



northern
beaches
council

Development Engineering Minor Works Specification

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MINOR WORKS SPECIFICATION

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1. GENERAL REQUIREMENTS

This document is the specification defining construction details for minor works undertaken by private contractors within the road reserve of Warringah Council, and the requirements of both Council and the contractors who undertake the works.

1.1 Traffic Control

The contractor undertaking construction works on any public road within Warringah Council shall be responsible for the safety of traffic both vehicular and pedestrian during the works. The contractor must provide the provision of continuous access for vehicles and pedestrians and provide all security, lights, barriers, signs and fences necessary to prevent any accident or public or private damage or loss. The contractor shall provide traffic control during the progress of the works in accordance with the requirements of AS 1742.3 – 2009.

If it comes to the attention of Council that Traffic Control Devices are insufficient or inoperational (particularly in an after-hours situation), then Council may arrange to reinstate the Traffic Control Devices and recoup the costs from the contractor and or applicant.

1.2 Testing

Where this document makes reference to compaction requirements it will be necessary for the contractor to provide test results for the required compaction from a NATA registered laboratory.

1.3 Working Hours

All construction works on any public road within Warringah Council shall be carried out in daylight hours between 7.00am and 5.00pm Monday to Friday inclusive and 7.00am to 1.00pm on Saturdays. No construction work is to occur on Sundays and public holidays.

1.4 Insurance

The contractor shall provide copies proving the currency of Public Liability Insurance for \$10 million and full Workers Compensation insurance on all construction works undertaken on public roads within Warringah Council. Insurances must be kept current for the duration of the works.

1.5 Silt and Sediment Control

All construction works on any public road within Warringah Council shall provide silt and sediment control in accordance with Council's Silt and Sediment Control Manual.

1.6 Occupational Health and Safety

Civil Contractors are to provide their employees and subcontractors with:

- safe plant and safe systems of work
- written procedures and instructions to ensure health, safety and welfare at work
- the necessary safety equipment required to do their work.
- health and safety information, instruction, training and supervision
- measures to ensure that they comply with all legislative requirements, standards and Council policies and regulations.

Inspections undertaken by Council does not relieve the applicant/contractor of any responsibility to comply with all OH & S responsibilities encumberant upon them by such works.

1.7 Written Approval

The Applicant must not proceed with any part of the works until written approval has been received from Council.

2. FOOTPATH PAVING

2.1 Footpath Details

Concrete footpaths are to be constructed in accordance with Council Drawing Number A4 10536.

Footpaths using concrete pavers are to be constructed in accordance with Council Drawing Number A4 10483.

2.2 Concrete Footpath Requirements

Where shown on the Drawings, concrete footpaths shall be constructed true to the line, level and width as indicated and be in accordance with the following standards.

Ready Mixed Concrete shall conform to the provisions of AS 1379 – 2007 “Specification and Supply of Concrete”.

The minimum compressive strength F_c of the concrete shall be 20 MPa at 28 days in accordance with AS 3600 – 2009 “Concrete Structures”.

Footpaths shall have a crossfall of 2% and be 1.5 metres wide if it is constructed adjacent to the kerb, and 1.2 metres wide in all other locations.

The subgrade shall be excavated to a depth of 100mm and all soft and other unsuitable material shall be removed and replaced with sand or road base (recycled road base is acceptable) and shall be thoroughly compacted.

Timber pegs of 50mm x 50mm-dimension minimum must be provided for the support of all formwork. The use of steel pegs for the support of formwork is prohibited.

The footpath shall be generally 75mm thick and increased at vehicular crossings to the crossing thickness.

Expansion joints 10mm thick for the full depth of the slab using a preformed jointing material, shall be provided at intervals not greater than 4.8 metres, at a junction with other footpaths, kerbs or other concrete structures, on each side of vehicular crossings and adjacent to all kerb ramps. Jointing material shall be flush with the surface of the footpath.

Dummy joints shall be provided at intervals of 1.2 metres maximum or equidistant between expansion joints and also being equalised between vehicular entrances. Joints shall be at right angles to the outer edge of the path.

The surface finish of all concrete footpaths shall be light broom with all edges treated with a 50mm wide edging tool.

