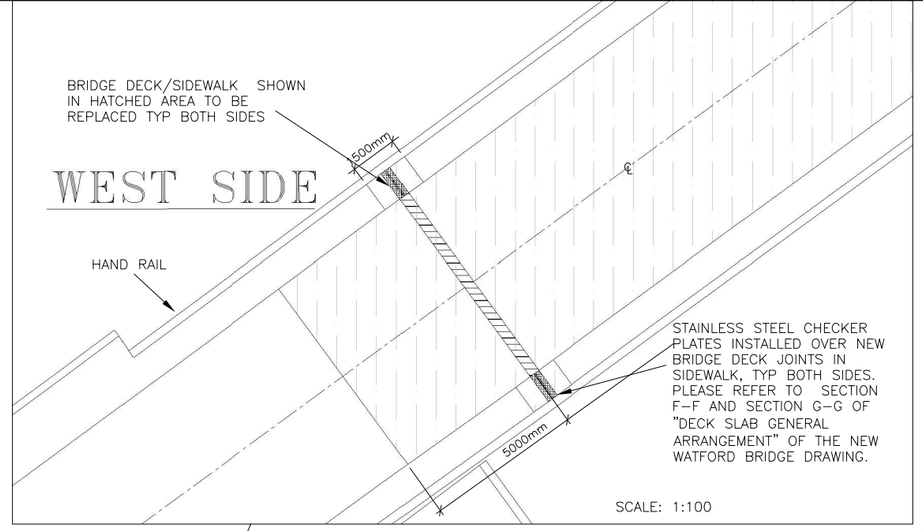
Annex C

Watford Bridge – Waterproofing and Expansion Joint Replacement

Drawings and Reference Documents

NOTES

1. THE SITE SHALL BE MAINTAINED IN A SAFE MANNER WITH ADEQUATE LIGHTING AND ADVANCED WARNING SIGNS. ONE VEHICULAR AND PEDESTRIAN LANE SHALL BE OPENED AT ALL TIMES.
2. THE CONTRACTOR SHALL REMOVE THE EXISTING BRIDGE DECK SURFACING AND WATERPROOFING MEMBRANE.
3. THE CONTRACTOR SHALL ALSO REMOVE A PORTION OF THE CONCRETE SIDEWALK AS PER THE GRAY SHADED AREA IN THE DRAWING. THE STEEL REINFORCEMENT IN THE AREA SHALL REMAIN IN PLACE.
4. THE CONTRACTOR SHALL REMOVE THE EXISTING BRIDGE DECK JOINTS; ANY METAL FIXINGS FOR THE MECHANISM REMAINING SHALL BE CUT BACK TO GIVE 50mm COVER TO THE REINSTATED CONCRETE BRIDGE DECK SURFACE.
5. THE BRIDGE DECK SHALL BE ADEQUATELY PREPARED IN STRICT ACCORDANCE WITH THE MANUFACTURE'S INSTRUCTION TO RECEIVE THE LIQUID APPLIED WATERPROOFING MEMBRANE FOR THE FULL LENGTH AND WIDTH OF THE BRIDGE DECK AND UP EACH KERB.
6. THE CONTRACTOR SHALL REPAIR THE CONCRETE BRIDGE DECK USING PROPRIETARY HIGH STRENGTH CONCRETE REPAIR MORTAR THAT HAS BEEN APPROVED BY THE ENGINEER AND ACCEPTABLE TO THE JOINT AND WATERPROOFING MANUFACTURERS.
7. THE EXPOSED BRIDGE DECK AND ABUTMENT SURFACES SHALL BE TREATED WITH A TWO PART LIQUID APPLIED WATERPROOFING MEMBRANE.
8. THE DECK SHALL BE RESURFACED BY THE MINISTRY OF PUBLIC WORKS. THE CONTRACTOR SHALL LIAISE WITH THE MINISTRY OF PUBLIC WORKS TO COORDINATE THIS ELEMENT OF THE WORKS.
9. THE SURFACING SHALL BE REINSTATED TO THE CORRECT DEPTH FOR THE DESIGN OF THE JOINT.
10. THE CONTRACTOR SHALL INSURE THAT THE NEW ASPHALT IS CLEANLY CUT AND REMOVED IN THE AREA OF THE DECK JOINT SO THAT A SOUND ASPHALT EDGE IS PRESENTED FOR THE INSTALLATION OF THE JOINT.
11. THE CONTRACTOR SHALL SUPPLY AND INSTALL NEW EXPANSION JOINTS.
12. THE CONTRACTOR SHALL REINSTATE THE CONCRETE IN THE SIDEWALK AREA AFTER APPLYING A BONDING AGENT SUCH AS WELDCRETE TO THE EXISTING STEEL REINFORCEMENT AND TO THE CONTACT FACES BETWEEN NEW AND OLD CONCRETE. THE BONDING AGENT SHALL BE APPLIED IN AGREEMENT WITH MANUFACTURER'S SPECIFICATIONS.
13. THE CONTRACTOR SHALL SUPPLY AND INSTALL STAINLESS STEEL COVER PLATES WHERE THE EXPANSION JOINT PASSES THROUGH THE SIDEWALKS AND KERBS.
14. THE CONTRACTOR SHALL SUPPLY AND INSTALL TWO PART POLYSULPHIDE JOINT FILLER.



THE MINISTRY OF PUBLIC WORKS

P.O. Box HM525 Hamilton HMCX Bermuda
Phone: (441)295-5151

DEPARTMENT OF
WORKS AND ENGINEERING
Fax: (441)294-9087

Structures Section

NOTE

1. ORIGINAL PAPER SIZE OF DRAWING IS 34"X22". ALL SCALES SHOWN ARE TO BE HALVED WHEN DRAWING IS PRINTED ON 17"X11" PAPER.

