



ASHGHAL

قطر تستحق الأفضل  
Qatar Deserves The Best

**I A**

**INFRASTRUCTURE AFFAIRS  
DESIGN DEPARTMENT-ROADS**

**SPECIMEN DESIGN FOR TUNNEL MANAGEMENT SYSTEM  
EQUIPMENT LISTS EXAMPLE**

**THIS SPECIMEN IS PROVIDED FOR GUIDANCE ONLY**

**THIS PACKAGE CONTAINS SPECIMEN LISTS OF VARIOUS CRITICAL  
INFRASTRUCTURES FOR A TYPICAL TUNNEL MANAGEMENT SYSTEM. THE  
INDIVIDUAL LISTS MAY NOT CORRELATE TO OTHER LISTS AND THEIR  
PURPOSE IS TO PROVIDE PRESENTATIONAL GUIDANCE ONLY.**

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>						Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>	
Document Name: PXXX Tunnel E Plant Control & Monitoring, Equipment List							
Version	Date	Status	Written by	Checked by	QA Approver	Notes	
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review	
						(*) Not used for Tunnel management operations	
HLD Issued By:							
Signature: ..... <i>INSERT SIGNATURE</i> .....Name:..... <i>INSERT NAME</i> .....Date:..... <i>INSERT DATE</i> .....							

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
LV GENERATOR															
0	1600kVA Generator IAT-01	GEN/001/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
1	1600kVA Generator PG1	GEN/002/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
2	1600kVA Generator room control panel IAT-01	CP-/001/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
3	1600kVA Generator room control panel PG1	CP-/002/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
4	30VDC battery + battery charger for LV panel- IAT-01	BAT/001/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
5	30VDC battery + battery charger for LV panel- PG-1	BAT/002/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
6	Level switch for diesel oil day Tank DT-00-01	LSW/001/ESC/E20		0	Tunnel E service compound	Diesel oil day Tank	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
7	Level switch for diesel oil day Tank DT-00-02	LSW/002/ESC/E20		0	Tunnel E service compound	Diesel oil day Tank	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
8	Level switch for diesel oil storage Tank	LSW/004/ESC/E21		0	Tunnel E service compound	Diesel oil storage Tank	N/A	N/A	Contact Relay	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
9	Level switch for diesel oil storage Tank	LSW/005/ESC/E21		0	Tunnel E service compound	Diesel oil storage Tank	N/A	N/A	Contact Relay	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
10	Pressure sensor for fuel line 1	PID/001/ESC/E21		0	Tunnel E service compound	Diesel oil storage Tank	N/A	N/A	Mod-bus TCP/IP	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
11	Pressure sensor for fuel line 2	PID/002/ESC/E21		0	Tunnel E service compound	Diesel oil storage Tank	N/A	N/A	Mod-bus TCP/IP	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
12	Flow sensor for day Tank DT-00-01	FLS/001/ESC/E20		0	Tunnel E service compound	Diesel oil day Tank	N/A	N/A	Mod-bus TCP/IP	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
13	Flow sensor for day Tank DT-00-02	FLS/002/ESC/E20		0	Tunnel E service compound	Diesel oil day Tank	N/A	N/A	Mod-bus TCP/IP	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
14	Flow sensor for fuel line 1	FLS/004/ESC/E21		0	Tunnel E service compound	Diesel oil storage Tank	N/A	N/A	Mod-bus TCP/IP	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
15	Flow sensor for fuel line 2	FLS/005/ESC/E21		0	Tunnel E service compound	Diesel oil storage Tank	N/A	N/A	Mod-bus TCP/IP	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
16	Fuel Pump 1	POT/001/ESC/E21		0	Tunnel E service compound	Diesel oil storage Tank	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
17	Fuel Pump 2	POT/002/ESC/E21		0	Tunnel E service compound	Diesel oil storage Tank	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
18	Motorised valve for day Tank DT-00-01	VAL/001/ESC/E20		0	Tunnel E service compound	Diesel oil day Tank	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
19	Motorised valve for day Tank DT-00-02	VAL/002/ESC/E20		0	Tunnel E service compound	Diesel oil day Tank	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
20	Solenoid valve for day Tank DT-00-01	VAL/004/ESC/E20		0	Tunnel E service compound	Diesel oil day Tank	N/A	N/A	Contact Relay	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
21	Solenoid valve for day Tank DT-00-02	VAL/005/ESC/E20		0	Tunnel E service compound	Diesel oil day Tank	N/A	N/A	Contact Relay	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel															
Project Name: <i>INSERT PROJECT NAME HERE</i>											Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>				
Document Name: PXXX Tunnel E Plant Control & Monitoring, Equipment List															
Version	Date	Status	Written by	Checked by	QA Approver	Notes									
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review									
						(*) Not used for Tunnel management operations									
HLD Issued By:															
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....															
EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
22	Fuel fill point valve with lock	VAL/007/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	7	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>MCC ROOMS</b>															
23	Motor control center, MCC-IAT-SP-01	MCC/001/ESC/E19		0	Tunnel E service compound	Tunnel E Storm Water Pump Room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
24	Motor control center, MCC-JWI-03	MCC/003/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
25	Motor control center, MCC-IAT-01	MCC/004/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	3	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
26	Motor control center, MCC-IAT-02	MCC/005/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
27	Motor control center, MCC-V-1	MCC/006/EI-/E19		0	Tunnel E	Tunnel E Storm Water Pump Room	N/A	N/A	Contact Relay	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
28	Motor control center, MCC-V-2	MCC/007/EI-/E19		0	Tunnel E	Tunnel E Storm Water Pump Room	N/A	N/A	Contact Relay	6	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>LIGHT CONTROL PANELS</b>															
29	Light control panel, IAT-EL-LCP1	CP-/004/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
30	Light control panel, IAT-EL-LCP2	CP-/005/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
31	Light control panel, IAT-EL-LCP3	CP-/006/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	6	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
32	Light control panel, IAT-EL-LCP4	CP-/007/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	7	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>CONTROL PANELS</b>															
33	Programmable logic control panel, IAT-EL-LCP-PLC	PLC/001/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
34	Instrumentation control panel-01	CP-/008/EI-/E19		0	Tunnel E	Tunnel E Storm Water Pump Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	8	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
35	Control panel for heat detection cable	CP-/009/ESC/E02		0	Tunnel E service compound	Control Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	9	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
36	Central battery system panel for emergency lighting	CP-/010/ESC/E02		0	Tunnel E service compound	Control Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	10	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
37	Central battery system control cabinet	CP-/011/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	11	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
38	Control panel for sump pump room supply fan	VCP/001/EI-/E19		0	Tunnel E	Tunnel E Storm Water Pump Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
39	Mechanical Control Panel MSB-00-01	CP-/012/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	12	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>DISTRIBUTION BOARDS</b>															
40	LV main distribution board , LV PANEL-IAT-01	DB-/001/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
41	Sub-main distribution board, SMDB-IAT-EL1	DB-/002/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
42	Sub-main distribution board, SMDB-IAT-EL2	DB-/003/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	3	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>										Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>					
Document Name: PXXX Tunnel E Plant Control & Monitoring, Equipment List															
Version	Date	Status	Written by	Checked by	QA Approver	Notes									
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review									
(*) Not used for Tunnel management operations															
HLD Issued By:															
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....															

