

D.3.14 Twin Bridges over Water Course and Fauna Crossing – Station 81km880

These bridges carry the highway over a water course and fauna crossing. They are on a curved horizontal alignment and comprise four equal spans of 15.60m. The superstructure utilises thirteen 600mm deep pre-stressed concrete planks per span for the northbound bridge and fifteen 600mm deep planks for the southbound bridge. The width of the bridge deck for the northbound carriageway is 11.05m and for the southbound carriageway 12.86m. Spill through abutments are adopted with a slope of 1.5H:1V. The substructure comprises reinforced concrete headstocks supported on 1000mm diameter circular concrete piers.

The parapets are medium performance level barriers comprising a 650mm high precast concrete barrier / parapet surmounted by twin steel rails, providing an overall height of 1300mm above road surface level. A single conduit is located in each barrier. For each bridge, a longitudinal drainage pipe is located between the outermost and second planks, concealing the drainage pipe when the bridge is viewed in elevation.

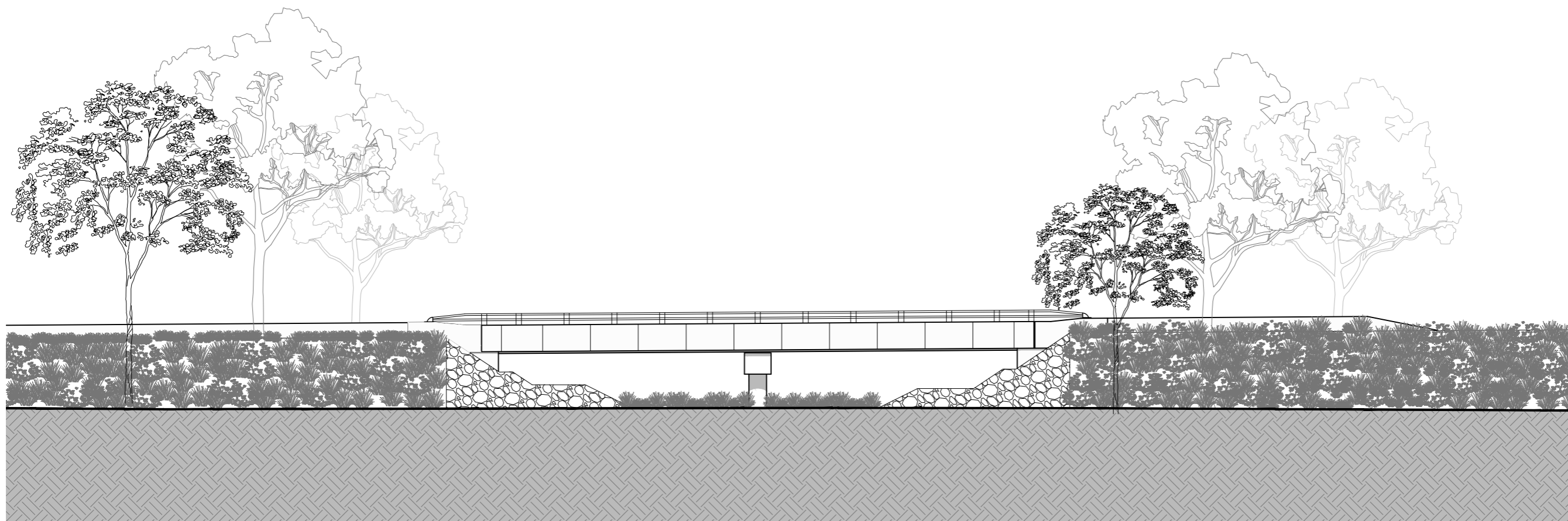
The abutment slopes are treated with stone boulders as they are potentially susceptible to scour.

Changes since 15% DCD

- Number of concrete planks in northbound bridge reduced from 14 to 13.

Urban Design Comments on 85% PDD to be incorporated in 100% SDD

- None.



DRY FAUNA
PASSAGE

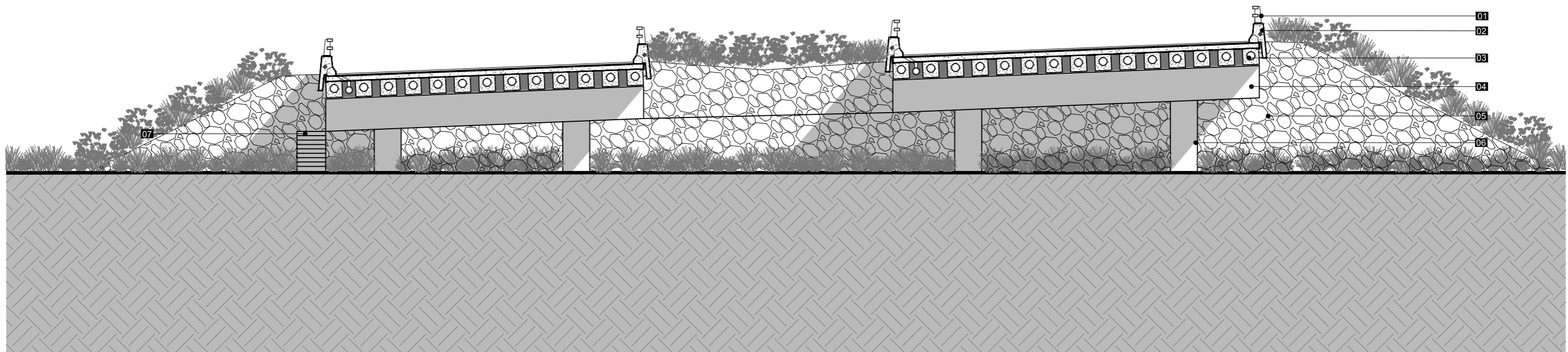
DRY FAUNA
PASSAGE

E 3.14.2

Drawings are for illustrative purposes only.
For dimensions and extent of works refer to Engineers Drawings.
For Landscape types and extents refer to Landscape Drawings.

