Reference Documents

Swing Span Repair Drawings 2016

1.0 GENERAL

All dimensions are in millimetres unless stated otherwise.

Do not scale any items or information from this drawing set.

This drawing set supersedes cross girder interim repair drawings MMD-353865-C-SK-00-XX-001 and MMD-353865-C-SK-00-XX-002.

Interim repair measures have been designed for 2 running lanes of traffic limited to a maximum axle weight of 10T and a maximum gross vehicle weight of 29T. The repairs are assumed to be in place for no more than 5 years.

Any procedures or methods of carrying out the work as defined in the general notes or drawings will not exonerate the contractor from undertaking work in a safe manner.

The Contractor is responsible for all traffic safety and management as specified in the general notes and drawings.

The Contractor is to take full responsibility for the works, permitting, applications, arrangements, agreements and procurement.

The Contractor is to undertake a detailed dimensional survey of the existing structure to establish/verify the following dimensions prior to commencement of the works:
- Dimensions marked * in this drawing set.
- Dimensions t_f, t_w, $t_{w,sup,VB}$ and $t_{w,sup,MG}$ as defined on drawing MMD-353865-C-SK-00-XX-004 for determination of the required repair type.

Whilst undertaking the dimensional survey the contractor is to review details with respect to erection methodology and highlight any potential problems such as inadequate access for grinding, drilling, bolting, welding, plate and section installation.

Procedures for site cutting, drilling, bolting and welding to be agreed with the Client Representative prior to commencement of the site works.

2.0 STEELWORK

All steel for Type 3 and Type 4 repairs to be grade S355 J0 in accordance with BS EN 10025-2:2004 unless noted otherwise. As an alternative, ASTM A709 grade 50T1 may be used.

All steel for Type 1 repairs, Type 2 repairs, temporary support beams and temporary stool beams to be grade S275 J0 in accordance with BS EN 10025-2:2004. As an alternative, ASTM A709 grade 36T1 may be used.

Bolting assemblies shall be HSFG grade 8.8 HRC to BS EN 14399-10. Alternatively ASTM A325M Class 8.8 type 1 bolts may be used. Bolts should be pre-loaded to 0.7 f_{ub} in accordance with BS EN 1993-1-8.

All faying surfaces to be class C as a minimum in accordance with BS EN 1090-2 with a min slip factor $\mu = 0.3$ (surfaces cleaned by wire brush or flame cleaning with loose rust removed).

Holes for bolts shall be drilled standard clearance holes with a diameter 2mm greater than the bolt shank unless noted otherwise. Any burrs to be removed.

If the existing plate surface beneath the proposed HSFG bolt head is severely corroded, the surface is to be made even with devcon epoxy putty or similar approved.

All welds to be undertaken by a qualified welder. Any zinc coating in the vicinity of the weld zone should be removed by grinding prior to welding. Site welds should be inspected for visible signs of cracking prior to removal of diagonal strut bolts.

Fabrication drawings to be supplied to the Designer for review prior to fabrication.

3.0 PROTECTIVE TREATMENTS

All existing steelwork may be left unpainted. However, in areas where thickness measurements are close to reaching trigger levels (defined on drawing MMD-353865-C-SK-00-XX-004), it may be prudent to apply a holding coat to ensure any un-strengthened cross girders will remain adequate over 5 years. These painted areas are to be determined by the Client Representative.

All new steelwork to be supplied with blast primer.

Unless noted otherwise faying surfaces shall have a minimum friction coefficient of 0.3 and shall be unpainted.

4.0 ERECTION METHODOLOGY

During cross girder repair works all traffic over the swing bridge should be limited to:

- **A central single 3m wide running lane**
- **A 15mph speed limit**
- **Single axle load of 6T**
- **Gross vehicle weight of 10T**

For all repair types, any loose rust, paint or debris associated with the works should be appropriately contained and removed from site.

Repair Type 1/Type 4 - Channel Repair (Intermediate Cross Girders)

1a. **Any required Type 2A/2B/2C repair should be installed before commencement of Type 1 and Type 4 repairs.**

1b. Adjacent cross girders must not be repaired concurrently.

1c. Cut an opening through the facia plate in each bay adjacent to a cross girder identified as requiring a Type 1/Type 4 repair.

1d. Remove any M&E equipment attached to the cross girders that will clash with the repair.

1e. If cross girder is located below a troughing joint, weld inner diagonal strut connection to cross girder bottom flange (refer to drawing MMD-353865-C-SK-00-XX-020).

1f. Slide channel sections, temporary stool beams and temporary support beams (if required) through each facia plate opening and pack out temporary beams with folding wedges to ensure troughing soffit and main girder top flanges are fully engaged (refer to drawing MMD-353865-C-SK-00-XX-020).

1g. Remove bolts from support zone connections which coincide with a Type 1/Type 4 repair. For diagonal strut connections, **bolts must not be removed whilst the bridge is subject to traffic** (traffic is only permitted for a complete connection or no connection). **The contractor is responsible for the temporary support of any diagonal struts with connection bolts removed.**

1h. Where required over the main girder support zones, grind out any existing cross girder web stiffeners, previous strengthening repairs or any rippled cross girder bottom flanges.

1i. Remove any loose paint and corrosion deposits from the repair area and prepare any faying surfaces.

1j. Apply devcon putty over required regions proud of anticipated final level and install shims as appropriate.

1k. Land channel sections onto shims and putty beds before allowing putty to go off. **Note temporary support may be required at this stage to secure channel sections in position before any flange bolts are installed**. If the contractor decides to provide this temporary support by early installation of any web bolts, they should be "finger tight" only.

1l. Install bolts through channel section bottom flange. **Bolts shall be fully torqued only after putty has reached full strength**. For diagonal strut connections, **bolts must not be torqued whilst the bridge is subject to traffic** (traffic is only permitted for a complete connection or no connection).

1m. Drill web holes (except any holes covered by any temporary stool beams over the main girders) and torque the bolts starting from the centre of the channel section beams and working towards the ends.

1n. If a central channel splice is to be provided, all holes should be drilled and the web bolts first torqued starting from the outside of the splice connection and working inwards. The flange bolts should then be torqued starting from the outside of the splice connection and working inwards.

1o. Disengage temporary support beams/ stool beams by removing folding wedges and slide back out through facia plate opening.

1p. Drill remaining web holes over the main girders and torque bolts.

1q. Reinstate any previously removed M&E equipment.

Repair Type 2 - Web Strengthening Plate

2a. Remove any loose paint and corrosion deposits from the repair area and prepare any faying surfaces.

2b. For Type 2A and Type 2B repairs, land strengthening plates and drill bolt holes before installing bolts.

2c. For Type 2C repairs, install temporary stool beams (refer to drawing MMD-353865-C-SK-00-XX-020) before grinding out corroded web stiffener. Land strengthening plates, drill holes and install bolts for outer 2 bolts on either side of the temporary stool beams. Remove temporary stool beams and drill remaining holes and install remaining bolts.

Repair Type 3 - Channel Repair (End Cross Girders)

3a. Penultimate cross girders must not be repaired concurrently with end cross girders.

3b. Cut an opening through the facia plate on either side of the end cross girder web.

3c. Remove any M&E equipment attached to the cross girders that will clash with the repair.

3d. Slide channel sections through facia plate openings. Slide temporary support beams and temporary stool beams (refer to drawing MMD-353865-C-SK-00-XX-020) through facia plate opening in first cross girder bay and pack out with folding wedges to ensure troughing soffit and main girder top flanges are fully engaged.

3e. Install a contractor designed temporary bridging plate (to be reviewed by Designer) between the last cross girder of the approach span and the temporary support beam on the swing span.

3f. Remove bolts from support zone connections. **The contractor is responsible for the temporary support of the diagonal struts with connection bolts removed.**

3g. Where required grind out any existing cross girder web stiffeners, previous strengthening repairs or any rippled cross girder bottom flanges.

