KvW1 COTO STANDARD SPECIFICATIONS FOR ROAD & BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES
OCTOBER 2020 - DRAFT STANDARD

CHAPTER 11: ANCILLARY ROAD WORKS

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Slide 1

KvW1 Kobus vd Walt, 2021/05/06

COTO
Committee of Transport Officials

Standard Specifications for Road and Bridge Works for South African Road Authorities

Draft Standard (DS)

August 2020

October 2020

Permission is granted to freely copy, print and distribute this Draft Standard document for industry use.

FOREWORD

The new COTO Standard Specifications for Road and Bridge Works for South African Road Authorities was approved by COTO on 18 August 2020 as a Draft Standard (DS) and will be replacing the COLTO Standard Specifications for Road and Bridge Works for State Road Authorities (1998 Edition).

Existing contracts and tenders in the design phases based on the COLTO Standard Specifications (1998 Edition) will remain unaffected but will be phased out during the next 6 months and the COTO Standard Specifications (2020 Edition) will be mandatory for use in procurement documents advertised as from 1 March 2021.

The Draft Standard will be implemented in industry for a period of two (2) years, during which written comments may be submitted to the COTO subcommittee. Draft Standards (DS) have full legal standing.

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BACKGROUND

Development of SA Standard Specifications.

- **1970's: The Red Book" (used only by N-DoT/NTC and TPA ?)**
- **1987: The "Orange Book" CSRA**
- **1998: The "Green Book" COLTO Standard Specifications for Road and Bridge Works**
- **2020: The "Green Book " COTO Draft Standard (DS)**

All of the above evolved from a draft to a final standard via accumulated amendments from industry.

Previous Document was somewhat haphazard in structure

All the Chapters in COTO DS2020 now have the same structure ☺

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COTO SUITE OF DOCUMENTS

VOLUME 1	GENERAL CONDITIONS OF CONTRACT (e.g. FIDIC, SAICE GCC, NEC3)
VOLUME 2	STANDARD SPECIFICATIONS FOR:
	2.1 ROADS AND BRIDGE WORKS 2.2 ROUTINE ROAD MAINTENANCE
VOLUME 3	CONTRACT DOCUMENT
VOLUME 4	ROADWORKS DRAWINGS
VOLUME 5	STRUCTURES DRAWINGS
VOLUME 6	MATERIAL UTILISATION
VOLUME 7	ENVIRONMENTAL MANAGEMENT PLAN

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CONTRACT DOCUMENTATION (A1.1.2)

Contract Documentation - **includes all the documents which define the content and terms of the Contract entered into by the Employer and the Contractor**. **The Contract Documentation usually consists of the following documents:**

- Conditions of Contract;
- Contract Agreement;
- Drawings;
- Letter or Form of Tender;
- Letter or Form of Acceptance;
- Pricing Schedule;
- Project Specifications (which may include (now discontinued) SABS 1200 or SANS 2001);
- Scope of the Works;
- Special (or Particular) Conditions of Contract;
- **Standard Specification (this document**); and
- Any other documents forming part of the contract.

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CONTRACT DOCUMENTATION

WHAT DO YOU EXPECT FROM ROAD AND BRIDGE STANDARD SPECIFICATIONS?

- **No reference to proprietary products**
- **Cover all manner of road (across all road classes and road authorities)**
- **Clear and specific (What is required)**
- **Quality of the end product assured.**
- **Pricing - compensation pay for the product**
- **Predictable product performance**

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ROADWORKS & STRUCTURES DRAWINGS

- The different **Road Authorities** have their **own standard drawings** that must be converted (or duplicated) so as to be **incorporated into the Contract Documentation and** therefore **project specific**.
- Contractors need tender drawings to **price the items for tendering and contract drawings for construction** of the works.
- **High quality, accurate** and detailed drawings are paramount.
- **As-built (or record) drawings** need to reflect what was actually constructed for future usage in understanding the real value of works.
- Need to change the "**way we have always done it**" and not simply use details from previous projects and use the same drawings. We need a change in mindset.

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ROADWORKS & STRUCTURES DRAWINGS (contd…)

Western Cape Government

Transport and Public Works

5500	1	FENCING	DETAIL OF VERMIN PROOF FENCING		WCS/55/1/C1
			DETAIL OF STOCK PROOF FENCING		WCS/55/1/C2
			TYPICAL DETAIL OF FENCING AT UNDERPASSES		WCS/55/1/C3
			TYPICAL DETAIL OF FENCING AT RIVER CROSSINGS		WCS/55/1/C4
			DETAIL OF GATES		WCS/55/1/C5
			DETAIL OF VELDSPAN FENCE		WCS/55/1/C6
			SECURITY FENCE		WCS/55/1/C7
			SECURITY FENCE GATE		WCS/55/1/C8
			DETAILS OF GAME PROOF FENCING – GROUP I	WCS/55/1/D1	
			DETAILS OF GAME PROOF FENCING – GROUPS II AND III	WCS/55/1/D2	
			DETAIL OF 2400mm HIGH PALISADE FENCING	WCS/55/1/D3	
			DETAIL OF 1300mm HIGH PALISADE FENCING	WCS/55/1/D4	
			ROTATING GATE IN PALISADE FENCE	WCS/55/1/D5	
			SLIDING GATE IN PALISADE FENCE	WCS/55/1/D6	
			STANDARD GATE IN PALISADE FENCE	WCS/55/1/D7	
	2	MOTOR GRID GATES	APPROACHES TO SINGLE MOTOR GRID GATE TYPE A		WCS/55/2/C1
			SINGLE MOTOR GRID GATE TYPE A		WCS/55/2/C2

STANDARD PLANS

			CHEVRON SIGNS – ERECTION DETAIL		WCS/56/1/C8
			RIVER NAME BOARD		WCS/56/1/C9
	2	MARKER SIGNS	KILOMETER POST – CONCRETE KILOMETER MARKER	WCS/56/2/D1	
			DISTANCE MARKER PLATE	WCS/56/2/D2	
5700	1	ROAD MARKINGS	AUXILIARY LANES	WCS/57/1/D1	
			RUMBLE STRIPS	WCS/57/1/D2	
			ROAD SIGNS AND MARKINGS AT LEVEL CROSSINGS	WCS/57/1/D3	
			POSITIONING OF ROAD SIGNS AND MARKINGS AT LEVEL CROSSINGS	WCS/57/1/D4	
			ROAD MARKINGS FOR LANE REDUCTION	WCS/57/1/D5	
			ROAD SIGNS AND MARKINGS AT SINGLE LANE STRUCTURE	WCS/57/1/D6	
6000	1	BRIDGES	RURAL STRUCTURE – STANDARD WIDTHS	WCS/60/1/D1	
			RURAL STRUCTURE – STANDARD CLEARANCES	WCS/60/1/D2	

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ROADWORKS & STRUCTURES DRAWINGS (contd…)

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ROADWORKS & STRUCTURES DRAWINGS (contd…)

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COLTO STANDARD SPECIFICATIONS 1998

SERIES	TITLE	SECTIONS
1000	GENERAL	7
2000	DRAINAGE	4
3000	EARTHWORKS AND PAVEMENT LAYERS OF GRAVEL OR CRUSHED STONE	9
4000	ASPHALT PAVEMENTS AND SEALS	9
5000	ANCILLARY ROADWORKS	9
6000	STRUCTURES	8
7000	SUNDRY STRUCTURES	5
8000	SUNDRIES	4
	TOTAL	55

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COTO DRAFT STANDARD CHAPTERS

CHAPTER	TITLE	SECTIONS
1	GENERAL	7
2	SERVICES	4
3	DRAINAGE	3
4	EARTHWORKS AND PAVEMENT LAYERS: MATERIALS	5
5	EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION	5
6	CONCRETE LAYERS	2
7	MAINTENANCE & REPAIR OF CONCRETE LAYERS	6
8	PRE-TREATMENT AND REPAIR OF CONCRETE LAYERS	9
9	ASPHALT LAYERS	1
10	SURFACE TREATMENTS	1
11	ANCILLARY ROAD WORKS	9
12	GEOTECHNICAL APPLICATIONS	12
13	STRUCTURES	14
14	REPAIR AND REHABILITATION OF STRUCTURES	11
15 TO 19	RESERVED FOR FUTURE USE	
20	QUALITY ASSURANCE	1
	TOTAL	90

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CHAPTERS (1-20)

- **EACH CHAPTER (#) SECTION (#) CONSISTS OF:**

❑ **PART A#.#: SPECIFICATIONS**

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

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CHAPTERS (1-20)

- **EACH CHAPTER (#) SECTION (#) CONSISTS OF:**

❑ **PART B#.#: LABOUR ENHANCEMENT**

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

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CHAPTERS (1-20)

- **EACH CHAPTER (#) SECTION (#) CONSISTS OF:**

❑ **PART C#.#: MEASUREMENT AND PAYMENT**

- **(i) Preamble**
- **(ii) Notes on Measurement and Pay Items**
- **(iii) Items that will not be measured separately**
- **(iv) Items to be measured and paid for using items specified elsewhere in the specifications**
- **(v) Items specifically for this Section of the specifications**