Batters in cut and fill situations shall have slopes desirably not exceeding 1V: 5H and up to 1V: 3H where so determined either by Council or an Accredited Certifier (Civil Works). The top and lower edge of the cutting shall be neatly rounded. In any circumstance where the batter slope will exceed that which can be maintained with a domestic lawn mover, the batter shall be treated in a manner other than turf to the satisfaction of Council.

On completion of works, grassed footways are to be restored to a condition at least equivalent to that which existed prior to commencement. Any bare ground arising from the construction works is to be returfed. Minor differences in levels, up to 20mm, may be accommodated by top dressing where the existing turf is in good condition.

2.3 Footpaths using Concrete Pavers

Pavers will generally only be approved in commercial areas. Approved areas are to be paved in “Boral Classic Pave 50” (200mm x 100mm x 50mm) concrete pavers.

Pavers shall be laid on 30mm bed of clean washed river sand over a 25Mpa concrete base 75mm thick non-reinforced.

Double-header course banding will be provided along the kerb line and property boundary and will comprise of two differing coloured header courses. The header course adjacent to the kerb and boundary is to be the colour *Saraha*. The second header course will provide the variation in banding colour and be in *Charcoal*.

The double-header course banding will be laid to flow as two continuous parallel lines where angles or bends are required along kerb lines or boundaries. The double-header course along kerb lines will flow in a continuous line around the perimeter of kerb ramps.

Infill pavers between header course banding to be laid in Herringbone pattern in colour *Antique Copper*.

Double-header course perpendicular to the kerb line is to be provided at 15m intervals in colour *Charcoal*.

Paver type and layout for the footpath pavers in the Dee Why Town Centre are to be in accordance with the Warringah Design Guidelines : STR-PR350, Part D – Specifications, Dee Why Town Centre.

Driveways within areas to be paved must be constructed in plain concrete as per Council Standard Crossing Profiles.

2.4 Tolerances

Tolerance on the level of footpaths both horizontal and vertical shall be plus or minus 10mm.

3. KERB AND GUTTER

The construction of concrete kerb and gutter is to be in accordance with AS 2876 – 2000 “Concrete kerbs and channels (gutters) – manually or machine placed” unless otherwise indicated below.

3.1 Kerb and Gutter Detail

Kerb and gutter shall be in accordance with Council Drawing Number A4 2267/A.

3.2 Levels

Design plans are to be prepared by the applicant and approved by Council prior to construction.

Generally the following criteria should be met preparing a design for kerb and gutter.

- a minimum longitudinal grade of 1% is required
- the crossfall from the edge of the existing pavement should generally be 3%.
- reconstruction of existing kerb and gutter may be required to ensure that a satisfactory connection is provided.

3.3 Kerb Access Ramps

Kerb access ramps are to be constructed in accordance with Council Drawing Number A4 7284.

Kerb access ramps shall be constructed at the kerb return adjacent to the constructed footpath and in the kerb return opposite the extension of the footpath construction.

Kerb access ramps are to be rough broom finished in an apricot coloured oxide at all locations except where they abut Council approved concrete pavers where the finish shall be rough broom in plain concrete.

3.4 Excavation

All soft, yielding and other unsuitable material shall be removed and replaced with an approved road base (recycled road base is acceptable).

The base material shall be thoroughly compacted and finished to a smooth surface with a uniform bearing value of minimum density of 95% Standard Compaction in accordance with AS 1289.5.4.1 – 2007 “Methods of testing soils for engineering purposes - Soil compaction and density tests - Compaction control test - Dry density ratio, finished to a smooth surface moisture variation and moisture ratio”.

3.5 Formwork

The forms shall be aligned true to grade and without local irregularities. The tolerances shall be $\pm 15\text{mm}$ provided that variations in levels are not local and are over lengths of 3 metres or more.

Forms shall be constructed so that they can be removed without damaging the concrete and shall be adequately braced. The inner surface of forms shall be adequately oiled to ensure the non-adhesion of the concrete. The material used for forms for the exposed surfaces shall be dressed soft woof timber.

Timber pegs of 50mm x 50mm-dimension minimum must be provided for the support of all formwork. The use of steel pegs for the support of formwork is prohibited.

