GOVERNMENT OF JERSEY

INFRASTRUCTURE, HOUSING AND ENVIRONMENT

HIGHWAY MAINTENANCE

MONT LES VAUX RESURFACING WORKS

Feasibility Report

August 2021

Report – Stage 1

Report No: 1965/001

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REVISION STATUS		
Date	**Description**	**Revision**
-	For Gateway 1	-

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1 GENERAL INFORMATION

1.1 Purpose of Scheme

1.1.1 The scheme will involve the resurfacing of Mont Les Vaux from the junction of Route de Noirmont / Route Des Genets to a point just west of the junction of Le Jardin de la Chapelle

1.1.2 The section of carriageway to be resurfaced was identified as being in a poor condition and in need of resurfacing from the 2019 XAIS Jersey Pavement Condition review and the 2020 GAIST Visual condition survey.

1.1.3 The purpose of the scheme is to undertake carriageway maintenance works including planing, resurfacing and strengthening to improve the pavement structure and surface course to a serviceable condition, i.e. requiring minimal maintenance for 10-15 years post completion.

1.1.4 Additionally the footways along the section will be assessed and any improvements will be recommended to the client for inclusion in the scheme.

1.2 Scheme location

1.2.1 The scheme is located in the Parish of St Brelade.

1.2.2 The length and surface areas of the scheme are as follows:

- Area of Phase 1 (Chainage 0 – 25m) = 164.5 m^2
- Area of Phase 2 (Chainage 25 – 140m) = 881.5 m^2
- Area of Phase 3 (Chainage 140 – 742m) = 5302.5 m^2
- Area of Phase 4 (Chainage 742 – 1205m) = 3060 m^2
- Area of Phase 5 (Chainage 1205 – 1436m) = 423 m^2
- Total area = 10,707 m^2

1.2.3 The extents of each phase are subject to change following consultation with stakeholders and Gateway meetings.

1.2.4 The scheme extents are shown in Appendix A.

1.3 Road Description, Classification and Traffic Counts

1.3.1 Mont Les Vaux is a Class 1 route as defined by the Government of Jersey (GoJ) Directions for the Control & Management of Streetworks (2008). The impact of the scheme is high.

1.3.2 Street lighting is present throughout the scheme extents.

1.3.3 The proposed period of works is February 2022. Unfortunately, no traffic count data is available for this period of previous years.

1.3.4 Traffic count data was collected on Mont Les Vaux at the junction of Route Des Genets / Route de Noirmont between the 20th and the 26th of September 2017 and volumes assessed.

1.4 Stakeholders

1.4.1 The majority of properties along the scheme's length are residential, however there are a few commercial properties that will be affected.

1.4.2 A communication and consultation plan have been produced which includes details for all key stakeholders.

1.5 Public Transport

1.5.1 Mont Les Vaux is used by the following buses:

- 12 A– Liberation Station to Corbiere
- 12 – Liberation Station to Greve de Lecq via Corbierr
- 14 - Liberation Station to St Brelades Bay
- 15 – Liberation Station to Jersey Airport.

1.5.2 Phasing of works at two key junctions will affect the following buses:

- 14 – Liberation Station – St Brelade's Bay.
- 22 – Liberation Station – L'Etacq.

1.6 Non-motorised users

1.6.1 There is a footway available from Ch.0 to Ch.80 and from Ch.980 extends to the end of scheme extents. These footways are only alongside the eastbound carriageway. There is a narrow footpath present adjacent to the westbound carriageway from chainage 1200m to the Ch.1280. There is an existing public footpath at Ch.360 linking Mont Les Vaux and Le Chamin Des Pietons along the westbound carriageway.

