BANANA SHIRE COUNCIL

MOURA BOAT RAMP EXTENSION

DETAILED DESIGN

DRAWING INDEX

DRAWING NUMBER	DRAWING DESCRIPTION
657-001-C001	LOCALITY PLAN AND DRAWING INDEX
657-001-C002	NOTES AND LEGEND
657-001-C003	TYPICAL SECTION
657-001-C004	GENERAL ARRANGEMENT AND LONGITUDINAL SECTION
657-001-C005	CROSS SECTIONS SHEET 1
657-001-C006	CROSS SECTIONS SHEET 2
657-001-C007	EROSION AND SEDIMENT CONTROL

LOCALITY PLAN
Not to Scale

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Rev.	Description	Date	Drawn	Design	Check	RPEQ No. & Initial	
A	ISSUED FOR CONSTRUCTION	08/05/23	JC	LB	DB	6343	DB

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	No.	DATE
CIVIL	D Berry		6343	8/5/2023

SCALE
Not to Scale

MOURA BOAT RAMP EXTENSION

LOCALITY PLAN AND DRAWING INDEX

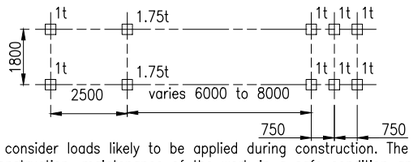
DRAWING NUMBER 657-001-C001 | No IN SET 1 OF 7 | REVISION A

GENERAL NOTES

1. These drawings shall be read in conjunction with the specifications, other consultants drawings and specifications, and all authority standard drawings and specifications.
2. Before proceeding with the work any discrepancies in the contract documents shall be referred for decision to the Administrator.
3. The Contractor shall verify all locations of services prior to construction, including up to date BYDA. The Contractor is responsible for the costs involved in the protection and the repair of any damaged services as a result of the work.
4. All materials and workmanship shall be in accordance with the relevant authority requirements. Where the relevant authority does not stipulate requirements, the Queensland Department of Transport and Main Roads Standard Specifications shall apply.
5. The Contractor shall prepare a Workplace Health and Safety Plan for the project and shall not commence work until it is complete and evidence of such has been provided to the Administrator.
6. The Contractor shall not commence works until all required insurances are in place and evidence of such has been provided to the Administrator.
7. The Contractor shall be responsible for notifying all relevant authorities before commencing work. Works shall not commence until pre-start meetings are held with the relevant authorities.
8. Where traffic management is required as part of the works the Contractor shall submit a traffic management plan for approval by the relevant authority prior to commencing work, and shall be responsible for the management of traffic throughout the construction period.
9. The Contractor is responsible for preparing Erosion and Sediment Control Plans, and undertaking Erosion and Sediment Control during construction in accordance with Council and other relevant authority's requirements.
10. The Contractor shall provide a consolidated set of test certificates demonstrating compliance with all construction requirements, along with the required authority CCTV reports at the completion of construction.
11. The Contractor shall be responsible for organising and coordinating any required private works that need to be undertaken by the approval authorities.
12. Unless otherwise advised, the Contractor shall be responsible for undertaking As Constructed survey of the works, including ADAC XML files with correct layering, labelling, co-ordinates and level information as per Council and water authority requirements.
13. The Contractor shall make allowance for works to be carried out by other Contractors or the Principal e.g. Electrical, Communications and Landscaping Contractors.
14. All levels are AHD.
15. All dimensions are in metres unless noted otherwise.
16. Scales shown are A1 size unless noted otherwise. Do not scale from drawings.

NOTES

1. All codes shall be current Standards Australia codes.
2. All dimensions are in millimetres unless noted otherwise.
3. All chainages are in metres.
4. All levels and contours are in metres and are reduced to Australian Height Datum (AHD).
5. Contours shown represent existing surface levels and do not reflect the design levels.
6. All co-ordinates are in metres and are to MGA Zone 56 (GDA2020).
7. The ramp is designed for recreational boating use only in accordance with the design wheel loading.



8. The design does not consider loads likely to be applied during construction. The Contractor shall be responsible for the method of construction, maintenance of the work in a safe condition and ensuring construction loads are adequately resisted.
9. Reconstruction of pavements, kerb and relocation of services by Contractor unless noted otherwise.
10. Existing concrete or pavement shall be cut where required. Edges shall be neat, vertical and parallel or perpendicular to edges or centrelines when practical.
11. Shoulders shall be 750mm wide and 30mm lower than the ramp surface for a visible and tactile indication of the edge of the ramp. Refer TMR Standard Drawing 4022.

LEGEND

EXISTING

- Contours – Minor
- Contours – Major
- Walkway
- Edge of Bitumen
- Stormwater Pipe
- Elec Light Pole
- Sign

PROPOSED

- LWL – 100.15 (Nominated by Council)
- Contours – Minor
- Contours – Major
- Ungrouted Rock Shoulder
- 75mm Crushed Rock Core
- RG4000 and T4000 Concrete Planks

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ENGINEERING CERTIFICATION (RPEQ)

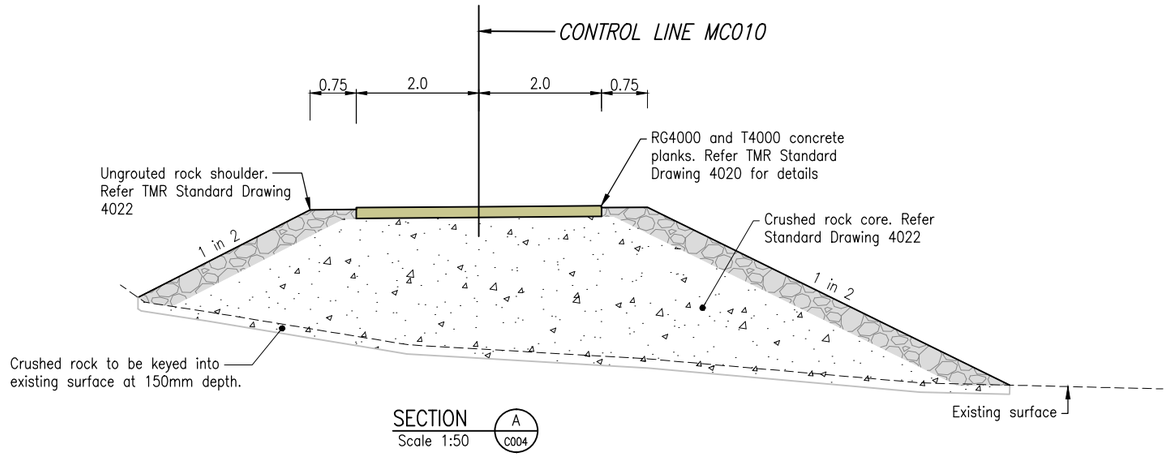
ENG. AREA	NAME	SIGNATURE	No.	DATE
CIVIL	D Berry		6343	8/5/2023

SCALE: Not to Scale

MOURA BOAT RAMP EXTENSION

NOTES AND LEGEND

DRAWING NUMBER: 657-001-C002 | No IN SET: 2 OF 7 | REVISION: A



SECTION A
Scale 1:50 C004

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ENGINEERING CERTIFICATION (RPEQ)

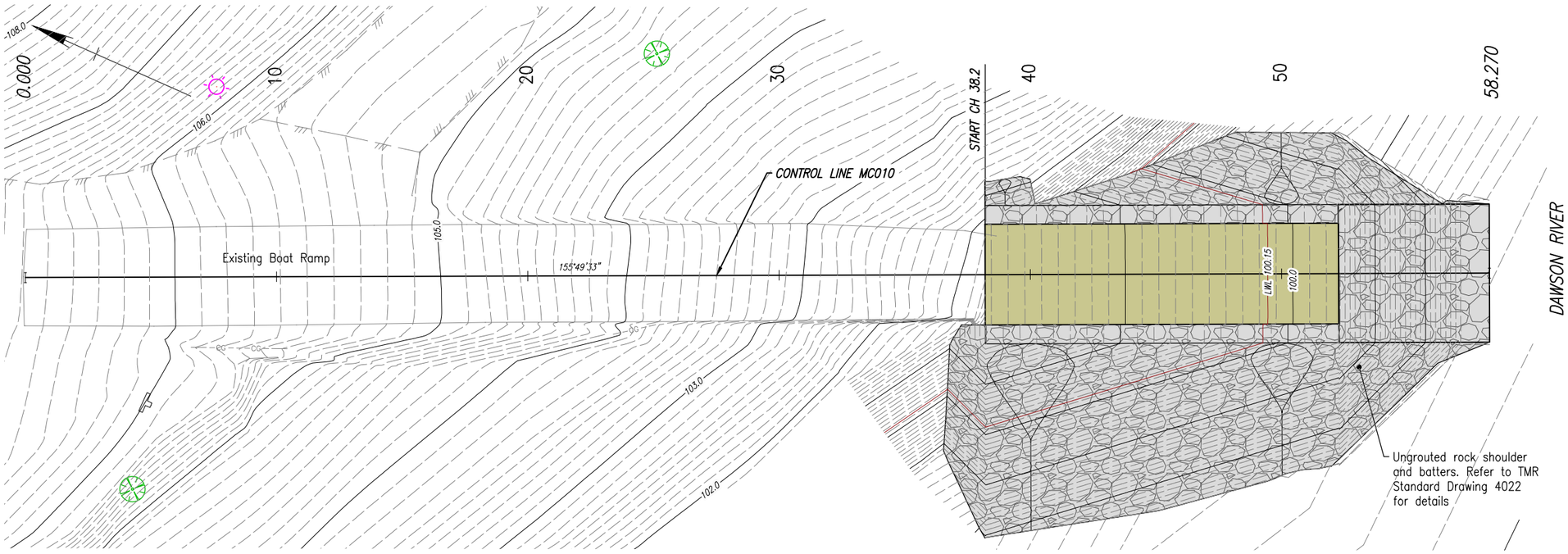
ENG. AREA	NAME	SIGNATURE	No.	DATE
CIVIL	D Berry		6343	8/5/2023

