

CORK COUNTY COUNCIL (SOUTH)

BANDON SEWERAGE SCHEME

STAGE 2 REVIEW

VOLUME 1

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CORK

Job Nr. A3661

June 1997

Revision Control Table

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Rev. Nr	Description of Changes	Prepared by	Checked by	Approved by	Date
A	Initial Issue	M.Creedon	JW	GO'S	03/04/97
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TABLE OF CONTENTS

<u>VOLUME 1</u>	<u>Page</u>
1.0 INTRODUCTION	1 of 24
2.0 1996 DEVELOPMENT PLAN	4 of 24
3.0 OPTIONS CONSIDERED	10 of 24
4.0 POTENTIAL SAVINGS	12 of 24
5.0 ASSESSMENT OF OPTIONS	13 of 24
6.0 CONCLUSIONS AND RECOMMENDATIONS	14 of 24

APPENDICES

VOLUME 2

SECTION A	APPENDICES 4-6 INCLUSIVE: COMPARISON OF PIPE SIZES FOR DIFFERENT OPTIONS.
SECTION B	APPENDICES 7-19 INCLUSIVE: ESTIMATES OF COSTS FOR SEWERS.
SECTION C	APPENDICES 20-22 INCLUSIVE: ESTIMATES OF COSTS FOR FULL SCHEMES.

VOLUME 3

SECTION D	APPENDIX 23: MICRO-DRAINAGE CALCULATIONS
SECTION E	APPENDICES 24-27 INCLUSIVE PUMPING REQUIREMENTS
SECTION F	APPENDICES 28: DRAWINGS
SECTION G	APPENDIX 29-30: MISCELLANEOUS

BANDON SEWERAGE SCHEME

STAGE 2 - REVIEW

1.0 INTRODUCTION

- 1.1 The Preliminary Report for Stage 2 of the Bandon Sewerage Scheme was prepared in May 1993 and later submitted to the Department of the Environment. Following evaluations of the Report, the Department of the Environment requested that the Preliminary Report be reviewed in order to identify possible savings that could be considered by the Council and thereby reduce the estimated cost of the proposals.

In addition to the identifying of savings, it was agreed with the Council that the Review should include consideration of the changes in the Development Plan for Bandon in accordance with the Council's 1996 Development Plan. It was also agreed that consideration should be given to incorporating surface water drainage at the eastern side of the Town into the scope of the proposed By-Pass roadworks.

- 1.2 The design for the sewerage system set out in the 1993 Preliminary Report was based on the 1986 Development Plan (See Fig. 1.1 and 1.2 and Appendix Nr. 1). The design consisted of a partially separate system taking only stormwater from rear roofs and back yards, together with 13 separate storm sewers taking the rest of the stormwater run-off, with outfalls to the River Bandon.












Below the 20.5m contour, there were two stormwater relief sewers proposed:-

A North Relief Sewer draining to a new pumping station at Watergate Street, where the stormwater is pumped to the River Bandon and;

A South Relief Sewer draining to a new pumping station at Patrick's Hill where the stormwater was envisaged to be pumped to the River Bridewell (a new site for the pumping station at Bridge Lane is now proposed).

The cost of these proposals, together with other flood relief measures, including a 10m compound channel in the River Bandon was estimated to be £8,324,882.00. (Appendices 7 and 20 of this Report).