0 10 20m

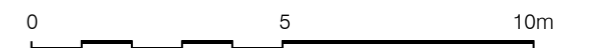
Figure D.3.14.1 Twin Bridges over Water Course and Fauna Crossing: Elevation



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- 01 TWIN METAL RAIL BARRIER
- 02 CONCRETE PARAPET
- 03 PSC PLANKS
- 04 CONCRETE HEADSTOCK
- 05 STONE BOULDER SCOUR PROTECTION
- 06 CIRCULAR CONCRETE PIER
- 07 MAINTENANCE ACCESS STAIRS, DARK TINTED CONCRETE

Figure D.3.14.2 Twin Bridges over Water Course and Fauna Crossing: Cross Sectional Elevation



**E.3.15 Twin Bridges over Flow Balancing Water Course and Fauna Crossing
– Station 82km420**

These bridges carry the highway over a water course and fauna crossing. They are on a curved horizontal alignment and comprise a single span of 18.37m. The northbound bridge includes a deceleration lane and the southbound bridge an onramp for the Waterfall Way interchange. The superstructure utilises seventeen 700mm deep pre-stressed concrete planks per span for the northbound bridge and twenty one 700mm deep planks per span for the southbound bridge. The width of the bridge deck for the northbound carriageway is 14.55m and for the southbound carriageway a maximum of 18.67m. Spill through abutments are adopted with a slope of 1.5H:1V. .

The parapets are medium performance level barriers comprising a 650mm high precast concrete barrier / parapet surmounted by twin steel rails, providing an overall height of 1300mm above road surface level. A single conduit is located in each barrier. For each bridge a longitudinal drainage pipe is located between the outermost and next planks, concealing the drainage pipe when the bridge is viewed in elevation.

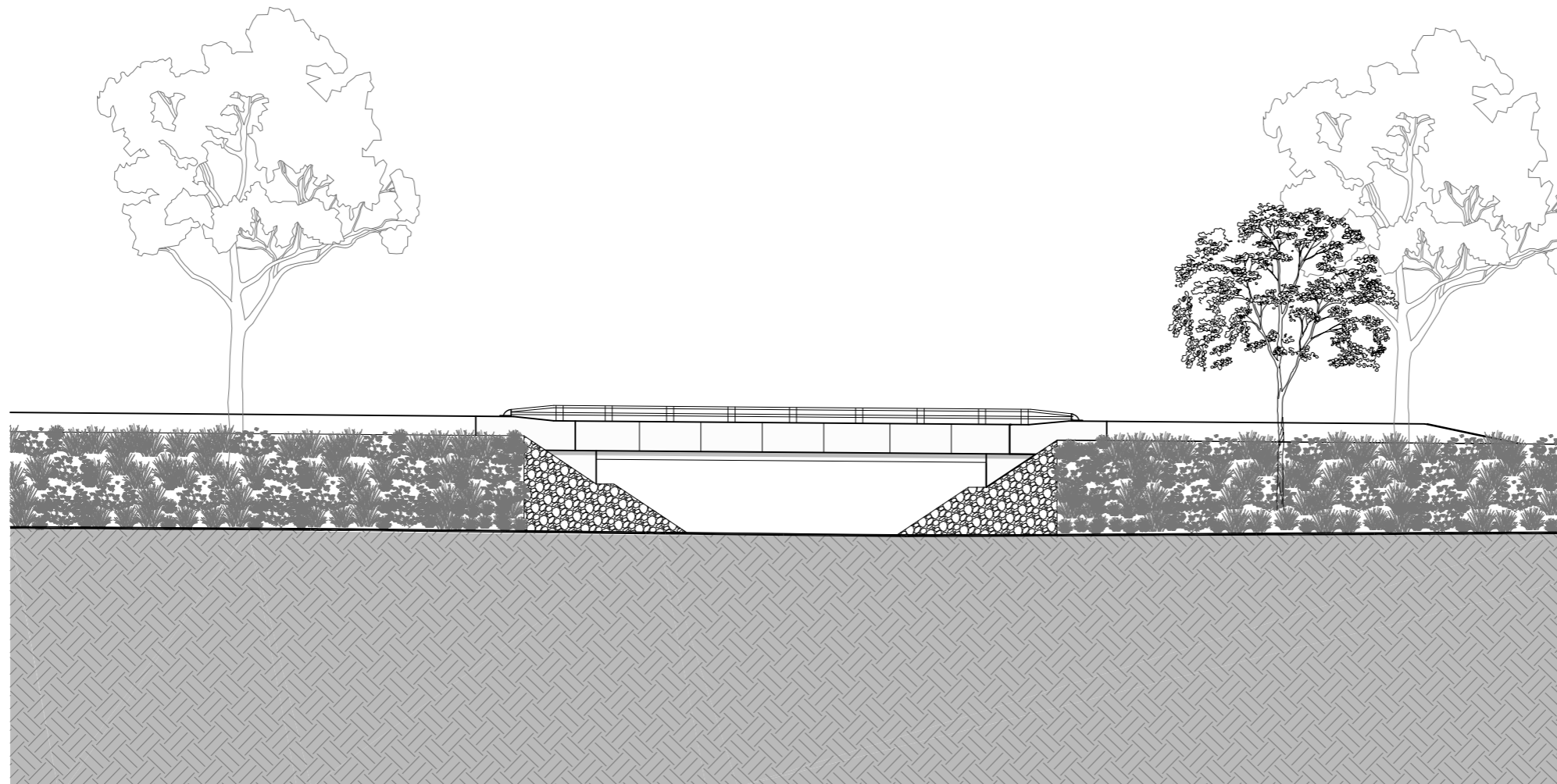
The abutment slopes are treated with stone boulders as they are potentially susceptible to scour.

Changes since 15% DCD

- Number of spans reduced from two to one (central piers and headstock deleted).
- Span length increased slightly.
- Number of concrete planks in southbound bridge reduced from 27 to 21.
- Maximum width of southbound carriageway reduced from 23.82m to 18.67m.
- Longitudinal drainage pipe added to each bridge.

Urban Design Comments on 85% PDD to be incorporated in 100% SDD

- None.