SCALE
1:50 0 0.5 1 2 A1
1:100 A3

MOURA BOAT RAMP EXTENSION

TYPICAL SECTION

DRAWING NUMBER 657-001-C003 | No IN SET 3 OF 7 | REVISION A



LAYOUT PLAN

Scale 1:100 at A1

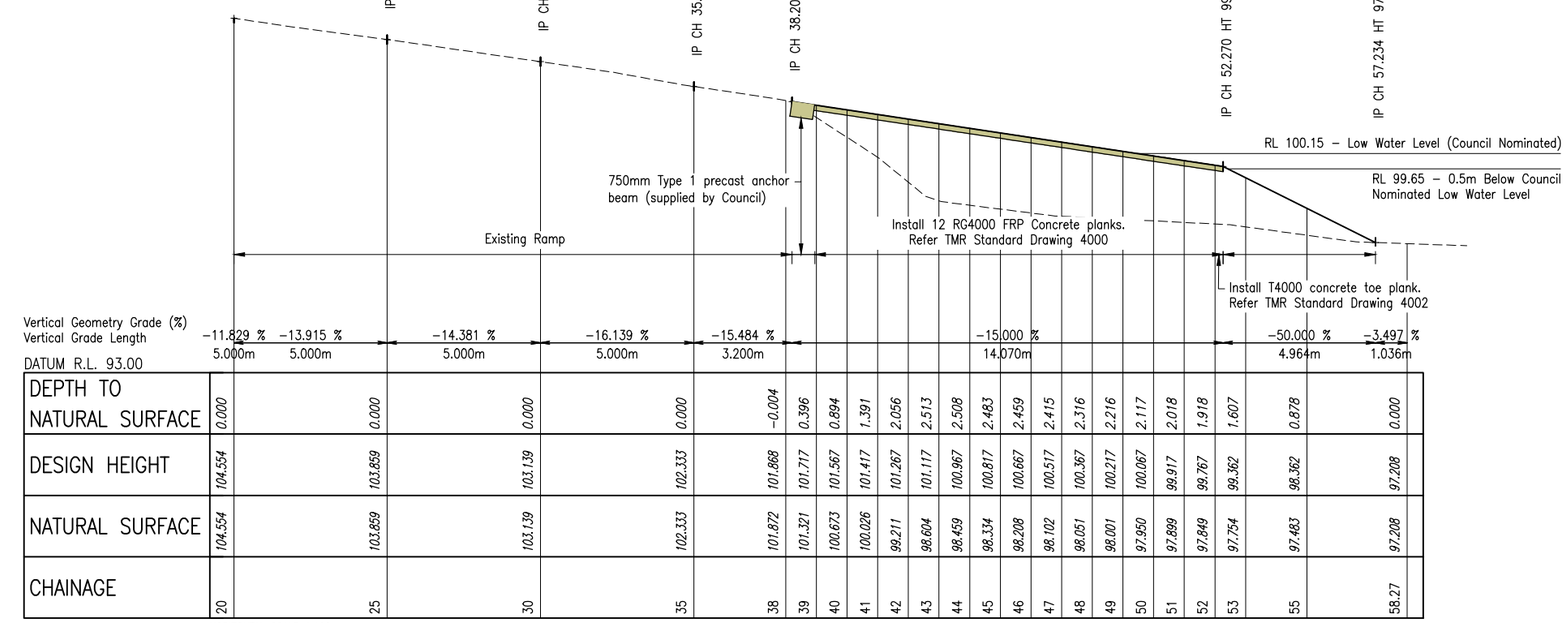
ALIGNMENT MC010 SETOUT TABLE

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING
S	0.000	187091.646	7275843.662	106.585	155°49'32.89"
TT	38.200	187107.289	7275808.812	101.837	155°49'32.89"
TT	52.270	187113.051	7275795.976	99.727	155°49'32.89"
E	58.270	187115.508	7275790.502	97.208	155°49'32.89"

SURVEY CONTROL TABLE

STN	EASTING	NORTHING	HEIGHT
1	187067.4565	7275849.7333	106.2712
2	187005.8020	7275923.1436	110.0117

NOTE: Survey stations outside of view port area



Vertical Geometry Grade (%): −11.829 % | −13.915 % | −14.381 % | −16.139 % | −15.484 % | −15.000 % | −50.000 % | −3.497 %

Vertical Grade Length: 5.000m | 5.000m | 5.000m | 5.000m | 3.200m | 14.070m | 4.964m | 1.036m

DATUM R.L. 93.00

DEPTH TO NATURAL SURFACE	0.000		0.000		0.000		0.000	−0.004	0.396	0.894	1.391	2.056	2.513	2.508	2.483	2.459	2.415	2.316	2.216	2.117	2.018	1.918	1.607	0.878		0.000						
DESIGN HEIGHT	104.554		103.859		103.139		102.333	101.868	101.717	101.567	101.417	101.267	101.117	100.967	100.817	100.667	100.517	100.367	100.217	100.067	99.917	99.767	99.362	98.362		97.208						
NATURAL SURFACE	104.554		103.859		103.139		102.333	101.872	101.321	100.673	100.026	99.211	98.604	98.459	98.334	98.208	98.102	98.051	98.001	97.950	97.899	97.849	97.754	97.483		97.208						
CHAINAGE	20		25		30		35	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	55		58.27						

HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100

LONGITUDINAL SECTION MC010

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A	ISSUED FOR CONSTRUCTION	08/05/23	JC	LB	DB	6343 DB

ENGINEERING CERTIFICATION (RPEQ)

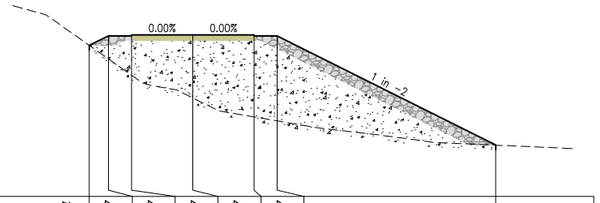
ENG. AREA	NAME	SIGNATURE	No.	DATE
CIVIL	D Berry		6343	8/5/2023

SCALE
1:100 0 1 2 3 4 A1
1:200 A3

MOURA BOAT RAMP EXTENSION

GENERAL ARRANGEMENT AND LONGITUDINAL SECTION

DRAWING NUMBER 657-001-C004 | No IN SET 4 OF 7 | REVISION A

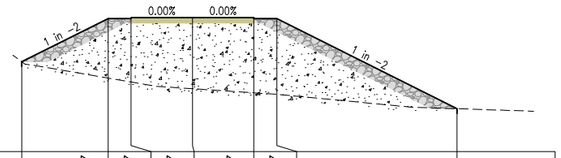


CONTROL LINE MC010
X = 187108.846
Y = 7275805.346
Z = 101.267

Datum 96.00

DESIGN HEIGHT	*100.774*	*101.237*	*101.237*	*101.267*	*101.267*	*101.237*	*97.673*		
EXISTING SURFACE	100.925	100.482	99.952	99.211	98.595	98.465	97.673		
OFFSETS	*−3.377*	*−2.751*	*−2.001*	*0.000*	*2.000*	*2.751*	*9.879*		

CHAINAGE 42.000

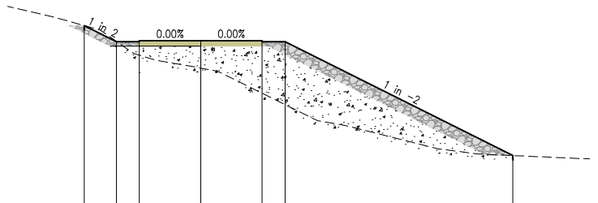


CONTROL LINE MC010
X = 187111.303
Y = 7275799.872
Z = 100.367

Datum 96.00

DESIGN HEIGHT	*98.780*	*100.337*	*100.337*	*100.367*	*100.367*	*100.337*	*97.398*		
EXISTING SURFACE	98.931	98.401	98.272	98.051	97.919	97.869	97.398		
OFFSETS	*−5.566*	*−2.751*	*−2.001*	*0.000*	*2.000*	*2.751*	*8.629*		