3h. Remove any loose paint and corrosion deposits from the repair area and prepare any faying surfaces.

3i. Apply devcon putty over required regions proud of anticipated final level and install shims as appropriate.

3j. Land channel sections onto shims and putty beds before allowing putty to go off. **Note temporary support may be required at this stage to secure channel sections in position before any flange bolts are installed**. If the contractor decides to provide this temporary support by early installation of any web bolts, they should be "finger tight" only.

3k. Install bolts through channel section bottom flange. **Bolts shall be fully torqued only after putty has reached full strength**.

3l. Drill web holes (except any holes covered by any temporary stool beams over the main girders) and torque the bolts starting from the centre of the channel section beams and working towards the ends.

3m. Remove temporary bridging plate.

3n. Disengage temporary support beams and stool beams by removing folding wedges and slide back out through facia plate opening.

3o. Drill remaining web holes over the main girders and torque the bolts.

3p. Reinstate any previously removed M&E equipment.

Notes

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	26/09/16	RF	Erection Methodology Updated	SR	TA
A	02/09/16	RF	For Construction	SR	TA
P1	22/08/16	AJS	Preliminary	AB	TA

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Bermuda

Title

Swing Bridge, St. George's
Bermuda
Swing Bridge Cross Beams
Interim Repairs General Notes

Designed	R. Foster		Eng check	R. Rusev	
Drawn	A. Scott		Coordination	S. Robinson	
Dwg check	S. Robinson		Approved	T. Abbott	

Scale at A1	Status	Rev	Security
As Shown	CON	B	STD

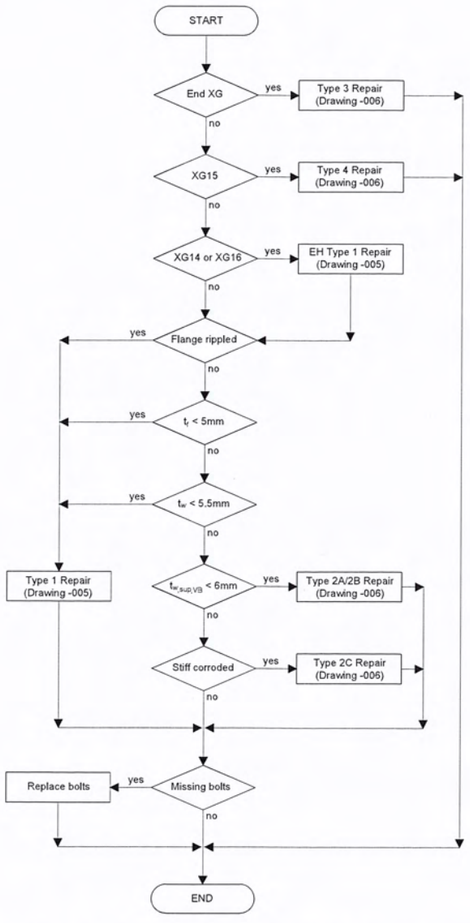
Drawing Number
MMD-353865-C-SK-00-XX-003

REQUIRED REPAIR TYPE (SWING SPANS)

See below flow chart for determining required repair type for each cross girder.

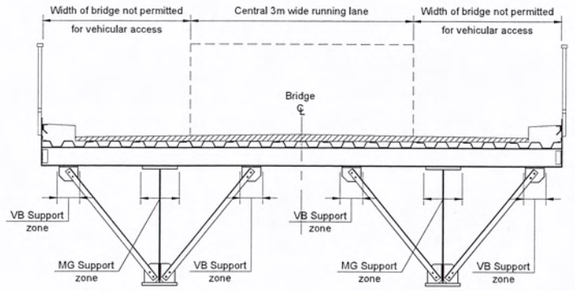
The flowchart should be used for all locations along each cross girder to determine the minimum extent of required repairs. Full length repairs should only be provided where necessary.

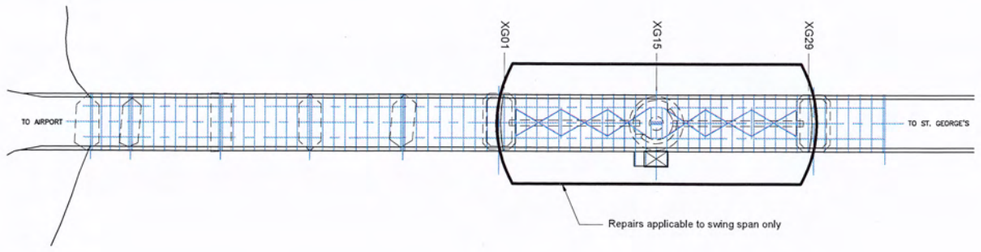
Client Representative to confirm whether a repair is necessary for each cross girder prior to fabrication.



Definition of symbols and abbreviations used in the flow chart:

- "End XG" refers to the first and last cross girders (XG01 and XG29)
- "EH Type 1 Repiar" refers to a Type 1 repiar which extends over the East half of the cross girder.
- "Flange rippled" refers to any local rippling of the bottom flange over the Main Girder (MG) support zone (refer to cross section for support zones)
- t_f is the cross girder top or bottom flange thickness (whichever flange is the lesser thickness)
- t_w is the cross girder web thickness
- $t_{w,sup,VB}$ is the cross girder web thickness directly above a V-brace (VB) support zone (refer to cross section for support zones)
- "Stiff corroded" refers to a severely corroded cross girder web stiffener located above a MG support zone (refer to cross section for support zones)
- "Missing bolts" refers to the bolted connections between the diagonal struts and the cross girder bottom flanges.





Notes

1. For general notes refer to drawing No. MMD-353865-C-SK-00-XX-003.

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	26/09/16	RF	Type 2C and Type 4 Repiar Introduced	SR	TA
A	02/09/16	RF	For Construction	SR	TA
P1	22/08/16	KEK	Preliminary	AB	TA

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Title

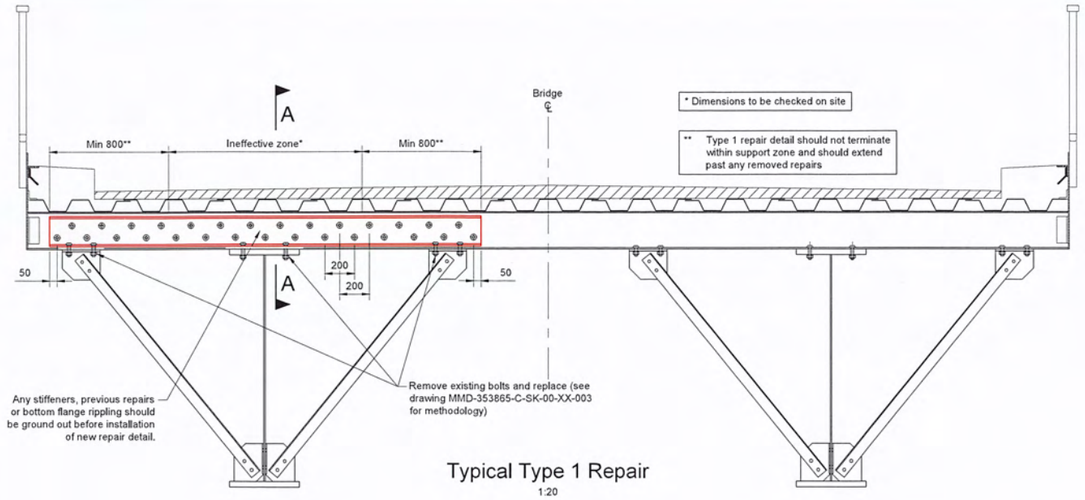
Swing Bridge, St. George's
Bermuda
Swing Bridge Cross Beams
Repair Type Flowchart

Designed	R. Foster		Eng check	R. Rusev	
Drawn	K. Kidd		Coordination	S. Robinson	
Dwg check	S. Robinson		Approved	T. Abbott	

