Appendix L: Testing Schedule Summary ~~Table 3.1 - Road Design Standards – Urban (speed limit < 70 km/h)~~

Commented [SC1]: New Appendix L was previous appendix N. Only one change (comment below)

APPENDIX L: TESTING SCHEDULE SUMMARY

Summary of testing requirements as specified in Whanganui District Council Land Development and Subdivision Engineering Document (Supplement to NZS 4404: 2010) Appendix I, Technical Specifications.

Testing Requirements	Frequency
Section 2 Earthworks Earth fill density compaction For granular material, test required is density index test For non-granular material, test required is air voids & shear vane test.	**Large Scale Operations** greater than 1,500m2, e.g. subdivisions, large lots or road embankments. 1 test per layer per material per 2500m2 or 1 test per 500m3 distributed evenly throughout full depth and area or 3 tests per lot. **Small scale operations** e.g. (Individual residential lots) 1 test per layer per 1000m2 or 1 test per 200m3 distributed evenly throughout full depth and area or 1 test per residential lot per layer. **Concentrated operations** less than 500m2, e.g. backfill small farm dams, gullies and similar. 1 test per layer per 500m2 or 1 test per 100m3 distributed throughout full depth and area or 3 tests per visit. **Confined operations** e.g. filling behind structure 1 test per 2 layers per 50m2 **Trenches** 1 field density test per 2 layers per 40 linear metres. For earthworks, the test option to be used is whichever requires the most tests.
Section 3 Trench Excavation Clause 3.2.3 Pipe foundation test as approved by the Authorised Representative	1 test per pipe length.
Section 4 Pipe line Construction Drainage. Grading on bedding material Bedding and haunch zone material compaction test.	As requested by the Authorised Representative. At least one test every 10 metres of trench

Testing Requirements	**Frequency**
Backfill material compaction For Granular Material, test required is Density Index test For Non granular Material, test required is Air voids & Shear Vane test.	
In berms	One test per layer of backfill per 15 metres of trench, with a minimum of two tests. 1 field density test per 2 layers per 40 linear metres. For indirect tests the Scala or Clegg Hammer may be used.
In carriageways or under footpaths.	One test per layer of backfill per 5 metres of trench, with a minimum of two tests. 1 field density test per 2 layers per 40 linear metres. For indirect tests the Scala or Clegg Hammer may be used.
Pipe Line testing, pressure and Vacuum tests	All pipe line lengths
Section 5. Pipeline Construction Water Supply **Personnel Public health**	
Hepatitis A	Prior to starting work and retested every 12 months
Grading on bedding material	As requested by the Authorised Representative.
Backfill compaction, clause 5.14.3	**Trenches**
In berms	One test per layer of backfill per 15 metres of trench, with a minimum of two tests.1 field density test per 2 layers per 40 linear metres.

Testing Requirements	Frequency
In carriageways and under footpaths.	One test per layer of backfill per 5 metres of trench, with a minimum of two tests. 1 field density test per 2 layers per 40 linear metres. For indirect tests the Scala or Clegg Hammer may be used.
Pipeline testing, pressure and vacuum tests.	All pipe lines to be tested.
Section 6. Manholes and Sumps	
Manhole, water testing or inspection test.	Each man hole.
Backfill compaction tests	Where excavated area is greater than 0.5m2 and less than 5m2 one test per backfill layer is required.
Section 7 Concrete Work	
Test certificate for concrete materials	As requested by the Authorised Representative.
Section 8 Pavement Construction	
Subgrade Shape	Lift pegs installed at a maximum spacing of 20 metres on straights and 10 metres where super-elevation changes.
Subgrade Strength.	
Field Insitu CBR tests	Every 75m, with a minimum of 3, located at each end of the subdivision and midway between ends.
Laboratory soaked CBR tests	Prior to starting the fill operation and on completion a test every 75m along the subgrade.
Benkelmen Beam testing	At 10m intervals, in both wheel paths of each lane.
Pavement materials	
Subbase. Test required, grading, soaked CBR and Sand Equivalent.	One test prior to commencement and then two tests per site or one test per 200m3 of material. One test prior to commencement and then two tests per site or one test per 200m3 of material.

Testing Requirements	Frequency
Basecourse. Tests required, gradin, Sand Equivalent, broken faces. If shellrock is used clay index is required and broken faces not required.	One test prior to commencement and then two tests per site or one test per 200m3 of material. One test prior to commencement and then two tests per site or one test per 200m3 of material.
Pavement Surface finish.	
Benkelman Beam testing	Prior to surfacing, in both wheel paths of each lane at a maximum interval of 10 metres.
Surface Shape	As for subgrade surface shape.
Pavement materials compaction, MDD testing	As required by TNZ B/2 Specification.
Surface Roughness	Prior to surfacing, readings at 20 metre intervals and in each lane.
Section 9 Chip Sealing	
Sealing chip, chip size, shape and cleanliness	One test prior to commencement and then one test per chip size per 800 lineal metres of subdivision.
Section 10. Thin Asphaltic Surfacing.	
Provide job mix formula	One test prior to commencement.
Asphalt Concrete	One test to provide evidence of compliance with job mix
Section 11. Kerb & Channel, Footpath and Vehicle Crossings Construction	
Test certificate for concrete materials	As requested by the Engineer
Kerb base	CIV 35 @ 5m centres along length