CHAINAGE 48.000

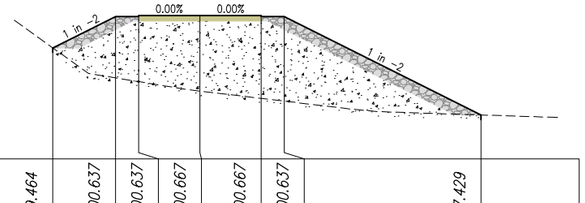


CONTROL LINE MC010
X = 187108.027
Y = 7275807.170
Z = 101.567

Datum 96.00

DESIGN HEIGHT	*101.910*	*101.537*	*101.537*	*101.567*	*101.567*	*101.537*	*97.821*		
EXISTING SURFACE	102.060	101.544	101.096	100.673	99.855	99.482	97.821		
OFFSETS	*−3.797*	*−2.751*	*−2.001*	*0.000*	*2.000*	*2.751*	*10.182*		

CHAINAGE 40.000

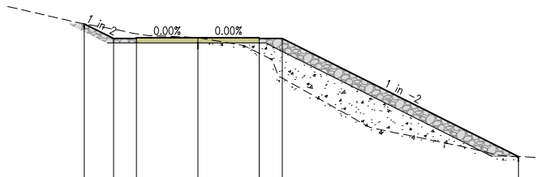


CONTROL LINE MC010
X = 187110.484
Y = 7275801.696
Z = 100.667

Datum 96.00

DESIGN HEIGHT	*99.464*	*100.637*	*100.637*	*100.667*	*100.667*	*100.637*	*97.429*		
EXISTING SURFACE	99.615	98.638	98.516	98.208	97.970	97.881	97.429		
OFFSETS	*−4.797*	*−2.751*	*−2.001*	*0.000*	*2.000*	*2.751*	*9.166*		

CHAINAGE 46.000

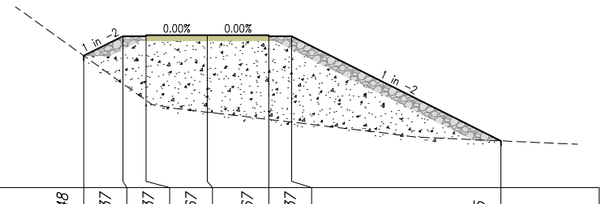


CONTROL LINE MC010
X = 187107.289
Y = 7275808.812
Z = 101.837

Datum 96.00

DESIGN HEIGHT	*102.133*	*101.807*	*101.807*	*101.837*	*101.837*	*101.807*	*97.955*		
EXISTING SURFACE	102.283	102.113	101.961	101.837	101.326	100.518	97.955		
OFFSETS	*−3.704*	*−2.751*	*−2.001*	*0.000*	*2.000*	*2.751*	*10.455*		

CHAINAGE 38.200



CONTROL LINE MC010
X = 187109.665
Y = 7275803.521
Z = 100.967

Datum 96.00

DESIGN HEIGHT	*100.148*	*100.937*	*100.937*	*100.967*	*100.967*	*100.937*	*97.525*		
EXISTING SURFACE	100.299	99.384	98.847	98.459	98.224	98.135	97.525		
OFFSETS	*−4.029*	*−2.751*	*−2.001*	*0.000*	*2.000*	*2.751*	*9.576*		

CHAINAGE 44.000

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A	ISSUED FOR CONSTRUCTION	08/05/23	JC	LB	DB	6343 DB

ENGINEERING CERTIFICATION (RPEQ)

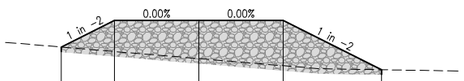
ENG. AREA	NAME	SIGNATURE	No.	DATE
CIVIL	D Berry		6343	8/5/2023

SCALE
1:100 0 1 2 3 4 A1
1:200 A3

MOURA BOAT RAMP EXTENSION
CROSS SECTIONS
SHEET 1

DRAWING NUMBER 657-001-C005
No IN SET 5 OF 7
REVISION A

CONTROL LINE MC010
X = 187113.760
Y = 7275794.398
Z = 98.862

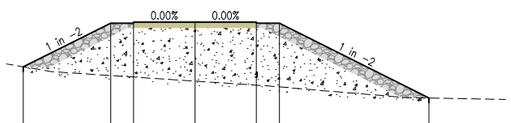


Datum 96.00

DESIGN HEIGHT	97.845	98.862	98.862	98.862	97.256	
EXISTING SURFACE	97.995	97.850	97.619	97.388	97.256	
OFFSETS	-4.484	-2.750	0.000	2.750	5.962	

CHAINAGE 54.000

CONTROL LINE MC010
X = 187112.941
Y = 7275796.223
Z = 99.767

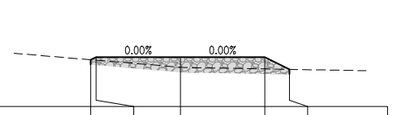


Datum 96.00

DESIGN HEIGHT	98.163	99.737	99.737	99.767	99.767	99.737	97.297
EXISTING SURFACE	98.314	98.031	97.981	97.849	97.716	97.659	97.297
OFFSETS	-5.599	-2.751	-2.001	0.000	2.000	2.751	7.631

CHAINAGE 52.000

CONTROL LINE MC010
X = 187114.784
Y = 7275792.117
Z = 97.612

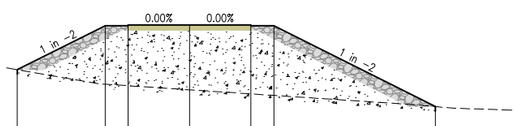


Datum 96.00

DESIGN HEIGHT	97.375	97.612	97.612	97.612	97.209	
EXISTING SURFACE	97.525	97.510	97.279	97.223	97.209	
OFFSETS	-2.924	-2.750	0.000	2.750	3.554	

CHAINAGE 56.500

CONTROL LINE MC010
X = 187112.122
Y = 7275798.047
Z = 100.067

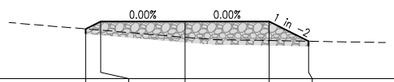


Datum 96.00

DESIGN HEIGHT	98.455	100.037	100.037	100.067	100.067	100.037	97.404
EXISTING SURFACE	98.605	98.132	98.083	97.950	97.817	97.768	97.404
OFFSETS	-5.617	-2.751	-2.001	0.000	2.000	2.751	8.017

CHAINAGE 50.000

CONTROL LINE MC010
X = 187114.579
Y = 7275792.573
Z = 97.862



Datum 96.00

DESIGN HEIGHT	97.469	97.862	97.862	97.862	97.219	
EXISTING SURFACE	97.619	97.578	97.347	97.241	97.219	
OFFSETS	-3.236	-2.750	0.000	2.750	4.036	

CHAINAGE 56.000

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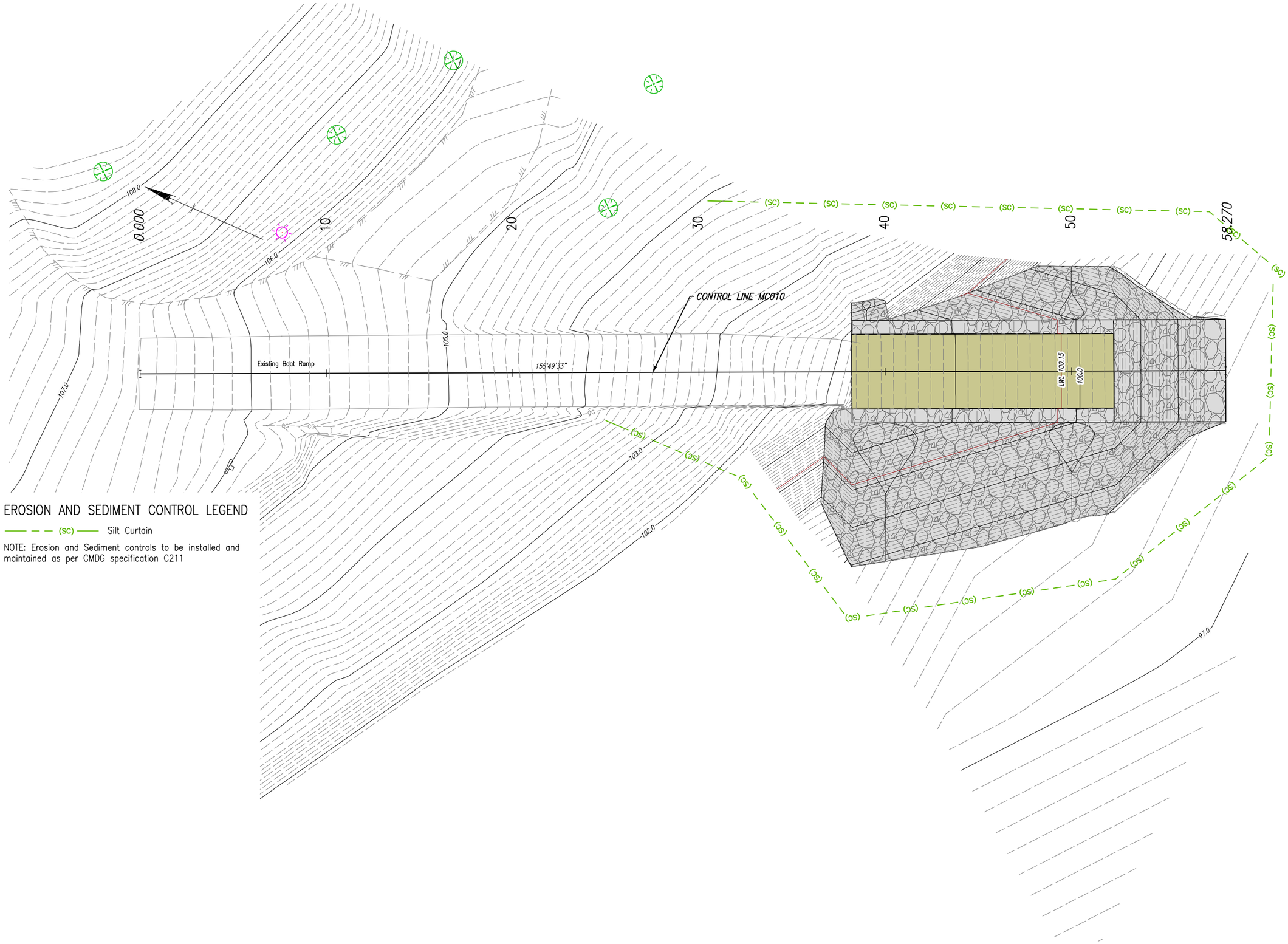
CIVIL	D Berry		6343	8/5/2023

