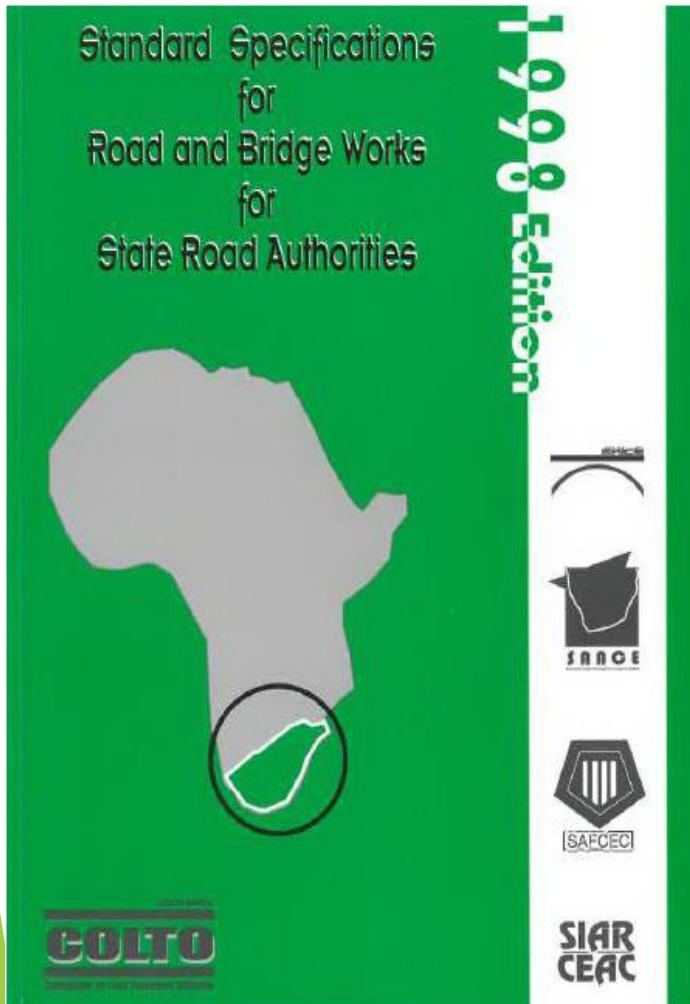


Revision of existing COLTO Standard Specifications for Road and Bridge Works for State Road Authorities



DRAFT COTO REVISION UPDATE TO RPF

JC VAN DER WALT
12 AND 13 NOVEMBER 2018¹



- **CONTENT:**
- **BACKGROUND**
- **NEW FORMAT**
- **WHAT HAS CHANGED FROM OLD TO NEW?**
- **LAYOUT OF NEW CHAPTERS**
- **WORKSHOP PROGRAMME**
- **COTO PROCEDURE FOR REVISION OF DOCUMENTATION**

BACKGROUND: COTO SUITE OF DOCUMENTS

VOLUME 1	GENERAL CONDITIONS OF CONTRACT (FIDIC; GCC, ETC)
VOLUME 2	STANDARD SPECIFICATIONS FOR: 2.1 ROADS AND BRIDGE WORKS 2.2 ROUTINE ROAD MAINTENANCE ??
VOLUME 3	CONTRACT DOCUMENT
VOLUME 4	ROADWORK DRAWINGS
VOLUME 5	STRUCTURES DRAWINGS
VOLUME 6	MATERIAL UTILISATION
VOLUME 7	ENVIRONMENTAL MANAGEMENT PLAN

BACKGROUND:

- The revision work is carried out under the auspices of the Road Materials Committee (RMC).
- Working Groups for each of the Chapters were formalised in early 2014 which consists of a co-ordinator with the following members:
 - RMC
 - Provinces
 - SAFCEC
 - ASPASA
 - Municipalities & Metros
 - Consultants (members specialising in specific fields)
 - SANRAL
 - DOT
- The document to cater for the use of all authorities – SANRAL, Provincial, Municipal and Metros.
- The document to be available electronically and free of charge.
- COTO Standard Specifications is not a **“design document”**.

