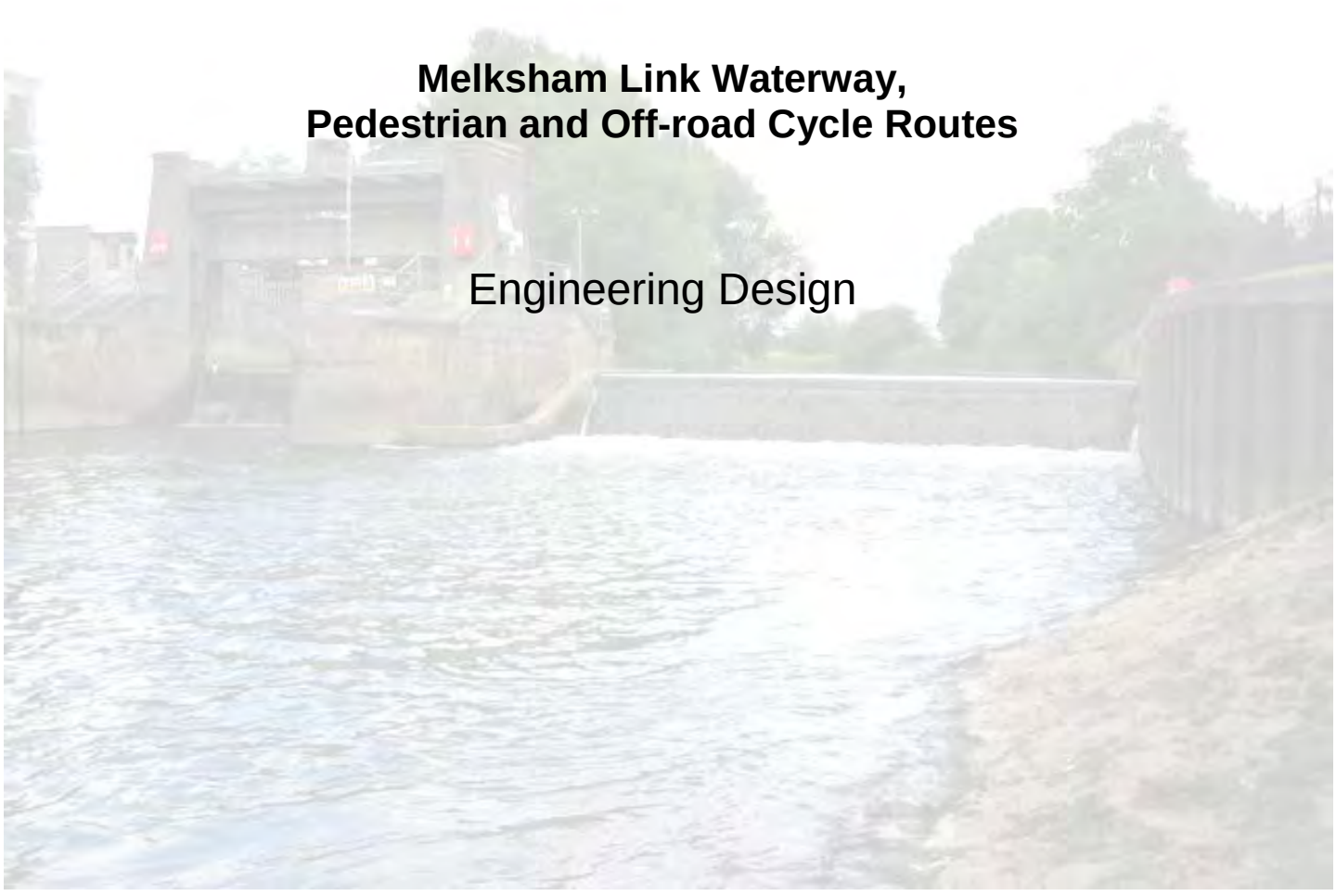
# Wilts and Berks Canal Trust

**Melksham Link Waterway,**
**Pedestrian and Off-road Cycle Routes**

Engineering Design



## Contents

**Document Control**

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|---|---|
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| Approval: | Edward Thomas Hon. Engineering Director Wilts & Berks Canal Trust. |

**Background**

The Wilts & Berks Canal Trust have been working with partners for a number of years to define a new route for the canal in Melksham where the historic alignment has been built over since the waterway was officially abandoned in 1914. This proposal, 'The Melksham Link' has been developed by a project team following the Wilts & Berks Canal Partnership decision in June 2009 to promote the scheme as a priority project. The proposed route has evolved from a feasibility report previously commissioned in 2007 by consultants Black & Veatch.

The 'Melksham Link' is the first phase of the route solution for the town and will allow navigation on a new section of canal to an impounded section of the River Avon.

This report deals with the technical issues (Parts 1,2,& 3) in this first phase to be delivered and acknowledges some of the design requirements for the second phase (part 4) to link back from the river to the historic route of the canal north of the town

The new navigable waterway has been designed in 4 parts.

Part 1: K&A junction to Berryfield village.

Part 2: Berryfield to junction with river Avon.

Part 3: River Avon impounded from new weir to the existing weir upstream of Town Bridge

Part 4: River Avon to the junction with the proposed new canal link to the historic line of the Wilts & Berks Canal

A Flood Risk Assessment is carried out in a separate document

**Technical Design**

The design for this proposal includes a new length of canal between Kennet & Avon canal and the River Avon, impounding of a section of the River Avon in Melksham**,** and a new lock adjacent to the existing weir with the following features:-

- New canal approximately 3km in length with 3 locks, designed to Kennet & Avon dimensions, falling a total 7.3m to the River Avon.
- New weir in the River Avon below Challeymead (A350) bridge raising the water level by approximately 0.5m from current ( summer flow) level.
- New narrow (2.1m) lock and hydropower facility, adjacent to the existing weir above Town Bridge allowing craft to be raised 2m to the river above the weir.

The waterway has been designed in four parts:

1. Kennet & Avon Canal junction to Berryfield community
2. Berryfield to junction with the River Avon
3. Impoundment of River Avon from new weir below Challeymead bridge to the existing weir and sluice above Town bridge
4. River Avon from the existing sluice to junction with proposed new canal (Note as an informative the proposed new route to connect to the historic line is shown is this design)

**Part 1 K&A Junction to Berryfield**

The junction will be approx 75m. west of the original entrance to the Wilts & Berks Canal , on the same level as the K&A, without a junction lock but will include provision for stop planks.

The water level in the K&A has been quoted at 38.30 AOD in all previous reports but several checks, taken during 2010, have shown this to be incorrect. There is considerable variation in levels from 38.01 to 38.21. In the light of these results the datum level has been adjusted to 38.20 AOD.

Water depth on this length is 1.4m.

**K &A entrance to old railway embankment**

1.1 A layout plan of this section is shown on Sheet1 scale 1:1250.

The connection to the K&A allows 30m. swinging room into the new length with vertical banks protected with either steel or plastic revetment. The K&A Towpath will be carried over the new canal junction by an 8m span Macrete® FlexiArch® footbridge with 1:15 approach ramps either side. This bridge will incorporate suitable ducts to carry the fibre optic communications cable that is currently buried in the towpath

Stop planks are provided, in the approach channel, to allow isolation of the new canal.

The canal will have a bed width of 7m.with nominal slopes of 1:3 and a channel width of 15m. The navigable width is 9m for a boat having a draught of 1m.

The length of channel shown on drawings 1,2 &3 will be on a low embankment for most of its length.

The position of the channel is dictated by the restriction of the Esso pipeline for part of this length and by agreement with the operator finished work will not be closer than 3m.to the pipeline. There are restrictions in the weight of construction plant working in the restricted area.

1.2 As part of this design, provision has been made adjacent to the canal for a Marina capable of accommodating 200 narrowboats, or a lesser number of wide beam, with a few residential moorings. The access will be from the suitably splayed connecting channel through a separation embankment incorporating a provision for stop planks. This will be built as a private venture and detailed proposals will be submitted as a separate planning application.

1.3 At the old railway embankment, a 5m waterway plus 3m towpath, in cutting, is proposed. This will have concrete retaining walls, possibly brick faced and bridged with a circa 1942 Bailey Bridge recovered from Frome and donated to the Trust.

1.4 This section will probably be mostly in the Oxford clay strata but, because of the limited water supply, this length will be fully lined with Rawmat sodium Bentonite lining. This will reduce bed and bank losses to the minimum possible.

1.5 Drawing No 2 shows cross-sectional details close to the old embankment where a new water main has already been laid to accommodate the canal.

1.6 The towpath is proposed to be 3m wide wherever possible with a minimum width of 2m surfaced to a standard to accommodate light plant, farm vehicles and cyclists

1.7 The length from the old railway to Berryfield is shown on Layout Plan Sheet 2.
This will be a 15m wide waterway on a low embankment incorporating a 3m wide towpath as above.
There will be at least one lift or swing bridge to accommodate footpaths and farm equipment.
A culvert will also be required to pass a small watercourse under the canal.

1.8 The canal water surface level will be at or above existing ground levels and imported fill will be required to construct the low embankments. This can come from the Marina development or from beyond Berryfield. If the latter source is used movement of spoil will have to be along the line of the canal and length 1 cannot be completed until spoil is available from length 2

1.9 Berryfield lock will be constructed just before the sharp bend leading into the village. Drawing 4b shows the cross section of the lock which will have a drop of 1.65m.
Construction will be reinforced concrete, with local stone copings and possibly brick facings. Standard K&A gates with steel balance beams will be used although the possible use of composite steel and timber has still to be

evaluated. Brick quadrants and heel grips, to BW pattern, will be provided at each gate.

1.10 The length from the lock to the aqueduct will need piled revetment on both sides.
Subject to further research, this will be plastic rather than steel piling
Appendix 1 shows details of plastic piling

1.11 Water supply. This length of canal is directly connected to the K&A and water will come from that source. To reduce water demand to the minimum channel lining will be used so that the biggest losses will be evaporation and transpiration. To further reduce demand, on the K&A's limited resources, back pumping will be installed to put locking water back that canal.

**Part 2 Berryfield to junction with river Avon**.
Layout Plan Sheet 3 and Sheet 4 shows the general details for this length.
Sheet 3a shows the work envisaged at Berryfield in greater detail.

2.1 There is a sharp turn into the village and the channel will have to be widened and protected with either steel or plastic piling, which will lead into an reinforced concrete aqueduct over the Berryfield Brook. This will be on skew of to the existing line of the brook
This will also allow limited room for mooring and winding. Drawings no.5 & 6

2.2 The aqueduct will be 5m.wide, plus the 3m wide towpath, and lead into a concrete channel 7m wide, with a narrow towpath, through the village.
The possibility of using plastic piling instead of concrete is still being investigated.
This area will be landscaped and planted and a new children's play area constructed to replace the existing one which is on the line of the canal. Due to the channel design there no mooring will be possible on this section from the aqueduct to Berryfield Lane.

2.3 Access to Berryfield village. The existing junction of Berryfield Park road with the main road will be severed and the concrete channel narrowed to 5 m. A manually operated lift bridge will be built.
A new road access will be constructed to provide 2 new roads from the main road into the village, with 2 arch bridges spanning the canal. The bridges will be FlexiArch® a patented, very modern, method of building arch bridges but with suitable approach ramps for current highway sight line requirements.. The external finish will be brick facings to produce a very similar appearance to the canal's original arch bridges.
Appendix 2 FlexiArch® system.

2.4 At the New Inn the available width is very restricted and channel width will have to be reduced to 5m, even possibly 4.5m, and the large tree removed.. It is proposed to terminate Berryfield lane with no canal crossing to Semington Road.

2.5 Downstream of Berryfield lock water levels will, at 36.55AOD, be approx. 400mm below ground level increasing to approx. 1m below ground level on the remainder of the length to top lock. Water depth will be 1.4 m through the village increasing to 1.6m depth beyond the concrete section. The depth of water is increased to 1.6m in order to provide water storage and to reduce turbulence and suspended solids arising from the passage of boats.
.
2.6 The winding hole and approach area at the end of the narrow section will need to be piled but beyond this the channel will be in a shallow cutting. This will require a simple plastic and timber piled revetment on the towpath side and a sloping bank to meet existing ground levels on the offside. Coir roll revetment may be required if the bank above he stone erosion protection is very soft. See drawing No.8

2.7 The towpath will revert to a 3m width and be surfaced to cycleway standards.

2.8 There will need to be a swing pedestrian access bridge near the 2nd. Lock to accommodate a revised footpath route.

2.9 Refuge moorings and a limited number of residential moorings are proposed part way to the next lock. Refuge moorings are essential as in a potential flood event all boats will have to move off the river.

2.10 Top lock. This lock is proposed to be built by volunteers and the design is being kept as a simple reinforced concrete structure. If this work is completed by volunteers it will be known as Volunteer Lock. Drawing No.4a
Top water level 36.55
Bottom water level 33.75
Fall 2.8m
Depth over cills 1.6m
Lock gates BW. standard timber or, possibly, composite steel construction with steel balance beams.

2.11 River lock. This lock will drop the canal to river level, which of course, varies considerably depending on rainfall and ground water conditions.
On the information currently available, a low summer water level of 30.60 should be achievable with a 500 mm increase in water level maintained by a new weir downstream of the junction, giving a probable max fall of 3.15m.
See longitudinal section Drawing. No.7

2.12 Water supply this length of canal will be supplied from the River Avon.
An automatic pumping station will be constructed near to Challeymead Bridge. This will pump water to a controlled outlet up stream of Top Lock and to another in the pound between the locks. Lockage water will discharge to the lock approach channel.
There will be an initial large quantity required for the first filling, but then water will only be required to make up bed losses, evaporation and transpiration; all lockage water being returned to the river.

2.13 Siltation. The passage of boats along the canal will cause some sediment to be put into suspension, this will be reduced by the increased depth and cross section area of this length of canal. Additionally the pound between the locks can be deepened by up to 1m. further reducing the suspended silt.
The resultant discharge to the river will, for most of the year, be less than the silt load in the river. The gate paddles on the bottom lock will be made larger than usual so that the rate of discharge will be greater than normal, which will help reduce the accumulation of silt in the approach channel.

2.14 The channel below the lock will be defined by revetment at or below nominal water level (similar to that used on the K&A Canal).The marginal area between the channel and the banks will be planted with reed and other native marginal plants to provide further habitat enhancement.

**Part 3 Impounded River Avon from canal junction to existing weir and sluice**

3.1 Details of this section are shown in Layout Plans Sheet 5

3.2 Melksham weir and sluice were built in 1958 to provide flood relief to Melksham. The Channel from the weir to below Challymead bridge is very wide and not as stable as the natural balance of the channel downstream of the widened section. There is considerable siltation in the area of Town Bridge and erosion at Challeymead Bridge and several long lengths of deep channel.

3.3 In order to make the River Avon navigable up to Melksham it is proposed to construct a low weir downstream of the junction with the new canal, at the end of the widened section, where the bed level is high. This weir will raise the water level by approx. 500mm ; incorporate a fish pass, canoe slalom and have a crest level of 30.35 to retain a water level of approx. 30.60 AOD. This will be sufficient, with minor dredging, to give a navigable depth of 1.6m up to the existing weir and sluice.
The dredged bed level will be 29.00 which will mean removing the high area at Town Bridge and under Challeymead Bridge, where erosion and siltation has completely altered the correct channel location. The dredged width will be a navigable channel approx 12m wide and the spoil will be used to reshape the left bank in the area of Challeymead bridge and minor bank regrading. The major part of the channel is already lower than the required depth.
Drawing 10 shows a longitudinal section of the river with the proposed levels superimposed.

3.4 The new weir will have a weir length of 20m. and be slightly curved in plan. A canoe weir/slalom will be constructed close to the North bank. Further discussion is required with canoeists to decide the design of this structure On the South side a 4m. x1m. tilting weir sluice gate will be constructed; this will allow the level to be dropped for inspection, maintenance and minor adjustments to the water level. This sluice can also be left open in the winter and will reduce the rate of siltation. Alongside the sluice there is room for a 600mm wide fish pass.
Drawings 11 and 12

3.5 In Melksham the existing weir and sluice gate will be retained and a new narrow lock built on the South side(Left bank) of the weir. This will mean that wide beam boats will not be able to navigate beyond the existing weir; there is however ample room on the south bank to re-profile the bank to provide bankside or pontoon moorings and improve the general appearance of the river corridor.
Drawing no.9

3.6 There will still be adequate fall at this weir to make hydropower generation a practical proposition and drawing 9 also shows a possible position for an installation.

3.7 Melksham lock. The proposed lock will be a conventional narrow lock and the same length as the K&A locks.
This lock will be subject to regular flooding as it will be adjacent to the existing weir wall. An additional Hydraulic Modelling Report has been commissioned from Messrs. Black and Veatch which indicates that the construction will have no measurable effect on flood levels if built as a standard narrow lock.
As a flood relief channel it could provide a very modest reduction in flood levels of 20-40mm. The high additional cost of providing this option is not justifiable, but the facility to open top and bottom gates together can be provided .

3.8 Basic lock data
Top Gates.
Oxford Canal pattern. Ground paddles only
Crest level of weir. 32.61 AOD
Assumed summer level. 150mm over weir
Cill level. 31.11. ie. 1.5 m below weir crest level. There will therefore adequate depth for navigation if level drops to crest level.
Overspill level. Top gates 33.20
Flood level. 1:100 year 34.80
Coping level. As existing piling 34.13.

Bottom Gates
Mitre Gates. Single paddle in each gate
Downstream water level. 30.60 approx.
Lock fall 2360mm
Lock gate cill level. 29.00

Lock island
The existing piling to remain untouched.
New steel piling to be driven to connect with the existing to form a bullnose up stream and downstream of the lock and the wall of the lock. Tie rods to tie across the island and to be surfaced with an reinforced concrete deck detailed to suit the proposed hydropower scheme.

Towpath side
Steel sheet piling to start approx. 40m upstream of the forebay. Concrete coping level 33.20.
Lock wall piled with coping level of 34.13.
Downstream of lock piling continued for 40m. Coping level 31.00-31.50.
With the high risk of flooding the towpath and bank, including the piled lengths upstream and downstream, up to the 34.80 level, need to be protected from erosion with pitched stone or block revetment.
The existing structure is piled on both banks and piling will be in keeping, but the lock chamber could have a cosmetic finish of brick or stone if required.

3.9 Basic Challeymead weir data
Main weir . Length 20m broad crested type with upstream and downstream approaches sloped at 30 degrees.

The drop over the weir will vary with changes in water level but under average summer flows will be 0.54m.
In flood conditions the downstream water level will rise to a point where the weir is completely covered i.e. ‘drowned out’. This is likely on 1:2 year flood return period.
Adjustable sluice . A tilting weir of the type produced by Waterfront Fluid Controls Ltd is proposed on the south bank. This will allow the retained level to be dropped so the limited maintenance and inspections can be carried out during low flow periods. It will also allow a small amount of fine adjustment in retention level and subject to experiment there may be a reduction in silt accumulation if left open for part of the winter.
Fish Pass A 800mm wide Larinier type fish pass will be constructed next to the sluice. This type of fish pass has closely spaced baffles along its length making an easier passage for fish.
The provision of an access platform over the sluice will also provide easy access to the pass.
Canoe Channel. A channel 5m wide to the approved design of the British Canoe Union will be built on the north bank.
With the low drop over this weir both the channel and the main weir will be particularly attractive to canoeists and it is likely to become a very popular training length of the river. Simple landing stages will be constructed above and below the weir .
It is not proposed to fit a boom at the weir and appropriate warning signs will warn boaters and canoeists.