SCALE
1:100 0 1 2 3 4 A1
1:200 A3

MOURA BOAT RAMP EXTENSION
CROSS SECTIONS
SHEET 2

DRAWING NUMBER 657-001-C006
No IN SET 6 OF 7
REVISION A



EROSION AND SEDIMENT CONTROL LEGEND

(SC) Silt Curtain

NOTE: Erosion and Sediment controls to be installed and maintained as per CMDG specification C211

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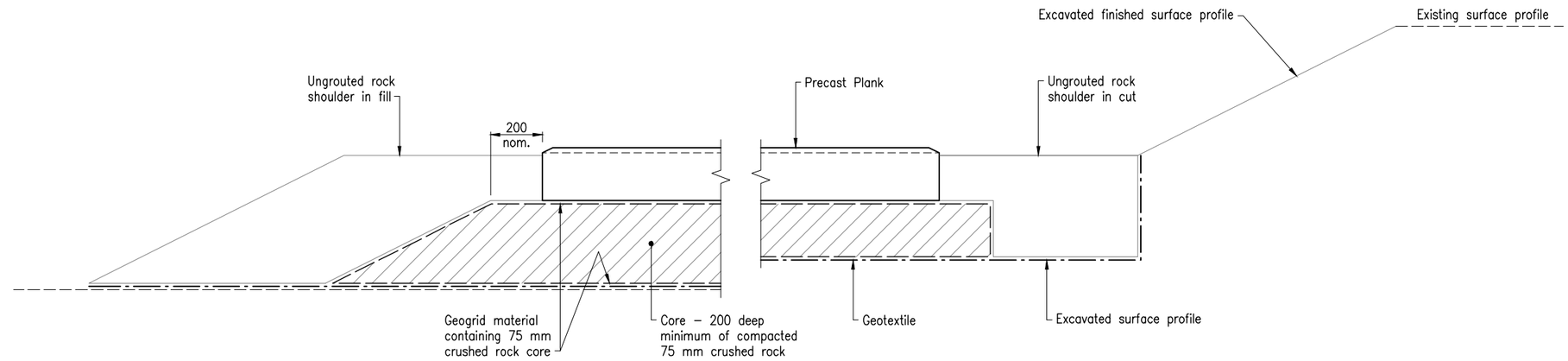
SCALE: 1:100 / 1:200 — 0 1 2 3 4 — A1 / A3

MOURA BOAT RAMP EXTENSION

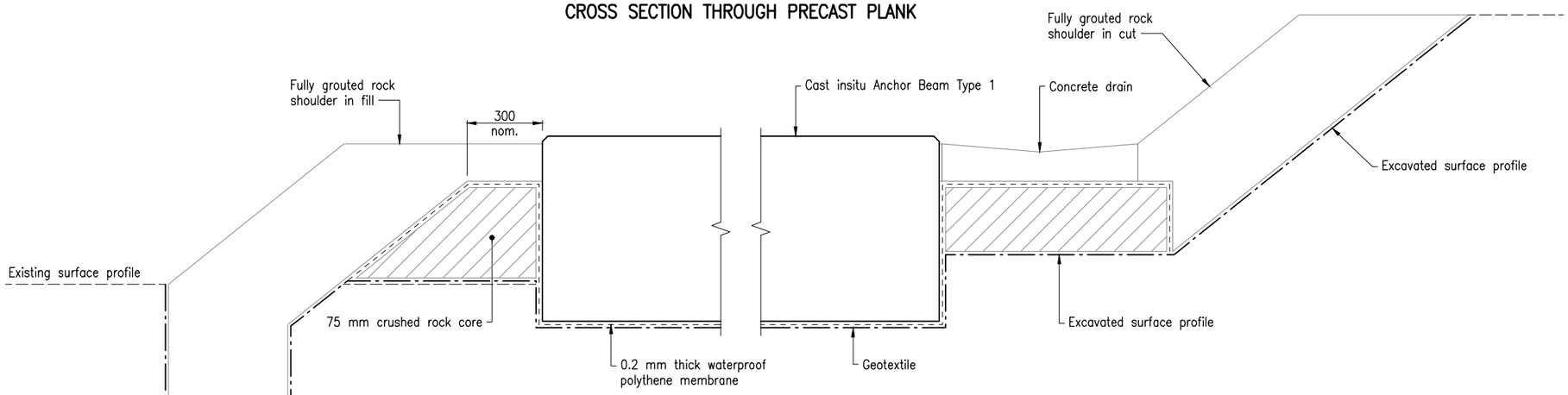
EROSION AND SEDIMENT CONTROL

DRAWING NUMBER: 657-001-C007 | No IN SET: 7 OF 7 | REVISION: A

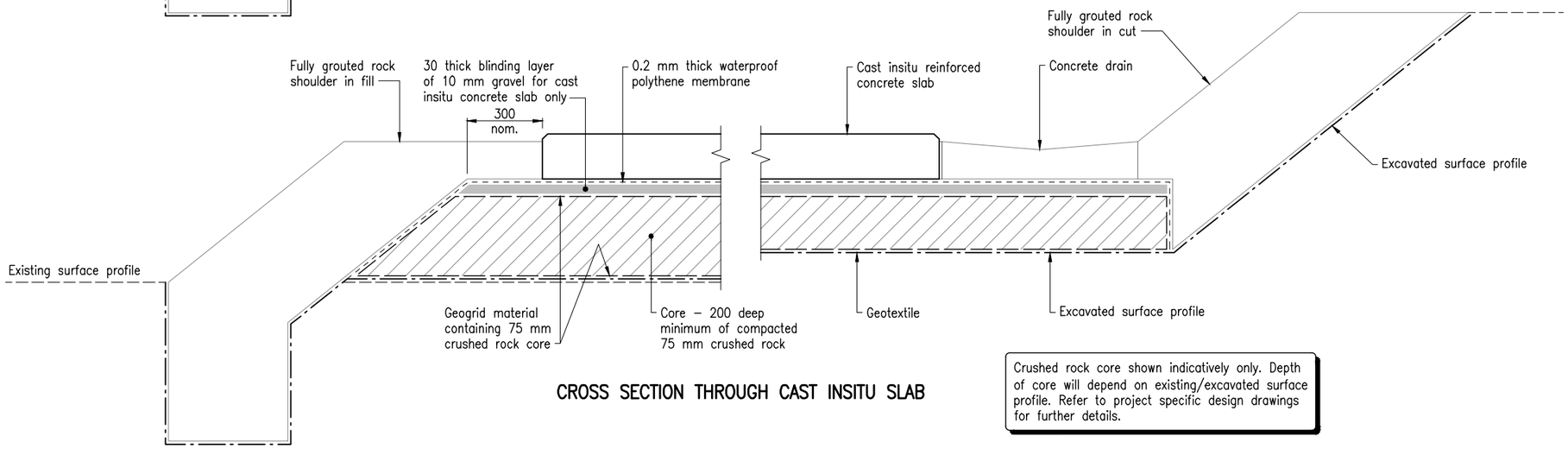
Last Modified - May 09, 2023 - 2:24pm C:_12dSv5\data\S-AP-01\657-001 Moura BR_23869\Design\AutoCAD_DRAWINGS\657-001-C100-ES-01.dwg By - CourtneyB



CROSS SECTION THROUGH PRECAST PLANK



CROSS SECTION THROUGH CAST INSITU ANCHOR BEAM TYPE 1



CROSS SECTION THROUGH CAST INSITU SLAB

Crushed rock core shown indicatively only. Depth of core will depend on existing/excavated surface profile. Refer to project specific design drawings for further details.

