

Technical Note

Project:	P21-390 Land at Burbage Fields Farm, Bullfurlong Lane, Burbage		
Subject:	Land at Burbage Fields Farm (application ref: 24/00083/HYB) Response to National Highways Planning Response (NHPR 22-12)		
Prepared by:	Jake Blay – Graduate Transport Planner	Date:	25/04/2024
Authorised by:	Andy Miles – Principal Transport Planner	Status:	S2 - Information
Document Ref:	21390-RLL-24-XX-TN-D-5015	Revision:	P01

1 Introduction

- 1.1.1 This Technical Note (TN) has been produced by Rodgers Leask Ltd (RL) on behalf of Redrow Homes to respond to the comments raised by National Highways (NH) in their Planning Response (NHPR 22-12) dated 16th February 2024.
- 1.1.2 The NH response provides comments on the hybrid planning application (ref: for Land at Burbage Fields Farm, Bullfurlong Lane, Burbage, Leicestershire ([24/00083/HYB](#)) submitted 23rd January 2024. The description of development is provided below:
- 1.1.3 *“Hybrid planning application for 422 dwellings, public open space, associated infrastructure and the demolition of 65 and 65a Coventry Road, and Burbage Fields Farm and outline planning application for a residential care home and up to 11no. self-build plots (all matters reserved except for access).”*
- 1.1.4 This TN looks to address the comments raised by NH and provide the relevant information to resolve the concerns from NH where applicable. The response from NH has been included within this TN as **Appendix A**.
- 1.1.5 The NH response provided comments on the content and findings of the Transport Assessment (TA) (document ref: 21390-RLL-23-XX-RP-D-5001) submitted in support of the planning application.
- 1.1.6 At the time of writing this TN, the application is awaiting determination by Hinckley & Bosworth Borough Council (the local planning authority).

2 Progress to Date

2.1.1 A list of the agreed items from the NH response are provided below in **Table 1**.

Table 1: Agreed Items and Outstanding Comments

Item	Agreed	Comments
Local Trip Rates (Ambion Way survey)	✓	-
TRICS Trip Rates (Residential Care Facility)	✓	-
Use of the PRTM model for the residential trip distribution	✓	-
Use of a gravity model for the care home trip distribution	✓	-
TEMPro Growth Factors	✗	Addressed in Section 3.1 of this TN
Traffic flows in Appendix CC and Appendix QQ in the submitted TA	✗	Addressed in Section 3.2 of this TN
Detailed explanation of the procedure for the trip assignments applied	✗	Addressed in Section 3.2 of this TN
Use of Zone 6014 in the PRTM Model as a representative zone for residential trip distribution	✓	-
Opening Year confirmation	✗	Addressed in Section 3.2 of this TN
Choice of junctions of the detailed capacity assessments	✓	-
Junction model of A5 Watling Street / Wolvey Road junction	✗	Addressed in Section 3.3 of this TN
Furnessing methodology	✓	-
A5 / B578 Lutterworth Rd jct approach geometric info	✗	Addressed in Section 3.4 of this TN
A5 / B578 Lutterworth Rd jct model with 2031 scenario	✗	Addressed in Section 3.4 of this TN
M69 J1 model	✗	Addressed in Section 3.5 of this TN
Merge / Diverge Assessments	✗	Addressed in Section 3.6 of this TN
Construction Traffic	n/a	Details suggested by NH will be incorporated into the CTMP
Boundary Treatment	n/a	Not addressed within this TN. Details have been provided separately by the applicant.

3 NH Comments and RL Response

3.1 TEMPro Growth Factors

- 3.1.1 NH have requested that the TEMPro growth factors used as part of the assessment work are recalculated using the most recent version of TEMPro.
- 3.1.2 A comparison of TEMPro growth factors extracted from v7.2c and v8.1 for the Hinckley and Bosworth 014 Middle Super Output Area is presented below in **Table 2**.

Table 2: TEMPro Growth Factors

Road Type	TEMPro v7.2C		TEMPro v8.1	
	AM	PM	AM	PM
2023 – 2026				
Principal / A-Road	1.0214	1.0211	1.0126	1.0133
Trunk	1.0255	1.0253	1.0234	1.0241
Motorway	1.0366	1.0363	1.0304	1.0312
2023 – 2031				
Principal / A-Road	1.0547	1.0549	1.0586	1.0610
Trunk	1.0655	1.0656	1.0888	1.0913
Motorway	1.0930	1.0932	1.1180	1.1205

Note: Category labelling change between the two versions; v7.2c = Principal & v8.1 = A-Road

- 3.1.3 As shown in the **Table 2**, the TEMPro growth factors extracted for the 2023 to 2026 period from v7.2c show higher growth across all roads types and for both peak periods than the factors extracted from v8.1. For the 2023 to 2031 time period this trend is reversed, with the TEMPro v8.1 growth factors showing higher growth over the time period than the factors extracted from v7.2c.
- 3.1.4 As requested by NH, the TEMPro growth factors used within this assessment have been recalculated using TEMPro v8.1.
- 3.1.5 As a point of the note, any change in growth factors will only impact the junction modelling undertaken for the M69 J1. The other junctions assessed as part of the submitted TA were developed using traffic growth calculated from the PRTM model outputs.

3.2 Traffic Flow Spreadsheet

- 3.2.1 As requested by NH, a spreadsheet showing the traffic flow calculations, trip distribution and trip assignment calculations has been sent as a zip file alongside this TN for review.
- 3.2.2 The forecast year scenarios were determined by the future year scenarios set within the PRTM. For the purposes of the M69 J1 modelling the opening year is 2026. In line with DfT Circular 01/2022, the 2026 opening year assessment included trips associated with the fully built out development, forecasted growth and committed development. A contents table explaining the development of the spreadsheet presented in **Table 3**.

Table 3: Spreadsheet Summary

Scenario	Description	Note
-	2021 PRTM Traffic Flow	PRTM Output
-	2021 Furnessed Traffic Flows	Furnessed
-	Committed Development	-
Base Year	2021 Traffic Flows	-
-	2021 – 2026 PRTM growth	PRTM growth
Opening Year	2026 Traffic Flows	-
-	2021 – 2031 PRTM growth	PRTM growth
Forecast Year	2031 Traffic Flows	-
-	PRTM Distribution	PRTM output
-	Resi Veh Trip Distribution	-
-	Resi Veh Trip Assignment Flanders CI	-
-	Resi Veh Trip Assignment Coventry Rd	-
-	Care Home Veh Trip Distribution	Gravity Model
-	Care Homes Veh Trip Assignment	-
-	Total Dev Veh Trip Assignment	-
Opening Year + Development	2026 + Development Trip Assignment	-
Forecast Year + Development	2031 + Development Trip Assignment	-
-	2023 Traffic Survey data	29/06/2023
-	TEMPro Growth Factors	v8.2
-	LinSig Matrices	-
	Merge / Diverge Assessments	-

3.3 A5 / Wolvey Road Junction

- 3.3.1 At the request of NH, a junction model has been developed for the A5/ Wolvey Road junction.
- 3.3.2 A DWG file with the annotated geometric measurements, junction modelling file and results output has been included within the zip file sent to NH alongside this TN.
- 3.3.3 The Junctions 10 model of the A5 / Wolvey Road junction has assessed the operation of the junction for the 2021 base year, 2026 opening year and 2031 forecast year both 'with' and 'without' development. The results of this can be seen below in **Table 4**.

Table 4: A5 / Wolvey Road Junction Capacity Assessment Results

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
2021								
Stream B-C	0.7	281.65	0.53	F	0.1	15.58	0.06	C
Stream B-A	4.1	144.53	0.87	F	1.1	74.01	0.55	F
Stream C-AB	0.1	9.02	0.05	A	0.2	8.68	0.14	A
2026								
Stream B-C	0.1	53.44	0.13	F	0.3	81.67	0.28	F
Stream B-A	2.2	86.12	0.71	F	2.9	192.24	0.82	F
Stream C-AB	0.0	9.01	0.03	A	0.5	7.95	0.24	A
2026 + Dev								
Stream B-C	0.2	99.11	0.22	F	0.5	117.15	0.37	F
Stream B-A	3.2	114.25	0.81	F	3.0	189.69	0.83	F
Stream C-AB	0.0	9.03	0.03	A	0.5	7.98	0.25	A
2031								
Stream B-C	0.1	53.58	0.13	F	2.9	561.14	1.22	F
Stream B-A	2.0	91.81	0.70	F	8.4	428.19	1.21	F
Stream C-AB	0.0	9.34	0.02	A	0.6	7.68	0.27	A
2031 + Dev								
Stream B-C	0.3	106.24	0.23	F	3.0	578.06	1.25	F
Stream B-A	3.1	124.06	0.81	F	8.9	445.04	1.24	F
Stream C-AB	0.0	9.37	0.02	A	0.6	7.71	0.27	A

Note: Arm A – A5 (NW), Arm B – Wolvey Road, Arm C – A5 (SE)

- 3.3.4 For the 2026 opening year, in the AM peak hour the junction is seeing a betterment in performance, explained by the reduction in traffic growth between 2021 and 2026 as output from the PRTM model for the A5 / Wolvey Road Junction. The junction is operating within capacity in the 2026 + Dev opening year although delay increasing on the Wolvey Road approach. Due to a minor reduction in traffic growth 2026 to 2031 junction operation is similar in both 2026 and 2031 both 'with' and 'without' development.
- 3.3.5 For the PM peak hour, the junction is operating within capacity in both the 2026 opening year 'with' and 'without' development scenarios. In 2031, the junction is operating over theoretical capacity with an increase in queueing on the Wolvey Road approach with a minor increase in delay and queueing as a consequence of the ten development trips using the junction the PM peak hour.
- 3.3.6 On this basis the impact of development traffic at the junction is considered indiscernible.

3.4 A5 / B578 Lutterworth Road Junctions 10 Modelling Assessment

- 3.4.1 As requested by NH, a review of the junction model parameters used for the A5 / B578 Lutterworth Road junction capacity assessment has been undertaken. Following this review several parameters have been updated. A summary is provided below in **Table 5**.

Table 5: A5 / B578 Lutterworth Road Junctions Parameters

Parameter	Submitted model	Revised model
Width at give-way	10	10
Width at 5m	9.20	8.60
Width at 10m	5.50	5.20
Width at 15m	4.80	4.40
Width at 20m	4.60	4.20
Flare length	3.00	2.00

- 3.4.2 A DWG file with the annotated geometric measurements has been included within the zip file sent to NH alongside this TN.

The updated junction capacity assessment for the A5 / B578 Lutterworth Road junction, including the 2031 forecast year, can be seen in **Table 6** The junction modelling file and results output has been sent to NH within the zip file alongside this technical note.

Table 6: A5 / B578 Lutterworth Road Junction Capacity Assessment Results

Resources

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Set ID	Queue (Veh)	Delay (s)	RFC	LOS
	2021									
Stream B-C	D1	0.6	10.35	0.37	B	D2	0.2	7.27	0.17	A
Stream B-A		0.1	23.43	0.09	C		0.0	27.39	0.03	D
Stream C-AB		0.3	9.21	0.21	A		0.7	11.93	0.42	B
	2026									
Stream B-C	D3	1.0	12.88	0.50	B	D4	0.3	8.70	0.24	A
Stream B-A		0.1	27.02	0.11	D		0.1	52.69	0.06	F
Stream C-AB		0.2	9.07	0.20	A		0.9	14.09	0.46	B
	2026 + Dev									
Stream B-C	D5	1.2	14.48	0.55	B	D6	0.3	9.00	0.26	A
Stream B-A		0.1	29.54	0.13	D		0.1	74.39	0.08	F
Stream C-AB		0.3	9.32	0.21	A		1.2	16.54	0.54	C
	2031									
Stream B-C	D7	3.0	29.71	0.76	D	D8	0.4	9.15	0.28	A
Stream B-A		0.9	51.83	0.48	F		0.1	84.80	0.09	F
Stream C-AB		0.2	8.88	0.20	A		1.2	16.41	0.55	C
	2031 + Dev									
Stream B-C	D9	4.4	41.45	0.83	E	D10	0.4	9.70	0.30	A
Stream B-A		1.2	75.05	0.58	F		0.2	159.76	0.16	F
Stream C-AB		0.3	9.13	0.21	A		1.6	19.72	0.62	C

Note: Arm A – A5 (NW), Arm B – B578 Lutterworth Road, Arm C – A5 (SE)

- 3.4.3 The junction capacity assessment results shown above demonstrate that the A5 / B578 Lutterworth Road junction is expected to operate within its theoretical capacity in all scenarios assessed in both peak hours.
- 3.4.4 During the 2026 + Dev PM peak hour, there is an increase in delay by approximately 20 seconds for vehicle movements from the B578 Lutterworth Road to the A5 (NW) in the 2026 forecast year with the inclusion of development trips. This is only exacerbated in the 2031 scenarios.
- 3.4.5 However, it should be considered that only a small number of vehicles make this movement at the junction, recorded as 15 in the AM peak hour and 4 in the PM peak hour in 2026. The dominant movement from the B578 Lutterworth Road to the A5 (SE) can accommodate the additional development trips with a minor increase in delay and queueing in the 2026 and 2031 scenarios.
- 3.4.6 On this basis, the impact of development traffic on junction operation is considered indiscernible.

3.5 M69 Junction 1 – LinSig Modelling Assessment

- 3.5.1 NH raised multiple points regarding the submitted M69 J1 LinSig model used to support the planning application. The comments raised by NH and the responses from RL can be seen below in **Table 7**.

Table 7: NH Comments Regarding M69 J1 LinSig Model and RL Responses

NH Comments	RL Response
Signal phases G and H seem to be provided on the links the opposite way round.	The signal phases for G and H have been corrected.
Lane length values are recommended for several long lanes within the model.	Lane length (PCUs) have been updated to: J2:1/2 – 32 PCUs J3:1/1 – 32 PCUs J4:1/2 – 37 PCUs J6:1/1 – 32 PCUs
Saturation flow values of 1900 PCU/Hr have been used for each lane. We recommend the applicant provides justification for using this value.	As stated in the 'LinSig Signal Roundabout Design' handbook, JCT, Issue 1.0, Section 2.5: <i>"For evaluation work, the use of 1,900 pcu/hr saturation flows for all signal controlled entry and circulating lanes at the majority of roundabouts should provide a robust assessment. These may be adjusted if dictated by site observations. However, it is recommended that consistent saturation flows are utilised for all lanes. This avoids any issue that may arise when traffic arrives at a circulating lane with a slightly lower saturation flow than an upstream lane feeding it."</i>
A maximum flow giving way value of 1155 PCU/Hr has been used at the B4109 Hinckley Road give way approach.	The maximum flow giving way value was calculated using the junction geometry of the approach. The calculation is shown in Appendix B .
Justification is required for a give way co-efficient of 0.27 being used at the B4109 Hinckley Road give way lane approach.	The co-efficient was calculated using the junction geometry of the approach. The calculation is shown in Appendix B .
The lane connectors provided for the M69 EB off-slip need reviewing.	The lane connectors from the M69 EB off-slip approach to the junction have been corrected to replicate the road markings on the carriageway. The alteration to the connectors now replicates: J6:1/1 to J1:3/1 J6:1/2 to J1:3/2

NH Comments	RL Response
The traffic flows provided within the models do not seem to match the flows identified within Appendix CC. It is appreciated that the values to be used in LinSig are required to be in PCUs and may not match, therefore the applicant should provide the flow calculation spreadsheet.	The traffic flows submitted within Appendix CC are in 'vehicles' whereas the traffic flow matrices within the LinSig models are in PCUs. The flow calculation spreadsheet used to convert "vehicles" into "PCUs" for input into the LinSig modelling has been included within the spreadsheet sent to NH alongside this TN.
The traffic signal specification should be provided for us to review the signal controller elements	The traffic signal specification received from NH on 10 th May 2022, can be seen in Appendix C.

- 3.5.2 It should be noted that the traffic signal specification was obtained for the M69 J1 to understand the staging and phasing arrangements for the junction. The signal specification highlighted that the junction operates using three different controllers, one for the M69 eastbound off slip and the A5 (West), the second for the B4109 Rugby Road (North) and M69 eastbound on slip and the third for the A5 (East).
- 3.5.3 It is noted that for the permitted roadside services facility (ref: [20/00531/HYB](#)), situated adjacent to M69 J1, a LinSig model was produced modelling the junction with each signalised entry and adjacent circulatory operating with a two stage controller. It was reported within the TA that supported the application that discussions between the applicant and NH confirmed that the approach was preferred by NH when addressing a junction of this type.
- 3.5.4 On this basis, this approach was replicated when developing the LinSig model of M69 J1.
- 3.5.5 The M69 J1 LinSig model has been updated to include the changes suggested by NH, documented in **Table 7** above. This updated model has also included the revised traffic flows calculated using the latest TEMPro growth factors from version 8.1.
- 3.5.6 A summary of the junction modelling results is provided below in **Table 8**. The junction modelling file and results output has been sent to NH within the zip file alongside this TN.

Table 8: M69 J1 Results

Scenario	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (17:00 – 18:00)	
	PRC (%)	Total Delay (pcuHr)	PRC (%)	Total Delay (pcuHr)
2023 Base Year	2.9%	50.14	-3.1%	55.79
2026 Forecast Year	0.7%	52.47	-6.1%	59.35
2026 with Land South of Burbage (433 dwellings)	0.7%	54.01	-6.1%	61.85
2031 Forecast Year	-4.7%	60.52	-15.4%	73.74
2031 with Land South of Burbage (433 dwellings)	-4.7%	64.34	-15.4%	77.90

- 3.5.7 It should be noted that the conclusions drawn from the junction results of the previous model have not changed with the revised growth factors and adjustments to the LinSig model. On this basis the impact of the proposed development cannot be considered severe and the effect on junction operation is considered negligible.

3.6 Merge & Diverge Assessment

- 3.6.1 The merge and diverge assessments were undertaken using the traffic survey data recorded at the M69 J1 on Thursday 29th June 2023. This ensured consistency with the calculated traffic flows (in PCUs) used within the M69 J1 LinSig modelling, which utilised the 2023 traffic survey data as documented within the submitted TA.
- 3.6.2 The links selected for the merge and diverge assessments can be seen below in **Table 9**.

Table 9: Merge and Diverge Assessment Flow Locations

Location	Date	Source	Code
M69 J1 Northbound Diverge			
M69 Northbound (South of Junction)	29 th June 2023	WebTRIS	M69/8010A
M6 J2 Off-Slip to M69 Northbound (South of Junction)	29 th June 2023	WebTRIS	M69/8010K
M69 Northbound Off-Slip	29 th June 2023	Traffic Survey	-
M69 J1 Northbound Merge			
M69 Northbound (South of Junction)	29 th June 2023	WebTRIS	M69/8010A
M6 J2 Off-Slip to M69 Northbound (South of Junction)	29 th June 2023	WebTRIS	M69/8010K
M69 Northbound Off-Slip	29 th June 2023	Traffic Survey	-
M69 Northbound On-Slip	29 th June 2023	Traffic Survey	-
M69 J1 Southbound Diverge			
M69 Southbound (North of Junction)	29 th June 2023	WebTRIS	M69/8147B
M69 Southbound Off-Slip	29 th June 2023	Traffic Survey	-
M69 J1 Southbound Merge			
M69 Southbound (North of Junction)	29 th June 2023	WebTRIS	M69/8147B
M69 Southbound Off-Slip	29 th June 2023	Traffic Survey	-
M69 Southbound On-Slip	29 th June 2023	Traffic Survey	-

- 3.6.3 The selected sites were the closest operational count points to the junction, and data was selected for Thursday 29th June 2023.
- 3.6.4 As revised TEMPro growth factors (version 8.1) have been applied to the traffic flow calculations for the M69 J1 LinSig model, the merge and diverge assessments have been updated with this updated growth.
- 3.6.5 The updated merge and diverge assessments have been included within the traffic flow spreadsheet sent to NH alongside this TN within the zip file.
- 3.6.6 The conclusion drawn from the merge and diverge assessments within the submitted TA remain the same, and therefore the existing merge and diverge forms along the M69 J1 are well suited to serve the increased traffic flow as a result of the proposed development.

