



DRAWING LIST

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B1 F	Bridge Small	ISO A4	1:25
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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
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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
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F1a	Earth Ramparts Flyover	ISO A4	1:25
F1b	Earth Ramparts Flyover	ISO A4	1:25
FT	Floating Trail	ISO A4	1:25
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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



Cover Page

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MOUNTAIN BIKE TRAILS
ILLAWARRA ESCARPMENT

SCALE:NTS

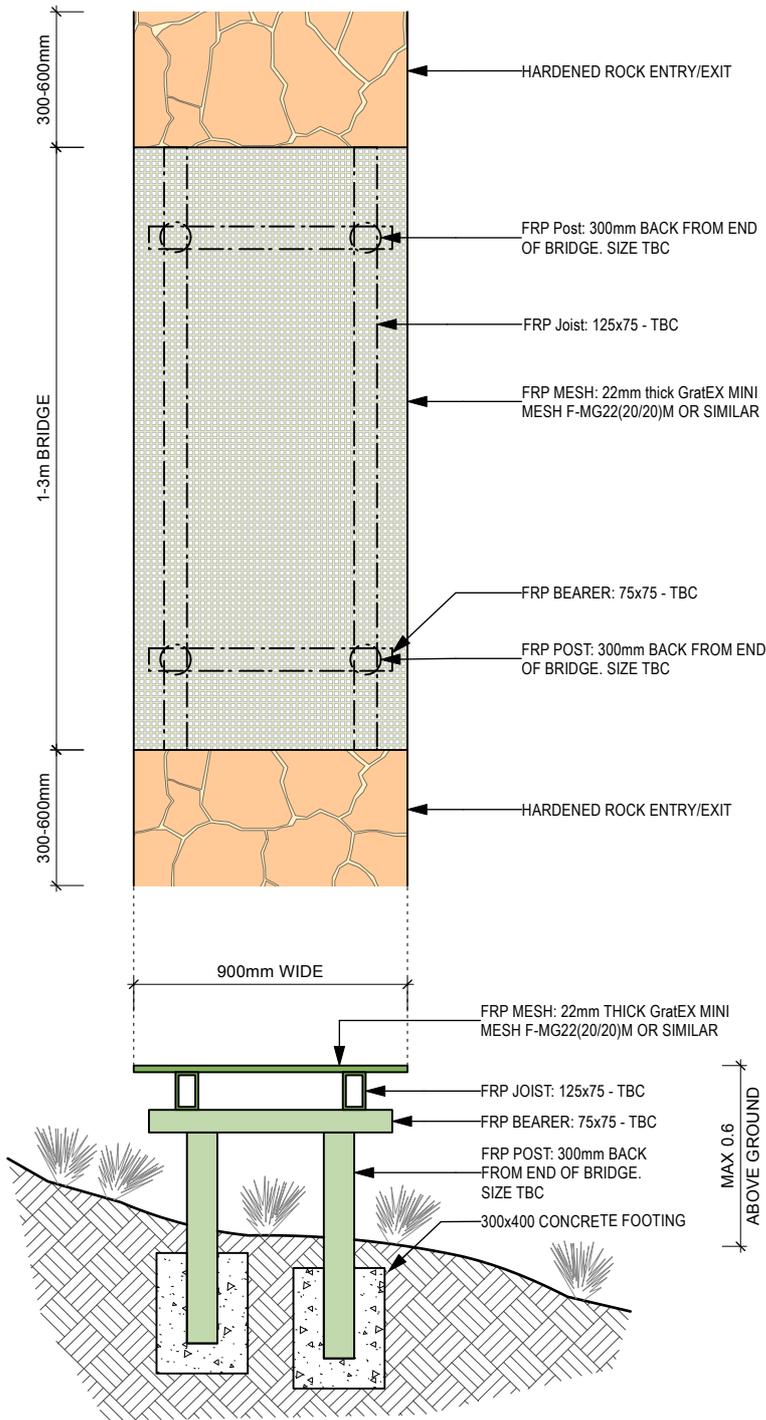
DATE: 5/8/21

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DISCLAIMER

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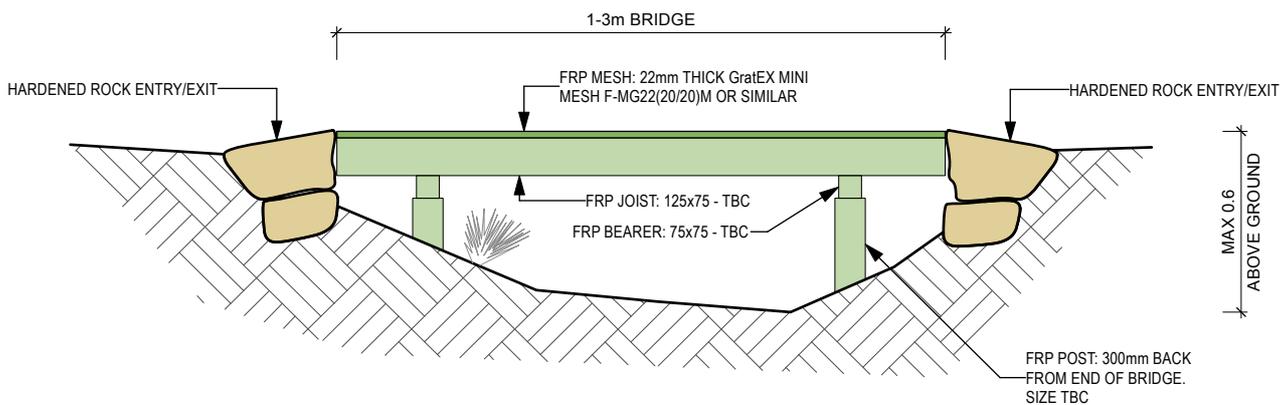
Raised FRP Trail

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

LOCATION: Used to cross small creeks, gullies, 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 be 1:10 subject to trail conditions
4. Bearers between posts and joists allows for upto 300mm of lateral tolerance in joist & mesh location



Bridge Small

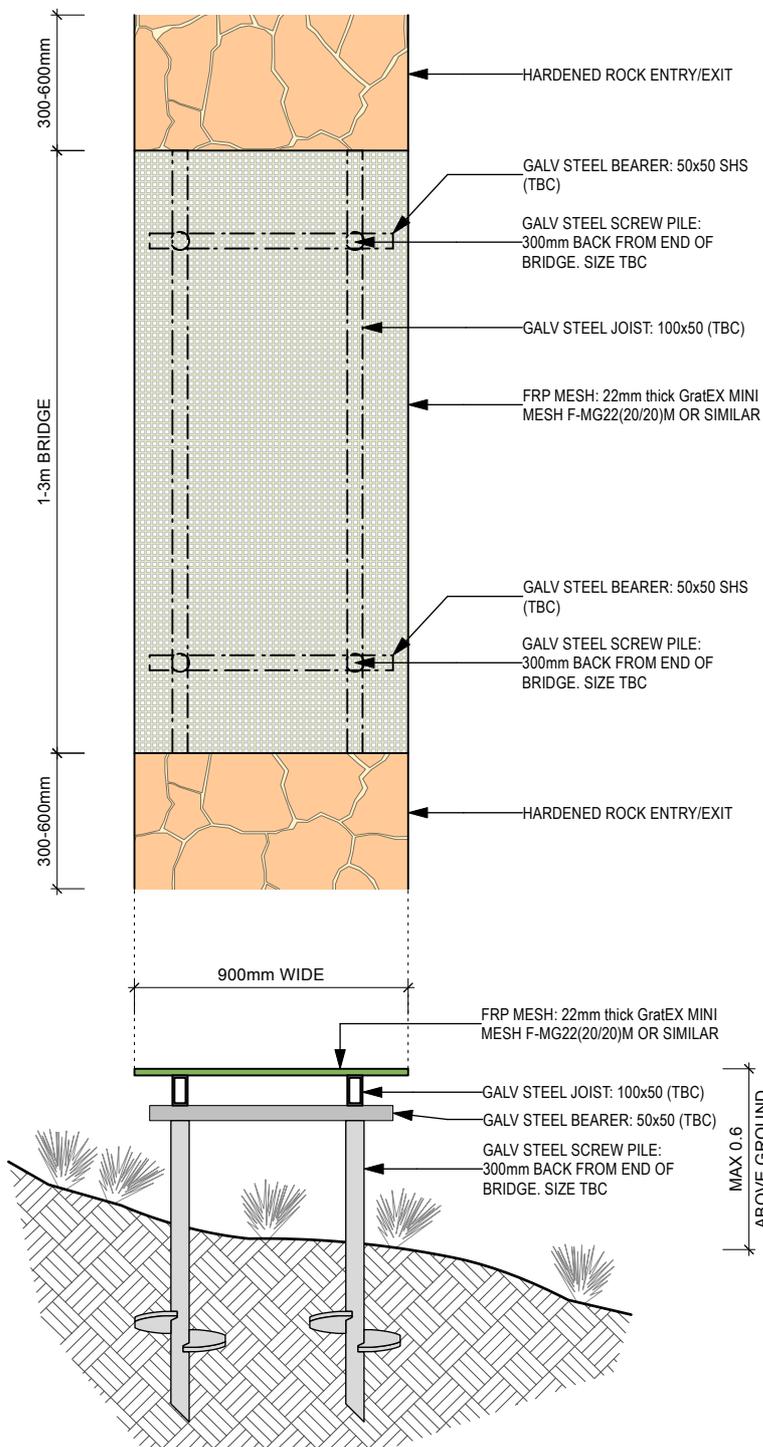
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SCALE: 1:25

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B1 F



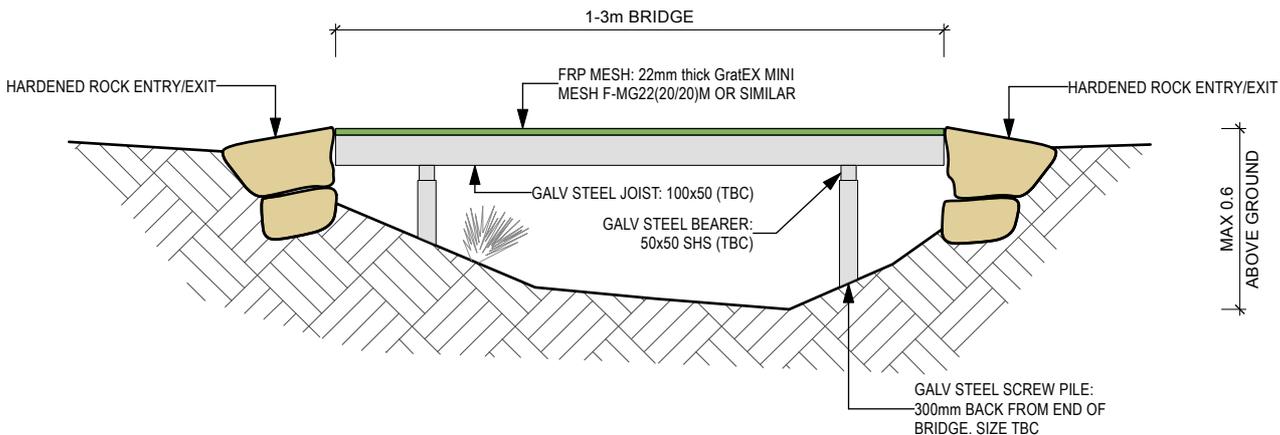
Raised FRP Trail

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, gullies, 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 be 1:10 subject to trail conditions
4. Bearers between posts and joists allows for upto 300mm of lateral tolerance in joist & mesh location



Bridge Small

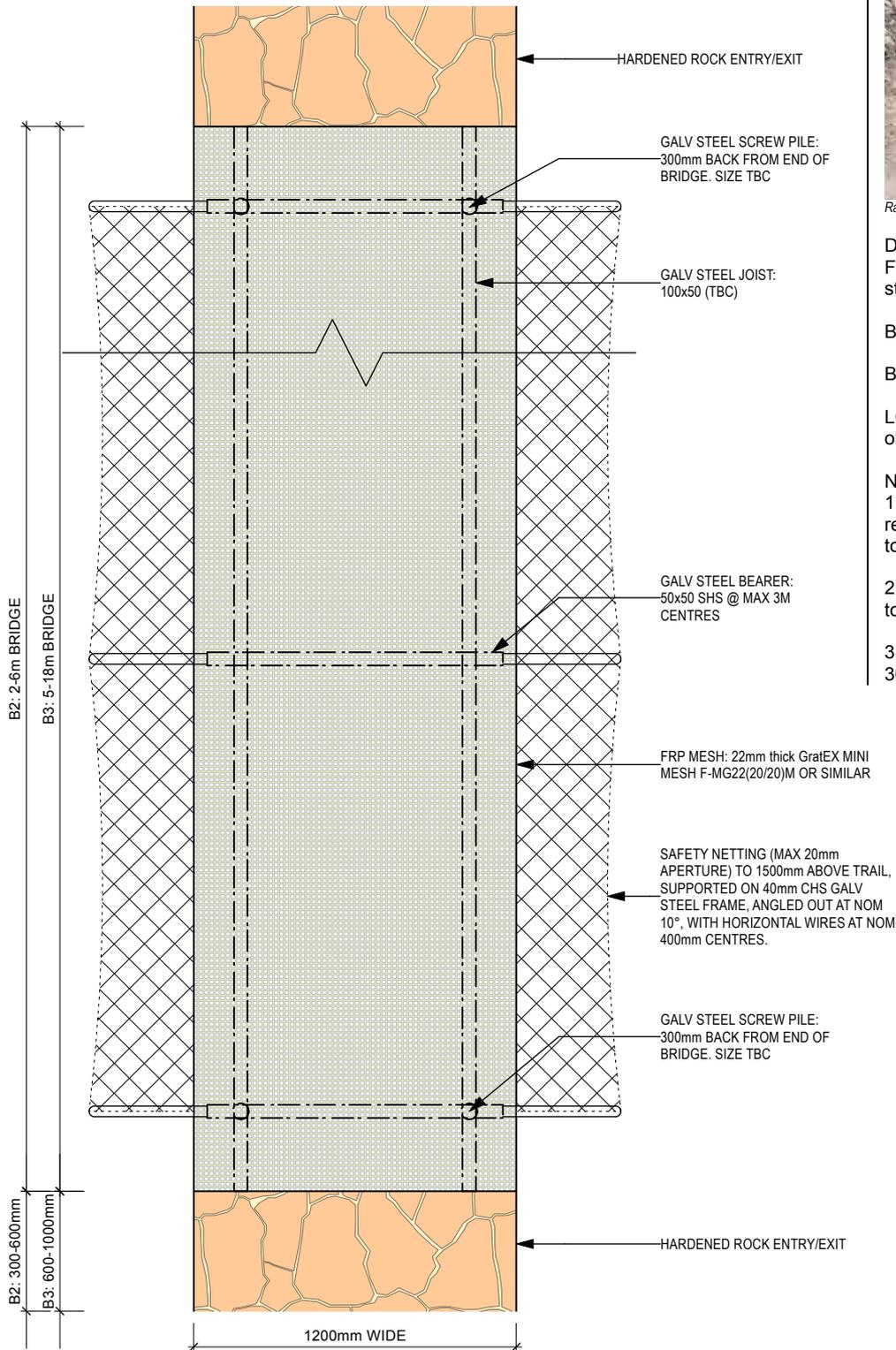
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SCALE: 1:25

