Muswellbrook Shire Council

CONSTRUCTION SPECIFICATION

AUS-SPEC (Cot 09)

1136 Cold Milling of Asphalt and Base Course

Version 01

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
0	No amendment has been made	all	Nil		14 June 2012

Contents

1136 COLD MILLING OF ASPHALT AND BASE COURSE

1 GENERAL

1.1 RESPONSIBILITIES

Objectives
General: Provide cold milling of asphalt and base course.

Performance
Requirements: Removal of asphalt and base course by cold milling to a depth shown on drawings or directed. Stockpile or dispose of material and sweep the pavement, to conform with *0161 Quality (Construction)*.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:

- *0152 Schedule of rates – supply projects.*
- *0161 Quality (Construction) or 0167 Integrated management.*
- *0179 General requirements (Construction).*
- *1101 Control of traffic.*
- *1142 Bituminous cold mix.*

1.3 REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

Standards
AS 1742 Manual of uniform traffic control devices
AS 1742.3-2009 Traffic control devices for works on roads
SAA HB 81: Various Field guides for traffic control
Other publications
Austroads – 2008 Glossary of Austroads Terms

1.4 SUBMISSIONS

Acceptance criteria
General: All submissions and activities to satisfy **HOLD POINTS** and **WITNESS POINTS**, will be subject to the approval of the Superintendent.

Documents
Submit the following for approval:

- Drawings and reports:
  - Survey report for milled surface levels and tolerances.
  - Verification documents showing the marking and location of all hidden objects and utilities recorded.
  - Plan showing core locations, thickness of existing asphalt and proposed depths of cut.
  - Records of milling operators experience and training.
- Calculations: As specified, submitted and/or approved.
- Components: Schedule road signs for traffic control.
- Materials: Bituminous materials for tack coats and ramps.
- Execution details: As specified, submitted and/or approved.

1.5 INSPECTION

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

Summary of HOLD POINTS

Clause title/Item	Requirement	Notice for inspection	Release by
Control of traffic - General	Proposal for traffic control and diversion to work section *1101 Control of Traffic*	14 days before planned site commencement	Superintendent
Survey of hidden objects and utilities - General	Submit survey showing details of any hidden objects or utilities.	5 working days before commencing works	Superintendent
Cold milling operations			
General	Nominated depths of cut as directed and inspect extent of works	3 working days before setting the machine cut depth	Superintendent
Milling of asphalt over concrete structures	Submit procedure for asphalt coring if required	3 working days prior to carrying out works	Superintendent
Milling of asphalt over concrete structures	Submit the investigation thickness report following concrete coring	1 working day prior to carrying out works	Superintendent
Milling over bridges	Seek specification from superintendent and stop work	Prior to commencing works on bridges	Superintendent
Damage	Assessment and repair of utilities	3 working days before reinstatement	Superintendent and relevant Authority
Public Safety	Site works adversely affecting the work or public safety to cease and eliminate / modify works	Progressive	Superintendent
Milled surface	Inspection prior to covering milled surface	1 working day before finalising milled surface	Superintendent

Summary of Witness Points – Off-site activities

Clause title/Item	Requirement	Notice for inspection
Control of traffic – Licensing and qualification of personnel	Certification of Personnel Qualification Documentation	7 days before planned traffic control
Survey of hidden objects and utilities - Utility location	Advice to Superintendent that relevant Authorities requirements have been satisfied	3 working days before setting out for milling
Cold Milling Operation - Milling operators	Certification of Personnel Qualification Documentation	7 days before starting work

Summary of Witness Points – On-site activities

Clause title/Item	Requirement	Notice for inspection
Cold Milling Operation		
Control of levels	Review of procedures and/or approval by Superintendent	Progressive
Milling of asphalt over concrete structures	Approval for milling operations over structures	1 working day prior to starting works
Milling equipment	Submit proposed milling equipment	7 days prior to starting works
Milling procedures	Submit proposed milling procedures	7 days prior to starting works
Unsuitable material	Assessment and direction by Superintendent	Progressive

Clause title/Item	Requirement	Notice for inspection
Obstructions	Review of proposed work methods by Superintendent	Progressive
Interface with road structures	Remove material by hand or other approved method	Progressive
Milled surface	Clean and sweep all loose material	Progressive
Public safety procedures	Submit procedures to minimise effects on the public and the works	Progressive
Temporary ramps - General	Place temporary ramps when necessary or as directed	Progressive

2 PRE-CONSTRUCTION PLANNING

2.1 ACTIVITY PLAN

General

Plan for the following:

- Resources to allocate plant and personnel for the contract period.
- Program the work to meet the constraints of **HOLD POINTS** and **WITNESS POINTS**.
- Program the work to minimise traffic problems.
- Liaise with relevant Authorities.
- Ensure personnel are fully qualified.

