

**ROAD WORKS (CONTINUE)****R.3.3.3 TACK COAT**

R.3.3.3.1 WHEN READY FOR ASPHALTING, THE PRIMER SEALED SURFACE SHALL BE BROOMED FREE OF ALL LOOSE MATERIAL AND A TACK COAT SHALL BE APPLIED TO PROVIDE A "KEY" FOR THE ASPHALTIC CONCRETE.

R.3.3.3.2 APPLICATION SHALL TAKE PLACE NOT LESS THAN 30 MINUTES NOR MORE THAN 2 HOURS BEFORE PLACING ASPHALTIC CONCRETE.

R.3.3.3.3 THE TACK COAT APPLICATION RATE SHALL ACHIEVE A RESIDUAL BITUMEN OF 0.1 TO 0.2 LITRES PER SQUARE METRE. WITH APPROVAL FROM THE LOCAL AUTHORITY (OR ENGINEER WHERE APPLICABLE), THIS RATE MAY BE VARIED TO SUIT THE CLASS OF MATERIAL.

R.3.3.3.4 NO ASPHALT SHALL BE LAID ON AN EMULSION TACK COAT UNTIL THE EMULSION HAS BROKEN AND THE WATER HAS SUBSTANTIALLY EVAPORATED.

R.3.3.3.5 ANY POOLS OF TACK COAT WHICH MAY HAVE FORMED IN SURFACE DEPRESSIONS SHALL BE BRUSHED OUT.

**R.3.3.4 ASPHALTIC CONCRETE**

R.3.3.4.1 ASPHALTIC CONCRETE SHALL BE LAID AT A RATE SO AS TO ACHIEVE A COMPACTED THICKNESS AS NOMINATED ON THE DRAWINGS, USING A 7mm OR 10mm NOMINAL AGGREGATE GRADED MIX AS NOMINATED ON THE DRAWINGS.

R.3.3.4.2 THE ASPHALTIC CONCRETE MIX SHALL BE PLACED AT A MINIMUM TEMPERATURE OF 140 DEGREES CELSIUS IMMEDIATELY ON DELIVERY TO THE SPREADER AND IN THE PRESENCE OF EXPERIENCED PERSONNEL. THE TEMPERATURE OF THE ASPHALTIC CONCRETE AT THE TIME OF INITIAL ROLLING MUST NOT FALL BELOW 120 DEGREES CELSIUS. SPREADING OF MATERIAL BELOW THIS TEMPERATURE WILL NOT BE PERMITTED. NO ASPHALTIC CONCRETE SHALL BE PLACED WHEN THE AMBIENT TEMPERATURE IS LESS THAN 10 DEGREES CELSIUS.

R.3.3.4.3 THE ASPHALTIC CONCRETE SHALL BE PLACED IN ONE LAYER BY AN APPROVED SELF PROPELLED MACHINE SPREADER, CONFORMING TO AS 2150.

R.3.3.4.4 COMPACTION SHALL BE ACCORDANCE WITH AS 2150 EXCEPT AS FOLLOWS: COMPACT INITIALLY BY ROLLING WITH AT LEAST TWO COVERAGES OF THE SMOOTH, STEEL DRUM TANDEM ROLLER AS SPECIFIED UNDER THE CLAUSE ON "PLANT". IMMEDIATELY FOLLOWING THE INITIAL ROLLING AND WHILE THE ASPHALTIC CONCRETE IS STILL HOT, ROLL WITH NOT LESS THAN TWELVE COVERAGES OF THE SELF-PROPELLED PNEUMATIC-TYRED ROLLER, OF MASS NOT EXCEEDING 12 TONNES, AS SPECIFIED UNDER THE CLAUSE ON "PLANT". ROLL FINALLY WITH A MAXIMUM OF TWO COVERAGES OF THE SMOOTH, STEEL DRUM ROLLER WHILE THE ASPHALTIC CONCRETE IS SUFFICIENTLY WARM, TO PRODUCE A SMOOTH, DENSE SURFACE.