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E 3.15.2

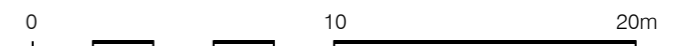
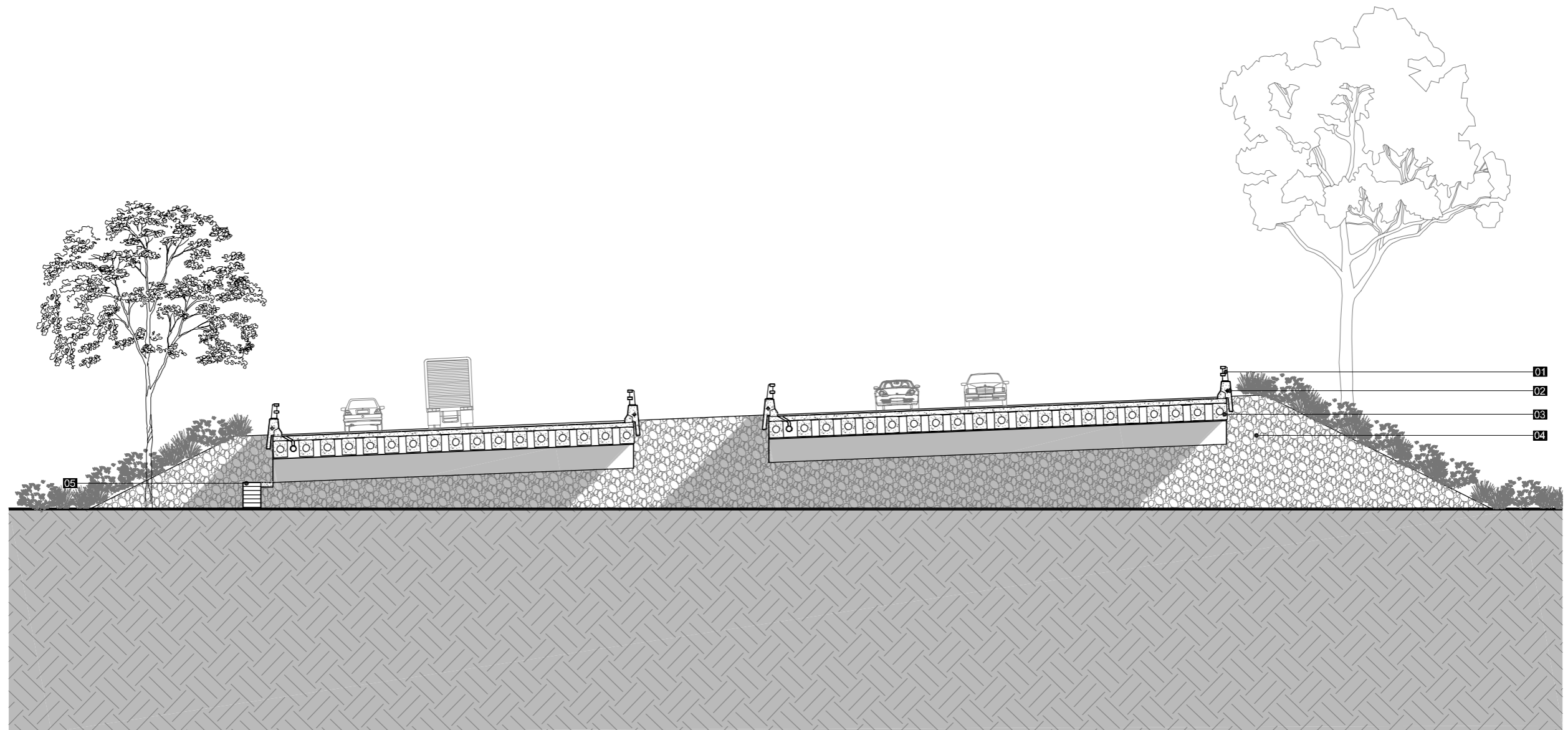


Figure D.3.15.1 Twin Bridges over Flow Balancing Water Course and Fauna Crossing: Elevation



NORTHBOUND

SOUTHBOUND

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- 01 TWIN METAL RAIL BARRIER
- 02 CONCRETE PARAPET
- 03 PSC PLANKS
- 04 STONE BOULDER SCOUR PROTECTION

0 5 10m

Figure D.3.15.2 Twin Bridges over Water Course and Fauna Crossing: Cross Sectional Elevation

D.4 LOCAL ACCESS ROAD BRIDGES

D.4.1 Service Road Bridge over Boggy Creek – Station 62km750

This bridge carries a local service road over Boggy Creek. It is on a curved horizontal alignment and comprises two equal spans of 27.0m with four 1200mm deep Super-T girders. The width of the bridge deck is 9.0m from barrier to barrier. Spill through abutments are adopted with a slope of 1.5H:1V. The abutment structures comprise reinforced concrete beams with wing walls and are supported on piles.

The parapets are medium performance level barriers comprising a 650mm high precast concrete parapet with twin steel rails providing an overall height of 1300mm above road surface level. A single conduit is provided in each barrier.

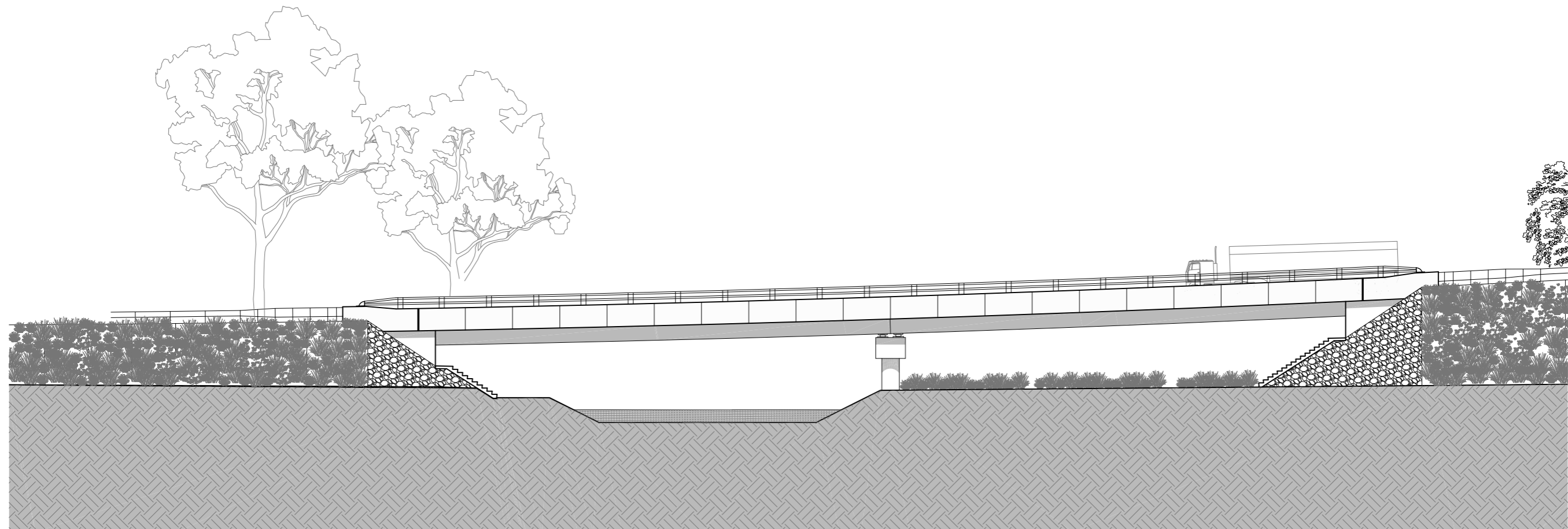
The abutments are potentially subject to scour and are treated with stone boulders.