## Part 4 River Avon above Melksham Gate ( existing sluice)

4.1 Details of this section are shown on Layout Plan Sheet 5

4.2 Upstream of the Melksham Gate (existing sluice).

The left bank up stream of the sluice is suitable for the development of mooring space and an improved towpath. An outline design for a simple revetment to protect the river bank and improve boat access has been prepared for the canoe club and would be suitable for the whole bank beyond the new piling.

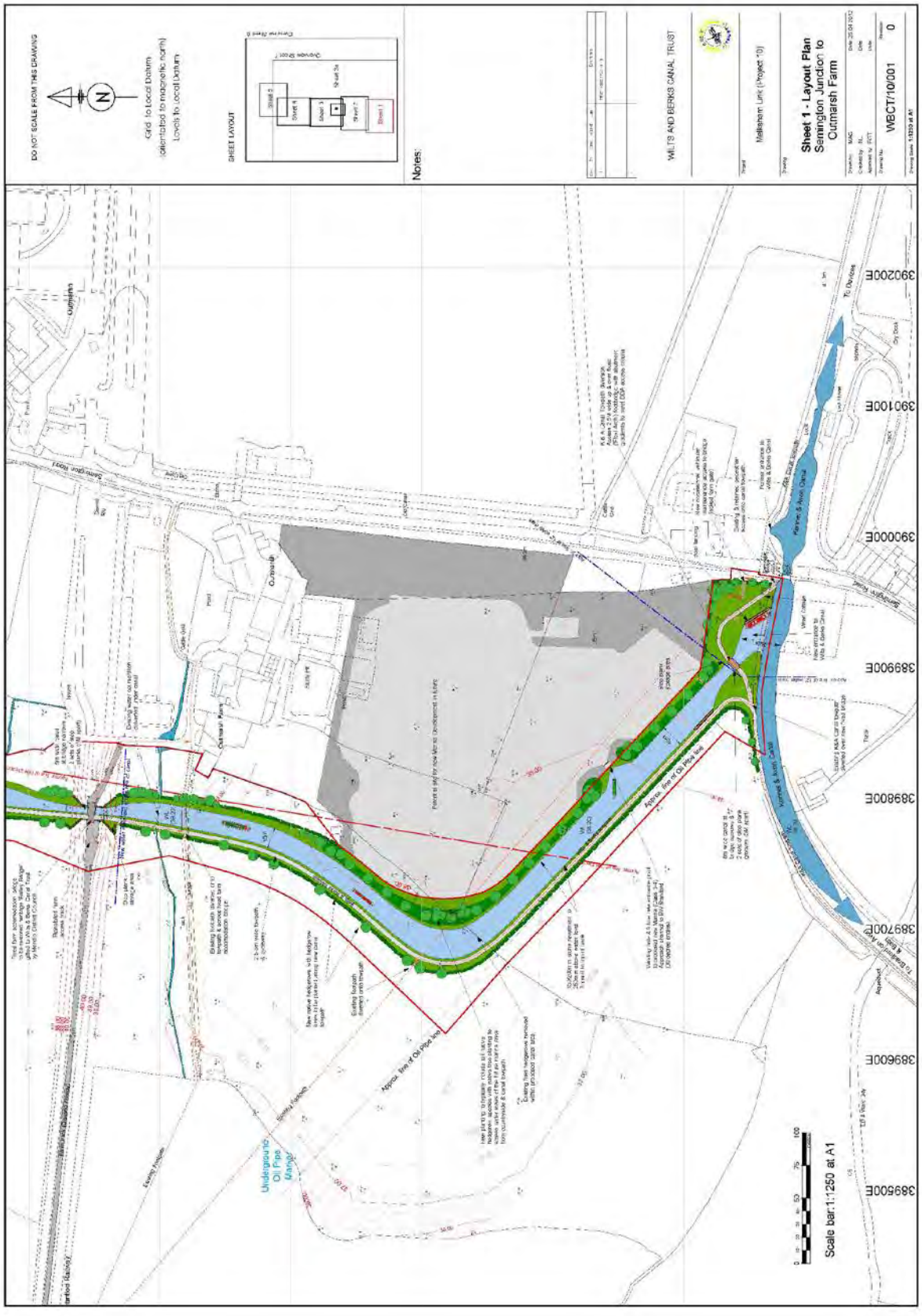
4.3 Beyond the river the drawings indicate the proposed route to link to the historic line of the canal north of Melksham.

**Part 5 Services**
Information has been obtained from the various service providers.

The work expected to be required to deal these is summarised:-
5.1 Fibre–optic cables. As already noted these will be diverted over the new footbridge at Semington
5.2 Esso pipeline. The alignment of the canal runs parallel to the pipeline but it is designed to be just outside “the restricted width” of approach to the pipe line required by the Operator.
5.3 Water. The main problem expected to arise has been dealt with and Wessex Water’s new main has been laid with adequate cover under the set out position for the canal.
At the K&A junction the main crossing under the K&A will have to be extended to pass under the new line and a new valve complex will have to be constructed. The alignment of the main is avoided by the layout shown for the junction and Marina.
Water service pipes will have to be re-located at Berryfield where the canal will cross them.
5.3 Foul sewers A 200 diam crosses the canal line near Berryfield. With a canal depth of 1.4m there should be clearance under the canal based on the information obtained.
A rising main crosses under the Berryfield Brook at Berryfield this should not cause a problem but may be to high to pass under the concrete section and may need lowering.
5.4 Storm sewers. 450 and 600mm storm drains cross the line of the canal near to the 2 locks and diversions will be required.
The sewage treatment works outfall, Southbrook outfall and a storm water outfall are downstream of the new weir so are not affected.
There are sewer overflow outfalls and road drains discharging to the river above the new weir but the small rise in retained water level should have little effect.
5.5 Overhead cables. Some diversion or temporary raising may be required but most of the overhead lines can be worked under or avoided.

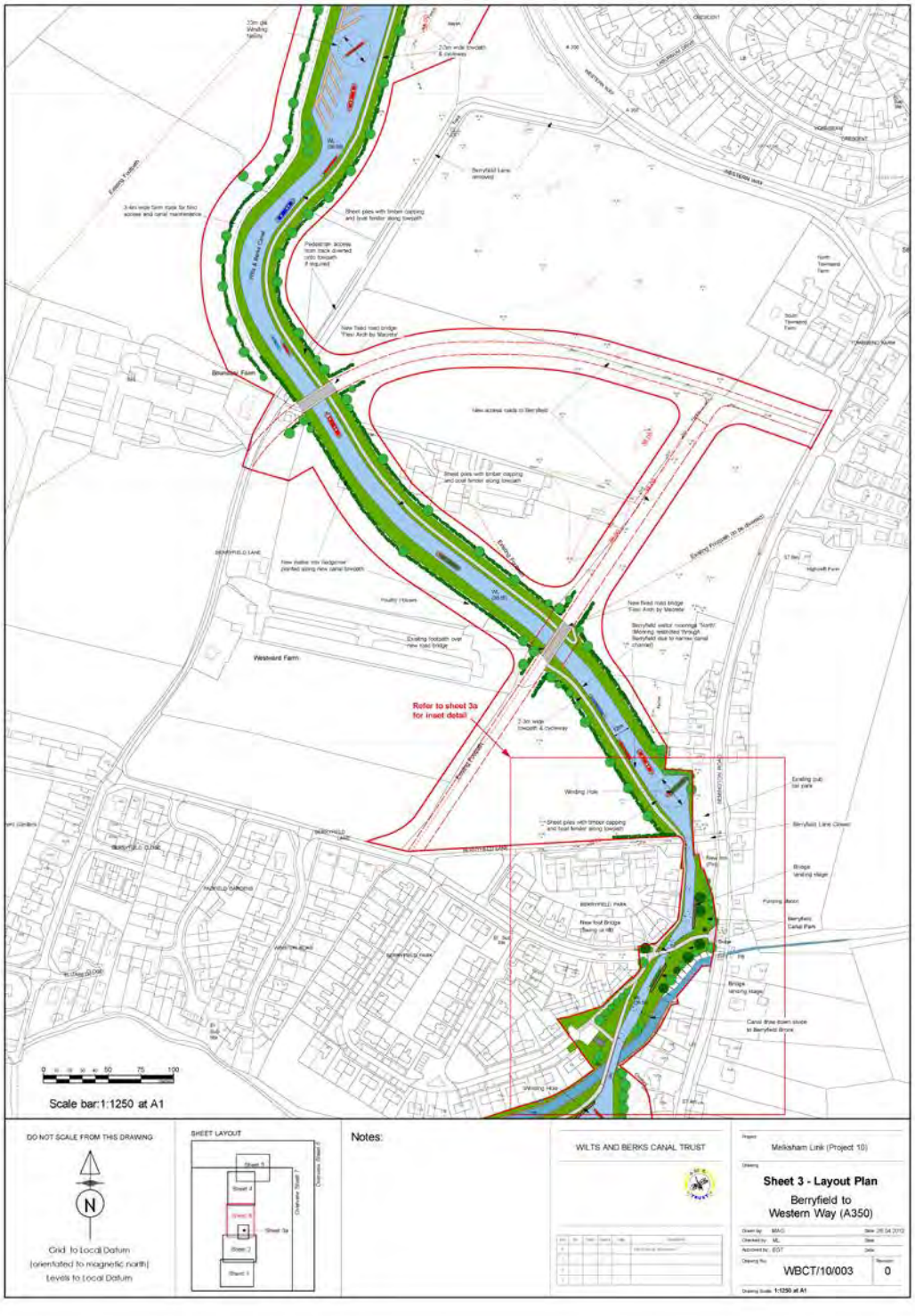
**Layout Plans & Maps**

Layout Plan Sheet 1
Do not scale from this drawing-see separately submitted drawings

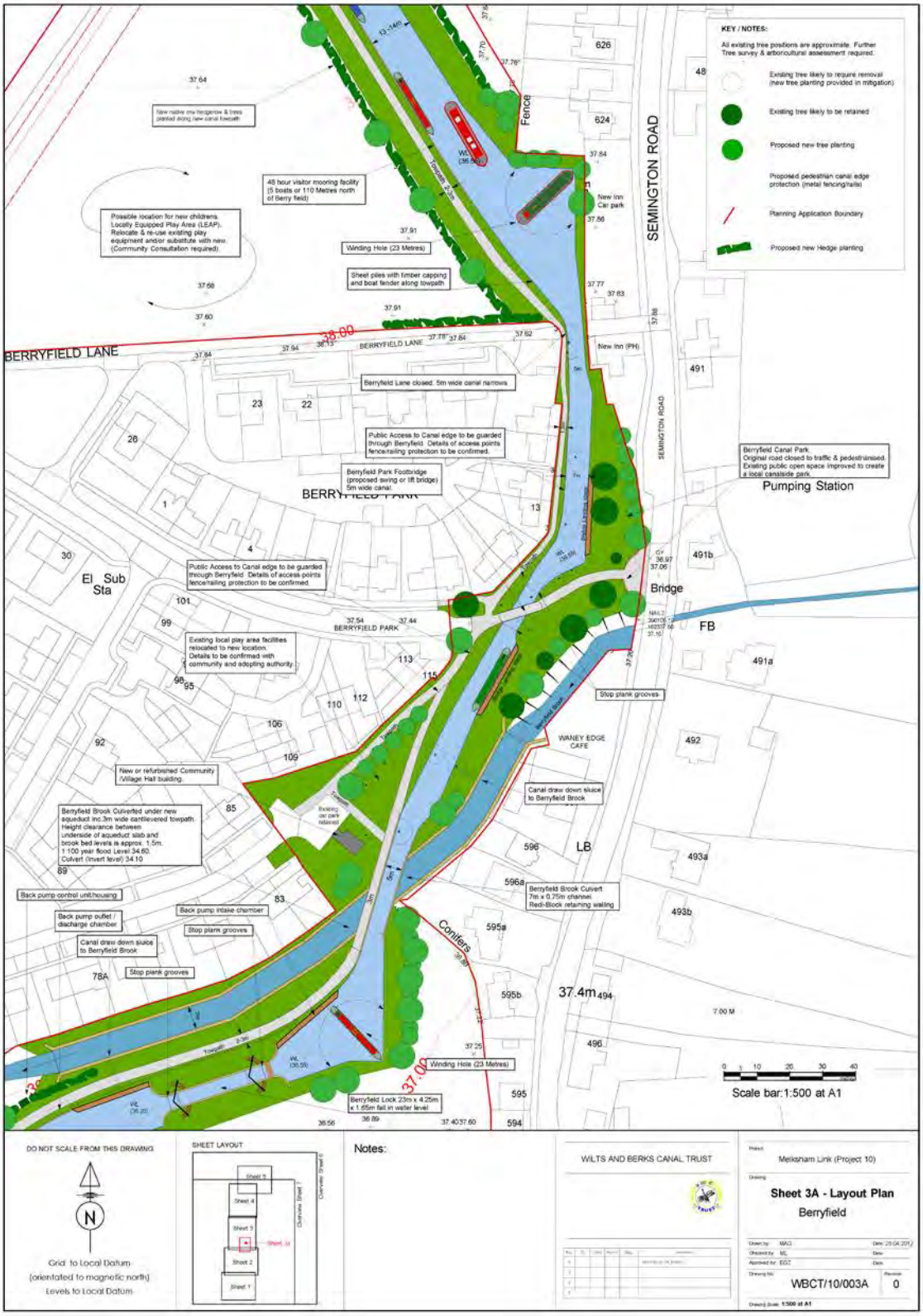


Layout Plan Sheet 2
Do not scale from this drawing-see separately submitted drawings

Layout Plan Sheet 3
Do not scale from this drawing-see separately submitted drawings



Layout Plan Sheet 3a
Do not scale from this drawing-see separately submitted drawings



Layout Plan Sheet 4
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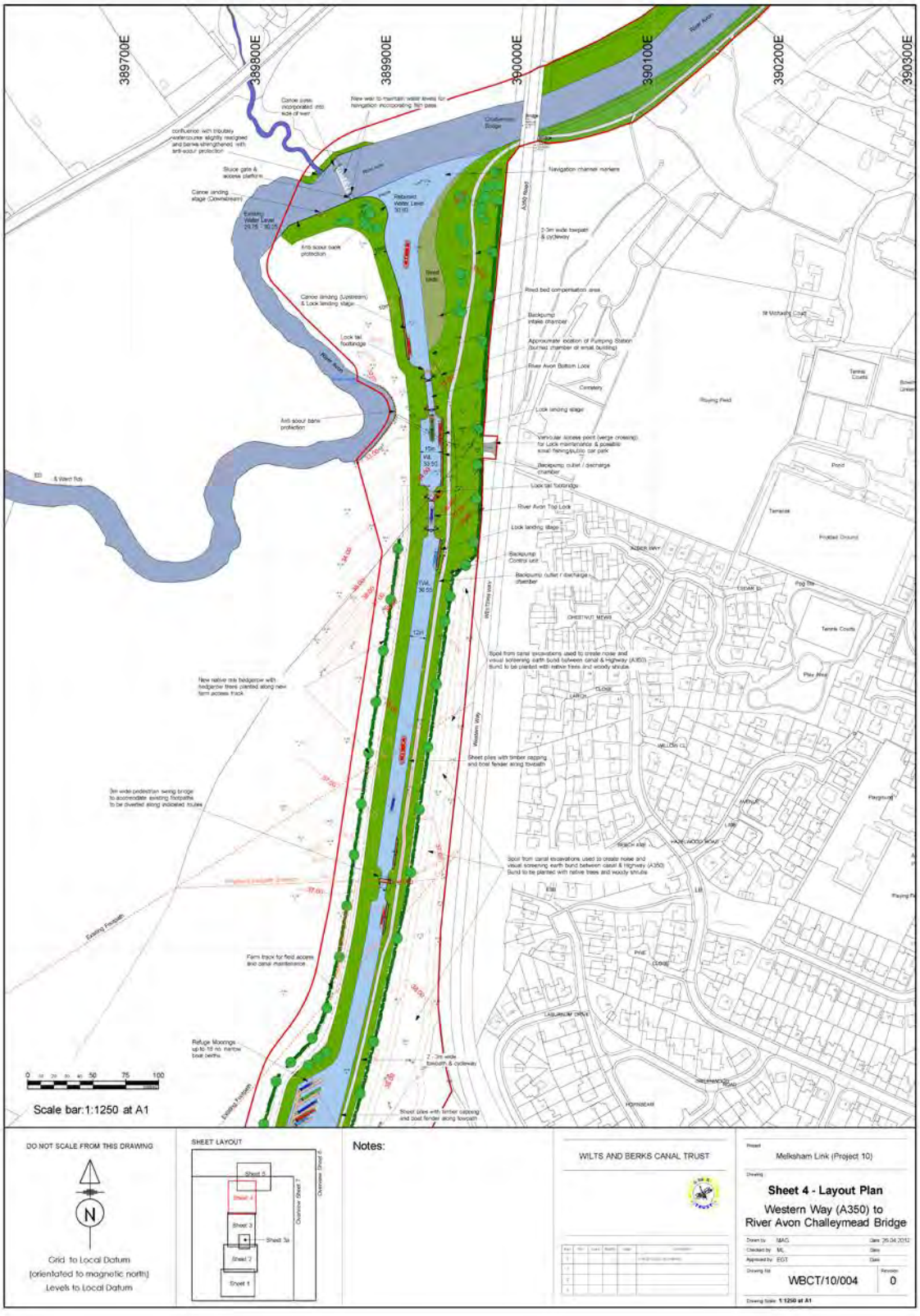