BACKGROUND:

- **Revision procedure:**
 - **Compile web-based document (replace 2 columns with 1)**
 - **Use SANRAL pro-forma as basis**
 - **Review other documentation including local and international specifications**
 - **Change the layout, format and restructure the document to be in line with international standards**
 - **Identify outdated requirements/equipment/specification**
 - **What works and what doesn't – practical for contractor and measurable by engineer**
 - **Identify changes that affect other series (TRH; TMH, etc.)**
 - **Move away from terminology such as “determined by the Engineer”.**

WHAT HAS CHANGED FROM THE OLD TO THE NEW

- **BASICALLY THE WHOLE DOCUMENT HAS CHANGED!!! (12 new chapters)**
- **Management and Utilisation (M&U) Plan: for borrow material, blasting, cuttings and fills $\geq 5000\text{m}^3$**
- **Material Grading Requirements: change in the sieve sizes**
- **Material Classification: Soft, intermediate and hard. No more intermediate, only for labour enhanced works**
- **Incorporate some SABS/SANS 1200 Specification principles into chapter 2**

OLD CHAPTERS OF COLTO STANDARD SPECIFICATIONS (VOLUME 2 – 1998)

- **SERIES 1000:** GENERAL
- **SERIES 2000:** DRAINAGE
- **SERIES 3000:** EARTHWORKS AND PAVEMENT LAYERS OF GRAVEL OR CRUSHED STONE
- **SERIES 4000:** ASPHALT PAVEMENTS AND SEALS
- **SERIES 5000:** ANCILLIARY ROADWORKS
- **SERIES 6000:** STRUCTURES
- **SERIES 7000:** SUNDRY STRUCTURES
- **SERIES 8000:** SUNDRIES

NEW FORMAT OF COTO CHAPTERS

EACH CHAPTER SECTION CONSISTS OF:

PART A: SPECIFICATIONS

Table of Contents:

- 1. Scope**
- 2. Definitions**
- 3. General**
- 4. Design by Contractor/Performance Based Systems**
- 5. Materials**
- 6. Construction Equipment**
- 7. Execution of the Works**
- 8. Workmanship**

PART B: LABOUR ENHANCED

1. to 8.

PART C: MEASUREMENT AND PAYMENT (of Part A & B)

PART D: GUARANTEES AND COMPLIANCE CERTIFICATES

NEW FORMAT OF COTO CHAPTERS:

PART B: LABOUR ENHANCED

Definition: Labour Enhanced means to improve the scope for labour

The methods and specifications related to labour enhanced construction are contained in **Part B** of each of the relevant sections of these Standard Specifications. The requirement for the use of labour enhanced construction methods to satisfy any particular **project goals** will be set out in the contract documentation.

The specifications given in **Part A** of these Standard Specifications will apply to all work carried by using labour enhanced construction methods unless some of the specifications in Part A are replaced with revised specifications in Part B that are specifically applicable to the specified labour enhanced construction or additional specification for labour enhanced construction are provided in **Part B**.

NEW CHAPTERS OF REVISED COTO STANDARD SPECIFICATIONS (VOLUME 2)

- **CHAPTER 1: GENERAL**
- **CHAPTER 2: SERVICES**
- **CHAPTER 3: DRAINAGE**
- **CHAPTER 4: EARTH AND LAYER WORKS: MATERIALS**
- **CHAPTER 5: EARTH AND LAYER WORKS: CONSTRUCTION**
- **CHAPTER 6: CONCRETE LAYERS**
- **CHAPTER 7: REPAIR & REHABILITATION OF CONCRETE LAYERS**
- **CHAPTER 8: PRE-TREATMENT AND REPAIR OF EXISTING SURFACES**
- **CHAPTER 9: ASPHALT LAYERS**
- **CHAPTER 10: SEALS**
- **CHAPTER 11: ANCILLARY ROAD WORKS**
- **CHAPTER 12: GEOTECHNICAL APPLICATIONS**
- **CHAPTER 13: STRUCTURES**
- **CHAPTER 14: REPAIR & REHABILITATION OF STRUCTURES**
- **CHAPTERS 15 TO 19: RESERVED FOR FUTURE USE**
- **CHAPTER 20: QUALITY ASSURANCE**