Appendix List

Appendix A: National Highways response NH/24/04828



National Highways Planning Response (NHPR 22-12) Formal Recommendation to an Application for Planning Permission

From: Andrew Jinks (Regional Director)
Operations Directorate
Midlands Region
National Highways
PlanningM@nationalhighways.co.uk

To: Hinckley & Bosworth Borough Council (FAO Alex Jelley)

CC: transportplanning@dft.gov.uk
spatialplanning@nationalhighways.co.uk

Council's Reference: 24/00083/HYB

Location: Land At Burbage Fields Farm Bullfurlong Lane Burbage

Proposal: Hybrid planning application for 422 dwellings, public open space, associated infrastructure and the demolition of 65 and 65a Coventry Road, and Burbage Fields Farm and outline planning application for a residential care home and up to 11 no. self-build plots (all matters reserved except for access)

National Highways Ref: NH/24/04828

Referring to the consultation on a planning application dated 29 January 2024 referenced above, in the vicinity of the M69 that forms part of the Strategic Road Network, notice is hereby given that National Highways' formal recommendation is that we:

- ~~a) offer no objection (see reasons at Annex A);~~
- ~~b) recommend that conditions should be attached to any planning permission that may be granted (see Annex A – National Highways recommended Planning Conditions & reasons);~~
- c) recommend that planning permission not be granted for a specified period (see reasons at Annex A);
- ~~d) recommend that the application be refused (see reasons at Annex A)~~

Highways Act 1980 Section 175B is not relevant to this application.¹

This represents National Highways' formal recommendation and is copied to the Department for Transport as per the terms of our Licence.

Should the Local Planning Authority not propose to determine the application in accordance with this recommendation they are required to consult the Secretary of State for Transport, as set out in the [Town and Country Planning \(Development Affecting Trunk Roads\) Direction 2018](#), via transportplanning@dft.gov.uk and may not determine the application until the consultation process is complete.

The Local Planning Authority must also copy any consultation under the 2018 Direction to PlanningM@nationalhighways.co.uk.

Date: 16 February 2024	
 Signature:	
Name: Martin Seldon	Position: Assistant Spatial Planner
National Highways National Highways | The Cube | 199 Wharfside Street | Birmingham | B1 1RN	

¹ Where relevant, further information will be provided within Annex A.

Annex A **National Highways' assessment of the proposed development**

National Highways has been appointed by the Secretary of State for Transport as a strategic highway company under the provisions of the Infrastructure Act 2015 and is the highway authority, traffic authority and street authority for the Strategic Road Network (SRN). The SRN is a critical national asset and as such we work to ensure that it operates and is managed in the public interest, both in respect of current activities and needs as well as in providing effective stewardship of its long-term operation and integrity.

Recommended Non-Approval

It is recommended that the application should not be approved for a period of three months from the above date to allow the applicant to provide the additional information set out below.

The site is in the outskirts of Burbage village, Leicestershire. The closest point of impact with the Strategic Road Network (SRN) is the M69 junction 1 / A5 trunk road, circa 800m north from the junction. The site also abuts the M69 at the northbound side.

National Highways has previously engaged with the applicant at pre-application stage and provided comments to agree on transport matters.

The proposed development comprises 422 dwellings, 11 self-build plots and a residential care home for 66 members. Based on our review of the Transport Assessment (TA) we have the following comments:

The trip generation methodology utilised a combination of self-build plots and housing development to create a total of 433 dwellings. Trip rates were obtained from a traffic survey conducted in a nearby residential area at Ambion Way which comprises a total of 72 dwellings. The trip rates from TRICS are lower than the trip rates obtained from the traffic survey. We therefore consider that the approach undertaken by the applicant is suitable.

For the residential care facility, the trip rates are derived from the TRICS data, and this is confirmed by our independent checks. We are therefore content with the trip generation process overall.

National Highways had already agreed to adopt the PRTM model for the trip distribution process for the residential development consisting of 433 homes. It is noted that the applicant has used appropriate 2021 census data to calculate the trip distribution for the residential care home using a gravity model. Traffic assignment has

been assigned using the PRTM mode, this information matches with the number of trips calculated during the trip generation process.

In the TA, the TEMPro growth factor is based on Version 7.2C. We recommend growth factors are recalculated using the most recent version of TEMPro V8.1.

Traffic flows shown in Appendix CC do not match with those provided in Appendix QQ capacity assessment. This needs to be reviewed and corrected. In addition, we request the applicant provides the calculation spreadsheets used for the forecast year to validate the information provided.

There appears to be some confusion in the PRTM forecasting report between the trip distribution and trip assignment. The trip distribution involves determining origins and destinations for development trips, which are not impacted by the zone connection. On the other hand, the trip assignment relates to the path/route taken by the trips. We are agreeable to retaining the trip distribution, but we require a detailed explanation of the procedure for the trip assignments applied without an actual PRTM run. This is crucial, as the paths of the trips will change if the connection between two zones is removed. This isn't a straightforward case of simple addition and subtraction once the trips leave the zone connection, as additional traffic loaded onto the Coventry Road access will have different route choices based on generalised costs for various links in the assignment model. Consequently, this is likely to lead to discrepancies in the local area route choice.

It is noted that zone 6014 from the PRTM model, situated adjacent to the proposed development, is utilised as a representative zone for trip distribution. Given that this zone is primarily residential, it is deemed a suitable match for the proposed development. Additionally, we would like to review the absolute trip distribution from the two development parcels stipulated in the TA, delineating the specific values for each.

While we cannot find the Volume/Capacity (V/C) comparison within the Area of Interest (AOI) selection criteria, we are broadly content with the choice of junctions for the detailed assessment, which includes M69 Junction 1 and A5/Lutterworth Road.

We note that the initial proposal identified 11 junctions for detailed assessment, while the TA section 6.1.8 has excluded two junctions, namely:

- i. A5 Watling Street / Wolvey Road junction.
- ii. B4109 Rugby Road / Brookside junction.

While we are not concerned about the Rugby Road junction, given its location away from the site and not being near to the Strategic Road Network (SRN), we would like to request detailed results for the A5/Wolvey Road junction.

We are happy with the application of the Furnessing methodology. Notably, we have observed the use of 2020 data for two locations, Burbage Road and Sapcote Road, where 2021 data was not available. While this may not be considered a major issue, it is acknowledged that the 2020 data could have been adjusted further with a growth rate to align it with 2021.

We have undertaken a review of the modelling assessments and merge and diverge assessments for the A5 / B578 Lutterworth Road priority junction and M69 Junction 1 signalised junction as these are the only two junctions assessed that will impact the SRN. There are two junctions on the B4109 Rugby Road which queues appear small and therefore it is unlikely these junctions will affect the operation of the M69 J1.

A5 / B578 Lutterworth Road - Junctions 10 Modelling Assessment

We note that the applicant has supplied the Junctions 10 model inputs and results for the A5/B578 Lutterworth Rd junction. An independent check has been undertaken and has identified differences in some geometric properties input into the junction model. In order to validate the information provided in the TA, we request the applicant supplies a CAD drawing of the junction with annotated geometric measurements for our review.

We also note that traffic flows provided within Appendix CC for 2026 and 2031 forecast years, however the Junctions 10 report for the junction assessment in Appendix QQ only includes assessments for 2021 and 2026 scenarios. Similarly, to the above point, to validate the information contained within the TA, we request the applicant supplies 2031 models for our review.

M69 Junction 1 – LinSig Modelling Assessment

From a comparison of the phase diagram and link information provided in Appendix SS, signal phases G and H seem to be provided on the links the opposite way round. In the phase diagram Phase G is identified for the eastern circulatory and Phase H is for the M69 Westbound off-slip, however this is the opposite on the link information. This therefore needs reviewing and amending.

A few alterations to lane lengths are recommended for several long lanes within the model. These are where long lanes have been used but diverge from a single lane further upstream.

- For lane J2:1/2 and J2:1/3 a lane length of 32 PCUs is recommended to be used for one of the two long lanes due to the carriageway reducing to a single lane upstream.
- For lane J3:1/1 and J3:1/2 a lane length of 32 PCUs is recommended to be used for one of the two long lanes due to the carriageway reducing to a single lane upstream.

- For lane J4:1/2 and J3:1/3 a lane length of 37 PCUs is recommended to be used for one of the two long lanes due to the carriageway reducing to a single lane upstream.
- For lane J6:1/1 and J2:1/2 a lane length of 32 PCUs is recommended to be used for one of the two long lanes due to the carriageway reducing to a single lane upstream.

Saturation flow values of 1900 PCU/Hr have been used for each lane. We recommend the applicant provides justification for using this value.

A maximum flow giving way value of 1155 PCU/Hr has been used at the B4109 Hinckley Road give way approach. The applicant needs to clarify why this value has been used for National Highways consideration on the approach.

Similarly, a justification is required for a give way co-efficient of 0.27 being used at the B4109 Hinckley Road give way lane approaches.

The lane connectors provided for the M69 EB off-slip need reviewing. Lane J6:1/1 has a connector provided to lane J1:3/2 (A5 North), based on a review the satellite imagery of the road markings this should be removed and a lane connector between lane J6:1/2 and lane J1:3/2 should be provided for the M69 EB off-slip to A5 North movement.

The traffic flows provided within the models do not seem to match the flows identified within Appendix CC. It is appreciated that the values to be used in LinSig are required to be in PCUs and may not match, therefore the applicant should provide the flow calculation spreadsheet used within the LinSig assessments for our review and validation of the information provided by the applicant.

The traffic signal specification should be provided for us to review the signal controller elements.

For all assessments, the proposed opening year needs to be clarified, as well as how the modelling assessments undertaken satisfy the evaluation of the opening year and requirements of DfT Circular 01/2022.

In the assessments undertaken, no model validation appears to have been undertaken or reported within the TA. National Highways recommends that Degree of Saturation validation for the LinSig model assessments and queue comparison validation for Junctions 10 model assessments are undertaken. This will provide comfort that the models represent existing network conditions. We also request LinSig models are provided for our review.

Merge & Diverge Assessment

Initial checks of the assessments provided in appendices TT and UU indicate that the merge and diverge flows do not align with summations using the traffic flow diagrams provided with the TA. The applicant therefore needs to supply the flow data used for the merge and diverge assessment. This is for National Highways to complete the review including the mainline flow data for 2021, 2026 and 2031 scenarios. Paragraph 8.11.2 of the TA states that mainline flows were obtained from the TRIS database, we also seek clarification on the sites used from the database.

Construction Traffic

We note the applicant intends to submit a Construction Traffic Management Plan (CTMP) prior to the start of construction of the proposal and we welcome this approach.

The proposed site shares a boundary with the M69 and is near the M69 J1 and the A5 trunk road. We therefore recommend the submission and approval of the CTMP is managed through a suitable condition, prior to commencement of any works for our approval and agreement. This is to ensure that the structural integrity and safely operation of the SRN is maintained during the entire construction period of the development.

National Highways expects that the CTMP includes, as a minimum, the following:

- Hours of working; Date works will commence & anticipated completion date/duration;
- Site Contact Details responsible for ensuring Health & Safety;
- Location of the site compounds and offices, erecting fencing, etc in relation to the M69 boundary;
- Confirmation of the intended construction access arrangements to and from the site from the M69 and A5 trunk road;
- Review the standard of the access to be used as the construction access to and from the site from the M69 and A5 Details of any gates / security / barrier – location;
- Photographs and accompanying description of any defects within the M69 boundary prior to the commencement of activities on site [Before and after];
- Details of the management and routing of heavy goods vehicle to and from the site;
- Details of any proposed traffic management and signing arrangements to be implemented upon the M69 and A5 Trunk Road (TRSDG) [any implementation of such will require a Road Space booking with National Highways];
- Anticipated average two-way daily traffic numbers associated with the construction phase of the project;
- and in terms of accommodating the volume, nature and type of construction traffic vehicular movements;
- Consider any conflict between all vehicles associated with the construction site and existing users of the proposed construction access arrangements to and from the site;

- Details of any special or abnormal deliveries or vehicular movements;
- Pollution prevention of National Highways assets (if any);
- Arrangements for parking and turning facilities for the vehicles of all site personnel;
- Arrangements for visitor parking and directions;
- Arrangements for the loading and unloading of plant and materials;
- Areas of storage for plant and materials used during the construction of the development;
- Details of any temporary lighting, including the type, number, location, illumination details and hours of use;
- Measures to prevent the deposition of deleterious material on the public highway during the construction period;
- Measures to suppress noise and dust;
- Details of works or temporary works directly abutting the M69 boundary; example of issues of concern to National Highways, features causing a hazard to motorists, structural integrity of the M69 / protection of environment, habitat & trees / impact upon street furniture, drainage etc;
- This document should be used by the construction contractor in the development of their Construction Health and Safety Plan.

Boundary Treatment

The proposed development is adjacent to the M69. Details should therefore be provided of the proposed boundary treatment.

Standing advice to the local planning authority

The Climate Change Committee's [2022 Report to Parliament](#) notes that for the UK to achieve net zero carbon status by 2050, action is needed to support a modal shift away from car travel. The NPPF supports this position, with paragraphs 73 and 105 prescribing that significant development should offer a genuine choice of transport modes, while paragraphs 104 and 110 advise that appropriate opportunities to promote walking, cycling and public transport should be taken up.

Moreover, the build clever and build efficiently criteria as set out in clause 6.1.4 of [PAS2080](#) promote the use of low carbon materials and products, innovative design solutions and construction methods to minimise resource consumption.

These considerations should be weighed alongside any relevant Local Plan policies to ensure that planning decisions are in line with the necessary transition to net zero carbon.

Appendix B: Hinckley Road Approach Calculation Sheet

GIVEWAY ENTRY CALCULATION FOR SIGNALISED ROUNDABOUTS



Maximum Flow and Coefficient calculation

Junction:	M69 Junction 1
Approach Arm:	Hinckley Road

Geometric Parameters

v (m)	Approach road half-width	3.65
e (m)	entry width	8
l' (m)	flare	100
r (m)	Entry radius	35
D (m)	Inscribed circle diameter	200
Φ (deg)	conflict	30

k =	1.0210
t_D =	1.0000
X_2 =	7.4685
S =	0.0696

Maximum Flow and Coefficient calculations

Arm (over all lanes)

Intercept (F) (maximum flow) =	2310
Slope f (coefficient) =	0.53

Number of lanes on approach:	2
------------------------------	---

Arm (per lane)

Intercept (F) (maximum flow) =	1155
Slope f (coefficient) =	0.27

Appendix C: M69 J1 Traffic Signal Specification

Andy Miles

From: Roxburgh, Mark <Mark.Roxburgh@highwaysengland.co.uk>
Sent: 10 May 2022 17:39
To: Freek, Steve; Andy Miles
Cc: Moss, Stephen
Subject: RE: Burbage Fields Farm, Burbage (Redrow Homes) - 21/00946/EAS - PRTM Base model review
Attachments: M69 J1 Signals as of May 2022.zip

ALERT: External email. Check the address. Think before you click links and attachments.

Steve, Andy,

The current signal control data for M69 J1 is attached. This includes drawings of the designed layout, controller configs, MOVA datasets and some additional explanatory documents for the MOVA control. Please note that I cannot guarantee the descriptive documents are completely accurate so I recommend that these are checked against the controller and MOVA data as well as reviewed against site observations of the operation to ensure it is correctly understood and represented.

Please let me know if you receive this with the attachment (and hence it hasn't got stuck in someone's e-mail filters somewhere).

Regards
Mark

Mark Roxburgh, Engineering Team Leader (Studies)
Midlands (East) Asset Team
National Highways | Stirling House | Lakeside Court, Osier Drive | Annesley | Nottinghamshire | NG15 0DS
Tel: +44 (0) 300 470 7567 | **Mob:** +44 (0) 7525 310 774
Web: www.nationalhighways.co.uk

From: Freek, Steve
Sent: 09 May 2022 13:37
To: Andy Miles <andy.miles@rodgersleask.co.uk>; Roxburgh, Mark <Mark.Roxburgh@highwaysengland.co.uk>
Cc: Moss, Stephen <stephen.moss@aeacom.com>
Subject: RE: Burbage Fields Farm, Burbage (Redrow Homes) - 21/00946/EAS - PRTM Base model review

Hi Andy,

In response to your email below, we would be able to accept a Linsig Model of M69 J1, we would however need to agree all input data etc.

Mark – do you have the signal specification for this junction which we could forward to Andy?

Regards

Steve Freek
Assistant Spatial Planner
National Highways (Area 7), Stirling House, Lakeside Court, Osier Drive, Sherwood Business Park Nottingham NG15 0DS
Tel: 0300 470 4457

Mob: 07712 543047

Email: steve.freek@highwaysengland.co.uk

From: Andy Miles <andy.miles@rodgersleask.co.uk>

Sent: 28 April 2022 15:43

To: Freek, Steve <Steve.Freek@highwaysengland.co.uk>

Cc: Moss, Stephen R <stephen.moss@aecon.com>; Stachelek, Dagmara
<Dagmara.Stachelek@highwaysengland.co.uk>

Subject: RE: Burbage Fields Farm, Burbage (Redrow Homes) - 21/00946/EAS - PRTM Base model review

Good afternoon Steve,

Following our phone call today where we briefly discussed possible options for assessing M69 Junction 1, I noticed that for the Land East of Stretton Croft planning application(ref: 20/00531/HYB) the transport consultant produced a LinSig model of M69 Junction 1 with National Highways providing the signal specification for the junction.

In anticipation of the need to assess M69 Junction 1 as part of a future application for Burbage Fields Farm, would you accept a LinSig model of M69 Junction 1 on the basis that it is submitted to National Highways for approval? This model would utilise traffic flows from the PRTM,

Would it be possible to email over the signal specification for this junction?