Scale at A1	Status	Rev	Security
As Shown	CON	B	STD

Drawing Number

MMD-353865-C-SK-00-XX-004



Typical Type 1 Repair
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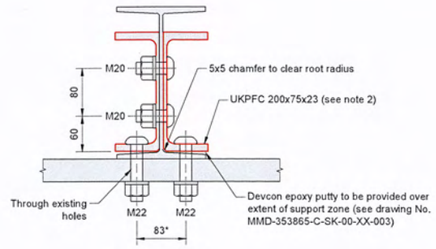

Section A-A
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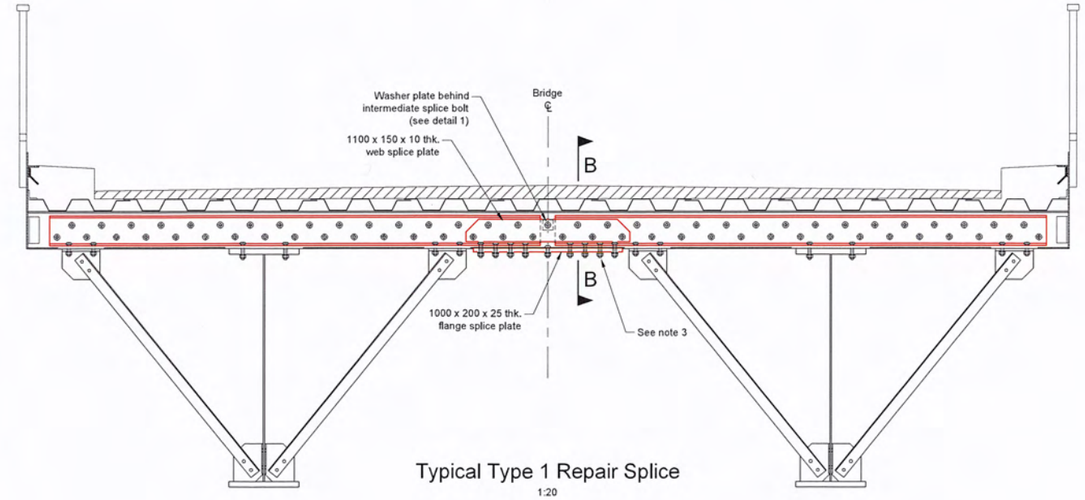

Typical Type 1 Repair Splice
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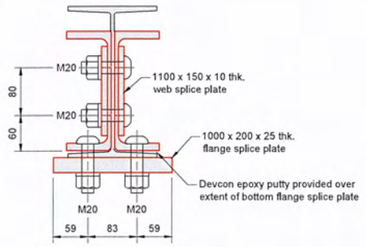
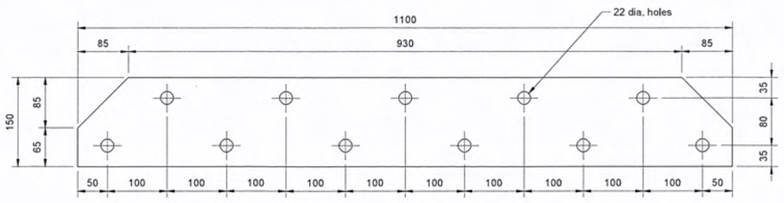
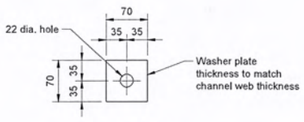


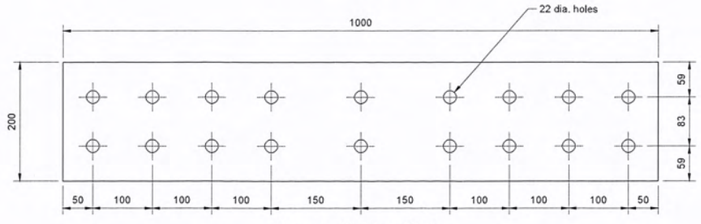
Section B-B
1:5



Web Splice Plate
1:5



Detail 1
1:5



Flange Splice Plate
1:5

Notes

1. For general notes refer to drawing No. MMD-353865-C-SK-00-XX-003.
2. As an alternative to UKPFC 200x75x23 channel sections, wide flange beams W8x18 may be used with flanges ground off flush on one side to form channel section.
3. As an alternative to spliced channel sections, full length channel sections may be provided.

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	26/09/16	RF	Type 2C and Type 4 Repiars Introduced	SR	TA
A	02/09/16	RF	For Construction	SR	TA
P1	22/08/16	AJS	Preliminary	AB	TA

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Ministry of Public Works
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56 Church Street
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Bermuda

Title

Swing Bridge, St. George's
Bermuda
Swing Bridge Cross Beams
Interim Repair Type 1

Designed	R. Foster		Eng check	R. Rusev	
Drawn	A. Scott		Coordination	S. Robinson	
Dwg check	S. Robinson		Approved	T. Abbott	

Scale at A1	Status	Rev	Security
As Shown	CON	B	STD

Drawing Number
MMD-353865-C-SK-00-XX-005

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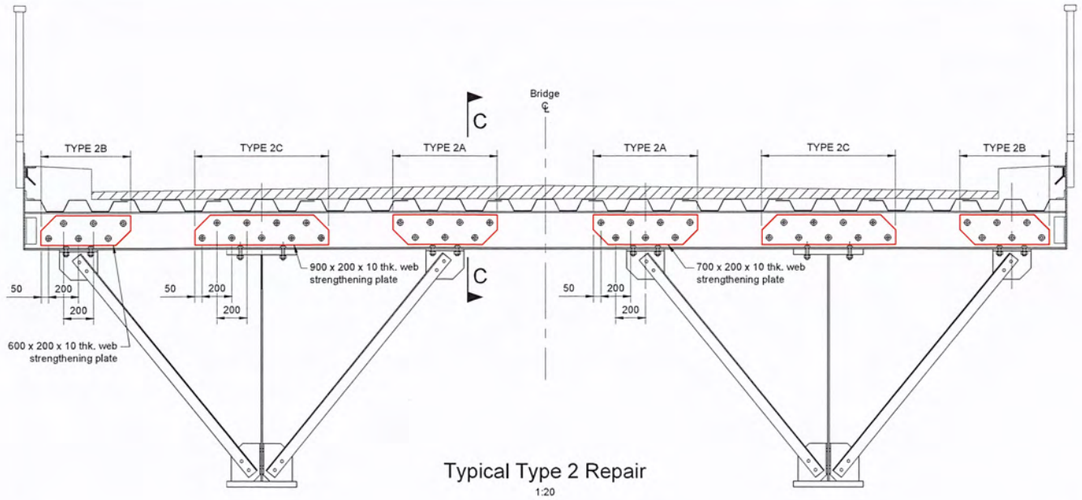
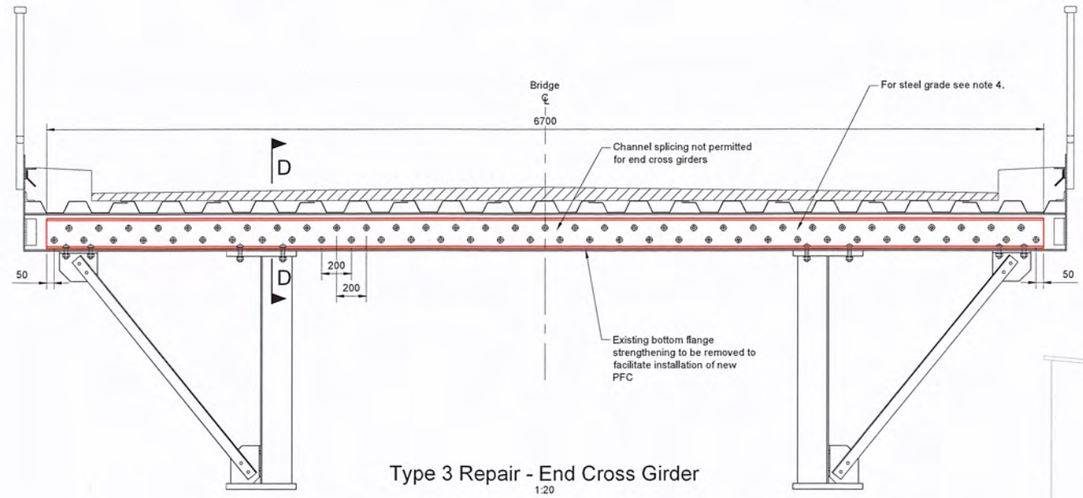
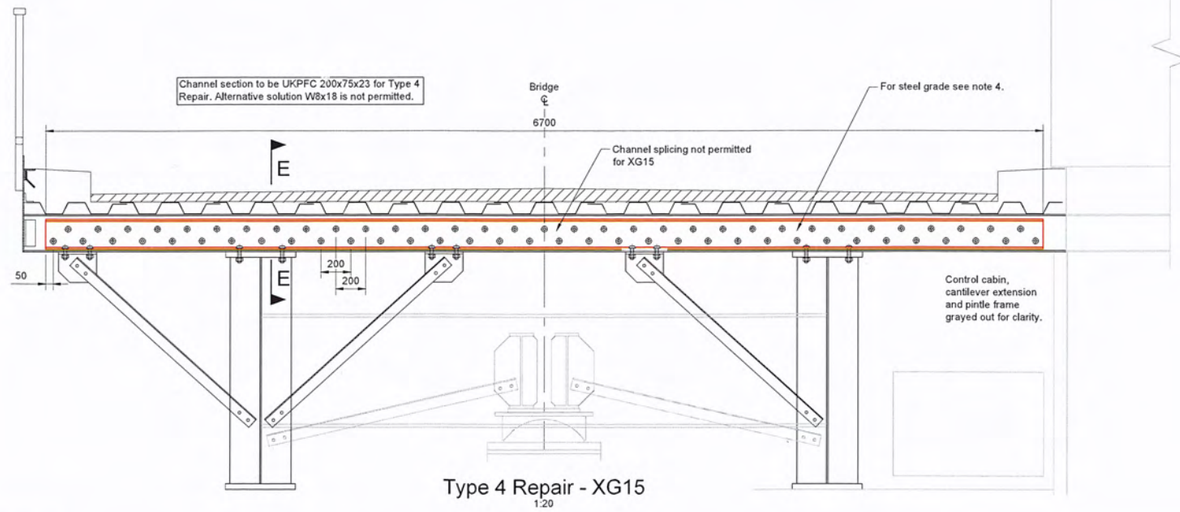