ISSUED FOR: TENDER 09/2016

AMENDMENTS:

NO	REVISION	BY	APP	DATE
1	ISSUED FOR TENDER	MAM	YL	2017-07-10

SCALE: AS SHOWN

SURVEY
PREPARED BY: DATE:

DESIGN
PREPARED BY: R. CROSSLEY DATE: 01/2011
CHECKED BY: M. MURPHY DATE: 01/2011

DRAWING
PREPARED BY: R. GRAHAM-WARD DATE: 08/2016
CHECKED BY: M.MURPHY DATE: 08/2016
APPROVED BY: Y. LORTIE DATE: 08/2016

PROJECT NUMBER:
44/11/50

PROJECT NAME:

WATFORD BRIDGE MAINTENANCE 2016

BRIDGE DECK REPLACEMENT SANDYS PARISH

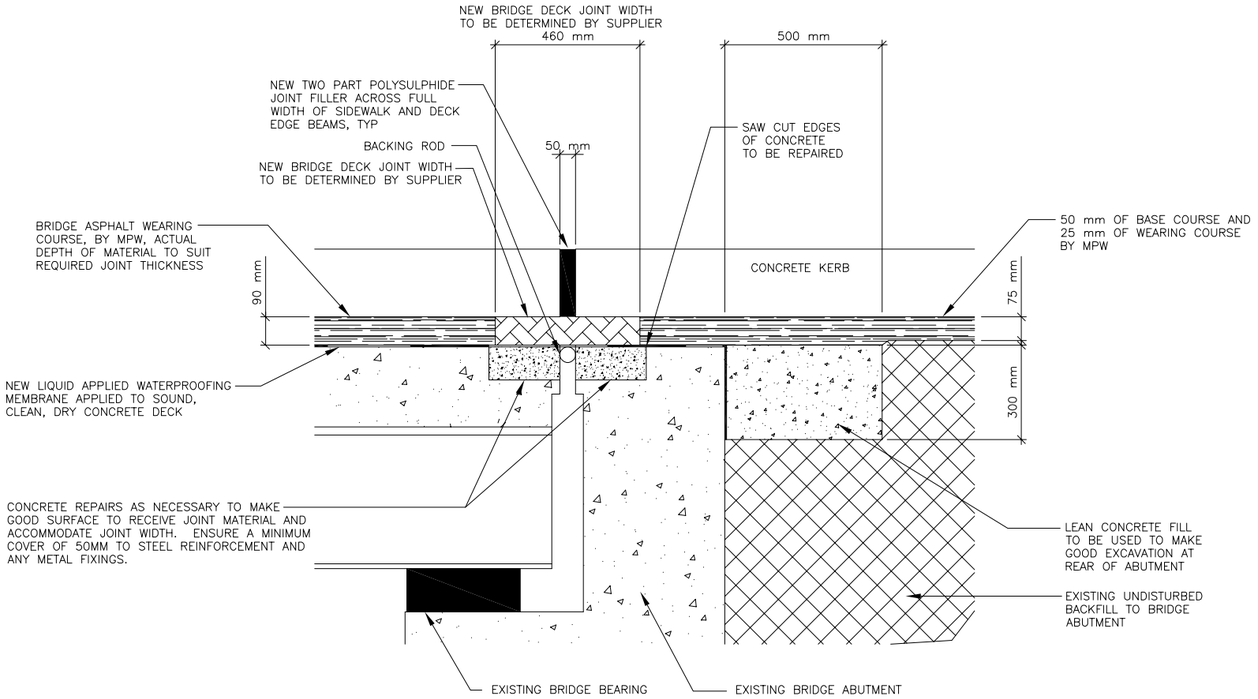
SHEET TITLE:

AREA OF WORKS

SHEET NUMBER: S-1

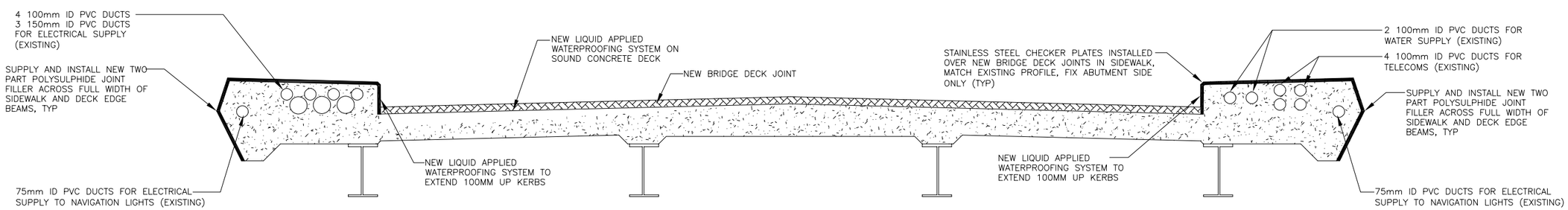
REVISION 1

ACAD 2002



SECTION AT ABUTMENT

SCALE: 1:10



DECK CROSS SECTION

SCALE: 1:20

THE MINISTRY OF PUBLIC WORKS

P.O. Box HM525 Hamilton HMCX Bermuda
Phone: (441)295-5151

DEPARTMENT OF
WORKS AND ENGINEERING
Fax: (441)294-9087

Structures Section

NOTES:

1. THE JOINT SHALL BE DESIGNED TO ACCOMMODATE A MOVEMENT OF +/- 19mm ON THE WEST END AND +/- 28mm ON THE EAST END. THE JOINT SHALL NOT REQUIRE MECHANICAL FIXINGS INTO THE CONCRETE BRIDGE DECK.
2. ASPHALTIC PLUG JOINT AS SUPPLIED BY UNIVERSAL SEALANTS LIMITED IS CONSIDERED ACCEPTABLE FOR THIS JOINT.
   ALTERNATIVELY A BRITFLEX NJ EXPANSION JOINT AS SUPPLIED BY UNIVERSAL SEALANTS LIMITED IS CONSIDERED ACCEPTABLE.

