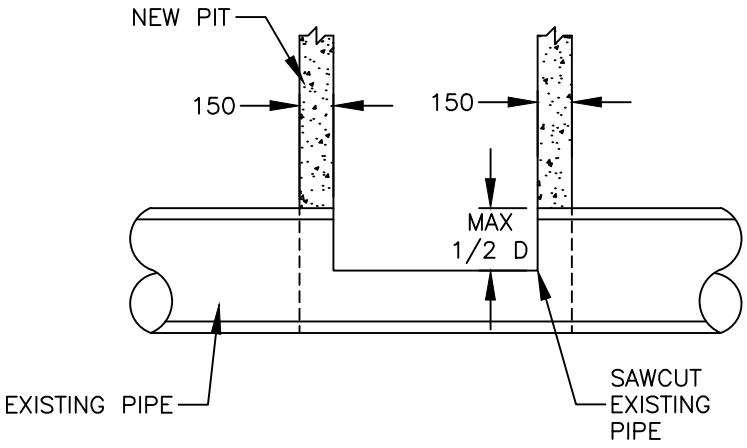
SECTION A-A



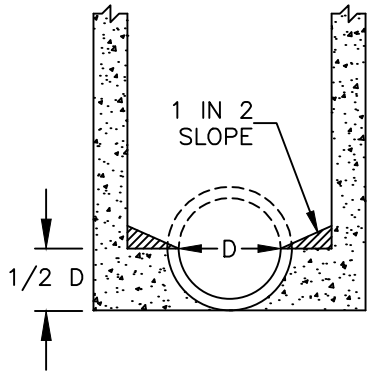
SECTION B-B



PLAN



SECTION A–A

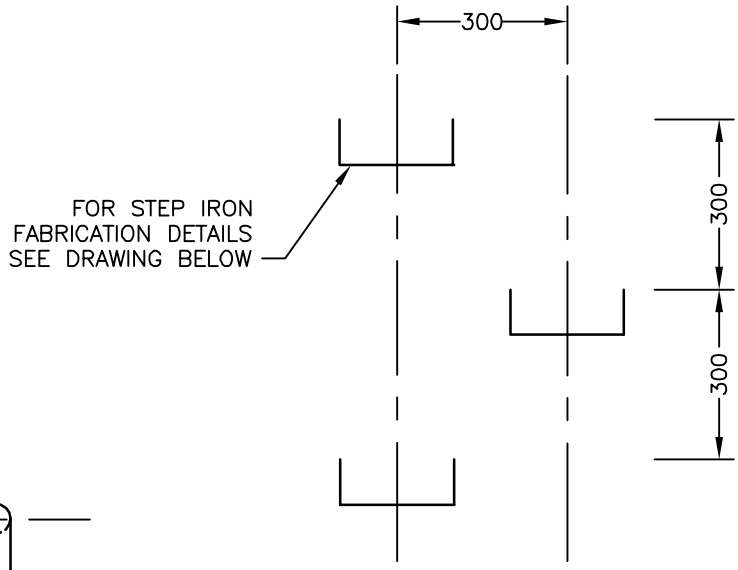


SECTION B–B

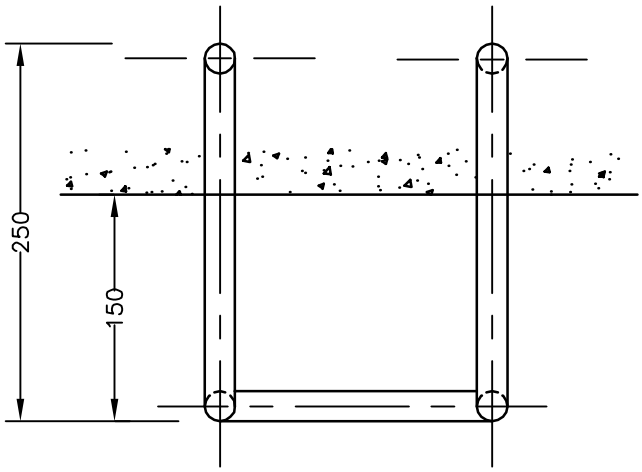
NOTES:

1. MAXIMUM PIPE ø IS 825mm
2. COMPRESSIVE STRENGTH Fc FOR CAST IN SITU CONCRETE TO BE MINIMUM 32 MPa AT 28 DAYS
3. PIT SIZE TO BE IN ACCORDANCE WITH S201, S202 OR S203
4. ALL PIT WALLS ARE TO BE 150 THICK
5. PROVIDE SL82 MESH CENTRALLY PLACED TO WALLS AND BASE FOR ALL PITS ≥ 1500 DEEP. MINIMUM 50 COVER. RETURN MESH MIN 300 INTO BASE AND SIDES.
6. PIT NOT TO EXCEED 2500 IN DEPTH
7. STEP IRONS TO BE PROVIDED FOR PITS GREATER THAN 1200 DEEP REFER TO S206.
8. ALL PIPES SHALL BE AS SPECIFIED ON PLANS AND SHALL BE STEEL REINFORCED.
9. PROVIDE A 2m LENGTH SLOTTED AG–PIPE WITH FILTER SOCK AT THE UPSTREAM END OF THE PIT.
10. ALL PITS ARE TO BE CAST IN–SITU UNLESS DIRECTED OTHERWISE

APPROVED: COUNCIL ENGINEER DATE: 17/03/20	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL	SCALE N.T.S
		STANDARD SADDLE PIT	DRAWING NO. S205



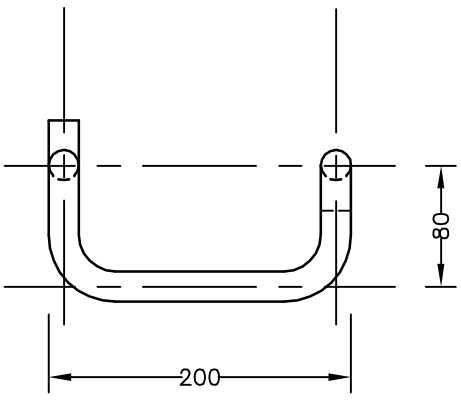
STEP IRON PLACEMENT DIAGRAM



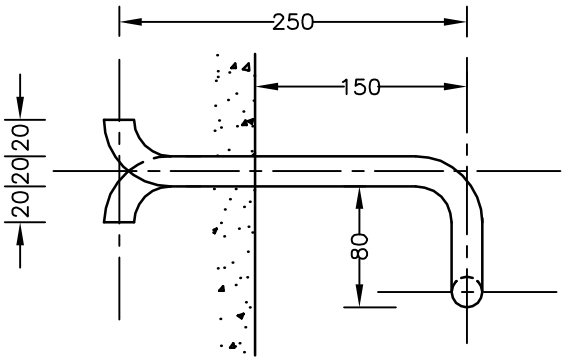
PLAN

NOTES:

1: STEP IRONS TO BE FABRICATED FROM 20mm ø M.S.
2: ALL BENDS TO BE FORMED AROUND 12mm diameter PIN
3: STEP IRONS TO BE PROVIDED IN PITS DEEPER THAN 1.2m
4: STEP IRONS TO BE HOT–DIPPED GALVANISED
5: STEP IRONS TO BE LOCATED DIRECTLY UNDER PIT ACCESS

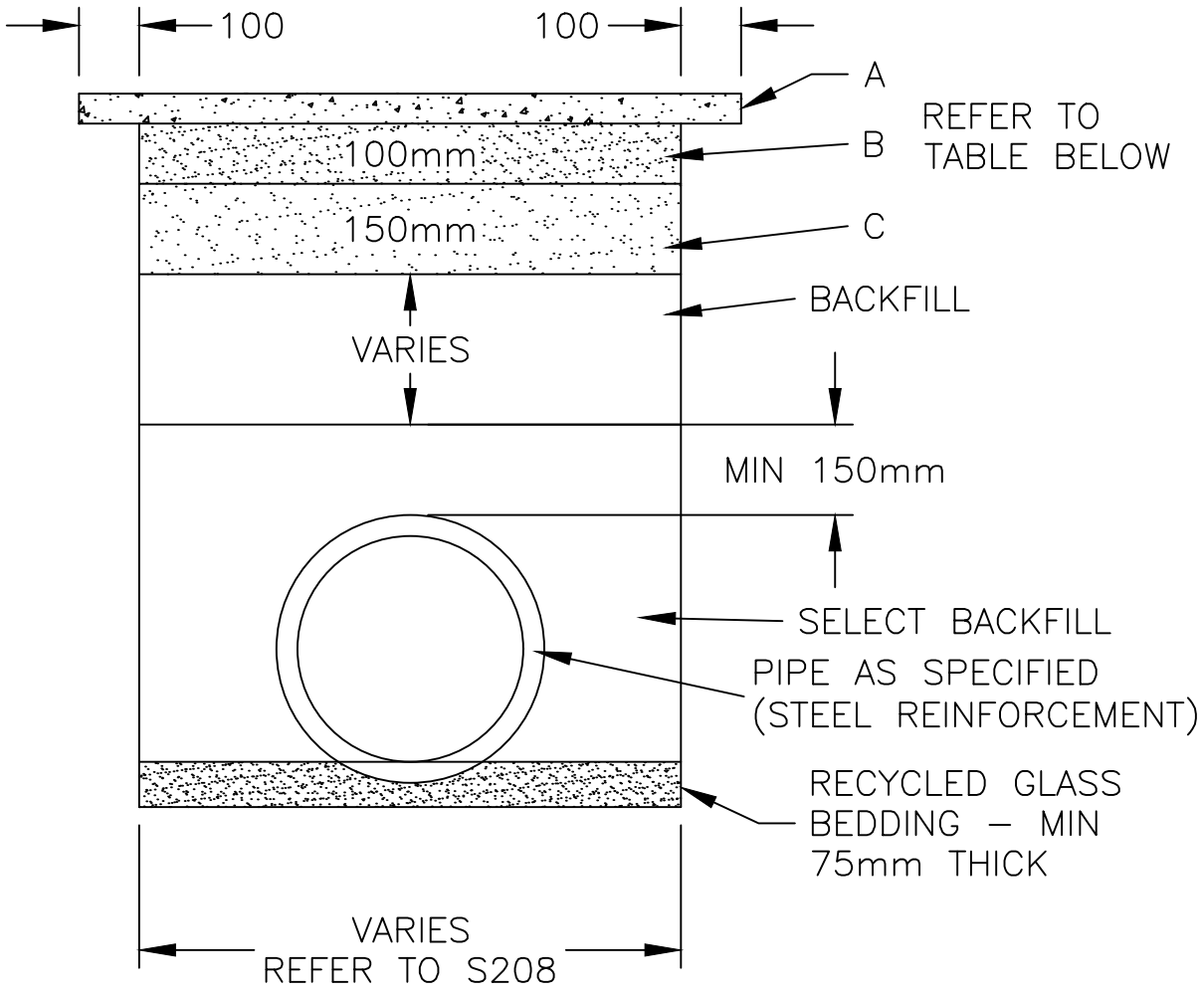


FRONT ELEVATION



SIDE ELEVATION

APPROVED: COUNCIL ENGINEER DATE: 01/05/04		NORTH SYDNEY COUNCIL STANDARD STEP IRON DETAIL	SCALE N.T.S DRAWING NO. S206



	A	B	C
ROAD WAY	AC10 – 50mm THICK	DGB20	DGB40
FOOTPATH	CONCRETE – 75mm THICK	DGB20	–
PARK/GRASS VERGE	TURF	TOP SOIL	TURF UNDERLAY

NOTES:

1: COMPACTION: REFER TO COUNCIL SPECIFICATION
2: TRENCH WIDTH REFER TO DRAWING NUMBER S208

APPROVED: COUNCIL ENGINEER DATE: 17/03/20		NORTH SYDNEY COUNCIL TYPICAL BACK FILL CROSS SECTION	SCALE N.T.S DRAWING NO. S207

PIPE ø (mm)	PIPE THICKNESS (mm)	SOCKET COLLAR (mm)	WATERWAY AREA (sq.m)	TRENCH WIDTH (metres)	EASEMENT WIDTH (metres)
150	26.5	41.5	0.018	0.6	2.0
225	31.0	44.0	0.041	0.6	2.0
300	31.0	44.5	0.072	0.6	2.0
375	35.0	47.5	0.114	0.9	2.5
450	41.5	54.0	0.164	0.9	2.5
525	45.5	57.0	0.223	0.9	2.5
600	49.5	63.5	0.292	0.9	2.5
675	56.0	67.0	0.369	1.2	3.0
750	60.0	73.0	0.456	1.2	3.0
825	60.5	70.0	0.552	1.2	3.0
900	71.5	75.5	0.657	1.2	3.0
1050	72.0	79.5	0.894	1.8	3.0
1200	82.5	89.0	1.167	1.8	3.5
1350	87.0	92.0	1.478	1.8	3.5
1500	94.5	98.5	1.824	2.4	3.5
1650	102.0	105.0	2.207	2.4	4.0
1800	109.5	111.5	2.627	2.4	4.0

NOTE : EASEMENT WIDTH FOR TWIN PIPES

$1m + D + 1/2m + D + 1m = 2D + 2.5m$

APPROVED:		NORTH SYDNEY COUNCIL	SCALE
COUNCIL ENGINEER		PIPE SIZES AND TRENCH DETAILS	DRAWING NO. S208
DATE: 01/05/04			

PARKING METER DRAWINGS S300 SERIES

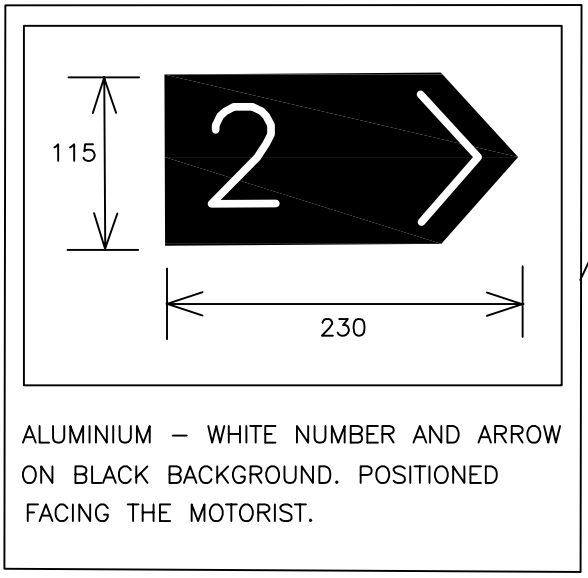
DRAWING NO	DESCRIPTION
S301A	STANDARD PARKING METER BAY LINE MARKING –CONCRETE/SANDSTONE KERB
S301B	STANDARD PARKING METER BAY LINE MARKING – GRANITE KERB
S301C	STANDARD PARKING METER BAY LINE MARKING – ANGLE PARKING
S302A	METER INSTALLATION & RESTORATION REQUIREMENTS IN GRANITE PAVING WITH EXISTING CONCRETE BASE
S302B	METER INSTALLATION & RESTORATION REQUIREMENTS IN GRANITE PAVING WITH NEW CONCRETE BASE
S303A	METER INSTALLATION & RESTORATION REQUIREMENTS IN PAVING WITH ROADBASE SUB–BASE
S303B	METER INSTALLATION & RESTORATION REQUIREMENTS IN PAVING WITH CONCRETE SUB–BASEROADBASE SUB–BASE
S304	METER INSTALLATION & RESTORATION REQUIREMENTS IN UNREINFORCED CONCRETE
S305	METER INSTALLATION & RESTORATION REQUIREMENTS IN BITUMEN
S306	METER INSTALLATION & RESTORATION REQUIREMENTS IN TURF INCLUDING PLATFORM

1 ALL LINEMARKING SHALL BE 80mm WIDE THERMOPLASTIC OR PAINTED IN THE INTERIM

2 ALL NUMBERS AND ARROWS SHALL BE PLACED USING SINGLE USE STICK–ON ALUMINIUM STENCIL

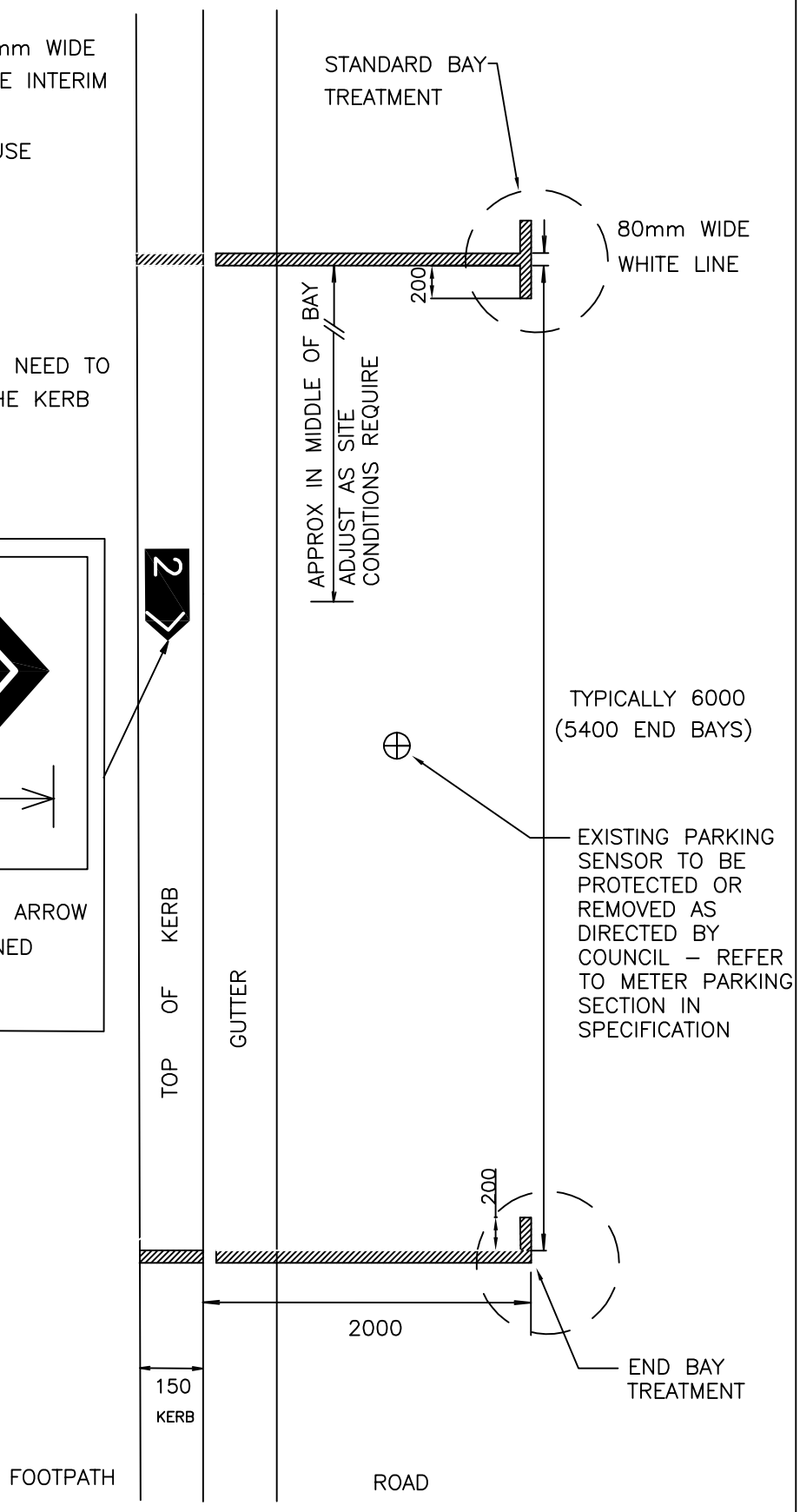
3 ALL SURFACES SHALL BE CLEANED PRIOR TO THE APPLICATION OF BAY PAD

4 OTHER TYPES OF BAY PADS MAY NEED TO BE USED DUE TO NATURE OF THE KERB



ALUMINIUM – WHITE NUMBER AND ARROW ON BLACK BACKGROUND. POSITIONED FACING THE MOTORIST.

BAY PAD (BY OTHERS)



NOTE: ALL DIMENSIONS IN MILLIMETERS

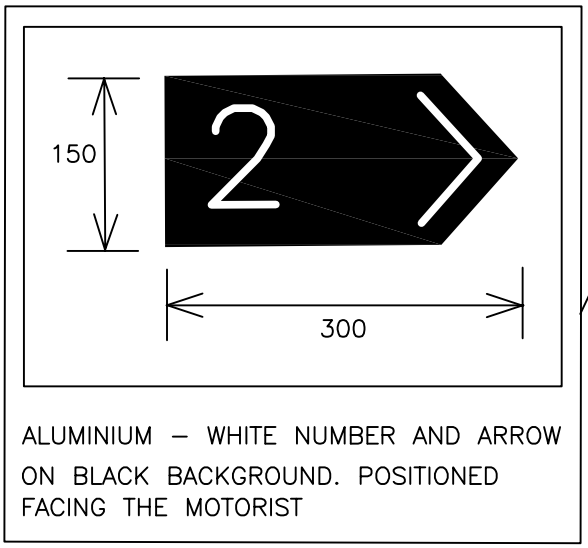
APPROVED: COUNCIL ENGINEER DATE: 04/07/22	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STANDARD PARKING METER BAY LINEMARKING MARKING–CONCRETE or SANDSTONE KERB	SCALE N.T.S. DRAWING NO. S301A

1 ALL LINEMARKING SHALL BE 80mm WIDE THERMOPLASTIC OR PAINTED IN THE INTERIM

2 ALL NUMBERS AND ARROWS SHALL BE PLACED USING SINGLE USE STICK–ON ALUMINIUM STENCIL

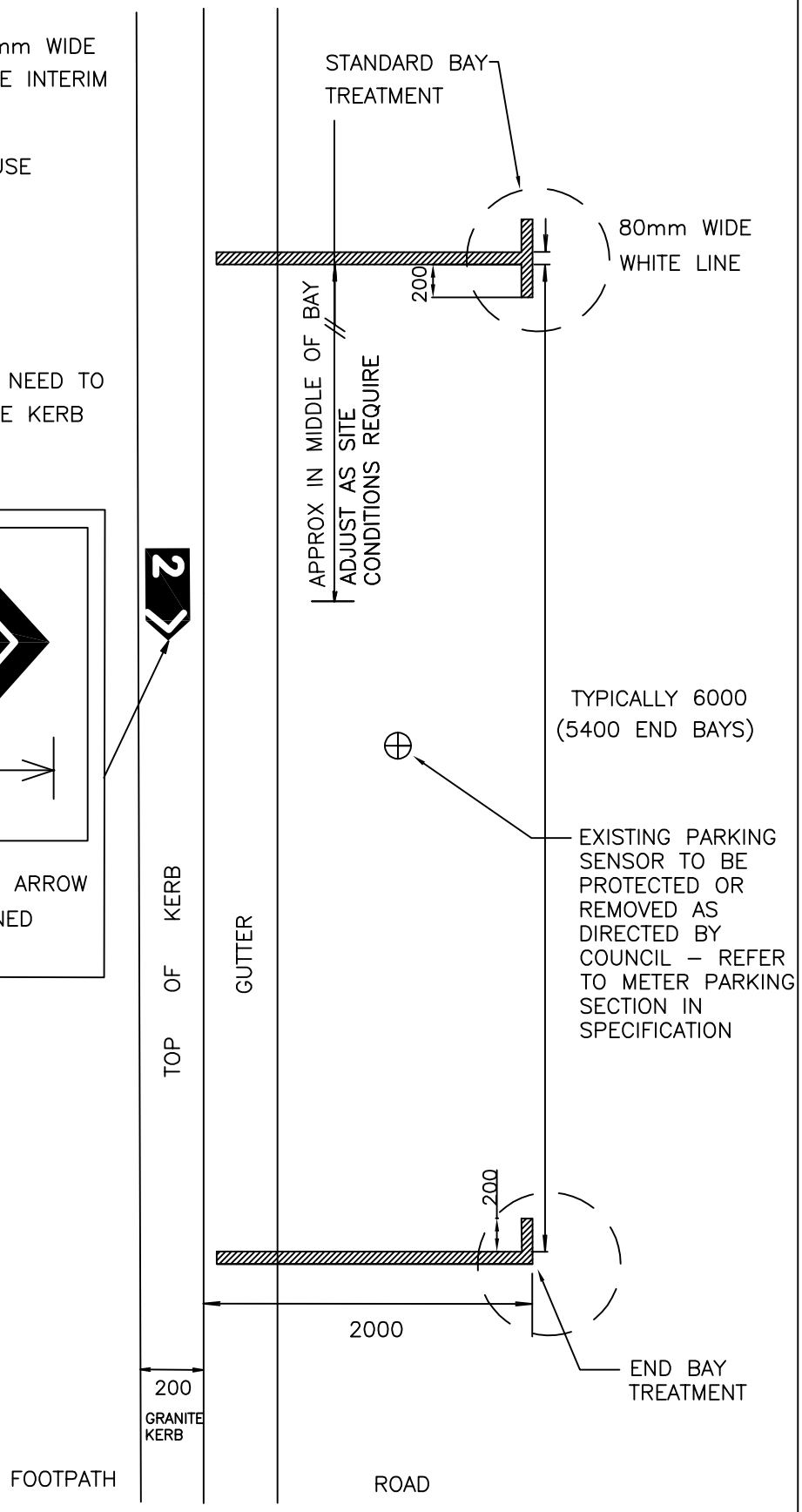
3 ALL GRANITE SURFACES SHALL BE CLEANED PRIOR TO THE APPLICATION OF BAY PAD

4 OTHER TYPES OF BAY PADS MAY NEED TO BE USED DUE TO NATURE OF THE KERB



ALUMINIUM – WHITE NUMBER AND ARROW ON BLACK BACKGROUND. POSITIONED FACING THE MOTORIST

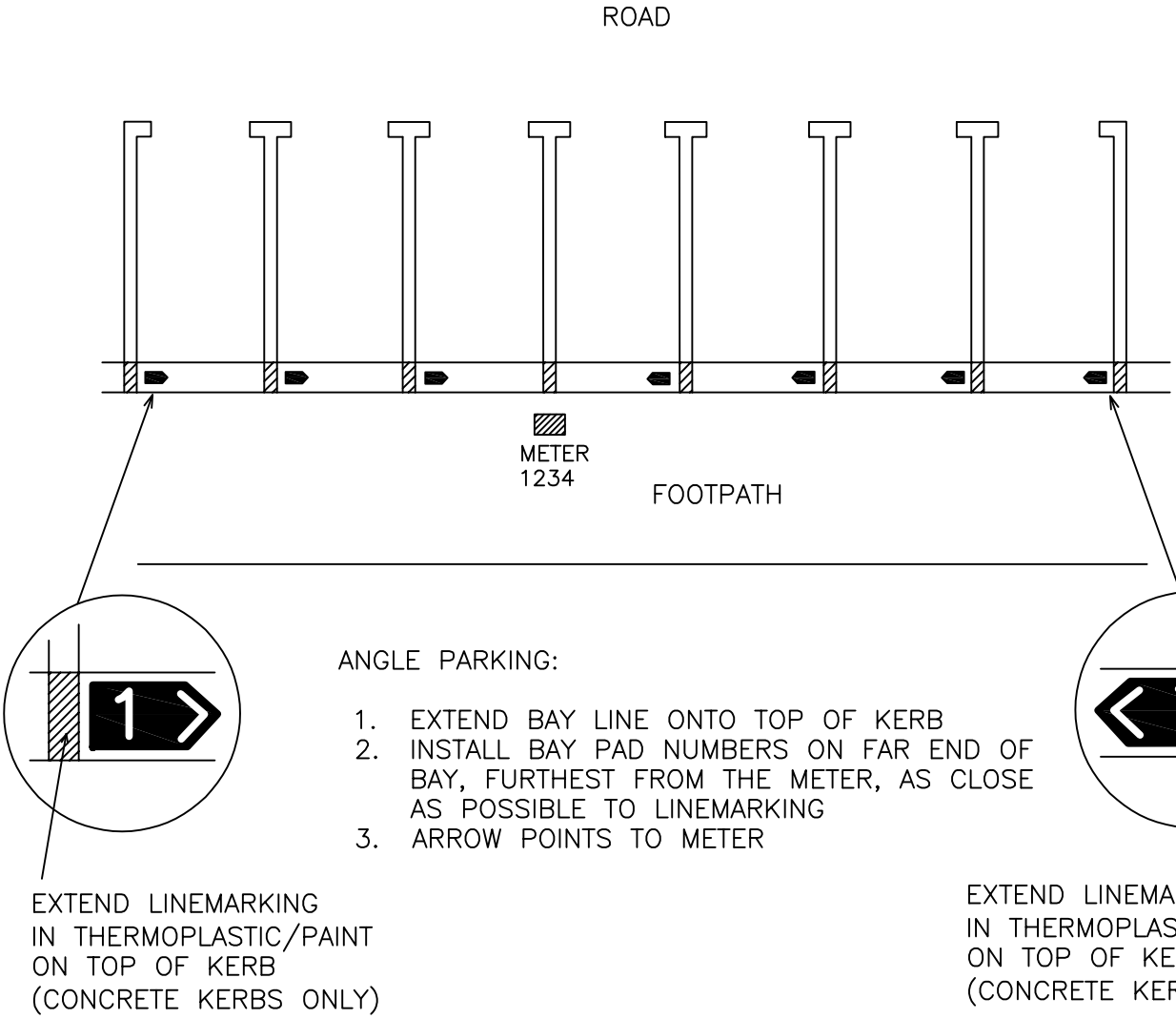
BAY PAD (BY OTHERS)



NOTE: ALL DIMENSIONS IN MILLIMETERS

APPROVED: COUNCIL ENGINEER DATE: 04/07/22		NORTH SYDNEY COUNCIL STANDARD PARKING METER BAY LINE MARKING GRANITE KERBS	SCALE N.T.S. DRAWING NO. S301B

ALUMINIUM BAY PAD
INSTALLATION
– ANGLE PARKING



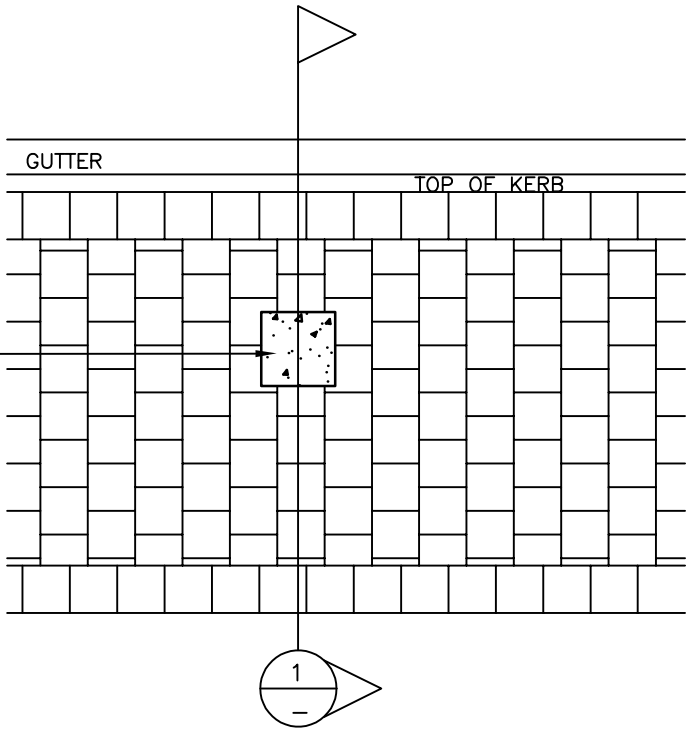
ANGLE PARKING:

1. EXTEND BAY LINE ONTO TOP OF KERB
2. INSTALL BAY PAD NUMBERS ON FAR END OF BAY, FURTHEST FROM THE METER, AS CLOSE AS POSSIBLE TO LINEMARKING
3. ARROW POINTS TO METER

EXTEND LINEMARKING
IN THERMOPLASTIC/PAINT
ON TOP OF KERB
(CONCRETE KERBS ONLY)

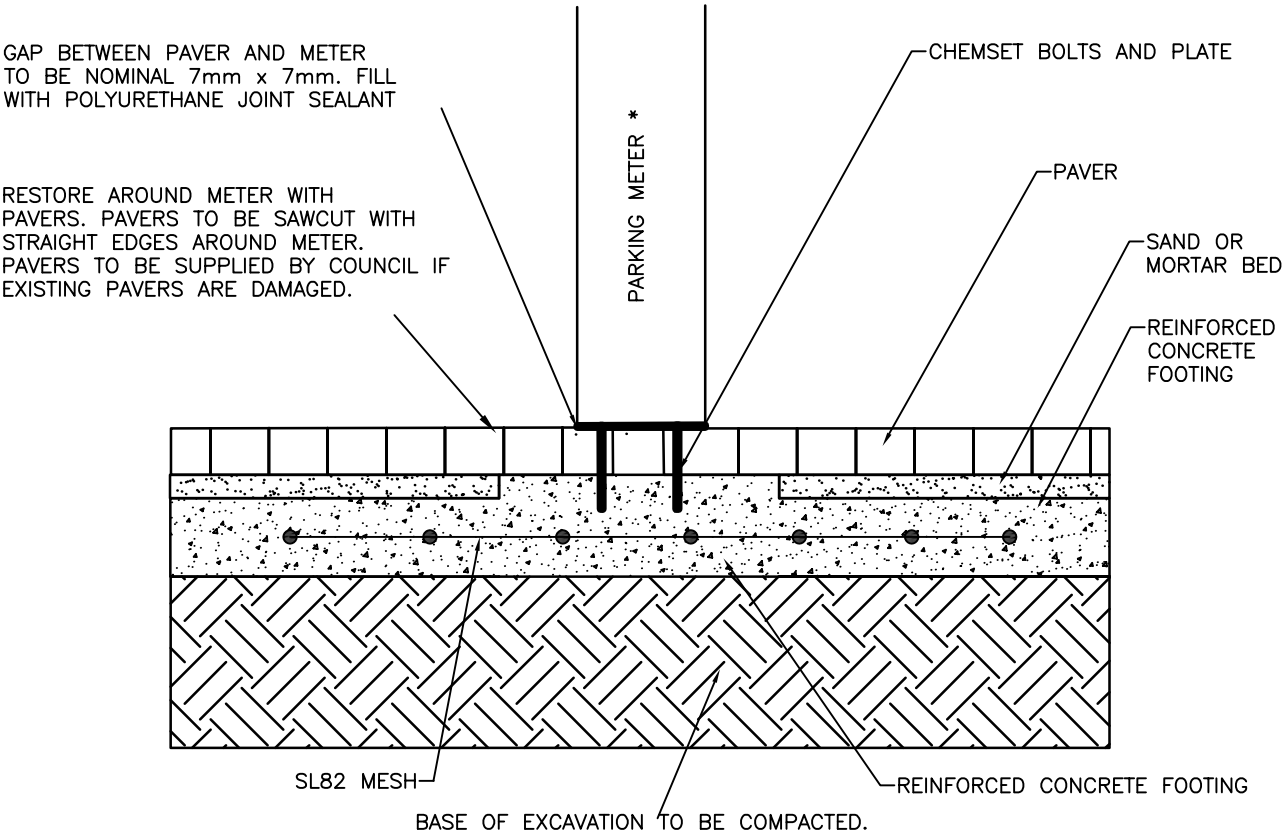
EXTEND LINEMARKING
IN THERMOPLASTIC/PAINT
ON TOP OF KERB
(CONCRETE KERBS ONLY)

APPROVED: COUNCIL ENGINEER DATE: 04/07/22		NORTH SYDNEY COUNCIL STANDARD PARKING METER BAY LINEMARKING ANGLE PARKING	SCALE N.T.S. DRAWING NO. S301C



* CURRENT METERS TO BE AT LEAST 1.2m FROM GROUND LEVEL TO CENTRE OF COIN SLOT

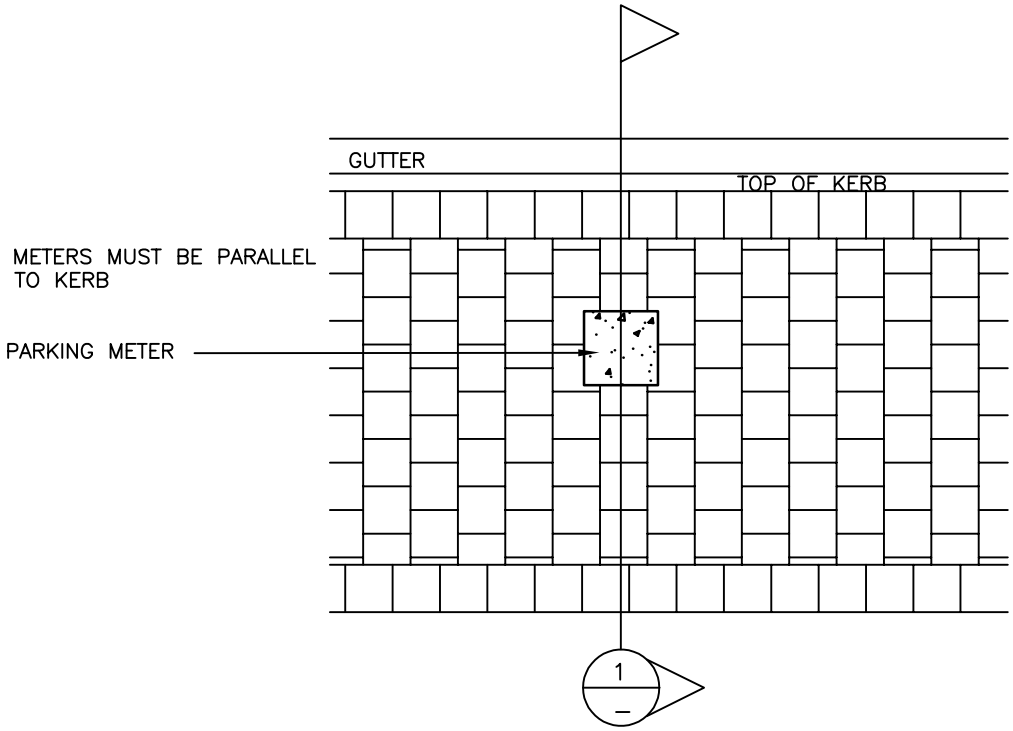
PLAN VIEW



SECTION 1
METER FOOTING INSTALLATION

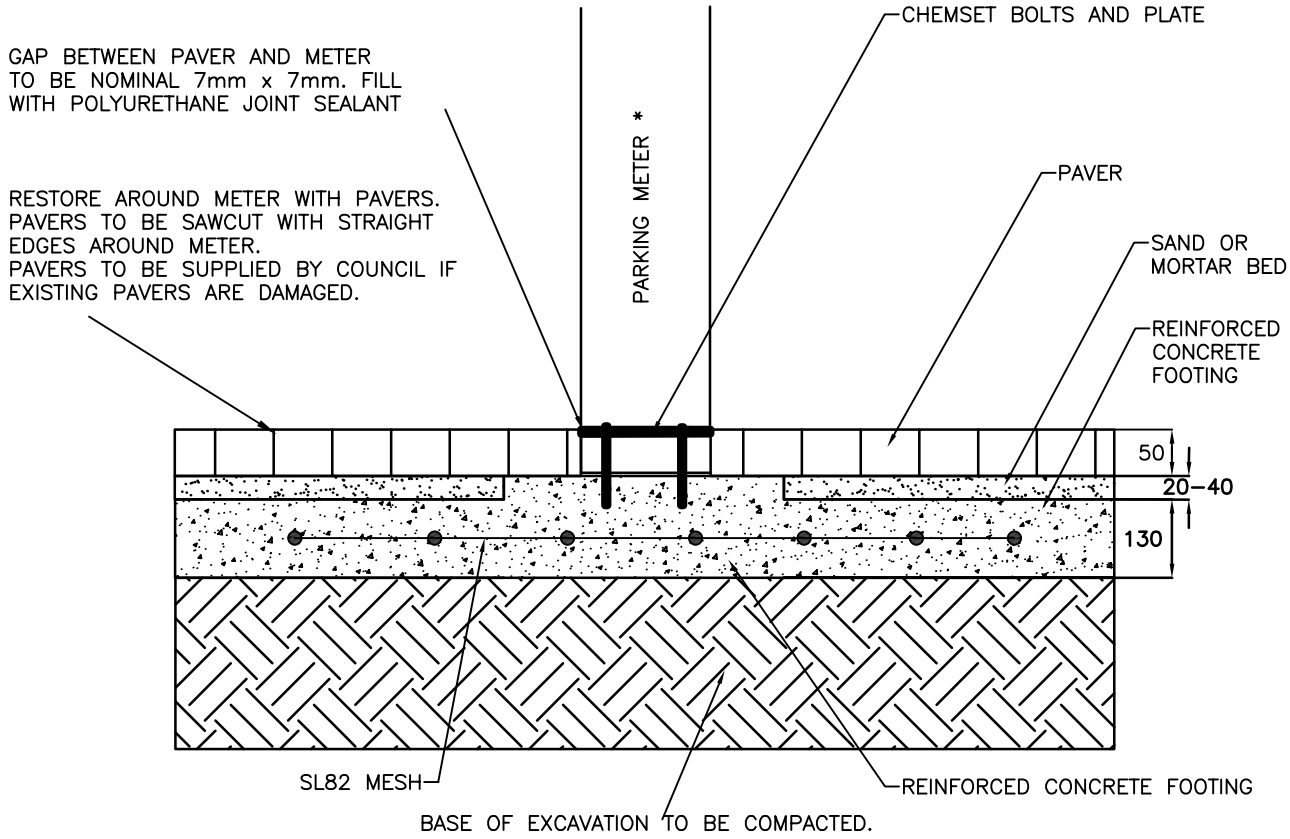
NOTE
ABSOLUTE MINIMUM CLEARANCE FROM FACE OF KERB TO METER IS 600mm OR AS APPROVED BY THE SUPERINTENDENT

APPROVED: COUNCIL ENGINEER DATE: 04/07/22		NORTH SYDNEY COUNCIL METER INSTALLATION & RESTORATION REQUIREMENTS IN GRANITE PAVING WITH EXISTING CONCRETE SUB-BASE	SCALE N.T.S. DRAWING NO. S302A



* CURRENT METERS TO BE AT LEAST 1.2m FROM GROUND LEVEL TO CENTRE OF COIN SLOT

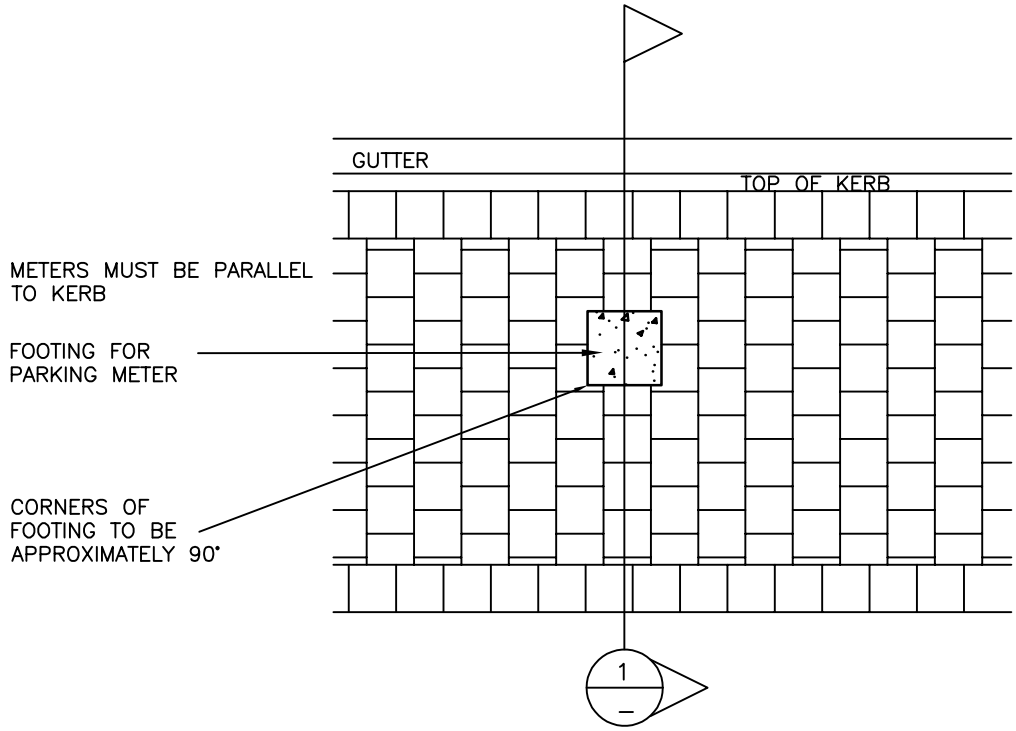
PLAN VIEW



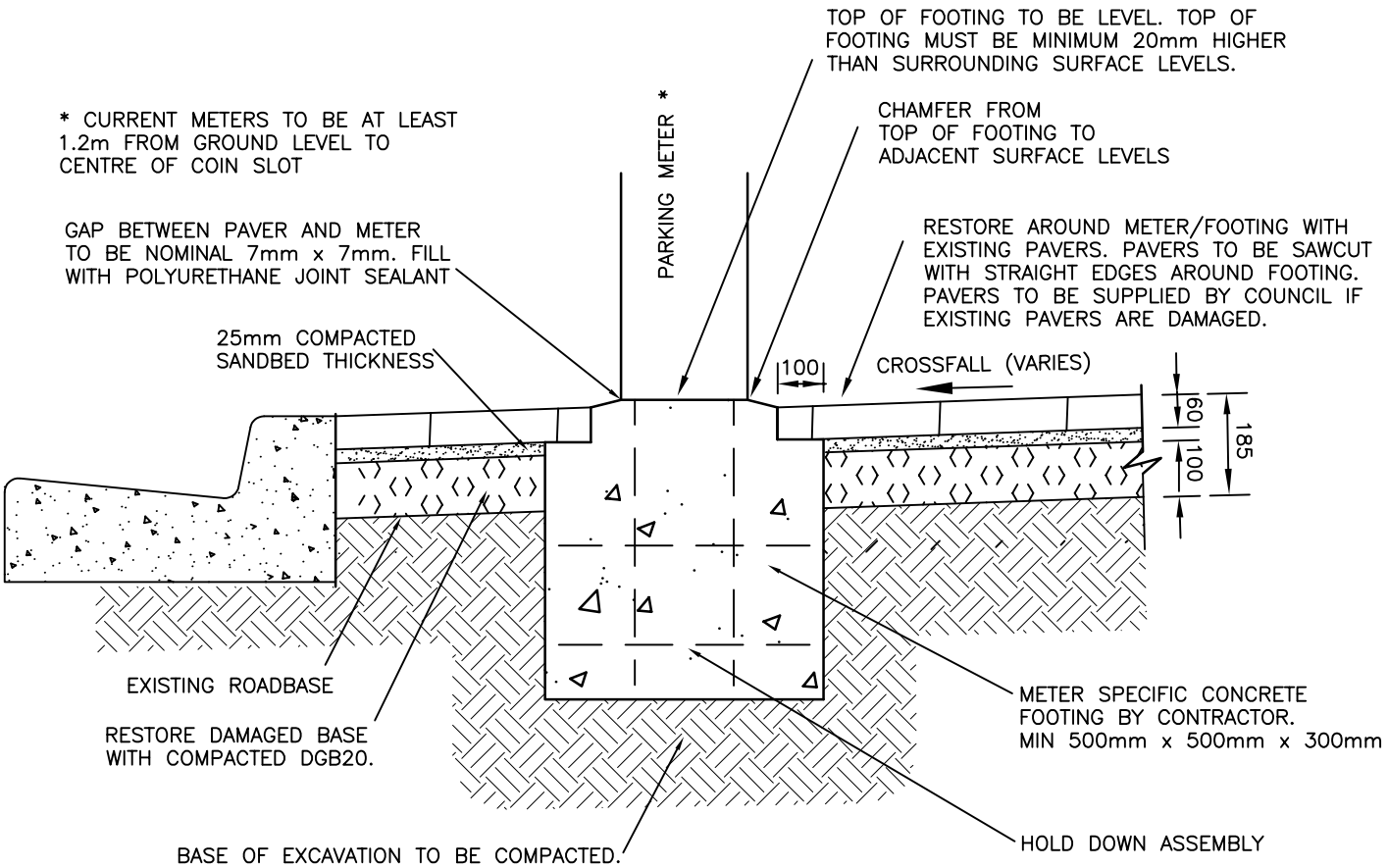
SECTION 1
METER FOOTING INSTALLATION

NOTE
ABSOLUTE MINIMUM CLEARANCE FROM FACE OF KERB TO METER IS 600mm OR AS APPROVED BY THE SUPERINTENDENT

APPROVED: COUNCIL ENGINEER DATE: 04/07/22		NORTH SYDNEY COUNCIL METER INSTALLATION & RESTORATION REQUIREMENTS IN GRANITE PAVING WITH NEW CONCRETE SUB–BASE	SCALE N.T.S. DRAWING NO. S302B



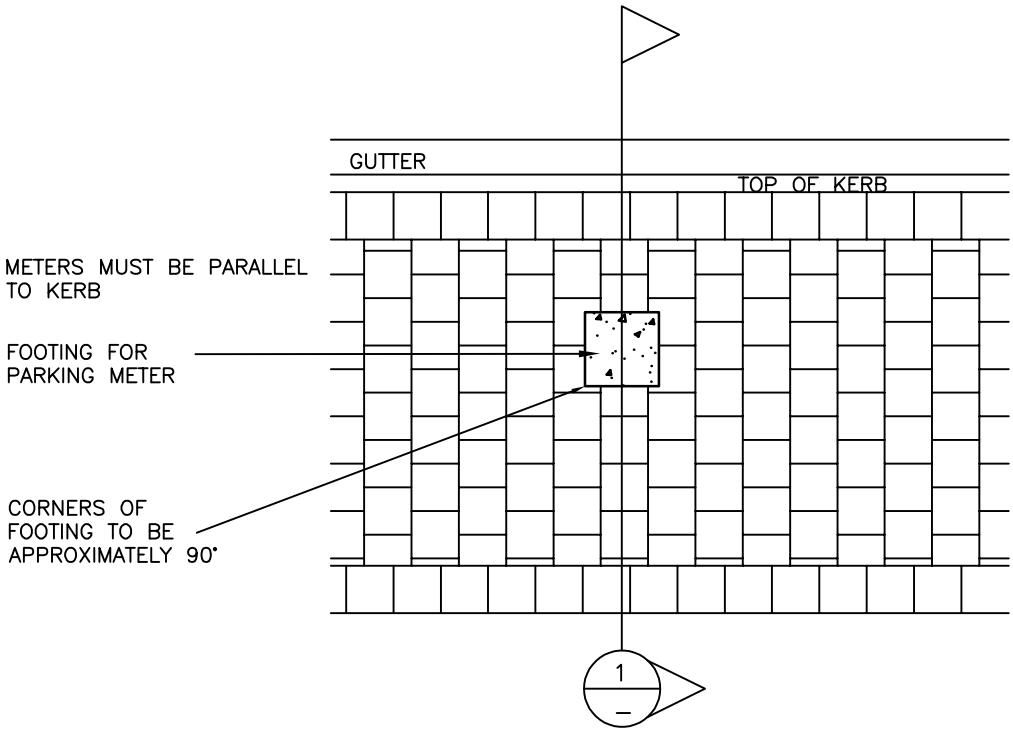
PLAN VIEW



SECTION 1
METER FOOTING INSTALLATION

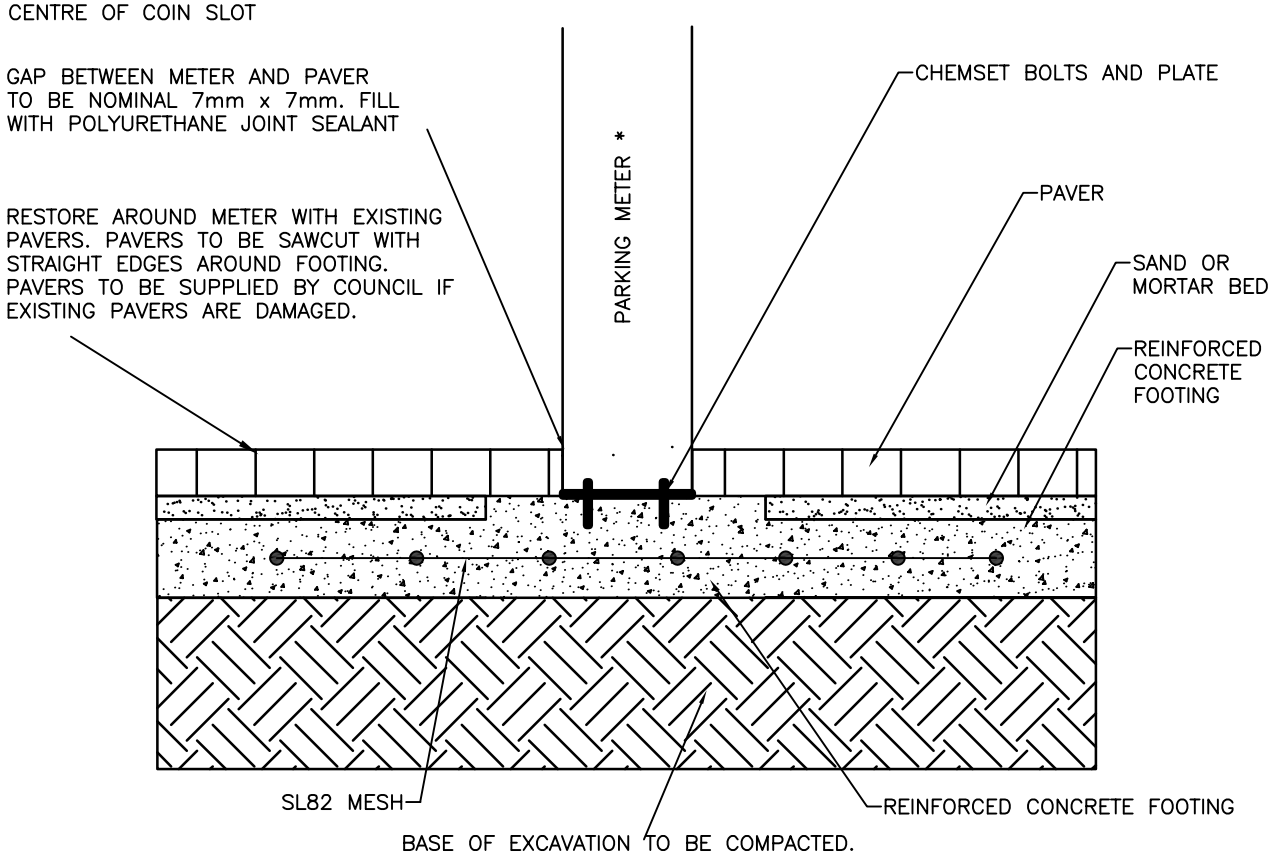
NOTE
ABSOLUTE MINIMUM CLEARANCE FROM FACE OF KERB TO METER IS 600mm OR AS APPROVED BY THE SUPERINTENDENT

APPROVED: COUNCIL ENGINEER DATE: 04/07/22	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL METER INSTALLATION & RESTORATION REQUIREMENTS IN PAVING WITH ROADBASE SUB–BASE	SCALE N.T.S. DRAWING NO. S303A