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
43	Emergency sub-main distribution board, ESMDB-IAT-EL1	DB-/004/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
44	Sub-main distribution board, SMDB-IAT-FP	DB-/005/ESC/E06		0	Tunnel E service compound	Fire Pump Room	N/A	N/A	Contact Relay	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
45	LV main distribution board , LV PANEL-PG-2	DB-/006/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	6	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
46	Sub-main distribution board, SMDB-M-2	DB-/007/ESC/Exx		0	Tunnel E service compound		N/A	N/A	Contact Relay	7	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
47	Sub-main distribution board, SMDB-EL-2	DB-/008/ESC/Exx		0	Tunnel E service compound		N/A	N/A	Contact Relay	8	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
48	Sub-main distribution board, SMDB-EL-2	DB-/09/ESC/Exx		0	Tunnel E service compound		N/A	N/A	Contact Relay	9	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
49	Sub-main distribution board, SMDB-M-3	DB-/010/ESC/Exx		0	Tunnel E service compound		N/A	N/A	Contact Relay	10	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
50	LV main distribution board , LV PANEL-PG-1	DB-/011/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	11	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
51	Sub-main distribution board, SMDB-L&S	DB-/012/ESC/Exx		0	Tunnel E service compound		N/A	N/A	Contact Relay	12	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
52	Sub-main distribution board, SMDB-M-1	DB-/013/ESC/Exx		0	Tunnel E service compound		N/A	N/A	Contact Relay	13	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
53	Sub-main distribution board, SMDB-EL-1	DB-/014/ESC/Exx		0	Tunnel E service compound		N/A	N/A	Contact Relay	14	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
54	Distribution board, DB-HV	DB-/015/ESC/E05		0	Tunnel E service compound	HV Room	N/A	N/A	Contact Relay	15	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
55	Distribution board, DB-MV	DB-/016/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	16	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
56	Distribution board, DB-IAT-EL	DB-/017/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	17	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
57	Distribution Board, DB-IAT-01	DB-/018/EI-/0565		0	Tunnel E	0+565	North	Hard Shoulder	Contact Relay	18	PTZ/007/EIW/570	0+570	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
58	Distribution Board, DB-IAT-02	DB-/019/EI-/0565		0	Tunnel E	0+565	South	Hard Shoulder	Contact Relay	19	PTZ/006/EIE/570	0+570	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
59	Distribution board, DB-CBS	DB-/020/ESC/E02		0	Tunnel E service compound	Control Room	N/A	N/A	Contact Relay	20	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
60	Sub-main distribution board, SMDB-UPS	DB-/021/ESC/E02		0	Tunnel E service compound	Control Room	N/A	N/A	Contact Relay	21	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
61	Distribution Board, DB-ITS	DB-/022/ESC/E13		0	Tunnel E service compound	Passage Lower Level	N/A	N/A	Contact Relay	22	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
62	Distribution Board, DB-FC	DB-/023/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Contact Relay	23	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
63	Distribution board, DB-UPS	DB-/024/EI-/E19		0	Tunnel E	Tunnel E Storm Water Pump Room	N/A	N/A	Contact Relay	24	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
64	Distribution Board, CBS-IAT-DB1	DB-/025/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	25	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel															
Project Name: <i>INSERT PROJECT NAME HERE</i>											Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>				
Document Name: <i>PXXX Tunnel E Plant Control &amp; Monitoring, Equipment List</i>															
Version	Date	Status	Written by	Checked by	QA Approver	Notes									
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review									
						(*) Not used for Tunnel management operations									
HLD Issued By:															
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....															
EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
65	Distribution Board, CBS-IAT-DB2	DB-/026/ESC/E18		0	Tunnel E service compound	Electrical Room	N/A	N/A	Contact Relay	26	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>FIRE ALARM PANEL</b>															
66	Main Fire alarm control panel, MFACP	FCP/001/ESC/E02		0	Tunnel E service compound	Control Room	N/A	N/A	Contact Relay - Serial comm	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>ISOLATORS</b>															
67	1000A TP ISOL incomer CB for APFC-2 from LV PANEL- IAT-1	ISO/001/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
68	800A TP ISOL incomer CB for APFC-2 from LV PANEL- PG-1	ISO/002/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
69	1000A TP ISOL incomer CB for APFC-2 from LV PANEL- PG-2	ISO/003/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	3	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
70	100A TPN isolator for fire pump fed from SMDB-IAT-FP	ISO/004/ESC/E06		0	Tunnel E service compound	Fire Pump Room	N/A	N/A	Contact Relay	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
71	32A TPN isolator for jockey pump fed from SMDB-IAT-FP	ISO/005/ESC/E06		0	Tunnel E service compound	Fire Pump Room	N/A	N/A	Contact Relay	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
72	32A TPN isolator for foam water pump fed from SMDB-IAT-FP	ISO/006/ESC/E06		0	Tunnel E service compound	Fire Pump Room	N/A	N/A	Contact Relay	6	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
73	32A TPN isolator for crane fed from SMDB-IAT-FP	ISO/007/ESC/E06		0	Tunnel E service compound	Fire Pump Room	N/A	N/A	Contact Relay	7	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
74	20A,SP ISOL isolator for SUPPLY FAN 1 fed from SMDB-IAT-FP	ISO/008/ESC/E06		0	Tunnel E service compound	Fire Pump Room	N/A	N/A	Contact Relay	8	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
75	20A,SP ISOL isolator for SUPPLY FAN 2 fed from SMDB-IAT-FP	ISO/009/ESC/E06		0	Tunnel E service compound	Fire Pump Room	N/A	N/A	Contact Relay	9	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
76	20A TPN Isolator for OU-HV-001	ISO/010/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	10	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
77	20A TPN Isolator for OU-HV-002	ISO/011/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	11	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
78	20A TPN Isolator for OU-HV-003	ISO/012/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	12	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
79	20A TPN Isolator for OU-HV-004	ISO/013/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	13	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
80	20A DP Isolator for OU-LV-001	ISO/014/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	14	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
81	20A DP Isolator for OU-LV-002	ISO/015/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	15	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
82	20A DP Isolator for OU-LV-003	ISO/016/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	16	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
83	20A DP Isolator for OU-LV-004	ISO/017/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	17	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
84	20A TPN Isolator for OU-EL-001	ISO/018/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	18	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
85	20A TPN Isolator for OU-EL-002	ISO/019/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	19	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
86	20A TPN Isolator for OU-CR-001	ISO/020/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	20	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel															
Project Name: <i>INSERT PROJECT NAME HERE</i>											Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>				
Document Name: PXXX Tunnel E Plant Control & Monitoring, Equipment List															
Version	Date	Status	Written by	Checked by	QA Approver	Notes									
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review									
						(*) Not used for Tunnel management operations									
HLD Issued By:															
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....															
EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
87	20A TPN Isolator for OU-CR-002	ISO/021/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	21	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
88	25A TPN Isolator for VF-TR-002-1	ISO/022/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	22	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
89	25A TPN Isolator for VF-TR-002-2	ISO/023/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	23	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
90	25A TPN Isolator for VF-TR-001-1	ISO/024/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	24	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
91	25A TPN Isolator for VF-TR-001-2	ISO/025/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	25	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
92	63A TPN Isolator for VF-GE-001	ISO/026/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	26	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
93	63A TPN Isolator for VF-GE-002	ISO/027/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	27	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
94	63A TPN Isolator for VF-GE-003	ISO/028/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	28	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
95	Isolator for Fuel Transfer Pump	ISO/029/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	29	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
96	20A DP Isolator for OU-ER-001	ISO/030/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	30	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
97	20A DP Isolator for OU-ITS-001	ISO/031/ESC/E22		0	Tunnel E service compound	Substation Compound Roof	N/A	N/A	Contact Relay	31	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
98	16A TPN Isolator for battery charger - 01 fed from DB-FC	ISO/032/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Contact Relay	32	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
99	16A TPN Isolator for battery charger - 02 fed from DB-FC	ISO/033/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Contact Relay	33	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
100	16A TPN Isolator for battery charger - 03 fed from DB-FC	ISO/034/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Contact Relay	34	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
101	16A TPN Isolator for battery charger - 01 fed from DB-MV	ISO/035/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	35	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
102	16A TPN Isolator for battery charger - 02 fed from DB-MV	ISO/036/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	36	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
103	20A DP Isolator for OU-OF-001	ISO/037/ESC/E01		0	Tunnel E service compound	Generator Room	N/A	N/A	Contact Relay	37	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
104	40A Isolator for Central Battery system	ISO/038/ESC/E02		0	Tunnel E service compound	Control Room	N/A	N/A	Contact Relay	37	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>CIRCUIT BREAKERS</b>															
105	2500A TP ACB incomer from transformer for LV PANEL-IAT-1	CBR/001/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	001	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
106	2500A TP ACB from emergency Generator Main Auto C/O for LV PANEL-IAT-1	CBR/002/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	002	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
107	630A TP MCCB in LV PANEL- IAT-1 for incomer at SMDB-IAT-EL1	CBR/003/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	003	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
108	630A TP MCCB in LV PANEL- IAT-1 for incomer at SMDB-IAT-EL2	CBR/004/ESC/E03		0	Tunnel E service compound	LV Room	N/A	N/A	Contact Relay	004	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel						
Version	Date	Status	Written by	Checked by	QA Approver	Notes
Project Name: <i>INSERT PROJECT NAME HERE</i>						
Document Name: PXXX K Underpass Plant Control & Monitoring, Equipment List						
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review
						(* ) Not used for Tunnel management operations
HLD Issued By:						
Signature:..... <i>INSERT SIGNATURE</i> .....Name:..... <i>INSERT NAME</i> .....Date:..... <i>INSERT DATE</i> .....						

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
<b>MCC ROOM</b>															
0	Motor Control Center, MCC-KP-SP	MCC/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
<b>CONTROL PANELS</b>															
1	Control panel for supply fan for K Underpass pump room	VCP/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
2	Instrumentation control panel-01	CP-/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Mod-bus TCP/IP	1	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
<b>DISTRIBUTION BOARDS</b>															
3	6 Ways TPN Distribution Board, DB-KP	DB-/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
4	Distribution Board, DB-UPS	DB-/002/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
<b>UPS</b>															
5	Uninterrupted Power Supply, UPS-01	UPS/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay - Mod-bus TCP/IP	1	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
<b>CIRCUIT BREAKERS</b>															
6	100A TP MCCB for MCC-KP-SP incomer CB fed from MV panel	CBR/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
7	20A SPN MCCB for UPS incomer CB fed from MCC-KP-SP	CBR/002/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
8	40A TP MCCB for DB-KP incomer CB fed from MCC-KP-SP	CBR/003/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	3	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
9	40A TP MCCB for Underpass sump pump incomer CB fed from MCC-KP-SP	CBR/004/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	4	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
10	40A TP MCCB for Underpass sump pump incomer CB fed from MCC-KP-SP	CBR/005/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	5	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
11	40A TP MCCB for Underpass sump pump incomer CB fed from MCC-KP-SP	CBR/006/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	6	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
12	16A SPN fixed MCCB incomer CB in MCC-KP-SP for socket outlet	CBR/007/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	7	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
13	16A SPN fixed MCCB incomer CB in MCC-KP-SP for socket outlet	CBR/008/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	8	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
14	40A TP MCCB for DB-KP field equipment CB fed from MCC-KP-SP	CBR/009/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	9	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
15	20A SPN MCCB for DB-UPS field equipment CB fed from UPS	CBR/010/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	7	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
<b>ISOLATORS</b>															
16	16A,SP ISOL incomer isolator for UPS fed from MCC-KP-SP	ISO/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
17	16A,SP ISOL incomer isolator for DB-UPS fed from UPS	ISO/002/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
<b>K Underpass STORM WATER PUMPS</b>															
18	Pump-01	PSW/001/KU-/K01		0			N/A	N/A	Contact Relay	1	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition
19	Pump-02	PSW/002/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	insert reference drawing number from MEP and ITS designs	insert reference drawing edition



NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>						Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>
Document Name: PXXX K Underpass Plant Control & Monitoring, Equipment List						
Version	Date	Status	Written by	Checked by	QA Approver	Notes
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review
						(* ) Not used for Tunnel management operations
HLD Issued By:						
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....						

