AUS-SPEC

Infrastructure Specifications

1193 Guide posts

1193 GUIDE POSTS

IMPORTANT: This document has been adapted from the NATSPEC suite of specification templates for use in the Cessnock City Council area by both Council and industry. NATSPEC regularly updates the base templates (currently in April and October each year), and Council may incorporate changes into its version of AUS-SPEC from time to time. To assist in highlighting any changes made by Council to the NATSPEC templates, the following conventions are used.

- See ANNEXURE M at the end of this document which contains (where practical) Cessnock City Council customisations (also known as 'office master' text). References to the Annexure are to also be inserted at relevant clauses in the main body of the document.
- Where content is added to the main body of the document, it is to be shown in brown text like this.
- Where content is deleted or excluded from the main body of the document, it is to be shown ~~struck through like this~~. Such clauses are to have no effect.

Where there is a conflict between main body text and Cessnock City Council specific clauses, Council's specific clauses shall prevail.

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide guide posts, delineators, and remove and dispose of existing posts, as documented.

1.2 CROSS REFERENCES

General

Requirement: This worksection is not a self-contained specification. In addition to the requirements of this worksection, conform to the following:

- *0136 General requirements (Construction)*.
- *0152 Schedule of rates (Construction)*.
- *0161 Quality management (Construction)*.
- *1101 Traffic management*.

1.3 INTERPRETATION

Definitions

General: For the purposes of this worksection the following definitions apply:

- Delineator: Small retroreflectors or panels of retroreflective sheeting attached to guide posts to provide a coherent pattern of delineation of carriageway edges as an aid to night driving.
- Flexible guide post: A guide post that when impacted by a vehicle, deflects and returns to the vertical position without maintenance intervention.
- Guide post: Post used to mark the edge of the road carriageway. They assist the road user by indicating the alignment of the road ahead, especially at horizontal and vertical curves, and in some cases, provide a gauge with which to assess available sight distance.
- Rigid guide post: Not acceptable in the Cessnock City area. A guide post which when impacted by a vehicle, fails by fracturing or remains intact and straight, but not vertical.
- Semi-flexible guide post: : Not preferred, use only in circumstances approved by the roads authority. A guide post which when impacted by a vehicle, fails by bending but can be straightened with maintenance intervention.

1.4 TOLERANCES

Maximum guide post installation tolerances

Verticality: 3° from the true vertical position.

Height: 25 mm of the uniform profile height.

Location (in plan): In relation to the control line of the road, conform to the following:

- 200 mm longitudinally of the documented spacing.
- 100 mm transversely of the documented position.

1.5 SUBMISSIONS

Design documentation
Set-out drawings: Submit set-out of post locations.

Execution details
Guide posts fixed to concrete pavements: Submit details of post fixing to the concrete.

Proprietary guide posts: Submit manufacturer's instructions for anchorage.

Products and materials
Post product data: Submit details of the proposed guide post including the following:

- Requirement: To RMS QA Specification 3412 – Supply of Guide Posts (Non-timber).
- Type of material. Timber posts are not permitted in the Cessnock City Council area and metal posts are not permitted unless semi-flexible guide posts are approved for use. See Clause 2.1.
- Manufacturer's recommended installation procedures.
- Technical specifications.

Tests
Requirement: Submit results, as follows:

- Post strength.
- Flexibility.
- Impact and heat and cold resistance.
- Durability.

Warranties
Manufacturer's warranty: Submit the manufacturer's published product warranties.

1.6 INSPECTIONS

Notice
General: Give notice so that inspection may be made of the following:

- Location of guide posts: Completed post set-out.
- Installation of guide post:
  - Posts set in natural ground: After completion of backfilling for posts.
  - Posts set in concrete pavement: After completion of post fixings.
- Removal and disposal of existing guide posts: Completed reinstatement of surrounding material including backfilling.

2 MATERIALS

2.1 GENERAL

Guide post materials
Flexible guide posts: Plastic, rubber or similar.

Semi-flexible guide posts: ~~Plastic, metal or other~~ If approved for use, metal only..

Rigid guide posts: ~~Metal or non-timber material~~ Not acceptable..

