WILLIAM STREET
GOOLWA ROAD
FLAGSTAFF HILL ROAD
WALKER PLACE
THOMAS STREET
ELLENSFORD TERRACE
MILL TERRACE
HAYNES ROAD
PADMAN CRESCENT
MCLEOD ROAD
HIGGINS TERRACE
ELIZABETH CRESCENT
HARGREAVES ROAD
ESPLANADE

Legend

Hazard Category

- No hazard
- H1
- H2
- H3
- H4
- H5
- H6

tonkin

0 50 100 m

Job Number: 230477
Filename: 230477 Middleton HEC-RAS
Revision: Rev A
Date: 2024-01-23 12:26
Drawn: James Woolley

Data Acknowledgement:
Satellite Imagery from MetroMap (Aerometrex), 2022

N

Alexandrina Council

Middleton Flood Study
Scenario 6: Creek Clearing and Levees
Critical 100-year ARI event
Flood Hazard Category

WILLIAM STREET
GOOLWA ROAD
FLAGSTAFF HILL ROAD
WALKER PLACE
THOMAS STREET
ELLENSFORD TERRACE
HIGGINS TERRACE
MILL TERRACE
PADMAN CRESCENT
MCLEOD ROAD
HARGREAVES ROAD
ESPLANADE
ELIZABETH CRESCENT
HAYNES ROAD

Legend

Hazard Category

- No hazard
- H1
- H2
- H3
- H4
- H5
- H6

tonkin

0 50 100 m

Job Number: 230477
Filename: 230477 Middleton HEC-RAS
Revision: Rev A
Date: 2024-01-23 12:27
Drawn: James Woolley

Data Acknowledgement:
Satellite Imagery from MetroMap (Aerometrex), 2022

N

Alexandrina Council

Middleton Flood Study
Scenario 7: Channel Widening and Levees
Critical 100-year ARI event
Flood Hazard Category

WILLIAM STREET
WALKER PLACE
GOOLWA ROAD
FLAGSTAFF HILL ROAD
MILL TERRACE
THOMAS STREET
ELLENSFORD TERRACE
HIGGINS TERRACE
MILL TERRACE
PADMAN CRESCENT
MCLEOD ROAD
HAYNES ROAD
ELIZABETH CRESCENT
HARGREAVES ROAD
ESPLANADE

Legend

Hazard Category

- No hazard
- H1
- H2
- H3
- H4
- H5
- H6

tonkin

0 50 100 m

N

Job Number: 230477
Filename: 230477 Middleton HEC-RAS
Revision: Rev A
Date: 2024-01-23 12:27
Drawn: James Woolley

Data Acknowledgement:
Satellite Imagery from MetroMap (Aerometrex), 2022

Alexandrina Council

Middleton Flood Study
Scenario 8: Creek Clearing and Culvert Upgrade
Critical 100-year ARI event
Flood Hazard Category



tonkin

0 50 100 m

Job Number: 230477
Filename: 230477 Middleton HEC-RAS
Revision: Rev A
Date: 2024-01-23 12:28
Drawn: James Woolley

Data Acknowledgement:
Satellite Imagery from MetroMap (Aerometrex), 2022

N

Alexandrina Council

Middleton Flood Study
Scenario 9: Channel Widening and Culvert Upgrade
Critical 100-year ARI event
Flood Hazard Category



tonkin

0 50 100 m

Job Number: 230477
Filename: 230477 Middleton HEC-RAS
Revision: Rev A
Date: 2024-01-23 12:28
Drawn: James Woolley

Data Acknowledgement:
Satellite Imagery from MetroMap (Aerometrex), 2022

N

Alexandrina Council

Middleton Flood Study
Scenario 10: Creek Clearing, Levees and Culvert Upgrade
Critical 100-year ARI event
Flood Hazard Category