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
20	Pump-03	PSW/003/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	3	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
21	Pressure transmitter PIT-01	PIT/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Analog 4-20mA	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
22	Pressure transmitter PIT-02	PIT/002/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Analog 4-20mA	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
23	Pressure transmitter PIT-03	PIT/003/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Analog 4-20mA	3	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
24	Storm water tank level element	LEL/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
25	Curb mounted Ventilation & Staircase Pressurization Fan-SF1	PFN/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
26	Gas detector	GD-/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
27	Gate valve	VAL/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
28	Gate valve	VAL/002/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
29	Gate valve	VAL/003/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	3	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>SPOT DETECTION DEVICES</b>															
30	Smoke detector, 1/2/S1 WP	SDR/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	N/A	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
31	Break glass type Manual call point, 1/2/BG1 WP	MBG/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	N/A	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
32	Fire alarm sounder, 1/2/B3	ESU/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	N/A	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>FIRE ALARM PANELS</b>															
33	Main Fire alarm control panel, MFAFP	FCP/001/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	N/A	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>ITS EQUIPMENT</b>															
34	Ground Mounted Enclosure, ENC-73	GME/001/KUN/5079		0	K Underpass North Bound Carriageway	5+079	To East Industrial	Road side	Contact Relay - TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
35	Ground Mounted Enclosure, ENC-66	GME/002/KUS/7238		0	K Underpass South Bound Carriageway	7+238	To Woqod	Road side	Contact Relay - TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
36	Wall Mounted Enclosure, ENC-77	WME/001/KUN/6135		0	K Underpass North Bound Carriageway	6+135	To East Industrial	Hard shoulder	Contact Relay - TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
37	Wall Mounted Enclosure, ENC-60	WME/002/KUS/6240		0	K Underpass South Bound Carriageway	6+240	To Woqod	Hard shoulder	Contact Relay - TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
38	Dynamic Message Sign, DMS 73	DMS/001/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Lane	Contact Relay - TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
39	Dynamic Message Sign, DMS 66	DMS/002/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	Contact Relay - TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
40	Lane Control Sign, LCS 73-1	LCS/001/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Hard shoulder	Contact Relay - TCP/IP (*)	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>



NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>						Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>
Document Name: PXXX K Underpass Plant Control & Monitoring, Equipment List						
Version	Date	Status	Written by	Checked by	QA Approver	Notes
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review
						(* ) Not used for Tunnel management operations
HLD Issued By:						
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....						

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
41	Lane Control Sign, LCS 73-2	LCS/002/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Lane	Contact Relay - TCP/IP (*)	2	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
42	Lane Control Sign, LCS 73-3	LCS/003/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Lane	Contact Relay - TCP/IP (*)	3	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
43	Lane Control Sign, LCS 73-4	LCS/004/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Lane	Contact Relay - TCP/IP (*)	4	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
44	Lane Control Sign, LCS 77-1	LCS/005/KUN/6148		0	K Underpass North Bound Carriageway	6+148	To East Industrial	Hard shoulder	Contact Relay - TCP/IP	5	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
45	Lane Control Sign, LCS 77-2	LCS/006/KUN/6147		0	K Underpass North Bound Carriageway	6+147	To East Industrial	Lane	Contact Relay - TCP/IP	6	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
46	Lane Control Sign, LCS 77-3	LCS/007/KUN/6145		0	K Underpass North Bound Carriageway	6+145	To East Industrial	Lane	Contact Relay - TCP/IP	7	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
47	Lane Control Sign, LCS 77-4	LCS/008/KUN/6142		0	K Underpass North Bound Carriageway	6+142	To East Industrial	Lane	Contact Relay - TCP/IP	8	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
48	Lane Control Sign, LCS 60-1	LCS/009/KUS/6234		0	K Underpass South Bound Carriageway	6+234	To Woqod	Hard shoulder	Contact Relay - TCP/IP	9	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
49	Lane Control Sign, LCS 60-2	LCS/010/KUS/6231		0	K Underpass South Bound Carriageway	6+231	To Woqod	Lane	Contact Relay - TCP/IP	10	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
50	Lane Control Sign, LCS 60-3	LCS/011/KUS/6229		0	K Underpass South Bound Carriageway	6+229	To Woqod	Lane	Contact Relay - TCP/IP	11	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
51	Lane Control Sign, LCS 60-4	LCS/012/KUS/6227		0	K Underpass South Bound Carriageway	6+227	To Woqod	Lane	Contact Relay - TCP/IP	12	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
52	Lane Control Sign, LCS 66-1	LCS/013/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	Contact Relay - TCP/IP (*)	13	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
53	Lane Control Sign, LCS 66-2	LCS/014/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	Contact Relay - TCP/IP (*)	14	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
54	Lane Control Sign, LCS 66-3	LCS/015/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	Contact Relay - TCP/IP (*)	15	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
55	Lane Control Sign, LCS 66-4	LCS/016/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	Contact Relay - TCP/IP (*)	16	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
56	Lane Control Sign, LCS 66-5	LCS/017/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Hard shoulder	Contact Relay - TCP/IP (*)	17	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
57	Access Point, AP 73-1	DZA/001/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Lane	TCP/IP (*)	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
58	Access Point, AP 77-1	DZA/002/KUN/6132		0	K Underpass North Bound Carriageway	6+132	To East Industrial	Lane	TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
59	Access Point, AP 60-1	DZA/003/KUS/6246		0	K Underpass South Bound Carriageway	6+246	To Woqod	Lane	TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
60	Access Point, AP 66-1	DZA/004/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	TCP/IP (*)	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
61	License Plate Reader, LPR 73-1	LPR/001/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Hard shoulder	TCP/IP (*)	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
62	License Plate Reader, LPR 73-2	LPR/002/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Lane	TCP/IP (*)	2	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>						Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>
Document Name: PXXX K Underpass Plant Control & Monitoring, Equipment List						
Version	Date	Status	Written by	Checked by	QA Approver	Notes
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review
						(* ) Not used for Tunnel management operations
HLD Issued By:						
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....						

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
63	License Plate Reader, LPR 73-3	LPR/003/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Lane	TCP/IP (*)	3	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
64	License Plate Reader, LPR 73-4	LPR/004/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Lane	TCP/IP (*)	4	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
65	License Plate Reader, LPR 73-5	LPR/005/KUN/5090		0	K Underpass North Bound Carriageway	5+090	To East Industrial	Hard shoulder	TCP/IP (*)	5	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
66	License Plate Reader, LPR 66-1	LPR/006/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	TCP/IP (*)	6	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
67	License Plate Reader, LPR 66-2	LPR/007/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	TCP/IP (*)	7	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
68	License Plate Reader, LPR 66-3	LPR/008/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	TCP/IP (*)	8	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
69	License Plate Reader, LPR 66-4	LPR/009/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	TCP/IP (*)	9	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
70	License Plate Reader, LPR 66-5	LPR/010/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	TCP/IP (*)	10	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
71	License Plate Reader, LPR 66-6	LPR/011/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Hard shoulder	TCP/IP (*)	11	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
72	License Plate Reader, LPR 66-7	LPR/012/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Lane	TCP/IP (*)	12	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
73	License Plate Reader, LPR 66-8	LPR/013/KUS/7230		0	K Underpass South Bound Carriageway	7+230	To Woqod	Hard shoulder	TCP/IP (*)	13	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
74	Pan tilt zoom CCTV camera, PTZ 77	PTZ/001/KUN/6150		0	K Underpass North Bound Carriageway	6+150	To East Industrial	Lane	TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
75	Pan tilt zoom CCTV camera, PTZ 60	PTZ/002/KUS/6226		0	K Underpass South Bound Carriageway	6+226	To Woqod	Lane	TCP/IP	2	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
76	Magnetometer 1, Detection zone 77-1	DZM/001/KUN/6124		0	K Underpass North Bound Carriageway	6+124	To East Industrial	Lane	TCP/IP	1	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
77	Magnetometer 2, Detection zone 77-1	DZM/002/KUN/6124		0	K Underpass North Bound Carriageway	6+124	To East Industrial	Lane	TCP/IP	2	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
78	Magnetometer 3, Detection zone 77-1	DZM/003/KUN/6124		0	K Underpass North Bound Carriageway	6+124	To East Industrial	Lane	TCP/IP	3	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
79	Magnetometer 4, Detection zone 77-1	DZM/004/KUN/6124		0	K Underpass North Bound Carriageway	6+124	To East Industrial	Lane	TCP/IP	4	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
80	Magnetometer 5, Detection zone 77-1	DZM/005/KUN/6124		0	K Underpass North Bound Carriageway	6+124	To East Industrial	Lane	TCP/IP	5	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
81	Magnetometer 6, Detection zone 77-1	DZM/006/KUN/6129		0	K Underpass North Bound Carriageway	6+129	To East Industrial	Lane	TCP/IP	6	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
82	Magnetometer 7, Detection zone 77-1	DZM/007/KUN/6129		0	K Underpass North Bound Carriageway	6+129	To East Industrial	Lane	TCP/IP	7	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
83	Magnetometer 8, Detection zone 77-1	DZM/008/KUN/6129		0	K Underpass North Bound Carriageway	6+129	To East Industrial	Lane	TCP/IP	8	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
84	Magnetometer 9, Detection zone 77-1	DZM/009/KUN/6129		0	K Underpass North Bound Carriageway	6+129	To East Industrial	Lane	TCP/IP	9	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>						Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>
Document Name: PXXX K Underpass Plant Control & Monitoring, Equipment List						
Version	Date	Status	Written by	Checked by	QA Approver	Notes
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review
						(* ) Not used for Tunnel management operations
HLD Issued By:						
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....						