R.3.3.4.5 IF THE ASPHALTIC CONCRETE BEGINS TO SHOVE OR CRACK, IN NO CIRCUMSTANCES CONTINUE WITH ROLLING UNTIL THE CAUSE HAS BEEN DETERMINED AND CORRECTIVE MEASURES TAKEN. KEEP DRUMS AND WHEELS OF ROLLERS WET WITH WATER AND CLEAN DURING ALL ROLLING OPERATIONS.

R.3.3.4.6 FORM ANY JOINTS NECESSARY AND ENSURE THAT THE FINISHED PROFILE IS SMOOTH AND EVEN OVER THE JOINTS WITHOUT RIDGES OR DEPRESSIONS. JOINTS SHALL BE WATERPROOF. JOINTS SHALL BE IN ACCORDANCE WITH AS 2150.

R.3.3.4.7 THE DENSITY OF THE COMPACTED CONCRETE SHALL BE NOT LESS THAN 97% OF THE MARSHALL MAXIMUM DENSITY.

R.3.3.4.8 THE DESIGN LEVELS GIVEN ON THE DRAWINGS INDICATE THE LEVELS OF THE FINISHED ROAD SURFACE.

R.3.3.4.9 SAMPLES OF THE COMPACTED ASPHALTIC CONCRETE SHALL BE TAKEN BY AN APPROPRIATE TESTING CONSULTANT. THE DEPTH OF LAYER AND FIELD DENSITY SHALL BE DETERMINED. ALL DENSITY HOLES SHALL BE REPAIRED BY THE CONTRACTOR.

R.3.3.4.10 THE CONTRACTOR SHALL SUBMIT A RECORD OF THE GRADING OF THE MIX AND ANY TEST RESULTS REQUIRED BY THE ENGINEER, TO THE LOCAL AUTHORITY (AND ENGINEER WHERE APPLICABLE).

**R.3.4 EXTRUDED CONCRETE KERBING**

R.3.4.1 CONCRETE SHALL CONFORM TO AS 3600 AND SHALL BE SUPPLIED BY A CONCRETE SUPPLIER CONFORMING WITH AS 1379.

R.3.4.2 CONCRETE STRENGTH SHALL BE TESTED BY MEANS OF PRODUCT ASSESSMENT METHODS IN ACCORDANCE WITH SECTION 5 AND 6 OF AS 1379. THE CONTRACTOR SHALL REGISTER THE PROJECT AND ARRANGE FOR THE RESULTS TO BE SENT TO THE LOCAL AUTHORITY (AND ENGINEER WHERE APPLICABLE).

R.3.4.3 KERBS TO ROADS SHALL BE CONSTRUCTED OF EXTRUDED CONCRETE KERBING. KERBING TO SMALLER RADI THAN CAN BE PLACED WITH THE EXTRUSION MACHINE USED SHALL BE CAST INSITU TO THE SAME CROSS SECTION AS THAT OF THE EXTRUDED KERBING, EXCEPT THAT THE CAST INSITU KERB SHALL BE 100mm DEEPER THAN THE EXTRUDED KERBING AND SHALL BE EMBEDDED FIRMLY IN THE ROAD SURFACE TO THE EXTRA DEPTH. THE OUTWARD APPEARANCE OF THE EXTRUDED AND CAST INSITU KERBING SHALL BE IDENTICAL.

R.3.4.4 ALL KERBING SHALL BE CONSTRUCTED FROM 32 MPa 28 DAY CYLINDER TEST COMPRESSIVE STRENGTH CONCRETE MANUFACTURED IN ACCORDANCE WITH AS 3600 FOR 10mm AGGREGATE WITH A MAX 50mm SLUMP.

R.3.4.5 THE FINAL SHAPE AND DIMENSIONS OF THE EXTRUDED KERB SHALL BE AS DETAILED ON THE DRAWINGS. THE TOP SURFACE OF THE KERB SHALL ALWAYS BE PARALLEL TO THE RULING GRADE OF THE PAVEMENT, WITH GENTLE TRANSITIONS AT CHANGES IN GRADE.