Appendix B – Middleton Survey

SYMBOL & LINETYPE LEGEND

- SURVEY CONTROL
- PSM
- WATER
- INV 1.2x0.9 CULVERT
- INV 0.6 PIPE
- INV 0.45 PIPE
- INV 0.375 PIPE
- INV 0.750 PIPE
- INV 0.925 PIPE
- CULVERT
- SPOT HEIGHT
- TREE TRUNK
- TREE CANOPY
- FLOOD LEVEL
- FLOOR LEVEL
- STORMWATER JB
- EDGE OF TRACK
- GRATING
- KERB
- GUTTER
- EDGE OF BITUMEN
- SUMP
- SPOON DRAIN
- CONTINUITY LINE
- SOLID LINE
- NATURAL STRING
- GUARD RAIL
- 300 DIAM PIPE
- EDGE OF CONCRETE
- EDGE OF SHOULDER
- BRIDGE DECK
- WATER PIPE
- FENCE
- BANK TOP
- BANK BOTTOM
- RETAINING WALL
- RAIL TRACK
- EDGE OF VEGETATION
- GATE
- BUILDING
- WALL
- U/G STORMWATER

WILLIAM STREET

GOOLWA ROAD

Middleton

CONTINUED SHEET 2

CONTINUED SHEET 3

SHEET 1 OF 3

ANDREW & ASSOCIATES SURVEYORS & DEVELOPMENT CONSULTANTS
311 Angas Street Adelaide SA 5000 Telephone: 8232 1954
34 Victoria Street Victor Harbor SA 5211

PROJECT MIDDLETON FLOOD STUDY
CLIENT TONKIN CONSULTING
DRAWING TITLE DETAIL & LEVEL PLAN

NOTES

REVISIONS

HORIZONTAL DATUM: MGA 2020 ZONE 54
MGA SCALED COORDINATES BASED FROM PSM 6626/1793
VERTICAL DATUM: PSM 6626/1793
RL 18-100m AHD

SCALE 1:200 ON B1 SHEET METRES
0 2 4 8 12 16 20

DRAWN	SCALE	DATE
SMS/RVD	AS SHOWN	11-07-23
COMP.FILE	FIELD	CHECKED
MIDDLETON-see	RVD/JCP	RVD

DRAWING NUMBER 223252-1-1
ISSUE

CONTINUED SHEET 1

CONTINUED SHEET 1

ROAD

GOOLWA

13

29

17

17

27

VICTOR HARBOR – GOOLWA RAILWAY

N

SYMBOL & LINETYPE LEGEND

- SURVEY CONTROL
- PSM
- WATER
- OUTLET
- INV 0.40x0.60 CULVERT
- INV 0.10 PIPE
- INV 0.450 PIPE
- INV 0.375 PIPE
- INV 0.750 PIPE
- INV 0.525 PIPE
- INVERT
- SPOT HEIGHT
- TREE TRUNK
- TREE CANOPY
- FLOOD LEVEL
- FLOOR LEVEL
- STORMWATER JB
- EDGE OF TRACK
- GRATING
- KERB
- GUTTER
- EDGE OF BITUMEN
- SUMP
- SPOON DRAIN
- CONTINUITY LINE
- SOLID LINE
- NATURAL STRING
- GUARD RAIL
- 300 DIAM PIPE
- EDGE OF CONCRETE
- EDGE OF SHOULDER
- BRIDGE DECK
- WATER PIPE
- FENCE
- BANK TOP
- BANK BOTTOM
- RETAINING WALL
- RAIL TRACK
- EDGE OF VEGETATION
- GATE
- BUILDING
- WALL
- U/G STORMWATER

SHEET 2 OF 3

ANDREW & ASSOCIATES
SURVEYORS & DEVELOPMENT CONSULTANTS
311 Angas Street Adelaide SA 5000
Telephone: 8232 1954
34 Victoria Street Victor Harbor SA 5211

PROJECT MIDDLETON FLOOD STUDY

CLIENT TONKIN CONSULTING

DRAWING TITLE DETAIL & LEVEL PLAN

NOTES

REVISIONS

HORIZONTAL DATUM: MGA 2020 ZONE 54
MGA SCALED COORDINATES BASED FROM PSM 6626/1793
VERTICAL DATUM: PSM 6626/1793
RL 18.100m AHD