3 EXECUTION

3.1 CONTROL OF TRAFFIC

General

Submit: Submit proposal for traffic control and diversion to work to conform with *Section 1101 Control of traffic*. This is a **HOLD POINT**.

Traffic delays

Minimise: Take all necessary steps to avoid or minimise delays and inconvenience to road users during the course of the work.

Detours: When detours or side-tracks are required divert traffic temporarily while the work is in progress.

Work under traffic

Traffic flow: If facilities for the diversion of traffic are not available, arrange the work to provide for the flow of traffic in accordance with the requirements of *1101 Control of traffic*.

Signage

All temporary signage: To the site specific requirements of AS 1742.3 and SAA HB 81.

Additional signage: Provide extra signage on the approaches to the work and at intervals shown in AS 1742.3 for the appropriate speed zone. Clearly display temporary reflectorised sign ‘Cycle Hazard Grooved Road’, Type ST 1-10.

Licensing and qualification of personnel

Certification: Ensure that all traffic control personnel possess valid state drivers licences and relevant certification in accordance with *1101 Control of traffic*.

Documentation: Provide the names of traffic control personnel and their respective traffic control certification for inspection prior to the commencement of work. This is a **WITNESS POINT**.

Responsibility: It is the Contractors’ responsibility to ensure the appropriate qualifications of Traffic Control personnel.

Costs: Borne by the Contractor.

3.2 SURVEY OF HIDDEN OBJECTS AND UTILITIES

General

Location: The Contractor is responsible for locating all hidden objects and utilities and determining their susceptibility to damage by operations.

Equipment: Use appropriate equipment such as metal detectors.

Before proceeding: Submit a schedule of all hidden objects or utilities showing information on the type of object, the size and location and the method of cold milling proposed for use to avoid damaging the object or utility. This is a **HOLD POINT**.

Identifying objects

Identify hidden objects: Prior to milling operations determine the location of any hidden utilities or buried objects that may be damaged or exposed by milling operations.

Utility location

Authority's: Liaise with the relevant Authorities for all underground utility services within the site of the works. The utility Authorities' contact persons are given in 0179 *General Requirements (Construction)*. Contact Dial before you dig on phone number 1100 prior to any works being carried out.

Report: Provide written advice to the Superintendent confirming that all authorities requirements have been satisfied. This is a **WITNESS POINT**.

3.3 COLD MILLING OPERATION

General

Set out: Set out the cold milling work area as shown on the drawings or specified in schedules. Mark all milling depths and locations of any hidden objects or utilities.

Depth and dimensions: Perform cold milling to the nominated depth(s), width, length, alignment and road sections as per drawings or as directed by the Superintendent. This is a **HOLD POINT**.

Control of levels

Controls: Demonstrate the use of controls to the satisfaction of the Superintendent.

Machine: Control the cold milling machine either by levelling beam or stringline and automatic sensors unless otherwise approved. This is a **WITNESS POINT**.

Tolerance: 5 mm maximum difference in levels between adjacent runs, depths and surface levels

Milling to achieve specified depth of cut

Depth of cut: Milling to achieve a specified depth of cut, may be directed in one of the following ways:

- Where nil tolerance on depth of cut applies for 'greater than specified' as per **Annexure B**.
- Where above and below depth of cut has been specified as per **Annexure C**.

Milling to retexture a surface

Method: Groove depths in the existing surface to be between 5 – 10 mm depth. Do not fully remove the existing surface. Groove spacing to be 10 mm maximum.

Milling of asphalt over concrete structures

Investigation: Seek direction for investigation of the thickness of existing asphalt over the concrete structures.

Cores: Submit the size of the proposed cores, locations and intervals. This is a **HOLD POINT**.

Submission: Submit the schedule of the investigation 24 hours prior to commencing milling works. This is **HOLD POINT**.

Variation: If the investigation identifies a revised scope of works due to the depth of asphalt, request a direction for a variation to the contract.

Milling machine: During operations over concrete structures provide at least 3 qualified machine operators (one on the driving platform, one on each side of the machine in the vicinity of the sensor / cutting mandrel), or submit alternative procedures for approval. This is a **WITNESS POINT**.

Cold milling: Do not use cold milling machines to correct the shape, level or ride quality of the surface over concrete structures.

Milling operators

Qualifications: Ensure that milling operators have adequate training and experience in the operation of the cold milling machine (including automatic sensing equipment). Provide the names, experience and training records for each operator prior to the commencement of works. This is a **WITNESS POINT**.