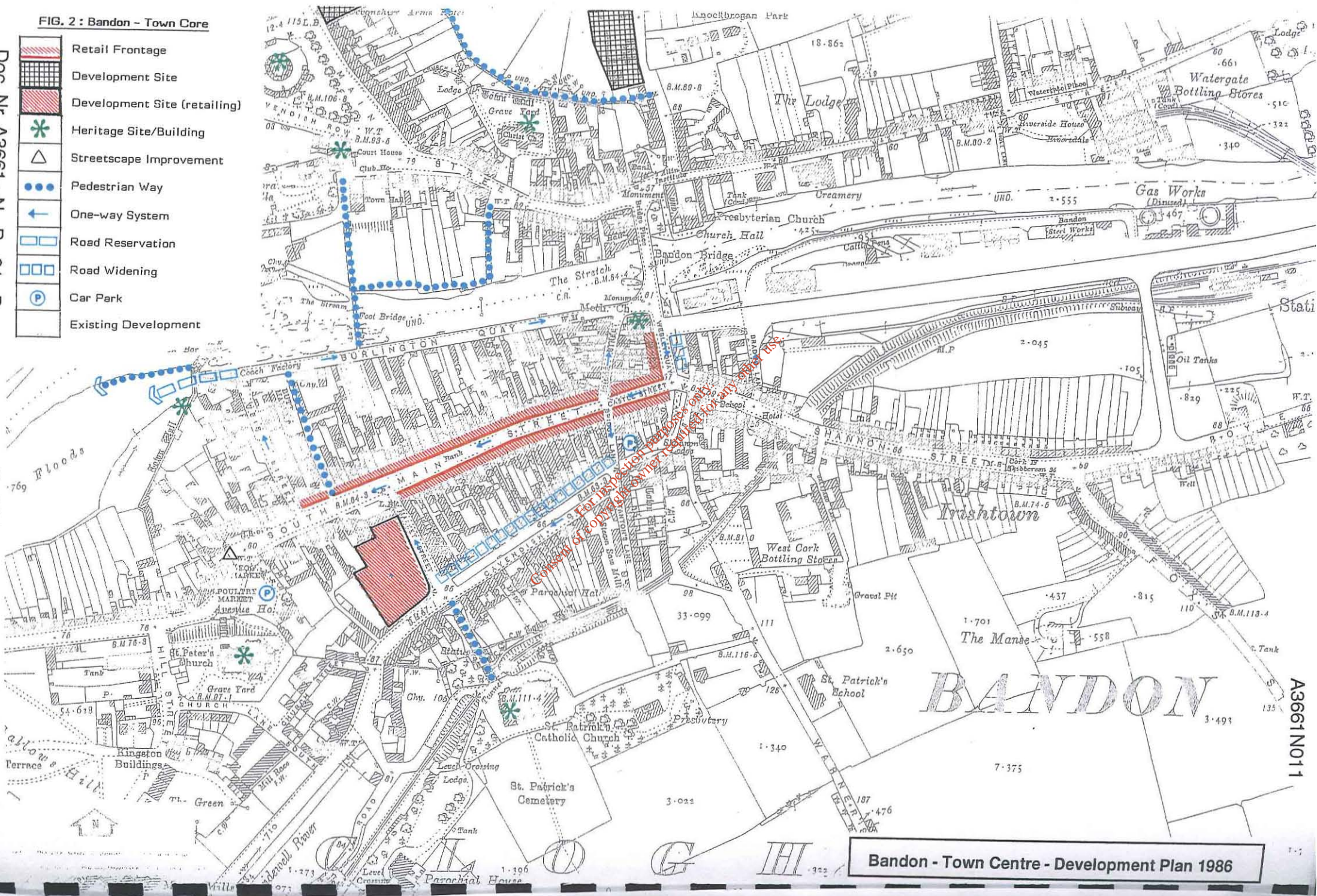
FIG. 2 : Bandon - Town Core

-  Retail Frontage
-  Development Site
-  Development Site (retailing)
-  Heritage Site/Building
-  Streetscape Improvement
-  Pedestrian Way
-  One-way System
-  Road Reservation
-  Road Widening
-  Car Park
-  Existing Development

Doc. Nr. A3661-N-R-01-B

3 of 24

FIG. 1.2



Bandon - Town Centre - Development Plan 1986

1.3

Following initial discussions with Cork County Council in May 1995, the scope of work was identified for the Review, setting out certain options to the Preliminary Report, such as incorporating storm overflows at the 20.5m contour. See appendix Nr. 6, Nr. 28 (Drg. Nr. A3661-N007-B) and 29.

In December 1995, the work was reviewed and some of the options investigated were discarded. Two further options were identified, and examined, namely, Option 1 and Option 2. A review of this work took place in December 1996, when three more options were identified. This meant that there were now five options to be considered for this Report, as follows:

Option 1:

A totally combined system taking all foul and stormwater in a single pipeline network draining to the pre-treatment installation at Glasslinn Road.

Option 2:

A totally combined system taking all foul and stormwater in a single pipeline network draining to the pre-treatment installation at Glasslinn Road, as Option 1, but with 9 nr. overflow installations at the 20.5 m contour.

Option 3:

Similar to the Preliminary Report proposal, i.e. a partially separate system incorporating two relief sewers and one separate storm sewer on the eastern side of Bandon Town, but with 8 nr. stormwater installations at the 20.5 m contour and no further work being carried out above 20.5 m OD.

Option 4:

Similar to the Preliminary Report proposal, i.e. a partially separate system incorporating two relief sewers and one separate storm sewer on the eastern side of Bandon Town, but with 9 nr. stormwater installations at the 20.5 m contour and a totally combined system above 20.5 m OD.

Option 5:

A totally combined system as in Option 1 above but with no work being carried out above 20.5 m OD.

These Options are illustrated in Diag. Nr. 1 and are elaborated on in Chapters 2 and 3.

1.4

This Review Report sets out evaluations of costs for the Preliminary Report, as revised, for the 1996 Development Plan (see Fig. 2.1, 2.2 and 2.3). It also sets out the assessment of the five options outlined above, based on the 1996 Development Plan.

The Review also sets out potential savings to the scope of the Preliminary Report.

Further items, discussed in December 1996, were investigated, details of which can be found in Appendices 22 and 27. These items were found to be non-viable from an economic standpoint and no further consideration has been given to them in this Report.

2.0

1996 DEVELOPMENT PLAN

The 1996 Development Plan includes for additional development over the 1986 Development Plan. This revised development will impact on the proposals set out in the Preliminary Report.

Appendices 2, 3 and 4 set out the modifications that would be necessary for:-

- The proposals for the sewerage network in the Preliminary Report.
- Options 1, 2, 3, 4 and 5 considered in Chapter 3.

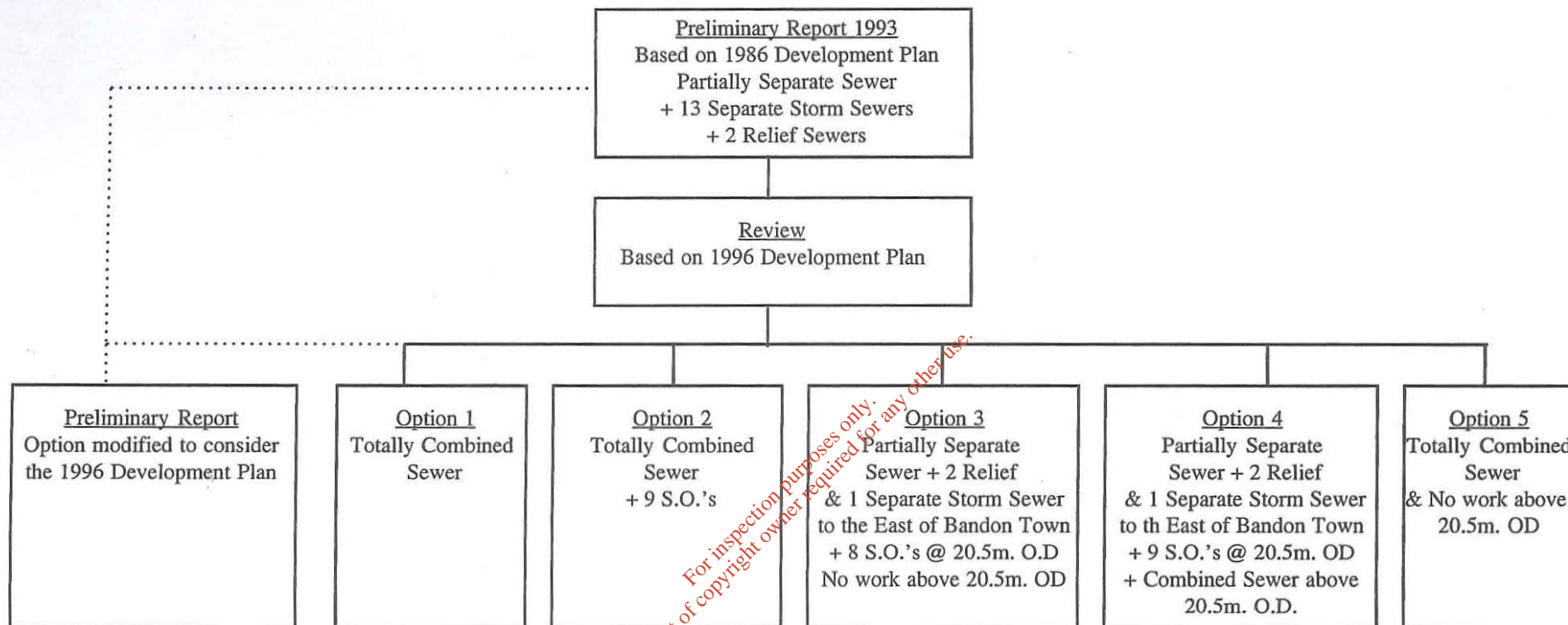
The estimate of cost for the modifications to the Preliminary Report proposal is set out in Appendices 10, 14 and 20.

