TNZ M/4: 2006

SPECIFICATION FOR BASECOURSE AGGREGATE

1. SCOPE

This specification sets out requirements for basecourse aggregate for use on state highways and other heavily trafficked roadways.

2. GENERAL

All sampling and testing shall be performed by an IANZ Accredited laboratory for the performance of the relevant test as shown in Figure 1.

All basecourse aggregate which does not comply with the requirements of this specification shall be either: tested as agreed by the Transit New Zealand's Engineering Policy Manager for consideration as a regional basecourse aggregate for inclusion in Table 4 or rejected.

The basecourse aggregate shall be classified as either M/4 or one of the regional basecourse aggregates detailed in Table 4. Additional guidance on the use of regional basecourse aggregates is provided in the appendices to the Notes for this specification.

3. SOURCE PROPERTIES

The basecourse aggregate shall be broken or crushed from either: waterworn gravel; quarried rock or from other sources accepted as a regional basecourse aggregate detailed in Table 4. Source material shall consist of hard, sound material of uniform quality, free from soft or disintegrated stone or other deleterious material.

3.1 Testing Source Properties General

Source properties of the aggregate shall be assessed by the testing specified in Clause 3.3 on samples of aggregate from current production, which are representative of the processing method.

If the aggregate source or processing method is changed then the source properties shall be tested immediately and the Engineer informed. Acceptance of basecourse aggregate from the varied process shall be at the discretion of the engineer until the source properties are shown by test to comply with this specification.

The source property tests shall be performed at periods not exceeding two years unless a comparative petrographic examination of the current aggregate and a

sample from the material successfully tested two years earlier shows that there has been no significant change in the material.

If a petrographic examination is used as described above the source properties shall be tested at least once every four years.

The petrographic examination must be performed by persons who are qualified by education and experience to employ techniques for the recognition of the characteristic properties of aggregates and minerals. The examination shall follow the guidelines given in ASTM C 295 *Standard Practice For Petrographic Examination of Aggregate For Concrete*.

When testing source properties a sample of the aggregate suitable for petrographic examination shall be stored for a minimum of two years by the IANZ Accredited laboratory performing the test.

The Engineer may require some or all of the source property tests to be performed in addition to the testing frequencies stated above. Should the test results show that the material complies with this specification, testing will be at the Principal's cost, otherwise testing will be at the cost of the Contractor.

3.2 Source Property Tests and Sampling

Source properties shall be sampled and tested at a rate of at least one sample for every 10,000m^3 of source material.

3.3 Source Property Tests

3.3.1 Crushing Resistance

When tested in accordance with NZS 4407 : 1991, Test 3.10, *The Crushing Resistance Test*, under a load of 130 kN less than 10% fines passing 2.36 mm sieve size shall be produced.

3.3.2 Weathering Quality Index

The aggregate shall have a quality index of AA, AB, AC, BA, BB or CA when tested according to NZS 4407 : 1991, Test 3.11 *Weathering Quality Index Test.*

3.3.3 California Bearing Ratio

The sample shall be:

(a) compacted in accordance with NZS 4402 : 1986, Test 4.1.3 *New Zealand Vibrating Hammer Compaction Test at Optimum Water Content* and;

(b) tested in accordance with NZS 4407 : 1991, Test 3.15 *The California Bearing Ratio Test* (without a surcharge for at least 4 days). The soaked CBR of the basecourse aggregate shall not be less than 80%.

4. PRODUCTION PROPERTIES

Production properties of the aggregate shall be assessed by the testing specified in Clause 4.2 on representative samples of the crushed aggregate.

Representative samples of aggregate may be taken from conveyor belt, bin, stockpile or truck. Representative samples of the aggregate shall be obtained in accordance with NZS 4407 : 1991.

4.1 Production Property Test Sampling

Stored aggregate shall be subdivided into lots so that aggregates of visible difference are sampled and tested separately. The rate of obtaining samples from lots shall be as in the Table 1.

Table 1: Minimum sampling rate for production property tests

Lot Size		Number of Samples
From	To	
1 m^3	400m^3	2
400m^3	1500m^3	3
1500m^3	4000m^3	4

Where the lot size exceeds 4000m^3 additional testing shall be at the rate of one sample for every 1000m^3.