Regards

Andy



Rodgers Leask Limited

2430/2440 The Quadrant, Aztec West, Almondsbury, Bristol BS32 4AQ

Andy Miles BA (Hons) MSc MTPS
Principal Transport Planner

andy.miles@rodgersleask.co.uk
07584041159

rodgersleask.co.uk

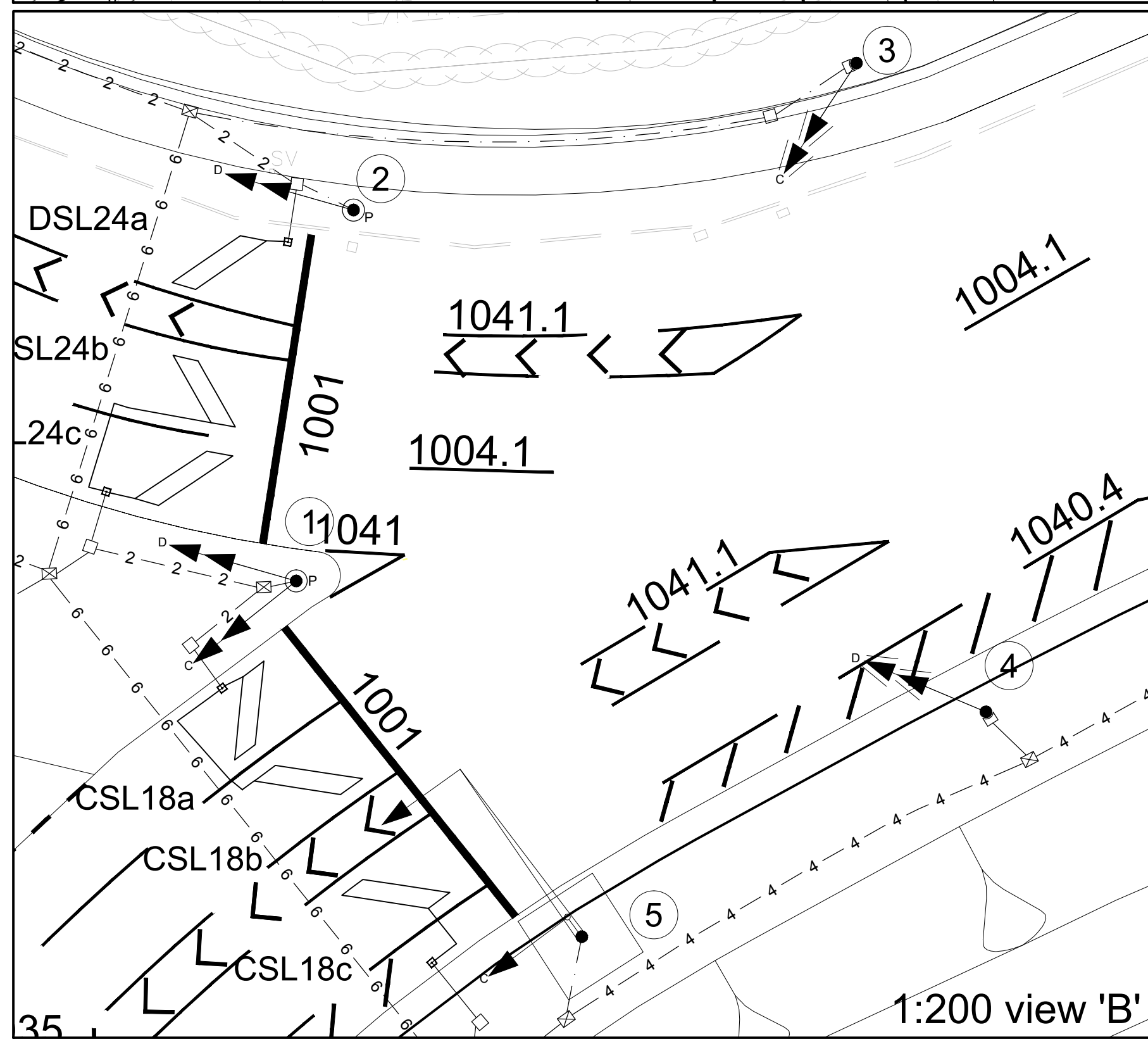
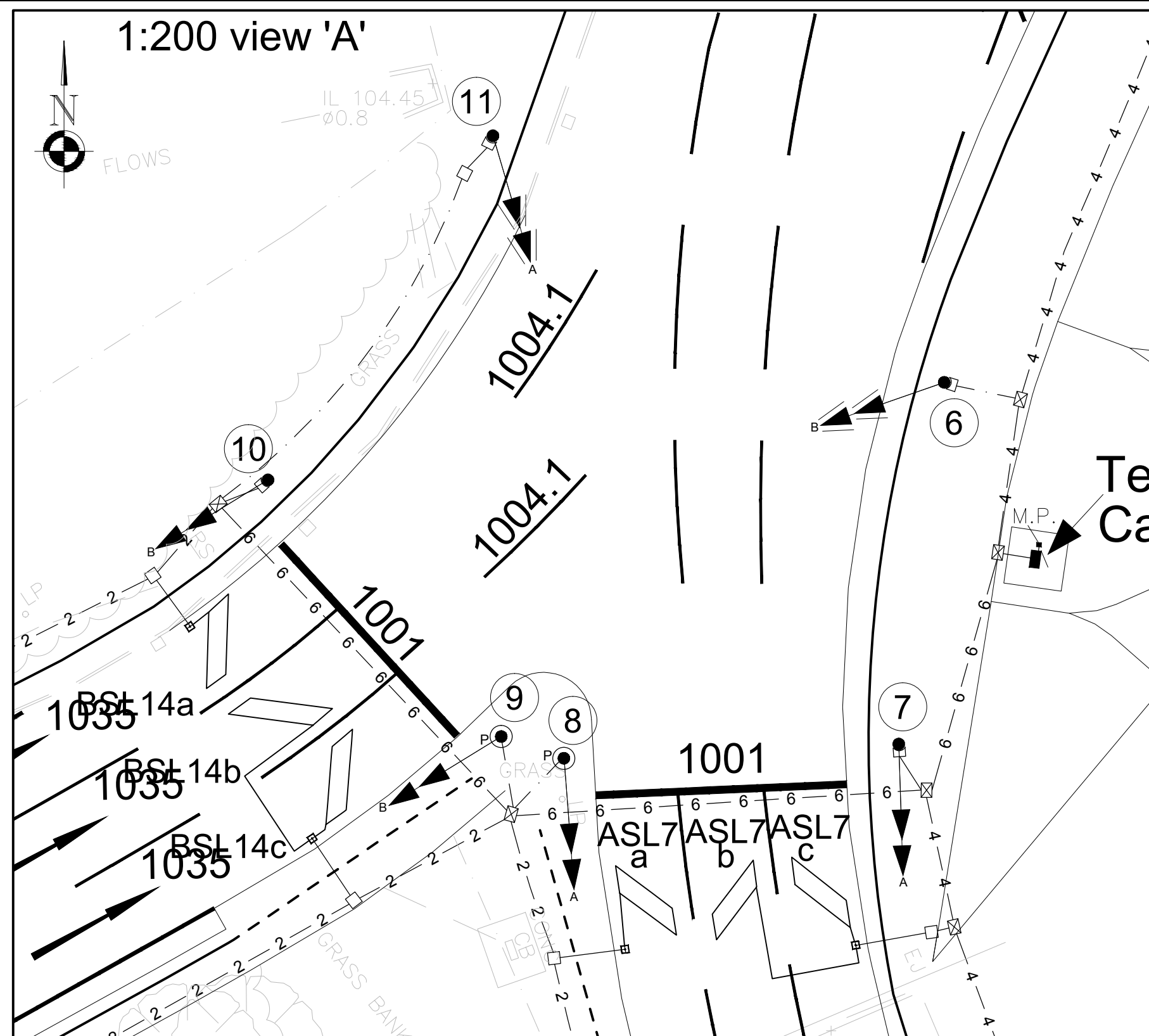
Civil | Structural | Geo-environmental | Traffic & Transport Planning

This e-mail is confidential and is intended solely for the use of the individuals or entity to whom it is addressed. If you are not the intended recipient and you have received this e-mail in error then any use, dissemination, forwarding, printing or copying of this e-mail is strictly prohibited and you should contact the sender by e-mail return and then delete all the material from your system. Any view or opinions presented are solely those of the author and not necessarily represent those Rodgers Leask Limited.

Rodgers Leask Limited Company Registration No. 2352923, Rodgers Leask Environmental Limited Company Registration No. 4837039. Registered office: St James House, St Mary's Wharf, Mansfield Road, Derby DE1 3TQ

Please be environmentally friendly - don't print this email unless you have to.





(Paragraph 130) (Regulation 13(2)(b)) Construction (Design & Management) Regulations 1994

In accordance with paragraph 131 of HSG224, the Approved Code of Practice to the Construction (Design and Management) Regulations 1994 - 2000, we believe there are no residual hazards which, in our opinion, would not be "Obvious" to a Competent Contractor (those which are classed as "Unusual" or "Likely to be Difficult to Manage").

Risks where information is available at this stage of the design have been taken into account in preparation of the indicative design. Possible revisions to the design are subject to further information and associated Risk Assessment.

This map is based on Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationary Office. © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways Agency 100018928, 2008.

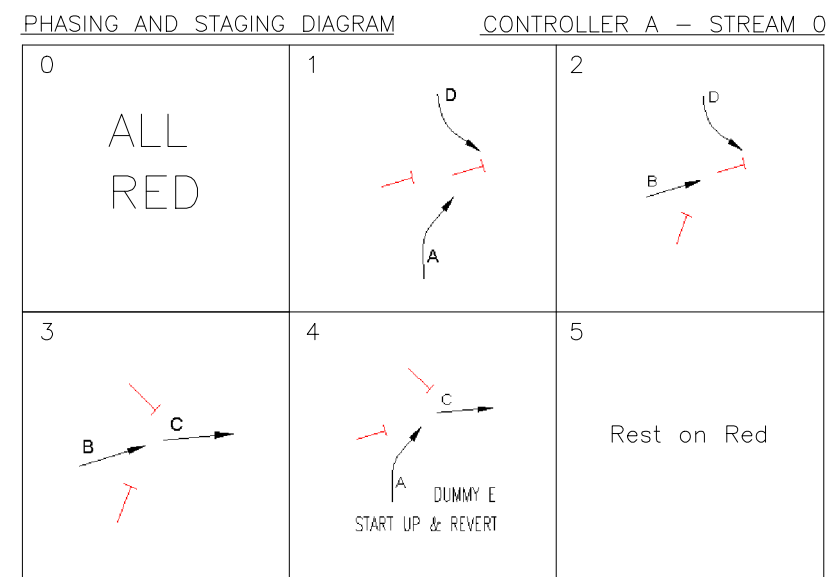
All work encapsulated within the area bounded by arrowheads shall be measured as a single item as per MCDHW Vol 4 section 1, chapter IV, series 1200, clause 30

KEY: NEW ROAD MARKINGS			
MARKING	TSRGD dia.	>=50mph module	>=50mph module where (*) shown
1001	300mm width		
1003			100mm width 300mm length
1003.1	300mm width		
1004.1	100mm width 6000mm length	150mm width 6000mm length	
1009	100mm width 1000mm length		
1010	150mm width 1000mm length		
1012.1	100mm width	150mm width	
1012.2	200mm width		
1014	6000mm length		
1023			1750mm length
1029	280mm text		
1035	6000mm arrows 2800mm text		
1040	Dia. 1004.1 lines 150mm diags.		
1041	Dia. 1004.1 lines 150mm diags.		
1055.1	100 x 100mm 300mm centres		
1057			1780mm height
1058			1035mm text

KEY		M.P.
114/168mm dia. bell shape signal pole and pole reference socket with associated pole number		Electricity supply mini-pillar
168mm dia. passive signal pole and concrete pole reference socket with associated pole number		Detector haldo-pillar
Mast arm (outreach of 8.5m) with associated pole		MOVA detector loop
2x Primary LED signal head with associated phase letter (on the lower head) on a 6m pole		Queue detector loop
2x Secondary LED signal head with associated phase letter (on the lower head) on a 6m pole		Stop line detector loop
Primary LED signal head on a 1m extension bracket		Carriageway loop connection box with 50mm diameter duct
Signal controller / termination cabinet with hardstanding area		750mm x 750mm signal access chamber with drainage hole and free draining material beneath
		600mm x 600mm signal joint chamber with drainage hole and free draining material beneath
		100mm diameter orange cable duct
		Multiple 100mm diameter cable duct

All work encapsulated within the area bounded by arrowheads shall be measured as a single item as per MCDHW Vol 4 section 1, chapter IV, series 1200, clause 30

All work encapsulated within the area bounded by arrowheads shall be measured as a single item as per MCDHW Vol 4 section 1, chapter IV, series 1200, clause 30



NOTES

- All dimensions in millimetres unless stated otherwise.
- The accuracy of this drawing cannot be guaranteed for setting out purposes.
- Diagram above shows sheet layouts. Refer to drawing numbers 11/06012/H/12/01.1 & 01.2 for sheets 2 & 3.
- References shall be made to the following contract drawing numbers:
11/06012/H/04/01.0-01.2 for safety barrier layout.
11/06012/H/11/01.0-01.2 for kerb alignment layout.
11/06012/H/07/02.0-02.2 for high friction surfacing.
11/06012/H/12/03.0-03.2 for road marking layout.
11/06012/H/12/01.3 for mast arm foundation detail.
11/06012/H/12/02.0-02.2 for signing layout.
11/06012/H/11/01.0-01.2 & 02.0 for maintenance bay detail.
- Stop lines to be located 1.0m from the centre line of the primary signal pole.
- MOVA loop and signal pole positions are to be agreed on site with signal design engineer.
- All ducting to be 100a except between joint chambers and carriageway loop connection boxes which shall be 50a.
- All loops are to be fed into a carriageway loop connection box. Each loop shall be cut into a separate slot.
- All signal heads are to be LED.
- References should be made to the following Highway Construction Detail Drawings:
Dwg G25 for carriageway loop connection boxes.
Dwg G27 for the installation of stop line loops.
Dwg G28 for the installation of queue loops.
Dwg G32 for the installation of MOVA loops.
- Refer to appendix 12/5 for traffic signal installation requirements and to appendix 5/2 for traffic signal ducting/chamber installation requirements.
- Kerb drain cable loop units (Type ACO KD480CL) are to be installed so as to coincide with proposed loop positions. Refer to dwg 11/06012/H/11/01.0-01.2.
- Refer to Appendix 7/2 for c/w trench reinstatement details.

Detector Locations:

Detector	Distance from Stop Line (m)
AIN1*	77m
AIN3*	77m
AIN5*	77m
AX2*	39m
AX4*	39m
AX6*	39m
ASL7a,b,c*	3m
BIN8*	101m
BIN10*	101m
BIN12*	101m
BX9*	39m
BX11*	39m
BX13*	39m
BSL14a,b,c*	3m
BQ26a,b*	200m
CX15	39m
CX16	39m
CX17	39m
CSL18a,b,c	3m
DIN19	93m
DIN21	93m
DX20	39m
DX22	39m
DX23	39m
DSL24a,b,c	3m

N.B.
Loops marked with * are to be terminated in Termination cabinet 'A'.

Rev	Description	By	Chk'd	App	Date
-----	-------------	----	-------	-----	------



OPTIMA
INFRASTRUCTURE MANAGEMENT

Galena Close, Amington, Tamworth, Staffordshire, B77 4AS
Tel: 01827 313 313 Fax: 01827 313 113 e-mail: enquires@optima-im.com

Project
AREA 11 MAC CONTRACT

Title
**A5 / M69 SIGNALISATION
Traffic Signal Installation - Sheet 1 of 3**

Scale	Drawn	Date	Checked	Date	Approved	Date
1:500	EA	01-06-06	TH	16-06-06	AD	14-09-06
Office		Project No.		Drawing No.		Revision
11		/ 06012		/ H/12/01.0		/ -

CUSTOMER DOCUMENTATION
AAAAAAAAAAAAAAAAAAAAAAAA

Project :- T04710 Version :- 50 Date :- 09-JUN-11
AA

Customer :- Aone+
AAAAAAAAAAAAAAAAAAAA

Site :- M69 J1 / A5 Controller A
AA

Engineer :- Alan Solaini
AAAAAAAAAAAAAAAAAAAAAAAA
Telephone :- 01623886611
AAAAAAAAAAAAAAAAAAAA

Produced by
AAAAAAAAAAAA
Version 4.07.007 (14-Dec-04)
AAAAAAAAAAAAAAAAAAAAAAAA

MISCELLANEOUS DETAILS
AAAAAAAAAAAAAAAAAAAA

Coded by PH

Special features :- TRX 8 Phase Gray With Duel Mova

Country :-	44R	Mains :-	50Hz
Manually selected modes revert on police-panel door closure ?	N	Dimming :-	160V
Need date/time on cold start ?	N	Starting i/g :-	8

LSM #1 is dimmable.

This database has the following integral facilities:-

(none)

Mode Priorities
AAAAAAAAAAAAAAAA

- 1 Manual
- 2 VA (manually selected)
- 3 Fixed Time (manually selected)
- 4 UTC - - - - "TS" sets time to 12:00:00
- 5 Hurry-call
- 6 Cableless Linking
- 7 VA (automatically selected)

SITE LAYOUT
AAAAAAAAAAAA

```
Stage stream 1
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Stage      Phases
```

Start_up stage in each stream is marked thus *.

STAGE SEQS: FXT+VA+CLF+MAN
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Y = permitted move, Ya = extra i/g on max change, Yx = extra i/g on max change if extended, Ys = Conditional movement.

```

Stream 1
AAAAAAAAAA
      3      To
From 3 1 2 3 4
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
      1 3 - Y Y Y
      3
      2 3 Y - Y Y
      3
      3 3 Y Y - Y
      3
      4 3 Y Y Y -
      3

```

MANUAL BUTTON INFORMATION
AAAAAAAAAAAAAAAAAAAA

```

Button          Stage  Phases
AAAAAAAAAAAAAA

```

All-Red	4	F
1	1	B, C
2	2	A, D
3	3	A, C, E
4	Ä	
5	Ä	
6	Ä	
7	Ä	
8	Ä	

DETECTOR DETAILS
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Types :- I = internal pack, X = external/ped button, Z = dummy
O/C = normally open/closed, P = p.d. on 9/18 hr fault

Functions :- R = regular loop, P/B = ped btn without/with "WAIT"
M = MOVA, S/T = SCOOT Occupancy/Count, Q = queue
V = speed, K/W = puffin kerbside/crossing, Z = dummy
L = latching, N = non-latching (call/cancel)
U = unidirectional, H = vehicle priority, J = SPRINT

No	Title	Type	Func	Phase/stg	dem	ext	cal	can	ext	dfm	Special Parameter
1	CX 15	IO-	RN-				5	2		**	
2	CX 16	IO-	RN-				5	2		**	
3	CX 17	IO-	RN-				5	2		**	
4	CSL 18A,B,C	IOP	RL-	C						**	
5	DIN 19	IO-	RN-				10	2		**	
6	DX 20	IOP	RL-	D	D				4.5	**	
7	DIN 21	IO-	RN-				10	2		**	
8	DX 22	IOP	RL-	D	D				4.5	**	
9	DX 23	IOP	RL-	D	D				4.5	**	
10	DSL 24A,B,C	IOP	RL-	D						**	
11	SPACE	IO-	RN-								
12	SPACE	IO-	RN-								
13	AIN 1	XO-	RN-				10	2		**	
14	AX 2	XOP	RL-	A	A				4.5	**	
15	AIN 3	XO-	RN-				10	2		**	
16	AX 4	XOP	RL-	A	A				4.5	**	
17	AIN 5	XO-	RN-				10	2		**	
18	AX 6	XOP	RL-	A	A				4.5	**	

No	Title	Type	Func	Phase/stg	dem	ext	cal	can	ext	dfm	Special
AA											
19	ASL 7A,B,C	XOP	RL-	A						**	
20	SPACE	XO-	RN-								
21	BIN 8	XO-	RN-				10	2		**	
22	BX 9	XOP	RL-	B	B				4.5	**	
23	BIN 10	XO-	RN-				10	2		**	
24	BX 11	XOP	RL-	B	B				4.5	**	
25	BIN 12	XO-	RN-				10	2		**	
26	BX 13	XOP	RL-	B	B				4.5	**	
27	BSL 14A,B,C	XOP	RL-	B						**	
28	BQ25A & 25 BX	O-	RN-				10	2		**	

Suppress PD on presence fault

ENHANCED MON.	Regular & alt.		Conditions for inhibition
No	Title	pres abs ?	and alternative timings
AA			

1	CX 15	reg: 5 18	inh:
		alt:	N alt:
2	CX 16	reg: 5 18	inh:
		alt:	N alt:
3	CX 17	reg: 5 18	inh:
		alt:	N alt:
4	CSL 18A,B,C	reg: 120 18	inh:
		alt:	N alt:
5	DIN 19	reg: 5 18	inh:
		alt:	N alt:
6	DX 20	reg: 120 18	inh:
		alt:	N alt:
7	DIN 21	reg: 5 18	inh:
		alt:	N alt:
8	DX 22	reg: 120 18	inh:
		alt:	N alt:
9	DX 23	reg: 120 18	inh:
		alt:	N alt:
10	DSL 24A,B,C	reg: 120 18	inh:
		alt:	N alt:
13	AIN 1	reg: 5 18	inh:
		alt:	alt:
14	AX 2	reg: 120 18	inh:
		alt:	alt:
15	AIN 3	reg: 5 18	inh:
		alt:	alt:
16	AX 4	reg: 120 18	inh:
		alt:	alt:
17	AIN 5	reg: 5 18	inh:
		alt:	alt:

		Suppress PD on presence fault			
ENHANCED MON.	Regular & alt.				Conditions for inhibition
No	Title	pres	abs	?	and alternative timings
AA					
18	AX 6	reg: 120	18		inh:
		alt:			alt:
19	ASL 7A,B,C	reg: 120	18		inh:
		alt:			alt:
21	BIN 8	reg: 5	18		inh:
		alt:			alt:
22	BX 9	reg: 120	18		inh:
		alt:			alt:
23	BIN 10	reg: 5	18		inh:
		alt:			alt:
24	BX 11	reg: 120	18		inh:
		alt:			alt:
25	BIN 12	reg: 5	18		inh:
		alt:			alt:
26	BX 13	reg: 120	18		inh:
		alt:			alt:
27	BSL 14A,B,C	reg: 120	18		inh:
		alt:			alt:
28	BQ25A & 25 B	reg: 5	18		inh:
		alt:			alt:

No	Title	Dummy condition / Input address	Wait-Lamp or Test- Pulse accessed as
AA			
1	CX 15	card 1 input 1	
2	CX 16	card 1 input 2	
3	CX 17	card 1 input 3	
4	CSL 18A,B,C	card 1 input 4	
5	DIN 19	card 1 input 5	
6	DX 20	card 1 input 6	
7	DIN 21	card 1 input 7	
8	DX 22	card 1 input 8	
9	DX 23	card 1 input 9	
10	DSL 24A,B,C	card 1 input 10	
11	SPACE	card 1 input 11	
12	SPACE	card 1 input 12	
13	AIN 1	card 1 input 13	
14	AX 2	card 1 input 14	
15	AIN 3	card 1 input 15	
16	AX 4	card 1 input 16	
17	AIN 5	card 1 input 17	
18	AX 6	card 1 input 18	
19	ASL 7A,B,C	card 1 input 19	
20	SPACE	card 1 input 20	
21	BIN 8	card 1 input 21	
22	BX 9	card 1 input 22	
23	BIN 10	card 1 input 23	
24	BX 11	card 1 input 24	

No	Title	Dummy condition / Input address	Wait-Lamp or Test- Pulse accessed as
AA			
25	BIN 12	card 1 input 25	
26	BX 13	card 1 input 26	
27	BSL 14A,B,C	card 1 input 27	
28	BQ25A & 25 B	card 1 input 28	

PHASE DETAILS
 ÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Types :- D = dummy, F = Full traffic, I/A = Indicative or Filter Arrow (ends in bkout/flashing green), V = Vehicle in ped stream, W = ped With traffic, M = MCE0145 ped, L/U = peLican/pUffin ped, N/T = Near or far-sided Toucan bicycle, X = far-sided pedestrian

Phase	Type	Related Colour phase option	Appearance depends on demand :-	Terminates on
A	F	1	Always appears	End of stage
B	F	1	Always appears	End of stage
C	F	1	Always appears	End of stage
D	F	1	Always appears	End of stage
E	D	1	Always appears	End of stage
F	D	1	Always appears	End of stage

Phase	minimum green	blackout/flash	maximum greens			
A	7 (7)		40	40	40	40
B	7 (7)		20	20	20	20
C	7 (7)		40	40	40	40
D	7 (7)		20	20	20	20
E	2 (2)		0	0	0	0
F	2 (2)		0	0	0	0

Phase	location	minimum red
AA		
A	Circ M69 E BND	2 (2)
B	M69 E BND Slip	2 (2)
C	Circ At A5 S BND	2 (2)
D	A5 S BND	2 (2)
E	Revert	2 (2)
F	Rest on Red	2 (2)

PHASE INTERGREEN DETAILS
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

[illegible]

STAGE CHANGE TIMINGS
 AAAAAAAAAAAAAAAAAAAAAA

Change 1 : stages 1 --> 2
 lose B [0], C [6]
 gain A [0], D [0]

Change 2 : stages 1 --> 3
 lose B [0]
 gain A [0], E [0]

Change 3 : stages 1 --> 4
 lose B [0], C [0]
 gain F [0]

Change 4 : stages 2 --> 1
 lose A [0], D [0]
 gain B [0], C [0]

Change 5 : stages 2 --> 3
 lose D [0]
 gain C [0], E [0]

Change 6 : stages 2 --> 4
 lose A [0], D [0]
 gain F [0]

Change 7 : stages 3 --> 1
 lose A [0], E [0]
 gain B [0]

Change 8 : stages 3 --> 2
 lose C [0], E [0]
 gain D [0]

Change 9 : stages 3 --> 4
 lose A [0], C [0], E [0]
 gain F [0]

Change 10 : stages 4 --> 1
 lose F [0]
 gain B [0], C [0]

Change 11 : stages 4 --> 2
 lose F [0]
 gain A [0], D [0]

Change 12 : stages 4 --> 3
 lose F [0]
 gain A [0], C [0], E [0]

CHANGE CONDNS - FXT + VA
AAAAAAAAAAAAAAAAAAAAAAAAAA

STAGE 1

1 --> 4 Movement no. 1 (change no. 3) Regular maximum.

Demand	dF
Inhibit	dA + dD + dE
Extend	eB

1 --> 3 Movement no. 2 (change no. 2) Regular maximum.

Demand	dA + dE
Inhibit	dD
Extend	eB

1 --> 2 Movement no. 3 (change no. 1) Regular maximum.

Demand	dD
Inhibit	f
Extend	eB

STAGE 2

2 --> 1 Movement no. 16 (change no. 4) Regular maximum.

Demand	dB
Inhibit	dE + dF
Extend	eA + eD

2 --> 4 Movement no. 17 (change no. 6) Regular maximum.

Demand	dF
Inhibit	dC + dE
Extend	eA + eD

2 --> 3 Movement no. 18 (change no. 5) Regular maximum.

Demand	dC + dE
Inhibit	f
Extend	eD

STAGE 3

3 --> 2 Movement no. 25 (change no. 8) Regular maximum.

Demand	dD
Inhibit	dB + dF
Extend	mnc

3 --> 1 Movement no. 26 (change no. 7) Regular maximum.

Demand	dB
Inhibit	dF
Extend	eA + mF

3 --> 4 Movement no. 27 (change no. 9) Regular maximum.

Demand	dF
Inhibit	f
Extend	eA + mF

STAGE 4

4 --> 3 Movement no. 34 (change no. 12) Regular maximum.

Demand	dA + dE & (dC + dE)
Inhibit	dB + dD
Extend	mnc

4 --> 2 Movement no. 35 (change no. 11) Regular maximum.

Demand	dA + dD
Inhibit	dB + dC
Extend	mnc

4 --> 1 Movement no. 36 (change no. 10) Regular maximum.

Demand	dB + dC
Inhibit	f
Extend	mnc

CHANGE CONDNS - CLF
AAAAAAAAAAAAAAAAAAAA

STAGE 1

1 --> 2 Movement no. 7 (change no. 1)

Demand cF2 & (cD2 + dA + dD)
Inhibit cF1
Extend f
Quit if inhibited or minima unexpired.

1 --> 3 Movement no. 8 (change no. 2)

Demand cF3 & (cD3 + dA + dE)
Inhibit cF1
Extend f
Quit if inhibited or minima unexpired.

1 --> 4 Movement no. 9 (change no. 3)

Demand cF4 & (cD4 + dF)
Inhibit cF1
Extend f
Quit if inhibited or minima unexpired.

STAGE 2

2 --> 3 Movement no. 13 (change no. 5)

Demand cF3 & (cD3 + dC + dE)
Inhibit cF2
Extend f
Quit if inhibited or minima unexpired.

2 --> 4 Movement no. 14 (change no. 6)

Demand cF4 & (cD4 + dF)
Inhibit cF2
Extend f
Quit if inhibited or minima unexpired.

2 --> 1 Movement no. 15 (change no. 4)

Demand	cF1 & (cD1 + dB + dC)
Inhibit	cF2
Extend	f

Quit if inhibited or minima unexpired.

STAGE 3

3 --> 4 Movement no. 22 (change no. 9)

Demand	cF4 & (cD4 + dF)
Inhibit	cF3
Extend	f

Quit if inhibited or minima unexpired.

3 --> 1 Movement no. 23 (change no. 7)

Demand	cF1 & (cD1 + dB)
Inhibit	cF3
Extend	f

Quit if inhibited or minima unexpired.

3 --> 2 Movement no. 24 (change no. 8)

Demand	cF2 & (cD2 + dD)
Inhibit	cF3
Extend	f

Quit if inhibited or minima unexpired.

STAGE 4

4 --> 1 Movement no. 31 (change no. 10)

Demand	cF1 & (cD1 + dB + dC)
Inhibit	cF4
Extend	f

Quit if inhibited or minima unexpired.

4 --> 2 Movement no. 32 (change no. 11)

Demand	cF2 & (cD2 + dA + dD)
Inhibit	cF4
Extend	f

Quit if inhibited or minima unexpired.

4 --> 3 Movement no. 33 (change no. 12)

Demand	cF3 & (cD3 + dA + dC + dE)
Inhibit	cF4
Extend	f

Quit if inhibited or minima unexpired.

CHANGE CONDNS - UTC
 AAAAAAAAAAAAAAAAAAAAAA

STAGE 1

1 --> 2 Movement no. 4 (change no. 1)

Demand	uF2
Inhibit	uF1
Extend	f

Quit if inhibited or minima unexpired.

1 --> 3 Movement no. 5 (change no. 2)

Demand	uF3
Inhibit	uF1
Extend	f

Quit if inhibited or minima unexpired.

1 --> 4 Movement no. 6 (change no. 3)

Demand	uF4
Inhibit	uF1
Extend	f

Quit if inhibited or minima unexpired.

STAGE 2

2 --> 3 Movement no. 10 (change no. 5)

Demand	uF3
Inhibit	uF2
Extend	f

Quit if inhibited or minima unexpired.

2 --> 4 Movement no. 11 (change no. 6)

Demand	uF4
Inhibit	uF2
Extend	f

Quit if inhibited or minima unexpired.

2 --> 1 Movement no. 12 (change no. 4)

Demand	uF1
Inhibit	uF2
Extend	f

Quit if inhibited or minima unexpired.

STAGE 3

3 --> 4 Movement no. 19 (change no. 9)

Demand	uF4
Inhibit	uF3
Extend	f

Quit if inhibited or minima unexpired.

3 --> 1 Movement no. 20 (change no. 7)

Demand	uF1
Inhibit	uF3
Extend	f

Quit if inhibited or minima unexpired.

3 --> 2 Movement no. 21 (change no. 8)

Demand	uF2
Inhibit	uF3
Extend	f

Quit if inhibited or minima unexpired.

STAGE 4

4 --> 1 Movement no. 28 (change no. 10)

Demand	uF1
Inhibit	uF4
Extend	f

Quit if inhibited or minima unexpired.

4 --> 2 Movement no. 29 (change no. 11)

Demand uF2
Inhibit uF4
Extend f
Quit if inhibited or minima unexpired.

4 --> 3 Movement no. 30 (change no. 12)

Demand uF3
Inhibit uF4
Extend f
Quit if inhibited or minima unexpired.

Entry	Time	Days of week	Function & Value	Calendar dependency
1	07:00	*MTWTF..	MAX 1	
2	00:00		MAX 1	
3	00:00		MAX 1	
4	00:00		MAX 1	
5	09:00	*MTWTF..	MAX 2	
6	00:00		MAX 2	
7	00:00		MAX 2	
8	00:00		MAX 2	
9	16:30	*MTWTF..	MAX 3	
10	00:00		MAX 3	
11	00:00		MAX 3	
12	00:00		MAX 3	
13	18:30	*MTWTF..	MAX 1	
14	00:00		MAX 1	
15	00:00		MAX 1	
16	00:00		MAX 1	
17	09:00	*.....S.	MAX 4	
18	00:00		MAX 4	
19	00:00		MAX 4	
20	00:00		MAX 4	
21	19:00	*.....S.	MAX 1	
22	00:00		MAX 1	
23	00:00		MAX 1	

Entry	Time	Days of week	Function & Value	Calendar dependency
24	00:00		MAX 1	
25	09:00	*.....S	MAX 4	
26	00:00		MAX 4	
27	00:00		MAX 4	
28	00:00		MAX 4	
29	19:00	*.....S	MAX 1	
30	00:00		MAX 1	
31	00:00		MAX 1	
32	00:00		MAX 1	
33	00:00	*.....	PLN 1	
34	00:00		PLN 1	
35	00:00		PLN 1	
36	00:00		PLN 1	
37	00:00	*.....	PLN 2	
38	00:00		PLN 2	
39	00:00		PLN 2	
40	00:00		PLN 2	
41	00:00	*.....	PLN 3	
42	00:00		PLN 3	
43	00:00		PLN 3	
44	00:00		PLN 3	
45	00:00	*.....	PLN 4	
46	00:00		PLN 4	
47	00:00		PLN 4	

Entry	Time	Days of week	Function & Value	Calendar dependency
48	00:00	.....	PLN 4	
49	00:00	*.....	PLN 0	
50	00:00	.....	PLN 0	
51	00:00	.....	PLN 0	
52	00:00	.....	PLN 0	

CLF OPERATION
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Influence bits :-

```
-- -- -- -- -- -- -- -- cD4 cF4 cD3 cF3 cD2 cF2 cD1 cF1
```

Plan 1 Cycletime = 60 Offset = 0 Sync = t
 ÅÅÅÅÅÅÅÅ Call condition = p1 (adjusted daily)

Action No.	Action Time	Influence type	Influence stage	Influence Pattern			
1:	255	IM	1	xxxx	xxxx	0000	0010
2:	255	IM	2	xxxx	xxxx	0000	1100
3:	255	IM	3	xxxx	xxxx	0011	0000
4:	255	IM	4	xxxx	xxxx	1100	0000
5:	255	DD	1	xxxx	xxxx	0000	0001
6:	255	DD	2	xxxx	xxxx	0000	0100
7:	255	DD	3	xxxx	xxxx	0001	0000
8:	255	DD	4	xxxx	xxxx	0100	0000
9:	255	HO		xxxx	xxxx	0000	0000
10:	255			xxxx	xxxx	xxxx	xxxx
11:	255			xxxx	xxxx	xxxx	xxxx
12:	255			xxxx	xxxx	xxxx	xxxx
13:	255			xxxx	xxxx	xxxx	xxxx
14:	255			xxxx	xxxx	xxxx	xxxx
15:	255			xxxx	xxxx	xxxx	xxxx
16:	255			xxxx	xxxx	xxxx	xxxx

Plan 2 Cycletime = 60 Offset = 0 Sync = t
 AAAA AAAA Call condition = p2 (adjusted daily)

Action No.	Action Time	Influence type	Influence stage	Influence Pattern
1:	255	IM	1	xxxx xxxx 0000 0011
2:	255	IM	2	xxxx xxxx 0000 1100
3:	255	IM	3	xxxx xxxx 0011 0000
4:	255	IM	4	xxxx xxxx 1100 0000
5:	255	DD	1	xxxx xxxx 0000 0001
6:	255	DD	2	xxxx xxxx 0000 0100
7:	255	DD	3	xxxx xxxx 0001 0000
8:	255	DD	4	xxxx xxxx 0100 0000
9:	255	HO		xxxx xxxx 0000 0000
10:	255			xxxx xxxx xxxx xxxx
11:	255			xxxx xxxx xxxx xxxx
12:	255			xxxx xxxx xxxx xxxx
13:	255			xxxx xxxx xxxx xxxx
14:	255			xxxx xxxx xxxx xxxx
15:	255			xxxx xxxx xxxx xxxx
16:	255			xxxx xxxx xxxx xxxx

```

                                Influence bits :-
-- -- -- -- -- -- -- -- cD4 cF4 cD3 cF3 cD2 cF2 cD1 cF1

Plan 3  Cycletime = 60  Offset = 0      Sync = t
AAAAAA  Call condition = p3      (adjusted daily)

```

Action No.	Action Time	Influence type	stage	Influence Pattern
1:	255	IM	1	xxxx xxxx 0000 0011
2:	255	IM	2	xxxx xxxx 0000 1100
3:	255	IM	3	xxxx xxxx 0011 0000
4:	255	IM	4	xxxx xxxx 1100 0000
5:	255	DD	1	xxxx xxxx 0000 0001
6:	255	DD	2	xxxx xxxx 0000 0100
7:	255	DD	3	xxxx xxxx 0001 0000
8:	255	DD	4	xxxx xxxx 0100 0000
9:	255	HO		xxxx xxxx 0000 0000
10:	255			xxxx xxxx xxxx xxxx
11:	255			xxxx xxxx xxxx xxxx
12:	255			xxxx xxxx xxxx xxxx
13:	255			xxxx xxxx xxxx xxxx
14:	255			xxxx xxxx xxxx xxxx
15:	255			xxxx xxxx xxxx xxxx
16:	255			xxxx xxxx xxxx xxxx

```

Plan 4  Cycletime = 60  Offset = 0      Sync = t
AAAAAA  Call condition = p4      (adjusted daily)

```

Action No.	Action Time	Influence type	stage	Influence Pattern
1:	255	IM	1	xxxx xxxx 0000 0011
2:	255	IM	2	xxxx xxxx 0000 1100
3:	255	IM	3	xxxx xxxx 0011 0000
4:	255	IM	4	xxxx xxxx 1100 0000
5:	255	DD	1	xxxx xxxx 0000 0001
6:	255	DD	2	xxxx xxxx 0000 0100
7:	255	DD	3	xxxx xxxx 0001 0000
8:	255	DD	4	xxxx xxxx 0100 0000
9:	255	HO		xxxx xxxx 0000 0000
10:	255			xxxx xxxx xxxx xxxx
11:	255			xxxx xxxx xxxx xxxx
12:	255			xxxx xxxx xxxx xxxx
13:	255			xxxx xxxx xxxx xxxx
14:	255			xxxx xxxx xxxx xxxx
15:	255			xxxx xxxx xxxx xxxx
16:	255			xxxx xxxx xxxx xxxx

HURRY-CALL DETAILS
AAAAAAAAAAAAAAAAAAAA

OTU INTERFACE
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Control bits are active closed
Reply bits are active open

```
Timeout for stuck force bits = 200
```

[illegible]

LAMP MONITORING
 AAAAAAAAAAAAAA

Sn = n channels safety red monitor (and maintenance monitor other colours).
 M = one channel of maintenance monitor only.
 U = 1+ un-monitored channel(s). X = amber/wait toroid absent.