Changes since 15% DCD

- Number of spans increased from one to two.
- Central piers and headstock added.
- Single span of 30.0m replaced with two equal spans of 27.0m.
- Super-T girder depth reduced from 1500mm to 1200mm.

Urban Design Comments on 85% PDD to be incorporated in 100% SDD

- None.



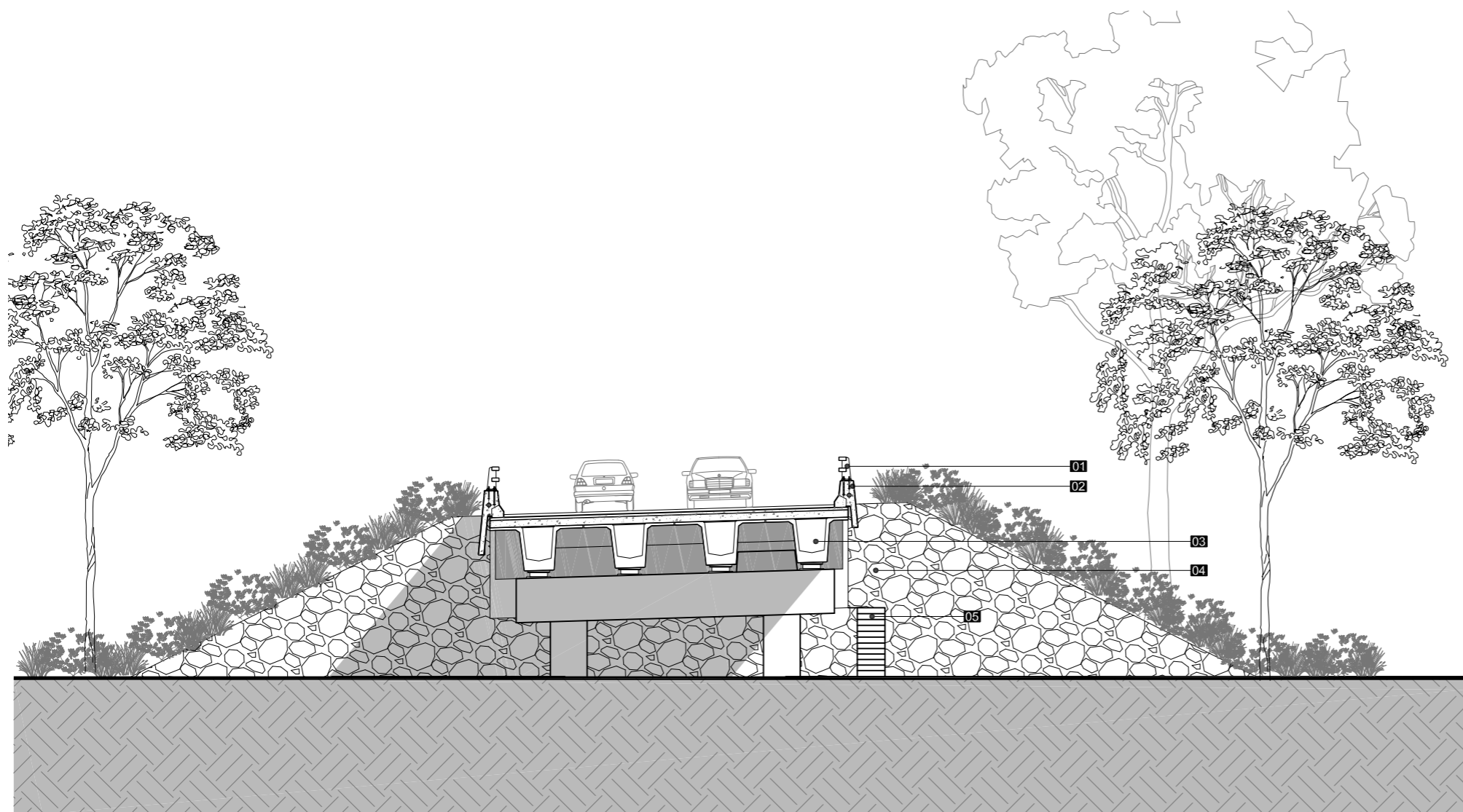
BOGGY CREEK

E 4.1.2

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For Landscape types and extents refer to Landscape Drawings.

0 10 20m

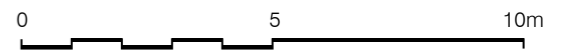
Figure D.4.1.1 Service Road Bridge over Boggy Creek: Elevation



- 01 TWIN METAL RAIL BARRIER
- 02 CONCRETE PARAPET
- 03 SUPER-T GIRDERS
- 04 STONE BOULDER SCOUR PROTECTION
- 05 MAINTENANCE ACCESS STAIRS

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Figure D.4.1.2 Service Road Bridge over Boggie Creek: Cross Sectional Elevation



D.4.2 Service Road Bridge over Cow Creek – Station 63km650

This bridge provides a new crossing for the existing Pacific Highway over Cow Creek. It is on a straight horizontal alignment and comprises a single span of 35.0m with five 1800mm deep Super-T girders. The width of the bridge deck is 11.4m from barrier to barrier. Spill through abutments are adopted with a slope of 1.5H:1V. The abutment structures comprise reinforced concrete beams with wing walls and are supported on piles.