Milling Equipment

Submit: Submit the proposed equipment. This is a **WITNESS POINT**.

Maintain: Maintain all approved milling machines in a good condition.

Trial cutting: Conduct a cutting trial using the proposed machine at the commencement of each working shift or when the machine has been adjusted or repaired.

Milling procedures

Submit: Submit the proposed procedures for the works. Include the following:

- Type, mass and number of milling machines and other heavy equipment.
- Proposed method of carrying out the work such as milling runs and planned daily outputs. This is a **WITNESS POINT**.

Milling over bridges

Bridges: If milling over bridges, request from the superintendent specifications for equipment and measures of control considering the expected dynamic effects on the structure. This is a **HOLD POINT**.

Unsuitable material

Inspection: Carry out an inspection and assessment on the acceptance of the milled floor material. As directed, mill the material to a depth nominated by the Superintendent or backfill with replacement material. This is a **WITNESS POINT**.

Payment: Base additional payment on a m^2 rate measurable by a common standard with the remainder of the works quoted.

Obstructions

Work method: If milling near access chambers or other similar structures, operate the cold milling machine as close as possible to the structure without causing damage to it. Remove to the remaining asphalt and base course by hand or other approved method. This is a **WITNESS POINT**.

Interfaces with road structures

Hand work: Remove by hand or other approved means any material not already removed by the cold milling machine adjacent to concrete medians, kerb and gutter or drainage structures such as pit grates This is a **WITNESS POINT**.

Milled surface

Loose material: Following the cold milling operation remove all loose material from the road pavement, gully pits and median areas.

Clean: Sweep the pavement and leave the site in a clean and tidy state. Remove all cold milled material from the site and transport to stockpile site(s) or otherwise remove from the site as directed. This is a **WITNESS POINT**.

Damage

Contractor's costs: If sub-surface utilities or structures are damaged by milling or transport operations, notify the relevant Authority and arrange for the damage to be rectified to reinstate the utility or structure to pre-construction condition. This is a **HOLD POINT**.

Costs: Borne by the Contractor.

Public safety

Submit: Procedures to minimise dust nuisance, excessive noise, excessive windrows, loose material or excessive roughness of the cold milled surface. This is a **WITNESS POINT**.

Adverse effects: The Superintendent may order work to cease temporarily on account of dust nuisance, excessive windrows or loose material, excessive roughness of the cold milled surface or any circumstances which may adversely affect the work or public safety. Immediately modify work methods to eliminate adverse conditions. This is a **HOLD POINT**.

Inspection

Final milled surface: Prior to covering the milled surface, arrange to inspect the surface with the Superintendent prior to the removal of milling equipment from site. This is a **HOLD POINT**.

3.4 TEMPORARY RAMPS

General

Required: Prior to opening of the work to traffic, ramp the edges of the milled surface to tie into the existing road levels. Place temporary ramps when necessary for traffic safety or when directed. This is a **WITNESS POINT**.

Damage: Do not cause damage to concrete medians or kerbs, manholes, gully grates, utility covers or other similar structures. Repair any damage caused due to the milling works.

Costs: Borne by the Contractor.

New materials: If the contract works require replacement of the milled material with new materials, remove any ramps before new material is placed.

Costs: Temporary ramps do not constitute a variation of the contract.

Dimensions for transverse joints

> 60 km/h: If the speed limit exceeds 60 km/h, produce a minimum taper length of 2.5 m/50 mm variation in levels.

≤ 60 km/h: If speed limit is less then or equal to 60 km/h, produce a minimum taper length of 1.5 m/50 mm.

Dimensions for longitudinal joints

Minimum: Provide a ramp of minimum 1.0 m length for each 50 mm variation in levels.

Interface with Structures

Locations: Form and compact asphalt ramps around manholes, gully grates, utility covers or other similar structures unless otherwise directed.

Taper: Produce the ramps with a minimum taper length of 1.5 m for each 50 mm depth of cut.

Methods of forming ramps

Bevelling: Bevel with the cold milling machine ensuring any lip remaining at the toe or head of the bevel does not exceed 10 mm in height.

Coldmix asphalt: Conform to the following:

- Apply an emulsion tack coat to the milled surface prior to the placement of coldmix asphalt.
- The maximum thickness of coldmix asphalt: 40 mm. If site conditions require greater thickness, place and compact the coldmix asphalt in layers between 25 mm and 30 mm thick.
- Leave the coldmix asphalt ramp in place no longer than one week.
- Maintain the ramp in good condition.
- Coldmix material: To *1142 Bituminous cold mix.*
- Compact all coldmix.