3.6 Materials

Ready Mixed Concrete shall conform to the provisions of AS 1379 – 2007 “Ready Mixed Concrete”.

The minimum compressive strength F_c of the concrete shall be 25 MPa at 28 days in accordance with AS 3600 - 2009 “Concrete Structures”.

3.7 Joints

For hand placed kerb and gutter expansion joints 10mm thick for the full depth of the kerb and gutter shall be provided at intervals not exceeding 6m.

For machine placed kerb and gutter, expansion joints 6mm thick shall be provided at intervals of 6m and contraction joints shall be formed every 3m for the full depth of the kerb and gutter.

Joints are also required where the gutter abuts gully pits and gutter crossings. Expansion joints shall consist of preformed jointing material bituminous fibreboard.

3.8 Placing Concrete

The concrete shall be placed so as to avoid segregation and shall be adequately compacted. Care shall be taken to fill every part of the forms and to work the coarser aggregate back from the face. Exposed surfaces shall be finished with a steel float, and corners and edges shall be neatly rounded with a nosing tool. Concrete shall not be disturbed after it has been in the forms for twenty (20) minutes.

3.9 Finish

After removal of the forms, minor or porous sections or holes shall be repaired with a 3 to 1 sand and cement mortar mix. The exposed surfaces shall then be rubbed with a wooden float and clean water to leave the surfaces smooth and uniform in colour and appearance.

3.10 Backfilling

After removal of formwork the footway behind the kerb shall be neatly trimmed, filled and or turfed to make a smooth connection to the undisturbed nature strip.

3.11 Tolerances

Tolerance on the level of kerb and gutter construction both horizontal and vertical shall be plus or minus 10mm.

3.12 Stormwater Drainage Outlets

Any existing stormwater drainage outlets located within the proposed kerb and gutter construction works are to be reconstructed as part of the works.

4. VEHICULAR ACCESS

No construction is to commence until profiles have been determined and issued by Council to ensure satisfactory vehicular access is provided.

4.1 Excavation

All soft, yielding and other unsuitable material shall be removed and replaced with an approved road base, (recycled road base is acceptable) and shall be thoroughly compacted and finished to a smooth surface. At filled locations a crushed sandstone sub-base 100mm thick (minimum) shall be provided. Where laybacks are to be constructed in existing kerbs as directed by Council, the gutter pad is to be neatly sawn.

4.2 Formwork

The forms shall be aligned true to grade and without local irregularities. Forms shall be constructed so that they can be removed without damaging the concrete and shall be adequately braced. The inner surface of forms shall be adequately oiled to ensure the non-adhesion of the concrete. The material used for forms for the exposed surfaces shall be dressed soft wood timber.

Timber pegs of 50mm x 50mm-dimension minimum must be provided for the support of all formwork. The use of steel pegs for the support of formwork is prohibited.

4.3 Materials

Ready Mixed Concrete shall conform to the provisions of AS 1379 – 2007 “Ready Mixed Concrete”. The minimum compressive strength F_c of the concrete shall be 25 MPa at 28 days in accordance with AS 3600 - 2009 “Concrete Structures”.

4.4 Joints

Expansion joints 10mm thick for the full depth of the slab shall be provided at intervals not exceeding 6 metres. Joints are also required where the layback abuts gully pits and kerb and gutter. Expansion joints shall consist of preformed jointing material bituminous fibreboard.

4.5 Placing Concrete

The concrete shall be placed so as to avoid segregation and shall be adequately compacted. Care shall be taken to fill every part of the forms and to work the coarser aggregate back from the face. Exposed surfaces shall be finished with a wood float, and corners and edges shall be neatly rounded with a nosing tool. Concrete shall not be disturbed after it has been in the forms for twenty (20) minutes.

4.6 Tolerances

Tolerance on the level of vehicular access construction both horizontal and vertical shall be plus or minus 10mm.

5. STORMWATER DRAINAGE

Stormwater systems are to be designed in accordance with Council's Aus-spec Design Manual.

5.1 Stormwater Pipes

Stormwater pipes shall be designed to cater for the flows determined by Council's Aus-spec Design Manual.