* CURRENT METERS TO BE AT LEAST 1.2m FROM GROUND LEVEL TO CENTRE OF COIN SLOT

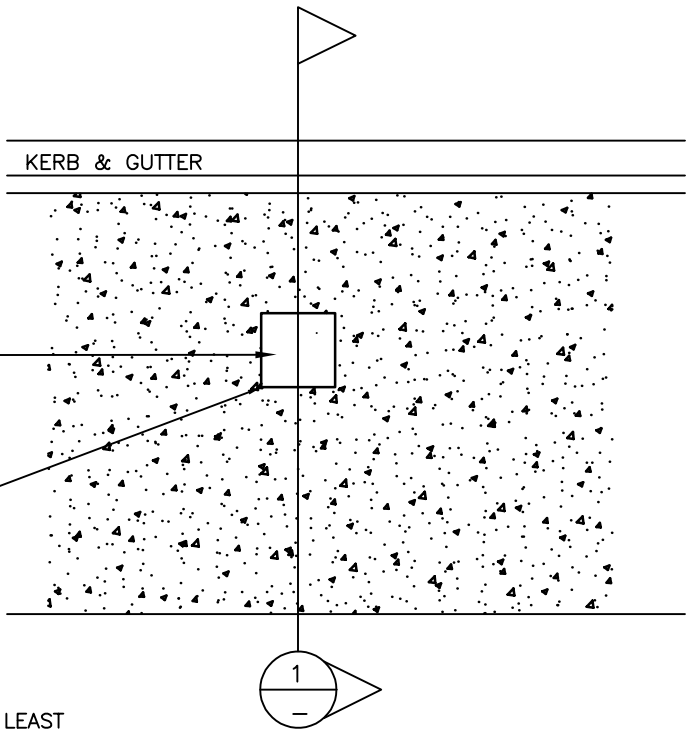
PLAN VIEW



SECTION 1
METER FOOTING INSTALLATION

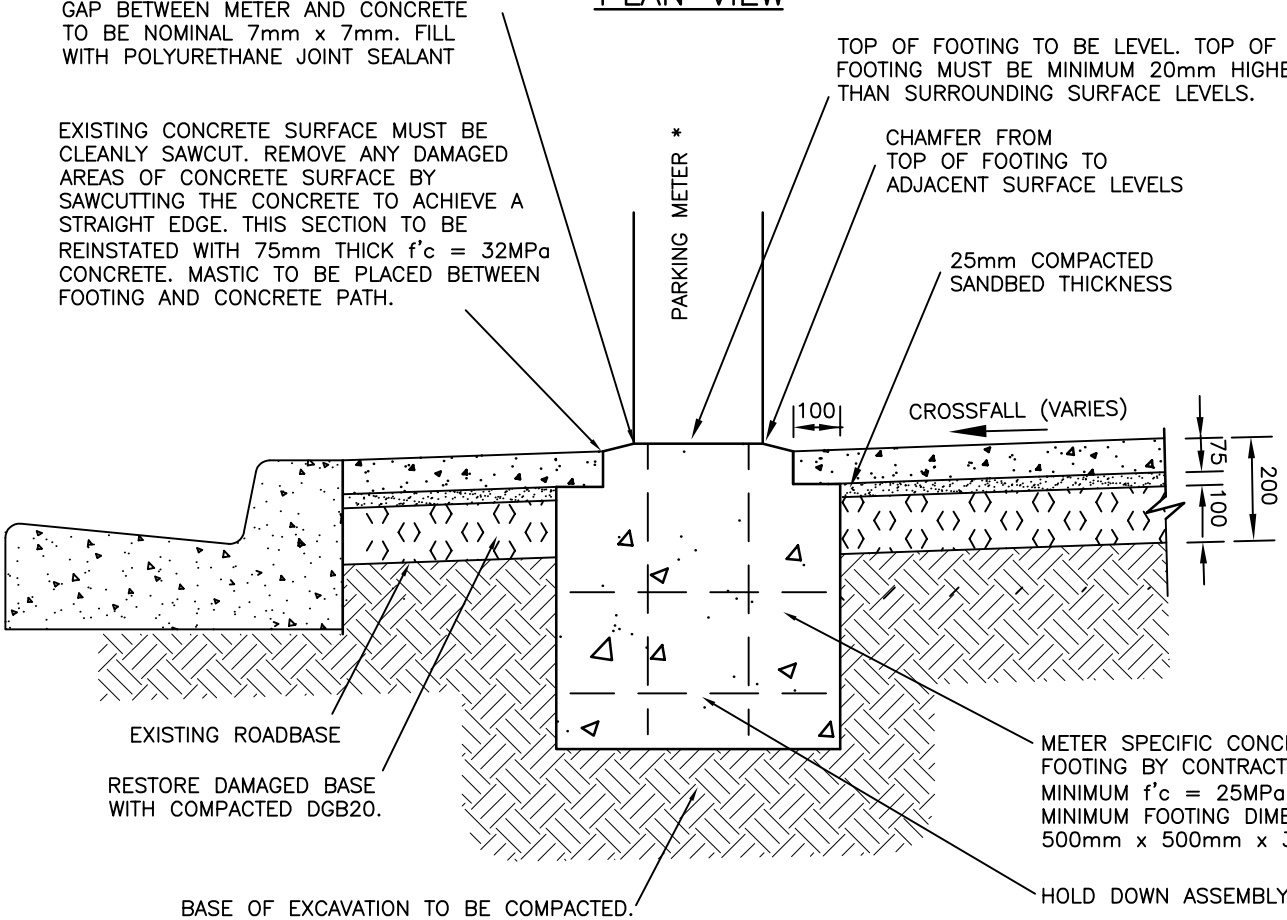
NOTE
ABSOLUTE MINIMUM CLEARANCE FROM FACE OF KERB TO METER IS 600mm OR AS APPROVED BY THE SUPERINTENDENT

APPROVED: COUNCIL ENGINEER DATE: 04/07/22		NORTH SYDNEY COUNCIL METER INSTALLATION & RESTORATION REQUIREMENTS IN PAVING WITH CONCRETE SUB–BASE	SCALE N.T.S. DRAWING NO. S303B



* CURRENT METERS TO BE AT LEAST 1.2m FROM GROUND LEVEL TO CENTRE OF COIN SLOT

PLAN VIEW

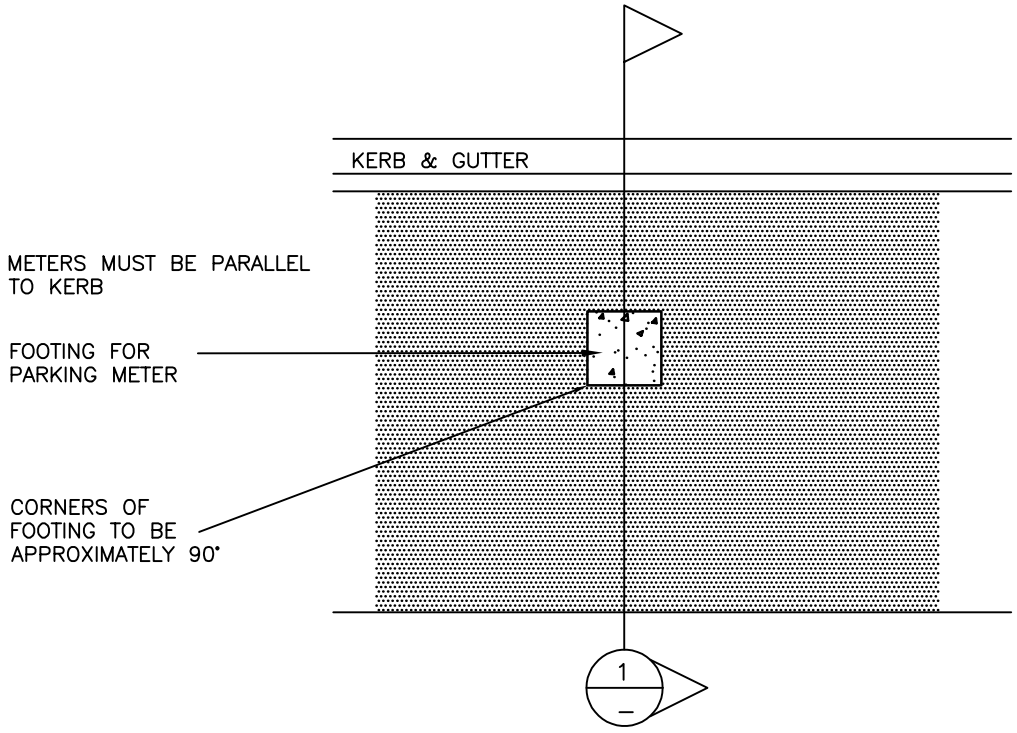


SECTION 1
METER FOOTING INSTALLATION

NOTE

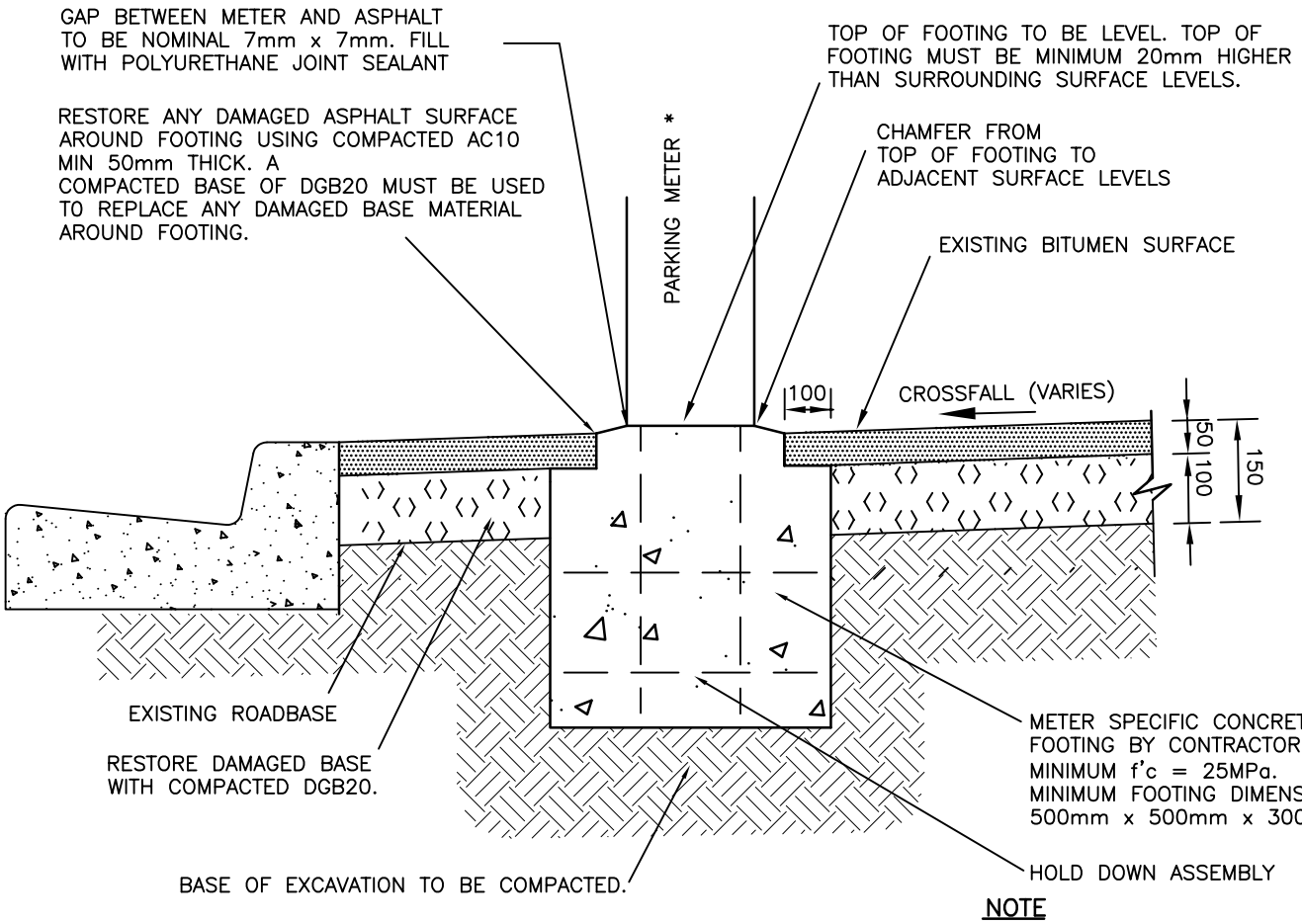
ABSOLUTE MINIMUM CLEARANCE FROM FACE OF KERB TO METER IS 600mm OR AS APPROVED BY THE SUPERINTENDENT

APPROVED: COUNCIL ENGINEER DATE: 04/07/22		NORTH SYDNEY COUNCIL METER INSTALLATION & RESTORATION REQUIREMENTS IN UNREINFORCED CONCRETE	SCALE N.T.S. DRAWING NO. S304



* CURRENT METERS TO BE AT LEAST 1.2m FROM GROUND LEVEL TO CENTRE OF COIN SLOT

PLAN VIEW



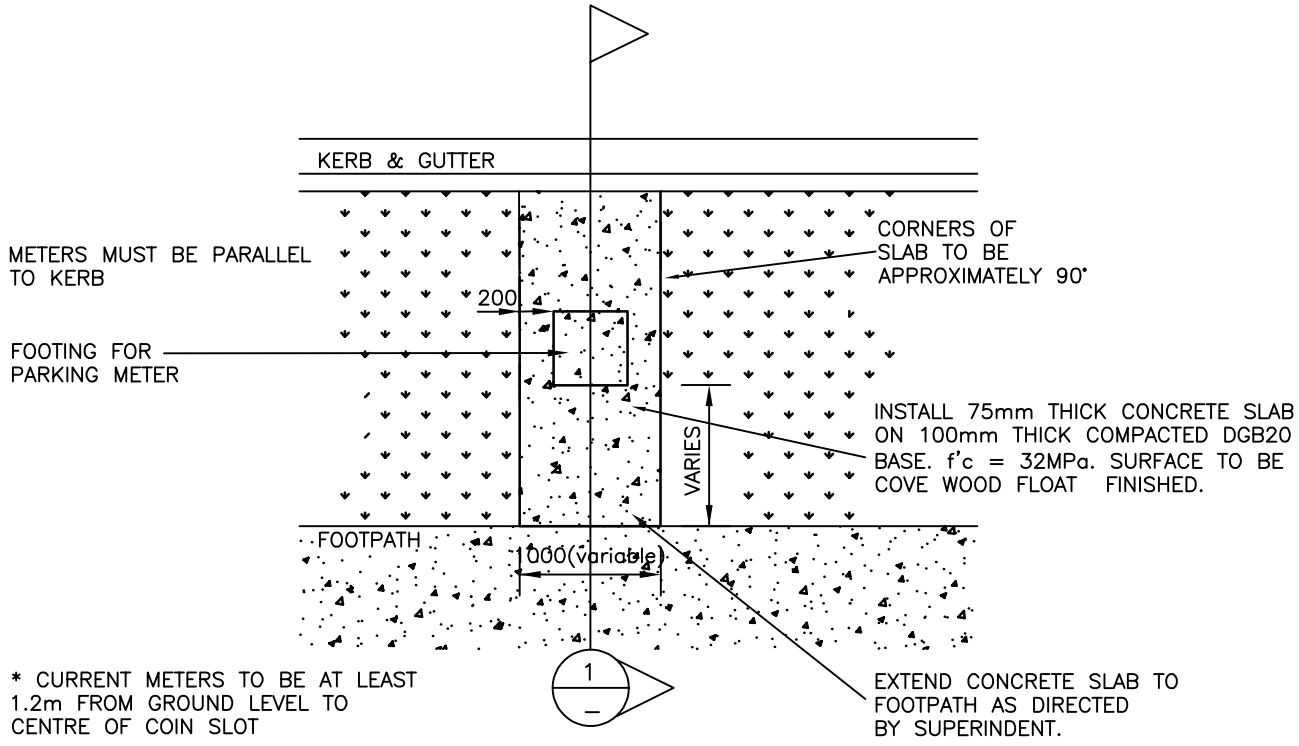
SECTION 1

METER FOOTING INSTALLATION

NOTE

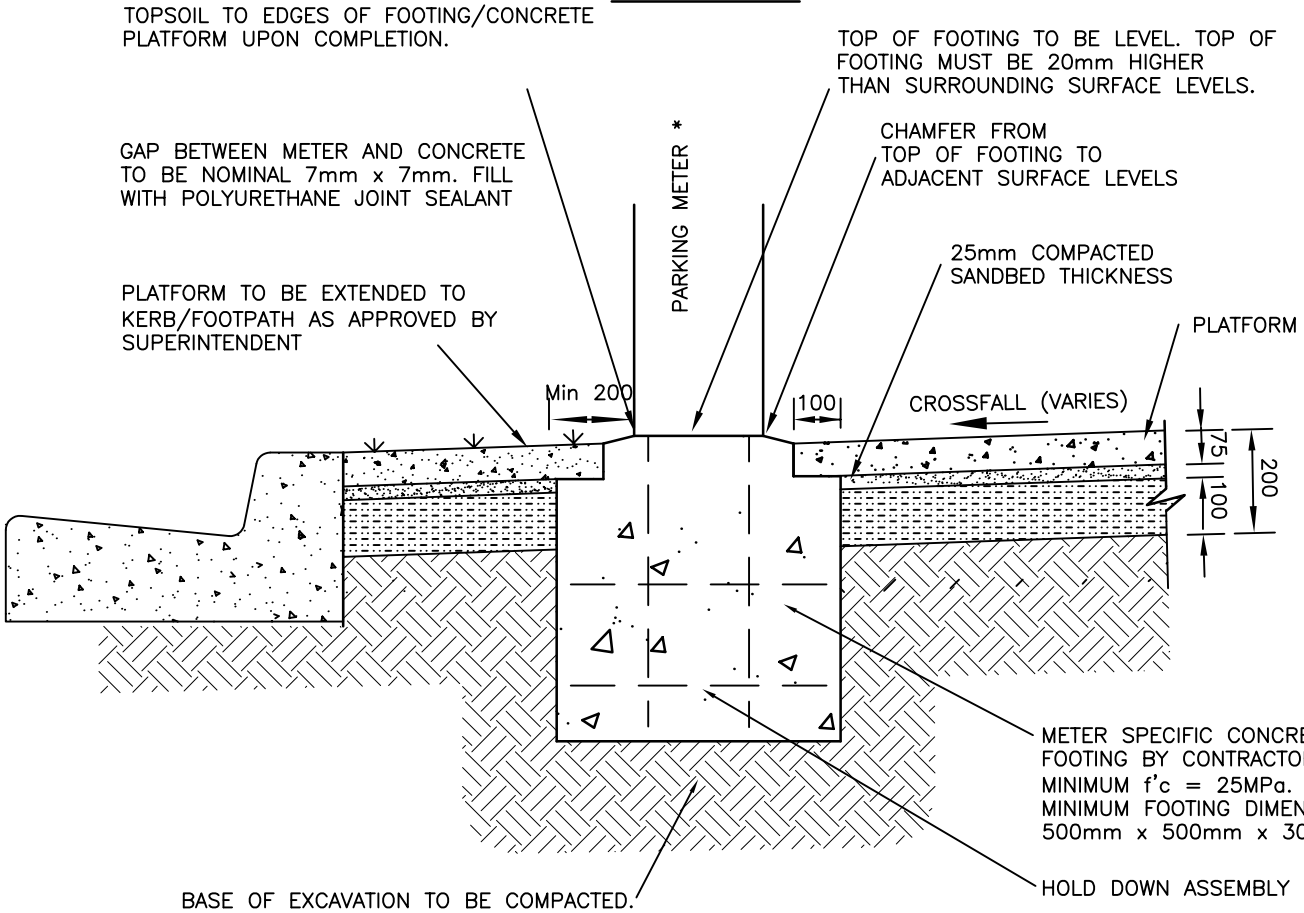
ABSOLUTE MINIMUM CLEARANCE FROM FACE OF KERB TO METER IS 600mm OR AS APPROVED BY THE SUPERINTENDEN

APPROVED: COUNCIL ENGINEER DATE: 04/07/22		NORTH SYDNEY COUNCIL METER INSTALLATION & RESTORATION REQUIREMENTS IN ASPHALT FOOTPATH	SCALE N.T.S. DRAWING NO. S305



NOTE:
DAMAGE TO EXISTING TURF TO BE MINIMISED. BACKFILL WITH CLEAN TOPSOIL TO EDGES OF FOOTING/CONCRETE PLATFORM UPON COMPLETION.

PLAN VIEW



NOTE
ABSOLUTE MINIMUM CLEARANCE FROM FACE OF KERB TO METER IS 600mm OR AS APPROVED BY THE SUPERINTENDEN

SECTION 1
METER FOOTING INSTALLATION

APPROVED: COUNCIL ENGINEER DATE: 30/06/22		NORTH SYDNEY COUNCIL METER INSTALLATION PLATFORM & RESTORATION REQUIREMENTS IN TURF	SCALE N.T.S. DRAWING NO. S306

PAVING DRAWINGS

S400 SERIES

Drawing Number	Description
S407	CBD SANDSTONE PENETRATION AND RESTORATION

APPROVED:

COUNCIL ENGINEER

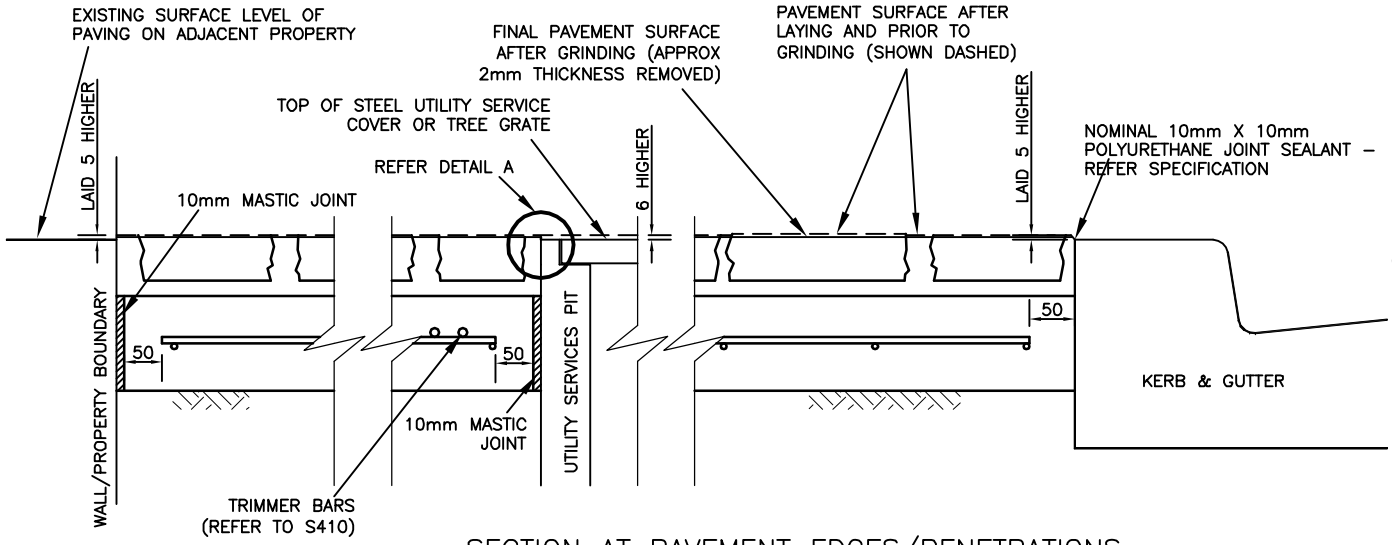
DATE: 01/04/08

NORTH SYDNEY COUNCIL

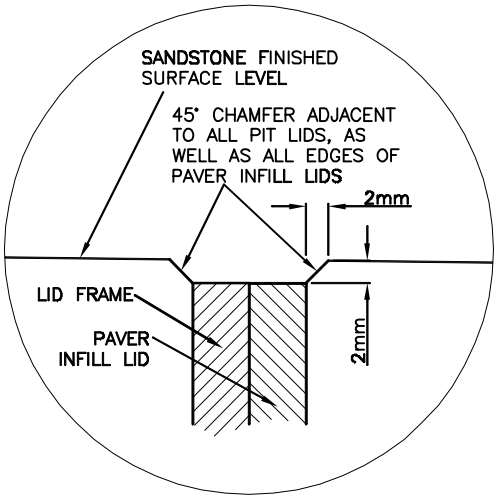
CBD SANDSTONE PENETRATION AND RESTORATION DETAILS

SCALE N.T.S.

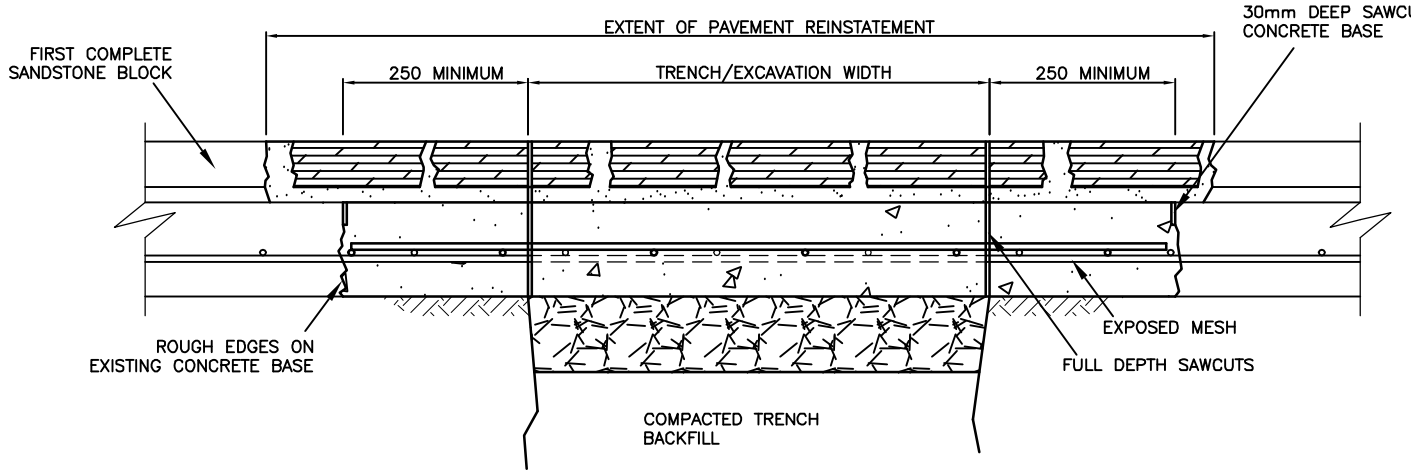
DRAWING NO. S407



SECTION AT PAVEMENT EDGES/PENETRATIONS



DETAIL A

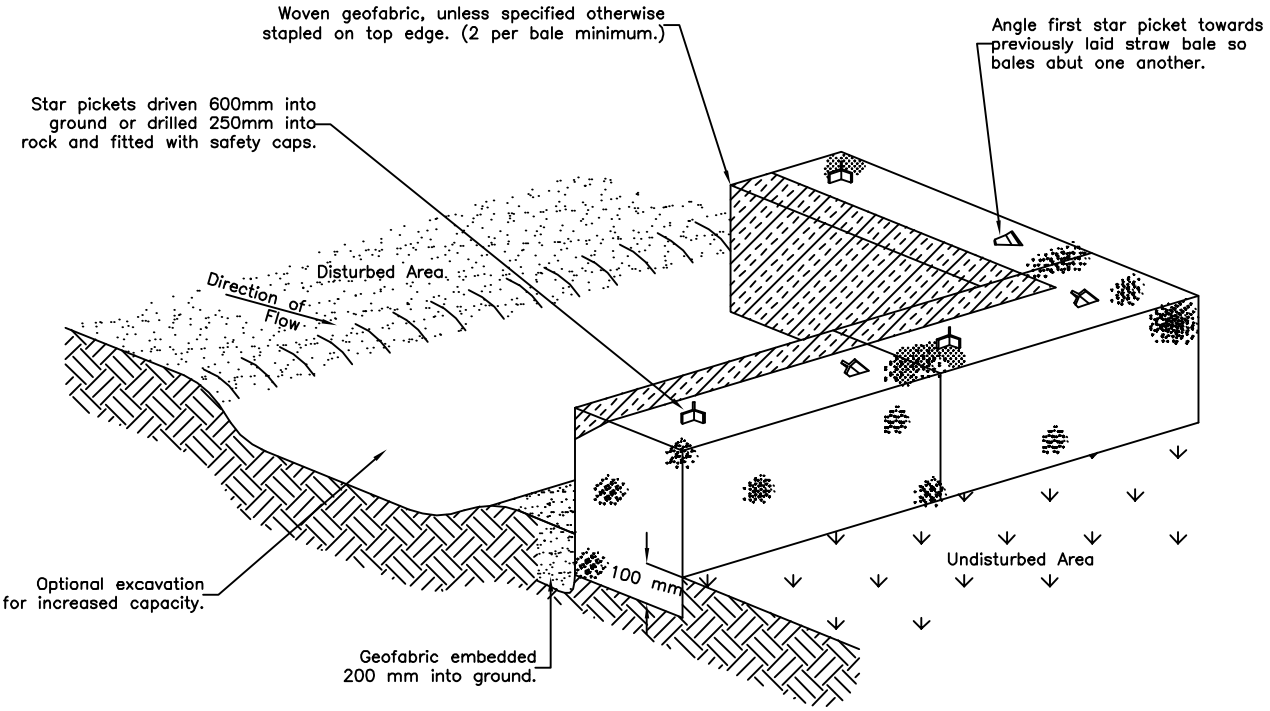


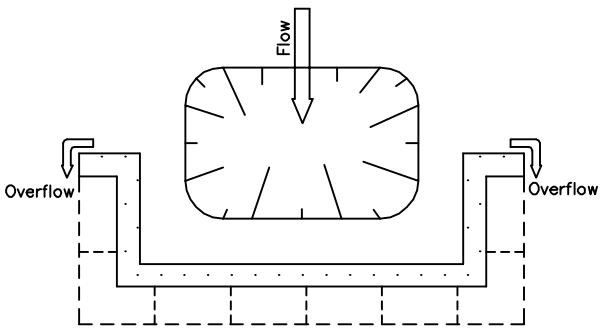
STEP 1: FULL DEPTH SAWCUT THROUGH PAVEMENT ALONG THE EDGES OF THE TRENCH/EXCAVATION.
STEP 2: REMOVE SANDSTONE BLOCKS, JOINTING AND BEDDING UP TO AT LEAST 250mm EITHER SIDE OF SAWCUTS, UP TO THE NEAREST COMPLETE SANDSTONE BLOCKS.
STEP 3: 30mm DEEP SAWCUTS 250mm MINIMUM EITHER SIDE OF FULL DEPTH SAWCUTS.
STEP 4: BREAK OUT CONCRETE BASE SLAB BETWEEN 30mm SAWCUTS, EXPOSE REINFORCING MESH AND LEAVE REMAINING SLAB EDGES ROUGH FOR AGGREGATE INTERLOCK WITH NEW CONCRETE.
STEP 5: EXCAVATE, BACKFILL AND COMPACT TRENCH ACCORDING TO NORTH SYDNEY COUNCIL INFRASTRUCTURE SPECIFICATION.
STEP 6: LAY AND COMPACT DGB20 LAYER ACROSS THE TOP OF THE TRENCH/EXCAVATION
STEP 7: STRAIGHTEN EXPOSED MESH AS FAR AS POSSIBLE.
STEP 8: LAY SL82 MESH ACROSS EXCAVATION WITH 200mm MINIMUM OVERLAP TO EXPOSED MESH.
STEP 8: REMOVE DUST AND LOOSE MATERIAL FROM SIDES OF EXISTING CONCRETE BASE SLAB.
STEP 10: POUR CONCRETE INFILL SLAB (f'c=20MPa).
STEP 11: REINSTATE MORTAR BEDDING, SANDSTONE BLOCKS AND JOINTING USING ALL NEW MATERIALS.

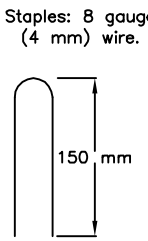
SANDSTONE PAVEMENT RESTORATION DETAIL

SEDIMENT CONTROL DRAWINGS S500 SERIES

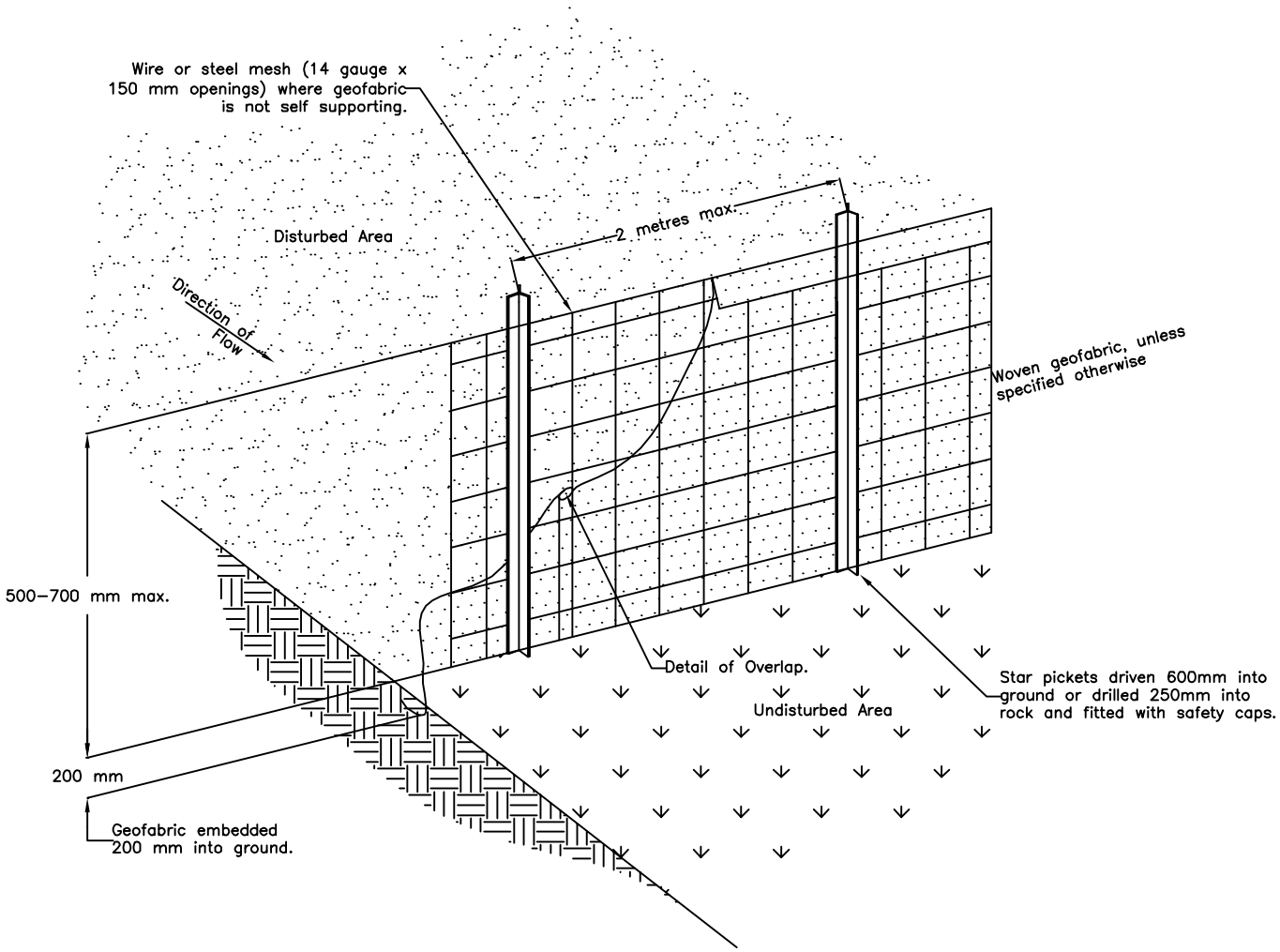
DRAWING NO	DESCRIPTION
S501	MINOR SEDIMENT TRAP STRAW BALE GEOFABRIC CONSTRUCTION
S502	SILT FENCE
S503	SUMP SILT FENCE
S504	FILTER TRENCH
S505	SEDIMENT TRENCH
S506	SEDIMENT PIT
S507	SEDIMENT POND
S508	DIVERSION BANKS
S509	STABILISED SITE ACCESS
S510	TEMPORARY SEDIMENT TRAP
S511	STRAW BALE FILTER



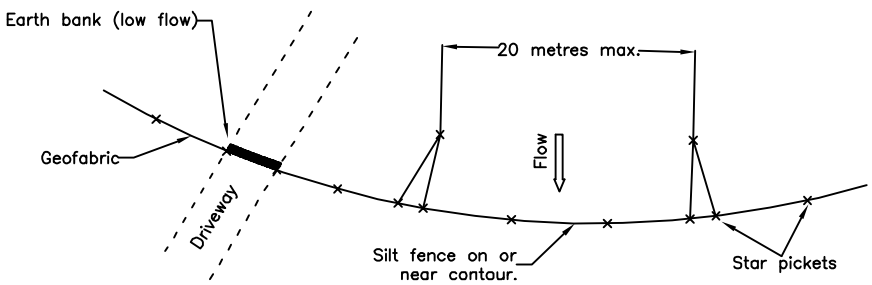




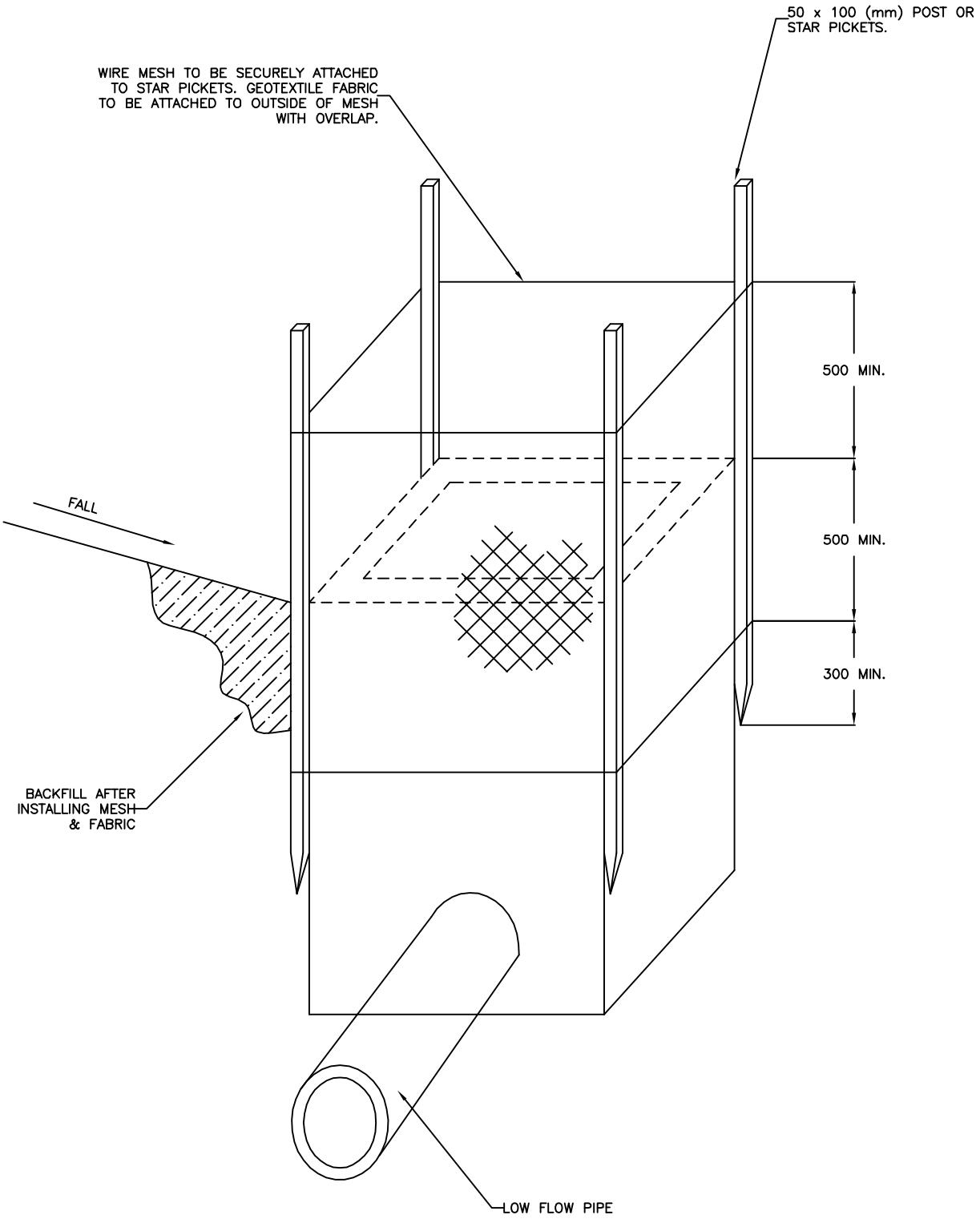
APPROVED: COUNCIL ENGINEER DATE: 6/12/95	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL MINOR SEDIMENT TRAP STRAW BALE GEOFABRIC CONSTRUCTION	SCALE NOT TO SCALE DRAWING NO. S501



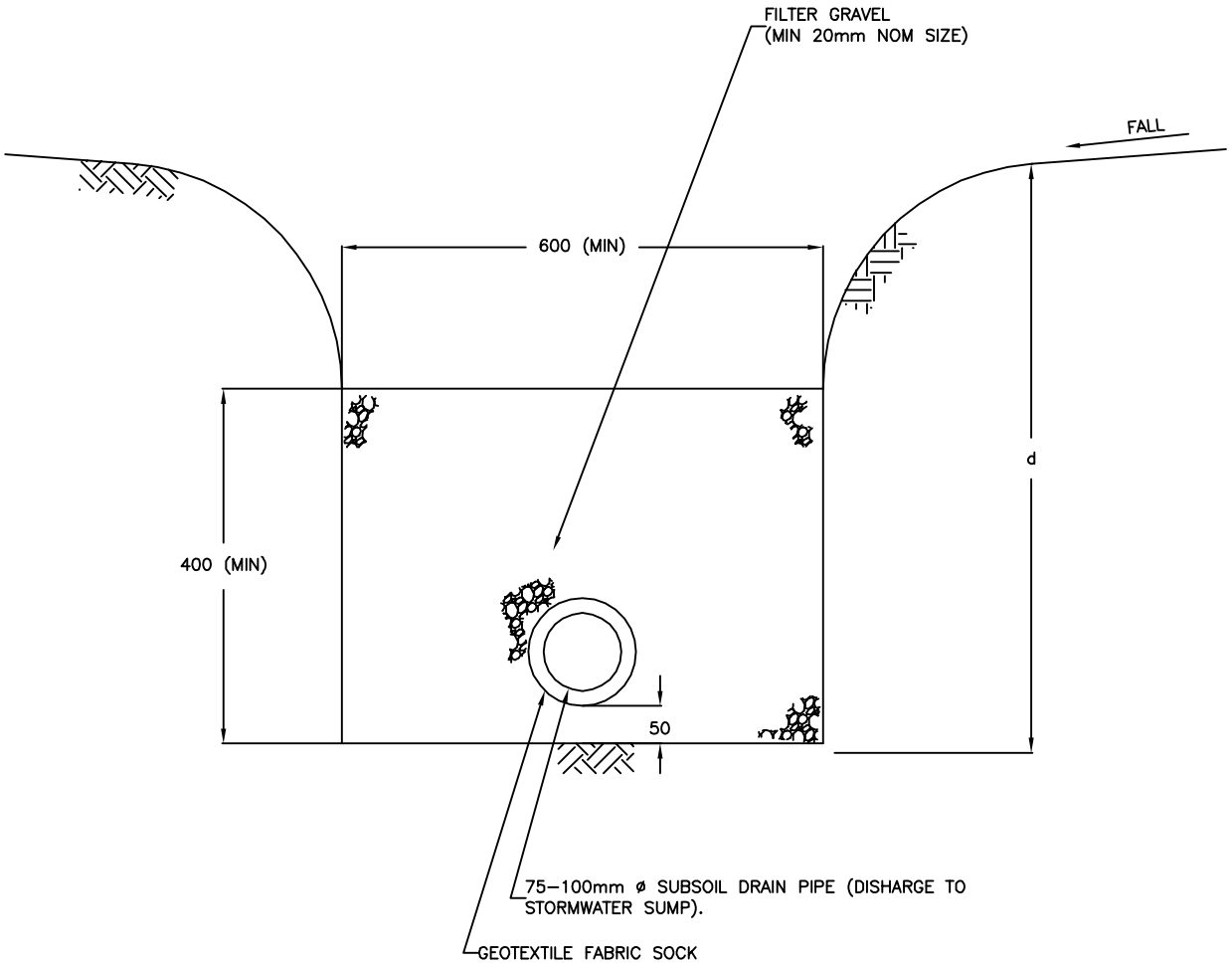
Returns in silt fence every 20 meters.



APPROVED: COUNCIL ENGINEER DATE: 6/12/95		NORTH SYDNEY COUNCIL SILT FENCE	SCALE NOT TO SCALE DRAWING NO. S502

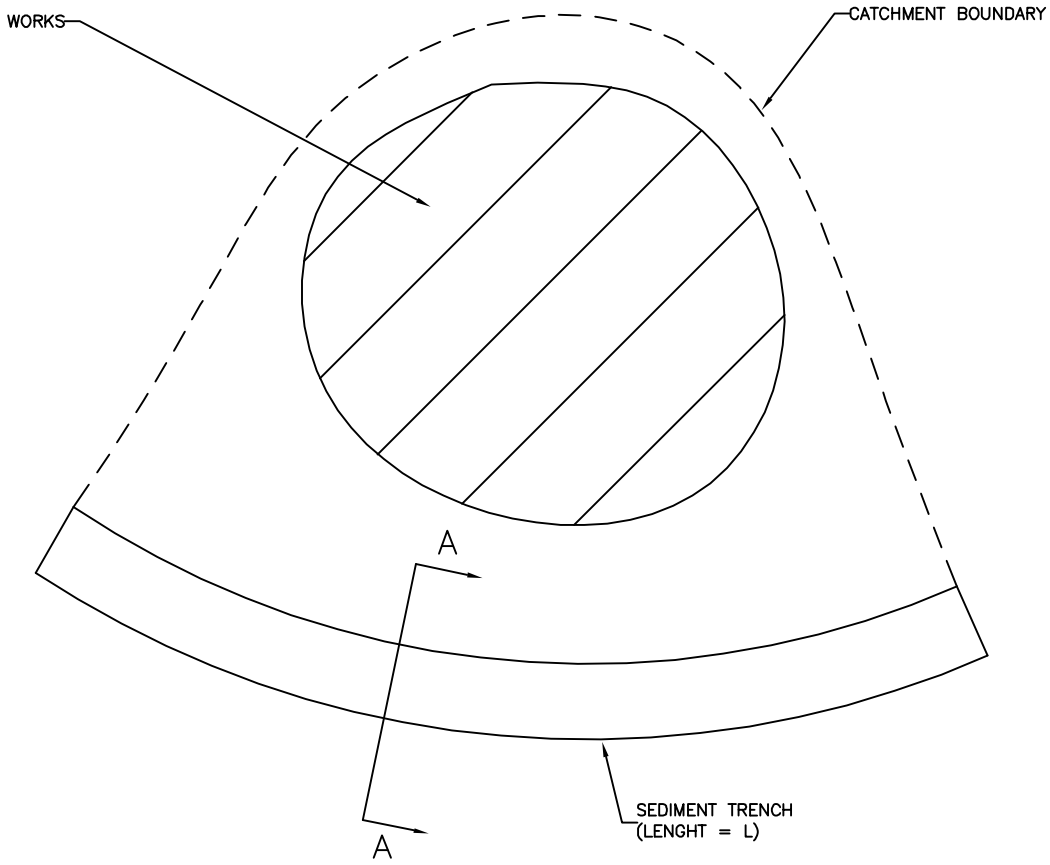


APPROVED: COUNCIL ENGINEER DATE: 6/12/95		NORTH SYDNEY COUNCIL SUMP SILT FENCE	SCALE NOT TO SCALE DRAWING NO. S503

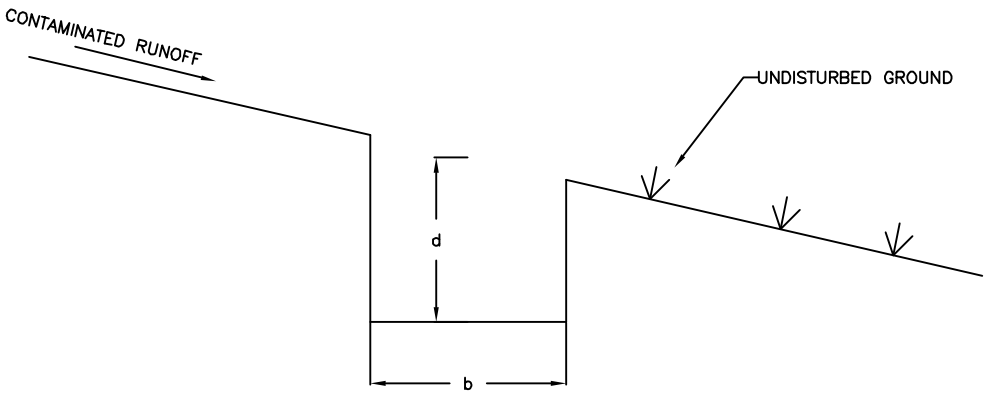


NOTE: Minimum trench bed grade 0.5% (continuos).

APPROVED: COUNCIL ENGINEER DATE: 6/12/95	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL FILTER TRENCH	SCALE NOT TO SCALE DRAWING NO. S504



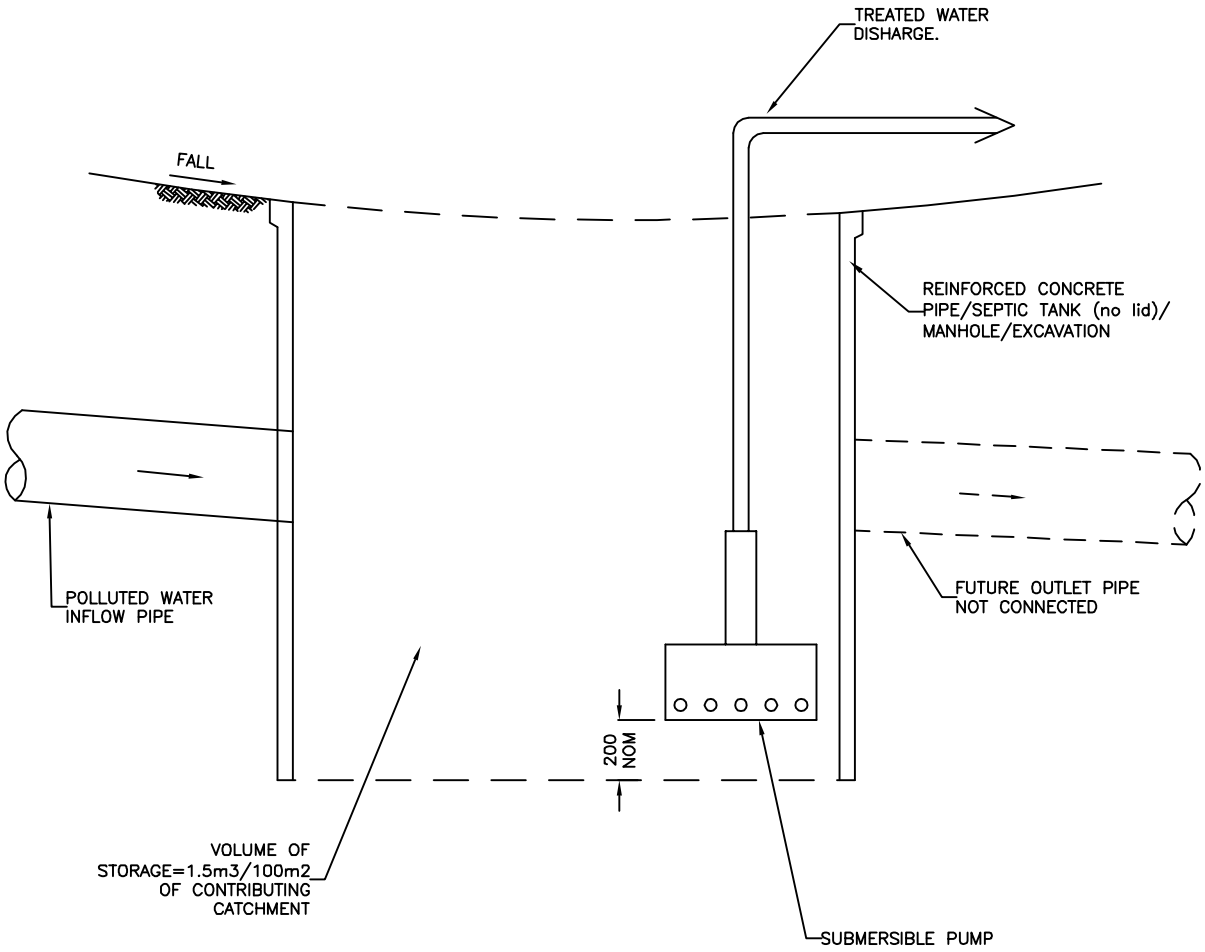
PLAN



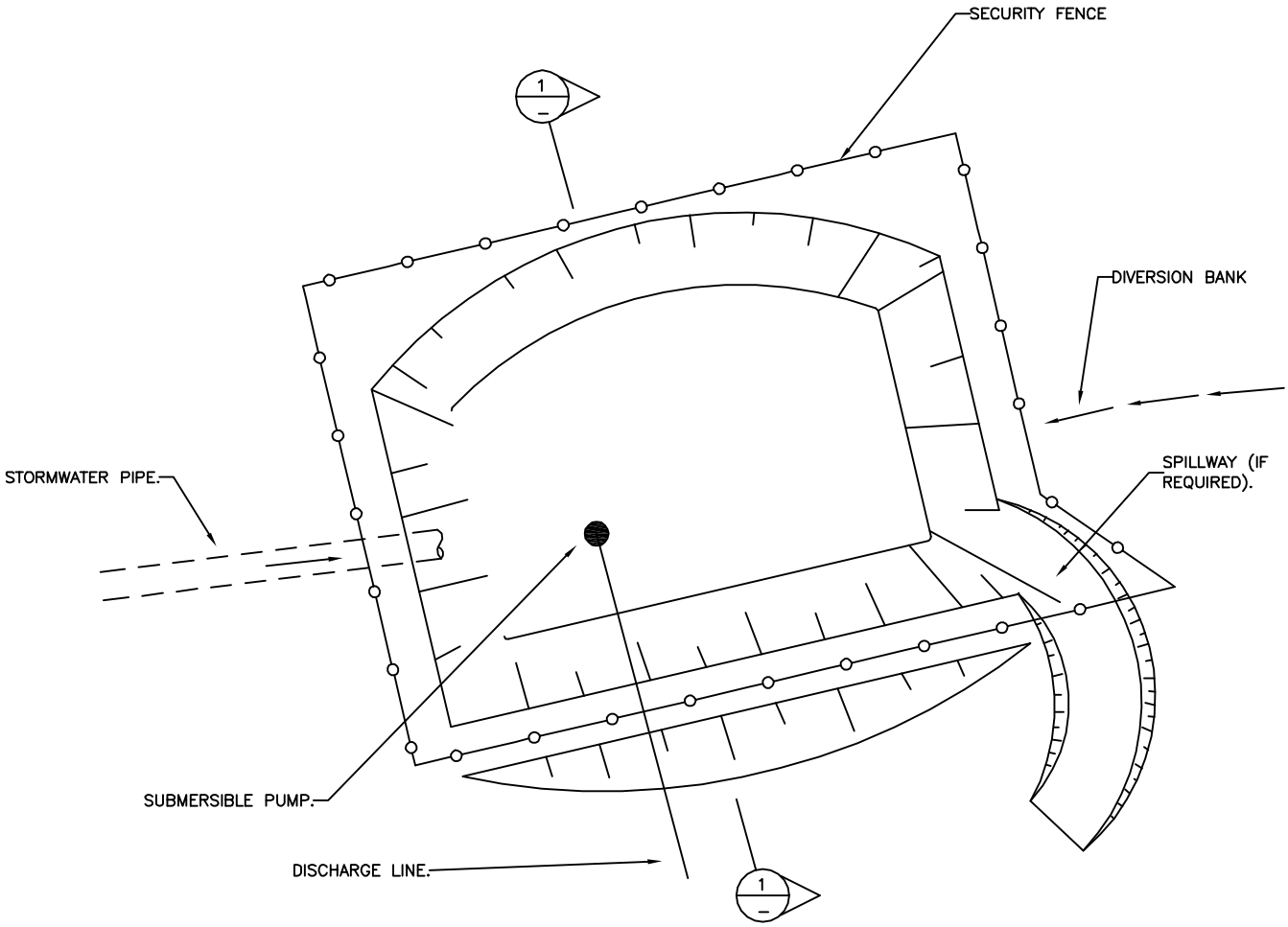
MINMUM TRENCH VOLUME (bxdxL) = 150m3 /ha

SECTION A–A

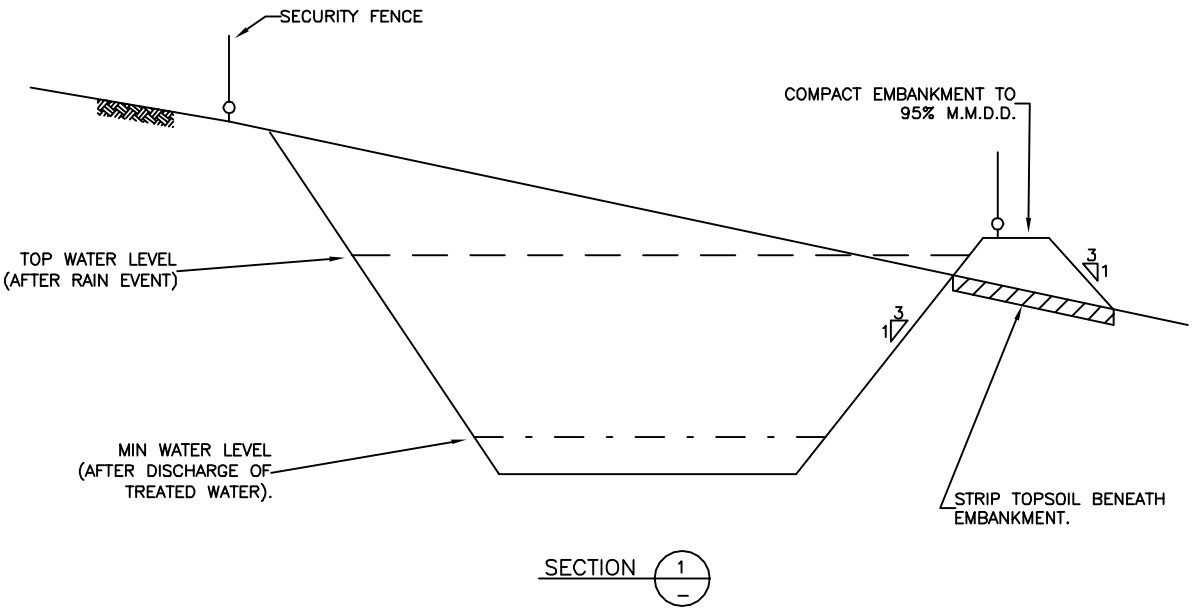
APPROVED: COUNCIL ENGINEER DATE: 6/12/95		NORTH SYDNEY COUNCIL SEDIMENT TRENCH	SCALE NOT TO SCALE DRAWING NO. S505



APPROVED: COUNCIL ENGINEER DATE: 6/12/95		NORTH SYDNEY COUNCIL SEDIMENT PIT	SCALE NOT TO SCALE DRAWING NO. S506



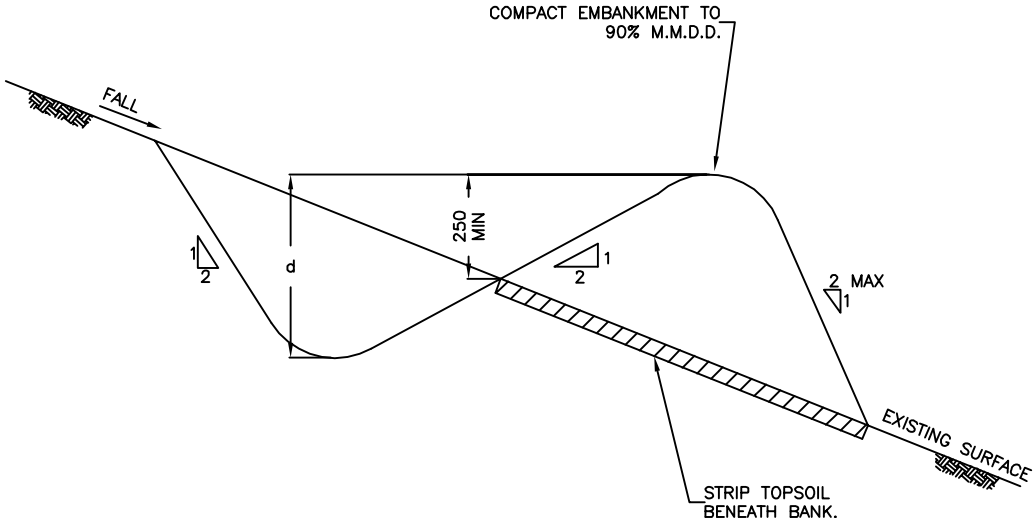
PLAN



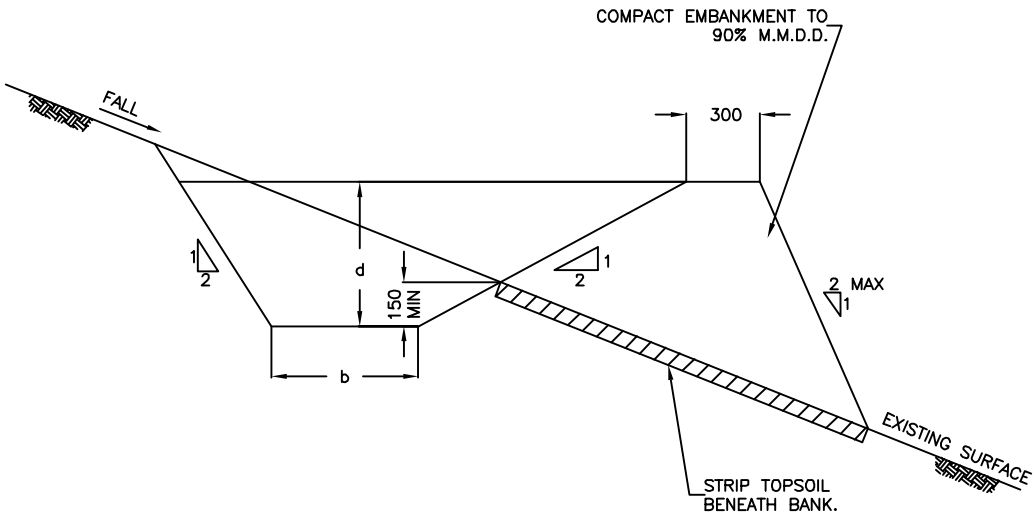
SECTION 1

NOTE: CAPACITY TO TWL = 150m3 /ha OF CATCHMENT.