The parapets are medium performance level barriers comprising a 650mm high precast concrete parapet with twin steel rails providing an overall height of 1300mm above road surface level. A single conduit is provided in each barrier. A longitudinal drainage pipe is located between the parapet skirt and outermost Super-T. The skirt extends downwards sufficiently to conceal the drainage pipe when the bridge is viewed in elevation.

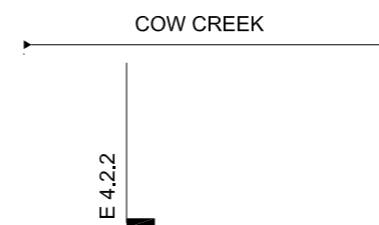
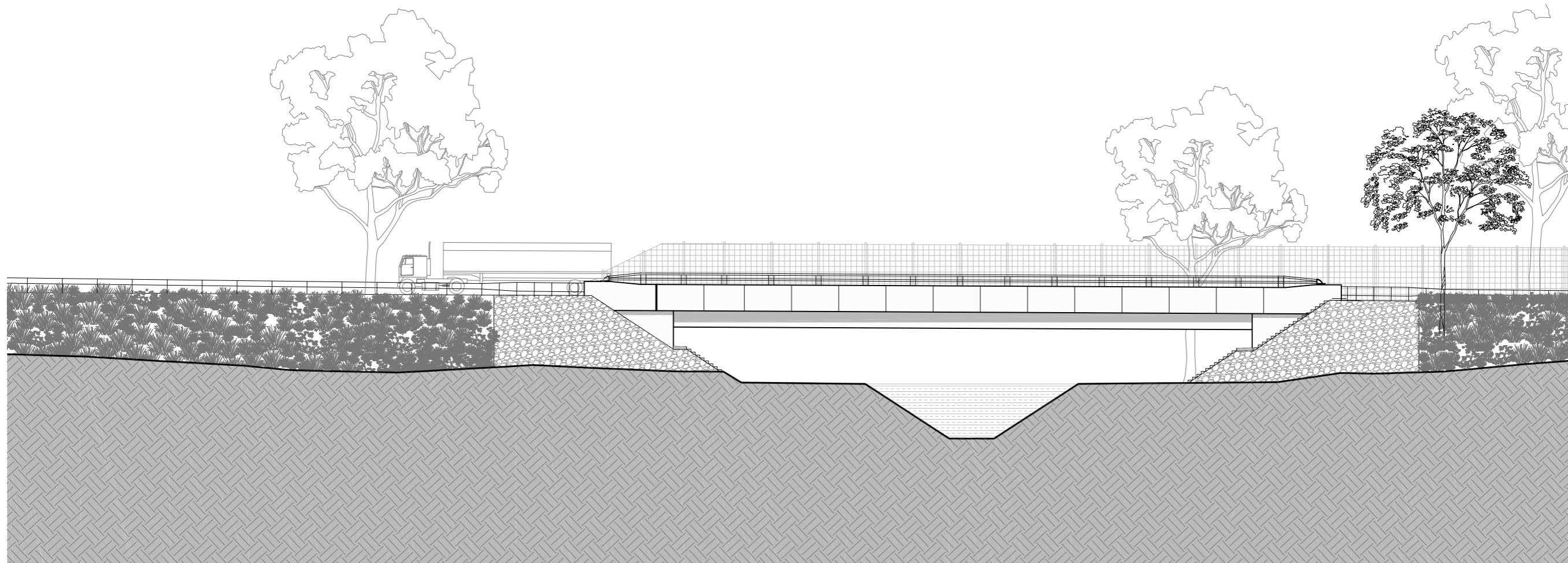
The abutments are potentially subject to scour and are treated with stone boulders.

Changes since 15% DCD

- Span increased from 32.0m to 35.0m.
- Super-T girder depth increased from 1500mm to 1800mm.
- Width of deck increased from 11.0m to 11.4m..

Urban Design Comments on 85% PDD to be incorporated in 100% SDD

- None.



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For Landscape types and extents refer to Landscape Drawings.

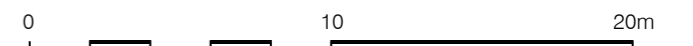
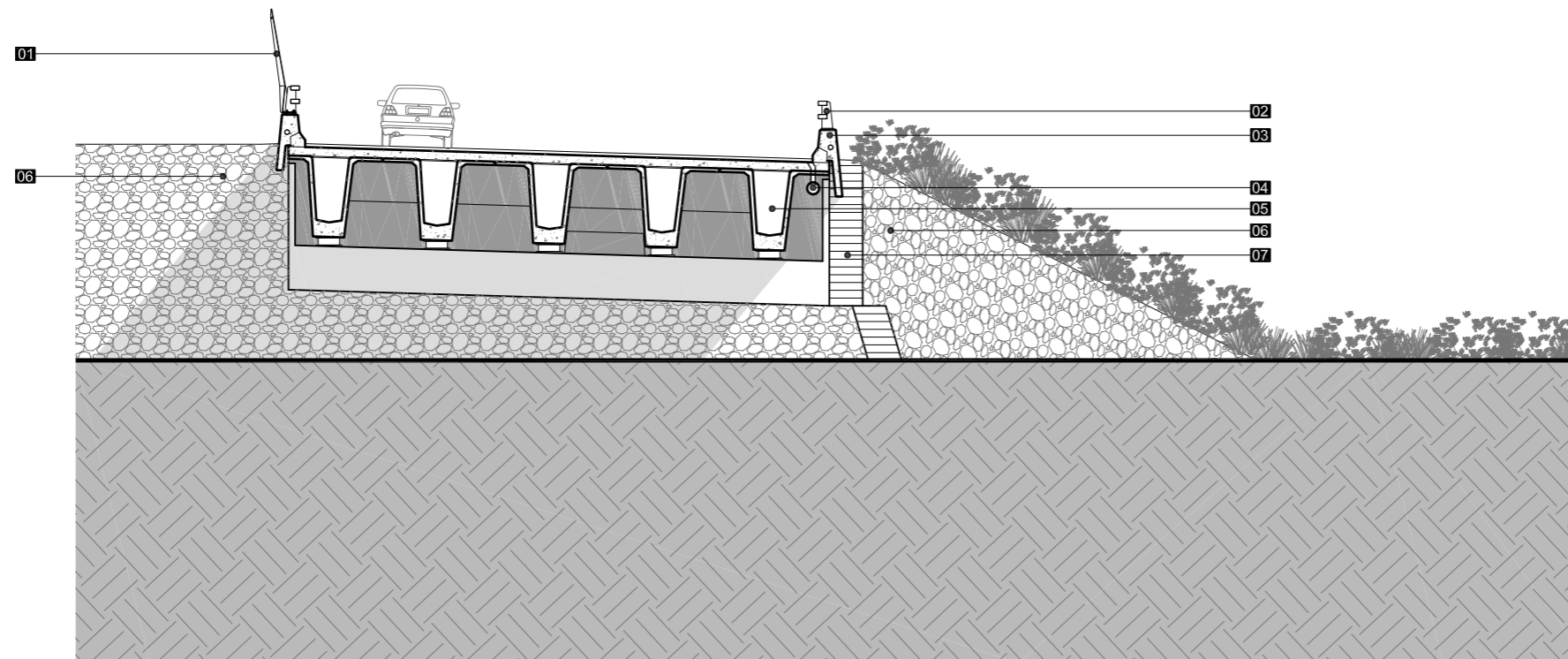