The Engineer may require some or all of the production property tests to be performed in addition to the testing frequencies stated above. Should the test results show that the aggregate complies with this specification, testing will be at the Principal's cost, otherwise testing will be at the cost of the Contractor.

4.2 Production Property Tests

4.2.1 Quality of Fines

The basecourse aggregate shall comply with either Sand Equivalent or Clay Index or Plasticity Index requirement stated below.

4.2.1.1 Sand Equivalent

The sand equivalent shall not be less than 40 when the aggregate is tested according to NZS 4407 : 1991, Test 3.6 *Sand Equivalent Test*.

4.2.1.2 Clay Index

The clay index of the fraction of basecourse passing the 75μm sieve shall not be greater than 3 when the aggregate is tested according to NZS 4407 : 1991, Test 3.5 *Clay Index Test*.

4.2.1.3 Plasticity Index

The plasticity index of the fraction of basecourse passing the 425μm sieve shall not be greater than 5 when the aggregate is tested according to NZS 4407 : 1991, Test 3.4 *Plasticity Index Test.*

4.2.2 Broken Face Content

The aggregate broken face content in each of the three aggregate fractions between the 37.5mm and 4.75mm sieves shall not be less than 70% by weight and shall have two or more broken faces, when tested according to NZS 4407 : 1991, Test 3.14 *Broken Face Test*.

4.2.3 Particle Size Distribution

The particle-size distribution of the aggregate shall conform with the envelope limits defined in both Tables 2 and 3 below, when the aggregate is tested according to NZS 4407 : 1991, Test 3.8.1 *Wet Sieving Test*.

If testing has been performed to show that the dry sieving method is not significantly different to the wet sieving method at 95% confidence limit for the same aggregate then dry sieving method may be used.

Table 2: Particle Size Distribution Envelope Limits for an Individual Sample

Test Sieve Aperture	Maximum and Minimum Allowable Percentage Weight Passing	
	AP40 (Max size 40mm)	AP20 (Max size 20mm)
37.5mm	100	-
19mm	66 - 81	100
9.5mm	43 - 57	55 - 75
4.75mm	28 - 43	33 - 55
2.36mm	19 - 33	22 - 42
1.18mm	12 - 25	14 - 31
600μm	7 - 19	8 - 23
300μm	3 - 14	5 - 16
150μm	0 - 10	0 - 12
75μm	0 - 7	0 - 8

Table 3: Particle Size Distribution Shape Control

Fractions	Maximum and Minimum Allowable Percentage Weight Of Material Within the Given Fraction	
	AP40 (Max size 40mm)	**AP20 (Max size 20mm)**
19mm - 4.75mm	28 - 48	-
9.5mm - 2.36mm	14 - 34	20 - 46
4.75mm - 1.18mm	7 - 27	9 - 34
2.36mm - 600μm	6 - 22	6 - 26
1.18mm - 300μm	5 - 19	3 - 21
600μm - 150μm	2 - 14	2 - 17

5. REGIONAL BASECOURSES AGGREGATES

For the regional basecourse aggregates the M/4 criteria shall apply except for deviations as stated in Table 4.

The regional basecourse aggregates may only be used in the region detailed if specified in Table 4 or as approved by the Engineer. The use and source of regional materials must be clearly identified in the Contractor's tender. A methodology for dealing with any special considerations must also be included in the tender.

6. COMPLIANCE

The Contractor shall supply proof of compliance before basecourse aggregate is supplied.

7. BASIS OF MEASUREMENT AND PAYMENT

The basis of payment shall be on the final compacted volume of the basecourse aggregate in place with the method of measurement as defined in the contract documents.