Layout Plan Sheet 5
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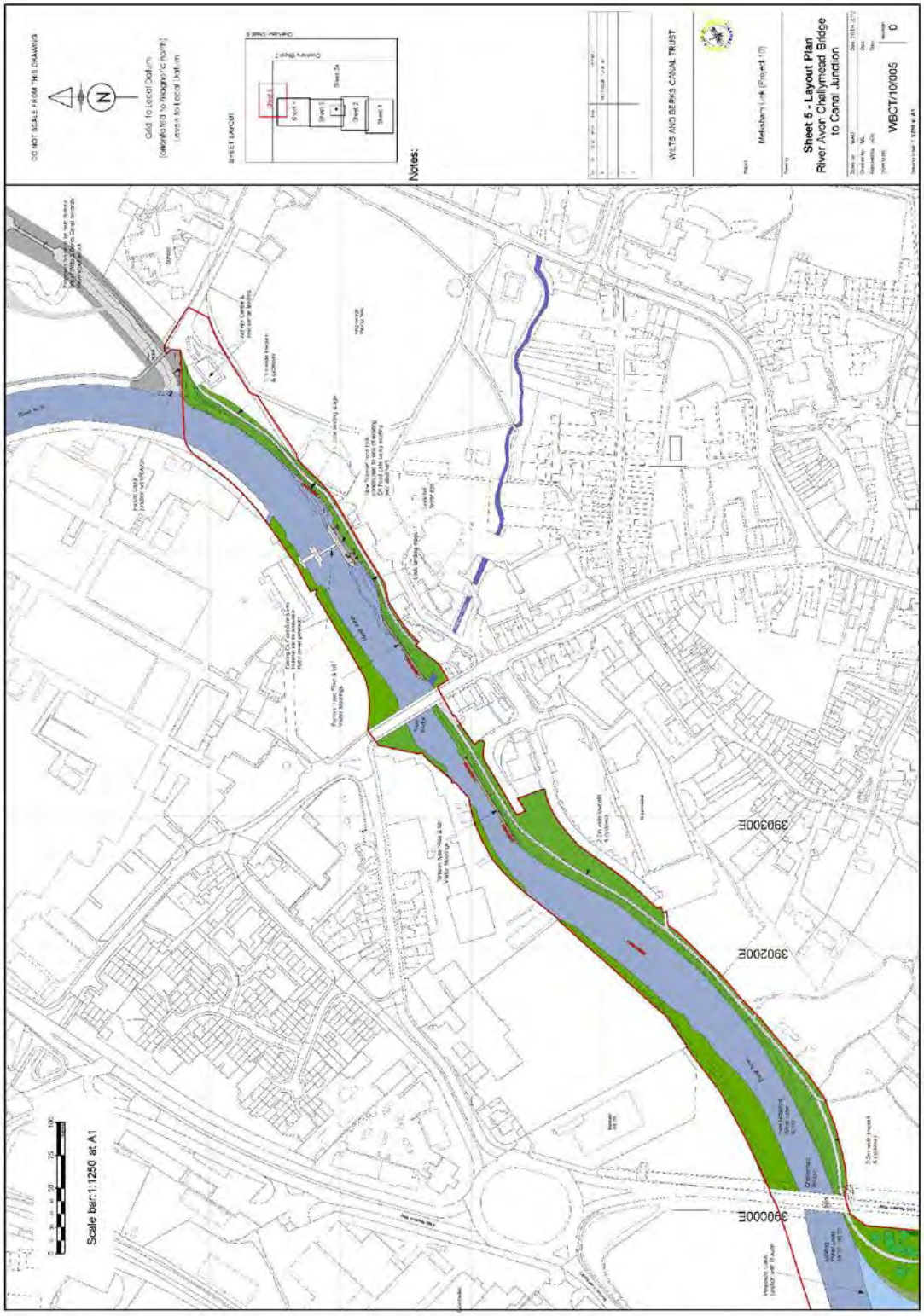
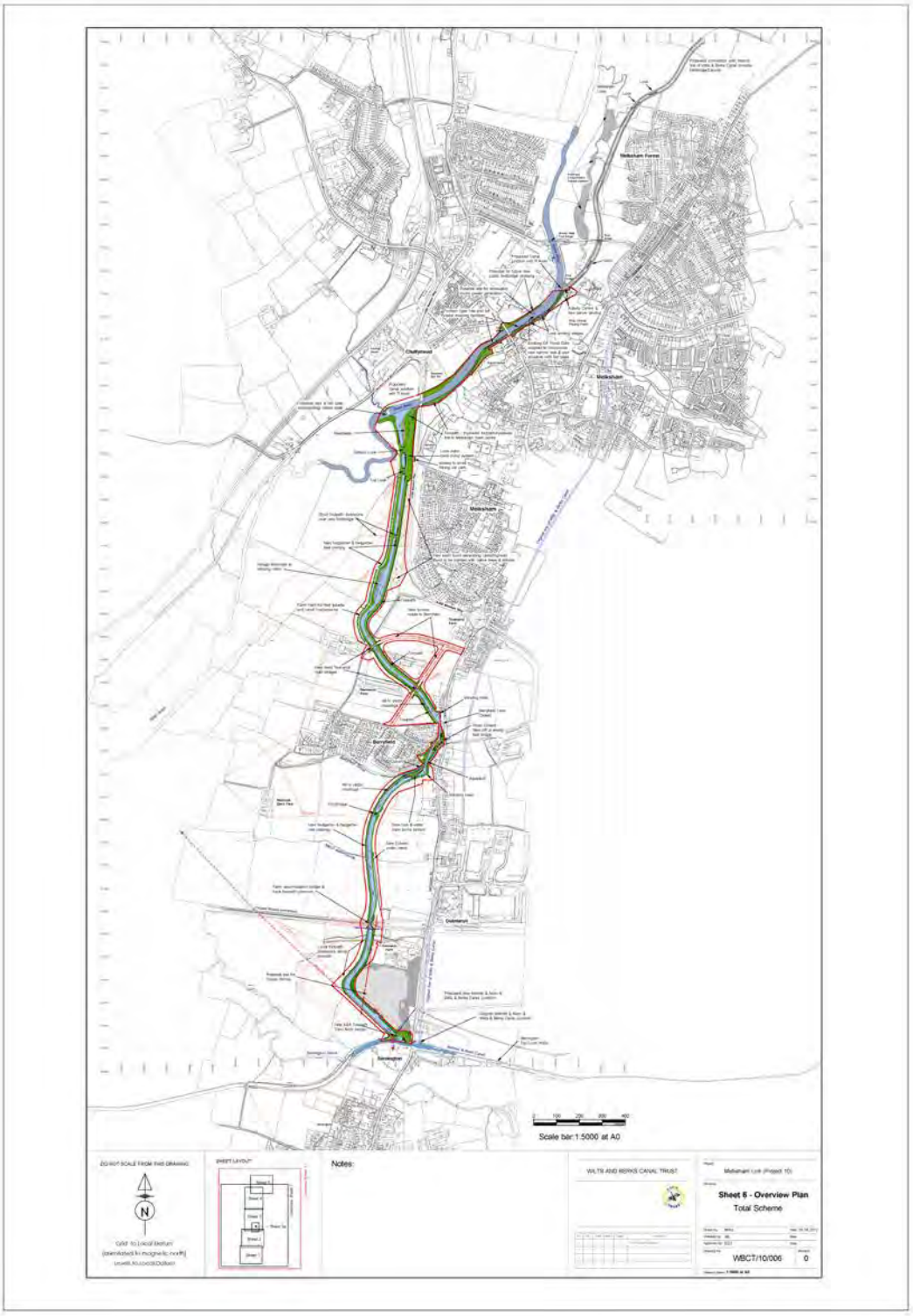


Layout Plan Sheet 6 Overall Scheme
Do not scale from this drawing-see separately submitted drawings



**Engineering drawings /sketches**

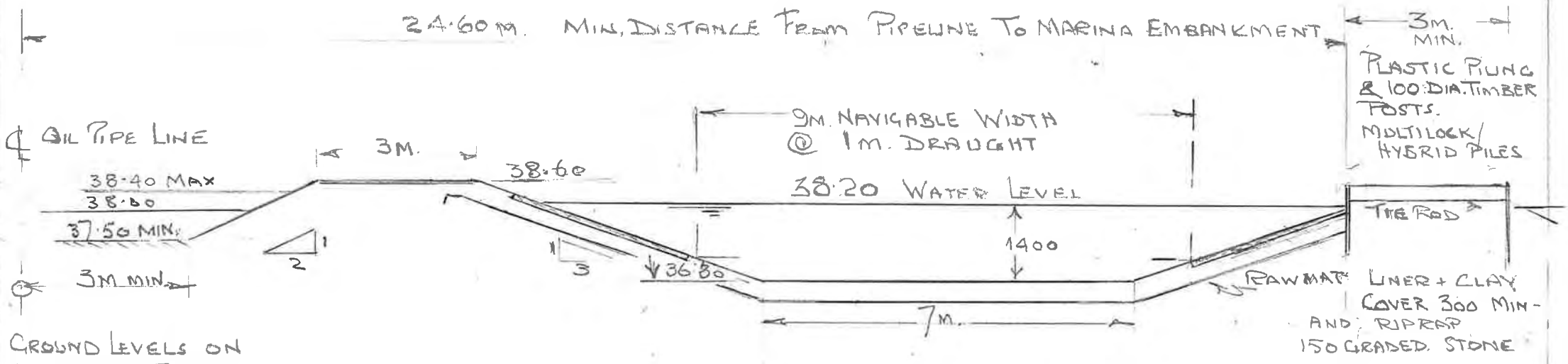
Drawing No. 1

Typical cross section of channel between K&A and the railway embankment

Scale 1:100 @ A4

# WILTS AND BERKS CANAL

## MELKSHAM LINK




CROSS SECTION OF PROPOSED W&B CANAL AT OUTMARSH FARM

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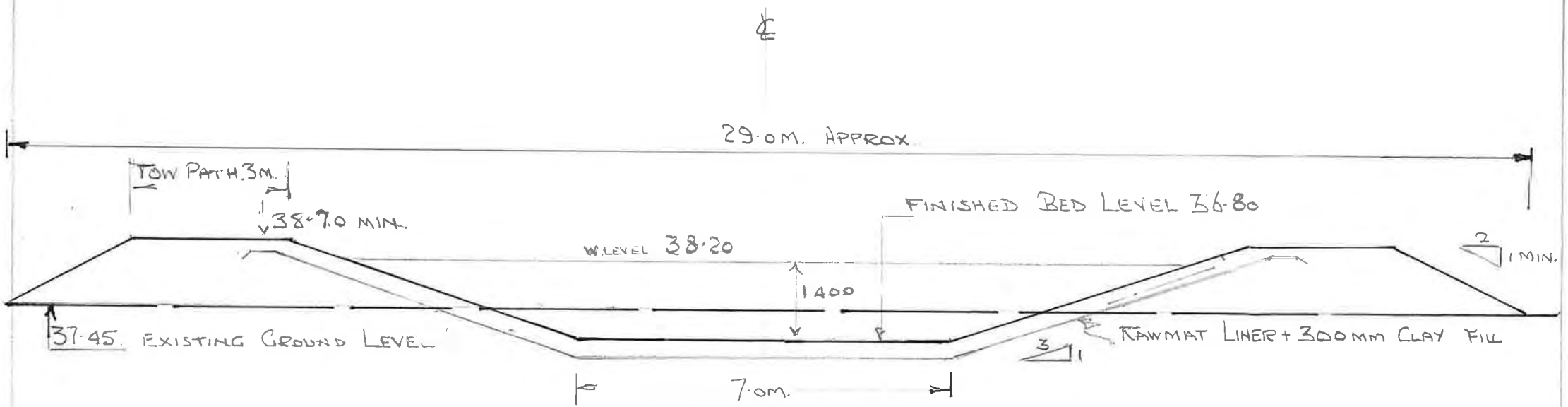
|---|
| DRAWN MJL 3.06.10<br>REVISED 10.1.11/13.09.12 |
| SCALE 1:100 |
| DRWG. No. 1 |

Drawing No.2.  Cross section as set out at new water main crossing at Outmarsh Farm.

Scale 1:100 @A4



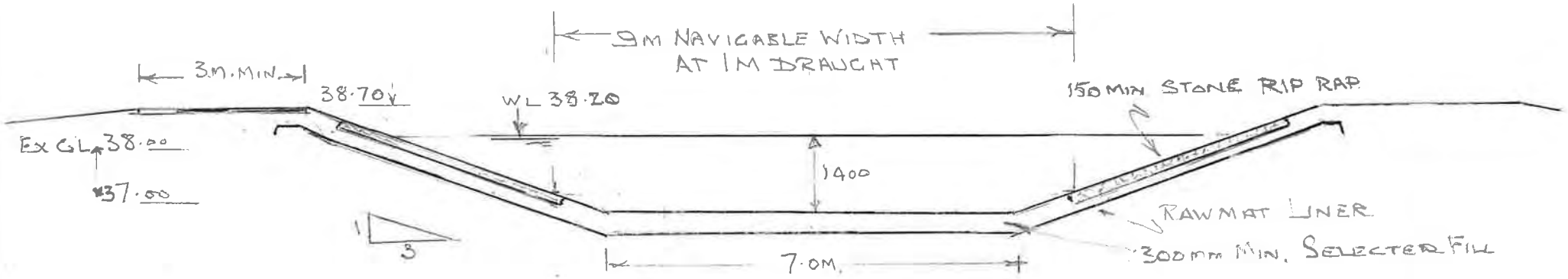

CANAL CROSS SECTION AT LOCATION OF NEW WATER MAIN CROSSING.
CLOSE TO TOE OF EXISTING OLD RAILWAY EMBANKMENT

WILTS AND BERKS CANAL
MELKSHAM LINK
WESSEX WATER. REALIGNMENT OF W. MAIN
LAND OWNER. MR JOHN STAINER, OUTMARSH FARM

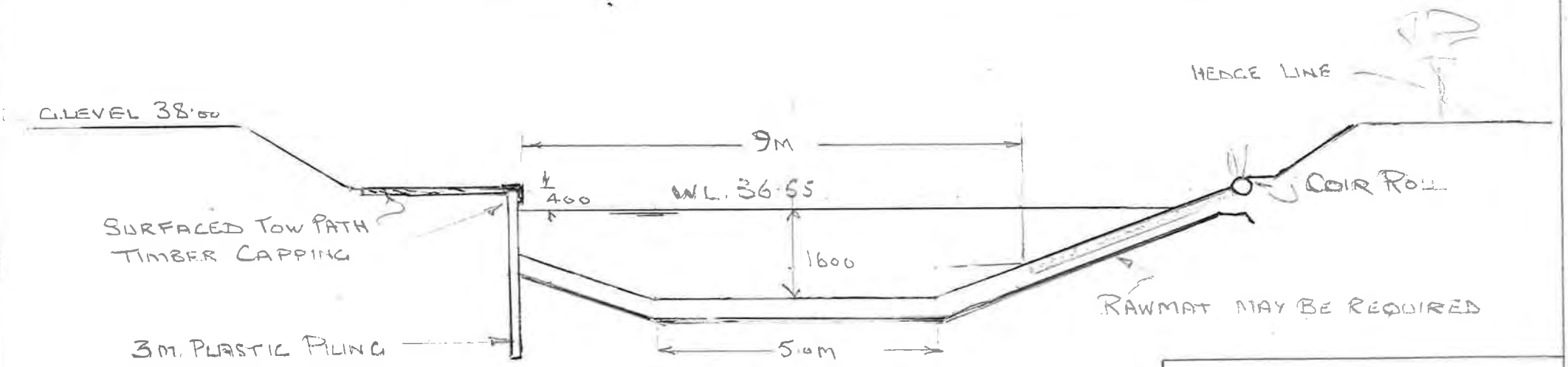
| WILTS AND BERKS C.T. |
| --- |
| DRAWN M Lee |
| 27TH MAY 2010 |
| SCALE 1:100 DRWG NO 2 |

Drawing No.3  Typical cross sections :
Between railway embankment and Berryfield Village
& between Berryfield and river Avon.

Scale 1:100 @A4




TYPICAL SECTION - OLD EMBANKMENT TO BERRYFIELD




TYPICAL SECTION BERRYFIELD TO RIVER AVON

SCALE 1:100

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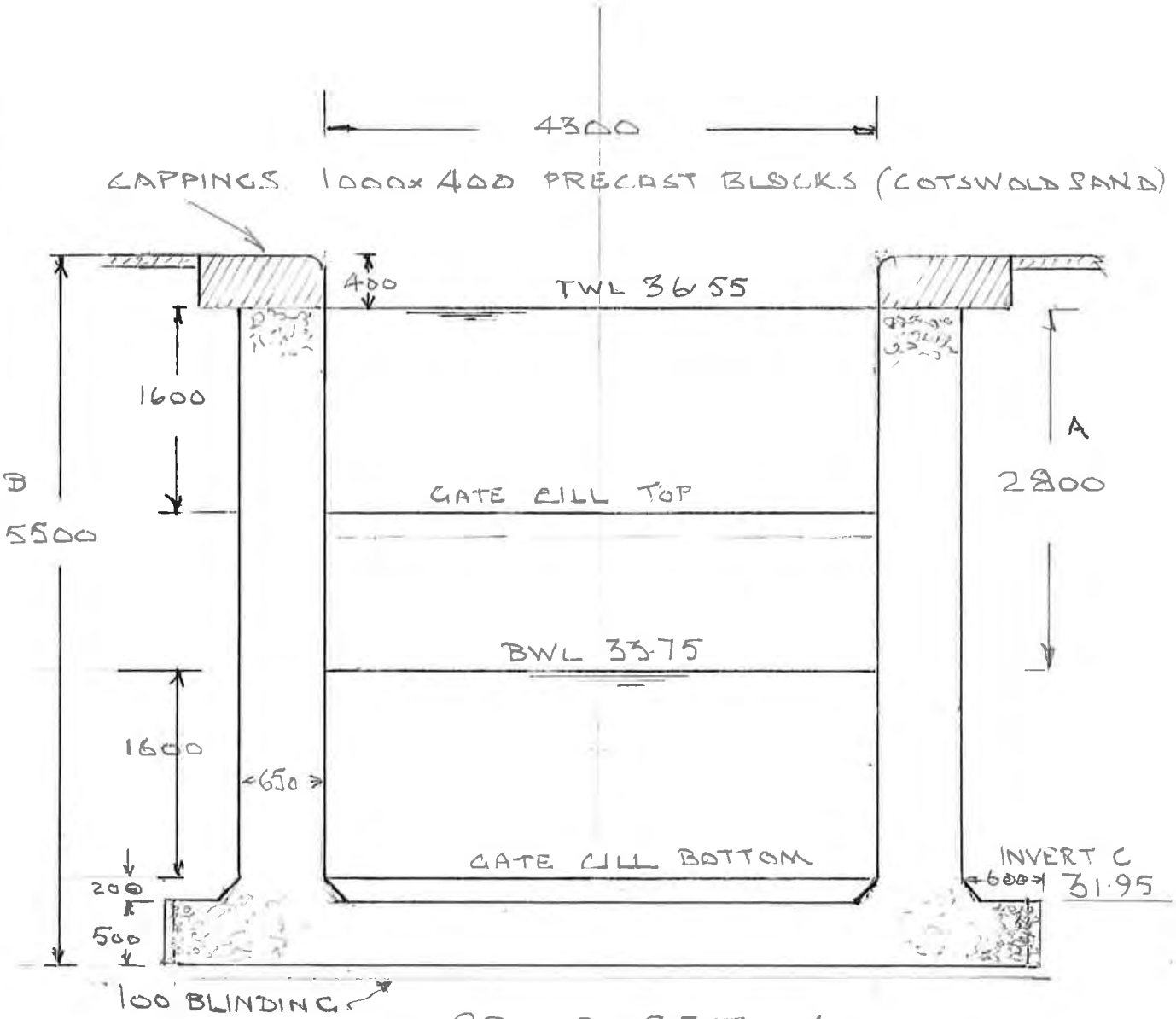
| WILTS AND BERKS CANAL<br>MELKSHAM LINK |
| DRAWN MJL 19.02.10<br>REVISED 10.1.11 |
| DRWG.NO. 3 |

Drawing No.4a section –lock construction

Scale 1:50 @ A4




## CROSS SECTION TOP LOCK

LENGTH 23M - AS K & A LOCKS

LOCK GATES AND BALANCE BEAMS
MILD STEEL - GALVANISED
QUOIN AND MITRE SEALS - OAK OR PLASTIC.