Item	Description	Unit
C#.#.1	dsajsadbah	___
C#.#.2	fnjsfnfsj	___
C#.#.3	kjfdkjfuhf	___

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CHAPTERS (1-20)

- **EACH CHAPTER (#) SECTION (#) CONSISTS OF:**

❑ **PART D: GUARANTEES AND COMPLIANCE CERTIFICATES**

- **D#.#.1 Scope**
- **D#.#.2 General**
- **D#.#.3 Performance Guarantee Requirements**
- **D#.#.4 Functional Performance Assessments**
- **D#.#.5 Visually Assessed Properties**
- **D#.#.6 Instrumentally Assessed Properties**
- **D#.#.7 Evaluation for Acceptance**
- **D#.#.8 Additional Procedures to be adopted in the event of failure**
- **D#.#.9 Notification of Remedial Work**
- **D#.#.10 Remedial Works**

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CHAPTER 1

South Africa
COTO
Committee of Transport Officials

Standard Specifications for Road and Bridge Works for South African Road Authorities

Draft Standard (DS)

CHA

SUMMARY OF ALL CHAPTERS AND SECTIONS

CHAPTER 1: GENERAL
1.1 GENERAL PREAMBLE
1.2 GENERAL REQUIREMENTS AND PROVISIONS
1.3 CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS
1.4 FACILITIES FOR THE ENGINEER
1.5 ACCOMMODATION OF TRAFFIC
1.6 CLEARING AND GRUBBING
1.7 LOADING AND HAULING
CHAPTER 2: SERVICES
2.1 GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES
2.2 DRY SERVICES
2.3 WET SERVICES
2.4 ENERGY AND OTHER SERVICES
CHAPTER 3: DRAINAGE
3.1 DRAINS
3.2 CULVERTS
3.3 CONCRETE KERBING AND CHANNELING, ASPHALT BERMS, CHUTES, DOWNPIPES, CONCRETE, STONE PITCHED AND GABION LININGS FOR OPEN DRAINS
CHAPTER 4: EARTHWORKS AND PAVEMENT LAYERS: MATERIALS
4.1 BORROW MATERIALS
4.2 CUT MATERIALS
4.3 EXISTING ROAD MATERIALS
4.4 COMMERCIAL MATERIALS
4.5 ALTERNATIVE MATERIALS
CHAPTER 5: EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION
5.1 ROADBED
5.2 FILL
5.3 ROAD PAVEMENT LAYERS
5.4 STABILISATION
5.5 RECONSTRUCTION OF PAVEMENT LAYERS
CHAPTER 6: CONCRETE LAYERS
6.1 PAVER LAID CONCRETE LAYERS

CHAPTER 1: GENERAL
1.1 GENERAL PREAMBLE
1.2 GENERAL REQUIREMENTS AND PROVISIONS
1.3 CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS
1.4 FACILITIES FOR THE ENGINEER
1.5 ACCOMMODATION OF TRAFFIC
1.6 CLEARING AND GRUBBING
1.7 LOADING AND HAULING

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CHAPTER 11 REFERENCES TO OTHER CHAPTERS

PORTION	NAME	PART	PARAGRAPH OR CLAUSE	CLAUSE	CLAUSE OUTLINE	EXTENT			
11.1	PITCHING, STONEWORK; CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION	A: SPECIFICATIONS		A12.4	Concrete - Specification	22 page			
				A12.11	Geosynthetics - Specification (incl. table of sensitivity specification	7 page			
			1	A1.5.7	Execution of Clearing & Grubbing - where, how,	10 page			
					Excavation of topsoil, disposal, preparation				
			3	A2.2.7.1a)	Drainage Structures - excavation and preparation of bedding (kerb & channel, catch & mv, linings for open drains and chutes)	10 page			
			3	A2.2.7.1b)	Drainage Structures - prefabricated concrete kerbing and channel, precast concrete drainage	10 page			
		C: MEASUREMENT AND PAYMENT	1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
			C1.5	allowable items	Preamble to Clearing & Grubbing & measurement & payment	4 page			
			C1.7	allowable items	Preamble to Leading & Hauling & measurement & payment	3 page			
11.2	NON-STRUCTURAL GABIONS	A: SPECIFICATIONS	3	A2.2.5.2b)	Subsoil drainage materials - natural and synthetic permeable material	11 page			
			12	A12.3	Reinforcement - Specification	9 page			
			12	A12.4	Mechanically Stabilized Earth and Gabions - Specification	10 page			
			12	A12.4.8	Mechanically Stabilized Earth and Gabions - Materials - MSEW,	1 page			
			12	A12.4.8.2	Mechanically Stabilized Earth and Gabions - Materials - gabions	1 page			
			12	A12.4.8.2b)	Mechanically Stabilized Earth and Gabions - Materials - gabions - mesh	1 page, 3 tables			
		C: MEASUREMENT AND PAYMENT	12	A12.11	Geosynthetics - Specification (incl. table of sensitivity specification	7 page			
			1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
11.3	GUIDE BLOCKS AND KILOMETRE MARKERS	A: SPECIFICATIONS	13	A13.4	Concrete - Specification & Bedding & measurement &	22 page			
			13	A13.4.5.2	Concrete - Specification - Aggregates (SANS 2001/cr.)	1 page			
			11	A11.7	Road Markings and Road Studs - Specification	1 page			
			9	Table A9.1.5-5	Grading Control Points for Continuously Graded 13 and 26 Bituminous Mix (Gabion Fine, 13)	10 page			
		C: MEASUREMENT AND PAYMENT	1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
11.4	PITCHING, STONEWORK; CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION	A: SPECIFICATIONS	1	A1.5.7	Traffic control devices - manufacture (incl. Vol. 2	1 page,			
			1	A1.5.6.1	traffic control facilities - barricade, delineator, temporary cones, flagsh, control stations	1 page			
			1	A1.5.7.11	temporary traffic control facilities - classification devices, erection of PRS, cones, flagmen,	5 page			
					warning signs, slowing devices, other traffic				
			12	A12.4	Concrete - Specification	22 page			
			12	A12.10.7.1	Painting and galv.	11 page			
			12	A12.3	Ancillary Structural Elements - Specification	4 page			
		C: MEASUREMENT AND PAYMENT	1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
			1	C1.5	Preamble to Clearing & Grubbing & measurement &	3 page			
			1	C1.7	Preamble to Leading & Hauling & measurement &	3 page			
			12	C12.10.1.1	Fasteners - gabions (per linear metre, ch minus (article length d)	11 page			
			12	A12.3	Ancillary Structural Elements - Specification	4 page			
11.5	FENCING	A: SPECIFICATIONS	1	A1.1.2	Definitions of Construction zones & schedule of	11 page			
			1	C1.1	Site Establishment and General Obligations -	1 page			
			11	A11.10	Painting of Minor Structures - Specification	4 page			
			11	B11.7.11	Clarification of excavation - cable	1 page			
		C: MEASUREMENT AND PAYMENT	1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
			1	C1.5	Preamble to Clearing & Grubbing & measurement &	3 page			
			1	C1.7	Preamble to Leading & Hauling & measurement &	3 page			
11.6	ROAD SIGNS	A: SPECIFICATIONS	2	A2.4	Dry Service - Specification	8 page,			
			12	A12.2	Fabrication, Formwork and Concrete Finish - Specification	10 page			
			12	A12.4	Concrete - Specification	22 page			
			13	A13.4	Concrete - Specification	22 page			
			13	A13.9	Structural Steelwork for Minor Structures - Specification	3 page			
			13	A13.10.7	Painting of Minor Structures - Specification - execution,	4 page			
			13	zero ref	13.1 Foundations - Specification	11 page			
		C: MEASUREMENT AND PAYMENT	1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
			1	C1.5	Preamble to Clearing & Grubbing & measurement &	3 page			
			12	C12.2.1	Formwork to provide a smooth finish - measurement & payment	11 page			
			12	C12.4.10.2	Cast in situ Concrete and RLC Cast in situ Concrete: measurement &	2 page,			
			12	C12.2.1	Formwork to provide a rough finish - measurement & payment	11 page			
			13	C13.3.1	Vertical formwork to provide a rough finish - measurement &	11 page			
			13	13.9-13.12	mortar and mastic grouting	10 page			
			1	PC Sum	traffic signals - actual cost, sub contractor	1 page			
					(Provisional Sum - Actual cost to be paid to sub-contractor)				
			12	A12.4	Concrete - Specification	22 page			
			12	A12.2.2	Steel Reinforcement - Specification	7 page,			
11.7	ROAD MARKING AND ROAD STUDS	A: SPECIFICATIONS	1	A1.5	Accommodation of Traffic - Specification	3 page			
		C: MEASUREMENT AND PAYMENT	1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
			1	C1.1.4	Variation from Specified Method of Application Rates				
			1	C1.5	Accommodation of Traffic - Measurement & Payment	3 page			
		D: GUARANTEES AND COMPLIANCE CERTIFICATES	20	A20.1.4.11	Testing of Pavements (Texture, rut depth, rolling resistance, DCP,	10 page			
			20	C10	Combined Index Value (not used in Ch. 20)				
11.8	LANDSCAPING AND PLANTING PLANTS	A: SPECIFICATIONS	1	C1.5	Accommodation of Traffic - Measurement & Payment	3 page			
			1	A1.1.2	Definitions of Topsoil and Subsoil	11 page			
			1	A1.1.2	Definitions of Topsoil and Subsoil	11 page			
			5	C5.1.11	Chasing (reference to Ch. 5 Measurement & Payment (probably	10 page			
			1	A1.2.2	Acceptance Quality Control (Employer/Engineer) & Process Quality Control (Contractor)	10 page			
		C: MEASUREMENT AND PAYMENT	1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
			1	C1.7	Preamble to Leading & Hauling & measurement &	3 page			
			1	C1.4.4	Excavation and Topsoil - (including or not including -				
					Measurement & Payment				
11.9	LANDSCAPING AND PLANTING PLANTS	A: SPECIFICATIONS	1	A1.4	Clearing & Grubbing - timely or appropriate				
		C: MEASUREMENT AND PAYMENT	1	C1.1	Preamble, quantity, color, payment, variation from	3 page			
			1	C1.1.5	Bank and Ditch - measurement and payment	10 page			
			1	C1.1	Drain - measurement and payment	7 page			