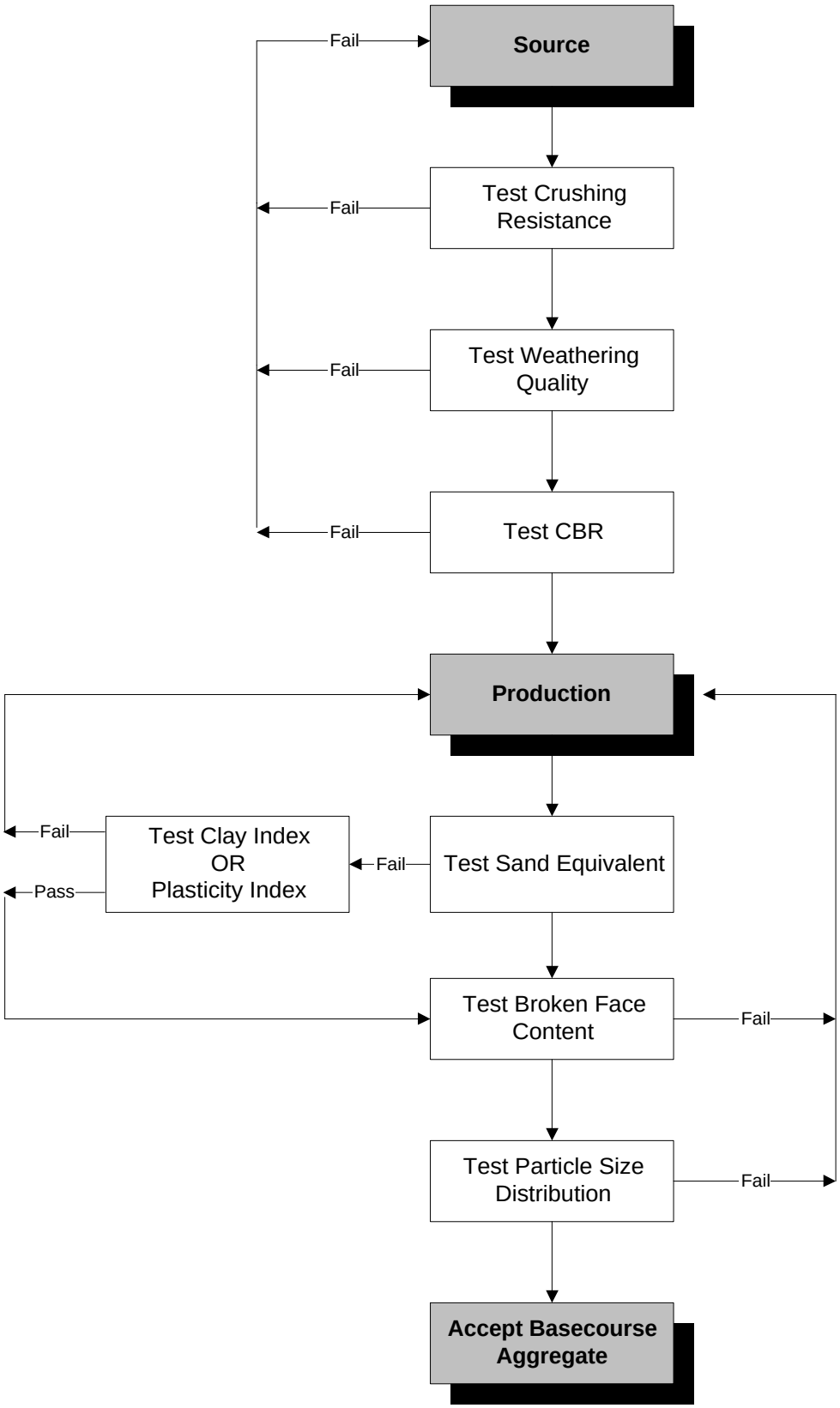

Figure 1 : Flow Chart for Basecourse Aggregate Tests

Table 4: Regional Basecourses

NZS 4407:1991 TEST NAME	TEST NO	TNZ M/4		NAPIER RIVER GRAVEL	
WEATHERING QUALITY INDEX	3.11	AA,AB,BA,BB,CA			
CRUSHING RESISTANCE	3.1	NOT LESS THAN 130kN			
CALIFORNIA BEARING RATIO	3.15	NOT LESS THAN 80%			
BROKEN FACE CONTENT GREATER THAN TWO	3.14				
SIEVE SIZE					
19mm - 37.5mm		NOT LESS THAN 70%		NOT LESS THAN 50%	
9.5mm - 19.0mm		NOT LESS THAN 70%		NOT LESS THAN 50%	
4.75mm - 9.5mm		NOT LESS THAN 70%		NOT LESS THAN 50%	
QUALITY OF FINES					
SAND EQUIVALENT OR	3.6	NOT LESS THAN 40		NOT LESS THAN 35	
CLAY INDEX OR	3.5	NOT GREATER THAN 3		IF SAND EQUIVALENT IS LESS THAN 35	
PLASTICITY INDEX	3.4	NOT GREATER THAN 5		IF SAND EQUIVALENT IS LESS THAN 35	
WET SIEVING TEST	3.8.1				
TEST SIEVE APERTURE		AP40	AP20	AP40	AP20
37.5mm		100	—		
26.5mm		—	—	78 - 100	
19mm		66 - 81	100		
9.5mm		43 - 57	55 - 75		
4.75mm		28 - 43	33 - 55		
2.36mm		19 - 33	22 - 42		
1.18mm		12 - 25	14 - 31	13 - 25	
600μm		7 - 19	8 - 23	10 - 19	
300μm		3 - 14	5 - 16	7 - 14	
150μm		0 - 10	0 - 12	5 - 11	
75μm		0 - 7	0 - 8	3 - 8	
PARTICLE SIZE DISTRIBUTION SHAPE					
FRACTIONS		AP40	AP20	AP40	AP20
19.0mm - 4.75mm		28 - 48	—		
9.5mm - 2.36mm		14 - 34	20 - 46		
4.75mm - 1.18mm		7 - 27	9 - 34		
2.36mm - 600μm		6 - 22	6 - 26	6 - 20	
1.18mm - 300μm		3 - 19	3 - 21	5 - 15	
600μm - 150μm		2 - 14	2 - 17	2 - 12	
TRAFFIC LOADING LIMIT					

NZS 4407:1991 TEST NAME	TEST NO	ROTORUA 1 RHYOLITE	ROTORUA 2 PART CRUSHED RIVER GRAVEL
WEATHERING QUALITY INDEX	3.11		
CRUSHING RESISTANCE	3.1	NOT LESS THAN 60 kN	