3.5 LOADING, TRANSPORT AND DISPOSAL OF MILLINGS

Disposal equipment

Continuous output: Supply sufficient trucks to enable a continuous output to be achieved by the cold milling machine with minimal delay.

Elevator loading: When loading by elevator, back the trucks up and maintain a similar speed to the cold milling machine.

Load distribution: Distribute the load of milled material uniformly over the truck body.

Cover the loads: Conform to all regulations regarding the covering and securing of loads where applicable, including that the cover is to overlap the truck body by at least 250 mm and be tied down securely.

Superintendent's stockpiles

Sites: Proposed stockpile site(s) to be nominated by the Superintendent in **Annexure A**.

Levelling of stockpiles

Shape: Tip the cold milled material in orderly stockpiles and not isolated heaps. If measurement is by volume, level the stockpiles to a height of 2 m with uniform shape.

Disposal by Contractor

Disposal: If the Superintendent does not wish to keep the millings, legally dispose of millings.

3.6 LIMITS AND TOLERANCES

Application

Summary: The limits and tolerances applicable to this worksection are summarised in **Summary of limits and tolerances table**.

Summary of limits and tolerances table

Activity	Limits/tolerances	Worksection clause reference
Cuts of cold milling machine		
Difference in levels between adjacent runs, depths and surface levels	< 5 mm	**Cold milling operation**

Activity	Limits/tolerances	Worksection clause reference
Temporary Ramps		
Dimensions for transverse joints	Speed limit > 60 km/h: minimum taper length of 2.5 m per 50 mm variation in levels. Speed limit ≤ 60 km/h: minimum taper length of 1.5 m per 50 mm.	**Temporary ramps**
Dimensions for longitudinal joints	Provide a ramp of minimum 1.0 m length for each 50 mm variation in levels.	**Temporary ramps**
Interface with structures	Provide ramps with a minimum taper length of 1.5 m for each 50 mm depth of cut.	**Temporary ramps**
Methods of forming ramps		
Bevelling	Ensure any lip remaining at the toe or head of the bevel does not exceed 10 mm in height.	**Temporary ramps**
Coldmix asphalt	Maximum thickness ≤ 40 mm. Where site conditions require greater thickness, place the coldmix asphalt and compact in layers between 25 and 30 mm thick.	**Temporary ramps**
Levelling of stockpiles	Height = 2 m with uniform shape.	**Loading, transport and disposal of millings**

4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

General

Payment made to the schedule of Rates: To *0152 Schedule of rates – projects*, this worksection, as shown on the drawings and Pay items **1136.1**.

Lump Sum prices: Not acceptable.

Unpriced items: If any item, for which a quantity of work is listed in the Schedule of Rates, has not been priced by the Contractor, due allowance is made in the prices of other items for the cost of the activity which has not been priced.

Methodology

The following methodology will be applied for measurement and payment:

- Control of traffic is measured and paid to conform with *1101 Control of traffic*.

4.2 PAY ITEMS

Pay items	Unit of measurement	Schedule rate scope
1136.1 Removal of material by cold milling 1136.1(1) Up to 40 mm in depth. 1136.1(2) > 40 mm.	m² measured as follows: For item 1136.1(1) area of final milled surface. For item 1136.1(2) sum of areas of each increment of 10 mm depth of milled surface. Area calculated from the width, length specified on the Drawings or approved by the Superintendent.	All costs associated with the milling operation including transporting and stockpiling of material and the sweeping and cleaning of the pavement.

