

SPECIFICATION FOR THE SUPPLY OF AGGREGATES FOR ROAD PAVEMENT CONSTRUCTION (interim)

8.1 Scope

This Standard Specification sets out the requirements for the supply of basecourse, sub-basecourse and bedding aggregates for use in road pavements. The Contract Works Specifications which may amend this Standard Specification where provided, takes precedence over the Standard Specification.

8.2 General Notes

1. Recycled crushed concrete may be used as an alternative **bedding** material for general concrete works, **pavement backfill** to undercuts, or **sub-basecourse**. The Contractor is encouraged to recycle all clean concrete waste.

8.3 Referenced Standards / Specifications

The following standards and specifications are referenced by this standard:

TNZ B/2 Specification for the Construction of Unbound Pavement Layers
TNZ F/1 Specification for Earthwork Construction
TNZ M/4 Specification of Basecourse Aggregates
NZS4407:1991 Methods of Sampling and Testing Road Aggregates
NZS4402:1986 Test 4.1.3 Methods of Testing Soil for Civil Engineering Purposes

Where any of the above documents are not current edition, the updated edition must be used.

8.4 Materials covered

The following material specifications relate to all aggregate material approved by Auckland Transport for use in asset construction. The following materials are covered by this specification:

- NZTA TNZ M/4
- ATAP65, ATAP40, ATAP20
- ATGAP65, ATGAP40, ATGAP20

The aggregate sourced to produce the above products must be of the following mineralogy:

1. Unweathered sedimentary rock, e.g. greywacke;
2. Competent volcanic rock, e.g. basalt;
3. Recycled crushed concretes; and

The following aggregate sources may be used by Departure from Standard only:

4. Synthetic aggregates, e.g. Melter slag.

For the purpose of this specification, the following suffixes apply:

1. 'RCC' stands for Recycled Crushed Concrete; and
2. 'S' stands for Synthetic aggregates.

Recycled crushed concrete shall not exceed the percentages of foreign materials by mass as specified in NZTA M4 and shown below:

Type I Materials: Glass, Brick stone, ceramics and asphalt: < 3%

Type II Materials: Plaster, clay lumps and other friable material: < 1%

Type III Materials: Rubber, Plastic, Bitumen, Paper, Wood and other vegetable or decomposable matter: < 0.5%

In no circumstances shall the RCC product contain any asbestos or asbestos fibre.

The percentages of foreign materials shall be determined by RTA Test Method T276. All other materials must be clean, free from clay, all organic matter and other deleterious materials.

Testing for foreign materials shall be at the minimum sampling rate for production property tests.

8.5 Sampling and Testing

All sampling and testing must be performed by an IANZ accredited laboratory that is certified to undertake the relevant tests. All aggregates that do not comply with this specification must either be tested as agreed by the Engineer for consideration as a variation to this specification, or be otherwise rejected.

For Source Property Tests and Sampling, refer to TNZ M/4 Clause 3.2

For Production Property Tests, refer to TNZ M/4 Clause 4.2

Each of the criteria shall be tested for once per 1000m³ of supply per contract.

Special Considerations

Where recycled or synthetic aggregates are used in granular base course applications in conjunction with sub drains, the following procedures are recommended to reduce the likelihood of leachate precipitates clogging the drainage system:

- Wash the processed RCM aggregates to remove dust from the coarse particles.
- Ensure that any geotextile fabric surrounding the drainage trenches (containing the sub drains) does not intersect the drainage path from the base course (to avoid potential plugging with fines).

The specific requirements for the storage of recycled or synthetic aggregates shall be detailed by the contractor as part of the project specific CEMP.