CHAPTER 1: GENERAL

SECTION	DESCRIPTION
A1.1	GENERAL PREAMBLE
A1.2	GENERAL REQUIREMENTS AND PROVISIONS
A1.3	CONTRACTORS SITE ESTABLISHMENT AND GENERAL OBLIGATIONS
A1.4	FACILITIES FOR THE ENGINEER
A1.5	ACCOMMODATION OF TRAFFIC
A1.6	CLEARING AND GRUBBING
A1.7	LOADING AND HAULING
A1.8	USE OF EXPLOSIVES

CHAPTER 2: SERVICES

SECTION	DESCRIPTION	SCOPE
A 2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	<p>Section 2.1 covers the general requirements applicable to civil construction work associated with the location, identification, protection, relocation and the installation of services in road reserves as well as the protection and reinstatement of existing road infrastructure. This section also covers the trenching requirements applicable to the installation of services in road reserves.</p> <p>Chapter 2 does not cover storm water and other drainage structures.</p>
A 2.2	DRY SERVICES	<p>Section 2.2 covers the civil engineering components for the construction work associated with the installation of dry services (ducts and/or cables for telecommunications, electricity and street lighting) and ancillary works in road reserves and including the installation of services in road carriageways using micro and mini trenching.</p>
A 2.3	WET SERVICES	<p>This section of Chapter 2 covers the civil engineering components for the construction work associated with the installation of wet services (water supply and waste water (sewerage) pipelines) and ancillary works in road reserves. This section only covers medium pressure pipelines of diameter up to 1,0 m, for transporting water and sewerage under working pressures of up to 2,5 MPa.</p>
A 2.4	ENERGY AND OTHER SERVICES	<p>Section 2.4 covers the civil construction work associated with the installation of street lighting and electric power and other energy services (gas and fuel pipelines) and any other types of services not dealt with elsewhere in Chapter 2.</p> <p>Section 2.4 only covers excavation and backfilling work on electric power and street lighting services. The section does not cover the supports (poles, struts, stays, pylons, gantries etc) or the cables or other electric plant associated with such infrastructure.</p> <p>Work on certain energy (gas and fuel pipelines and higher voltage (HV, EHV and UHV) services, due to their nature, is specialised and therefore few standard specifications and conditions are considered to be applicable to such work. All such energy services shall therefore be installed in accordance with the project specifications. The purpose of Section 2.4 is therefore partly to provide a structured framework for the project specifications for civil construction work for such services.</p>

CHAPTER 3: DRAINAGE

SECTION	DESCRIPTION
A3.1	DRAINS
A3.2	CULVERTS
A3.3	CONCRETE CURBING, CONCRETE CHANNELLING, CHUTES AND DOWNPIPES AND CONCRETE AND STONE PITCHED AND GABION LININGS FOR OPEN DRAINS

EVERYTHING!