1.6.2 Table 1 lists the pedestrian crossing points along Route Des Genets within the scheme extents.

Location	Type of crossing
Mont Les Vaux, near St Brelade's College	Uncontrolled Crossing

Table 1: Types of crossing/ location along Mont Les Vaux

1.6.3 There are no provisions for cyclists on Mont Les Vaux.

1.7 Scoping

1.7.1 A scoping meeting for the resurfacing element has yet to be undertaken.

1.7.2 It is recommended that a scoping walkthrough is undertaken with the client to agree proposals at Gateway 2.

2 EXISTING CONDITIONS, INVESTIGATIONS & ANALYISIS

2.1 Pavement – Visual Conditions

2.1.1 A visual inspection of the existing pavement was undertaken on the 14th of July 2021 by [redacted], Senior Engineer from WSP.

2.1.2 There are a number of visible defects across the scheme extents which are listed below:

- Cracking (Linear and crocodile)
- Severe rutting
- Utilities trenches
- Potholes

2.1.3 Figure 1 & 2 below are typical of the state of the carriageway surface.

Figure 1 & 2 – Typical state of the schemes existing carriageway

2.2 Flexible Asphalt Pavement - Cores

2.2.1 A Red, Amber, Green (RAG) system has been implemented in grading the pavement cores. This has been implemented to highlight any cores which have shallow construction depth of bound material and which may require further investigation. The grading system is based on the parameters shown in Table 2 below:

Table 2 – Pavement Core Grading Parameters

Core grading colour	Existing asphalt thickness	Criteria for core grading thickness
Red	< 115mm	The lower bound 'Red' grading is based on using DMRB Volume 7, HD 39/16, Heavy-vehicle footways/cycleway design. Using Table 3.4 of HD 39/16 and excluding sub-grade thickness and CBR values (Para 2.2.10), a minimum asphalt thickness of 115mm should be used comprising of 25mm Surface Course and 90mm Dense AC Binder. **This is equivalent to approximately one heavy vehicle per working day over a design life of 40 years.**
Amber	Between 115mm and 150mm	The 'Amber' grading is determined as the median asphalt thickness between 150mm (Green) and 115mm (Red).
Green	> 150mm	The 'Green' grading is based on providing a cost effective solution and evaluating previous resurfacing schemes undertaken by States of Jersey Resurfacing Schemes, 150mm asphalt thickness has proved to be effective on numerous schemes and is therefore suggested that this forms the minimum asphalt thickness which is re-instated within the carriageway. This upper bound limit will form the 'Green' grading of coring.

2.2.2 30 No. cores were undertaken to establish the existing pavement construction throughout the site.

2.2.3 The pavement cores were undertaken by NJD between the 14th and 16th July 2021

2.2.4 A summary of the core results is shown in Table 3.

2.2.5 The location and results of all the cores samples are contained within Appendix B. Also shown in Appendix B is the approximate envisaged extents of the different core thicknesses (these are shown as the core grading colours listed in Table 2). It has been assumed that the core grading thicknesses extend 10m in each direction from the core, in the lane where the core has been taken.

Table 3 – Core Summary at Mont Les Vaux

	Asphalt Thickeness					Concrete/ Granite					Core Analysis				
Core No.	Layer 1 (mm)	Layer 2 (mm)	Layer 3 (mm)	Layer 4 (mm)	Layer 5 (mm)	Layer 1 (mm)	Non Collected Material (mm)	Material at Bottom	Total Drill Depth (mm)	Total Bound Thickness (mm)	Core Grading Thickness	Analysis of Core Grading Thickness	Comments	PAC Test Positive reading (Y/N)	PAC Test Comments
														PAC Testing completed on all cores,	
C1	20	20	25	30	45	-	-	Bound	140	140	Amber	Amber		N	No Change
C2	50	40	-	-	-	-	30	Unbound	120	90	Red	Red	Bottom 30mm separated from above base layer and showing signs of degradation	N	No Change
C3	20	50	60	-	-	-	30	Bound	160	130	Amber	Red	Surface and base/binder separated and heavily degraded.	N	No Change
C4	20	60	55	-	-	-	-	Bound	135	135	Amber	Amber		N	No Change
C5	40	50	20	-	-	-	-	Bound	110	110	Red	Red		N	No Change