SCALE 1:200 ON B1 SHEET METRES
0 2 4 8 12 16 20

DRAWN	SCALE	DATE
SMS/RVD	AS SHOWN	11-07-23
COMP.FILE	FIELD	CHECKED
MIDDLETON-see	RVD/JCP	RVD

DRAWING NUMBER 223252-1-2

ISSUE

CONTINUED SHEET 1

CONTINUED SHEET 2

GOOLWA ROAD

VICTOR HARBOR – GOOLWA RAILWAY

ELLENSFORD TERRACE

Ellensford Rd

STN 300
PSM 6626/3886

STN 100

32 34 23 25

SYMBOL & LINETYPE LEGEND

- SURVEY CONTROL
- PSM
- WATER
- SHRUBS
- RIV DRAINAGE CULVERT
- RIV 0.450 PIPE
- RIV 0.600 PIPE
- INV 0.375 PIPE
- INV 0.750 PIPE
- INV 0.525 PIPE
- INVERT
- SPOT HEIGHT
- TREE TRUNK
- TREE CANOPY
- FLOOD LEVEL
- FLOOR LEVEL
- STORMWATER JB
- EDGE OF TRACK
- GRATING
- KERB
- WATER
- EDGE OF BITUMEN
- SUMP
- SPOON DRAIN
- CONTINUITY LINE
- SOLID LINE
- NATURAL STRING
- GUARD RAIL
- 300 DIAM PIPE
- EDGE OF CONCRETE
- EDGE OF SHOULDER
- BRIDGE DECK
- WATER (TOP)
- FENCE
- BANK TOP
- BANK BOTTOM
- RETAINING WALL
- TRACK
- EDGE OF VEGETATION
- GATE
- BUILDING
- WALL
- U/G STORMWATER

SHEET 3 OF 3

ANDREW & ASSOCIATES SURVEYORS & DEVELOPMENT CONSULTANTS
311 Angas Street Adelaide SA 5000 Telephone: 8232 1954
34 Victoria Street Victor Harbor SA 5211

PROJECT MIDDLETON FLOOD STUDY
CLIENT TONKIN CONSULTING
DRAWING TITLE DETAIL & LEVEL PLAN

NOTES

REVISIONS

HORIZONTAL DATUM: MGA 2020 ZONE 54
MGA SCALED COORDINATES BASED FROM PSM 6626/1793
VERTICAL DATUM: PSM 6626/1793 RL 18·100m AHD

SCALE 1:200 ON B1 SHEET METRES
0 2 4 8 12 16 20

DRAWN	SCALE	DATE
SMS/RVD	AS SHOWN	11-07-23
COMP.FILE	FIELD	CHECKED
MIDDLETON-see	RVD/JCP	RVD

DRAWING NUMBER 223252-1-3
ISSUE

Appendix C – Detailed Cost Breakdown

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 1 - Creek clearing
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of other costs	item	1		$ 11,029.08
	Sub-Total					**$ 11,029.08**
2.0	**Creek clearing**					
2.1	Initial clearing of creek		item	1	$ 50,000.00	$ 50,000.00
	Sub-Total					**$ 50,000.00**
3.0	**Maintenance of creek condition**					
3.1	Removal of weeds, branches etc.	See NPV Calcs	item	1	$60,291	$ 60,290.80
	Sub-Total					**$ 60,290.80**

Sub-total		**$**	**121,319.88**
Contingency	30%	$	36,395.97
Grand Total		**$**	**157,715.85**

Note:

Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:

- Latent conditions
- Changes in scope
- Market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for service relocation
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- Calculations assume sandy soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work.

Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 2 - Channel widening
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of other costs	item	1	$	30,028.99
1.2	Design fees	Assumed to be 5% of other costs	item	1	$	15,014.49
	Sub-Total				**$**	**45,043.48**
2.0	**Channel widening**					
2.1	Strip topsoil	Excavate to remove top soil average 150 mm deep and deposit in spoil heaps within 500 m, assume clay	m^2	3,150	$ 7.35	$ 23,152.50
2.2	Cut to spoil	See WideningEarthworks tab	m^3	1,294	$ 20.85	$ 26,974.69
2.3	Clean soil disposal	Includes carting, nominal tip fees, soil disposal, assumes uncontaminated clean fill	t	2,199	$ 45.00	$ 98,971.88
2.4	Shaping of batters		m^3	1,294	$ 36.00	$ 46,575.00
2.5	Batter erosion protection	Jute mat	m^2	5,063	$ 3.00	$ 15,187.50
2.6	Topsoil spreading for vegetation reinstatement	150mm thick	m^2	3,150	$ 9.25	$ 29,137.50
	Sub-Total				**$**	**239,999.06**
3.0	**Maintenance of creek condition**					
3.1	Removal of weeds, branches etc.	See NPV Calcs	item	1	$60,291	$ 60,290.80
	Sub-Total				**$**	**60,290.80**

Sub-total		**$**	**345,000.00**
Contingency	30%	$	103,500.00
Grand Total		**$**	**448,500.00**

Note: **Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:**

- Latent conditions
- Changes in scope
- Market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- Calculations assume sandy soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work. Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 3 - Flood levees
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of estimate				$ 15,996.05
1.2	Design fees	5%				$ 7,998.03
	Sub-Total					**$ 23,994.08**
2.0	**Levee**					
2.1	Bulk fill	Based on average height per levee section, batter slopes of 1 in 3. See "Levee sizes" tab.	m^3	1256	$ 36.00	$ 45,216.00
2.2	Subgrade preparation	Based on base surface area. See Levee sizes tab	m^2	2418	$ 3.00	$ 7,254.00
2.3	Proof roll of subgrade	As above.	m^2	2418	$ 0.60	$ 1,450.80
2.4	Compaction of embankment material	Compact in layers 150 mm thick. Determined by average height divided by 150mm, times approximate average surface area. See levee sizes tab	m^2	6045	$ 4.15	$ 25,086.75
2.5	Shaping of batters	As above.	m^3	1256	$ 36.00	$ 45,216.00
2.6	Topsoil spreading	150 mm thick. As above.	m^2	2,418	$ 9.25	$ 22,366.50
2.7	Hydromulch	As above.	m^2	2,418	$ 0.36	$ 870.48
2.8	Tree removal	Cut down tree, 1-2 m circumference.	each	25	$ 500.00	$ 12,500.00
	Sub-Total					**$ 159,960.53**

Sub-total		**$**	**183,954.61**
Contingency	30%	$	55,186.38
Grand Total		**$**	**239,140.99**

Note:

Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:

- Latent conditions
- Changes in scope
- Market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for land acquisition
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- Calculations assume clay soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work.
Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 4 - Upstream flood detention
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of other costs	item	1		$ 374,417.44
1.2	Design fees	Assumed to be 5% of other costs	item	1		$ 187,208.72
	Sub-Total					**$ 561,626.16**
2.1	Bulk fill	Taken from volume calc (1 in 3 batters)	m^3	45,000.00	$ 36.00	$ 1,620,000.00
2.2	Subgrade preparation	Base footprint estiomated in GIS	m^2	14,000.00	$ 3.00	$ 42,000.00
2.3	Proof roll of subgrade		m^2	14,000.00	$ 0.60	$ 8,400.00
2.4	Compaction of embankment material	Compact in layers 150 mm thick. Conservative, have assumed full central height acorss whole length	m^2	256,200.00	$ 4.15	$ 1,063,230.00
2.5	Spillway Concrete	Assumed 150 m long, 10 m wide, 1 m high, 500 mm thick walls	m^3	825	$ 300.00	$ 247,500.00
2.6	Pipe (2 x 1800)	Assumed just pipe supply. Assumed 50 m long	m	50	$ 3,600.00	$ 180,000.00
2.7	Headwalls	Assumed based on 1650 headwall rate of $6100	each	2	$ 8,000.00	$ 16,000.00
2.8	Tree removal	Assumed	each	10	$ 500.00	$ 5,000.00
2.9	Watercourse diversion and preparation	Assumed 2.5 %				$ 83,203.88
2.1	Spillway Cut to spoil	Assume average excavation depth of 1 m	m^3	1,500	$ 20.85	$ 31,275.00
2.11	Spillway Clean soil disposal	Includes carting, nominal tip fees, soil disposal, assumes uncontaminated clean fill	t	2,550	$ 45.00	$ 114,750.00
2.12	Reinstatement and finishing	Assumed 10%				$ 332,815.50
	Sub-Total					**$ 3,744,174.38**