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CHAPTER 1 SECTION 1.1 GENERAL PREAMBLE

PART A: SPECIFICATIONS

A1.1.1 SCOPE

A1.1.2 DEFINITIONS

PART B: LABOUR ENHANCEMENT

CONTENTS

B1.1.1 SCOPE

B1.1.2 DEFINITIONS

B1.1.3 GENERAL

B1.1.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS

B1.1.5 MATERIALS

B1.1.6 CONSTRUCTION EQUIPMENT

B1.1.7 EXECUTION OF THE WORKS

B1.1.8 WORKMANSHIP

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CHAPTER 1 SECTION 1.1 GENERAL PREAMBLE

PART C: MEASUREMENT AND PAYMENT

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C1.1.1 PREAMBLE
C1.1.2 MEASUREMENT
C1.1.3 PAYMENT
C1.1.4 VARIATION FROM SPECIFIED NOMINAL RATES OF APPLICATION OR FROM NOMINAL MIX PROPORTIONS

PART D: GUARANTEES AND COMPLIANCE CERTIFICATES

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D1.1.1 SCOPE
D1.1.2 GENERAL
D1.1.3 PERFORMANCE GUARANTEE REQUIREMENTS
D1.1.4 FUNCTIONAL PERFORMANCE ASSESSMENTS
D1.1.5 VISUALLY ASSESSED PROPERTIES
D1.1.6 INSTRUMENTALLY ASSESSED PROPERTIES
D1.1.7 EVALUATION FOR ACCEPTANCE
D1.1.8 ADDITIONAL PROCEDURES TO BE ADOPTED IN THE EVENT OF FAILURE
D1.1.9 NOTIFICATION OF REMEDIAL WORK
D1.1.10 REMEDIAL WORKS

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CHAPTER 1 SECTION 1.1 GENERAL PREAMBLE

CHAPTER 1: GENERAL

1.1 GENERAL PREAMBLE

CONTENTS

PART A: SPECIFICATIONS
A1.1.1 SCOPE
A1.1.2 DEFINITIONS

- Intention of COTO DS2020 to be compatible with whichever Conditions of Contract is used
- Discrepancy in terminology – refer to Conditions of Contract
- CIDB recommends CCC BEW (FIDC Red Book) or GCC CW (SAICE) or NEC Engineering and Construction Contract Documentation
- Defects Notification Period, Engineer (3 dfns), Pricing Schedule, Project Specifications, Site – extent to be verified, Taking Over Certificate (3 dfns), Performance Certificate, Works

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CHAPTER 1 SECTION 1.1 GENERAL PREAMBLE

PART B: LABOUR ENHANCEMENT

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B1.1.1 SCOPE
B1.1.2 DEFINITIONS
B1.1.3 GENERAL
B1.1.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS
B1.1.5 MATERIALS
B1.1.6 CONSTRUCTION EQUIPMENT
B1.1.7 EXECUTION OF THE WORKS
B1.1.8 WORKMANSHIP

- Part A specifications apply unless Part B is invoked
- Labour enhancement….improving the scope for the use of manual labour
- Labour intensive…..by their basic nature…
- Project Labour Goals
- Any activity specified in Part A, where hand work is given as an alternative… maximise labour

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CHAPTER 1 SECTION 1.1 GENERAL PREAMBLE

PART C: MEASUREMENT AND PAYMENT

CONTENTS

C1.1.1 PREAMBLE
C1.1.2 MEASUREMENT
C1.1.3 PAYMENT
C1.1.4 VARIATION FROM SPECIFIED NOMINAL RATES OF APPLICATION OR FROM NOMINAL MIX PROPORTIONS

- Lump sum, Prime Cost sum (outside provider), Provisional sum (actual cost, 3 quotes) – Conditions of Contract definitions apply if different to these
- SI units, haulage vehicle capacity clearly marked, 2 decimal places, trenches and foundation depth of excavation post-mass earthworks, unless unavoidable to measure from NGL
- No rate entered….assume R0.00 (ie. no compensation)
- No pay item…..Conditions of Contract provisions for additional work
- Partial width and restricted areas….except where amended (separate but similar pay items for separate portions of the work)
- Payment for Materials on Site

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CHAPTER 1 SECTION 1.1
GENERAL PREAMBLE

PART D: GUARANTEES AND COMPLIANCE CERTIFICATES

CONTENTS

D1.1.1 SCOPE
D1.1.2 GENERAL
D1.1.3 PERFORMANCE GUARANTEE REQUIREMENTS
D1.1.4 FUNCTIONAL PERFORMANCE ASSESSMENTS
D1.1.5 VISUALLY ASSESSED PROPERTIES
D1.1.6 INSTRUMENTALLY ASSESSED PROPERTIES
D1.1.7 EVALUATION FOR ACCEPTANCE
D1.1.8 ADDITIONAL PROCEDURES TO BE ADOPTED IN THE EVENT OF FAILURE
D1.1.9 NOTIFICATION OF REMEDIAL WORK
D1.1.10 REMEDIAL WORKS

- Populate Part D#.# under the relevant section of the Specification
- All certificates issued by SABS and ASA will be accepted
- Foreign testing authorities' certificates are only acceptable if Specified or at Employer's discretion

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CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS
A1.2.1 SCOPE
A1.2.2 DEFINITIONS
A1.2.3 GENERAL
A1.2.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS
A1.2.5 MATERIALS
A1.2.6 CONSTRUCTION EQUIPMENT
A1.2.7 EXECUTION OF THE WORKS
A1.2.8 WORKMANSHIP

PART B: LABOUR ENHANCEMENT

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B1.2.1 SCOPE
B1.2.2 DEFINITIONS
B1.2.3 GENERAL
B1.2.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS
B1.2.5 MATERIALS
B1.2.6 CONSTRUCTION EQUIPMENT
B1.2.7 EXECUTION OF THE WORKS
B1.2.8 WORKMANSHIP

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CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART C1.2 MEASUREMENT AND PAYMENT

- **(i) Preamble**
- **(ii) Notes on Measurement and Pay Items**
- **(iii) Items that will not be measured separately**
- **(iv) Items to be measured and paid for using items specified elsewhere in the specifications**
- **(v) Items specifically for this Section of the specifications**

PART D1.2 *NOT APPLICABLE*

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CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A:	**SPECIFICATIONS**
A1.2.1	**SCOPE**
A1.2.2	**DEFINITIONS**

- Matters that relate to this Standard Specifications as a whole
- Acceptance Quality Control – actions by Engineer and/or Engineer to ……acceptable
- Process Quality Control – actions by Contractor to assess …… meets specified requirements. ….ensure quality control…..effectively
- Stakeholder Liaison – Employer and Contractor engage with IAPs…local authorities, residents, schools….how Works will affect the local community. Adverse effects…. Health and safety…relevant

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Contractor occupation outside road reserve – statutory provisions, written notice to property owners,
- Adherence to Employer <-> property owner agreements
  - Borrow pits, haul roads, bypasses
  - Reinstatement to damage
  - Moving fencing, services
- Environmental and legislation – land outside road reserve
  - Written statements from owner – fulfilment of obligations, restoration, fences and other in good order
  - Signed, dated and copies to Engineer

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Property not provided by Employer (e.g. haul roads, workshops, site offices, laboratory)
  - Engineer agrees to use thereof
  - Cordoned off
  - Surveyed, lease agreement, with provision for extension, default to successive Contractor
  - Permanent ref. beacons alongside material storage area – demarcation and qties
  - Signed statements at conclusion of lease agreement

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Environmental Management
  - EA, EMP, WUL for extraction of water
  - Permits submitted to Engineer before construction
  - Search and rescue where specified
  - NEMA, N water Act, NE Waste Act
  - Monitoring