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
85	Magnetometer 10, Detection zone 77-1	DZM/010/KUN/6129		0	K Underpass North Bound Carriageway	6+129	To East Industrial	Lane	TCP/IP	10	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
86	Magnetometer 1, Detection zone 60-1	DZM/011/KUS/6251		0	K Underpass South Bound Carriageway	6+251	To Woqod	Lane	TCP/IP	11	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
87	Magnetometer 2, Detection zone 60-1	DZM/012/KUS/6251		0	K Underpass South Bound Carriageway	6+251	To Woqod	Lane	TCP/IP	12	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
88	Magnetometer 3, Detection zone 60-1	DZM/013/KUS/6251		0	K Underpass South Bound Carriageway	6+251	To Woqod	Lane	TCP/IP	13	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
89	Magnetometer 4, Detection zone 60-1	DZM/014/KUS/6251		0	K Underpass South Bound Carriageway	6+251	To Woqod	Lane	TCP/IP	14	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
90	Magnetometer 5, Detection zone 60-1	DZM/015/KUS/6251		0	K Underpass South Bound Carriageway	6+251	To Woqod	Lane	TCP/IP	15	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
91	Magnetometer 6, Detection zone 60-1	DZM/016/KUS/6256		0	K Underpass South Bound Carriageway	6+256	To Woqod	Lane	TCP/IP	16	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
92	Magnetometer 7, Detection zone 60-1	DZM/017/KUS/6256		0	K Underpass South Bound Carriageway	6+256	To Woqod	Lane	TCP/IP	17	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
93	Magnetometer 8, Detection zone 60-1	DZM/018/KUS/6256		0	K Underpass South Bound Carriageway	6+256	To Woqod	Lane	TCP/IP	18	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
94	Magnetometer 9, Detection zone 60-1	DZM/019/KUS/6256		0	K Underpass South Bound Carriageway	6+256	To Woqod	Lane	TCP/IP	19	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
95	Magnetometer 10, Detection zone 60-1	DZM/020/KUS/6256		0	K Underpass South Bound Carriageway	6+256	To Woqod	Lane	TCP/IP	20	N/A	N/A	0	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>CONTROL PANELS (REMOTE IOU)</b>															
96	SCADA Marshalling Remote I/O Unit (SMROIU) KU- Pump Station	CP-/002/KU-/K01		0	K Underpass	K Underpassstorm water pump room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>						Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>
Document Name: PXXX Tunnel E Area EFA pump station plant control & monitoring, Equipment List						
Version	Date	Status	Written by	Checked by	QA Approver	Notes
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review
						(* ) Not used for Tunnel management operations
HLD Issued By:						
Signature:..... <i>INSERT SIGNATURE</i> .....Name:..... <i>INSERT NAME</i> .....Date:..... <i>INSERT DATE</i> .....						

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
<b>EFA SW PUMPING STATION</b>															
<b>MCC ROOM</b>															
0	Motor Control Center, MCC-IAT-SP-02	MCC/002/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	8	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>CONTROL PANELS</b>															
1	Instrumentation control panel	CP-/001/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Mod-bus TCP/IP	13	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>Tunnel E Area EFA PUMP STATION</b>															
2	Distribution Board, DB-IAT-SP-02	DB-/027/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	27	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
3	Distribution Board, DB-UPS	DB-/028/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	28	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>FIRE ALARM PANEL</b>															
4	Fire alarm control panel, FACP	FCP/002/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay - Serial comm	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>PUMPS AND PIPING</b>															
5	Electrical activated Pen-stock open/close	PN-/001/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
6	Pump-01	PSW/003/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	3	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
7	Pump-02	PSW/004/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
8	Pump-03	PSW/005/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
9	Pressure transmitter PIT	PIT/003/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Analog 4-20mA	3	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
10	Pressure transmitter PIT	PIT/004/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Analog 4-20mA	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
11	Pressure transmitter PIT	PIT/005/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Analog 4-20mA	5	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
12	Storm water tank level element	LEL/002/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
13	Gate valve	VAL/022/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	22	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
14	Gate valve	VAL/023/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	23	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
15	Gate valve	VAL/024/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	24	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>CIRCUIT BREAKERS</b>															
16	800A TP MCCB incomer CB in MCC-IAT-SP-02 fed from LV PANEL-IAT-PG2	CBR/314/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	314	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
17	150A TP MCCB in MCC-IAT-SP-2 for APFC 75 KVAR	CBR/315/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	315	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
18	400A TP MCCB in MCC-IAT-SP-2 for sump pump	CBR/316/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	316	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
19	400A TP MCCB in MCC-IAT-SP-2 for sump pump	CBR/317/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	317	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>						Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>
Document Name: PXXX Tunnel E Area EFA pump station plant control & monitoring, Equipment List						
Version	Date	Status	Written by	Checked by	QA Approver	Notes
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review
						(* ) Not used for Tunnel management operations
HLD Issued By:						
Signature..... <i>INSERT SIGNATURE</i> .....Name..... <i>INSERT NAME</i> .....Date..... <i>INSERT DATE</i> .....						

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
20	400A TP MCCB in MCC-IAT-SP-2 for sump pump	CBR/318/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	318	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
21	40A TP MCCB in MCC-IAT-SP-2 for DB-IAT-SP-02	CBR/319/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	319	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
22	20A SPN MCCB in MCC-IAT-SP-2 for UPS	CBR/320/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	320	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
23	16A SPN fixed MCCB in MCC-IAT-SP-2 for socket outlet	CBR/321/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	321	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
24	16A SPN fixed MCCB in MCC-IAT-SP-2 for socket outlet	CBR/322/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	322	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
25	40A TP MCCB incomer in DB-IAT-SP-02 fed from MCC-IAT-SP-2	CBR/323/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	323	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
26	10A MCB in DB-IAT-SP-2 for EFA pump room lighting	CBR/324/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	324	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
27	10A MCB in DB-IAT-SP-2 for EFA pump room lighting	CBR/325/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	325	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
28	10A MCB in DB-IAT-SP-2 for EFA pump and control room lighting	CBR/326/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	326	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
29	10A MCB in DB-IAT-SP-2 Spare 1	CBR/327/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	327	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
30	20A MCB in DB-IAT-SP-2 for spur unit at APFC	CBR/328/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	328	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
31	20A MCB in DB-IAT-SP-2 Spare 1	CBR/329/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	329	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
32	20A MCB in DB-IAT-SP-2 Spare 2	CBR/330/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	330	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
33	32A MCB in DB-IAT-SP-2 Spare 1	CBR/331/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	331	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
34	32A MCB in DB-IAT-SP-2 for EFA Control room sockets	CBR/332/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	332	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
35	20A MCB in DB-IAT-SP-2 Spare 3	CBR/333/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	333	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
36	20A MCB in DB-IAT-SP-2 Spare 4	CBR/334/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	334	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
37	20A MCB in DB-IAT-SP-2 Spare 5	CBR/335/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	335	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>ISOLATORS</b>															
38	16A,SP isolator for UPS fed from MCC-IAT-SP-2	ISO/038/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	38	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
39	16A,SP isolator for UPS-DB fed from UPS	ISO/039/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	39	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
40	150A TPN isolator for APFC fed from MCC-IAT-SP-2	ISO/040/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	40	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>POWER FACTOR CORRECTION PANELS</b>															
41	Automatic power factor correction panel, 75 KVAR	PFC/004/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	N/A	4	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>

NOTE: items included in this list are for illustrative purposes only. Actual list will vary project to project.

TUNNEL MANAGEMENT SYSTEM EXAMPLE EQUIPMENT LIST

Document Control Panel

Project Name: <i>INSERT PROJECT NAME HERE</i>						Ref. Number: <i>INSERT DOCUMENT REFERENCE NUMBER</i>
Document Name: PXXX Tunnel E Area EFA pump station plant control & monitoring, Equipment List						
Version	Date	Status	Written by	Checked by	QA Approver	Notes
0	<i>INSERT DATE</i>	First Edition	<i>INSERT NAME</i>	<i>INSERT NAME</i>	<i>INSERT NAME</i>	Draft for Ashghal review
						(*) Not used for Tunnel management operations
HLD Issued By:						
Signature:..... <i>INSERT SIGNATURE</i> .....Name:..... <i>INSERT NAME</i> .....Date:..... <i>INSERT DATE</i> .....						