CONCRETE C40 FAIR FINISHED
REINFORCEMENT 10mm

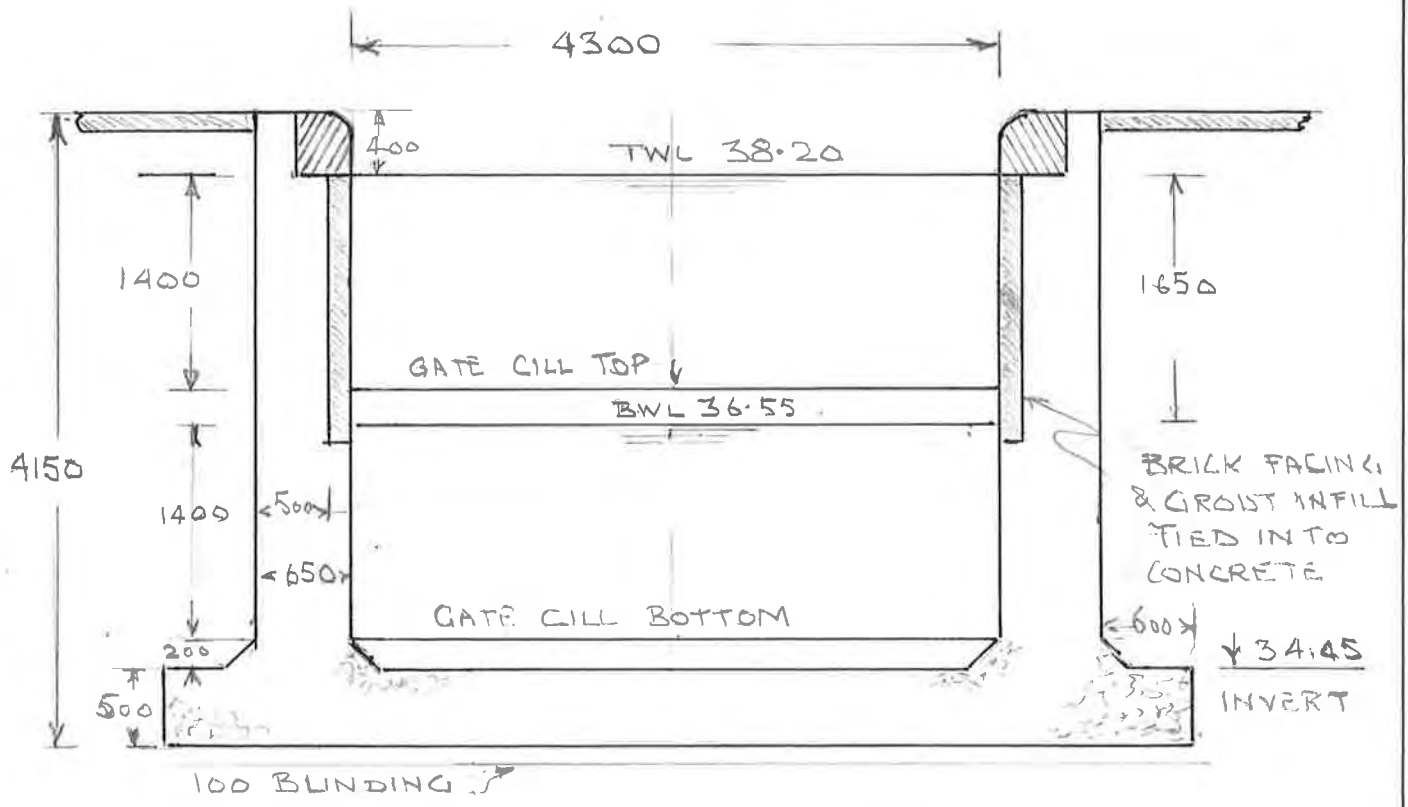
RIVER LOCK AS ABOVE.

EXCEPT
A. FALL IS 3150MM
B. HEIGHT 5850 mm
C INVERT 28.75 AOD.

| |
|---|
| WILTS & BERKS CANAL TRUST |
| MELKSHAM LINK CROSS SECTION TOP LOCK |
| DRAWN MJL 13/09/12 |
| SCALE 1:50 |
| DRAWING NO 4A REVISION 3. |

Drawing No.4b section –Berryfield lock construction

Scale 1:50 @A4




# CROSS SECTION

## BERRYFIELD LOCK

FALL 1.65M.

LENGTH 23M. AS K&A LOCKS

LOCK GATES, MILD STEEL, GALVANISED

QUOIN & MITRE SEALS, OAK OR PLASTIC

CONCRETE, C40 FAIR FINISHED

REINFORCEMENT 10mm.

COPINGS - BULLNOSE BRICKWORK OR PRECAST CONCRETE.

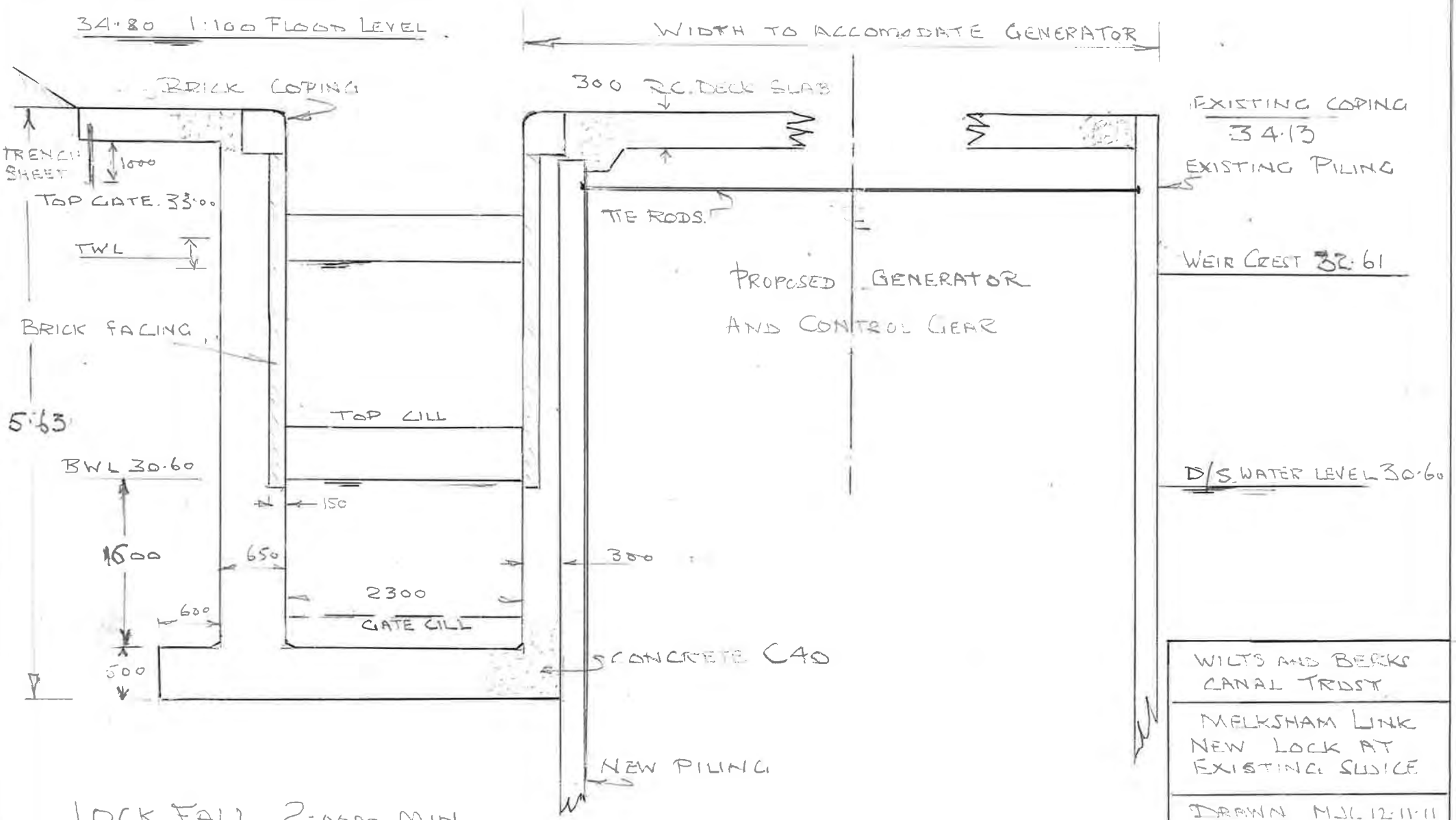
BRICK FACINGS AS WBCT SPEC. FOR RESTORATION BRICKS.

| |
|---|
| WILTS & BERKS CANAL TRUST |
| MELKSHAM LINK CROSS SECTION BERRYFIELD LOCK |
| DRAWN MJL 14/09/12 |
| SCALE 1:50 |
| DRAWING No. 4b REV. 3. |

Drawing 4c sections –lock construction at Melksham Gate

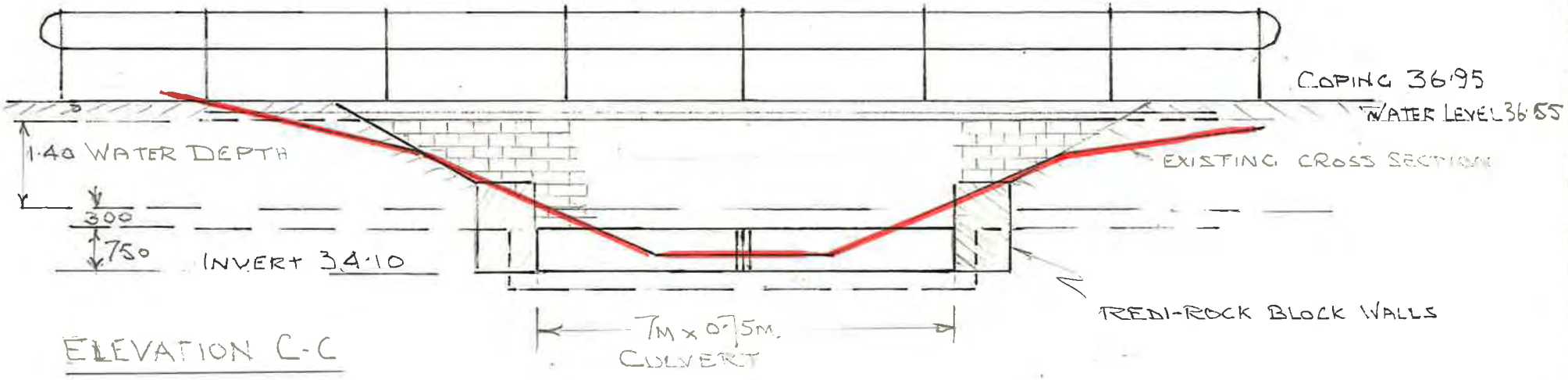
Scale 1:50 @ A4

See  also separately submitted drawing WBCT 10/008

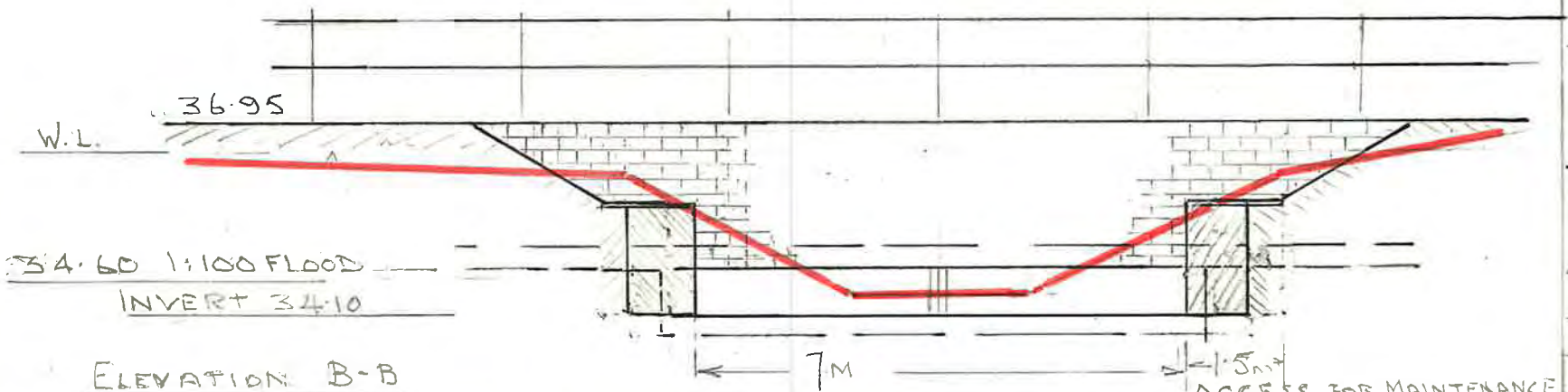

34.80 1:100 FLOOD LEVEL
WIDTH TO ACCOMODATE GENERATOR
BRICK COPING
300 R.C. DECK SLAB
EXISTING COPING
34.13
EXISTING PILING
TRENCH SHEET
1000
TOP GATE 33.00
TWL
TIE RODS
PROPOSED GENERATOR
AND CONTROL GEAR
WEIR CREST 32.61
BRICK FACING
5.63
TOP CILL
BWL 30.60
D/S WATER LEVEL 30.60
150
1600
650
300
2300
600
GATE CILL
500
CONCRETE C40
NEW PILING
LOCK FALL 2.00m MIN.
VARIES DUE TO RIVER LEVEL CHANGES
WILTS AND BERKS CANAL TRUST
MELKSHAM LINK
NEW LOCK AT
EXISTING SLUICE
DRAWN MJL 12.11.11
SCALE 1:50
DRAWING NO 4C
REV 2

Drawing No.5  Berryfield brook aqueduct
Elevations looking upstream and downstream

Scale 1:100 @A4




ELEVATION C-C




ELEVATION B-B

WILTS & BERKS CANAL TRUST

MELKSHAM LINK

BERRYFIELD BR. CULVERT U/S & D/S ELEVATIONS

DRAWN MJL JUNE 2011

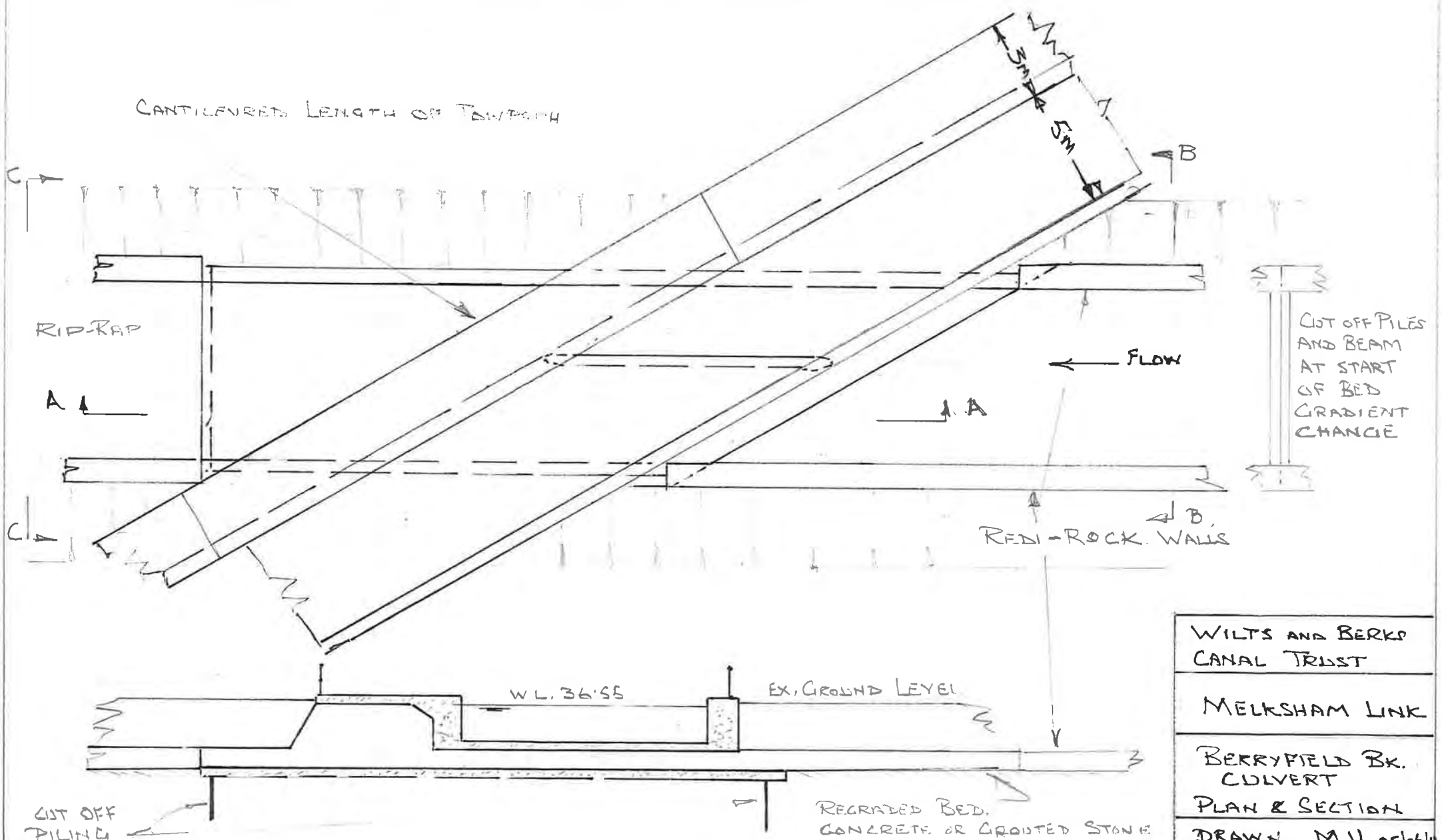
SCALE 1:100

DRWG No 5 MOD 1

Drawing No.6 Berryfield Brook.
Plan & Section

Scale 1:200 @A4

R.C. CHANNEL SECTION INCORPORATING 7m x 0·75m CULVERT




CROSS SECTION A-A.

| |
|---|
| WILTS AND BERKS CANAL TRUST |
| MELKSHAM LINK |
| BERRYFIELD BK. CULVERT PLAN & SECTION |
| DRAWN MJL 05/06/11 |
| SCALE 1:200 |
| DRWG'N NO. 16 |