Sub-total		**$ 4,306,000.00**
Contingency	30%	$ 1,291,800.00
Grand Total		**$ 5,597,800.00**

Note: **Land acquisition costs have not been included in the above cost calculations. However, these have been estimated as being in the order of $2M.**

Note: **Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:**

- Latent conditions
- Changes in scope
- Market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- Calculations assume sandy soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work. Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 5 - Goolwa Road culvert upgrade
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of estimate				$ 91,548.20
1.2	Design fees	Assumed to be 5% of other costs	item	1		$ 45,774.10
	Sub-Total					**$ 137,322.30**
2.0	**Culvert upgrade**					
2.1	Demolition and reinstatement	Bridge rails, fence, guardrail etc	item	1	$ 15,000.00	$ 15,000.00
2.2	Vegetation removal around culvert for construction		item	1	$ 20,000.00	$ 20,000.00
2.3	Cut to spoil	Channel widening on upstream and downstream ends	m^3	100	$ 21.70	$ 2,170.00
2.4	Clean spoil disposal	Includes carting, nominal tip fees, soil disposal.	t	170	$ 45.00	$ 7,650.00
2.5	3x 2.4 x 2.2m culverts	Supply and install	m	36	$ 7,700.00	$ 277,200.00
2.6	Additional cost channel and culvert transitions (formwork, connection to existing structures)		m	10	$ 5,000.00	$ 50,000.00
2.7	Match in and make good	Match in works around culverts	item	1	$ 10,000.00	$ 10,000.00
2.8	Miscellaneous costs associated with bridge works		item	1	$ 500,000.00	$ 500,000.00
2.9	Pavement reinstatement	200mm PM2/20 sub base, 200mm PM1/20 base course, 40mm AC10 with prime coat and proof rolls	m^2	468	$ 71.50	$ 33,462.00
	Sub-Total					**$ 915,482.00**

Sub-total		**$ 1,052,804.30**
Contingency	30%	$ 315,841.29
Grand Total		**$ 1,368,645.59**

Note:

Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:

- Latent conditions
- Changes in scope
- No allowance for changes in cost due to market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for service relocation costs
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- No allowance has been made for third party traffic control costs
- No allowance has been made for bridge bracing during construction
- No allowance has been made for replacement of bridge structure
- Calculations assume clay soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work.

Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 6: Creek clearing and flood levees
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of estimate				$ 19,481.07
1.2	Design fees	5%				$ 9,740.54
	Sub-Total					**$ 29,221.61**
2.0	**Levee**					
2.1	Bulk fill	Based on average height per levee section, batter slopes of 1 in 3. See "Levee sizes" tab.	m^3	747	$ 36.00	$ 26,892.00
2.2	Subgrade preparation	Based on base surface area. See Levee sizes tab	m^2	1734	$ 3.00	$ 5,202.00
2.3	Proof roll of subgrade	As above.	m^2	1734	$ 0.60	$ 1,040.40
2.4	Compaction of embankment material	Compact in layers 150 mm thick. Determined by average height divided by 150mm, times approximate average surface area. See levee sizes tab	m^2	2890	$ 4.15	$ 11,993.50
2.5	Shaping of batters	As above.		747	$ 36.00	$ 26,892.00
2.6	Topsoil spreading	150 mm thick. As above.	m^2		$ 9.25	$ -
2.7	Hydromulch	As above.	m^2		$ 0.36	$ -
2.8	Tree removal	Cut down tree, 1-2 m circumference.	each	25	$ 500.00	$ 12,500.00
	Sub-Total					**$ 84,519.90**
3.0	**Creek clearing**					
3.1	Initial clearing of creek		item	1	$ 50,000.00	$ 50,000.00
3.2	Removal of weeds, branches etc.	See NPV Calcs	item	1	$60,291	$60,291
	Sub-Total					**$ 110,290.80**

Sub-total		**$ 224,032.31**
Contingency	30%	$ 67,209.69
Grand Total		**$ 291,242.00**

Note:

Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:

- Latent conditions
- Changes in scope
- Market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for land acquisition
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- Calculations assume clay soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work.

Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 7: Channel widening and flood levees
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of estimate				$ 36,266.15
1.2	Design fees	5%				$ 18,133.07
	Sub-Total					**$ 54,399.22**
2.0	**Levee**					
2.1	Bulk fill	Based on average height per levee section, batter slopes of 1 in 3. See "Levee sizes" tab.	m^3	512	$ 36.00	$ 18,432.00
2.2	Subgrade preparation	Based on base surface area. See Levee sizes tab	m^2	1236	$ 3.00	$ 3,708.00
2.3	Proof roll of subgrade	As above.	m^2	1236	$ 0.60	$ 741.60
2.4	Compaction of embankment material	Compact in layers 150 mm thick. Determined by average height divided by 150mm, times approximate average surface area. See levee sizes tab	m^2	2060	$ 4.15	$ 8,549.00
2.5	Shaping of batters	As above.		512	$ 36.00	$ 18,432.00
2.6	Topsoil spreading	150 mm thick. As above.	m^2		$ 9.25	$ -
2.7	Hydromulch	As above.	m^2		$ 0.36	$ -
2.8	Tree removal	Cut down tree, 1-2 m circumference.	each	25	$ 500.00	$ 12,500.00
	Sub-Total					**$ 62,362.60**
3.0	**Channel widening**					
3.1	Strip topsoil	Excavate to remove top soil average 150 mm deep and deposit in spoil heaps within 500 m, assume clay	m^2	3,150	$ 7.35	$ 23,152.50
3.2	Cut to spoil	Assume average excavation depth of 1 m	m^3	1,294	$ 20.85	$ 26,974.69
3.3	Clean soil disposal	Includes carting, nominal tip fees, soil disposal, assumes uncontaminated clean fill	t	2,199	$ 45.00	$ 98,971.88
3.4	Shaping of batters		m^3	1,294	$ 36.00	$ 46,584.00
3.4	Batter erosion protection	Jute mat, assumes 3 m high embankment	m^2	5,063	$ 3.00	$ 15,187.50
	Topsoil spreading for vegetation reinstatement	150mm thick	m^2	3,150	$ 9.25	$ 29,137.50
3.5	Maintenance of creek condition	See NPV Calcs	item	1	$60,291	$ 60,290.80
	Sub-Total					**$ 300,298.87**
	Sub-Total					**$ 362,661.47**

Sub-total		**$**	**417,060.69**
Contingency	30%	$	125,118.21
Grand Total		**$**	**542,178.89**

Note:

Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:

- Latent conditions
- Changes in scope
- Market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for land acquisition
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- Calculations assume clay soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work.

Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 8: Goolwa Road culvert upgrade and creek clearing
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of estimate				$ 102,577.28
1.2	Design fees	Assumed to be 5% of other costs	item	1		$ 51,288.64
	Sub-Total					**$ 153,865.92**
2.0	**Culvert upgrade**					
2.1	Demolition and reinstatement	Bridge rails, fence, guardrail etc	item	1	$ 15,000.00	$ 15,000.00
2.2	Vegetation removal		item	1	$ 20,000.00	$ 20,000.00
2.3	Cut to spoil	Channel widening on upstream and downstream ends	m^3	100	$ 21.70	$ 2,170.00
2.4	Clean spoil disposal	Includes carting, nominal tip fees, soil disposal.	t	170	$ 45.00	$ 7,650.00
2.5	6.1 x 4.2 RCBC	Supply and install	m	36	$ 7,700.00	$ 277,200.00
2.6	Additional cost channel and culvert transitions (formwork, connection to existing structures)		m	10	$ 5,000.00	$ 50,000.00
2.7	Match in and make good	Match in works around culverts	item	1	$ 10,000.00	$ 10,000.00
2.8	Miscellaneous costs associated with bridge works		item	1	$ 500,000.00	$ 500,000.00
2.9	Pavement reinstatement	200mm PM2/20 sub base, 200mm PM1/20 base course, 40mm AC10 with prime coat and proof rolls	m^2	468	$ 71.50	$ 33,462.00
	Sub-Total					**$ 915,482.00**
3.0	**Creek clearing**					
3.1	Initial clearing of creek		item	1	$ 50,000.00	$ 50,000.00
3.2	Removal of weeds, branches etc.	See NPV Calcs	item	1	$60,291	$60,291
	Sub-Total					**$ 110,290.80**