Guide post selection table

Post type	Traffic and road condition
Flexible guide posts	Posts are likely to be struck by vehicles, e.g. adjacent to driveways, tight curves and narrow shoulders.
Guide posts hinged at ground level	Roads with high volumes of motor cycles or bicycles.
~~Timber or~~ semi-flexible guide posts	Posts unlikely to be struck by vehicles.

2.2 PROPRIETARY NON-TIMBER POSTS

General

Type and material: ~~Metallic or~~ flexible, plastic, driveable or non-driveable, posts.

Surface finish of posts: Durable gloss or semi-gloss opaque white which is smooth and easy to clean.

- Colour: Whiter than Y35 Off White of AS 2700 (2011).

Resistance to impact: Post is resistant to overturning, twisting and displacement from wind and impact forces when installed in the ground to the manufacturer's recommendations.

Dimensions

Minimum height above ground surface: 1000 ±100 mm.

Minimum width of post above ground: One face of 100 ±5 mm.

Thickness: ~~50 ±5 mm~~ To RMS Specification 3412.

Anchorage

Requirement: Resistant to bending, twisting and displacement by wind and/or impact forces.

Resistance to removal: Cannot be removed by persons other than personnel using recommended removal tools.

Markings

Traceability: Mark each post legibly and indelibly with the following:

- Name of the supplier.
- Month and year of manufacture.

Letter size: 5 to 10 mm high.

Marking placement: On at least one side and 500 mm from the top of the post.

Marking of ground level: Mark 1000 mm from the top of the post.

End treatment

Top cap: Fit posts manufactured from thin walled hollow sections or sheet material less than 10 mm thick with a cap on the top of the post.

Cap dimensions: Cover the whole top of the post .

- Minimum dimensions: 100 x 25 mm.

Cap type: Rounded with no sharp edges, and of the same colour and durability as the guide post.

Attachment: Attach cap so that it cannot be dislodged from the post by a force of 500 N pulling on the cap in a direction away from the post.

Top of plastic posts: Have rounded edges and corners.

Physical properties and performance

Durability: No deterioration of post material after minimum 720 hours under accelerated weatherometer testing.

2.3 NON-TIMBER POST TESTS

Physical properties after testing

Deflection tolerance: 50 mm maximum.

Acceptable physical condition of post: No fractures, cracks or splits.

Heat resistance – flexible guide posts

Heating: Condition posts at 60 ±2°C for 2 hours in an oven.

Test procedure: Conform to the following:

- After conditioning, remove the post from the oven and clamp the base so that the post is vertical and protruding 1000 mm from the post top.
- Bend the conditioned post adjacent to the clamp in the direction of the adjacent traffic flow to form a 90° angle.
- Subject the post to 3 cycles of bending through 180° within 2 minutes of its removal from the oven so that the post is bent in a right angle. Release the post after the third cycle.
- Record the physical condition and horizontal deflection at the top of the post from a vertical line 30 seconds after release from the bent position.

Cold resistance – flexible and semi-flexible guide posts

Cooling: Condition post at 0 ±2°C for 2 hours in an ice bath.

Test procedures for metallic and non-metallic posts: Conform to the following:

- After conditioning, remove post from the ice bath and clamp in a vertical position with the top of the post protruding 1000 mm.
- Bend the conditioned post adjacent to the clamp in the direction of the adjacent traffic flow to form a 90° angle within 30 seconds of its removal from the ice bath.
- Manually straighten semi-flexible posts.
- Release the post from the clamp 60 seconds after removing it from the ice bath and place in the ice bath for an additional 60 seconds.
- Repeat the bending and ice bath procedure three times and conform to the following:
  . Semi-flexible posts: Manually straighten.
  . Flexible posts: Release post from the bent position and record the horizontal deflection at the top of the post from a vertical line 60 seconds after release.

Non-metallic posts: After completing test procedures for metallic and non-metallic posts, conform to the following:

- Return the post to ice bath for 60 seconds minimum.
- Remove the post from ice bath and place in a horizontal position, securely clamped so that the minimum clear length between supports is 1000 mm.
- Drop a 1 kg steel ball for a distance of 1500 mm vertically through a low friction guide so that it impacts the centre face of the post displayed towards the traffic.
- Recondition post in ice bath for 60 seconds.
- Repeat ball dropping and reconditioning procedures. After the fifth ball drop, record the condition of the post.