Typical Type 2 Repair
1:20



Type 3 Repair - End Cross Girder
1:20



Type 4 Repair - XG15
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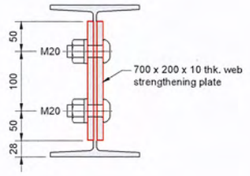
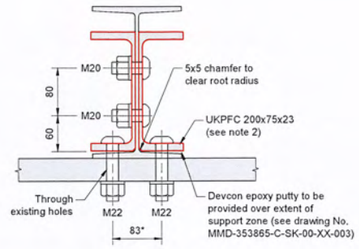


Section C-C
(Type 2B and 2C Similar)
1:5



Section D-D
(Section E-E Similar)
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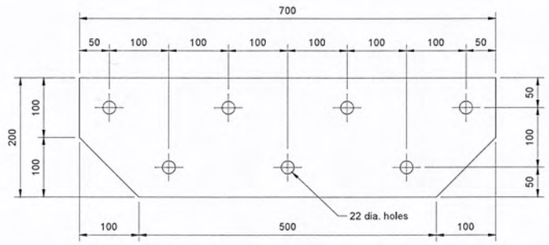
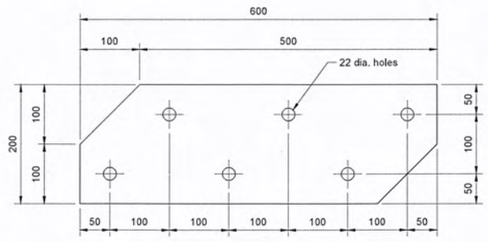
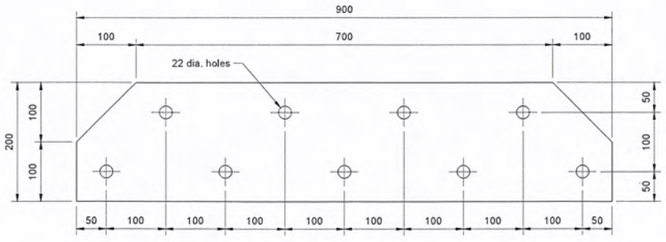


Strengthening Plate
Type 2A
1:5



Strengthening Plate
Type 2B
1:5



Strengthening Plate
Type 2C
1:5

Notes

1. For general notes refer to drawing No. MMD-353865-C-SK-00-XX-003.
2. As an alternative to UKPFC 200x75x23 channel sections, wide flange beams W8x18 may be used with flanges ground off flush on one side to form channel section. This is not applicable for Type 4 Repair which may only be a UKPFC 200x75x23 channel section.
3. All bolts are to be fully tightened under dead load only (i.e. not traffic on the bridge)
4. Steel for Type 3 and Type 4 repairs (end cross girders and XG15) to be S355 J0 in accordance with BS EN 10025-2:2004. As an alternative ASTM A709 grade 50T1 may be used.

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	26/09/16	RF	Type 2C and Type 4 Repairs Introduced	SR	TA
A	02/09/16	RF	For Construction	SR	TA
P1	22/08/16	AJS	Preliminary	AB	TA

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Title

Swing Bridge, St. George's
Bermuda
Swing Bridge Cross Beams
Interim Repair Type 2 & 3

Designed	R. Foster		Eng check	R. Rusev	
Drawn	A. Scott		Coordination	S. Robinson	
Dwg check	S. Robinson		Approved	T. Abbott	

Scale at A1	Status	Rev	Security
As Shown	CON	B	STD

Drawing Number
MMD-353865-C-SK-00-XX-006

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1.0 GENERAL

All dimensions are in millimetres unless stated otherwise.

Do not scale any items or information from this drawing set.

Interim repair measures have been designed for 2 running lanes of traffic limited to a maximum axle weight of 10T and a maximum gross vehicle weight of 29T. The repairs are assumed to be in place for no more than 5 years.

Any procedures or methods of carrying out the work as defined in the general notes or drawings will not exonerate the contractor from undertaking work in a safe manner.

The Contractor is responsible for all traffic safety and management as specified in the general notes and drawings.

The Contractor is to take full responsibility for the works, permits, applications, arrangements, agreements and procurement.

The Contractor is to undertake a detailed dimensional survey of the existing structure to establish/verify any dimensions marked * in this drawing set.

Whilst undertaking the dimensional survey the contractor is to review details with respect to erection methodology and highlight any potential problems such as inadequate access for grinding, drilling, bolting, welding, plate and section installation.

Procedures for site cutting, drilling, bolting and welding to be agreed with the Client Representative prior to commencement of the site works.

2.0 STEELWORK

All new steelwork to be grade S275 J0 in accordance with BS EN 10025-2:2004. As an alternative, ASTM A709 grade 36T1 may be used.

Bolting assemblies shall be HSFG grade 8.8 HRC to BS EN 14399-10. Alternatively ASTM A325M Class 8.8 type 1 bolts may be used. Bolts should be pre-loaded to 0.7 f_{ub} in accordance with BS EN 1993-1-8.

All faying surfaces to be class C as a minimum in accordance with BS EN 1090-2 with a min slip factor μ = 0.3 (surfaces cleaned by wire brush or flame cleaning with loose rust removed).

Holes for bolts shall be drilled standard clearance holes with a diameter 2mm greater than the bolt shank unless noted otherwise. Any burrs to be removed.