Sub-total		**$**	**1,179,638.73**
Contingency	30%	$	353,891.62
Grand Total		**$**	**1,533,530.34**

Note:

Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:

- Latent conditions
- Changes in scope
- No allowance for changes in cost due to market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for service relocation costs
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- No allowance has been made for third party traffic control costs
- No allowance has been made for bridge bracing during construction
- No allowance has been made for replacement of bridge structure
- Calculations assume clay soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work.

Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 9: Goolwa Road culvert upgrade and channel widening
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of estimate				$ 114,005.94
1.2	Design fees	Assumed to be 5% of other costs	item	1		$ 57,002.97
	Sub-Total					**$ 171,008.91**
2.0	**Culvert upgrade**					
2.1	Demolition and reinstatement	Bridge rails, fence, guardrail etc	item	1	$ 15,000.00	$ 15,000.00
2.2	Vegetation removal around culvert for construction		item	1	$ 20,000.00	$ 20,000.00
2.3	Cut to spoil	Channel widening on upstream and downstream ends	m3	100	$ 21.70	$ 2,170.00
2.4	Clean spoil disposal	Includes carting, nominal tip fees, soil disposal.	t	170	$ 45.00	$ 7,650.00
2.5	3x 2.4 x 2.2m culverts	Supply and install	m	36	$ 7,700.00	$ 277,200.00
2.6	Additional cost channel and culvert transitions (formwork, connection to existing structures)		m	10	$ 5,000.00	$ 50,000.00
2.7	Match in and make good	Match in works around culverts	item	1	$ 10,000.00	$ 10,000.00
2.8	Miscellaneous costs associated with bridge works		item	1	$ 500,000.00	$ 500,000.00
2.9	Pavement reinstatement	200mm PM2/20 sub base, 200mm PM1/20 base course, 40mm AC10 with prime coat and proof rolls	m2	468	$ 71.50	$ 33,462.00
	Sub-Total					**$ 915,482.00**
2.0	**Channel widening**					
	Strip topsoil	Excavate to remove top soil average 150 mm deep and deposit in spoil heaps within 500 m, assume clay	m2	3,150	$ 7.35	$ 23,152.50
	Cut to spoil	Assume average excavation depth of 1 m	m3	1,294	$ 20.85	$ 26,974.69
	Clean soil disposal	Includes carting, nominal tip fees, soil disposal, assumes uncontaminated clean fill	t	2,199	$ 45.00	$ 98,971.88
	Batter erosion protection	Jute mat, assumes 3 m high embankment	m2	5,063	$ 3.00	$ 15,187.50
	Maintenance of creek condition	See NPV Calcs	item	1	$60,291	$ 60,290.80
	Sub-Total					**$ 224,577.37**

Sub-Total		**$ 1,140,059.37**

Sub-total		**$ 1,311,068.27**
Contingency	30%	$ 393,320.48
Grand Total		**$ 1,704,388.75**

Note:

Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:

- Latent conditions
- Changes in scope
- No allowance for changes in cost due to market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for service relocation costs
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- No allowance has been made for third party traffic control costs
- No allowance has been made for bridge bracing during construction
- No allowance has been made for replacement of bridge structure
- Calculations assume clay soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work.

Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.

