DRAWING LIST

Sheet No.	Sheet Name	Size	Scale
00	Cover Page	ISO A4	NTS
B1 F	Bridge Small	ISO A4	1:25
B1 S	Bridge Small	ISO A4	1:25
B2,3a	Bridge Medium & Large	ISO A4	1:25
B2,3b	Bridge Medium & Large	ISO A4	1:25
B4a	Bridge Large Two Way	ISO A4	1:25
B4b	Bridge Large Two Way	ISO A4	1:25
B5	Bridge and Hardened River Crossing	ISO A4	1:25
DF1,2,3	Drop off FRP	ISO A4	1:25
BM1,2	Natural Berm Small & Medium	ISO A4	1:25
BM3	Natural Berm Large	ISO A4	1:25
DN1,2,3	Drop off Natural	ISO A4	1:25
BR1,2	Hardened Berm Small & Medium	ISO A4	1:25
BR3	Hardened Berm Large	ISO A4	1:25
DCR	Rock Culvert Drain	ISO A4	1:25
DRN	Natural Rolling Dip Drain	ISO A4	1:50
DRR	Hardened Rolling Drain	ISO A4	1:50
DSN	Natural Spoon Drain	ISO A4	1:25
DSR	Hardened Spoon Drain	ISO A4	1:25
F1a	Earth Ramparts Flyover	ISO A4	1:25
F1b	Earth Ramparts Flyover	ISO A4	1:25
FT	Floating Trail	ISO A4	1:25
G1,2,3	Natural Gap Jump	ISO A4	NTS
HSW	Hardened Spill Way	ISO A4	1:25
R	Rock Armouring	ISO A4	1:25
RG	Rock Garden	ISO A4	1:25
RN1,2,3	Natural Roller	ISO A4	1:25
RTF	Raised Trail FRP	ISO A4	1:25
RTS	Raised Trail Steel	ISO A4	1:25
T1,2,3	Natural Table Top	ISO A4	1:25

SYNERGY

Cover Page

Bennett Murada Architects
Suite 4.04, 1 Chandos Street
St Leonards NSW 2065
Tel: (02) 9043 9968
www.bennettmurada.com.au

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

00

SCALE:NTS DATE: 5/8/21

DISCLAIMER

This report was prepared by Synergy Trails in good faith exercising all due care and attention, but no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect of, their situation. The views expressed within are not necessarily the views of the Department of Planning and Environment and may not represent department policy.

Raised FRP Trail

DESCRIPTION: Small 1-3m FRP bridge with no side rails. Hardened rock entry and exits.

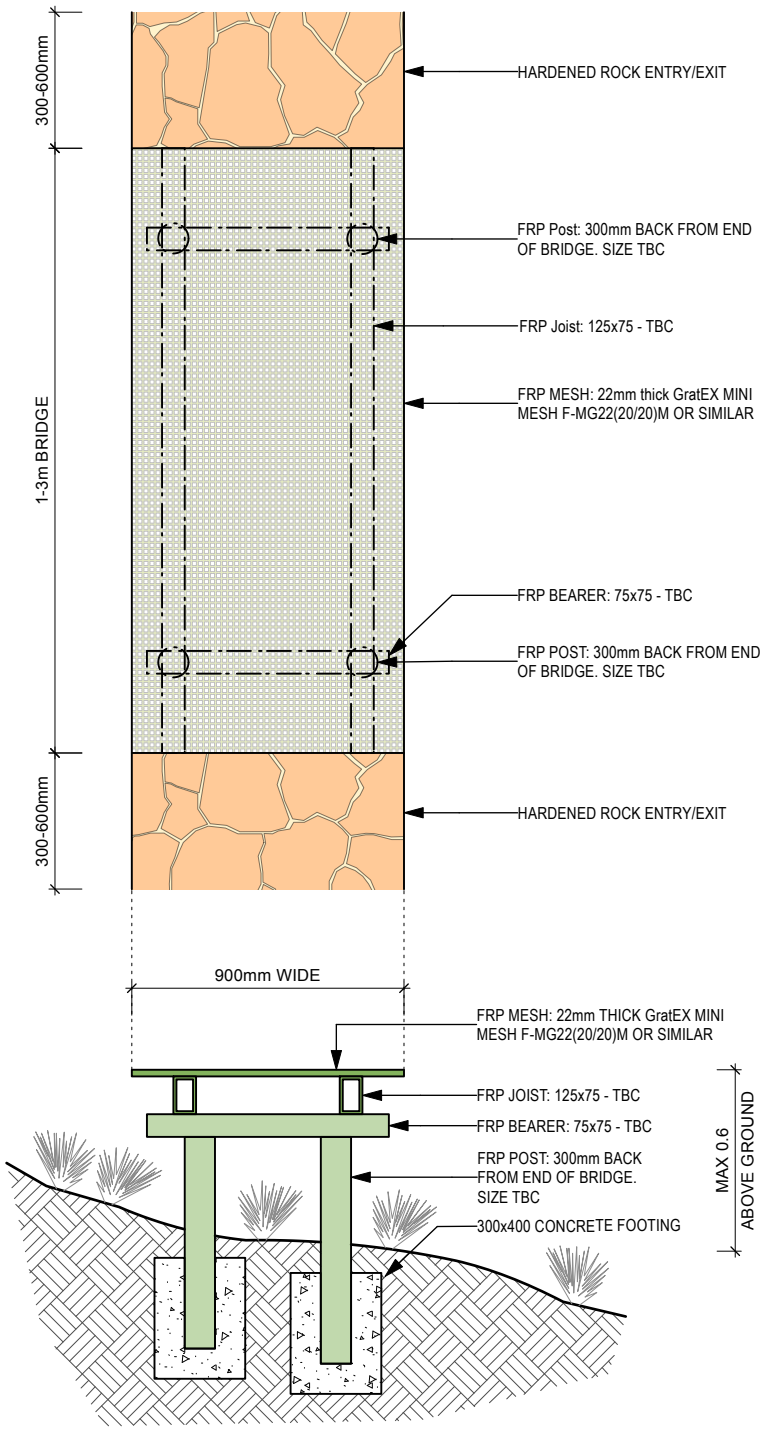
LOCATION: Used to cross small creeks, gullys, or other obstructions.

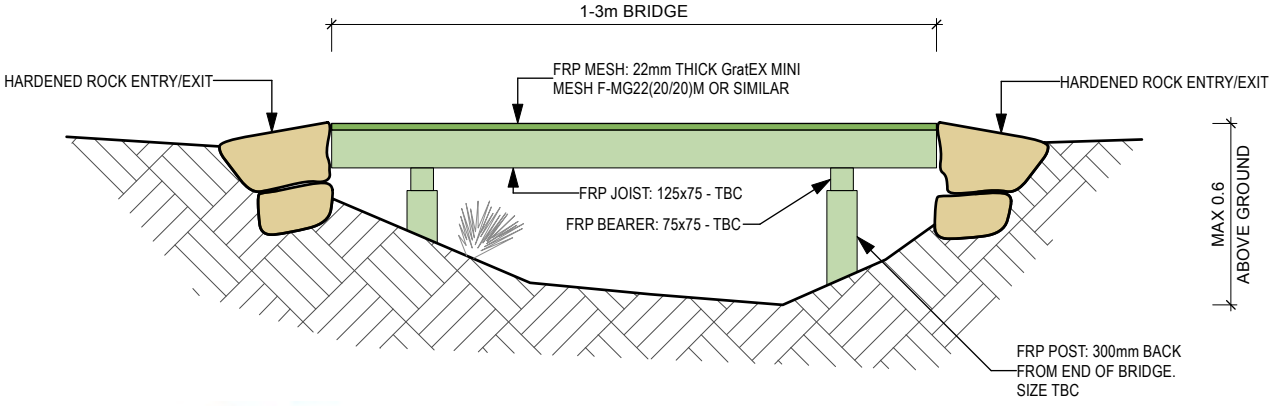
NOTES:
1. No Higher Than 600mm above ground. Fall zones to be assessed for potential hazards.

2. Structural Engineering & Geotechnical advice required

3. Maximum long fall to be 1:6, Maximum cross fall to be1:10 subject to trail conditions

4. Bearers between posts and joists allows for upto 300mm of lateral tollerance in joist & mesh location





Bridge Small

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

B1 F

SCALE:1:25 DATE: 5/8/21

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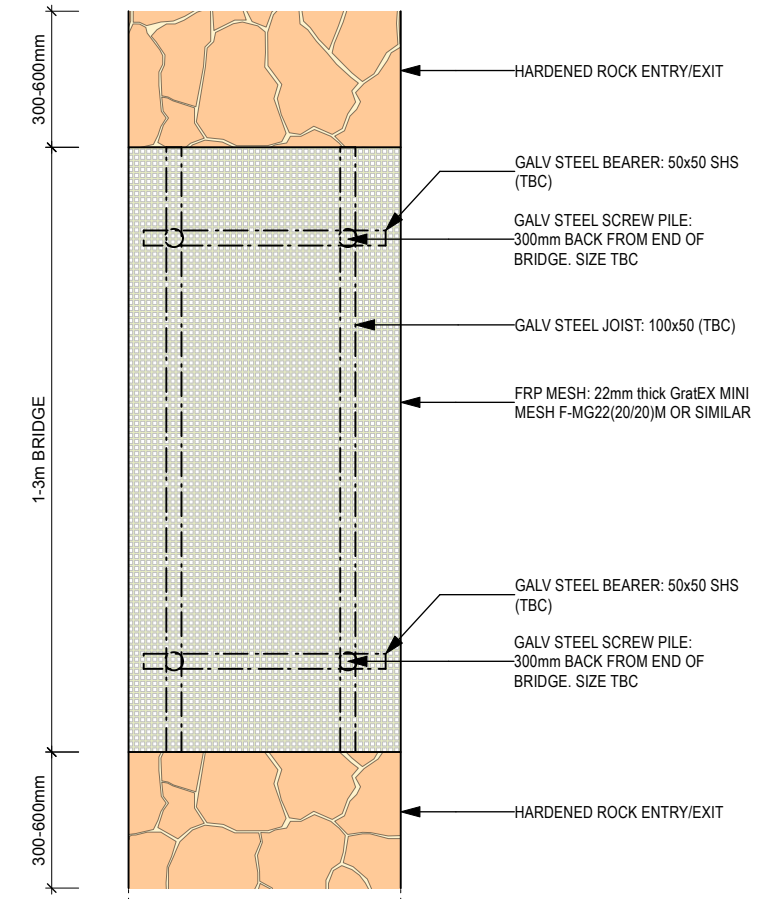
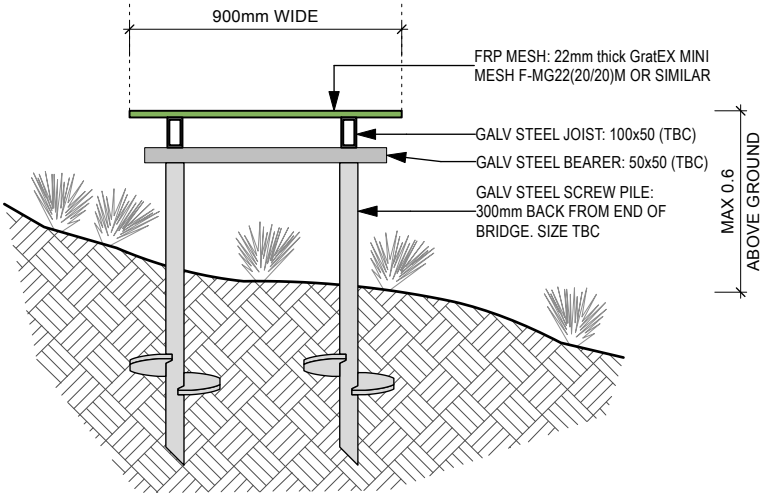
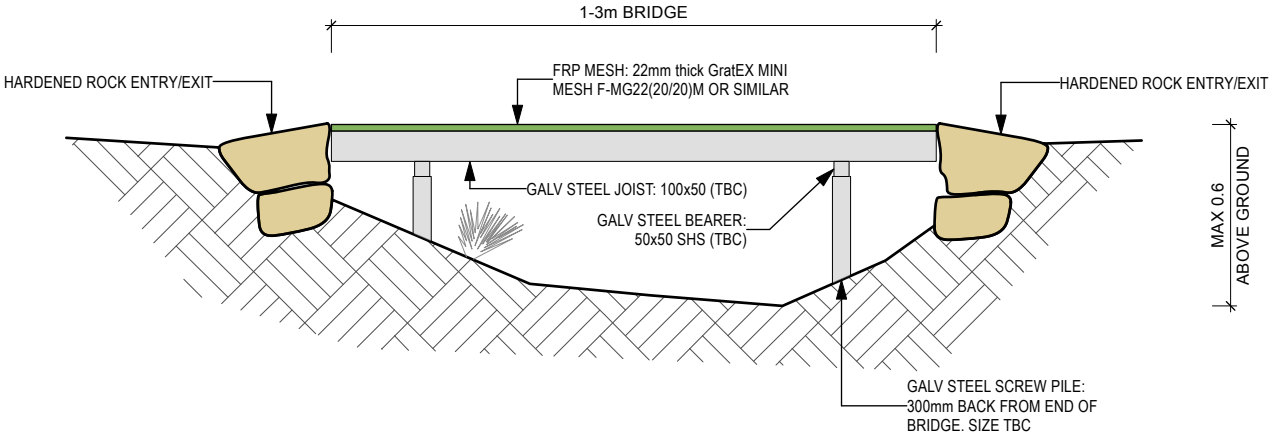
St Leonards NSW 2065
Tel: (02) 9043 9968
www.bennettmurada.com.au
Nominated Architect: Jacqueline Bennett 6536







Raised FRP Trail

DESCRIPTION: Small 1-3m bridge with galv steel structure and FRP mesh surface, with no side rails. Hardened rock entry and exits.

LOCATION: Used to cross small creeks, gullys, or other obstructions.

NOTES:
1. No Higher Than 600mm above ground. Fall zones to be assessed for potential hazards.

2. Structural Engineering & Geotechnical advice required

3. Maximum long fall to be 1:6, Maximum cross fall to be1:10 subject to trail conditions

4. Bearers between posts and joists allows for upto 300mm of lateral tollerance in joist & mesh location

SYNERGY TRAILS

Bridge Small

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Suite 4.04, 1 Chandos Street
St Leonards NSW 2065
Tel: (02) 9043 9968
www.bennettmurada.com.au
Nominated Architect: Jacqueline Bennett 6536

MOUNTAIN BIKE TRAILS

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SCALE:1:25 DATE: 5/8/21

B1 S

Raised FRP Trail

DESCRIPTION: Bridge with galv steel structure and FRP mesh surface, safety mesh to sides on galv steel posts. Hardened rock entry and exits.