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Extension of Time - rainfall
  - One of three methods
    - 1 Rainfall Formula $V = (N_W - N_n) + [(R_W - R_n) \div X]$
    - 2 Critical path method with consequential delays
    - 3 **Critical path method without consequential delays. N is__**
  - Handing over Site, subject to:
    - Sequence
    - Deviations - max. length at any one time
    - Half or partial width sections permitted
    - Minimum length of existing or newly completed full width
    - Other matter relating to occupation or road reseve
  - Health & Safety Plan
  - Insurances and Sureties

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Tolerances
- Monthly Reports
- Notices, signs advertisements
  - One Small Sign indicating Site Office
  - Contract Name Board
- Daywork
  - Engineer to agree to approximate resources
  - Daily report
- Assets -ownership and diposal
  - Employer is owner
  - Submit rates for disposal (neg. or pos.) – non-useable
  - Provisional Sum – income derived shall be offset
- Prevention of damage to nearby properties and services
  - Written and photographic record
  - Vulnerable underground services
  - Max PPV (range 2.5-15.0 mm/sec, measured at 50Hz)

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Remedial work complete before TOC
- Routine Maintenance
  - Contractor responsible within Site
  - If not, may be required to attend meetings to co-ordinate
- Site Meetings
  - At least monthly
  - Formal monthly report
- Site Security
  - Unauthorised persons to be kept off site
  - Carefully Assess measures necessary
  - Camps, Accommodation, Borrow Areas
  - Rented housing – alarm linked to armed response

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Stakeholder Liaison
  - Initially Employer<->Engineer => PLC and PLO
  - Outcomes and Agreements to included in Contract Docs.
  - Contractor to resume with further SH liaison – Employer's social facilitation principles and processes
  - Contractor to identify all other potential stakeholders (15+), in addition to those already in Contract Doc.
    - Provincial, Municipal and Traditional Authorities
    - Organised Representation (youth, women, disabled, labour)
    - Other structured community groups (faith-based, farming, education)
    - Transport Industry Forums
    - Ward Committees
  - Contractor shall listen, record, inform to alleviate concerns and mitigate adverse effects of the Works (Safety is key)
  - Manage compelling expectations
  - Use local media
  - Where a PLC has been established, it shall be the official communication channel, with the assistance of the PLO
  - May include issues related to local labour employment.
  - Labour and sub-contractor matters shall remain Contractor's responsibility

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Temporary drainage and dewatering
  - For adequately protecting, draining and dewatering Works and temp. Works
  - Do not cause erosion or flooding
  - Duty to report signs of instability – ssuspend, barricade, OHS, propose design, rectify
- Road safety audits
  - Work zone traffic management – Stage 4, and RTSM Vol. 3 Chapter 13
  - Pre-opening stage road safety audit – Stage 5 and **Chapter 11**
  - If not, may be required to attend meetings to co-ordinate
- Water
  - Own arrangements
  - Abstraction from nearby sources – need Permit
  - Supply Agreement with municipality
  - Suitability – 11 products across 8 Chapters of COTO DS

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

- Wayleaves/Agreements
  - Employer to obtain planning and design approvals
  - Deemed to be granted i.a.w. 'wayleaves'
  - **If specified**, Contractor to ensure wayleaves can be issued
  - Contractor to pay all fees (?) and charges for wayleaves to road authority.
- Permits
  - Contractor to obtain
  - Deemed to be granted ito construction permits or work permits
  - Contractor shall pay, and comply:
    - Notice
    - Supervision
    - Compliance
    - Access for inspections
    - Roas and service crossings
    - Location of services
    - Requirements for reinstatement
    - Record Drawings.
- Work in Restricted Areas
  - Programme and Working Methods

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

A1.2.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS

A1.2.4.1 Designs and drawings for the permanent Works provided by the Contractor

Where the Contractor is required to prepare any designs and/or drawings for the permanent Works they shall be prepared as specified below and in accordance with any further requirements that may be specified by the Engineer. The drawings shall comply in all respects with the requirements of the Employer. If provided by the Employer, the Contractor shall use the master standard drawing sheets and schedules as masters for all drawings prepared by him and submitted to the Engineer for consideration.

The Contractor shall submit to the Engineer for comment two A0 paper copies of each drawing and all relevant design calculations prepared by, or on behalf of, the C relevant design calculations should als as those of the drawings supplied to th

Accepted designs and/ accepted by the Engineer will not be pe Notwithstanding the acceptance and/or ponsibility for all details, discrepancies, ing therefrom.

Contractor to submit designs to Engineer for approval, where PBS is called for. Contractor remains liable for performance according to Specification

The Contractor shall submit only fully completed and checked designs and/or drawings in accordance with this Standard Specification and shall not be entitled to claim for any delays resulting from the submission of incomplete or incorrect drawings. Unless already specified elsewhere in the Contract Documentation, the Contractor shall agree with the Engineer the amount of time required by the Engineer to consider and comment on the designs and/or drawings. The same time frame requirements will apply to any resubmissions of the designs and/or drawings that may be required.

A1.2.4.2 Designs and drawings for temporary works provided by the Contractor

The Contractor shall be responsible for the design and execution of all temporary work and structures that are required for the construction and completion of the W ing and blasting, excavations, scaffold of the permanent Works.

The design of all su ed by legislation, professionally qualifie een carried out in accordance with all nd supervised by competent, experienc

All design calculation the Contractor is requested to do so. U gineer the amount of time required by the Engineer to consider and comment on the designs and/or drawings. The same time frame requirements will apply to any resubmissions of the designs and/or drawings that may be required.

Contractor to submit deviations, temp. drainage, drilling, blasting, support, shoring designs to Engineer for approval, where PBS is called for. Contractor and Engineer to agree time frames

A1.2.4.3 Performance based systems

The specifications pertaining to the provision and implementation of performance based systems are given in Part D of the various Sections of each of the Chapters of this Standard Specification where applicable.

Refer Part D of various sub-chapters

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

A1.2.5 MATERIALS

A1.2.5.1 General

The Contractor shall confirm the quantities of all manufactured items or materials required for the completion of the Works with the Engineer before finalizing any orders or production processes.

The Contractor, before using manufactured articles or materials that are required to comply with any specification, shall furnish the Engineer with certificates showing that the materials do comply with that specification. Where so specified, materials shall bear the official mark of the appropriate authority. All materials and products which should comply with a South African National Standard Specification (SANS) shall comply the cert

Sample ordered may be

Unless publishe

All man the Con be damaged during manufacture, delivery or by the Contractor during handling, transportation, storage, installation or testing they shall be replaced, or repaired to comply with the original specification, by the Contractor at his own cost.

All places where articles and materials are being manufactured or obtained for use in the Works, and all the processes in their entirety connected therewith, shall be open to inspection by the Engineer (or other persons authorised by the Engineer) at all reasonable times.

Contractor to confirm quantities, deliver samples in advance with required mark/certification/Agrèment, remain open to inspection by Engineer

A1.2.5.2 Mix designs

Unless otherwise specified in the Co Contractor shall make allowance for t associated construction activities, the mixes:

- Sampling and testing of constr all according to relevant standa
- Production of the required mix
- Production of laboratory, produ
- Adjustments to the mix designs
- Construction and testing of trial
- Submission of duplicate sampl the Contract Documentation.
- Verification of the mix designs.

The Contractor's mix designs shall be format which includes all the relevant in

Contractor to be responsible, and make allowance in Programme:
-sampling and testing materials
-mix designs (with Engineer if needed)
-trial mixes and adjustment
-trials and testing thereof
-duplicate samples
(all the above before permanent Works)

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

A1.2.6 CONSTRUCTION EQUIPMENT

- Submit a schedule for review.
- Licenced, roadworthy etc.
- Suitable, well maintained
- H&S
  - Flashing amber LED
  - “CONSTRCUTION VEHICLE” retro-reflective Class 3 red (200mm high) on Class 3 white
  - Acoustic reverse system
- Confirm the above prior to operating on Site

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

A1.2.7 EXECUTION OF THE WORKS

Programme of work
-…in addition to CoC
-basis for delay calculations and extensions of time
-Scheme 1 (bar chart with logical links and critical path) where nothing in Contract Docs
-Scheme 2:
-submitted at start of Contract
-first 3 months in detail
-full programme within 6 weeks
-logical links, sub-contractor activities, access dates, earliest and latest dates, allowance for:
- designs, sample approvals, commissioning, float , time risk allowance, QC procedures
-updating and revising monthly
-measures to make up for slippage

- Setting Out and Survey Beacons
- Services (refer Ch.2)
- Work near utilities
- Use of explosives

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

A1.2.8 WORKMANSHIP

Process Quality Control by Contractor

-Onus on Contractor
-Where PBS, Contractor to demonstrate performance standards are met, else ISO-accredited system
-Compliance testing for SABS-marked products
-method specification to be followed via method statement

- Agree process control sampling, testing, measurement and approval processes prior to commencing with element subject to
- Regardless, Contractor fully responsible for defective material, product, plant/equipment

Acceptance Quality Control by Employer and/or Engineer

-visual inspections, sampling, testing and measurements in terms of Chapter 20

-other properties judged by clauses in appropriate chapters

-method specifications: Engineer to monitor, inspect but may require sampling, tests and measurements to ensure conformance