CALIFORNIA BEARING RATIO	3.15		
BROKEN FACE CONTENT GREATER THAN TWO	3.14		
SIEVE SIZE			
19mm - 37.5mm 9.5mm - 19.0mm 4.75mm - 9.5mm		N/A N/A N/A	NOT LESS THAN 40% NOT LESS THAN 40% NOT LESS THAN 40%
QUALITY OF FINES			
SAND EQUIVALENT OR	3.6		NOT LESS THAN 45
CLAY INDEX OR	3.5		IF SAND EQUIVALENT IS LESS THAN 45
PLASTICITY INDEX	3.4		IF SAND EQUIVALENT IS LESS THAN 45
WET SIEVING TEST	3.8.1		
TEST SIEVE APERTURE		AP40 AP20	AP40 AP20
37.5mm 26.5mm 19mm 9.5mm 4.75mm 2.36mm 1.18mm 600μm 300μm 150μm 75μm			
PARTICLE SIZE DISTRIBUTION SHAPE CONTROL			
FRACTIONS		AP40 AP20	AP40 AP20
19.0mm - 4.75mm 9.5mm - 2.36mm 4.75mm - 1.18mm 2.36mm - 600μm 1.18mm - 300μm 600μm - 150μm			
TRAFFIC LOADING LIMIT		LESS THAN 1 x 10^6 ESA	

NZS 4407:1991 TEST NAME	TEST NO	WANGANUI SHELL ROCK	TARANAKI ANDESITE – 65kN
WEATHERING QUALITY INDEX	3.11		
CRUSHING RESISTANCE	3.1	NOT LESS THAN 50 kN	NOT LESS THAN 65 kN
CALIFORNIA BEARING RATIO	3.15	NOT LESS THAN 120%	
BROKEN FACE CONTENT GREATER THAN TWO	3.14		
SIEVE SIZE			
19mm - 37.5mm		N/A	
9.5mm - 19.0mm		N/A	
4.75mm - 9.5mm		N/A	
QUALITY OF FINES			
SAND EQUIVALENT OR	3.6		
CLAY INDEX OR	3.5		
PLASTICITY INDEX	3.4		
WET SIEVING TEST	3.8.1		
TEST SIEVE APERTURE		AP40 AP20	AP40 AP20
37.5mm		N/A	
26.5mm		N/A	
19mm		N/A	
9.5mm		N/A	
4.75mm		70 MAX	
2.36mm		N/A	
1.18mm		50 MAX	
600μm		N/A	
300μm		N/A	
150μm		N/A	
75μm		10 MAX	
PARTICLE SIZE DISTRIBUTION SHAPE			
FRACTIONS		AP40 AP20	AP40 AP20
19.0mm - 4.75mm		N/A	
9.5mm - 2.36mm		N/A	
4.75mm - 1.18mm		N/A	
2.36mm - 600μm		N/A	
1.18mm - 300μm		N/A	
600μm - 150μm		N/A	
TRAFFIC LOADING LIMIT			LESS THAN 2 x 10^5 ESA