Commented [SC2]: New addition – change from original appendix N

~~**Table 3.1 – Road design standards – Urban (speed limit ≤ 70 km/h) : Supplement Document changes in bold**~~

Class	Type	Area Served	Traffic Volumes Vpd (1)	Design Speed, (km/h)		Road Reserve Width, m	Minimum carriageway width (m)				Footpath (m)	Berm (m)	Max/min gradient	Normal camber	Max super-elevation	Notes
				Flat or rolling	Hilly		Parking (2)	Traffic	Cycles(3)	Total						
Local roads	Private way	1-3 du(1)	NA	NA	NA	3.8	-	1 x 3.0	-	3.0(4)	-	0.5 + 0.3	16% max. 0.4 % min.	3%	NA	Not public Street(4)
	Private way	4-6 du	NA	NA	NA	6.5	-	1 x 5.5	-	5.5(4)	-	2 x 0.5	16% max. 0.4% min.	3%	NA	
	Cul de sac	Up to 20 du	NA	NA	NA	11.0	1 x 2.5	1 x 3.5	-	6.0	1.4	0.5 + 3.1	12.5% max. 0.4% min.	3%	6%	No stopping on one side
	Cul de sac	21-50 du	NA	NA	NA	15.5	1 x 2.5	2 x 3	-	8.5	2 x 1.4	2 x 2.1	12.5% max. 0.4% min.	3%	6%	No stopping on one side
	Residential	21-150 du	Up to 750	30	30	18	2 x 2.5	2 x 3.0	-	11.0	2 x 1.4	2 x 2.1	12.5% max. 0.4 % min.	3%	6%	(5)
	Industrial	Up to 20 units	>300	30	30	15.5	1 x 2.5	2 x 3.5	-	9.5	2 x 3.0	-	10% max. 0.4% min.	3%	6%	No stopping on one side
	Industrial/ Commercial Service lane	-	NA	NA	NA	8	-	2 x 3.5	-	7.0	-	2 x 0.5	10% max. 0.4% min.	3%	NA	(6)
	Commercial (Park precinct)	-	<2000	30	30	(7)	(7)	2 x 3.5	-	7.0	2 x 3.0	-	10% max. 0.4% min.	3%	NA	(7)
Local distributor roads	Residential	<150 du	200 – 1000	40	40	21.0	2 x 2.5	2 x 3.5	-	12.0	2 x 1.4	2 x 3.1	12.5% max. 0.4 % min.	3%	8%	
	Industrial/ Commercial	20 – 40 units	300 – 1000	40	40	18.0	2 x 2.5	2 x 3.5	-	12.0	2 x 3.0	-	10% max. 0.4% min.	3%	6%	(7)
Collector roads	Residential	150 – 450 du	1000 - 3000	50	40	23.0	2 x 2.5	2 x 3.5	2 x 1.0	14.0	2 x 1.4	2 x 3.1	10% max. 0.4% min.	3%	8%	
	Industrial/ Commercial	>40 units	>1000	50	40	20.0	2 x 2.5	2 x 3.5	2 x 1.0	14.0	2 x 3.0	-	10% max. 0.4% min.	3%	6%	(7)
Secondary (District) arterial Primary (Regional) arterial		>450 du	3000 – 7000	50	50	24	2 x 2.5	2 x 3.5	2 x 1.5	15.0	2 x 1.4	2 x 3.1	10% max. 0.4% min..	3%	8%	
		-	>7000	70	60	27	2 x 3.0	2 x 3.5 1 x 2.0	2 x 1.5	18.0	2 x 1.4	2 x 3.1	10% max. 0.4% min.	3%	8%	Painted median occupies 2 m Traffic lane

NOTE –
(1) du = dwelling units, vpd = vehicles per day
(2) Parking land width allows for limited cycle space.
(3) Where the TA gives approval to remove cycle lanes each traffic lane shall be increased to 4.0m.
(4) Where a private way adjoins a local distributor road or higher, it shall have a 5.5 m traffic width and 6.5 m road reserve width for a minimum of 6.0 m from road boundary.
(5) Parking bays set into berm footpath zones.
(6) No parking both sides.
(7) Width dictated by parking provision. Parking (including angle parking) shall be provided on both sides of street and maximized taking into account traffic considerations.
(8) Companion Document changes shown in bold
(9) Urban: All cut and fill batters including retaining structures shall be located outside of the road reserve.
(10) Rural: All cut and fill batters and side drains shall be incorporated within the legal road reserve.
(11) Industrial Footpath width may be reduced at Council's discretion.
(12) Minimum road widths are derived from AS/NZS 2890.1:2004 and apply to straight roads. Refer Table 2.2 AS/NZS 2890.1:2004 for minimum road widths for curved roads.