   THE MINISTRY OF PUBLIC WORKS WILL CONSIDER ANY ALTERNATIVE PROPOSALS THAT DO NOT REQUIRE MECHANICAL FIXING TO THE CONCRETE DECK.
3. ORIGINAL PAPER SIZE OF DRAWING IS 34"X22", ALL SCALES SHOWN ARE TO BE HALVED WHEN DRAWING IS PRINTED ON 17"X11" PAPER.

ISSUED FOR: TENDER

AMENDMENTS:

NO	REVISION	BY	APP	DATE
1	ISSUED FOR TENDER	MAM	YL	2017-07-10

SCALE: AS SHOWN

SURVEY
PREPARED BY: DATE:

DESIGN
PREPARED BY: R. CROSSLEY DATE: 01/2011
CHECKED BY: M. MURPHY DATE: 01/2011

DRAWING
PREPARED BY: R.GRAHAM-WARD DATE: 08/2016
CHECKED BY: M.MURPHY DATE: 03/2017

APPROVED BY: Y. LORTIE DATE: 03/2017

PROJECT NUMBER: 44/11/50

PROJECT NAME:

WATFORD BRIDGE

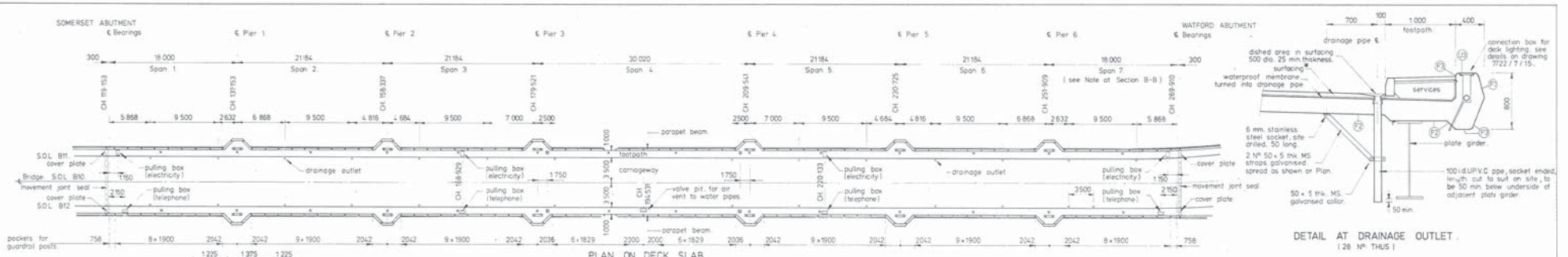
WATERPROOFING & EXPANSIO JOINT REPLACEMENT
SANDYS PARISH

SHEET TITLE:

BRIDGE JOINT DETAILS

SHEET NUMBER: S-2

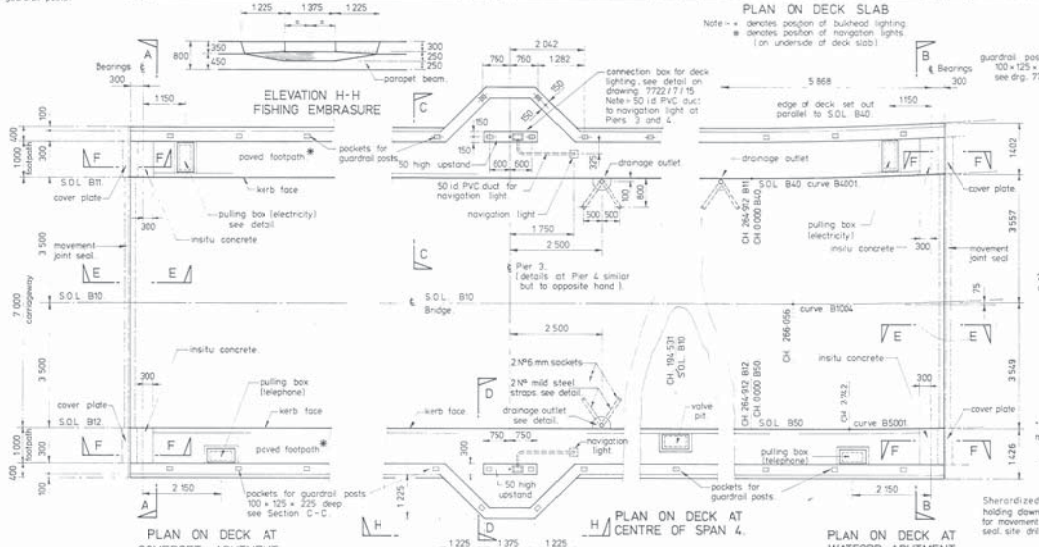
REVISION 1



PLAN ON DECK SLAB

Note :- ✳ denotes position of bulkhead lighting.
✱ denotes position of navigation lights.
(on underside of deck slab)

DETAIL AT DRAINAGE OUTLET.
(28 Nº THUS)

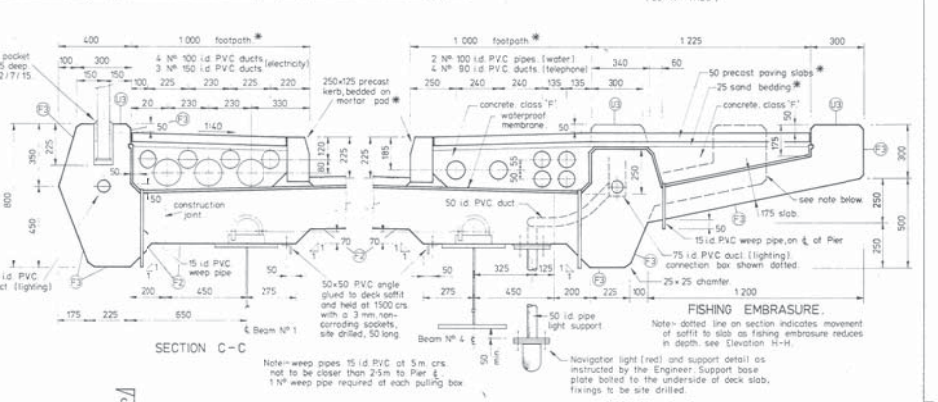


PLAN ON DECK AT SOMERSET ABUTMENT

PLAN ON DECK AT PIER FISHING EMBRASURE

PLAN ON DECK AT CENTRE OF SPAN 4.