NZS 4407:1991 TEST NAME	TEST NO	TARANAKI ANDESITE –85kN	TARANAKI ANDESITE–100kN
WEATHERING QUALITY INDEX	3.11		
CRUSHING RESISTANCE	3.1	NOT LESS THAN 85 kN	NOT LESS THAN 100 kN
CALIFORNIA BEARING RATIO	3.15		
BROKEN FACE CONTENT GREATER THAN TWO	3.14		
SIEVE SIZE			
19mm - 37.5mm 9.5mm - 19.0mm 4.75mm - 9.5mm			
QUALITY OF FINES			
SAND EQUIVALENT OR	3.6		
CLAY INDEX OR	3.5		
PLASTICITY INDEX	3.4		
WET SIEVING TEST	3.8.1		
TEST SIEVE APERTURE		AP40 AP20	AP40 AP20
37.5mm 26.5mm 19mm 9.5mm 4.75mm 2.36mm 1.18mm 600μm 300μm 150μm 75μm			
PARTICLE SIZE DISTRIBUTION SHAPE			
FRACTIONS		AP40 AP20	AP40 AP20
19.0mm - 4.75mm 9.5mm - 2.36mm 4.75mm - 1.18mm 2.36mm - 600μm 1.18mm - 300μm 600μm - 150μm			
TRAFFIC LOADING LIMIT		LESS THAN 1 x 10^6 ESA	

NZS 4407:1991 TEST NAME	TEST NO	WELLINGTON 1 GREYWACKE	
WEATHERING QUALITY INDEX	3.11		
CRUSHING RESISTANCE	3.1		
CALIFORNIA BEARING RATIO	3.15		
BROKEN FACE CONTENT GREATER THAN TWO	3.14		
SIEVE SIZE			
19mm - 37.5mm 9.5mm - 19.0mm 4.75mm - 9.5mm		NOT LESS THAN 60% NOT LESS THAN 60% NOT LESS THAN 60%	
QUALITY OF FINES			
SAND EQUIVALENT OR	3.6	NOT LESS THAN 30	
CLAY INDEX OR	3.5	IF SAND EQUIVALENT IS LESS THAN 30	
PLASTICITY INDEX	3.4	IF SAND EQUIVALENT IS LESS THAN 30	
WET SIEVING TEST	3.8.1		
TEST SIEVE APERTURE		AP40 AP20	
37.5mm 26.5mm 19mm 9.5mm 4.75mm 2.36mm 1.18mm 600μm 300μm 150μm 75μm		100 - 95 58 - 85 30 - 65 15 - 45 10 - 35 8 - 25 5 - 20 3 - 15 0 - 10 0 - 8	
PARTICLE SIZE DISTRIBUTION SHAPE CONTROL			
FRACTIONS		AP40 AP20	
19.0mm - 4.75mm 9.5mm - 2.36mm 4.75mm - 1.18mm 2.36mm - 600μm 1.18mm - 300μm 600μm - 150μm			
TRAFFIC LOADING LIMIT			