Phase Option	Phase Option	Phase Option	Phase Option
AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA
A M	B M	C M	D M

SPECIAL EVENTS
 AAAAAAAAAAAAAA

Event name	Pulse ?	Event number	Up-ramp time	Down-ramp time
AA				
won	N	2	0.25	0
NODET	N	11	10	0
ENDGREEN	N	12	10	0
GREEN	N	13	22	0
FLASH1	N	16	0.5	0.5
FLASH2	N	17	1	1
INEXT	N	21	0	4
iCBA5NB	N	22	8	10
iCAA5CIRC	N	23	8	10
TOGGLE	Y	33	0	2
lfl	N	35	0.25	0.25
utcm	N	40	0	0.25
diminput	N	41	60	2
AAM69CIR	N	70	0	10
ACA5CIR	N	75	13	10
MOVA29	Y	78	0	2

Event name	Pulse ?	Event number	Up-ramp time	Down-ramp time
AAAAAA				
MOVA63	Y	96	10	2
MOVA61	Y	98	10	2

DIGITAL INPUTS AAAAAAAAAAAAAA

Input name	Input address	Active state
AAAAAA		
iCaa5circ	card 1 input 29	closed (1)
iCba5nb	card 1 input 30	closed (1)
iCdb4109	card 1 input 31	closed (1)
iSW1	card 1 input 32	closed (1)
iSW2	card 2 input 1	closed (1)
iMOVAB	card 2 input 2	closed (1)
iMOVAC	card 2 input 3	closed (1)

DIGITAL OUTPUTS AAAAAAAAAAAAAAAA

Types: CO = contact, LV = 24Vdc, AC = 240Vac, DM = dimmable mains
LK = pelican link (contact), SP = SDE/SA phase green (contact)
HC = hurycall confirm (contact)

Driving condition	Output address	Type	Active state
AA			
AAM69CIR	card 1 output 1	CO	High / closed
ABM69EB	card 1 output 2	CO	High / closed
ACA5CIR	card 1 output 3	CO	High / closed
ADA5SB	card 1 output 4	CO	High / closed
MOVA64	card 1 output 5	CO	High / closed
MOVA63	card 1 output 6	CO	High / closed
MOVA62	card 1 output 7	CO	High / closed
MOVAON	card 1 output 8	CO	High / closed
MOVA61	card 1 output 9	CO	High / closed
MOVA62	card 1 output 10	CO	High / closed
MOVA63	card 1 output 11	CO	High / closed
MOVA64	card 1 output 12	CO	High / closed
MOVA29	card 1 output 13	CO	High / closed
MOVA28	card 1 output 14	CO	High / closed
MOVA27	card 1 output 15	CO	High / closed
MOVA26	card 1 output 16	CO	High / closed
MOVA25	card 2 output 1	CO	High / closed
MOVA61	card 2 output 2	CO	High / closed

LONG-TERM TIMERS AAAAAAAAAAAAAAAA

No	Period	Initialising condition	Enabling condition
AA			
1	0:02:00	%ltrs1	%ltrn1
2	0:01:00	%ltrs2	Mova62
3	0:01:00	%ltrs3	Mova64
16	24:00:00	%dimoff	%dimon

EVENT FORMULAE
 ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

no.	name	Formula
2	won	= -f
3	%bo	= bo
4	woff	= woff + won.F & -won & -off
5	okoff	= gA & -smA & gC & -smC & gE & -smE
6	gA	= gA
7	NODEM1	= -(id4+id6+id8) & -(id9+id10+id14+id16) & -(id18+id19)
8	NODEM2	= -(id22+id24) & -(id26+id27)
9	uF3	= [39: 20H] & uTC
10	off	= okoff & woff + (sr & -won) + off & -won.R # %bo.R
11	NODET	= NODEM1 & NODEM2
12	ENDGREEN	= gA.F
13	GREEN	= gA
14	uF1	= [39: 80H] & uTC
15	uF2	= [39: 40H] & uTC
16	FLASH1	= -FLASH1
17	FLASH2	= -FLASH2
18	STATE1	= mU & -(iMOVAB+iMOVAC)
19	STATE2	= iMOVAB & (-mU & -iMOVAC)
20	STATE3	= iMOVAC & (-mU & -iMOVAB)
21	INEXT	= id13+id15 + id17
22	iCBA5NB	= iCba5nb
23	iCAA5CIRC	= iCaa5circ

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
24		= ltx1
25	gD	= gD
26	qG1G2	= lof + off
27	dE	= mV & NODET & -sw5
28	dF	= mV & NODET & sw5
29	dB	= dpB + mMF
30	GREENA	= GREEN & -ENDGREEN
31	dC	= dpC + mMF
32	dD	= dpD + mMF
33	TOGGLE	= <ltx1>.R
34	eD	= epD + mF
35	lfl	= -lfl & lf
36	FULLON	= mU & iMOVAB & iMOVAC
37	FLASHF	= mU & iMOVAB + (mU & iMOVAC) + (iMOVAB & iMOVAC) & FLASH1
38	FLASHS	= STATE1 + STATE2 + STATE3 & FLASH2
39	uD1	= uF1 & uTC
40	utcm	= zfdx
41	diminput	= iss
42	uD2	= uF2 & uTC
43	dA	= dpA + mMF
44	Mova62	= iCBA5NB & -sw3 + ((iCBA5NB & INEXT) & sw3)
45	Mova64	= iCAA5CIRC & -sw1 + ((iCAA5CIRC & INEXT) & sw1)
46	uD3	= uF3 & uTC
47	eA	= epA + mF

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
48	gB	= gB
49	gC	= gC
50		= dd5
51		= dd7
52		= dd1
53		= dd2
54		= dd3
55		= dd28
56		= dd13
57		= dd15
58		= dd17
59	qG1	= s1 & gB & gC + qG1G2
60	qG2	= s2 & gA & gD + qG1G2
61		= dA + dD + dE
62		= dA + dE
63	%ltrs1	= <lt;x1>.R
64	%ltrn1	= -mU
65	%ltrs2	= -Mova62
66	%ltrs3	= -Mova64
67	zva	= -bf
68	tPL1	= tp11
69	tPL2	= tp12
70	AAM69CIR	= GREENA & eA
71	tPL3	= tp13

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
72	tPL4	= tpl4
73	cF1	= cF1
74	ABM69EB	= gA.F + ABM69EB & -gB.F
75	ACA5CIR	= gC
76	ADA5SB	= gC.F + ADA5SB & -gD.F
77	MOVAON	= FULLON + FLASHF + FLASHS
78	MOVA29	= NODET
79	MOVA28	= <dd5>.R & -dt5 + (<dd7>.R & -dt7)
80	MOVA27	= <dd1>.R & -dt1 + (<dd2>.R & -dt2) + (<dd3>.R & -dt3) + iSW1
81	MOVA25	= <dd28>.R & -dt28 + iSW2
82	MOVA26	= <dd13>.R & -dt13 + (<dd15>.R & -dt15) + (<dd17>.R & -dt17) + iSW1
83	NOTNORM	= mMC + bf+bv+bm + off + lof + TOGGLE
84	cF2	= cF2
85	cF3	= cF3
86	cF4	= cF4
87	%dimoff	= -iss + sr
88	%dimon	= iss
89	iCdb4109	= iCdb4109
90	wD	= dpD
91	mnc	= mF
92	dimdrive	= diminput & -ltx16 & -sw32
93	df1	= df + bt # lf1
94	uTC	= uTC

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
95	MOVA64	= Mova64 & -ltx3
96	MOVA63	= iCaa5circ
97	MOVA62	= Mova62 & -ltx2
98	MOVA61	= iCba5nb
99	eB	= epB + mF
100	wA	= dpA
101	qG3	= s3 & gA & gC & gE
102	uF4	= [39: 10H] & uTC
103	qG4	= s4 & gF
104	%cd042	= cF2 & (cD2 + dA + dD)
105	%cd013	= cF3 & (cD3 + dA + dE)
106	%cd034	= cF4 & (cD4 + dF)
107	%cd023	= cF3 & (cD3 + dC + dE)
108	%cd041	= cF1 & (cD1 + dB + dC)
109	%vi024	= dC + dE
110	%vi021	= dE + dF
111	%ve024	= eA + eD
112	%cd031	= cF1 & (cD1 + dB)
113	%cd032	= cF2 & (cD2 + dD)
114	%vi032	= dB + dF
115	%ve034	= eA + mF
116	%cd043	= cF3 & (cD3 + dA + dC + dE)
117	%vi042	= dB + dC
118	%vd042	= dA + dD

no.	name	Formula
119	%vd043	= dA + dE & (dC + dE)
120	%vi043	= dB + dD
121	uSPACE1	= [39: 8H] & uTC
122	wB	= dpB
123	wC	= dpC
124	zhc	= hfh & -(bf+bv+bm)
125	zman	= bm
126	qSD1	= uD1 & utcm + (dB & -gB) + (dC & -gC)
127	qSD2	= uD2 & utcm + (dA & -gA) + (dD & -gD)
128	qSD3	= uD3 & utcm + (dA & -gA) + (dC & -gC) + (dE & -gE)
129	zutc	= utcm & -(bf+bv+bm) & uTC
130	zclf	= -tp10 & -(bf+bv)

COMMENTS ON CONFIGURATION

V01: Final on F.A.T 7/08/2007

V02: Chainges to Mova outputs, New F.A.T 10/3/2011
sw1 = Mova64 Ext Loops. Switch on to use the Ext
sw3 = Mova62 Ext Loops. Switch on to use the Ext
sw5 = Revert, Off = Phase A & C. On = All Red.

V03: Chainges to Manual Panel LED's 10/03/2011

CUSTOMER DOCUMENTATION
AAAAAAAAAAAAAAAAAAAAAAAA

Project :- T04720 Version :- 05 Date :- 09-JUN-11
AA

Customer :- Aone+
AAAAAAAAAAAAAAAAAAAA

Site :- M69 J1 / A5 Controller B
AA

Engineer :- Alan Solaini
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
Telephone :- 01623 886611
AAAAAAAAAAAAAAAAAAAAAAAAAAAA

Produced by
AAAAAAAAAAAA
Version 4.07.007 (14-Dec-04)
AAAAAAAAAAAAAAAAAAAAAAAAAAAA

MISCELLANEOUS DETAILS
AAAAAAAAAAAAAAAAAAAA

Coded by PH

Special features :- TRX 8 Phase Gray With Duel Mova

Country :-	44R	Mains :-	50Hz
Manually selected modes revert on police-panel door closure ?	N	Dimming :-	160V
Need date/time on cold start ?	N	Starting i/g :-	8

LSM #1 is dimmable.

This database has the following integral facilities:-

(none)

Mode Priorities
AAAAAAAAAAAAAAAA

- 1 Manual
- 2 VA (manually selected)
- 3 Fixed Time (manually selected)
- 4 UTC - - - - "TS" sets time to 12:00:00
- 5 Hurry-call
- 6 Cableless Linking
- 7 VA (automatically selected)

SITE LAYOUT
AAAAAAAAAAAA

STAGE - PHASE ALLOCATION

```
Stage stream 1
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Stage      Phases
```

1		B,	C	
2		A,	D	
3	*	A,	C,	E
4		F		

Start_up stage in each stream is marked thus *.

STAGE SEQS: FXT+VA+CLF+MAN
 ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Y = permitted move, Ya = extra i/g on max change, Yx = extra i/g on max change if extended, Ys = Conditional movement.

[illegible]

MANUAL BUTTON INFORMATION
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Button Stage Phases

All-Red	4	F	
1	1	B,	C
2	2	A,	D
3	3	A,	C, E
4	Ä		
5	Ä		
6	Ä		
7	Ä		
8	Ä		

DETECTOR DETAILS
 AAAAAAAAAAAAAAAAAA

Types :- I = internal pack, X = external/ped button, Z = dummy
 O/C = normally open/closed, P = p.d. on 9/18 hr fault

Functions :- R = regular loop, P/B = ped btn without/with "WAIT"
 M = MOVA, S/T = SCOOT Occupancy/Count, Q = queue
 V = speed, K/W = puffin kerbside/crossing, Z = dummy
 L = latching, N = non-latching (call/cancel)
 U = unidirectional, H = vehicle priority, J = SPRINT

No	Title	Type	Func	Phase/stg		Timings			Special	
				dem	ext	cal	can	ext	dfm	Parameter
AA										
1	AX 1	IOP	RL-	A	A			4.5	**	
2	AIN 2	IO-	RN-			10	2		**	
3	AX 3	IOP	RL-	A	A			4.5	**	
4	AIN 4	IO-	RN-			10	2		**	
5	AX 5	IOP	RL-	A	A			4.5	**	
6	ASL 6A,B & C	IOP	RL-	A					**	
7	SPACE	IO-	RN-						**	
8	SPACE	IO-	RN-						**	
9	BIN 7	IO-	RN-			10	2		**	
10	BX 8	IOP	RL-	B	B			4.5	**	
11	BIN 9	IO-	RN-			10	2		**	
12	BX 10	IOP	RL-	B	B			4.5	**	
13	BIN 11	IO-	RN-			10	2		**	
14	BX 12	IOP	RL-	B	B			4.5	**	
15	BSL 13A,B,C	IOP	RL-	B					**	
16	SPACE	IO-	RN-							
17	CIN 14	XO-	RN-			10	2		**	
18	CX 15	XOP	RL-	C	C			4.5	**	

No	Title	Type	Func	Phase/stg		Timings			Special	
				dem	ext	cal	can	ext	dfm	Parameter
AA										
19	CIN 16	XO-	RN-			10	2		**	
20	CX 17	XOP	RL-	C	C			4.5	**	
21	CSL 18A,18B	XOP	RL-	C					**	
22	DIN 19	XO-	RN-			10	2		**	
23	DX 20	XOP	RL-	D	D			4.5	**	
24	DIN 21	XO-	RN-			10	2		**	
25	DX 22	XOP	RL-	D	D			4.5	**	
26	DIN 23	XO-	RN-			10	2		**	
27	DX 24	XOP	RL-	D	D			4.5	**	
28	DSL 25A,C,D	XOP	RL-	D					**	
29	DQ 26A & 26B	XO-	RN-			8	0		**	
30	SPACE	XO-	RN-							
31	SPACE	XO-	RN-							
32	SPACE	XO-	RN-							

Suppress PD on presence fault

ENHANCED MON.	Regular & alt.		Conditions for inhibition
No	Title	pres abs ?	and alternative timings

AA

1	AX 1	reg: 120 18	inh:
		alt:	N alt:
2	AIN 2	reg: 5 18	inh:
		alt:	N alt:
3	AX 3	reg: 120 18	inh:
		alt:	N alt:
4	AIN 4	reg: 5 18	inh:
		alt:	N alt:
5	AX 5	reg: 120 18	inh:
		alt:	N alt:
6	ASL 6A,B & C	reg: 120 18	inh:
		alt:	N alt:
7	SPACE	reg:	inh:
		alt:	N alt:
8	SPACE	reg:	inh:
		alt:	N alt:
9	BIN 7	reg: 5 18	inh:
		alt:	N alt:
10	BX 8	reg: 120 18	inh:
		alt:	N alt:
11	BIN 9	reg: 5 18	inh:
		alt:	N alt:
12	BX 10	reg: 120 18	inh:
		alt:	N alt:
13	BIN 11	reg: 5 18	inh:
		alt:	alt:
14	BX 12	reg: 120 18	inh:
		alt:	alt:
15	BSL 13A,B,C	reg: 120 18	inh:
		alt:	alt:

Suppress PD on presence fault
 ENHANCED MON. Regular & alt. | Conditions for inhibition
 No Title pres abs ? and alternative timings
 AA

17	CIN 14	reg: 5	18	inh:
		alt:		alt:
18	CX 15	reg: 120	18	inh:
		alt:		alt:
19	CIN 16	reg: 5	18	inh:
		alt:		alt:
20	CX 17	reg: 120	18	inh:
		alt:		alt:
21	CSL 18A,18B	reg: 120	18	inh:
		alt:		alt:
22	DIN 19	reg: 5	18	inh:
		alt:		alt:
23	DX 20	reg: 120	18	inh:
		alt:		alt:
24	DIN 21	reg: 5	18	inh:
		alt:		alt:
25	DX 22	reg: 120	18	inh:
		alt:		alt:
26	DIN 23	reg: 5	18	inh:
		alt:		alt:
27	DX 24	reg: 120	18	inh:
		alt:		alt:
28	DSL 25A,C,D	reg: 120	18	inh:
		alt:		alt:
29	DQ 26A & 26B	reg: 5	18	inh:
		alt:		alt:

No	Title	Dummy condition / Input address	Wait-Lamp or Test- Pulse accessed as
AA			
1	AX 1	card 1 input 1	
2	AIN 2	card 1 input 2	
3	AX 3	card 1 input 3	
4	AIN 4	card 1 input 4	
5	AX 5	card 1 input 5	
6	ASL 6A,B & C	card 1 input 6	
7	SPACE	card 1 input 7	
8	SPACE	card 1 input 8	
9	BIN 7	card 1 input 9	
10	BX 8	card 1 input 10	
11	BIN 9	card 1 input 11	
12	BX 10	card 1 input 12	
13	BIN 11	card 1 input 13	
14	BX 12	card 1 input 14	
15	BSL 13A,B,C	card 1 input 15	
16	SPACE	card 1 input 16	
17	CIN 14	card 1 input 17	
18	CX 15	card 1 input 18	
19	CIN 16	card 1 input 19	
20	CX 17	card 1 input 20	
21	CSL 18A,18B	card 1 input 21	
22	DIN 19	card 1 input 22	
23	DX 20	card 1 input 23	
24	DIN 21	card 1 input 24	

No	Title	Dummy condition / Input address	Wait-Lamp or Test- Pulse accessed as
AA			
25	DX 22	card 1 input 25	
26	DIN 23	card 1 input 26	
27	DX 24	card 1 input 27	
28	DSL 25A,C,D	card 1 input 28	
29	DQ 26A & 26B	card 1 input 29	
30	SPACE	card 1 input 30	
31	SPACE	card 1 input 31	
32	SPACE	card 1 input 32	

PHASE DETAILS
 ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Types :- D = dummy, F = Full traffic, I/A = Indicative or Filter Arrow (ends in bkout/flashing green), V = Vehicle in ped stream, W = ped With traffic, M = MCE0145 ped, L/U = peLican/pUffin ped, N/T = Near or far-sided Toucan bicycle, X = far-sided pedestrian

Phase	Type	Related phase	Colour option	Appearance depends on demand :-	Terminates on
A	F		1	Always appears	End of stage
B	F		1	Always appears	End of stage
C	F		1	Always appears	End of stage
D	F		1	Always appears	End of stage
E	D		1	Always appears	End of stage
F	D		1	Always appears	End of stage

Phase	minimum green	blackout/flash	maximum greens
A	7 (7)		40 40 40 40
B	7 (7)		20 20 20 20
C	7 (7)		40 40 40 40
D	7 (7)		20 20 20 20
E	2 (2)		0 0 0 0
F	2 (2)		0 0 0 0

Phase	location	minimum red
A	Circ at B4109	2 (2)
B	B4109 Rugby Road	2 (2)
C	Circ At M69 WBND	2 (2)
D	M69 W BND	2 (2)
E	Revert	2 (2)
F	Rest on Red	2 (2)

PHASE INTERGREEN DETAILS
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

[illegible]

[illegible]

Change 1	:	stages	1 -->	2	
		lose	B [0],	C [9]	
		gain	A [0],	D [0]	
Change 2	:	stages	1 -->	3	
		lose	B [0]		
		gain	A [0],	E [0]	
Change 3	:	stages	1 -->	4	
		lose	B [0],	C [0]	
		gain	F [0]		
Change 4	:	stages	2 -->	1	
		lose	A [0],	D [0]	
		gain	B [0],	C [0]	
Change 5	:	stages	2 -->	3	
		lose	D [0]		
		gain	C [0],	E [0]	
Change 6	:	stages	2 -->	4	
		lose	A [0],	D [0]	
		gain	F [0]		
Change 7	:	stages	3 -->	1	
		lose	A [0],	E [0]	
		gain	B [0]		
Change 8	:	stages	3 -->	2	
		lose	C [0],	E [0]	
		gain	D [0]		
Change 9	:	stages	3 -->	4	
		lose	A [0],	C [0],	E [0]
		gain	F [0]		
Change 10	:	stages	4 -->	1	
		lose	F [0]		
		gain	B [0],	C [0]	
Change 11	:	stages	4 -->	2	
		lose	F [0]		
		gain	A [0],	D [0]	
Change 12	:	stages	4 -->	3	
		lose	F [0]		
		gain	A [0],	C [0],	E [0]

CHANGE CONDNS - FXT + VA
AAAAAAAAAAAAAAAAAAAAAAAAAA

STAGE 1

1 --> 4 Movement no. 7 (change no. 3) Regular maximum.

Demand	dF
Inhibit	dA + dD + dE
Extend	eB + eC

1 --> 3 Movement no. 8 (change no. 2) Regular maximum.

Demand	dE
Inhibit	dD
Extend	eB

1 --> 2 Movement no. 9 (change no. 1) Regular maximum.

Demand	dA + dD
Inhibit	f
Extend	eB + eC

STAGE 2

2 --> 1 Movement no. 16 (change no. 4) Regular maximum.

Demand	dB
Inhibit	dE + dF
Extend	eA + eD

2 --> 4 Movement no. 17 (change no. 6) Regular maximum.

Demand	dF
Inhibit	dC + dE
Extend	eA + eD

2 --> 3 Movement no. 18 (change no. 5) Regular maximum.

Demand	dC + dE
Inhibit	f
Extend	eD

STAGE 3

3 --> 2 Movement no. 25 (change no. 8) Regular maximum.

Demand	dD
Inhibit	dB + dF
Extend	eC + mF

3 --> 1 Movement no. 26 (change no. 7) Regular maximum.

Demand	dB
Inhibit	dF
Extend	eA + mF

3 --> 4 Movement no. 27 (change no. 9) Regular maximum.

Demand	dF
Inhibit	f
Extend	eA + eC + mF

STAGE 4

4 --> 3 Movement no. 34 (change no. 12) Regular maximum.

Demand	dA + dE & (dC + dE)
Inhibit	dB + dD
Extend	mnc

4 --> 2 Movement no. 35 (change no. 11) Regular maximum.