B2: 2-6M bridge

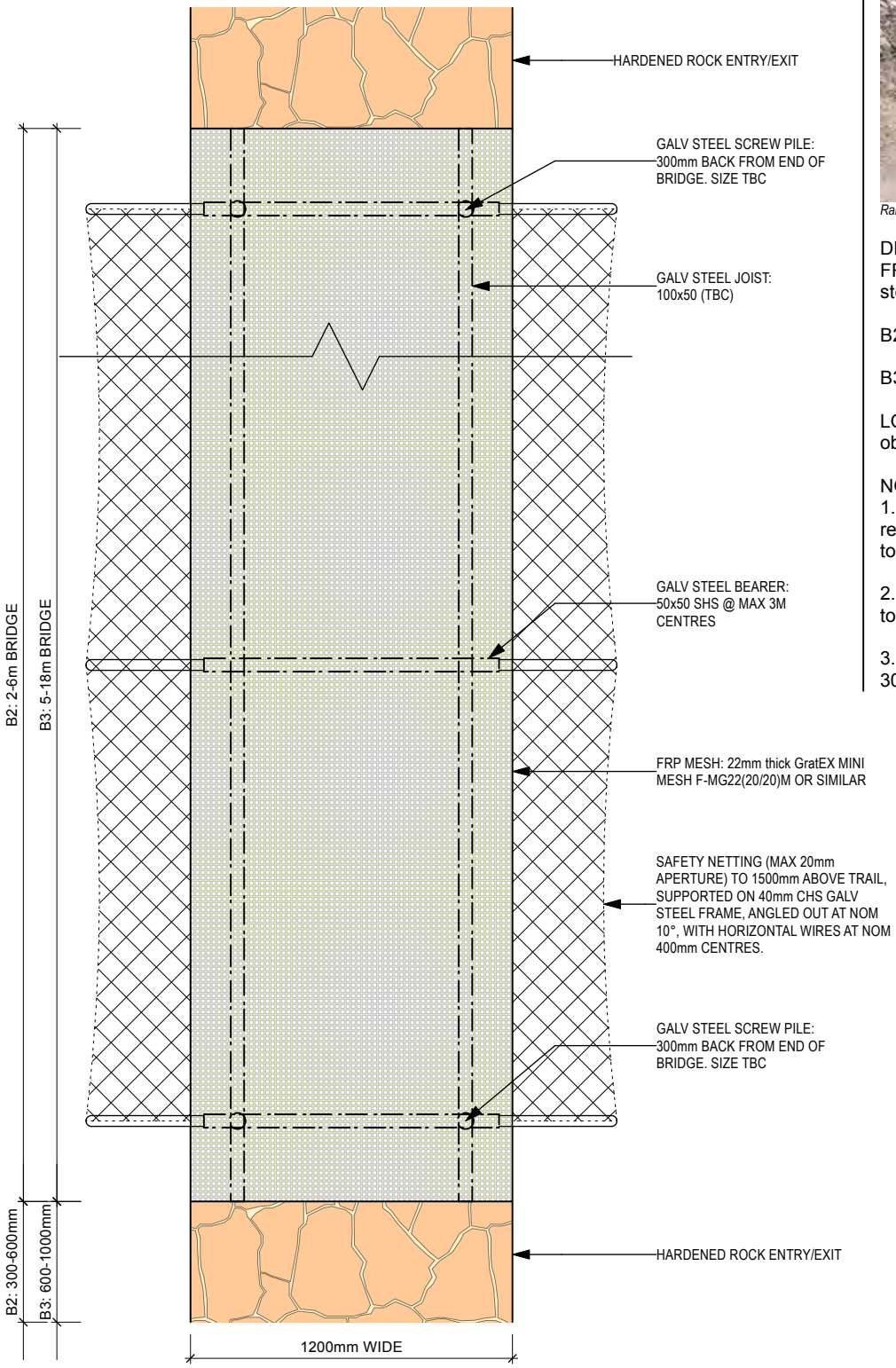
B3: 5-18M bridge

LOCATION: Used to cross creeks, gullys, or other obstructions.

NOTES:
1. Structural Engineering & Geotechnical advice required. Structural sizes for larger spans will need to be increased.

2. Maximum long fall to be 1:6, Maximum cross fall to be1:10 subject to trail conditions.

3. Bearers between posts and joists allows for upto 300mm of lateral tollerance in joist & mesh location.



Bridge Medium & Large

MOUNTAIN BIKE TRAILS

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B2,3a

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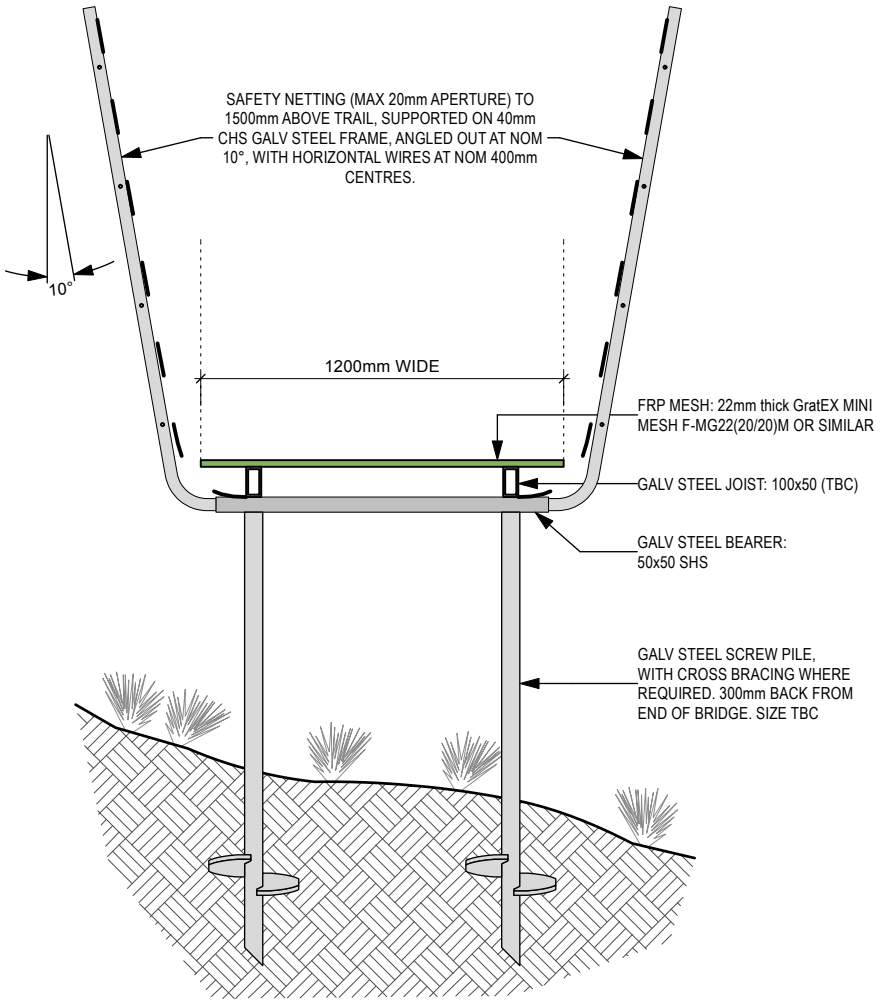
Nominated Architect: Jacqueline Bennett 6536



Raised FRP Trail

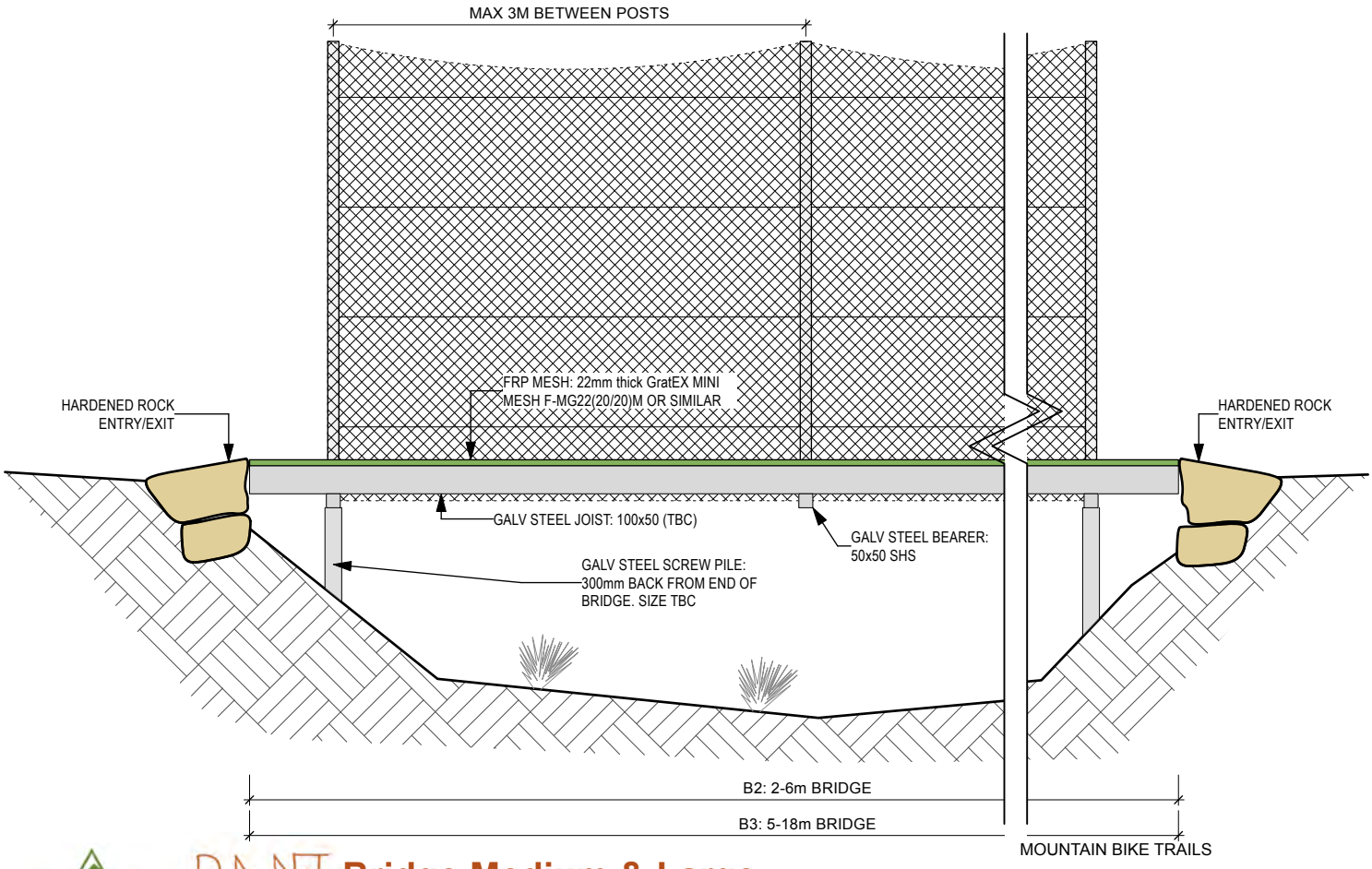
DESCRIPTION: Small 2-6m bridge with galv steel structure and FRP mesh surface, safety mesh to sides on galv steel posts. Hardened rock entry and exits.

LOCATION: Used to cross small creeks, gullys, or other obstructions.

NOTES:
1. Structural Engineering & Geotechnical advice required. Structural sizes for larger spans will need to be increased.

2. Maximum long fall to be 1:6, Maximum cross fall to be1:10 subject to trail conditions.

3. Bearers between posts and joists allows for upto 300mm of lateral tollerance in joist & mesh location.



Bridge Medium & Large

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B2,3b

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Suite 4.04, 1 Chandos Street
St Leonards NSW 2065
Tel: (02) 9043 9968
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SCALE:1:25 DATE: 5/8/21

Raised FRP Trail

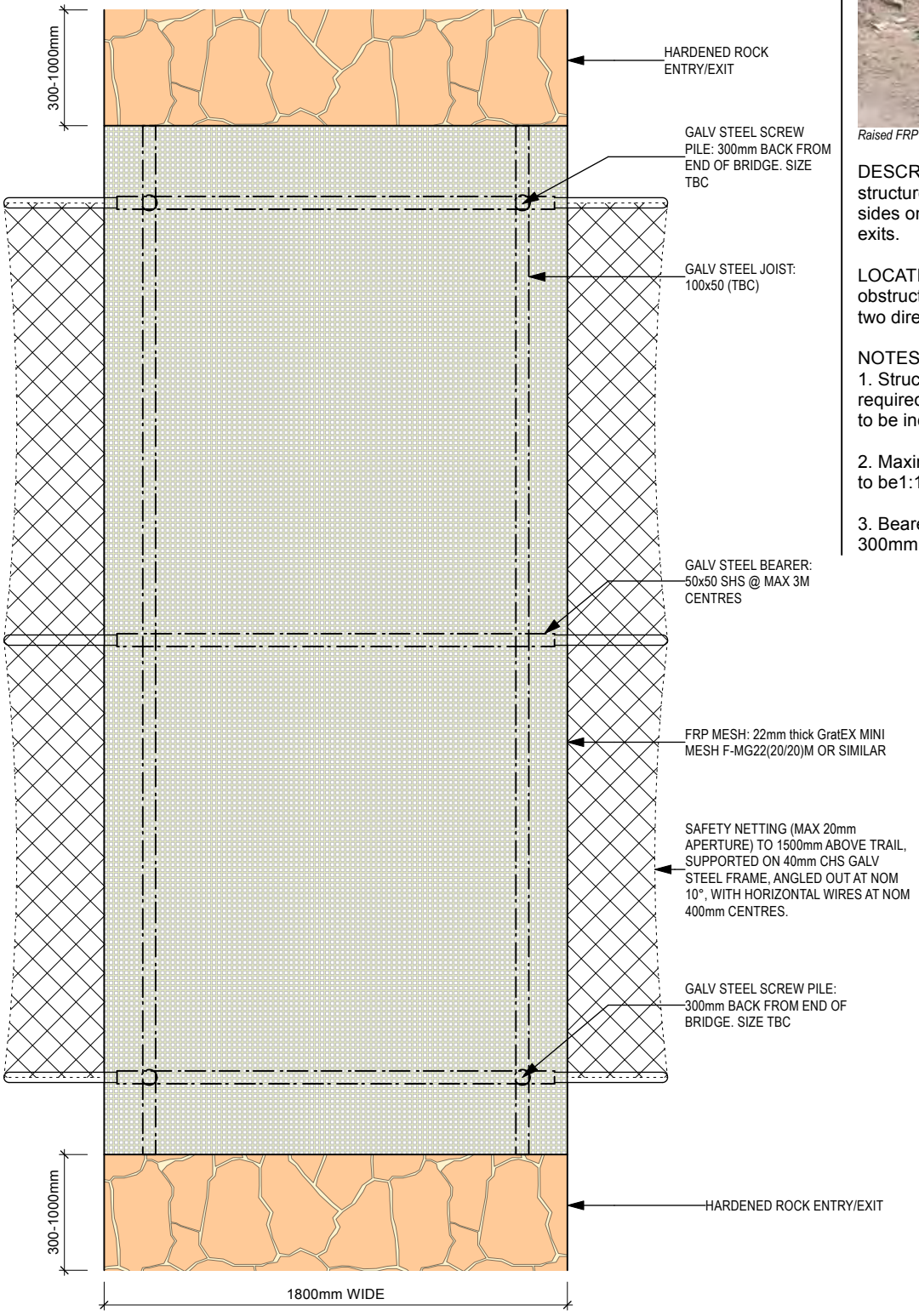
DESCRIPTION: Two way Bridge with galv steel structure and FRP mesh surface, safety mesh to sides on galv steel posts. Hardened rock entry and exits.

LOCATION: Used to cross creeks, gullys, or other obstructions where bikes are required to travel in two directions.

NOTES:
1. Structural Engineering & Geotechnical advice required. Structural sizes for larger spans will need to be increased.