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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

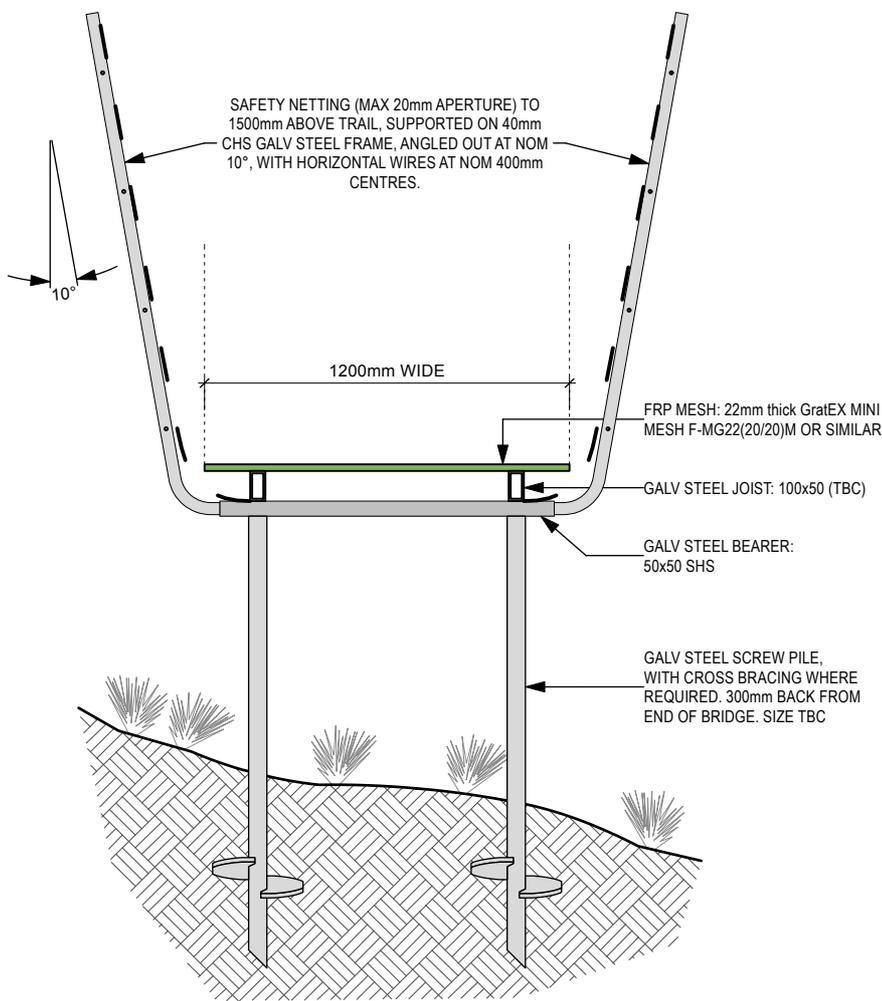
LOCATION: Used to cross creeks, gullies, or other obstructions.

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 be 1:10 subject to trail conditions.

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



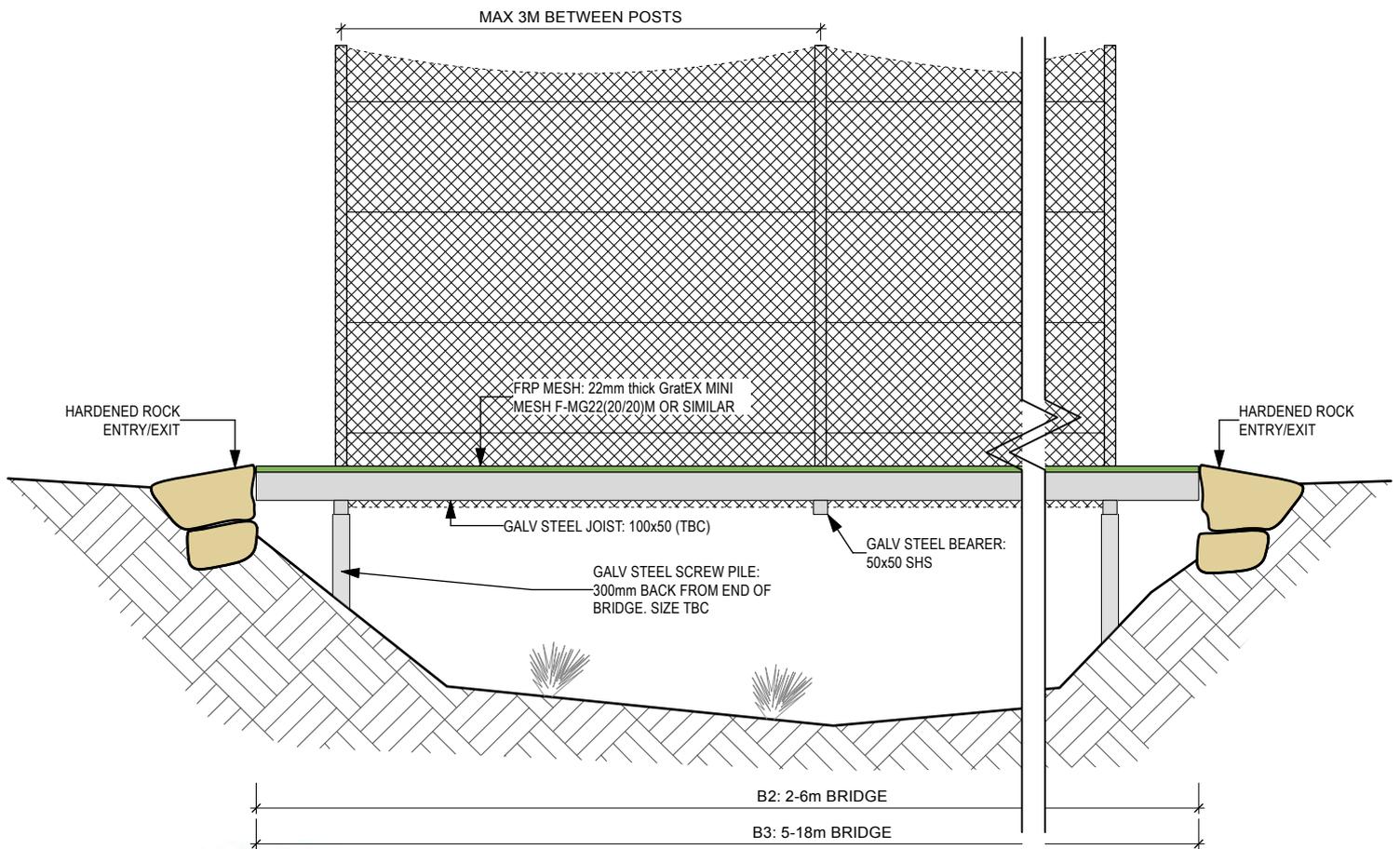
Raised FRP Trail

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, gullies, 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 be 1:10 subject to trail conditions.
3. Bearers between posts and joists allows for upto 300mm of lateral tolerance in joist & mesh location.



Bridge Medium & Large

ILLAWARRA ESCARPMENT

B2,3b

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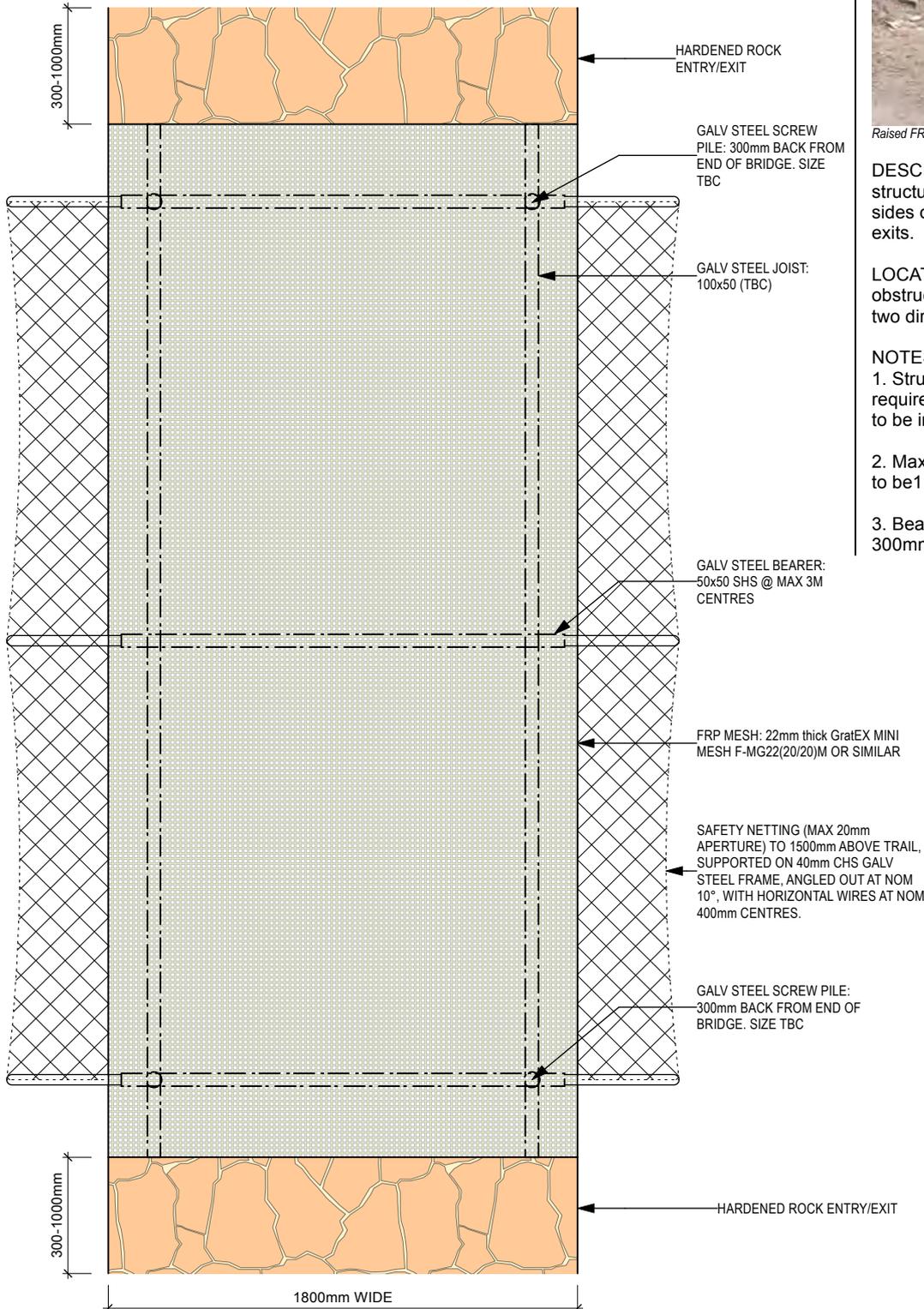
Raised FRP Trail

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, gullies, 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 be 1:10 subject to trail conditions.
3. Bearers between posts and joists allows for upto 300mm of lateral tolerance in joist & mesh location.