ASSOCIATED DEPARTMENTAL DOCUMENTS:
- Standard Drawings
- Specifications

REFERENCED DOCUMENTS:
Departmental Standard Drawings:
- 4022 Boat Ramp Construction – Fully Grouted Shoulders and Ungrouted Shoulders

Departmental Specifications:
- MRTS300 Boat Ramps

NOTES:
1. CONSTRUCTION OF BOAT RAMP shall be in accordance with MRTS300.
2. 75 mm CRUSHED ROCK shall have the following grading:

Australian Standard Sieve Size	Percent Passing
100	100
53	< 30
37.5	0

3. CRUSHED ROCK COMPACTION shall be in accordance with MRTS300.
4. 10 mm GRAVEL BLINDING LAYER shall only be used under cast insitu concrete slabs. Blinding layer is not to be used under precast planks.
5. TREATMENT OF ASS/PASS and other contaminants (if required) is defined in the project specific Environmental Management Plan.
6. GEOGRID shall have the following properties:

Parameter	Requirement
Material	Manufactured from polypropylene sheet with transverse and longitudinal ribs of minimum thickness 1.3 mm
Aperture size	Approximately 37x 37 to contain 75 mm crushed rock
Quality Control Strength	30 kN/m with a peak strain of 10% in both directions
Junction strength between the longitudinal and transverse ribs	Greater than 95% of the Quality Control Strength in both directions

Unless shown otherwise laps shall be 250 minimum and braided together so that both edges are fixed to the lapped sheets.

Braid shall have a nominal weight of 6.8 g/m and be made from 3 ply, 19 strands per ply, high density polyethylene (HDPE), and shall have a breaking strength greater than 200 kg.

7. GEOTEXTILE shall have the following properties:

Parameter	Requirement
Material	Non-woven needle punched staple fibre polyester or polypropylene meeting minimum strength Class D and Filtration Class 1
Elongation	>= 30%
Grab Strength	1200 N
Tear Strength	450 N
G Rating	3000

Placement shall be in accordance with MRTS300.

Unless shown otherwise laps shall be 500 minimum.

Construction equipment shall not stand or travel directly over geotextile.

Rock armour (> 150 mm) placed directly on geotextile shall have a maximum drop height of 1.5m.

8. For precast plank installation and anchor beam details refer Standard Drawing 4020.
9. DIMENSIONS are in millimetres unless shown otherwise.

Department of Transport and Main Roads

BOAT RAMP

BOAT RAMP CONSTRUCTION – EARTHWORKS AND CRUSHED ROCK CORE DETAILS

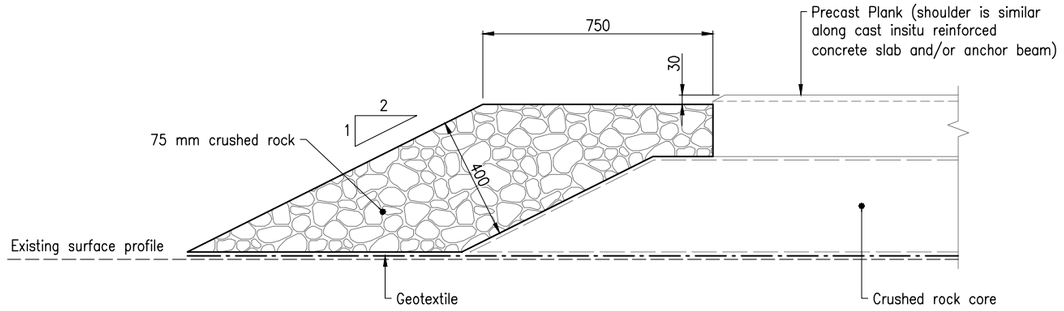
Queensland Government

A3 | Not to Scale

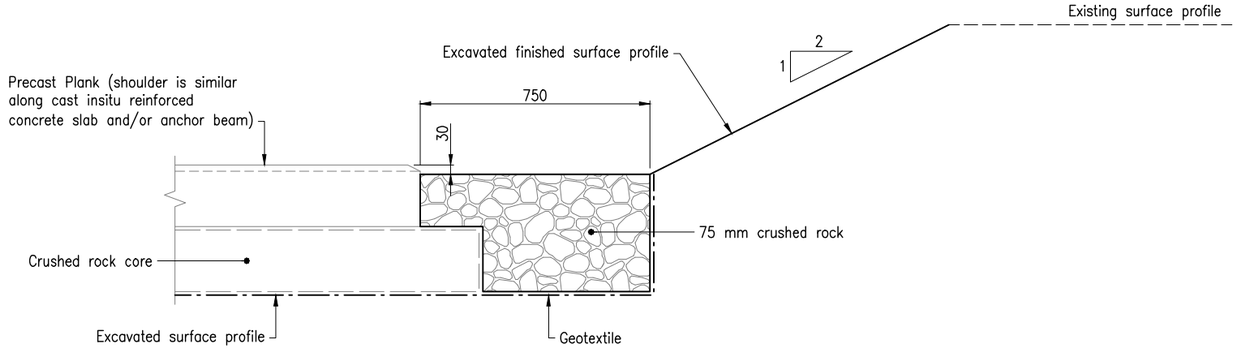
Standard Drawing No 4021

Date 10/15

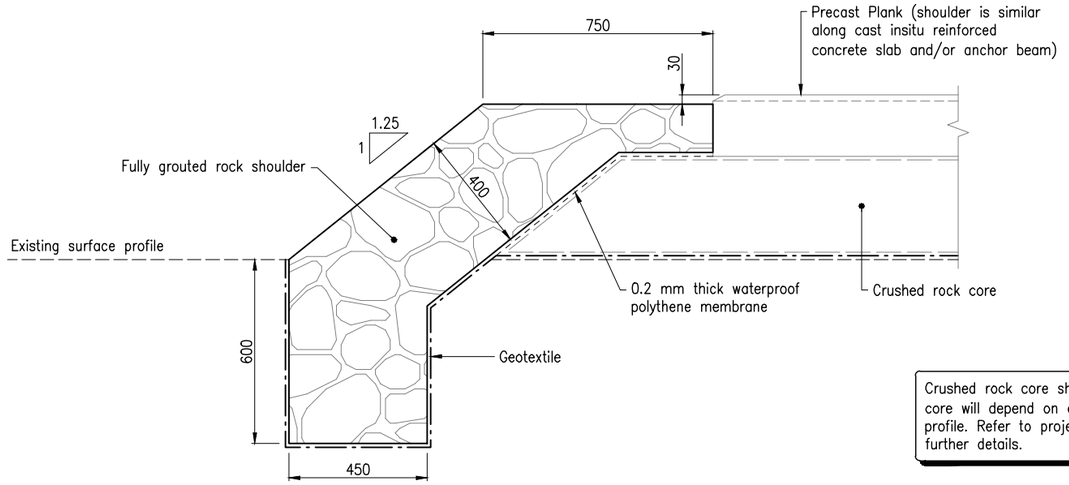
A | B



UNGROUTED ROCK SHOULDER IN FILL

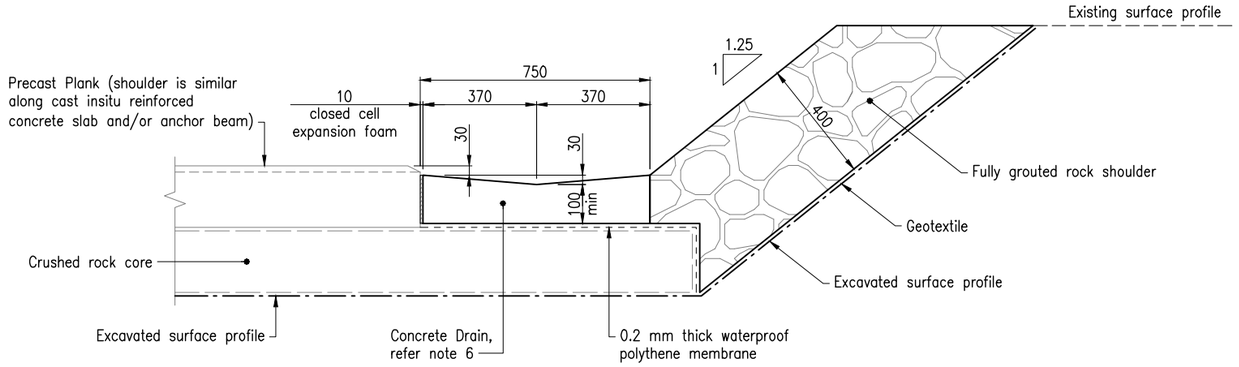


UNGROUTED ROCK SHOULDER IN CUT



FULLY GROUTED ROCK SHOULDER IN FILL

Crushed rock core shown indicatively only. Depth of core will depend on existing/excavated surface profile. Refer to project specific design drawings for further details.