2. Maximum long fall to be 1:6, Maximum cross fall to be1:10 subject to trail conditions.

3. Bearers between posts and joists allows for upto 300mm of lateral tollerance in joist & mesh location.



Bridge Large Two Way

MOUNTAIN BIKE TRAILS

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B4a

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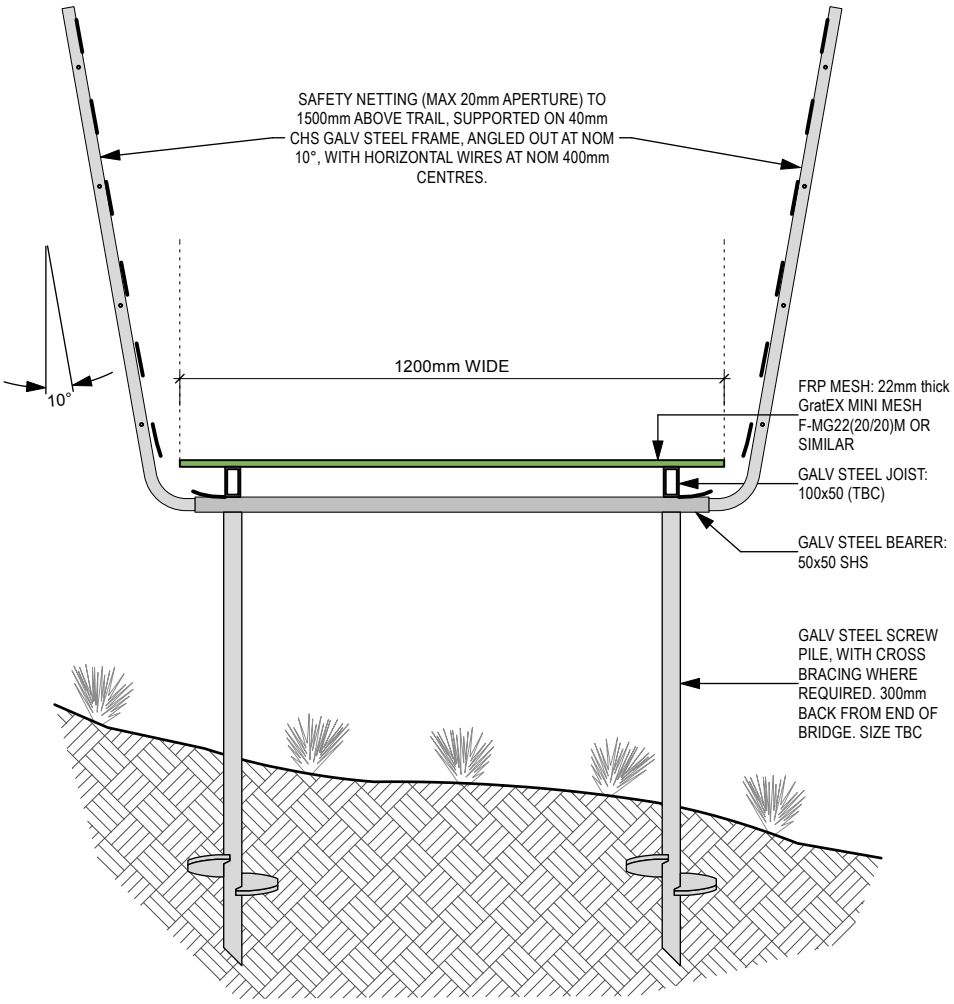


Raised FRP Trail

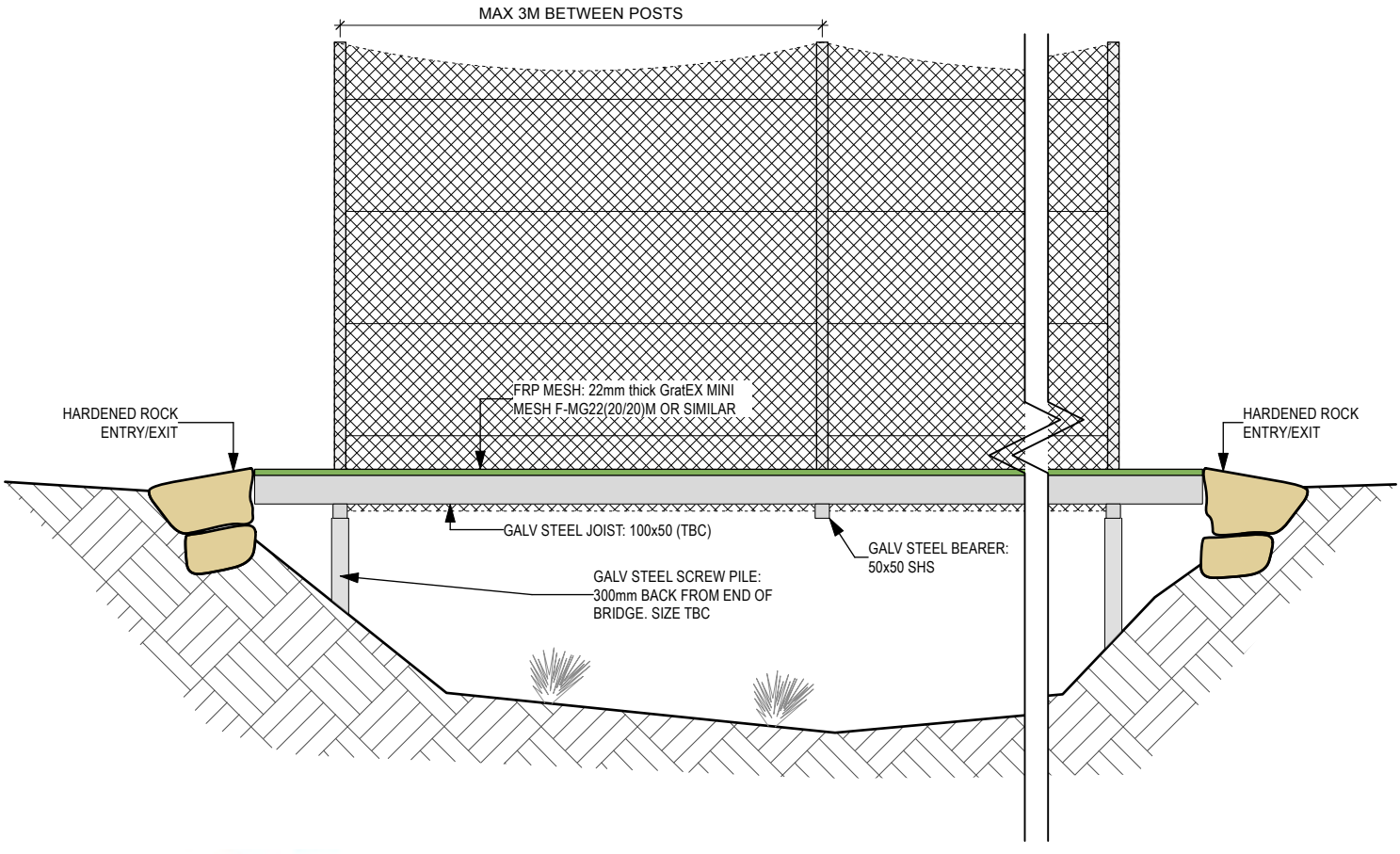
DESCRIPTION: Two way Bridge with galv steel structure and FRP mesh surface, safety mesh to sides on galv steel posts. Hardened rock entry and exits.

LOCATION: Used to cross creeks, gullys, or other obstructions where bikes are required to travel in two directions.

NOTES:
1. Structural Engineering & Geotechnical advice required. Structural sizes for larger spans will need to be increased.

2. Maximum long fall to be 1:6, Maximum cross fall to be1:10 subject to trail conditions.

3. Bearers between posts and joists allows for upto 300mm of lateral tollerance in joist & mesh location.



SYNERGY TRAILS

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Bridge Large Two Way

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St Leonards NSW 2065
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MOUNTAIN BIKE TRAILS

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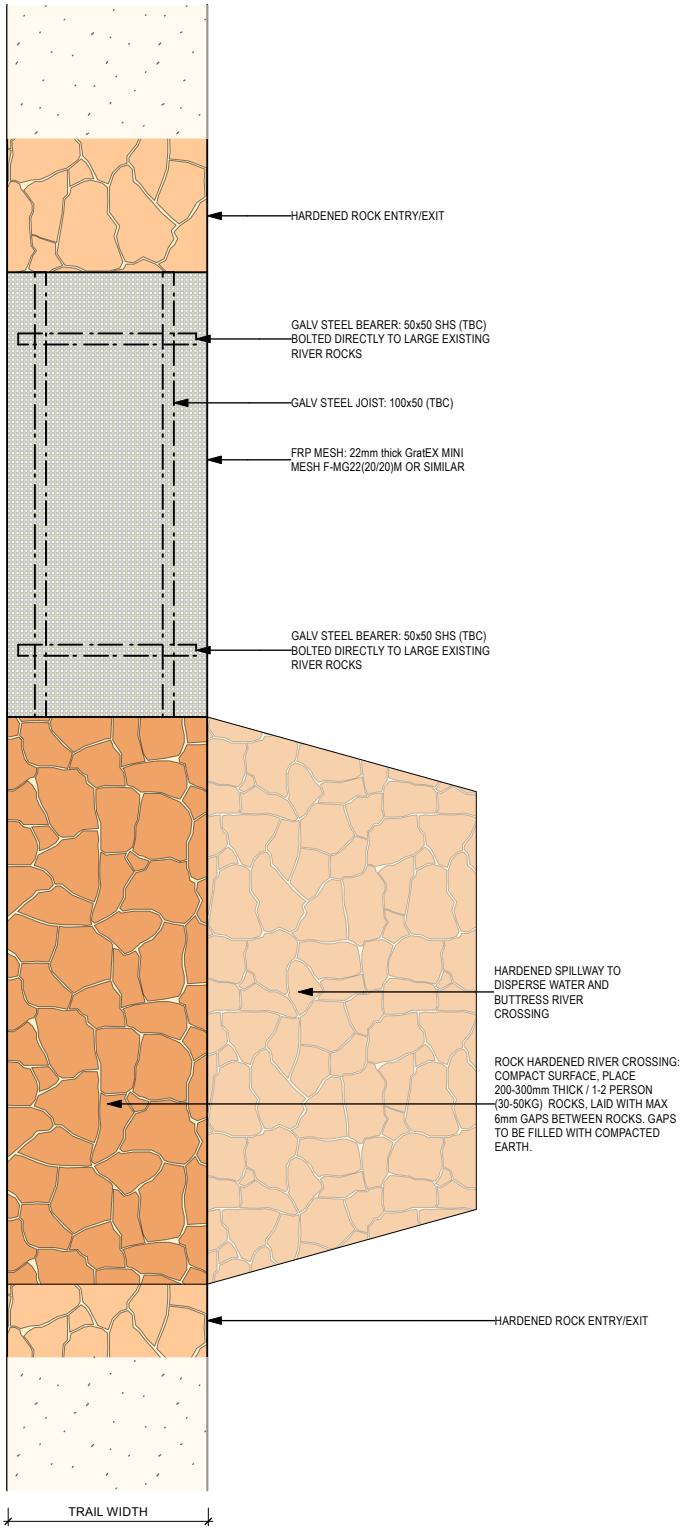
SCALE:1:25 DATE: 5/8/21

B4b



Raised FRP Trail

DESCRIPTION: Hybrid Bridge and rock armoured river crossing.
Bridge section to have galv steel structure (bolted directly to large existing river rocks) and FRP mesh surface, Hardened rock entry and exits.

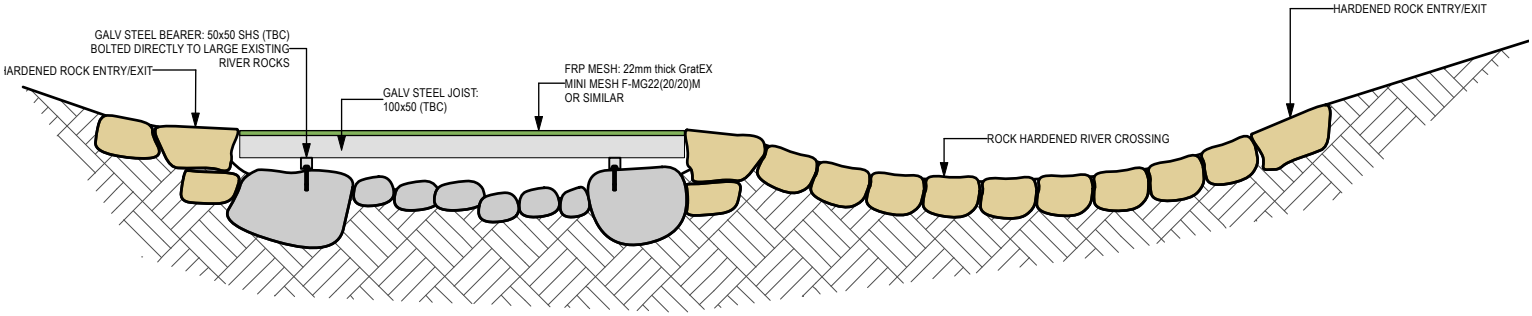
LOCATION: Used to cross creeks & small rivers, where there is substantial flood risk, and high likelyhood of trail features being washed out. Located in riffle sections.

NOTES:
1. In the event of substantial flooding the FRP panel is considered sacrificial. The connections between the FRP and the Galv Steel Joists should be designed to fail before the connection of the steel subframe to the large river rocks.

2.Structural Engineering & Geotechnical advice required.

3. Maximum long fall on bridge to be 1:6, Maximum cross fall to be1:10 subject to trail conditions.

4. Bearers between posts and joists allows for upto 300mm of lateral tollerance in joist & mesh location.



MOUNTAIN BIKE TRAILS

Bridge and Hardened River Crossing

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B5

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St Leonards NSW 2065
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SCALE:1:25 DATE: 5/8/21

Landing Zone of Large Drop Off

Large Timber Drop off - Rollable

DESCRIPTION: FRP feature that ends with a drop to an inclined landing ramp. Rock Armouring to entry and exits of FRP. Feature may require import of soil for a landing ramp. Landing ramp may need to be rock hardened.

DF1: Feature vertical drop height 200 - 400mm, Gap between drop and lander 0 - 1m.

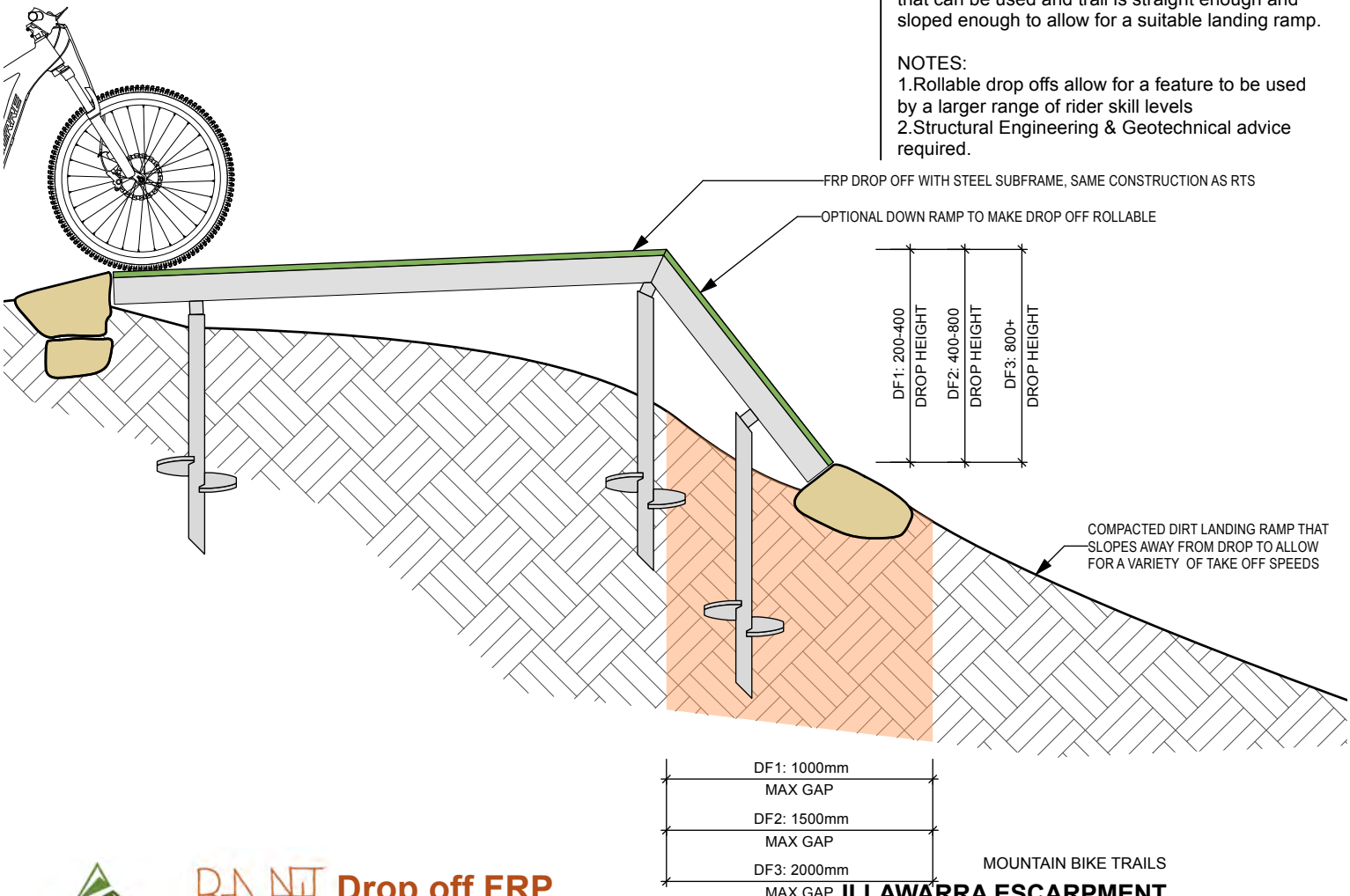
DF2: Feature vertical drop height 400 - 800mm, Gap between drop and lander 0 - 1.5m.