C6	40	-	-	-	-	-	80	Unbound	120	40	Red	Red	Surface and base/binder separated and heavily degraded.	N	No Change
C7	20	40	70	-	-	-	-	Bound	130	130	Amber	Amber		N	No Change
C8	60	40	-	-	-	-	20	Bound	120	100	Red	Red		N	No Change
C9	20	20	100	-	-	-	-	Bound	140	140	Amber	Red	Surface and base/binder separated and heavily degraded.	N	No Change
C10	20	25	60	-	-	-	25	Unbound	130	105	Red	Red		N	No Change
C11	25	15	30	45	-	-	-	Unbound	115	115	Red	Red		N	No Change
C12	30	25	-	-	-	-	45	Unbound	100	55	Red	Red		N	No Change
C13	30	30	110	-	-	-	-	Bound	170	170	Green	Amber	Layers 1 and 2 in poor condition.	N	No Change
C14	70	55	-	-	-	-	-	Unbound	125	125	Amber	Red	Surface and base/binder separated and heavily degraded.	N	No Change
C15	30	20	110	40	-	-	20	Bound	220	200	Green	Amber	Signs of material deterioration in layers 1 and 2,	N	No Change

													layer 1 separated from remaining 3 layers.		
C16	20	30	95	-	-	-	-	Bound	145	145	Amber	Red	Surface and base/binder separated and heavily degraded.	N	No Change
C17	20	50	40	-	-	-	10	Bound	120	110	Red	Red		N	No Change
C18	20	30	40	-	-	-	20	Bound	110	90	Red	Red		N	No Change
C19	30	30	-	-	-	-	20	Unbound	80	60	Red	Red		N	No Change
C20	40	40	60	-	-	-	-	Bound	140	140	Amber	Amber		N	No Change
C21	50	20	-	-	-	-	50	Unbound	120	70	Red	Red		N	No Change
C22	30	30	-	-	-	-	45	Unbound	105	60	Red	Red		N	No Change
C23	40	20	-	-	-	-	30	Unbound	90	60	Red	Red		N	No Change
C24	50	110	-	-	-	-	20	Unbound	180	160	Green	Amber	Surface and base/binder separated	N	No Change
C25	30	70	-	-	-	-	10	Unbound	110	100	Red	Red	Material at base deemed to be concrete.	N	No Change
C26	30	95	-	-	-	-	10	Unbound	135	125	Amber	Red	Signs of voiding and deterioration	N	No Change

													in layers 1&2, layer 3 separated from layers above		
C27	40	60	-	-	-	-	-	Unbound	100	100	Red	Red		N	No Change
C28	50	30	-	-	-	-	10	Unbound	90	80	Red	Red		N	No Change
C29	20	30	50	-	-	-	20	Unbound	120	100	Red	Red		N	No Change
C30	20	40	30	-	-	-	5	Unbound	95	90	Red	Red		N	No Change

2.2.6 Table 3' results shows a large variation in core depths with a 109mm average thickness of bound material. Areas where core RAG ratings give a rating of red or amber directly correlate with areas of rutting, cracking and crazing noted during a pavement condition survey completed by [redacted] (Senior Engineer, WSP) on July 14th, 2021.

2.2.7 Details of recommended pavement treatments are noted in section 3 following.

2.2.8 Classified traffic count data for Mont Les Vaux was not available therefore a design traffic calculation in accordance with Design Manual for Bridges HD26/06 and could not be undertaken to determine a proposed design traffic loading.

2.2.9 It should be noted that no CBR results are available at this stage to determine the sub-grade strength. There is limited evidence of settlement, therefore it is assumed that sufficient sub-grade strength is available based on previous resurfacing schemes undertaken by States of Jersey.