Regardless, Contractor fully responsible for defective material, product, plant/equipment

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART B: LABOUR ENHANCEMENT

CONTENTS

B1.2.1 SCOPE
B1.2.2 DEFINITIONS
B1.2.3 GENERAL
B1.2.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS
B1.2.5 MATERIALS
B1.2.6 CONSTRUCTION EQUIPMENT
B1.2.7 EXECUTION OF THE WORKS
B1.2.8 WORKMANSHIP

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART B: LABOUR ENHANCEMENT

CONTENTS

B1.2.1 SCOPE
B1.2.2 DEFINITIONS
B1.2.3 GENERAL

- Requirements for LE to be Specified in Contract Doc.
- Contractor to indicate how these will be met in Works Programme
- Handwork specified in Part A as an alternative: shall be executed so as to maximise labour

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

B1.2.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS
B1.2.5 MATERIALS
B1.2.6 CONSTRUCTION EQUIPMENT
B1.2.7 EXECUTION OF THE WORKS
B1.2.8 WORKMANSHIP

- Where Part A refers to appropriate equipment, light/hand operated equipment to be used in trial sections.
- Contractor to indicate how these will be met in Works Programme
- Handwork specified in Part A as an alternative: shall be executed so as to maximise labour

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART C1.2 MEASUREMENT AND PAYMENT

- **(i) Preamble**
- **(ii) Notes on Measurement and Pay Items**
- **(iii) Items that will not be measured separately**
- **(iv) Items to be measured and paid for using items specified elsewhere in the specifications**
- **(v) Items specifically for this Section of the specifications**

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART C1.2 MEASUREMENT AND PAYMENT

- **(i) Preamble**

The tendered rate for each item shall include full compensation for providing, operating, maintaining and decommissioning upon completion, of all the construction equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the Conditions of Contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

- **(ii) Items that will not be measured separately**

- Spilt materials
- Compliance when outside the road reserve
- Remedy to defective or faulty work
- Site meetings
- Water for construction
- Work in restricted areas
- Design of permanent work under PBS
- Design and construction of all temporary work
- Setting out and protection of beacons
- Obtaining permits
- Work near utilities
- Process control

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART C1.2 MEASUREMENT AND PAYMENT

- **(iii) Items that will not be measured separately**

For activities in Table C1.2-1 payment items specified in other Chapters or Sections of the specifications, where they relate to work under this Section, will be listed in the Pricing Schedule.

Table C1.2-1: Payment items from other Chapters or Sections

Activity	Section 1.2 reference	Section item reference
Provision and later removal of the contract sign boards.	A1.2.3.12	C1.3.2 of Chapter 1
Provision of all site security measures for the Contractor's facilities and equipment and at the Site of the Works, quarries, borrow pits and traffic accommodation facilities and equipment.	A1.2.3.17	C1.3.1 of Chapter 1
Provision of security at the engineer's offices, laboratories, and site and rented accommodation.	A1.2.3.17	C1.4.8 of Chapter 1
Obtaining construction/work permits from service authorities	A1.2.3.22b)	C2.1.3 of Chapter 2
Identification, protection and relocation of existing services	A1.2.7.3	C2.1.1 & C2.1.2 of Chapter 2
Acceptance quality control – sampling and testing requested by the Engineer	A1.2.8.2	C20.1.2.2 of Chapter 20

Sensitivity - General

CHAPTER 1 SECTION 1.2
GENERAL REQUIREMENTS AND PROVISIONS

PART C1.2 MEASUREMENT AND PAYMENT

- **(iv) Items to be measured and paid for using items specified elsewhere in the specifications**

ITEM NO	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.2	**GENERAL REQUIREMENTS AND PAYMENT**					
C1.2.1	Environmental Management					
C1.2.2	Programming and Reporting					
C1.2.3	Routine road maintenance of existing public roads within the Site of the Works or other public roads outside the Site of Works which are used as detours					
C1.2.4	Stakeholder liaison	month				R 0.0
C1.2.5	Safety					
C1.2.6	Work adjacent to properties					
C1.2.7	Road safety audits					
C1.2.8	Dayworks					
C1.2.9	Disposal of non-usable assets					

Sensitivity - General

CHAPTER 1 SECTION 1.3
CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

ITEM NO	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.3	**CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS**					
C1.3.1	The Contractor's general obligations					
C1.3.1.1	Fixed obligations	Lump Sum				R 0.00
C1.3.1.2	Value-related obligations	Lump Sum				R 0.00
C1.3.1.3	Time-related obligations	month				R 0.00
C1.3.2	Contract sign boards	m^2				R 0.00

Sensitivity - General

CHAPTER 1 SECTION 1.4
FACILITIES FOR THE ENGINEER

ITEM NO	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.4	**FACILITIES FOR THE ENGINEER**					
C1.4.1	Site accommodation					
C1.4.2	Items measured by area					
C1.4.3	Items measured by number					
C1.4.4	Prime cost items					
C1.4.5	Services at site offices, laboratories and site accommodation					
C1.4.6	Office Staff					
C1.4.7	Site inspection transport					
C1.4.8	Site security measures for the Engineer's facilities					

Sensitivity - General

CHAPTER 1 SECTION 1.5
ACCOMMODATION OF TRAFFIC

TEM NO	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.5	**ACCOMMODATION OF TRAFFIC**					
C1.5.1	Accommodation of pedestrian and non-motorised traffic					
C1.5.2	Accommodation of vehicular traffic	month				R 0.00
C1.5.3	Liaison with traffic authorities	month				R 0.00
C1.5.4	Construction of temporary deviations					
	The applicable payment items required for the construction of temporary deviations shall be taken from the relevant chapters and sections in Chapter 1, 3, 5, 9 and 10 and inserted into the Pricing Schedule here. Each payment item for the construction of temporary deviations shall be preceded by the main payment item number C1.5.4 / followed by the payment number for the applicable payment item	Unit must relate to relevant pay item from the relevant chapters and sections				R 0.00
C1.5.5	Maintenance of temporary deviations					
C1.5.6	Removal of temporary deviations					
C1.5.7	Temporary traffic control facilities					
C1.5.8	Traffic safety officer	Man-month				R 0.00
C1.5.9	Traffic safety vehicle	month				R 0.00
C1.5.10	Tow trucks					
C1.5.11	Provision of safety equipment for visitors					
C1.5.12	Additional traffic accommodation facilities ordered by the Engineer:					

Sensitivity - General

CHAPTER 1 SECTION 1.6
CLEARING AND GRUBBING

ITEM NO	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.6	**CLEARING AND GRUBBING**					
C1.6.1	Clearing					
C1.6.2	Grubbing					
C1.6.3	Removal and grubbing of large trees and tree stumps:					
C1.6.4	Removal of buildings and structures					
C1.6.5	Spreading organic matter and covering with soil	m^3				R 0.00
C1.6.6	Mulching selected organic matter	m^3				R 0.00
C1.6.7	Re-clearing of previously cleared areas	ha				R 0.00
C1.6.8	Conservation of vegetation					
C1.6.9	Conservation of topsoil					
C1.6.10	Disposal of hazardous waste material:					

Sensitivity - General

CHAPTER 1 SECTION 1.7
LOADING AND HAULING

ITEM NO	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.7	**LOADING AND HAULING**					
C1.7.1	Loading					
C1.7.1.1	Loading from stockpile using machines and some hand loabour where necessary	m^3				R 0.00
C1.7.1.2	Loading from heaps or windrows using machines and/some hand labour where necessary	m^3				R 0.00
C1.7.1.3	Loading by hand only from stockpile or heaps when labour ehancement work is specified or is not possible to use machines	m^3				R 0.00
C1.7.2	Hauling					
C1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:	m^3 - km				R 0.00
(a)	Soil, gravel, crushed stone and pavement layer material	m^3 - km				R 0.00
(b)	Boulders and hard material	m^3 - km				R 0.00
C1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil or stockpile are:					
(a)	Cleared and grubbed material (organic matter and all other unsuitable or waste material)	m^3 - km				R 0.00
(b)	Soil and gravel material	m^3 - km				R 0.00
(c)	Boulders, hard material and concrete	m^3 - km				R 0.00

Sensitivity - General

PART A: MATERIALS

GENERAL

During the design process take note of vandalism and theft in the vicinity.

Bricks, thin reinforced concrete, paving blocks, metal, timber and aluminium have resale value.

Consider the use of products manufactured from polymer-reinforced concrete/plastic/rubber/fiberglass. Every chapter contains a section *Alternative Materials*.

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PART A: MATERIALS

GENERAL

- The **material specifications are for the materials as placed and/or processed in their/its final position within the road reserve.**
- **Contractor's responsibility to ensure that the materials delivered to the road meet the specifications.**
- **Materials removed from existing works**, except where excavated materials are specified **to be reused or disposed of, or except** where provision has been made **in Part C for their reuse or specific disposal**, **shall be deemed to be the property of the Contractor. (or the Client). See item C1.2.9: Disposal of non-useable assets**

AGGREGATE for concrete - SANS 1083 and for nominal size with SANS 3001–AG1 in Table A13.4.7-1.