DF3: Feature vertical drop height 800mm +, Gap between drop and lander 0 - 2m.

Material quantity dependent on slope & location

LOCATION: Where there aren't existing features that can be used and trail is straight enough and sloped enough to allow for a suitable landing ramp.

NOTES:
1.Rollable drop offs allow for a feature to be used by a larger range of rider skill levels
2.Structural Engineering & Geotechnical advice required.



Drop off FRP

MOUNTAIN BIKE TRAILS

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DF1,2,3

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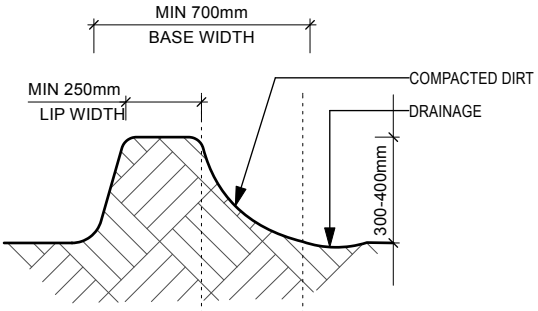
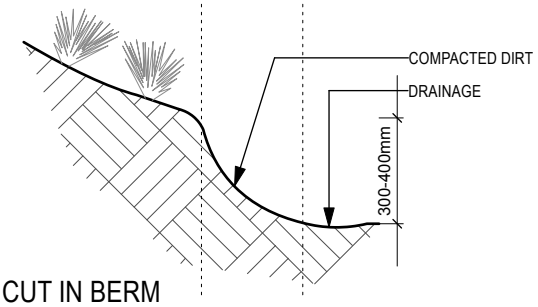
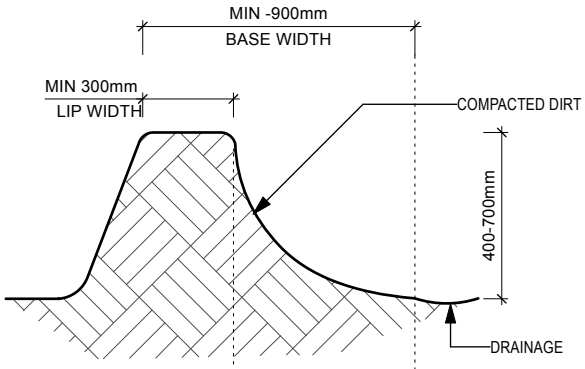


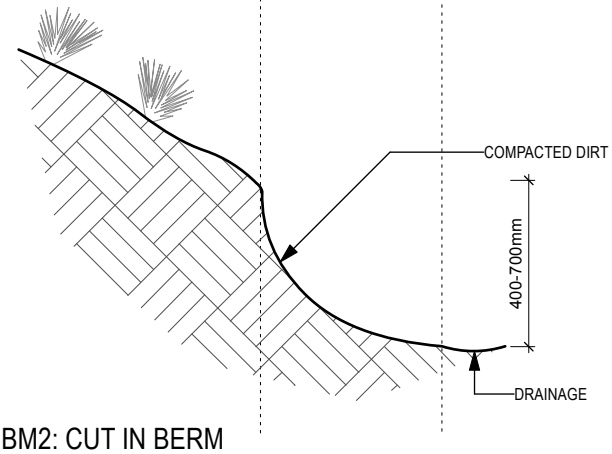
BM1: BUILT UP BERM



BM2: CUT IN BERM



BM2: BUILT UP BERM



BM2: CUT IN BERM

Small Berm

DESCRIPTION: Compacted soil raised lip above ground level. contoured to suit feature location and trail difficulty.

BM1: 300-400mm high, Base width nom 700mm, lip width (if required) nom 250mm. Approx 0.15 cubic metres of soil per lineal metre.

BM2: 400-700mm high, base width nom 900mm, lip width (if required) nom 300mm. Approx 0.3 cubic metres of soil per lineal metre.

LOCATION: Used to camber trail corners

NOTES:
1.Note If soil is available insitu or requires to be imported.
2. Bottom of berms should be shaped to channel and direct water towards the DSR at the berm exit
3.Exits of Berms in high flow areas should be provided with DSR's

MOUNTAIN BIKE TRAILS

Natural Berm Small & Medium

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BM1,2

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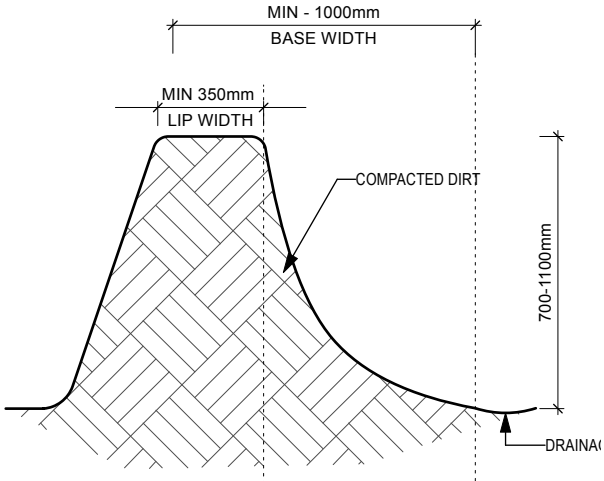
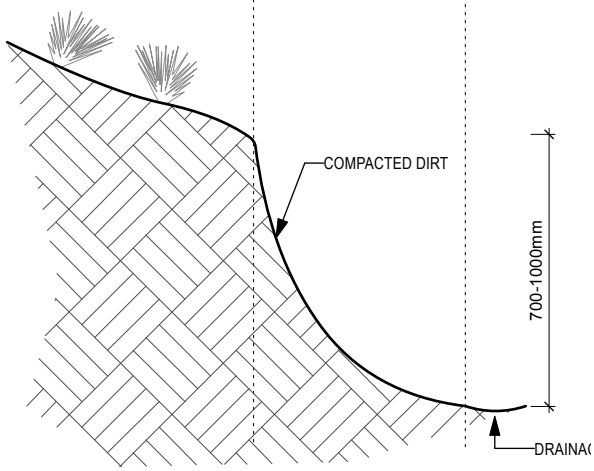


BUILT UP BERM



CUT IN BERM

Small Berm

DESCRIPTION: Compacted soil raised lip above ground level. contoured to suit feature location and trail difficulty.

BM3: 700-1100mm high, Base width nom 1000mm, lip width (if required) nom 350mm. Approx 0.6 cubic metres of soil per lineal metre.

LOCATION: Used to camber trail corners

NOTES:
1.Note If soil is available insitu or requires to be imported.
2. Bottom of berms should be shaped to channel and direct water towards the DSR at the berm exit
3.Exits of Berms in high flow areas should be provided with DSR's

Natural Berm Large

MOUNTAIN BIKE TRAILS

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BM3

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St Leonards NSW 2065
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Small Rock Drop off

DESCRIPTION: Rock feature that ends with a vertical drop to an inclined landing ramp. Feature may require import of soil for a landing ramp. Landing ramp may need to be rock hardened.

DN1: Feature vertical drop height 200 - 400mm, Gap between drop and lander 0 - 1m.

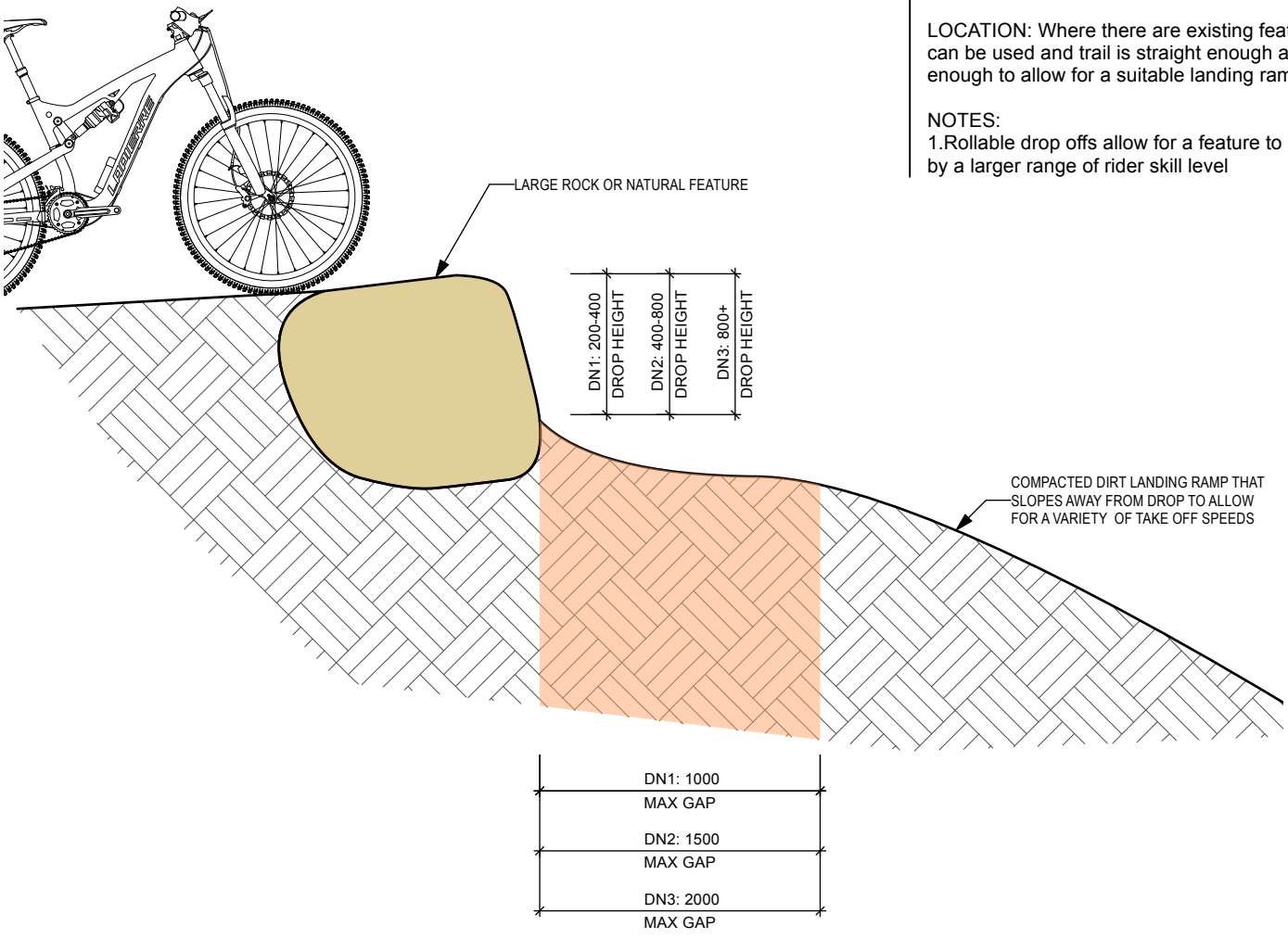
DN2: Feature vertical drop height 400 - 800mm, Gap between drop and lander 0 - 1.5m.

DN3: Feature vertical drop height 800mm +, Gap between drop and lander 0 - 2m.

Material quantity dependent on slope, location and existing feature

LOCATION: Where there are existing features that can be used and trail is straight enough and sloped enough to allow for a suitable landing ramp.

NOTES:
1.Rollable drop offs allow for a feature to be used by a larger range of rider skill level



Drop off Natural

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DN1,2,3

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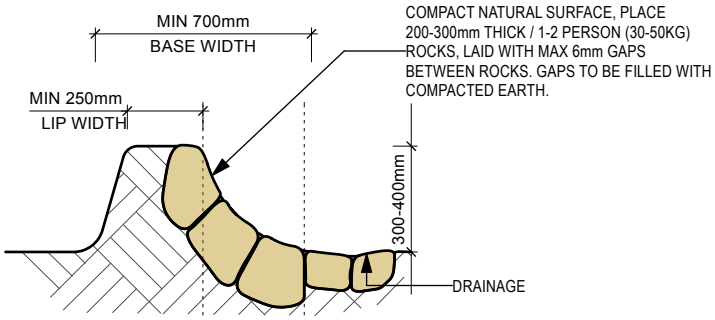
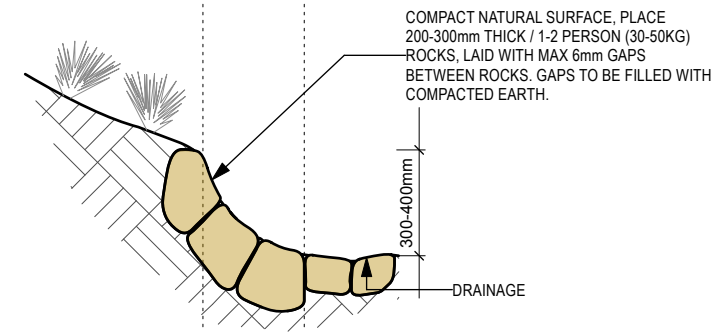
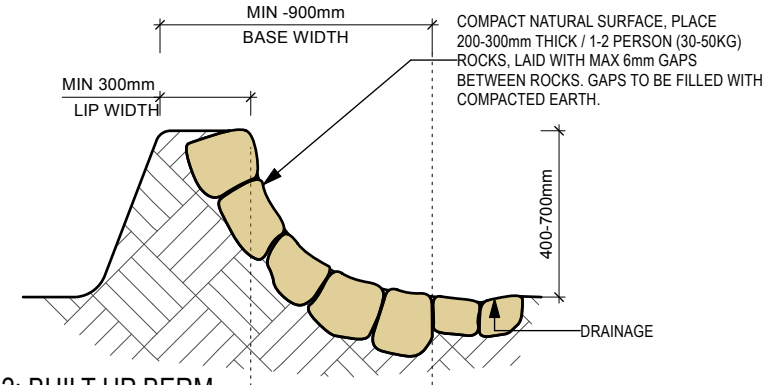


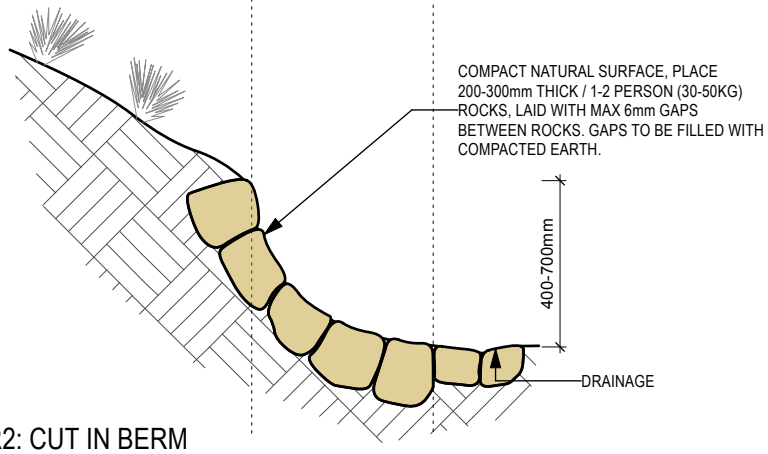
BR1: BUILT UP BERM



BR1: CUT IN BERM



BR2: BUILT UP BERM



BR2: CUT IN BERM

Rock Armoured Berm

DESCRIPTION: Rock hardened raised lip above ground level. contoured to suit feature location and trail difficulty.