APPROVED: COUNCIL ENGINEER DATE: 6/12/95	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL SEDIMENT POND	SCALE NOT TO SCALE DRAWING NO. S507

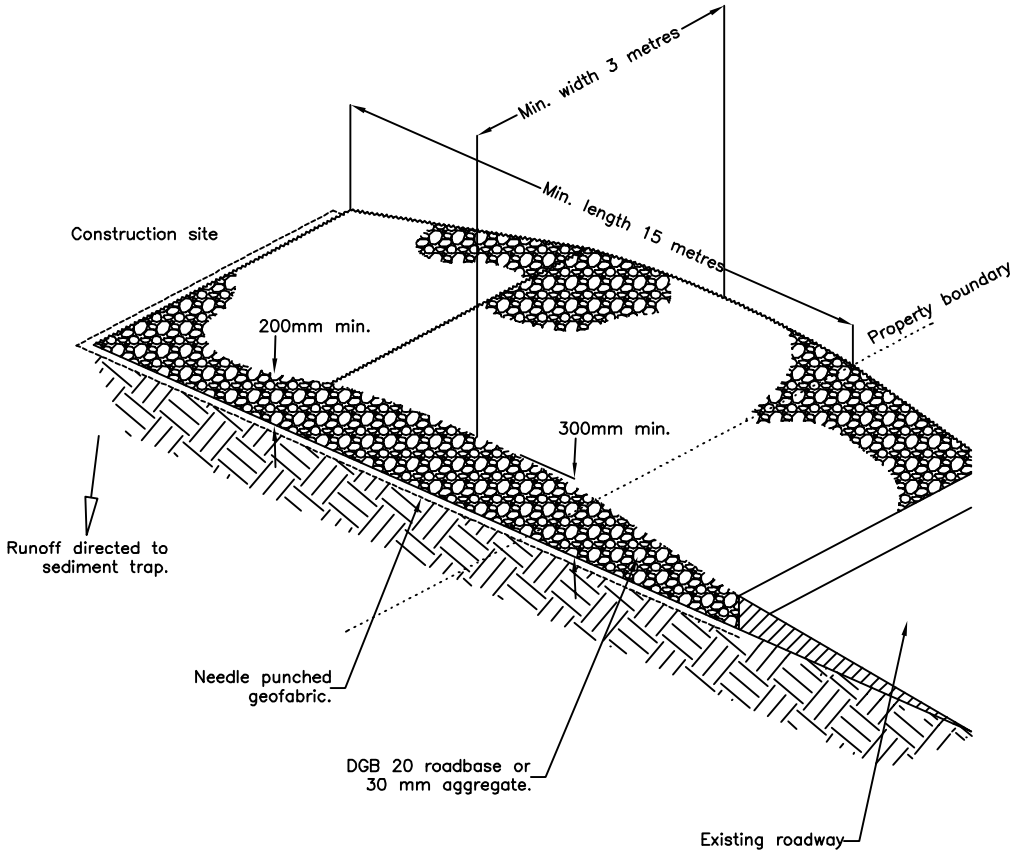


DIVERSION DRAIN TYPE 1
(For smaller catchments)

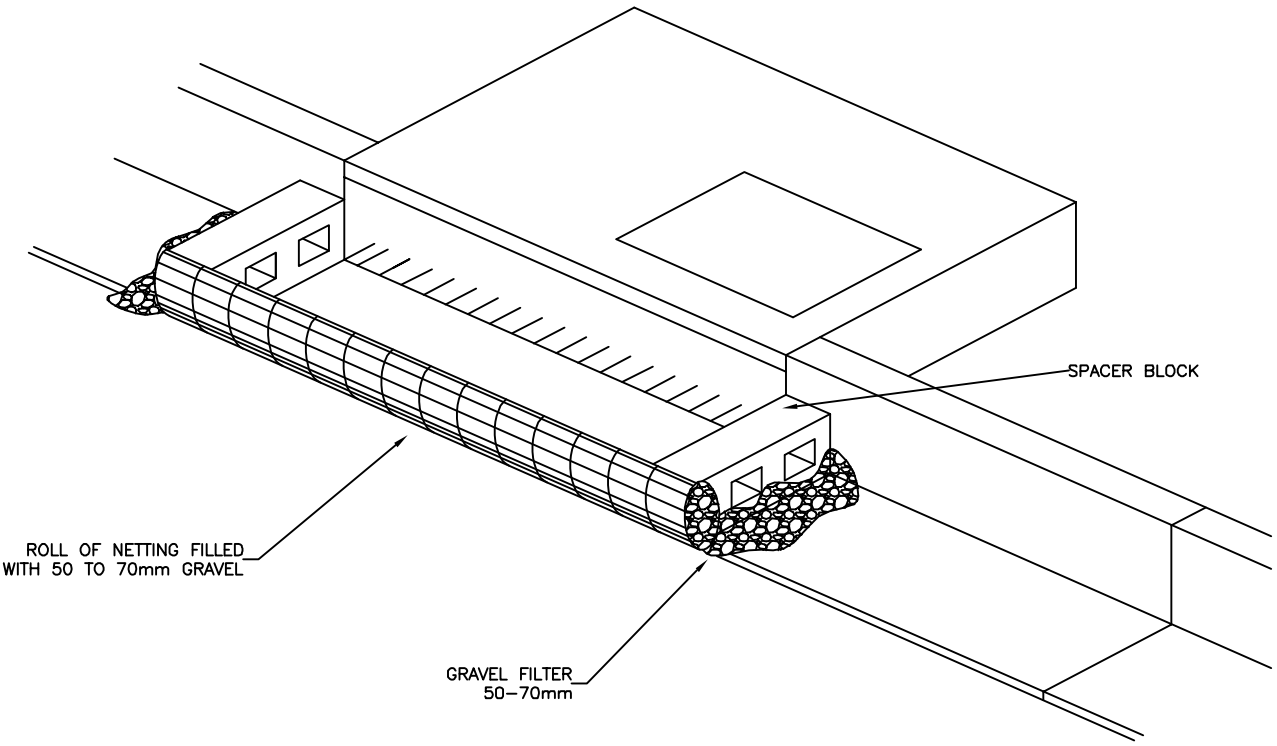


DIVERSION DRAIN TYPE 2
(For larger catchments)

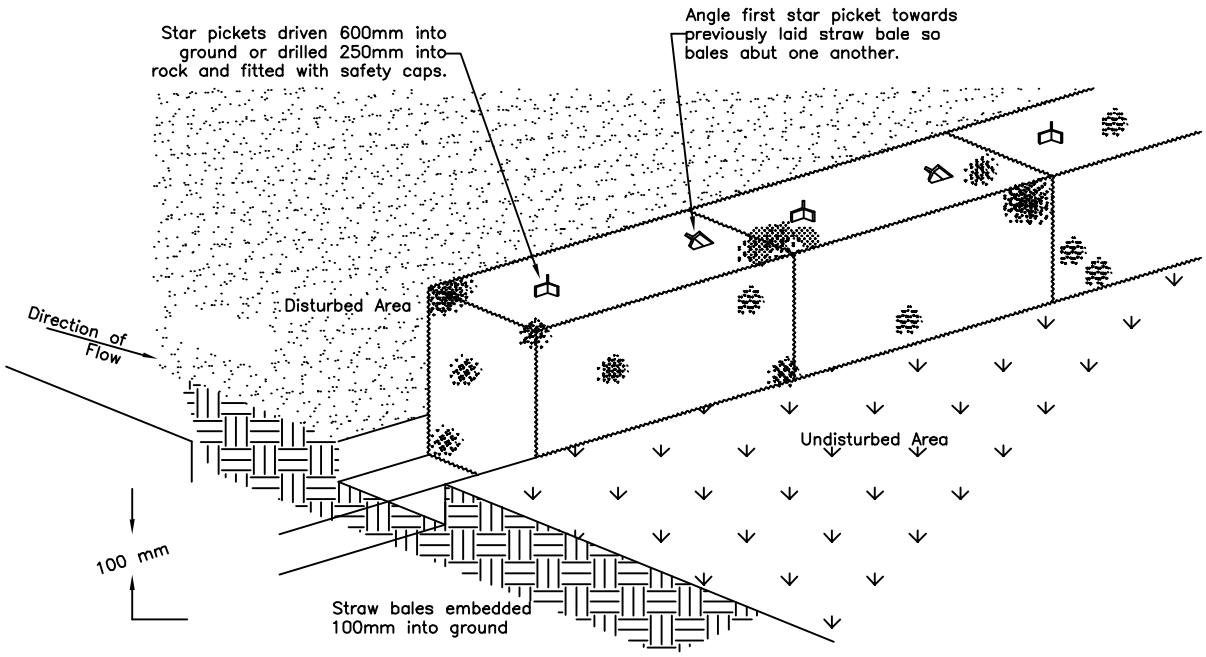
APPROVED: COUNCIL ENGINEER DATE: 6/12/95		NORTH SYDNEY COUNCIL DIVERSION BANKS	SCALE NOT TO SCALE DRAWING NO. S508



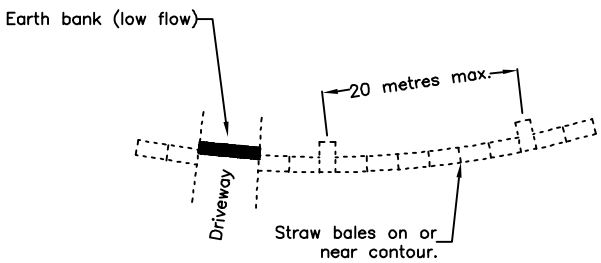
APPROVED: COUNCIL ENGINEER DATE: 6/12/95		NORTH SYDNEY COUNCIL STABILISED SITE ACCESS	SCALE NOT TO SCALE DRAWING NO. S509



APPROVED: COUNCIL ENGINEER DATE: 6/12/95		NORTH SYDNEY COUNCIL TEMPORARY SEDIMENT TRAP	SCALE NOT TO SCALE DRAWING NO. S510



Returns in straw bale filter every 20 meters.

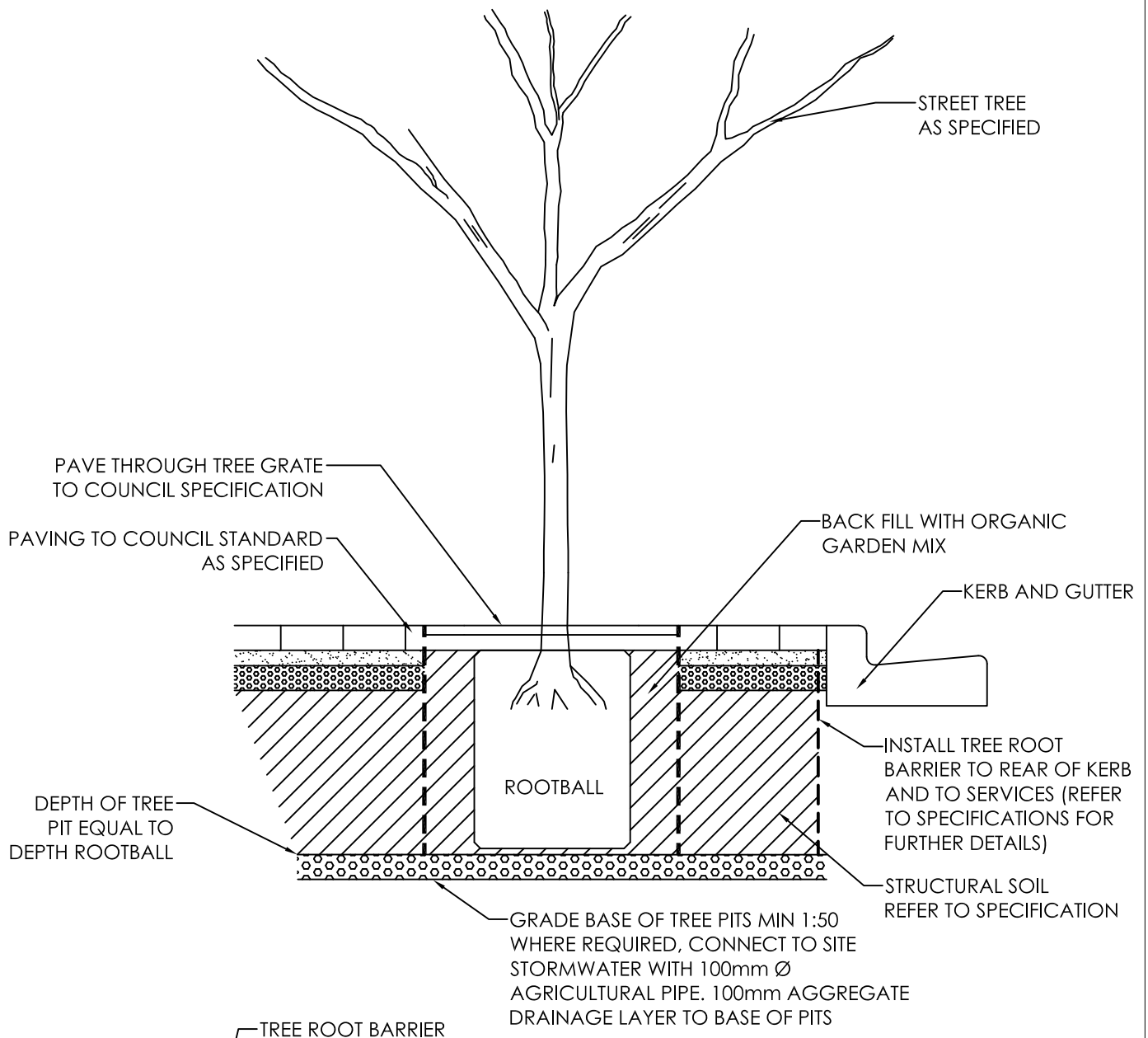


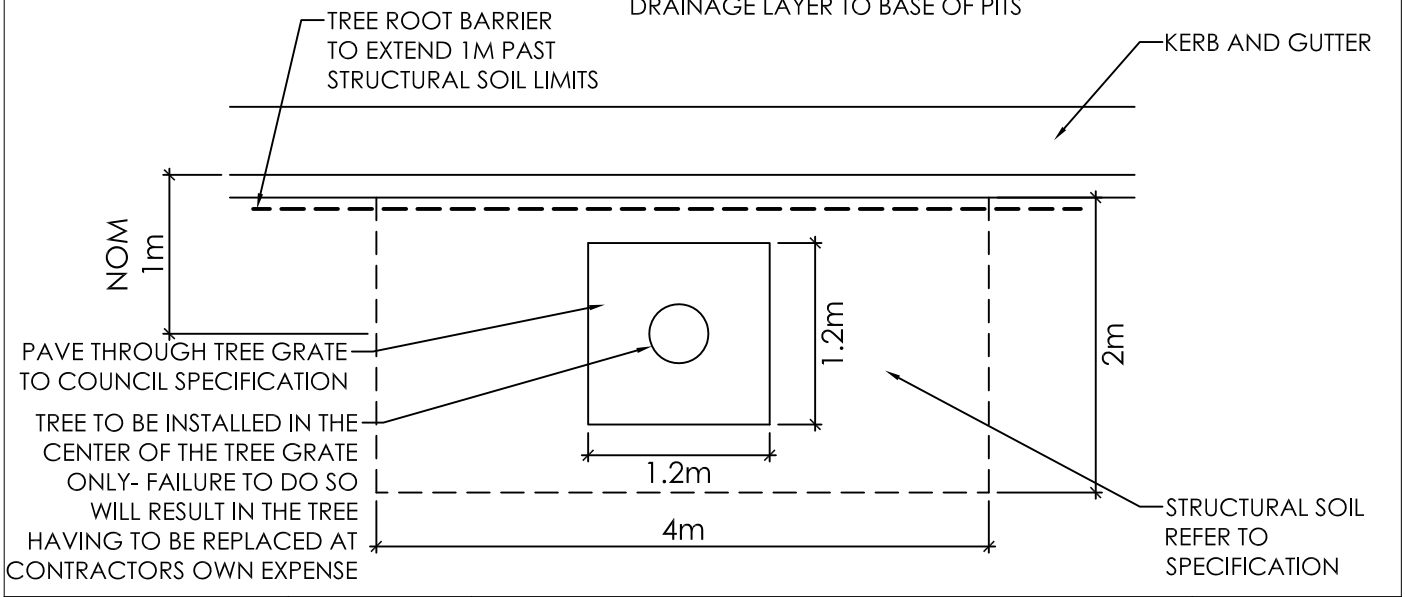
APPROVED: COUNCIL ENGINEER DATE: 6/12/95	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STRAW BALE FILTER	SCALE NOT TO SCALE DRAWING NO. S511

LANDSCAPING DRAWINGS

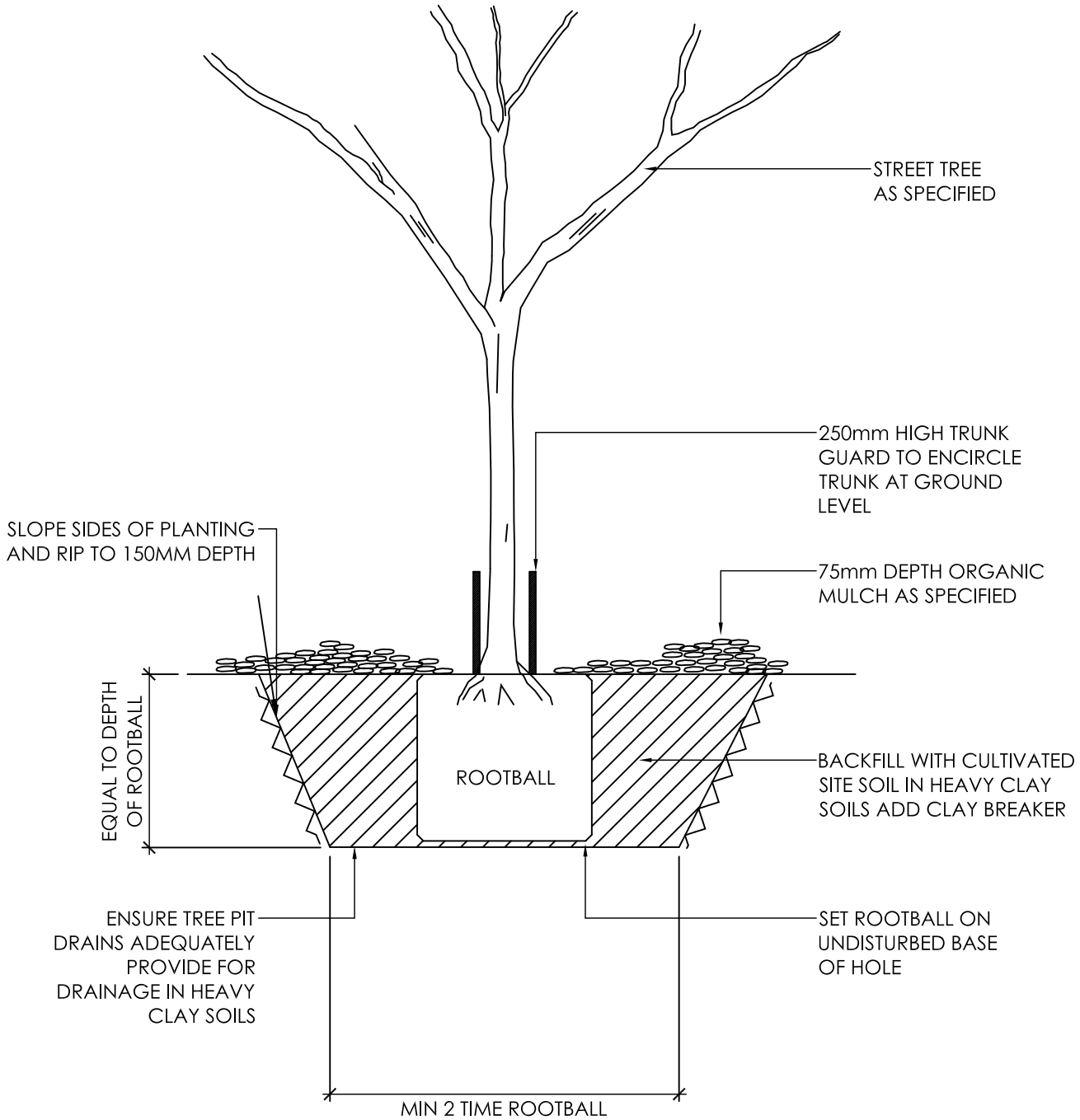
S600 SERIES

Drawing Number	Description
S601	STANDARD TREE PLANTING IN STRUCTURAL SOIL FOR PAVED AREAS
S602A	STANDARD TREE PLANTING IN GRASS VERGE OR PLANTER BEDS
S602B	STANDARD TREE PLANTING IN ROADSIDE PLANTER BEDS
S603	STANDARD SHRUB/SMALL TREE PLANTING
S604	PLANTER BOX SECTION
S605	PLANTER BED PREPARATION
S606	STANDARD TURFING DETAIL
S612	CBD TREE SITE WATERING

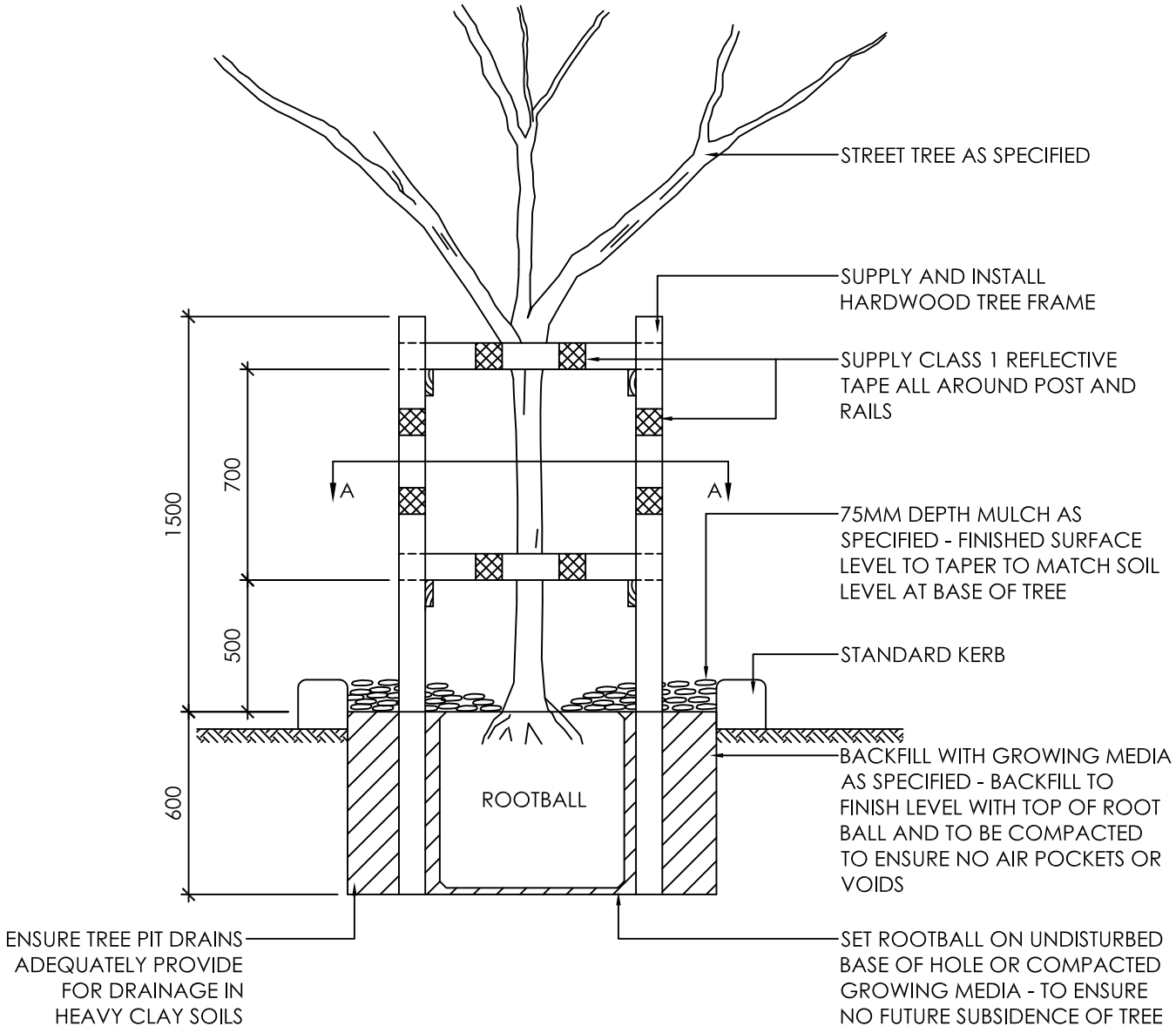




APPROVED: COUNCIL ENGINEER DATE: 01/05/06	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STANDARD TREE PLANTING IN STRUCTURAL SOIL FOR PAVED AREAS	SCALE N.T.S DRAWING NO. S601



APPROVED: COUNCIL ENGINEER DATE: 01/05/06	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STANDARD TREE PLANTING IN GRASS VERGE OR PLANTER BEDS	SCALE N.T.S DRAWING NO. S602A



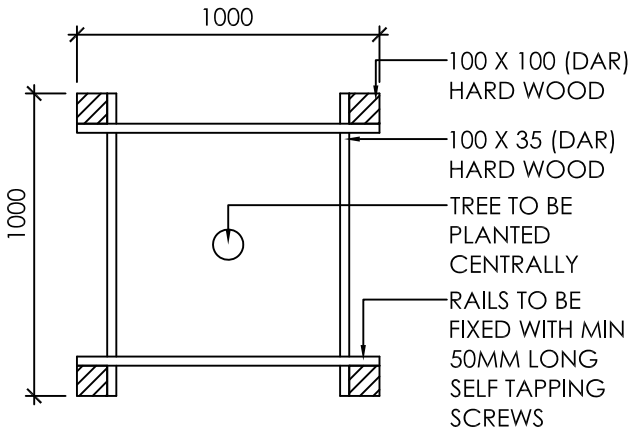
NOTES:

TIMBER:
- ALL EXPOSED SHARP EDGES SHALL BE REMOVED AFTER DRESSING
- ALL TIMBER TO BE DRESSED ALL ROUND WITH MINIMUM STRESS GRADE F17 HARDWOOD
- ALL TIMBER SHALL BE TREATED AGAINST WHITE ANTS, TERMITES, ROT AND OTHER SIMILAR PESTS

FIXINGS:
- ALL JOINTS SHALL BE PRIMED BEFORE FIXING.
- ALL FIXINGS SHALL BE GALVANISED

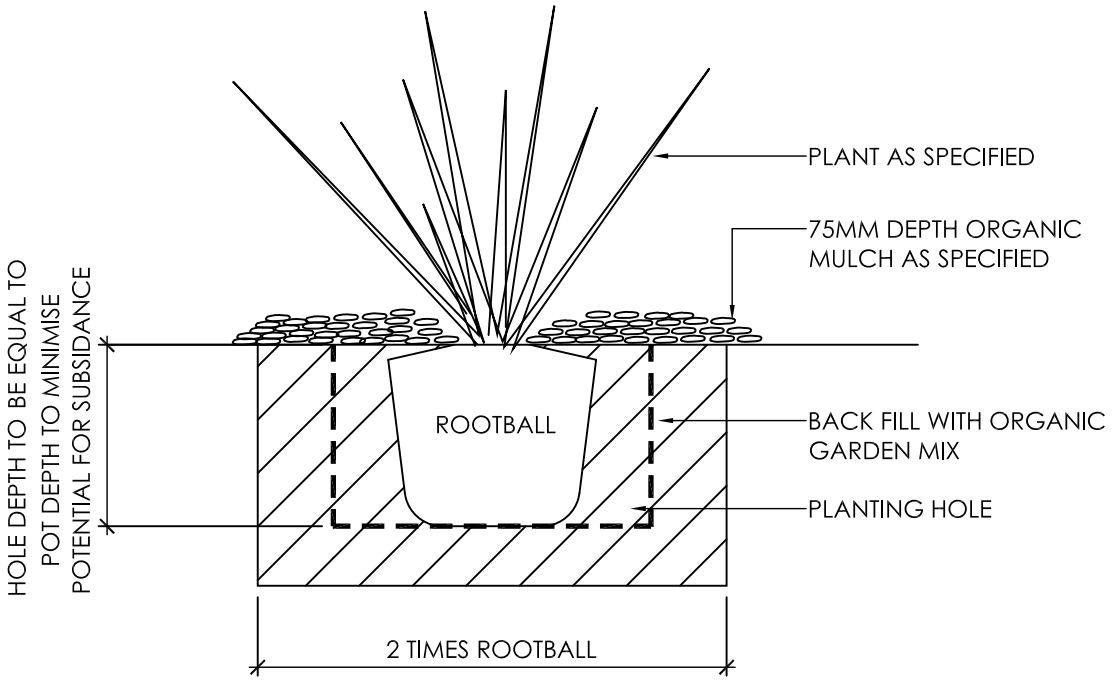
POSTS:
- POSTS ARE TO BE PLUMB

PAINT:
- ALL PAINT FROM TAUBMANS CUSTOM COLOURS OR APPROVED EQUIVALENT
- ALL PAINT SHALL BE PAINTED ON A WHITE SEALER PRIMER BASE
- ALL TIMBER SHALL BE PAINTED WITH TWO COATS OF BRUNSWICK GREEN
- ALL POSTS AND RAILS TO BE SANDED FREE OF SPLINTERS PRIOR TO PAINTING



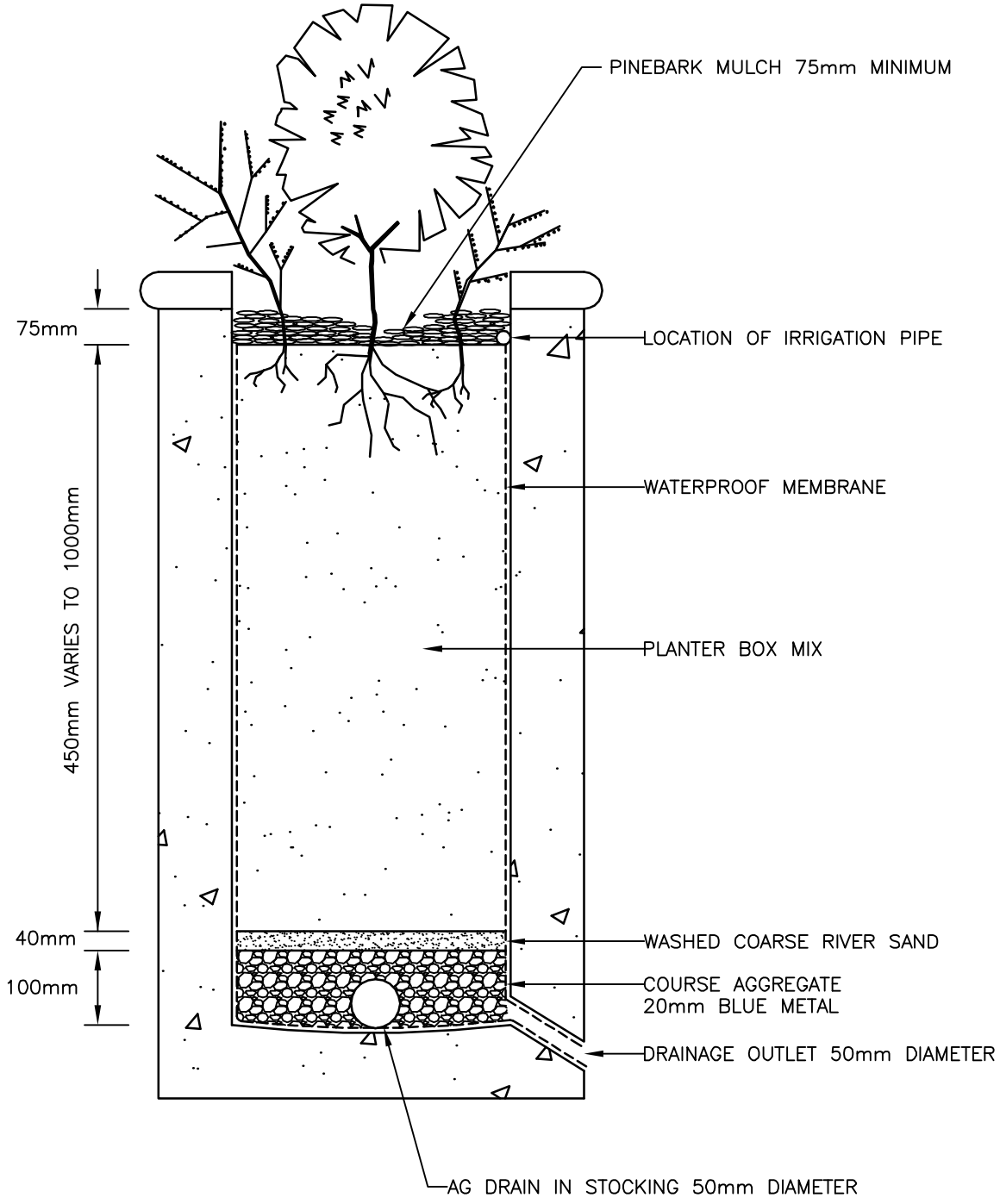
SECTION A-A

APPROVED: COUNCIL ENGINEER DATE: 01/02/08		NORTH SYDNEY COUNCIL STANDARD TREE PLANTING IN ROADSIDE ISLAND PLANTER BEDS	SCALE N.T.S DRAWING NO. S602B

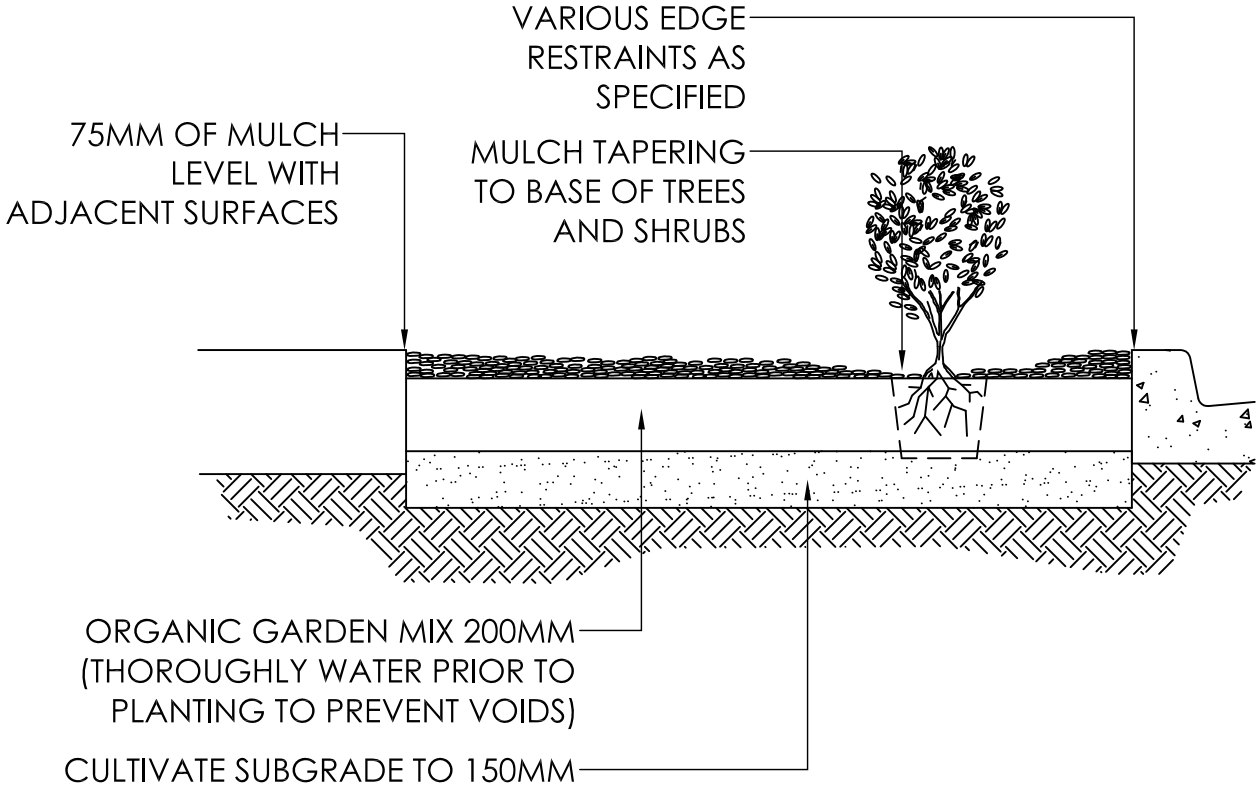


APPROVED: COUNCIL ENGINEER DATE: 01/05/06		NORTH SYDNEY COUNCIL STANDARD SHRUB/SMALL TREE PLANTING	SCALE N.T.S DRAWING NO. S603

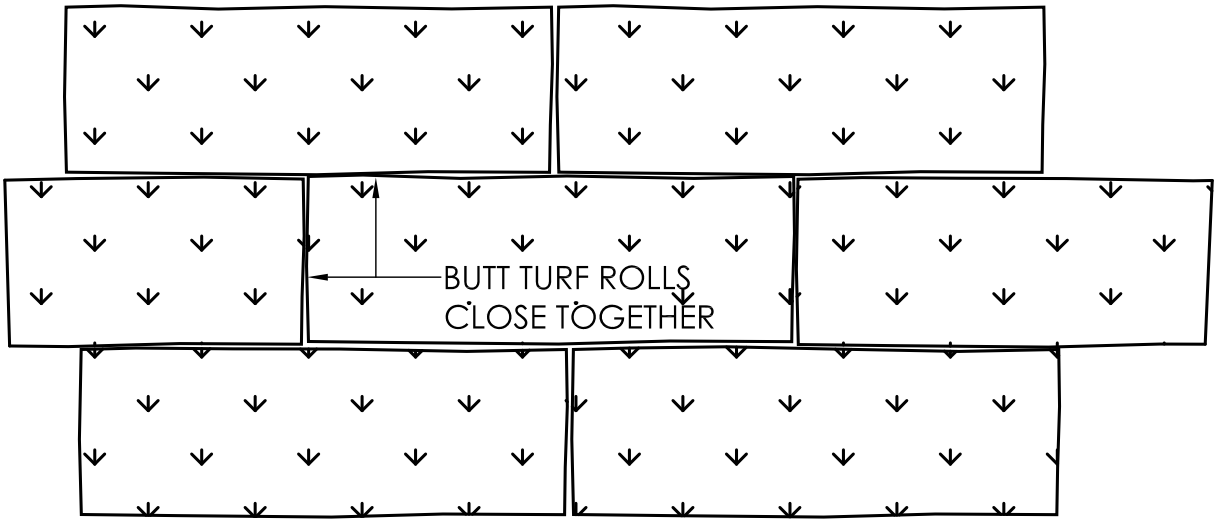
THOROUGHLY WATER TO FILL VOIDS.
ADD PLANTER MIX TO REQUIRED LEVELS BEFORE PLANTING.



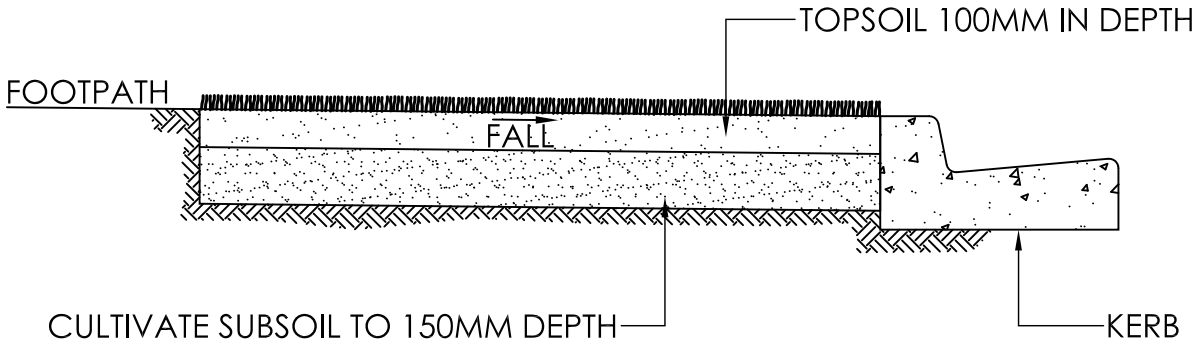
APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL PLANTER BOX SECTION	SCALE N.T.S DRAWING NO. S604



APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL PLANTER BED PREPARATION	SCALE N.T.S DRAWING NO. S605



PLAN VIEW



SECTIONAL VIEW

APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL STANDARD TURFING DETAIL	SCALE N.T.S DRAWING NO. S606

APPROVED:

COUNCIL ENGINEER

DATE: 01/05/04

NORTH SYDNEY COUNCIL

SEALING OF OPEN TREE SITES IN PAVED AREAS

SCALE N.T.S

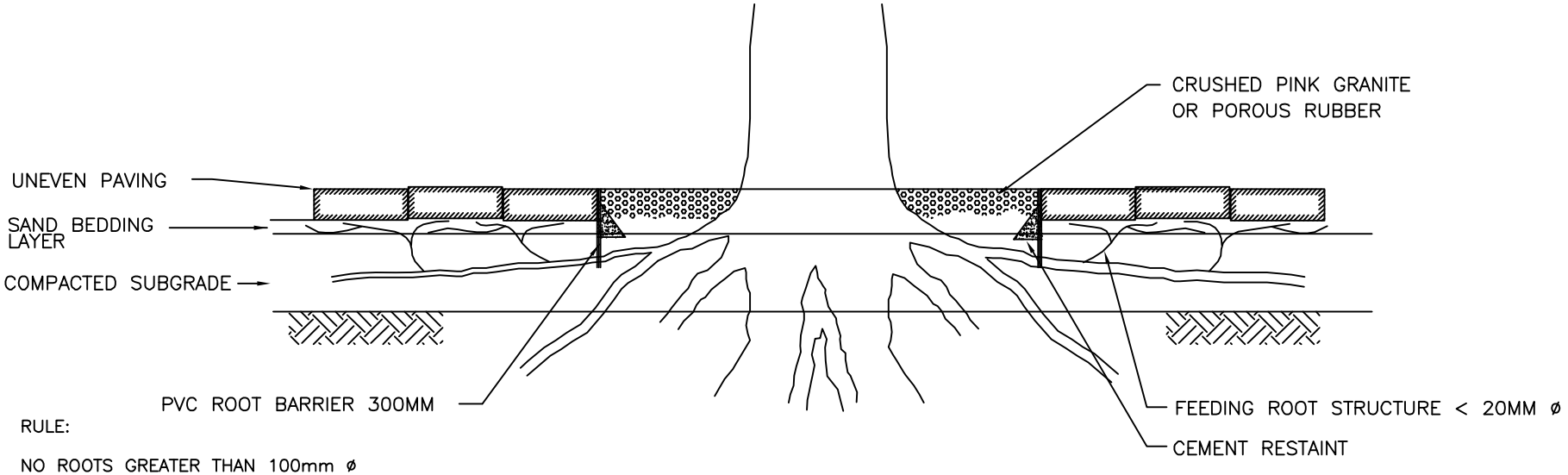
DRAWING NO. S607

SEALING OF OPEN TREE SITES IN PAVED AREAS

(AND REPAIRING UNEVEN PAVERS)

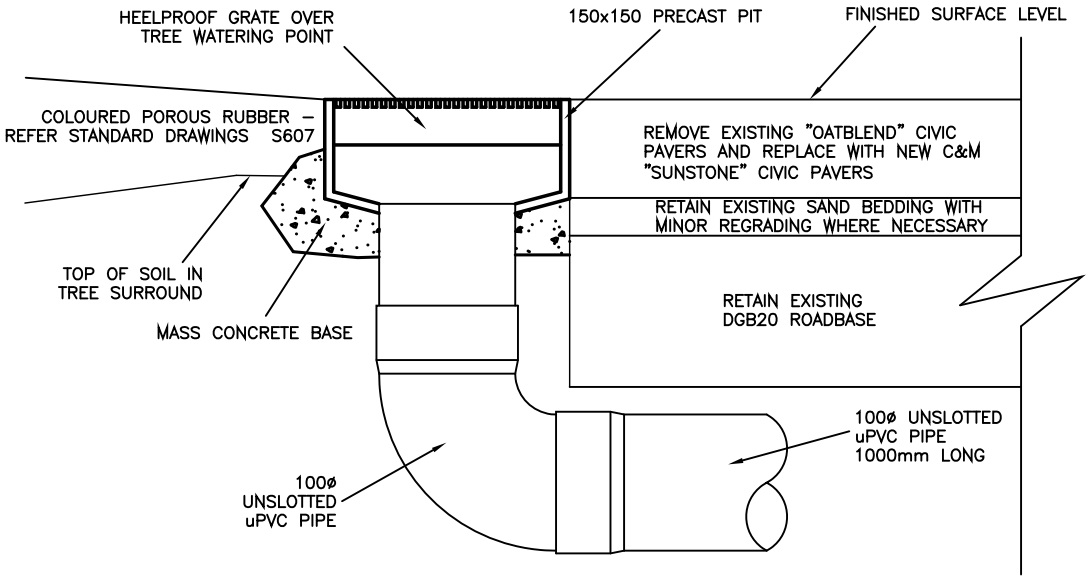
NOTES:

1. TREE ROOT BARRIER SHALL BE CENTURY PRODUCT DWS 300MM DEEP OR APPROVED EQUIVALENT.
2. CRUSHED PINK GRANITE 50MM THICK OR POROUS 'WET–POUR' RUBBER TO BE PROVIDED WITHIN TREE SITE AS REFERRED TO IN THE SPECIFICATION
3. POROUS RUBBER SHALL BE 'EPDM' 50MM THICK TERROCOTTA (WITH BLACK FLECKS) AT A RATIO OF 4:1 – REFER TO SPECIFICATIONS FOR FURTHER DETAILS. LOCAL THICKENING (50MM) TO BE PROVIDED AT EDGE OF TREE SURROUND 100MM WIDE.
4. TRAFFIC CONTROL FOR PEDESTRIANS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE SPECIFICATIONS AND SHALL BE MAINTAINED TO AN ACCEPTABLE LEVEL
5. NO TREE SITE SHALL BE LEFT EXPOSED OVER NIGHT WITHOUT DUE CONSIDERATION TO PEDESTRIAN SAFETY
6. REMOVE UNEVEN PAVING IN THE VICINITY OF TREE SITE AND PRUNE ROOTS WITHIN BEDDING LAYER IN ACCORDANCE WITH SPECIFICATION
7. COMPACT SUB GRADE AS NECESSARY
8. SUPPLY, LAY AND COMPACT 25MM THICK SAND BEDDING
9. RELAY PAVING IN ACCORDANCE WITH COUNCIL'S SPECIFICATIONS
10. PROVIDE CRUSHED PINK GRANITE OR POROUS RUBBER
11. BARRICADE POROUS RUBBER AFTER LAYING UNTIL FIRMLY SET

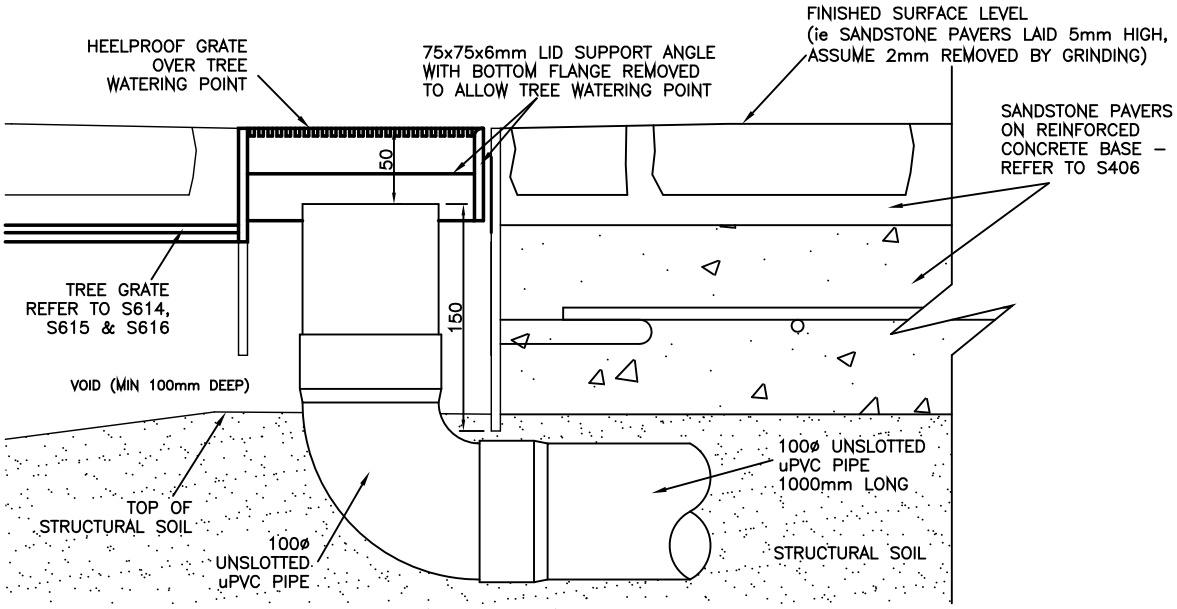


RULE:

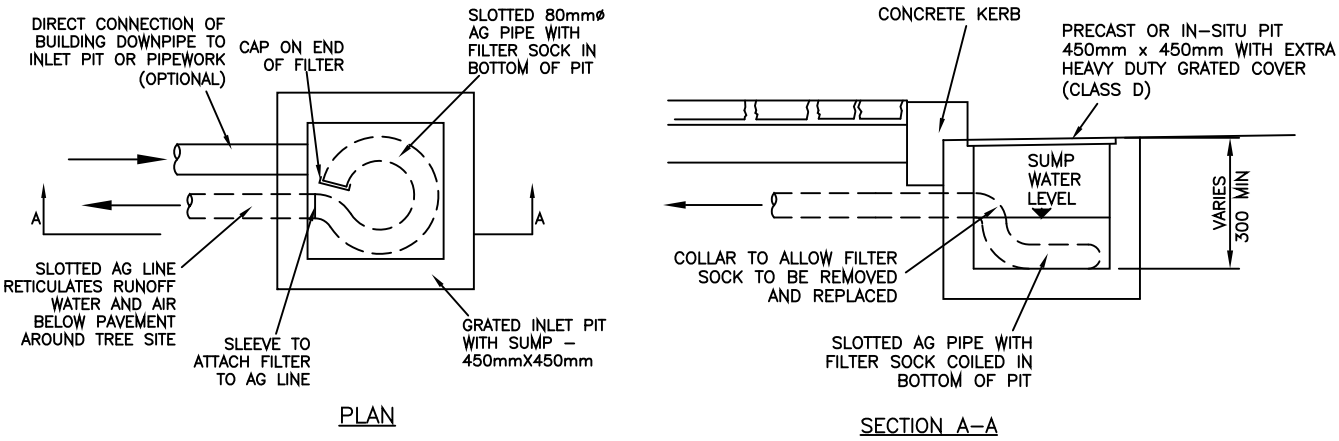
NO ROOTS GREATER THAN 100mm ø TO BE CUT WITHIN TREE SITE. IF MORE THAN 2 ROOTS 75mm ø OR GREATER NEED TO BE CUT, COUNCIL'S ARBORIST TO BE CONTACTED.