EQUIPMENT: NUMBER	EQUIPMENT: DESCRIPTION	EQUIPMENT: ID	EQUIPMENT: ALIAS	EQUIPMENT: REV.	LOCATION: ROAD/BUILDING	LOCATION: CH/ROOM	LOCATION: TRAFFIC DIRECTION	LOCATION: LANE / HS	EQUIPMENT: COMMS TYPE	EQUIPMENT: UNIT NO	ASSOCIATED CAMERA	CAMERA: DESCRIPTION	CAMERA: REV.	DRAWING NUMBER	DRAWING VERSION
<b>SPOT DETECTION DEVICES</b>															
42	Smoke detector, S1/1	SDR/018/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	N/A	18	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
43	Smoke detector, S1/2	SDR/019/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	N/A	19	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
44	Smoke detector, S1/3	SDR/020/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	N/A	20	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
45	Break glass type Manual call point, BG1/1	MBG/022/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	N/A	22	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
46	Fire alarm sounder, B1/1	ESU/010/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	N/A	10	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>UPS</b>															
47	Uninterruptable Power Supply, UPS	UPS/002/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Mod-bus TCP/IP - Contact Relay	2	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>
<b>CONTROL PANELS (REMOTE IOU)</b>															
48	SCADA Marshalling Remote I/O Unit (SMROIU) EIU Pump Station	CP-/002/EFA/F01		0	Tunnel E Area EFA Pump Station	EFA Storm Water Pump Room	N/A	N/A	Contact Relay	1	N/A	N/A	N/A	<i>insert reference drawing number from MEP and ITS designs</i>	<i>insert reference drawing edition</i>



ASHGHAL

قطر تستحق الأفضل  
Qatar Deserves The Best

**I A**

**INFRASTRUCTURE AFFAIRS  
DESIGN DEPARTMENT-ROADS**

**SPECIMEN DESIGN FOR TUNNEL MANAGEMENT SYSTEM  
I/O LISTS EXAMPLE**

**THIS SPECIMEN IS PROVIDED FOR GUIDANCE ONLY**

**THIS PACKAGE CONTAINS SPECIMEN LISTS OF VARIOUS CRITICAL  
INFRASTRUCTURES FOR A TYPICAL TUNNEL MANAGEMENT SYSTEM. THE  
INDIVIDUAL LISTS MAY NOT CORRELATE TO OTHER LISTS AND THEIR  
PURPOSE IS TO PROVIDE PRESENTATIONAL GUIDANCE ONLY.**



TUNNEL MANAGEMENT SYSTEM EXAMPLE I/O LIST

Document Control Panel		Ref. Number: INSERT DOCUMENT REFERENCE NUMBER																			
Project Name: INSERT PROJECT NAME																					
Document Name: PXXX Tunnel E Plant Control & Monitoring, IO signals list																					
Version	Date	Status																Written by	Checked by	QA Approver	Notes
0	INSERT DATE	First Edition																Insert name	Insert name	Insert name	Draft for Ashghal review
HLD Issued By:																					
Signature:.....insert signature.....Name.....Insert name.....Date.....insert date.....																					
Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
1600kVA Generator IAT-01																					
0		DIN	R		BUS/COMM	Emergency Generator Available/Unavailable	Emergency Generator	Discrete IO	Tunnel E Service Compound	Available/Unavailable	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	UnderFreq, GEN OverFreq, GEN UnderVolt, GEN OverVolt, GEN ReversePower, GEN LossOfField, GEN Over Excitation, GEN Removed, etc.
1		DIN	R		DB	Emergency Generator Duty/Stand-by	Emergency Generator	Discrete IO	Tunnel E Service Compound	Duty/Standby	GEN/001/ESC/E01					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
2		DIN	R		BUS/COMM	Emergency Generator Running/Stop	Emergency Generator	Discrete IO	Tunnel E Service Compound	Running/Stop	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
3		DIN	R		BUS/COMM	Emergency Generator Operating Condition	Emergency Generator	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
4		DIN	R		BUS/COMM	Emergency Generator Engine Low Fuel Normal/Alarm	Emergency Generator Low Fuel	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
5		DIN	R		BUS/COMM	Emergency Generator Engine Low Oil Pressure Normal/Alarm	Emergency Generator Low Oil	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
6		DIN	R		BUS/COMM	Emergency Generator Engine Low Battery Normal/Alarm	Emergency Generator Low Battery	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
7		DIN	R		BUS/COMM	Emergency Generator Engine Low Coolant Level Normal/Alarm	Emergency Generator Low Coolant Level	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
8		DIN	R		BUS/COMM	Emergency Generator Engine Over Temperature Normal/Alarm	Emergency Generator Over Temperature	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
9		DIN	R		BUS/COMM	Emergency Generator Engine Over Crank Normal/Alarm	Emergency Generator Over Crank	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
10		DIN	R		BUS/COMM	Emergency Generator Engine Over Speed Normal/Alarm	Emergency Generator Over Speed	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
11		DIN	R		BUS/COMM	Emergency Generator Auto C/O Enabled/Disabled	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Enabled/Disabled	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
12		DIN	R		BUS/COMM	Emergency Generator CB Fail to Open	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
13		DIN	R		BUS/COMM	Emergency Generator CB Fail to Close	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
14		DIN		W	DB	Emergency Generator Duty/Stand-by	Emergency Generator	Discrete IO	Tunnel E Service Compound	Duty/Standby	GEN/001/ESC/E01					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
15		DOUT		W	PLC/RIQ	Emergency Generator Start/Stop	Emergency Generator	Discrete IO	Tunnel E Service Compound	Start/Stop	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
16		DOUT		W	PLC/RIQ	Emergency Generator No Load Run Up Test	Emergency Generator	Discrete IO	Tunnel E Service Compound	Start/Stop	GEN/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
1600kVA Generator PG1																					
17		DIN	R		BUS/COMM	Emergency Generator Available/Unavailable	Emergency Generator	Discrete IO	Tunnel E Service Compound	Available/Unavailable	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	UnderFreq, GEN OverFreq, GEN UnderVolt, GEN OverVolt, GEN ReversePower, GEN LossOfField, GEN Over Excitation, GEN Removed, etc.
18		DIN	R		DB	Emergency Generator Duty/Stand-by	Emergency Generator	Discrete IO	Tunnel E Service Compound	Duty/Standby	GEN/002/ESC/E01					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
19		DIN	R		BUS/COMM	Emergency Generator Running/Stop	Emergency Generator	Discrete IO	Tunnel E Service Compound	Running/Stop	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
20		DIN	R		BUS/COMM	Emergency Generator Operating Condition	Emergency Generator	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
21		DIN	R		BUS/COMM	Emergency Generator Engine Low Fuel Normal/Alarm	Emergency Generator Low Fuel	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
22		DIN	R		BUS/COMM	Emergency Generator Engine Low Oil Pressure Normal/Alarm	Emergency Generator Low Oil	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
23		DIN	R		BUS/COMM	Emergency Generator Engine Low Battery Normal/Alarm	Emergency Generator Low Battery	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
24		DIN	R		BUS/COMM	Emergency Generator Engine Low Coolant Level Normal/Alarm	Emergency Generator Low Coolant Level	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
25		DIN	R		BUS/COMM	Emergency Generator Engine Over Temperature Normal/Alarm	Emergency Generator Over Temperature	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
26		DIN	R		BUS/COMM	Emergency Generator Engine Over Crank Normal/Alarm	Emergency Generator Over Crank	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
27		DIN	R		BUS/COMM	Emergency Generator Engine Over Speed Normal/Alarm	Emergency Generator Over Speed	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
28		DIN	R		BUS/COMM	Emergency Generator Auto C/O Enabled/Disabled	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Enabled/Disabled	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
29		DIN	R		BUS/COMM	Emergency Generator CB Fail to Open	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
30		DIN	R		BUS/COMM	Emergency Generator CB Fail to Close	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
31		DIN		W	DB	Emergency Generator Duty/Stand-by	Emergency Generator	Discrete IO	Tunnel E Service Compound	Duty/Standby	GEN/002/ESC/E01					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
32		DOUT		W	PLC/RIQ	Emergency Generator Start/Stop	Emergency Generator	Discrete IO	Tunnel E Service Compound	Start/Stop	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
33		DOUT		W	PLC/RIQ	Emergency Generator No Load Run Up Test	Emergency Generator	Discrete IO	Tunnel E Service Compound	Start/Stop	GEN/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
1600kVA Generator room control panel IAT-01																					
34		DIN	R		PLC/RIQ	Control Panel Door Access	Control panel JWI-01 Door Open/Closed Status	Limit Switch	Tunnel E Service Compound	Open/Closed	CP-/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to limit switch
35		DIN	R		PLC/RIQ	Control Panel Operating Condition Power Supply	Control Panel JWI-01 Operating Condition Status	Relay	Tunnel E Service Compound	Normal/Failure	CP-/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
36		DIN	R		PLC/RIQ	Control Panel Operating Condition Temperature	Control Panel JWI-01 Operating Condition Status	Relay	Tunnel E Service Compound	Normal/Failure	CP-/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages in singlephase, two-wire circuits
37		DIN	R		PLC/RIQ	Control Panel Manual Over-Ride On/Off	Control Panel Manual Over-Ride	Relay	Tunnel E Service Compound	On/Off	CP-/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
38		DOUT		W	PLC/RIQ	Control Panel Manual Over-Ride On/Off	Control Panel Manual Over-Ride	Relay	Tunnel E Service Compound	On/Off	CP-/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
1600kVA Generator room control panel PG1																					
39		DIN	R		PLC/RIQ	Control Panel Door Access	Control panel PG1 Door Open/Closed Status	Limit Switch	Tunnel E Service Compound	Open/Closed	CP-/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to limit switch
40		DIN	R		PLC/RIQ	Control Panel Operating Condition Power Supply	Control Panel PG1 Operating Condition Status	Relay	Tunnel E Service Compound	Normal/Failure	CP-/002/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
41		DIN	R		PLC/RIQ	Control Panel Operating Condition Temperature	Control Panel PG1 Operating Condition Status	Relay	Tunnel E Service Compound	Normal/Failure	CP-/001/ESC/E01	RIQ/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages in singlephase, two-wire circuits