The estimated cost of the modified Preliminary Report sewer proposals to conform with the 1996 Development Plan is £8,343,804.50 including VAT.

This represents an increase of £18,922.50 over the Preliminary Report estimate of £8,324,882.00.

Drg. Nr. A3661-N001-B and Drg. Nr. A3661-N008-A (Appendix Nr. 28) show the effect that the changes in zoning for the 1996 Development Plan had on the Preliminary Report proposals.

Diagram Nr. 1



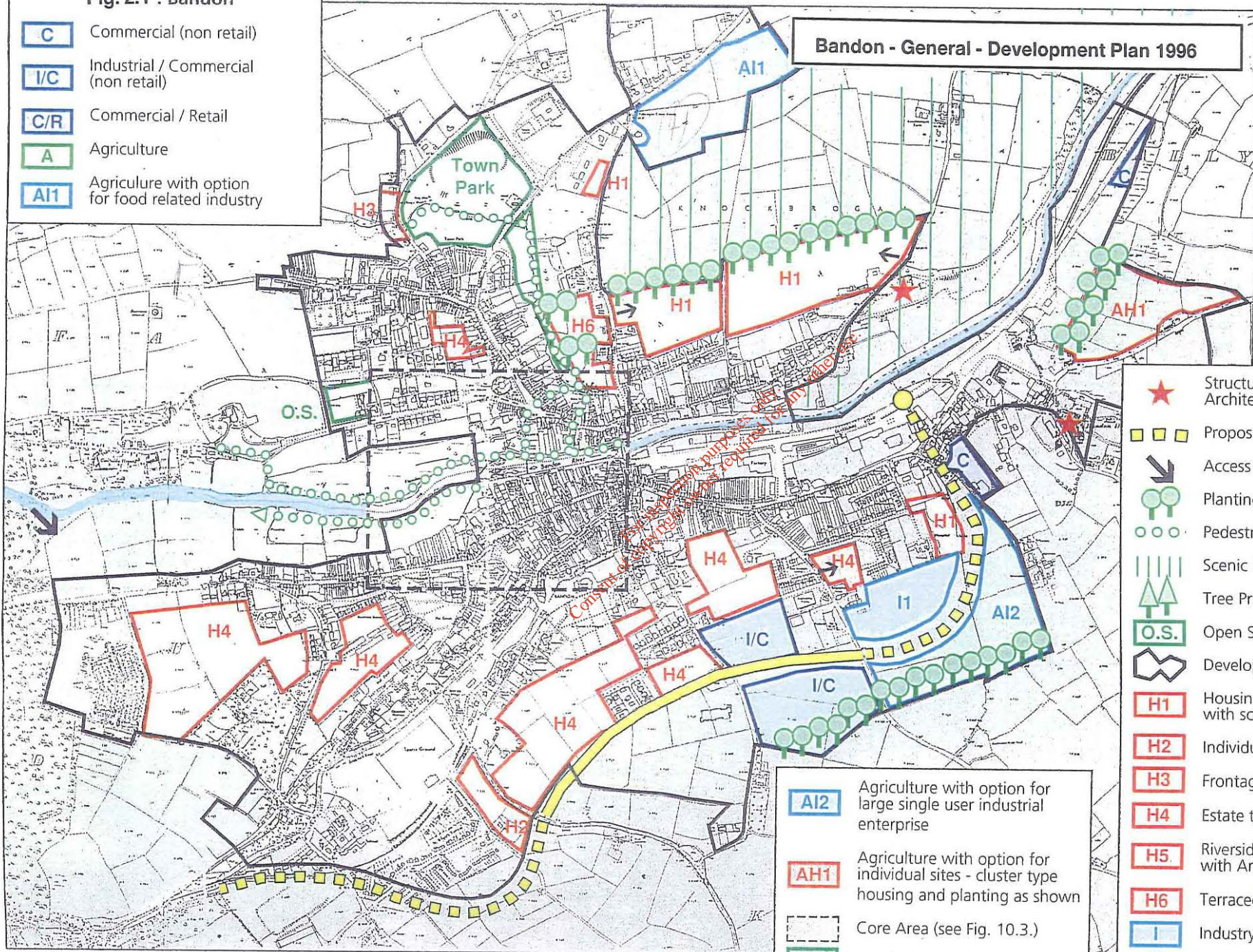
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Note:
S.O. = Stormwater Overflow

Fig. 2.1 . Bandon

- C Commercial (non retail)
- I/C Industrial / Commercial (non retail)
- C/R Commercial / Retail
- A Agriculture
- AI1 Agriculture with option for food related industry