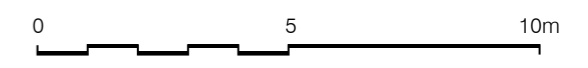
Figure D.4.2.1 Service Road Bridge over Cow Creek - Elevation



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- 01 GALVANISED STEEL HEADLIGHT SCREEN
- 02 TWIN METAL RAIL BARRIER
- 03 CONCRETE PARAPET
- 04 DRAINAGE PIPE
- 05 SUPER-T GIRDERS
- 06 STONE BOULDER SCOUR PROTECTION
- 07 MAINTENANCE ACCESS STAIRS

Figure D.4.2.2 Service Road Bridge over Cow Creek: Cross Sectional Elevation



D.4.3 Service Road Bridge over Flow Balancing Water Course and Fauna Crossing – Station 82km420

This bridge provides a new crossing for the existing Pacific Highway over a water course and fauna crossing. It is on a straight horizontal alignment and comprises a single span of 18.37m with thirteen 700mm deep pre-stressed concrete planks. The width of the bridge deck is 11.0m from barrier to barrier. Spill through abutments are adopted with a slope of 1.5H:1V. The abutment structures comprise reinforced concrete beams with wing walls and are supported on piles.

The parapets are medium performance level barriers comprising a 650mm high precast concrete parapet with twin steel rails providing an overall height of 1300mm above road surface level. A single conduit is provided in each barrier.

A longitudinal drainage pipe is located between the outermost and second planks, concealing the drainage pipe when the bridge is viewed in elevation.

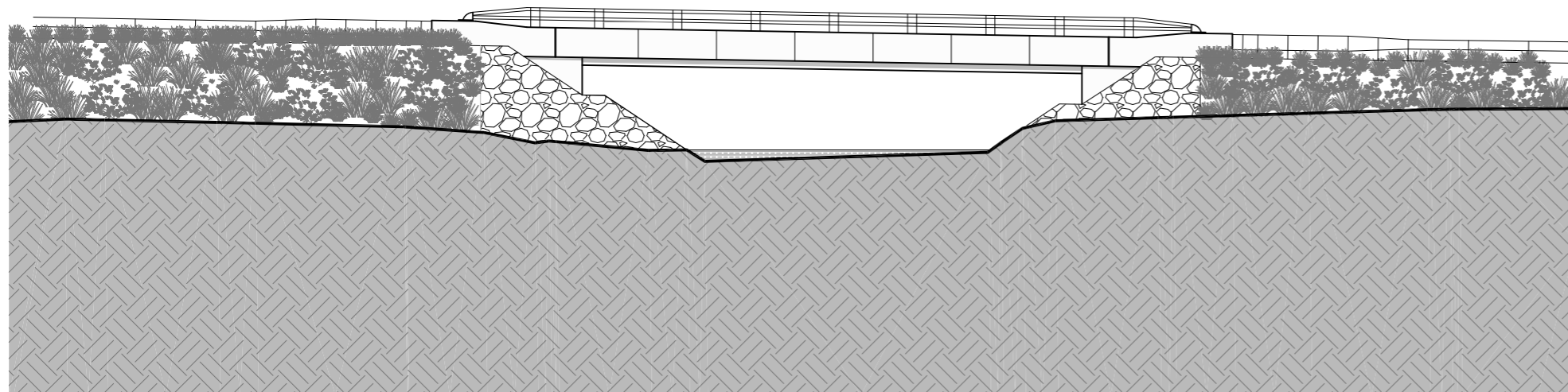
The abutment slopes are treated with stone boulders as they are potentially susceptible to scour.

Changes since 15% DCD

- Number of spans reduced from 2 to 1 (Central piers and headstock deleted).
- Length of span increased from 17.0m to 18.37m.

Urban Design Comments on 85% PDD to be incorporated in 100% SDD

- None.