BR1: 300-400mm high, Base width nom 700mm, lip width (if required) nom 250mm. Approx 0.15 cubic metres of soil per lineal metre. Approx 0.4 cubic metres of rock per lineal metre.

BR2: 400-700mm high, base width nom 900mm, lip width (if required) nom 300mm. Approx 0.3 cubic metres of soil per lineal metre. Approx 0.8 cubic metres of rock per lineal metre.

LOCATION: Used to camber trail corners

NOTES:
1.Note If soil is available insitu or requires to be imported.
2. Bottom of berms should be shaped to channel and direct water towards the DSR at the berm exit
3.Exits of Berms in high flow areas should be provided with DSR's
4.Rock rubble found within trail excavation can be used as subface support under rock armouring or the like.

Hardened Berm Small & Medium

MOUNTAIN BIKE TRAILS
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BR1,2

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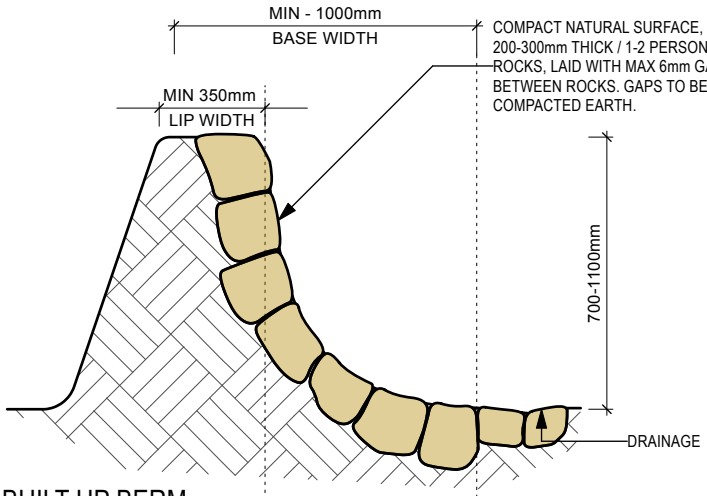
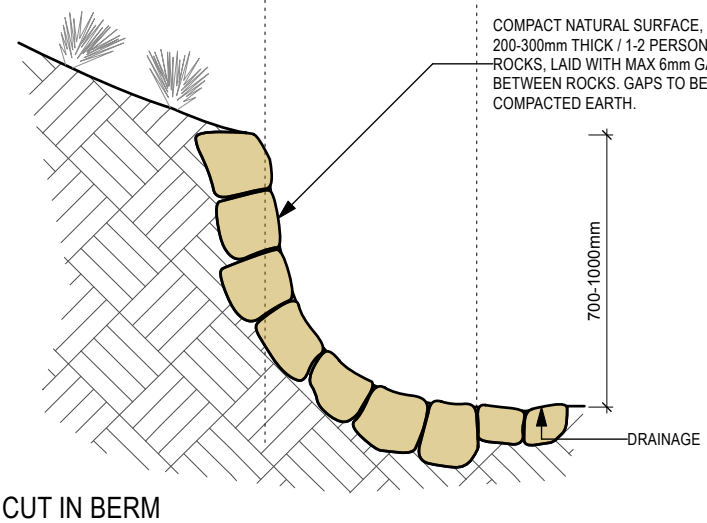


BR3: BUILT UP BERM



BR3: CUT IN BERM

Rock Armoured Berm

DESCRIPTION: Rock hardened raised lip above ground level. contoured to suit feature location and trail difficulty.

BR3: 700-1100mm high, Base width nom 1000mm, lip width (if required) nom 350mm. Approx 0.6 cubic metres of soil per lineal metre. Approx 1.6 cubic metres of rock per lineal metre.

LOCATION: Used to camber trail corners

NOTES:
1.Note If soil is available insitu or requires to be imported.
2. Bottom of berms should be shaped to channel and direct water towards the DSR at the berm exit
3.Exits of Berms in high flow areas should be provided with DSR's
4.Rock rubble found within trail excavation can be used as subface support under rock armouring or the like.

SYNERGY TRAILS

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Hardened Berm Large

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MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

BR3

SCALE:1:25 DATE: 5/8/21

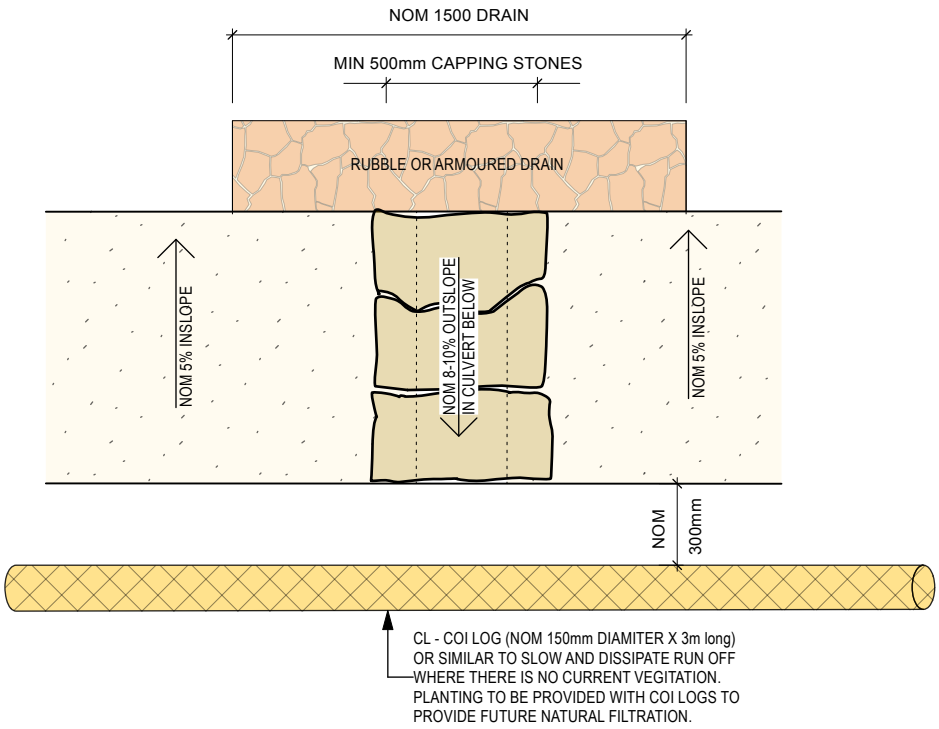
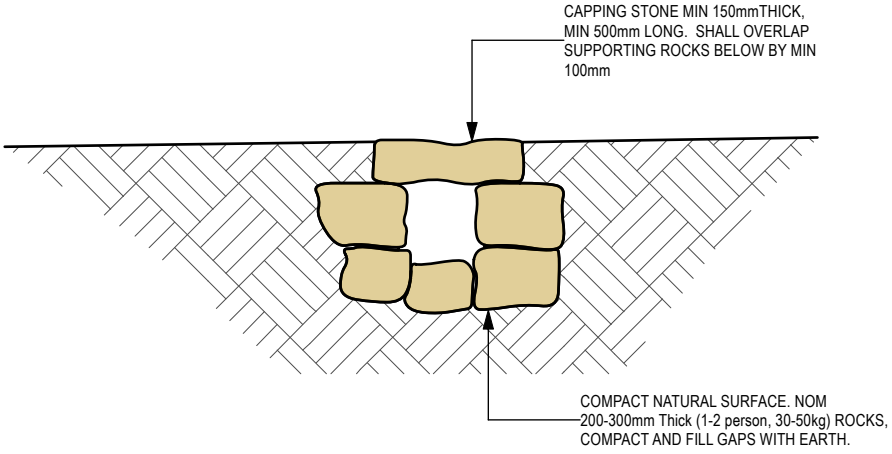


IMAGE DISCRIPTION

DESCRIPTION: Rock Armoured culvert drain to match trail width.

LOCATION: To be used in areas where the trail cannot be out sloped to the landscape and a high amount of water flow is captured above from upslope.

NOTES: Water flows to the inslope side of the trail where it is directed by a rock armoured or rubble drain in to the culvert and then through under the trail to the outslope side of the trail.



Rock Culvert Drain

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

DCR

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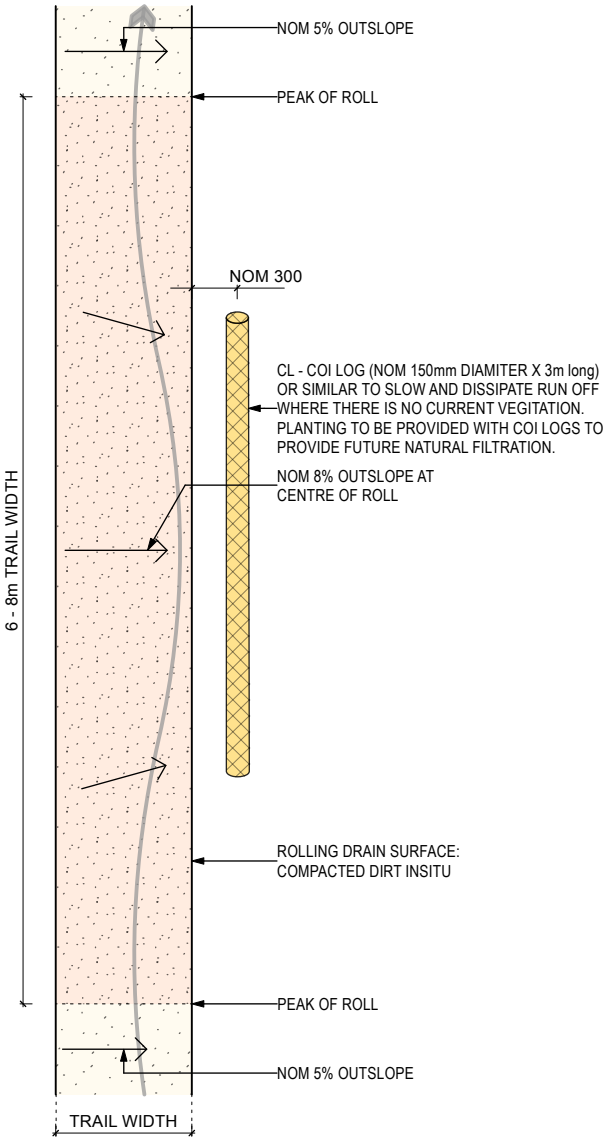
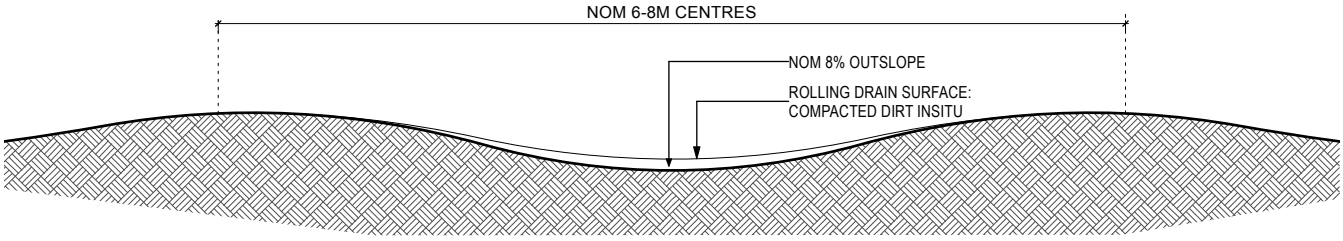


Rolling Dip with Hardened Spill Way

DESCRIPTION: Rolling Dip in trail to allow water to drain

LOCATION: Used between multiple rollers

NOTES:



Natural Rolling Dip Drain

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

DRN

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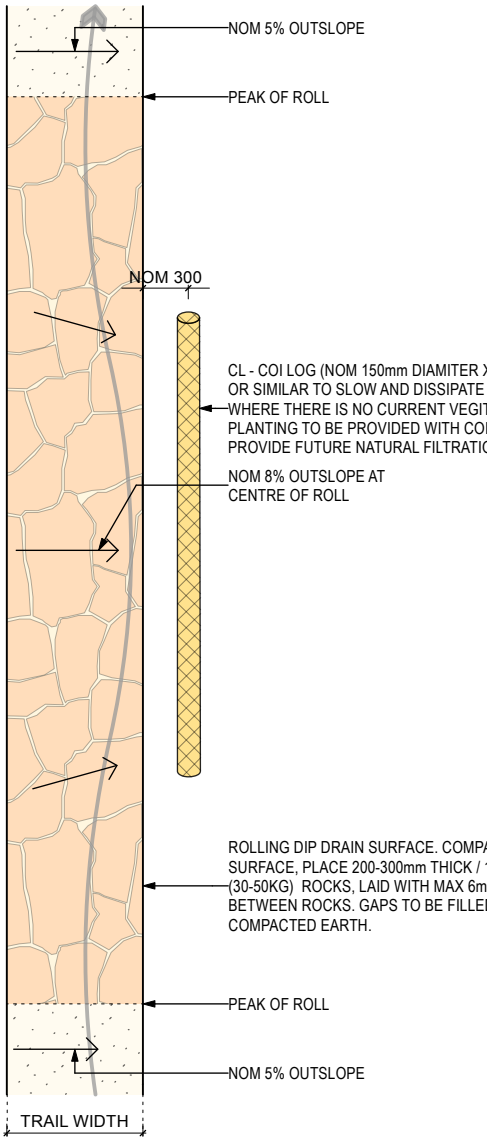
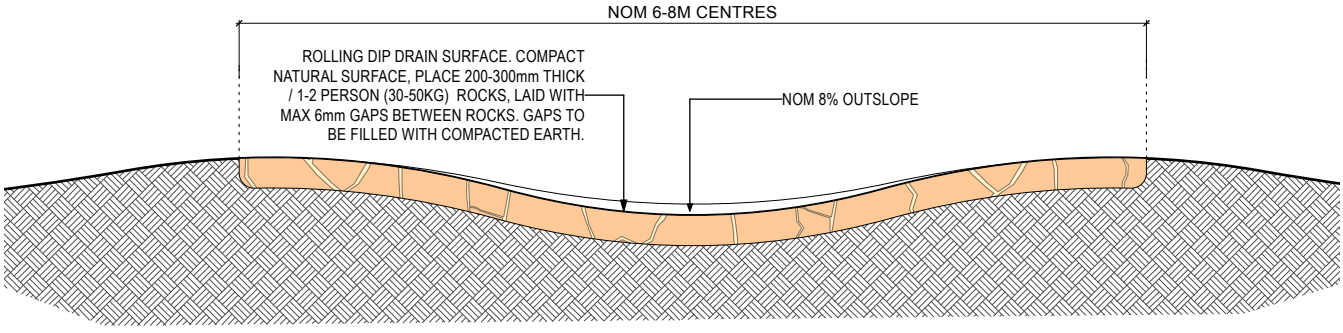


Rolling Dip with Hardened Spill Way

DESCRIPTION: Rock Hardened version of DRN (Natural Rolling Dip Drain)

LOCATION: Hardened version to be used where erosion would make Natural version unsustainable

NOTES: Rock rubble found within trail excavation can be used as subface support under rock armouring or the like.