RCC – Recycled Crushed Concrete

NZS 4407: 1991 TEST NAME	**TEST NO**	**RCC BASECOURSE**	
[2,3]**DEFINITION**	**RCC** is **Recycled Crushed Concrete** composed of rock fragments coated with cement with or without sands and/or filler, produced in a controlled manner to close tolerances of grading and minimum foreign material content. RCC fragments shall consist of clean, hard, durable, angular fragments of concrete. A basecourse is the upper 150 mm layer in the pavement, while the sub-base is below the basecourse layer. Subbases shall conform to the requirements of TNZ M/3 notes, the Foreign Material Contents listed below and the project specific specification. Variation to the following limits are possible should the material meet the requirements of TNZ M22, accepted by Transit New Zealand. **It must be approved for use by the appropriate Regional Council.**		
[2]**FOREIGN MATERIAL**	The percentages of foreign materials shall be determined by RTA Test Method T276. The percentages of foreign materials shall not exceed the following percentages by mass: Type 1 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% No Type II or III materials may be retained on the 37.5mm or above sieves for RCC Basecourse materials. In no circumstances shall the RCC product contain any asbestos or asbestos fibre. Testing for foreign materials shall be at the minimum sampling rate for production property tests		
WEATHERING QUALITY INDEX	3.11	(N/A)	
CRUSHING RESISTANCE	3.1	NOT LESS THAN 130kN	
CALIFORNIA BEARING RATIO	3.15	NOT LESS THAN 80%	
BROKEN FACE CONTENT GREATER THAN 2	3.14		
SIEVE SIZE			
19mm - 37.5mm 9.5mm - 19.0mm 4.75mm - 9.5mm		NOT LESS THAN 70% NOT LESS THAN 70% NOT LESS THAN 70%	
QUALITY OF FINES			
SAND EQUIVALENT OR	3.6	(N/A)	
CLAY INDEX[2] OR	3.5	(N/A)	
PLASTICITY INDEX[2]	3.4	NOT GREATER THAN 5	
WET SIEVING TEST	3.8.1		
TEST SIEVE APERTURE		AP40	
75mm 63mm 37.5mm 19mm 9.5mm 4.75mm 2.36mm 1.18mm		100 100 98 - 100 76 - 94 57 - 75 38 - 58 27 - 47 19 - 39	

NZS 4407: 1991 TEST NAME	TEST NO	RCC BASECOURSE	
600μm 300μm 150μm 75μm		12 - 32 6 - 26 0 - 22 0 - 14	
RCC – Recycled Crushed Concrete – continued: **PARTICLE SIZE DISTRIBUTION SHAPE**			
FRACTIONS		AP40	
37.5mm - 9.5mm 19.0mm - 4.75mm 9.5mm - 2.36mm 4.75mm - 1.18mm 2.36mm - 600μm 1.18mm - 300μm 600μm - 150μm		 27 - 47 17 - 41 8 - 30 6 - 24 5 - 21 3 - 19	
TRAFFIC LOADING LIMIT			

Please note: N/A = Not Applicable and test is not required
1. RCC is generally non plastic as cement dust reacts with any plastic fines present.
2. These requirements for RCC were based on the Transport South Australia's Pavement Material Specification Part 215.
3. RCC shows comparable performance to high quality M4 aggregate as proven at Transit New Zealand accelerated pavement testing facility CAPTIF.

Special Considerations

Stockpiles of RCC should be separated (a minimum distance) from water courses because of the alkaline nature of RCC leachate.

Where RCC aggregates are used in granular basecourse applications in conjunction with subdrains, the following procedures are recommended to reduce the likelihood of leachate precipitates clogging the drainage system:

- Wash the processed RCC aggregates to remove dust from the coarse particles.
- Ensure that any geotextile fabric surrounding the drainage trenches (containing the subdrains) does not intersect the drainage path from the base course, ie do not fully wrap drains (to avoid potential plugging with fines).

The pH value of the RCC aggregate can exceed a pH value of 11. This can be corrosive to galvanized or aluminum pipes placed in direct contact with the RCC. Galvanized or aluminum pipes shall not be used in RCC pavements.

NZS 4407: 1991 TEST NAME	TEST NO	GLENBROOK MELTER SLAG
DEFINITION	Glenbrook Melter Slag is a co-product of the iron making operation at NZ Steel, Glenbrook. The material is processed by "SteelServ" to produce an AP40 aggregate complying to the standard TNZ M4 requirements. **It must be approved for use by the appropriate Regional Council.**	
CHEMICAL ANALYSIS	To ensure a consistent product, the acceptable ranges of the individual relative proportions of slag are: Cao: Min % 10, Max % 20 Fe: Min % 0, Max % 10 SiO2: Min % 9, Max % 15 Al2O3: Min % 15, Max % 21 MnO: Min % 0.5, Max % 1.7 MgO: Min % 11, Max % 15 TiO2: Min % 27, Max % 42 Cr2O3: Min % 0.2, Max % 0.6 V2O5: Min % 0.1, Max % 0.5 Note: The Fe content is removed from the slag during the crushing process The non-ferrous component of every production batch of sub-base and base course Slag shall be analysed in a IANZ accredited laboratory for its chemical properties and at an interval of six months or 10,000m3 of production (whichever occurs first), for the source properties, so as to assure Transit New Zealand that the Slag remains within the parameters specified.	
POTENTIAL EXPANSION OF AGGREGATES FROM HYDRATION REACTIONS (preformed as a Source Test)	EN 1744-1:1998	Not Greater than 0.5% at seven days
WEATHERING QUALITY INDEX	3.11	>BB
CRUSHING RESISTANCE	3.1	NOT LESS THAN 130kN
OTHER	As per TNZ M4	
TRAFFIC LOADING LIMIT		

Special Considerations

Stockpiles should be separated (a minimum distance) from water courses because of the alkaline nature of leachate.