Rigidity tests

Testing conditions: Conduct tests under the following conditions:

- Temperature: At 23 ±2°C.
- Clamps: Shape jaws of clamps to suit post profile so that the post cannot rotate in the clamp.

~~Rigid guide post test procedures: Conform to the following:~~

- ~~Securely clamp post to a bench in a horizontal position with the top of post unsupported and protruding 1000 mm.~~
- ~~Apply a 10 kg mass to a point 50 mm from the top of the post, in the direction of adjacent traffic flow. Continue to add mass in 10 kg increments until post fractures.~~
- ~~Record mass at which fracture occurs.~~

Flexible and semi-flexible guide post test procedures: Conform to the following:

- Securely clamp post to a bench in a horizontal position with the top of post unsupported and protruding 1000 mm.
- Bend the post adjacent to the clamp in the direction of adjacent traffic flow to 90° and straighten. Repeat this procedure 10 times with maximum 3 minute intervals between procedures.
- Apply a 0.9 kg mass to a point 50 mm from the top of the post, in the direction of adjacent traffic flow. Record the vertical deflection of post top from its original position.
- Remove mass and record the final deflection.

Alternative testing procedures for flexible and semi-flexible guide posts: Conduct testing as for standard testing procedures. Instead of applying a mass, conduct testing in a wind tunnel with an wind speed of 12.5 m/s applied in the direction of the adjacent traffic flow.

Maximum rigidity of flexible and semi-flexible guide posts test procedures: Conform to the following:

- Securely clamp post to a bench in a horizontal position with the top of post unsupported and protruding 1000 mm.
- Apply a 10 kg mass to a point 50 mm from the top of the post, in the direction of adjacent traffic flow.
- Record the vertical deflection of post top from its original position.

Rigidity test results table

Guide post type and test	Property	Acceptable range
Rigid (Not used)	~~Applied mass when fracture occurs~~	~~30 to 100 kg~~

Guide post type and test	Property	Acceptable range
Flexible and semi-flexible: Maximum deflection	Minimum deflection when mass is applied	500 mm from original position
Flexible and semi-flexible	Maximum vertical deflection of post top when mass is applied	130 mm from original position
	Unassisted return of post to its original position when mass is removed	Within 10 minutes
	Final deflection when mass is removed	Maximum 10 mm from vertical position
Flexible and semi-flexible: When tested in a wind tunnel	Wind speed post is able to withstand	12.5 m/s
	Maximum horizontal deflection of post top when wind is applied	130 mm from original position
	Unassisted return of post to its original position when wind is removed	Return to 10 mm maximum from vertical position

2.4 TIMBER POSTS

Requirement: Timber posts are not permitted in the Council area.

~~**Description**~~

~~Cross section: Rectangular.~~

~~Structural properties: To AS/NZS 1748.1 (2011) and AS/NZS 1748.2 (2011).~~

~~Surfaces: Smooth and free from obvious saw marks.~~

~~Dimensions: 100 x 50 mm finished size x 1400 mm long.~~

~~Post top: Slope the 90 mm face 10 mm lower than the opposite edge.~~

~~**Hardwood**~~

~~Natural durability class of the species supplied: To AS 5604 (2022).~~

~~Minimum Hazard Class: H4 to AS/NZS 1604.1 (2021).~~

~~Minimum preservative retention treatment: To AS/NZS 1604.1 (2021) Table 5.3.~~

~~Grade: Structural grade No.4 to AS 2082 (2007).~~

~~**Softwood**~~

~~Minimum Hazard Class: H4 to AS/NZS 1604.1 (2021).~~

~~Minimum preservative retention treatment: To AS/NZS 1604.1 (2021) Table 5.3.~~

~~Grade: Structural grade No.5 to AS 2858 (2008).~~

~~**Finish**~~

~~Preparation: Stop holes, cracks and other imperfections with white putty after applying primer coat.~~

~~Paint coating system:~~

~~- Primer: One coat of latex wood primer to AS 3730.17 (2006).~~

~~. Preservative treated posts: Apply solvent-borne primer followed by the latex primer.~~

~~- Undercoat: One coat of latex undercoat for exterior applications to AS 3730.18 (2006).~~

~~- Top coat: One coat of gloss latex for exterior applications to AS 3730.10 (2006).~~

~~Application: To AS/NZS 2311 (2017) Section 6.~~

~~Colour: White.~~

~~**Extent of preservative treatment**~~

~~Natural durability class 1 or 2 with less than 20% sapwood cross section: No treatment.~~

~~Natural durability class 1 or 2 with more than 20% sapwood cross section: Full treatment.~~

~~Natural durability class 3 or 4: Full treatment.~~

2.5 DELINEATORS

General

Properties: To AS/NZS 1906.2 (2007).