PLAN ON DECK AT WATFORD ABUTMENT.

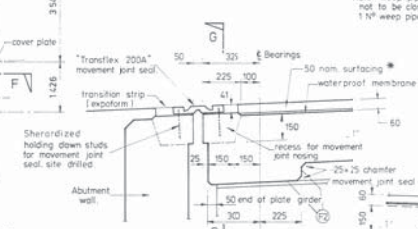


SECTION C-C

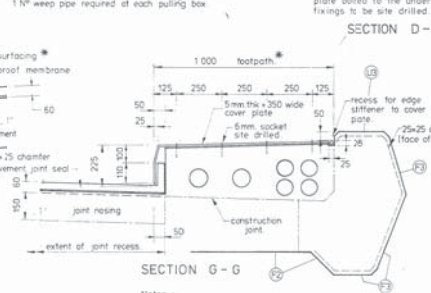
FISHING EMBRASURE.
Note :- dotted line on section indicates movement of soffit to slab as fishing embrasure reduces in depth. see Elevation H-H.

SECTION D-D.

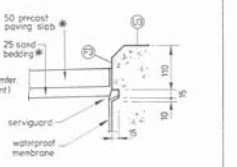
Note :- weep pipes 15 i.d. PVC at 5 m. crs. not to be closer than 2·5 m. to Pier ℄
1 Nº weep pipe required at each pulling box



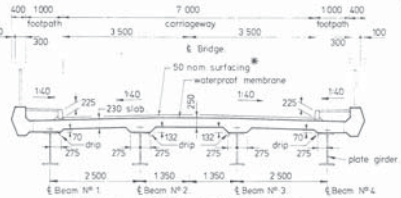
SECTION E-E
MOVEMENT JOINT



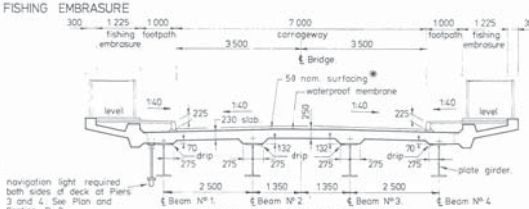
SECTION G-G



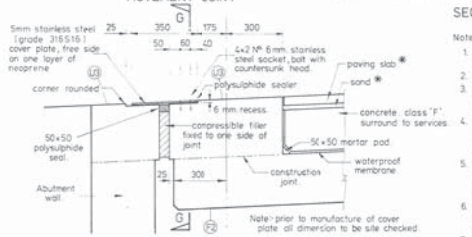
DETAIL OF TUCK FOR WATERPROOF MEMBRANE.
quarter full size.



TYPICAL SECTION THROUGH DECK

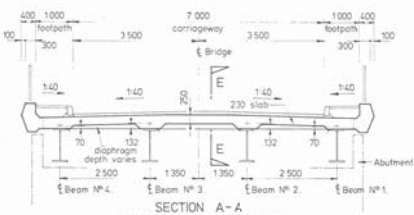


TYPICAL SECTION THROUGH DECK AT FISHING EMBRASURE

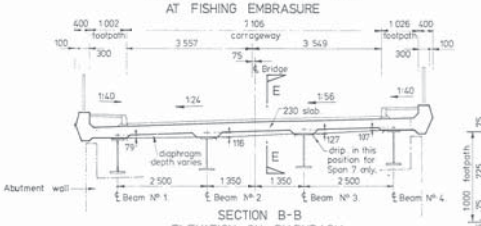


SECTION F-F.

Note :- prior to manufacture of cover plate all dimension to be site checked.

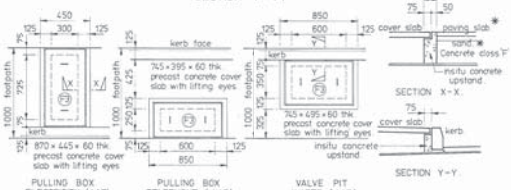


SECTION A-A
ELEVATION ON DIAPHRAGM
SOMERSET ABUTMENT



SECTION B-B
ELEVATION ON DIAPHRAGM
WATFORD ABUTMENT

Note :- Span 7 — depth of haunch varies along the length of each beam to suit deck profile. Haunch dimensions shown on Section B-B apply on centre-line of bearings.



COVER SLABS FOR SERVICES.

1. ✳ Denotes work to be carried out by P.W.D. in conjunction with the Main Contractor.
2. All dimensions are in millimetres.
3. Surface finishes :- denoted on drawing thus (F3) formed surfaces to be F1 unless otherwise noted unformed surfaces to be U1 unless otherwise noted.
4. All sealants and joint fillers as Servicised. (W.R. Grace Ltd.) or similar approved and installed in accordance with manufacturers specification.
5. Waterproof membrane :- Heavy Duty Bitu-thene with Bitu-shield protection, by Servicised. (W.R. Grace Ltd.) or similar approved and laid in accordance with manufacturers specification.
6. Movement joint :- Transflex 200A by Expandite Ltd., or similar approved, and installed in accordance with manufacturers specification.
7. This drawing to be read in conjunction with the following drawings :-

7722/7/2 — Vertical and Horizontal Alignments. (and the Setting Out Book).
7722/7/6 — Somerset Abutment. G.A.
7722/7/8 — Watford Abutment. G.A.
7722/7/11 — Deck Steelwork. Sheet 1.
7722/7/12 — Deck Steelwork. Sheet 2.
7722/7/14 — Deck Slab. R.C. Details.
7722/7/15 — Guardrail and Lighting Details.