R.3.4.6 THE WIDTH OF THE ROAD SHALL BE THE DISTANCE BETWEEN THE KERBS ALONG STRAIGHT SECTIONS OF THE ROAD MEASURED AT RIGHT ANGLES TO THE KERBS FROM TOE TO TOE AND SHALL BE AS DETAILED ON THE DRAWINGS. THE KERBS SHALL BE EQUIDISTANT FROM THE ROAD CENTRE LINE. AT ROAD JUNCTIONS AND INTERSECTIONS, THE RADIUS OR KERBING SHALL BE MEASURED FROM THE ROAD SIDE TOE OF THE KERB.

R.3.4.7 ANY KERBING MARKED BY BITUMEN SPRAY SHALL BE MADE GOOD BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

R.3.4.8 THE BACKFILLING TO KERBING SHALL BE PLACED AS SHOWN ON THE DRAWINGS AFTER THE CURING, PLACEMENT OF JOINTS, AND ACCEPTANCE OF THE KERBING. THE BACKFILL MATERIAL SHALL BE A SIMILAR MATERIAL TO THE LOCALLY OCCURRING TOPSOIL, FREE FROM DEBRIS AND COMPACTED ADEQUATELY TO ACCOMMODATE THE DRIVING OF RUBBER TYRED DOMESTIC VEHICLES.

**R.3.4.9 CONTRACTION JOINTS**

R.3.4.9.1 CONTRACTION JOINTS SHALL BE CONSTRUCTED AT 2.0m INTERVALS (UNLESS NOTED OTHERWISE ON THE DRAWINGS) AND AT TANGENT POINTS OF SWEEPS BY COMPLETE SEPARATION OF ADJOINING SECTIONS OF THE KERB IMMEDIATELY AFTER EXTRUSION, USING A WET KNIFE THROUGH THE FULL DEPTH OF KERB.

R.3.4.9.2 THE EXTRUDED KERB SHALL BE FINISHED BY MEANS OF A KERB-SHAPED SCREED.

R.3.4.9.3 THE FINISHING SHALL FOLLOW IMMEDIATELY AFTER THE CUTTING OF CONTRACTION JOINTS. THE FINISHING SHALL BRIDGE OVER THE CONTRACTION JOINTS TO FORM A CONTINUOUS COVER.

R.3.4.9.4 EACH CONTRACTION JOINT POSITION SHALL BE CLEARLY MARKED BY A GROOVE CUT IN THE FINISHED SURFACE ON THE ENTIRE EXPOSED FACE OF THE KERB BEFORE THE CONCRETE HAS SET, TO A DEPTH OF 15-20mm.

**ROAD WORKS (CONTINUE)****R.3.4.10 EXPANSION JOINTS**

R.3.4.10.1 NOT LESS THAN 24 HOURS AFTER PLACING OF THE KERB, EXPANSION JOINTS SHALL BE CONSTRUCTED AT EVERY SECOND CONTRACTION JOINT. THE EXPANSION JOINTS SHALL BE FORMED BY THE SAWING OF A 10mm GAP THAT COMPLETELY SEVERES THE ADJOINING SECTIONS OF THE KERB. THE GAP SHALL BE FILLED WITH APPROVED JOINT FILLER AFTER THE LOCAL AUTHORITY (AND ENGINEER WHERE APPLICABLE) HAVE INSPECTED AND APPROVED THE CUT JOINTS.

R.3.4.10.2 EXPANSION JOINTS SHALL BE PLACED WHERE THE KERB MEETS A SIDE ENTRY OR COMBINATION PIT.