CONSTRUCTION COST ESTIMATE

Project: **Middleton Flood Study**
Job No: 230477
Date: 26/01/2024
Revision: C
Summary of works: Scenario 10: Creek clearing, Goolwa Road culvert upgrade and flood levees
Estimated: JRW
Review: KSS/TAK

Item No	Description	Comment	Unit	Qty	Rate	Cost
1.0	**Preliminaries**					
1.1	Preliminaries	Assumed to be 10% of estimate				$ 107,424.79
1.2	Design fees	5%				$ 53,712.40
	Sub-Total					**$ 161,137.19**
2.0	**Levee**					
2.1	Bulk fill	Based on average height per levee section, batter slopes of 1 in 3. See "Levee sizes" tab.	m^3	231	$ 36.00	$ 8,316.00
2.2	Subgrade preparation	Based on base surface area. See Levee sizes tab	m^2	1032	$ 3.00	$ 3,096.00
2.3	Proof roll of subgrade	As above.	m^2	1032	$ 0.60	$ 619.20
2.4	Compaction of embankment material	Compact in layers 150 mm thick. Determined by average height divided by 150mm, times approximate average surface area. See levee sizes tab	m^2	1376	$ 4.15	$ 5,710.40
2.5	Shaping of batters	As above.		231	$ 36.00	$ 8,316.00
2.6	Topsoil spreading	150 mm thick. As above.	m^2	1,032	$ 9.25	$ 9,546.00
2.7	Hydromulch	As above.	m^2	1,032	$ 0.36	$ 371.52
2.8	Tree removal	Cut down tree, 1-2 m circumference.	each	25	$ 500.00	$ 12,500.00
	Sub-Total					**$ 48,475.12**
3.0	**Culvert upgrade**					
	Demolition and reinstatement	Bridge rails, fence, guardrail etc	item	1	$ 15,000.00	$ 15,000.00
	Vegetation removal around culvert for construction		item	1	$ 20,000.00	$ 20,000.00
	Cut to spoil	Channel widening on upstream and downstream ends	m3	100	$ 21.70	$ 2,170.00
	Clean spoil disposal	Includes carting, nominal tip fees, soil disposal.	t	170	$ 45.00	$ 7,650.00
	3x 2.4 x 2.2m culverts	Supply and install	m	36	$ 7,700.00	$ 277,200.00
	Additional cost channel and culvert transitions (formwork, connection to existing structures)		m	10	$ 5,000.00	$ 50,000.00
	Match in and make good	Match in works around culverts	item	1	$ 10,000.00	$ 10,000.00
	Miscellaneous costs associated with bridge works		item	1	$ 500,000.00	$ 500,000.00
	Pavement reinstatement	200mm PM2/20 sub base, 200mm PM1/20 base course, 40mm AC10 with prime coat and proof rolls	m2	468	$ 71.50	$ 33,462.00
	Sub-Total					**$ 915,482.00**
3.0	**Creek clearing**					
3.1	Initial clearing of creek		item	1	$ 50,000.00	$ 50,000.00
3.2	Removal of weeds, branches etc.	See NPV Calcs	item	1	$60,291	$60,291
	Sub-Total					**$ 110,290.80**

Sub-total		**$**	**1,235,385.11**
Contingency	30%	$	370,615.53
Grand Total		**$**	**1,606,000.65**

Note:

Cost estimates provided by Tonkin are based upon historic cost information and experience, and do not allow for:

- Latent conditions
- Changes in scope
- Market conditions (i.e. competition, escalation)
- No allowance for approvals for these works
- No allowance for land acquisition
- No allowance for site contamination and remediation or disposal of contaminated material
- No allowance for land acquisition
- No allowance has been made for the staging of these works
- No allowance has been made for landscaping works
- No allowance has been made for service depthing, liaison with service authorities, design of and relocation of services
- No allowance has been made for project delivery costs including project management
- Calculations assume clay soil and no rock will be encountered

These estimates are to be considered as indicative only, and are not purported to represent anything more than an indication of the cost of the scope of the work.

Tonkin recommends that an appropriately qualified quantity surveyor be consulted to provide detailed market cost inputs.