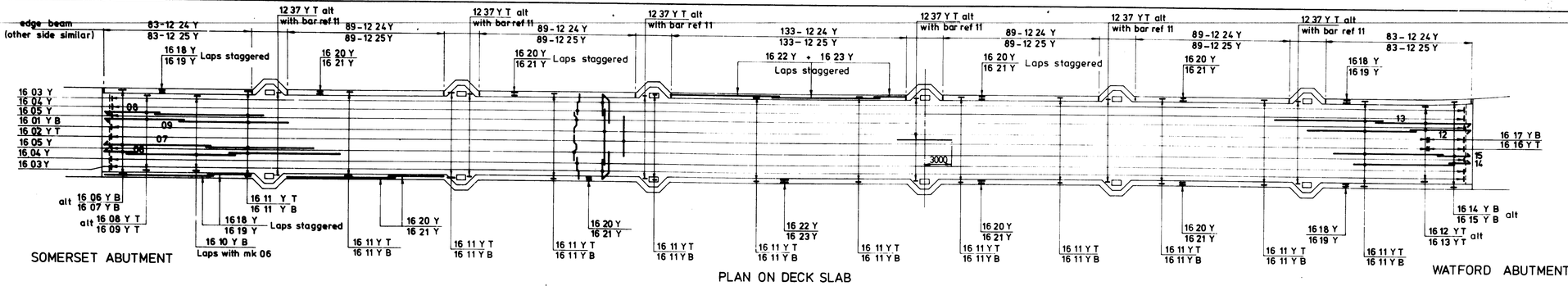
REV.	DESCRIPTION	DATE	CHECKED

GOVERNMENT OF BERMUDA

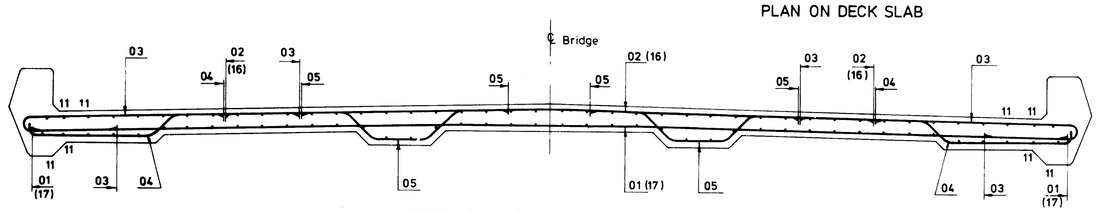
NEW WATFORD BRIDGE

DECK SLAB GENERAL ARRANGEMENT.

PUBLIC WORKS DEPT. HAMILTON 5 BERMUDA	G. MAUNSELL & PARTNERS CONSULTING ENGINEERS LONDON S.E.20.
SCALE: 1:200, 1:50, 1:20 1:10.	DRG. NO. 7722/7/13.
DATE: DEC 1979.	DRAWN BY: N.A.R.

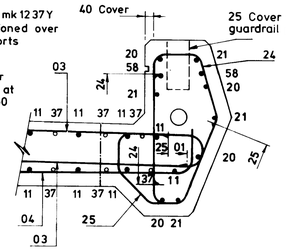


PLAN ON DECK SLAB



TYPICAL SECTION THROUGH DECK SLAB

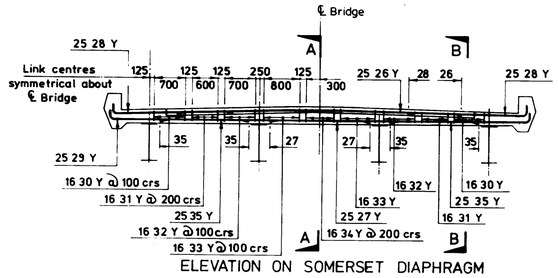
Note :- Bars mk 12 37 Y positioned over supports



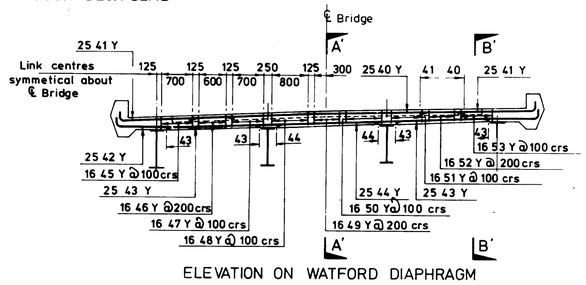
Note :- Where shear connectors are not at the standard 240,360 or 600 centres the transverse bottom reinforcement shall be not greater than 150 and not less than 100 centres

Note :- Bars mk 16 58 Y positioned at each guardrail pocket.
For location of guardrail pocket and lighting connection boxes see drg 7722/3/19

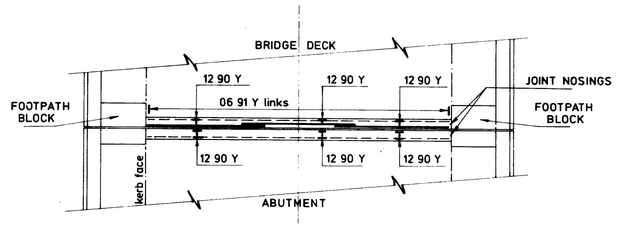
EDGE BEAM DETAIL



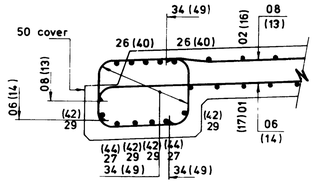
ELEVATION ON SOMERSET DIAPHRAGM



ELEVATION ON WATFORD DIAPHRAGM

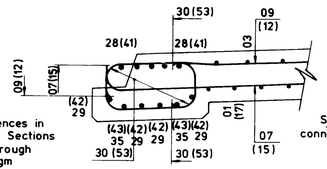


PLAN ON END OF DECK

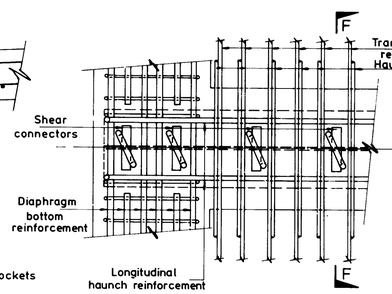


SECTION A-A

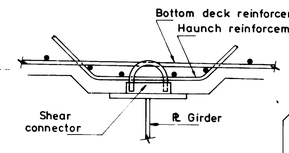
Note :- bar references in brackets are for Sections A-A' and B'-B' through Watford diaphragm