EXISTING TREE WATERING POINT –
TYPICAL SECTION IN POROUS RUBBER



NEW TREE WATERING POINT –
TYPICAL SECTION IN TREE GRATE



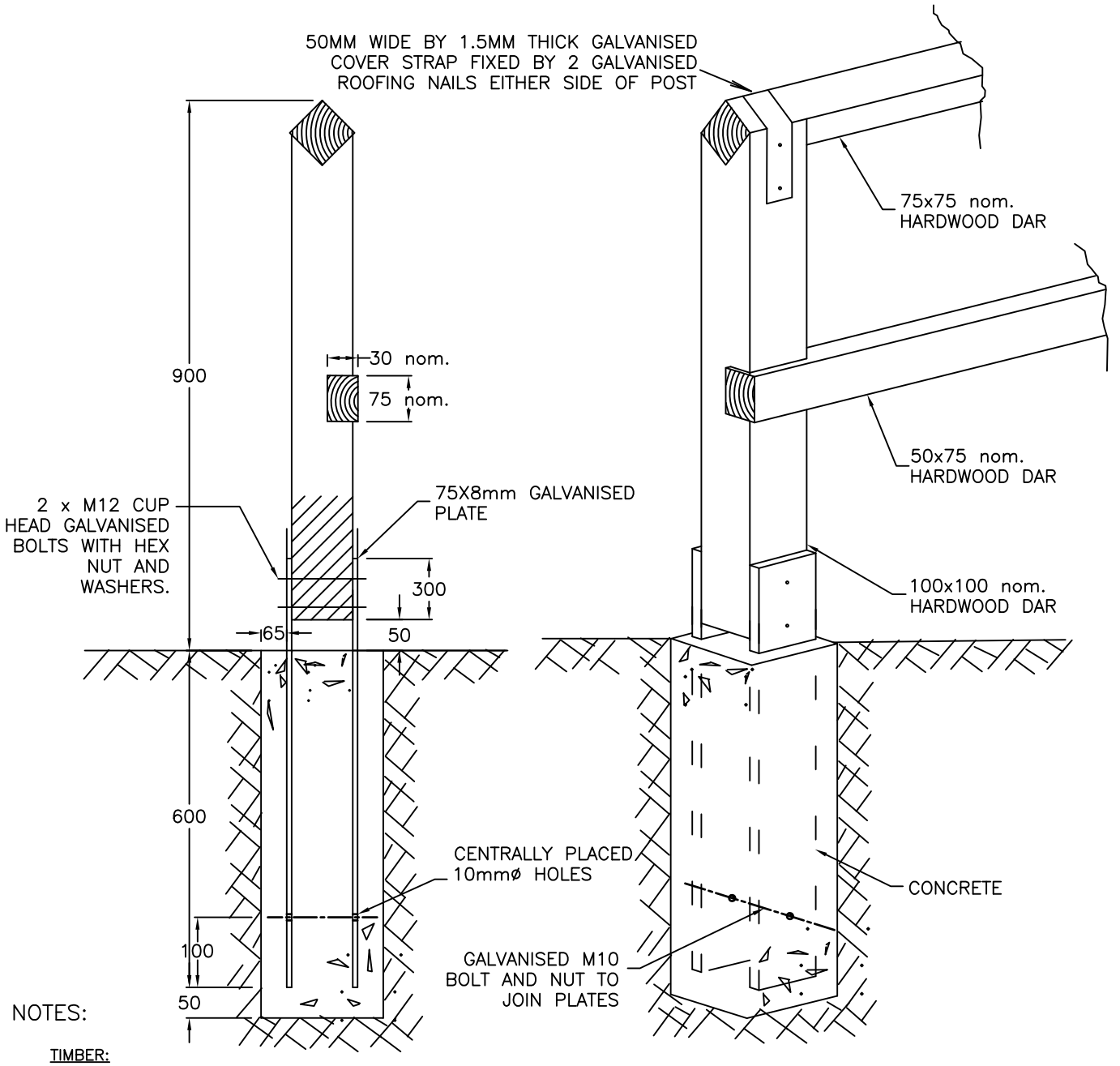
GUTTER INLET PIT AT TREE SITES

APPROVED: COUNCIL ENGINEER DATE: 01/05/07		NORTH SYDNEY COUNCIL CBD TREE SITE WATERING DETAILS	SCALE N.T.S. DRAWING NO. S612

FENCE DRAWINGS

S700 SERIES

Drawing Number	Description
S701	ORDINANCE RAIL FENCE
S702	ORDINANCE RAIL FENCE CONFIGURATIONS
S703	ORDINANCE HAND RAIL
S704	ORDINANCE HAND RAIL CONFIGURATIONS
S705	PIPE AND WIRE PEDESTRIAN FENCE DETAILS
S706	PIPE AND WIRE FENCE DETAILS
S707	PIPE FENCE DETAILS
S708	POST FENCE DETAILS
S709A	PAILING FENCE DETAILS - POST FOOTING
S709B	PAILING FENCE DETAILS – STEEL FOOTING
S710	PICKET FENCE WITH CONCRETE FOOTING
S711	PICKET FENCE WITH POST FOOTING
S712	PICKET FENCE GATE



NOTES:

TIMBER:
- ALL TIMBER SIZES MUST BE CONFIRMED BY PROPERTY MAINTENANCE SUPERVISOR
- ALL TIMBER SHALL BE DRESSED ALL ROUND (DAR) PENCIL ROUND FINISH ON ALL CORNERS
- ALL EXPOSED SHARP EDGES SHALL BE REMOVED AFTER CUTTING
- ALL TIMBER SHALL HAVE A MINIMUM STRESS GRADE OF F17
- ALL TIMBER SHALL BE TREATED AGAINST WHITE ANTS, TERMITES, ROT AND OTHER SIMILAR PESTS

FIXINGS:
- ALL TIMBER TO TIMBER FIXINGS SHALL BE MADE USING 14G BUGLE SCREWS
- ALL FIXINGS SHALL BE GALVANISED
- ALL JOINTS SHALL BE PRIMED BEFORE FIXING.
- COVER STRAP FIXINGS SHALL BE AS INSTRUCTED BY PROPERTY MAINTENANCE SUPERVISOR

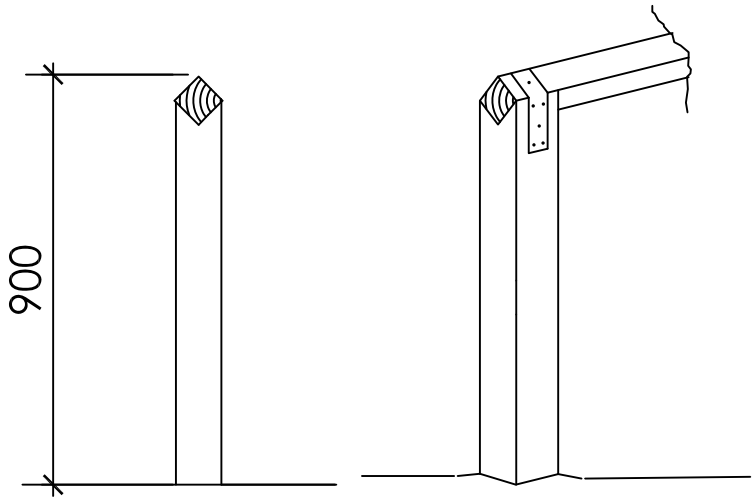
POSTS:
- ALL POSTS MUST BE VERTICAL AND FIXED TO THE GALVANISED SUPPORT PLATES THROUGH THE 14mm SQUARE HOLES BY M12 CUP HEAD BOLTS, HEX NUTS AND WASHERS
- SPACING OF POSTS SHALL BE A MAXIMUM OF 3.0M

PAINT:
- ALL FENCES SHALL BE PAINTED WITH TWO (2) COATS OF THE PAINT SPECIFIED FOR THE LOCATION
  - STREET FENCES SHALL BE PAINTED IN "NORTH SYDNEY COUNCIL PAINT FORMULA" – DULUX WEATHERSHEILD GLOSS ACRYLIC ON VIVID WHITE BASE TINTED USING DULUX AUTHENTIC COLOUR LOW VOX TINTERS AS FOLLOWS; EE(OCHRE) 13.5; LL(STRONG RED) 17.5; XX(YELLOW) 62.5 DOSAGE IS PER LITRE
  - PARKS AND RESERVE FENCES SHALL BE PAINTED "DEEP BRUNSWICK GREEN" DULUX WEATHERSHEILD GLOSS ACRYLIC TINTED USING DULUX AUTHENTIC COLOUR LOW VOX TINTERS AS FOLLOWS; M(BLACK) 48; SS(STRONG GREEN) 16; XX(YELLOW) 64 DOSAGE IS PER LITRE

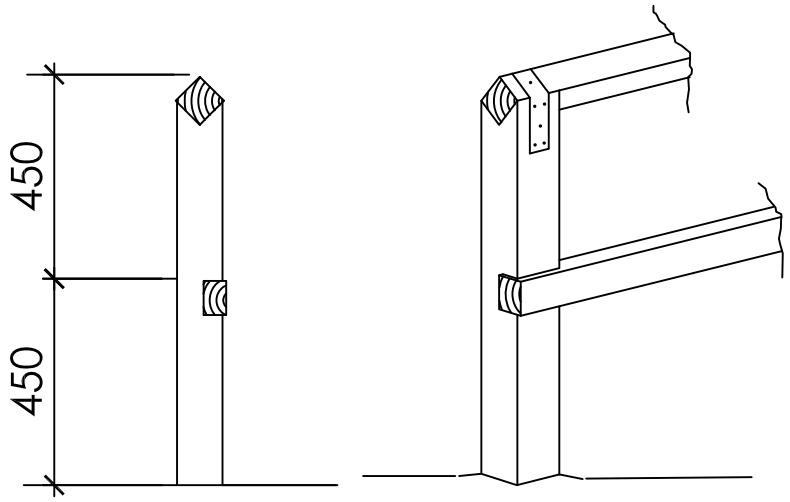
WIRE:
- PVC COATED (GREEN OR BLACK) WIRE IS TO BE USED WHERE THE LOCATION REQUIRES.

APPROVED: COUNCIL ENGINEER DATE: 01/07/22		NORTH SYDNEY COUNCIL ORDINANCE RAIL FENCING DETAILS	SCALE N.T.S DRAWING NO. S701

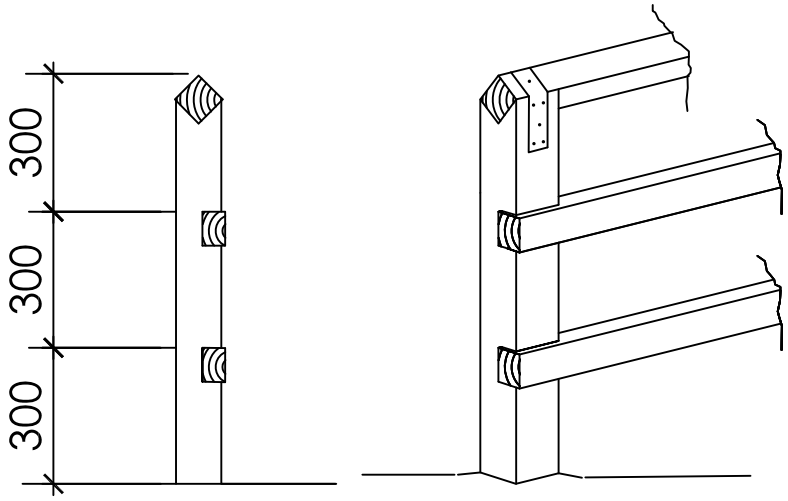
TYPE 1



TYPE 2

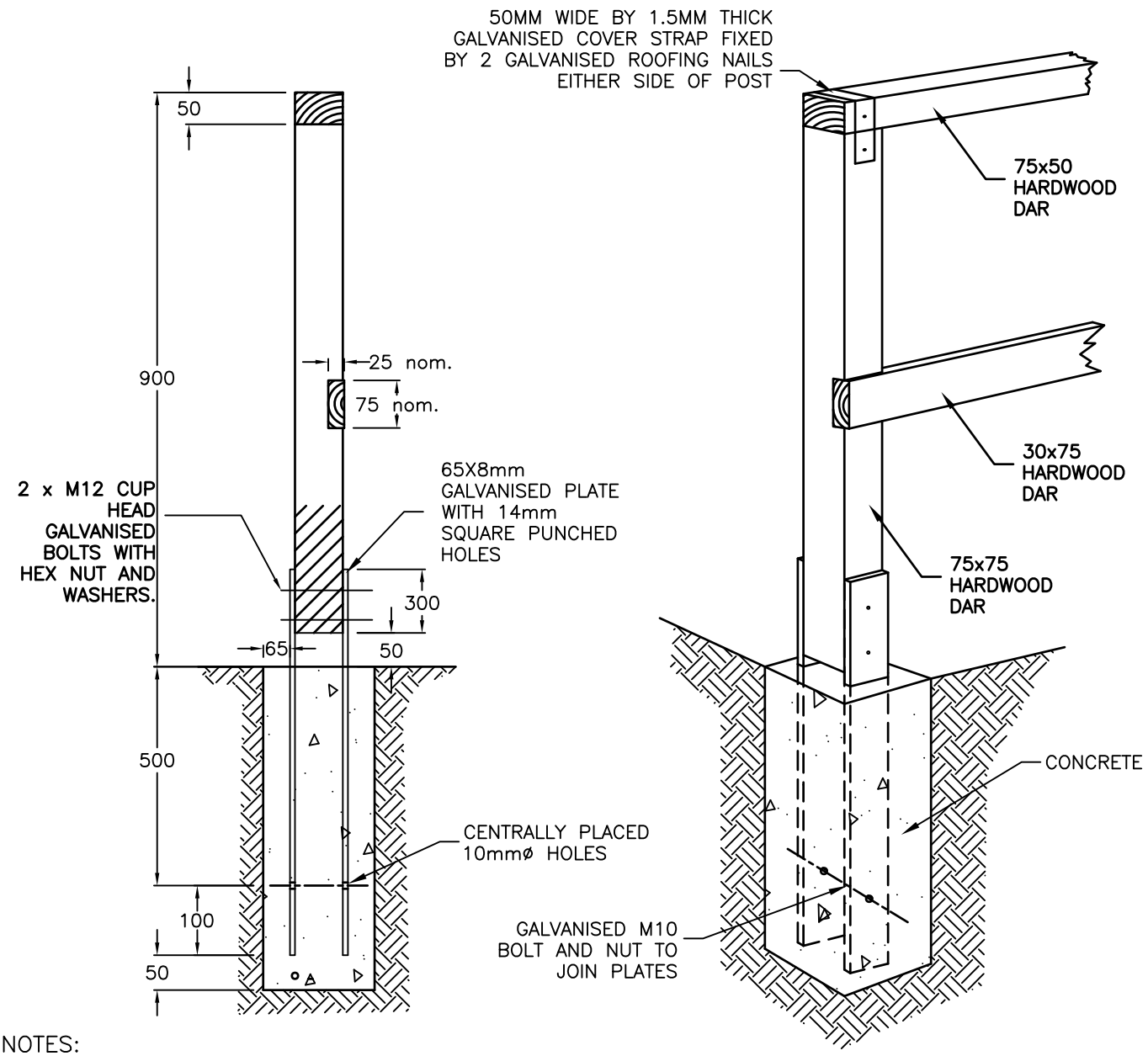


TYPE 3



ALL DETAILS AS PER RAIL FENCING DRAWING S701

APPROVED:		NORTH SYDNEY COUNCIL	SCALE NOT TO SCALE
DATE: 01/05/04		ORDINANCE FENCE	DRAWING NO. S702



NOTES:

TIMBER:
- ALL TIMBER SIZES MUST BE CONFIRMED BY PROPERTY MAINTENANCE SUPERVISOR
- ALL TIMBER SHALL BE DRESSED ALL ROUND (DAR) PENCIL ROUND FINISH ON ALL CORNERS
- ALL EXPOSED SHARP EDGES SHALL BE REMOVED AFTER CUTTING
- ALL TIMBER SHALL HAVE A MINIMUM STRESS GRADE OF F17
- ALL TIMBER SHALL BE TREATED AGAINST WHITE ANTS, TERMITES, ROT AND OTHER SIMILAR PESTS

FIXINGS:
- ALL TIMBER TO TIMBER FIXINGS SHALL BE MADE USING 14G BUGLE SCREWS
- ALL FIXINGS SHALL BE GALVANISED
- ALL JOINTS SHALL BE PRIMED BEFORE FIXING.
- COVER STRAP FIXINGS SHALL BE AS INSTRUCTED BY PROPERTY MAINTENANCE SUPERVISOR

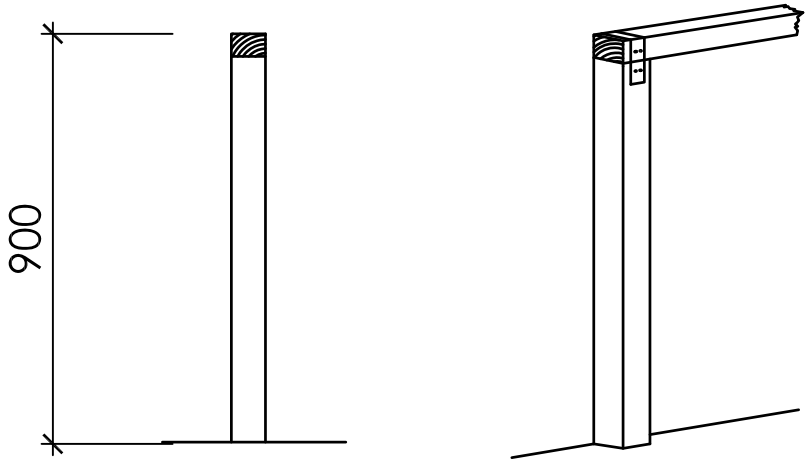
POSTS:
- ALL POSTS MUST BE VERTICAL AND FIXED TO THE GALVANISED SUPPORT PLATES THROUGH THE 14mm SQUARE HOLES BY M12 CUP HEAD BOLTS, HEX NUTS AND WASHERS
- SPACING OF POSTS SHALL BE A MAXIMUM OF 3.0M

PAINT:
- ALL FENCES SHALL BE PAINTED WITH TWO (2) COATS OF THE PAINT SPECIFIED FOR THE LOCATION
  - STREET FENCES SHALL BE PAINTED IN "NORTH SYDNEY COUNCIL PAINT FORMULA" – DULUX WEATHERSHEILD GLOSS ACRYLIC ON VIVID WHITE BASE TINTED USING DULUX AUTHENTIC COLOUR LOW VOX TINTERS AS FOLLOWS; EE(OCHRE) 13.5; LL(STRONG RED) 17.5; XX(YELLOW) 62.5 DOSAGE IS PER LITRE
  - PARKS AND RESERVE FENCES SHALL BE PAINTED "DEEP BRUNSWICK GREEN" DULUX WEATHERSHEILD GLOSS ACRYLIC TINTED USING DULUX AUTHENTIC COLOUR LOW VOX TINTERS AS FOLLOWS; M(BLACK) 48; SS(STRONG GREEN) 16; XX(YELLOW) 64 DOSAGE IS PER LITRE

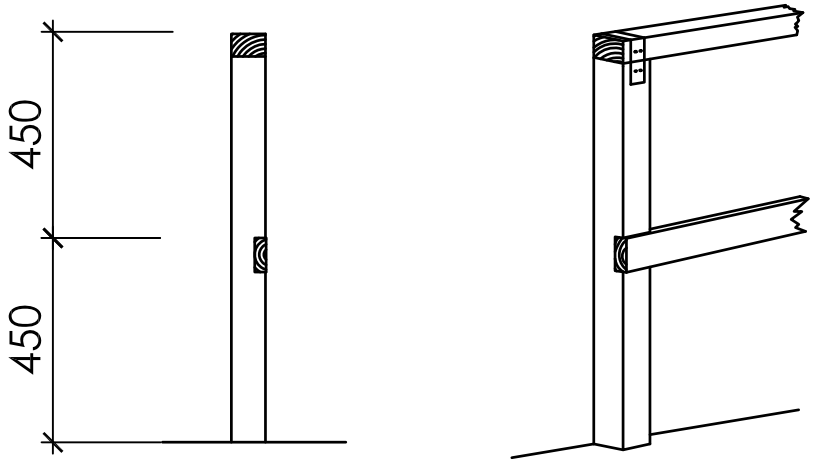
WIRE:
- PVC COATED (GREEN OR BLACK) WIRE IS TO BE USED WHERE THE LOCATION REQUIRES.

APPROVED: COUNCIL ENGINEER DATE: 01/07/22		NORTH SYDNEY COUNCIL ORDINANCE HAND RAIL DETAIL	SCALE N.T.S DRAWING NO. S703

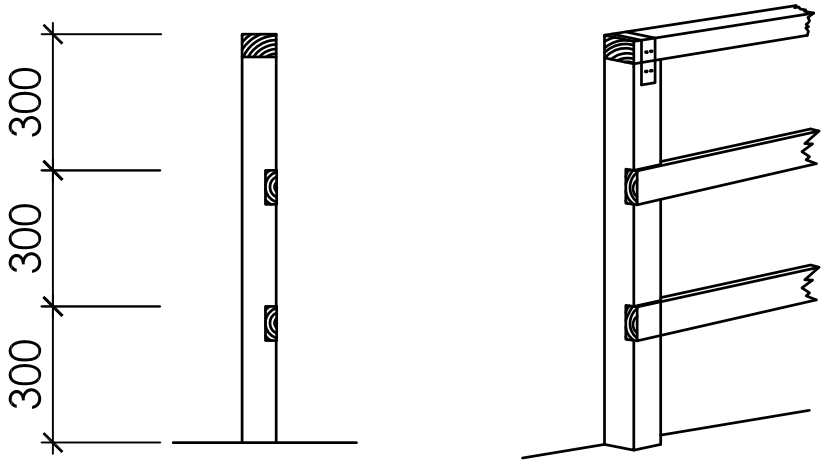
TYPE 4



TYPE 5

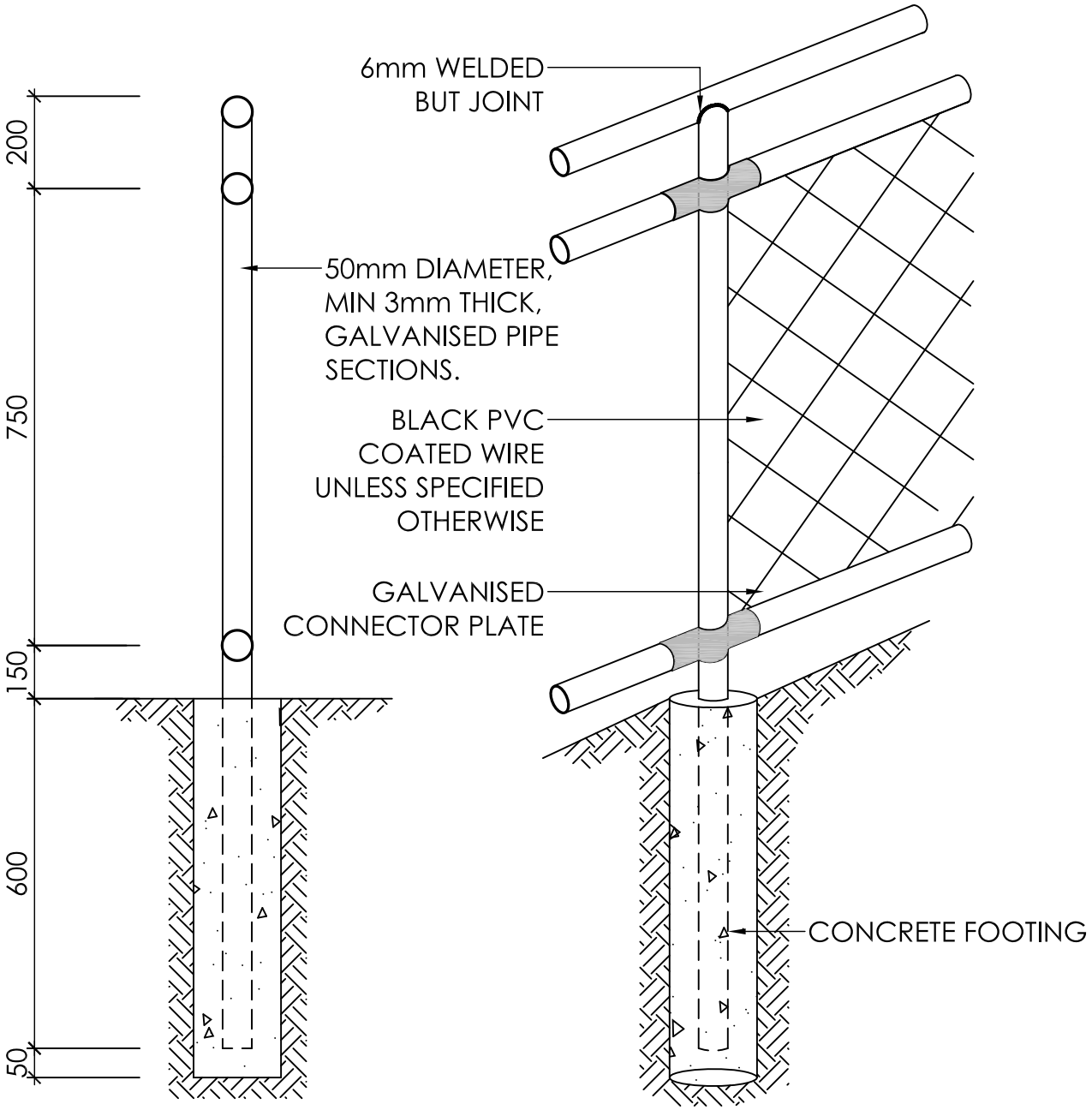


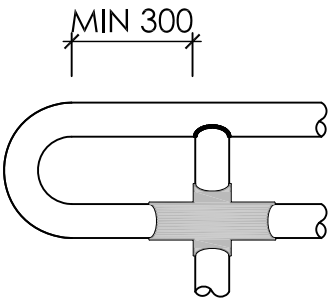
TYPE 6



REFER TO DRAWING S703 FOR MORE DETAILS

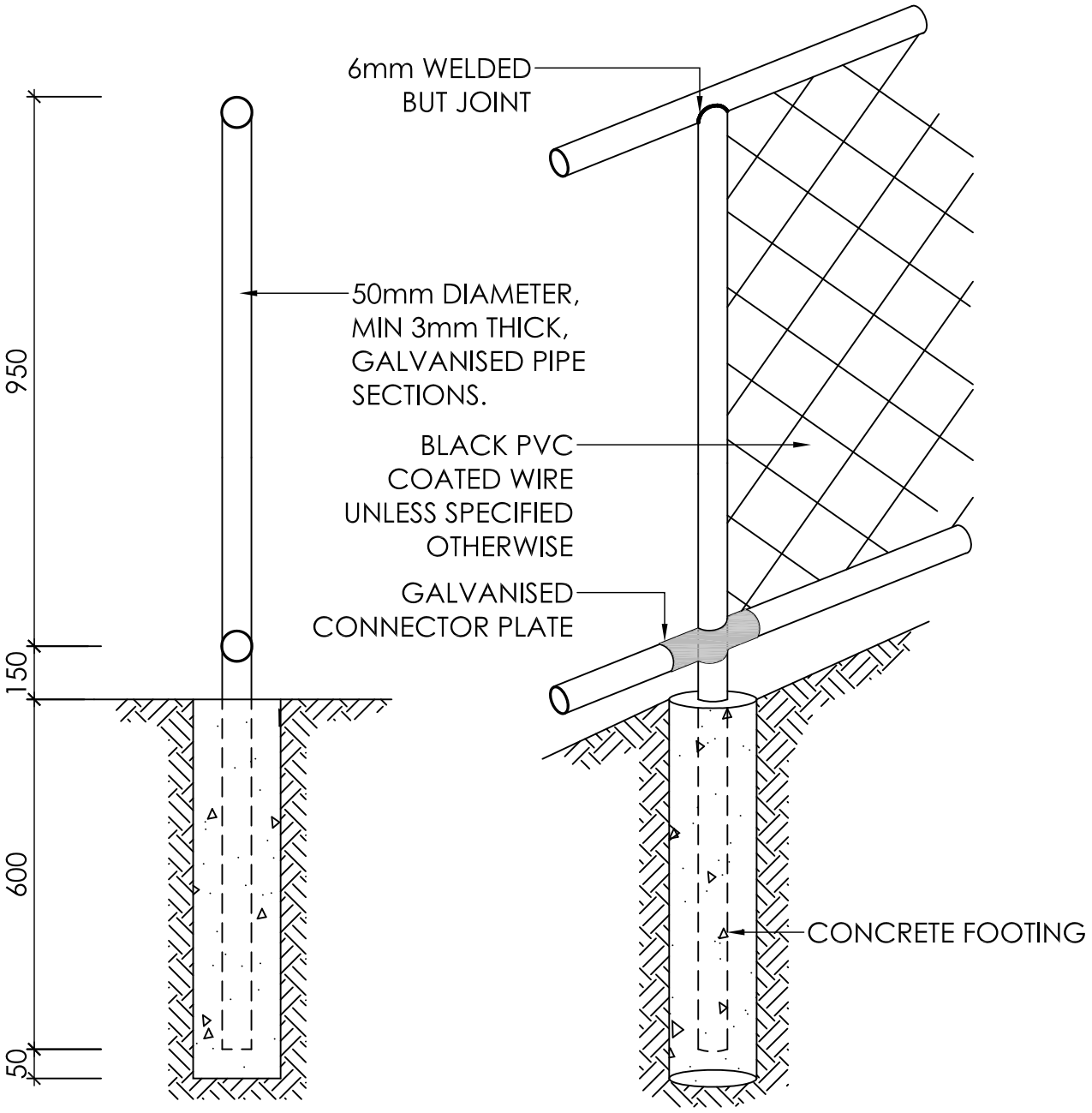
APPROVED: COUNCIL ENGINEER DATE: 01/05/04		NORTH SYDNEY COUNCIL ORDINANCE HAND RAIL CONSTRUCTION	SCALE N.T.S. DRAWING NO. S704

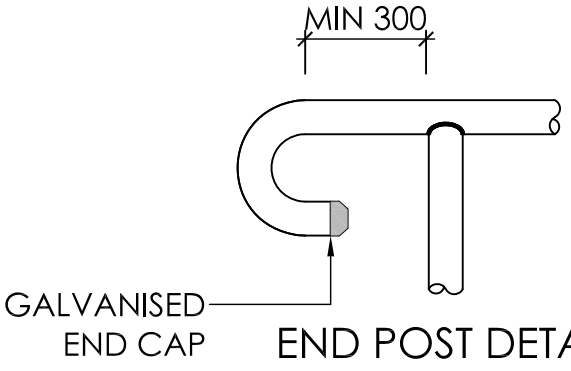




END POST DETAIL

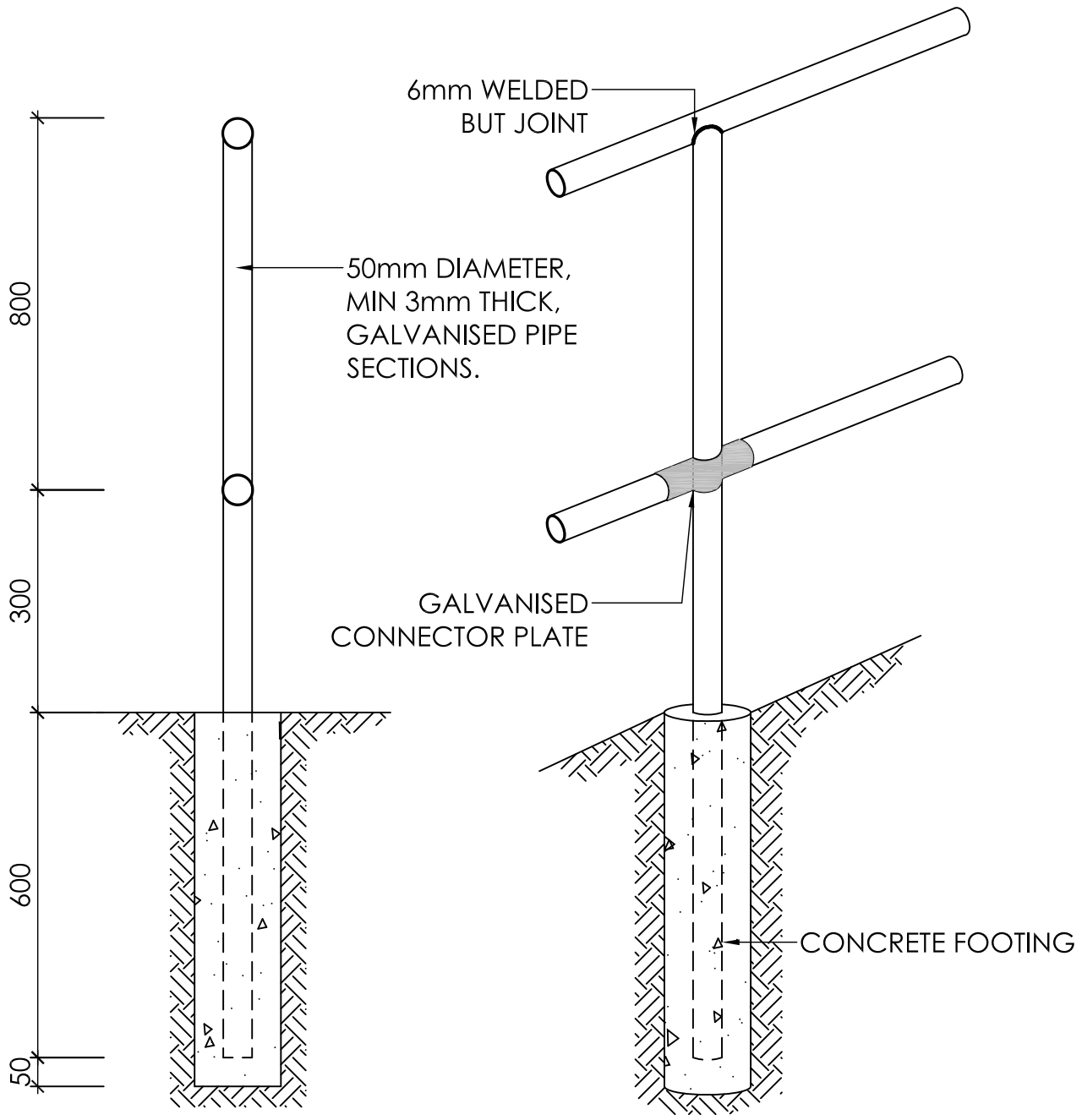
APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL PIPE AND WIRE PEDESTRIAN FENCE DETAILS	SCALE N.T.S. DRAWING NO. S705

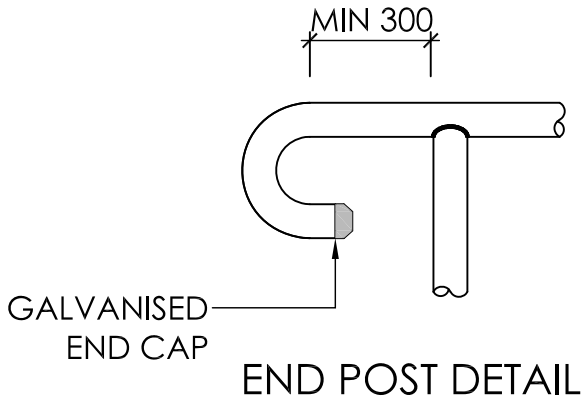




END POST DETAIL

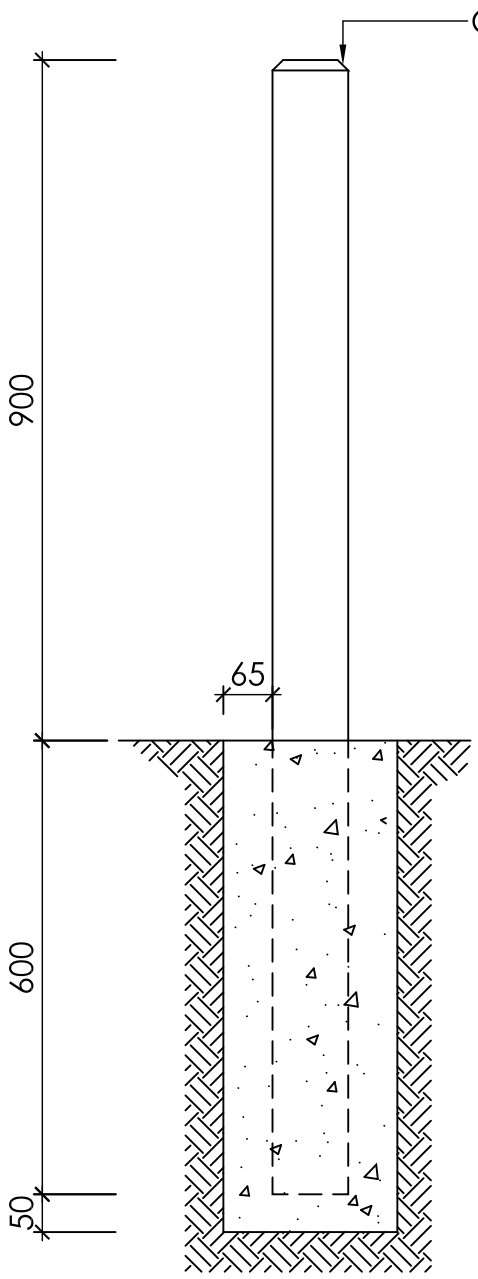
APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL PIPE AND WIRE FENCE DETAILS	SCALE N.T.S. DRAWING NO. S706



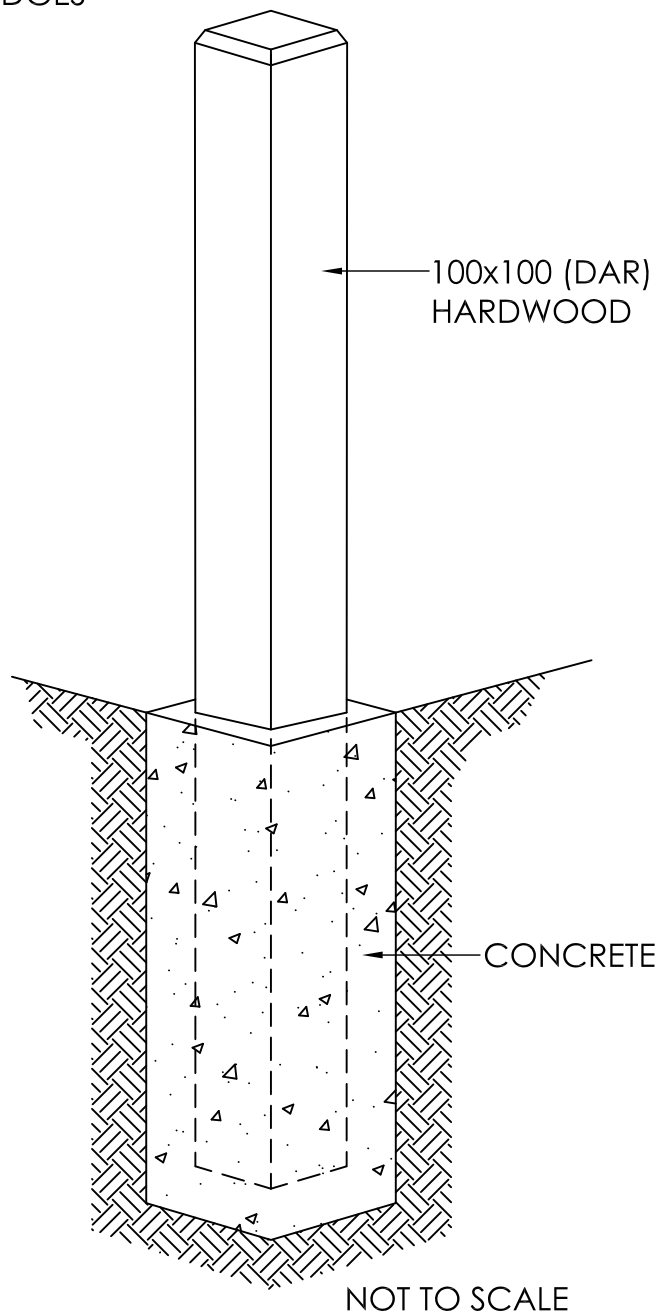


END POST DETAIL

APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL PIPE FENCE DETAILS	SCALE N.T.S. DRAWING NO. S707



SCALE 1:10



NOT TO SCALE

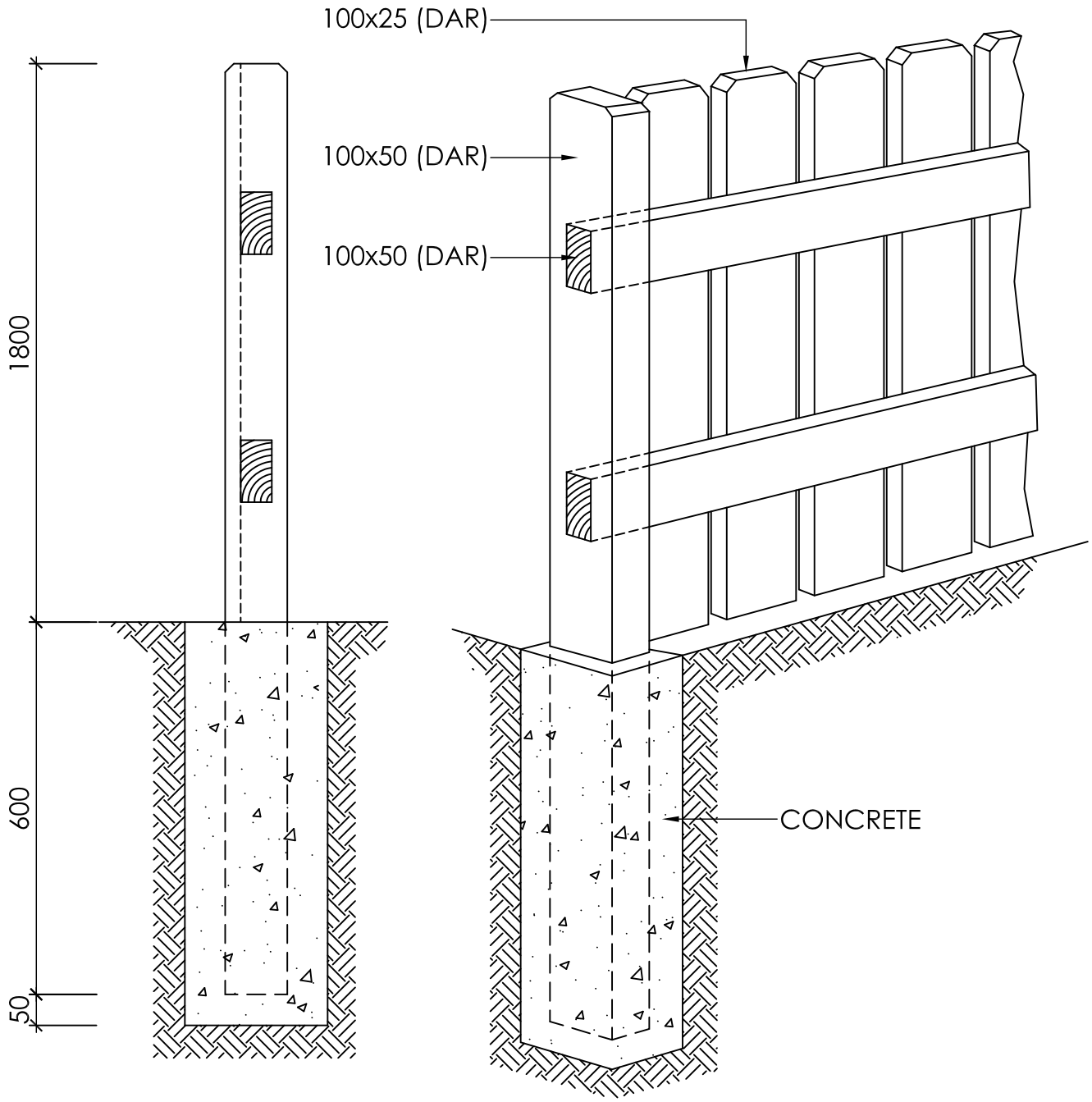
NOTES:

TIMBER:
- ALL TIMBER TO BE DRESSED ALL ROUND WITH MINIMUM STRESS GRADE F17 HARDWOOD
- ALL TIMBER SHALL BE TREATED AGAINST WHITE ANTS, TERMITES, ROT AND OTHER SIMILAR PESTS

POSTS:
- POSTS ARE TO BE PLUMB AND EMBEDDED INTO CONCRETE WITH A MINIMUM COVER OF 50mm INTO UNDISTURBED SOIL FOUNDATIONS
- SPACING OF POSTS SHALL BE A MINIMUM OF 1.2m AND A MAXIMUM OF 2.0M

PAINT:
- ALL PAINT SHALL BE PAINTED ON A WHITE SEALER PRIMER BASE
- STREET FENCES SHALL BE PAINTED WITH TWO COATS OF "CANTALOUPE" BY BRISTOL TAUBMANS
- PARK FENCES SHALL BE PAINTED WITH TWO COATS OF "DEEP BRUNSWICK GREEN" GLOSS WEATHERSHEILD ARCYLIC BY DULUX

APPROVED: COUNCIL ENGINEER DATE: 01/05/04		NORTH SYDNEY COUNCIL POST FENCE DETAILS	SCALE N.T.S DRAWING NO. S708



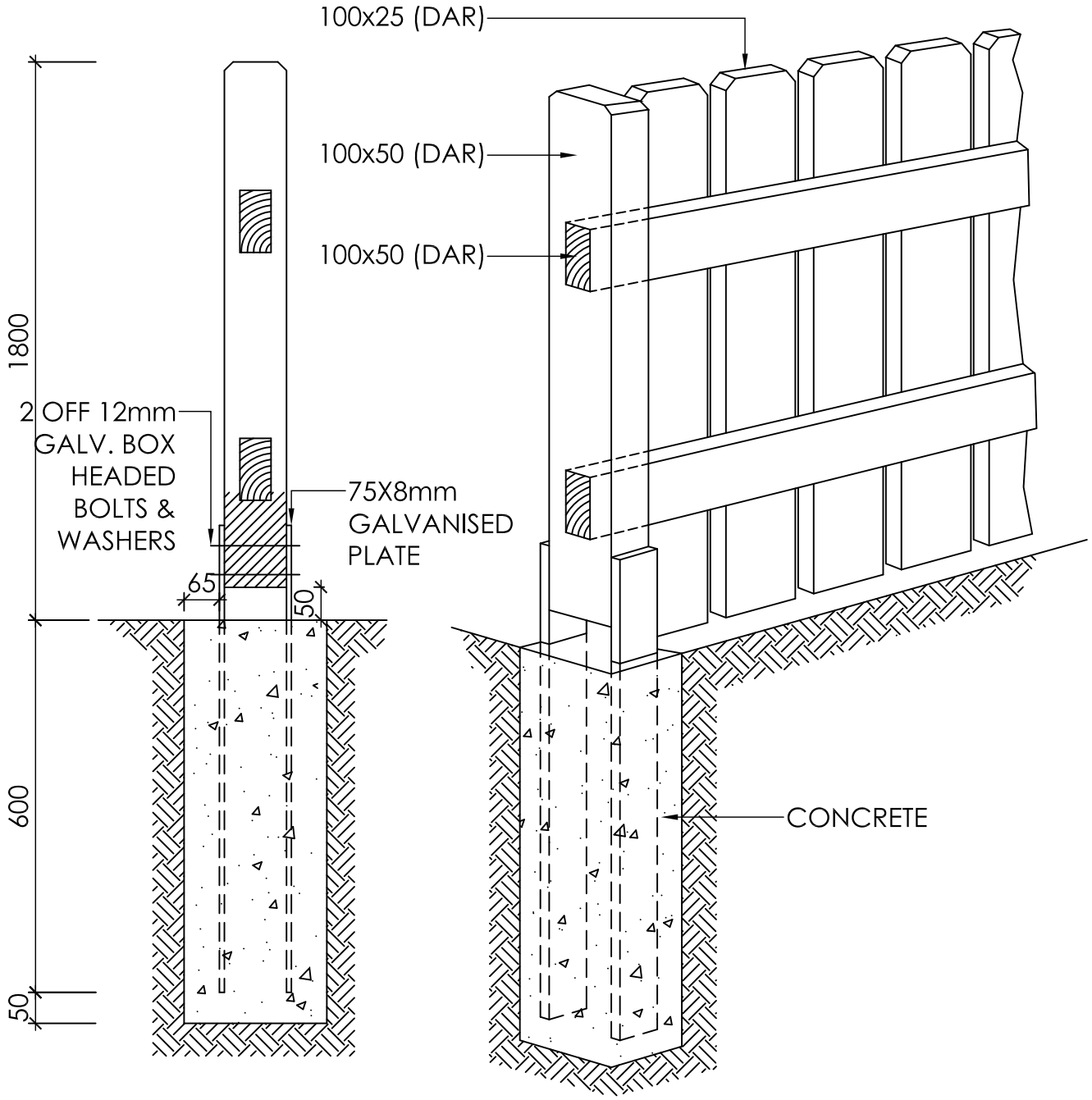
NOTES:

TIMBER:
- ALL TIMBER TO BE DRESSED ALL ROUND WITH MINIMUM STRESS GRADE F17 HARDWOOD
- ALL TIMBER SHALL BE TREATED AGAINST WHITE ANTS, TERMITES, ROT AND OTHER SIMILAR PESTS

POSTS:
- POSTS ARE TO BE PLUMB AND EMBEDDED INTO CONCRETE WITH A MINIMUM COVER OF 50mm INTO UNDISTURBED SOIL FOUNDATIONS
- SPACING OF POSTS SHALL BE A MAXIMUM OF 3.0M

PAINT:
- ALL PAINT SHALL BE PAINTED ON A WHITE SEALER PRIMER BASE
- STREET FENCES SHALL BE PAINTED WITH TWO COATS OF "CANTALOUPE" BY BRISTOL TAUBMANS
- PARK FENCES SHALL BE PAINTED WITH TWO COATS OF "DEEP BRUNSWICK GREEN" GLOSS WEATHERSHEILD ARCYLIC BY DULUX

APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL PALING FENCE DETAILS POST FOOTING	SCALE N.T.S. DRAWING NO. S709A



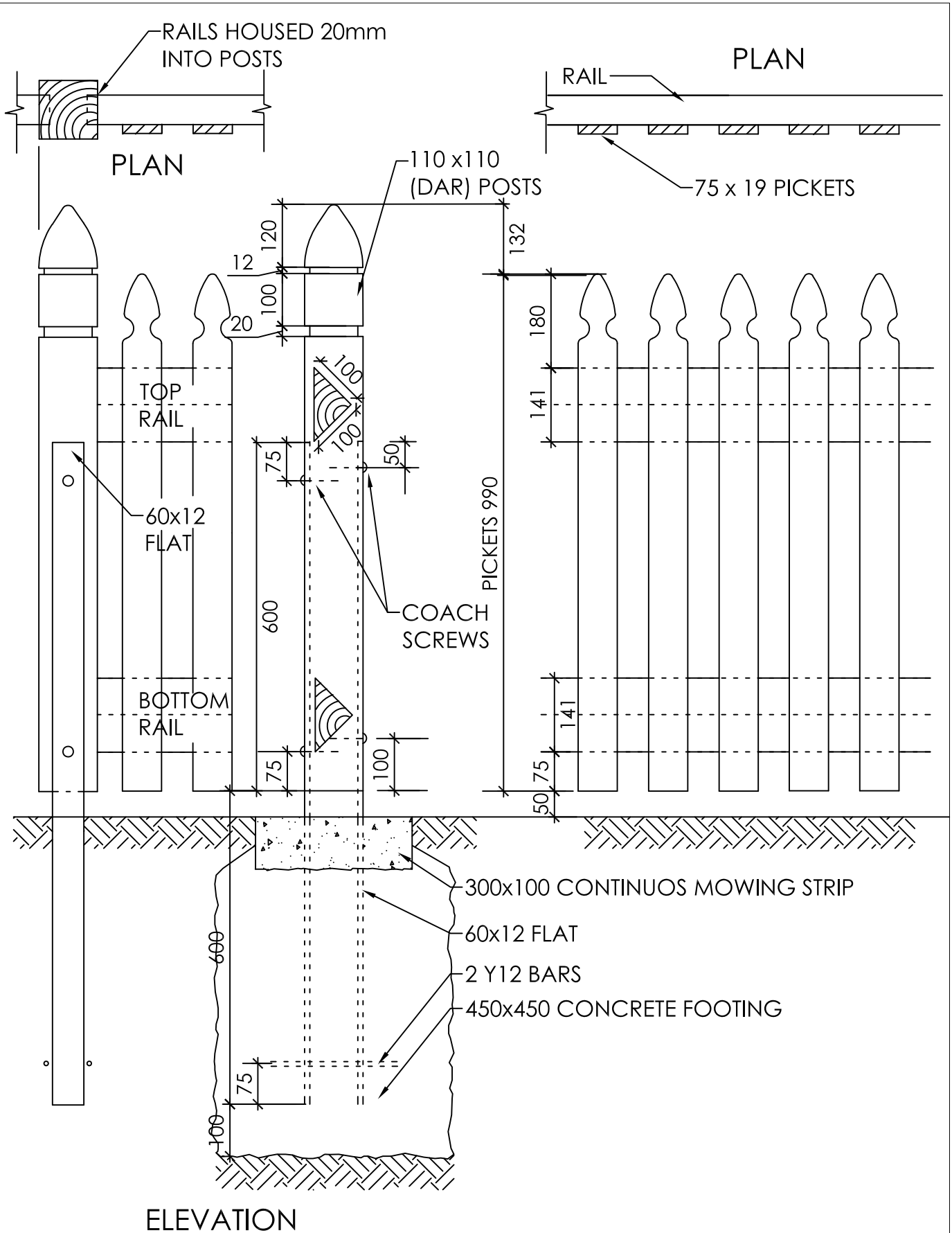
NOTES:

TIMBER:
- ALL TIMBER TO BE DRESSED ALL ROUND WITH MINIMUM STRESS GRADE F17 HARDWOOD
- ALL TIMBER SHALL BE TREATED AGAINST WHITE ANTS, TERMITES, ROT AND OTHER SIMILAR PESTS

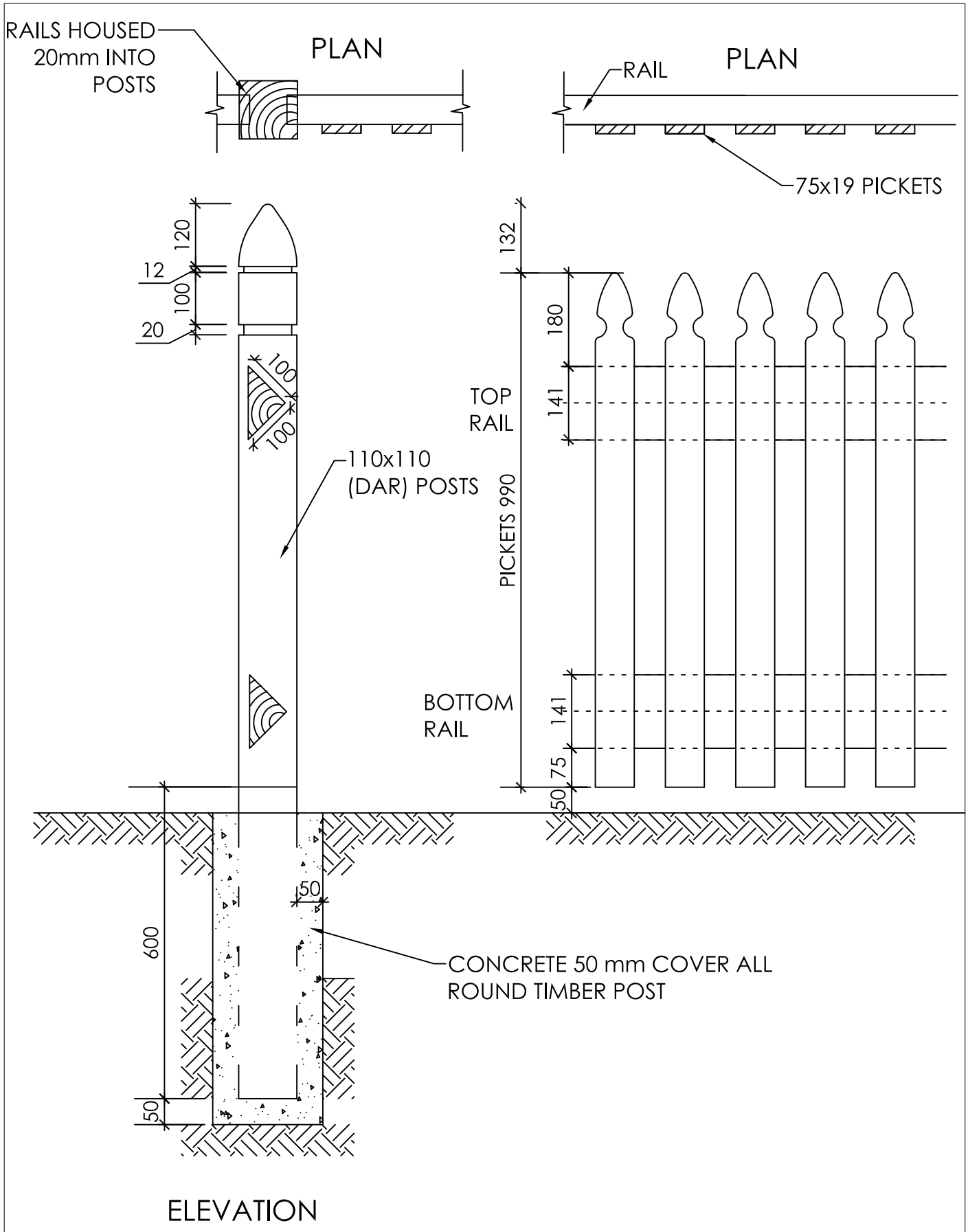
POSTS:
- POSTS ARE TO BE PLUMB AND EMBEDDED INTO CONCRETE WITH A MINIMUM COVER OF 50mm INTO UNDISTURBED SOIL FOUNDATIONS
- SPACING OF POSTS SHALL BE A MAXIMUM OF 3.0M

PAINT:
- ALL PAINT SHALL BE PAINTED ON A WHITE SEALER PRIMER BASE
- STREET FENCES SHALL BE PAINTED WITH TWO COATS OF "CANTALOUPE" BY BRISTOL TAUBMANS
- PARK FENCES SHALL BE PAINTED WITH TWO COATS OF "DEEP BRUNSWICK GREEN" GLOSS WEATHERSHEILD ARCYLIC BY DULUX

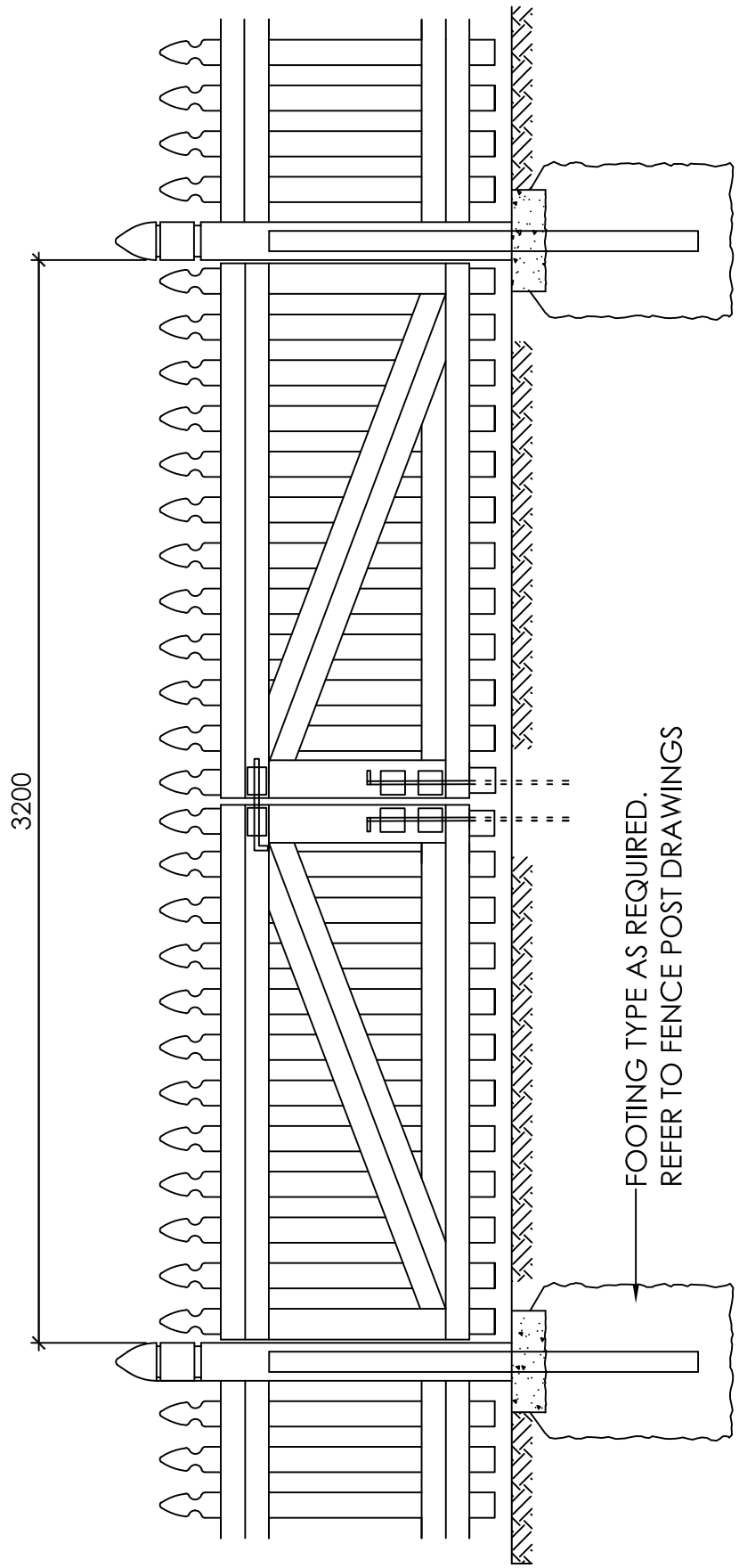
APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL PALING FENCE DETAILS STEEL FOOTING	SCALE N.T.S. DRAWING NO. S709B