FULLY GROUTED ROCK SHOULDER IN CUT

NOTES:

1. CONSTRUCTION OF BOAT RAMP shall be in accordance with MRTS300.
2. ROCK for the fully grouted shoulders shall be unweathered, clean, hard and durable graded 150 to 200 mm with essentially flat faces.
   Grout shall be 20 MPa cement mortar made from a 1:3 GP cement/sand mixture with sufficient water added to give it a plastic like texture that will retain its shape and not flow like a liquid.
3. FOOTINGS: The excavation for footings shall be to the minimum design depth and thickness and fully lined with geotextile. Sufficient extra geotextile shall be allowed so that full separation of footing and existing base material is retained during consolidation.
   The footings shall be full thickness grouted rock to ensure that structural integrity of the core and shoulders is retained if the existing base materials erode.
   Footings may alternatively be constructed using S25/20 mass concrete.
4. SHOULDER BATTERS CONSTRUCTION: The shoulder and shoulder batter shall be constructed by placing alternate layers of grout and rock so that the grout shall extend through the full design thickness of the shoulders. Rocks shall be placed to form irregular joints and be interlocked with smaller sized rock so that there are not any large voids and individual rocks cannot be easily dislodged.
   Shoulders which are constructed by placing rock and then grouting or shotcreting only the outer surface shall be rejected.
   The shoulder batter shall be fully supported and not extend beyond the edge of the footing.
5. GROUTED ROCK SURFACE FINISH: Exposed surfaces shall have a minimum of 80% of exposed rock with a close faced maximum mortar setback of 10. Excess cement mortar coating shall be removed.
   The finished surface shall have a generally flat, even and neat appearance, and will not have any sharp or angular points which will be hazardous to ramp users.
6. CONCRETE DRAIN: Concrete shall be S50/20, exposure classification C and cured in accordance with MRTS70.
   Tooled contraction joints to be provided at 2 m nominal spacings by forming grooves 40 deep and not more than 6 mm wide in exposed surfaces of the concrete. Grooves shall be normal to the top surface and square to the drain alignment. Joint locations shall match with adjacent precast plank gaps.
   Trafficable surface shall have a medium broom finish at 90° to the boat ramp control line.
7. For geotextile, geogrid, 75 mm crushed rock grading and earthworks details refer Standard Drawing 4021.
8. DIMENSIONS are in millimetres unless shown otherwise.

ASSOCIATED DEPARTMENTAL DOCUMENTS:
- Standard Drawings
- Specifications

REFERENCED DOCUMENTS:
Departmental Standard Drawings:
- 4020 Boat Ramp Construction – Precast Plank Installation and Anchor Beam Types 1 and 2
- 4021 Boat Ramp Construction – Earthworks and Crushed Rock Core Details

Departmental Specifications:
- MRTS70 Concrete
- MRTS300 Boat Ramps

Department of Transport and Main Roads

BOAT RAMP

BOAT RAMP CONSTRUCTION – FULLY GROUTED SHOULDERS AND UNGROUTED SHOULDERS

Queensland Government

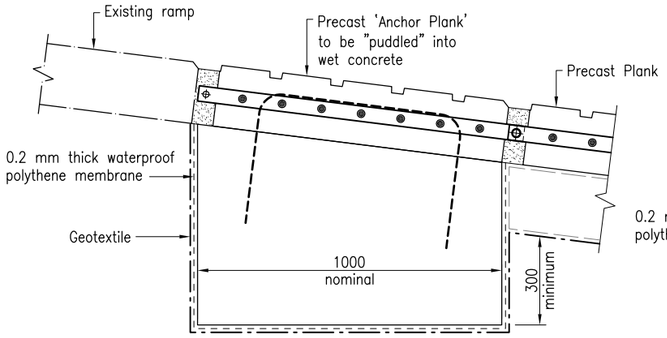
A3

Not to Scale

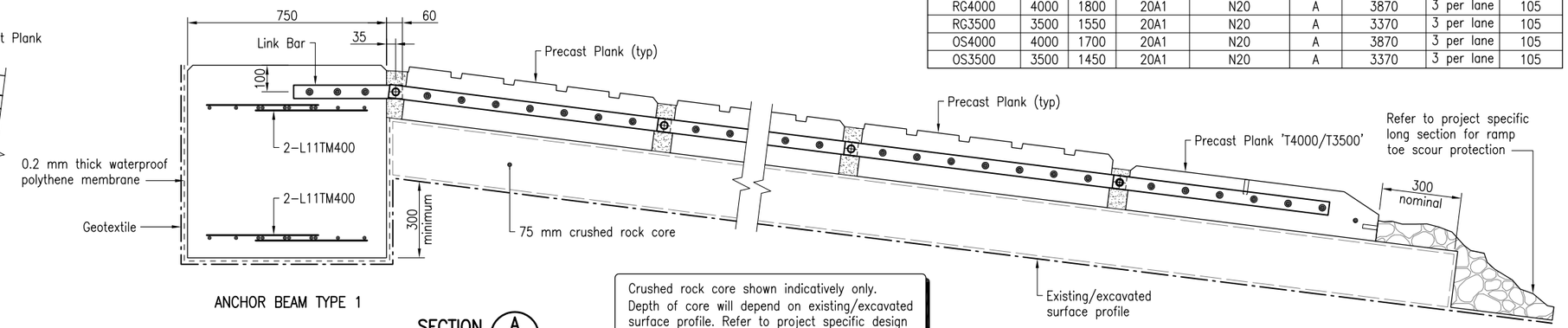
Standard Drawing No 4022

Date 10/15

A | B



ANCHOR BEAM TYPE 2



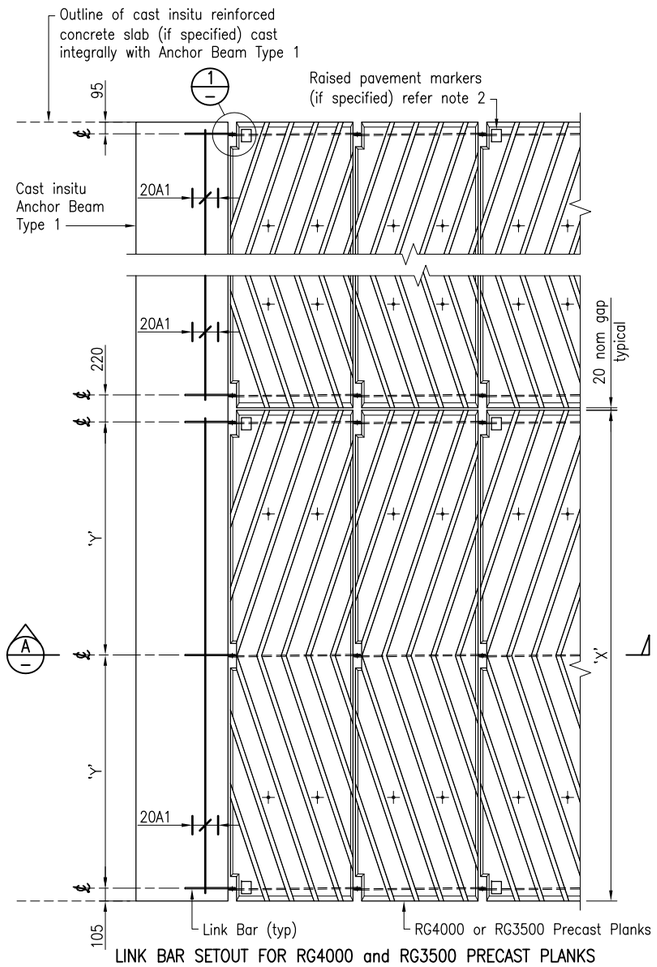
ANCHOR BEAM TYPE 1

Crushed rock core shown indicatively only. Depth of core will depend on existing/excavated surface profile. Refer to project specific design drawings for further details.

ANCHOR BEAM TYPE 1 SCHEDULE

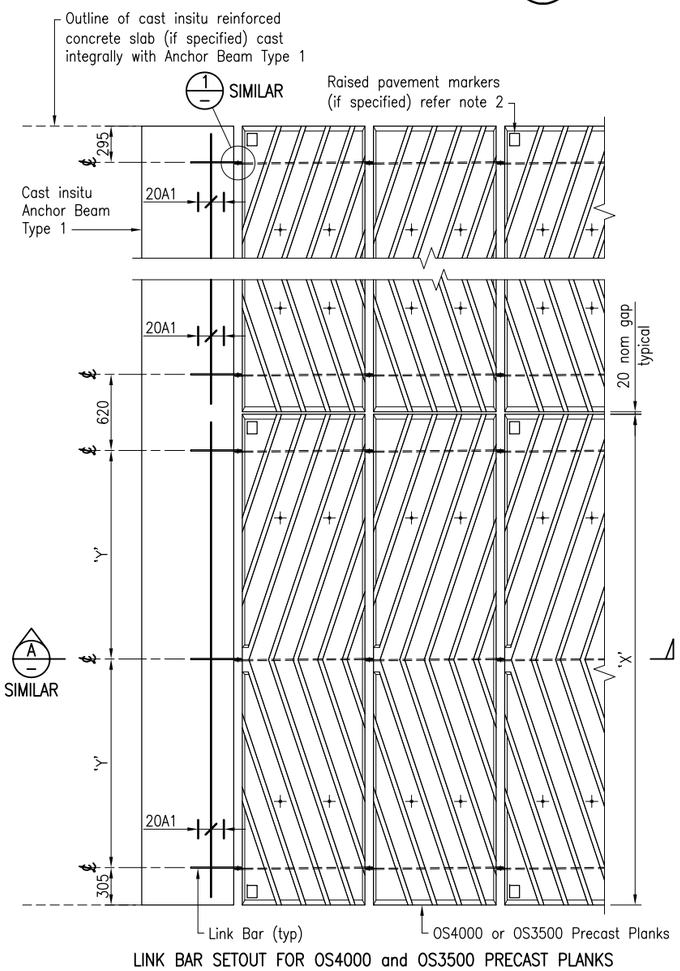
PLANK TYPE	DIMENSIONS		REINFORCEMENT					
	'X'	'Y'	Bar Mark	Grade & Size	Shape	Length (A)	Quantity	Centres
RG4000	4000	1800	20A1	N20	A	3870	3 per lane	105
RG3500	3500	1550	20A1	N20	A	3370	3 per lane	105
OS4000	4000	1700	20A1	N20	A	3870	3 per lane	105
OS3500	3500	1450	20A1	N20	A	3370	3 per lane	105