2.2.10 There was no evidence of ground water in any of the cores taken.

2.3 Topographical Survey, Carriageway levels & Surface Water Drainage

2.3.1 A Topographical survey has been undertaken and will be used within the design. This will be checked on site by WSP. Any anomalies will be re-surveyed.

2.3.2 There are 35 No. highway gullies within the proposed extents of the resurfacing.

2.3.3 The condition of the existing drainage network is unknown. Infrastructure, Housing & Environment (IHE) Drainage department has been asked to commission a CCTV survey. IHE drainage will need to carry out any necessary repairs prior to the start of work.

2.3.4 It is recommended that a walkthrough is undertaken to identify any areas of flooding/ponding after a period of heavy rainfall. This will be completed when the opportunity arises.

2.4 Utilities and Works to Chambers

2.4.1 Statutory Undertaker's information was requested from the following organisations:

- Jersey Electricity
- Jersey Water
- Jersey Telecoms
- Jersey Gas
- Newtel Solutions
- Sure Cable & Wireless
- GHE Drainage
- GHE Street lighting
- GHE traffic signals

2.4.2 The following statutory undertaker's apparatus is present in the carriageway within the scheme extents:

- Jersey Electricity
- Jersey Water
- Jersey Telecoms
- Jersey Gas
- GHE Drainage
- GHE Street lighting
- GHE traffic signals

2.4.3 A desktop study of all ironwork and chambers in the carriageway has been undertaken by design team members. This assessment will be provided to the utility companies who are then tasked with inspecting their own assets and confirm the work to be undertaken, as per agreement.

2.4.4 Any chambers that require resetting, replacing or removing will be listed in a chamber schedule which is shown in Appendix C.

2.5 Kerb, Footways and Non-motorised user facilities

2.5.1 The existing footways on Mont Les Vaux consist of a mixture of 300mm wide granite kerbs, standard pink pressed kerbing and some standard concrete kerbing with approximately 100mm upstand. The footways being primarily asphalt construction.

2.5.2 A walkthrough of the site completed by [redacted] (WSP) and [redacted] (GHE) was undertaken on the 14th of July 2021 to identify any existing damaged kerbs and footways that need replacing or repairing. This work will be undertaken prior to the resurfacing works commencing.

2.6 Advance Works

2.6.1 It is proposed to have a five-year embargo associated to the resurfacing works. This has prompted utility companies to undertake any essential maintenance works/ upgrades before the resurfacing commences. Co-ordination meetings with the utility companies will be held with the trafficworx department to discuss this work.

2.6.2 There are no known major developments in the immediate vicinity of the schemes works area.

2.7 Road Markings

2.7.1 All road markings will be renewed as part of the works by GHE Signs & Road Markings.

2.8 Surface Friction - Pavement

2.8.1 The surface friction of the carriageway is essential to the safety of the road user. Surface friction is measured in terms of the Polished Stone Value (PSV).

2.8.2 The aggregate supplied from the Ronez Quarry has a PSV of 48. The minimum PSV requirements for a section of carriageway in accordance with the Design Manual for Roads & Bridges is 50.

2.8.3 To determine the PSV of the carriageway within the scheme extents, the process shown in Figure 3 has been followed. Appendix D shows the PSV requirements for the carriageway within the scheme extents.