TUNNEL MANAGEMENT SYSTEM EXAMPLE I/O LIST

Document Control Panel		Ref. Number: INSERT DOCUMENT REFERENCE NUMBER																			
Project Name: INSERT PROJECT NAME		Document Name: PXXX Tunnel E Plant Control & Monitoring, IO signals list																			
Version	Date	Status																Written by	Checked by	QA Approver	Notes
0	INSERT DATE	First Edition																Insert name	Insert name	Insert name	Draft for Ashghal review
HLD Issued By:																					
Signature: .....insert signature .....Name:.....Insert name .....Date:.....insert date .....																					
Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
42		DIN	R		PLC/RIO	Control Panel Manual Over-Ride On/Off	Control Panel Manual Over-Ride	Relay	Tunnel E Service Compound	On/Off	CP-/002/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
43		DOUT		W	PLC/RIO	Control Panel Manual Over-Ride On/Off	Control Panel Manual Over-Ride	Relay	Tunnel E Service Compound	On/Off	CP-/002/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
30VDC battery + battery charger for LV panel- JWI-01																					
44		DIN	R		PLC/RIO	Battery Operating Condition	Battery	Relay	Tunnel E Service Compound	Normal/Failure	BAT/001/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages in singlephase, two-wire circuits
45		DIN	R		PLC/RIO	Battery On Load On/Off	Battery On Load	Relay	Tunnel E Service Compound	On/Off	BAT/001/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
46		DIN	R		PLC/RIO	Battery Charger On/Off	Battery Charger	Relay	Tunnel E Service Compound	On/Off	BAT/001/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
47		DOUT		W	PLC/RIO	Battery On Load On/Off	Battery On Load	Relay	Tunnel E Service Compound	On/Off	BAT/001/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
48		DOUT		W	PLC/RIO	Battery Charger On/Off	Battery Charger	Relay	Tunnel E Service Compound	On/Off	BAT/001/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
30VDC battery + battery charger for LV panel- PG-1																					
49		DIN	R		PLC/RIO	Battery Operating Condition	Battery	Relay	Tunnel E Service Compound	Normal/Failure	BAT/002/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages in singlephase, two-wire circuits
50		DIN	R		PLC/RIO	Battery On Load On/Off	Battery On Load	Relay	Tunnel E Service Compound	On/Off	BAT/002/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
51		DIN	R		PLC/RIO	Battery Charger On/Off	Battery Charger	Relay	Tunnel E Service Compound	On/Off	BAT/002/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
52		DOUT		W	PLC/RIO	Battery On Load On/Off	Battery On Load	Relay	Tunnel E Service Compound	On/Off	BAT/002/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
53		DOUT		W	PLC/RIO	Battery Charger On/Off	Battery Charger	Relay	Tunnel E Service Compound	On/Off	BAT/002/ESC/E01	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Level switch for diesel oil day Tank DT-00-01																					
54		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/High	Diesel Oil Day Tank Level	Sensor	Tunnel E Service Compound	Normal/High	LSW/001/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
55		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/Low	Diesel Oil Day Tank Level	Sensor	Tunnel E Service Compound	Normal/Low	LSW/001/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Level switch for diesel oil day Tank DT-00-02																					
56		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/High	Diesel Oil Day Tank Level	Sensor	Tunnel E Service Compound	Normal/High	LSW/002/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
57		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/Low	Diesel Oil Day Tank Level	Sensor	Tunnel E Service Compound	Normal/Low	LSW/002/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Level switch for diesel oil storage Tank																					
58		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/High	Diesel Oil Storage Tank Level	Sensor	Tunnel E Service Compound	Normal/High	LSW/004/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
59		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/Low	Diesel Oil Storage Tank Level	Sensor	Tunnel E Service Compound	Normal/Low	LSW/004/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Level switch for diesel oil storage Tank																					
60		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/High	Diesel Oil Storage Tank Level	Sensor	Tunnel E Service Compound	Normal/High	LSW/005/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
61		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/Low	Diesel Oil Storage Tank Level	Sensor	Tunnel E Service Compound	Normal/Low	LSW/005/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Sensors																					
62		DIN	R		PLC/RIO	Pressure sensor for fuel line 1 Level Normal/Low	Pressure sensor for fuel line 1 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	PID/001/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
63		DIN	R		PLC/RIO	Pressure sensor for fuel line 2 Level Normal/Low	Pressure sensor for fuel line 2 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	PID/002/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
64		DIN	R		PLC/RIO	Flow sensor for day Tank DT-00-01 Level Normal/Low	Flow sensor for day Tank DT-00-01 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	FLS/001/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
65		DIN	R		PLC/RIO	Flow sensor for day Tank DT-00-02 Level Normal/Low	Flow sensor for day Tank DT-00-02 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	FLS/002/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
66		DIN	R		PLC/RIO	Flow sensor for fuel line 1 Level Normal/Low	Flow sensor for fuel line 1 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	FLS/004/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
67		DIN	R		PLC/RIO	Flow sensor for fuel line 2 Level Normal/Low	Flow sensor for fuel line 2 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	FLS/005/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Fuel Pump 1, 2																					
68		DIN	R		DB	Fuel Pump 1 Available/Unavailable	Fuel Drainage Pump 1	Discrete IO	Tunnel E Service Compound	Available/Unavailable	POT/001/ESC/E21					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
69		DIN	R		PLC/RIO	Fuel Pump 1 Auto/Manual	Fuel Pump 1	Relay	Tunnel E Service Compound	Auto/Manual	POT/001/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
70		DIN	R		DB	Fuel Pump 1 Duty/Standby	Fuel Pump 1 Duty/Standby	Discrete IO	Tunnel E Service Compound	Duty/Standby	POT/001/ESC/E21					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
71		DIN	R		PLC/RIO	Fuel Pump 1 Running/Stop	Fuel Pump 1	Relay	Tunnel E Service Compound	Running/Stop	POT/001/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay used for operating status control: Monitor overcurrent and undercurrent (2 relay contacts)
72		DIN	R		PLC/RIO	Fuel Pump 1 Operating Condition	Fuel Pump 1	Relay	Tunnel E Service Compound	Normal/Failure	POT/001/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Monitor motor temperature probe, generally a PT100 (1 Relay contact) Monitor overcurrent and undercurrent (2 relay contacts)
73		DIN	R		DB	Fuel Pump 2 Available/Unavailable	Fuel Pump 2	Discrete IO	Tunnel E Service Compound	Available/Unavailable	POT/002/ESC/E21					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
74		DIN	R		PLC/RIO	Fuel Pump 2 Auto/Manual	Fuel Pump 2	Relay	Tunnel E Service Compound	Auto/Manual	POT/002/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
75		DIN	R		DB	Fuel Pump 2 Duty/Standby	Fuel Pump 2 Duty/Standby	Discrete IO	Tunnel E Service Compound	Duty/Standby	POT/002/ESC/E21					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
76		DIN	R		PLC/RIO	Fuel Pump 2 Running/Stop	Fuel Pump 2	Relay	Tunnel E Service Compound	Running/Stop	POT/002/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay used for operating status control: Monitor overcurrent and undercurrent (2 relay contacts)
77		DIN	R		PLC/RIO	Fuel Pump 2 Operating Condition	Fuel Pump 2	Relay	Tunnel E Service Compound	Normal/Failure	POT/002/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Monitor motor temperature probe, generally a PT100 (1 Relay contact) Monitor overcurrent and undercurrent (2 relay contacts)
78		DOUT		W	PLC/RIO	Fuel Pump 1 Auto/Manual	Fuel Pump 1	Relay	Tunnel E Service Compound	Auto/Manual	POT/001/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
79		DOUT		W	DB	Fuel Pump 1 Duty/Standby	Fuel Pump 1 Duty/Standby	Discrete IO	Tunnel E Service Compound	Duty/Standby	POT/001/ESC/E21					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	