If the existing plate surface beneath the proposed HSFG bolt head is severely corroded, the surface is to be made even with Devcon putty or similar approved (steel-filled epoxy putty, min compressive strength 57N/mm^2).

All welds to be undertaken by a qualified welder. Any zinc coating in the vicinity of the weld zone should be removed by grinding prior to welding. Site welds should be inspected for visible signs of cracking.

Fabrication drawings to be supplied to the Designer for review prior to fabrication.

3.0 PROTECTIVE TREATMENTS

All existing steelwork may be left unpainted.

All new steelwork to be supplied with blast primer.

Unless noted otherwise faying surfaces shall have a minimum friction coefficient of 0.3 and shall be unpainted.

4.0 JACKING

Hydraulic cylinders to be Simplex CLP-1502 locking collar hydraulic pancake cylinders.

For jacking operations the cylinders should be connected up to a hydraulic system comprising a pump, a synchronised pressure gauge and hoses. The system is to be installed and pressured in accordance with the suppliers instructions.

The pump and pressure gauge system should be capable of delivering a force accuracy of +/- 5kN (+/- 2.5 bar).

5.0 ERECTION METHODOLOGY

Except during jacking operations where the bridge must be closed to traffic (stages 1l to 1q and 1r to 1s), throughout the repair and strengthening works all traffic over the swing bridge should be limited to:

- **A central single 3m wide running lane**
- **A 15mph speed limit**
- **Single axle load of 6T**
- **Gross vehicle weight of 10T**

Throughout the works, any loose rust, paint or debris associated with the works should be appropriately contained and removed from site.

All works associated with the central jack supports must be complete before starting the plan bracing and pintle frame stiffener strengthening works.

Central Jack Supports

1a. Fuses for the main pump motors should be removed so the Hydraulic Power Unit (HPU) cannot be started and all hydraulic solenoids should be electrically disconnected. Drain down the hydraulic oil to ensure no leaks in the future.

1b. The existing PLC bracket and connections are to be removed from the West main girder and the existing sub-marine cable beneath the East main girder is to be slewed to allow installation of the central jack supports.

1c. The contractor to advise the Designer whether the existing HPU needs to be temporarily moved to facilitate the works. If this is the case, the structure may need to be re-balanced prior to any jacking operations.

1d. A template of the steel base plate should be fabricated to match the anchor layout. **The contractor is to ensure the positioning of the template plate on the pier top is sufficiently accurate prior to drilling the anchor holes.** The design assumes a total of 20mm construction tolerance in both the longitudinal and transverse directions at the jack/pack plate interface with respect to the eccentricity of the jack centroid to the theoretical support centroid (refer to drawing No. MMD-353865-C-SK-00-XX-022).

1e. The resin bonded anchors should be installed in accordance with the manufacturer's recommendations.

1f. The concrete pier top is to be prepared under the footprint of the proposed mortar bed in accordance with the grout manufacturer's specification/ recommendations.

1g. The pre-fabricated stool beam assembly to be landed on nylon shims. **Note the use of steel shims is not permitted.** All shims to be arranged symmetrically with respect to the theoretical support centroid. Client representative to verify 20mm construction tolerance is met with respect to the eccentricity of the jack centroid to the theoretical support centroid prior to casting the grout bed.

1h. Grout bed to be cast in accordance with the manufacturer's specification/ recommendation.

1i. The grout beds should not be loaded until they have reached at least 40N/mm^2 compressive strength. Concrete cubes should be kept in similar site conditions and tested in accordance with BS EN 12390-3.

1j. The threaded bar portion should be taped off above bottom flange level before the oversized holes are backfilled with Devcon putty. The tape may then be removed and the washer plates and nuts installed.

1k. Slide the hydraulic cylinders in from the sides, drop between the fin plates on top of the stool beam assembly and **thoroughly grease the load caps**. The cylinders are then connected up to the hydraulic system.

1l. **The bridge is to be closed to traffic and no vehicles or plant are to be positioned on the swing span.**

1m. Place nylon shims and trowel on Devcon putty to the top surface of pre-fabricated pack plate assemblies. **It should be noted that more than the desired final putty thickness should be troweled onto the pack plates to ensure that a uniform bedding is achieved. The use of steel shims is not permitted.**

1n. Immediately after the previous stage and whilst the putty is with workable consistency, the hydraulic cylinders are used to press the puttied plates onto the main girder soffits: **both cylinders are to be simultaneously pressurised at the same rate from the same pump in a controlled manner.** The desired putty thickness is controlled by the nylon shims and any excess putty will be squeezed out of the sides. A feeler gauge should be used to continuously monitor the gaps between the main girder soffits and the perimeter of the upper pack plates. **When a gap of 2mm is acheived, a constant pressure within the hydraulic system is to be maintained. At no stage should the load in either cylinder exceed 130kN (61 bar).**

1o. Whilst the putty is still wet, clean any excess which was squeezed out from the sides and locally rake out along the line of the proposed weld seams.

1p. The z4 sealing welds are then to be made followed by the z14 fillet welds.

1q. The pressure in the hydraulic system should be relieved untill zero load is recorded and the loading caps are fully retracted. The bridge may then be re-opened to traffic.

1r. Once the Devcon putty has hardened (after the full curing time recommended by the manufacturer) **the bridge is to be closed to traffic and no vehicles or plant are to be positioned on the swing span.**

1s. Both cylinders are then simultaneously pressurised at the same rate from the same pump in a controlled manner up to a lock-off load of 130kN in each cylinder (61 bar). The lock nuts should then be engaged to provide positive mechanical load hold.

1t. Once the cylinders have been locked off, the pressure in the hydraulic system should then be relieved until zero load is recorded at which point the pump, pressure gauge and hoses may be removed. Following a final inspection by the Client and Contractor, the bridge is re-opened to traffic.

Pintle Frame Stiffener Strengthening

2a. **The works associated with the central jack supports shall be complete prior to the installation of the pintle frame stiffener strengthening.**

2b. The Contractor to advise the Designer whether the existing HPU needs to be temporarily moved to facilitate the works.

2c. The cheese plates and splice plates are landed onto the existing pintle frame stiffeners. **Note temporary restraints will be required at this stage to clamp the plates to the existing pintle frame stiffeners before any bolts are installed.**

2d. All bolt holes are match drilled through the splice plates/ cheese plates and existing stiffener plates.

2e. The bolts are then torqued starting from the centre of the splice plate/ cheese plate and working outwards.

Plan Bracing Strengthening

3a. **The works associated with the central jack supports shall be complete prior to the installation of the plan bracing strengthening.**

3b. Existing access ladders to be removed and any cabling or M&E equipment mounted on the bracing member to be temporarily relocated to facilitate the works.

3c. The pack plates, cheese plates and stiffening plates are landed onto the bracing member webs. **Note temporary restraints will be required at this stage to clamp the plates to the bracing members before any bolts are installed.**

3d. The bracing member web holes are match drilled through the pre-drilled stiffening plate, cheese plate and pack plate bolt holes.

3e. The bolts are then torqued starting from the centre of the stiffening plate and working outwards.

3f. Re-attach any cabling or M&E equipment which was previously mounted on the bracing member.