SECTION B - B

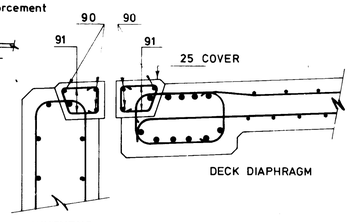


TYPICAL DETAILS OF BAR POSTIONING AROUND SHEAR CONNECTORS

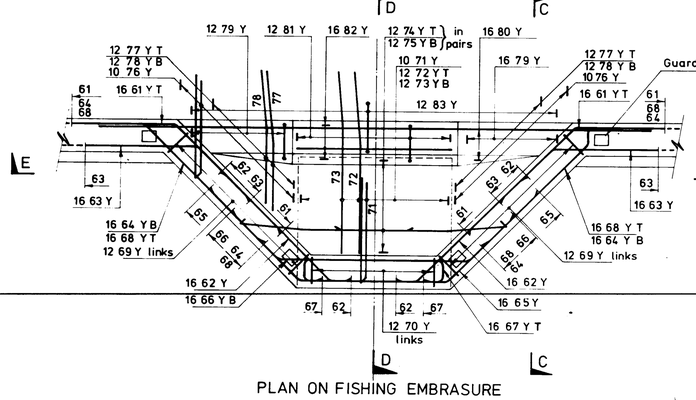


SECTION F-F

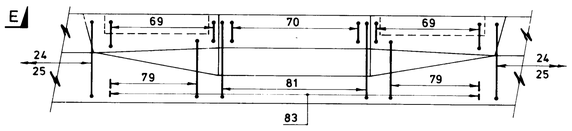
Note :- Minimum distance between reinforcement and shear connectors to be 20 mm



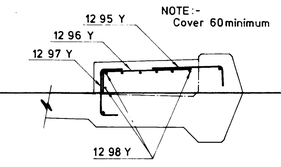
DETAIL OF JOINT NOSINGS
(2 No Thus)



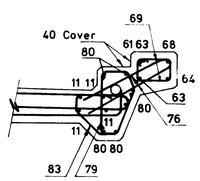
PLAN ON FISHING EMBRASURE



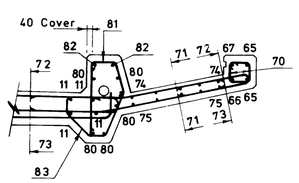
ELEVATION ON FISHING EMBRASURE



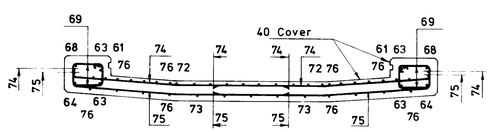
FOOTPATH BLOCK
(4 No Thus)



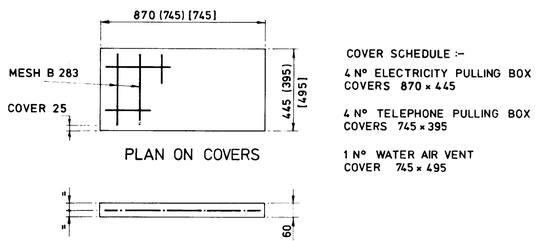
SECTION C - C



SECTION D - D



SECTION E - E



PLAN ON COVERS

COVER SCHEDULE :-
4 N° ELECTRICITY PULLING BOX COVERS 870 x 445
4 N° TELEPHONE PULLING BOX COVERS 745 x 395
1 N° WATER AIR VENT COVER 745 x 495