Hardened Rolling Drain

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

DRR

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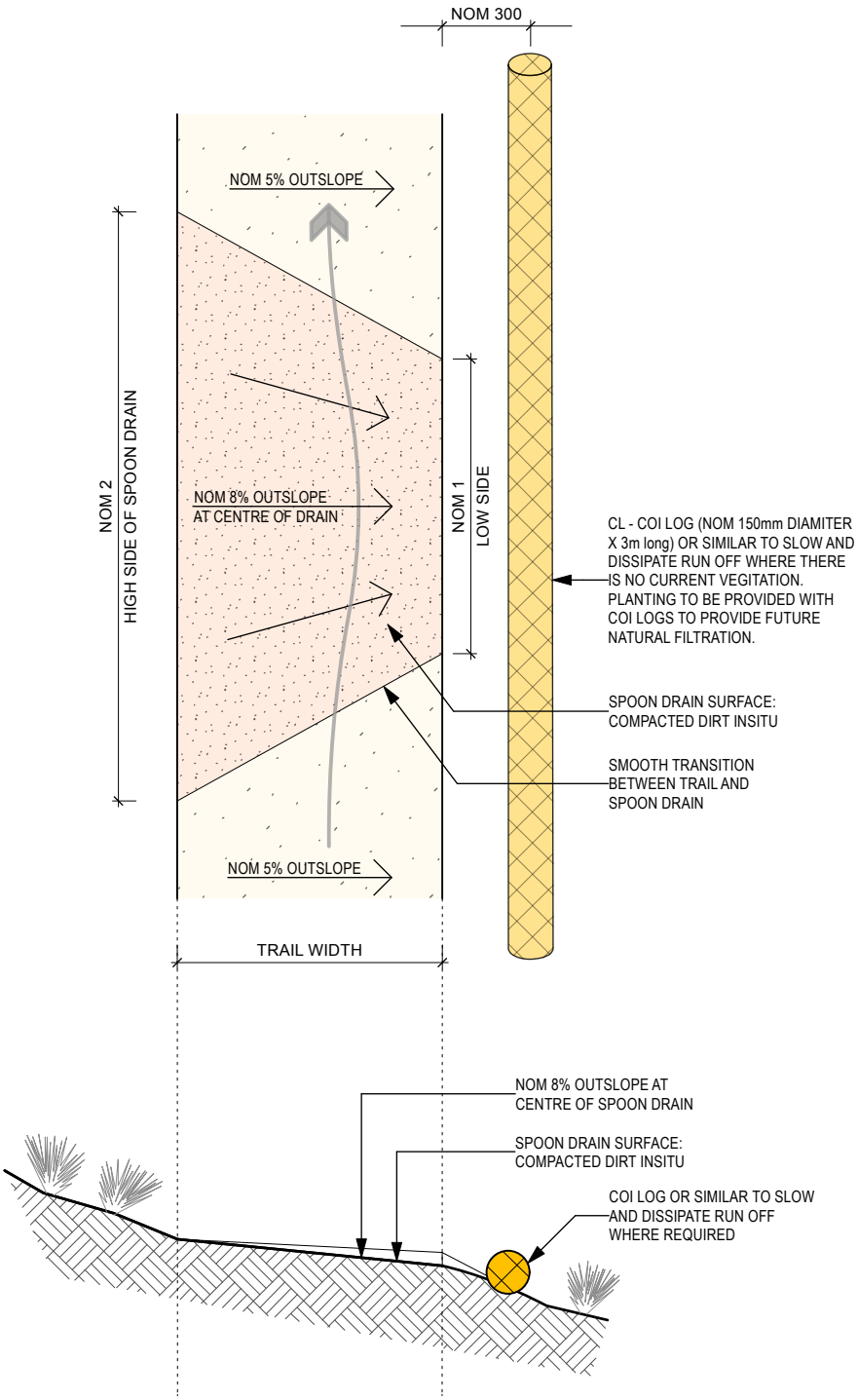

Spoon drain with spreader log

DESCRIPTION: Small dip in trail to allow surface water to drain to the outslope side of the trail.

LOCATION: Where trail drainage is required but there is not significant water flow from above the trail.

NOTES:

Natural Spoon Drain

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

DSN

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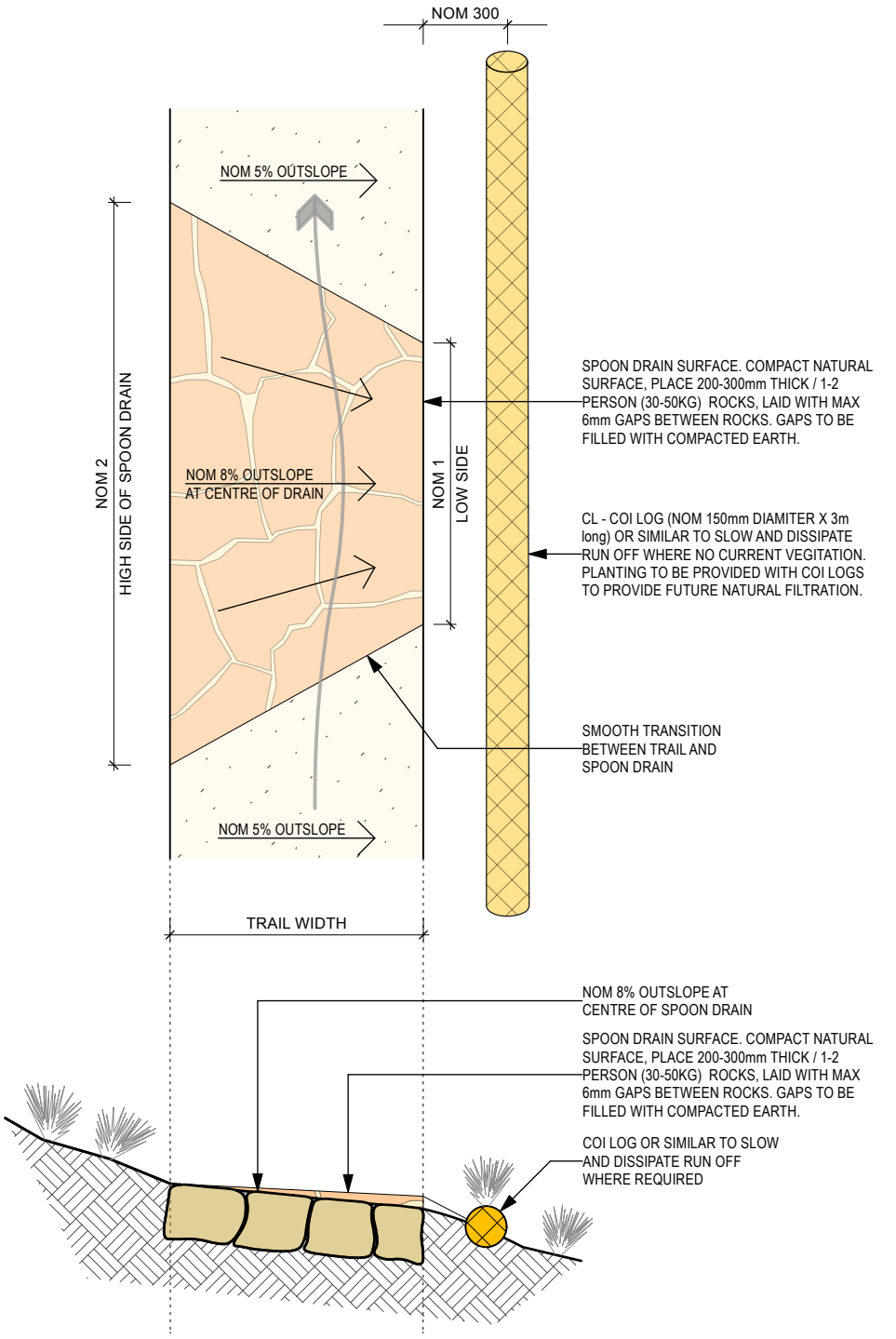

Hardened Spoon drain with HSW

DESCRIPTION: Rock Hardened Spoon Drain

LOCATION: To be used in areas where water is coming from above and on the trail.

NOTES:

Hardened Spoon Drain

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

DSR

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Fly Over

DESCRIPTION: Fly over to allow two trails to cross without intersecting.

LOCATION: Used where two trails cross & there is sufficiant height differentail so that excessive ramping can be avoided

NOTES:
1. Fly overs to be minimum 1200mm wide.
2. Structure should have minimum 2400mm clear below to other trail.
3. Where ramparts required: to be wider at the base tapering to match the width of the bridge at the top.
4. Entry and exits to be rock hardened.
5. Steepness of ramps & level of corner camber to be adjusted to suit site conditions & difficulty rating of trail.
6. Structural Engineering & Geotechnical advice required.

Earth Ramparts Flyover

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

F1a

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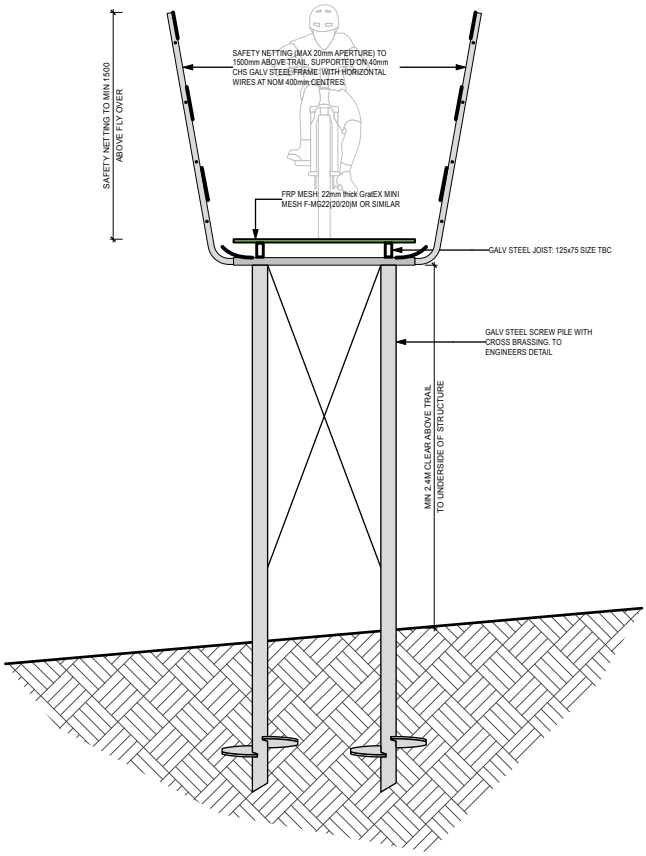
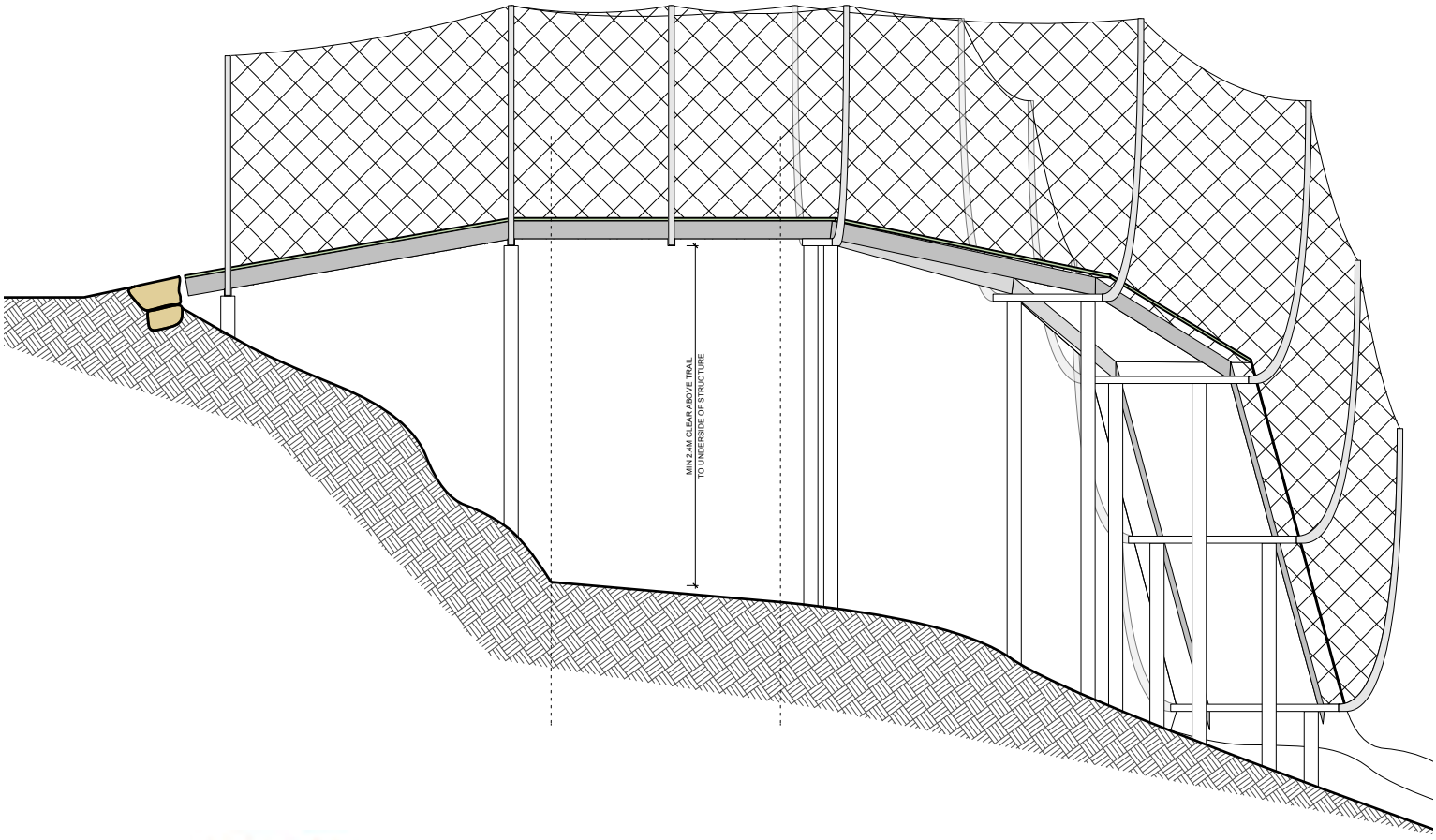


Fly Over

DESCRIPTION: Fly over to allow two trails to cross without intersecting.

LOCATION: Used where two trails cross & there is sufficiant height differentail so that excessive ramping can be avoided

NOTES:
1. Fly overs to be minimum 1200mm wide.
2. Structure should have minimum 2400mm clear below to other trail.
3. Where ramparts required: to be wider at the base tapering to match the width of the bridge at the top.
4. Entry and exits to be rock hardened.
5. Steepness of ramps & level of corner camber to be adjusted to suit site conditions & difficulty rating of trail.
6. Structural Engineering & Geotechnical advice required.