Demand	dA + dD
Inhibit	dB + dC
Extend	mnc

4 --> 1 Movement no. 36 (change no. 10) Regular maximum.

Demand	dB + dC
Inhibit	f
Extend	mnc

CHANGE CONDNS - CLF
AAAAAAAAAAAAAAAAAAAA

STAGE 1

1 --> 2 Movement no. 4 (change no. 1)

Demand cF2 & (cD2 + dA + dD)
Inhibit cF1
Extend f
Quit if inhibited or minima unexpired.

1 --> 3 Movement no. 5 (change no. 2)

Demand cF3 & (cD3 + dA + dE)
Inhibit cF1
Extend f
Quit if inhibited or minima unexpired.

1 --> 4 Movement no. 6 (change no. 3)

Demand cF4 & (cD4 + dF)
Inhibit cF1
Extend f
Quit if inhibited or minima unexpired.

STAGE 2

2 --> 3 Movement no. 13 (change no. 5)

Demand cF3 & (cD3 + dC + dE)
Inhibit cF2
Extend f
Quit if inhibited or minima unexpired.

2 --> 4 Movement no. 14 (change no. 6)

Demand cF4 & (cD4 + dF)
Inhibit cF2
Extend f
Quit if inhibited or minima unexpired.

2 --> 1 Movement no. 15 (change no. 4)

Demand	cF1 & (cD1 + dB + dC)
Inhibit	cF2
Extend	f

Quit if inhibited or minima unexpired.

STAGE 3

3 --> 4 Movement no. 22 (change no. 9)

Demand	cF4 & (cD4 + dF)
Inhibit	cF3
Extend	f

Quit if inhibited or minima unexpired.

3 --> 1 Movement no. 23 (change no. 7)

Demand	cF1 & (cD1 + dB)
Inhibit	cF3
Extend	f

Quit if inhibited or minima unexpired.

3 --> 2 Movement no. 24 (change no. 8)

Demand	cF2 & (cD2 + dD)
Inhibit	cF3
Extend	f

Quit if inhibited or minima unexpired.

STAGE 4

4 --> 1 Movement no. 31 (change no. 10)

Demand	cF1 & (cD1 + dB + dC)
Inhibit	cF4
Extend	f

Quit if inhibited or minima unexpired.

4 --> 2 Movement no. 32 (change no. 11)

Demand	cF2 & (cD2 + dA + dD)
Inhibit	cF4
Extend	f

Quit if inhibited or minima unexpired.

4 --> 3 Movement no. 33 (change no. 12)

Demand	cF3 & (cD3 + dA + dC + dE)
Inhibit	cF4
Extend	f

Quit if inhibited or minima unexpired.

CHANGE CONDNS - UTC
 AAAAAAAAAAAAAAAAAAAAAA

STAGE 1

1 --> 2 Movement no. 1 (change no. 1)

Demand	uF2
Inhibit	uF1
Extend	f

Quit if inhibited or minima unexpired.

1 --> 3 Movement no. 2 (change no. 2)

Demand	uF3
Inhibit	uF1
Extend	f

Quit if inhibited or minima unexpired.

1 --> 4 Movement no. 3 (change no. 3)

Demand	uF4
Inhibit	uF1
Extend	f

Quit if inhibited or minima unexpired.

STAGE 2

2 --> 3 Movement no. 10 (change no. 5)

Demand	uF3
Inhibit	uF2
Extend	f

Quit if inhibited or minima unexpired.

2 --> 4 Movement no. 11 (change no. 6)

Demand	uF4
Inhibit	uF2
Extend	f

Quit if inhibited or minima unexpired.

2 --> 1 Movement no. 12 (change no. 4)

Demand	uF1
Inhibit	uF2
Extend	f

Quit if inhibited or minima unexpired.

STAGE 3

3 --> 4 Movement no. 19 (change no. 9)

Demand	uF4
Inhibit	uF3
Extend	f

Quit if inhibited or minima unexpired.

3 --> 1 Movement no. 20 (change no. 7)

Demand	uF1
Inhibit	uF3
Extend	f

Quit if inhibited or minima unexpired.

3 --> 2 Movement no. 21 (change no. 8)

Demand	uF2
Inhibit	uF3
Extend	f

Quit if inhibited or minima unexpired.

STAGE 4

4 --> 1 Movement no. 28 (change no. 10)

Demand	uF1
Inhibit	uF4
Extend	f

Quit if inhibited or minima unexpired.

4 --> 2 Movement no. 29 (change no. 11)

Demand uF2
Inhibit uF4
Extend f
Quit if inhibited or minima unexpired.

4 --> 3 Movement no. 30 (change no. 12)

Demand uF3
Inhibit uF4
Extend f
Quit if inhibited or minima unexpired.

TIMETABLE DETAILS
AAAAAAAAAAAAAA

Entry	Time	Days of week	Function & Value	Calendar dependency
1	07:00	*MTWTF..	MAX 1	
2	00:00	.....	MAX 1	
3	00:00	.....	MAX 1	
4	00:00	.....	MAX 1	
5	09:00	*MTWTF..	MAX 2	
6	00:00	.....	MAX 2	
7	00:00	.....	MAX 2	
8	00:00	.....	MAX 2	
9	16:30	*MTWTF..	MAX 3	
10	00:00	.....	MAX 3	
11	00:00	.....	MAX 3	
12	00:00	.....	MAX 3	
13	18:30	*MTWTF..	MAX 1	
14	00:00	.....	MAX 1	
15	00:00	.....	MAX 1	
16	00:00	.....	MAX 1	
17	09:00	*.....S.	MAX 4	
18	00:00	.....	MAX 4	
19	00:00	.....	MAX 4	
20	00:00	.....	MAX 4	
21	19:00	*.....S.	MAX 1	
22	00:00	.....	MAX 1	
23	00:00	.....	MAX 1	

Entry	Time	Days of week	Function & Value	Calendar dependency
24	00:00	.....	MAX 1	
25	09:00	*.....S	MAX 4	
26	00:00	.....	MAX 4	
27	00:00	.....	MAX 4	
28	00:00	.....	MAX 4	
29	19:00	*.....S	MAX 1	
30	00:00	.....	MAX 1	
31	00:00	.....	MAX 1	
32	00:00	.....	MAX 1	
33	00:00	*.....	PLN 1	
34	00:00	.....	PLN 1	
35	00:00	.....	PLN 1	
36	00:00	.....	PLN 1	
37	00:00	*.....	PLN 2	
38	00:00	.....	PLN 2	
39	00:00	.....	PLN 2	
40	00:00	.....	PLN 2	
41	00:00	*.....	PLN 3	
42	00:00	.....	PLN 3	
43	00:00	.....	PLN 3	
44	00:00	.....	PLN 3	
45	00:00	*.....	PLN 4	
46	00:00	.....	PLN 4	
47	00:00	.....	PLN 4	

Entry	Time	Days of week	Function & Value	Calendar dependency
48	00:00	.....	PLN 4	
49	00:00	*.....	PLN 0	
50	00:00	.....	PLN 0	
51	00:00	.....	PLN 0	
52	00:00	.....	PLN 0	

CLF OPERATION
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Influence bits :-

```
-- -- -- -- -- -- -- -- cD4 cF4 cD3 cF3 cD2 cF2 cD1 cF1
```

Plan 1 Cycletime = 60 Offset = 0 Sync = t
 ÅÅÅÅÅÅÅ Call condition = p1 (adjusted daily)

Action No.	Action Time	Influence type	Influence stage	Influence Pattern			
1:	255	IM	1	xxxx	xxxx	0000	0011
2:	255	IM	2	xxxx	xxxx	0000	1100
3:	255	IM	3	xxxx	xxxx	0011	0000
4:	255	IM	4	xxxx	xxxx	1100	0000
5:	255	DD	1	xxxx	xxxx	0000	0001
6:	255	DD	2	xxxx	xxxx	0000	0100
7:	255	DD	3	xxxx	xxxx	0001	0000
8:	255	DD	4	xxxx	xxxx	0100	0000
9:	255	HO		xxxx	xxxx	0000	0000
10:	255			xxxx	xxxx	xxxx	xxxx
11:	255			xxxx	xxxx	xxxx	xxxx
12:	255			xxxx	xxxx	xxxx	xxxx
13:	255			xxxx	xxxx	xxxx	xxxx
14:	255			xxxx	xxxx	xxxx	xxxx
15:	255			xxxx	xxxx	xxxx	xxxx
16:	255			xxxx	xxxx	xxxx	xxxx

Plan 2 Cycletime = 60 Offset = 0 Sync = t
 ÅÅÅÅÅÅÅ Call condition = p2 (adjusted daily)

Action No.	Action Time	Influence type	Influence stage	Influence Pattern
1:	255	IM	1	xxxx xxxx 0000 0011
2:	255	IM	2	xxxx xxxx 0000 1100
3:	255	IM	3	xxxx xxxx 0011 0000
4:	255	IM	4	xxxx xxxx 1100 0000
5:	255	DD	1	xxxx xxxx 0000 0001
6:	255	DD	2	xxxx xxxx 0000 0100
7:	255	DD	3	xxxx xxxx 0001 0000
8:	255	DD	4	xxxx xxxx 0100 0000
9:	255	HO		xxxx xxxx 0000 0000
10:	255			xxxx xxxx xxxx xxxx
11:	255			xxxx xxxx xxxx xxxx
12:	255			xxxx xxxx xxxx xxxx
13:	255			xxxx xxxx xxxx xxxx
14:	255			xxxx xxxx xxxx xxxx
15:	255			xxxx xxxx xxxx xxxx
16:	255			xxxx xxxx xxxx xxxx

```

                                Influence bits :-
-- -- -- -- -- -- -- -- cD4 cF4 cD3 cF3 cD2 cF2 cD1 cF1

Plan 3  Cycletime = 60  Offset = 0      Sync = t
AAAAAA  Call condition = p3          (adjusted daily)

```

Action No.	Action Time	Influence type	stage	Influence Pattern
1:	255	IM	1	xxxx xxxx 0000 0011
2:	255	IM	2	xxxx xxxx 0000 1100
3:	255	IM	3	xxxx xxxx 0011 0000
4:	255	IM	4	xxxx xxxx 1100 0000
5:	255	DD	1	xxxx xxxx 0000 0001
6:	255	DD	2	xxxx xxxx 0000 0100
7:	255	DD	3	xxxx xxxx 0001 0000
8:	255	DD	4	xxxx xxxx 0100 0000
9:	255	HO		xxxx xxxx 0000 0000
10:	255			xxxx xxxx xxxx xxxx
11:	255			xxxx xxxx xxxx xxxx
12:	255			xxxx xxxx xxxx xxxx
13:	255			xxxx xxxx xxxx xxxx
14:	255			xxxx xxxx xxxx xxxx
15:	255			xxxx xxxx xxxx xxxx
16:	255			xxxx xxxx xxxx xxxx

```

Plan 4  Cycletime = 60  Offset = 0      Sync = t
AAAAAA  Call condition = p4          (adjusted daily)

```

Action No.	Action Time	Influence type	stage	Influence Pattern
1:	255	IM	1	xxxx xxxx 0000 0011
2:	255	IM	2	xxxx xxxx 0000 1100
3:	255	IM	3	xxxx xxxx 0011 0000
4:	255	IM	4	xxxx xxxx 1100 0000
5:	255	DD	1	xxxx xxxx 0000 0001
6:	255	DD	2	xxxx xxxx 0000 0100
7:	255	DD	3	xxxx xxxx 0001 0000
8:	255	DD	4	xxxx xxxx 0100 0000
9:	255	HO		xxxx xxxx 0000 0000
10:	255			xxxx xxxx xxxx xxxx
11:	255			xxxx xxxx xxxx xxxx
12:	255			xxxx xxxx xxxx xxxx
13:	255			xxxx xxxx xxxx xxxx
14:	255			xxxx xxxx xxxx xxxx
15:	255			xxxx xxxx xxxx xxxx
16:	255			xxxx xxxx xxxx xxxx

HURRY-CALL DETAILS
AAAAAAAAAAAAAAAAAAAA

OTU INTERFACE
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Control bits are active closed
Reply bits are active open

```
Timeout for stuck force bits = 200
```

[illegible]

LAMP MONITORING
 AAAAAAAAAAAAAA

Sn = n channels safety red monitor (and maintenance monitor other colours).
 M = one channel of maintenance monitor only.
 U = 1+ un-monitored channel(s). X = amber/wait toroid absent.

Phase	Option	Phase	Option	Phase	Option	Phase	Option
AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA
A	M	B	M	C	M	D	M

SPECIAL EVENTS
 AAAAAAAAAAAAAA

Event name	Pulse ?	Event number	Up-ramp time	Down-ramp time
AA				
won	N	2	0.25	0
FLASH1	N	13	0.5	0.5
FLASH2	N	14	1	1
INEXT	N	18	0	4
iABM69EB	N	19	8	10
TOGGLE	Y	32	0	2
dF	N	39	10	0
dE	N	40	10	0
lfl	N	45	0.25	0.25
utcm	N	49	0	0.25
diminput	N	50	60	2
MOVA30	Y	72	10	2
MOVA64	N	90	0	15
MOVA63	Y	91	12	2
MOVA61	Y	93	6	2

DIGITAL INPUTS AAAAAAAAAAAAAAAA

Input name	Input address	Active state
AA		
iAam69cir	card 2 input 1	closed (1)
iAbm69eb	card 2 input 2	closed (1)
iAca5cir	card 2 input 3	closed (1)
iADA5SB	card 2 input 4	closed (1)
iSW1	card 2 input 5	closed (1)
iSW2	card 2 input 6	closed (1)
iMOVAA	card 2 input 7	closed (1)
iMOVAC	card 2 input 8	closed (1)

DIGITAL OUTPUTS AAAAAAAAAAAAAAAA

Types: CO = contact, LV = 24Vdc, AC = 240Vac, DM = dimmable mains
LK = pelican link (contact), SP = SDE/SA phase green (contact)
HC = hurrycall confirm (contact)

Driving condition	Output address	Type	Active state
AA			
MOVA30	card 1 output 1	CO	High / closed
BBB4109	card 1 output 2	CO	High / closed
BBB4109	card 1 output 3	CO	High / closed
BDM69WB	card 1 output 4	CO	High / closed
MOVA61	card 1 output 5	CO	High / closed
MOVA62	card 1 output 6	CO	High / closed
MOVA63	card 1 output 7	CO	High / closed
MOVA64	card 1 output 8	CO	High / closed
MOVAON	card 1 output 9	CO	High / closed
MOVA61	card 1 output 10	CO	High / closed
MOVA62	card 1 output 11	CO	High / closed
MOVA63	card 1 output 12	CO	High / closed
MOVA64	card 1 output 13	CO	High / closed
MOVA29	card 1 output 14	CO	High / closed
MOVA28	card 1 output 15	CO	High / closed
MOVA27	card 1 output 16	CO	High / closed
MOVA26	card 2 output 1	CO	High / closed

LONG-TERM TIMERS
 AAAAAAAAAAAAAAAAAA

No	Period	Initialising condition	Enabling condition
AA			
1	0:02:00	%ltrs1	%ltrn1
2	0:01:00	%ltrs2	Mova62
3	0:01:00	%ltrs3	Mova64
16	24:00:00	%dimoff	%dimon

EVENT FORMULAE
 AAAAAAAAAAAAAAAAAA

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
2	won	= -f
3	%bo	= bo
4	woff	= woff + won.F & -won & -off
5	okoff	= gA & -smA & gC & -smC & gE & -smE
6	off	= okoff & woff + (sr & -won) + off & -won.R # %bo.R
7	uF1	= [39: 80H] & uTC
8	uF2	= [39: 40H] & uTC
9	uF3	= [39: 20H] & uTC
10	uF4	= [39: 10H] & uTC
11	NODEM1	= -(id1+id3+id5+id6) & -(id10+id12+id14+id15) & -id18
12	NODEM2	= -(id20+id21+id23) & -(id25+id27+id28)
13	FLASH1	= -FLASH1
14	FLASH2	= -FLASH2
15	STATE1	= mU & -(iMOVAA+iMOVAC)
16	STATE2	= iMOVAA & (-mU & -iMOVAC)

no.	Event name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		

17	STATE3	= iMOVAC & (-mU & -iMOVAA)
----	--------	----------------------------

18	INEXT	= id2+id4
----	-------	-----------

19	iABM69EB	= iAbm69eb
----	----------	------------

20		= ltx1
----	--	--------

21	uD2	= uF2 & uTC
----	-----	-------------

22	dA	= dpA + mMF
----	----	-------------

23	uD3	= uF3 & uTC
----	-----	-------------

24	eA	= epA + mF
----	----	------------

25	uD4	= uF4 & uTC
----	-----	-------------

26	uSPACE1	= [39: 8H] & uTC
----	---------	------------------

27	gA	= gA
----	----	------

28	gB	= gB
----	----	------

29	gC	= gC
----	----	------

30	gD	= gD
----	----	------

31	qG1G2	= lof + off
----	-------	-------------

32	TOGGLE	= <ltx1>.R
----	--------	------------

33	dB	= dpB + mMF
----	----	-------------

34	eB	= epB + mF
----	----	------------

35	FULLON	= mU & iMOVAA & iMOVAC
----	--------	------------------------

36	FLASHF	= mU & iMOVAA + (mU & iMOVAC) + (iMOVAA & iMOVAC) & FLASH1
----	--------	---

37	FLASHS	= STATE1 + STATE2 + STATE3 & FLASH2
----	--------	-------------------------------------

38	ALLRED	= NODEM1 & NODEM2
----	--------	-------------------

39	dF	= NODEM1 & NODEM2 & mV & sw1
----	----	------------------------------

40	dE	= NODEM1 & NODEM2 & mV & -sw1
----	----	-------------------------------

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
41	dC	= dpC + mMF
42	eC	= epC + mF
43	dD	= dpD + mMF
44	eD	= epD + mF
45	lf1	= -lf1 & lf
46	Mova62	= iAda5sb & -sw2 + ((iAda5sb & INEXT) & sw2)
47	Mova64	= iABM69EB & -sw4 + ((iABM69EB & INEXT) & sw4)
48	uD1	= uF1 & uTC
49	utcm	= zfdx
50	diminput	= iss
51		= dd17
52		= dd19
53		= dd9
54		= dd11
55		= dd13
56		= dd29
57		= dd2
58		= dd4
59	zutc	= utcm & -(bf+bv+bm) & uTC
60	tPL3	= tpl3
61	qG1	= s1 & gB & gC + qG1G2
62	qG2	= s2 & gA & gD + qG1G2
63	%ltrs1	= <ltxl>.R
64	%ltrn1	= -mU