Type: Provide one of the following for each post:

- Corner-cubed: 80 to 85 mm diameter.

- Class 1A retroflective sheeting:
  . Minimum area: 0.01 m².
  . Minimum width: 50 mm.

Colour: To AS 1742.2 (2022) clause 5.2.6.

3 EXECUTION

3.1 ESTABLISHMENT

Safety

Precautions: The flexible and semi-flexible guideposts that may be permitted in the Cessnock City area do not equire post holes to be bored. If excavation is required, restrict site access to prevent people and stock from stepping into the post holes during the erection of posts.

Existing underground services

Services laid in close proximity to the guide posts: Locate before placement of footings and protect from damage.

Location of guide posts

Location: To AS 1742.2 (2022) clause 4.2.4 and as documented.

Placement: Place posts at a uniform distance from the pavement edge and as follows:

- Shoulder adjacent to an embankment or at the surrounding natural surface level: Place post so that the inside edge is in line with the outside edge of the shoulder.
- Shoulder located in a cutting: Place post on the road pavement side of the table drain so that it does not impede water flow in the drain.

3.2 INSTALLATION OF GUIDE POSTS

Positioning

Requirement: Set posts vertically in the shoulder pavement as follows:

- Orientation: angled towards flow of traffic as per manufacturers' recommendations.
- Embedded depth:
  . Rigid and timber guide posts: ~~500 mm minimum.~~ Not permitted.
  . Flexible and semi-flexible guide posts (where permitted): 350 mm minimum.
- Shoulder irregularities: Vary embedded depth to provide uniform post height above ground level, with the tops evenly graded.
- Post position in relation to road: Install each post with 100 mm axis at right angles to the centre line of the road.

Vertical alignment

Post height allowance: To keep the posts within the range of the beam of vehicle headlights, allow for the effects of superelevation and other road geometry.

Posts installed in natural ground

Posts for which driving is not recommended Not used: ~~Erect inside excavated holes. Backfill and compact around post after erection.~~

~~**Backfilling**~~

~~Backfill material: Use the excavated material. If relative compaction cannot be achieved using the excavated material, use imported fill and remove excavated material from site.~~

~~Imported backfill properties: Similar to the shoulder material.~~

~~Backfilling and compacting: Backfill the posts firm in the ground as follows:~~

- ~~Compact in layers not more than 150 mm for the full depth of the post up to ground level.~~
- ~~Density of the compacted backfilling: Not less than that of the adjacent undisturbed ground.~~
- ~~Relative compaction of the compacted backfill material: Not less than that of the adjacent shoulder material.~~

3.3 DELINEATORS

Fixing

Delineator position: Centrally locate delineators between the edges of the post, with the top of each delineator finishing 50 to 100 mm below the top of the post.

Fixings: Fix the delineators to the post so that they are weatherproof and vandal resistant, and can be replaced without damaging the post.

- Timber posts: Fix corner-cubed delineators to post with one-way, anti-theft screws.
- Proprietary posts: Glue or fasten so that delineators cannot be dislodged by vehicular impact.

Corner-cube delineators that can be damaged by vehicular impact: Do not use on flexible or semi-flexible guide posts.

Arrangement: Arrange the delineators so that drivers approaching from either direction will see only red delineators on their left side and white delineators on their right side.

Consistency: Provide the same type of delineator on each post for a minimum distance of 2 km. Do not change delineator type within this distance.

3.4 EXISTING GUIDE POSTS

Removal and disposal of existing guide posts

Removal: Extract and dispose of all posts and other in-ground components and materials, as documented.

Backfilling: Backfill all holes after removal of existing guide posts and compact to the relative compaction of the surrounding shoulder material in maximum 150 mm deep layers.