APPROVED: COUNCIL ENGINEER DATE: 01/05/08		NORTH SYDNEY COUNCIL PICKET FENCE WITH CONCRETE FOOTING	SCALE N.T.S DRAWING NO. S710



APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL PICKET FENCE WITH TIMBER POST FOOTING	SCALE N.T.S DRAWING NO. S711



NOTES

TO BE READ IN CONJUNCTION WITH PICKET FENCE DRAWING S708 & S709
GATE HINGES TO BE 200mm HEAVY DUTY GALVANISED STEEL, SCREW FIXED
ALL GATES TO BE FITTED WITH 200mm BARREL BOLTS TO PERMIT SECURING IN THE OPEN POSITION
GATES TO BE FITTED WITH A SELF LOCKING CHILD RESISTANT LATCH

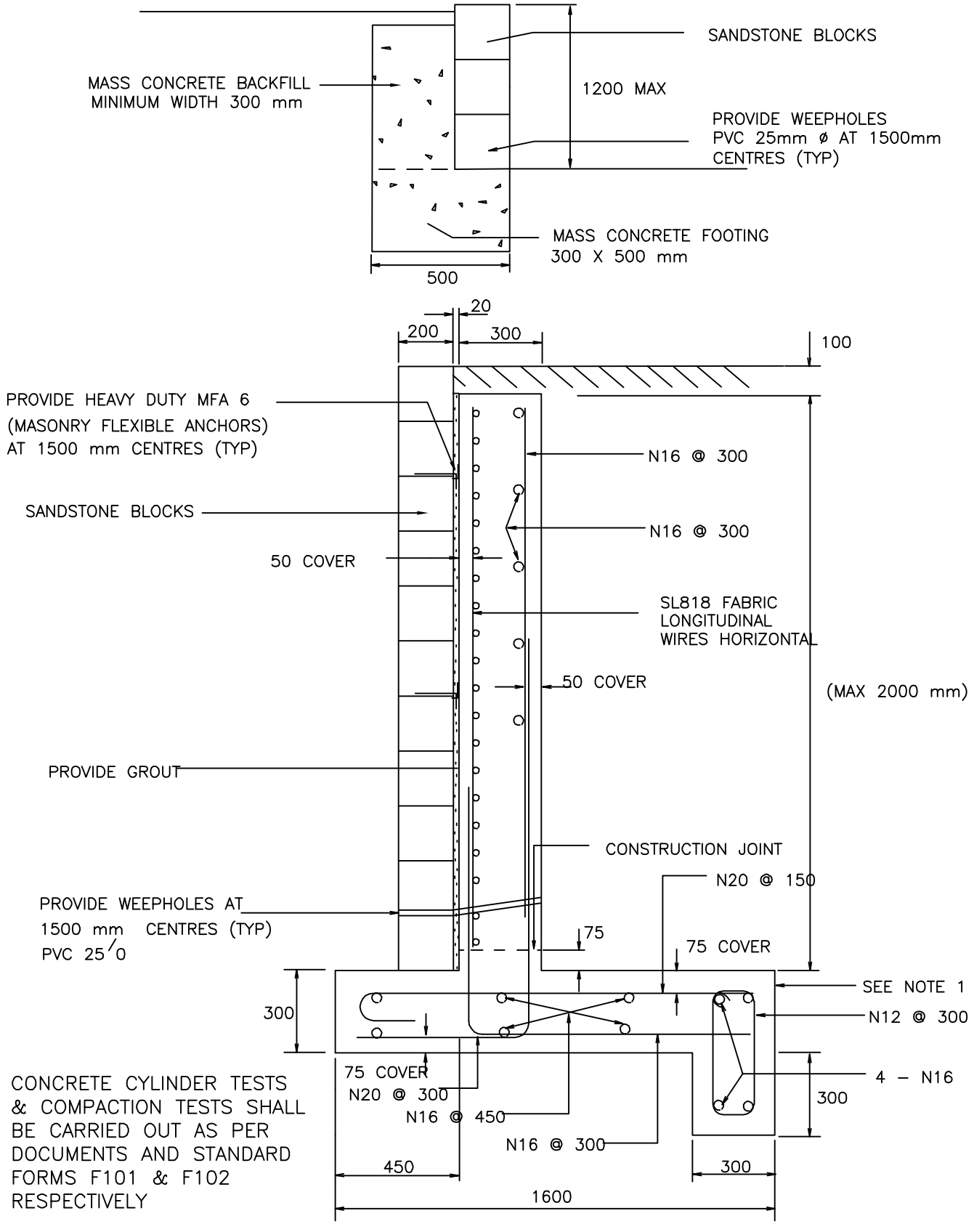
APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL PICKET FENCE GATES	SCALE 1:20 DRAWING NO. S712

MISCELLANEOUS DRAWINGS

S800 SERIES

Drawing Number	Description
S801	CONCRETE RETAINING WALL WITH SANDSTONE FACE
S801B	SANDSTONE RETAINING WALL – TYPICAL PLAN
S801C	SANDSTONE RETAINING WALL – TYPICAL SECTION
S802A	STANDARD BOLLARD
S803	BICYCLE RAIL
S807	CIVIC LIGHT POLE
S809	HERITAGE LIGHT POLE
S810	HERITAGE LIGHT POLE - FOOTINGS
S812A	METAL BIN INSTALLATION DETAIL
S812B	METAL BIN INSTALLATION DETAIL
S812C	METAL BIN INSTALLATION DETAIL
S812D	METAL BIN INSTALLATION DETAIL
S822	CBD MULTI-FUNCTION POLE FOOTING TYPES 1 AND 2
S823	CBD MULTI-FUNCTION POLE FOOTING TYPE 3
S824	CBD MULTI-FUNCTION POLE FOOTING TYPE 4
HUB 01007	PIER FOOTING DETAILS

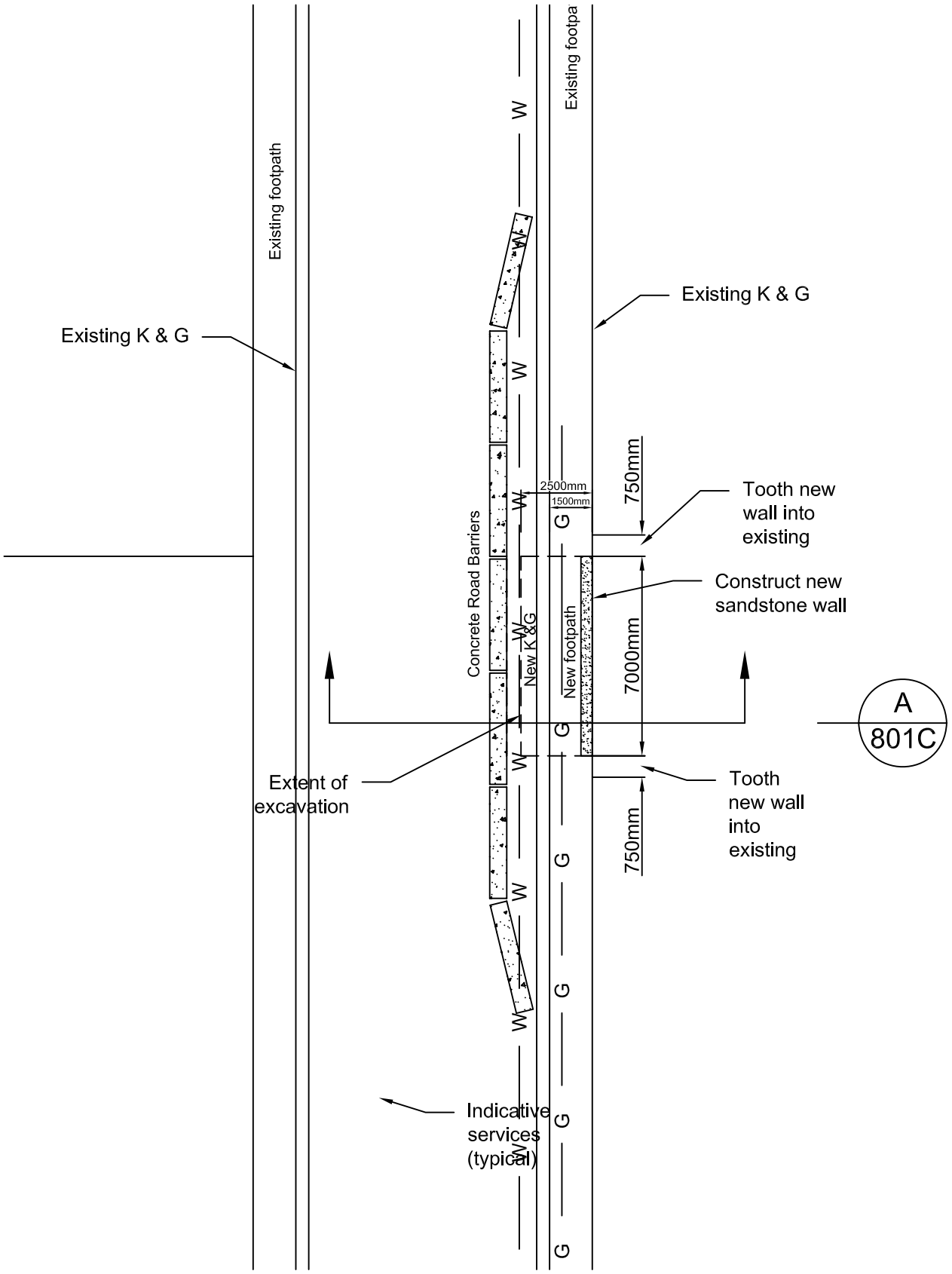
HUB 01047	PAD FOOTING DETAILS
HUB 01435	HOLD DOWN BOLT ASSEMBLY
HUB 01452	SHALLOW HOLD DOWN BOLT ASSEMBLY
HUB 02901	STANDARD FOOTING PIER - 114DIA POLE
S825	UNDER AWNING LIGHTS – MOUNTABLE DETAILS AND OPTIONS
S826	UNDER AWNING LIGHTS – DISTRIBUTION BOARD AND SWITCHBOARD CUBICLE
S827	STANDARD MULTI PURPOSE POLE BANNER LOGO PLACEMENT GUIDE
S828	STANDARD MULTI PURPOSE POLE BANNER ASSEMBLY - LEFT HAND SIDE (L)
S829	STANDARD MULTI PURPOSE POLE BANNER ASSEMBLY - RIGHT HAND SIDE (R)



CONCRETE CYLINDER TESTS & COMPACTION TESTS SHALL BE CARRIED OUT AS PER DOCUMENTS AND STANDARD FORMS F101 & F102 RESPECTIVELY

NOTES
1 VERTICAL FACE OF HEEL & TOE SHALL BE POURED AGAINST UNDISTURBED SURFACE
2 MAXIMUM BEARING PRESSURE 150 kPa
3 MINIMUM CONCRETE STRENGTH AT 28 DAYS 32 MPa

APPROVED: COUNCIL ENGINEER DATE: 01/05/04	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL CONCRETE RETAINING WALL WITH SANDSTONE FACE	SCALE N.T.S DRAWING NO. S801



APPROVED: COUNCIL ENGINEER DATE: 24/04/14	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL SANDSTONE RETAINING WALL – TYPICAL PLAN	SCALE N.T.S. DRAWING NO. S801B

APPROVED:

COUNCIL ENGINEER

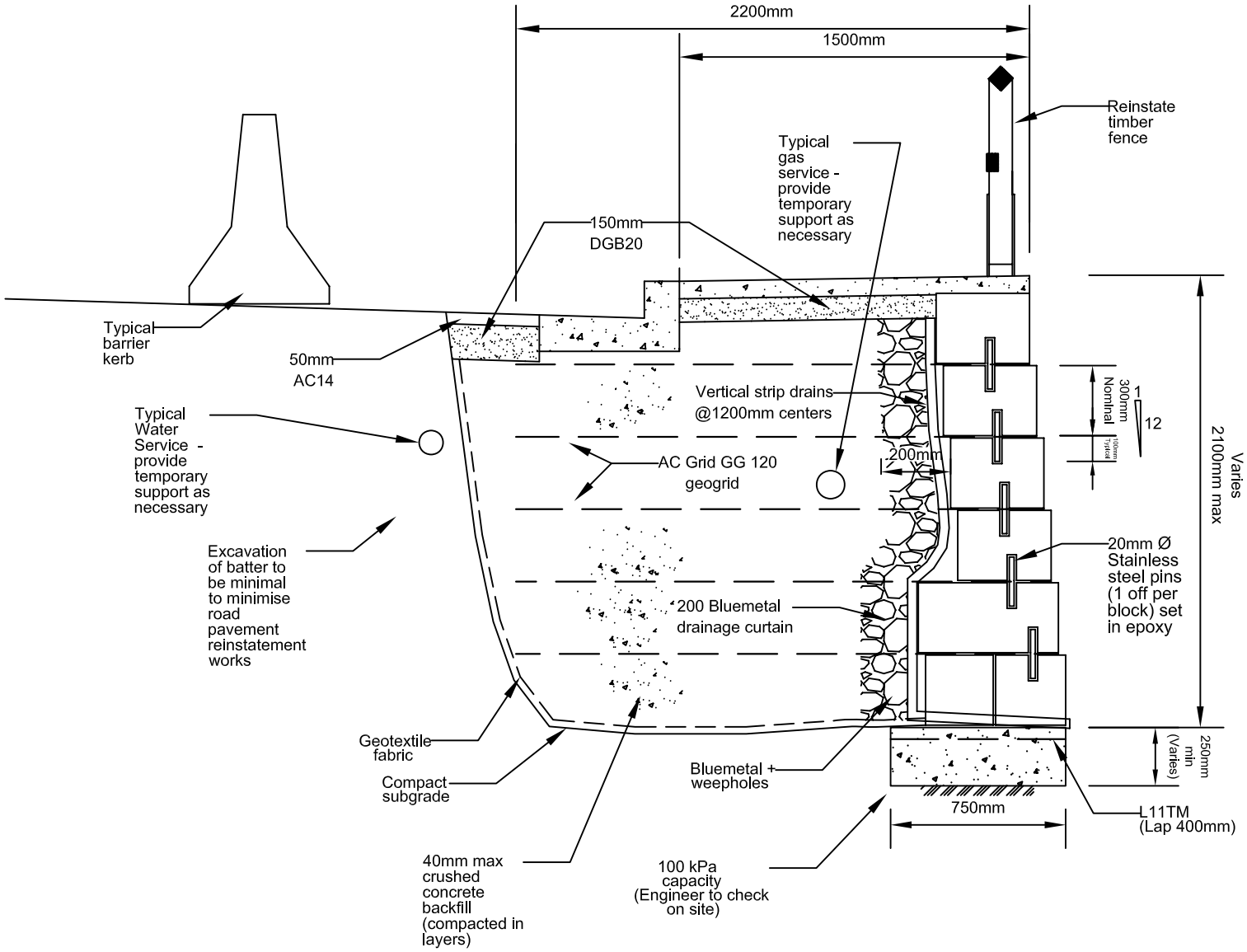
DATE: 24/04/14

NORTH SYDNEY COUNCIL

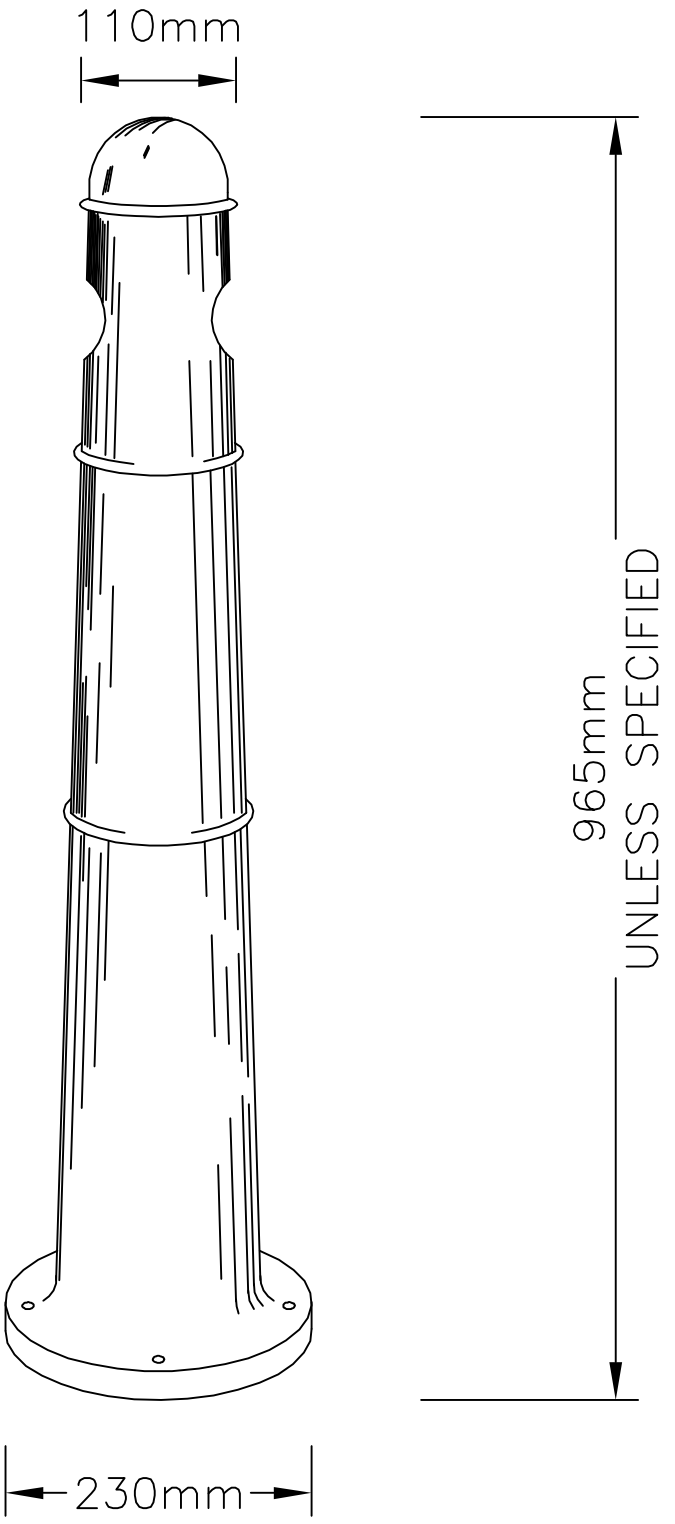
SANDSTONE RETAINING WALL – TYPICAL SECTION

SCALE N.T.S.

DRAWING NO. S801C



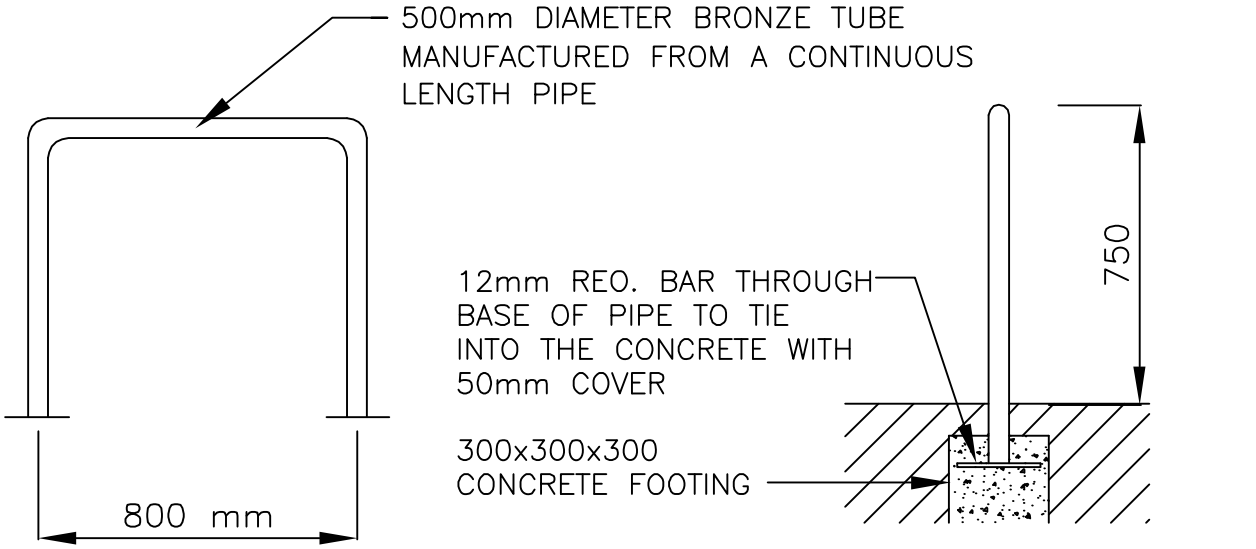
Section A 801B



NOTE:

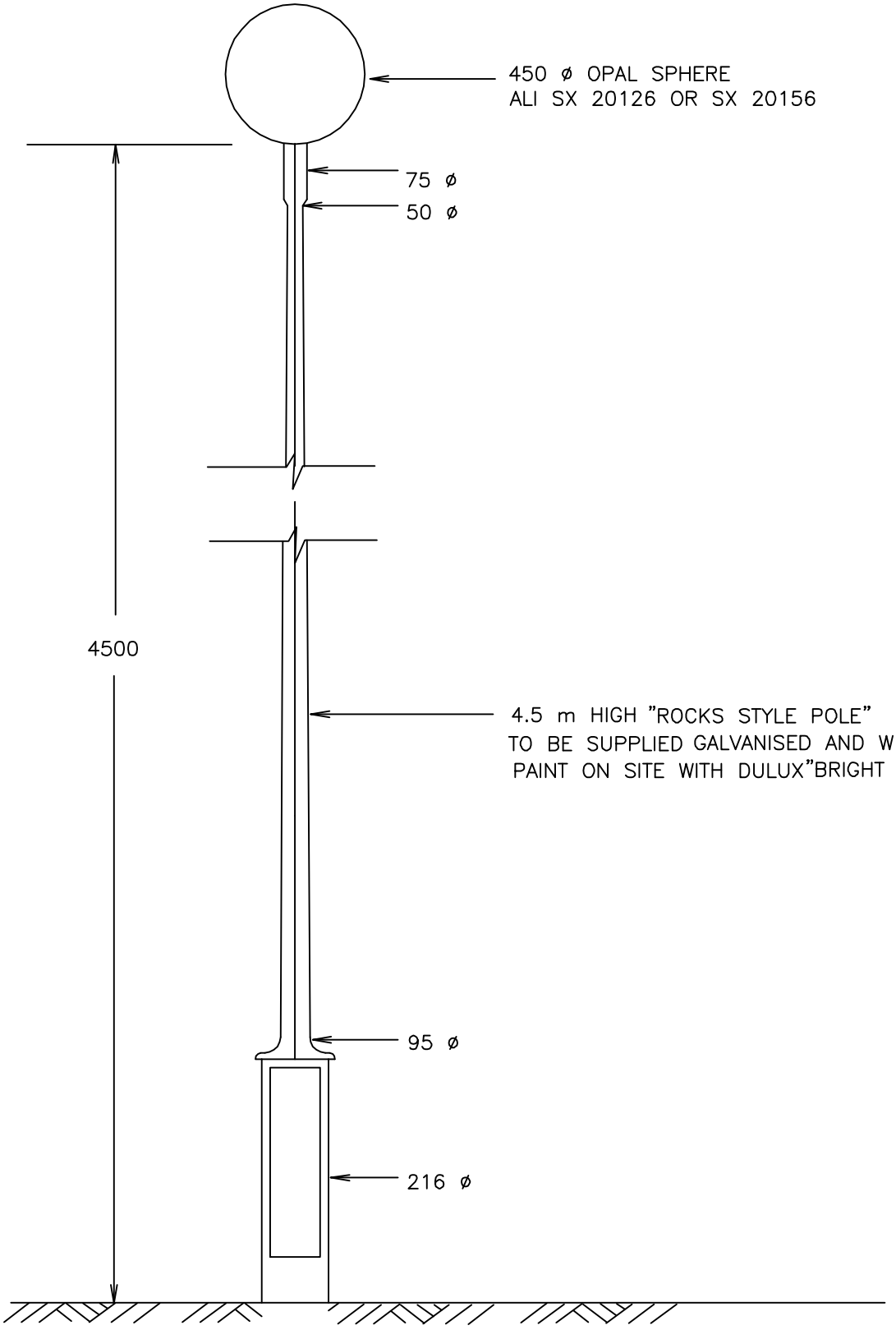
BOLLARDS ARE TO BE PAINTED TUDOR BRIGHT RED OR AS DIRECTED BY THE SUPERINTENDENT AND ARE TO BE CAST IN CONCRETE OR BOLTED AS DIRECTED BY THE SUPERINTENDENT

APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL STANDARD BOLLARD	SCALE NOT TO SCALE DRAWING NO. S802A



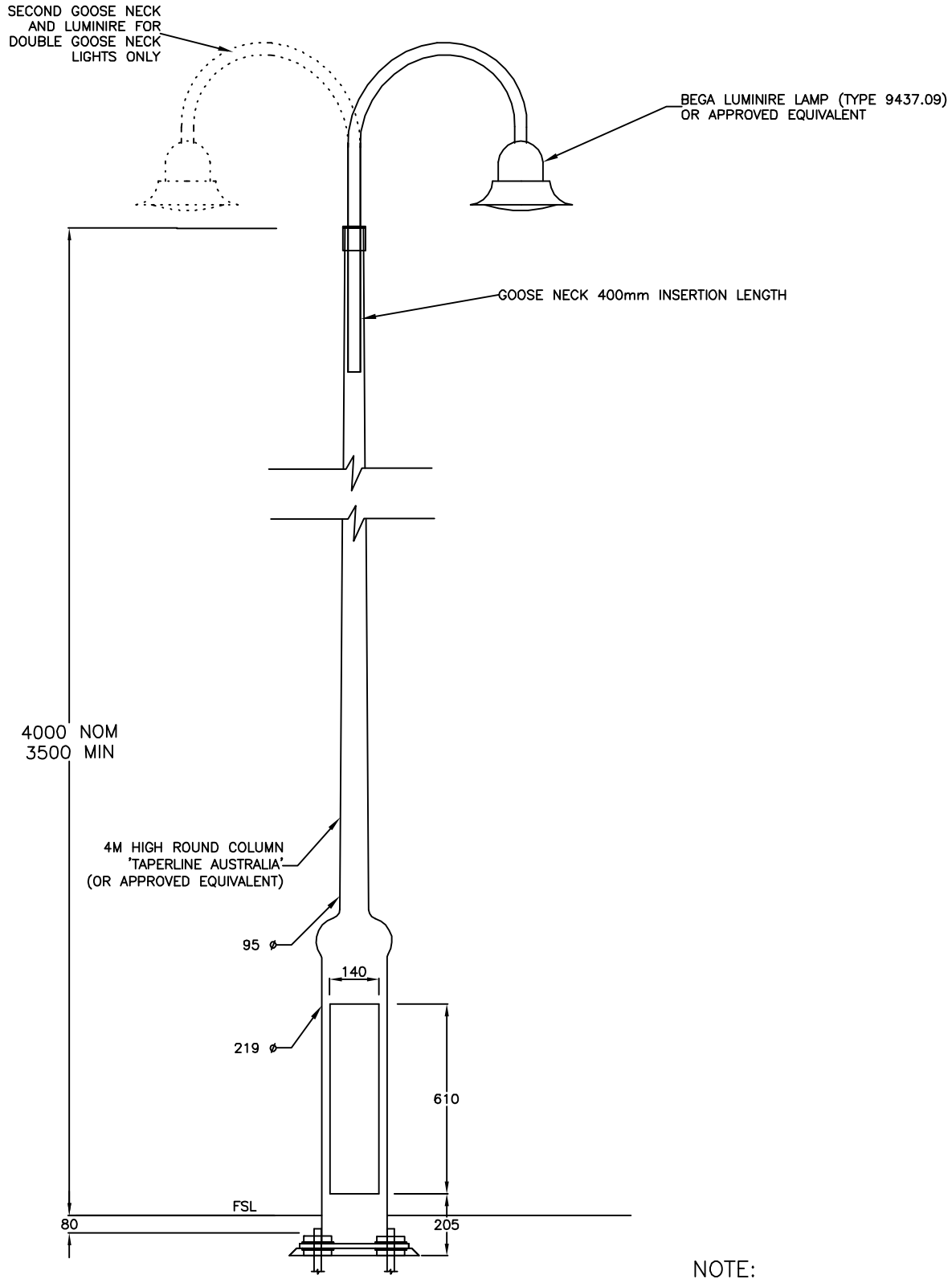
NOTE: MAY BE BOLTED TO
CONCRETE FOOTPATH.

APPROVED: COUNCIL ENGINEER DATE: 01/05/04		NORTH SYDNEY COUNCIL BICYCLE PARKING RAIL	SCALE 1:20 DRAWING NO. S803



REFER TO S810 FOR FOOTING DESIGN

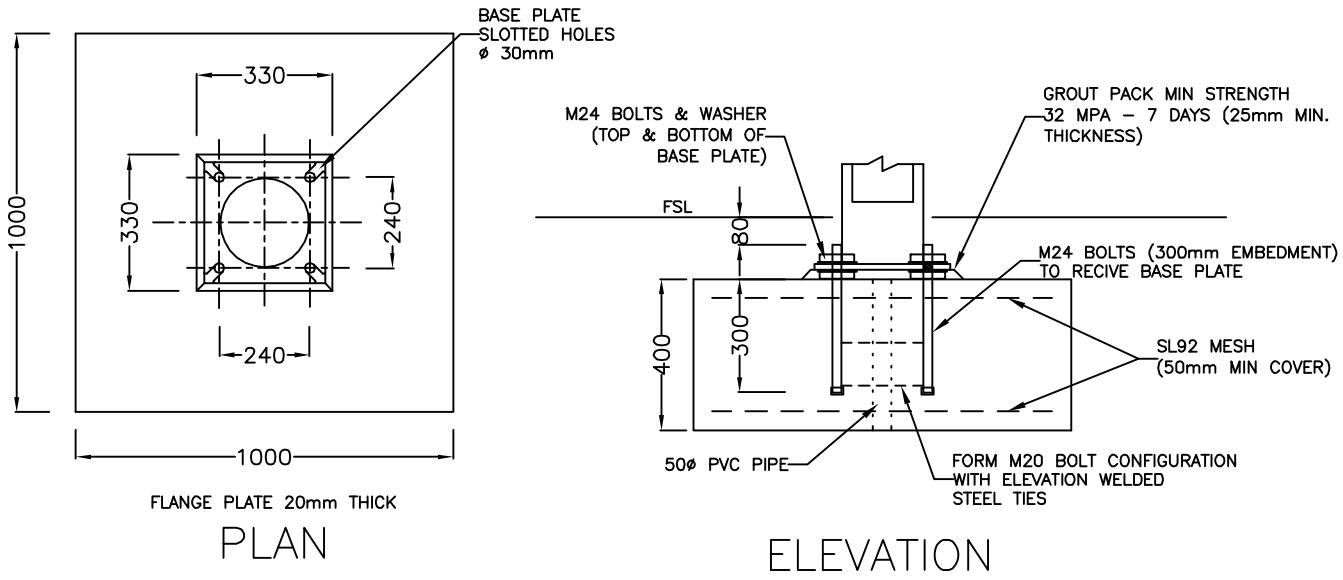
APPROVED: COUNCIL ENGINEER DATE: 01/05/04		NORTH SYDNEY COUNCIL CIVIC LIGHT POLE	SCALE N.T.S DRAWING NO. S807



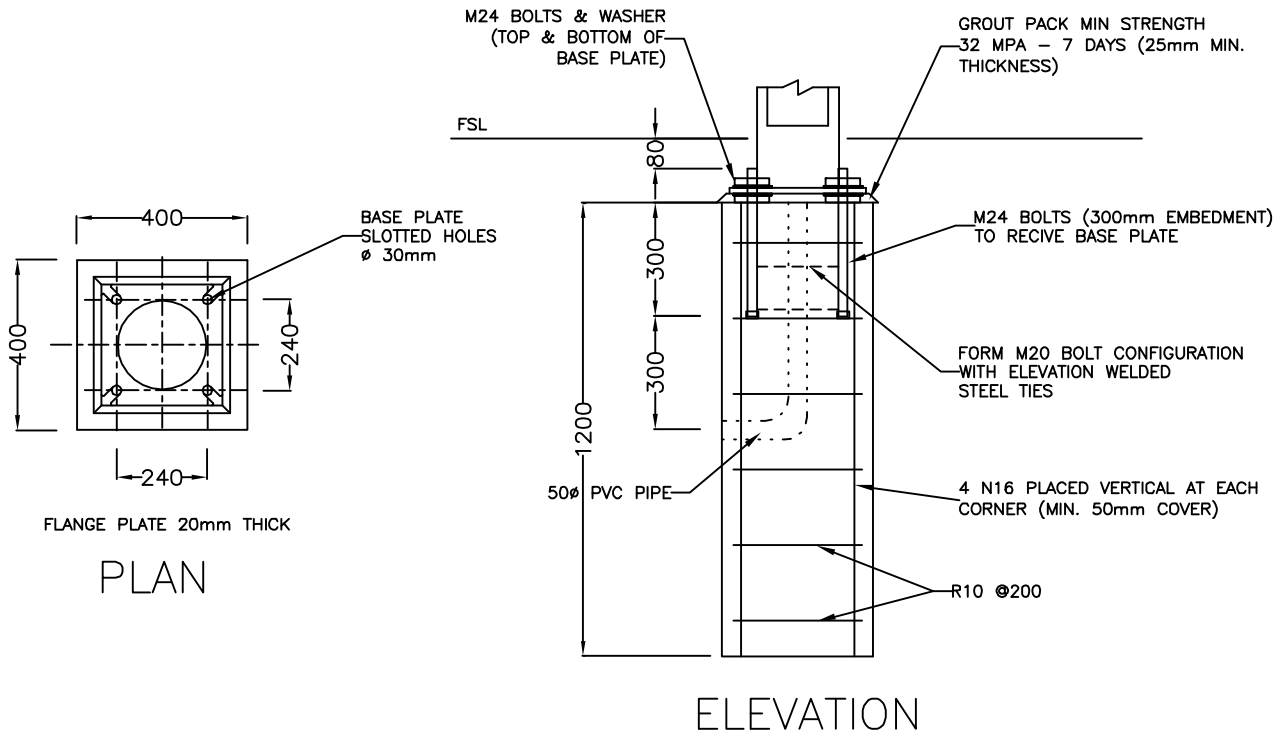
REFER TO S810 FOR FOOTING DESIGN

NOTE:
–THE MAXIMUM TOLERANCE FOR VERTICAL MISALIGNMENT SHALL BE 30mm FROM THE VERTICAL.
–ALL LIGHT POLES SHALL BE A MINIMUM OF 800mm OFF THE FACE OF KERB.
–THIS DRAWING IS TO BE READ IN CONJUNCTION WITH S810.

APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL HERITAGE LIGHT POLE	SCALE N.T.S DRAWING NO. S809

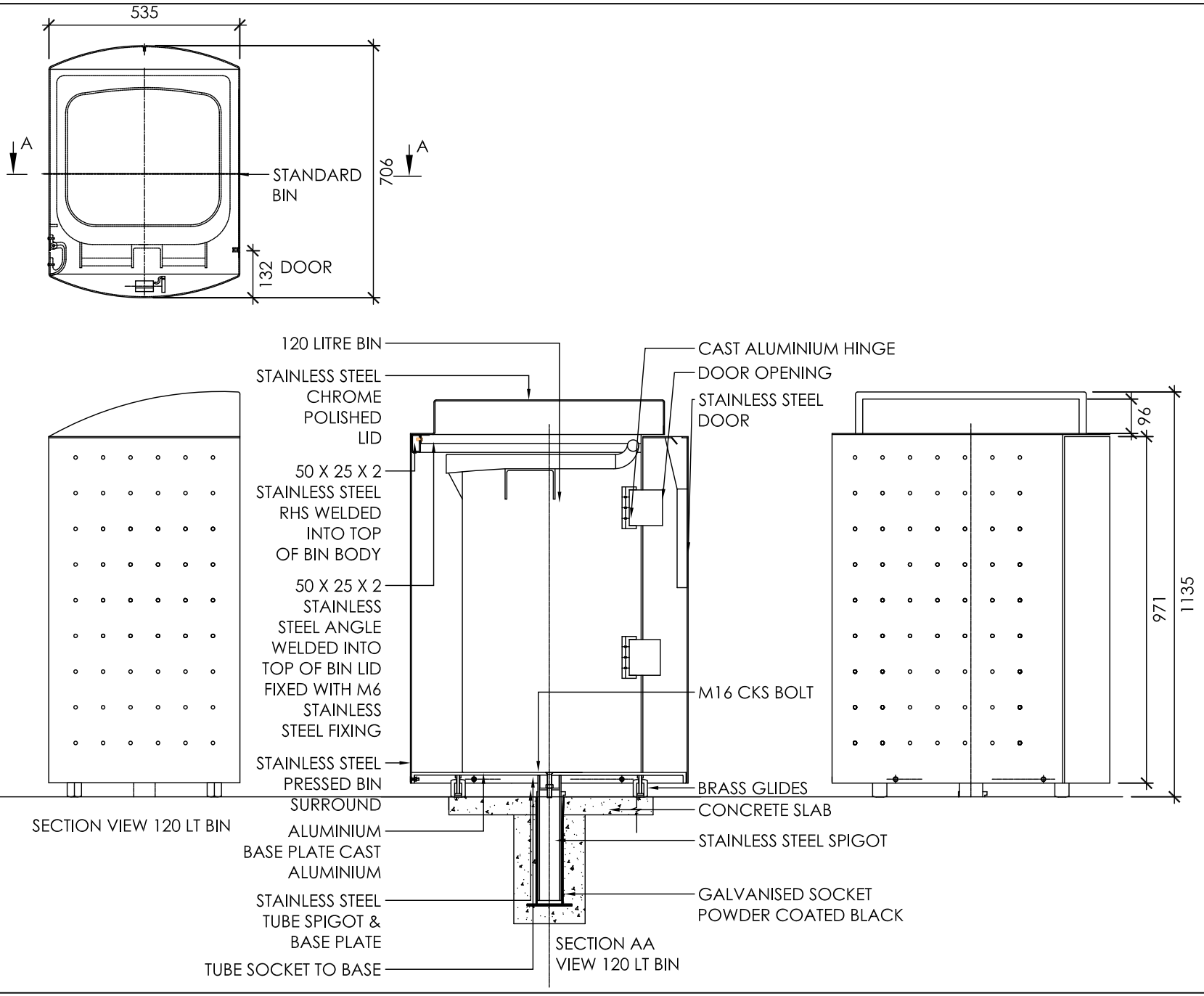


SHALLOW CONCRETE FOOTING



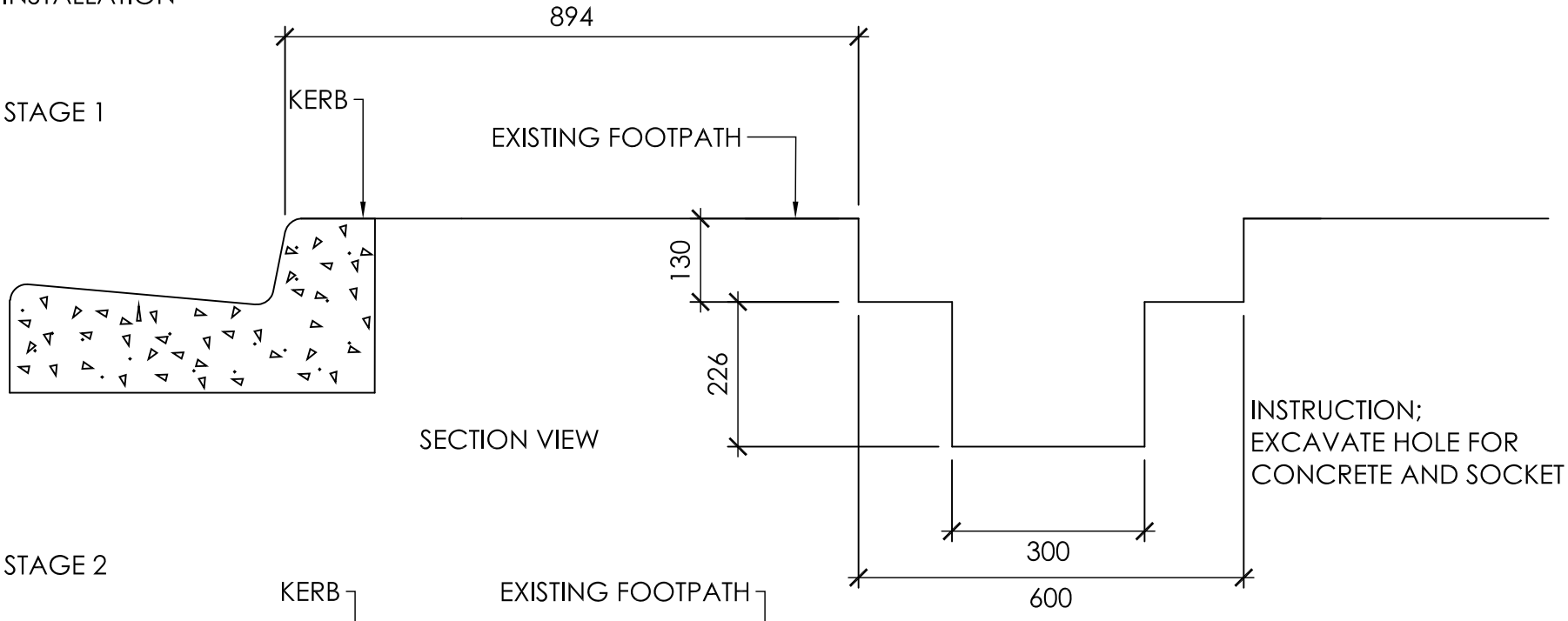
DEEP CONCRETE FOOTING

APPROVED: COUNCIL ENGINEER DATE: 01/04/06		NORTH SYDNEY COUNCIL HERITAGE LIGHT POLE FOOTINGS	SCALE N.T.S DRAWING NO. S810


535
A
A
STANDARD BIN
706
132
DOOR
120 LITRE BIN
STAINLESS STEEL CHROME POLISHED LID
50 X 25 X 2 STAINLESS STEEL RHS WELDED INTO TOP OF BIN BODY
50 X 25 X 2 STAINLESS STEEL ANGLE WELDED INTO TOP OF BIN LID FIXED WITH M6 STAINLESS STEEL FIXING
STAINLESS STEEL PRESSED BIN SURROUND
ALUMINIUM BASE PLATE CAST ALUMINIUM
STAINLESS STEEL TUBE SPIGOT & BASE PLATE
TUBE SOCKET TO BASE
CAST ALUMINIUM HINGE
DOOR OPENING
STAINLESS STEEL DOOR
M16 CKS BOLT
BRASS GLIDES
CONCRETE SLAB
STAINLESS STEEL SPIGOT
GALVANISED SOCKET POWDER COATED BLACK
96
971
1135
SECTION VIEW 120 LT BIN
SECTION AA
VIEW 120 LT BIN
SCALE 1:15
DRAWING NO. S812A
NORTH SYDNEY COUNCIL
METAL BIN
INSTALLATION DETAIL
APPROVED:
COUNCIL ENGINEER
DATE: 01/05/04

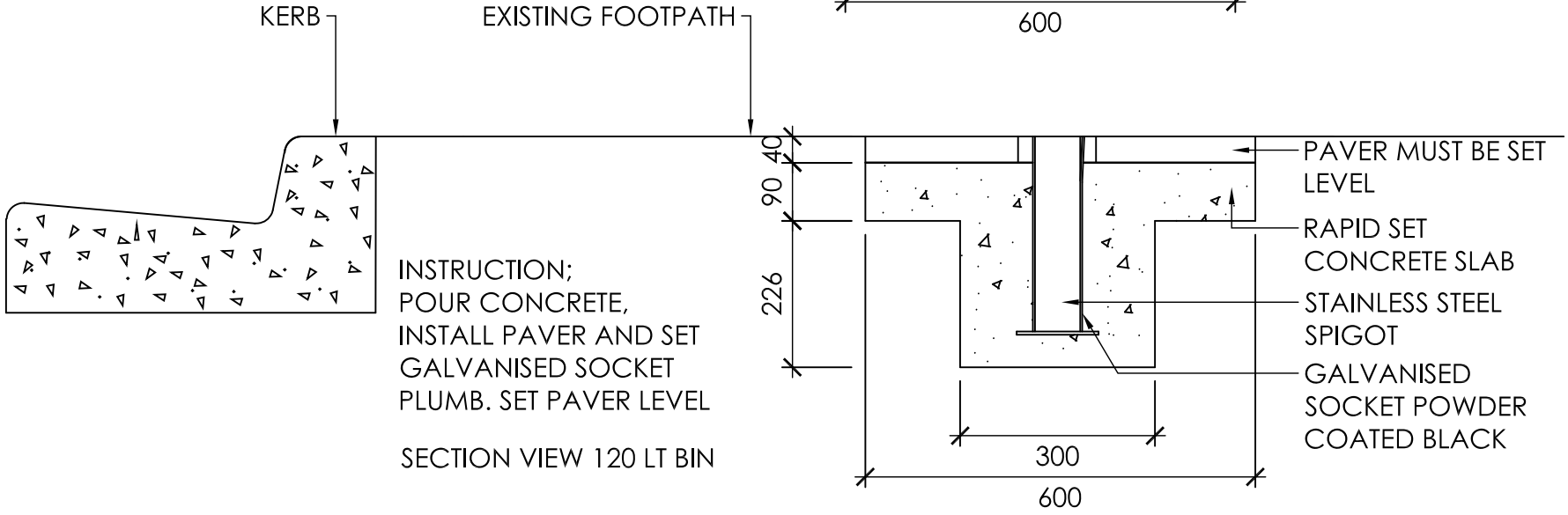
INSTALLATION

STAGE 1



SECTION VIEW

STAGE 2



INSTRUCTION;
POUR CONCRETE,
INSTALL PAVER AND SET
GALVANISED SOCKET
PLUMB. SET PAVER LEVEL

SECTION VIEW 120 LT BIN

SCALE 1:10

DRAWING NO. S812B

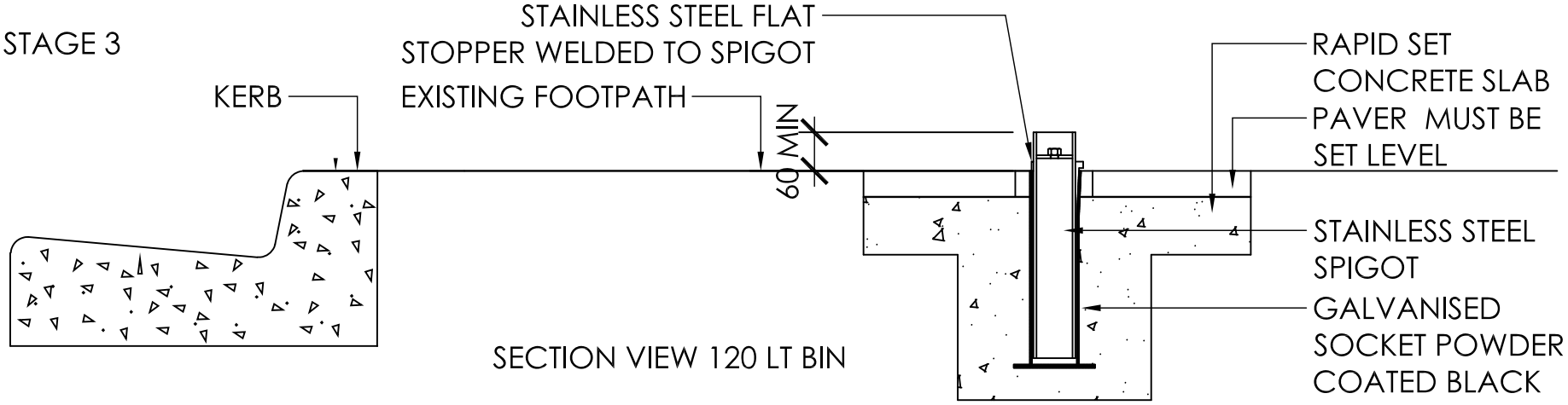
NORTH SYDNEY COUNCIL

METAL BIN
INSTALLATION DETAIL

APPROVED:

DATE: 01/05/04

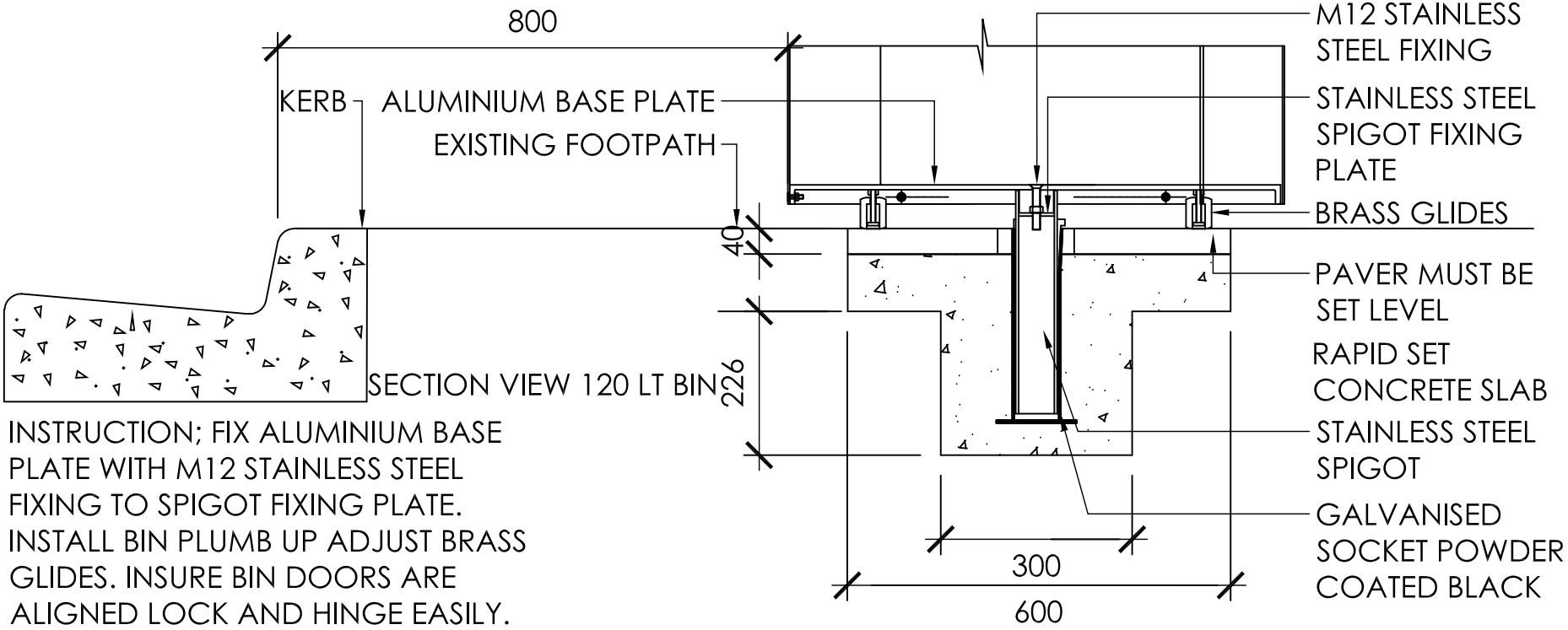
STAGE 3



SECTION VIEW 120 LT BIN

INSTRUCTION; INSTALL SPIGOT PLUMB UP TO STAINLESS STEEL FLAT STOPPER. INSTALL GIB KEY AND FIX IN PLACE.

STAGE 4



SECTION VIEW 120 LT BIN

INSTRUCTION; FIX ALUMINIUM BASE PLATE WITH M12 STAINLESS STEEL FIXING TO SPIGOT FIXING PLATE. INSTALL BIN PLUMB UP ADJUST BRASS GLIDES. INSURE BIN DOORS ARE ALIGNED LOCK AND HINGE EASILY.