SAND for **concrete, cement slurry and mortar -** SANS 1083.

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PART A: MATERIALS

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PART A: MATERIALS

STONE

•**Stone for pitching**

- **shall be sound, tough and durable**
- without any stones **less than 200 mm**
- Except that smaller pieces or spalls may be used for filling spaces between
- **Rounded boulders shall not be used on slopes steeper than 2:1 unless cement grouted.**
- Unless suitable stone located on site, procure from commercial sources.

•**Stone for masonry walls**

- **shall have a minimum mass of 8,0 kg**
- except that smaller pieces or spalls may be used
- **minimum vertical dimension of 75 mm and have a flat and stratified shape**.

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PART A: MATERIALS

STONE (contd.)

•**Stone for riprap**

- **shall be hard or quarry stone of angular shape**.
- free from soft material such as sand, clay, shale or organic material
- shall not contain an excessive quantity of elongated stones.

The required size of the stone will depend on the "critical mass" specified (**30kg max**).

At least 50% by mass shall consist of stones with a mass heavier than the critical mass,

Not more than 10% by mass shall consist of stones with a mass of less than 10 % of the critical mass or **more than 5 times the critical mass**.

Sensitivity - General

PART A: MATERIALS

CONCRETE AND MORTAR

•**All concrete work shall**

- **be carried out …… Section A13.4 of Chapter 13**
- together with the provisions of Section 11.1.5.4
- Cement …. SANS 50197-1 for CEM I or CEM II with a strength class of 32.5 or greater, and a rate of strength gain of N or greater.

•Contractor to provide suitable materials, determine the mix proportions and manufacture the concrete of the required quality to comply with SANS 50206.

•**Mix designs shall be based upon:**

- **Obtaining average concrete compressive strength sufficiently above the specified characteristic compressive strength** so that, considering the **expected variability** of the concrete and test procedures, **no more than 5 % of strength tests** will be expected to **fall below the specified characteristic compressive strength**.

•Readymix: **supplier shall ensure compliance with SANS 50206 (SANS 878),** and **the Contractor shall take full responsibility** for **implementing acceptance control testing (Chapter 1)**.

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Sensitivity - General

PART A: MATERIALS

CONCRETE AND MORTAR (CONTINUED)

- Unless otherwise specified, **mortar shall consist of a mixture of six parts of concrete sand to one part of cement**.
- **Concrete and mortar -** properly mixed to a uniform consistency. Max. 15 minutes between **cement placed into the mix and mixing start.**
- **Concrete and mortar transport**
  - **segregation** or loss of any of the ingredients or contamination to **be prevented**
  - mix is of the required workability at the point and time of placing.
  - **No additional water added in transit or where delivered or placed.**
- **Casting of concrete**
  - **continuous process between construction joints**.
  - **placed within 60 minutes from the start of mixing**.
  - **may be extended** by the Engineer **where a retarding admixture has been used**
  - Contact surfaces of an absorbent nature shall be damp, **but no standing water**

Sensitivity - General

PART A: MATERIALS

CONCRETE (CLASS C) STRENGTH

Compressive strength class:

- **indicated by the designated concrete code C**
- **the characteristic 28-day cylinder strength in Mpa**
- **the characteristic 28-day cube compressive strength in MPa;**
- **nominal size of coarse aggregate in the mix**.

For example, C20/25-20:

- **characteristic cylinder strength 20 MPa at 28 days;** or
- **characteristic cube compressive strength of 25 MPa** at 28 days; and
- **nominal size coarse aggregate 20mm.**

PORTLAND CEMENT TYPES (CEM1TO 5)

CEM1 42,5N would be expected to achieve at least **42,5 MPa at 28 days using the specified mortar prism test .**

While **real concrete** made from the cement will achieve **42,5 MPa in concrete cube tests depend on a range of other factors** like **concrete porosity, water**

Sensitivity - General

PART A: MATERIALS

CONCRETE (CLASS C) STRENGTH (continued)

PORTLAND CEMENT TYPES (CEM1 TO 5)

e.g.CEM1 42,5N:

- expected to achieve at least **42,5 MPa at 28 days,**
- **using the specified mortar prism test .**

Whether **real concrete** made from the cement will achieve **42,5 MPa in concrete cube tests depends on a range of factors:**

- **concrete porosity,**
- **water:cement ratio,**
- **soundness of aggregate,**
- **aggregate bonding; and**
- **cement related parameters** (alite content, alite and belite reactivity, cement sulphate content)**.**

Sensitivity - General

PART A: MATERIALS

Geotextiles:

- **planar soil and polymeric (synthetic or natural) textile material;**
- **may be non-woven, knitted, woven knitted or stitch-bonded fibres or yarns**.

Selection is based on:

- Permeability reduction(clogging)
- Piping (retention criteria)
- Permeability
- Strength (construction survivability)
- Durability criteria

Design phase:

- **soil sampling and testing**
- **design to be based on sound statistical principles**
- simulate long term field conditions in the laboratory
- Specified tests are in Chapter 20, Clause A20.14.13.

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PART A: MATERIALS

Geotextiles:

- **Covered in Chapter 12 Section A12.11**
- **Ch.12 does not contain any measurement and payment items**
- Schedule as follows:

C11.2.4	Geotextile (type and grade indicated)	m^2

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PART A: MATERIALS

Grade of geotextile to be specified?

- **To be determined during the design phase and specified prior to tender.**
- **Not to favour any suppliers**
- Property specifications for geotextiles was previously in table 2104/2 in COLTO
- COTO A12.11 and TRH15 1994

Sensitivity - General

PART A: MATERIALS

TRH15 1994

Sensitivity - General

PART A: MATERIALS

CONCRETE (CLASS C) STRENGTH

Compressive strength class:

- **indicated by the designated concrete code C**
- **the characteristic 28-day cylinder strength in Mpa**
- **the characteristic 28-day cube compressive strength in MPa;**
- **nominal size of coarse aggregate in the mix**.

For example, C20/25-20:

- **characteristic cylinder strength 20 MPa at 28 days;** or
- **characteristic cube compressive strength of 25 MPa** at 28 days; and
- **nominal size coarse aggregate 20mm.**

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PART A: MATERIALS

PORTLAND CEMENT TYPES (CEM1TO 5)

CEM1 42,5N would be expected to achieve at least **42,5 MPa at 28 days using the specified mortar prism test .**

While **real concrete** made from the cement will achieve **42,5 MPa in concrete cube tests depend on a range of other factors** like:

- **concrete porosity**
- **Water:cement ratio**
- **soundness of aggregate**
- **aggregate bonding; and**
- **cement related parameters** (alite content, alite and belite reactivity, cement sulfate content)**.**

Sensitivity - General

PART A: EXECUTION OF THE WORKS

CLASSIFICATION OF MATERIAL

All excavations shall be classified as follows for payment purposes:

Hard material:

- Material which **cannot be excavated except by drilling and blasting**, or with the use of pneumatic tools or mechanical breakers.
- **Boulders exceeding 0,1 m^3**; where more than **40 %** by volume of any material consists of boulders, each exceeding 0,1 m^3 in size .

Existing stabilized road layers :

- existing layer material which has been stabilized (irrespective of stabilizing agent); and
- requires careful cutting and excavation without damage to surrounding existing road layers by whichever method.

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PART A: EXECUTION OF THE WORKS

CLASSIFICATION OF MATERIAL (continued)

Soft Material:

All material not classified as hard material shall be classified as soft material

INTERMEDIATE CLASSIFICATION HAS BEEN DISCARDED for MACHINE-BASED WORK

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WORKMANSHIP/ QUALITY ASSURANCE

Quality
- Difference between products
- Type of product
- Distinctive feature
- "Fit for purpose"

Assurance
- Measurement
- Inspections
- Apply appropriate products
- Guarantee

End product
- Structural
- Functional
- Durability

For whom?
- Asset of the Country
- Betterment of Civil Society to be valued and enjoyed

Sensitivity - General

PART A: WORKMANSHIP

- The **Contractor shall determine the required frequency of testing and conduct sufficient tests** on the sourced material for each type of material **in order to ensure that the quality of materials produced will meet the specified requirements for which it will be used.**
- The **Engineer may, at his discretion, decide to use the Contractor's test results** if he is satisfied that the Contractor has complied with the process control requirements **as acceptance control.**
- **Any work or materials which do not comply with the specified requirements, shall be removed and replaced with work or materials which comply with the requirements or, if the Engineer so permits, shall be repaired so that it shall comply with the specified requirements after having been repaired**.

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PART A: WORKMANSHIP

A20.1 TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

SCOPE

- **During the execution of the work, control testing shall be conducted on materials and workmanship to monitor compliance with the requirements of the specifications**. **Tests, measurements, and inspections** shall be carried out using manual, mechanical and electronic equipment on materials and workmanship before, during and after construction **to ensure compliance** with the quality requirements of the specifications.
- **Chapter 20 also describes the schemes that are specified to ascertain compliance with the specification of certain materials properties and workmanship**. This is achieved by means of tests and measurements, and, where applicable, by applying statistical judgement plans.