- Imported backfill material properties: Similar to the shoulder material.

Recycle: Existing posts manufactured from recyclable materials.

4 ANNEXURE A

4.1 ANNEXURE – SUMMARY OF HOLD AND WITNESS POINTS

For private developments, certain Hold and Witness Points where specifically noted below require representatives of both the Superintendent and the Principal Certifier (e.g. Council) to authorise release.

Clause and description	Type	Submission/Inspection details	Submission/Notice times	Process held
SUBMISSIONS, Products and materials Post product data	H	Details of proposed guide posts.	2 weeks before manufacturing	Material ordering and delivery
SUBMISSIONS, Design documentation Set-out drawings	H	Set-out drawings of post location.	5 days before installation	Post installation
SUBMISSIONS, Execution details Guide posts fixed to concrete pavement	H	Details of post fixing to the concrete.	5 days before installation	Post installation
INSPECTIONS, Notice Location of guide posts	H	Completed post set-out.	5 days before installation	Post installation
INSPECTIONS, Notice	W – Superintendent	Completed post installation.	1 day before inspection	-

Clause and description	Type	Submission/Inspection details	Submission/Notice times	Process held
Installation of guide posts	and Principal Certifier			
INSPECTIONS, Notice Removal and disposal of existing guide posts	W – Superintendent and Principal Certifier	Completed reinstatement of surrounding materials.	1 day before inspection	-
Note: H = Hold Point, W = Witness Point				

4.2 ANNEXURE – PAY ITEMS

This Annexure applies to Council projects. For private development works use of this schedule is optional, at the Superintendent's discretion.

Pay items	Unit of measurement	Schedule rate inclusions
1193.1 Guide posts (Supply and erect)	Each guide post	All costs associated with the erection of each post, including supply of post, erection, painting (if applicable), and supply and fixing of corner-cubed delineators.
1193.2 Removal of existing guide posts	Each guide post	All cost associated with the supply, placement and compaction of backfill material for the reinstatement of post hole and the collection and disposal of the existing post.
Traffic management		To *1101 Traffic management*.

4.3 ANNEXURE - REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

AS/NZS 1604		Preservative-treated wood-based products
AS/NZS 1604.1	2021	Products and treatment
AS 1742		Manual of uniform traffic control devices
AS 1742.2	2022	Traffic control devices for general use
AS/NZS 1748		Timber - Solid - Stress-graded for structural purposes
AS/NZS 1748.1	2011	General requirements
AS/NZS 1748.2	2011	Qualification of grading method
AS 1906		Retroreflective materials and devices for road traffic control purposes
AS/NZS 1906.2	2007	Retroreflective devices (non-pavement application)
AS 2082	2007	Timber - Hardwood - Visually stress-graded for structural purposes
AS/NZS 2311	2017	Guide to the painting of buildings
AS 2700	2011	Colour standards for general purposes
AS 2858	2008	Timber - Softwood - Visually stress-graded for structural purposes
AS 3730		Guide to the properties of paints for buildings
AS 3730.10	2006	Latex - Exterior - Gloss
AS 3730.17	2006	Primer - Wood - Latex - Interior/exterior
AS 3730.18	2006	Undercoat/sealer - Latex - Interior/exterior
AS 5604	2022	Timber - Natural durability ratings
EN 15804	2012	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
ISO 14025	2006	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 21930	2017	Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services
RMS 3412	2013	QA Specification: Supply of Guide Posts (Non-timber)

5 ANNEXURE M – CESSNOCK CITY COUNCIL SPECIFIC CLAUSES

M1.	Variations to or non-conformances with Council's AUS-SPEC are to be evaluated with reference to the procedure in Council's *Development Engineering Handbook*. Acceptance is to be obtained in writing from: an authorised representative of Council's Director of Infrastructure and Engineering Services.	**Variation procedure**
M2.	This specification applies in addition to any development consent (DA) conditions. If there is any inconsistency, the conditions of consent shall prevail.	**DA Conditions**
M3.	Refer to the Cessnock City Council *Development Engineering Handbook* for final inspection, works-as-executed and handover requirements.	**Completion**

6 AMENDMENT HISTORY

0	15/01/2024	First Published