SCALE 1:10

DRAWING NO. S812C

NORTH SYDNEY COUNCIL

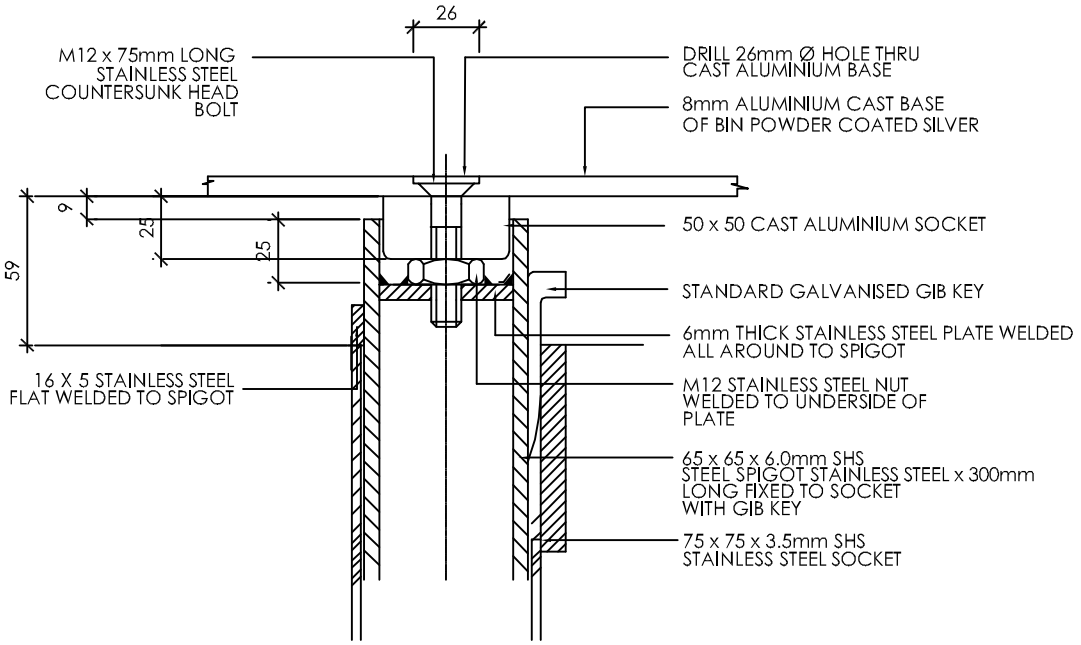
METAL BIN
INSTALLATION DETAIL

APPROVED:

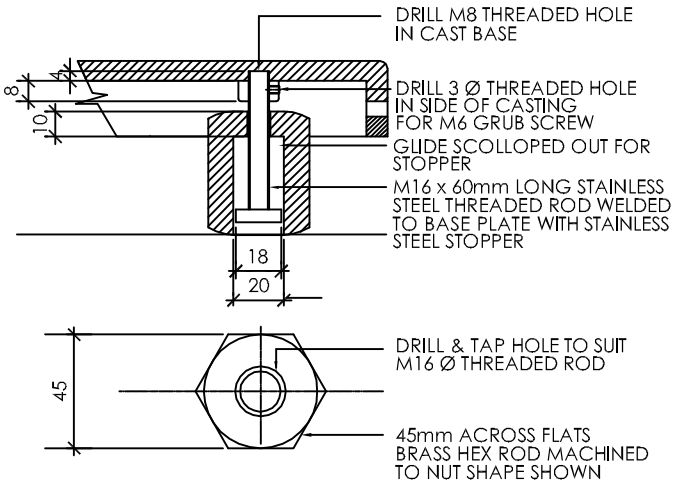
COUNCIL ENGINEER

DATE: 01/05/04

NOTES: ALL DIMENSIONS IN mm



DETAIL A
SPIGOT CONNECTION DETAIL



DETAIL B
ADJUSTABLE FEET DETAIL

SCALE 1:3

DRAWING NO. S812D

NORTH SYDNEY COUNCIL

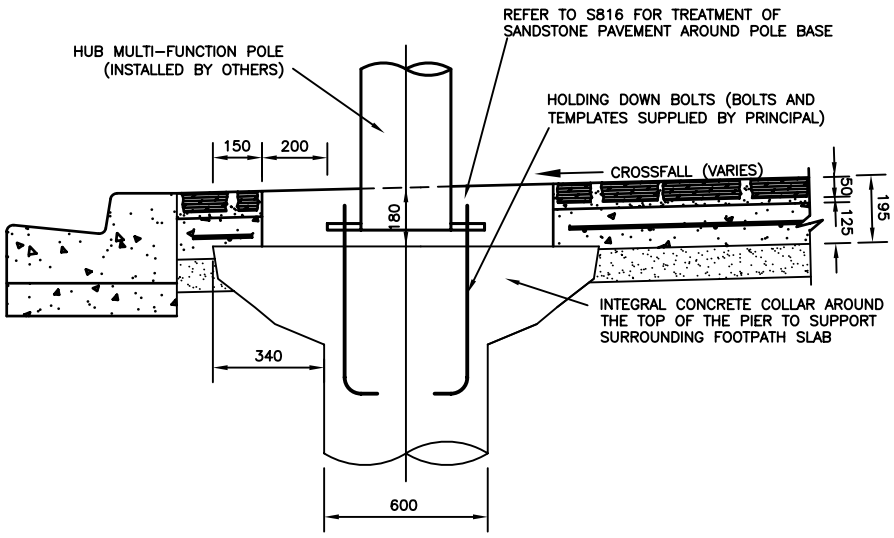
METAL BIN
INSTALLATION DETAIL

APPROVED:

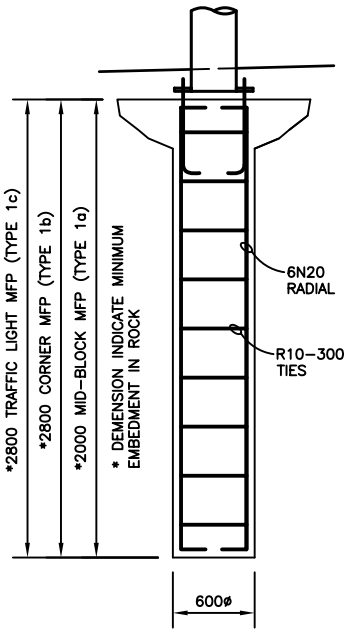
COUNCIL ENGINEER

DATE: 01/05/04

NOTE: ELECTRICAL AND/OR COMMUNICATIONS CONDUITS ARE NOT SHOWN FOR CLARITY



DETAIL

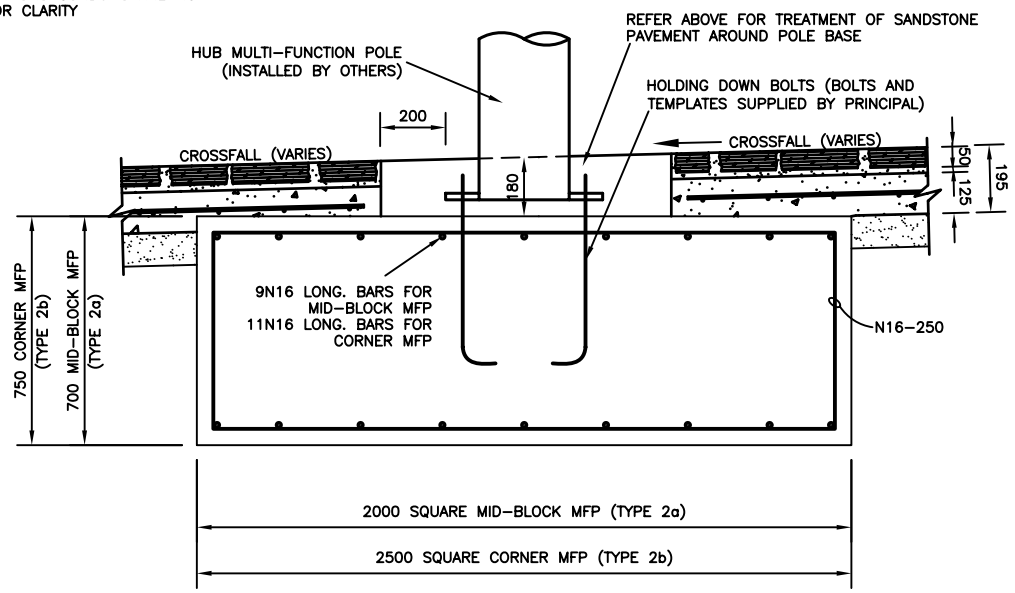


ELEVATION

STANDARD PIER FOOTING – TYPE 1

TYPE 1a: MID–BLOCK MULTI–FUNCTION POLE
TYPE 1b: CORNER MULTI–FUNCTION POLE
TYPE 1c: TRAFFIC LIGHT MULTI–FUNCTION POLE

NOTE: ELECTRICAL AND/OR COMMUNICATIONS CONDUITS ARE NOT SHOWN FOR CLARITY



SECTION

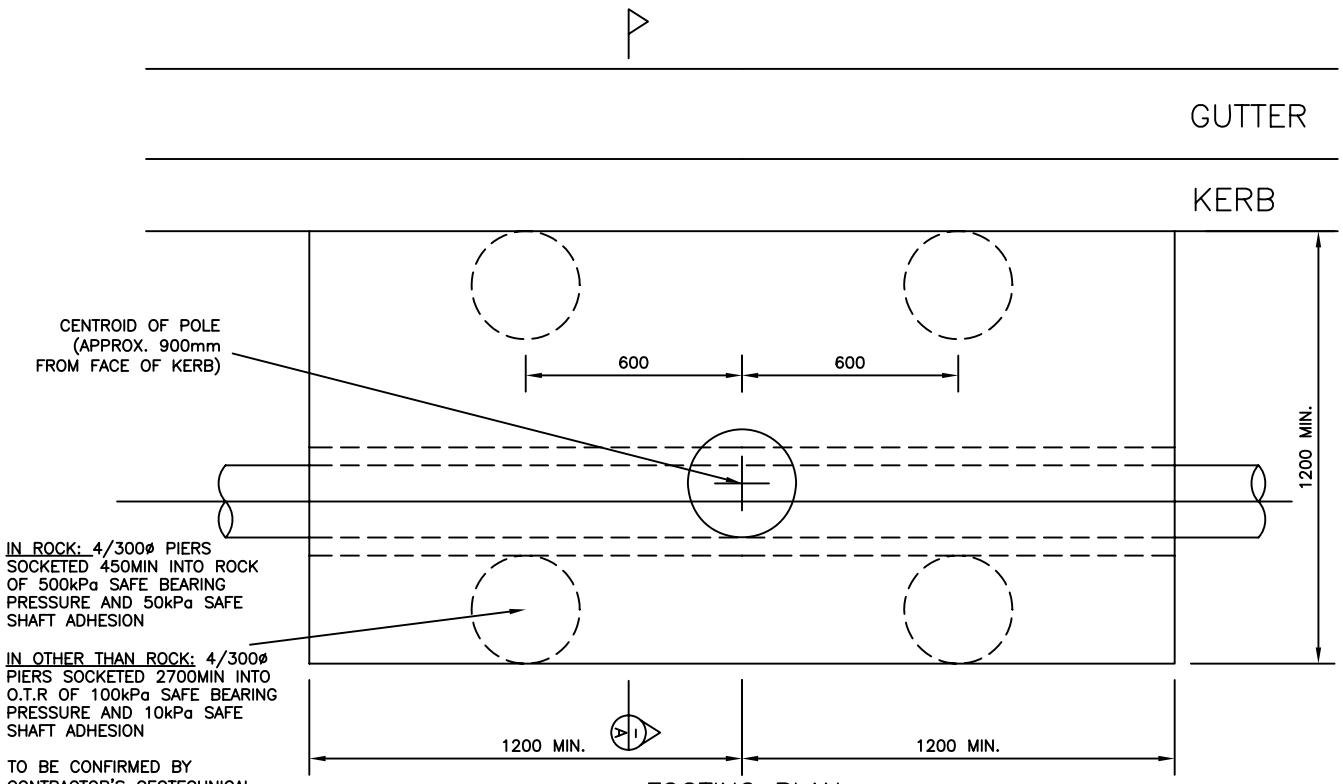
STANDARD PAD FOOTING – TYPE 2

TYPE 2a: MID–BLOCK MULTI–FUNCTION POLE
TYPE 2b: CORNER MULTI–FUNCTION POLE

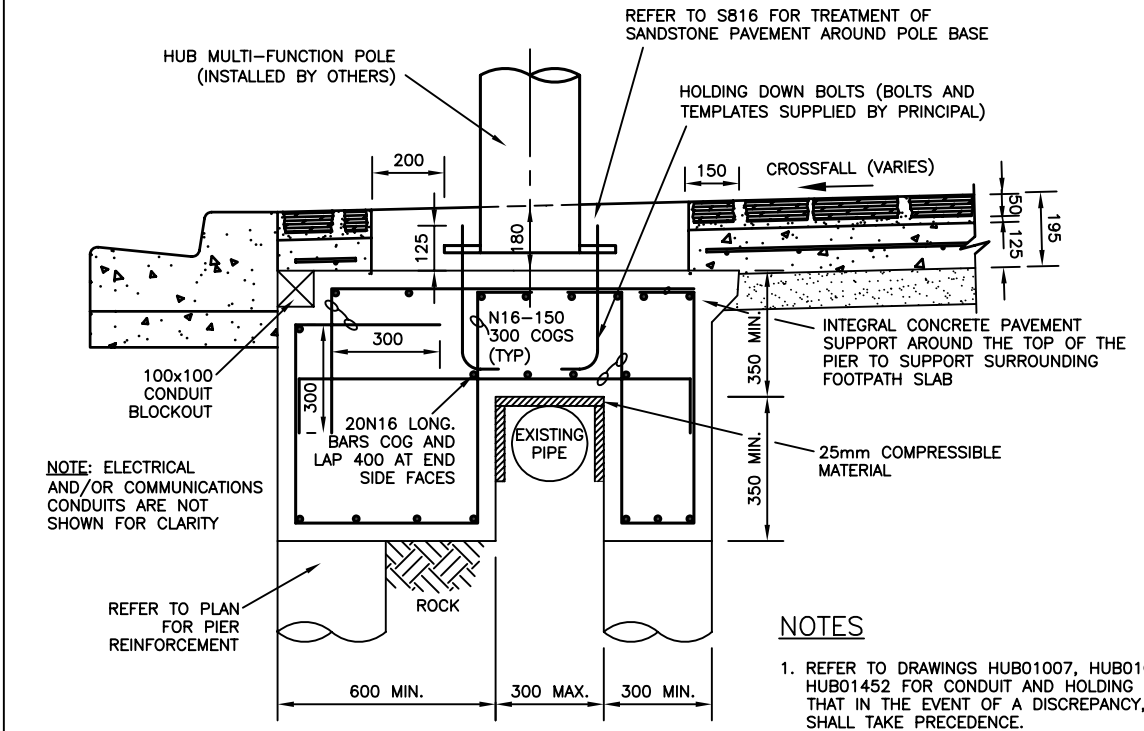
NOTES

1. REFER TO DRAWINGS HUB01007, HUB01047, HUB01435 AND HUB01452 FOR CONDUIT AND HOLDING DOWN BOLT DETAILS. NOTE THAT IN THE EVENT OF A DISCREPANCY, THE HUB DRAWINGS SHALL TAKE PRECEDENCE.
2. MINIMUM CONCRETE COVER TO REINFORCEMENT IS 40mm.
3. CONCRETE STRENGTH f'c = 32MPa.
4. PREFERRED MINIMUM CLEARANCE FROM FACE OF KERB TO FACE OF POLE IS 750mm, ABSOLUTE MINIMUM CLEARANCE IS 600mm.

APPROVED: COUNCIL ENGINEER DATE: 01/11/09	NORTH SYDNEY COUNCIL	NORTH SYDNEY COUNCIL CBD MULTI–FUNCTION POLE FOOTING TYPE 1 & 2	SCALE N.T.S. DRAWING NO. S822



FOOTING PLAN



SECTION A–A

NOTES

1. REFER TO DRAWINGS HUB01007, HUB01047, HUB01435 AND HUB01452 FOR CONDUIT AND HOLDING DOWN BOLT DETAILS. NOTE THAT IN THE EVENT OF A DISCREPANCY, THE HUB DRAWINGS SHALL TAKE PRECEDENCE.
2. MINIMUM CONCRETE COVER TO REINFORCEMENT IS 40mm.
3. CONCRETE STRENGTH f'c = 32MPa.
4. PREFERRED MINIMUM CLEARANCE FROM FACE OF KERB TO FACE OF POLE IS 750mm, ABSOLUTE MINIMUM CLEARANCE IS 600mm.

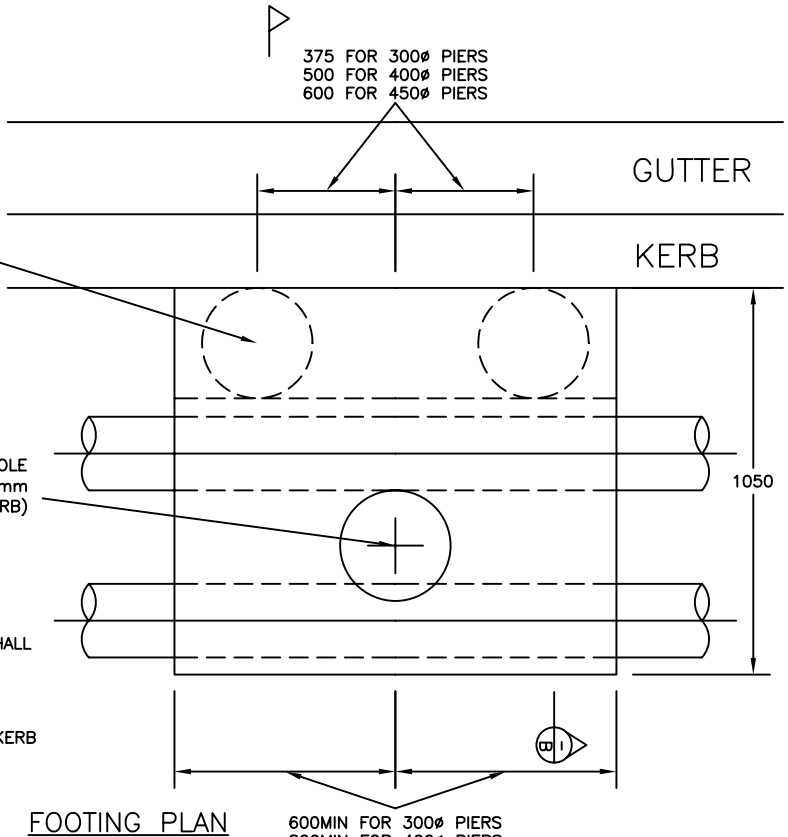
PIER AND BEAM FOOTING – TYPE 3

APPROVED: COUNCIL ENGINEER DATE: 01/04/08		NORTH SYDNEY COUNCIL CBD MULTI–FUNCTION POLE FOOTING TYPE 3	SCALE N.T.S. DRAWING NO. S823

IN ROCK
TYPE 4a: 2/300ø PIERS 3000 EMBEDMENT
TYPE 4b: 2/400ø PIERS 2000 EMBEDMENT
TYPE 4c: 2/450ø PIERS 1500 EMBEDMENT
INTO ROCK OF 500kPa SAFE BEARING PRESSURE AND 50kPa SAFE SHAFT ADHESION

IN OTHER THAN ROCK
TYPE 4c: 2/450ø PIERS 4500 EMBEDMENT
INTO O.T.R OF 100kPa SAFE BEARING PRESSURE AND 10kPa SAFE SHAFT ADHESION

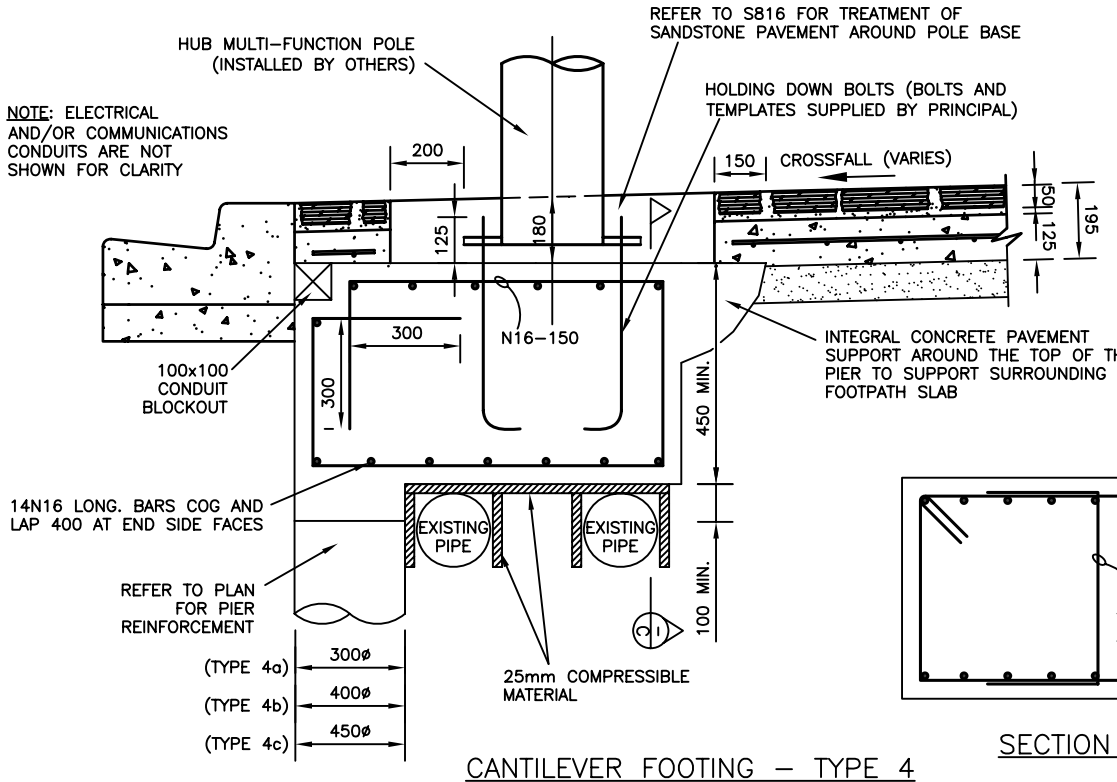
TO BE CONFIRMED BY CONTRACTOR'S GEOTECHNICAL ENGINEER. 6N20 + N12–150 PITCH. EXTEND VERTICAL BARS 500 INTO PADS AND COG 300 HORIZONTALLY.



FOOTING PLAN

NOTES

1. REFER TO DRAWINGS HUB01007, HUB01047, HUB01435 AND HUB01452 FOR CONDUIT AND HOLDING DOWN BOLT DETAILS. NOTE THAT IN THE EVENT OF A DISCREPANCY, THE HUB DRAWINGS SHALL TAKE PRECEDENCE.
2. MINIMUM CONCRETE COVER TO REINFORCEMENT IS 40mm.
3. CONCRETE STRENGTH f'c = 32MPa.
4. PREFERRED MINIMUM CLEARANCE FROM FACE OF KERB TO FACE OF POLE IS 750mm, ABSOLUTE MINIMUM CLEARANCE IS 600mm.



SECTION B–B

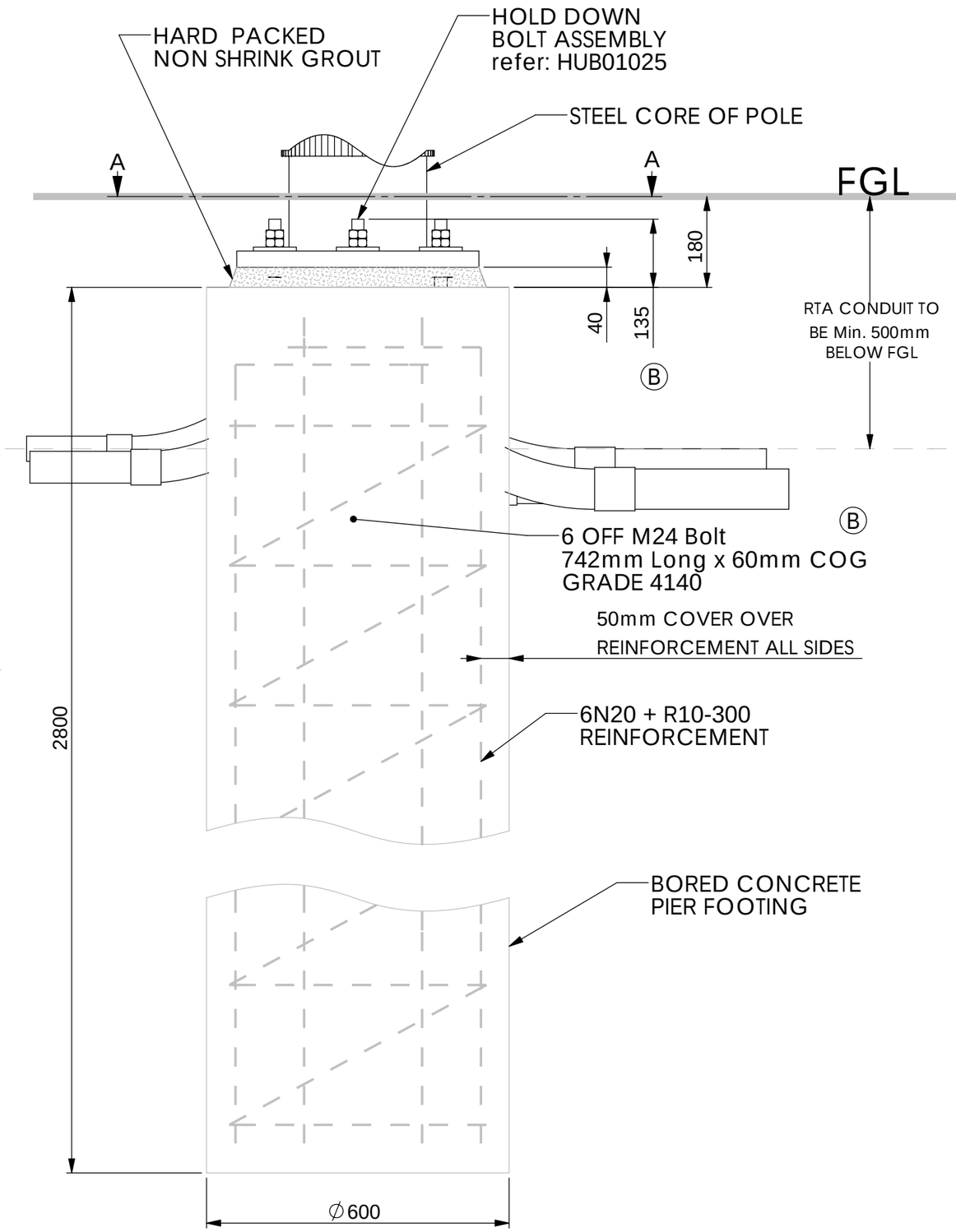
SECTION C–C

CANTILEVER FOOTING – TYPE 4

TYPE 4a: 2/300ø PIERS 3000 EMBEDMENT IN ROCK
TYPE 4b: 2/400ø PIERS 2000 EMBEDMENT IN ROCK
TYPE 4c: 2/450ø PIERS 1500 EMBEDMENT IN ROCK

APPROVED: COUNCIL ENGINEER DATE: 01/07/09		NORTH SYDNEY COUNCIL CBD MULTI–FUNCTION POLE FOOTING TYPE 4	SCALE N.T.S. DRAWING NO. S824

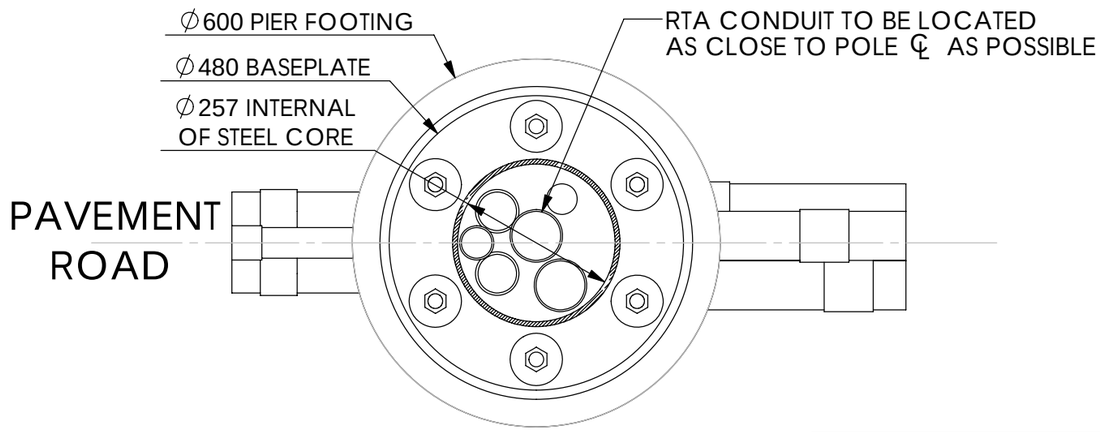
ISSUE	DESCRIPTION	DRAWN	DATE	CHECKED / CERTIFIED	DATE
A	Initial Release	GU	16.11.2006		
B	Note Update	MK	24.01.07		



Footpath Cable Junction Pit to be adjacent to Multi Function Poles. Minimum 450 x 450mm clear opening in accordance with RTA Specification PCF/2 and Drawing VC007-5.

Refer:RTA Specification SI/TCS/8 6.10(b)

An extra 3m of 29 Core Traffic Signal Cable to be stored within.



SECTION A-A

GENERAL NOTES:

1. All dimensions in millimetres unless otherwise shown.
2. Tolerances
   -Linear are ± 1,0mm unless marked with * then ±0.5mm
   -Angular are ±0.5°unless specified otherwise.
   -Holes and radii ± 0.5mm unless specified otherwise.
3. No deviation from drawing will be accepted without prior written approval.
4. Do not scale from drawings. Use dimensions provided if this is insufficient or ambiguous contact HUB for clarification

Title:
Footing Details - HH MPP - Pier Footing

Product:
North Sydney MPP

Dwg No:
HUB 01007

Project No:
8138

Date Drawn:
16.11.2006

Scale:
1:10

Sheet:
A3

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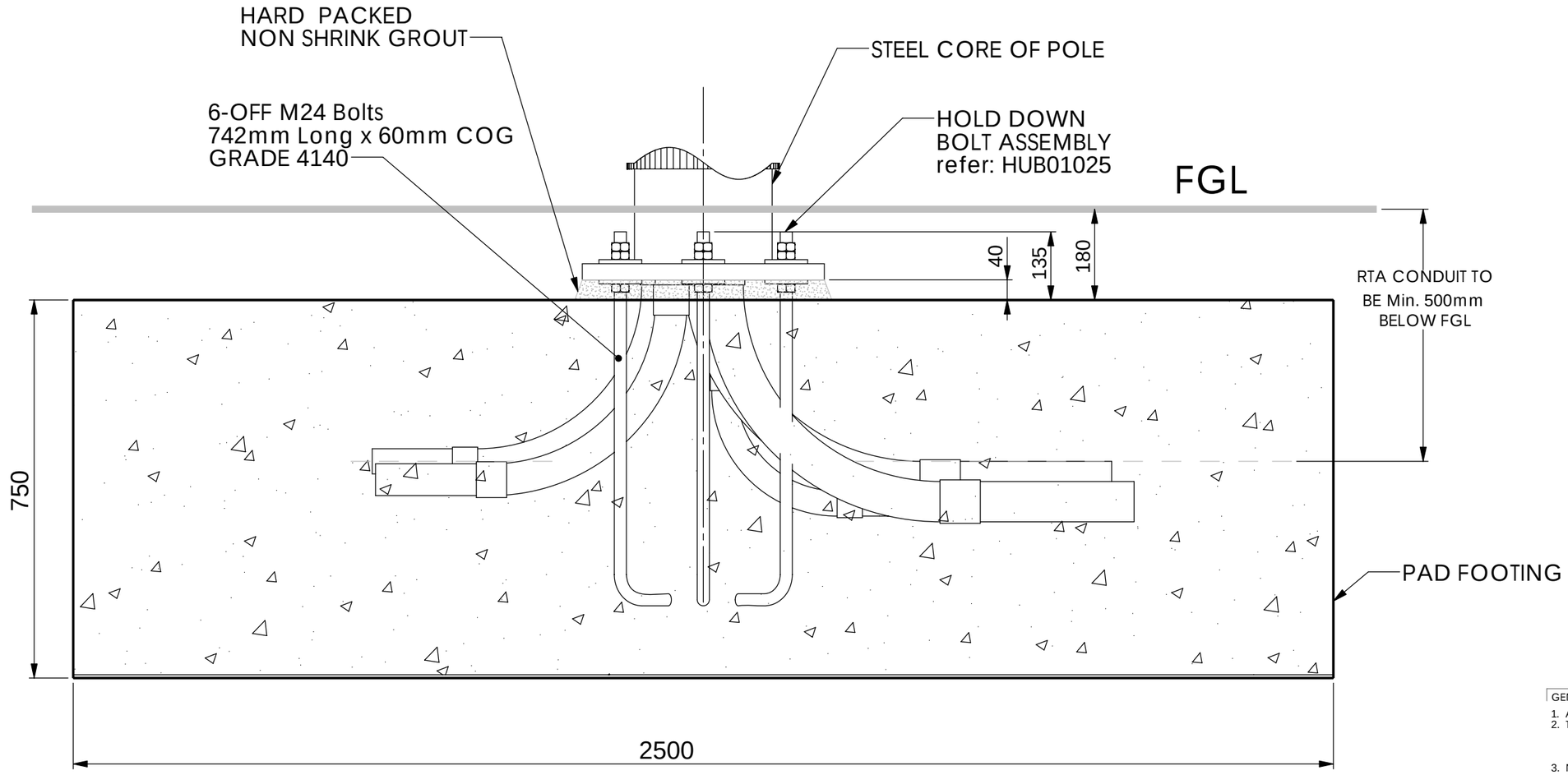
23 Edwin St,
Mt Eden, Auckland
Ph: +64 2 9638 8818
Fx: +64 2 9638 8819

Part Location:
\\Fileserver\hub\Activities\Current\8138 - MFP North Sydney\CAD\3D CAD\

Part Name:
8138_aSSy_POLE - Traffic

ISSUE	DESCRIPTION	DRAWN	DATE	CHECKED / CERTIFIED	DATE
A	Initial Release	MK	10.01.07		
B	Drawing Update	MK	24.01.07		
C	Dimension Update	MK	14.02.07		



NOTE:
Pad Style Footing to be used for specific locations only.
Please refer to site plan for details.

GENERAL NOTES:

1. All dimensions in millimetres unless otherwise shown.
2. Tolerances
   -Linear are ± 1,0mm unless marked with * then ±0.5mm
   -Angular are ±0.5°unless specified otherwise.
   -Holes and radii ± 0.5mm unless specified otherwise.
3. No deviation from drawing will be accepted without prior written approval.
4. Do not scale from drawings. Use dimensions provided if this is insufficient or ambiguous contact HUB for clarification

Title:
Pad Footing Details - HH MPP
Product:
North Sydney MPP

Dwg No:
HUB 01047
Project No:
8138
Date Drawn:
10.01.07
Scale:
1:10
Sheet:
A3

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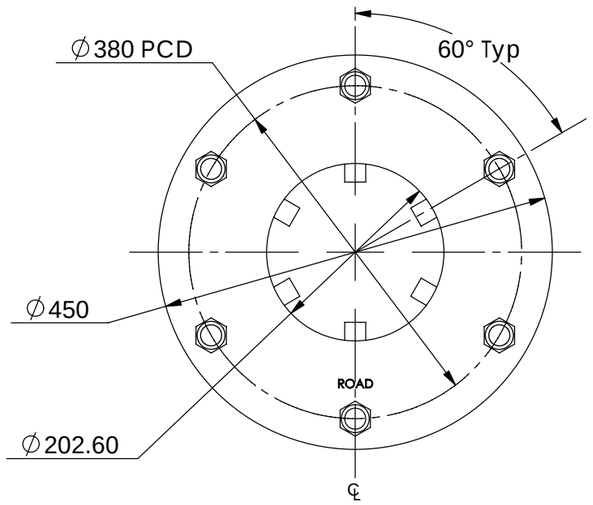
Mt Eden, Auckland
Ph: +64 2 9638 8818
Fx: +64 2 9638 8819

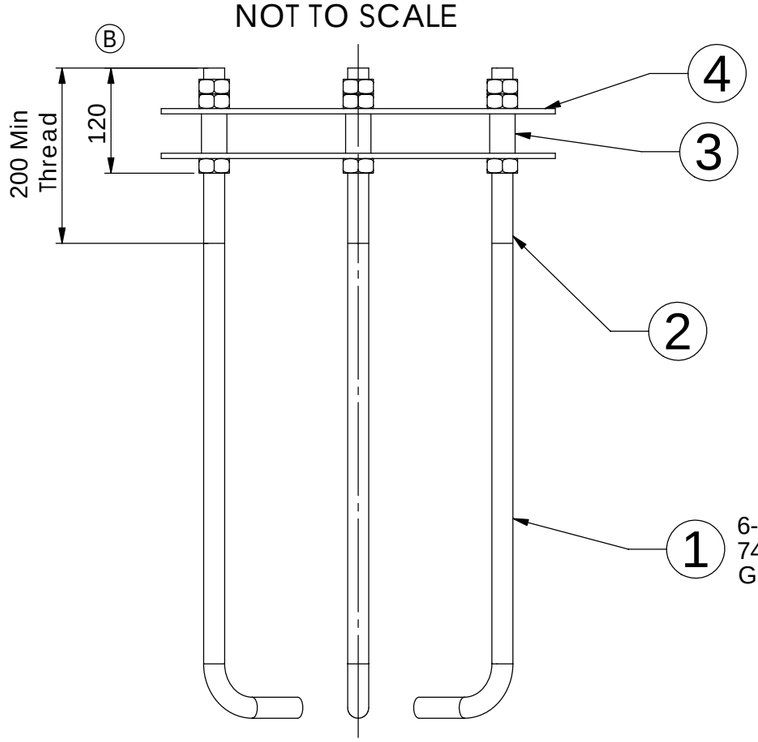
Part Location:
X:\ Activities\ Current\ 8138 - MFP North Sydney\ CAD\ 3D CAD\
Part Name:
8138_aSSy_POLE - Traffic

ITEM	DESCRIPTION	DWG No.	MATERIAL	QTY
4	HOLD DOWN BOLT SPACER PLATE	HUB01434	BLACK STEEL	2
3	HOLD DOWN BOLT SPACER	HUB01027	BLACK STEEL	6
2	M24 STRUCTURAL NUT	-	GALV.	18
1	HOLD DOWN BOLT	HUB01026	PRE-GALVANISED	6

ISSUE	DESCRIPTION	DRAWN	DATE	CHECKED / CERTIFIED	DATE
A	Initial Release	MK	24/01/07		
B	Dimension Update	MK	15/02/07		

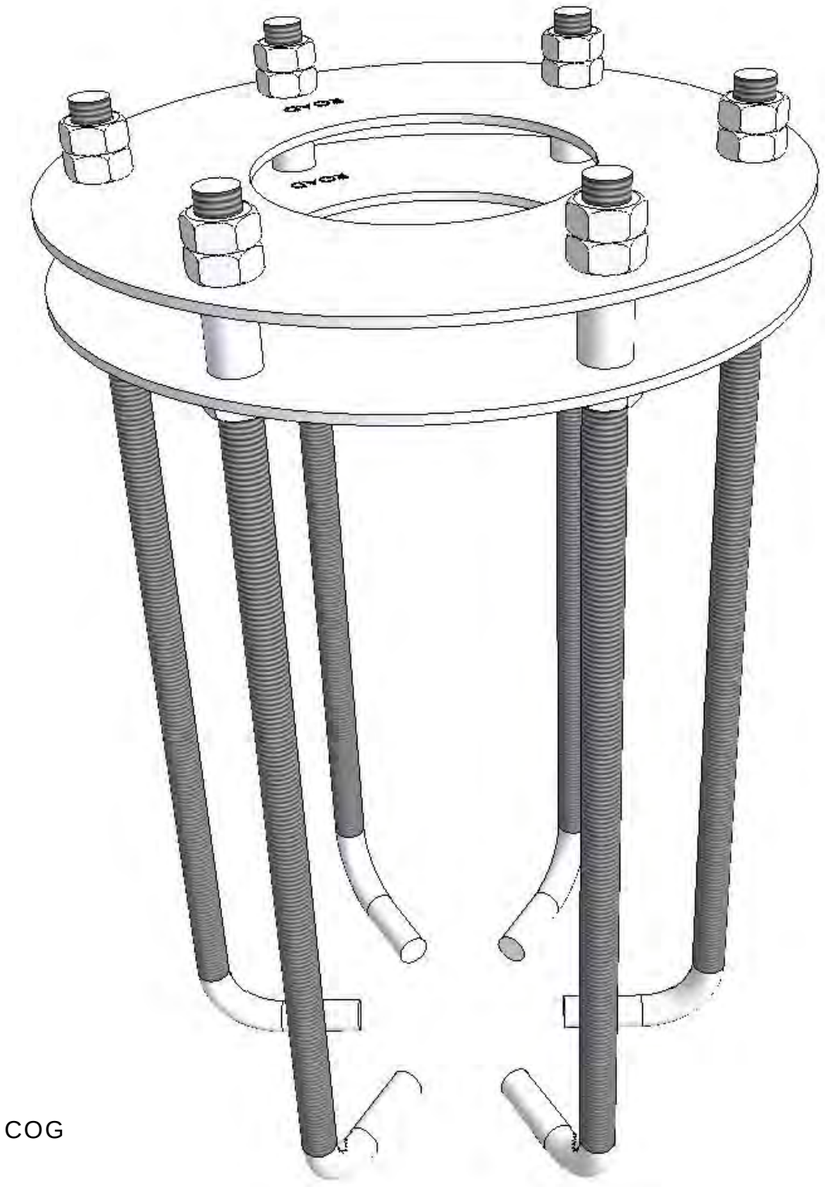


PLAN VIEW
NOT TO SCALE



FRONT VIEW
NOT TO SCALE

Asslembly shown for Hold Down Bolt Installation Only.
Hold Down Bolt Spacer Plate and Hold Down Bolt Spacers
to be removed prior to Pole Installation



ASSEMBLY NOTES:

1. All fasteners to be included in supply of assembly unless otherwise indicated by HUB.
2. All surfaces to be free from marks and scratches.

GENERAL NOTES:

1. All dimensions in millimetres unless otherwise shown.
2. Tolerances
   -Linear are ± 1,0mm unless marked with * then ±0.5mm
   -Angular are ±0.5°unless specified otherwise.
   -Holes and radii ± 0.5mm unless specified otherwise.
3. No deviation from drawing will be accepted without prior written approval.
4. Do not scale from drawings. Use dimensions provided if this is insufficient or ambiguous contact HUB for clarification

Title: Hold Down Bolt Assembly - Street Light Pole - Pier Footing

Product: North Sydney MPP

Dwg No: HUB 01435

Project No: 8138

Date Drawn: 24/01/07

Scale: 1:10

Sheet: A3

HUB STREET EQUIPMENT

AUSTRALIA
10 Regent St
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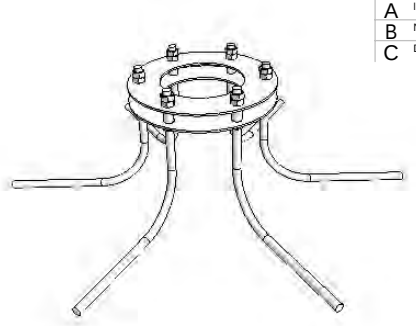
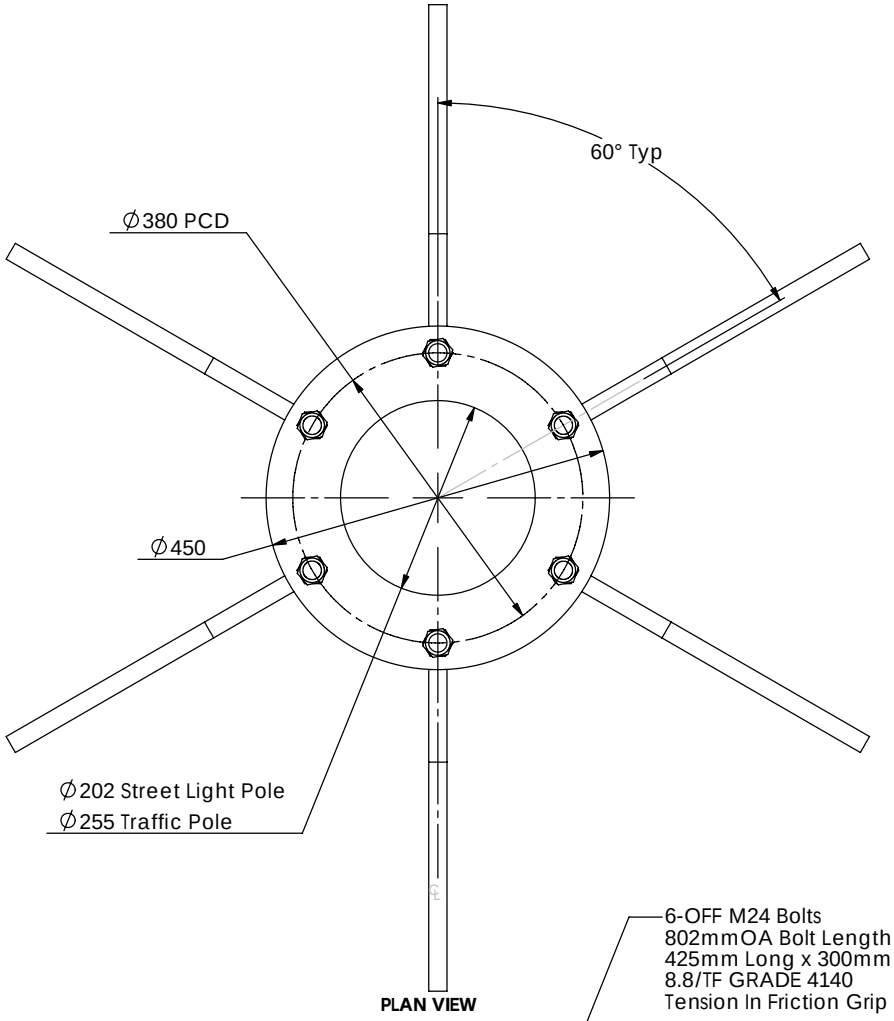
NEW ZEALAND
Zone 23, Unit G13
23 Edwin St,
Mt Eden, Auckland
Ph: +64 2 9638 8818
Fx: +64 2 9638 8819

Part Location: X:\Activities\Current\8138 - MFP North Sydney\CAD\3D CAD\HOLD DOWN BOLTS\

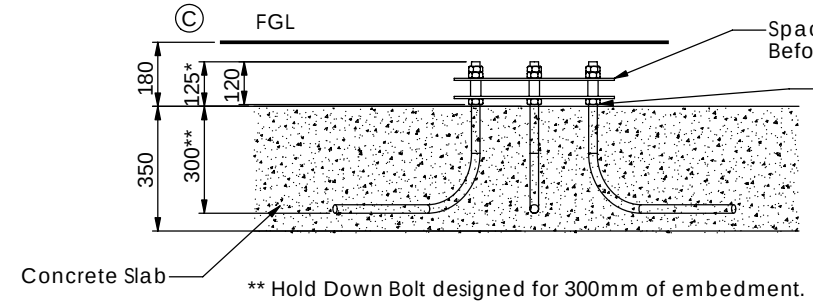
Part Name: 8138_aSSy_HOLD DOWN BOLTS

ISSUE	DESCRIPTION	DRAWN	DATE	CHECKED / CERTIFIED	DATE
A	Initial Release	MK	29/01/07		
B	Note Added to Embedment Detail	MK	30/01/07		
C	Dimension Update	MK	15/02/07		



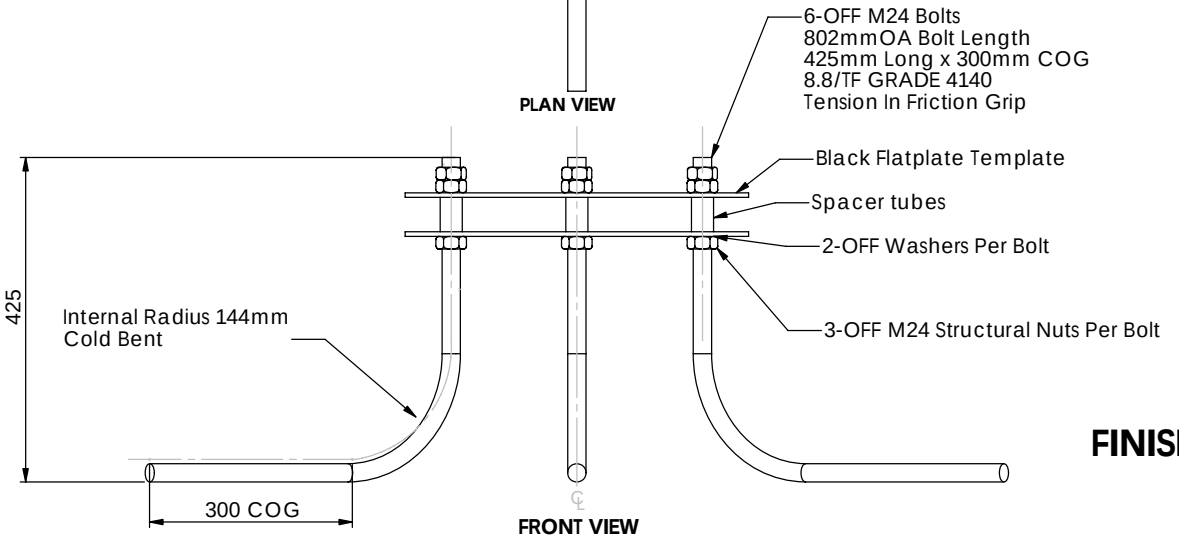


PLAN VIEW



** Hold Down Bolt designed for 300mm of embedment.

NOTE:
Pad Style Footing to be used for specific locations only.
Please refer to site plan for details.



FRONT VIEW

FINISH: Pre Galvanised M24 Bolt and Nuts to be used.

FABRICATION NOTES:

1. All splatter and slag to be removed.
2. All edges to be deburred and free of sharp protrusions.
3. All structural welds to AS 1554
4. All galvanised hollow sections to have adequate, ideally hidden ventallation holes.

GENERAL NOTES:

1. All dimensions in millimetres unless otherwise shown.
2. Tolerances
   -Linear are ± 1.0mm unless marked with * then ±0.5mm
   -Angular are ±0.5° unless specified otherwise.
   -Holes and radii ± 0.5mm unless specified otherwise.
3. 2% draft unless otherwise specified.
4. All corners and edges R1.0 unless otherwise specified.
5. No deviation from drawing will be accepted without prior written approval.
6. Do not scale from drawings. Use dimensions provided if this is insufficient or ambiguous contact HUB for clarification

Material: Mild Steel Grade - 4140
Finish: Hot Dip Galvanised

Title: Shallow Hold Down Bolt Assembly - Pad
Product: North Sydney MPP

Dwg No: HUB 01452
Project No: 8138
Date Drawn: 29/01/07
Scale: 1:10
Sheet: A3

HUB STREET EQUIPMENT

AUSTRALIA
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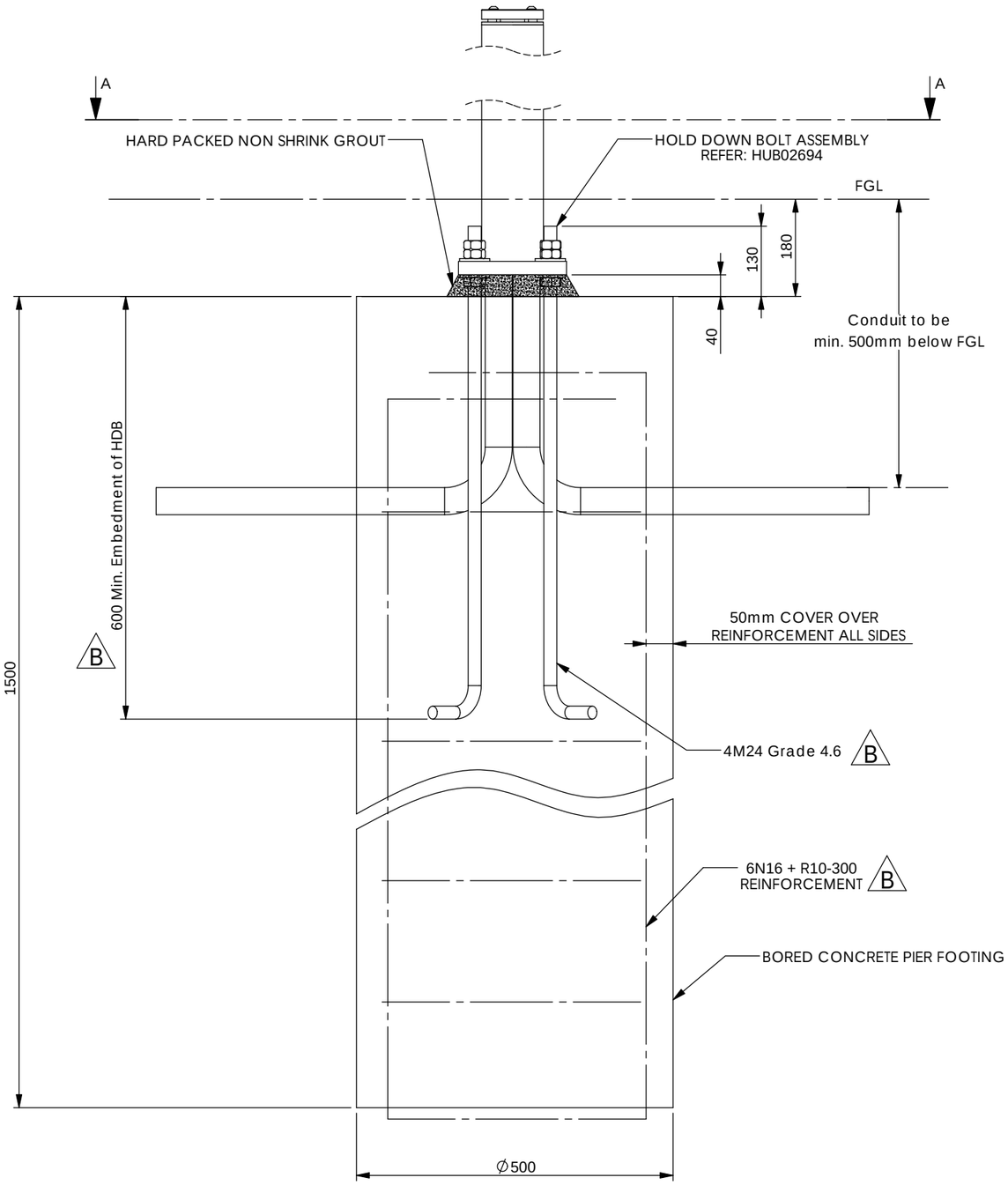
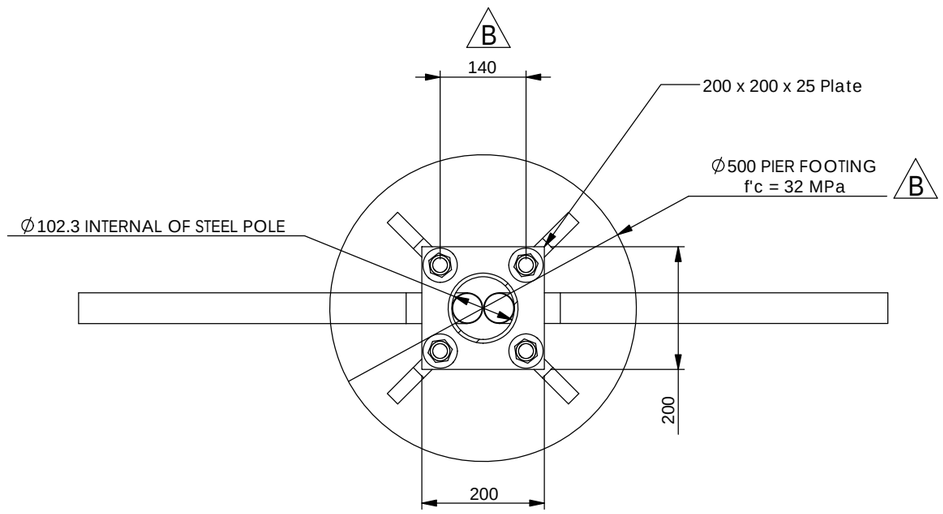
Mt Eden, Auckland
Ph: +64 2 9638 8818
Fx: +64 2 9638 8819

Part Location: X:\AUCKLAND\Products\MPP\HUB Pole-Standard Parts\Footing Details\HD Bolts\
Part Name: MPP-HOLD DOWN BOLT 400mm





SECTION A-A

GENERAL NOTES:

1. All dimensions in millimetres unless otherwise shown.
2. Tolerances
   -Linear are ± 1.0mm unless marked with * then ±0.5mm
   -Angular are ±0.5˚unless specified otherwise.
   -Holes and radii ± 0.5mm unless specified otherwise.
3. No deviation from drawing will be accepted without prior written approval.
4. Do not scale from drawings. Use dimensions provided if this is insufficient or ambiguous contact HUB for clarification

DESCRIPTION	DRAWN	DATE	CHECKED	DATE	CERTIFIED	DATE	REVISION
Change in Steel and Conrete Grades + Base Plate Details	DS	30/01/09					B
Initial Release	TW	28/01/09					A

HUB STREET EQUIPMENT

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Grey Lynn
Auckland
Ph: +64 9 378 8285
Fx: +64 9 378 8265

Title: Standard Footing - Pier

Dwg No: HUB 02901

Product: 114Dia Pole

Project No: 1037

Material: -

Date Drawn: 28/01/09

Finish: -

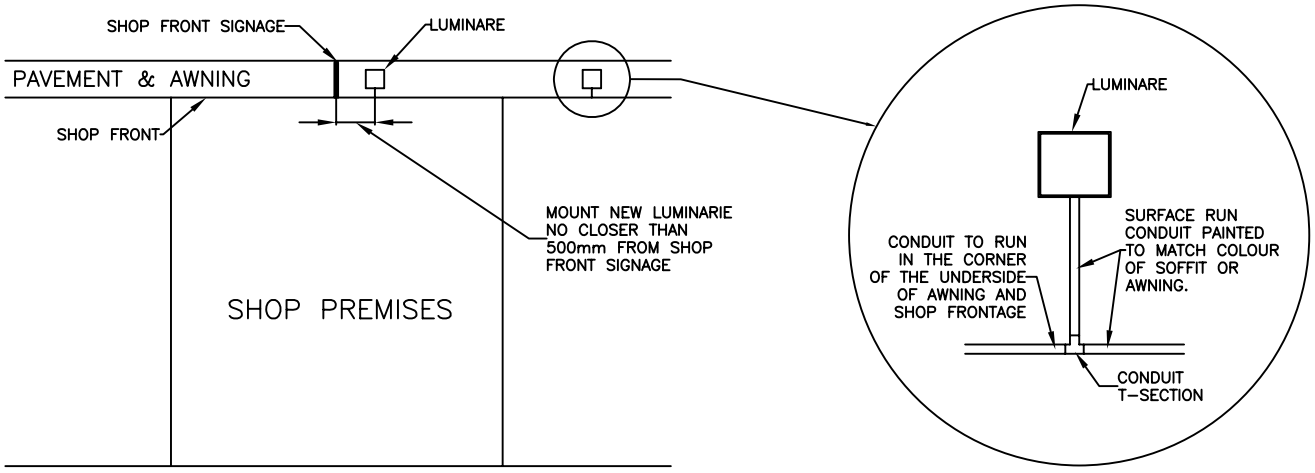
Scale: 1:10

Part Location: X:\AUCKLAND\Activities\1037 - St Pat's Sq MFP\Design\2-Concept CAD\