The minimum pipe size diameter for pipelines that will form part of Council's infrastructure is to be 375mm. The minimum box culvert size is to be 600mm wide x 300mm high.

The minimum pipe grade is to be 1.0%. The maximum pipe grade is to be in accordance with AS 3500.3 – 2003 "Stormwater Drainage", AS 3500.3:2003/Amdt 1:2006 and AS 3500.3:2003/Amdt 2:2010.

The minimum cover over pipes in Council roads is to be 600mm.

All pipes used shall be reinforced concrete pipes RCP minimum Class 2, spigot and socket with rubber ring joints and conform to the test requirements of AS 4058 – 2007 "Precast concrete pipes (pressure and non-pressure)". PVC and FRC pipes will generally not be accepted as Council pipelines.

The location of any new stormwater lines in Council roads is to under the kerb and gutter. The reconstruction of the kerb and gutter will form part of the works and must be in accordance with Council's standard kerb and gutter drawing number A4 2276/A.

5.2 Stormwater Pits

The location of gully pits in Council roads must not be on curves, kerb returns or in line with normal pedestrian flows and clear of existing or future kerb access ramp locations.

Stormwater pits are to be cast in-situ in accordance with Council's standard drawing number A2 5476/A. Precast pits or combined lintel and pit units will not be accepted for use in Council roads.

The minimum compressive strength F_c of the concrete shall be 25 MPa at 28 days in accordance with AS 3600 – 2009 "Concrete Structures".

The minimum size inlet or extended kerb inlet (E.K.I) length for gully pits is to be 1.8 metres.

All lintels in Council Roads are to be precast concrete.

Gully pit grates shall be hot dipped galvanised mild steel (MS) “Webforge” gully grate and frame WG-5.

Step irons shall be provided in all pits 1.2 metres deep or greater. Steps shall be 325mm apart vertically staggered one left and one right etc. with 75mm clear between step irons when viewed from above and the first iron being 325mm from the top of the pit.

All pit bases shall be benched to ensure the pit is streamlined and any hydraulic losses are reduced. This includes aligning the inlet and outlet pipes to ensure the inlet jets directly into the outlet pipe. All inlet and outlet pipes are to be finished flush with the pit walls.

5.3 Trench Excavation

Trenches shall be excavated to the required grade line to the base of the bedding level. All soft, yielding and other unsuitable material shall be removed and the trench shall be thoroughly compacted in sand or other granular material to a firm smooth surface of uniform bearing value of minimum density of 95% Standard Compaction in accordance with AS 1289.5.4.1 – 2007 “Methods of testing soils for engineering purposes - Soil compaction and density tests - Compaction control test - Dry density ratio, moisture variation and moisture ratio”.

The width of the trench shall be 1.4 times the external diameter of the pipe or culvert plus 300mm and shall be parallel with the inverts of the pipes.

Where any section of pipe has an outlet to a pit, a length of subsoil drain, minimum 3 metres in length, shall be laid in the trench with the outlet to the pit and the upstream end capped.

For pipes of 1200mm diameter or larger, two lengths of subsoil drain shall be laid, one each side of the pipe.

It is the responsibility of the contractor to comply with the requirements of Workcover and the NSW Department of Industrial Relations regarding the supporting of the sides of trenches during excavation.

5.4 Bedding

The pipe shall be evenly bedded on a continuous layer of compacted sand with a minimum depth of 200mm and a maximum of 325mm.

In wet trench conditions Council may specify 20mm blue metal or river gravel as granular material to replace the sand.

5.5 Installation

Pipes, which have markings indicating the crown or invert of the pipes, shall be laid strictly in accordance with the markings.

The space between the abutting ends of the pipes shall not exceed 0.5 % of the diameter of the pipe. Spigot and socket joints shall have recesses left under the pipe joints to permit jointing and to avoid bearing on the socket.

Pipes shall be uniformly supported over the entire length on the bedding layer and be laid true to grade and line.

Where multiple pipes are laid side by side, the space between the line of pipes shall be not less than one third ($1/3$) of the diameter of the pipes or 300mm whichever is the greater.

5.6 Jointing

Rubber ring joints shall be fitted in accordance with the manufacturer's specifications.

5.7 Backfilling

All pipes shall be backfilled with sand to a layer of 300mm above the pipe.