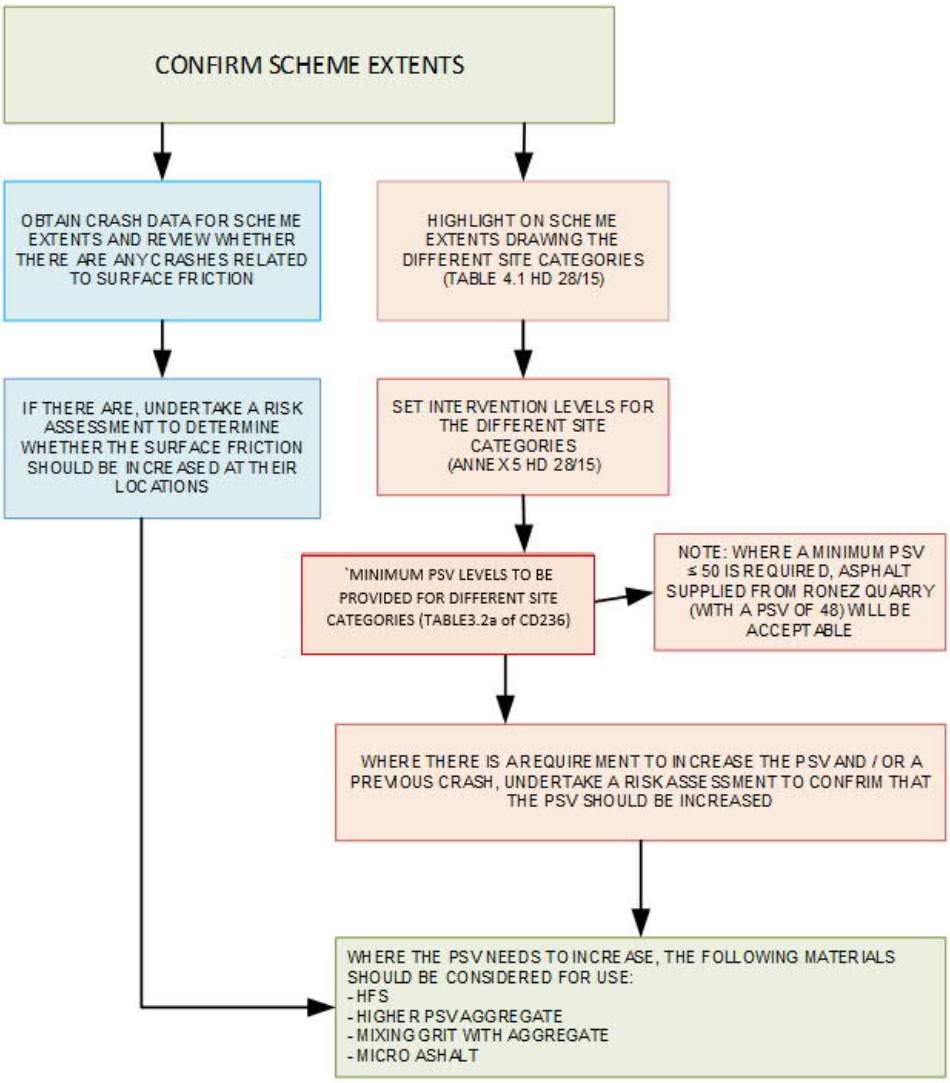

Figure 3: Flow chart for determining the PSV requirements for Mont Les Vaux

2.9 Surface Friction – Road Marking

2.9.1 Similar to the surface friction of the carriageway, the surface friction of the road markings is essential to the safety of the road user.

2.9.2 All road markings should have a minimum PSV of 55. During the detailed design stage of this project, a risk assessment should be undertaken to determine whether there are any locations within the scheme extents where the PSV of the road markings should be increased.

2.10 Accident Analysis

2.10.1 Accident data for Mont Les Vaux has been obtained for the past five years. This is summarised in Table 4.

Collision Ref	Year	Severity	Cause of collision	Collision related to	
				Driver/ pedestrian error	Highway condition
F02853	2015	Slight	[redacted]	X	
F03134	2015	Slight	[redacted]	X	
F06483	2015	Serious	[redacted]	X	
F13305	2015	Serious	[redacted]	X	
F02071	2016	Slight	[redacted]	X	
F06607	2016	Slight	Report incomplete	X	
F06679	2016	Slight	[redacted]	X	
F07550	2016	Slight	[redacted]	X	
F12082	2016	Slight	Report incomplete	X	

Collision Ref	Year	Severity	Cause of collision	Collision related to	
				Driver/ pedestrian error	Highway condition
F01999	2017	Slight	[redacted]	X	
F09329	2017	Slight		X	
F01655	2018	Slight		X	X
F04218	2018	Slight		X	
F08879	2018	Slight		X	
F07209	2018	Serious		X	
F12549	2019	Slight		X	
F13189	2019	Serious		X	

Table 4: Accident data summary for Mont Les Vaux

2.10.2 The majority of the accidents that have occurred along Mont Les Vaux over the past five years are related to driver/ cyclist/ pedestrian error.