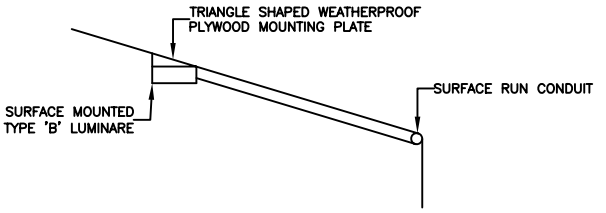
Part Name: 114Dia Pole GA - B

Weight: -

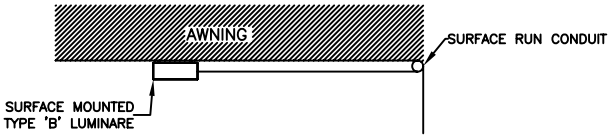
A3



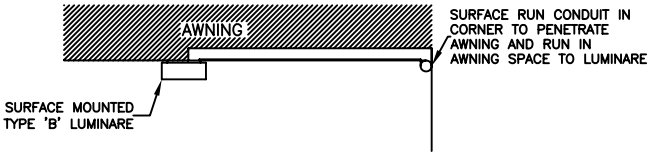
LUMINARE MOUNTING POSITION DETAIL



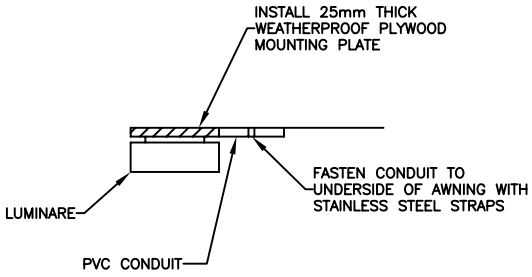
OPTION 1: – Sloped, un–lined awning

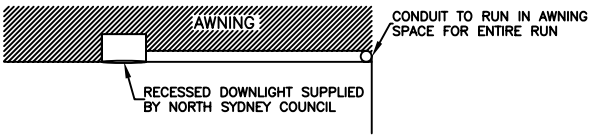


OPTION 2: – Fully Exposed



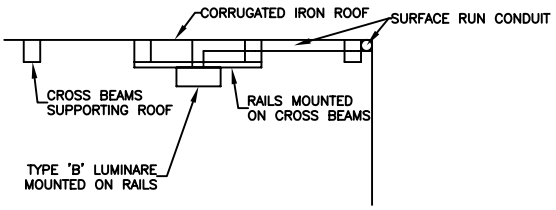
OPTION 3: – Partially Exposed





OPTION 4: – Fully Enclosed

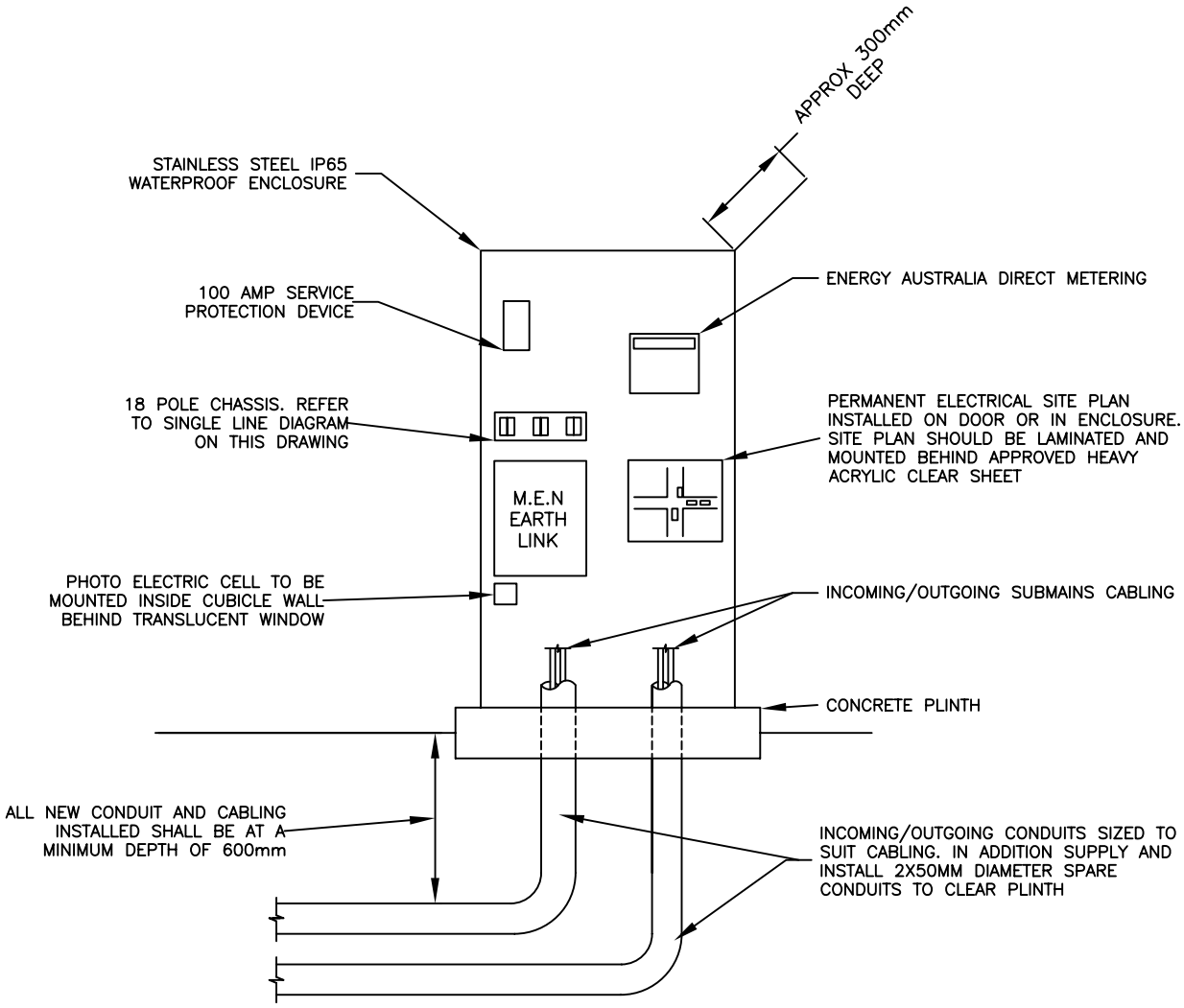
LUMINARE INSTALLATION DETAIL



OPTION 5: – Flat, un–lined awning

NOTE: CONTRACTOR SHALL VERIFY MOUNTING OPTION WITH COUNCIL PRIOR TO INSTALLATION

APPROVED: COUNCIL ENGINEER DATE: 01/06/09		NORTH SYDNEY COUNCIL UNDER–AWNING LIGHTS MOUNTING DETAILS AND OPTIONS	SCALE NOT TO SCALE DRAWING NO. S825



TYPICAL MAIN SWITCHBOARD CUBICLE

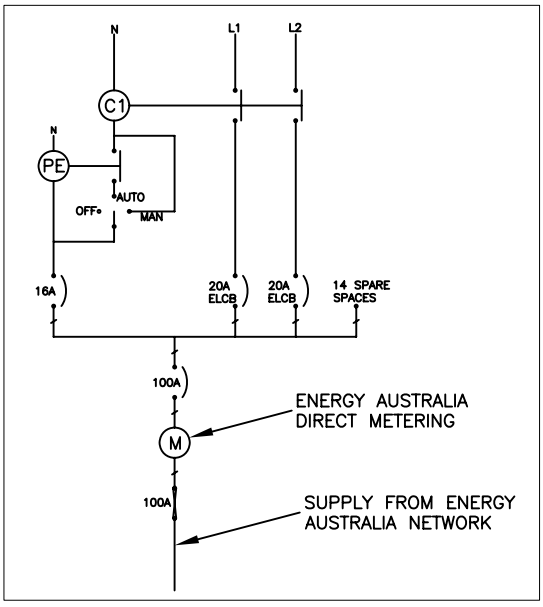
NOTES:

1. ENCLOSURE MUST MEET ALL REQUIREMENTS OF THE NSW SERVICE AND INSTALLATION RULES WETHER SPECIFIED HEREIN OR NOT
2. ENCLOSURE SHALL BE IP65 RATED FINISHED IN BRUSHED STAINLESS STEEL.
3. LABEL SHALL READ:
   - NORTH SYDNEY COUNCIL
   - UNDER AWNING LIGHTS

   LABEL SHOULD BE STAINLESS STEEL ENGRAVED AND BLACK ENAMEL FILLED, LETTERING 7mm

LEGEND:

ELCB	CIRCUIT BREAKER. ELCB – COMPLETE WITH INTEGRAL EARTH LEAKAGE CORE BALANCE DEVICE (SENSITIVITY 30mA)
– – //// – –	EXISTING BUSBAR OR CABLING (No. OF STROKES DENOTES NUMBER OF PHASES)
———//———	NEW BUSBAR OR CABLING (No. OF STROKES DENOTES NUMBER OF PHASES)
(PE)	PHOTOELECTRIC CELL
(C1)	CONCRACTOR COIL
(M)	ENERGY AUSTRALIA DIRECT METERING
———	SERVICE FUSE



TYPICAL DISTRIBUTION BOARD

APPROVED: COUNCIL ENGINEER DATE: 01/06/09		NORTH SYDNEY COUNCIL UNDER–AWNING LIGHTS DISTRIBUTION BOARD AND SWITCHBOARD CUBICLE	SCALE NOT TO SCALE DRAWING NO. S826

MODIFIED RTA PEDESTRIAN FENCES

S900 SERIES

DRAWING NO	DESCRIPTION
S901	MODIFIED RTA PEDESTRIAN FENCE END POST DETAIL
S902	MODIFIED RTA PEDESTRIAN FENCE INTERMEDIATE POST DETAIL
S903	MODIFIED RTA PEDESTRIAN FENCE CORNER POST DETAIL
S904	MODIFIED RTA PEDESTRIAN FENCE CONCRETE FOOTING DETAIL
S905	MODIFIED RTA PEDESTRIAN FENCE BASE PLATE FOOTING DETAIL
S906	MODIFIED RTA PEDESTRIAN FENCE (2M PANEL) DETAIL
S907	MODIFIED RTA PEDESTRIAN FENCE (1M PANEL) DETAIL

APPROVED:

COUNCIL ENGINEER

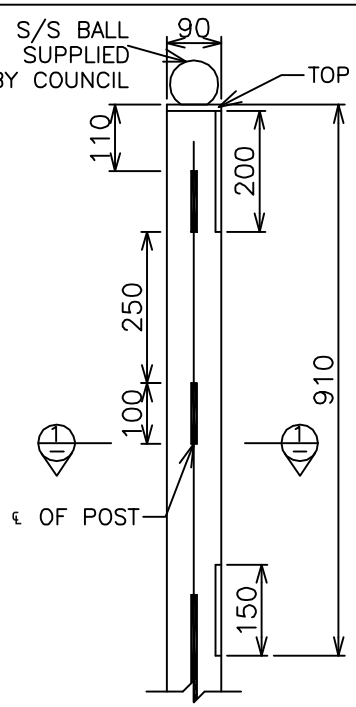
DATE: 06/12/07

NORTH SYDNEY COUNCIL

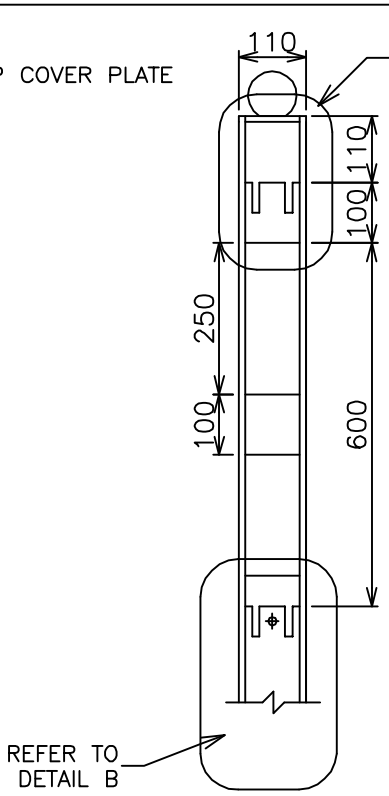
MODIFIED RTA
END POST DETAIL

SCALE
N.T.S.

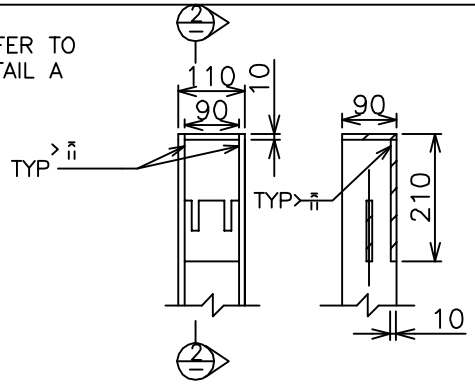
DRAWING NO.
S901



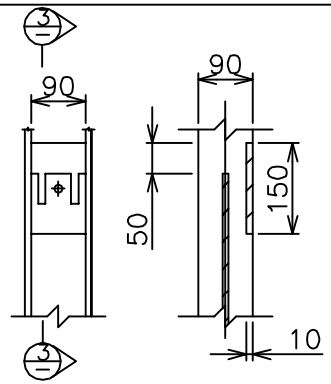
ELEVATION



END ELEVATION



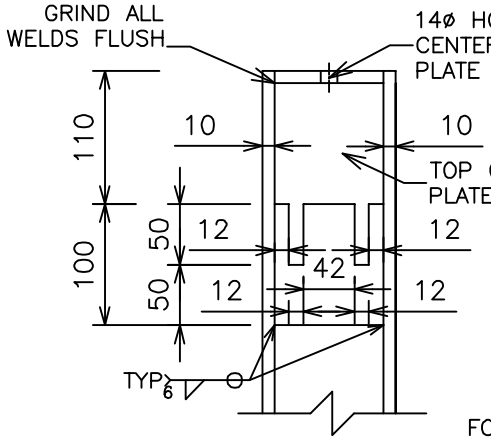
ELEVATION SECTION 2



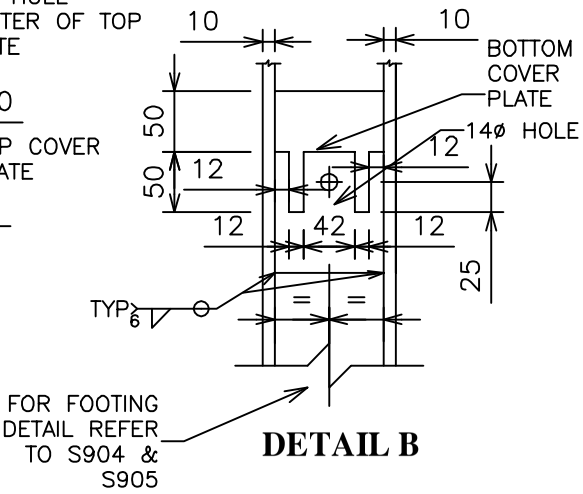
ELEVATION SECTION 3

TOP COVER PLATE

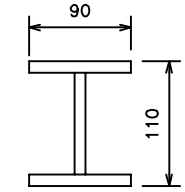
BOTTOM COVER PLATE



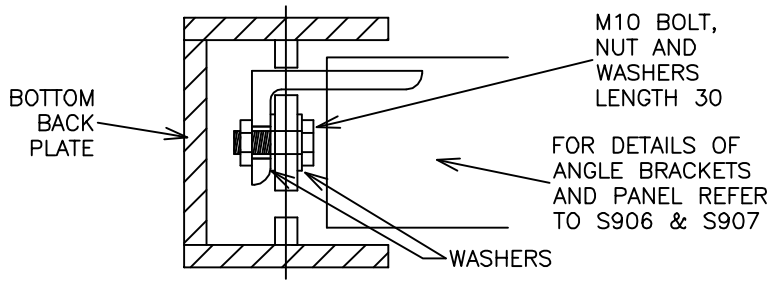
DETAIL A



DETAIL B



SECTION 1



DETAIL OF BOTTOM RAIL CONNECTION

GENERAL NOTES: (APPLIES TO ALL DRAWINGS)

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. STEEL PLATE SHALL BE GRADE 250 TO AS 3678.
3. STEEL SECTION SHALL BE GRADE 250 TO AS 3679.
4. COMMERCIAL BOLTS AND SCREWS SHALL CONFORM TO AS 1111.
5. PLAIN NUTS SHALL CONFORM TO AS 1112.
6. BLACK STEEL WASHERS (NORMAL AND LARGE SERIES) SHALL CONFORM TO AS 1237.
7. ALL WELDED CONNECTIONS SHALL BE 6mm FILLET WELDS IF NO SYMBOL SHOWN.
8. THE WELD CATEGORY SHALL BE GP IN ACCORDANCE WITH AS 1554 PART 1.
9. WELDING SYMBOLS ARE TO AS 1101 PART 3.
10. EDGES TO BE PROTECTIVE TREATED SHALL BE ROUNDED TO A RADIUS OF 1.5mm UNLESS SPECIFIED OTHER WISE.
11. ALL DIMENSIONS ARE BASE METAL THICKNESS.
12. ALL COMPONENTS SHALL BE HOT–DIP GALVANIZED.
13. ALL COMPONENTS SHALL BE PAINTED WITH ONE COAT PRIMER AND TWO COATS SOLVER–TORTILLA RED.
14. BOLTS, NUTS AND WASHERS SHALL BE HOT–DIP GALVANIZED IN ACCORDANCE WITH AS 1214.

APPROVED:

COUNCIL ENGINEER

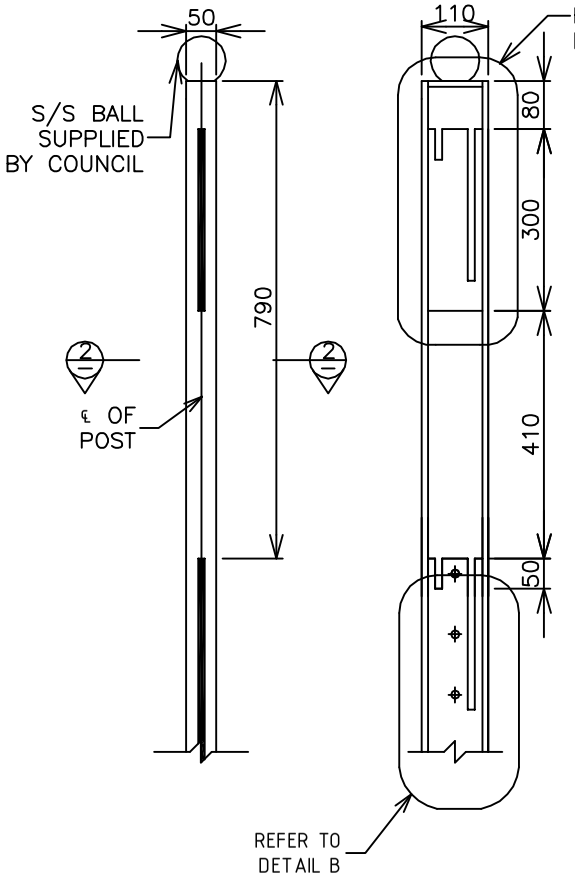
DATE: 31/12/07

NORTH SYDNEY COUNCIL

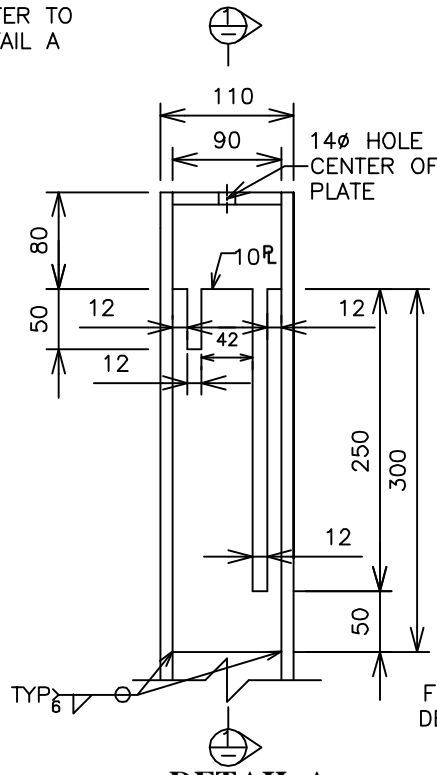
MODIFIED RTA INTERMEDIATE POST DETAIL

SCALE N.T.S.

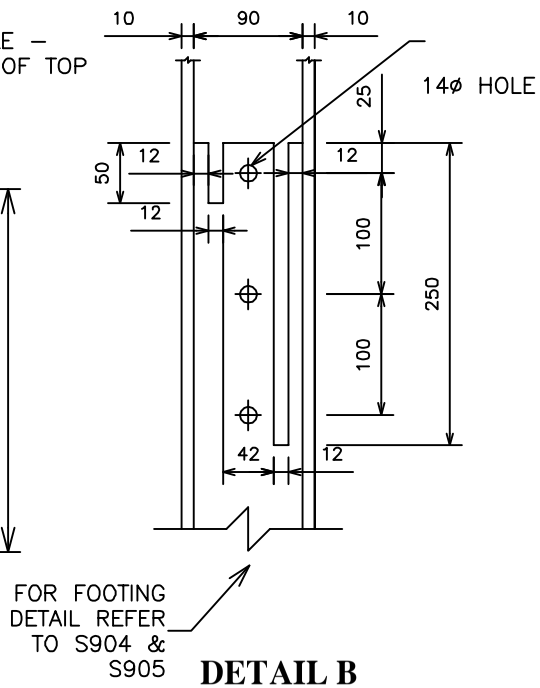
DRAWING NO. S902



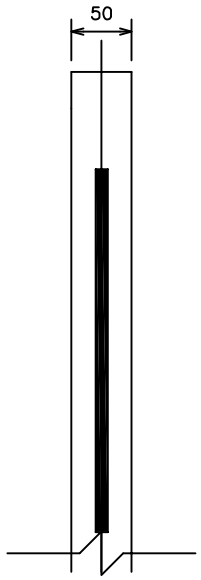
ELEVATION **END ELEVATION**



DETAIL A

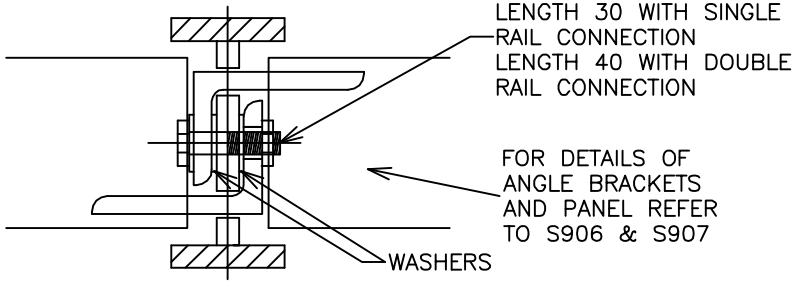


DETAIL B

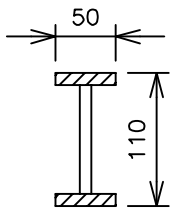


SECTION 1

NOTE:
1. DRAWING TO BE READ IN CONJUNCTION WITH S901.
2. ALL DIMENSIONS ARE IN MILLIMETRES.



DETAIL OF BOTTOM RAIL CONNECTION



SECTION 2

APPROVED:

COUNCIL ENGINEER

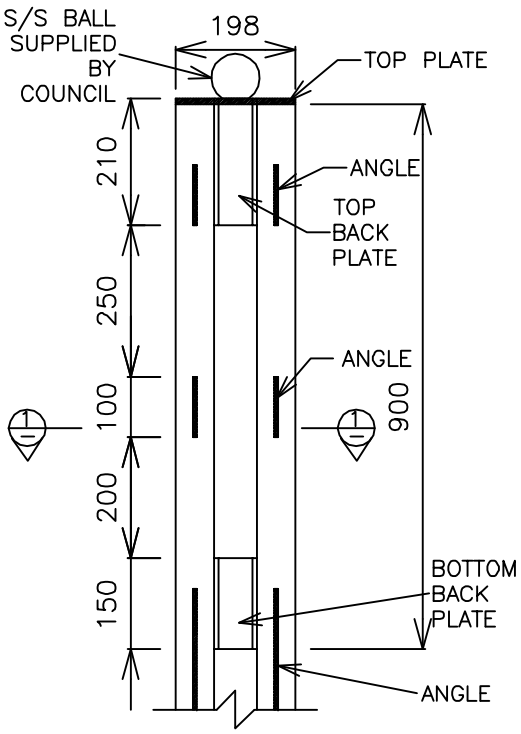
DATE: 01/06/07

NORTH SYDNEY COUNCIL

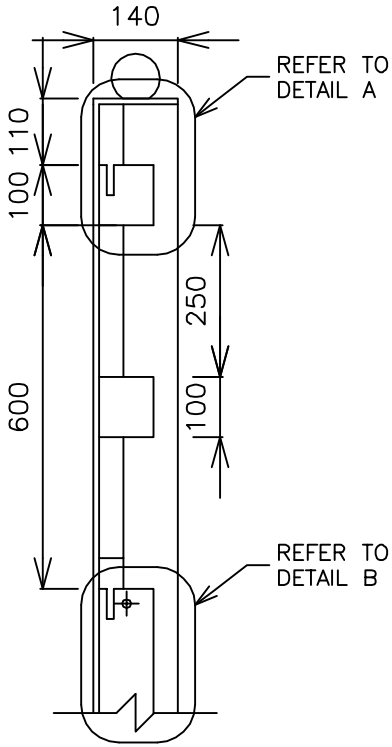
MODIFIED RTA CORNER POST DETAIL

SCALE N.T.S.

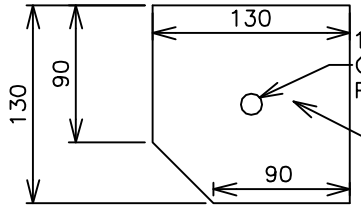
DRAWING NO. S903



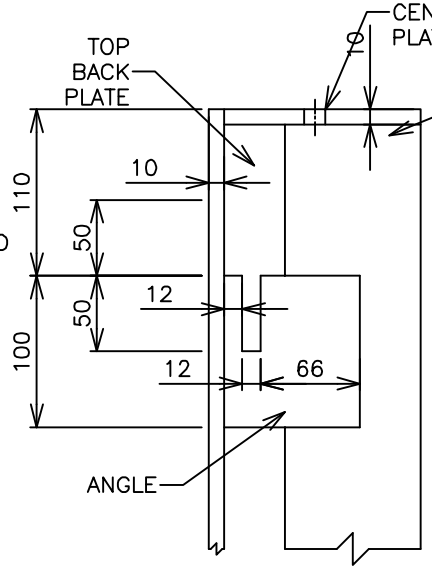
END ELEVATION



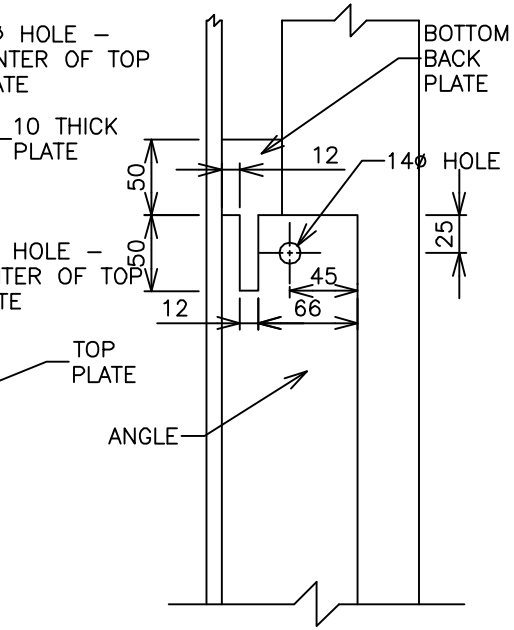
ELEVATION



TOP PLATE

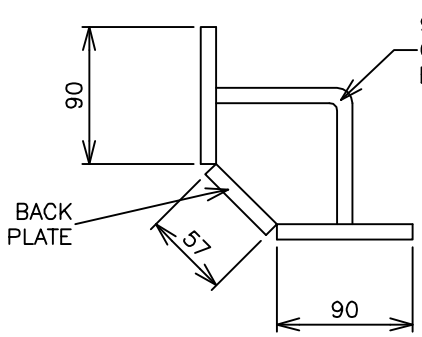


DETAIL A

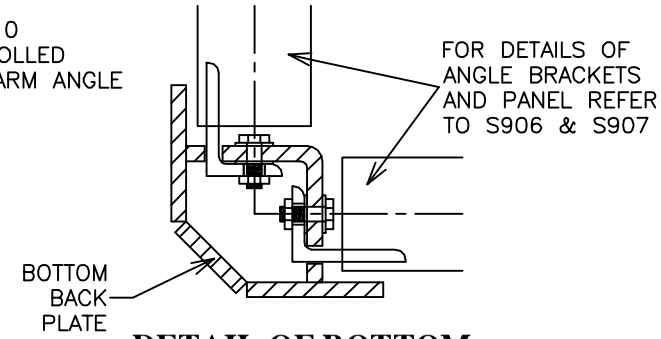


DETAIL B

NOTE:
1. DRAWING TO BE READ IN CONJUNCTION WITH S901.
2. ALL DIMENSIONS ARE IN MILLIMETRES.



SECTION 1



DETAIL OF BOTTOM RAIL CONNECTION

APPROVED:

COUNCIL ENGINEER

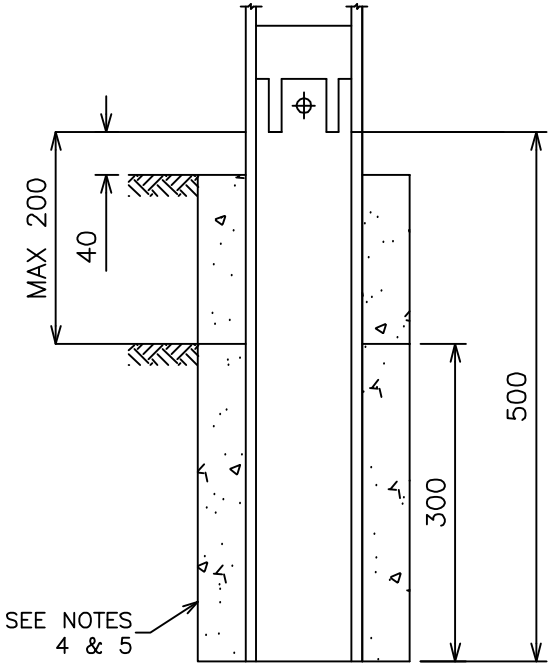
DATE: 02/01/08

NORTH SYDNEY COUNCIL

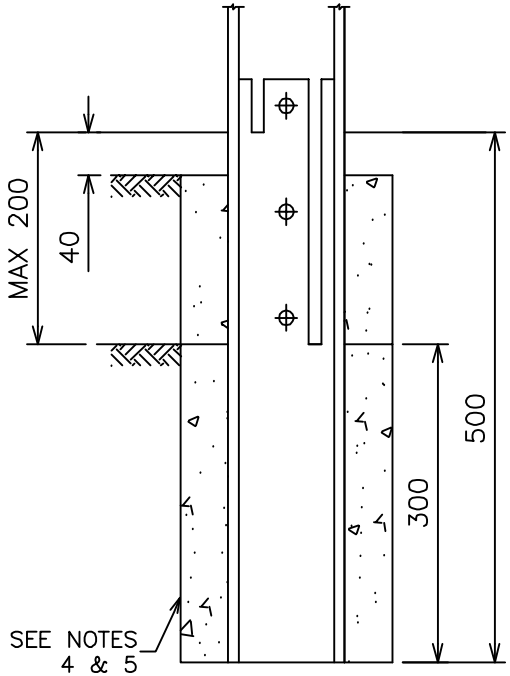
MODIFIED RTA PEDESTRIAN FENCE
CONCRETE FOOTING DETAIL

SCALE
N.T.S.

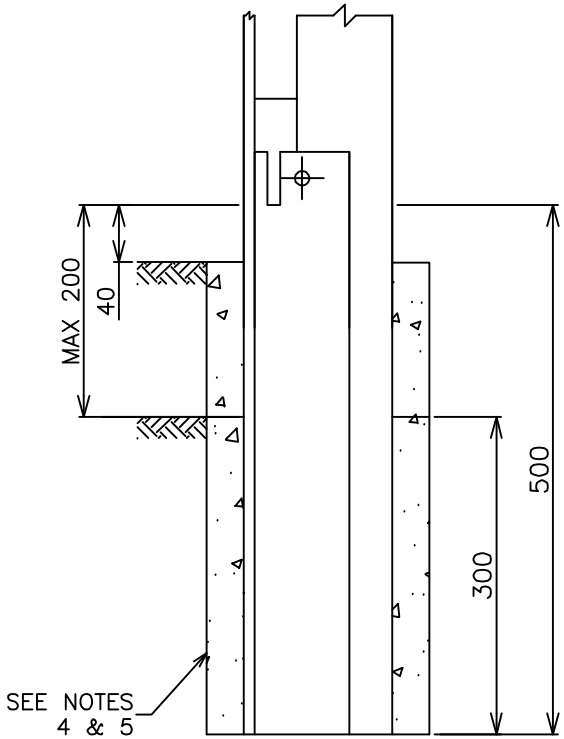
DRAWING NO.
S904



END POST



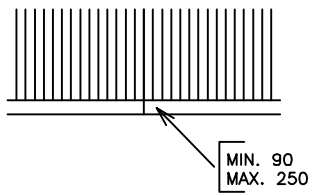
INTERMEDIATE POST



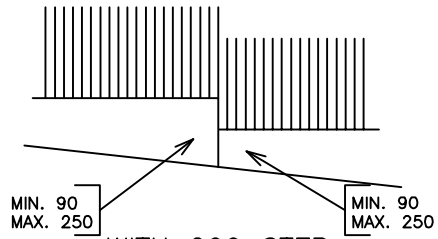
CORNER POST

NOTE:

1. DRAWING TO BE READ IN CONJUNCTION WITH S901.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. FENCE LIMITED TO GRADES OF UP TO 10%.
4. 200ø (250ø FOR CORNER POST) N20 CONCRETE FOOTING.
5. IN SOFT GROUND USE FOOTING 400ø, 600 DEEP.



NO STEP



WITH 200 STEP

APPROVED:

COUNCIL ENGINEER

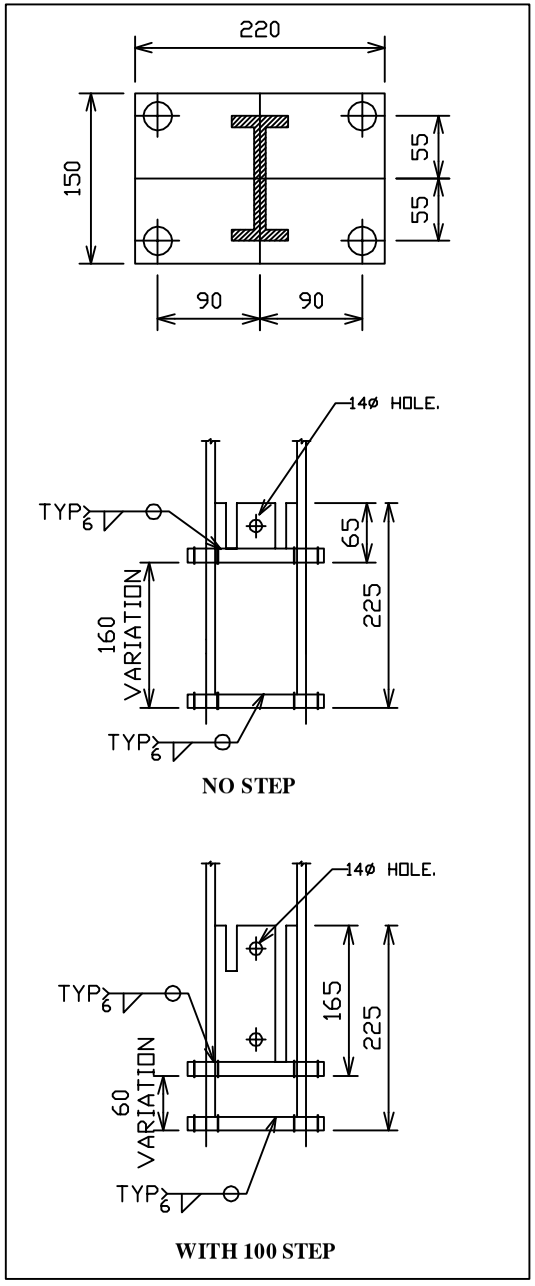
DATE: 02/01/08

NORTH SYDNEY COUNCIL

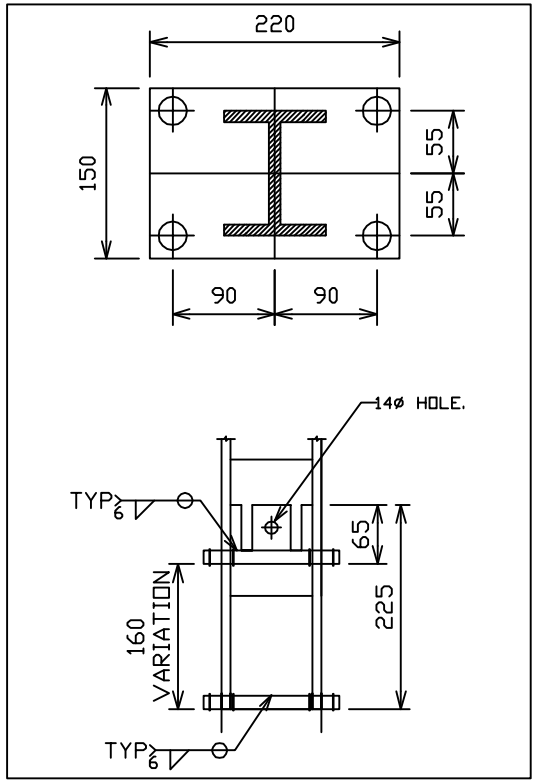
MODIFIED RTA PEDESTRIAN FENCE
BASE PLATE FOOTING DETAIL

SCALE
N.T.S.

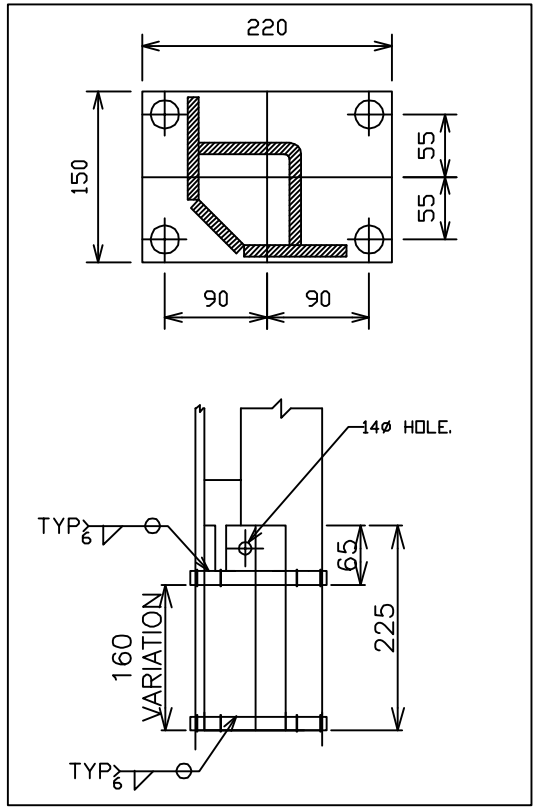
DRAWING NO.
S905



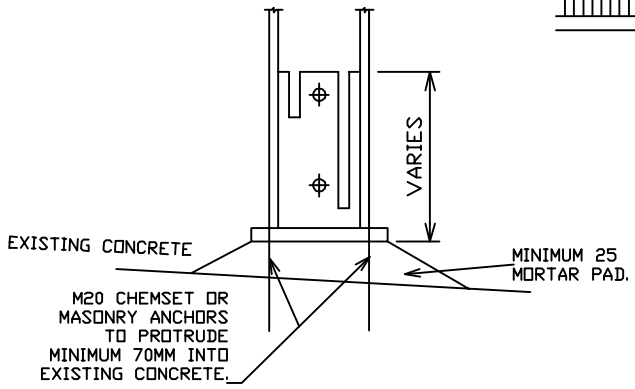
INTERMEDIATE POST

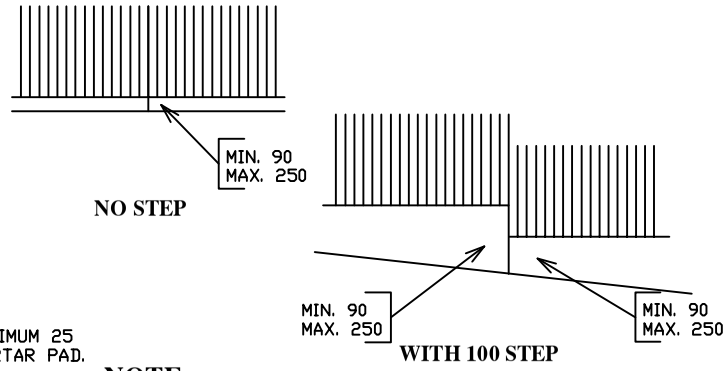


END POST



CORNER POST





NOTE:

1. DRAWING TO BE READ IN CONJUNCTION WITH S901.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. HEIGHT TO BE DETERMINED TO SUIT SITE CONDITION.
4. FENCE LIMITED TO GRADES UP TO 5%.

APPROVED:

COUNCIL ENGINEER

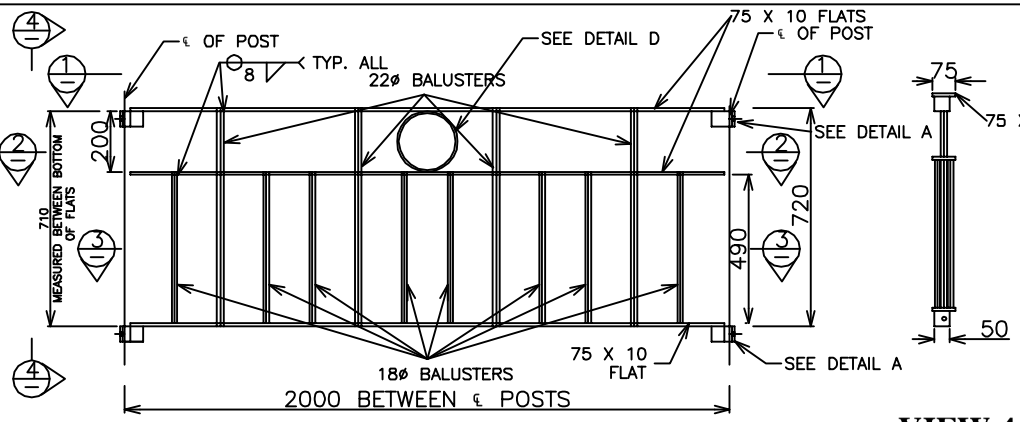
DATE: 31/12/07

NORTH SYDNEY COUNCIL

MODIFIED RTA PEDESTRIAN FENCE DETAIL

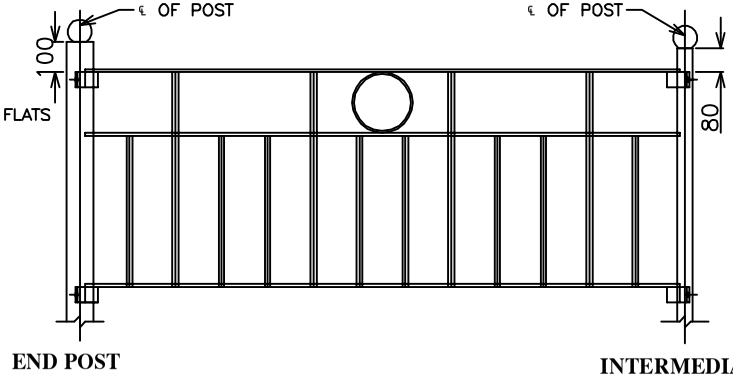
SCALE N.T.S.

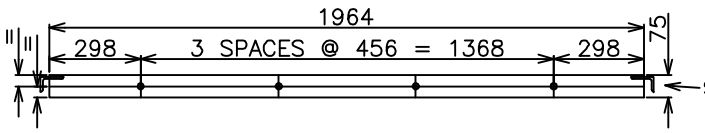
DRAWING NO. S906



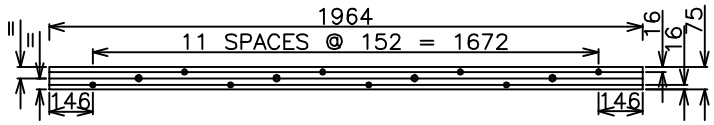
ELEVATION

VIEW 4

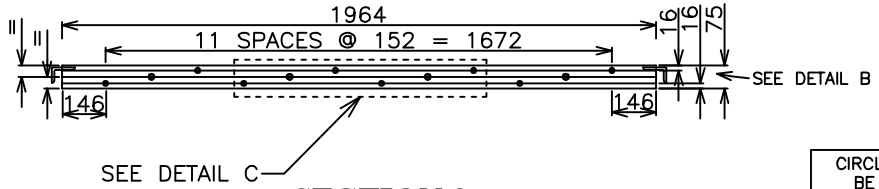




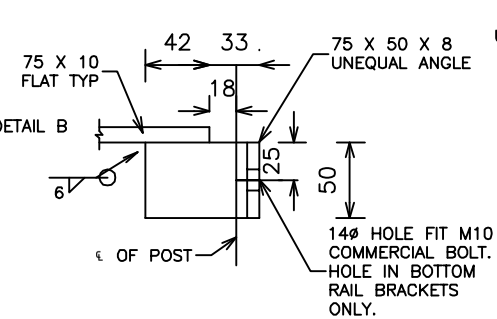
SECTION 1



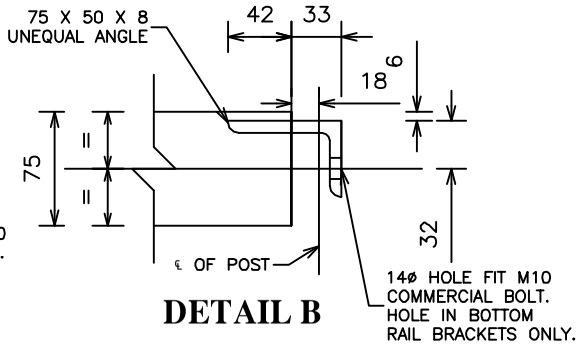
SECTION 2



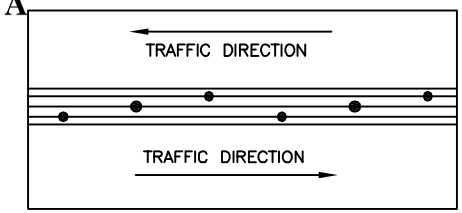
SECTION 3



DETAIL A



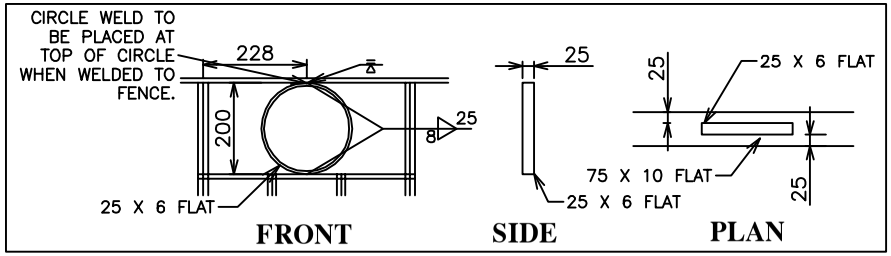
DETAIL B



DETAIL C

NOTE:

1. DRAWING TO BE READ IN CONJUNCTION WITH S901.
2. ALL DIMENSIONS ARE IN MILLIMETRES.



DETAIL D

APPROVED:

COUNCIL ENGINEER

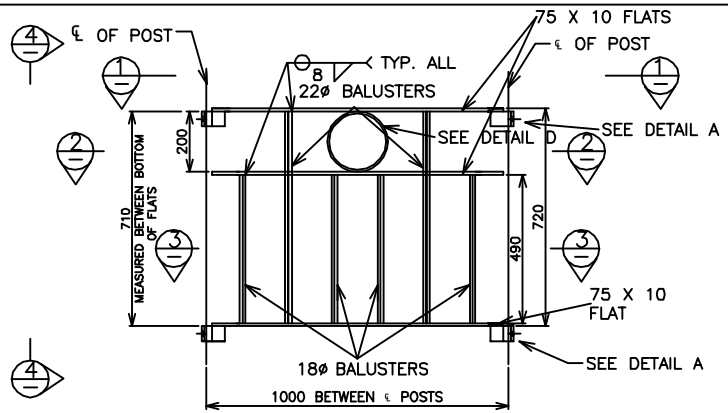
DATE: 02/01/08

NORTH SYDNEY COUNCIL

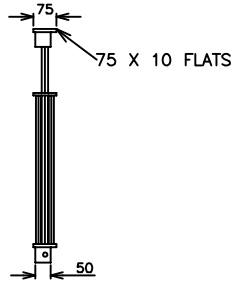
MODIFIED RTA PEDESTRIAN FENCE (1M PANEL) DETAIL

SCALE N.T.S.

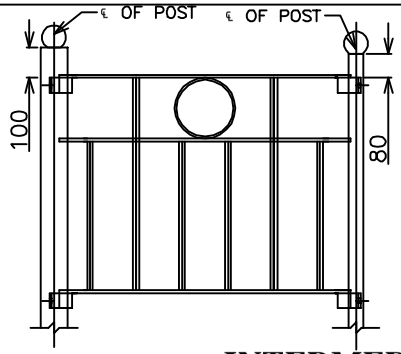
DRAWING NO. S907



ELEVATION

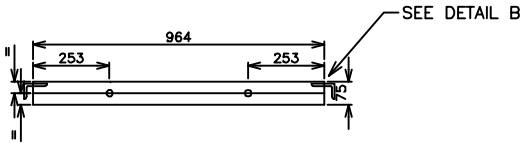


VIEW 4

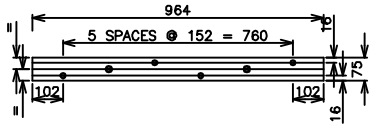


END POST

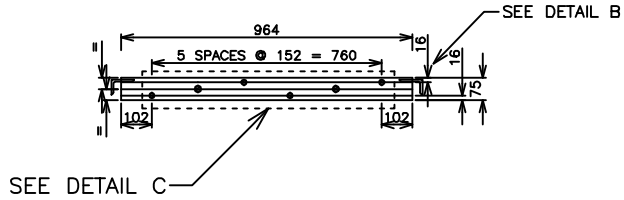
INTERMEDIATE POST



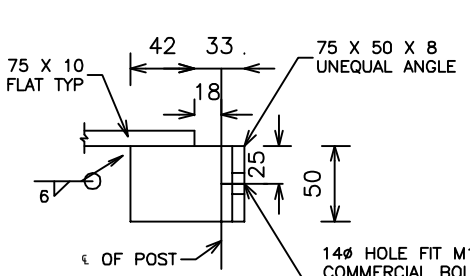
SECTION 1



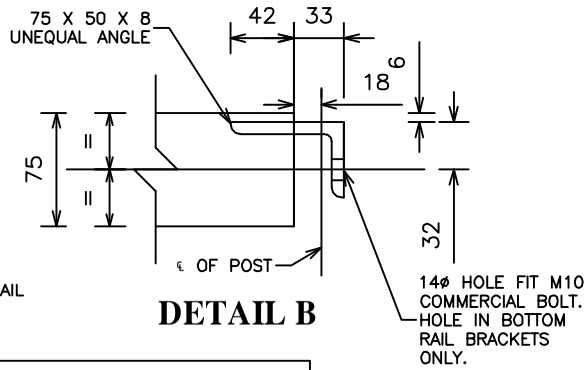
SECTION 2



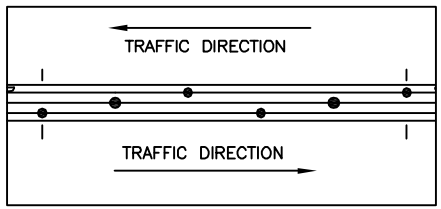
SECTION 3



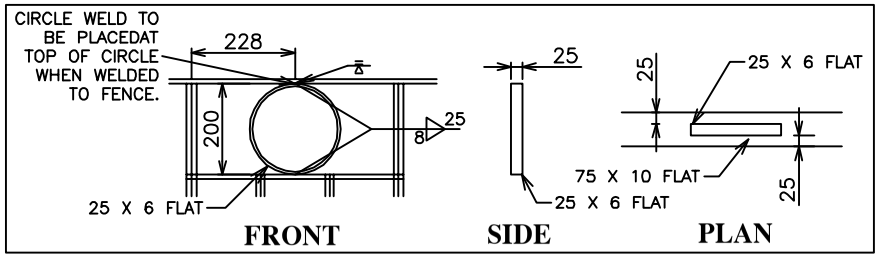
DETAIL A



DETAIL B



DETAIL C



DETAIL D

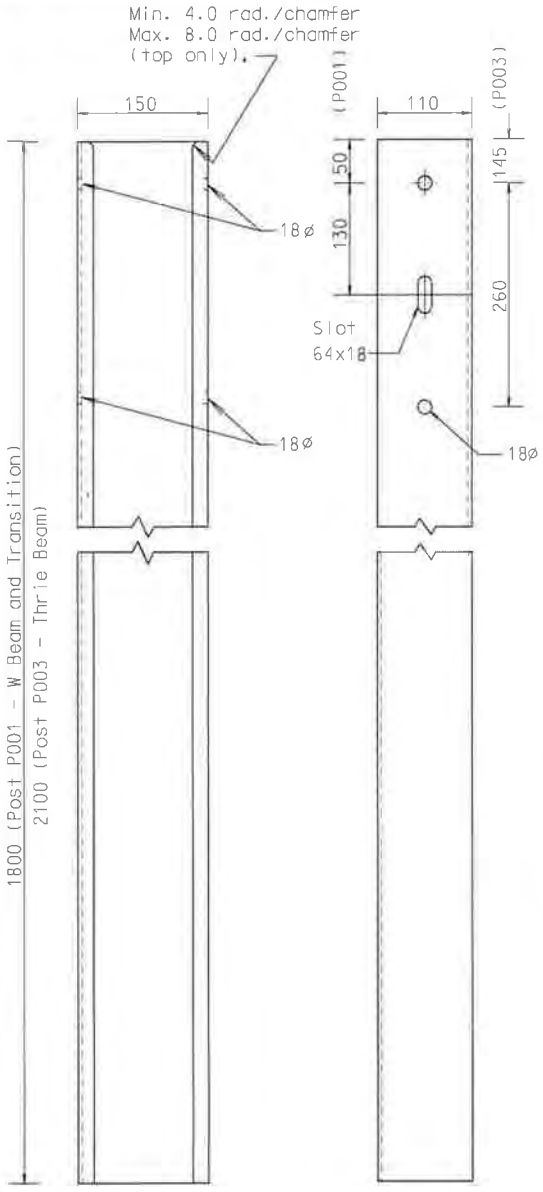
NOTE:

1. DRAWING TO BE READ IN CONJUNCTION WITH S901.
2. ALL DIMENSIONS ARE IN MILLIMETRES.

RMS W-BEAM SAFETY BARRIER SYSTEM

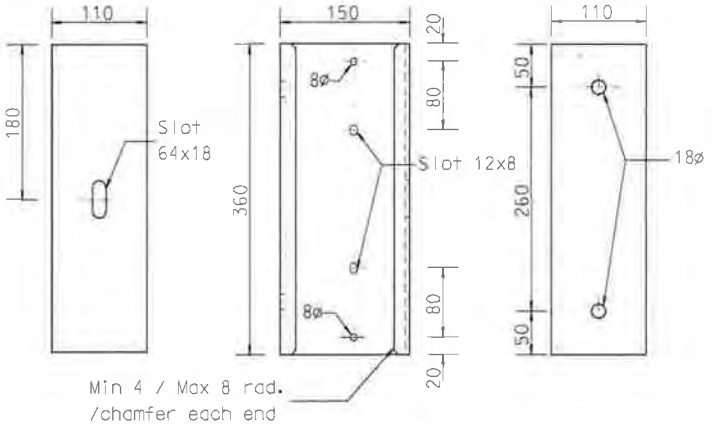
S1000 SERIES

Drawing Number	Description
MD.R132.A01.A	POST AND BLOCKOUT COMPONENTS
MD.R132.A04.A	POST ON BASE PLATE
MD.R132.A06.A	ABRAHAM BLOCKOUT FOR RAISING RAIL HEIGHT ON EXIST POSTS
MD.R132.B01.A	RAIL AND STIFFENING PIECE CONNECTION
MD.R132.B09.A	MELT AND TT TERMINALS, W BEAM DETAIL AND DETAIL OF TERMINAL RAILS
MD.R132.B10.A	MODIFIED ECCENTRIC LOADER TERMINAL (MELT) DIAPHRAM PLATE DETAILS
MD.R132.B11.A	MODIFIED ECCENTRIC LOADER TERMINAL AND TRAILING TERMINAL (TT) BUFFERED END DETAILS
MD.R132.C01.A	MODIFIED ECCENTRIC LOADER TERMINAL AND TRAILING TERMINAL (TT) CABLE ASSEMBLY AND FASTENERS
MD.R132.C02.A	FASTENERS COMPONENTS M16 BOLTS & NUTS – RAIL
MD.R132.C03.A	FASTENER COMPONENTS – HEXAGONAL HEAD BOLTS AND NUTS
MD.R132.F01.A	AASHTO G4 W BEAM ASSEMBLY
MD.R132.G01.A	MODIFIED ECCENTRIC LOADER TERMINAL (TT) GENERAL ARRANGEMENT
MD.R132.G02.A	MODIFIED ECCENTRIC LOADER TERMINAL (MELT) BUFFERED END AND ANCHORAGE DETAIL

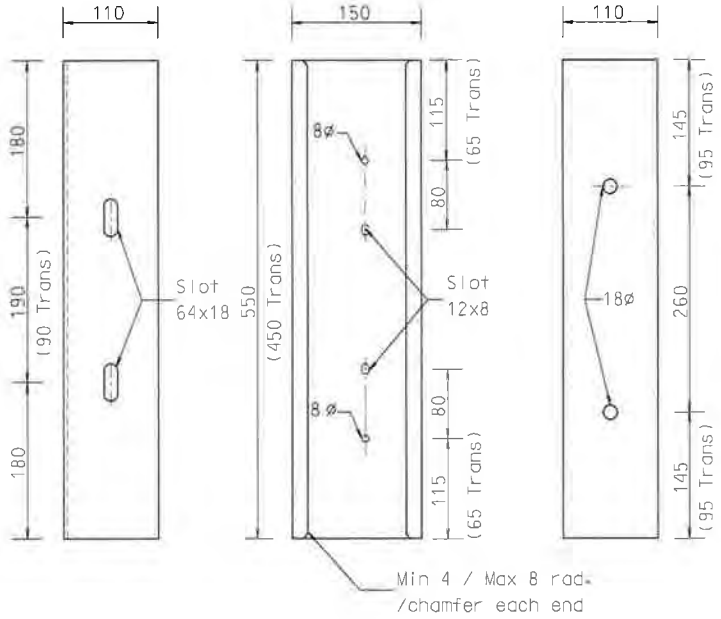


POST – W BEAM (P001)
– THRIE (P003)

(W beam post P001 to be used with transition Blockout Piece P005)

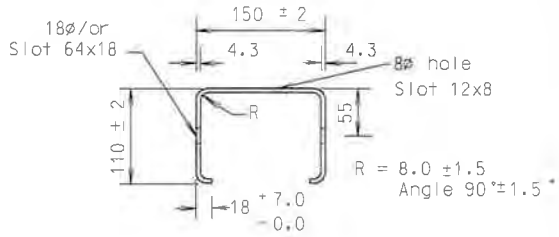


BLOCKOUT PIECE – W BEAM (P002)



BLOCKOUT PIECE – THRIE BEAM (P004)
– TRANSITION (P005)

(Dimensions for Transition Blockout P005 shown in brackets)



SECTION THROUGH POST AND BLOCKOUT

Posts and blockout pieces are from 4.3 BMT plate grade HA300 steel to AS 1594 and hot dip galvanised to AS 4680 after fabrication.