Pipes located outside the road pavement shall have the remainder of the trench to natural surface level be backfilled with sand, placed in layers not exceeding 150mm loose thickness, and compacted to a minimum density of 95% Standard Compaction in accordance with AS 1289.5.4.1 – 2007 “Methods of testing soils for engineering purposes - Soil compaction and density tests - Compaction control test - Dry density ratio, moisture variation and moisture ratio”.

Pipes laid under a road pavement or under kerb and gutter shall have the sand backfill taken to the underside of the selected subgrade layer only. The remainder of the trench shall be backfilled with 150mm loose layers of fine crushed rock or DGB 20 road base material and compacted to a minimum density of 100% Standard Compaction in accordance with AS 1289.5.4.1 – 2007 “Methods of testing soils for engineering purposes - Soil compaction and density tests - Compaction control test - Dry density ratio, moisture variation and moisture ratio”.

5.8 Concrete Works for Drainage Structures

Ready Mixed Concrete shall conform to the provisions of AS 1379 - 2007 “Ready Mixed Concrete”.

The minimum compressive strength F_c of the concrete shall be 25 MPa at 28 days in accordance with AS 1480 - 2001 “Concrete Structures”.

Steel reinforcement shall conform to the provisions of AS/NZS 4671 – 2001 “Steel Reinforcing Materials” and AS 4671:2001/Amdt 1:2003.

Formwork shall conform to the provisions of AS 3610 – 1995 “Formwork for Concrete” and AS 3610-1995/Amdt 1-2003. It must be designed to ensure removal will not damage the concrete. Oiling of the formwork is permitted to prevent adhesion of the concrete.

Concrete shall be placed to avoid segregation and shall be adequately compacted. If a mechanical vibrator is used to compact the concrete, care should be taken to ensure that no segregation of the aggregate is caused by over vibration.

Exposed surfaces shall be struck off with a wooden float and neatly finished. Concrete shall not be disturbed after it has been in the forms for 20 minutes.

Forms to concrete faces shall not be removed until at least 48 hours after the concrete has been placed. At locations where the concrete will be under load and unsupported, a period of 28 days will be required prior to removal of the forms.

Upon removal of the forms, any rough or porous surfaces or holes shall be thoroughly scabbled, dressed and rubbed up with a 3 to 1 sand to cement mortar. Faulty and honeycombed portions shall be taken down and rebuilt.

6. PLAN SUBMISSIONS

6.1 Presentation of Plans

Three copies of engineering plans are to be submitted to Council for approval. Unless otherwise agreed all drawings shall be prepared on A1 sheets in accordance with standard drawing practise.

Australian Height Datum shall be used for all levels and the consultant for each project shall provide a permanent benchmark.

Scales shall be clearly indicated on all sheets and the following scales normally used.

- Plans 1:250 horizontal
- Long Sections 1:250 horizontal, 1: 100 vertical
- Cross Section 1:100 natural
- Special Structures 1:20

6.2 Plan Requirements for Road Design

The position of the road(s), and relation to other roads, road centreline with the bearings of straight sections and the radius of the curves, all recovery pegs, benchmarks and reduced levels including a schedule set out listing Easting, Northing peg levels and finished surface levels, the road chainage, pits and pipe details. Horizontal curve information should include, intersection angle, arc length, tangent length and secant.

Longitudinal section with levels showing road alignment, existing natural levels, grades and vertical curves shall be provided.

Cross-sections are to detail the carriageway width, width and footpath slope, kerb and gutter details. Spacing shall be at 10m intervals.

Kerb returns shall be designed using 1:100 horizontal and 1:10 vertical and shall detail longitudinal profile of kerb levels.

6.3 Plan Requirements for Drainage

A catchment plan shall be included at a suitable scale with all existing Council and private stormwater drainage lines shown.

Plans shall include details of hydraulic grade line calculations on all stormwater drainage long sections.

The proposed drainage lines shall be shown on all road plans, together with the location and type of all pits.

A long section of every stormwater drainage line shall be shown, detailing existing ground levels, finished or proposed long sections, the pipe size and class, inverts and grades, pit types, hydraulic grade line and flow rates.