Drawing No.7 Longitudinal section- locks leading down into river Avon

Vertical Scale 1:50
Horizontal Scale : 1:1250

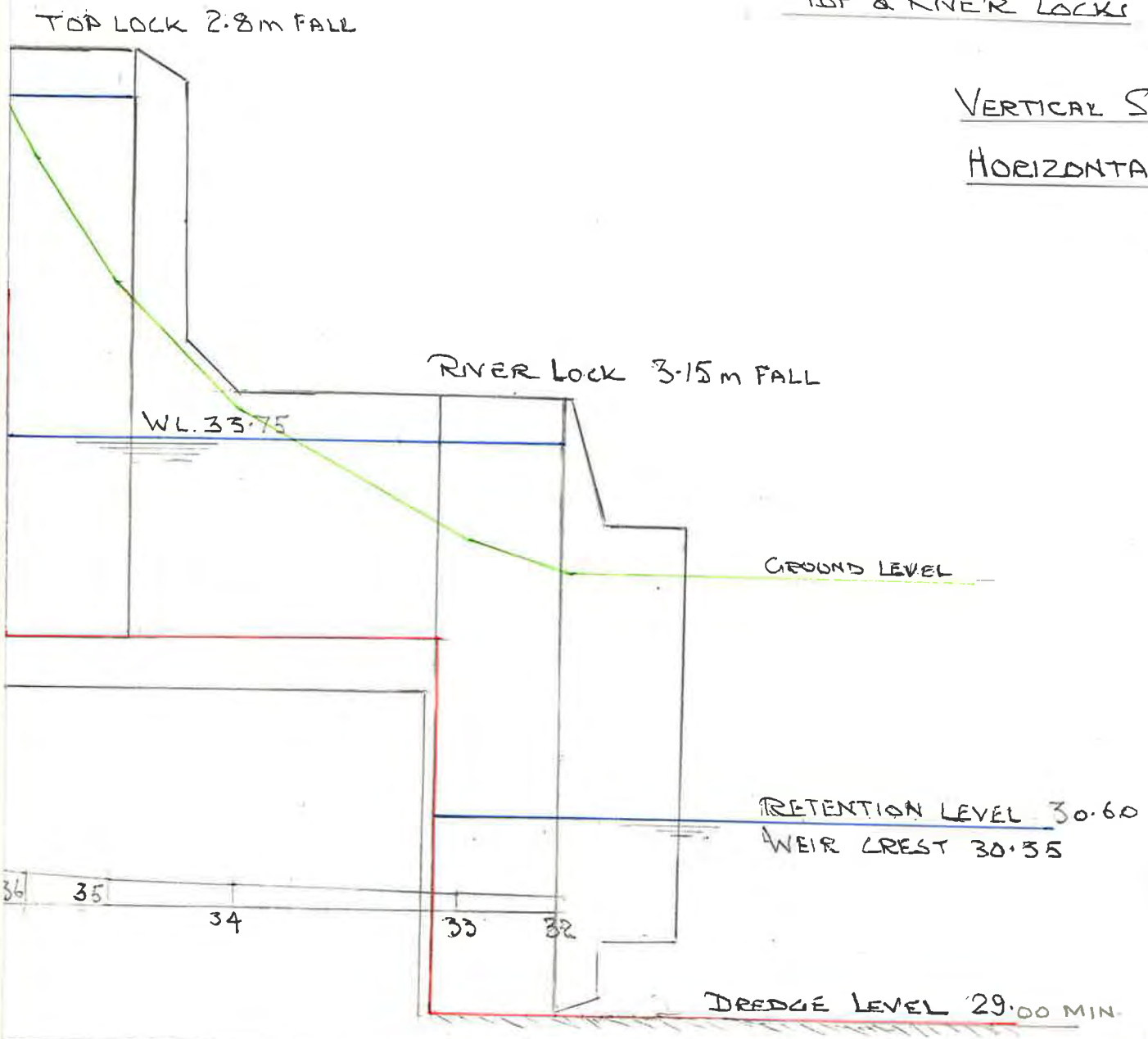
(note drawing extends over 2 A4 pages)

# LONGITUDINAL SECTION ON ℄ OF CANAL

## TOP & RIVER LOCKS

VERTICAL SCALE 1:50

HORIZONTAL SCALE 1:1250



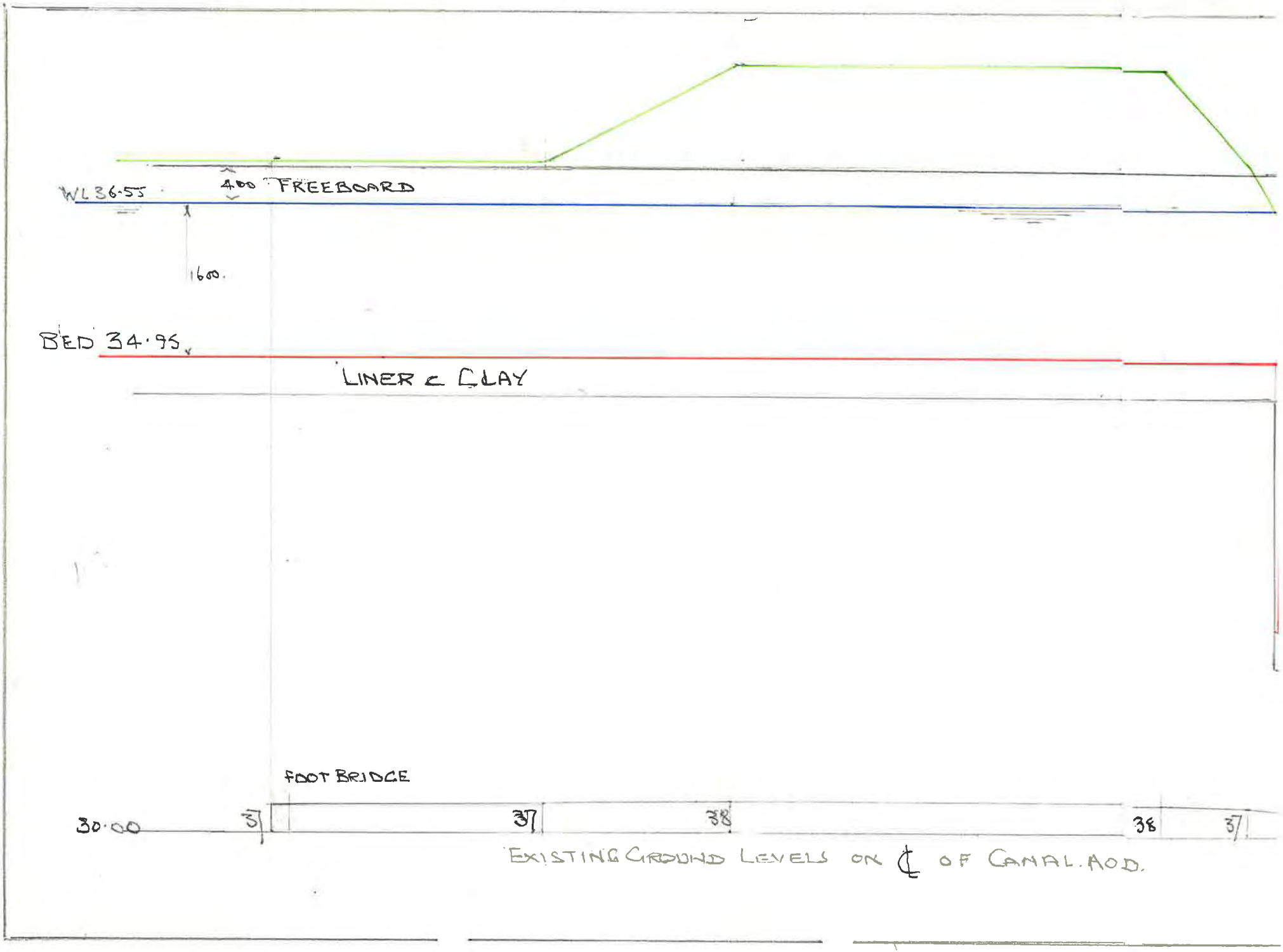

WILTS & BERKS CANAL TRUST

MELKSHAM LINK

LONGITUDINAL SECTION TOP & RIVER LOCKS

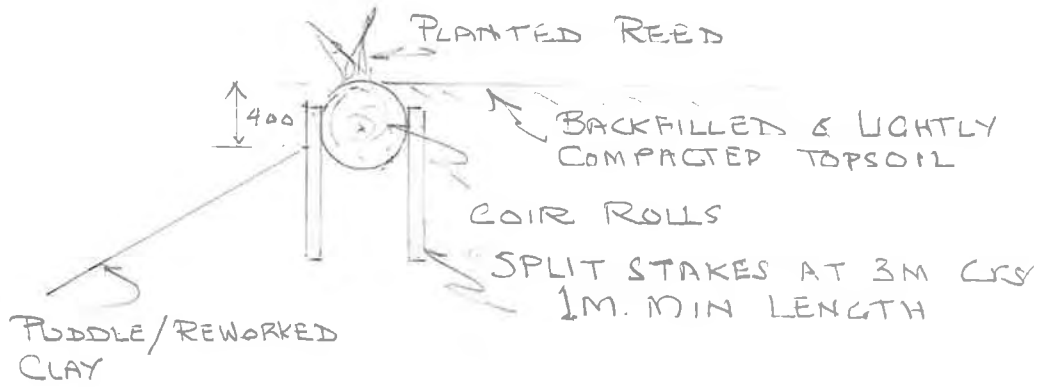
| DRAWN | DATE |
|---|---|
| MJL | 14·09·10 |

DRWG No 7


WL 36.55
400 FREEBOARD
1600.
BED 34.95
LINER & CLAY
FOOT BRIDGE
30.00
37
37
38
38
37
EXISTING GROUND LEVELS ON ℄ OF CANAL. AOD.

Drawing No.8 Alternative revetment methods

Scale 1:50 @ A4

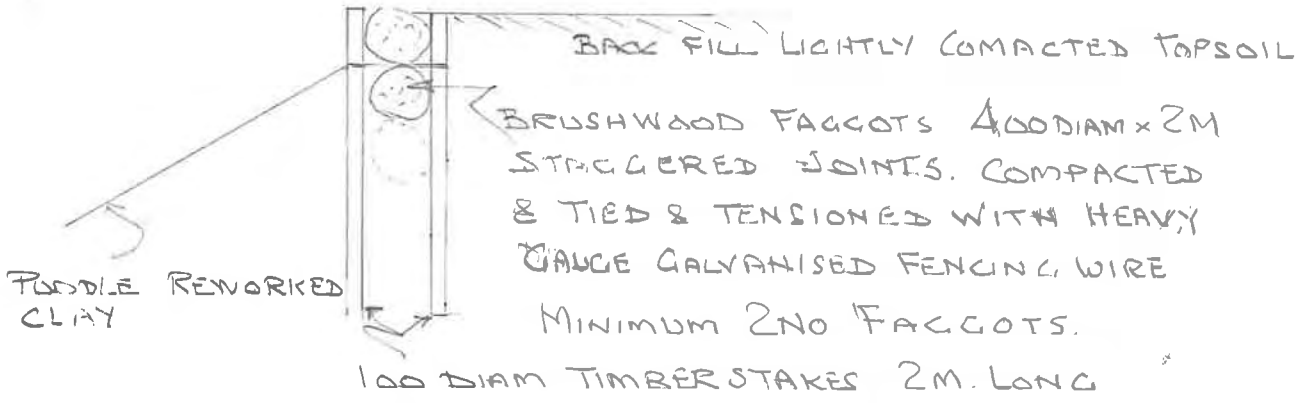



## 1 COIR ROLL REVETMENT - OFFSIDE ONLY

MULTILOCK PLASTIC PILING
1.5m LONG + 2NO TIMBER POSTS
SEE ATTACHED SHEET
AND APPENDIX 1

## 3 MULTILOCK PILING REVETMENT TOWPATH & OFFSIDE

## 4 REDI-ROCK BLOCK REVETMENT DETAILS - ATTACHED



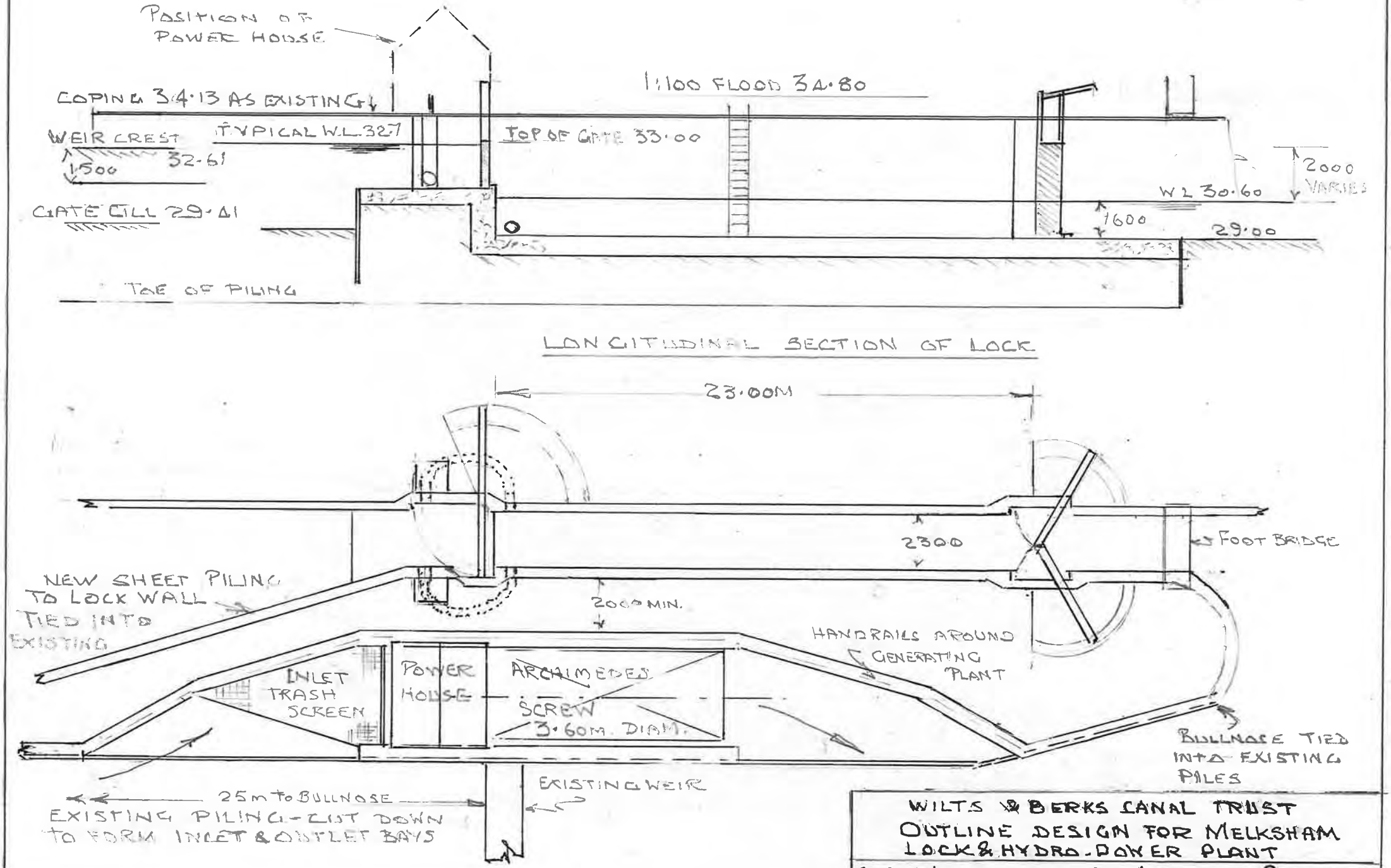

## 2. BRUSHWOOD FAGGOT REVETMENT OFFSIDE ONLY

| |
|---|
| WILTS & BERKS CANAL TRUST |
| MELKSHAM LINK ALTERNATIVE REVETMENTS |
| DRAWN MJL 12-11-2011 |
| SCALE 1:50 |
| DRAWING No 8 |