SERIES 3000 versus CHAPTER 4 & 5 LAYOUT

3000	EARTHWORKS AND PAVEMENT LAYERS OF GRAVEL OR CRUSHED STONE
3100	BORROW MATERIALS
3200	SELECTION, STOCKPILING AND BREAKING DOWN THE MATERIAL FROM BORROWPITS, CUTTINGS AND EXISTING PAVEMENT LAYERS, AND PLACING AND COMPACTING THE GRAVEL LAYERS
3300	MASS EARTHWORKS
3400	PAVEMENT LAYERS OF GRAVEL MATERIAL
3500	STABILIZATION
3600	CRUSHED-STONE BASE
3700	PLANT-MIXED PAVER-LAID PAVEMENT LAYERS
3800	BREAKING UP EXISTING PAVEMENT LAYERS
3900	PATCHING AND REPAIRING EDGE BREAKS



	CHAPTER 4
4.1	BORROW MATERIALS
4.2	CUT MATERIALS
4.3	EXISTING ROAD MATERIALS
4.4	COMMERCIAL MATERIALS
4.5	ALTERNATIVE MATERIALS

	CHAPTER 5
5.1	ROADBED
5.2	FILL
5.3	ROAD PAVEMENT LAYERS
5.4	STABILISATION
5.5	RECONSTRUCTION AND REHABILITATION OF LAYER WORKS

CHAPTER 4: EARTH AND LAYER WORKS: MATERIALS

4	EARTHWORKS AND LAYER WORKS: MATERIALS	
	DESCRIPTION	SCOPE
4.1	BORROW MATERIALS	Sourcing materials for earthworks and layer works from borrow pits and quarries for a specific road construction project or projects.
4.2	CUT MATERIALS	Sourcing materials that can be used for the construction of earthworks and layer works from: <ul style="list-style-type: none"> • New cuttings. • The widening of or altering the side slope of or cutting of benches into existing cuttings. • Box cuts for new roads and from box cuts for the widening of existing roads. • Designated excavations.
4.3	EXISTING ROAD MATERIALS	Sourcing of existing road construction materials that are: <ul style="list-style-type: none"> • Obtained from reclaiming or recycling existing road earthworks, layer works and asphalt materials (whether used as a pavement layer or used as the wearing course). • Used to reconstruct the same road they are obtained from or used on another road project.
4.4	COMMERCIAL MATERIALS	This section covers: <ul style="list-style-type: none"> • Sourcing materials for earthworks and layer works from commercial and other private sources. • The provision of commercial agents and additives that are added or worked into the available materials or layer to enhance, improve or alter its properties so that the materials then comply with the applicable quality and strength requirements.
4.5	ALTERNATIVE MATERIALS	Sourcing alternative materials for the construction of earthworks and layer works other than the sources under 4.1 to 4.4

CHAPTER 5: EARTH AND LAYER WORKS: CONSTRUCTION

5	EARTHWORKS AND LAYER WORKS: CONSTRUCTION	
	DESCRIPTION	SCOPE
5.1	ROADBED	<p>This section covers the following construction work:</p> <ul style="list-style-type: none"> 5.1.1.1 Clearing and grubbing. 5.1.1.2 Conservation of topsoil and vegetation. 5.1.1.3 Standard Roadbed treatment.
5.2	FILL	<p>This section covers:</p> <ul style="list-style-type: none"> 5.2.1.1 Hauling of material from the place of excavation (borrow, cut or existing road materials or from the stockpile, to the position of placement. In the case of commercial and alternative materials, the cost of the procurement of these materials includes all the haulage. 5.2.1.2 Off-loading the fill material and subsequent processing of the fill material in layers. 5.2.1.3 The control of the moisture content and all work in connection with the construction of fills.
5.3	ROAD PAVEMENT LAYERS	<p>This section covers the loading at the point of supply, the hauling and off-loading at the point of use, the spreading, mixing, watering and levelling and the compaction and finishing of all the various pavement layer materials required for the construction of the road pavement layer works.</p> <p>This section also covers plant-mixed, paver-laid (PMPL) pavement layer construction.</p>
5.4	STABILISATION	<p>This section covers the following construction work:</p> <ul style="list-style-type: none"> 5.4.1.1 Material stabilisation 5.4.1.2 Material modification 5.4.1.3 Use of recycler plant for material modification and/or stabilisation 5.4.1.4 Proprietary stabilisation agents
5.5	REHABILITATION AND RECYCLING OF LAYER WORKS	<p>This section covers the following work:</p> <ul style="list-style-type: none"> 5.5.1.1 Patching 5.5.1.2 Milling 5.5.1.3 In-place recycling