8.6 Environmental Properties

All aggregates shall comply with the following principles for environmental control:

1. Any aggregate that meets the MfE guideline document 'A Guide to the Management of Cleanfills (2002)' are considered to be a permitted activity under the Auckland Unitary Plan (2016);
2. Any aggregate that exceeds the cleanfill acceptance criteria (Class 4 Landfill) set out in Waste Management Institute guideline document 'Technical Guidelines for Disposal to Land' (2016) but not the requirements of Table 1 below shall require a consent for the handling and placement of the aggregate;
3. Any aggregate that exceeds the requirements of Table 1 below requires a consent for the handling, placement and long term discharge of the aggregate. Any aggregate that exceeds this requirement will require explicit approval from the Auckland Transport Chief Engineer before a consent is lodged for the use of the material.

All virgin aggregate shall be sourced in accordance with Table 6.1, Accepted Waste Types in Waste Management Institute New Zealand guideline document 'Technical Guidelines for Disposal to Land (2016).

Recycled and synthetic aggregates that cannot achieve requirements in Table 6.1 of Waste Management Institute New Zealand guideline document 'Technical Guidelines for Disposal to Land (2016) for Class 4 Landfills (Appendix G) shall be in accordance with Table 1 of this specification and a consent for the handling and placement must be sought from Auckland Council.

	Permitted Activity Soil Criteria (mg/kg)
	Discharge
Arsenic	100.0
Benzo(a) Pyrene (equivalent)	20
Cadmium	7.5
Chromium (total)	400.0
Copper	325.0
Total DDT1	12 or 0.72
Lead	250.0
Mercury	0.75
Nickel	105.0
Zinc	400.0

Table 1 Permitted Level Criteria Auckland Unitary Plan (2016).

1. Total DDT includes the sum of DDT, DDD and DDE. The table above sets out the relevant criteria for the identified contaminants and further reference to other guidelines for individual intermediate breakdown products are not required.
2. The criteria 12 mg/kg applies to land that is not being redeveloped. The criteria 0.7 mg/kg applies to land that is being redeveloped (redevelopment does not include cultivation and the formation and maintenance of tracks) during the redevelopment phase only. Once redevelopment has been completed, the higher criteria applies.

Where the requirements of the Table 1 cannot be met, a departure must be approved by the Design Office prior to resource consent application for the handling, placement and long term discharge of the proposed aggregate.

Compliance and Approval Register

Suppliers must be approved by Auckland Transport for the supply of aggregate to all projects. Each supplier seeking to be included to the approved supplier register shall provide to Auckland Transport a methodology of aggregate production and supply. This shall include ongoing compliance with this specification.

Where aggregate is to be produced from recycled or synthetic aggregate the supplier shall in addition provide the following:

- Waste Stream acceptance plan detailing risk and mitigation measures to protect the environment and human health.

Approval submission can be applied online at ATCOP@aucklandtransport.govt.nz

8.7 **Basecourse Aggregate Compliance**

Basecourse aggregates are either:

- TNZ M/4 AP40; or
- ATAP40; or
- ATAP40RCC/S

8.7.1 **TNZ M/4 AP40 Basecourse**

Where TNZ M/4 AP40 is specified, this must comply with the latest edition of the TNZ M/4 specification.

8.7.2 ATAP40

ATAP40 must:

- Have a soaked CBR of not less than 80% (NZS 4407, Test 3.15) when compacted in the laboratory in accordance with NZS 4402 Test 4.1.3 (Vibrating hammer).
- Be well graded with a particle size distribution that falls within the following limits:

AP 40	Percent Passing	
Sieve size (mm)	Lower limit	Upper limit
37.5	100	100
19	61	80
9.5	38	57
4.75	23	43
2.36	14	33
1.18	7	25
0.6	3	19
0.3	0	14
0.15	0	10
0.075	0	7

Shape control must comply with TNZ M/4 AP40.