2.10.3 Following the process outlined in the flow chart shown in Figure 2, based on the accident data, there doesn't appear to be any theme with accidents related to adverse skidding due to the PSV of the existing carriageway stone. Collison Refs F01655 & F12549 may suggest some skidding but is inconclusive whether driver error or road issues.

2.10.4 High friction surfacing is present between Ch.300 to Ch440, Ch 690 to Ch.840 and from Ch 1080 to Ch 1190 of the works, a review will be made at the detail design stage to determine whether its extents should be increased.

2.11 Traffic Data Analysis

2.11.1 Analysis of the traffic data is shown in Appendix E.

2.11.2 Traffic counts were taken of 24hr flow over a full 7-day period from the 20th to 26th of September 2017. This data was then analysed to produce the graph shown in Figure 4.

2.11.3 As illustrated, in general peak vehicle flows are between 8am and 6pm. With vehicle numbers uniformly increasing during the weekdays between 5am and 8am with a gradual decrease across all 7 days from 5pm to 11pm.

2.11.4 Peaks for the combined data show a: -

- 11:00 AM peak and 15:00 PM peak for weekdays (680 No of vehicles)
- 12:00 AM peak and 15:00 PM peaks for a full week count (668 No of Vehicles)

Peak traffic counts along this section of highway do not fall within standard peak commute hours i.e. 07:00 – 09:30 and 15:30 – 18:30. It is however noted that in general, traffic volumes increase between the hours of 06:00 and 07:00. Between the hours of 07:00 and 08:00 am traffic volumes decrease slightly and then increase again to its peak at 11:00am where volumes remain relatively high until 18:00hrs.

2.11.5 On average Saturdays have the highest overall traffic volume of any day in the week whilst Sundays have the lowest.

This would suggest that the majority of works should be completed within the weekdays. Where possible Saturday working should be avoided but Sunday working within difficult phases, across junctions etc would be preferable.

2.11.6 There is a likelihood that these trends may differ out of holiday season however no data for the intended works period is available.