Drawing No.9a
Elevation and section

Melksham Gate  Narrow Lock & Hydro power scheme
Scale 1:200 @A4

See  also separately submitted drawing WBCT 10/008 &
WBCT 10/009




WILTS & BERKS CANAL TRUST

OUTLINE DESIGN FOR MELKSHAM LOCK & HYDRO-POWER PLANT

SCALE 1:200 DRAWN MJL 19/09/12 DRWG 9 REV3

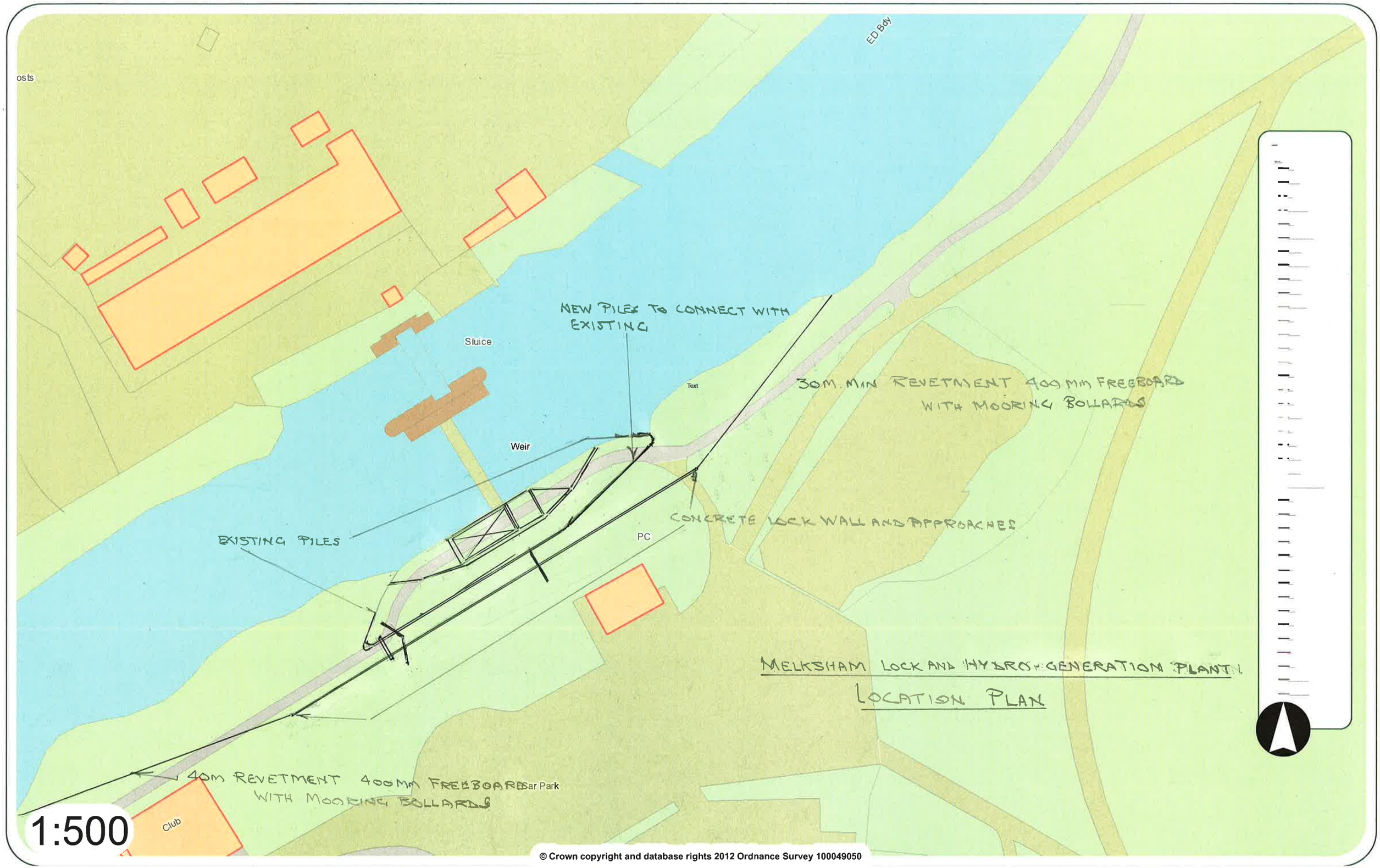
Drawing No.9b Melksham Flood Gate

Narrow Lock & Hydro power scheme –plan layout
Scale 1:500 @ A3

See also separately submitted drawing WBCT 10/008 & WBCT 10/009

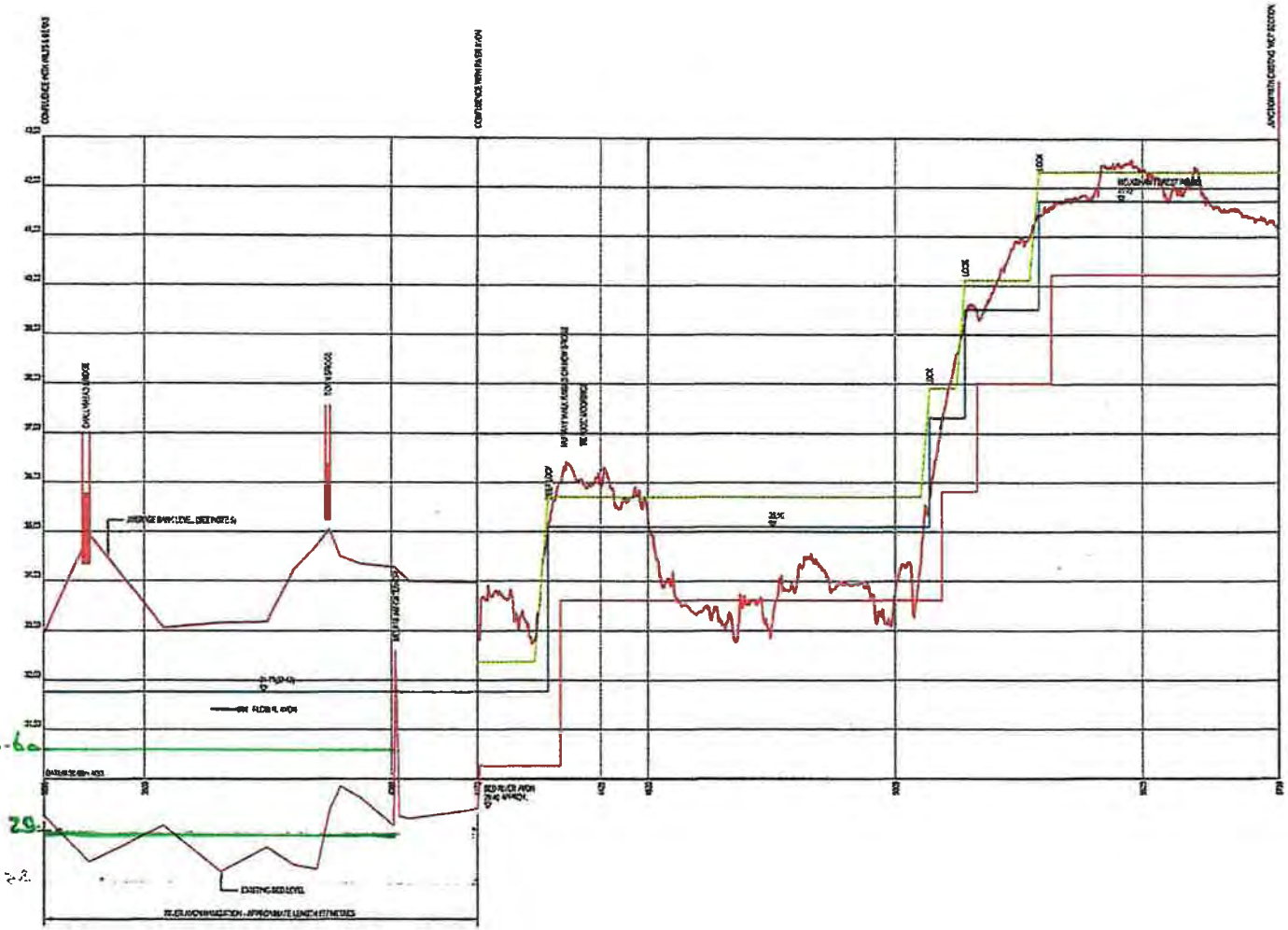
Wiltshire Council
Where everybody matters

# Melksham Link Flood Gate



Drawing No.10

Amended Black & Veatch Cross Longitudinal section of river from new weir to canal junction upstream of existing weir.



RETENTION 30.60

MIN. BED LEVEL 29.

LONGITUDINAL SECTION - RIVER AVON TO MELKSHAM FOREST LOCK

AMENDED RIVER RETENTION LEVEL

DRAWING No 10

PRELIMINARY

WILTS & BERKS CANAL TRUST

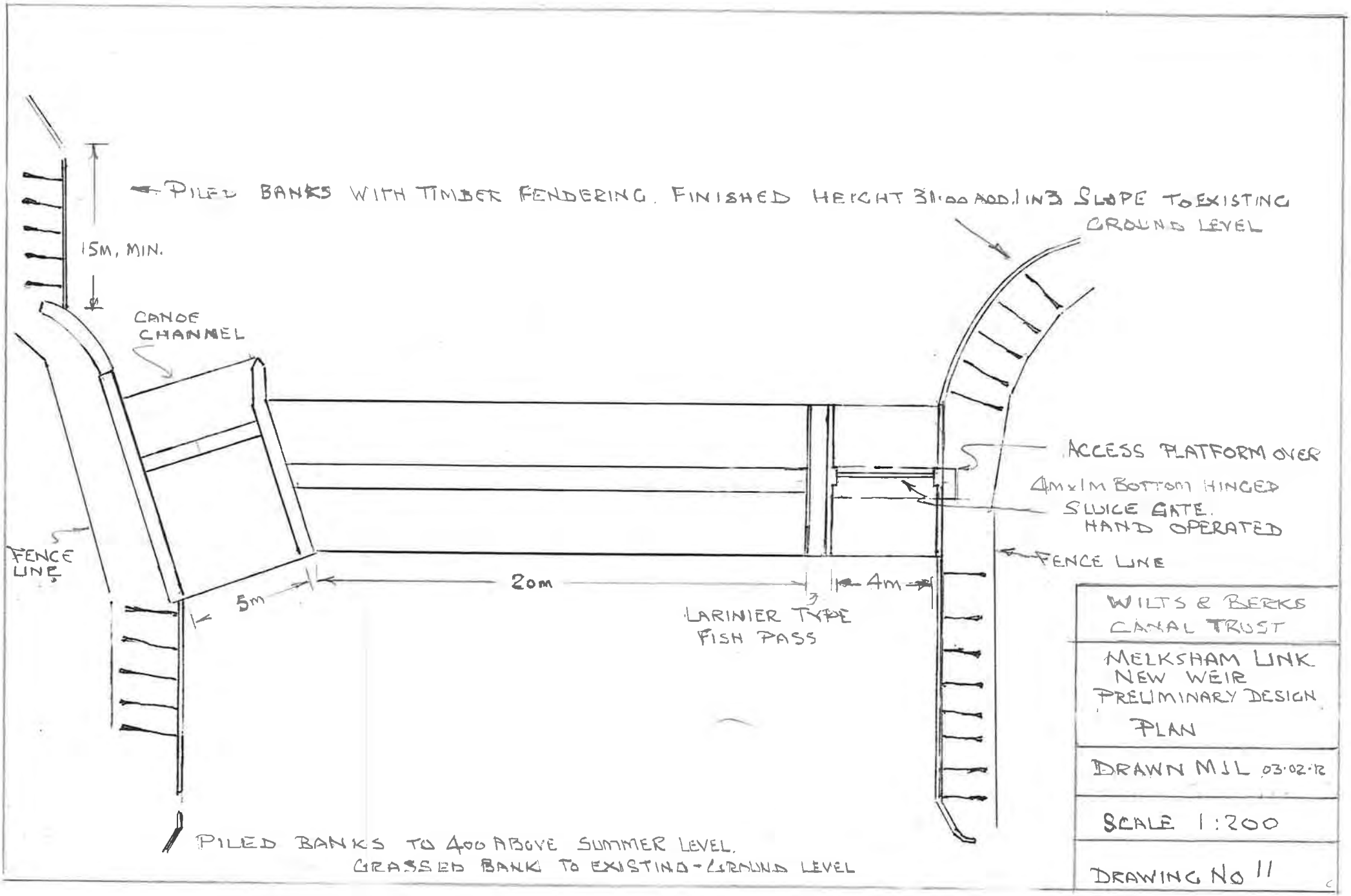
BLACK & VEATCH

MELKSHAM RIVER ROUTE

LONGITUDINAL SECTION
RIVER AVON TO MELKSHAM FOREST LOCK
FIGURE B1b

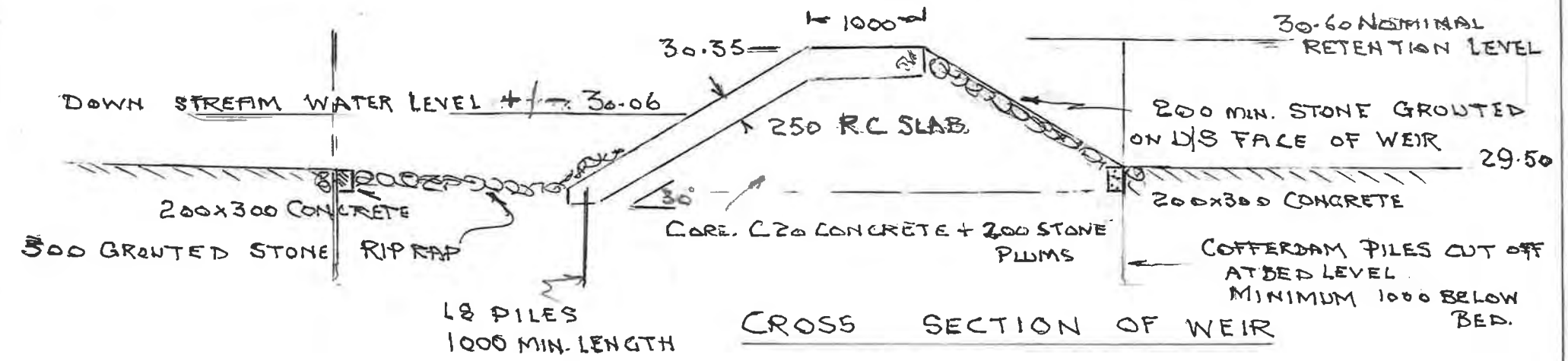
Drawing No.11 Challeymead Weir –Plan

Scale 1:200 @A4

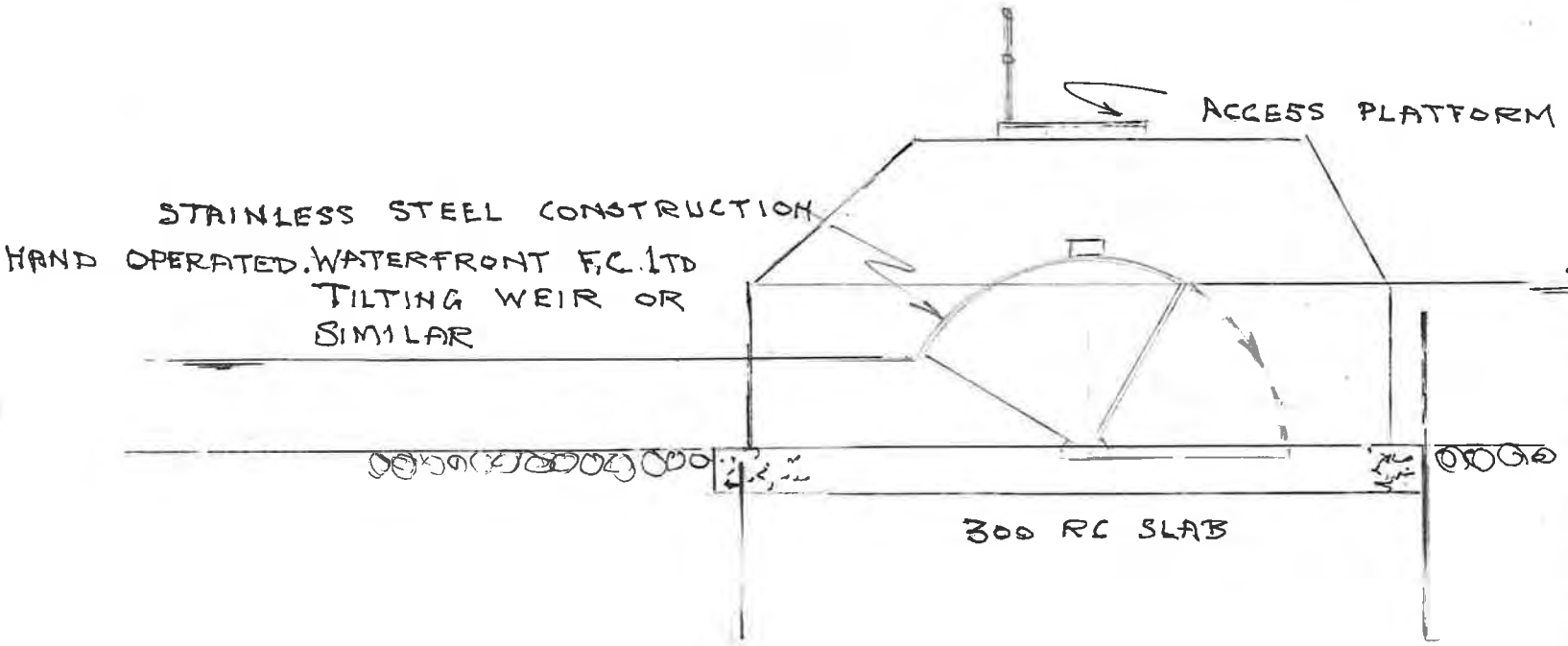

PILED BANKS WITH TIMBER FENDERING. FINISHED HEIGHT 31.00 ADD. 1IN3 SLOPE TO EXISTING GROUND LEVEL
15M, MIN.
CANOE CHANNEL
ACCESS PLATFORM OVER
4M x 1M BOTTOM HINGED SLUICE GATE. HAND OPERATED
FENCE LINE
FENCE LINE
5m
20m
4m
LARINIER TYPE FISH PASS
PILED BANKS TO 400 ABOVE SUMMER LEVEL.
GRASSED BANK TO EXISTING GROUND LEVEL
WILTS & BERKS CANAL TRUST
MELKSHAM LINK
NEW WEIR
PRELIMINARY DESIGN
PLAN
DRAWN MJL 03.02.12
SCALE 1:200
DRAWING No 11

Drawing No.12 Challeymead Weir –cross section

Scale 1:50@ A4




CROSS SECTION OF WEIR




CROSS SECTION OF SLUICE

| |
|---|
| WILTS & BERKS. C.T. |
| MELKSHAM LINK |
| CROSS SECTIONS OF WEIR |
| DRAWN MJL 5.3.12 |
| SCALE 1:50 |
| DRAWING No 12 |

WATERFRONT

# Tilting Weir

**Waterfront** designs and manufactures a range of Tilting Weirs for applications in the potable and wastewater sectors as well as for drainage, power and industrial plants.

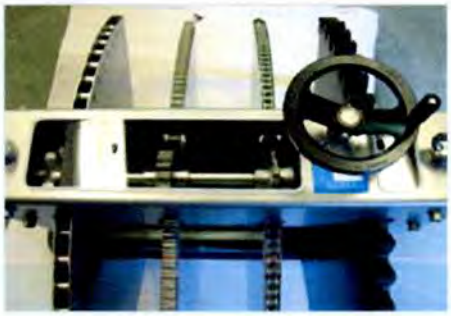
With the application of its **advanced computer design and quotation programmes**, a rapid response is achieved in providing quality customer service and on-time deliveries.

## TILTING WEIRS

| | |
|---|---|
| **Application:** | A tilting weir controls an upstream water level in an open channel. |
| **Positioning:** | HMPE or Stainless steel gear ring, Stainless steel pin rack, Stainless steel chain |
| **Materials:** | Weir plate: HDPE or Stainless steel AISI 304 or 316Side |
| | quadrants: HDPE or Stainless steel AISI 304 or 316 |
| | Frame: Stainless steel AISI 304 or 316 |
| | Sealing: EPDM |
| **Dimensions:** | Overflow width from 500 mm to 6000 mm |
| | Regulation height from 500 mm to 2500 mm |
| | Standard free overflow is 100 mm |
| | Other sizes on request |
| **Operation:** | Manually by crank or handwheel |
| | Electric actuator |
| | Hydraulics |

UVDB

UVDB Verify



**WATERFRONT FLUID CONTROLS LTD**
www.waterfrontfc.co.uk
The Hub (Unit 8), Digital Media Quarter, Pacific Drive, Glasgow, G51 1EA
TEL: +44 (0)141 427 7266 * FAX: +44 (0)141 427 2706 * E MAIL: SALES@WATERFRONTFC.CO.UK
Company Reg No: 305356 * VAT Reg No: 894898138

# Appendix 1 Details of Multi-lock plastic piling.

# Advanced Pile Elements
## from APE

Tel. 01543 277680
email pile@miniape.com
www.miniape.com

Stock available in 1,2,&3 metre lengths
(12 metre max available to order)

## ProLock-MultiLock
## Plastic and Timber retaining structures

**You may wonder how other plastic piles are driven?**
**But with this product, the ease of installation is clearly visible.**

Plastic is very sustainable, but it has a lower E-modulus than wood and steel. Softwood offers much strength and is cheap, but it rots away when it is applied at water surface. However, immersed softwood has a very long life-span.

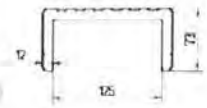
Therefore a new innovative sheet pile design has been developed, combining the characteristics of plastic with the benefits of softwood. The plastic screen is applied at the height where water is present up to ground level (and depending on the type of earth up to approx. 50 cm in the bottom), while the wooden pole is installed under the lowest water level, where it has to provide strength and the wood cannot rot

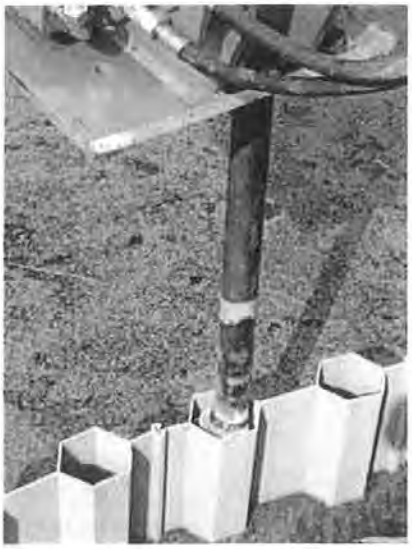
The most expensive segment of a piled wall is the piles, so why waste so much of the sheet under the ground?

All the benefits of plastic piling with the ease of driving timber, greatly reduces the overall cost and installation times - less pile to be driven, combined with the 500mm width, providing greater coverage per sheet, means less piles to drive!

The attractive symmetrical shape enhances the strength of the section and does not need extreme corrugations, as is the case with all existing plastic piles.