The basecourse must also comply with the following criteria:

- Crushing Resistance (minimum) 130kN
- Weathering Resistance AA, AB, AC, BA, BB, CA
- Sand Equivalent (minimum) 30, or
 - Plasticity Index ≤5, or
 - Clay Index ≤3

8.7.3 Particle Size Distribution Shape Control

Fractions	Maximum and Minimum Allowable Percentage Weight of Material Within the Given Fraction
19.0 mm – 4.75mm	23 - 52
9.5 mm – 2.36 mm	9 - 39
4.75 mm – 1.18 mm	2 - 32
2.36mm – 600 µm	1 - 27
1.18 mm – 300 µm	1 - 25
600 µm – 150 µm	0 - 19

8.8 Sub-basecourse Aggregate Compliance

Sub-basecourse aggregates for flexible or hydraulically bound pavements are either:

- ATAP65; or
- ATAP65RCC
- ATAP65S.

If structural asphalt or concrete is proposed, the following aggregates acceptable as a sub-basecourse are:

- ATAP40RCC; or
- ATAP40S; or
- TNZ M/4 AP40; or
- ATAP40.

8.8.1 ATAP65

ATAP65 must:

- Have a soaked CBR of not less than 35% (NZS 4407, Test 3.15) when compacted in the laboratory in accordance with NZS 4402 Test 4.1.3 (Vibrating hammer).
- Be well graded with a particle size distribution that falls within the following limits:

GAP 65	Percent Passing	
Sieve size (mm)	Lower limit	Upper limit
63	100	100
37.5	80	90
19	50	70
9.5	30	55
4.75	20	40
2.36	15	30
1.18	10	24
0.6	6	18
0.3	4	14
0.15	0	10
0.075	0	7

The sub-basecourse must also comply with the following criteria:

- Crushing Resistance (minimum) 100kN
- Weathering Resistance CA or better
- Sand Equivalent (minimum) 25, or
 - Plasticity Index <8, or
 - Clay Index ≤3

8.8.2 ATAP65RCC

Where ATAP65RCC is specified, it must meet the requirements of clause 8.9.1 above.

8.8.3 ATAP40RCCs

Where ATAP40RCCs is specified, it must:

- Have a soaked CBR of not less than 65% (NZS 4407, Test 3.15) when compacted in the laboratory in accordance with NZS 4402 Test 4.1.3 (Vibrating hammer).
- Be well graded with a particle size distribution that falls within the following limits:

AP 40 RCCs	Percent Passing	
Sieve size (mm)	Lower limit	Upper limit
37.5	100	100
19	61	90
9.5	38	75
4.75	23	55
2.36	14	40
1.18	7	30
0.6	3	25
0.3	0	20
0.15	0	15
0.075	0	8

The basecourse must also comply with the following criteria:

- Crushing Resistance (minimum) 100kN
- Weathering Resistance AA, AB, AC, BA, BB, CA
- Sand Equivalent (minimum) 25, or
 - Plasticity Index <5, or
 - Clay Index ≤3

8.9 **Bedding Aggregate Compliance**

Bedding aggregates are either:

- TNZ M/4 AP20; or
- ATAP20; or
- ATAP20RCC.

8.9.1 **TNZ M/4 AP20 Bedding**

AP20 Bedding Material must comply with the latest edition of the TNZ M/4 AP20 specification.

8.9.2 **ATAP20**

ATAP20 must:

- Have a soaked CBR of not less than 80% (NZS 4407, Test 3.15) when compacted in the laboratory in accordance with NZS 4402 Test 4.1.3 (Vibrating hammer).
- Be well graded with a particle size distribution that falls within the following limits:

AP 20	Percent Passing	
Sieve size (mm)	Lower limit	Upper limit
19	98	100
9.5	55	85
4.75	33	65
2.36	22	50
1.18	14	38
0.6	8	30

0.3	5	20
0.15	0	15
0.075	0	10

The bedding must also comply with the following criteria:

- Crushing Resistance (minimum) 100kN
- Weathering Resistance AA, AB, AC, BA, BB, CA
- Sand Equivalent (minimum) 25, or
 - Plasticity Index <5, or
 - Clay Index ≤3

8.9.3 ATAP20RCC

ATAP20RCC must meet the requirements of clause 8.10.2 above.

DRAFT