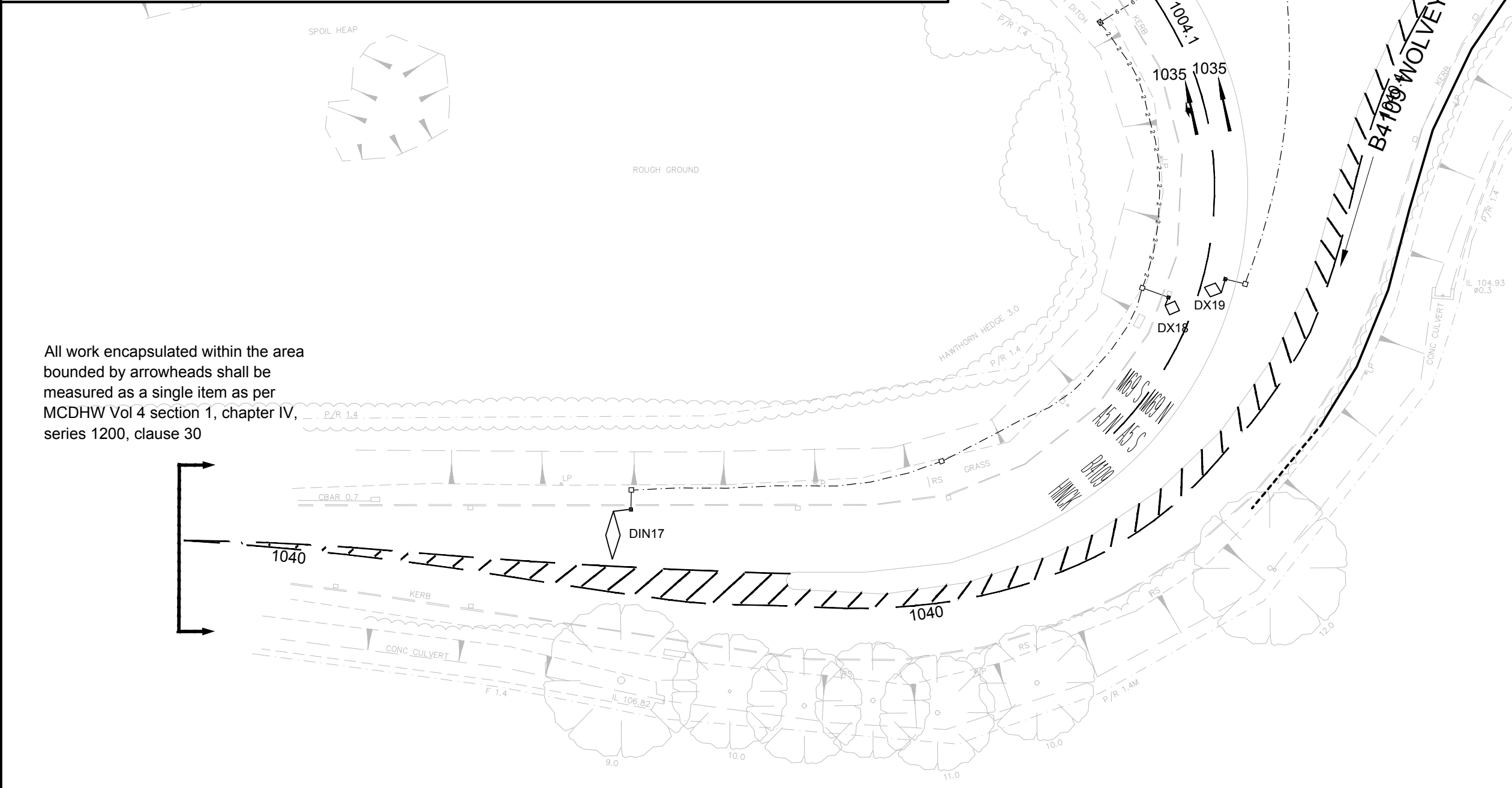
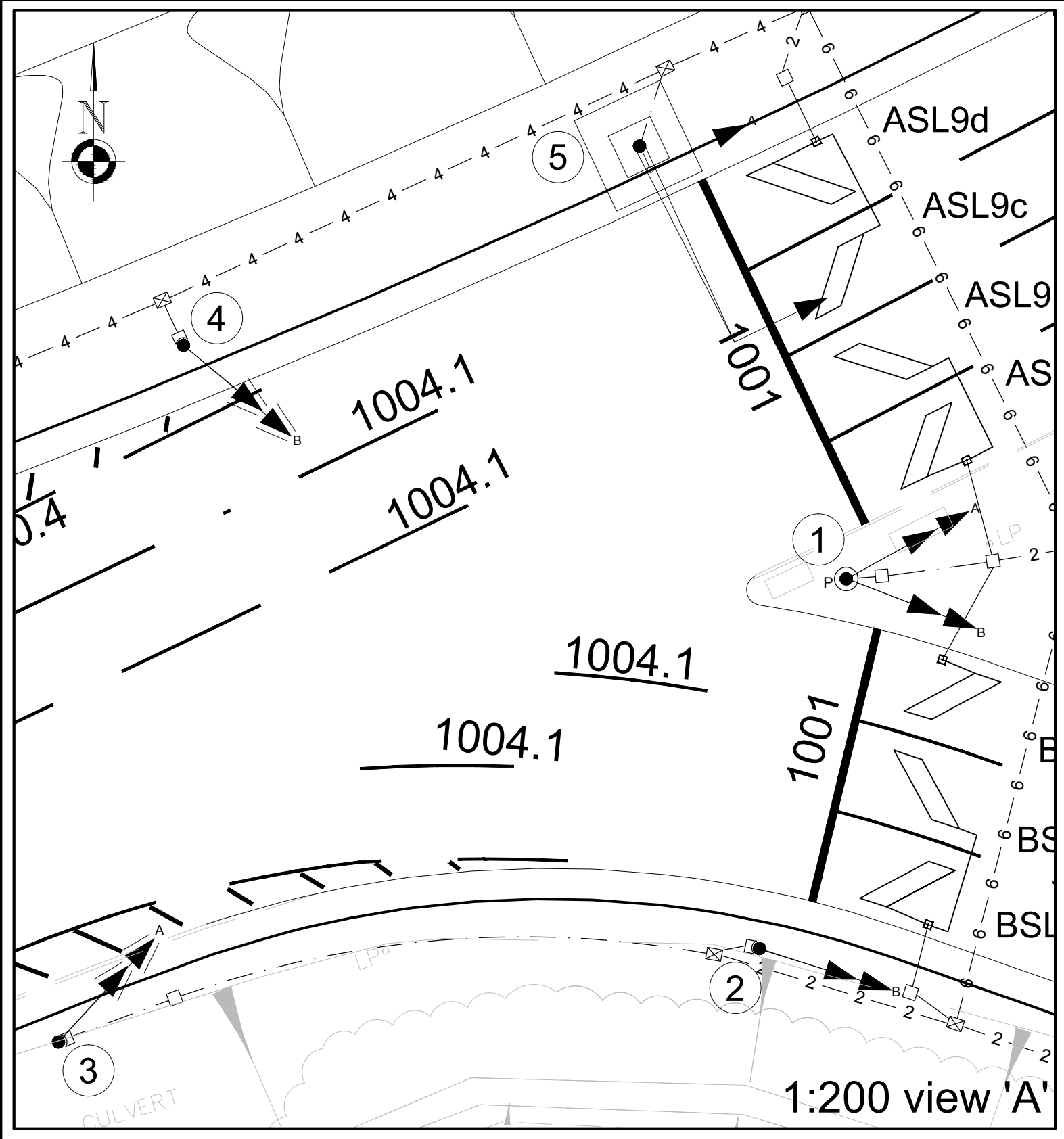
Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
65	%ltrs2	= -Mova62
66	%ltrs3	= -Mova64
67	MOVAON	= FULLON + FLASHF + FLASHS
68	MOVA29	= <dd17>.R & -dt17 + (<dd19>.R & -dt19) + iSW1
69	MOVA28	= <dd9>.R & -dt9 + (<dd11>.R & -dt11) + (<dd13>.R & -dt13)
70	MOVA26	= <dd29>.R & -dt29 + iSW2
71	MOVA27	= <dd2>.R & -dt2 + (<dd4>.R & -dt2) + iSW1
72	MOVA30	= ALLRED
73	NOTNORM	= mMC + bf+bv+bm + off + lof + TOGGLE
74	tPL4	= tpl4
75	cF1	= cF1
76	cF2	= cF2
77	cF3	= cF3
78	cF4	= cF4
79	%dimoff	= -iss + sr
80	%dimon	= iss
81	dimdrive	= diminput & -ltx16 & -sw32
82	df1	= df + bt # 1f1
83	uTC	= uTC
84	wA	= dpA
85	wB	= dpB
86	wC	= dpC
87	wD	= dpD
88	BBB4109	= gA.F + BBB4109 & -gB.F

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAA		
89	BDM69WB	$= gC.F + BDM69WB \ \& \ -gD.F$
90	MOVA64	$= Mova64 \ \& \ -ltx3$
91	MOVA63	$= iAbm69eb$
92	MOVA62	$= Mova62 \ \& \ -ltx2$
93	MOVA61	$= iAda5sb$
94	qSPACE3	$= uSPACE1 + iAam69cir$
95	qSPACE2	$= uSPACE1 + iAca5cir$
96	qG3	$= s3 \ \& \ gA \ \& \ gC \ \& \ gE$
97	mnc	$= mF$
98	zhc	$= hfh \ \& \ -(bf+bv+bm)$
99	qG4	$= s4 \ \& \ gF$
100	%cd042	$= cF2 \ \& \ (cD2 + dA + dD)$
101	%cd013	$= cF3 \ \& \ (cD3 + dA + dE)$
102	%cd034	$= cF4 \ \& \ (cD4 + dF)$
103	%vd042	$= dA + dD$
104	%vi014	$= dA + dD + dE$
105	%ve014	$= eB + eC$
106	%cd023	$= cF3 \ \& \ (cD3 + dC + dE)$
107	%cd041	$= cF1 \ \& \ (cD1 + dB + dC)$
108	%vi024	$= dC + dE$
109	%vi021	$= dE + dF$
110	%ve024	$= eA + eD$
111	%cd031	$= cF1 \ \& \ (cD1 + dB)$
112	%cd032	$= cF2 \ \& \ (cD2 + dD)$

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
113	%vi032	= dB + dF
114	%ve032	= eC + mF
115	%ve031	= eA + mF
116	%ve034	= eA + eC + mF
117	%cd043	= cF3 & (cD3 + dA + dC + dE)
118	%vi042	= dB + dC
119	%vd043	= dA + dE & (dC + dE)
120	%vi043	= dB + dD
121	zman	= bm
122	zclf	= -tp10 & -(bf+bv)
123	zva	= -bf
124	tPL1	= tp11
125	tPL2	= tp12
126	qSD1	= uD1 & utcm + (dB & -gB) + (dC & -gC)
127	qSD2	= uD2 & utcm + (dA & -gA) + (dD & -gD)
128	qSD3	= uD3 & utcm + (dA & -gA) + (dC & -gC) + (dE & -gE)
129	qSD4	= uD4 & utcm + (dF & -gF)

COMMENTS ON CONFIGURATION
AAAAAAAAAAAAAAAAAAAAAAAAAAAA

V01: Final On F.A.T 9/8/2007
V02: Chainges to MOVA 61,62,63 and 64 outputs
Phases In Stages. Remove Hurry Calls
New F.A.T 10/3/2011
sw4 = Mova64 switch on to use EXT condition
sw2 = Mova62 switch on to use EXT condition
sw1 = VA Revert ON = AllRed OFF = Cir.
LED1 = MOVA61
LED2 = MOVA62
LED3 = MOVA63
LED4 = MOVA64
V03: Chainges to Manual Panel LEDS 10/03/2011
V04: New Output BABB4109 for new link to Controller A
+ Upramp and downramp timers Changed
+ OtherMOVA linking outputs changed. 13/6/2011
V05: Add ram changes 8/2/12



(Paragraph 130) (Regulation 13(2)(b)) Construction (Design & Management) Regulations 1994

In accordance with paragraph 131 of HSG224, the Approved Code of Practice to the Construction (Design and Management) Regulations 1994 - 2000, we believe there are no residual hazards which, in our opinion, would not be "Obvious" to a Competent Contractor (those which are classed as "Unusual" or "Likely to be Difficult to Manage").

Risks where information is available at this stage of the design have been taken into account in preparation of the indicative design. Possible revisions to the design are subject to further information and associated Risk Assessment.

This map is based on Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationary Office. © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways Agency 100018028, 2005.

KEY: NEW ROAD MARKINGS				
MARKING	TSRGD dia.	>=50mph module	>=50mph module where (*) shown	Cycle module
1001	300mm width			
1003.1	300mm width			
1004.1	100mm width 6000mm length	150mm width 6000mm length		
1010	150mm width 1000mm length			
1012.1	100mm width	150mm width		
1035	6000mm arrows 2800mm text			
1040 1041 1040.4 1041.1	Dia. 1004.1 lines 150mm diags			

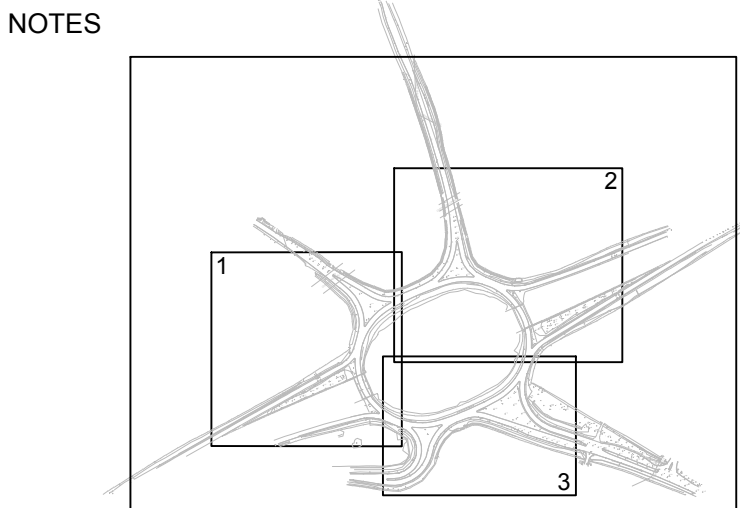
KEY

- 114/168mm dia. bell shape signal pole and pole retention socket with associated pole number
- 168mm dia. passive signal pole and concrete pole retention socket with associated pole number
- Mast arm (outreach of 8.5m) with associated pole number
- 2x Primary LED signal head with associated phase letter (on the lower head) on a 6m pole
- 2x Secondary LED signal head with associated phase letter (on the lower head) on a 6m pole
- Primary LED signal head on a 1m extension bracket
- Signal controller / termination cabinet with hardstanding area

- Electricity supply mini-pillar
- Detector haldo-pillar
- MOVA detector loop
- Queue detector loop
- Stop line detector loop
- Carriageway loop connection box with 50mm diameter duct
- 750mm x 750mm signal access chamber with drainage hole and free draining material beneath
- 600mm x 600mm signal joint chamber with drainage hole and free draining material beneath
- 100mm diameter orange cable duct
- Multiple 100mm diameter cable duct

Detector Locations: Controller C	
Detector	Distance from Stop Line (m)
AIN1	69m
AIN3	69m
AIN5	69m
AIN7	69m
AX2	39m
AX4	39m
AX6	39m
AX8	39m
ASL9a,b,c,d	3m
BIN10	109m
BIN12	109m
BIN14	109m
BX11	39m
BX13	39m
BX15	39m
BSL16a,b,c	3m
DIN17*	127m
DX18*	55m
DX19*	49m

N.B.
Loops marked with * are to be terminated in Termination haldo pillar.



- NOTES
- All dimensions in millimetres unless stated otherwise.
 - The accuracy of this drawing cannot be guaranteed for setting out purposes.
 - Diagram above shows sheet layouts. Refer to drawing numbers 11/06012/H/12/01.1 & 01.2 for sheets 2 & 3.
 - References shall be made to the following contract drawing numbers:
11/06012/H/04/01.0-01.2 for safety barrier layout.
11/06012/H/11/01.0-01.2 for kerb alignment layout.
11/06012/H/07/02.0-02.2 for high friction surfacing.
11/06012/H/12/03.0-03.2 for road marking layout.
11/06012/H/12/01.3 for mast arm foundation detail.
11/06012/H/12/02.0-02.2 for signing layout.
11/06012/H/11/01.0-01.2 & 02.0 for maintenance bay detail.
 - Stop lines to be located 1.0m from the centre line of the primary signal pole.
 - MOVA loop and signal pole positions are to be agreed on site with signal design engineer.
 - All ducting to be 100mm except between joint chambers and carriageway loop connection boxes which shall be 50mm.
 - All loops are to be fed into a carriageway loop connection box. Each loop shall be cut into a separate slot.
 - All signal heads are to be LED.
 - References should be made to the following Highway Construction Detail Drawings:
Dwg G25 for carriageway loop connection boxes.
Dwg G27 for the installation of stop line loops.
Dwg G28 for the installation of queue loops.
Dwg G32 for the installation of MOVA loops.
 - Refer to appendix 12/5 for traffic signal installation requirements and to appendix 5/2 for traffic signal ducting/chamber installation requirements.
 - Kerb drain cable loop units (Type ACO KD480CL) are to be installed so as to coincide with proposed loop positions. Refer to dwg 11/06012/H/11/01.0-01.2.
 - Refer to Appendix 7/2 for c/w trench reinstatement details.

A	Remove DX20 Loop	NH	TH	CH	18 May 2007
Rev	Description	By	Chk'd	App	Date



OPTIMA
INFRASTRUCTURE MANAGEMENT
Galena Close, Amington, Tamworth, Staffordshire, B77 4AS
Tel: 01827 313 313 Fax: 01827 313 113 e-mail: enquires@optima-im.com

Project
AREA 11 MAC CONTRACT

Title
**A5 / M69 SIGNALISATION
Traffic Signal Installation - Sheet 3 of 3**

Scale	Drawn	Date	Checked	Date	Approved	Date
1:500	EA	01-06-06	TH	16-06-06	AD	14-09-06

Office	Project No.	Drawing No.	Revision
11	06012	H/12/01.2	A

Status
PRELIMINARY ☐ DETAILED ☐ CONTRACT ☒ AS BUILT ☐

3

CUSTOMER DOCUMENTATION
AAAAAAAAAAAAAAAAAAAAAAAA

Project :- T04730 Version :- 03 Date :- 10-Feb-12
AA

Customer :- Aone+
AAAAAAAAAAAAAAAAAAAA

Site :- M69 J1/A5 Controller C
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

Engineer :- Alan Solaini
AAAAAAAAAAAAAAAAAAAA
Telephone :- 01623 886611
AAAAAAAAAAAAAAAAAAAA

Produced by
AAAAAAAAAAAA
Version 4.07.007 (14-Dec-04)
AAAAAAAAAAAAAAAAAAAA

MISCELLANEOUS DETAILS
AAAAAAAAAAAAAAAAAAAA

Coded by PH

Special features :- 8 Phase Mova

Country :-	44R	Mains :-	50Hz
Manually selected modes revert on police-panel door closure ?	N	Dimming :-	160V
Need date/time on cold start ?	N	Starting i/g :-	8

LSM #1 is dimmable.

This database has the following integral facilities:-

(none)

Mode Priorities
AAAAAAAAAAAAAAAA

- 1 Manual
- 2 VA (manually selected)
- 3 Fixed Time (manually selected)
- 4 UTC - - - - "TS" sets time to 12:00:00
- 5 Hurry-call
- 6 Cableless Linking
- 7 VA (automatically selected)

SITE LAYOUT
AAAAAAAAAAAA

```
Stage stream 1
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Stage      Phases
```

Start_up stage in each stream is marked thus *.