Other drainage structures eg headwalls, scour protection, gross pollutant traps shall be detailed.

6.4 Work as Executed Drawings

Upon completion of construction works on Council's road reserve, work as executed drawings by a registered surveyor are to be submitted to Council where directed. The plans shall include details of all infrastructure demolished as part of the works and a fully coordinated detail survey of the completed new works in hard copy and electronic formats (preferably DXF Format) using MGA94 Coordinates and Australian Height Datum (AHD).

Drainage asset infrastructure data (dimensions of pipes, pits, manholes etc.) shall be provided in approved format available from Council's Asset Management Section.

7. INSPECTIONS

7.1 Footpaths

A Compliance Certificate issued by an Accredited Certifier (Civil works) is to be submitted if Council does not inspect the footpath works stating the works have been completed in accordance with this specification. If Council inspects the footpath works 48 hours notice is to be given by the contractor. An inspection fee must be paid in accordance with Councils fees and charges.

The Accredited Certifier must confirm:

- Thickness and alignment of the formwork
- Suitability of the subgrade including any required compaction testing.
- The formwork levels.
- Suitability of transitions to existing footpath levels and alterations to services.

Upon completion of works the contractor is to ensure that any laid turf is not below the footpath or kerb, there are no localised depressions and no step-downs to any adjoining vehicle crossings.

Engineering bonds and the Builders Kerb Security deposit will not be refunded until all works have been completed to the satisfaction of Council and the 6-month maintenance period has finished.

7.2 Kerb and Gutter

A Compliance Certificate issued by an Accredited Certifier (Civil works) is to be submitted if Council does not inspect the Kerb and Gutter works stating the works have been completed in accordance with this specification. If Council inspects the Kerb and Gutter works 48 hours notice is to be given by the contractor. An inspection fee must be paid in accordance with Councils fees and charges.

The Compliance Certificate is to be issued to Council following placement of formwork, but prior to pouring of concrete. The Accredited Certifier (Civil works) is to check.

- The finished surface levels
- The quality of finish.
- The restoration of the footpath area.
- A traffic control plan and traffic management is in place prior to and during all construction works.

Any sections of kerb and gutter that do not meet these specification standards will need to be removed and reconstructed.

Engineering bonds and the Builders Kerb Security deposit will not be refunded until all works have been completed to the satisfaction of Council and the 6-month maintenance period has finished.

7.3 Road pavement

A Compliance Certificate(s) are to be issued by an Accredited Certifier (Civil works) and submitted to Council for the Road pavement works stating the works have been completed in accordance with this specification and prior to the following stages of construction:

- Subgrade trimmed and compacted.
- Base course spread and compacted
- Intermediate course spread and compacted.
- Wearing course laid.

The subgrade and base course is to have compaction testing carried out by a licensed NATA soil testing laboratory, in accordance with the requirements of Councils Engineering Specification Auspec One.

7.4 Drainage works

A Compliance Certificate issued by an Accredited Certifier (Civil works) is to be submitted if Council does not inspect the stormwater drainage works stating the works have been completed in accordance with this specification. If Council inspects the drainage works 48 hours notice is to be given by the contractor. An inspection fee must be paid in accordance with Councils fees and charges.

Compliance Certificate(s) are to be issued to Council at the following stages:

- Following excavation and bedding of the pipe, but prior to backfilling.
- Following backfilling and restoration.
- Following erection of formwork and placement of reinforcement to any pits or other concrete structures.

8. WORK AS EXECUTED PLANS

Following satisfactory completion of road and drainage works, “work as executed” details are to be submitted in both hard copy and electronic formats as detailed below.

Hard Copy: A copy of the approved plans overdrawn in red

Electronic Copy:

9. MAINTENANCE PERIOD

A maintenance period of six (6) months shall apply to all footpath, kerb and gutter and road works. Engineering bonds will not be refunded or released until the maintenance period is completed and all compliance certificates issued to Council. Councils Development Engineering section is required to complete a final inspection prior to handover of any engineering works with contractor and Accredited Certifier (civil works).

10. STANDARD ENGINEERING DRAWINGS

Standard Drawings - Footpaths,
Kerb and Gutter

Vehicle Crossing Profiles