Bandon - General - Development Plan 1996

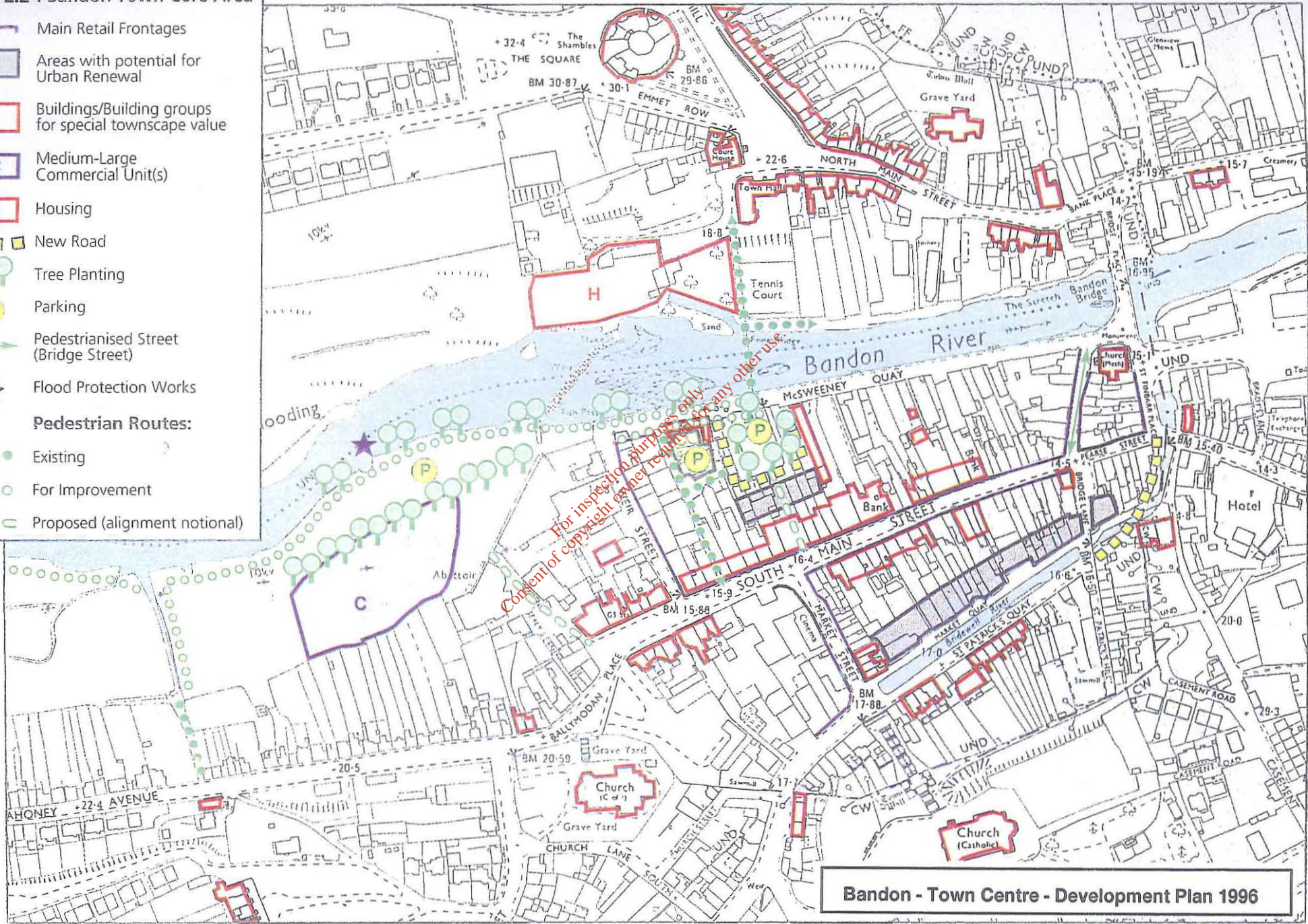


- ★ Structure of Archaeological / Architectural Importance
- Proposed by-pass
- ↘ Access Point
- Planting Required
- ○ ○ Pedestrian Route
- ||| Scenic Landscape
- ▲▲▲ Tree Protection
- O.S. Open Space
- Development Boundary
- H1 Housing (layout plan required) with screen planting to rear
- H2 Individual Sites
- H3 Frontage housing
- H4 Estate type housing
- H5 Riverside terraced development with Amenity area
- H6 Terraced Housing
- I Industry (small business)
- P Parking

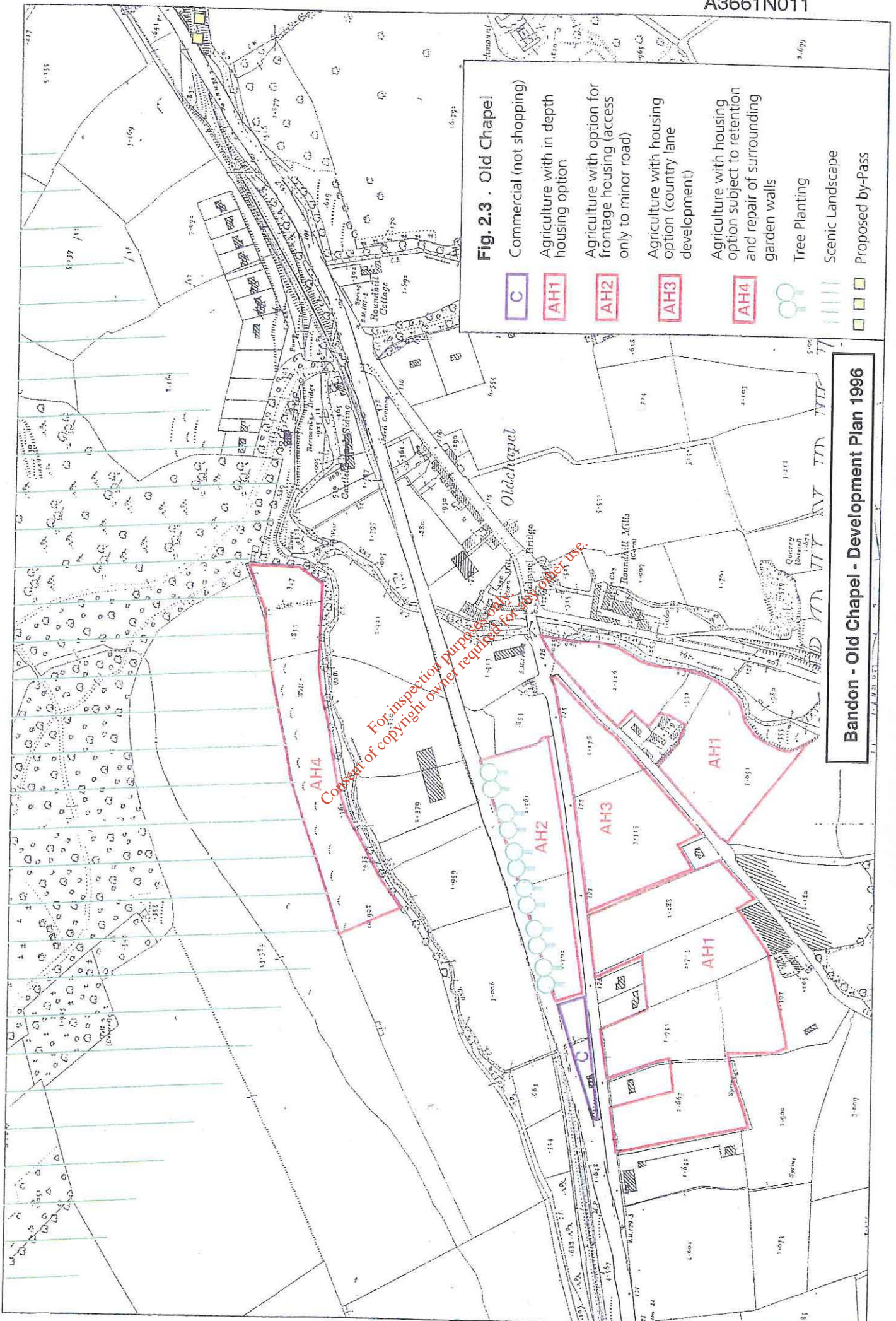
- AI2 Agriculture with option for large single user industrial enterprise
- AH1 Agriculture with option for individual sites - cluster type housing and planting as shown
- Core Area (see Fig. 10.3.)
- DLP Develop Linear Park