Bridge Large Two Way

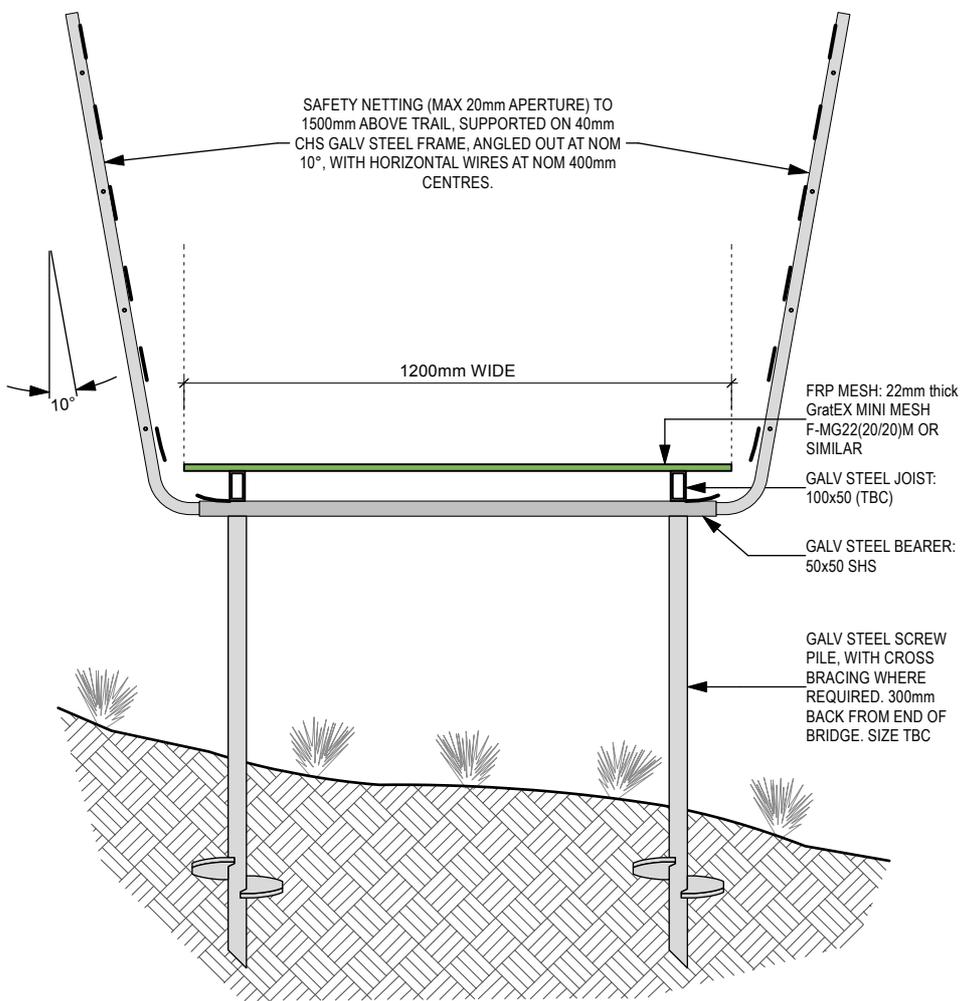
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MOUNTAIN BIKE TRAILS
ILLAWARRA ESCARPMENT

SCALE: 1:25

DATE: 5/8/21

B4a



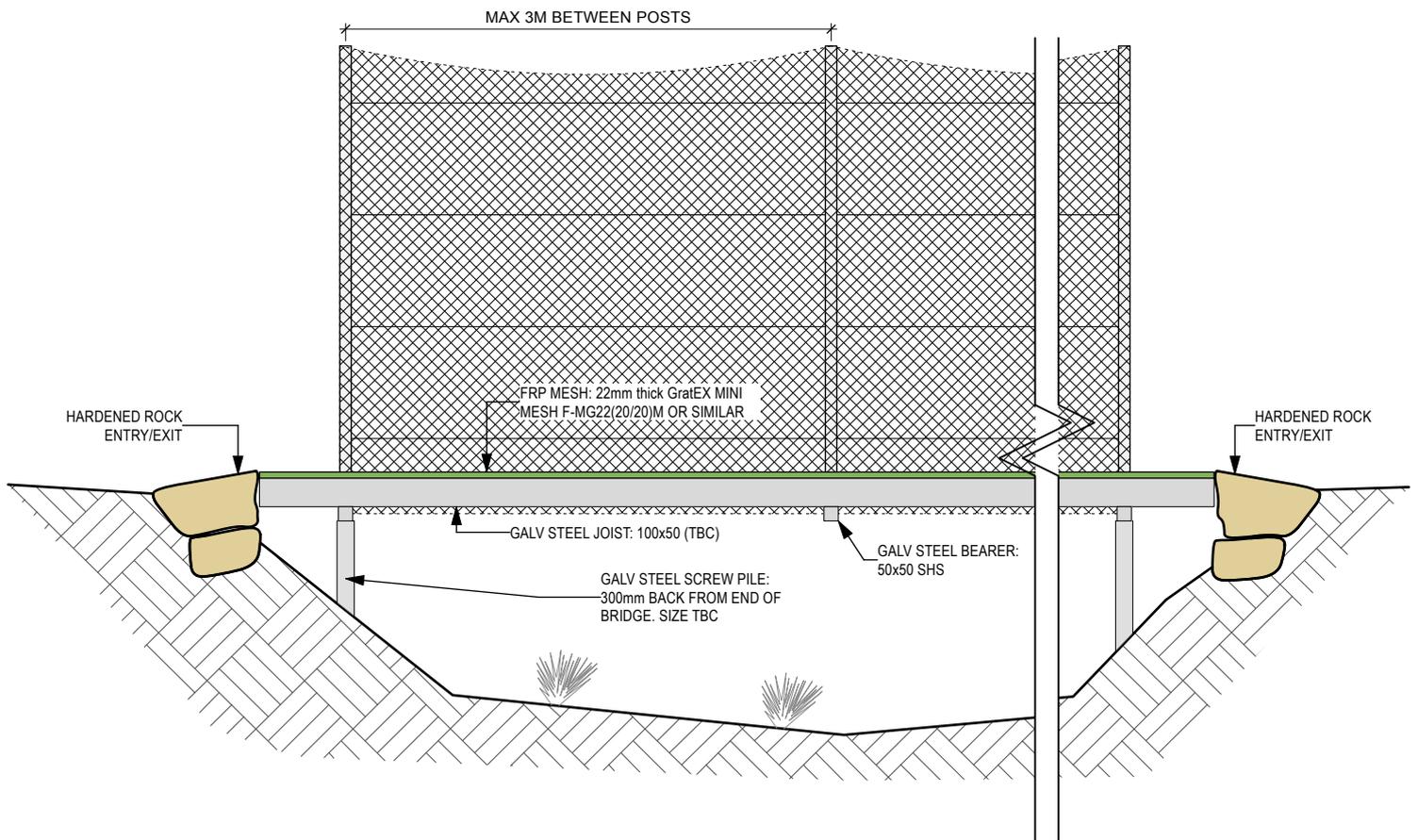
Raised FRP Trail

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, gullies, 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 be 1:10 subject to trail conditions.
3. Bearers between posts and joists allows for upto 300mm of lateral tolerance in joist & mesh location.



Bridge Large Two Way

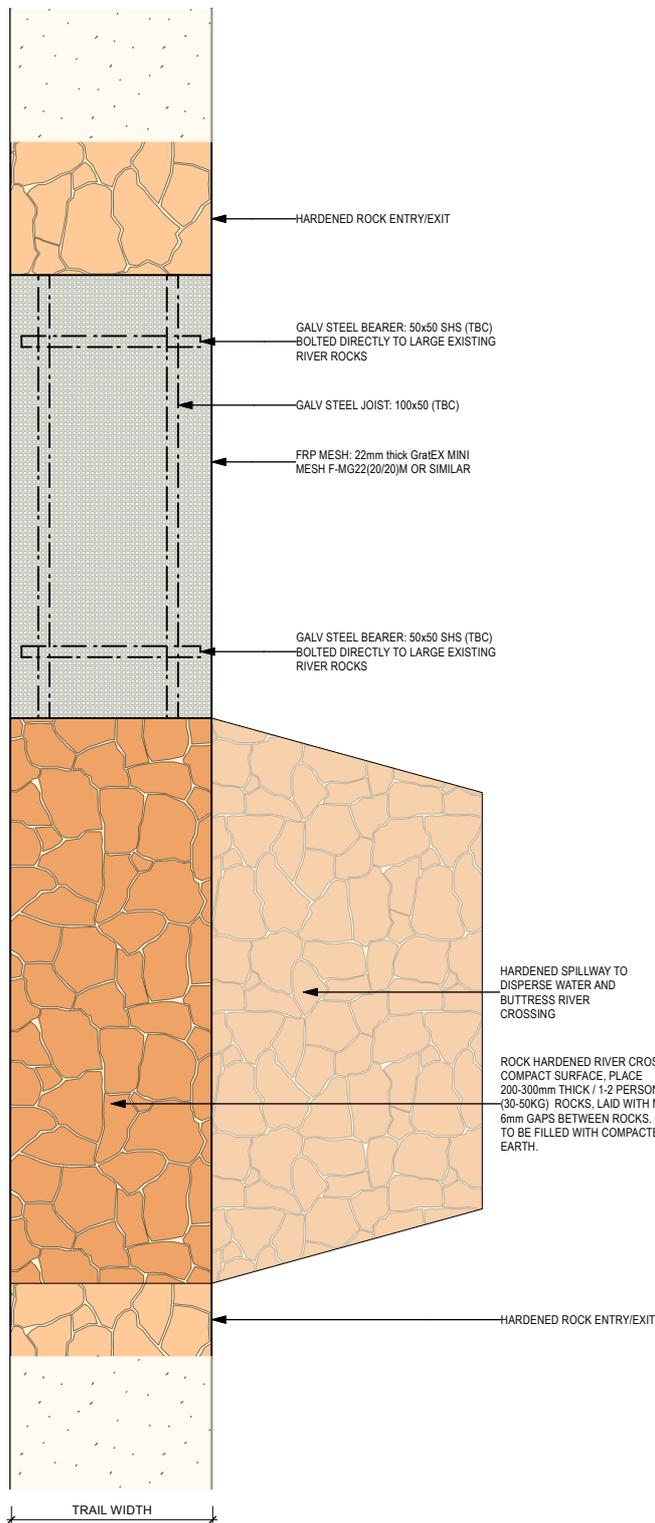
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MOUNTAIN BIKE TRAILS
ILLAWARRA ESCARPMENT

SCALE: 1:25

DATE: 5/8/21

B4b



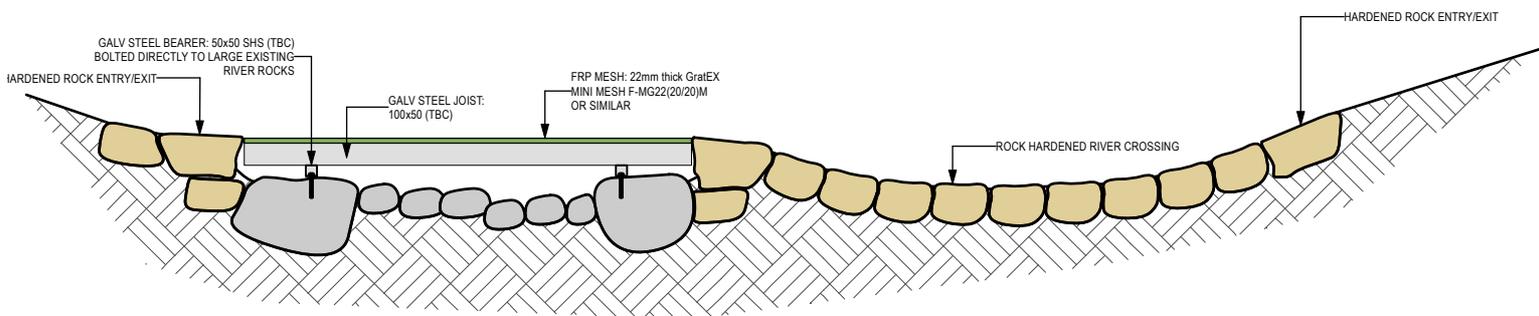
Raised FRP Trail

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 likelihood 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 be 1:10 subject to trail conditions.
4. Bearers between posts and joists allows for upto 300mm of lateral tolerance in joist & mesh location.



Bridge and Hardened River Crossing

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MOUNTAIN BIKE TRAILS

USANGRA ESCARPMENT

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B5



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.

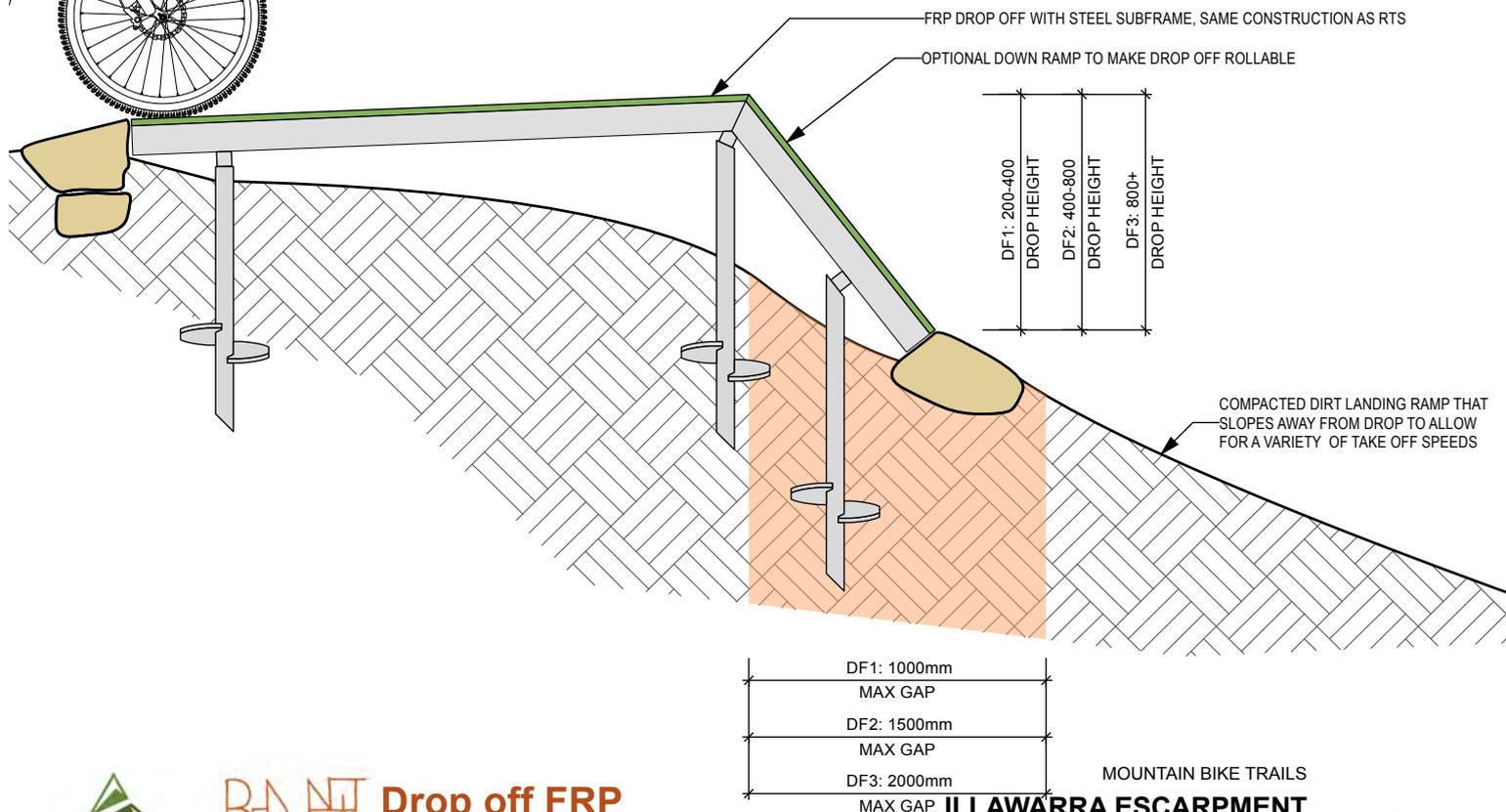
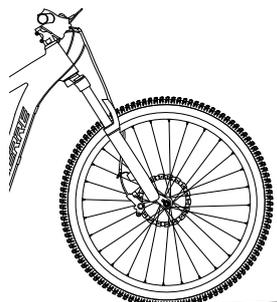
DF3: Feature vertical drop height 800mm +, Gap between drop and lander 0 - 2m.