TYPICAL SECTION
PRECAST COVERS FOR SERVICES

BAR LOCATING TABLE

Bending Schedule N° 23181

W	Bar mark size rel. type	Grouping	Shape	Crs.	Total No.
DECK SLAB (1 NO)					
	16 01 T	1 x 1221	20	120	1221
	16 02 T	1 x 977	20	150	977
	16 03 T	1 x 1255	39	120	2510
	16 04 T	2 x 1255	42	120	2510
	16 05 T	2 x 1295	43	120	2510
	16 06 T	1 x 21	37	450	21
	16 07 T	1 x 21	37	450	21
	16 08 T	1 x 21	9912	450	21
	16 09 T	1 x 21	9912	450	21
	16 10 T	1 x 21	20	450	21
	16 11 T	24 x 42	20	225	1008
	16 12 T	1 x 21	9912	450	21
	16 13 T	1 x 21	9912	450	21
	16 14 T	1 x 21	37	450	21
	16 15 T	1 x 21	37	450	21
	16 16 T	1 x 27	20	150	27
	16 17 T	1 x 34	20	120	34
	12 37 T	6 x 61	20	225	246
EDGE BEAM (2 NO)					
	16 18 T	2 x 8	20		16
	16 19 T	2 x 8	20		16
	16 20 T	4 x 8	20		32
	16 21 T	4 x 8	20		32
	16 22 T	1 x 8	20		8
	16 23 T	2 x 8	20		16
	12 24 T	1 x 655	9962	200	655
	12 25 T	1 x 655	9963	200	655
	16 58 T	73 x 2	20		146
SOMERSET DIAPHRAGM (1 NO)					
	25 26 T	1 x 5	20		5
	25 27 T	1 x 2	20		2
	25 28 T	2 x 5	38		10
	25 29 T	2 x 4	35		8
	16 30 T	2 x 2	74		4
	16 30 T	2 x 2	74		4
	16 30 T	2 x 2	74		4
	16 30 T	2 x 2	74		4
	16 31 T	2 x 2	74		4
	16 31 T	2 x 2	74		4
	16 32 T	2 x 2	74		4
	16 32 T	2 x 2	74		4
	16 32 T	2 x 2	74		4
	16 33 T	2 x 2	74		4
	16 33 T	2 x 2	74		4
	16 33 T	2 x 3	74		6
	16 34 T	1 x 4	74		4
	25 35 T	2 x 2	20		4
WATFORD DIAPHRAGM (1 NO)					
	25 40 T	1 x 5	20		5
	25 41 T	2 x 5	38		10
	25 42 T	1 x 4	35		4
	25 43 T	2 x 2	20		4
	25 44 T	1 x 2	20		2
	16 45 T	1 x 4	74		4
	16 46 T	1 x 4	74		4
	16 47 T	1 x 4	74		4
	16 48 T	1 x 4	74		4
	16 49 T	1 x 9	74		9
	16 50 T	1 x 9	74		9
	16 51 T	1 x 8	74		8
	16 52 T	1 x 7	74		7
	16 53 T	1 x 8	74		8
FISHING EMBRASURE (12 NO)					
	16 61 T	2 x [illegible]	62		2
	16 62 T	2 x [illegible]	62		4
	16 63 T	2 x [illegible]	[illegible]		4
	16 64 T	2 x [illegible]	[illegible]		2
	16 65 T	1 x [illegible]	[illegible]		2
	16 66 T	1 x [illegible]	85		[illegible]
	16 67 T	1 x [illegible]	56		[illegible]
	16 68 T	1 x [illegible]	[illegible]		[illegible]
	12 69 T	9 x [illegible]	50	150	24
	12 70 T	1 x [illegible]	62	150	8
	12 71 T	1 x [illegible]	62	150	10
	12 72 T	1 x 10	62	150	10
	12 73 T	1 x 5	62	240	5
	12 74 T	2 x 5	45		10
	12 75 T	2 x 5	85		10
	10 76 T	2 x 8	39	150	16
	16 77 T	2 x 6	62	150	12
	16 78 T	2 x 4	62	240	8
	12 79 T	2 x 5	9962	200	10
	16 80 T	1 x 3	20		6
	12 81 T	1 x 8	9962	200	8
	16 82 T	1 x 2	20		2
	12 83 T	1 x 18	9963	200	18
JOINT NOSINGS (2 NO)					
	12 90 T	3 x 3	20		9
	6 91 T	1 x 47	9931	150	47
FOOTPATH BLOCK (4 NO)					
	12 95 T	1 x 4	37	150	4
	12 96 T	1 x 4	37	150	4
	12 97 T	1 x 4	38	150	4
	12 98 T	1 x 7	20	150	7

PRECAST COVERS FOR SERVICES MESH TO B.S.-B283

Notes :-

1. All dimensions are in millimetres
2. Concrete class :-
   Class 30/20 - Deck slab, P.C. Covers & Footpath block
3. Cover to reinforcement :- Unless otherwise stated
   Edge beam 60 minimum
   Soffit haunches 60 minimum
   Soffit of deck slab 50 minimum
   Top of deck slab 40 minimum
4. Reinforcement :-
   a) all bars to be high yield deformed bars to B.S.4449 and galvanised in accordance with B.S 729 see Specification clause 1506 High yield bars are shown as bar type Y
   b) bar mark
      20 10 Y
      bar type
      reference number
      bar diameter
   c) lap lengths to be 42 x bar diameter minimum
   d) abbreviations used in bar call-up T = top, B = bottom, alt = alternate
5. Bending schedule No 23181 as shown at head of bar locating table
6. This drawing to be read in conjunction with the following drawings -
   7722/3/4 - General Arrangement
   7722/3/17 - Deck Slab General Arrangement
   7722/3/19 - Guardrail & Lighting Details

REV.	DESCRIPTION	DATE	CHECKED

GOVERNMENT OF BERMUDA

NEW WATFORD BRIDGE

DECK SLAB
R.C. DETAILS

PUBLIC WORKS DEPT.
HAMILTON 5
BERMUDA

G. MAUNSELL & PARTNERS
CONSULTING ENGINEERS
LONDON S.E. 20.

SCALE: 1:10, 1:20, 1:50, 1:200

DRG. NO. 7722/3/18

DATE. MAY 1979

DRAWN BY. G.J.H.