Fig. 2.2 . Bandon Town Core Area

-  Main Retail Frontages
-  Areas with potential for Urban Renewal
-  Buildings/Building groups for special townscape value
-  Medium-Large Commercial Unit(s)
-  Housing
-  New Road
-  Tree Planting
-  Parking
-  Pedestrianised Street (Bridge Street)
-  Flood Protection Works
- Pedestrian Routes:**
-  Existing
-  For Improvement
-  Proposed (alignment notional)



Bandon - Town Centre - Development Plan 1996



3.0 OPTIONS CONSIDERED

3.1 Option 1

A totally combined system taking all foul and stormwater in a single pipeline network, draining to the pretreatment installation at Glasslinn Road. Appendix 2 sets out the required pipe sizes and compares them with the existing sewerage pipe sizes and with the pipe sizes required for the Preliminary Report Proposal as revised for the 1996 Development Plan. Comparison is also made with pipe sizes recommended for the other options.

The estimate of costs are set out in Appendices 15 and 20.

The estimated cost of this option is £8,855,055.05, including VAT.

This represents an increase of £530,173.05 over the Preliminary Report estimate of £8,324,882.00.

Drg. Nr. A3661-N002-B shows the extent of the revisions to the existing sewerage system for Option 1.

3.2 Option 2

A totally combined system taking all foul and stormwater in a single pipeline network, draining to the pretreatment installation at Glasslinn Road and incorporating stormwater overflows at 9 Nr. locations above the 20.5 metre datum contour.

Appendix 2 sets out the required pipe sizes, as in Option 1 above.

The estimate of costs are set out in Appendices 16 and 20.

The estimated cost of this option is £7,323,146.65, including VAT.

This represents a decrease in cost of £1,001,735.35 from the Preliminary Report estimate of £8,324,882.00. For Micro-Drainage calculations, see Appendix Nr. 23. For comparison of modified sewer lengths with Option 1 - see Appendix Nr. 21.

Drg. Nr. A3661-N003-B shows the extent of the revisions to the existing sewerage system for Option 2.

3.3 Option 3

This is similar to the Preliminary Report proposal, but only up to the 20.5m contour, i.e., a separate system for stormwater below the 20.5m contour, incorporating a North Relief Sewer and a South Relief Sewer. In addition 8 Nr. stormwater overflows would be installed at the 20.5m contour. No further alterations to the existing sewer system are

proposed above that level. However, one further separate storm sewer, i.e., storm sewer 5 see Drg. Nr. A3661-N001-B would be necessary to relieve flooding to the East of Bandon Town to ensure a flood-free zone below the 20.5m contour, in the critical areas.

This option is considered to be a first phase of the proposals in the Preliminary Report, relieving in the immediate term the flooding experienced in the most sensitive areas of Bandon Town, with a view to later completing the work above the 20.5m contour.

An exercise simulating a 30 year return period storm resulted in flooding above the 20.5m contour in the following localised areas:-

1. Convent Hill downhill of the school, at the junction with Kilbrogan Street and down Kilbrogan Hill.

Comment

Very steep here, stormwater will run overground and re-enter the sewers downstream and/or drain off in old existing culverts.

2. Town end of Macroom Road, leading to Kilbrogan Hill.

Comment

Flood flow will find its way to the town park stream.

3. Town end of Dunmanway Road onto North Main Street.

Comment

Some flood flow will probably find its way into the storm overflow on North Main Street and some may drain off in old existing culverts. However, the area around the Town Hall could be badly affected.

4. Allen Square.

Comment

Some of the houses to the south may be affected.

5. Kilbrittain Road, just before the overflow.

Comment

Flood flow may find its way into the Bridewell River.

6. Upper & Lower O'Mahony Avenue (Flat Areas).

Comment

Terraced housing will be affected.

7. Avondale Drive, Casement Road.

Comment

Pipes inadequate, private housing affected.

8. Lower Casement Road just before Storm Overflow.

Comment

Steep area, flood flow will find its way to the Bridewell River.

9. Parnell Street.

Comment

Flooding will be relieved by the recently constructed Parnell Street storm sewer.

10. Connolly Street and northern end of Hospital Lane and junction of Distillery Road and Mill Road.

Comment

These areas are below the proposed storm overflow at Connolly Street and below the 20.5m contour. However, the partially separate sewer design is inadequate to take the flows. It is therefore recommended that Separate Storm Sewer Nr. 5 (Appendix Nr. 28 Drg. A3661-N001-B) be constructed in conjunction with Option 3 to relieve flooding in these areas.

11. The area around the Mart drains to the stream at Ballylängley, however, this area is below the 20.5m contour and should be storm sewered in principle. On the other hand, this is not a residential area and, therefore, it does not pose any threat to house owners, although the activities of Mart day are liable to be affected.

Some of the above flooding can be seen to occur to a lesser extent in a simulation of a 1 year return period storm - See Appendix Nr. 6.

The estimates of costs for Option 3 are set out in Appendices 17 and 20.

The estimated cost of this Option is £6,632,193.96, including VAT.

Drg. Nr. A3661-N001-B shows the extent of the revisions to the existing sewerage system for Option 3.

The additional cost required, i.e., £2,300,261.44 to complete the work (i.e. to eliminate the flooding in the above mentioned areas) within 10 years @ 3% p.a. inflation brings the final cost to £8,932,455.27.

This represents an increase in cost of £607,573.27 over the Preliminary Report estimate of £8,324,882.00 in the long term, i.e., when all the work is completed.

