



BASECOURSE CONSTRUCTION

RNZ PRACTITIONERS GUIDELINES SERIES

		EASILY LAYABLE (COHESIVE)	MODERATELY LAYABLE	HARD TO LAY (NON COHESIVE)
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BASECOURSE CLASSIFICATION

	DESCRIPTION	Generally softer materials which break down during compaction (usually finer grading)	Generally stronger materials that are less easily broken down during compaction.	Generally stronger and harder materials that are not easily broken down during compaction (generally coarse graded lacking natural fines)
BASECOURSE SUPPLY	SUPPLY	Control moisture content.	Control moisture content.	Control moisture content.
	MODIFICATION	Not required.	Compliant M/4 material May require modification (To grading) at source (e.g. addition of fines).	Compliant M/4 material must target top of fines envelope. Modify grading as necessary to meet this requirement at source (e.g. addition of fines). Modification at site possible but not best option.
	STOCKPILING	Suitable for stockpiling and re-handling.	If stockpiled, moisture content needs to be controlled to prevent segregation (e.g. irrigate stockpile).	If stockpiled, moisture content needs to be controlled to prevent segregation (e.g. irrigate stockpile).

CONSTRUCTION OF EDGES

	KERBED	Construct as for layers and add additional fines to surface adjacent to kerb lines.	Construct as for layers and add additional fines to surface adjacent to kerb lines.	Construct as for layers and add additional fines to surface adjacent to kerb lines.
	UNSEALED SHOULDERS/ FEATHER EDGE	Construct first to provide lateral stability for basecourse layer. Can be constructed by over building and trimming back or careful compaction on slopes.	Construct first to provide lateral stability for basecourse layer. Can be constructed by over building and trimming back or careful compaction on slopes.	Construct first to provide lateral stability for basecourse layer. Can be constructed by over building and trimming back or careful compaction on slopes.
	SEALED SHOULDER	Usually overbuild and trim back to required width.	Usually overbuild and trim back to required width.	Usually overbuild and trim back to required width.
	QUALITY ASSURANCE	Lift stakes defined by offset and level tape. Batter board set to required slope. These measurements can be used to build primary shape or to fix shape if over-built and cut back.		

CONSTRUCTION OF LAYERS

SPREADING MATERIAL	TRUCK	Target uniform even depth of spread to minimize segregation and redistribution with grader. Min 2.5 times particle size.	Target uniform even depth of spread to minimize segregation and redistribution with grader. Min 2.5 times particle size.	Target uniform even depth of spread to minimize segregation and redistribution with grader. Min 2.5 times particle size.
	PAVER	Paver is rarely used as some basecourses are not suitable for paver laying. If Paver use appropriate, lay uniform even depth with paver. Some prelevelling may be required to achieve uniform even depth.	Paver not suitable unless cementitious or bitumen binder used. If Paver use appropriate, lay uniform even depth with paver. Some prelevelling may be required to achieve uniform even depth.	Paver not suitable unless cementitious or bitumen binder used. If Paver use appropriate, lay uniform even depth with paver. Some prelevelling may be required to achieve uniform even depth.
	QUALITY ASSURANCE	Control spread of layers by string-line from lift stakes or by probe depths if lift stakes are not used.		

COMPACTION	INITIAL	Usually vibratory compaction to form stable layer (6 - 10 passes) (plateau density).	Usually vibratory compaction to form stable layer (6 - 10 passes) (plateau density).	Usually vibratory compaction to form stable layer (6 - 10 passes) (plateau density).
	SECONDARY	To create densification and stability of layer (steel wheel).	To create densification and stability of layer (steel wheel).	To create densification and stability of layer (steel wheel). Will require more compaction than easy/ moderate materials.
	FINAL	To produce suitable sealing surface (steel wheel & PTR). Manage traffic if available to aid compaction by even distribution.	To produce suitable sealing surface (steel wheel & PTR). Manage traffic if available to aid compaction by even distribution.	To produce suitable sealing surface (steel wheel & PTR). Manage traffic if available to aid compaction by even distribution.
	QUALITY ASSURANCE	Compaction testing Clegg Hammer 50 blows or better. Nuclear Densometer 95% subbase and 98% basecourse all of maximum dry density. Typically 2.2 – 2.3 in greywacke gravels.		