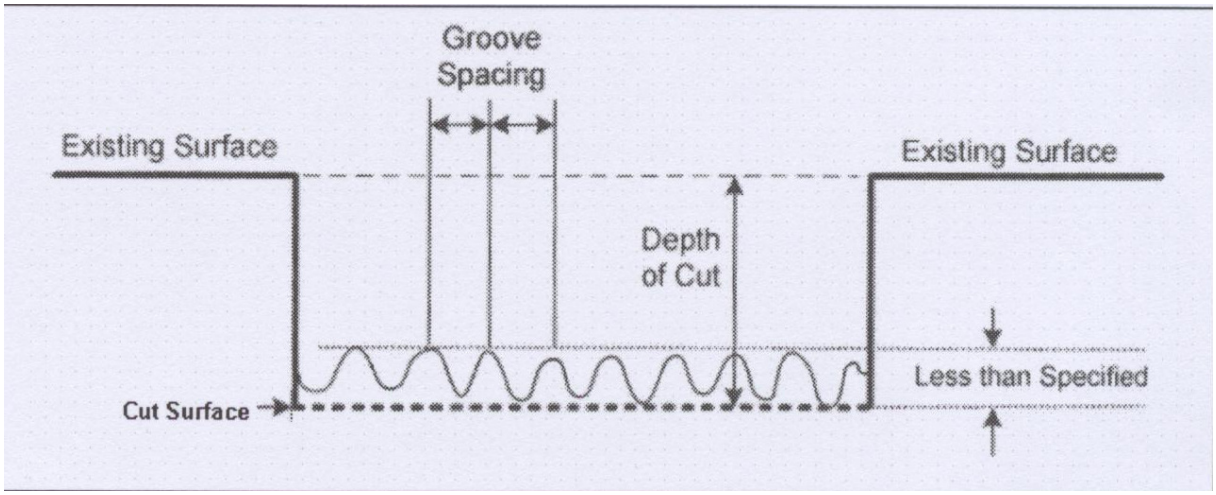
5 ANNEXURE A – LOCATION OF STOCKPILE SITES FOR MILLINGS

5.1 STOCKLIPES FOR MILLINGS

Location

Location of stockpile sites for millings in accordance with **Disposal of millings** is as follows:

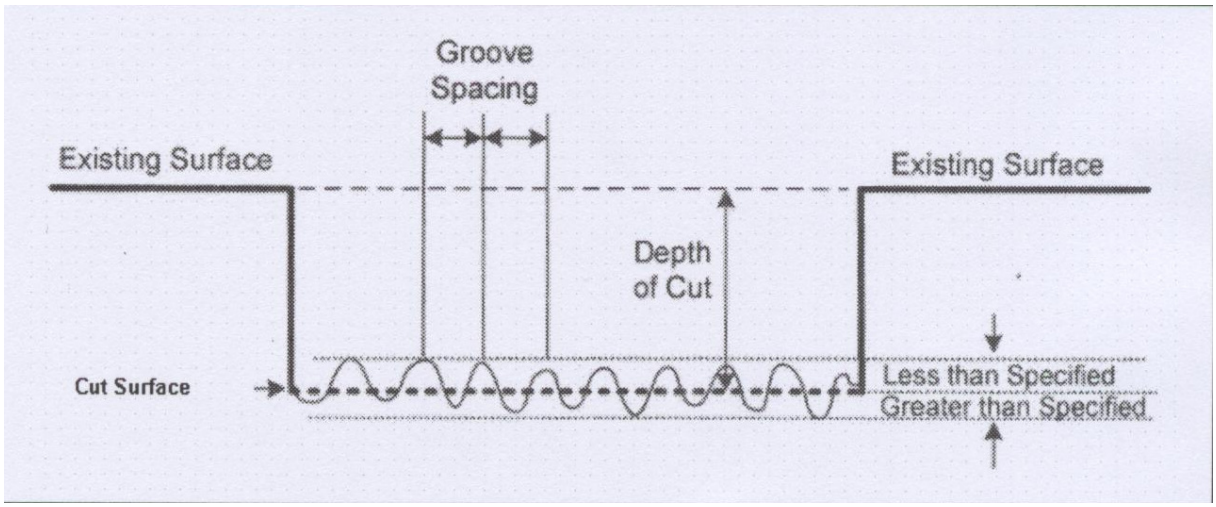
6 ANNEXURE B – DEPTH OF CUT TERMINOLOGY



Where 'Nil' tolerance on depth of cut applies for 'Greater than specified'.

Note: Existing surface is the uncut surface immediately adjacent to the cut.

7 ANNEXURE C – ALTERNATIVE SPECIFICATION



Where above and below depth of cut has been specified.

Note: Existing surface is the uncut surface immediately adjacent to the cut.

Milling to achieve specified level

Tolerances: Tolerance on depth of cut, 10 mm maximum greater than specified and nil for less than specified.

Levels: Mill to specified levels as shown on drawings or as directed.

Survey: If directed, survey the floor of the milled area prior to covering the work area using a flat based staff placed on the high points of the milled profile. Report levels to the nearest 5 mm.

Submit: Submit survey report for approval with methods of any remedial works to be carried out. This is a **HOLD POINT**.

Remedial works: If the milled floor is not within the tolerances, carry out the following remedial works:

- Where there are high areas: Re-mill to bring the levels within the tolerances.
- Where there are low areas: Immediately stop work, check machinery levels and seek a direction from the Superintendent. This is a **HOLD POINT**.

Costs: Borne by the contractor.

Summary of HOLD POINTS (sample as below)

Item/Clause title	Requirement	Notice for inspection	Release by
Milled floor survey report	Submit a survey of the milled floor area and the proposal for any remedial works required.	Prior to the area being covered.	Superintendent