**R.4 TOLERANCES**

R.4.1 FINISHED SUBGRADE LEVEL: +5mm or -30mm OF DESIGN

R.4.2 FINISHED BASECOURSE LEVEL: +10mm or -10mm OF DESIGN

R.4.3 FINISHED BASECOURSE WIDTH: +300mm or -0mm OF DESIGN

R.4.4 FINISHED BASECOURSE THICKNESS: -0mm OF DESIGN

R.4.5 FINISHED BASECOURSE GRADE: + or - 20% OF DESIGN

R.4.6 FINISHED BASECOURSE SURFACE: +15mm or -15mm WHEN TESTED WITH A 3m STRAIGHT EDGE

R.4.7 WIDTH OF PRIME FOR AC: +150mm or -0mm OF DESIGN

R.4.8 THICKNESS OF AC: +5mm or -0mm OF DESIGN

R.4.9 FINISHED AC OR PAVING LEVEL: +10mm or -0mm OF DESIGN

R.4.10 KERBING SURFACE: +10mm or -10mm FROM 3m STRAIGHT EDGE

R.4.11 KERBING LEVEL: +10mm or -10mm OF DESIGN

R.4.12 KERBING LINE: +10mm or -10mm OF DESIGN

**R.5. QUALITY ASSURANCE**

R.5.1 THE CONTRACTOR SHALL SUPPLY COMPACTION CERTIFICATES CONFIRMING COMPACTION OF THE SUBGRADE MEETS THE REQUIREMENTS OF THE ROADWORKS SPECIFICATION. TEST FREQUENCY TO BE AT LEAST 1 TEST PER 100m2.

R.5.2 THE CONTRACTOR SHALL SUPPLY COMPACTION CERTIFICATES CONFIRMING COMPACTION OF THE BASECOURSE MEETS THE REQUIREMENTS OF THE ROADWORKS SPECIFICATION. TEST FREQUENCY TO BE AT LEAST 1 TEST PER 100m2.

R.5.3 THE CONTRACTOR SHALL SUPPLY SUPPLIER'S CERTIFICATES CONFIRMING THE BASECOURSE MATERIAL MEETS THE REQUIREMENTS OF THE ROADWORKS SPECIFICATION. TEST FREQUENCY TO BE AT LEAST 1 PER PROJECT.

R.5.4 THE CONTRACTOR SHALL SUPPLY CONTRACTOR'S CERTIFICATES CONFIRMING THE SUBGRADE LEVELS MEET THE REQUIREMENTS OF THE ROADWORKS SPECIFICATION. TEST FREQUENCY TO BE AT LEAST 1 PER PROJECT.

R.5.5 THE CONTRACTOR SHALL SUPPLY CONTRACTOR'S CERTIFICATES CONFIRMING THE BASECOURSE LEVELS MEET THE REQUIREMENTS OF THE ROADWORKS SPECIFICATION. TEST FREQUENCY TO BE AT LEAST 1 PER PROJECT.

R.5.6 THE CONTRACTOR SHALL SUPPLY CONTRACTOR'S CERTIFICATES CONFIRMING THE APPLICATION OF AC (THICKNESS, COMPACTION, LEVELS, CHECK FOR PONDING, FINISH) MEETS THE REQUIREMENTS OF THE ROADWORKS SPECIFICATION. TEST FREQUENCY TO BE AT LEAST 1 PER PROJECT.

R.5.7 THE CONTRACTOR SHALL SUPPLY CONTRACTOR'S CERTIFICATES CONFIRMING THE APPLICATION OF THE LATERITE SEAL (THICKNESS, COMPACTION, LEVELS, CHECK FOR PONDING, FINISH) MEETS THE REQUIREMENTS OF THE ROADWORKS SPECIFICATION. TEST FREQUENCY TO BE AT LEAST 1 PER PROJECT.

R.5.8 THE CONTRACTOR SHALL SUPPLY CONTRACTOR'S CERTIFICATES CONFIRMING THE CONSTRUCTION OF KERBING (ALIGNMENT, LEVELS, FINISH, WIDTH BETWEEN EXPANSION JOINTS, CURING) MEETS THE REQUIREMENTS OF THE ROADWORKS SPECIFICATION. TEST FREQUENCY TO BE AT LEAST 1 PER PROJECT.

R.5.9 THIS INFORMATION SHALL BE SUBMITTED TO THE SUPERINTENDENT PRIOR TO PRACTICAL COMPLETION AND PRIOR TO ACCEPTANCE OF THE WORKS.