Steel Slag aggreate are known to potentially clog geotextile fabric wraped drains, the reduced amount of free lime in Melter Slag should reduce this risk. Where Melter Slag aggregates are used in granular basecourse applications in conjunction with subdrains, the following procedures required :

- Ensure that any geotextile fabric surrounding the drainage trenches (containing the subdrains) does not intersect the drainage path from the base course ie do not fully wrap drains (to avoid potential plugging with fines).

The pH value of the melter slag aggregate generally ranges from approximately 8 to 10 in laboratory testing and 7.5-8 in the field; however leachate from blast furnance and steel slags are often in these ranges and can exceed a pH value of 11. This can be corrosive to galvanized or aluminum pipes placed in direct contact with the slag. With this in mind galvanized or aluminum pipes shall not be used in melter slag aggregate pavements.

While melter slags have reportedly good test results in terms of potential to swell. The use of Slag aggregate next to structures (such as bridge abutments) is not permitted.

AGGREGATE / RECLAIMED GLASS BLENDED BASECOURSE

DEFINITION

Overseas experience suggests that appropriately processed reclaimed glass is well suited for use as a basecourse aggregate. Adding glass to aggregate, in suitable proportions, provides a number of environmental benefits without compromising the mechanical properties of the aggregate.

This extension of the M/4 specification allows up to 5% reclaimed glass (by mass) to be blended with natural or recycled aggregate for road base construction. The aggregate / reclaimed glass (cullet) blend must comply with the requirements of the M/4 specification except for the variations and additions provided in this table.

Up to 5% reclaimed glass can also be added to subbase aggregate in accordance with the relevant requirements of the M/4 specification.

Proportions of cullet in excess of 5% may be used at the discretion of the Transit New Zealand Engineering Policy Manager, provided that the requirements of the M/22 specification have been satisfied. Such applications are likely to be restricted to relatively low traffic volume projects and the material may be subject to higher standards with respect to contamination limits.

CULLET PROPERTIES

Reclaimed Glass Source	The cullet can originate from a number of glass products, viz: waste food and beverage containers, drinking glasses, window glass, or plain ceramic or china dinnerware. Reclaimed glass from hazardous waste containers, light bulbs, vehicle windscreens, fluorescent tubes or cathode ray tubes shall not be used.
Grading	The cullet shall be crushed to achieve the following gradation: (NZS 4407:1991 Test 3.8.1)

Sieve	Percent Passing
9.5 mm	100
4.75 mm	70 – 100
2.36 mm	35 – 88
1.18 mm	15 – 45
0.30 mm	4 – 12
0.075 mm	0 - 5

	The plus 4.75 mm component of the cullet must not contain more than 1% of flat or elongated particles, i.e. particles with a maximum to minimum dimension ratio greater than 5:1. The ASTM D 4791 test is appropriate (except that the test sample shall be taken as the material retained on the 4.75 mm sieve).
Contamination Limit	Debris, such as paper, foil, plastic, metal, cork, food residue, organic matter, etc can have a significant influence on the performance of the aggregate / glass material. The cullet shall not contain more than 5% debris, as determined using the procedure described in RTA Test Method T267 (where "reclaimed glass" is substituted for "recycled concrete").
Cleanliness	The cullet shall be washed to ensure that undesirable odours are eliminated.

PRODUCTION

Concentrations of reclaimed glass within the aggregate could have a detrimental influence on the performance of the material in a basecourse layer. Therefore, the aggregate and reclaimed glass shall be mixed thoroughly to ensure that there is an even distribution of glass throughout the basecourse stockpile.

CULLET QUALITY ASSURANCE TEST FREQUENCY

Tests for compliance with grading, particle shape and contamination shall be carried out at a frequency of two tests (each) per cullet stockpile.

ADDITIONAL PRODUCTION TESTING	As per TNZ M4	
TRAFFIC LOADING LIMIT		