3.4

Option 4

This Option is similar to the Preliminary Report proposal below the 20.5m contour, i.e., a separate system for stormwater below the 20.5m contour, incorporating a North Relief Sewer and a South Relief Sewer. 9 Nr. stormwater overflows installed above the 20.5m contour. Part of one further separate storm sewer, i.e., Storm Sewer 5 - See Appendix Nr. 28, Drg. Nr. A3661-N001-B would be necessary to relieve flooding to the east of Bandon Town to ensure a flood-free zone below the 20.5m contour. In contrast to Option 3, however, a combined sewer modified to take the design flows is proposed above the 20.5m contour, making this a complete option in the elimination of flooding.

The estimate of costs are set out in Appendices 18 and 20.

The estimated cost of this option is £7,964,483.00, including VAT.

This represents a decrease of £360,398.00 over the Preliminary Report estimate of £8,324,882.00. Drg. Nr. A3661-N005-B shows the extent of the revisions to the existing sewerage system for Option 4.

3.5

Option 5

This option consists of one large combined sewer below the 20.5m contour as in Option 1, with no alterations to the existing sewer system above the 20.5m contour. This option is considered to be Phase 1 of Option 1, relieving in the immediate term the flooding experienced in the most sensitive areas of Bandon. However, flooding would occur above the 20.5m contour, as outlined in Option 3, for a 30 year return period storm.

The estimate of costs are set out in Appendices 19 and 20.

The estimated cost of this option is £6,633,952.65, including VAT.

Drg. Nr. A3661-N006-B shows the extent of the revisions to the existing sewerage system for Option 5.

The additional cost required, i.e., £2,984,976.03 to complete the work (ie to eliminate the flooding in the aforementioned areas -See Option 3 above) within 10 years @ 3% p.a. inflation brings the final cost to £9,618,928.68.

This represents an increase in cost of £1,294,046.68 over the Preliminary Report estimate of £8,324,882.00 in the long term, i.e., when the work is completed.

3.6 Summary

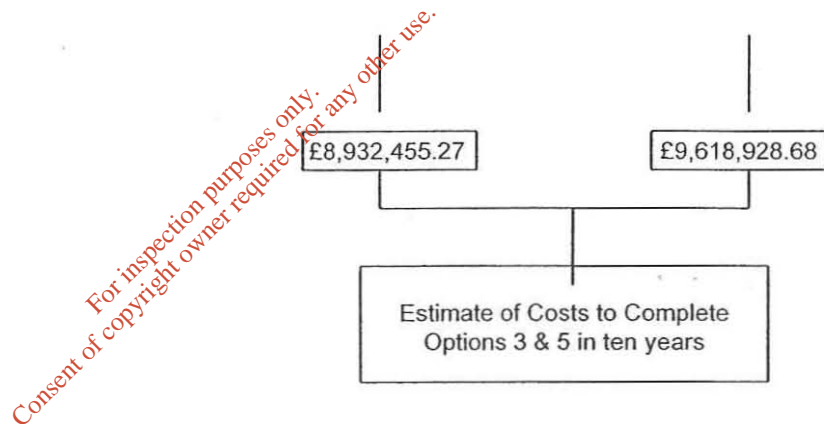
A summary of estimated costs for the Sewerage Options can be reviewed in Table 3.1 below.

Table 3.1

Summary of Estimates

Five Main Options Under Consideration Based on 1996 Development Plan

Original Preliminary Report	Revised Preliminary Report	Option 1	Option 2	Option 3 (Part of P.R. '96)	Option 4	Option 5 (Part of Option 1)
£	£	£	£	£	£	£
8,324,882.00	8,343,804.50	8,855,055.05	7,323,146.65	6,632,193.83	7,964,482.74	6,633,952.65



Note: Costs for above Options include proposed river works as outlined in the Preliminary Report May 1993, including a 10m compound channel, culvert to Townpark Stream and retaining walls on northern and southern banks, at an estimated cost of £770,000 (see appendix Nr. 8 Preliminary Report May 1993).

4.0 POTENTIAL SAVINGS

4.1 The scope of the Preliminary Report was reviewed to consider potential savings as discussed in a meeting with Cork County Council in May 1995. The following items were identified.

- Embankment at Weir Street.
- Grouting of quay walls.
- Deferment of proposed works at Ballylangley.
- Sewerage Extensions.
- Use of drainage for proposed By-Pass Road at Distillery Road, etc.
- Use of diesel pumps for storm pumping or small generators.
- Patrick's Hill Pumping Station.

See Table 4.2 for the Preliminary Report (May 1993) costing of the above items.

4.2 Embankment at Weir Street

The proposed embankment was to be located on the western side of the old Town Wall, immediately west of the Garda Station on Weir Street. This embankment was intended to protect the Town Wall, the Garda Station and other properties from inundation of the south bank of the Bandon River.

It is now considered that private development in the area could provide an embankment or raise the ground level in that area resulting in a saving of £25,000.

4.3 Grouting of Quay Walls

The Preliminary Report recommended the grouting of the quay walls at McSweeney Quay and at Market Quay to ensure protection of the Town Centre from inundation by the river through possible unknown defects or covered channels.

It is considered that this work could be deferred to a later stage when an appraisal of earlier stage works could be made. Accordingly, the scope of the proposals can be reduced by deferring this item of work, resulting in a saving of £375,000.

4.4 Ballylangley Stream

The Preliminary Report recommended raising the banks of the stream at Ballylangley to the east of the Town in order to prevent the flooding of adjacent lands.

As these lands are not developed at present, it is considered that any development that may take place there in the future can provide the necessary river bank improvement or raise the ground level without costs being incurred by the Council. Accordingly, the scope of the proposals can be reduced by omitting this item of work, resulting in a saving of £25,000.

4.5 Sewerage Extensions

The Preliminary Report recommended extensions to the sewerage network to cater for existing or proposed developments beyond the existing network.

It is considered that such developments beyond the existing sewerage network can be sewered by the developers without costs being incurred by the Council. Accordingly, the scope of the proposals can

be reduced by omitting this item of work, resulting in a saving of £163,030.

4.6

By-Pass Road Works

As it is intended by the Council to complete the By-Pass Road at the eastern end of the Town (construction due to start in 1997), consideration has been given to utilising the drainage for the proposed By-pass road for incorporation into the proposed sewerage scope.

The proposed industrial/commercial zones adjacent to the By-Pass road will be drained with the By-Pass road drainage. This involves a reduction in scope for the sewerage schemes, but an increase in scope for the road works. See Table 4.1 below.