Tel. 01543 277680
email pile@miniape.com



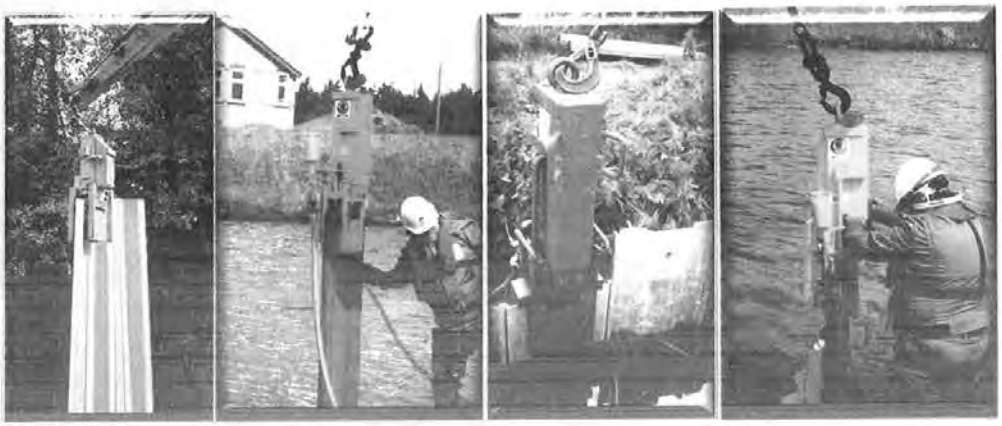



| Specifications | | Units | Multilock |
|---|---|---|---|
| Material Thickness | | mm | 5 |
| Weight | | kg/m | 6.2 |
| Weight of Wall | | $kg/m^2$ | 12.4 |
| Width Pile | | mm | 500 |
| Depth Pile | | mm | 120 |
| Density | | $kg/m^3$ | 1450 |
| Elastic Modulus | | $kN/m^2$ | 1770 |
| Stiffness EI rep | Multilock only | $kNm^2/m$ | 19 |
| | Multilock Sheet plus 100mm pole every 50 cm | $kNm^2/m$ | 107 |
| | Multilock Sheet plus 100mm pole every 25 cm | $kNm^2/m$ | 196 |
| Maximum Bending Moment | Multilock only | kNm/m | 2.77 |
| | Multilock Sheet plus 100mm pole every 50 cm | kNm/m | 4.69 |
| | Multilock Sheet plus 100mm pole every 25 cm | kNm/m | 6.6 |

- Attractive symmetrical shape - shallow corrugations.
- Combination system means strength without visually offensive deep corrugations
- Strong interlock
- 500 mm wide profiles
- Made from Recycled PVC
- Co-extruded for a uniform appearance
- Piling Caps available

## APE Mini Pile Drivers—The Mini Hammers

Tel 01543 277680-Fax 01543 270090- info@miniape.com www.miniape.com



The APE Mini Hammers are two small pile drivers, air powered and operate via high frequency impact. The hammers are purpose built for pile driving and as such include leg guides and anvils to facilitate installation.

Whilst heavier than "hand held" units these will not bounce off the pile and so not need to be held whilst in use. Handles are present but more to aid alignment when mounted on the pile to be driven.

These mini pile drivers are exceptionally easy to use, but do an excellent job used prolifically by waterways contractors and volunteers alike.

For more information or to hire or purchase a unit call us on 01543 277680 or email us at david@miniape.com

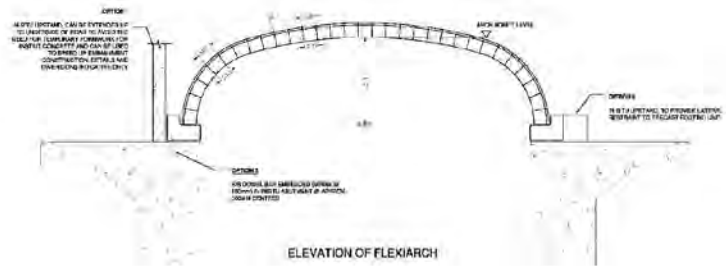
### Used to install:

- Plastic Piling
- Steel Trench Sheeting
- Timber posts
- H Sections
- Steel Tubes

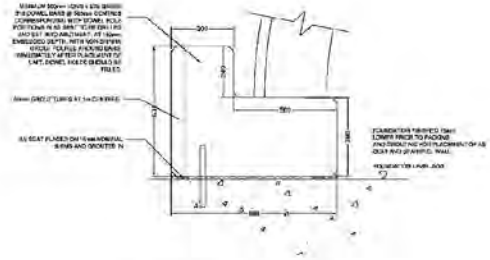
| Description | Units | APE No.1 | APE No.2 |
|---|---|---|---|
| Energy per blow (Theorectical) | Kg.m | 21.7 | 52.3 |
| Frequency | bpm | 445 | 442 |
| Piston Weight | Kgs | 11 | 26 |
| Piston Stroke | mm | 102 | 150 |
| Weight | kgs | 90 | 270 |
| Height | mm | 1000 | 1200 |
| Air flow required | cfm | 125 | 125 |
| Air pressure | psi | 90 | 90 |

# Appendix 2

# Macrete® Bridges



ELEVATION OF FLEXIARCH



ARCH SPRINGING SEAT (AS SEAT) 1:10
3m WIDE UNIT

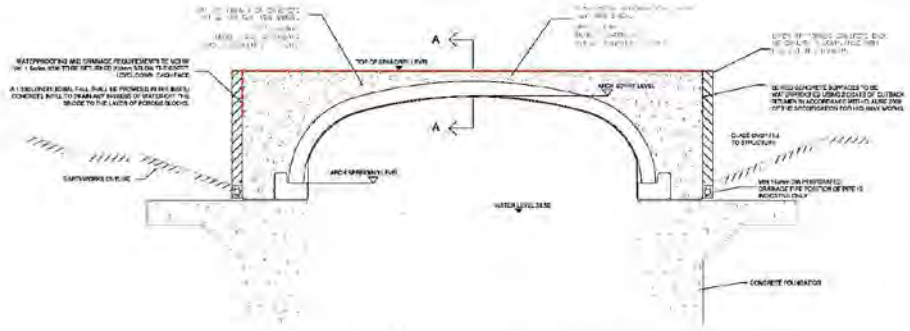
NOTES

1. All dimensions are shown in mm, unless otherwise stated and levels are in metres to an arbitrary datum
2. This drawing is to be read in conjunction with all other drawings and standard documentation.
3. C40/50 concrete mix (C8B-V) as per BS 8500 1:2006 for all precast units
4. Chamfers around voussoirs to be 15mm and remainder of precast units to have chamfer of 25mm
5. Surface finish on exposed faces of flexiarch units-F3
6. Surface finish on top of FlexiArch unit and to base of cill – U2 Tog surface of cill is also to be left roughened
7. Nominal cover to Reinforcement 50mm + 5mm unless noted otherwise
8. S/S Projected U bars to be cast into back of spandrel wall units to tie into backfill concrete.
9. Bridge deck waterproofing and workmanship to comply with SHW Series 2503 and 2505.
10. Steel floated (U4) finish required to top of C20/25 infill concrete to take waterproofing.
11. 5N Concrete with 1600kg/m3 density can be achieved using a combination of cement, sand and a highly air-entrained chemical mixture. The following guideline mix can be used.

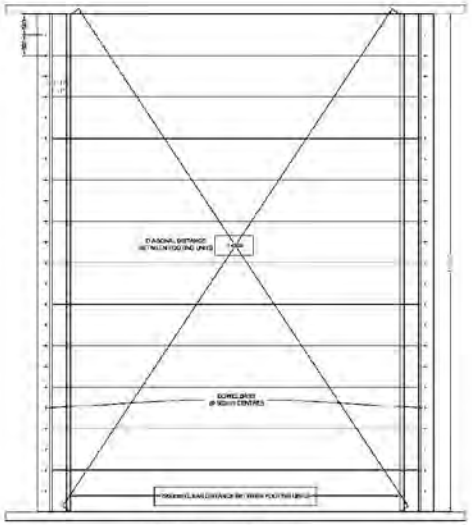
| 4-8 N strength (28 days) | |
|---|---|
| Concrete Sand (0/4) | 1350 Kg |
| CEM I | 250 Kg |
| Water | 200 L |
| Foaming agent | 5L per 9m3 load (Larlow FC or similar) |

Hardened density in region of 1600Kg/m3

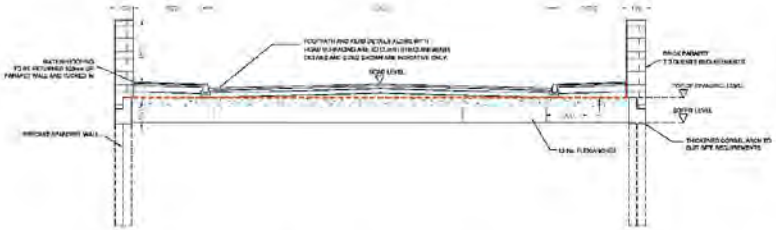
12. Concrete infill should be completed as per Macrete's Guidance Notes.
13. Prior to any excavation, the contractor should consider propping the existing bridge to prevent movement during the works.
14. Great care is required when excavating close to the existing foundation in order to prevent scour or loss of soil from below it. If this occurs concrete should be placed in any void formed.
15. A series of plate bearing tests should be carried out during the foundation works to confirm the allowable bearing capacity of the soils.



END SECTION OF BRIDGE SHOWING CONCRETE INFILL DETAILS



PLAN ON FLEXIARCH BRIDGE



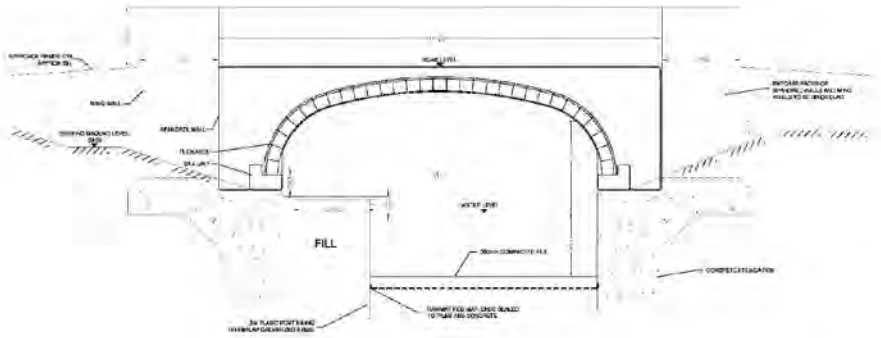
SECTION A-A THROUGH CENTRE OF BRIDGE

FOR APPROVAL

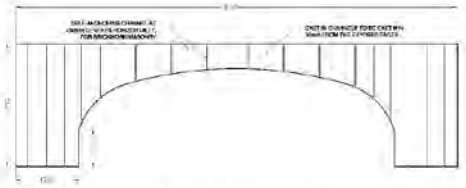
MACRETE

MELKSHAM LINK ROAD BRIDGE, BERRFIELD

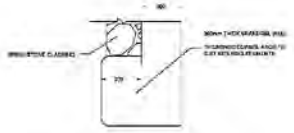
DETAILS OF FLEXIARCH BRIDGE UNITS



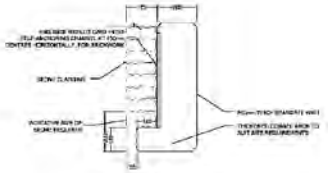

END SECTION OF BRIDGE SHOWING PRECAST DETAILS



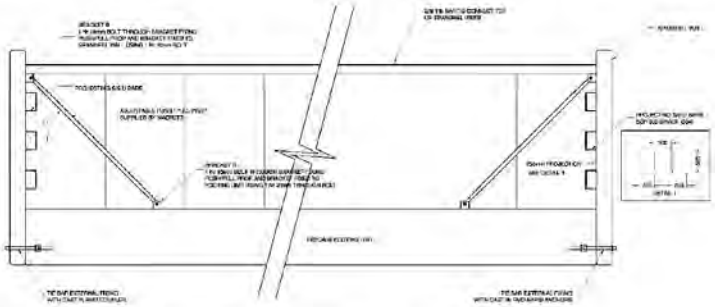
ELEVATION OF SPANDREL WALLS



**CLADDING OPTION 1**
PRECAST CORBEL DETAIL
1:10



**CLADDING OPTION 2**
PRECAST CORBEL DETAIL
1:10



**SIDE ELEVATION SHOWING SPANDREL WALL CONNECTIONS NTS**

1. All dimensions are shown in mm, unless otherwise stated and levels are in metres to an arbitrary datum.
2. This drawing is to be read in conjunction with all other drawings and standard documentation.
3. C40/50 concrete mix (CEM-V) as per BS EN 206-1:2000 for all precast units.
4. Chamfers around voussoirs to be 15mm and remainder of precast units to have chamfer of 25mm.
5. Surface finish on exposed faces of Bex and Unibuf3.
6. Surface finish on top of Flexi Arch unit and to base of cill = U2 Too surface of cill is also to be left roughened
7. Nominal cover to Reinforcement 60mm ± 5mm unless noted otherwise
8. SW Projected U bars to be cast into back of spandrel wall units to be into backfill concrete.
9. Bridge deck waterproofing and workmanship to comply with SHW Series 2003 and 2005.
10. Steel floated (UK) finish required to top of C20/25 infill concrete to save waterproofing.
11. 5% Concrete with 1800kg/m3 density can be achieved using a combination of cement, sand and a highly air-entrained chemical mixture. The following guideline mix can be used.

| 4 N/mm² strength (28 days) | |
|---|---|
| Concrete Sand (3/4) | 1360 Kg |
| CEM I | 250 Kg |
| Water | 200 L |
| Foaming agent | 5L per 1m3 load (Larbow FC or similar) |

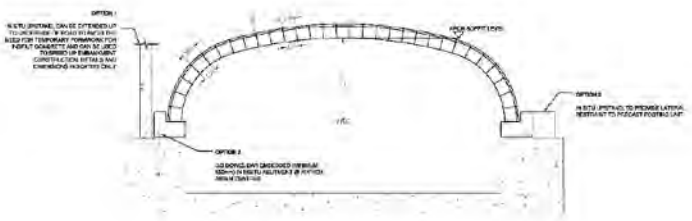
Hardened density in region of 1800Kg/m3

12. Concrete infill should be completed as per Masterks Guidance Notes.
13. Prior to any excavation, the contractor should consider propping the existing bridge to prevent movement during the works.
14. Great care is required when excavating close to the existing foundation in order to prevent scour or loss of soil from below it. If this occurs concrete should be placed in any void formed.
15. A series of plate bearing tests should be carried out during the foundation works to confirm the allowable bearing capacity of the soils.

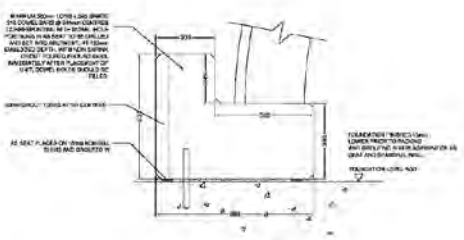
FOR APPROVAL

MELKSHAM LINK - ROAD BRIDGE, BERRFIELD

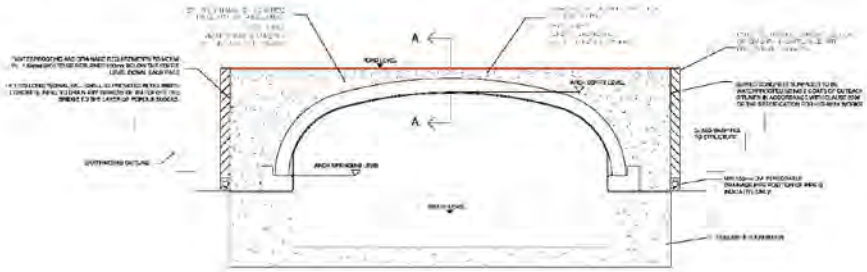
DETAILS OF FLEXIARCH BRIDGE UNITS



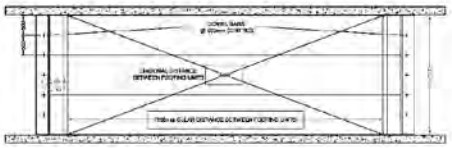
ELEVATION OF FLEXIARCH



ARCH SPRINGING SEAT (AS SEAT) 1:10



END SECTION OF BRIDGE SHOWING CONCRETE INFILL DETAILS



PLAN ON FLEXIARCH BRIDGE

SECTION A-A THROUGH CENTRE OF BRIDGE

1. All dimensions are shown in mm, unless otherwise stated and levels are in metres to an arbitrary datum.
2. This drawing is to be read in conjunction with all other drawings and standard documentation.
3. C40/50 concrete mix (CEM-1) as per BS 8500 1:2006 for all precast units.
4. Chamfers around voussoirs to be 15mm and remainder of precast units to have chamfer of 25mm
5. Surface finish on exposed faces of flexiarch units–F2
6. Surface finish on top of FlexiArch unit and to base of cill = U2 Top surface of cill is also to be left roughened
7. Nominal cover to Reinforcement 50mm ± 5mm unless noted otherwise
8. S/S Projected U bars to be cast into back of spandrel wall units to tie into backfill concrete.
9. Bridge deck waterproofing and earthworks to comply with SHW Series 2000 and 2500.
10. Steel floated (J4) finish required to top of C20/25 infill concrete to take waterproofing.
11. 5N Concrete with 1800kg/m3 density can be achieved using a combination of cement, sand and a highly air-entrained chemical mixture. The following guideline mix can be used.

| 5 & N strength (28 days) | |
|---|---|
| Concrete Sand (0/4) | 1300 Kg |
| CEM I | 250 Kg |
| Water | 250 L |
| Foaming agent | 5L per 6 m3 load (Lavilow FC or similar) |

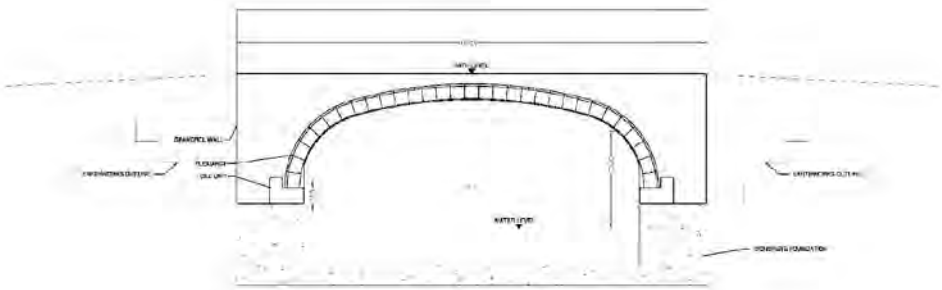
Hardened density in region of 1800Kg/m3

12. Concrete infill should be completed as per Macreti's Guidance Notes.
13. Prior to any excavation, the contractor should consider propping the existing bridge to prevent movement during the works.
14. Grout cast is required when excavating close to the existing foundation in order to prevent scour or loss of soil from below it. If this occurs concrete should be placed in any void formed.
15. A series of plate bearing tests should be carried out during the foundation works to confirm the allowable bearing capacity of the soils.