SECTION A



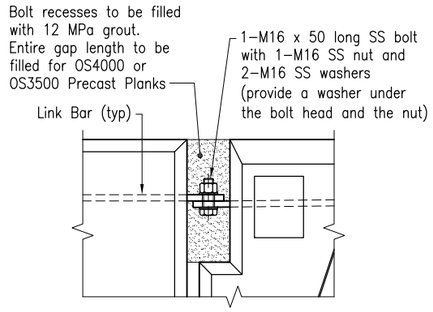
LINK BAR SETOUT FOR RG4000 and RG3500 PRECAST PLANKS

PLAN VIEW

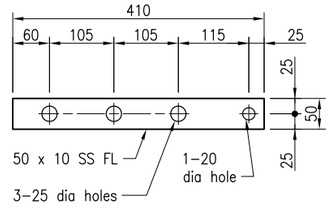


LINK BAR SETOUT FOR OS4000 and OS3500 PRECAST PLANKS

PLAN VIEW



DETAIL 1



(No OFF = 3 per lane)

LINK BAR DETAIL

NOTES:

1. CONSTRUCTION OF BOAT RAMP shall be in accordance with MRTS300.
2. RETROREFLECTIVE RAISED PAVEMENT MARKERS (RRPM) shall be applied where shown (if required) on the project specific design drawings.
   Pavement markers shall be yellow Type A1 bidirectional markers in accordance with AS 1906.3. Size to be 80 x 100 or 100 x 100.
   Pavement markers shall be fully supported on precast planks without overhanging the grooves. The reflective faces shall be aligned longitudinally so they face the water and the ramp approach.
   Contact surfaces are to be evenly ground back 1–2 mm, cleaned to remove all loose material and other contaminants, and thoroughly dried prior to adhesion.
   A two part epoxy adhesive for bonding to concrete shall be spread evenly over the entire base of the marker with sufficient thickness to fill voids, and shall flow out the sides to demonstrate full adhesion. Excess adhesive shall be removed without contaminating the reflective faces.
3. CONCRETE to be in accordance with MRTS70.
   Concrete to be S50/20, exposure classification C.
   Concrete to be cured in accordance with MRTS70.
   All exposed concrete edges shall have 20 x 20 chamfers unless shown otherwise.
4. REINFORCING STEEL to be read in conjunction with Standard Drawings 1043 and 1044.
   Reinforcing steel to be in accordance with AS/NZS 4671 and MRTS71.
   Deformed bars Grade D500N.
   Mesh Grade D500L.
   Minimum cover to reinforcing steel shall be 65 unless shown otherwise.
   All carbon reinforcing steel to be Australian Certification Authority for Reinforcing Steel (ACRS) certified.
   All carbon steel reinforcing bars, reinforcing mesh and tiewires shall be hot dip galvanised to AS/NZS 4680.
5. STAINLESS STEEL to be in accordance with ASTM A276.
   Stainless Steel flat bar Grade 316.
   All work shall be neatly finished with sharp edges removed.
6. SURFACE FINISH: Trafficable surface of Anchor Beam Type 1 to have a medium broom finish at 90° to the boat ramp control line.
7. STAINLESS STEEL BOLTS to be Grade A4/316, nuts to be Grade A4/316 A4–70 and washers to be Grade 316, and shall conform to ISO 3506.
   All stainless steel bolts, nuts and washers shall be either electro polished or passivated in accordance with ASTM 380.
   A nickel based anti–sieze lubricant shall be applied to threads prior to assembly.
   Bolted joints to be wrapped with polyethylene tape before grouting.
8. For RG4000 and RG3500 Precast Plank details refer Standard Drawing 4000.
   For OS4000 and OS3500 Precast Plank details refer Standard Drawing 4001.
   For T4000 and T3500 Precast Plank details refer Standard Drawing 4002.
   For geotextile, geogrid, 75 mm crushed rock and earthworks details refer Standard Drawing 4021.
9. DIMENSIONS are in millimetres unless shown otherwise.

ASSOCIATED DEPARTMENTAL DOCUMENTS:
- Standard Drawings
- Specifications

REFERENCED DOCUMENTS:

Departmental Standard Drawings:
- 1043 Reinforcing Steel – Standard Bar Shapes, Typical Details and Notes
- 1044 Reinforcing Steel – Lap Lengths

Departmental Standard Drawings continued:
- 4000 Precast Plank for Boat Ramp – Types RG4000 and RG3500
- 4001 Precast Plank for Boat Ramp – Types OS4000 and OS3500
- 4002 Precast Plank for Boat Ramp – Types T4000 and T3500
- 4021 Boat Ramp Construction – Earthworks and Crushed Rock Core Details

Departmental Specifications:
- MRTS70 Concrete
- MRTS71 Reinforcing Steel
- MRTS300 Boat Ramps

Australian and International Standards:

AS 1906.3	Retroreflective Materials and Devices for Road Traffic Control Purposes – Raised Pavement Markers
AS/NZS 4671	Steel Reinforcing Materials
AS/NZS 4680	Hot–dip Galvanized (Zinc) Coatings on Fabricated Ferrous Articles
ASTM A276	Standard Specification for Stainless Steel Bars and Shapes
ASTM 380	Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
ISO 3506	Mechanical Properties of Corrosion–resistant Stainless Steel Fasteners

Department of Transport and Main Roads

BOAT RAMP

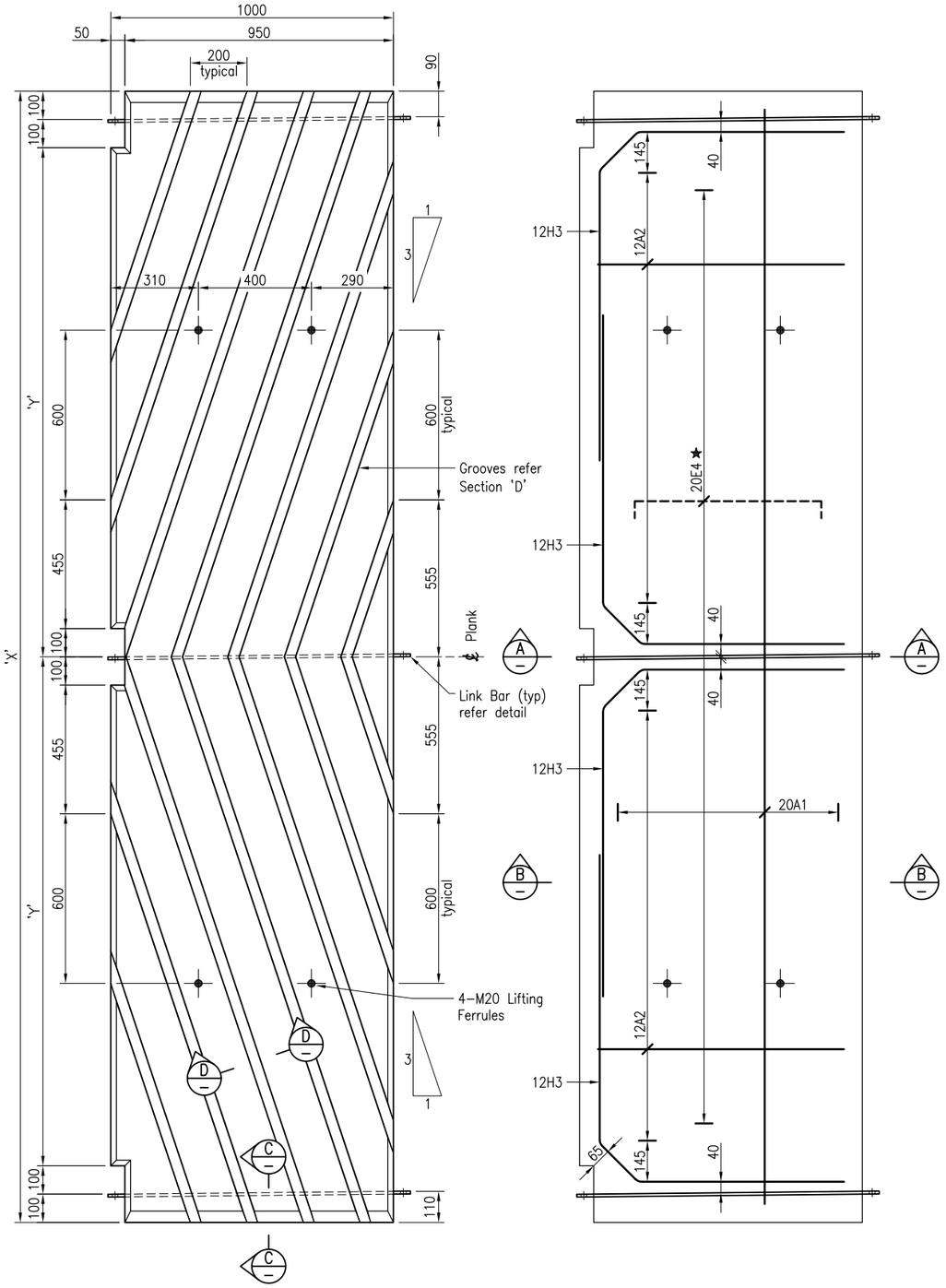
BOAT RAMP CONSTRUCTION – PRECAST PLANK INSTALLATION AND ANCHOR BEAM – TYPES 1 AND 2