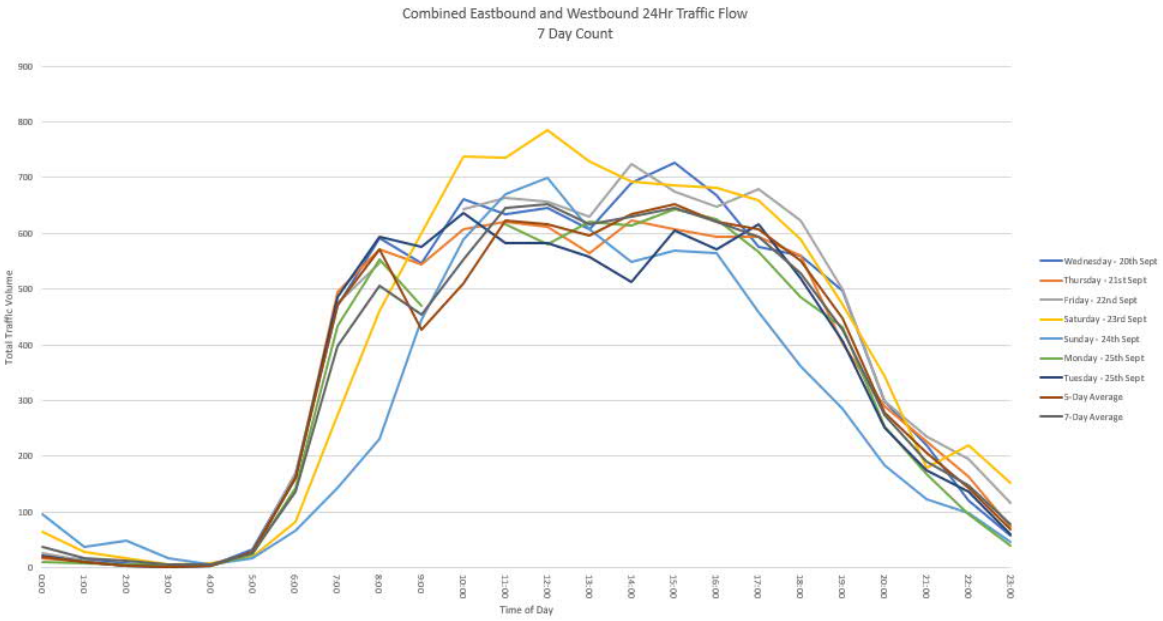

Figure 4 – Combined 7-day 24hrTraffic Flow Summary on Mont Les Vaux

3 SCOPE OF WORKS, COST COMPARISON & RECOMENDATIONS

3.1 Pavement

3.1.1 The cores taken along Mont Les Vaux show a vast variation in the thickness of bound pavement materials. This ranging from 200mm at most to 40mm at minimum. This taken from the analysis of the core grading thicknesses shown in Table 3 of this report,

3.1.2 Following analysis of cores within Table 3 two pavement options are recommended.

Option A- That areas of pavement be treated with a 150mm inlay for the scheme extents. 150mm Inlay consists of the following materials

→ 40mm AC14 Close Surf 40/60 Pen Surface Course Inlay
→ 110mm AC20 Dense Bin 40/60 Pen Surface Course Inlay

Option B – That part of the road be treated with 150mm inlay and between Ch.220 to Ch.978 be treated with 50mm overlay, materials noted following.

→ 40mm AC14 Close Surf 40/60 Pen Surface Course Inlay
→ 110mm AC20 Dense Bin 40/60 Pen Surface Course Inlay

→ 50mm AC14 Close Surf 40/60 Pen Surface course Overlay

3.1.3 The material should be tested in accordance with UKAS testing requirements.

3.1.4 Any remaining laminates which are present following the milling operation will need to be removed prior to the next stage of the works commencing.

3.1.5 A bond coat will be required between pavement layers and any bound material.

3.1.6 A five-year embargo should be implemented for the Mont Les Vaux resurfacing works.

3.2 Drainage – Utilities and Works to Chambers

3.2.1 Any chambers/ gullies that require resetting, replacing, removing or rebuilding will be listed in a chamber schedule. Following completion of all chamber inspections, any repairs below ground to the manholes or boxes will be undertaken by the utility company which owns them prior to the start of works.

3.2.1 Any chambers that require rebuilds will be undertaken by the utility company prior to the resurfacing scheme commencing.

3.3 Kerbs, Footways and Non-motorised user facilities

3.3.1 Uncontrolled crossing points that can't be maintained should be diverted using temporary crossing points.

3.3.2 A walkthrough of the site with [redacted] (GHE) has been undertaken and highlighted very minor repairs to one crossing only. This work will be undertaken prior to the resurfacing works commencing.

3.4 Advance Works

3.4.1 Any utility or highway improvement works proposed for Mont Les Vaux should be completed prior to any resurfacing commencing.

3.4.1 It is recommended that a meeting to co-ordinate the advance utility, drainage and any kerb re-alignment work be undertaken to ensure a co-ordinated approach to undertaking these works is implemented.

3.5 Road Markings/ Traffic Signs

3.5.1 The existing traffic signs will be discussed with [redacted] (Assistant Manager – IHE Road signs and markings) and replaced where necessary.

3.5.2 Proposed road markings will be discussed and approved by [redacted] (Traffic and Street works) prior to placing of contact.