TABLE 4.1

Effect of Utilisation of By-Pass Road Drainage

Details	Prelim. Report £	Option 1 £	Option 2 £	Option 3	Option 4	Option 5
Drainage of Ind./ Comm. zones to south taken into scope of sewerage Scheme	8,498,197.25	9,001,203.04	7,442,664.58	At a meeting with the Client in December '96, it was decided that the By-Pass Road drainage would be utilised, i.e., this was prior to preparation of estimate for Options 3, 4 & 5.		
"By-Pass road alternative" or Utilising By-Pass Road Drainage	8,343,804.50	8,855,055.05	7,323,146.65	6,632,193.83	7,964,482.74	6,633,952.65
Saving to Scheme	£154,392.75	£146,147.99	£119,517.93			

Note: This table is derived from results in Appendices 3, 4, 10 to 20.

It has been found that there would be benefit in economy in combining the drainage requirements, at an additional estimated cost of £89,600 to the proposed by-pass roadworks - See Appendix Nr. 5.

Present works at the by-pass road are being ignored in this Report in the interests of clarity.

4.7

Diesel Pumps and Generators

Consideration has been given to the utilisation of mobile diesel pumps and portable generators for stormwater pumping.

The use of mobile diesel pumps would have advantages of cost in terms of purchase costs and infrastructural costs. However, the required attendance for response to emergencies for all significant rainfall events coupled with the mobilisation of plant, would impose

onerous duties on the Council Staff. It is recommended that permanent pumping stations that can respond automatically to rainfall events be adopted.

The necessity for stand-by power generation is justified by the need for the Council to provide pumping facilities for stormwater at all times, even at power failure occurrences. The Preliminary Report recommended the inclusion of one stand-by generator for the north and south relief pumping stations with an interlinking cable at a cost of £90,000. It is now recommended that two permanent stand-by generators be installed i.e. one in each pumping station at a cost of £25,000, resulting in a saving of £5,000. It is also recommended that a stand-by generator be considered at Glasslinn Road Pumping Station in due course.

4.8 Patrick's Hill Pumping Station

The site proposed for the pumping station for the South Relief sewer was located at Patrick's Hill, adjacent to the Bridewell River. This site is not now available. Accordingly, in the event that the proposals set out in the Preliminary Report are adopted, it is proposed that an underground submersible pumping station be located at Bridge Lane Car Park, adjacent to the public toilet. Due to the limitation of available space, the proposed pumping station will of necessity be restricted in size. It will be possible to retain the Car Park on completion.

The change in site results in a saving of £5,000.

4.9 Summary

The results of the effects of the above mentioned potential savings for the following proposed sewerage schemes are summarised below in Table 4.2.

The following is a brief description of the various proposals under consideration.

Preliminary Report Revised for 1996 Development Plan

Partially separate sewer, two relief sewers in the town centre and 13 separate storm sewers.

Option 1

Totally Combined Sewer.

Option 2

Totally Combined Sewer with 9 nr. Stormwater overflows.

Option 3

Partially separate sewer with two relief sewers.

One separate storm sewer on the eastern side of the town, 8 nr. stormwater overflows at 20.5 m OD and no work undertaken above 20.5 m OD.

Options 4

Partially separate sewer with two relief sewers in the town centre,

1 separate storm sewer on the eastern side of the town, 9 nr. stormwater overflows at 20.5 m OD and a combined sewer above 20.5 m OD.

Option 5

Totally combined sewer and no work undertaken above 20.5 m OD.

Table 4.2 outlines the potential savings associated with these proposals.

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**TABLE 4.2
POTENTIAL SAVINGS**

Items to be eliminated or funded privately	PRELIMINARY REPORT 1996 DEV. PLAN	OPTION 1	OPTION 2	OPTION 3 (PART OF P.R.'96)	OPTION 4	OPTION 5 (PART OF OPTION 1)	OPTION 3 (COMPLETED PHASING IN 10 YEARS)	OPTION 5 (COMPLETED PHASING IN 10 YEARS)
	£	£	£	£	£	£	£	£
	8,343,804.50	8,855,055.50	7,323,146.65	6,632,193.83	7,964,482.74	6,633,952.65	8,932,455.27	9,618,928.68
SUB-TOTAL (Appendix 20A)	6,821,604.00	7,267,945.00	5,989,640.00	5,411,481.00	6,509,956.00	5,374,053.00	7,306,568.39	7,919,285.48
SAVINGS								
Weir Street Embankment	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00
Grouting of Quay Walls	375,000.00	375,000.00	375,000.00	375,000.00	375,000.00	375,000.00	375,000.00	375,000.00
Ballylängley Improvements	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00
Change of Site for PS	140,000.00	N/A	N/A	140,000.00	140,000.00	N/A	140,000.00	N/A
2 x Standby Generators - no cable	5,000.00	N/A	N/A	5,000.00	5,000.00	N/A	5,000.00	N/A
Sewer Extension	163,030.00	163,030.00	163,030.00	N/A	163,030.00	N/A	163,030.00	163,030.00
Allow for Parnell St (currently under construction)	290,538.28	200,000.00	165,000.00	N/A	290,538.28	N/A	290,538.28	200,000.00
TOTAL SAVINGS	1,023,568.28	788,030.00	753,030.00	570,000.00	1,023,568.28	425,000.00	1,023,568.28	788,030.00
NEW SUB-TOTAL	5,798,035.72	6,479,915.00	5,236,610.00	4,841,481.00	5,486,387.72	4,949,053.00	6,283,000.11	7,131,255.48
VAT @ 12.5%	724,754.46	809,989.38	654,576.25	605,185.12	685,798.46	618,631.63	785,375.01	891,406.94
TOTAL	6,522,790.18	7,289,904.38	5,891,186.25	5,446,666.12	6,172,186.18	5,567,684.63	7,068,375.12	8,022,662.42
Supervision Site & Fees (Flood) less £10,000 - no site req'd less £5,000 - cheaper site		209,400.00	209,400.00			209,400.00	209,400.00	209,400.00
Supervision Site & Fees (Drainage)	214,400.00			214,400.00	214,400.00			
Add £65,000 for site incl. Glasslinn Rd	515,100.00	515,100.00	515,100.00	515,100.00	515,100.00	515,100.00	515,100.00	515,100.00
ESTIMATED COST	7,252,290.18	8,014,404.38	6,615,686.25	6,176,166.12	6,901,686.18	6,292,184.63	7,792,875.12	8,747,162.42

Note: See also Appendix 20B - Adjustments to Estimates
and Chapter 3 re: completing phasing in Option 3 & 5.