Queensland Government

A3
Not to Scale

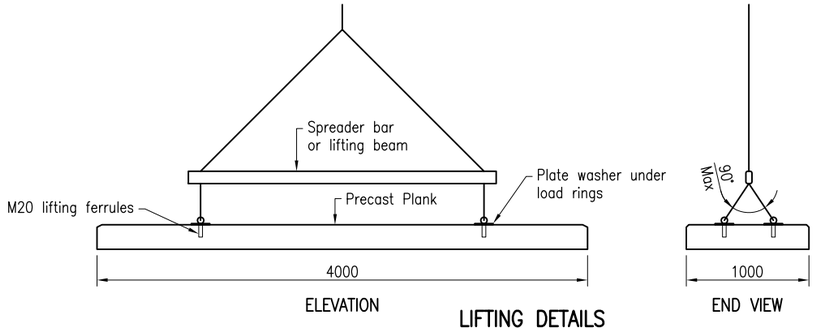
Standard Drawing No
4020
Date 07/16

A | B | C

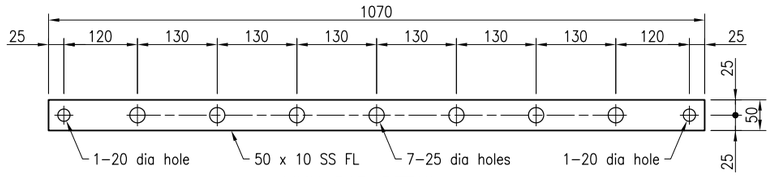


PLAN

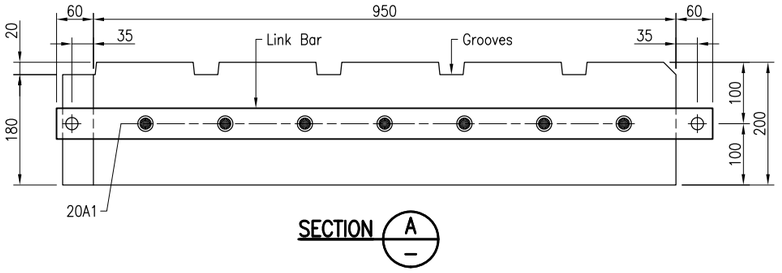
REINFORCEMENT PLAN



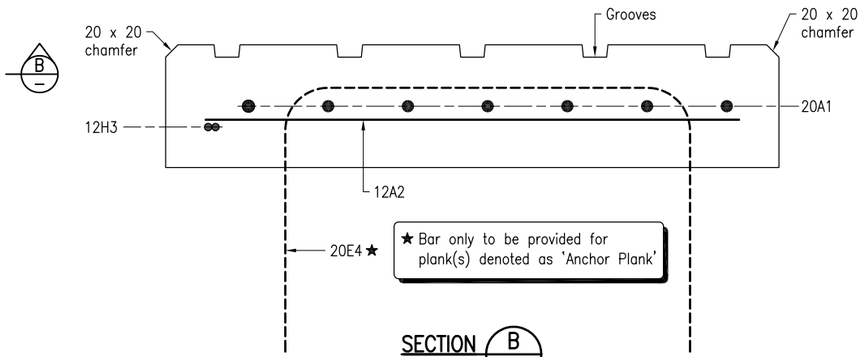
LIFTING DETAILS



LINK BAR DETAIL
(No OFF = 3)

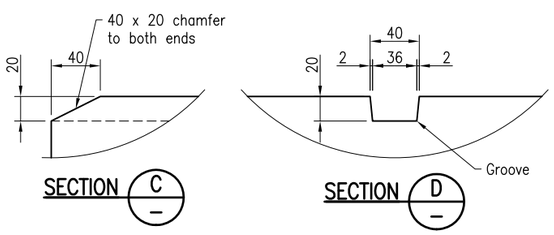


SECTION A



SECTION B

BAR DIMENSIONS



NOTES:

1. PRECAST PLANKS to be manufactured to MRTS72.
2. DESIGN LOADING: This plank shall only be used for recreational boating situations. The maximum design load is for a dual axle trailer – 2 tonnes per axle at 750 centres.
3. CONCRETE to be in accordance with MRTS70.
   Concrete to be S50/20, exposure classification C.
4. REINFORCING STEEL to be in accordance with AS/NZS 4671 and MRTS71.
   Deformed bars Grade D500N.
   Minimum cover to reinforcing steel shall be 65 unless shown otherwise.
   All carbon reinforcing steel to be Australian Certification Authority for Reinforcing Steel (ACRS) certified.
   All carbon steel reinforcing bars, reinforcing mesh and tie wires shall be hot dip galvanised to AS/NZS 4680.
   Stainless Steel reinforcing to be in accordance BS 6774 and MRTS71A.
   Stainless Steel round bar Grade 316.
5. STAINLESS STEEL to be in accordance with ASTM A276.
   Stainless Steel flat bar Grade 316.
   All work shall be neatly finished with sharp edges removed.
6. TRAFFICABLE SURFACE FINISH: The aggregate shall be lightly or medium exposed and level with or slightly above the concrete matrix to achieve a non–slip finish.
7. MASS of RG4000 Precast Plank is 2000 kg.
   MASS of RG3500 Precast Plank is 1750 kg.
   The mass of the plank shall be clearly and permanently marked on a side surface.
8. M20 FERRULES shall be stainless steel Grade 316 Elephant Foot Ferrules with the following capacities:

Ferrule	Length	Minimum Working Load Limit
M20	95mm	(Tension) 26.6kN for concrete strength of 32MPa

   Cross bars (if required to achieve minimum strength requirements) shall be stainless steel Grade 316
   The manufacturer shall seek approval for the proposed ferrules in accordance with Clause 5.6 of MRTS72
9. LIFTING, TRANSPORTATION AND STORAGE shall be in accordance with MRTS72. Planks shall not be moved before attaining a minimum strength of 32 MPa.
10. DIMENSIONS are in millimetres unless shown otherwise.

Departmental Specifications:

MRTS70 Concrete
MRTS71 Reinforcing Steel
MRTS71A Stainless Steel Reinforcing
MRTS72 Manufacture of Precast Elements

Australian and International Standards:

AS/NZS 1594 Hot Rolled Steel Flat Products
AS/NZS 3678 Structural Steel – Hot–rolled Plates, Floor Plates and Slabs
AS/NZS 4671 Steel Reinforcing Materials
AS/NZS 4680 Hot–dip Galvanized (Zinc) Coatings on Fabricated Ferrous Articles
ASTM A276 Standard Specification for Stainless Steel Bars and Shapes
BS 6744 Stainless Steel Reinforcement for use in Concrete

SCHEDULE

PLANK TYPE	DIMENSIONS 'X'	DIMENSIONS 'Y'	REINFORCEMENT Bar Mark	Grade and Size	Shape	P	A	B	C	E	F	Length	Quantity	Centres
RG4000	4000	1800	20A1	N20	A	–	3870	–	–	–	–	3870	7	130
			12A2	N12	A	–	870	–	–	–	–	870	24	138
			12H3	N12	H	60	1020	140	715	855	198	1933	4	–
			20E4 ★	20 dia SS round bar	E	100	660	430	430	–	–	1429	4	1100
RG3500	3500	1550	20A1	N20	A	–	3370	–	–	–	–	3370	7	130
			12A2	N12	A	–	870	–	–	–	–	870	20	138
			12H3	N12	H	60	900	140	715	855	198	1813	4	–
			20E4 ★	20 dia SS round bar	E	100	660	430	430	–	–	1429	4	1000

Department of Transport and Main Roads

PRECAST PLANKS FOR BOAT RAMP

TYPES RG4000 AND RG3500

Queensland Government

A3
Not to Scale

Standard Drawing No
4000
Date 10/16

A | B | C