**R.6. AS-CONSTRUCTED REQUIREMENTS**

R.6.1 THE CONTRACTOR SHALL ARRANGE FOR ALL AS-CONSTRUCTED SURVEY, TESTING OF THICKNESS AND PRESENTATION OF RESULTS USING A LICENSED SURVEYOR AT THE CONTRACTOR'S EXPENSE.

R.6.2 THE AS-CONSTRUCTED INFORMATION SHALL BE SIGNED AND CERTIFIED AS ACCURATE AND CORRECT BY THE CONTRACTOR AND THE LICENSED SURVEYOR BEFORE BEING SUBMITTED TO THE ENGINEER FOR APPROVAL.

R.6.3 THIS INFORMATION SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO PRACTICAL COMPLETION AND PRIOR TO ACCEPTANCE OF THE WORKS.

**STORMWATER DRAINAGE****SW.1 GENERAL**

SW.1.1 ALL THE WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS AND THIS SPECIFICATION AND WILL BE SUBJECT TO INSPECTIONS AND APPROVAL OF THE RELEVANT LOCAL AUTHORITY AND SUPERINTENDENT.

SW.1.2 ANY INSTRUCTIONS FROM THE AUTHORITY PERTAINING TO THE WORKS SHALL BE REQUESTED BY THE CONTRACTOR TO BE IN WRITING AND KEPT FOR FUTURE RECORD. A RECORD OF THIS SHALL BE SUBMITTED TO THE DESIGN ENGINEER.

**SW.2 TOLERANCES**

SW.2.1 GRADES STEEPER THAN 1:50 - PLUS/MINUS 10% OF DESIGN GRADE AND PLUS/MINUS 20mm OF DESIGN INVERT LEVEL.

SW.2.2 GRADES FLATTER THAN 1:50 - UP TO 10% STEEPER, BUT NOT LESS THAN 5% FLATTER THAN DESIGN GRADE AND PLUS/MINUS 10mm OF DESIGN INVERT LEVEL.

**S.W.3 SOURCE ROCK FOR ROCK PROTECTION AND ROCK PITCHING**

SW.3.1 SOURCE ROCK FOR ROCK PROTECTION AND ROCK PITCHING SHALL CONSIST OF CLEAN, SOUND, DURABLE, HARD ROCK. ROCK USED SHALL BE FRESH TO SLIGHTLY WEATHERED. ROCK THAT IS LAMINATED, FRACTURED, POROUS, OR OTHERWISE PHYSICALLY WEAK IS UNACCEPTABLE. FLAT SLAB-LIKE ROCK PIECES, WITH BREADTH OR THICKNESS LESS THAN ONE THIRD OF ITS LENGTH ARE NOT PERMITTED UNLESS GROUTING IS SPECIFIED.

SW.3.2 ROCK FOR ROCK PROTECTION SHALL BE OF VERY HIGH TO EXTREMELY HIGH STRENGTH, AS DEFINED BY AS 1726.

SW.3.3 ROCK FOR ROCK PITCHING SHALL BE OF MEDIUM TO HIGH STRENGTH, AS DEFINED BY AS 1726.

SW.3.4 ROCK SIZES FOR ROCK PROTECTION SHALL BE IN ACCORDANCE WITH THE DRAWINGS.

SW.3.5 ROCKS FOR ROCK PITCHING SHALL BE NOMINALLY 300MM UNLESS NOTED OTHERWISE ON THE DRAWINGS.

**SW.4 QUALITY ASSURANCE**

SW.4.1 THE CONTRACTOR SHALL PRODUCE, AND SUBMIT TO THE SUPERINTENDENT, VERIFIED STORMWATER DRAINAGE RECORDS AS FOLLOWS:

- MATERIALS SUPPLIER'S CERTIFICATES CONFIRMING MATERIALS MEET THE REQUIREMENTS OF THE STORMWATER DRAINAGE SPECIFICATION.