Notes

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	18/01/17	RF	For Construction	SR	TA
P1	06/01/17	RF	Preliminary	SR	TA

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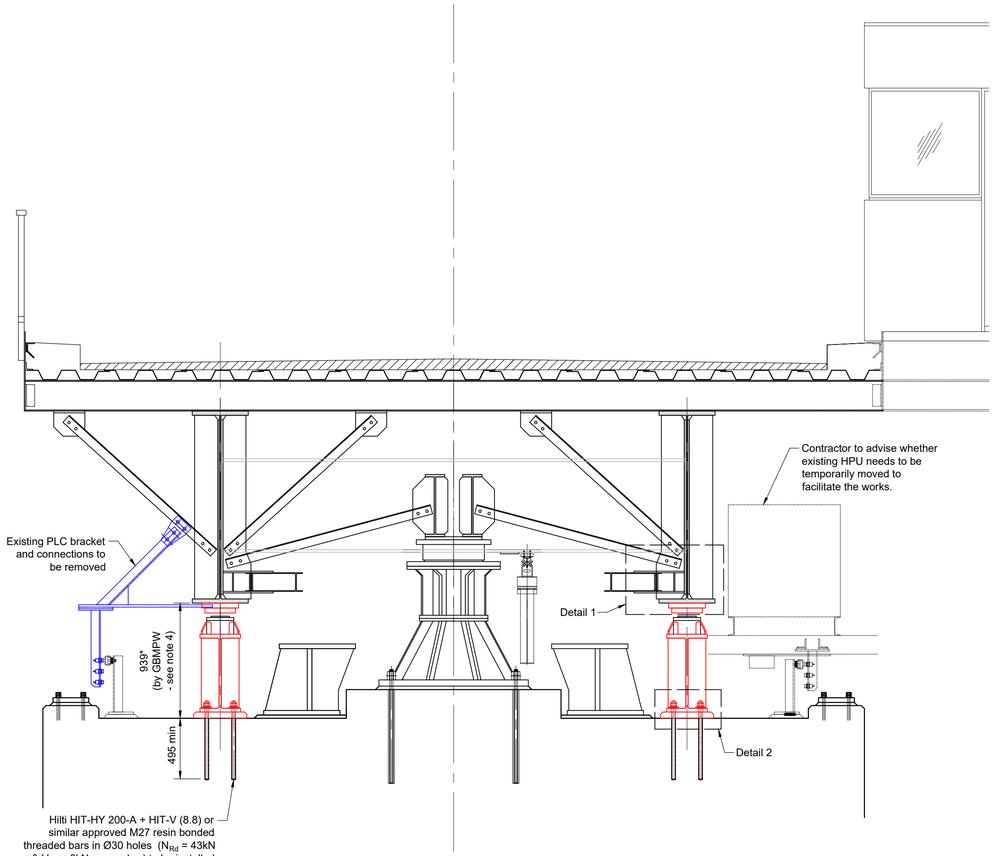
Title

Swing Bridge, St. George's Bermuda
Swing Bridge Strengthening
Interim Repairs
General Notes

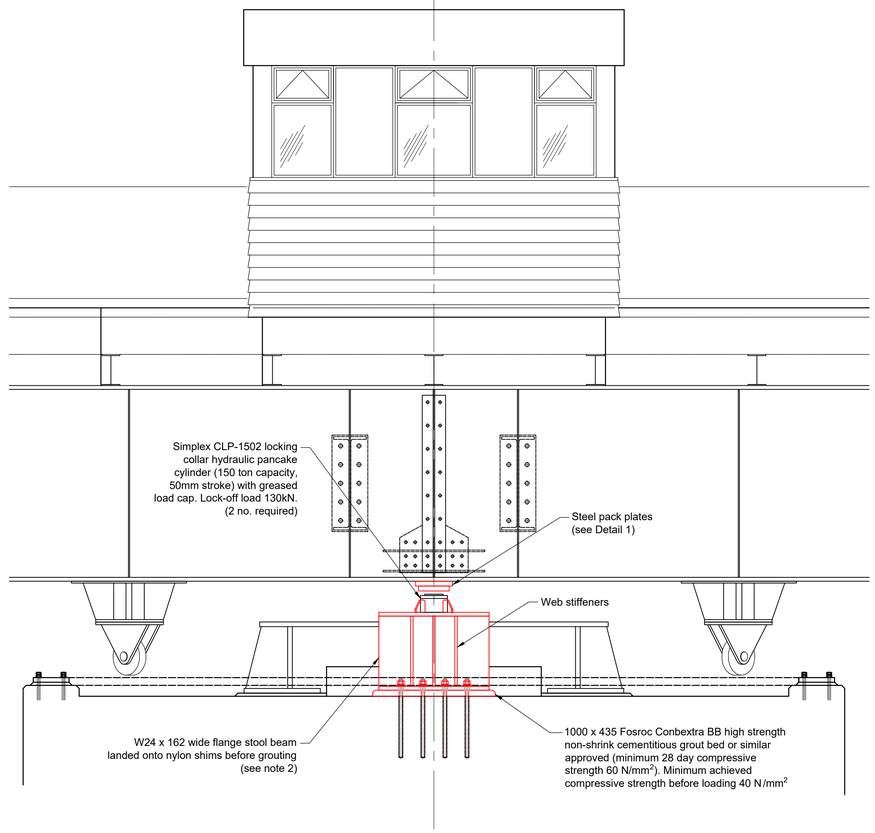
Designed	R. Foster		Eng check	R. Rusev	
Drawn	R. Foster		Coordination	S. Robinson	
Dwg check	S. Robinson		Approved	T. Abbott	

Scale at A1	Status	Rev	Security
As Shown	CON	A	STD

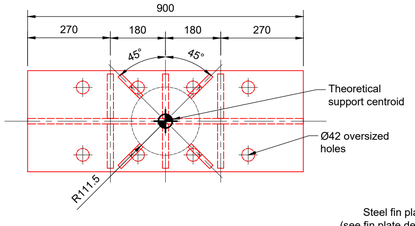
Drawing Number
MMD-353865-C-SK-00-XX-021

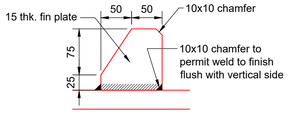


Section
1:25

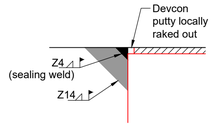


Elevation
1:25
(Not showing HPU platform for clarity)

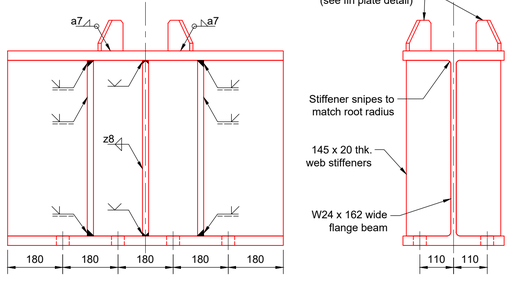




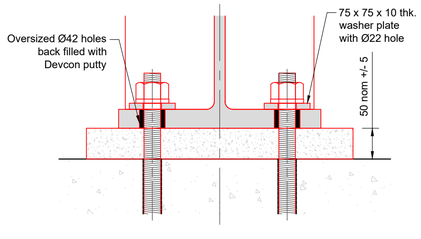
Fin Plate Detail
1:5



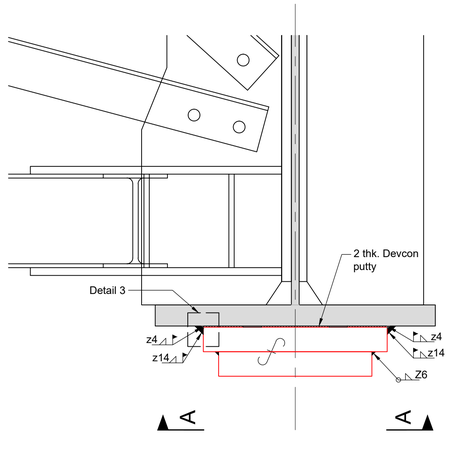
Detail 3
1:1



Stool Beam Assembly
1:10



Detail 2
1:5



Detail 1
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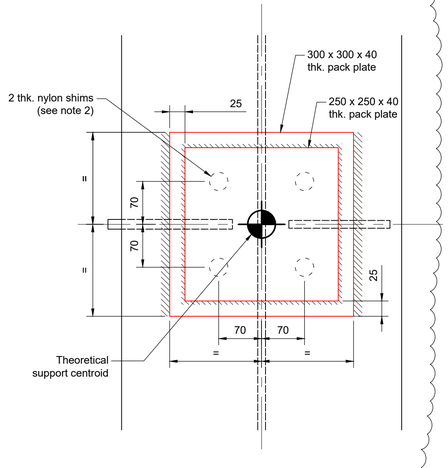

Plan A-A
1:5

Notes

1. For general notes and construction methodology, refer to drawing No. MMD-353865-C-SK-00-XX-021.
2. All shims to be nylon, the use of steel shims is not permitted.
3. Weld symbols in accordance with BS EN ISO 2553.
4. If the distance from main girder soffit to concrete pier top is any different to that provided by GBMPW the designer should be notified. This may result is changes to the design.