Earth Ramparts Flyover

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

F1b

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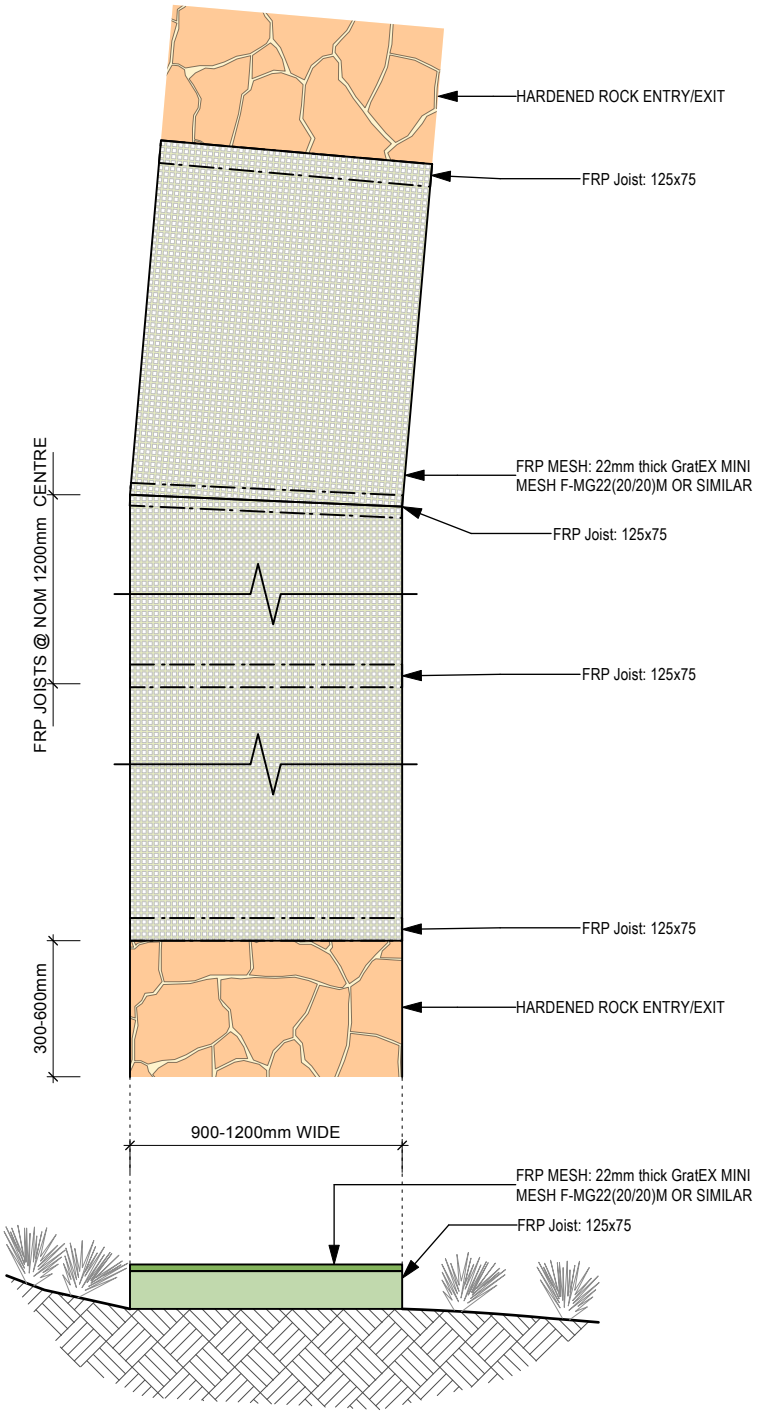


Hardened Rock Trail

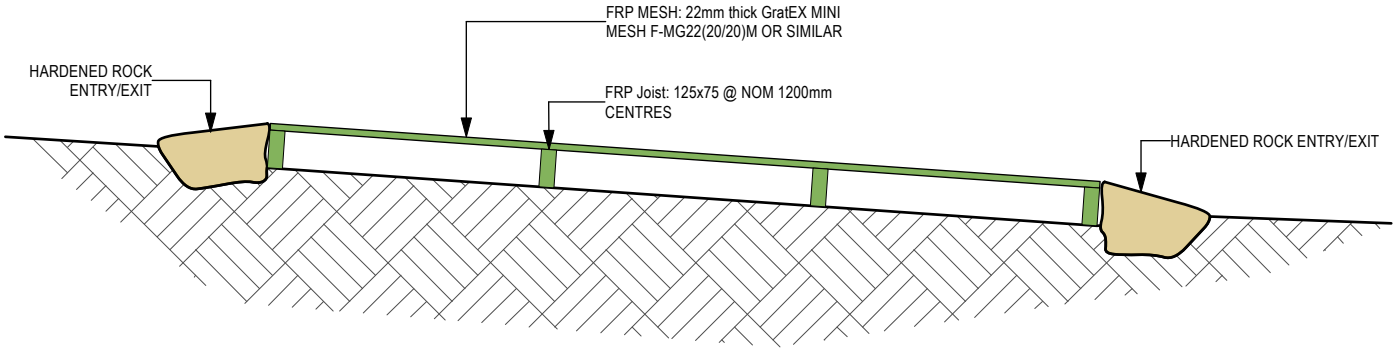
DESCRIPTION: 900-1200 wide FRP floating trail with no side rails. Hardened rock entry and exits.

LOCATION: Used where it is necessary to minimise the disturbance to the existing ground conditions

NOTES:

1. Floating trail to be fixed to the ground at each end and nom every 9m along trail, with galv screw stirrup's to future detail.
2. Structural Engineering & Geotechnical advice required.

Screw Stirrup



Floating Trail

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

FT

SCALE:1:25 DATE: 5/8/21

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Gap Jump

DESCRIPTION: Ramped take off ramp with a gap, space or void and a a built landing ramp. Minimum width is the widith of the specified trail corridor for both take off and landing ramps.

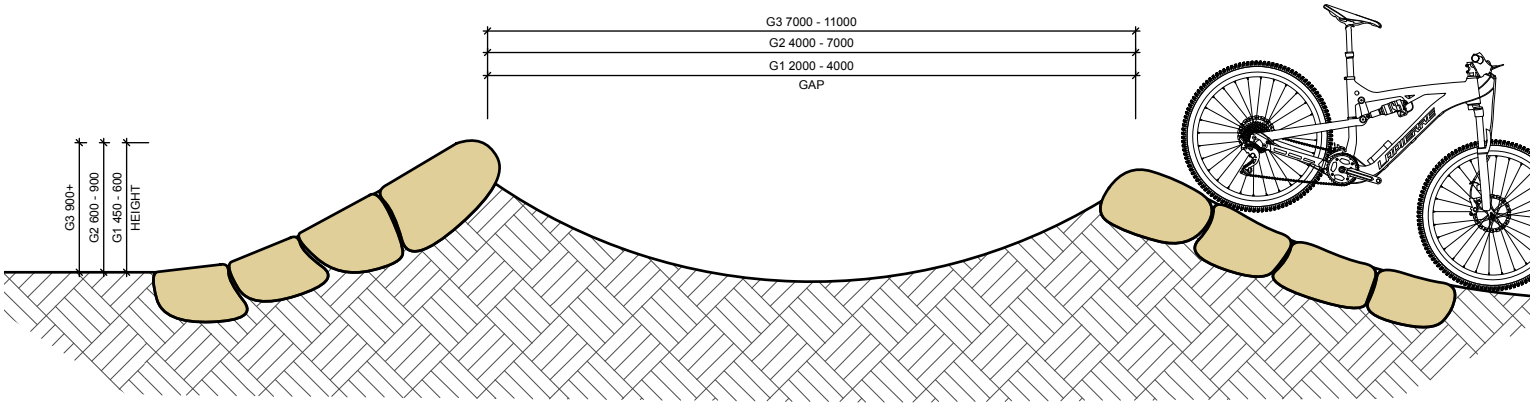
G1: Height of take off ramp 450 to 600mm. Feature length 2 -4m. Soil Volume is 0.9 to 1.2 cubic metres

G2: Height of take off ramp 600 to 900mm. Feature length 4 -7m. Soil Volume is 1.2 to 3 cubic metres

G3: Height of take off ramp 900mm plus. Feature length 7 - 11 m. Soil Volume is 3 to 6.5 cubic metres

LOCATION: Used primarily in Jump lines

NOTES:



Natural Gap Jump

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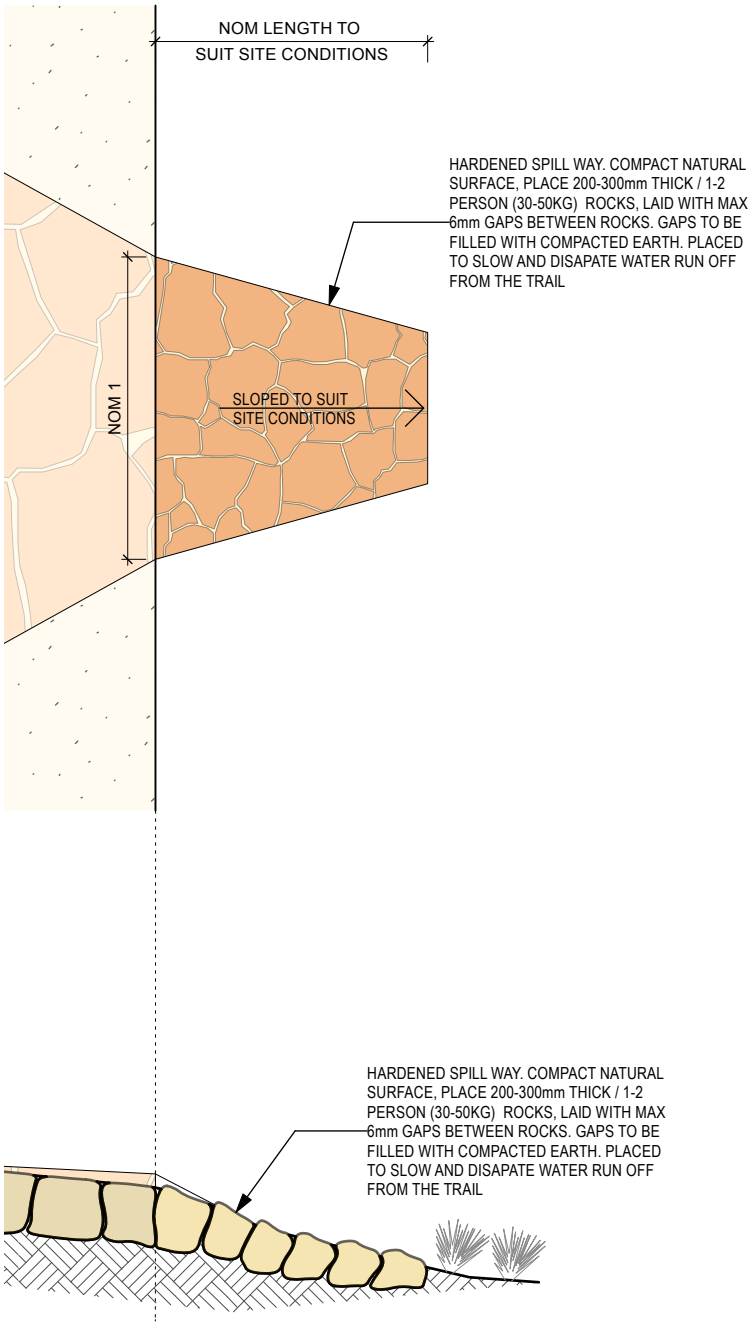
MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

G1,2,3

SCALE:NTS DATE: 5/8/21



Hardened Spill way with DSR

DESCRIPTION: Rock hardening to channel and disperse run off water

LOCATION: to be used where water un off from the trail would cause significant erosion.

NOTES: Extent of Spillway to be adjusted to suit site conditions

Hardened Spill Way

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

HSW

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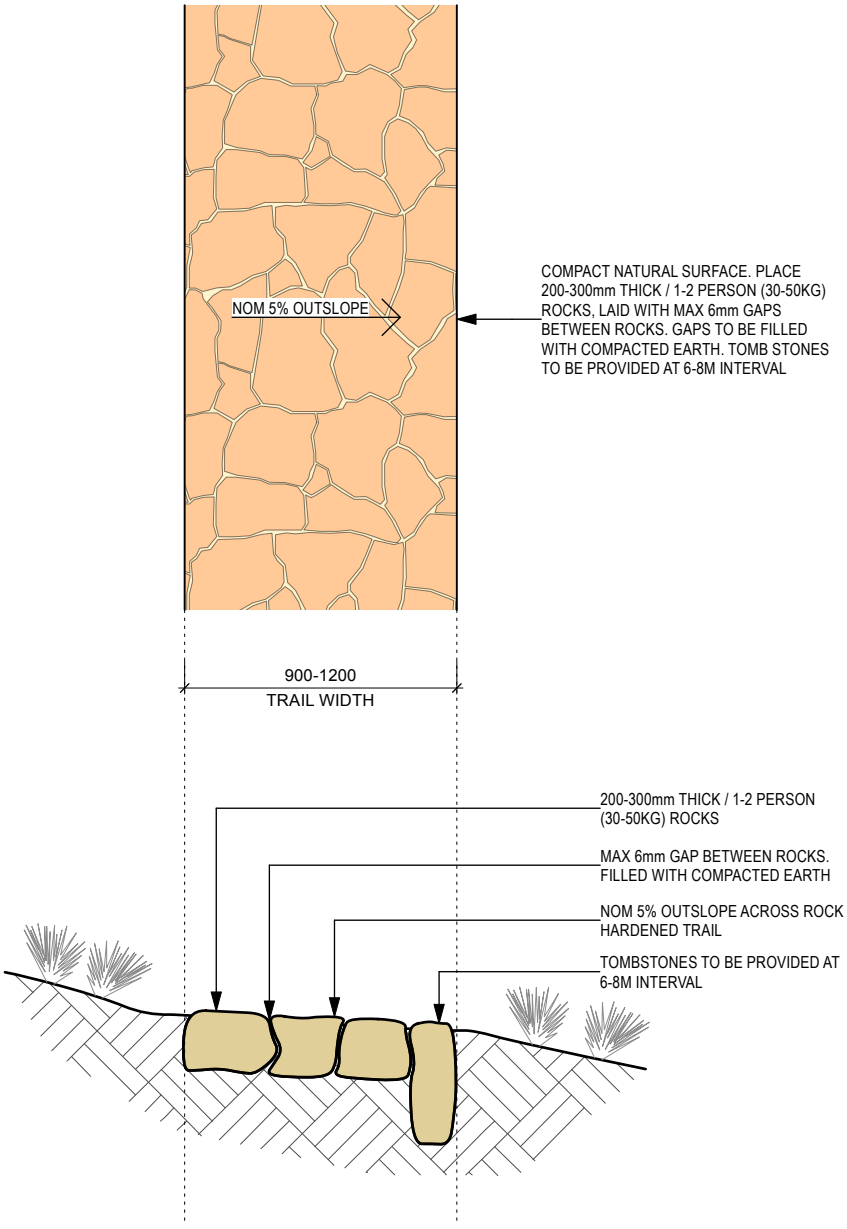
SCALE:1:25 DATE: 5/8/21

Hardened Rock Trail

DESCRIPTION: 200 to 300mm thick sandstone to operational width of trail with maximum 6mm gap

LOCATION: Rock Armouring to be used where erosion would make Natural trail unsustainable

NOTES: Rock rubble found within trail excavation can be used as subface support under rock armouring or the like.



Rock Armouring

MOUNTAIN BIKE TRAILS

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R

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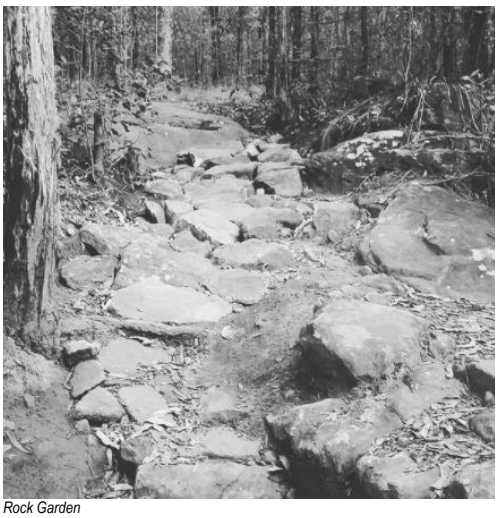

Rock Garden

DESCRIPTION: Trail feature comprised of randomly placed rocks designed to create technical challenge. Maximum height of rock obstacle 800

RG1: Length of feature 1 to 3m.

RG2: Length of feature 3 to 8m.

RG3: Length of feature 8 to 15m.

LOCATION: Where there are existing rock features. Generally in blue to black trails

NOTES: Placement of local or imported rock into the trail. tying together existing larger rocks. allowing for multiple lines dependant on rider capabilities

SYNERGY TRAILS

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Rock Garden

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MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

RG

SCALE:1:25 DATE: 5/8/21

Roller

DESCRIPTION: Flowing oscillations to full width of trail.