STAGE SEQS: FXT+VA+CLF+MAN
 ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Y = permitted move, Ya = extra i/g on max change, Yx = extra i/g on max change if extended, Ys = Conditional movement.

```

Stream 1
ÄÄÄÄÄÄÄÄ
      3      To
From 3      1      2      3
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
      1      3      -      Y      Y
      3
      2      3      Y      -      Y
      3
      3      3      Y      Y      -
      3

```

MANUAL BUTTON INFORMATION
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

[illegible]

All-Red	3	E,	F	
1	1	A,	C,	G
2	2	B,	D	
3	Ä			
4	Ä			
5	Ä			
6	Ä			
7	Ä			
8	Ä			

DETECTOR DETAILS

Types :- I = internal pack, X = external/ped button, Z = dummy
O/C = normally open/closed, P = p.d. on 9/18 hr fault

Functions :- R = regular loop, P/B = ped btn without/with "WAIT"
M = MOVA, S/T = SCOOT Occupancy/Count, Q = queue
V = speed, K/W = puffin kerbside/crossing, Z = dummy
L = latching, N = non-latching (call/cancel)
U = unidirectional, H = vehicle priority, J = SPRINT

No	Title	Type	Func	Phase/stg		Timings		Special	
				dem	ext	cal	can	ext	dfm
AA									

19	DX 19	IO-	RL-	D	10	**
20	DUMMY CX	ZO-	RL-	C	10	**

Suppress PD on presence fault

ENHANCED MON.	Regular & alt.		Conditions for inhibition
No	Title	pres abs ?	and alternative timings
AA			

1	AIN 1	reg: 5 18	inh:
		alt:	N alt:
2	AX 2	reg: 120 18	inh:
		alt:	N alt:
3	AIN 3	reg: 5 18	inh:
		alt:	N alt:
4	AX 4	reg: 120 18	inh:
		alt:	N alt:
5	AIN 5	reg: 5 18	inh:
		alt:	N alt:
6	AX 6	reg: 120 18	inh:
		alt:	N alt:
7	AIN 7	reg: 5 18	inh:
		alt:	N alt:
8	AX 8	reg: 120 18	inh:
		alt:	N alt:
9	ASL9A,B,C,D	reg: 120 18	inh:
		alt:	N alt:
10	BIN 10	reg: 5 18	inh:
		alt:	N alt:
11	BX 11	reg: 120 18	inh:
		alt:	N alt:
12	BIN 12	reg: 5 18	inh:
		alt:	N alt:
13	BX 13	reg: 120 18	inh:
		alt:	N alt:
14	BIN 14	reg: 5 18	inh:
		alt:	N alt:
15	BX 15	reg: 120 18	inh:
		alt:	N alt:

		Suppress PD on presence fault			
ENHANCED MON.	Regular & alt.	Conditions for inhibition			
No	Title	pres	abs	?	and alternative timings
AA					
16	BSL 16 A,B,C	reg: 120	18		inh:
		alt:		N	alt:
17	DIN 17	reg: 5	18		inh:
		alt:		N	alt:
18	DX 18	reg: 5	18		inh:
		alt:		N	alt:
19	DX 19	reg: 5	18		inh:
		alt:		N	alt:
20	DUMMY CX	reg: 5	18		inh:
		alt:		N	alt:

No	Title	Dummy condition / Input address	Wait-Lamp or Test- Pulse accessed as
AA			
1	AIN 1	card 1 input 1	
2	AX 2	card 1 input 2	
3	AIN 3	card 1 input 3	
4	AX 4	card 1 input 4	
5	AIN 5	card 1 input 5	
6	AX 6	card 1 input 6	
7	AIN 7	card 1 input 7	
8	AX 8	card 1 input 8	
9	ASL9A,B,C,D	card 1 input 9	
10	BIN 10	card 1 input 10	
11	BX 11	card 1 input 11	
12	BIN 12	card 1 input 12	
13	BX 13	card 1 input 13	
14	BIN 14	card 1 input 14	
15	BX 15	card 1 input 15	
16	BSL 16 A,B,C	card 1 input 16	
17	DIN 17	card 1 input 17	
18	DX 18	card 1 input 18	
19	DX 19	card 1 input 19	
20	DUMMY CX	id18+id19+id17	

PHASE DETAILS
 ÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Types :- D = dummy, F = Full traffic, I/A = Indicative or Filter Arrow (ends in bkout/flashing green), V = Vehicle in ped stream, W = ped With traffic, M = MCE0145 ped, L/U = peLican/pUffin ped, N/T = Near or far-sided Toucan bicycle, X = far-sided pedestrian

Phase	Type	Related Colour phase option	Appearance depends on demand :-	Terminates on
A	F	1	Always appears	End of stage
B	F	1	Always appears	End of stage
C	D	1	Before/in stage	End of stage
D	D	1	Before/in stage	End of stage
E	D	1	Always appears	End of stage
F	D	1	Always appears	End of stage
G	D	1	Always appears	End of stage

Phase	minimum green	blackout/flash	maximum greens
A	7 (7)		40 40 40 40
B	7 (7)		20 20 20 20
C	2 (2)		0 0 0 0
D	2 (2)		0 0 0 0
E	3 (3)		0 0 0 0
F	3 (3)		0 0 0 0
G	3 (3)		0 0 0 0

Phase	location	minimum red
A	Circ at A5 N BND	2 (2)
B	A5 N BND	2 (2)
C	Dummy IGN A	2 (2)
D	Dummy IGN B	2 (2)
E	Dummy E CALL 3	2 (2)
F	Dummy F CALL RED	2 (2)
G	Dummy G Rev	2 (2)

PHASE INTERGREEN DETAILS
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

[illegible]

```
Change 1 :      stages      1 -->  2
           lose      A [0],   C [0],   G [0]
           gain      B [0],   D [0]

Change 2 :      stages      1 -->  3
           lose      A [0],   C [0],   G [0]
           gain      E [0],   F [0]

Change 3 :      stages      2 -->  1
           lose      B [0],   D [0]
           gain      A [0],   C [0],   G [0]

Change 4 :      stages      2 -->  3
           lose      B [0],   D [0]
           gain      E [0],   F [0]

Change 5 :      stages      3 -->  1
           lose      E [0],   F [0]
           gain      A [0],   C [0],   G [0]

Change 6 :      stages      3 -->  2
           lose      E [0],   F [0]
           gain      B [0],   D [0]
```

STAGE 1

Demand	$mMF + dF$
Inhibit	$dB + dD$
Extend	$eA + mF$

Demand	$dB + dD$
Inhibit	f
Extend	$eA + mF$

STAGE 2

2 --> 1 Movement no. 9 (change no. 3) Regular maximum.

Demand	$dA + dC + dG$
Inhibit	$mMF + dF$
Extend	$eB + mF$

2 --> 3 Movement no. 10 (change no. 4) Regular maximum.

Demand	$mMF + dF$
Inhibit	f
Extend	$eB + mF$

STAGE 3

3 --> 2 Movement no. 15 (change no. 6) Regular maximum.

Demand	$dB + dD$
Inhibit	$dA + dC + dG$
Extend	mnc

3 --> 1 Movement no. 16 (change no. 5) Regular maximum.

Demand	$dA + dC + dG$
Inhibit	f
Extend	mnc

CHANGE CONDNS - CLF
AAAAAAAAAAAAAAAAAAAA

STAGE 1

1 --> 2 Movement no. 3 (change no. 1)

Demand	$cF2 \text{ \& } (cD2 + dB + dD)$
Inhibit	$cF1$
Extend	f

Quit if inhibited or minima unexpired.

STAGE 2

2 --> 1 Movement no. 8 (change no. 3)

Demand	cF1 & (cD1 + dA + dC + dG)
Inhibit	cF2
Extend	f

Quit if inhibited or minima unexpired.

STAGE 3

3 --> 1 Movement no. 13 (change no. 5)

Demand	cF1 & (cD1 + dA + dC + dG)
Inhibit	f
Extend	f

Quit if inhibited or minima unexpired.

3 --> 2 Movement no. 14 (change no. 6)

Demand	cF2 & (cD2 + dB + dD)
Inhibit	f
Extend	f

Quit if inhibited or minima unexpired.

CHANGE CONDNS - UTC
AAAAAAAAAAAAAAAAAAAA

STAGE 1

1 --> 2 Movement no. 1 (change no. 1)

Demand	uF2
Inhibit	uF1
Extend	f

Quit if inhibited or minima unexpired.

1 --> 3 Movement no. 2 (change no. 2)

Demand	uF3
Inhibit	uF1
Extend	f

Quit if inhibited or minima unexpired.

STAGE 2

2 --> 3 Movement no. 6 (change no. 4)

Demand uF3
Inhibit uF2
Extend f
Quit if inhibited or minima unexpired.

2 --> 1 Movement no. 7 (change no. 3)

Demand uF1
Inhibit uF2
Extend f
Quit if inhibited or minima unexpired.

STAGE 3

3 --> 1 Movement no. 11 (change no. 5)

Demand uF1
Inhibit uF3
Extend f
Quit if inhibited or minima unexpired.

3 --> 2 Movement no. 12 (change no. 6)

Demand uF2
Inhibit uF3
Extend f
Quit if inhibited or minima unexpired.

ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

[illegible]

Entry	Time	Days of week	Function & Value	Calendar dependency
24	00:00	.....	MAX 1	
25	09:00	*.....S	MAX 4	
26	00:00	.....	MAX 4	
27	00:00	.....	MAX 4	
28	00:00	.....	MAX 4	
29	19:00	*.....S	MAX 1	
30	00:00	.....	MAX 1	
31	00:00	.....	MAX 1	
32	00:00	.....	MAX 1	
33	00:00	*.....	PLN 1	
34	00:00	.....	PLN 1	
35	00:00	.....	PLN 1	
36	00:00	.....	PLN 1	
37	00:00	*.....	PLN 2	
38	00:00	.....	PLN 2	
39	00:00	.....	PLN 2	
40	00:00	.....	PLN 2	
41	00:00	*.....	PLN 3	
42	00:00	.....	PLN 3	
43	00:00	.....	PLN 3	
44	00:00	.....	PLN 3	
45	00:00	*.....	PLN 4	
46	00:00	.....	PLN 4	
47	00:00	.....	PLN 4	

Entry	Time	Days of week	Function & Value	Calendar dependency
48	00:00	.....	PLN 4	
49	00:00	*.....	PLN 0	
50	00:00	.....	PLN 0	
51	00:00	.....	PLN 0	
52	00:00	.....	PLN 0	


```

                                Influence bits :-
-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- cD2 cF2 cD1 cF1

Plan 3  Cycletime = 60  Offset = 0      Sync = t
AAAAAA  Call condition = p3          (adjusted daily)

```

Action No.	Action Time	Influence type	stage	Influence Pattern
1:	255	IM	1	xxxx xxxx xxxx 0011
2:	255	IM	2	xxxx xxxx xxxx 1100
3:	255	DD	1	xxxx xxxx xxxx 0001
4:	255	DD	2	xxxx xxxx xxxx 0100
5:	255	HO		xxxx xxxx xxxx 0000
6:	255	HO		xxxx xxxx xxxx 0000
7:	255			xxxx xxxx xxxx xxxx
8:	255			xxxx xxxx xxxx xxxx
9:	255			xxxx xxxx xxxx xxxx
10:	255			xxxx xxxx xxxx xxxx
11:	255			xxxx xxxx xxxx xxxx
12:	255			xxxx xxxx xxxx xxxx
13:	255			xxxx xxxx xxxx xxxx
14:	255			xxxx xxxx xxxx xxxx
15:	255			xxxx xxxx xxxx xxxx
16:	255			xxxx xxxx xxxx xxxx

```

Plan 4  Cycletime = 60  Offset = 0      Sync = t
AAAAAA  Call condition = p4          (adjusted daily)

```

Action No.	Action Time	Influence type	stage	Influence Pattern
1:	255	IM	1	xxxx xxxx xxxx 0011
2:	255	IM	2	xxxx xxxx xxxx 1100
3:	255	DD	1	xxxx xxxx xxxx 0001
4:	255	DD	2	xxxx xxxx xxxx 0100
5:	255	HO		xxxx xxxx xxxx 0000
6:	255	HO		xxxx xxxx xxxx 0000
7:	255			xxxx xxxx xxxx xxxx
8:	255			xxxx xxxx xxxx xxxx
9:	255			xxxx xxxx xxxx xxxx
10:	255			xxxx xxxx xxxx xxxx
11:	255			xxxx xxxx xxxx xxxx
12:	255			xxxx xxxx xxxx xxxx
13:	255			xxxx xxxx xxxx xxxx
14:	255			xxxx xxxx xxxx xxxx
15:	255			xxxx xxxx xxxx xxxx
16:	255			xxxx xxxx xxxx xxxx

HURRY-CALL DETAILS
AAAAAAAAAAAAAAAA

OTU INTERFACE
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Control bits are active closed
Reply bits are active open

```
Timeout for stuck force bits = 200
```

3	Bit	3	Control Word	3	Reply Word	3	
3		3		3		3	
3	1	3	F1UM card 2 input 32	3	G1 card 2 output 16	3	
3		3		3		3	
3	2	3	F2UM card 2 input 31	3	G2 card 2 output 15	3	
3		3		3		3	
3	3	3	F3UM card 2 input 30	3	G3 card 2 output 14	3	
3		3		3		3	
3	4	3	.. not assigned	3	SD1 card 2 output 13	3	
3		3		3		3	
3	5	3	.. not assigned	3	SD2 card 2 output 12	3	
3		3		3		3	
3	6	3	.. not assigned	3	SD3 card 2 output 11	3	
3		3		3		3	
3	7	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	8	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	9	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	10	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	11	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	12	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	13	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	14	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	15	3	.. not assigned	3	.. not assigned	3	
3		3		3		3	
3	16	3	TC card 2 input 29	3	CRB card 2 output 10	3	

LAMP MONITORING
 AAAAAAAAAAAAAA

Sn = n channels safety red monitor (and maintenance monitor other colours).
 M = one channel of maintenance monitor only.
 U = 1+ un-monitored channel(s). X = amber/wait toroid absent.

Phase Option	Phase Option	Phase Option	Phase Option
AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAA
A M	B M		

SPECIAL EVENTS
 AAAAAAAAAAAAAA

Event name	Pulse ?	Event number	Up-ramp time	Down-ramp time
AA				
won	N	2	0.25	0
FLASH1	N	7	0.5	0.5
FLASH2	N	10	1	1
NODET	N	11	10	0
INEXT	N	13	0	4
iBDM69WB	N	14	8	18
iBBB4109	N	15	0	10
TOGGLE	Y	18	0	2
diminput	N	23	60	2
utcm	N	34	0	0.25
lfl	N	35	0.25	0.25
CDB4109	N	57	5	2
MOVA21	Y	66	0	2
MOVA22	Y	67	0	2
MOVA24	Y	69	0	2
MOVA63	Y	75	10	2

Event name	Pulse ?	Event number	Up-ramp time	Down-ramp time
MOVA61	Y	77	0	1

DIGITAL INPUTS AAAAAAAAAAAAAA

Input name	Input address	Active state
iBab4109c	card 1 input 20	closed (1)
iBbb4109	card 1 input 21	closed (1)
iBcm69cir	card 1 input 22	closed (1)
iBdm69wb	card 1 input 23	closed (1)
iSW1	card 1 input 24	closed (1)
iSW2	card 1 input 25	closed (1)
iMOVAA	card 1 input 26	closed (1)
iMOVAB	card 1 input 27	closed (1)

DIGITAL OUTPUTS

AAAAAAAAAAAAAAAA

Types: CO = contact, LV = 24Vdc, AC = 240Vac, DM = dimmable mains
 LK = pelican link (contact), SP = SDE/SA phase green (contact)
 HC = hurycall confirm (contact)

Driving condition	Output address	Type	Active state
AA			
CAA5CIR	card 1 output 1	CO	High / closed
CBA5NB	card 1 output 2	CO	High / closed
CDB4109	card 1 output 3	CO	High / closed
MOVA64	card 1 output 4	CO	High / closed
MOVA63	card 1 output 5	CO	High / closed
MOVA62	card 1 output 6	CO	High / closed
MOVA61	card 1 output 7	CO	High / closed
MOVAON	card 1 output 8	CO	High / closed
MOVA61	card 1 output 9	CO	High / closed
MOVA62	card 1 output 10	CO	High / closed
MOVA63	card 1 output 11	CO	High / closed
MOVA64	card 1 output 12	CO	High / closed
MOVA21	card 1 output 13	CO	High / closed
MOVA22	card 1 output 14	CO	High / closed
MOVA23	card 1 output 15	CO	High / closed
MOVA24	card 1 output 16	CO	High / closed

LONG-TERM TIMERS

AAAAAAAAAAAAAAAA

No	Period	Initialising condition	Enabling condition
AA			
1	0:02:00	%ltrs1	%ltrn1
2	0:01:00	%ltrs2	Mova62
3	0:01:00	%ltrs3	Mova64
16	24:00:00	%dimoff	%dimon

EVENT FORMULAE
 AAAAAAAAAAAAAA

Event		
no.	name	Formula
AAAAAAAAAAAAAAAA		
2	won	= -f
3	NODET1	= -(id2+id4+id6+id8) & -(id9+id11+id13+id15+id16)
4	woff	= woff + won.F & -won & -off
5	okoff	= gA & -smA & gC & -smC & gG & -smG
6	uF3	= [39: 20H] & uTC
7	FLASH1	= -FLASH1
8	FLASHSA	= mU & -(iMOVAA+iMOVAB) + (iMOVAA & (-mU & -iMOVAB))
9	FLASHSB	= iMOVAB & (-mU & -iMOVAA)
10	FLASH2	= -FLASH2
11	NODET	= NODET1 & -id20
12	%bo	= bo
13	INEXT	= id1+id3+id5+id7
14	iBDM69WB	= iBdm69wb
15	iBBB4109	= iBbb4109
16		= ltx1
17	uD3	= uF3 & uTC
18	TOGGLE	= <ltx1>.R
19	FULLON	= mU & iMOVAA & iMOVAB
20	FLASHF	= mU & iMOVAA + (mU & iMOVAB) + (iMOVAA & iMOVAB) & FLASH1
21	off	= okoff & woff + (sr & -won) + off & -won.R # %bo.R
22	FLASHS	= FLASHSA + FLASHSB & FLASH2
23	diminput	= iss

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAA		
24	dA	= dpA + mMF
25	eA	= epA + mF
26	dB	= dpB + mMF
27	eB	= epB + mF
28	dG	= NODET & mV & -sw5
29	dF	= NODET & mV & sw5
30	Mova62	= iBDM69WB & -sw3 + ((iBDM69WB & INEXT) & sw3)
31	dC	= dpC + mMF
32	Mova64	= iBBB4109 & -sw1 + ((iBBB4109 & INEXT) & sw1)
33	dD	= dpD + mMF
34	utcm	= zfdx
35	lfl	= -lfl & lf
36	%dimon	= iss
37	CAA5CIR	= gA
38	iBab4109c	= iBab4109c
39	CBA5NB	= gB
40	iBcm69cir	= iBcm69cir
41	uF1	= [39: 80H] & uTC
42	wD	= dpD
43	qG1	= s1 & gA & gG
44	uF2	= [39: 40H] & uTC
45	qG2	= s2 & gB
46	mnc	= mF
47	id20	= id20

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAA		
48	qG3	= s3 & gE & gF
49	qSD3	= uD3 & utcm + (mMF & -gE) + (dF & -gF)
50	zutc	= utcm & -(bf+bv+bm) & uTC
51	%ltrs1	= <ltx1>.R
52	%ltrn1	= -mU
53	%ltrs2	= -Mova62
54	%ltrs3	= -Mova64
55	NOTNORM	= mMCF + bf+bv + lof + off + TOGGLE
56	dimdrive	= diminput & -ltx16 & -sw32
57	CDB4109	= gE
58	MOVAON	= FULLON + FLASHF + FLASHS
59	df1	= df + bt # 1f1
60	uTC	= uTC
61	wA	= dpA
62	wB	= dpB
63	wC	= dpC
64	dE	= mMF
65	zhc	= hfh & -(bf+bv+bm)
66	MOVA21	= dd1 + dd3 + dd5 + dd7 + iSW1
67	MOVA22	= dd10 + dd12 + dd14 + iSW2
68	MOVA23	= dd17 + dd18 + dd19
69	MOVA24	= NODET
70	zman	= bm
71	zclf	= -tp10 & -(bf+bv)

Event		
no.	name	Formula
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		
72	zva	= -bf
73	tPL1	= tpl1
74	MOVA64	= Mova64 & -ltx3
75	MOVA63	= iBbb4109
76	MOVA62	= Mova62 & -ltx2
77	MOVA61	= iBdm69wb
78	tPL2	= tpl2
79	tPL3	= tpl3
80	tPL4	= tpl4
81	cF1	= cF1
82	cF2	= cF2
83	%cd032	= cF2 & (cD2 + dB + dD)
84	%vi013	= dB + dD
85	%vi021	= mMF + dF
86	%ve013	= eA + mF
87	%cd031	= cF1 & (cD1 + dA + dC + dG)
88	%vi032	= dA + dC + dG
89	%ve023	= eB + mF
90	%dimoff	= -iss + sr

COMMENTS ON CONFIGURATION
AAAAAAAAAAAAAAAAAAAAAAAAAAAA

V01: Final on F.A.T 09/08/2007
V02: Chainges made to MOVA 61,62,63 and 64 outputs
Chainges made to CBA5NB and CAA5CIR outputs new F.A.T
10/3/2011
MOVA62 EXT Switch = sw3
MOVA64 EXT Switch = sw1
VA Revert sw5 OFF = Cir sw5 ON = Allred
LED1 = MOVA61
LED2 = MOVA62
LED3 = MOVA63
LED4 = MOVA64
V03: Ram changes 10/02/12