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	18/01/17	RF	For Construction	SR	TA
P2	06/01/17	RF	Support centroid clarified	SR	TA
P1	21/12/16	RF	Preliminary - for material order	SR	TA

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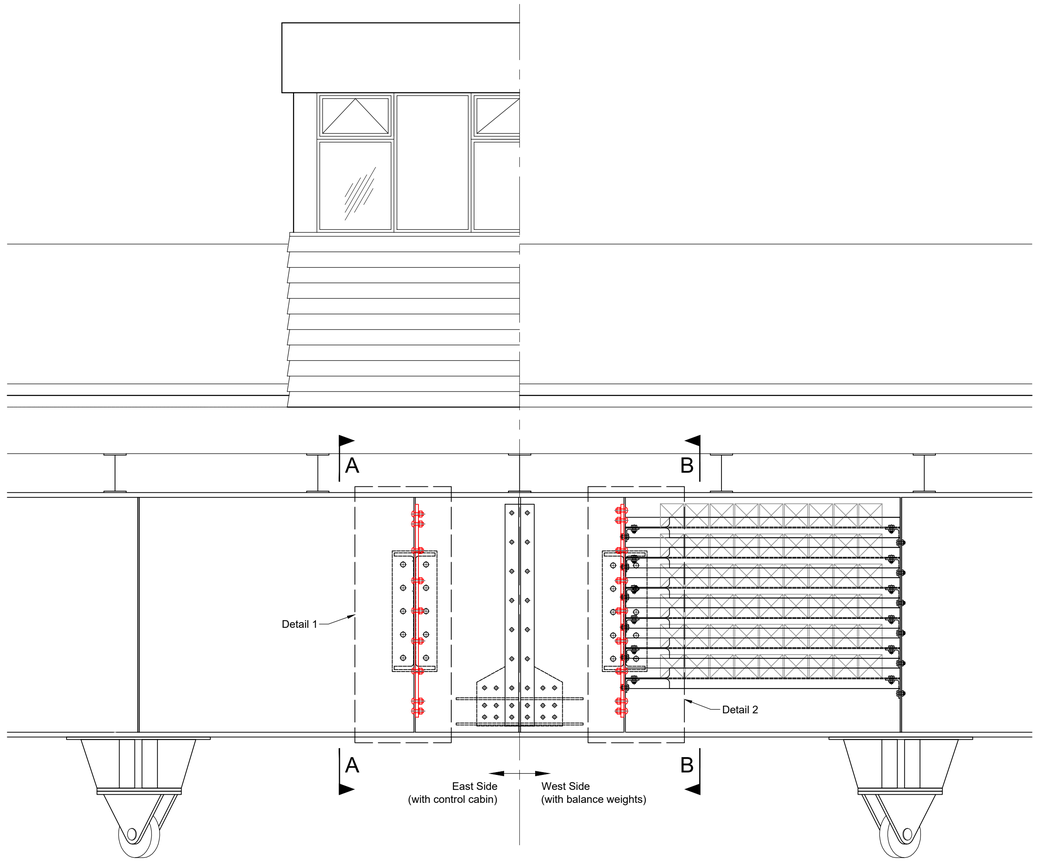
Title

Swing Bridge, St. George's
Bermuda
Swing Bridge Strengthening
Interim Repairs
Central Jack Supports

Designed	R. Foster		Eng check	R. Rusev	
Drawn	R. Foster		Coordination	S. Robinson	
Dwg check	S. Robinson		Approved	T. Abbott	

Scale at A1	Status	Rev	Security
As Shown	CON	A	STD

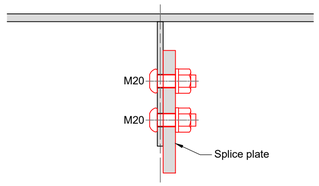
Drawing Number
MMD-353865-C-SK-00-XX-022



Elevation

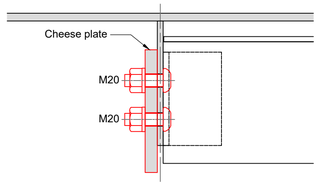
1:20

(Not showing HPU platform for clarity)



Section C-C

1:5



Section D-D

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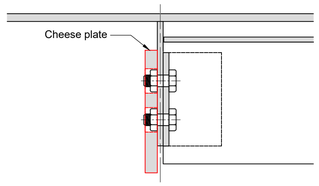

Section E-E

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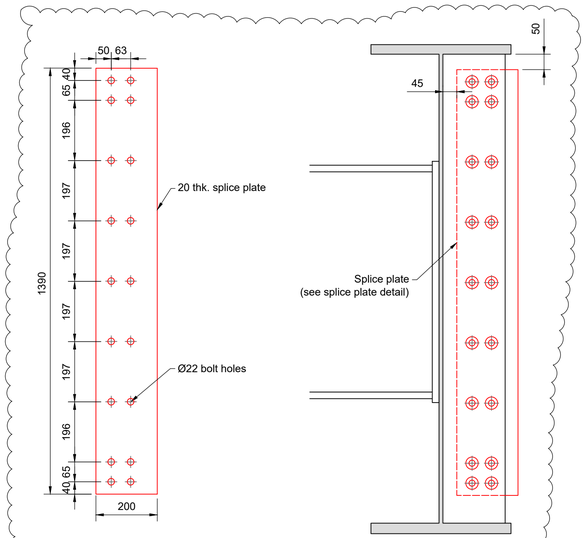


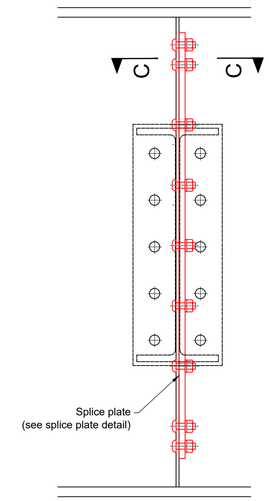
Splice Plate

1:10

(2 no. total)

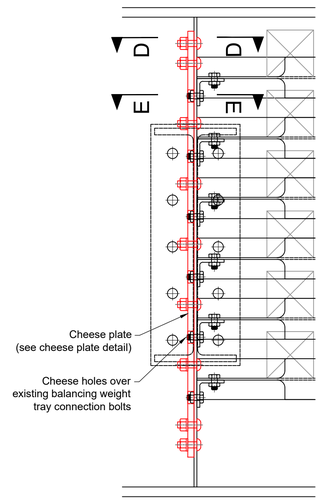
Section A-A

1:10



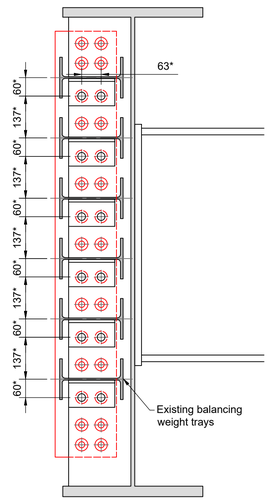
Detail 1

1:10



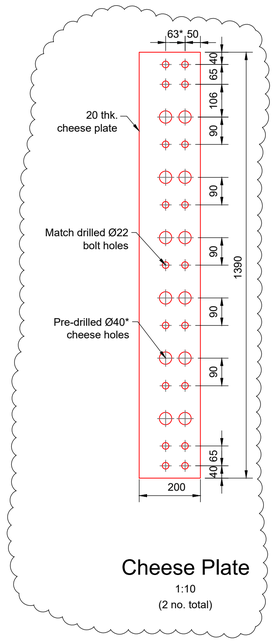
Detail 2

1:10



Section B-B

1:10



Cheese Plate

1:10

(2 no. total)