- DRAIN SET-OUT SURVEY RECORD - 1 PER DRAIN LINE

- DRAIN CONSTRUCTION SURVEY AS-CONSTRUCTED DETAILS - 1 PER DRAIN LINE, INCLUDING THE FOLLOWING DETAILS:

(I) PIPES - PLAN LOCATION, U/S AND D/S INVERT LEVELS, DIAMETER, LENGTH, GRADE, MATERIAL, CLASS AND BEDDING DETAILS;

(II) ACCESS CHAMBERS - PLAN LOCATION, TYPE, COVER LEVEL, BEDDING DETAILS;

(III) HEADWALLS - PLAN LOCATION, SIZE, INVERT LEVEL, TYPE, BEDDING DETAILS; AND ROCK PROTECTION - PLAN LOCATION, TYPE, ROCK SIZE, ROCK TYPE, THICKNESS/DEPTH.

- BEDDING, SIDE SUPPORT, OVERLAY AND REFILL CONTRACTOR'S CERTIFICATES CONFIRMING COMPLIANCE WITH THE STORMWATER DRAINAGE SPECIFICATION - 1 PER DRAIN LINE;

- COMPACTION CERTIFICATES CONFIRMING COMPACTION MEETS THE REQUIREMENTS OF THE STORMWATER SPECIFICATION. FREQUENCY TO BE 1 CERTIFICATE PER DRAIN LINE, WITH TESTING AT EACH LAYER, NEAR ACCESS CHAMBERS AND ALONG LINE.

SW.4.2 THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE SUPERINTENDENT SHOULD ANY ITEM FAIL TO MEET THE SPECIFIED REQUIREMENTS, AND ADVISE OF THE PLANNED REMEDIAL ACTION TO BE TAKEN.

SW.4.3 QUALITY ASSURANCE INFORMATION SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO PRACTICAL COMPLETION AND PRIOR TO ACCEPTANCE OF THE WORKS.

**SW.5 AS-CONSTRUCTED REQUIREMENTS**

SW.5.1 THE "AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT AND THE RESULTS RECORDED BY THE CONTRACTOR'S LICENSED SURVEYOR, THE COSTS OF WHICH SHALL BE INCORPORATED INTO THE CONTRACTOR'S LUMP SUM TENDER.

SW.5.2 THE SURVEY SHALL INCLUDE ALL INVERT LEVELS AT ACCESS CHAMBERS, ENTRY PITS, HEADWALLS AND ENDWALLS, CENTRE TO CENTRE DISTANCE OF PITS, DISTANCES FROM CENTRE OF PITS TO HEADWALLS OR ENDWALLS, SIZE OF PIPES, TYPES OF PIPES AND BEDDING, LOCATION OF PITS IN RELATION TO ADJACENT BOUNDARIES, REDUCED LEVELS OF ACCESS CHAMBER AND ENTRY PIT COVERS.

SW.5.3 "AS CONSTRUCTED" DRAWINGS, SHALL BE PRODUCED BY THE CONTRACTOR AND INCLUDED IN THE LUMP SUM TENDER.

SW.5.4 THESE DRAWINGS, WHEN COMPLETED, SHALL BE SIGNED AND CERTIFIED AS ACCURATE AND CORRECT BY THE CONTRACTOR'S LICENCED SURVEYOR AND CONTRACTOR BEFORE SUBMITTING IN HARD-COPY, AND DIGITAL FORMATS TO THE SUPERINTENDENT FOR THEIR APPROVAL.

SW.5.5 THIS INFORMATION SHALL BE SUBMITTED TO THE SUPERINTENDENT PRIOR TO PRACTICAL COMPLETION AND PRIOR TO ACCEPTANCE OF THE WORKS.



ARCHITECT/CIENT

**LIGHTS BEACH UPGRADE  
SPECIFICATION SHEET - SHEET 2 OF 2**

PROJECT/TITLE


**TENDER ISSUE**  
NOT FOR CONSTRUCTION  
CIVIL

MGA	mAHD	301248187 CI-007-GE-N2	A
COORDS	DATUM	SCALE @ A1	PROJECT No DRAWING No REV