GRADING	INITIAL	Initial trimming only carried out when basecourse is firm. Top up material spread to correct shape identified by stringing.	Initial trimming only carried out when basecourse is stable.	Initial trimming only carried out when basecourse is stable.
	SHAPING	Grader to develop windrow by trimming to produce required crossfalls. Windrowed material used to fill small voids in surface and to develop slurry for surface stability. Control the slurry to achieve solid stone surface (i.e. no caking).	Grader to develop windrow by trimming to produce required crossfalls. Windrowed material used to fill small voids in surface and to develop slurry for surface stability. Control the slurry to achieve solid stone surface (i.e. no caking).	Grader to develop windrow by trimming to produce required crossfalls. Windrowed material used to fill small voids in surface and to develop slurry for surface stability. Control the slurry to achieve solid stone surface (i.e. no caking).
	QUALITY ASSURANCE	Lift stakes define finished levels by tapes. Alternately 3D grader control can be used. B2 tolerances are subbase minus 25 plus 5 and basecourse minus 5 plus 15.		

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		EASILY LAYABLE (COHESIVE)	MODERATELY LAYABLE	HARD TO LAY (NON COHESIVE)
WATERCART	INITIAL	Control application to achieve moisture content near optimum.	Control application to achieve moisture content near optimum.	Control application to achieve moisture content near optimum.
	FINAL	Increase application to assist in forming slurry, at finishing stages.	Increase application to assist in forming slurry, at finishing stages.	Increase application to assist in forming slurry, at finishing stages.
	MAINTENANCE	After final construction, add as necessary to prevent unravelling prior to sealing. And manage dryback to achieve B/2 presealing requirements.	After final construction, add as necessary to prevent unravelling prior to sealing. And manage dryback to achieve B/2 presealing requirements.	After final construction, add as necessary to prevent unravelling prior to sealing. And manage dryback to achieve B/2 presealing requirements.
	QUALITY ASSURANCE	Establish optimum moisture content from Lab density. Water content per sq.m can be calculated and applied. Typically gravels range 3.5 – 4.5 OMC. Warning some vesicular basecourses such as Dacite can require 14% OMC.		
RUNNING COURSE	FINAL	Applied as necessary to protect surface from traffic wear and facilitate removal of any caked fines e.g. small chip with no fines. Manage traffic if available to control coverage of running course.	Applied as necessary to protect surface from traffic wear and facilitate removal of any caked fines e.g. small chip with some fines. See TNZB/2. Manage traffic if available to control coverage of running course.	Applied as necessary to protect surface from traffic wear and facilitate removal of any caked fines. Manage traffic if available to control coverage of running course. This may include additional fines being added as part of running course (e.g. crusher dust / grade 6 chip mix) typical application rate 1m ³ per 100m ³ . See TNZ B/2.
DRAG BROOMING	INITIAL	Carried immediately after the application of running coat to assist in uniformly spreading the running coat.	Carried immediately after the application of running coat to assist in uniformly spreading the running coat.	Carried immediately after the application of running coat to assist in uniformly spreading the running coat.
	MAINTENANCE	Carried out to ensure windrowing does not occur.	Carried out to ensure windrowing does not occur.	Carried out to ensure windrowing does not occur.
SURFACE SWEEPING	TEST	Hand broom with coarse bristle to ensure tight mosaic surface.	Hand broom with coarse bristle to ensure tight mosaic surface.	Hand broom with coarse bristle to ensure tight mosaic surface.
	FINAL	Mechanical sweeping (pre moisten if necessary to prevent excessive dust and aid bitumen adhesion).	Mechanical sweeping (pre moisten if necessary to prevent excessive dust and aid bitumen adhesion).	Mechanical sweeping (pre moisten if necessary to prevent excessive dust and aid bitumen adhesion).