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

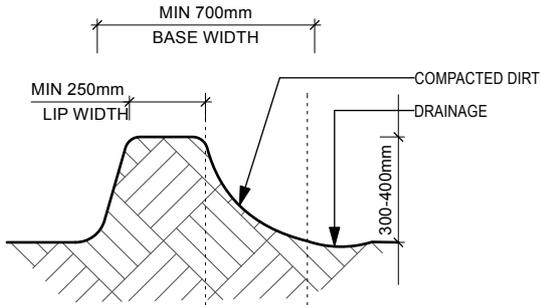
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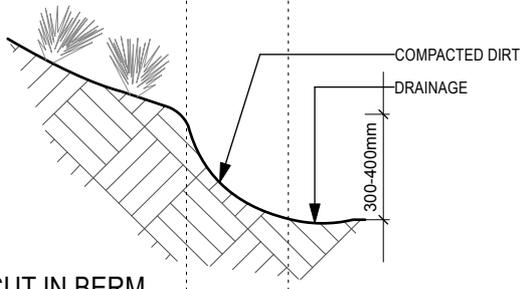
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MOUNTAIN BIKE TRAILS
ILLAWARRA ESCARPMENT

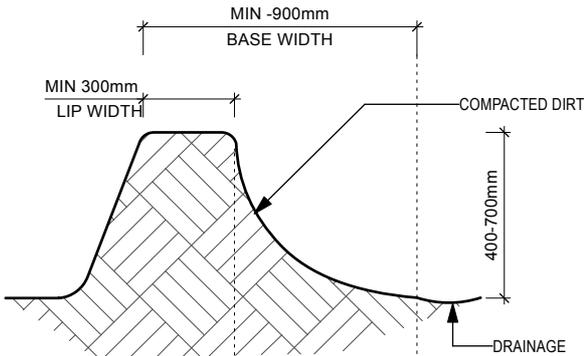
DF1,2,3



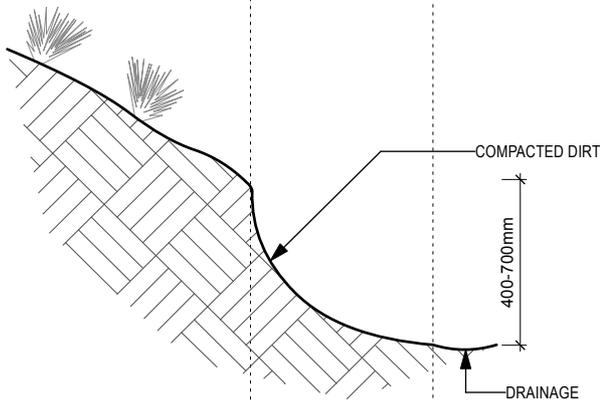
BM1: BUILT UP BERM



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.

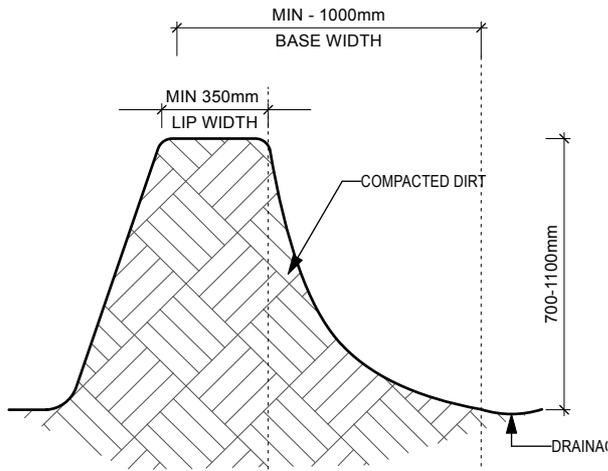
BM1: 300-400mm high, Base width nom 700mm, lip width (if required) nom 250mm. Approx 0.15 cubic metres of soil per lineal metre.

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

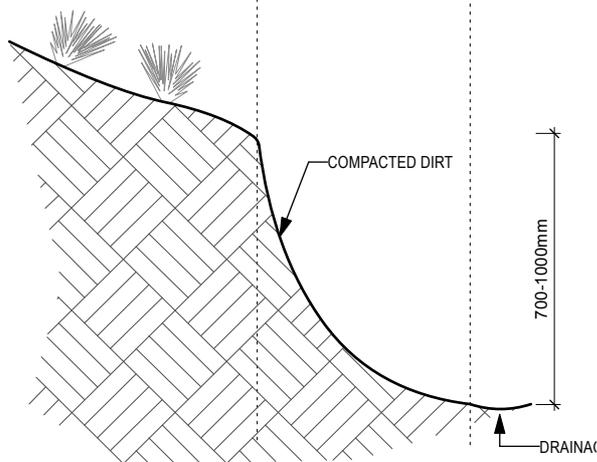
LOCATION: Used to camber trail corners

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



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



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.

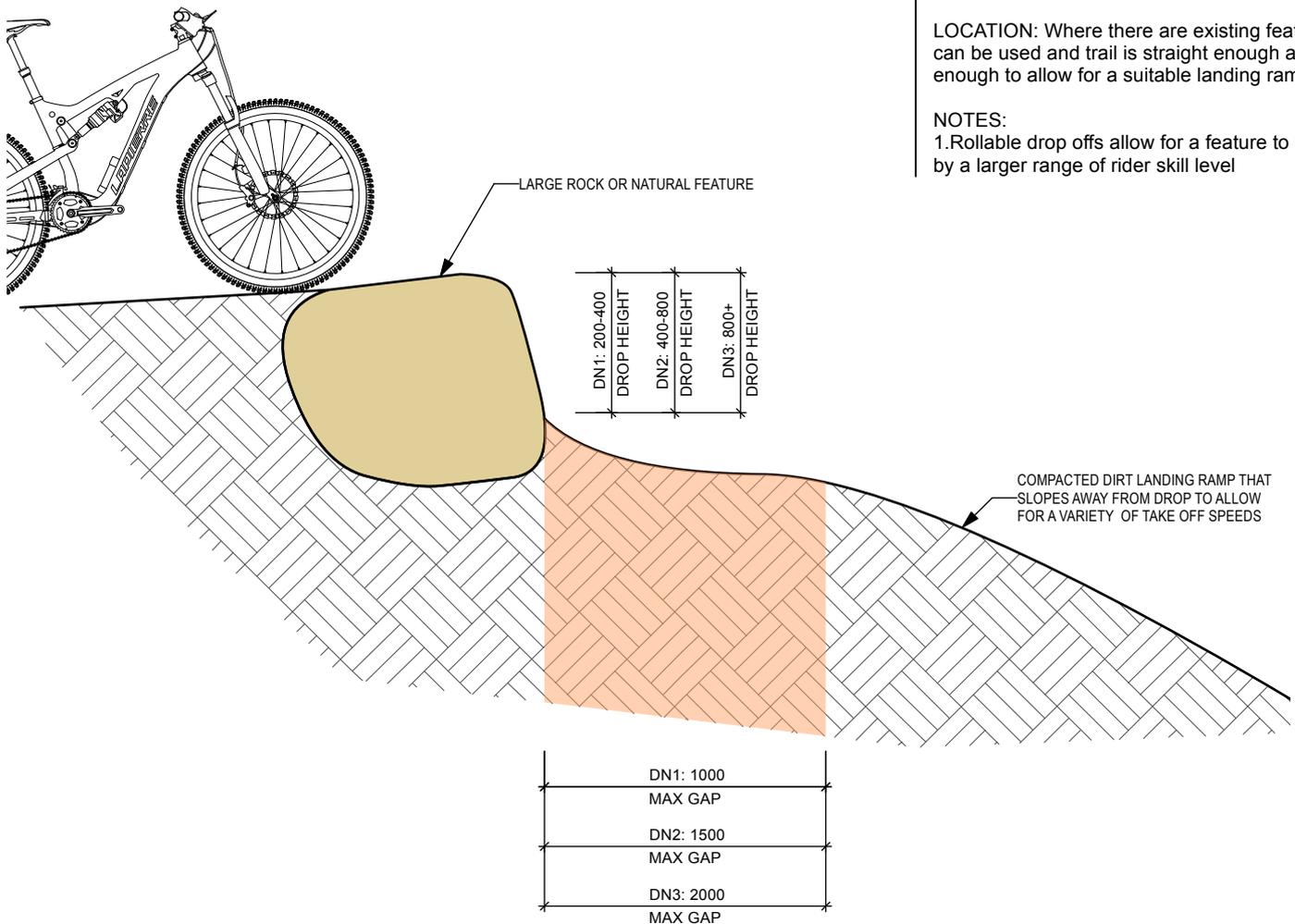
DN3: Feature vertical drop height 800mm +, Gap between drop and lander 0 - 2m.

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

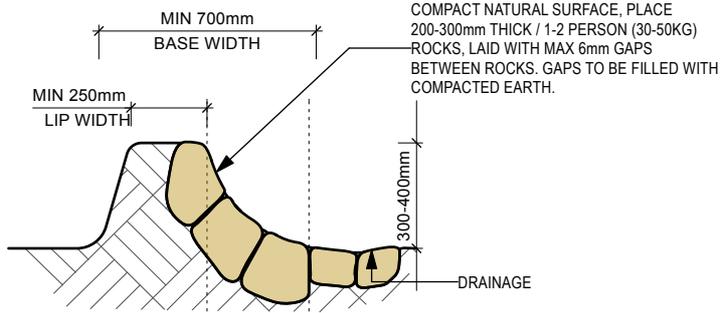
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MOUNTAIN BIKE TRAILS
ILLAWARRA ESCARPMENT

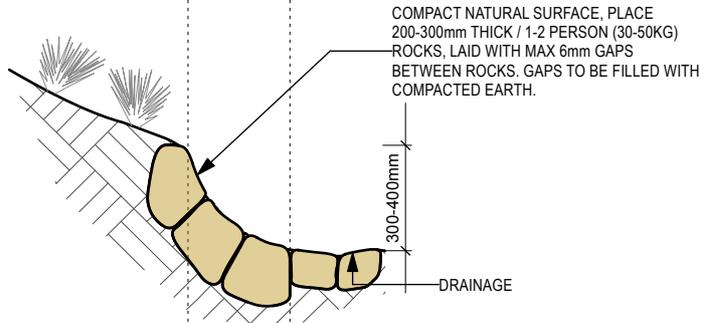
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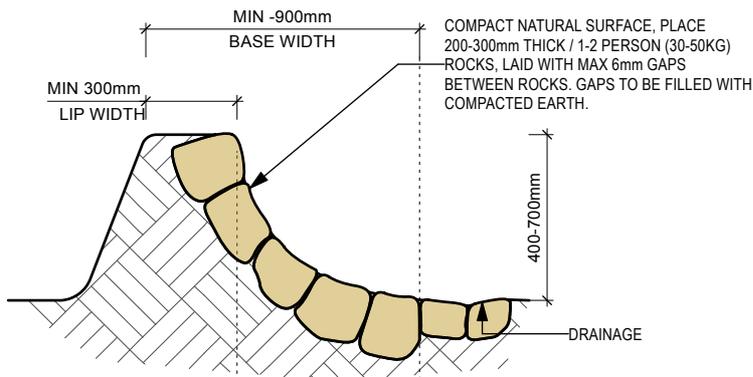
DN1,2,3



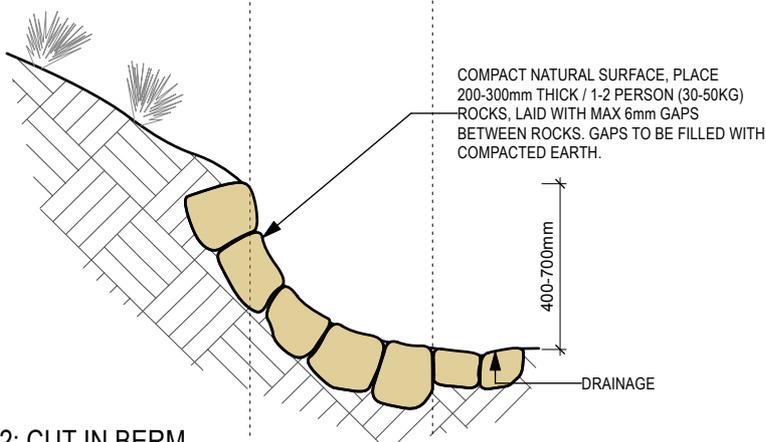
BR1: BUILT UP BERM



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

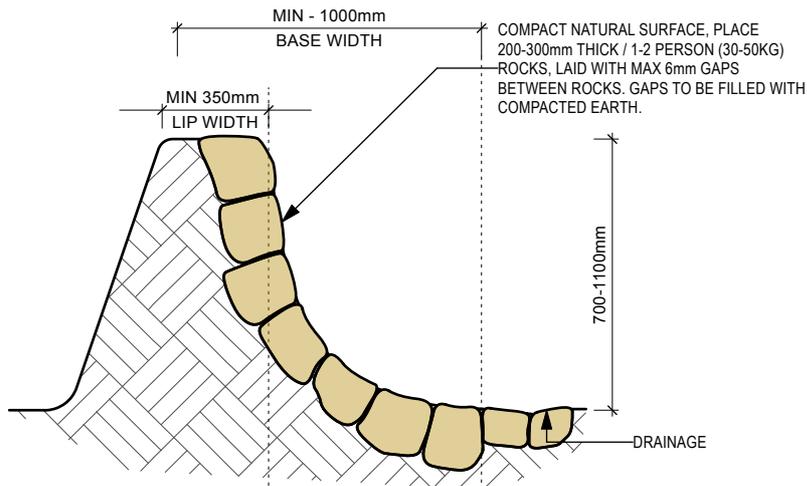
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MOUNTAIN BIKE TRAILS
LAWARRA ESCARPMENT

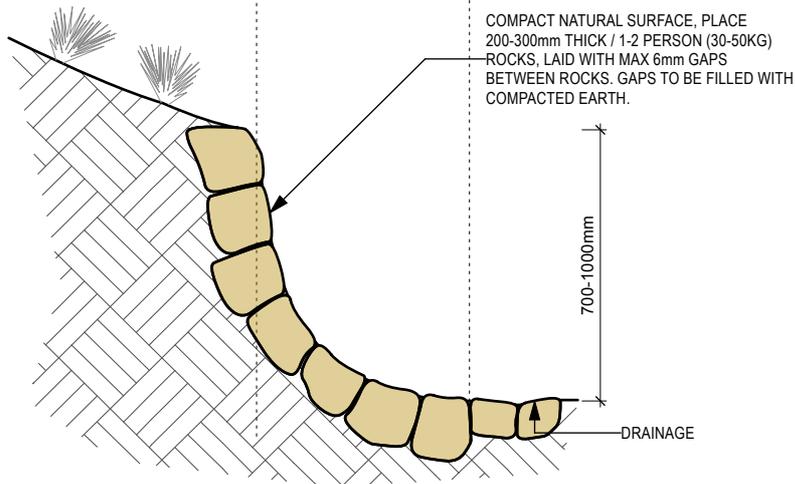
SCALE: 1:25

DATE: 5/8/21

BR1,2



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.