Notes

1. For general notes and construction methodology, refer to drawing No. MMD-353865-C-SK-00-XX-021.

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	18/01/17	RF	For Construction	SR	TA
P2	06/01/17	RF	Bolting arrangement ammended	SR	TA
P1	21/12/16	RF	Preliminary - for material order	SR	TA

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Title

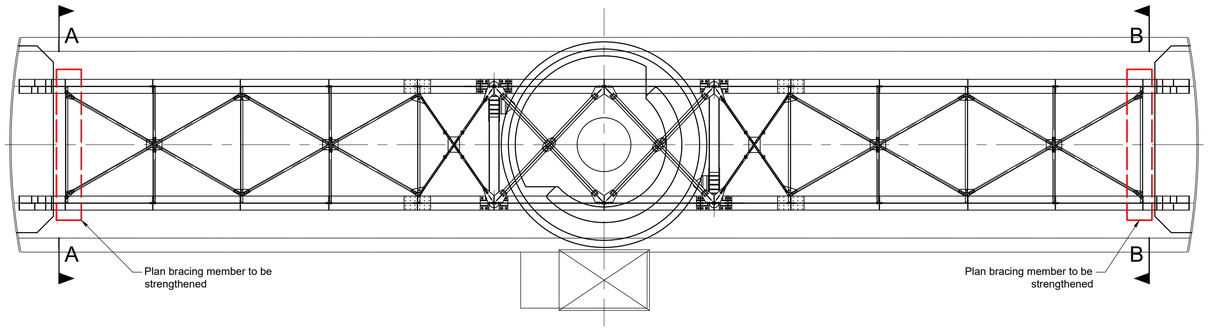
Swing Bridge, St. George's Bermuda
Swing Bridge Strengthening
Interim Repairs
Pintle Frame Stiffener Strengthening

Designed	R. Foster		Eng check	R. Rusev	
Drawn	R. Foster		Coordination	S. Robinson	
Dwg check	S. Robinson		Approved	T. Abbott	

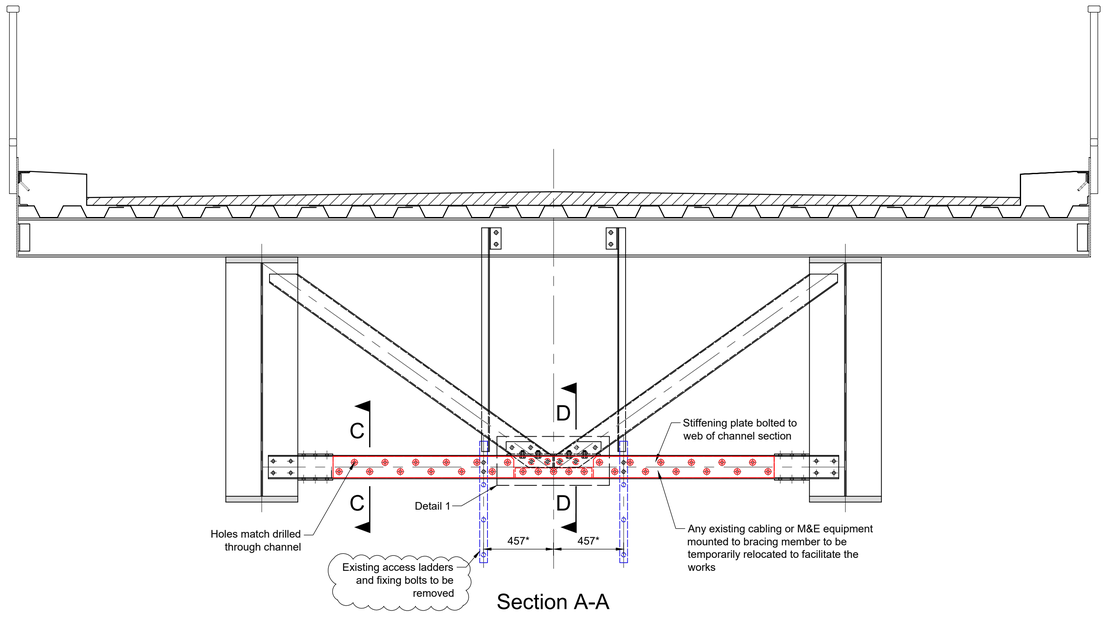
Scale at A1	Status	Rev	Security
As Shown	CON	A	STD

Drawing Number

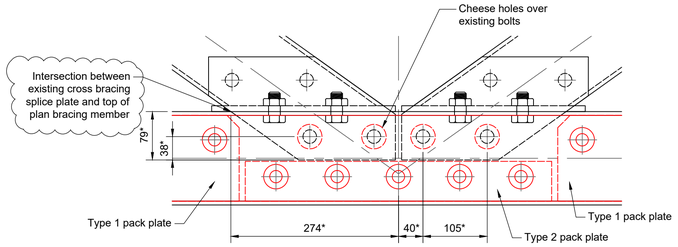
MMD-353865-C-SK-00-XX-023



Plan on Bracing
1:100



Section A-A
1:20
(Section B-B similar)



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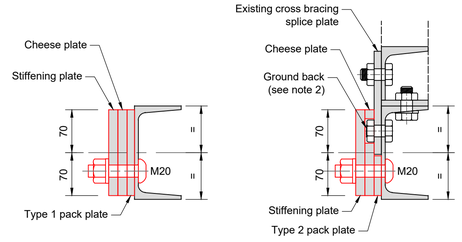
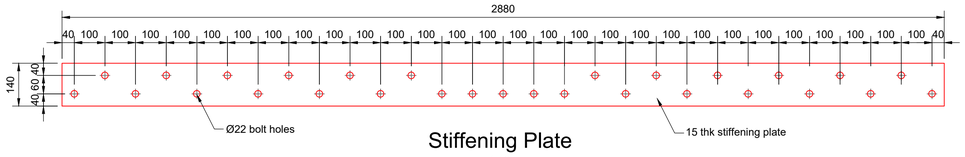


Section C-C
1:5

Section D-D
1:5



Stiffening Plate
1:10
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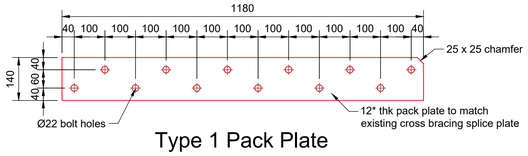

Type 1 Pack Plate
1:10
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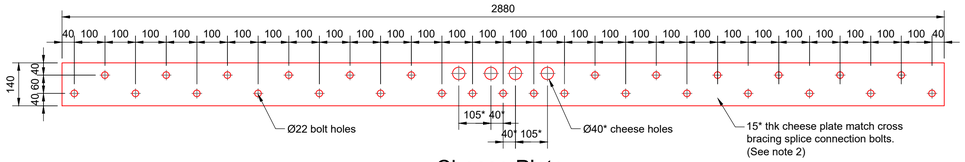
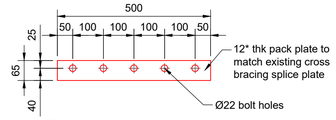


Cheese Plate
1:10
(2 no. total)



Type 2 Pack Plate
1:10
(2 no. total)

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FOS58213

Notes

1. For general notes and construction methodology, refer to drawing No. MMD-353865-C-SK-00-XX-021.
2. Bolt protrusion past nut may be ground back to limit cheese plate thickness. Required cheese plate thickness to be confirmed on site.

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	18/01/17	RF	For Construction	SR	TA
P1	06/01/17	RF	Preliminary - for material order	SR	TA

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Title

Swing Bridge, St. George's Bermuda
Swing Bridge Strengthening
Interim Repairs
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Scale at A1	Status	Rev	Security
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Drawing Number
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