5.0 ASSESSMENT OF OPTIONS IN DESCENDING ORDER OF COSTS:- (Ref. Table 4.2)

5.1 Option 5 - One Combined Sewer, Phase 1 & Completing the Work in 10 Years

£8,747,162.42.

This Option is not considered further as it is the most expensive option.

5.2 Option 1 - One Combined Sewer

£8,014,404.37.

This Option is not considered further as it is more expensive than the Preliminary Report Option.

5.3 Option 3 - Partially Separate System & Relief Sewers, Phase 1 & Completing the Work in 10 Years up to Preliminary Report Specifications

£7,792,875.12.

This Option is worthy of consideration, since Phase 1 at a cost of £6,176,166.12 creates a flood free zone in the most sensitive area of Bandon, i.e., within the 20.5m contour. However, the cost to complete the Option, i.e., to relieve flooding upstream of this contour and to allow for future development is more expensive in the long term than the Preliminary Report by £540,584.94. The justification for choosing this Option lies in evaluating the monies available in the immediate term to relieve Bandon Town of its invasive flooding problems.

5.4 Preliminary Report Option - Partially Separate System, Relief Sewers and Separate Storm Sewers

£7,252,290.18

The cost of this Option, taking the 1996 Development Plan into account and then identifying potential savings, as set out in Chapter 4, is considerably reduced by £1,072,591.82 from the Preliminary Report Option, presented in May 1993, of £8,324,882.00.

This Option is more expensive than Option 2, also a complete Option, by £636,603.93. However, the Preliminary Report Option has the advantage that there are no contaminated storm overflows discharging to the Bandon River, famous for its salmon fishing and abundant wildlife.

5.5 **Option 4 - Partially Separate System & Relief Sewers Below the 20.5m Contour Overflows and Combined Sewer Above**

£6,901,686.18.

This Option is not considered further as it is more expensive than Option 2 and with the combined sewer above the 20.5m contour and 9 Nr. overflows, it carries the same disadvantages as Option 2.

5.6 **Option 2 - One Combined Sewer with 9 Nr. Overflows**

£6,615,686.25.

This Option is the least expensive complete option. However, the Bandon River, in addition to fishing, is used as bathing waters upstream of the weir where 2 Nr. storm overflows are proposed to discharge.

5.7 **Option 5 - One Combined Sewer, Below the 20.5m Contour Only, i.e., Phase 1 of Option 1**

£6,292,184.62.

The Option is not considered further as it is more expensive than Option 3, the other part option. The cost to complete Option 5 in 10 years is £8,747,162.42, which is £954,287.30 more than the cost to complete Option 3 in 10 years, i.e., £7,792,875.12..

5.8 **Option 3 - Partially Separate System & Relief Sewers Below the 20.5m Contour Only and 8 nr. Storm Overflows, i.e., First Phase of the Preliminary Report**

£6,176,166.12.

This Option requires the least expensive outlay in the immediate term, i.e., £2,148,715.88 less than the Preliminary Report Proposal of £8,324,882.00. However, an additional outlay of £1,616,709.00 would be required in 10 years to complete the Option, thereby eliminating flooding in the whole of Bandon Town.

5.9

Summary

As a result of the above assessment it was decided to discard Option 5 (complete), Option 1, Option 4 and Option 5 (Partial) and to further assess the remaining options, outlined hereunder. Table 5.1 sets out the advantages and disadvantages of these 4 remaining options.

- Preliminary Report - Revised for 1996 Development Plan

Partially Separate System, two Relief Sewers, 13 Separate Storm Sewers.

- Option 2

Totally Combined System with 9 nr. stormwater overflows.

- Option 3

Part option of Preliminary Report, Partially Separate System, two relief sewers and one separate storm sewer below the 20.5 m contour. 8 nr. stormwater overflows at 20.5 m OD and no work carried out above that level.

- Option 3

Completed Option. As Preliminary Report but phased in two stages so that final cost will be greater than that for the Preliminary Report due to inflation.

Table 5.1

Option	Cost	Advantages	Disadvantages
Preliminary Report Revised for 1996 Development Plan	£7,252,290.18	<ul style="list-style-type: none"> No contamination of river water. Separate storm sewers preferable for future development. 	<ul style="list-style-type: none"> More expensive than Option 2.
Option 2	£6,615,686.25	<ul style="list-style-type: none"> Least expensive complete option. 	<ul style="list-style-type: none"> Contamination of river waters. Greater Pumping (App. Nrs. 24-26)
Option 3 Part-Option	£6,176,166.12	<ul style="list-style-type: none"> Critical flooding addressed, i.e., Flood free zone within 20.5m contour. 	<ul style="list-style-type: none"> Part-Option. Flooding problems evident above 20.5m O.D. Contamination of river waters
Option 3 Completed	£7,792,875.12	<ul style="list-style-type: none"> No contamination of river waters. Separate storm sewers preferable for future development. 	<ul style="list-style-type: none"> More expensive in the long term than the Preliminary Report.

NOTE: The above costs include for Potential Savings as set out in Chapter 4 above.

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6.0

CONCLUSIONS AND RECOMMENDATION

Following the assessment of the options, only one emerged as worthy of consideration as an alternative to the Preliminary Report. This is Option 2, which would consist of a single pipe sewerage system draining to the pre-treatment installation at Glasslinn Road, with overflows at 20.5 m OD and have an estimated cost of £6,615,686.25 (Table 5.1), as compared with the Preliminary Report proposals at an estimated cost of £7,252,290.18. The difference in cost between Option 2 and the Preliminary Report is £636,603.93, which is a decrease of approximately 9% in the cost of the proposals set out in the Preliminary Report.

It is considered that the proposals in the Preliminary Report incorporating a partially separate system with 2 relief sewers in the town centre and 13 separate storm sewers, are more efficient in terms of operating costs and would have a lesser impact on the environment. It is felt that the environmental advantages of the Preliminary Report proposal would outweigh the economic advantage of Option 2 and accordingly, it is recommended that the Preliminary Report proposals should be adopted.

Signed:

Mary Creedon
 Mary Creedon
 for: E. G. Pettit & Co.

Date: June 1997