CHAPTER 6: CONCRETE LAYERS

Progress – 70% complete

CHAPTER 7: REPAIR & REHABILITATION OF CONCRETE LAYERS

Progress – 25% complete

CHAPTER 8: PRE-TREATMENT AND REPAIR OF EXISTING SURFACES

SECTION	DESCRIPTION
A 8.1	PRIME COATS
A 8.2	FOG SPRAYS, COVER SPRAYS AND REJUVENATION SPRAYS
A 8.3	TEXTURE TREATMENT
A 8.4	RUT AND/OR DEPRESSION CORRECTION
A 8.5	STANDARD CRACK SEALING
A 8.6	GEOTEXTILE CRACK SEALING
A 8.7	PLANING
A 8.8	PATCHING AND EDGEBREAK REPAIR
A 8.9	REPAIR OF SURFACE DEFECTS

CHAPTER 9: ASPHALT LAYERS

SECTION	DESCRIPTION
A 9.1	ASPHALT LAYERS (Base and surfacing)
	<p>A 9.1.1 Scope</p> <ul style="list-style-type: none">• Asphalt<ul style="list-style-type: none">- Continuously graded asphalt base (BC)- High modulus asphalt: Enrobé á Modulé Elevé (EME)- Continuously graded asphalt surfacing with or without rolled-in pre-coated chippings (AC)- Gap-graded asphalt surfacing with or without rolled-in pre-coated chippings (AG)- Semi-gap graded asphalt surfacing with or without rolled-in pre-coated chippings (AS)- Open-graded asphalt surfacing (AO)- Stone-mastic asphalt surfacing (SMA)- Ultra-thin friction courses (UTFC)• Hot mix asphalt (HMA)• Warm mix asphalt (WMA)• Cold mix asphalt (CA)• Recycled asphalt• Reclaimed asphalt (RA)• Certified asphalt mixes – UTFC• Bond coat• Prime coat

CHAPTER 10: SEALS AND MICRO-SURFACING

SECTION	DESCRIPTION
A 10.1	GENERAL REQUIREMENTS FOR SEALS
	A 10.1.1 Scope <ul style="list-style-type: none">• Binders<ul style="list-style-type: none">- Penetration grade bitumen- Bitumen emulsions- Cutback bitumen- Modified binders• Aggregate• Sprayed seals• Combination seals• Slurry• Micro-surfacing• Cover spray• Fog spray/rejuvenation spray

CHAPTER 11: ANCILLARY ROAD WORKS

SECTION	DESCRIPTION
A11.1	PITCHING, STONEMWORK AND PROTECTION AGAINST EROSION
A11.2	GABIONS
A11.3	GUIDE BLOCKS AND KIKOMETRE MARKERS
A11.4	VEHICLE RESTRAINT SYSTEMS
A11.5	FENCING
A11.6	ROAD SIGNS
A11.7	ROAD MARKINGS
A11.8	LANDSCAPING AND PLANTING PLANTS
A11.9	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS

CHAPTER 12: GEOTECHNICAL APPLICATIONS

SECTION	DESCRIPTION
A 12.1	PILING
A 12.2	GROUND ANCHORS
A 12.3	GROUND IMPROVEMENT
A 12.4	LATERAL SUPPORT
A 12.5	SHOTCRETE
A 12.6	MECHANICALLY STABILISED EARTH WALLS
A 12.7	PIPE JACKING, DIRECTIONAL DRILLING, RAMBORING AND MICRO-TUNNELLING
A 12.8	GROUND DRAINAGE
A 12.9	SLOPE PROTECTION MEASURES
A 12.10	HARD EXCAVATION BY BLASTING
A 12.11	GEOSYNTHETICS
A 12.12	CONSTRUCTION DEWATERING