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PART A: WORKMANSHIP

A20.1 TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

SCOPE (CONTD.)

- **The statistical acceptance control requirements, unless otherwise specified, apply to Class A, B, C and D roads (TRH 26 SA Road Classification & Access Management Manual)**.
- The acceptance control requirements for lower classes of roads shall be specified in the Contract Documentation.

Class	Description
Road Class A:	Inter-urban freeways, major inter-urban rural roads;
Road Class B:	Inter-urban collectors, major rural roads, major industrial;
Road Class C:	Lightly trafficked rural roads, strategic roads;
Road Class D:	Special pavements, access roads.

Sensitivity - General

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** (e.g. B11.1, B11.2, B11.3) of each of the relevant sections of these Standard Specifications.

Requirement for the use of labour enhanced construction methods is to satisfy project goals and set out in the contract documentation. (decided at design stage)

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PART B: LABOUR ENHANCED

Part A (Specifications) apply to all work carried out using labour enhanced construction methods; unless:

- **The Specifications in Part A (part or whole) are replaced with revised Specifications in Part B (specifically applicable to the specified labour enhanced construction; or**
- **Additional Specifications for labour enhanced construction are provided in Part B.**

Sensitivity - General

PART B: LABOUR ENHANCED

A11.1.1 SCOPE

This Section covers the furnishing of materials and the construction of protective coverings using stone, cast in situ concrete, bricks, prefabricated concrete elements, wire or alternative materials on exposed surfaces such as earth slopes, drains and stream beds, as well as heavier protective layers in the form of riprap and the construction of stone masonry for walls, as specified and shown on the drawings, or as specified in the Contract Documentation.

A11.1.2 DEFINITIONS

No specific definitions.

A11.1.3 GENERAL

No general items.

A11.1.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS

None applicable.

A11.1.5 MATERIALS

The material specifications are the required specifications for the materials as placed and/or processed in its final position within the road reserve.

It remains the Contractor's responsibility to ensure that the materials delivered to the road shall meet these specified requirements

Materials removed under this Section from existing works, except where excavated materials are specified to be reused or disposed of, or except where provision has been made in Part C for their reuse or specific disposal, shall be deemed to be the property of the Contractor.

A11.1.5.1 Stone

Stone for pitching shall be sound, tough and durable, without any stones less than 200 mm in minimum dimension, except that smaller pieces or spalls may be used for filling spaces between the larger stones. The shapes of the rocks or stones shall be so as to form a stable protective layer of the required thickness. Rounded boulders shall not be used on slopes steeper than 2:1 unless cement grouted. Unless suitable stone can be located on site, the stone for pitching shall be procured from commercial sources but, from whatever source, it shall be subject to the prior approval of the Engineer.

Stone for masonry walls shall have a minimum mass of 8,0 kg for each stone, except that smaller pieces or spalls may be used for filling spaces between the larger stones. Stones shall have a minimum vertical dimension of 75 mm and have a flat and stratified shape if locally available.

Stone for riprap shall be hard field or quarry stone of angular shape, not susceptible to disintegration or excessive weathering on exposure to the atmosphere or water. It shall be free from soft material such as sand, clay, shale or organic material and shall not contain an excessive quantity elongated stones.

The required size of the stone will depend on the "critical mass" specified. At least 50 % by mass of the material comprising the riprap shall consist of stones with a mass heavier than the critical mass, and not more than 10 % by mass of the material shall consist of stones with a mass of less than 10 % of the critical mass or more than 5 times the critical mass.

A11.1.5.2 Sand

a) **Sand for concrete**

Sand for concrete, cement slurry and cement mortar shall comply with the requirements of SANS 1083. This sand can be from natural sources, crushed or obtained from commercial sources.

A11.1.5.3 Grass blocks

Concrete grass blocks shall consist of concrete slabs of the dimensions and strength class shown on the drawings, with openings through the slab totalling at least 20 % of the surface area.

A11.1.5.4 Concrete and mortar

All concrete work shall be carried out in accordance with the requirements of Section A13.4 of Chapter 13, read together with the provisions of this Section. Cement shall comply with SANS 50197-1 for CEM I or CEM II with a strength class of 32.5 or greater, and a rate of strength gain of N or greater.

Unless the Contractor obtains the concrete from a commercial concrete supplier, the Contractor shall be responsible for providing suitable materials, determining the mix proportions and manufacturing the concrete of the required quality to comply with SANS 50206.

The mix design shall be based upon obtaining an average concrete compressive strength sufficiently above the specified characteristic compressive strength so that, considering the expected variability of the concrete and test procedures, no more than 5 % of strength tests will be expected to fall below the specified characteristic compressive strength.

Where concrete is supplied by a commercial source outside the direct control of the Engineer, the concrete supplier shall ensure compliance with the requirements of SANS 50206 (SANS 2126), and the Contractor shall have full responsibility to implement acceptance control tests in accordance

B11.1.1 SCOPE

This Section covers the furnishing of materials and the construction of protective coverings using stone, cast in situ concrete, bricks or prefabricated concrete blocks on exposed surfaces such as earth slopes, drains and stream beds, as well as heavier protective layers in the form of riprap and the construction of stone masonry for walls, as specified and shown on the drawings, or as specified by the Engineer

This Section therefore includes work with a large component of labour.

This Part B therefore only covers additional specifications for work to enhance the labour component of construction activities where specified in Part A. This Section includes concrete mixed by hand.

B11.1.2 DEFINITIONS

The provisions of Part A shall apply.

B11.1.3 GENERAL

The provisions of Part A shall apply.

B11.1.4 DESIGN BY CONTRACTOR / PERFORMANCE BASED SYSTEMS

The provisions of Part A shall apply.

B11.1.5 MATERIALS

B11.1.5.1 General material specifications

When packed riprap is constructed using labour enhanced construction methods, the stone for the riprap shall have a maximum size of 0,03 m^3 or a maximum mass of 30 kg.

B11.1.5.2 Concrete

a) **Concrete mixing by hand**

Concrete may be mixed by hand or in hand-turned concrete mixers for small pours up to one (1) cubic metre. Larger pours greater than one cubic metre shall be machine mixed with on-site mechanical mixers and/or batch plants.

The mix design shall be based upon obtaining an average concrete compressive strength sufficiently above the specified characteristic compressive strength so that, considering the expected variability of the concrete and test procedures, no more than 5 % of strength tests will be expected to fall below the specified characteristic compressive strength.

All concrete mixed on the site of works shall be weigh-batched unless the Contractor can demonstrate to the Engineer that his method of proportioning the concrete ingredients consistently produces uniform concrete, which meets the strength requirements.

Sensitivity - General

PART B: LABOUR ENHANCED

A11.1.8 WORKMANSHIP

A11.1.8.1 General

The Contractor shall determine the required frequency of testing and conduct sufficient tests on the sourced material for each type of material, in order to ensure that the quality of materials produced will meet the specified requirements for the particular layer for which it will be used.

The Engineer may, at his discretion, decide to use the Contractor's test results if he is satisfied that the Contractor has complied with the process control requirements.

Any work or materials which do not comply with the specified requirements, shall be removed and replaced with work or materials which comply with the requirements or, if the Engineer so permits, shall be repaired so that it shall comply with the specified requirements after having been repaired.

A11.1.8.2 Finishing requirements: Grass-block pavement

The completed grass-block pavement shall have a neat and even appearance. The final surface of the pavement may not deviate by more than 15 mm from the specified levels and planes over the entire surface.

B11.1.8 WORKMANSHIP

The provisions of Part A shall apply.

Sensitivity - General

PART B: LABOUR ENHANCED

ADVANTAGES

- **All projects have components of labour.**
- The **Specifications are applicable to both machine and labour work**.
- **Emerging contractors are exposed to the entire document**, although small part may be applicable.
- The **Specifications combined with the payment items** were compiled **to be able to enhance the labour component.**

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PART B: LABOUR ENHANCED

PAYMENT ITEMS

- **Part C contains the payment items for both the conventional and labour enhanced options.**
- **A special payment item is provided to allow for the disclosure of the labour content for the full duration of the project in order to satisfy the project goals.**

A1.2.3.9 Monthly reports

The Contractor shall prepare monthly reports on progress, delays incurred, plant returns, OHS and EMP compliance, staff training, empowerment, capacity building, small Contractor development, labour and staff returns and any other information required by the Employer and/or the Engineer which is specified in the Contract Documentation.

The Contractor's monthly reports shall be submitted to the Engineer at least two working days prior to the applicable scheduled monthly site meetings.

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PART B: LABOUR ENHANCED

PAYMENT ITEMS (CONTD.)

- **Where the excavation of material is specified by means of labour enhanced construction methods, the tendered rates shall include loading and <u>transport by wheelbarrow if the material is disposed of or utilised within a radius of 50m, alternatively loading by hand onto transport vehicles</u> for such disposal or utilisation elsewhere, within a haul distance of 1,0 km.**

B11.1.7 EXECUTION OF THE WORKS

B11.1.7.1 Classification of excavation

Where excavation is done using labour enhanced construction methods, the Engineer shall classify excavated materials as either soft or intermediate for payment purposes in terms of Table B11.1.7-1 or, if the Contractor does not agree with the classification, in terms of Table B11.1.7-2. The decision of the Engineer regarding the classification of the excavated materials shall then be final and binding, subject to the provisions of the conditions of contract.