R1: Height of feature to 300mm over a 1.5M length (approximate) compacted soil volume .5 cubic metres

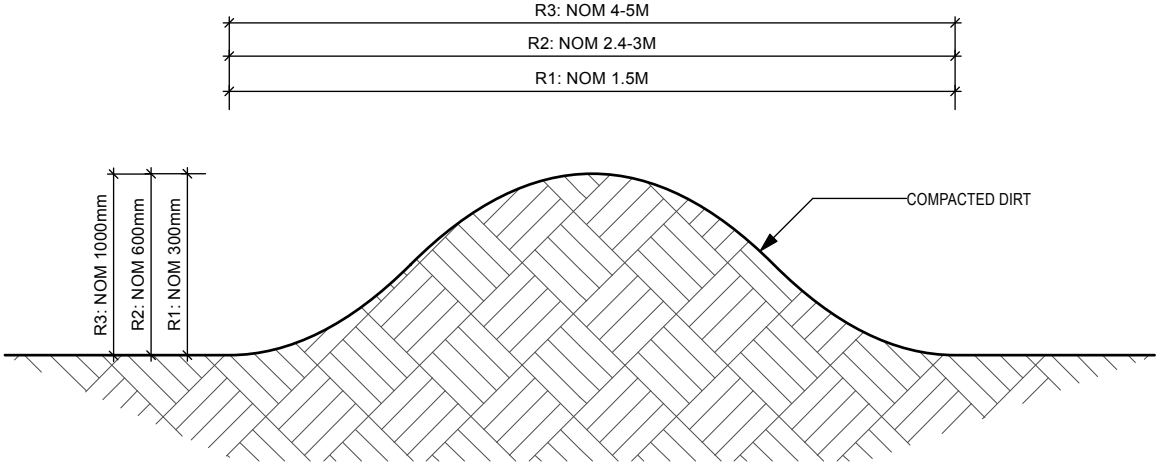
R2: Height of feature to 600mm over a 2.4-3M length (approximate) compacted soil volume 1 cubic metre

R3: Height of feature to 1000mm over a 4-5M length (approximate) Soil volume 3 cubic metres compacted

LOCATION: Used to break up water movement on trail and facilitate kinaesthetic rider movement. Usually placed in groupsin straighter sections of trail

NOTES:
1.Trail either side of and inbetween rollers to have nom 5% outslope
2. Transitions in and out of rollers to be smooth

3. Size and proportion of rollers to be varied to match trail setting, difficulty, and flow.



Natural Roller

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MOUNTAIN BIKE TRAILS

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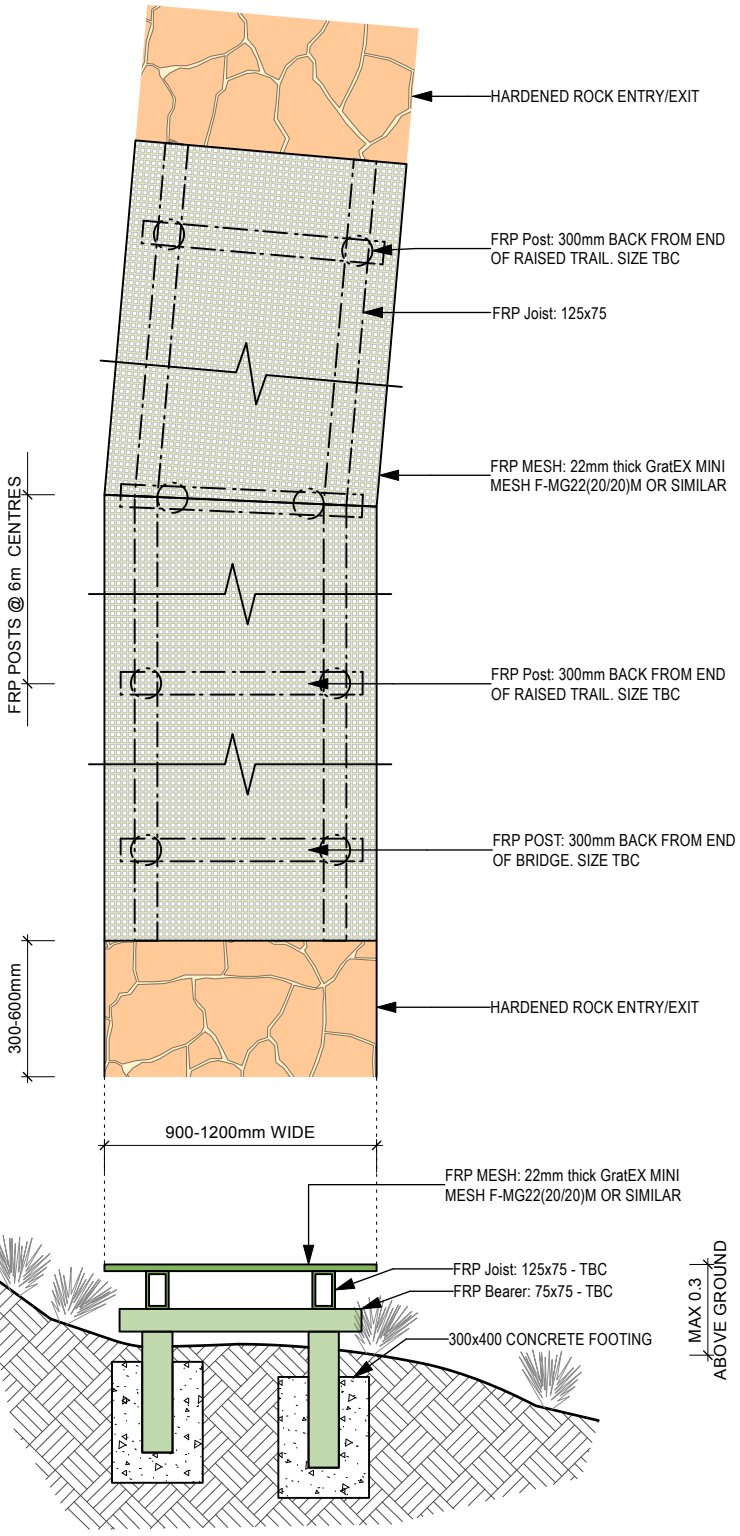
SCALE:1:25 DATE: 5/8/21

RN1,2,3

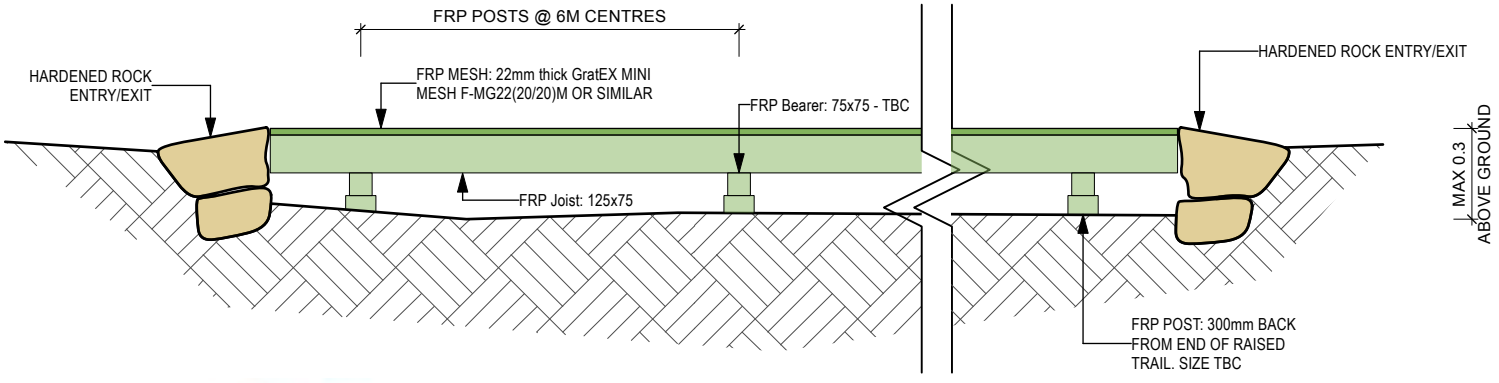


FRP Raised Trail

DESCRIPTION: 900-1200 wide FRP Trail with FRP substructure and no side rails. Hardened rock entry and exits.

LOCATION: Used where the ground conditions are not suitable for a natural or hardened trail.

NOTES:
1.No Higher Than 300mm above ground. Fall zones to be assessed for potential hazards.
2.FRP trail width may increase in width at corners to allow for turning radius of a mountain bike.
3. Structural Engineering & Geotechnical advice required.



Raised Trail FRP

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

RTF

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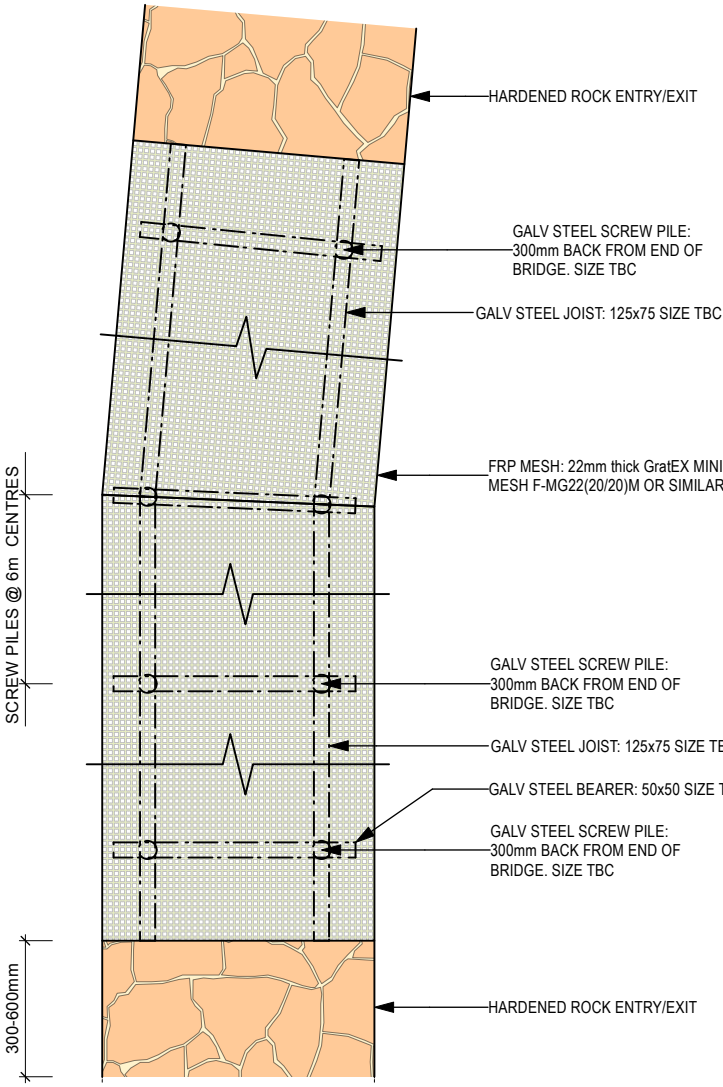

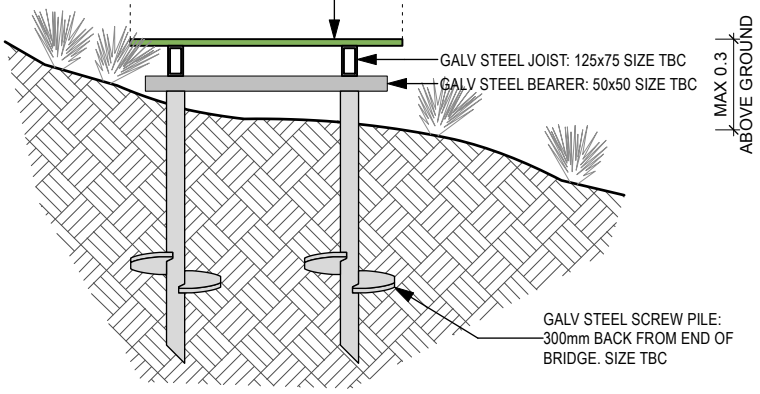

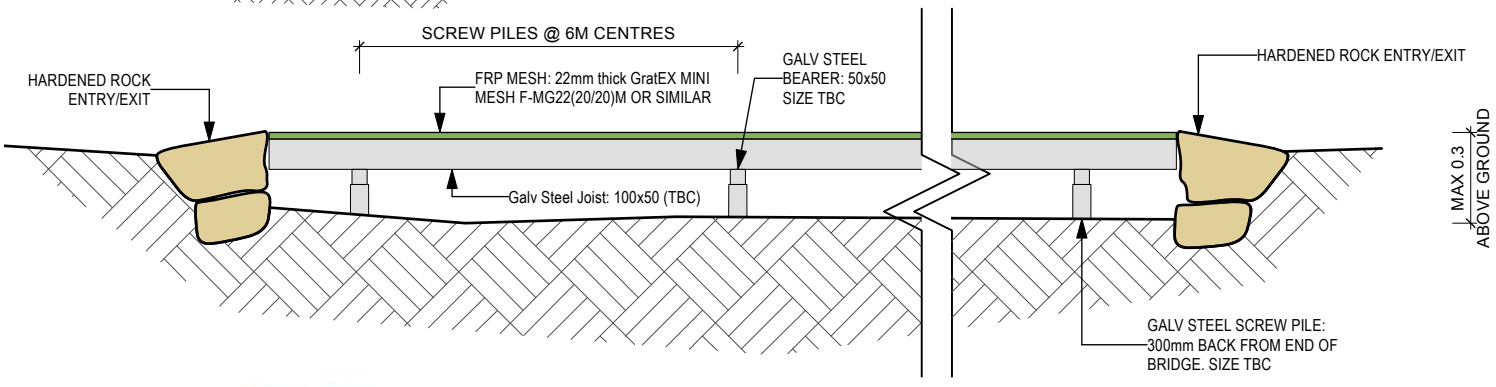

FRP Raised Trail

DESCRIPTION: 900-1200 wide FRP Trail with galv steel substructure and no side rails. Hardened rock entry and exits.

LOCATION: Used where the ground conditions are not suitable for a natural or hardened trail.

NOTES:
1. No Higher Than 300mm above ground. Fall zones to be assessed for potential hazards.
2. FRP trail width may increase in width at corners to allow for turning radius of a mountain bike.
3. Structural Engineering & Geotechnical advice required.

Raised Trail Steel

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

RTS

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Table Top

DESCRIPTION: Pentagonal shaped feature of compacted soil. Minimum width is that of construction trail width.

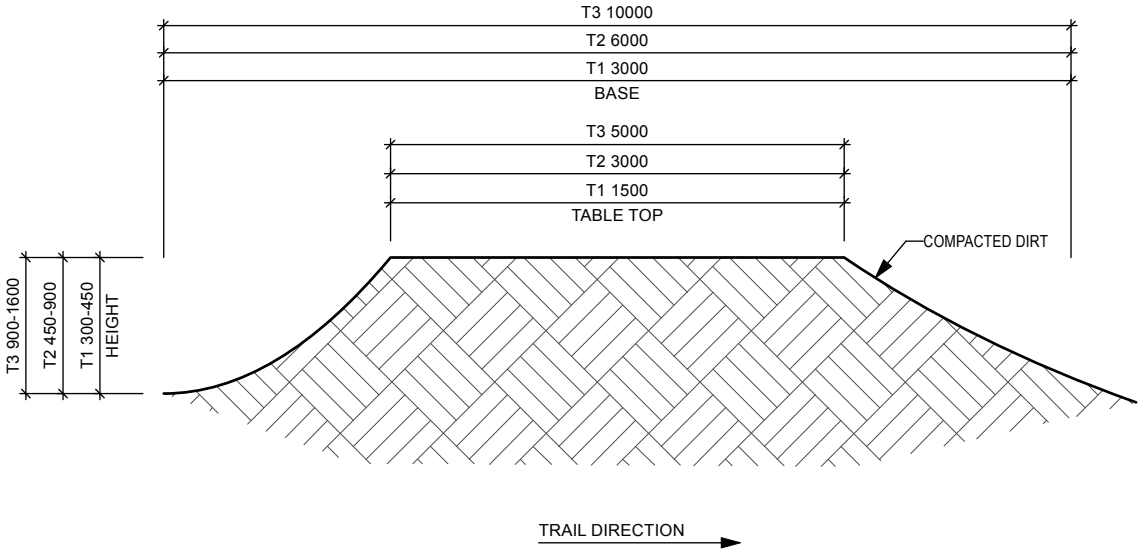
T1: Approx volume 0.5-1 cubic metres

T2: Approx volume 3-6 cubic metres

T3: Approx volume 9-16 cubic metres

LOCATION: Generally featured in jump line areas

NOTES:
1. Allows for rider progression
2. Out ramp should be more gently sloped to facilitate smooth landings.



Natural Table Top

MOUNTAIN BIKE TRAILS

ILLAWARRA ESCARPMENT

T1,2,3

SCALE:1:25 DATE: 5/8/21

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