CHAPTER 13: STRUCTURES

SECTION	DESCRIPTION
A13.1	FOUNDATIONS
A13.2	FALSEWORK, FORMWORK AND CONCRETE FINISH
A13.3	STEEL REINFORCEMENT
A13.4	CONCRETE
A13.5	PRESTRESSING
A13.6	BEARINGS
A13.7	JOINTS
A13.8	ANCILLARY STRUCTURAL ELEMENTS
A13.9	STRUCTURAL STEELWORK FOR MINOR STRUCTURES
A13.10	PAINTING OF MINOR STRUCTURES
A13.11	STRUCTURAL STEELWORK FOR MAJOR STRUCTURES
A13.12	STRUCTURAL STEELWORK PROTECTIVE TREATMENT OF MAJOR STRUCTURES
A13.13	INCREMENTAL LAUNCHING OF BRIDGE DECKS
A13.14	SPECIALIST STRUCTURES

CHAPTER 14: REPAIR AND REHABILITATION OF STRUCTURES

SECTION	DESCRIPTION
A14.1	ACCESS FOR BRIDGE REHABILITATION
A14.2	CORROSION SURVEY METHODS AND TESTING OF NEAR SURFACE CONCRETE PROPERTIES
A14.3	DEMOLITION AND REMOVAL OF STRUCTURAL CONCRETE AND STEELWORK
A14.4	SURFACE AND STRUCTURAL REPAIR OF CONCRETE MEMBERS
A14.5	ANCHORING OF REINFORCEMENT, GROUTING AND CRACK INJECTION
A14.6	SPRAYED CONCRETE FOR STRUCTURES
A14.7	PROTECTIVE COATINGS AND TREATMENTS FOR CONCRETE
A14.8	EXTERNAL BONDING OF STEEL AND CARBON FIBRE
A14.9	REPAIR AND REPLACEMENT OF ANCILLARY STRUCTURAL ELEMENTS
A14.10	JACKING OF BRIDGE STRUCTURES
A14.11	REPAIR OF STEEL ELEMENTS

CHAPTER 20: QUALITY ASSURANCE

SECTION	DESCRIPTION
A20.1	TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP
A20.2	SCOPE
A20.3	DEFINITIONS
A20.4	TEST METHODS
A20.5	PUBLISHED TEST METHODS
A20.6	UNPUBLISHED TEST METHODS
A20.7	SPECIAL TEST METHODS
A20.8	ACCEPTANCE CONTROL BY STATISTICAL JUDGEMENT PRINCIPLES

PROGRESS UPDATE PER CHAPTER

Chapter	Heading	Progress status			
		Part A	Part B	Part C	Part D
1	GENERAL	WD	✓	✓	✓
2	SERVICES	CD	✓	✓	✓
3	DRAINAGE	CD	✓	✓	✓
4	EARTH AND LAYER WORKS: MATERIALS	CD	✓	✓	✓
5	EARTH AND LAYER WORKS: CONSTRUCTION	CD	✓	✓	✓
6	CONCRETE LAYERS	In progress	X	X	X
7	REPAIR & REHABILITATION OF CONCRETE LAYERS	In progress	X	X	X
8	PRE-TREATMENT AND REPAIR OF EXISTING SURFACES	CDF	✓	✓	✓
9	ASPHALT LAYERS	CDF	✓	✓	✓
10	SEALS	CDF	✓	✓	✓
11	ANCILLARY ROAD WORKS	CD	✓	✓	✓
12	GEOTECHNICAL APPLICATIONS	CD	✓	✓	✓
13	STRUCTURES	CD	✓	✓	✓
14	REPAIR AND REHABILITATION OF STRUCTURES	CD	✓	✓	✓
20	QUALITY ASSURANCE	CD	✓	✓	X