No hard material shall be measured under labour enhanced construction methods.

C11.1.1 Foundation trenches for stone masonry walls

C11.1.1.1	Excavating foundation trenches in soft material using labour enhanced construction methods 0 m to 1,0 m depth	cubic metre (m^3)
C11.1.1.2	Excavating foundation trenches in intermediate material using labour enhanced construction methods 0 m to 1,0 m depth	cubic metre (m^3)

The unit of measurement shall be the cubic metre of material excavated for foundation trenches in accordance with the authorised di

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PART B: LABOUR ENHANCED

CONCRETE MIXING BY HAND

- **… in hand-turned concrete mixers …. up to one cubic metre**. Larger pours shall be machine mixed (on-site mechanical mixers and/or batch plants).
- **Mix design shall be based upon:**
  - **obtaining an average concrete compressive strength sufficiently above the specified characteristic compressive strength so that, considering the expected variability of the concrete and test procedures, no more than 5 % of strength tests will be expected to fall below the specified characteristic compressive strength**.
- **Weigh-batched unless:**
  - **the Contractor can demonstrate that the concrete ingredients consistently produce uniform concrete to strength specification.**

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PART B: LABOUR ENHANCED

CLASSIFICATION OF EXCAVATED MATERIALS

Table B11.1.7-1: Classification of Excavated Materials

Materials Classification	Description
Soft	Material which can be excavated by means of a suitable shovel with or without the use of a pick or other hand-swung tool.
Intermediate	Material which is difficult to excavate by hand even with the aid of a crowbar and requires the assistance of pneumatic tools for economic removal.

Table B11.1.7-2: Classification of Materials in Terms of Consistency and Shear Strength

Materials Classification	Consistency		Number of DCP blows to penetrate 100 mm *1	
	Granular soil	Cohesive soil	Granular soil	Cohesive soil *2
Soft	Very loose to dense	Very soft to stiff	≤ 15	≤ 8
Intermediate	Very dense	Very stiff	>15	>8

*1 Only applicable to materials comprising not more than 10 % gravel of size less than 10 mm and materials containing no cobbles or isolated small boulders.

*2 Classification depends on the moisture content of the cohesive material.

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PART C: MEASUREMENT & PAYMENT

ALL MEASUREMENT & PAYMENT SECTIONS IN THE VARIOUS CHAPTERS CONSIST OF THE FOLLOWING:

- Preamble
- Items that will **not be measured separately**
- Items to be measured and paid for using payment **items specified else where in the Specification**
- Payment **items specified for the Section**

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PART C: MEASUREMENT & PAYMENT

CONTRACT RATES

Payment…based on the actual quantity of authorized work done

Contract rates apply, subject to special provisions, irrespective of actual quantities

NO rate or price entered - NO compensation for such work will be paid, regardless.

Rate includes full compensation for:
- **providing, maintaining and decommissioning upon completion, of:**
  - **all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the Works in the item, unless otherwise stated.**

Prime Cost or Provisional sums paid in accordance with the provisions of the Conditions of Contract.

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PART C: MEASUREMENT & PAYMENT

PAYMENT ITEMS FROM DIFFERENT SECTIONS

Where a payment item that is specified in a particular Section is required to be used in another section of the Pricing Schedule then the relevant payment item number will be preceded by a reference to the Section in which it is being used.

For example, the loading and hauling payment items from Section C1.7 may be inserted into the Pricing Schedule for the loading and hauling of the material required for the pavement layers which are paid for under the payment Section C5.3 as follows:

C5.3/1.7.1.1	**Loading from stockpile**	**(m^3)**
C5.3/1.7.2.1	**Hauling material for use in the Works and off-loading on the site of the Works.**	**(m^3-km)**

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PART C: MEASUREMENT & PAYMENT

PAYMENT ITEMS FROM DIFFERENT SECTIONS

Examples :

- **C11.(sections)/ 1.2.9 Disposal of non-useable assets**
- **C11.(sections)/1.6 Clear and grubbing designated excavation areas/fence lines and other ancillary areas**
- **C11.(sections)/1.7.1 Loading –no payment for loading**
- **C11.(sections)/1.7.2 Hauling**
- **C11.4/13.8.1 Concrete barriers**
- **C11.5/1.6.3 Removal of trees**
- **C11.6/13.4.1,13.3.1,13.2.1 Gantry footings**
- **C11.8 /1.6.8 Replanting of shrubs and trees from site nursery**
- **C11.8/1.6.9 Stockpiling of topsoil**

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PART C: MEASUREMENT & PAYMENT

C1.7 LOADING AND HAULING

Loading ... picking material from an excavation or stockpile and placing it in a haul vehicle.

Payment item C1.7.1: Loading – only measured if from stockpiles, heaps or windrows.

Hauling is the moving of loaded construction material from point of excavation or from a stockpile to the point of use or designated spoil area (including offloading).

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PART C: MEASUREMENT & PAYMENT

C1.7 LOADING AND HAULING (contd.)

C1.7.2 Hauling –

- **-70% of loaded haul vehicle volume for soil and gravel;**
- **-50% for hard material or boulders.**

Note that for Sections C11.1 to C11.9 no separate payment for the loading of any material or hauling of material over a distance of less than and up to 1,0 km. Payment for these are deemed to be included in tender rates elsewhere.

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PART C: MEASUREMENT & PAYMENT

PRACTICAL ADVICE

- **Construction Monitoring (CM) team to keep files which reflect the calculation of the measured quantities.**
- **CM team to do independent quantity calculations**
- **Quantities considered final for completed lots/segments to be signed off as agreed, to avoid later disputes.**
- **CM team to monitor the contractor's working programme to be able to provide accurate cash flow estimates.**
- **CM team to do two independent remeasurements of the expected final contract amount (over- and under-expenditure).**
- **CM team to carry out daily inspections to monitor the works, and inform estimates.**

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PART C: MEASUREMENT & PAYMENT

PRACTICAL ADVICE

- **Where no specific payment items exist in the Part C Measurement and payment, the work can still be undertaken through negotiations between the Client /Engineer/Contractor on a basis of**

  1) Dayworks (item C1.2.6) or

  2) Variation Orders/Work Authorisation (WA)
- **How does the Contractor price in advance on an item which is " as determined /instructed by the Engineer " ? Rather specify the item clearly in the Contract document.**

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PART C: MEASUREMENT & PAYMENT

The <u>use of drones</u> to measure quantities in borrow pits/stockpiles/cuts /fills /clear and grub/finishing the road reserve etc. How effective when small dimensions are involved?

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PART C: MEASUREMENT & PAYMENT

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PART D: GUARANTEES AND COMPLIANCE CERTIFICATES

Performance Guarantees and/or compliance certificates are specified in Part D of each chapter where applicable.

All product quality/performance/safety certificates issued by the South African Bureau of Standards (SABS) and by Agrément South Africa (ASA) will be accepted. (Agrement certification/specification is used where no SANS certification/specification exists)

Product quality/performance/safety certificates issued by testing authorities based in foreign countries will only be accepted when specified in the Contract Documentation or at the discretion of the Employer.

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COMMENTS ON COTO CHAPTERS

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Written comments are to be completed on the Excel spreadsheet format provided with the Draft Standard documents on the SANRAL website and emailed to cotorevision@nra.co.za
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COMMENTS ON COTO CHAPTERS

Example of spreadsheet for COTO comments

COTO Chapter	Comment number (name/surname initials followed by number eg for John Smith would be JS1, JS2, etc.	Your name	Your Road Authority /Institution/ Company	Page	PART A, B, C or D Section/Clause	Type of comment: General comment – GC Editorial comment – EC Technical comment - TC	Comments : justification for change	Proposed change	Observations of the COTO subcommitte e on each comment submitted

Written comments to be emailed to cotorevision@nra.co.za

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COMMENTS

Proposal:

Drainage (Ch 3) to incorporate 11.1 and 11.2 into 3.3:

- **Section 11.1 : PITCHING, STONEWORK, CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION**
- **Section 11.2 : NON-STRUCTURAL GABIONS**

- **Section 3.1 : DRAINS – Open drains**
- **Section 3.3 : CONCRETE KERBING AND CHANNELLING, ASPHALT BERMS, CHUTES, DOWNPIPES, (AS WELL AS) CONCRETE, STONE PITCHING AND GABION LINING FOR OPEN DRAINS**

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COMMENTS

More work needed:

Part D: GAURANTEES AND COMPLIANCE CERTIFICATES.

- **D11.4 ROAD RESTRAINT SYSTEMS**
  - RTMC working group are finalising:

Volume 1: Methodology
Volume 2: Road Restraint Standards and Requirements
Volume 3: Risk Assessment Procedure
Volume 4: Literature Review

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COMMENTS

More work needed:

Part D: GAURANTEES AND COMPLIANCE CERTIFICATES.

- **D11.7 ROAD MARKING AND ROAD STUDS**

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QUESTIONS