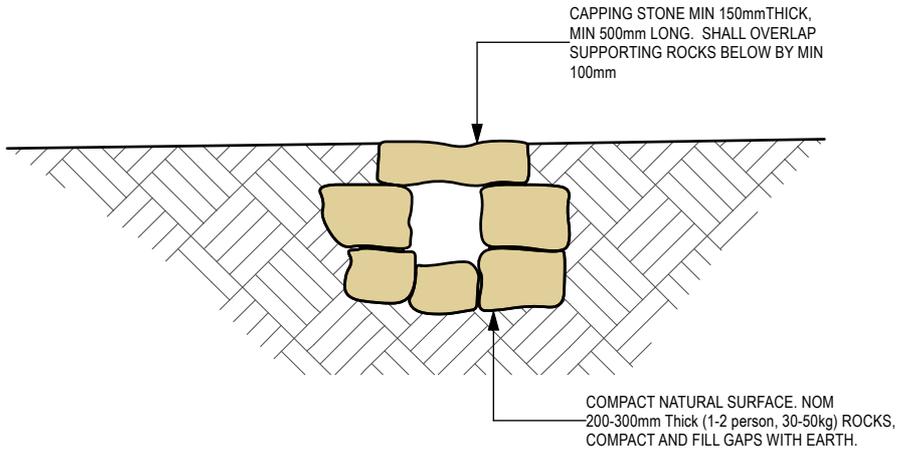
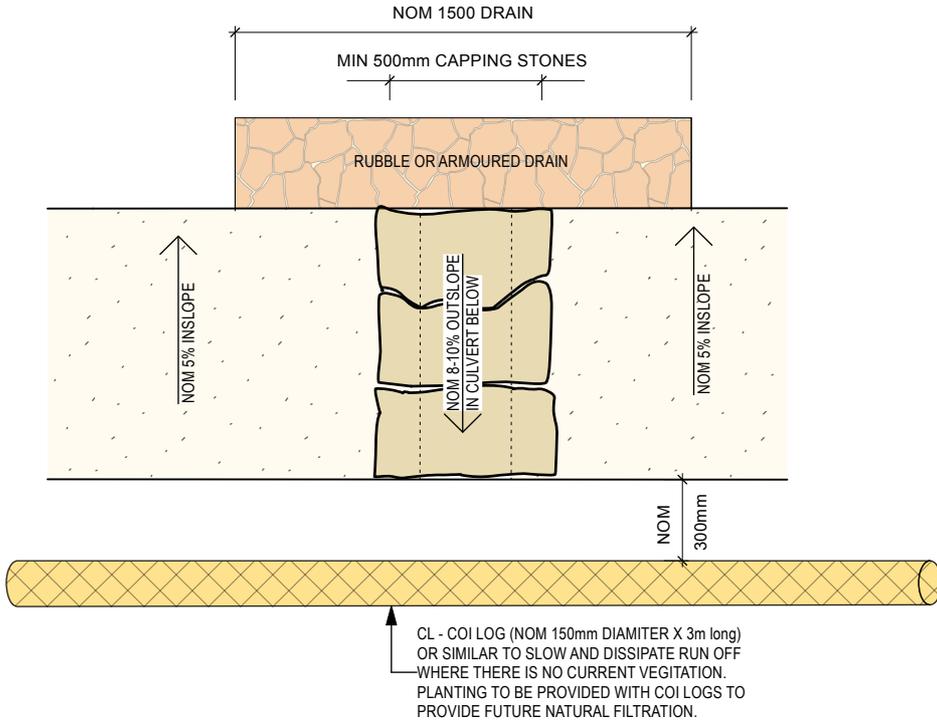
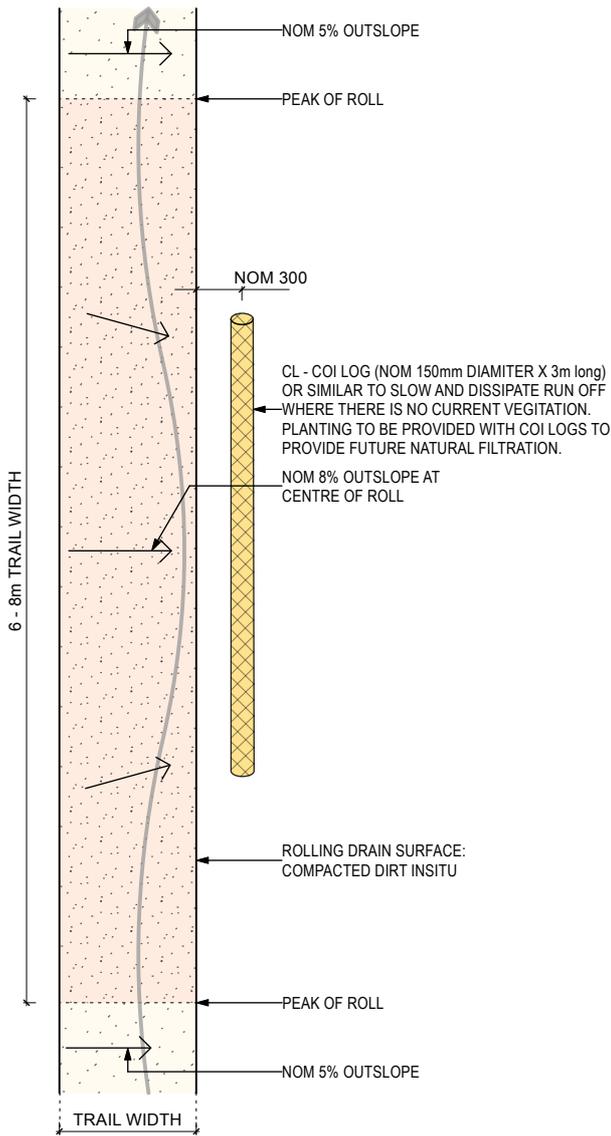


IMAGE DISCRIPTION

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.

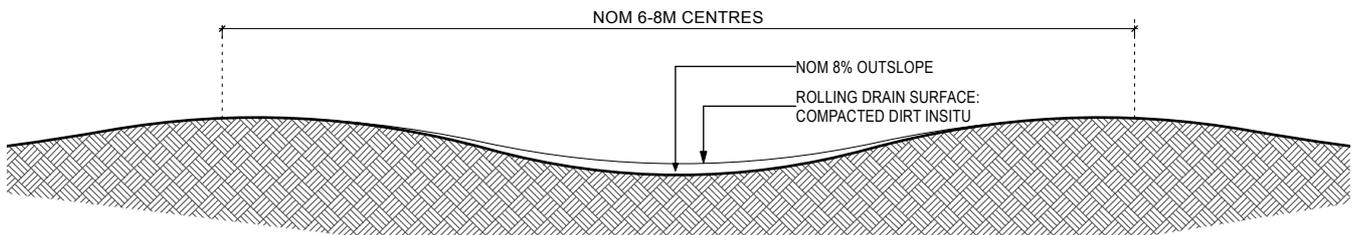


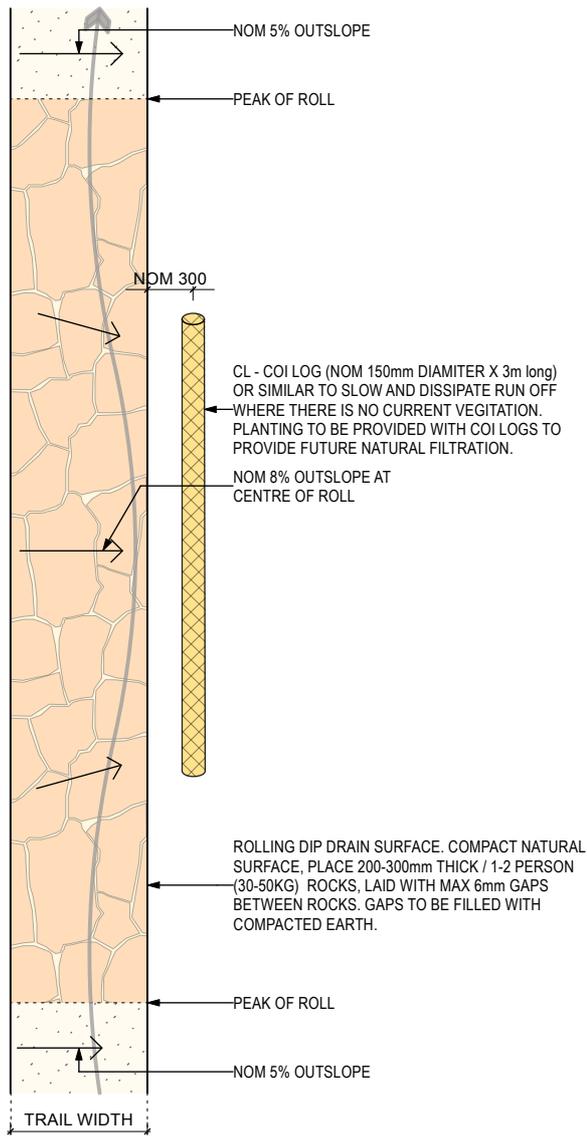
Rolling Dip with Hardened Spill Way

DESCRIPTION: Rolling Dip in trail to allow water to drain

LOCATION: Used between multiple rollers

NOTES:



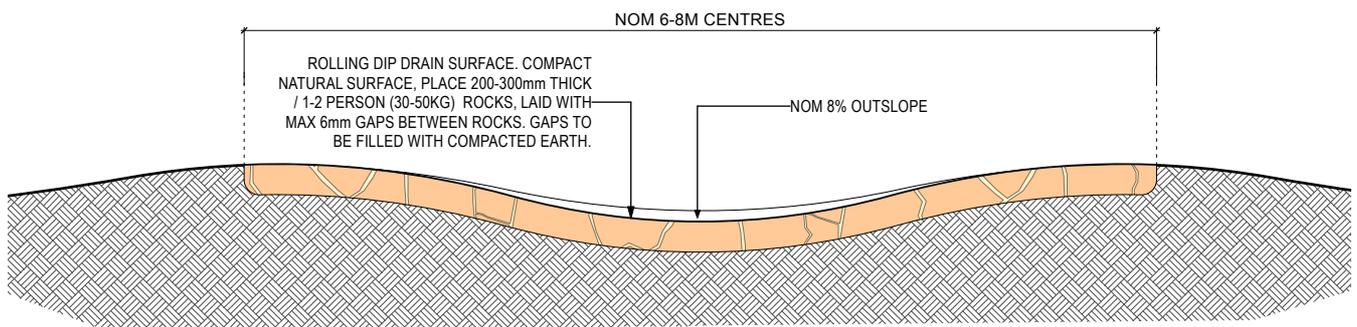


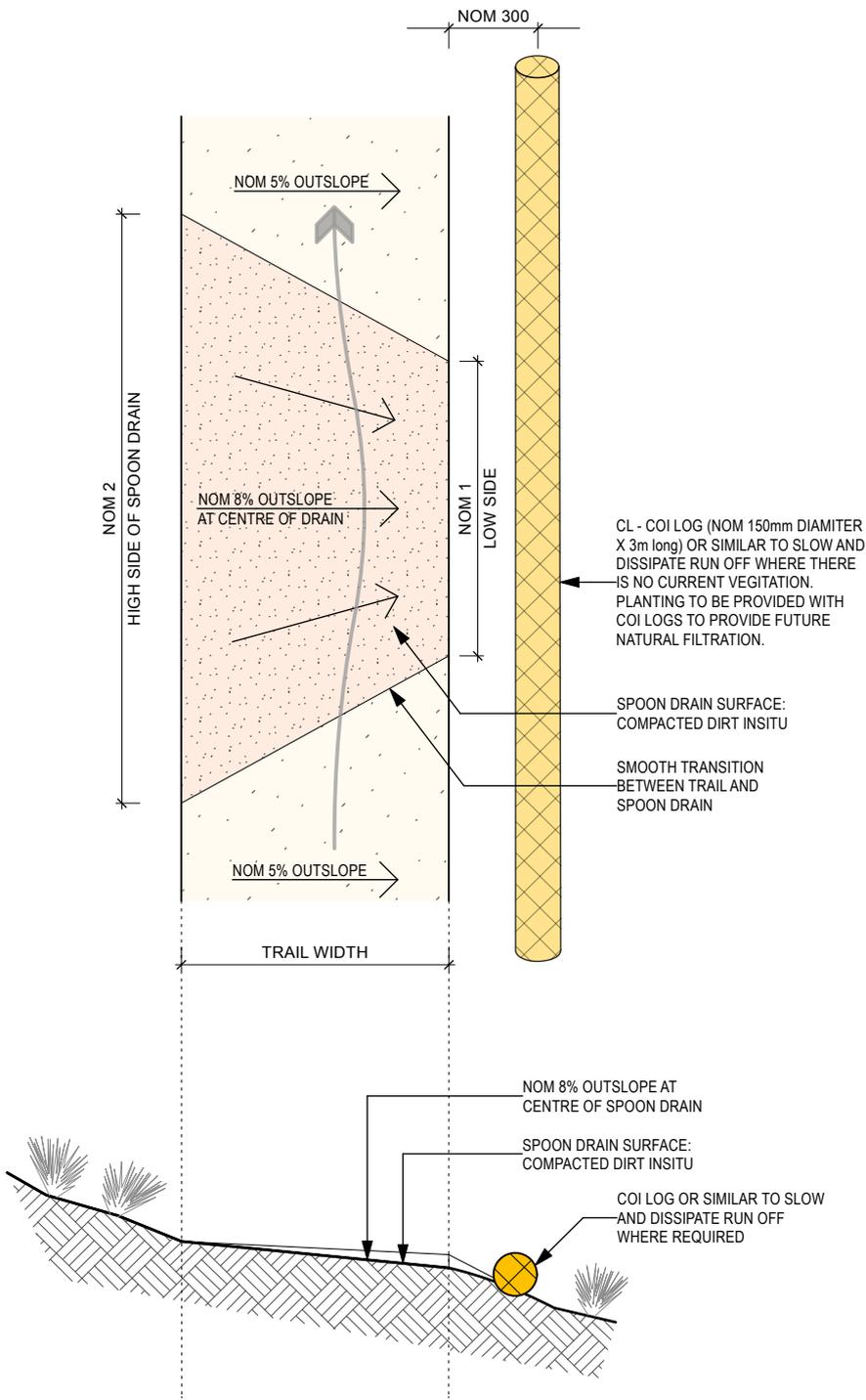
Rolling Dip with Hardened Spill Way

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.



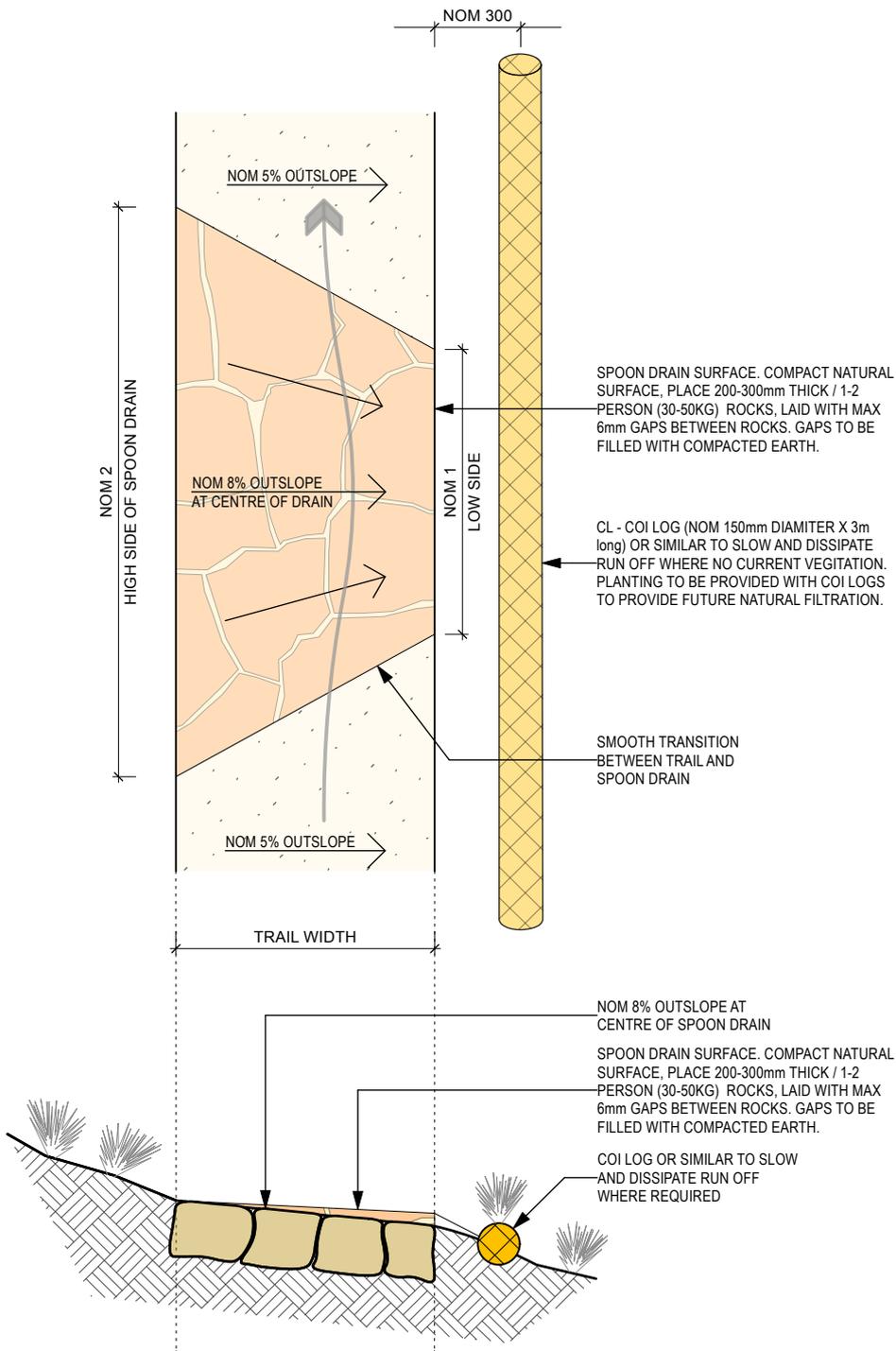


Spoon drain with spreader log

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:

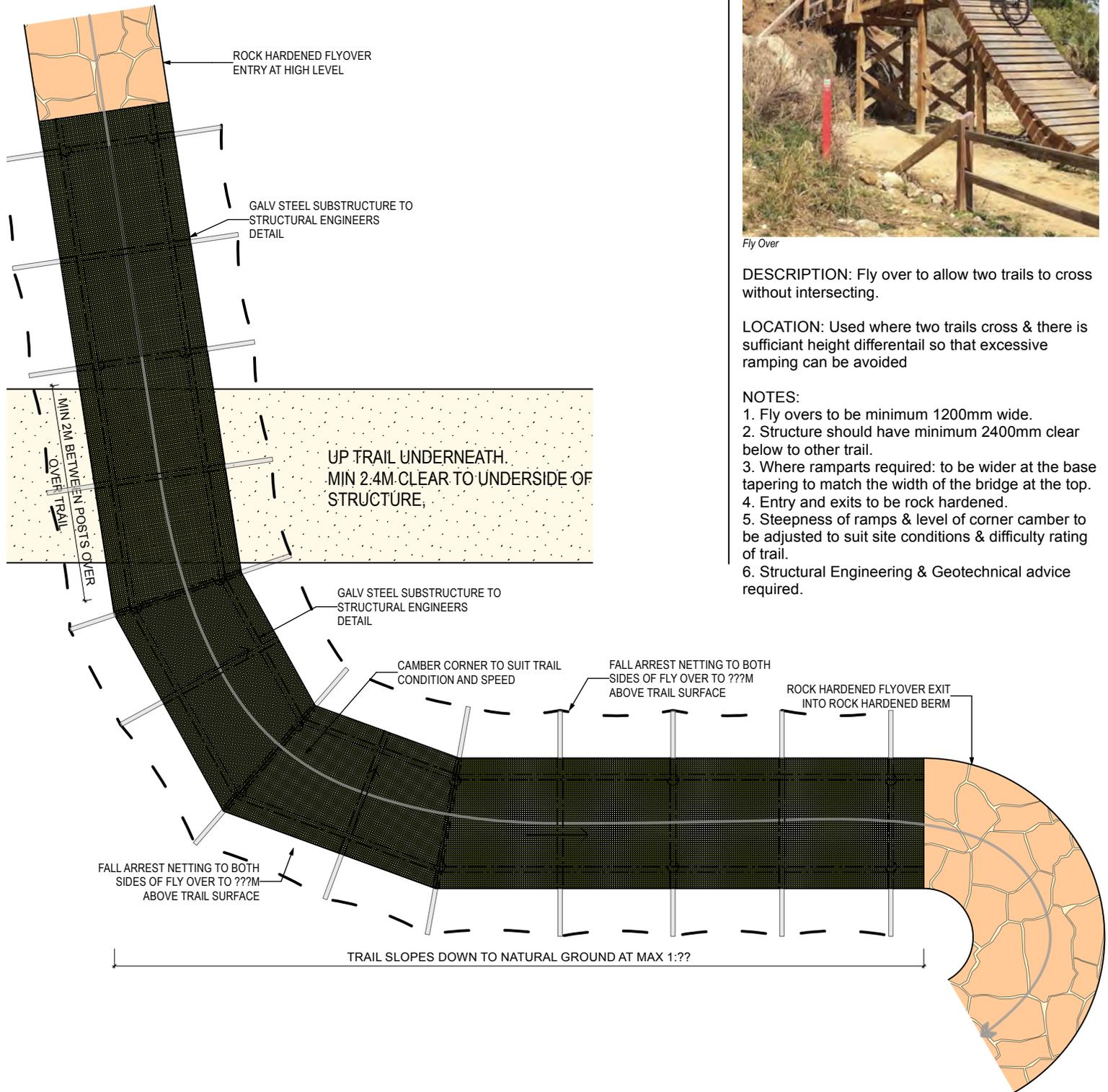


Hardened Spoon drain with HSW

DESCRIPTION: Rock Hardened Spoon Drain

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

NOTES:



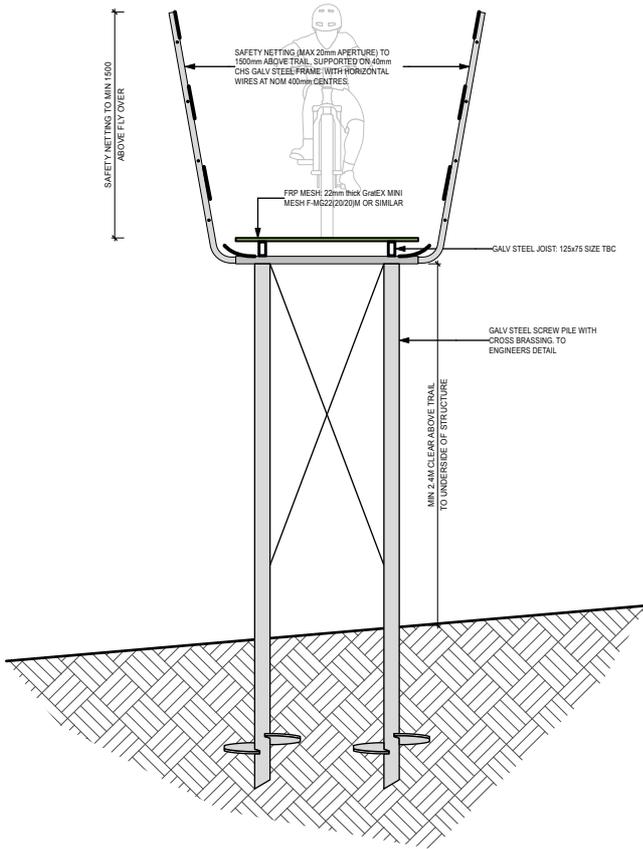
Fly Over

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

LOCATION: Used where two trails cross & there is sufficient height differential 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.



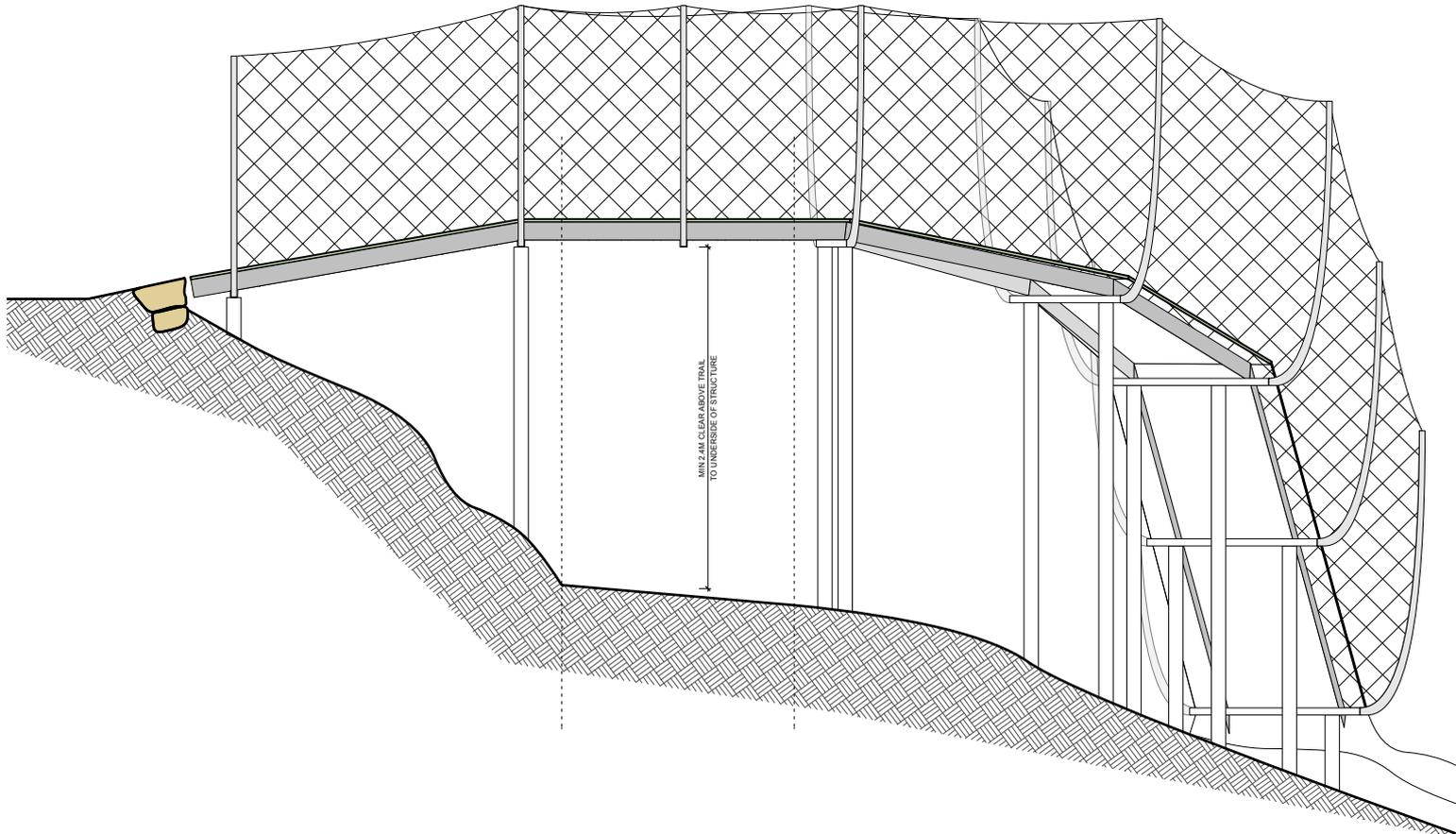
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NOTES:

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

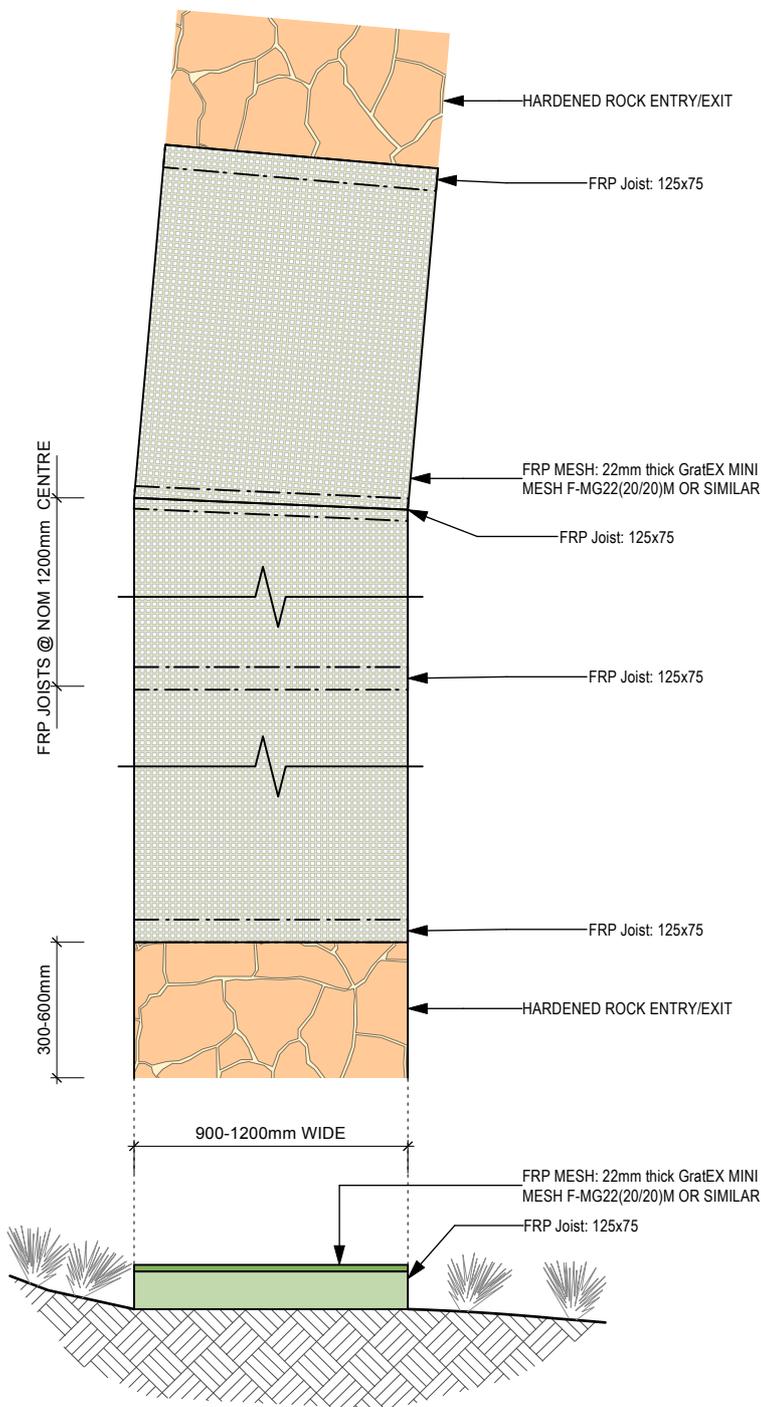
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 Nominated Architect: Jacqueline Bennett 6536

MOUNTAIN BIKE TRAILS
ILLAWARRA ESCARPMENT

SCALE: 1:25

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F1b



Hardened Rock Trail

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

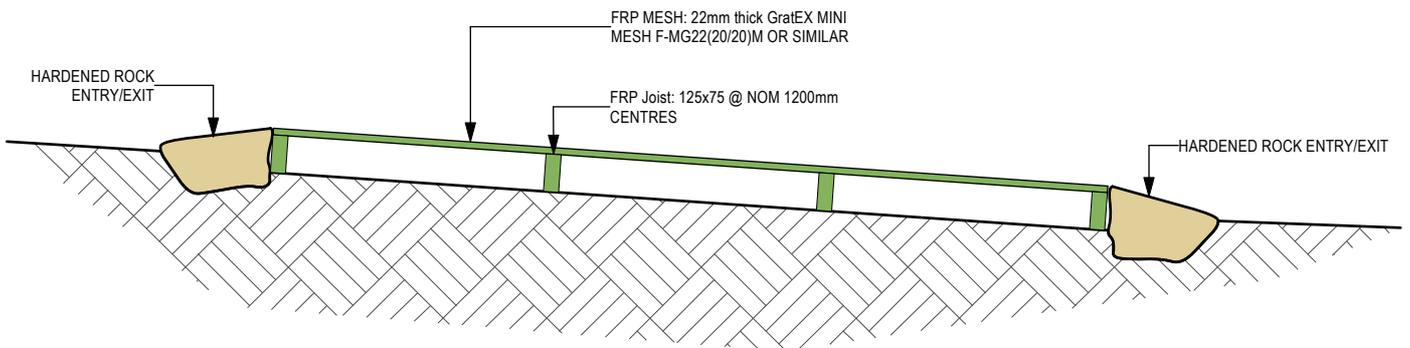
LOCATION: Used where it is necessary to minimise the disturbance to the existing ground conditions

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

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FT



Gap Jump

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

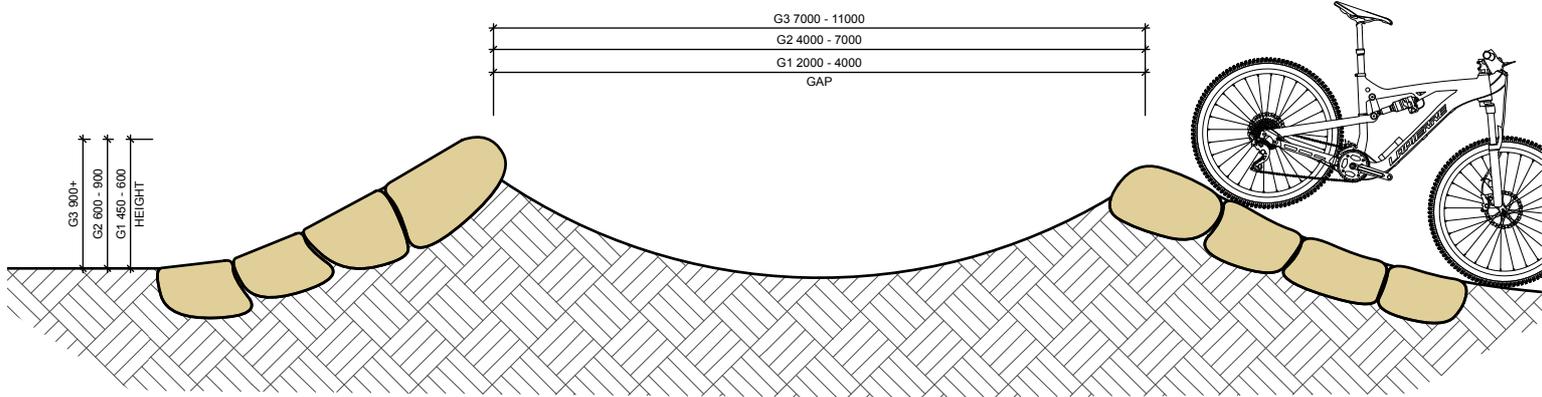
G1: Height of take off ramp 450 to 600mm. Feature length 2 -4m. Soil Volume is 0.9 to 1.2 cubic metres

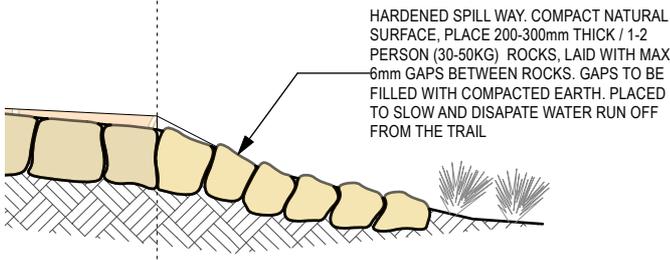
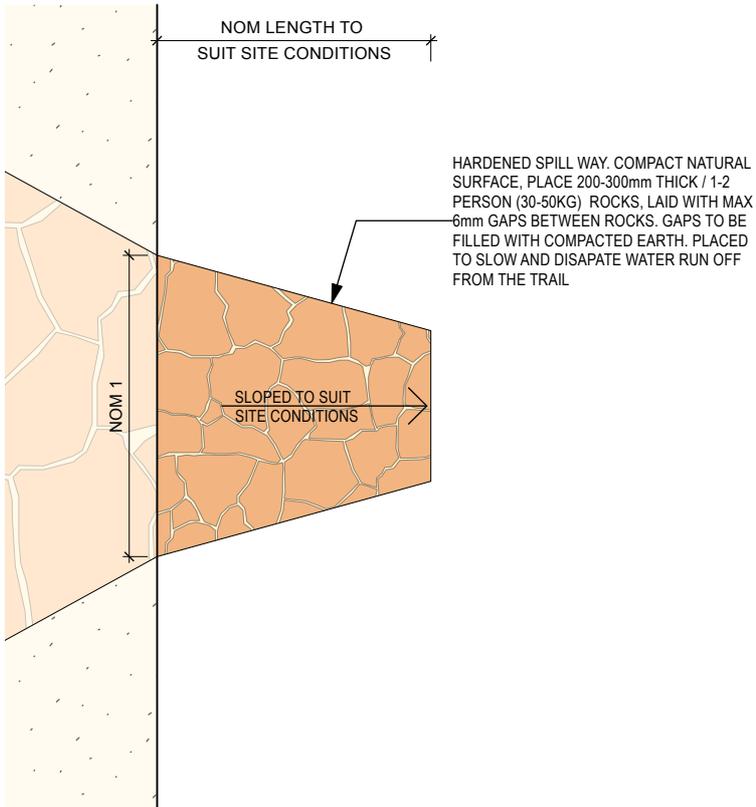
G2: Height of take off ramp 600 to 900mm. Feature length 4 -7m. Soil Volume is 1.2 to 3 cubic metres

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:





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

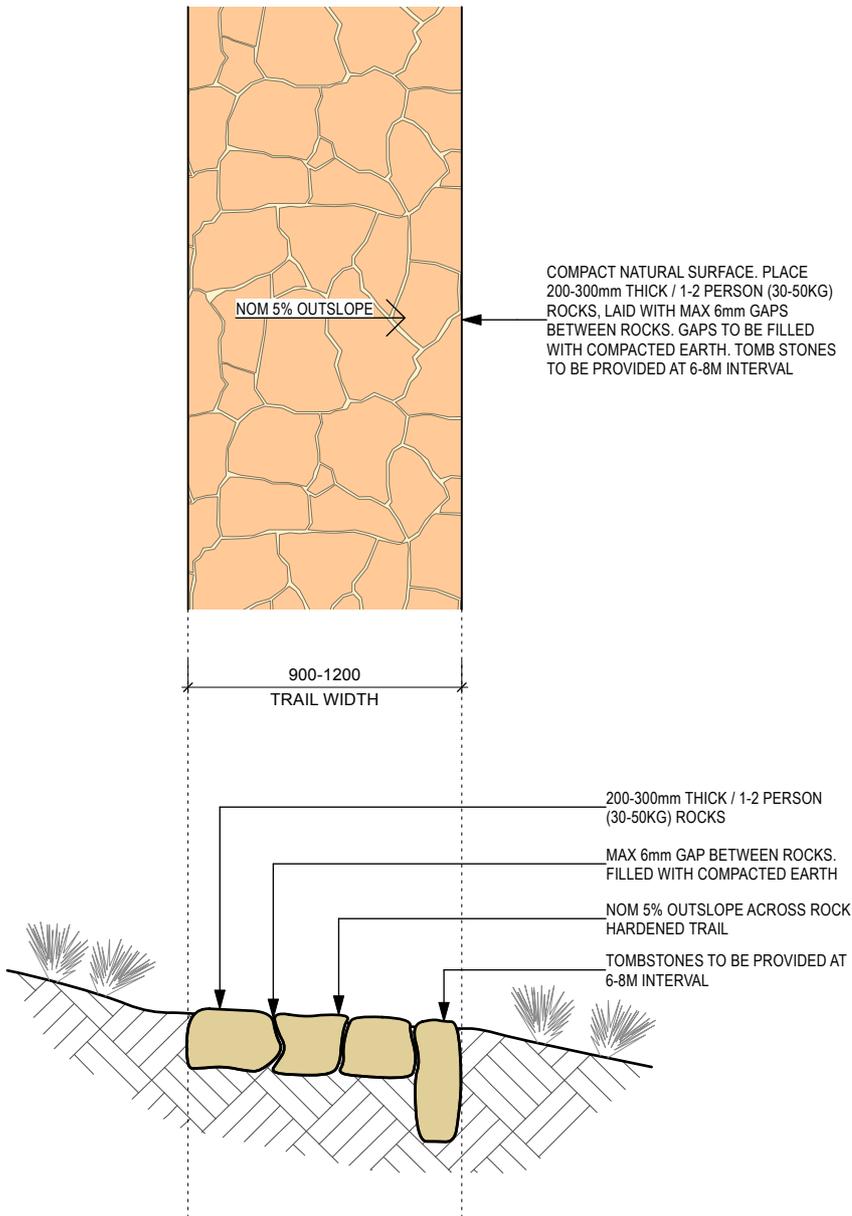


Hardened Rock Trail

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 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