WD = Working Draft CD = Committee Draft CDF = Committee Final Draft

PROPOSED WORKSHOP PROGRAMME FOR DIFFERENT CHAPTERS

<p>CHAPTER 8: PRE-TREATMENT AND REPAIR OF EXISTING SURFACES CHAPTER 9: ASPHALT LAYERS CHAPTER 10: SEALS CHAPTER 20: QUALITY ASSURANCE</p>	<p>10 & 11 MAY 2018 (CAPE TOWN)</p>
<p>CHAPTER 4: EARTH AND LAYER WORKS: MATERIALS CHAPTER 5: EARTH AND LAYER WORKS: CONSTRUCTION CHAPTER 20: QUALITY ASSURANCE</p>	<p>27 JULY 2018 (PRETORIA)</p>
<p>CHAPTER 2: SERVICES CHAPTER 3: DRAINAGE CHAPTER 11: ANCILLARY ROAD WORKS</p>	<p>19 & 20 SEPTEMBER 2018 (PORT ELIZABETH)</p>
<p>CHAPTER 12: GEOTECHNICAL APPLICATIONS CHAPTER 13: STRUCTURES CHAPTER 14: REPAIR & REHABILITATION OF STRUCTURES CHAPTER 20: QUALITY ASSURANCE</p>	<p>1 & 2 OCTOBER 2018 (CAPE TOWN)</p>
<p>CHAPTER 1: GENERAL CHAPTER 6: CONCRETE LAYERS CHAPTER 7: REPAIR & REHABILITATION OF CONCRETE LAYERS CHAPTER 20: QUALITY ASSURANCE</p>	<p>JANUARY 2019</p>
<p>DRAFT COTO DOCUMENT WITH ALL CHAPTERS (CDF)</p>	<p>FEBRUARY 2019</p>

COTO PROCEDURE FOR REVISION OF DOCUMENTS

Step 1

- COTO Subcommittee identify needs for new or revision of existing Standard Specifications
- COTO Subcommittee forms workgroup
- Panel of Industry Experts appointed to assist workgroup (if required)

Step 2

- COTO Subcommittee Workgroup draft new Standard Specifications – number of Working Drafts (WD)
- Once workgroup is satisfied, Working Draft Final converted to Committee Draft (CD) and submitted to COTO Subcommittee for review and comment
- When approved by COTO Subcommittee, Committee Draft (CD) is submitted to Roads Coordinating Body for wider review and comment
- All comments received are reviewed and incorporated where applicable and Committee Draft Final (CDF) prepared

Step 3

- **Workshop CDF with industry**
- **All comments received are reviewed and incorporated where applicable and Committee Draft Final (CDF) prepared**
- COTO/RCB Workshop arranged to discuss Committee Draft Final (CDF)
- All written comments received, reviewed and incorporated where applicable into Committee Draft Final (CDF)

COTO PROCEDURE FOR REVISION OF DOCUMENTS

Step 4

- Committee Draft Final (CDF) converted to Draft Standard (DS) and submitted by RCB to COTO for approval as Draft Standard Specifications
- Draft Standard (DS) Standard Specifications released to wider industry for implementation

Step 5

- Draft Standard (DS) Standard Specifications then introduced to Industry through workshops
- Draft Standard (DS) Standard Specifications utilised in industry for 2 year period, and comments/feedback provided to COTO subcommittee

Step 6

- At end of 2 year period all written comments received are collated and reviewed by COTO/RCB Subcommittee and incorporated where applicable
- Draft Standard (DS) converted to Final Standard (FS) and submitted by RCB to COTO for approval as Final Standard (FS) Standard Specifications.

COTO PROCEDURE FOR REVISION OF DOCUMENTS

Step 7

- Final Standard (FS) Standard Specifications then released to industry
- Should changes between Draft Standard (DS) and Final Standard (FS) be extensive then further industry workshops might be arranged

Step 8

- Final Standard (FS) Standard Specifications used for maximum of 5 years in industry before revision considered

THANK YOU FOR YOUR ATTENTION!