Figure 1 : Watford Bridge Looking North

Figure 2: Watford Bridge Looking South

Figure 3: Watford Bridge Approaches Looking North

Figure 4: North Expansion Joint

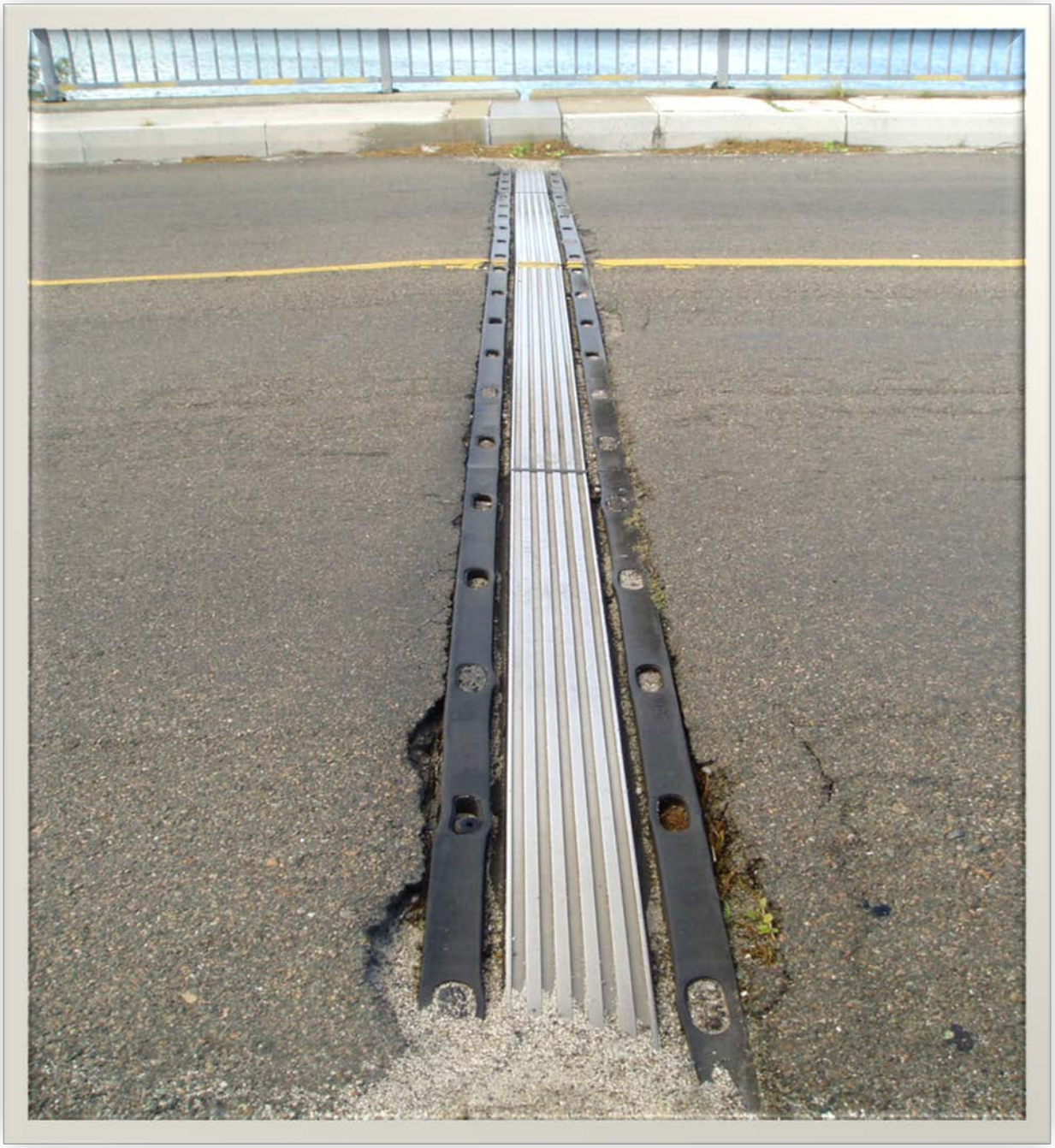


Figure 5: South Expansion Joint

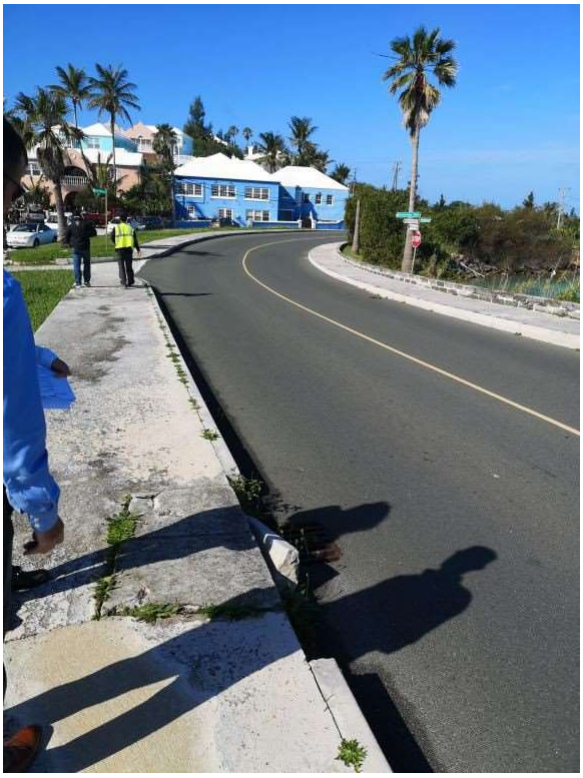


Figure 6: Broken kerb near west side of Bridge

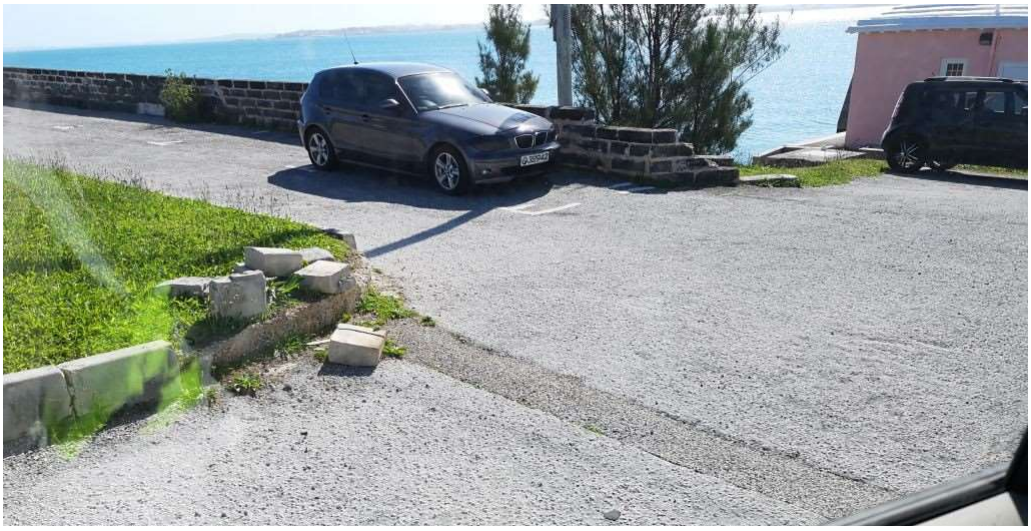


Figure 7. Additional broken kerb near Watford Bridge Ferry Terminal

Figure 8: Laydown area available (WEDCO)