BMT = Base Metal Thickness

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

All dimensions in millimetres unless otherwise shown.

AMENDMENT DETAILS	DATE
treatment to AS 4680	Aug 99

Roads and Traffic Authority NSW

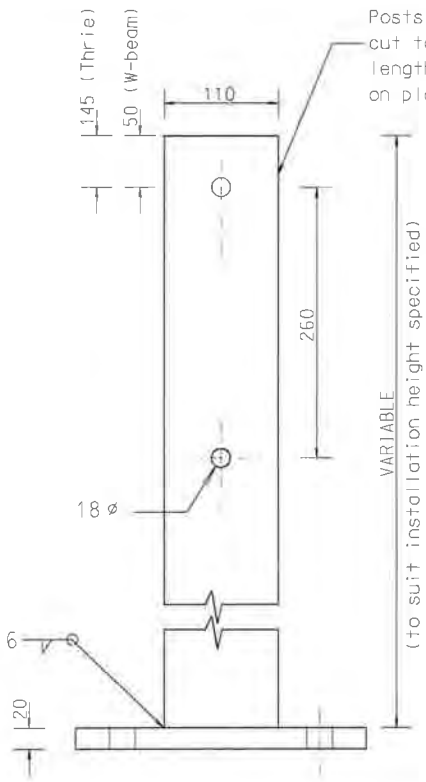
W BEAM AND THRIE BEAM SAFETY BARRIERS POST AND BLOCKOUT COMPONENTS

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

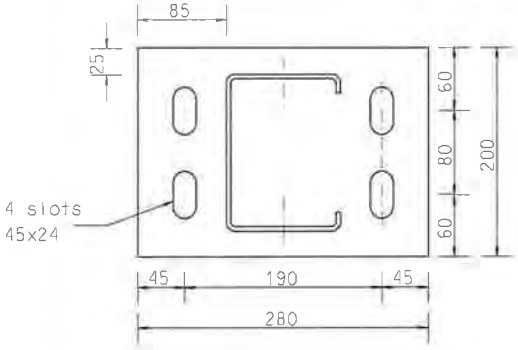
DRAWING NUMBER

MD.R132.A01.A.1

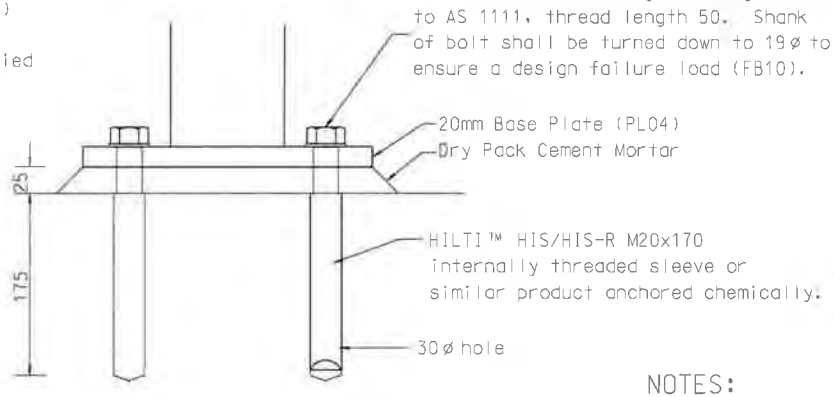
FIRST ISSUED : JULY 1996



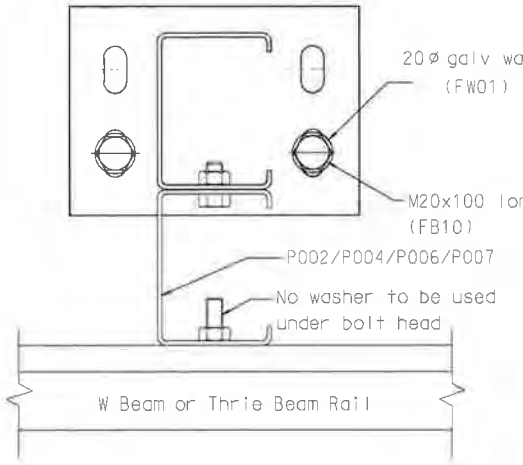
ELEVATION



20mm BASE PLATE
(PP01)



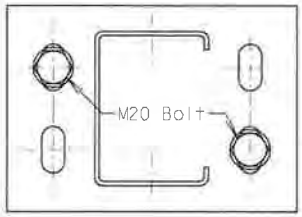
ELEVATION



DIRECTION OF TRAFFIC →

BASE PLATE
INSTALLATION DETAIL

DIRECTION OF TRAFFIC →



← DIRECTION OF TRAFFIC

MEDIAN - BACK TO BACK
BOLT CONFIGURATION

NOTES:

Posts are from 4.3 BMT plate grade Hd300 steel to AS 1594. Cross-section dimensions for posts are shown on MD.R132.A01
Steel base plate are to AS 3678, Grade Hd250.
Posts to be welded to base plate. Posts and plates hot dip galvanised to AS 4680 after fabrication.

Hexagon bolts to AS 1111 (grade 4.6). Black steel washers, series to AS 1237. Bolts and washers shall be hot dip galvanised in accordance with the requirements of AS 1214.

Two bolts are required to fasten the base plate to a rigid surface. The configuration of the bolt locations shall be as shown. Where base plates are used for median applications then different locations are used.

Bolts shall be snug tight to AS 4100.

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

All dimensions in millimetres unless otherwise shown

AMENDMENT DETAILS	DATE
treatment to AS 4680	Aug 99

Roads and Traffic Authority NSW

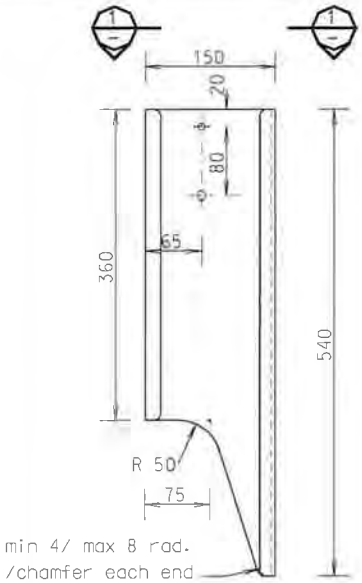
W BEAM AND THRIE BEAM
SAFETY BARRIER
POST ON BASE PLATE

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

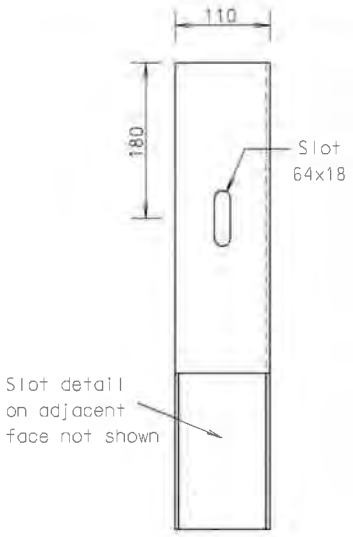
DRAWING NUMBER

MD.R132.A04.A.1

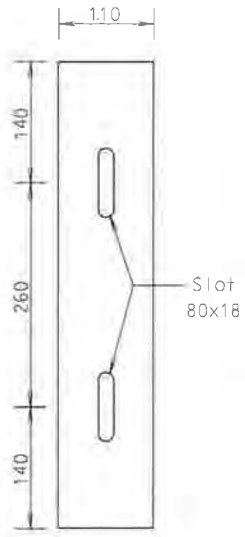
FIRST ISSUED : JULY 1996



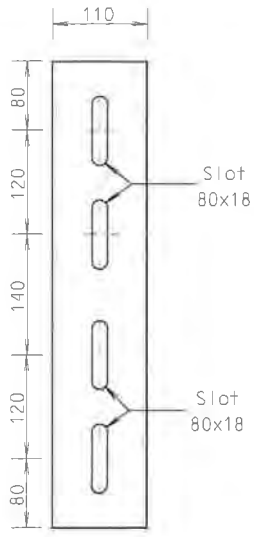
ABRAHAM BLOCKOUT NEARSIDE (P016–P017)



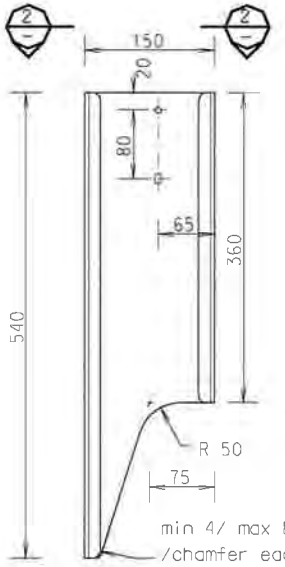
SECTION 3



60–120 RISE
(NS - P016, OS - P017)

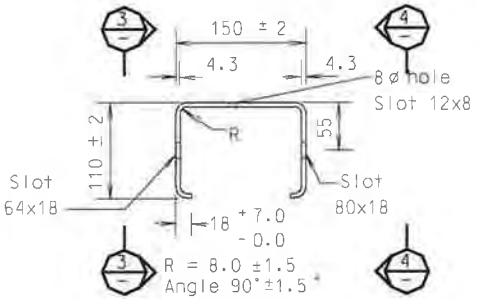


COMBINATION RISE
0–60 & 120–180
(NS - P018, OS - P019)



ABRAHAM BLOCKOUT OFFSIDE (P018–P019)

SECTION 4



SECTION 1

NOTES:

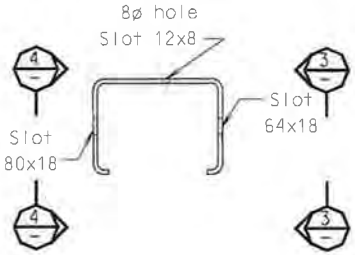
Blockout pieces are from 4.3 BMT plate, grade HA 300 steel to AS 1594, hot dip galvanised to AS 4680 after fabrication.

BMT = Base Metal Thickness

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

All dimensions in millimetres.

NS = Nearside (LHS)
OS = Offside (RHS on Single Carriageway)



See SECTION 1 for dimensions.

SECTION 2

These Blockouts can be used to raise W-beam rail height on existing posts up to 180mm.

AMENDMENT DETAILS	DATE
treatment to AS 4680	Aug 99
Delete sep. units 0-60 & 120-180	Sept 1997

Roads and Traffic Authority NSW

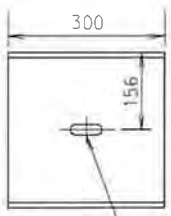
W BEAM SAFETY BARRIER
ABRAHAM BLOCKOUT FOR
RAISING RAIL HEIGHT ON EXIST POSTS

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

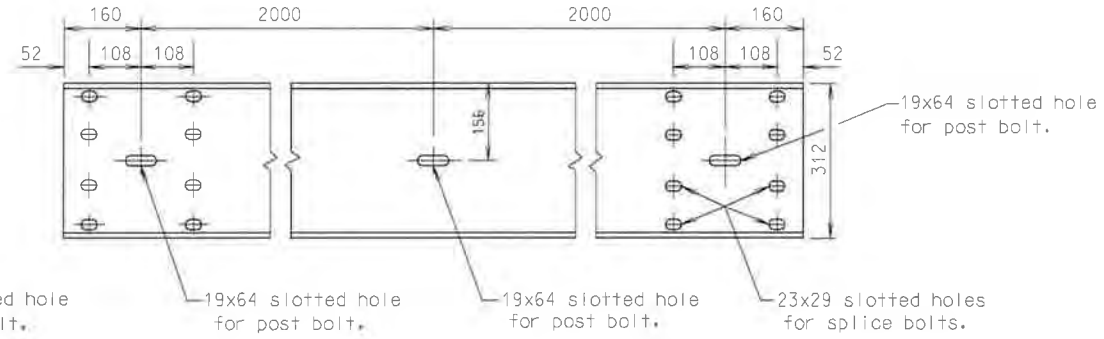
DRAWING NUMBER

MD.R132.A06.A.2

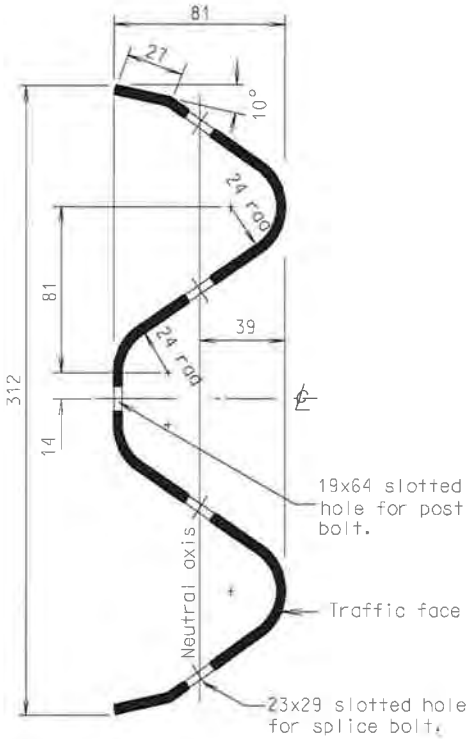
FIRST ISSUED : JAN 1997



STIFFENER
(B002)



RAIL
(B001)



SECTION THROUGH RAIL / STIFFENER
(Position of Slotted Holes Shown).

NOTES:

Rail and rail stiffening pieces are from 2.7 BMT Grade HA350 steel to AS 1594 and hot dip galvanised to AS 4680 after fabrication.
Flame cutting to rail is not permitted. Rail to be stamped 350/2.7 BMT (or similar) BMT = Base Metal Thickness.

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

All dimensions in millimetres unless otherwise shown.

AMENDMENT DETAILS	DATE
treatment to AS 4680	Aug 99

Roads and Traffic Authority NSW

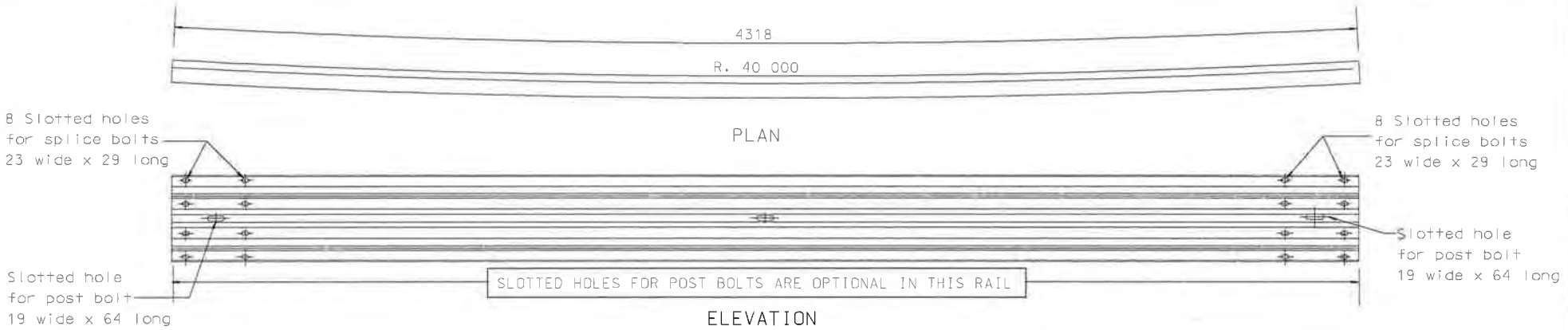
W BEAM RAIL AND STIFFENING PIECE CONNECTION

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

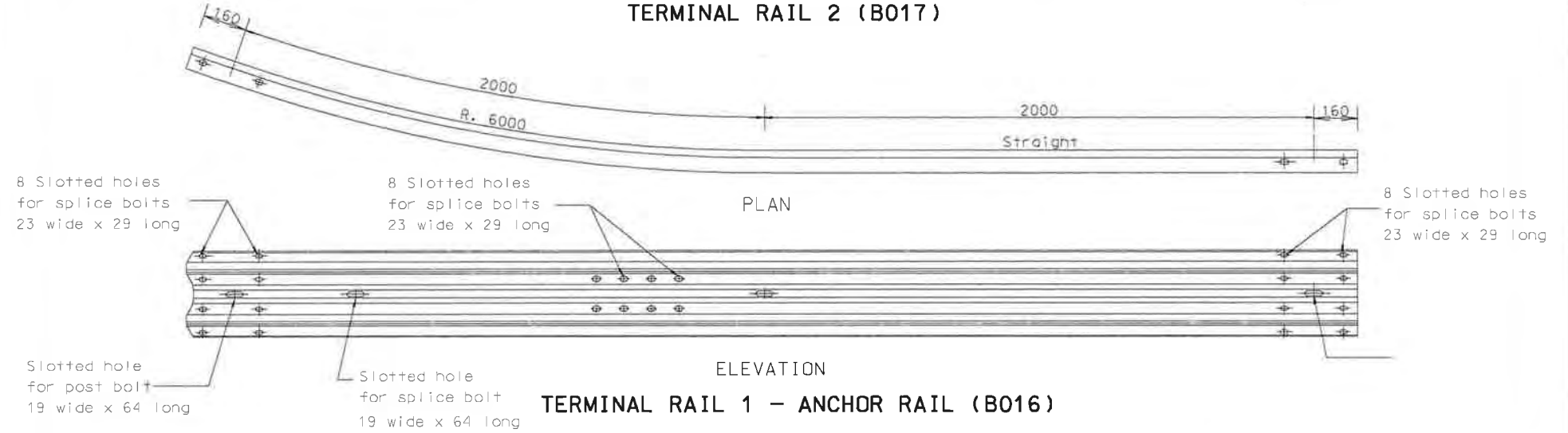
DRAWING NUMBER

MD.R132.B01.A.1

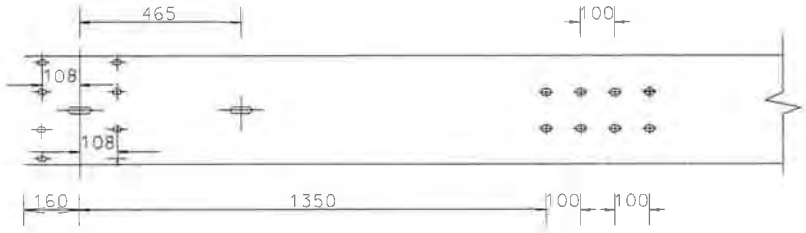
FIRST ISSUED : JULY 1996



TERMINAL RAIL 2 (B017)



TERMINAL RAIL 1 – ANCHOR RAIL (B016)



DETAIL A
SETOUT DIMENSIONS ON ANCHOR RAIL BEFORE CURVING

NOTES

Rail is from 2.7 BMT grade HA350 steel to AS 1594 and hot dipped galvanised to AS 4680 after fabrication. Flame cutting to rail is not permitted. Rail to be stamped 350/2.7 BMT (or similar)
BMT = Base Metal Thickness.

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

For section dimensions see Drawing No. MD.R132.B01

Dimensions are in millimetres unless otherwise shown.

AMENDMENT DETAILS	DATE
treatment to AS 4680	Aug 99
Dimen to slot B016, opt. holes	Sept 97

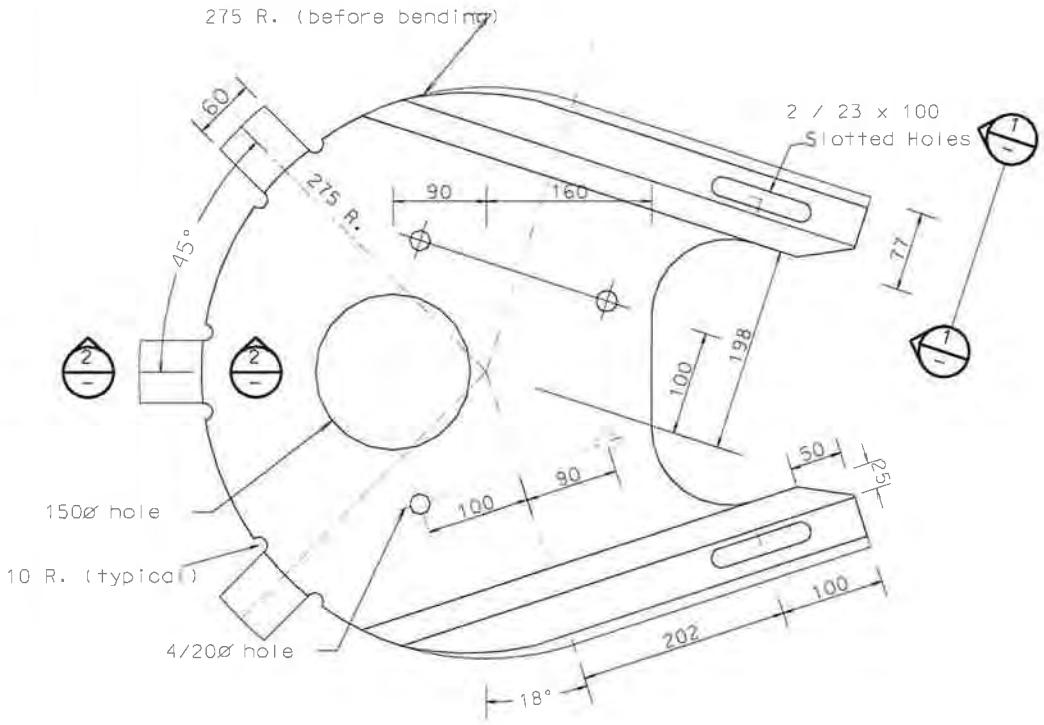
Roads and Traffic Authority NSW

MELT AND TT TERMINALS
W BEAM RAIL
DETAIL OF TERMINAL RAILS

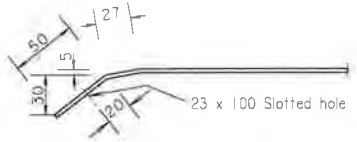
SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

DRAWING NUMBER
MD.R132.B09.A.2

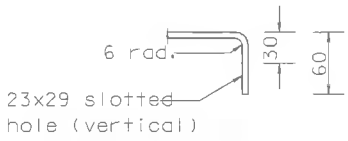
FIRST ISSUED : JULY 1996



DIAPHRAGM PLATE (B018)



SECTION 1



SECTION 2

NOTES:

Diaphragm from 3.0 BMT Grade HA250 steel to AS 1594 and hot dip galvanised to AS 4680 after fabrication.

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

Dimensions are in millimetres unless otherwise shown.

AMENDMENT DETAILS	DATE
treatment to AS 4680	Aug 99
Dimensions of Legs (18 deg)	Sept 97

Roads and Traffic Authority NSW

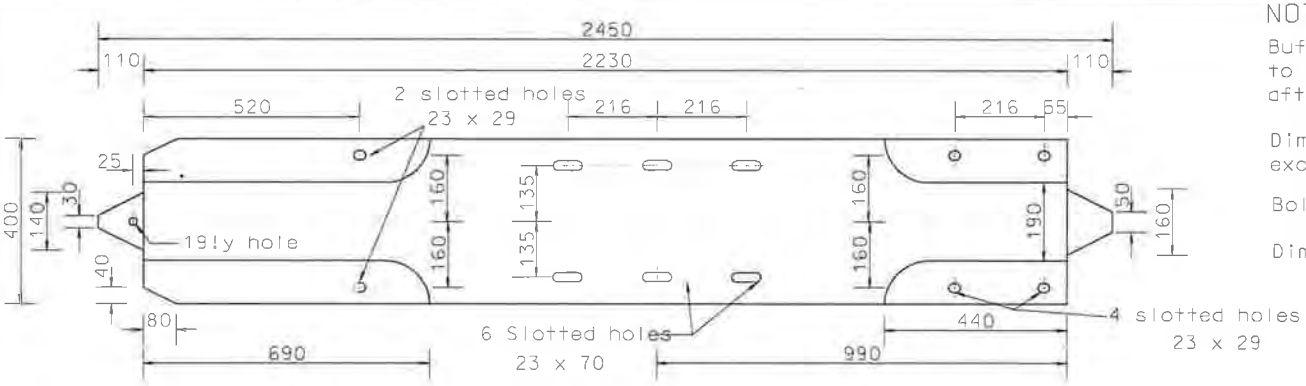
MODIFIED ECCENTRIC LOADER TERMINAL (MELT) DIAPHRAGM PLATE DETAILS

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

DRAWING NUMBER

MD.R132.B10.A.2

FIRST ISSUED : JULY 1996



DEVELOPMENT

BUFFERED END SECTION (B019)

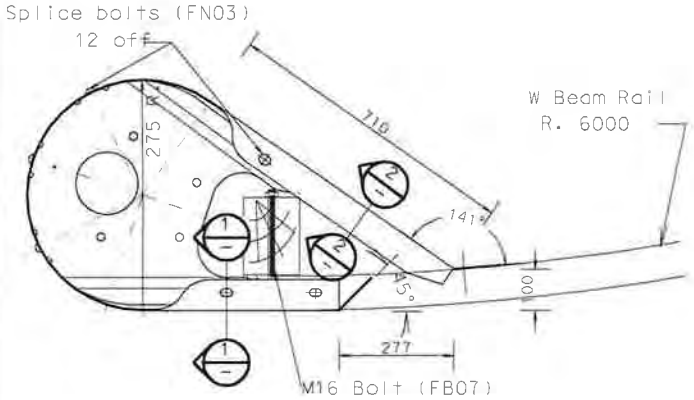
NOTES:

Buffered end section from 2.7 BMT Grade HA350 steel to AS 1594 and hot dip galvanised to AS 4680 after fabrication.

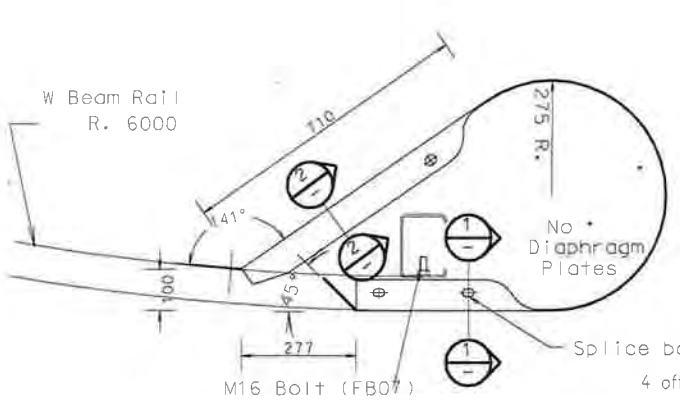
Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

Bolts / nuts shall be snug tight to AS 4100.

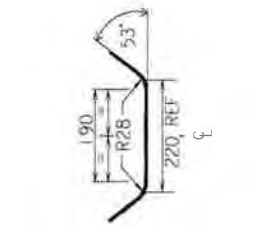
Dimensions are in millimetres unless otherwise shown.



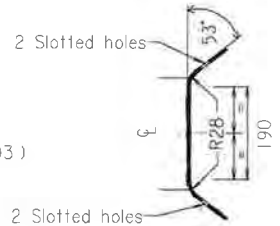
PLAN



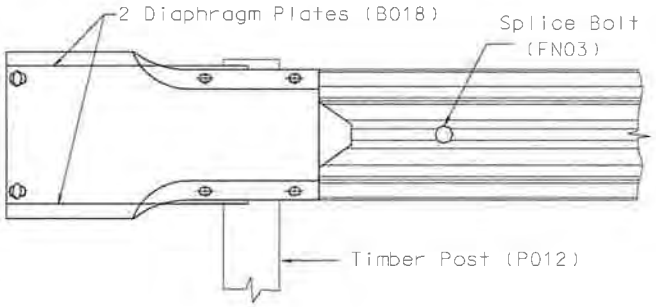
PLAN



SECTION 2
N.T.S.

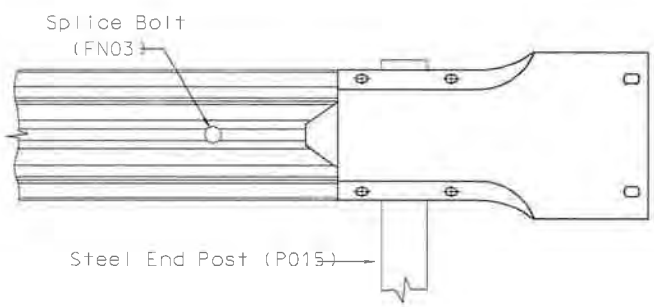


SECTION 1
N.T.S



ELEVATION

ASSEMBLED END - MELT



ELEVATION

ASSEMBLED END - TT

AMENDMENT DETAILS	DATE
treatment to AS 4680	Aug 99
Modified B019 - to fit diaphragms	Sept 97

Roads and Traffic Authority NSW

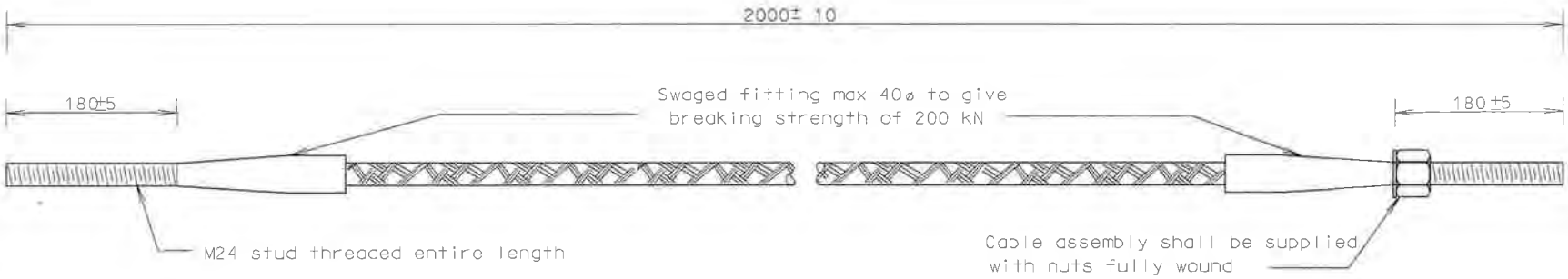
MODIFIED ECCENTRIC LOADER TERMINAL AND TRAILING TERMINAL (TT) BUFFERED END SECTION DETAILS

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

DRAWING NUMBER

MD.R132.B11.A.2

FIRST ISSUED : JULY 1996



CABLE ASSEMBLY (FC01)

NOTES

Cable to be minimum 20ø 6x19 or 6x25 wire strand core or independent wire rope core, galvanised, right regular lay to AS 3569.

Cable shall be supplied with two 36 thick M24 hexagon galanised steel nuts and two 5 thick gal. steel washers.

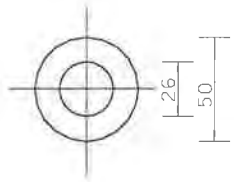
Hexagon nuts to AS 1112 (grade 5). Nuts shall be tapped to suit galvanised thread. Black steel washers , large series to AS 1237. Nuts and washers to be treated to AS 1627 and shall be hot dip galvanised in accordance with the requirements of AS 1214.

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

All nuts shall be snug tight to AS 4100.

All dimensions in millimetres unless otherwise shown.

M24 NUT FOR CABLE ASSEMBLY (FN05)



24ø GALV. ROUND WASHER (FW05)

AMENDMENT DETAILS	DATE
Supply with nuts fully wound	Sept 97

Roads and Traffic Authority NSW

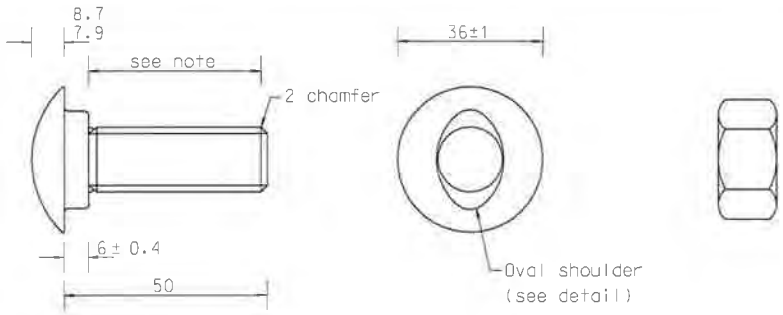
MODIFIED ECCENTRIC LOADER TERMINAL AND TRAILING TERMINAL (TT) CABLE ASSEMBLY AND FASTENERS

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

DRAWING NUMBER

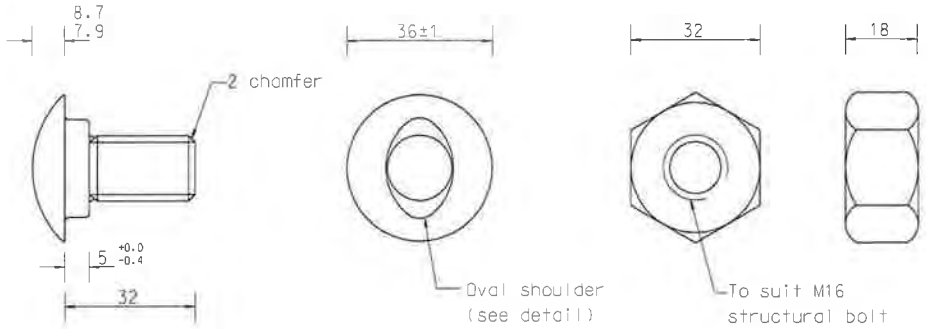
MD.R132.C01.A.1

FIRST ISSUED : JULY 1996



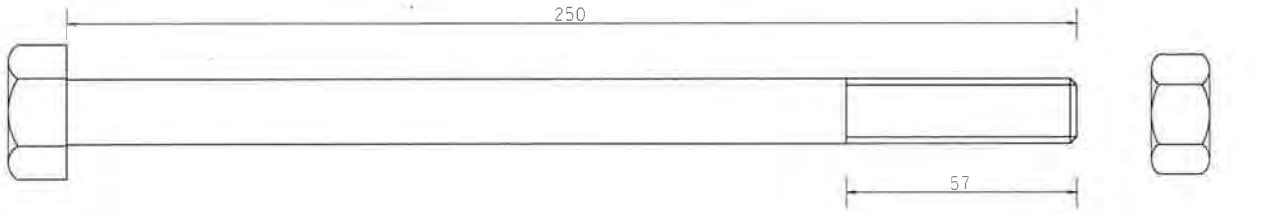
M16x50 POST BOLT HEAD M16 HEX. NUT

MUSHROOM HEAD POST BOLT (FB01) & NUT (FN01) FOR RAIL CONNECTION TO BLOCKOUT PIECE



M16x32 SPLICE BOLT HEAD OVERSIZED M16 HEX. NUT

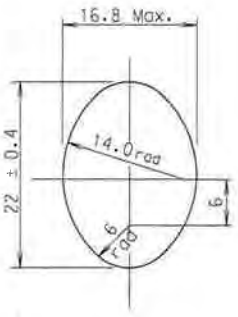
MUSHROOM HEAD SPLICE BOLT (FB03) AND OVERSIZED NUT (FN02) FOR RAIL TO RAIL CONNECTION



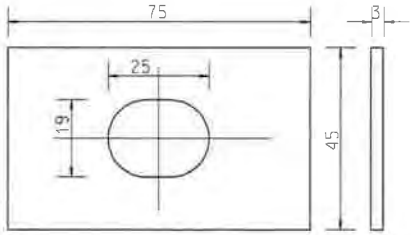
M16x250 POST BOLT

M16 HEX. NUT

HEXAGON HEAD POST BOLT (FB07) & NUT (FN01) FOR RAIL CONNECTION TO TIMBER POST #1 IN MELT



DETAIL OF SHOULDER



RECTANGULAR WASHER (FW03)

NOTES:

Post bolts FB01 & FB07 to have physical properties identical to AS 1111 (grade 4.6). Hexagon nut FN01 to AS 1112 (grade 5). Splice Bolt FB03 and nut FN02 to have physical properties identical to AS 1252 (class 8.8). Nuts shall be tapped to suit galvanised threads. Bolts, nuts and washers to be treated to AS 1627 and shall be hot dip galvanised in accordance with the requirements of AS 1214.

The length of thread on mushroom headed bolts FB01 & FB03 to be such that the nut shall touch the oval shoulder when tightened by hand.

Nuts shall be snug tight to AS 4100.

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated. All dimensions in millimetres unless otherwise shown.

AMENDMENT DETAILS	DATE
Bolt FB03 shoulder dimension amended	

Roads and Traffic Authority NSW

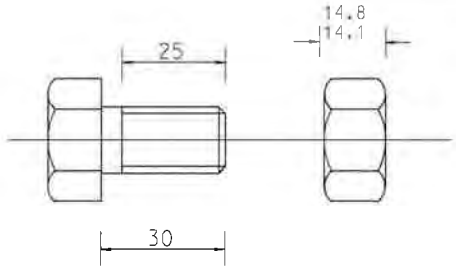
W BEAM AND THRIE BEAM RAIL FASTENER COMPONENTS M16 BOLTS & NUTS - RAIL

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

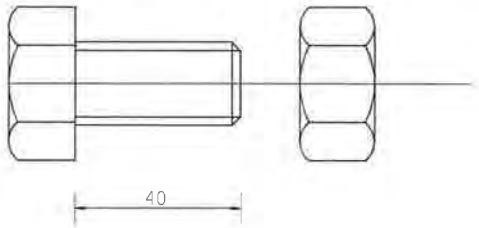
DRAWING NUMBER

MD.R132.C02.A.1

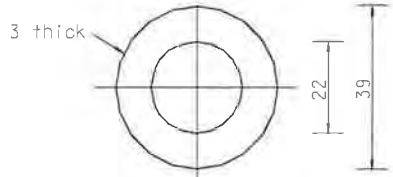
FIRST ISSUED : JULY 1996



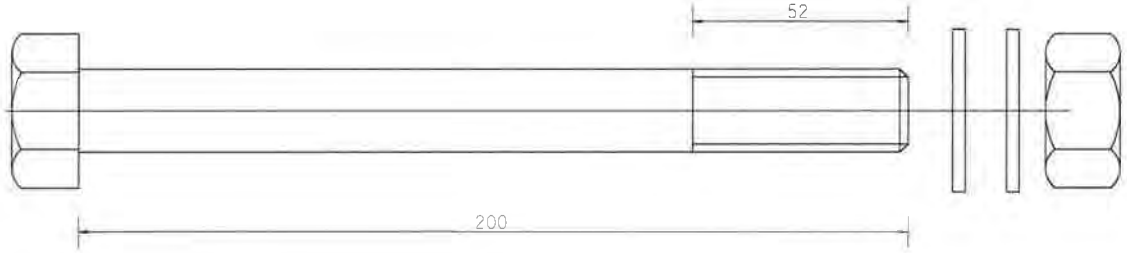
M16x30 BOLT (FB02) AND NUT (FN01)
BLOCKOUT CONNECTION TO POST



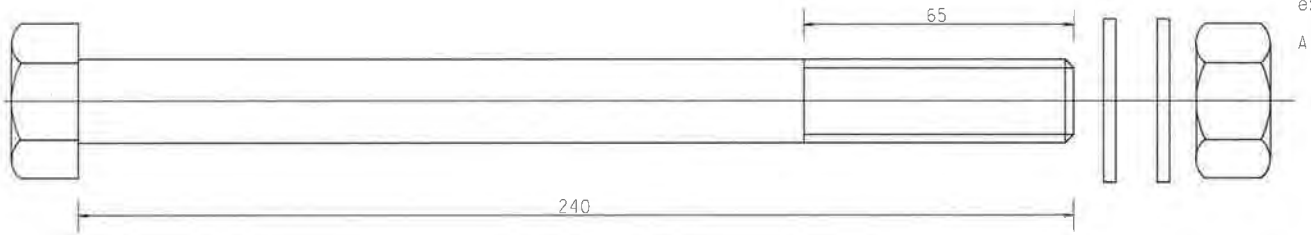
M20x40 BOLT (FB09) & NUT (FN04)
SOIL PLATE CONNECTION TO POST - TT



20⌀ GALV. ROUND
WASHER (FW01)



M20x200 BOLT (FB08),WASHERS (FW01) AND NUT (FN04)
SOIL PLATE CONNECTION TO STEEL TUBE - MELT



M20x240 BOLT (FB06), WASHERS (FW01) AND NUT (FN04)
STRUT AND YOKE CONNECTION TO STEEL TUBE - MELT

Hexagonal bolts to AS 1111 (grade 4.6). Hexagon nuts to AS 1112 (grade 5). Nuts shall be tapped to suit galvanised threads. Black steel washers, large series to AS 1237. Bolts nuts and washers to be treated to AS 1627 and hot dip galvanised ia accordance with the requirements of AS 1214.

Nuts shall be snug tight to AS 4100.

Dimensions are subject to manufacturer's tolerances except where allowable tolerances are nominated.

All dimensions in millimetres unless otherwise shown.

AMENDMENT DETAILS	DATE

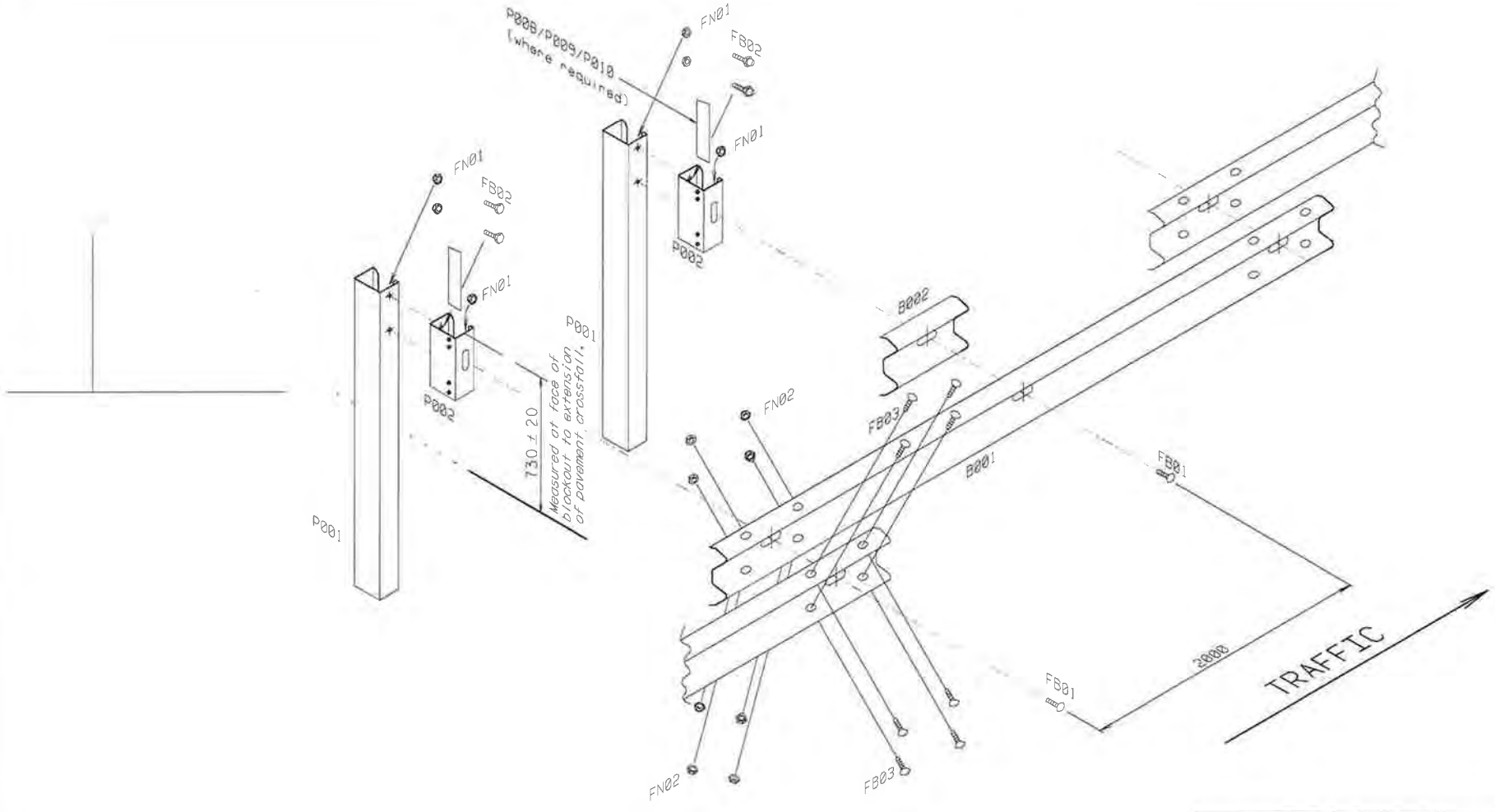
Roads and Traffic Authority NSW

W BEAM AND THRIE BEAM RAIL
FASTENER COMPONENTS
HEXAGON HEAD BOLTS AND NUTS

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

DRAWING NUMBER
MD.R132.C03.A

FIRST ISSUED : JULY 1996



SCHEDULE OF COMPONENTS

Item No - Ref Drawing	Description	Qty
P001 - MD.R132.A01	1800 Steel Post for W Beam	2
P002 - MD.R132.A01	360 Blockout Piece for W Beam	2
B001 - MD.R132.B01	4000 W Beam Rail	1
B002 - MD.R132.B01	300 W Beam Stiffening Piece	1
FB01 - MD.R132.C02	M16x50 Mushroom Head Bolt - Post	2
FB02 - MD.R132.C03	M16x30 Hexagon Bolt - Post	4
FB03 - MD.R132.C02	M16x32 Mushroom Head Bolt - Splice	8
FN01 - MD.R132.C02	M16 Nut	6
FN02 - MD.R132.C02	M16 Oversized Nut (18 deep)	8

NOTES:

Rail lap, post and blockout orientation in relation to traffic direction as shown is essential.

All dimensions shown in millimeters unless otherwise shown.

AMENDMENT DETAILS	DATE
Height of post 710 to 730	July 2001
Note for height of rail is measured	23/3/00

Roads and Traffic Authority NSW

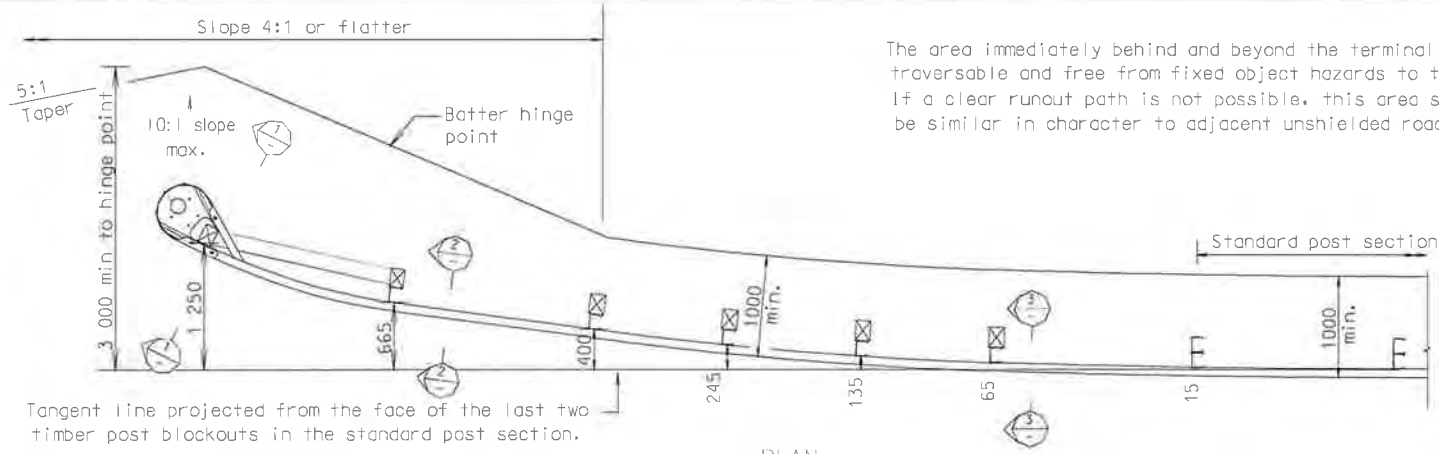
AASHTO G4 W BEAM ASSEMBLY

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

DRAWING NUMBER

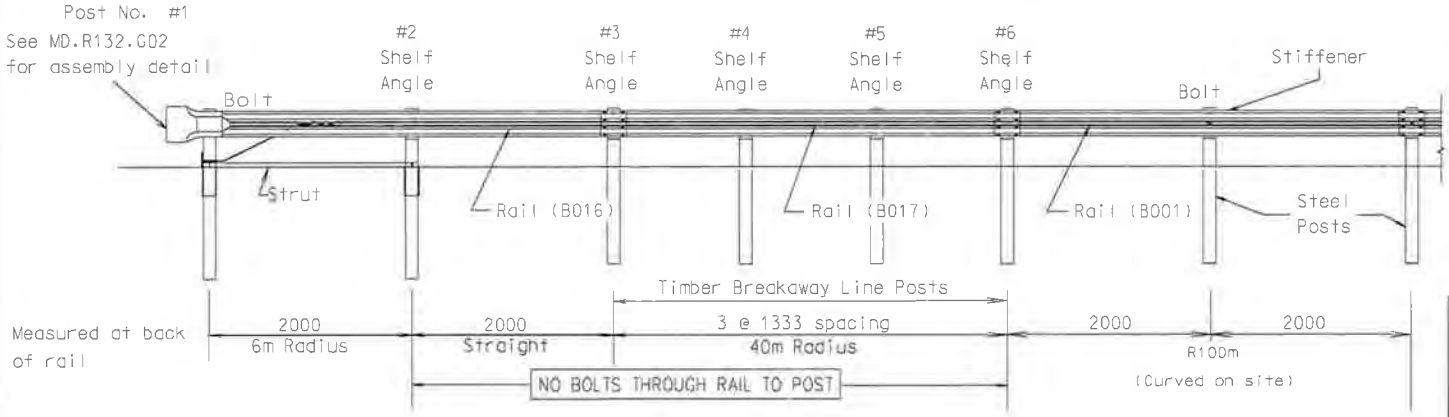
MD.R132.F01.A.2

FIRST ISSUED : JULY 1996



PLAN

The area immediately behind and beyond the terminal shall be reasonably traversable and free from fixed object hazards to the extent practicable. If a clear runout path is not possible, this area should at least be similar in character to adjacent unshielded roadside areas.



ELEVATION

NOTES:

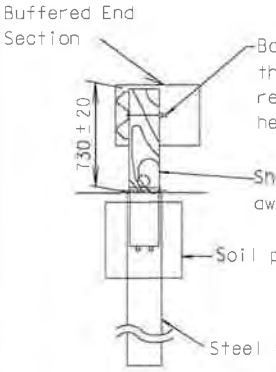
All timber posts shall be grade F8 Australian Slash Pine preservative treated to hazard level H4 (H5 in extreme wet conditions) to AS 1604.

All nuts shall be snug tight to AS 4100.

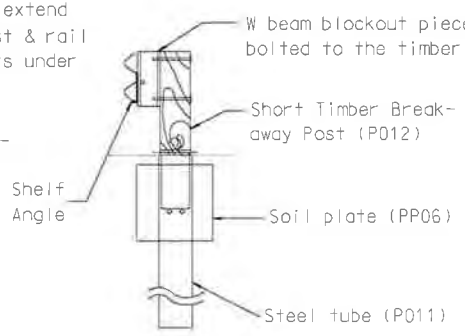
Flame cutting of galvanised posts and rail is not permitted.

Dimensions are in millimetres unless otherwise shown.

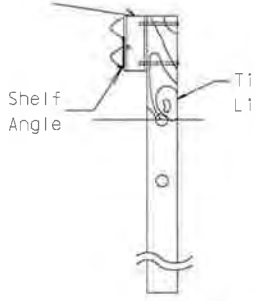
TOTAL LENGTH OF MELT IS 12m
HOWEVER
FOR SCHEDULES OF QUANTITY AND PAYMENT
The MELT system extends from Post #1 to Post #6, a length of 8 metres.



SECTION 1
N.T.S.
(Timber post No. #1)



SECTION 2
N.T.S.
(Timber post No.#2)



SECTION 3
N.T.S.
(Timber posts No.s #3, #4, #5 & #6)

AMENDMENT DETAILS	DATE
Height to blockout 710 to 730	July 2001

Roads and Traffic Authority NSW

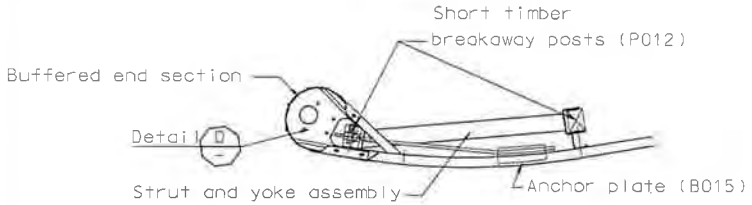
MODIFIED ECCENTRIC LOADER TERMINAL (MELT) GENERAL ARRANGEMENT

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

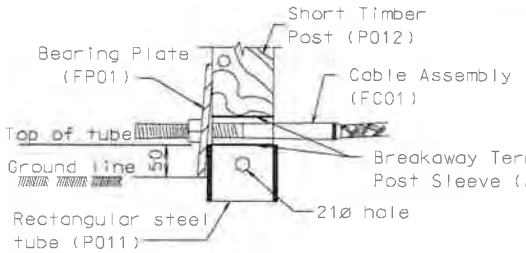
DRAWING NUMBER

MD.R132.G01.B

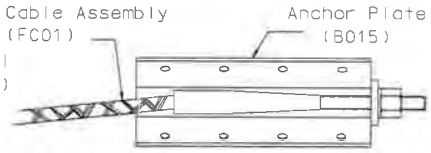
FIRST ISSUED = JULY 1996



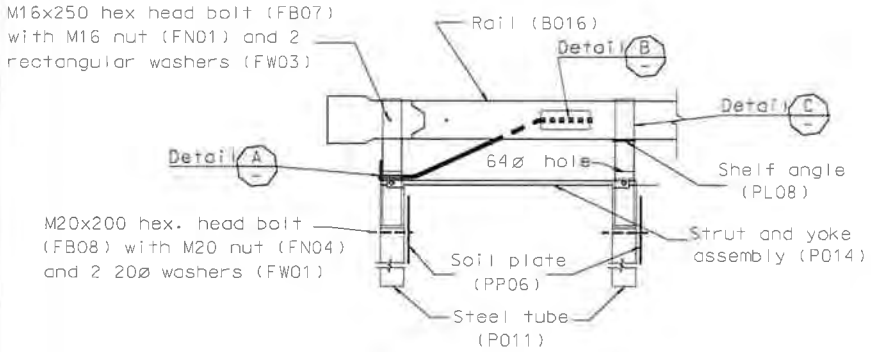
PLAN



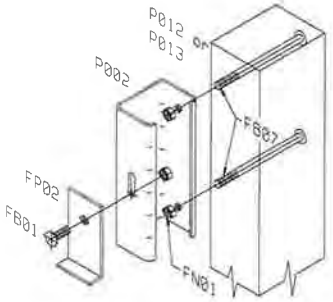
DETAIL A END POST



DETAIL B

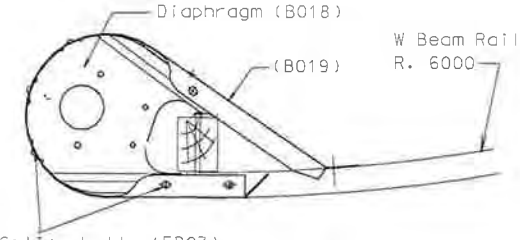


ELEVATION
BUFFERED END & ANCHORAGE ASSEMBLY



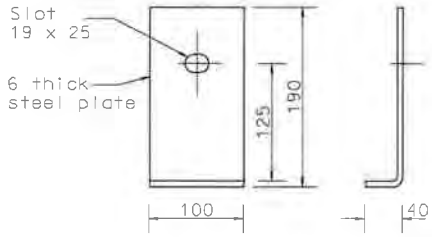
DETAIL C

SHELF ANGLE & BLOCK ASSEMBLY
POSTS #2 TO #6

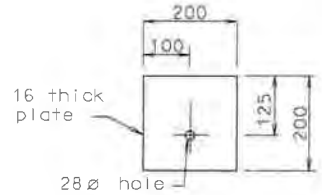


DETAIL D

BUFFERED END SECTION



SHELF ANGLE (FP02)



BEARING PLATE (FP01)

NOTES: Dimensions are in millemetres unless otherwise shown

Dimensions are subject to manufacturers tolerances except where allowable tolerances are nominated.

All nuts shall be snug tight to AS 4100.

Refer to MD.R132.F06 for post installation

TO BE READ IN CONJUNCTION
WITH MD.R132.G01

AMENDMENT DETAILS	DATE
Note: To be read in conj. MD.R132.G01	March 2001
Buffered End Section	Oct 1997

Roads and Traffic Authority NSW

MODIFIED ECCENTRIC
LOADER TERMINAL (MELT)
BUFFERED END & ANCHORAGE DETAIL

SCALE	No. OF SHEETS	SHEET No.
N.T.S.	1	1

DRAWING NUMBER

MD.R132.G02.A.2

FIRST ISSUED : JULY 1998

Roads & Maritime

Sign detail

Hazard marker (bi-directional)

Sign No:	D4-2-3
Descriptions	Hazard marker (bi-directional)
Standard sign?	Yes
Delegated to council for authorisation	Not Required
Legislative Reference	NA
Primary Technical Reference	AS1742.2 (Devices) Clause 4.6.7.2(b)
Additional Primary Technical References	Delineation (Roads and Maritime Services) - Section 17

Sign Design

Sign Graphic

Size	A
Width	1600
Height	400
RMS Cat No.	35030006
Size	B
Width	3200
Height	800
RMS Cat No.	35030007* (size shown (600x600) in IMS Material Display is in correct)
Symbols/Legend	Cl 1 White
Background	Black
Edge	-
Border	-
Notes:	Sign design not currently available in AS1743. Seek advice from technical.directions.publication@rms.nsw.gov.au

No design plan.