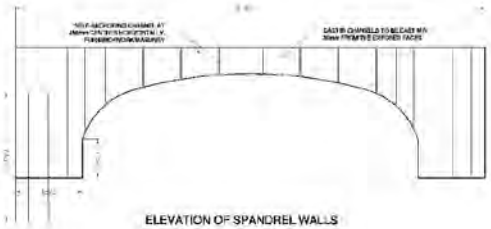
FOR APPROVAL

MELKSHAM LINK - TOW PATH BRIDGE

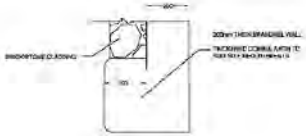
DETAILS OF FLEXIARCH BRIDGE UNITS



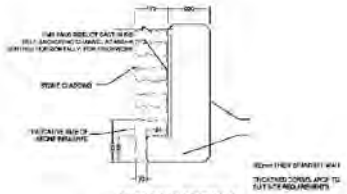
END SECTION OF BRIDGE SHOWING PRECAST DETAILS



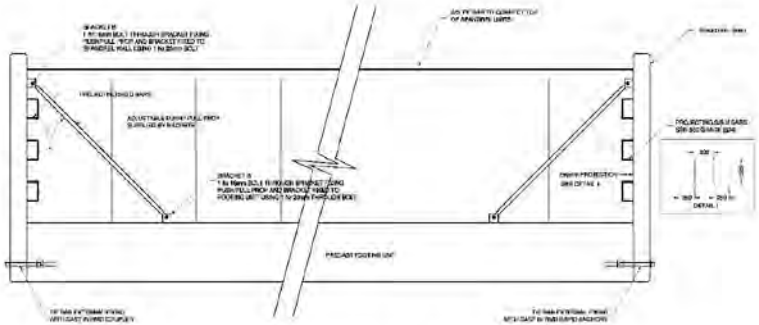
ELEVATION OF SPANDREL WALLS



**CLADDING OPTION 1**
PRECAST CORBEL DETAIL
1:10



**CLADDING OPTION 2**
PRECAST CORBEL DETAIL
1:10



**SIDE ELEVATION SHOWING SPANDREL WALL CONNECTIONS NTS**

1. All dimensions are shown in mm, unless otherwise stated and levels are in metres to an arbitrary datum.
2. This drawing is to be read in conjunction with all other drawings and standard documentation.
3. C40/50 concrete mix (CIIS-V) as per BS 8500-1:2006 for all precast units.
4. Chamfers around voussoirs to be 15mm and remainder of precast units to have chamfer of 25mm.
5. Surface finish on exposed faces of flexiarch units=F3.
6. Surface finish on top of FlexiArch unit and to base of cill = U2 Top surface of cill is also to be left roughened.
7. Nominal cover to Reinforcement 60mm + 5mm unless noted otherwise.
8. 5/8 Projected U bars to be cast into back of spandrel wall units to tie into backfill concrete.
9. Bridge deck waterproofing and workmanship to comply with SHW Series 2300 and 2005.
10. Steel floated (U4) finish required to top of C20/25 infill concrete to take waterproofing.
11. SN Concrete with 1800kg/m3 density can be achieved using a combination of cement, sand and a highly air-entrained chemical mixture. The following guideline mix can be used.

| 4.8 N strength (28 days) | |
|---|---|
| Concrete Sand (0/4) | 1350 Kg |
| CEM I | 250 Kg |
| Water | 200 L |
| Foaming agent | 5L per 6m3 load (Lanfow FC or similar) |

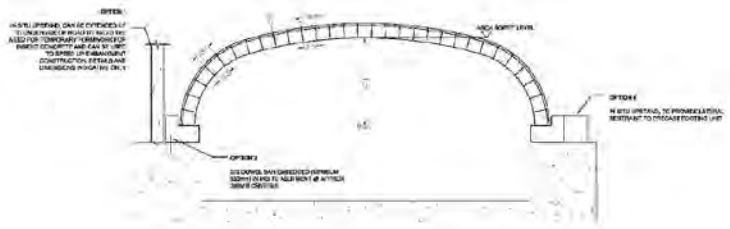
Hardened density a region of 1800Kg/m3

12. Concrete infill should be completed as per Macrete's Guidance Notes.
13. Prior to any excavation, the contractor should consider propping the existing bridge to prevent movement during the works.
14. Great care is required when excavating close to the existing foundation in order to prevent scour or loss of soil from below it. If this occurs, concrete should be placed in any void formed.
15. A series of plate bearing tests should be carried out during the foundation works to confirm the allowable bearing capacity of the soils.

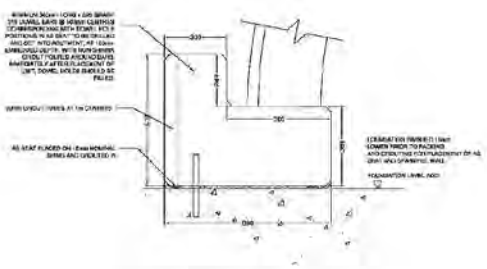
FOR APPROVAL

MELKSHAM LINK TOW PATH BRIDGE

DETAILS OF FLEXIARCH BRIDGE UNITS



ELEVATION OF FLEXIARCH



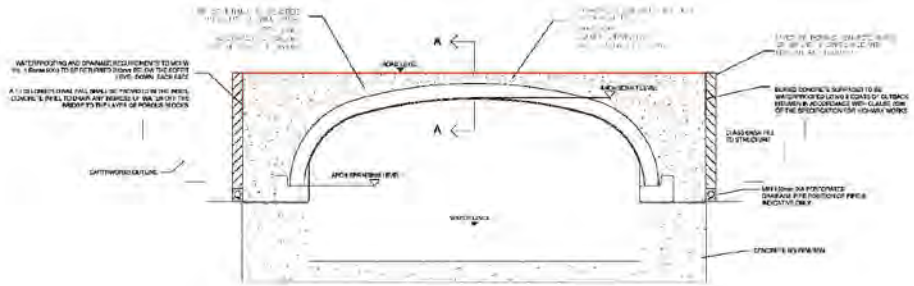
ARCH SPRINGING SEAT (AS SEAT) 1:10
3m WIDE UNIT

1. All dimensions are shown in mm, unless otherwise stated and levels are in metres to an arbitrary datum.
2. This drawing is to be read in conjunction with all other drawings and standard documentation.
3. C40/50 concrete mix (CIB 1) as per BS 8500 1:2006 for all precast units
4. Chamfers around voussoirs to be 15mm and remainder of precast units to have chamfer of 25mm
5. Surface finish on exposed faces of flexiarch units=F3
6. Surface finish on top of FlexiArch unit and to base of cill = U2 Top surface of cill is also to be left roughened
7. Nominal cover to Reinforcement 60mm + 5mm unless noted otherwise
8. 3/3 Projected U bars to be cast into back of spandrel wall units to tie into backfill concrete.
9. Bridge deck waterproofing and workmanship to comply with SHW Series 2003 and 2005.
10. Steel floated (U4) finish required to top of C20/25 infill concrete to take waterproofing.
11. SN Concrete with 1800kg/m3 density can be achieved using a combination of cement, sand and a highly air-entrained chemical module. The following guideline mix can be used.

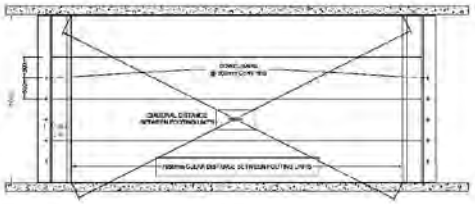
| 4-8 N strength (28 days) | |
|---|---|
| Concrete Sand (0/4) | 1390 Kg |
| CEM I | 250 Kg |
| Water | 200 L |
| Foaming agent | 5L per 0m3 load (Lanfaw FC or similar) |

Hardened density in region of 1800Kg/m3

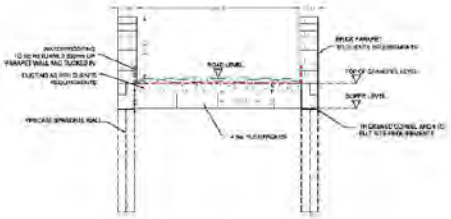
12. Concrete infill should be completed as per Macrete's Guidance Notes.
13. Prior to any excavation, the contractor should consider propping the existing bridge to prevent movement during the works
14. Great care is required when excavating close to the existing foundation in order to prevent scour or loss of soil from below it. If this occurs concrete should be placed in any void formed.
15. A series of plate bearing tests should be carried out during the foundation works to confirm the allowable bearing capacity of the soils.



END SECTION OF BRIDGE SHOWING CONCRETE INFILL DETAILS



PLAN ON FLEXIARCH BRIDGE

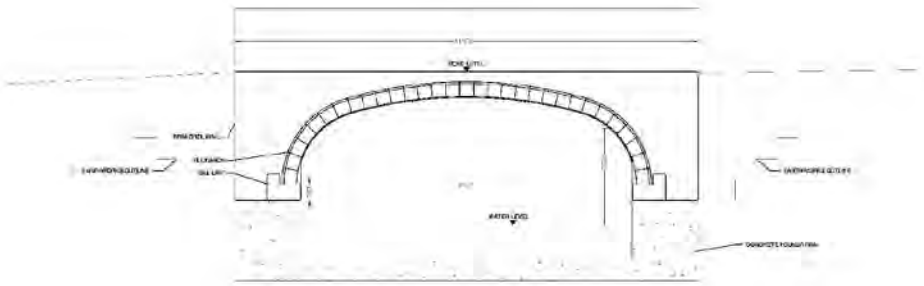


SECTION A-A THROUGH CENTRE OF BRIDGE

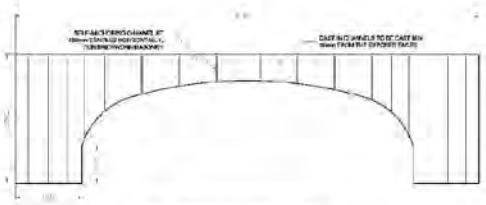
FOR APPROVAL

MELKSHAM LINK SEMINGTON BRIDGE

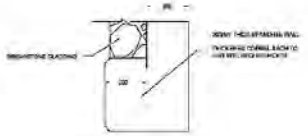
DETAILS OF FLEXIARCH BRIDGE UNITS



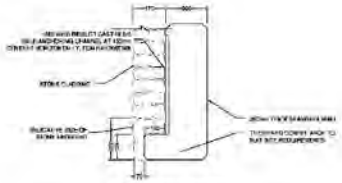
END SECTION OF BRIDGE SHOWING PRECAST DETAILS



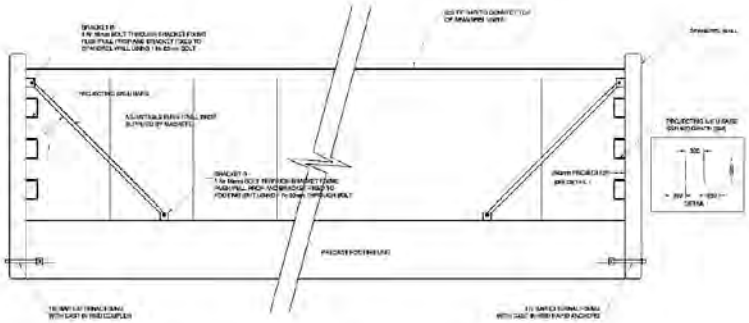
ELEVATION OF SPANDREL WALLS



**CLADDING OPTION 1**
PRECAST CORBEL DETAIL
1:10



**CLADDING OPTION 2**
PRECAST CORBEL DETAIL
1:10



**SIDE ELEVATION SHOWING SPANDREL WALL CONNECTIONS NTS**

1. All dimensions are shown in mm, unless otherwise stated and levels are in metres to an arbitrary datum.
2. The drawing is to be read in conjunction with all other drawings and standard documentation
3. C40b0 concrete mix (C8-V) as per BS 8500-1:2006 for all precast units.
4. Chamfers around vibrated edges to be 15mm and remainder of precast units to have chamfer of 25mm.
5. Surface finish on exposed faces of flexarch units–F3
6. Surface finish on top of FlexArch unit and to base of cill = U2 Top surface of cill is also to be left roughened
7. Nominal cover to Reinforcement 60mm + 5mm unless noted otherwise
8. S/S Projected U bars to be cast into back of spandrel wall units to tie into backfill concrete.
9. Bridge deck waterproofing and workmanship to comply with SHW Series 2003 and 2005.
10. Steel fibred (3Kg) mesh required to top of C20/25 infill concrete to take waterproofing.
11. SN Concrete with 1800kg/m3 density can be achieved using a combination of cement, sand and a highly air-entrained chemical mixture. The following guideline mix can be used.

| 4 N strength (28 days) | |
|---|---|
| Concrete Sand (3/4) | 1350 Kg |
| CEM I | 750 Kg |
| Water | 230 L |
| Foaming agent | 5L per 6m3 load (Ballflow FC or similar) |

Hardened density in region of 1800Kg/m3

12. Concrete infill should be completed as per Macrete's Guidance Notes.
13. Prior to any excavation, the contractor should consider propping the existing bridge to prevent movement during the works.
14. Great care is required when excavating close to the existing foundation in order to prevent scour or loss of soil from below it. If this occurs concrete should be placed in any void formed.
15. A series of plate bearing tests should be carried out during the foundation works to confirm the allowable bearing capacity of the soils.

FOR APPROVAL

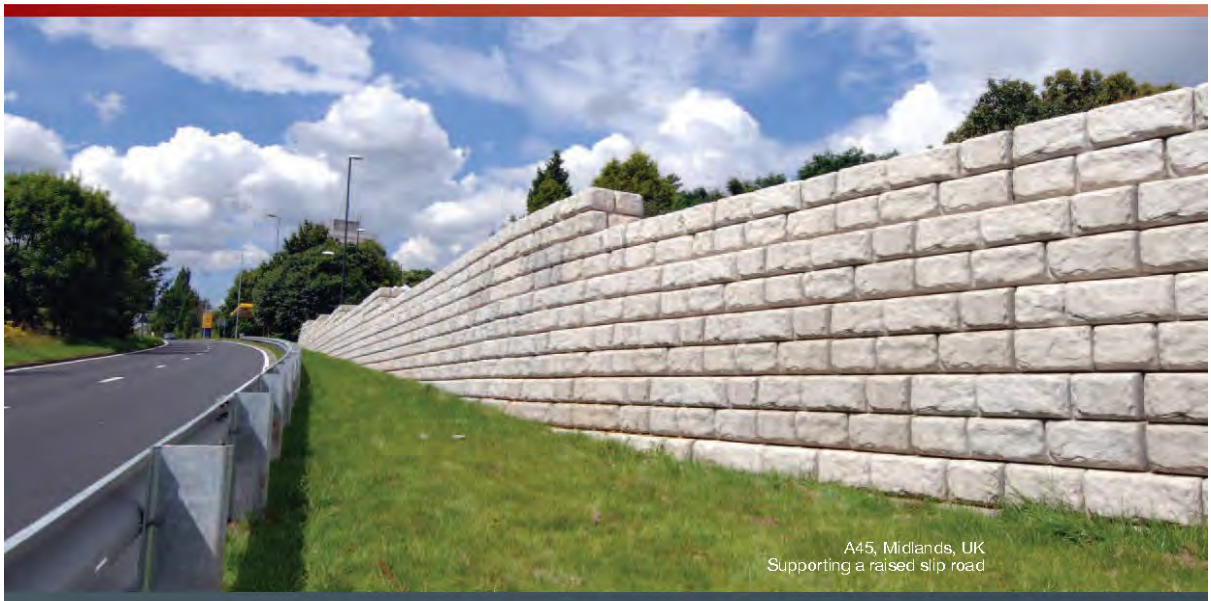
MELKSHAM LINK - SEMINGTON BRIDGE

DETAILS OF FLEXIARCH BRIDGE UNITS

# Appendix 3

# Redi-Rock Information

# Redi-Rock by cpm - retaining wall series



A45, Midlands, UK
Supporting a raised slip road

## The low project cost - high quality solution

Engineered solutions with the look of natural stone much more than a retaining wall.

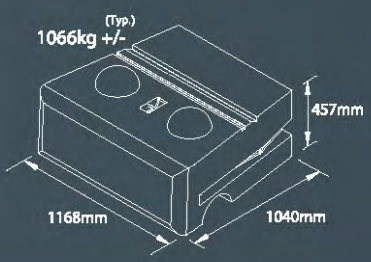
These massive 1 tonne interlocking concrete blocks are moulded from solid concrete and delivered ready to build.

As they are dry laid, it is a quick job building a wall, like giant concrete Lego™.

The blocks are versatile enough to achieve height without compromising strength, with fully engineered plans pre-drawn for different heights and ground conditions.

This system has many advantages over alternative retaining wall systems, not least substantial cost savings and faster build times.

CPM can work with you to provide a fully designed and engineered solution to any project requirement, from planning to installation - including provision of modified solutions for security or flood defence requirements.




REDI-ROCK
MODULAR WALL SYSTEM

3

# Water applications - protecting the environment

To answer the national challenge of rising water levels, CPM Group Ltd, offers a range of flexible low cost, high quality solutions based on their innovative Redi-Rock interlocking modular wall system.

Concrete has a proven track record of performance in water applications, and the blocks are 100 per cent concrete and not steel-reinforced. As the blocks are dry laid, they can be easily moved should the situation on the ground change.

Whether looking to heighten river banks, build new sea walls or construct flood plane defences, Redi-Rock offers considerable benefits over alternative solutions, not least an aesthetically pleasing finish that blends perfectly into the local environments.

## CPM system advantages:

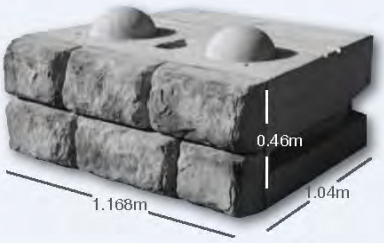
- Quick and economical installation, up to 10x faster than traditional walling
- Overall cost savings on projects typically more than 30% compared to alternatives In fact, many projects have achieved even greater savings when taking into account massive labour savings, less land take and faster installation
- Dry laid with no cement, formwork or shuttering and minimal foundations
- Can be installed in any weather or into water
- Minimal delays to work and schedules
- No maintenance
- Natural stone appearance to blend into or complement local landscapes

## CPM specialist water applications include:

- River bank walls
- Flood storage planes
- Sea defence walls
- Inland flood defences for buildings
- Bridge abutments and wing walls

Massive engineered blocks provide strength without geogrid

Permanent or temporary




1134 Kg

Jutting breaker blocks added to slow down current and prevent eddies forming

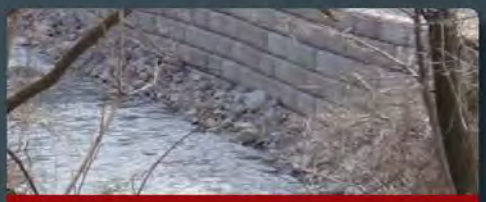
Easy and quick assembly like giant Lego™ with only 2-3 men required to fit blocks

Harbour entrance

Erosion control of an underground stream. Listed building saved, wall took 3 men 17 days.

A attractive solution to protect at risk homes in flood areas.

## Redi-Rock is the perfect solution in water applications



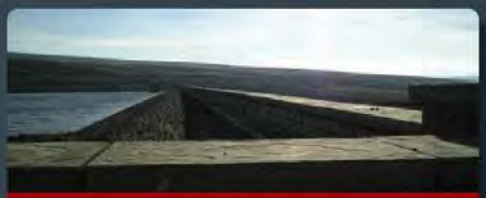
Engineered with toe-in to minimise erosion of the bank

Attractive culverts can be achieved

Perfect for large flood storage plains

Complete high flood control for when waters rise.
Optional stepped design increase water capacity and reduces pressure on banks

Homes protected from flooding in Tregaron - South Wales.
Environment Agency specified



Wavewall on Yorkshire Water reservoir

Watercourse diversion

Riverbank reinstatement

REDI-ROCK
MODULAR WALL SYSTEM

20