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

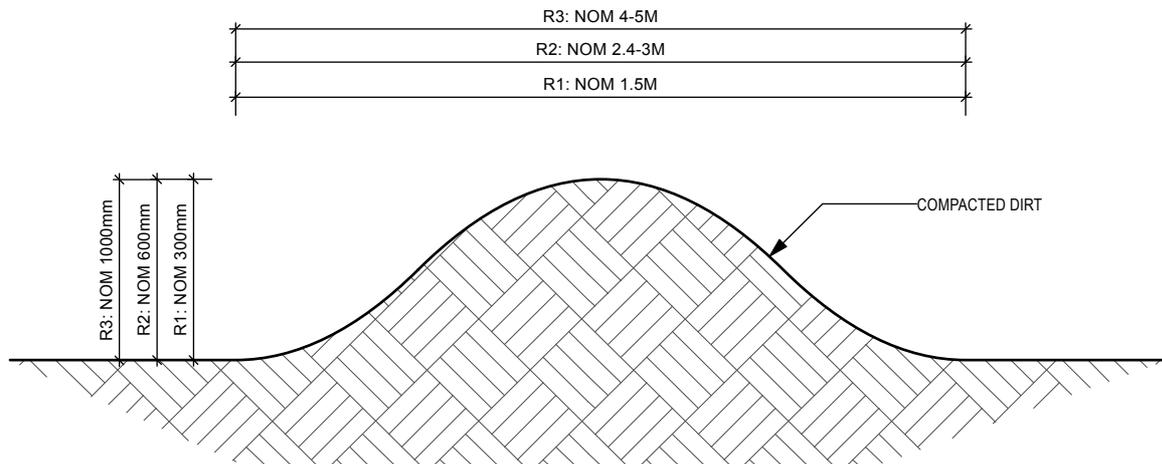
R2: Height of feature to 600mm over a 2.4-3M length (approximate) compacted soil volume 1 cubic metre

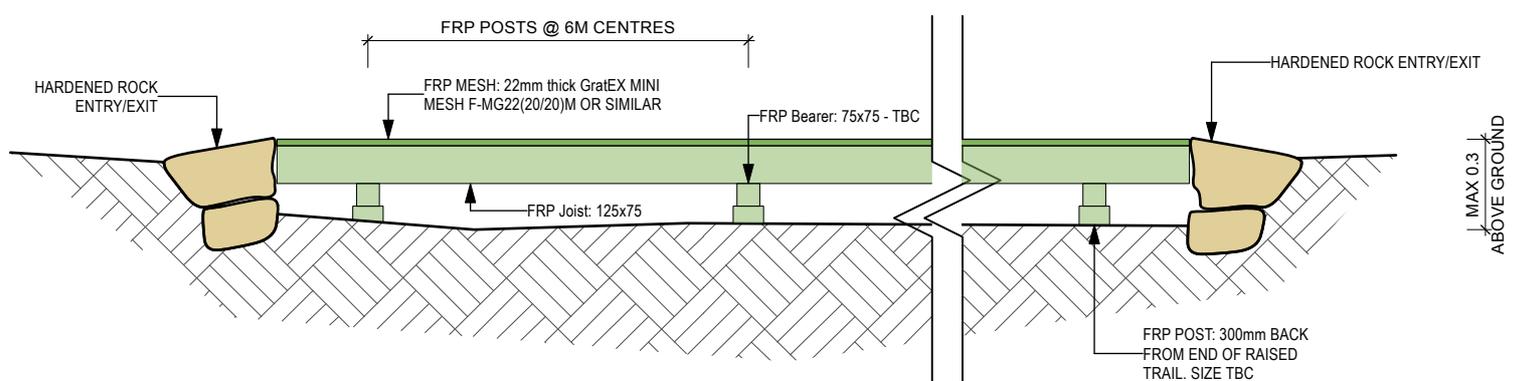
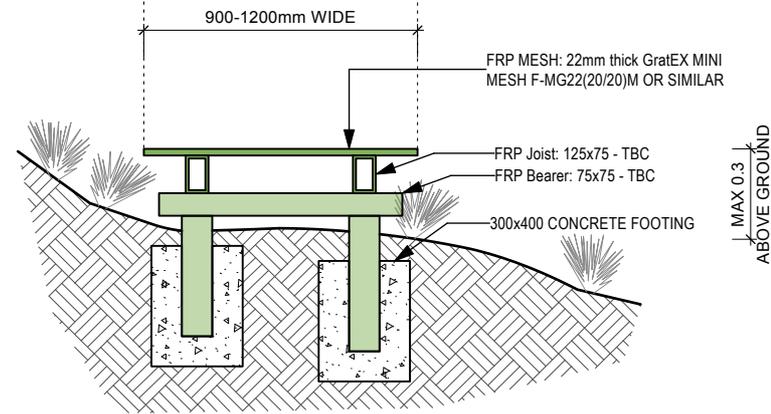
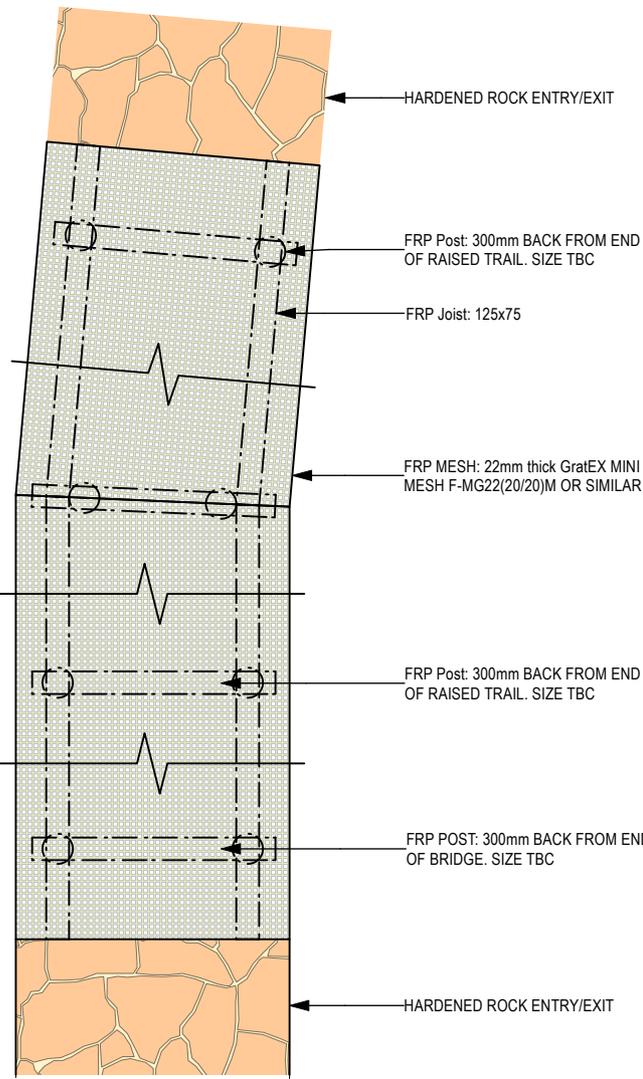
R3: Height of feature to 1000mm over a 4-5M length (approximate) Soil volume 3 cubic metres compacted

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

NOTES:

1. Trail either side of and in between 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.





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.



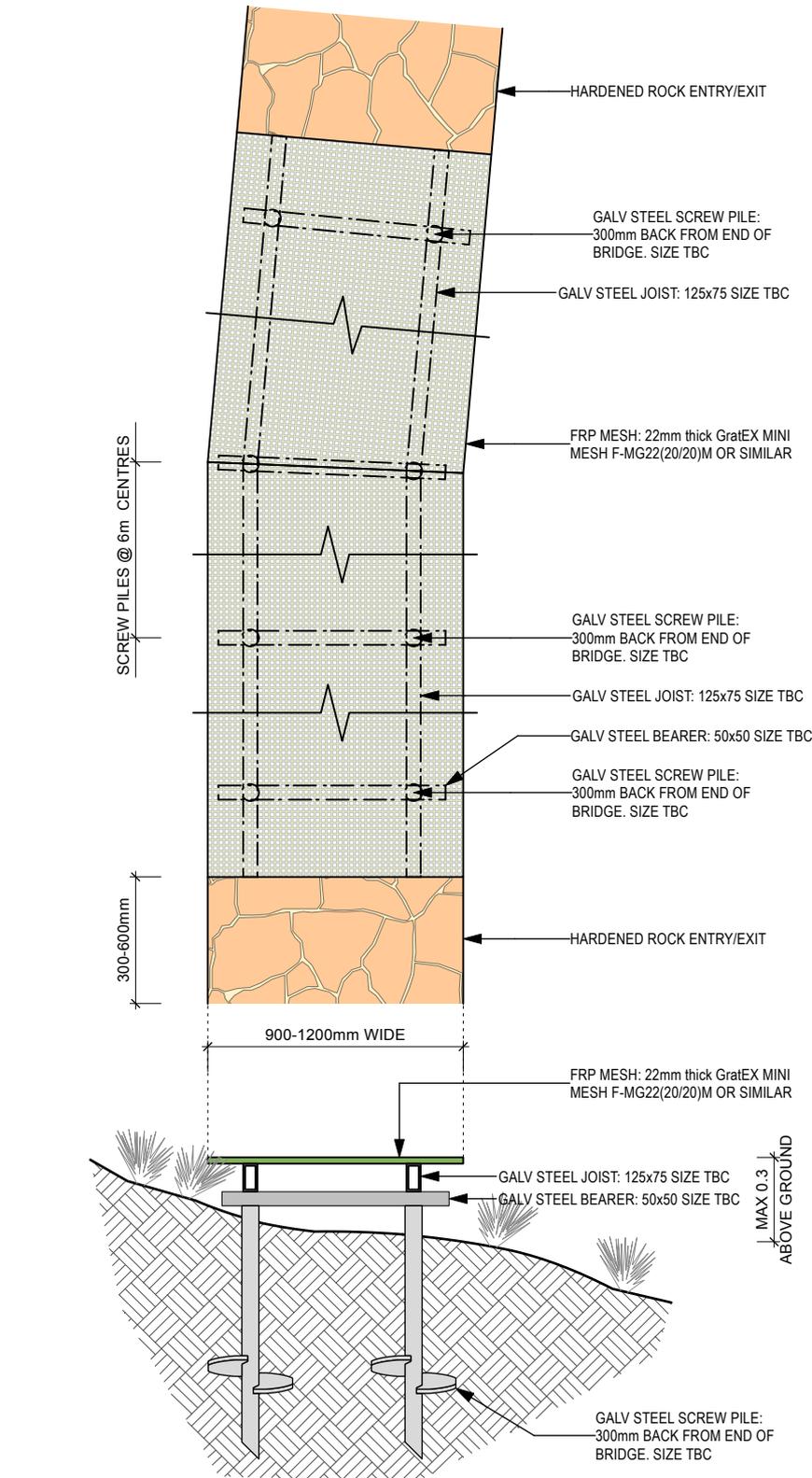
Raised Trail FRP

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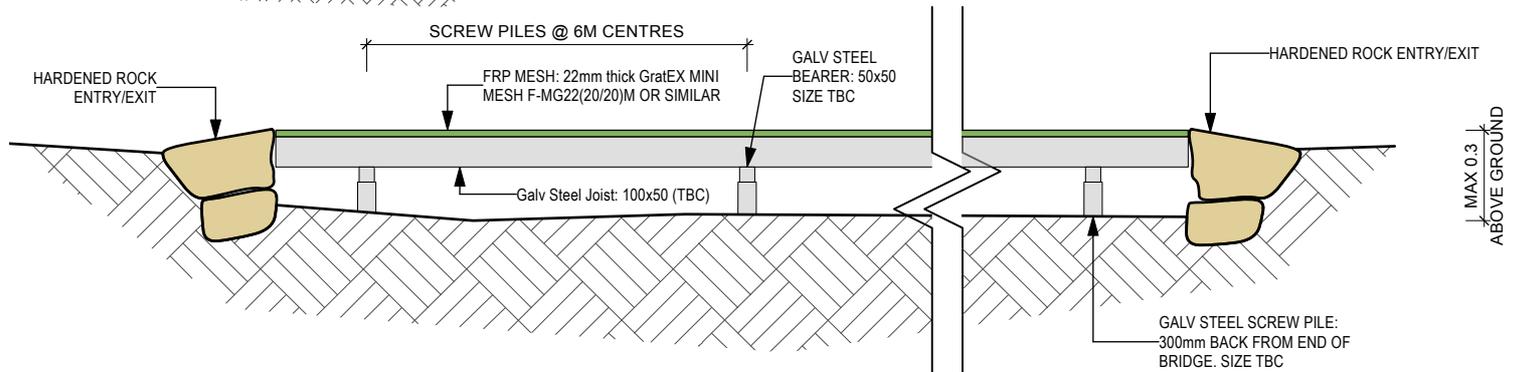
FRP Raised Trail

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

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MOUNTAIN BIKE TRAILS
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RTS



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.