FLOW BALANCING WATER COURSE/ FAUNA CROSSING



E 4.3.2

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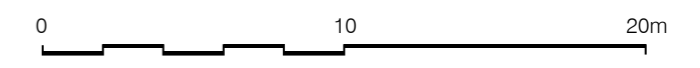
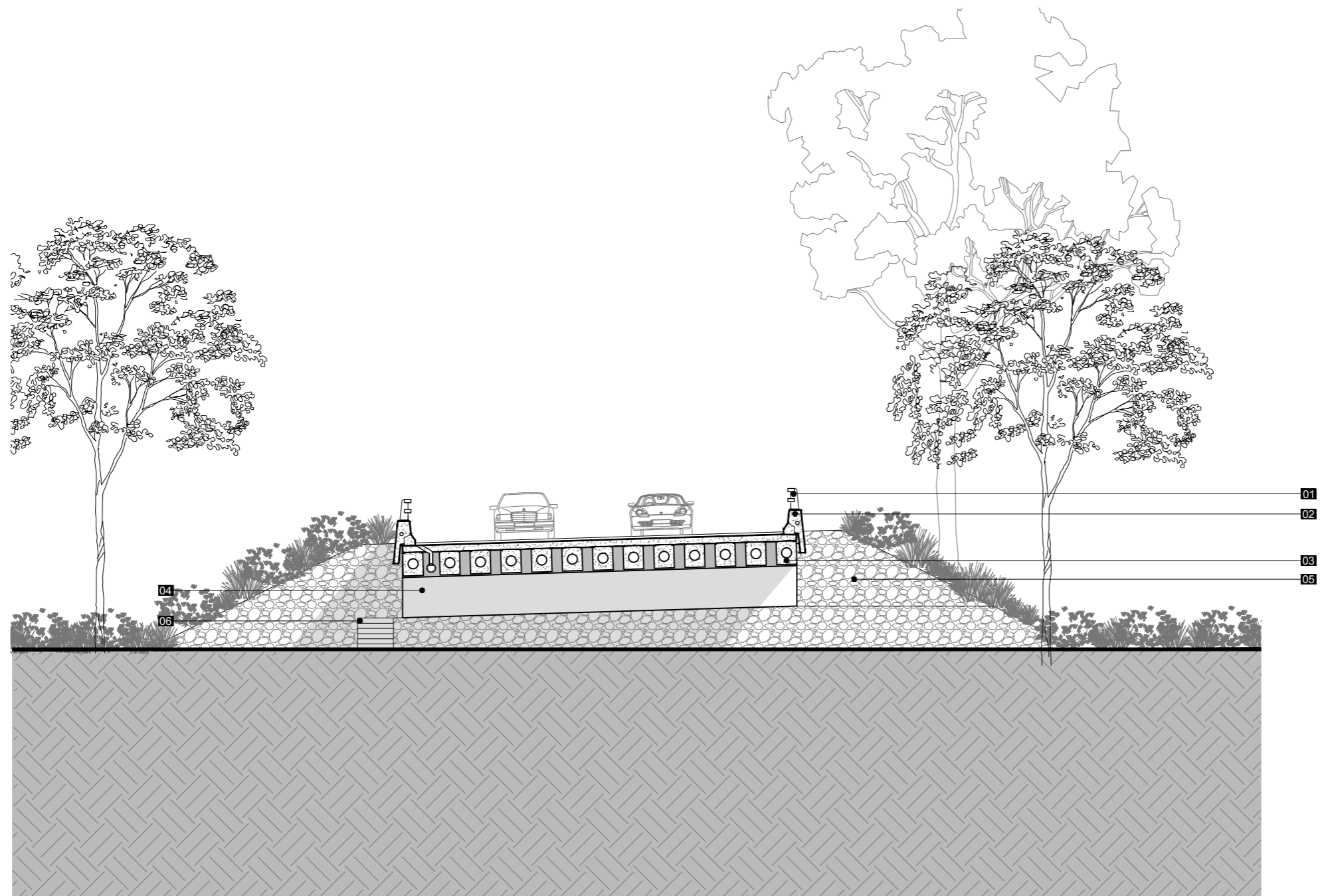


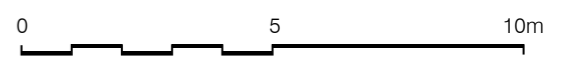
Figure D.4.3.1 Service Road Bridge over Water Course and Fauna Crossing - Elevation



- 01 TWIN METAL RAIL BARRIER
- 02 CONCRETE PARAPET
- 03 PSC PLANKS
- 04 CONCRETE HEADSTOCK
- 05 STONE BOULDER SCOUR PROTECTION
- 06 MAINTENANCE ACCESS STAIRS

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Figure D.4.3.2 Service Road Bridge over Water Course and Fauna Crossing: Cross Sectional Elevation



D.5 UNDERPASS BOX CULVERTS – TYPICAL ELEVATIONS AND CROSS SECTIONAL ELEVATIONS

The Upgrade includes box culverts at seventeen locations which serve as fauna underpasses, drainage underpasses or both:

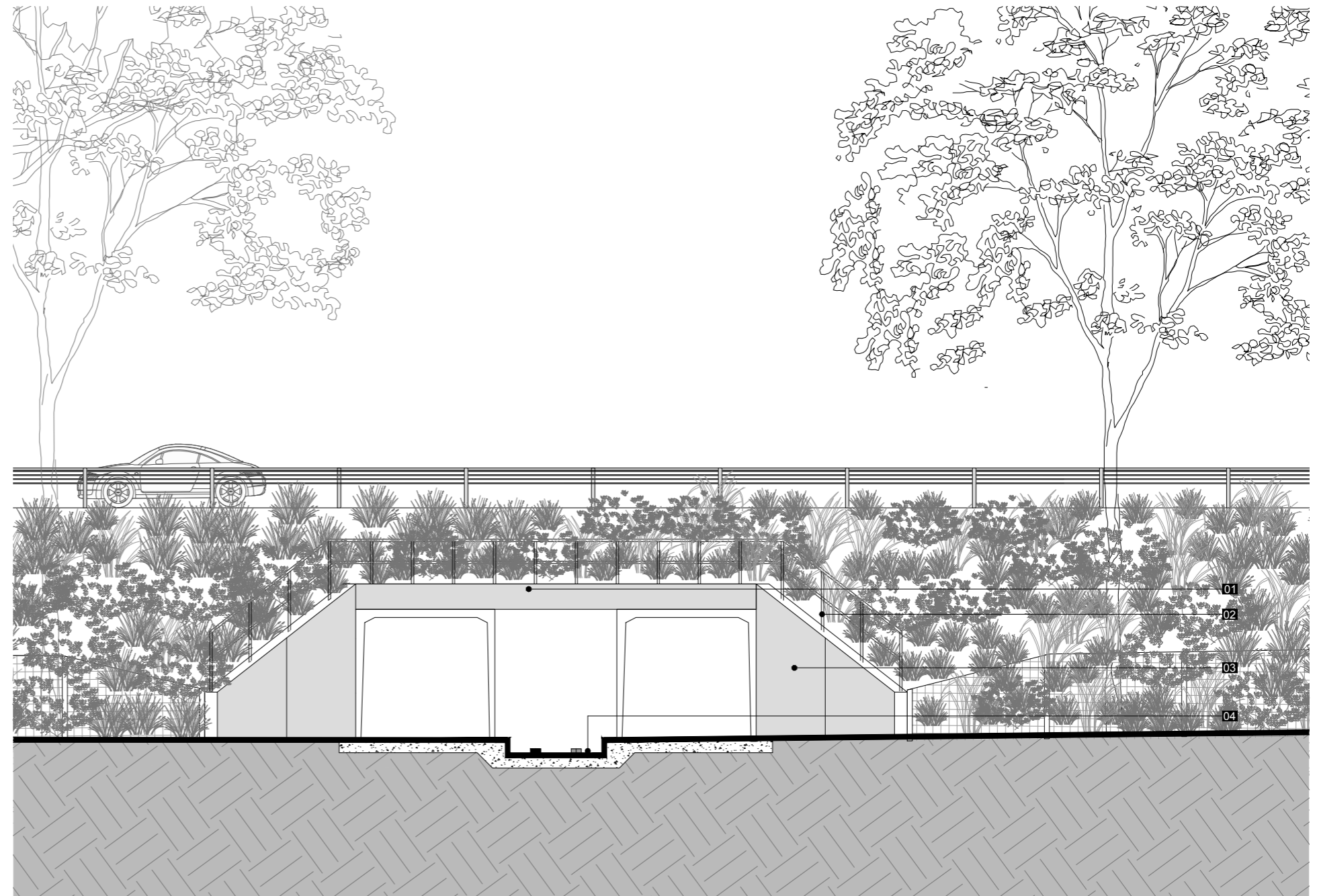
Table E.5.1 Box Culvert Locations

Station	Type	Number of Cells
61km700	Drainage and Fauna	3
66km220	Drainage and Fauna	1
68km050	Drainage and Fauna	3
68km470	Fauna	1
68km480	Drainage and Fauna	4
70km400	Drainage and Fauna	1
72km720	Drainage and Fauna	1
73km650	Drainage and Fauna	1
73km840	Drainage and Fauna	1
75km250	Drainage and Fauna	1
75km800	Fauna	1
76km300	Drainage and Fauna	1
76km560	Fauna	1
77km930	Drainage and Fauna Low Flow Channel	7 1
78km800	Drainage and Fauna	2
80km220	Drainage and Fauna	2
80km230	Drainage and Fauna	2

The box culvert structures comprise crown units ranging from 3.0m x 0.9m to 3.6m x 3.6m with fill heights ranging 1.3m to 12.8m. Crown units sit on cast in-situ base slabs. Wingwalls have heights ranging from a minimum of 1.6m to a maximum of 4.3 metres. Where required, light wells are provided to support fauna crossing.

The culverts are generally of low visibility and the wingwalls are cast in-situ concrete with an off form finish.

A typical culvert is illustrated in Figures D.5.1.1 and D.5.1.2.



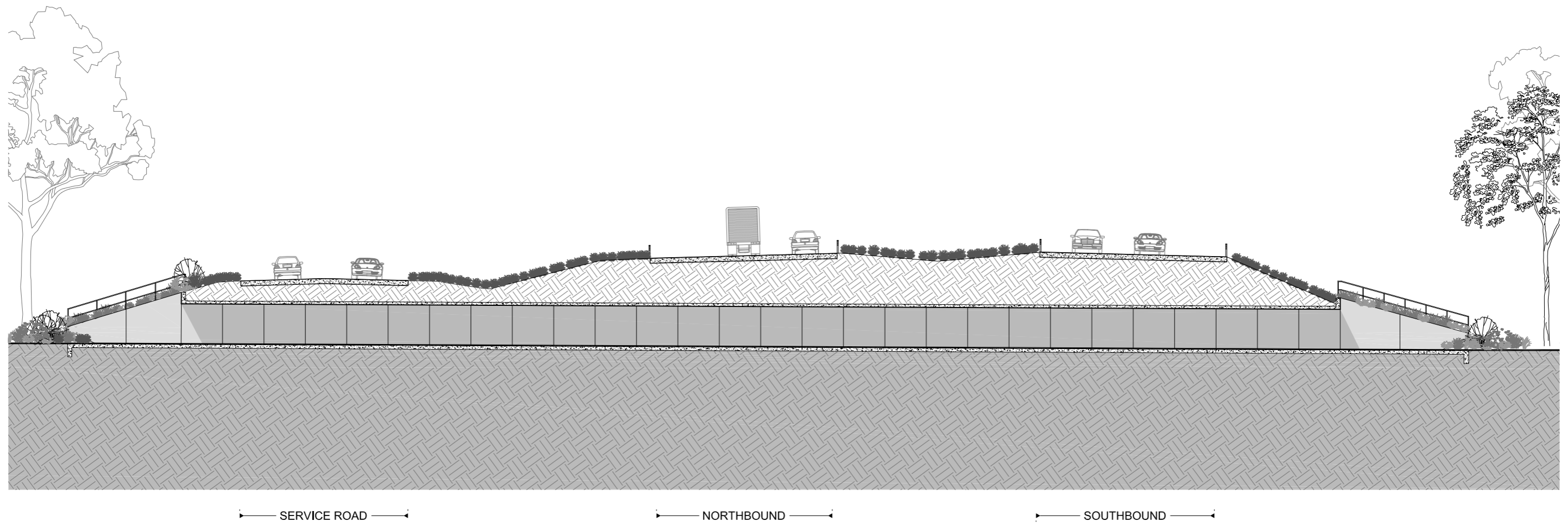
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E 5.1.2

- 01 CONCRETE HEADWALL
- 02 GALVANISED STEEL HANDRAIL
- 03 CAST-INSITU WING WALLS WITH OFF-FORM FINISH
- 04 FISH PASSAGE CELL (WHERE REQUIRED)

0 5m

Figure D.5.1.1 Typical Culvert: Elevation



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Figure D.5.1.2 Typical Culvert: Section

0 10m

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