3.5.3 Following planing of the road surface; temporary give way and stop line markings will need to be reinstated before the road is open to traffic.

3.5.4 All permanent road marking renewals will be undertaken by IHE Traffic Signs & Road Marking team.

3.6 Traffic Management

3.6.1 It is proposed to split the resurfacing works into five separate sections, which will allow the management of vehicle traffic and associated Diversions.

3.6.2 A clear route through the site for Emergency Service vehicles will be maintained at all times.

3.6.3 Consultation with Parish of St Brelade has not yet occurred but will be arranged within the next few months.

3.6.4 The Parish of St Brelade are a key stakeholder of the project and will continue to be kept updated as the project develops.

3.6.5 Initial discussions regarding the project have also been undertaken with Liberty Bus representative [redacted]. The proposed working hours, phasing of works and the proposed diversion routes were discussed. In principal, [redacted] advised he has no issues with the proposals. Detailed planning will commence in design stage.

3.6.6 The proposed working hours/ timings are listed to confirm are shown in Table 5:

Table 5 – Proposed Working Hours

Phase	Days	TM Hours	Working Hours	Restrictions
1	Monday to Friday	8:30am (Mon) to 6:00pm (Fri)	8:30am (Mon) to 6:00pm (Fri)	Full Closure
2	Monday to Friday	8:30am (Mon) to 6:00pm (Fri)	8:30am (Mon) to 6:00pm (Fri)	Full Closure
3	Monday to Friday	8:30am (Mon) to 6:00pm (Fri)	8:30am (Mon) to 6:00pm (Fri)	Full Closure
4	Monday to Friday	8:30am (Mon) to 6:00pm (Fri)	8:30am (Mon) to 6:00pm (Fri)	Full Closure
5	Monday to Friday	8:30am (Mon) to 6:00pm (Fri)	8:30am (Mon) to 6:00pm (Fri)	Full Closure

3.6.7 It is proposed to implement a number of One way systems during the entirety of the scheme to inhibit the use of adjacent roads as cut - throughs. Refer to traffic management plan 1965-TM-007

3.6.8 Phase extents and proposed diversion routes are shown in Appendix F

3.6.9 [redacted] at GoJ Environmental Health will need to be consulted about the working hours.

3.6.10 There are currently no known events which could conflict with the planned resurfacing works.

3.6.11 There will be no nighttime working due to adjacent residential properties

3.7 Residual Risks (Hazards, Environmental, Stakeholders)

3.7.1 The Health and Safety (Management in Construction) (Jersey) Regulations 2016 are to be followed for these works. The works are anticipated to last more than 30 working days and more than 500-person days, major construction project under these regulations meaning notification to the HSPC will be required.

3.7.2 There is a requirement to appoint a health and safety project co-ordinator.

3.7.1 [redacted] (WSP) undertook PAK (Polycyclic Aromatic Hydrocarbons) testing on all cores taken within the scheme extent on 15th August from 30 cores to test for the presence of coal tar within the existing pavement. The testing showed no change and therefore confirms that coal tar is not present within the existing pavement samples tested.

3.7.2 Whilst this is a representative sample that has been tested, should any concerns be raised whilst working on site then further PAK testing will be undertaken and appropriate steps then taken.

3.8 Overall Costs & Potential Savings

3.8.1 A construction cost estimate is shown in Table 6.

Table 6 – Construction Cost Estimate

Series	Cost - Option A (Inlay 150mm)	Cost - Option B (Inlay 150mm + Overlay 50mm)
100 – Preliminaries	£95,294	£95,294
200 – Site Clearance	-	-
500 – Drainage & Service Ducts	£79,539	£79,539
700 - Pavements	£1,148,453	£699,883
1200 – Traffic signs and road markings	£15,000.00	£15,000.00
TOTAL	**£1,338,286**	**£889,716**

APPENDIX A – LOCATION PLAN & SCHEME EXTENTS

APPENDIX C – CHAMBER SCHEDULE