TUNNEL MANAGEMENT SYSTEM EXAMPLE I/O LIST

Document Control Panel		Ref. Number: INSERT DOCUMENT REFERENCE NUMBER																			
Project Name: INSERT PROJECT NAME																					
Document Name: PXXX Tunnel E Plant Control & Monitoring, IO signals list																					
Version	Date	Status																Written by	Checked by	QA Approver	Notes
0	INSERT DATE	First Edition																Insert name	Insert name	Insert name	Draft for Ashghal review
HLD Issued By:																					
Signature:.....insert signature.....Name.....Insert name.....Date.....insert date.....																					
Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
80		DOUT		W	PLC/RIO	Fuel Pump 1 Start/Stop	Fuel Pump 1	Relay	Tunnel E Service Compound	Start/Stop	POT/001/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
81		DOUT		W	PLC/RIO	Fuel Pump 2 Auto/Manual	Fuel Pump 2	Relay	Tunnel E Service Compound	Auto/Manual	POT/002/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
82		DOUT		W	DB	Fuel Pump 2 Duty/Standby	Fuel Pump 2 Duty/Standby	Discrete IO	Tunnel E Service Compound	Duty/Standby	POT/002/ESC/E21					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
83		DOUT		W	PLC/RIO	Fuel Pump 2 Start/Stop	Fuel Pump 2	Relay	Tunnel E Service Compound	Start/Stop	POT/002/ESC/E21	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Motorized Valve																					
84		DIN	R		PLC/RIO	Motorised valve for day Tank DT-00-01 Open/Closed	Motorised valve for day Tank DT-00-01 Open/Closed Position	Relay	Tunnel E Service Compound	Open/Closed	VAL/001/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
85		DIN	R		PLC/RIO	Motorised valve for day Tank DT-00-02 Open/Closed	Motorised valve for day Tank DT-00-02 Open/Closed Position	Relay	Tunnel E Service Compound	Open/Closed	VAL/002/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Solenoid valve																					
86		DIN	R		PLC/RIO	Solenoid valve for day Tank DT-00-01 Open/Closed Position	Solenoid valve for day Tank DT-00-01 Open/Closed Position	Relay	Tunnel E Service Compound	Open/Closed	VAL/004/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
87		DIN	R		PLC/RIO	Solenoid valve for day Tank DT-00-02 Open/Closed Position	Solenoid valve for day Tank DT-00-02 Open/Closed Position	Relay	Tunnel E Service Compound	Open/Closed	VAL/005/ESC/E20	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
fuel fill point valve																					
88		DIN	R		PLC/RIO	Fuel fill point valve with lock Open/Closed Position	Fuel fill point valve with lock Open/Closed Position	Relay	Tunnel E Service Compound	Open/Closed	VAL/007/ESC/E22	RIO/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
Motor control center, MCC-IAT-SP-01																					
89		DIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Mains Supply Operating Condition	MCC Mains Supply	Relay	Tunnel E Service Compound	Normal/Failure	MCC/001/ESC/E18	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to 3-phase control relay: Monitor undervoltages, overvoltages, voltage asymmetry, phase-loss and phase-sequence in three-phase, three-wire circuits
90		DIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Operating Condition Power Supply	MCC Operating Condition	Relay	Tunnel E Service Compound	On/Off	MCC/001/ESC/E18	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
91		DIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Operating Condition Temperature	MCC Operating Condition	Relay	Tunnel E Service Compound	On/Off	MCC/001/ESC/E18	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
92		DIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Door Open/Closed	MCC Door	Relay	Tunnel E Service Compound	On/Off	MCC/001/ESC/E18	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to limit switch
93		DIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Manual Over-Ride On/Off	MCC Manual Over-Ride	Relay	Tunnel E Service Compound	On/Off	MCC/001/ESC/E18	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
94		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A from ESMDB-IAT-EL1 Incoming CB Open/Closed Position	MCC-IAT-SP-01DB 40A from ESMDB-IAT-EL1 Incoming CB Open/Closed P	Circuit Breaker	Tunnel E Service Compound	Open/Closed	CBR/056/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
95		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A from ESMDB-IAT-EL1 Incoming CB Trip Status	MCC-IAT-SP-01DB 40A from ESMDB-IAT-EL1 Incoming CB Trip Status	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/056/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
96		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A Duty Pump CB Open/Closed Position	MCC-IAT-SP-01 DB 40A Duty Pump CB Open/Closed Position	Circuit Breaker	Tunnel E Service Compound	Open/Closed	CBR/057/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
97		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A Duty Pump CB Trip Status	MCC-IAT-SP-01 DB 40A Duty Pump CB Trip Status	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/057/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
98		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A Stand-by Pump CB Open/Closed Position	MCC-IAT-SP-01 DB 40A Stand-by Pump CB Open/Clos	Circuit Breaker	Tunnel E Service Compound	Open/Closed	CBR/058/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
99		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A Stand-by Pump CB Trip Status	MCC-IAT-SP-01 DB 40A Stand-by Pump CB Trip Status	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/058/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
100		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 20A UPS CB Open/Closed Position	MCC-IAT-SP-0120A UPS CB Open/Closed Position	Circuit Breaker	Tunnel E Service Compound	Open/Closed	CBR/059/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
101		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 20A UPS CB Trip Status	MCC-IAT-SP-0120A UPS CB Trip Status	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/059/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
102		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 16A Socket Outlet 1 CB Open/Closed Position	MCC-IAT-SP-0116A Socket Outlet 1 CB Open/Clos	Circuit Breaker	Tunnel E Service Compound	Open/Closed	CBR/060/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
103		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 16A Socket Outlet 1 CB Trip Status	MCC-IAT-SP-0116A Socket Outlet 1 CB Trip Status	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/060/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
104		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 16A Socket Outlet 2 CB Open/Closed Position	MCC-IAT-SP-0116A Socket Outlet 2 CB Open/Clos	Circuit Breaker	Tunnel E Service Compound	Open/Closed	CBR/061/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
105		DIN	R		BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 16A Socket Outlet 2 CB Trip Status	MCC-IAT-SP-0116A Socket Outlet 2 CB Trip Status	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/061/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
106		DOUT		W	BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A from ESMDB-IAT-EL1 Incoming CB Normal/Trip Command	EL1 Incoming CB Normal/Trip Command	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/056/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
107		DOUT		W	BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A Duty Pump CB Normal/Trip Command	MCC-IAT-SP-01DB 40A Duty Pump CB Normal/Trip Command	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/057/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
108		DOUT		W	BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 40A Stand-by Pump CB Normal/Trip Command	MCC-IAT-SP-0140A Stand-by Pump CB Normal/Trip Command	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/058/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
109		DOUT		W	BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 20A UPS CB Normal/Trip Command	MCC-IAT-SP-01 20A UPS CB Normal/Trip Command	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/059/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
110		DOUT		W	BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 16A Socket Outlet 1 CB Normal/Trip Command	MCC-IAT-SP-01 16A Socket Outlet 1 CB Normal/Trip Command	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/060/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
111		DOUT		W	BUS/COMM	Motor control center, MCC-IAT-SP-01 DB 16A Socket Outlet 2 CB Normal/Trip Command	MCC-IAT-SP-01 16A Socket Outlet 2 CB Normal/Trip Command	Circuit Breaker	Tunnel E Service Compound	Normal/Trip	CBR/061/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
112		AIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Incomer CB Voltage	MCC-IAT-SP-01 Incomer CB	Signal Converter	Tunnel E Service Compound	Voltage	CBR/056/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm <sup>2</sup>	
113		AIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Incomer CB Current	MCC-IAT-SP-01 Incomer CB	Signal Converter	Tunnel E Service Compound	Current	CBR/056/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm <sup>2</sup>	
114		AIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Incomer CB Power	MCC-IAT-SP-01 Incomer CB	Signal Converter	Tunnel E Service Compound	Power	CBR/056/EI-/E19	RIO/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/001/EU-/E19	Tunnel E Plant Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm <sup>2</sup>	
Motor control center, MCC-JWI-03																					
115		DIN	R		PLC/RIO	Motor control center, MCC-JWI-03 Mains Supply Operating Condition	MCC Mains Supply	Relay	Tunnel E Service Compound	Normal/Failure	MCC/003/ESC/E18	RIO/005/ESC/E02	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-5			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to 3-phase control relay: Monitor undervoltages, overvoltages, voltage asymmetry, phase-loss and phase-sequence in three-phase, three-wire circuits
116		DIN	R		PLC/RIO	Motor control center, MCC-JWI-03 Operating Condition Power Supply	MCC Operating Condition	Relay	Tunnel E Service Compound	On/Off	MCC/003/ESC/E18	RIO/005/ESC/E02	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-5			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
117		DIN	R		PLC/RIO	Motor control center, MCC-JWI-03 Operating Condition Temperature	MCC Operating Condition	Relay	Tunnel E Service Compound	On/Off	MCC/003/ESC/E18	RIO/005/ESC/E02	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-5			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
118		DIN	R		PLC/RIO	Motor control center, MCC-JWI-03 Door Open/Closed	MCC Door	Relay	Tunnel E Service Compound	On/Off	MCC/003/ESC/E18	RIO/005/ESC/E02	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-5			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to limit switch
119		DIN	R		PLC/RIO	Motor control center, MCC-JWI-03 Manual Over-Ride On/Off	MCC Manual Over-Ride	Relay	Tunnel E Service Compound	On/Off	MCC/003/ESC/E18	RIO/005/ESC/E02	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-5			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
120		DIN	R		BUS/COMM	Motor control center, MCC-JWI-03 DB 250A from LV PANEL-PG-2 Incomer CB Open/Closed Position	MCC-JWI-03 DB20A from LV PANEL-PG-2 Incomer CB Open/Closed Position	Circuit Breaker	Tunnel E Service Compound	Open/Closed	CBR/082/ESC/E02	RIO/005/ESC/E02	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-5			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	















TUNNEL MANAGEMENT SYSTEM EXAMPLE I/O LIST

Document Control Panel										
Project Name: <i>INSERT PROJECT NAME</i>										
Document Name: <i>XXXX K Underpass Plant Control &amp; Monitoring, IO signals list</i>										
Ref. Number: #N/A										
Version	Date	Status	Written by				Checked by		QA Approver	Notes
0	<i>INSERT DATE</i>	First Edition	<i>Insert name</i>				<i>Insert name</i>		<i>Insert name</i>	<i>Draft for Ashghal review</i>

HLD Issued By: \_\_\_\_\_

Signature: \_\_\_\_\_ *insert signature* Name: \_\_\_\_\_ *Insert name* Date: \_\_\_\_\_ *insert date*

Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
135	DIN	R			BUS/COMM	Isolator 16ASP ISOL for DB-UPS fed from UPS Incoming CB Opened/Closed Position	SP ISOL for DB-UPS fed from UPS Incoming CB	Circuit Breaker	K Underpass-Storm Water Pump Room	Open/Closed	ISO/002/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
Pump-01, 02, 03																					
136	DIN	R			DB	Sump Drainage Pump 1 Available/Unavailable	Sump Drainage Pump 1	Discrete IO	K Underpass-Storm Water Pump Room	Available/Unavailable	PSW/001/KU-/K01					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
137	DIN	R			PLC/RIQ	Sump Drainage Pump 1 Auto/Manual	Sump Drainage Pump 1	Relay	K Underpass-Storm Water Pump Room	Auto/Manual	PSW/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
138	DIN	R			DB	Sump Drainage Pump 1 Duty/Standby	Sump Drainage Pump 1 Duty/Standby	Discrete IO	K Underpass-Storm Water Pump Room	Duty/Standby	PSW/001/KU-/K01					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
139	DIN	R			PLC/RIQ	Sump Drainage Pump 1 Running/Stop	Sump Drainage Pump 1	Relay	K Underpass-Storm Water Pump Room	Running/Stop	PSW/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a current limit relay
140	DIN	R			PLC/RIQ	Sump Drainage Pump 1 Operating Condition	Sump Drainage Pump 1	Relay	K Underpass-Storm Water Pump Room	Normal/Failure	PSW/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for P1100 thermistors
141	DIN	R			DB	Sump Drainage Pump 2 Available/Unavailable	Sump Drainage Pump 2	Discrete IO	K Underpass-Storm Water Pump Room	Available/Unavailable	PSW/002/KU-/K01					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
142	DIN	R			PLC/RIQ	Sump Drainage Pump 2 Auto/Manual	Sump Drainage Pump 2	Relay	K Underpass-Storm Water Pump Room	Auto/Manual	PSW/002/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
143	DIN	R			DB	Sump Drainage Pump 2 Duty/Standby	Sump Drainage Pump 2 Duty/Standby	Discrete IO	K Underpass-Storm Water Pump Room	Duty/Standby	PSW/002/KU-/K01					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
144	DIN	R			PLC/RIQ	Sump Drainage Pump 2 Running/Stop	Sump Drainage Pump 2	Relay	K Underpass-Storm Water Pump Room	Running/Stop	PSW/002/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a current limit relay
145	DIN	R			PLC/RIQ	Sump Drainage Pump 2 Operating Condition	Sump Drainage Pump 2	Relay	K Underpass-Storm Water Pump Room	Normal/Failure	PSW/002/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for P1100 thermistors
146	DIN	R			DB	Sump Drainage Pump 3 Available/Unavailable	Sump Drainage Pump 3	Discrete IO	K Underpass-Storm Water Pump Room	Available/Unavailable	PSW/003/KU-/K01					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
147	DIN	R			PLC/RIQ	Sump Drainage Pump 3 Auto/Manual	Sump Drainage Pump 3	Relay	K Underpass-Storm Water Pump Room	Auto/Manual	PSW/003/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
148	DIN	R			DB	Sump Drainage Pump 3 Duty/Standby	Sump Drainage Pump 3 Duty/Standby	Discrete IO	K Underpass-Storm Water Pump Room	Duty/Standby	PSW/003/KU-/K01					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
149	DIN	R			PLC/RIQ	Sump Drainage Pump 3 Running/Stop	Sump Drainage Pump 3	Relay	K Underpass-Storm Water Pump Room	Running/Stop	PSW/003/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a current limit relay
150	DIN	R			PLC/RIQ	Sump Drainage Pump 3 Operating Condition	Sump Drainage Pump 3	Relay	K Underpass-Storm Water Pump Room	Normal/Failure	PSW/003/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for P1100 thermistors
151	DIN	R			PLC/RIQ	Drainage Pumps Sump Level Normal/High	Operations Drainage Pumps Sump Level	Sensor	K Underpass-Storm Water Pump Room	Normal/High	LID/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
152	DIN	R			PLC/RIQ	Sump Gas Detector Level High Normal/Alarm	Sump Gas Detector Level High	Sensor	K Underpass-Storm Water Pump Room	Normal/High	GD-/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
153	DIN	R			PLC/RIQ	Sump Ventilation Fan 1 Running/Stop	Sump Ventilation Fan 1	Relay	K Underpass-Storm Water Pump Room	Running/Stop	PFN/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a current limit relay
154	DIN	R			PLC/RIQ	Sump Ventilation Fan 1 Operating Condition	Sump Ventilation Fan 1	Relay	K Underpass-Storm Water Pump Room	Normal/Failure	PFN/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for P1100 thermistors
155	DIN	R			DB	Sump Ventilation Fans Duty 1	Sump Ventilation Fans Duty 1	Discrete IO	K Underpass-Storm Water Pump Room	On/Off	PFN/001/KU-/K01					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
156	DIN	R			PLC/RIQ	Plant Control & Monitoring PLC	K Underpass Plant Control & Monitoring PLC	Discrete IO	K Underpass-Storm Water Pump Room	Normal/Failure	PLC/005/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
157	DOUT		W		PLC/RIQ	Sump Drainage Pump 1 Auto/Manual	Sump Drainage Pump 1	Discrete IO	K Underpass-Storm Water Pump Room	Auto/Manual	PSW/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
158	DOUT		W		PLC/RIQ	Sump Drainage Pump 1 Duty/Standby	Sump Drainage Pump 1 Duty/Standby	Discrete IO	K Underpass-Storm Water Pump Room	Duty/Standby	PSW/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
159	DOUT		W		PLC/RIQ	Sump Drainage Pump 1 Start/Stop	Sump Drainage Pump 1	Discrete IO	K Underpass-Storm Water Pump Room	Start/Stop	PSW/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
160	DOUT		W		PLC/RIQ	Sump Drainage Pump 2 Auto/Manual	Sump Drainage Pump 2	Discrete IO	K Underpass-Storm Water Pump Room	Auto/Manual	PSW/002/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
161	DOUT		W		PLC/RIQ	Sump Drainage Pump 2 Duty/Standby	Sump Drainage Pump 2 Duty/Standby	Discrete IO	K Underpass-Storm Water Pump Room	Duty/Standby	PSW/002/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
162	DOUT		W		PLC/RIQ	Sump Drainage Pump 2 Start/Stop	Sump Drainage Pump 2	Discrete IO	K Underpass-Storm Water Pump Room	Start/Stop	PSW/002/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
163	DOUT		W		PLC/RIQ	Sump Drainage Pump 3 Auto/Manual	Sump Drainage Pump 3	Discrete IO	K Underpass-Storm Water Pump Room	Auto/Manual	PSW/003/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
164	DOUT		W		PLC/RIQ	Sump Drainage Pump 3 Duty/Standby	Sump Drainage Pump 3 Duty/Standby	Discrete IO	K Underpass-Storm Water Pump Room	Duty/Standby	PSW/003/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
165	DOUT		W		PLC/RIQ	Sump Drainage Pump 3 Start/Stop	Sump Drainage Pump 3	Discrete IO	K Underpass-Storm Water Pump Room	Start/Stop	PSW/003/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
166	DOUT		W		PLC/RIQ	Sump Ventilation Fan 1 Start/Stop	Sump Ventilation Fan 1	Discrete IO	K Underpass-Storm Water Pump Room	Start/Stop	PFN/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
167	DOUT		W		DB	Sump Ventilation Fan Duty 1	Sump Ventilation Fans Duty 1	Discrete IO	K Underpass-Storm Water Pump Room	On/Off	PFN/001/KU-/K01					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	
168	DOUT		W		PLC/RIQ	Ventilation Fan Auto/Manual	Ventilation Fans	Relay	K Underpass-Storm Water Pump Room	Auto/Manual	PFN/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
169	DOUT		W		PLC/RIQ	Ventilation Fan Reset Status	Ventilation Fans	Relay	K Underpass-Storm Water Pump Room	On/Off	PFN/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	
170	AIN	R			PLC/RIQ	Pressure transmitter PIT-01	Pressure transmitter PIT-01	Sensor	K Underpass-Storm Water Pump Room	Pressure	PIT/001/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm*2	
171	AIN	R			PLC/RIQ	Pressure transmitter PIT-02	Pressure transmitter PIT-02	Sensor	K Underpass-Storm Water Pump Room	Pressure	PIT/002/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm*2	
172	AIN	R			PLC/RIQ	Pressure transmitter PIT-03	Pressure transmitter PIT-03	Sensor	K Underpass-Storm Water Pump Room	Pressure	PIT/003/KU-/K01	RIQ/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm*2	
ITS																					
173	DIN	R			DB	Access Point AP-77-1, Operating Condition	AP Operating Condition	NTCIP	6+132	Normal/Failure	DZA/002/KUN/6132					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, interface happens at Traffic Management server level
174	DIN	R			DB	Detection Zone, DZ 77-1, Magnetometer 1 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/001/KUN/6124					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
175	DIN	R			DB	Detection Zone, DZ 77-1, Magnetometer 2 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/002/KUN/6124					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
176	DIN	R			DB	Detection Zone, DZ 77-1, Magnetometer 3 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/003/KUN/6124					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
177	DIN	R			DB	Detection Zone, DZ 77-1, Magnetometer 4 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/004/KUN/6124					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
178	DIN	R			DB	Detection Zone, DZ 77-1, Magnetometer 5 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/005/KUN/6124					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
179	DIN	R			DB	Detection Zone, DZ 77-1, Magnetometer 6 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/006/KUN/6129					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
180	DIN	R			DB	Detection Zone, DZ 77-1, Magnetometer 7 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/007/KUN/6129					PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.

TUNNEL MANAGEMENT SYSTEM EXAMPLE I/O LIST

<b>Document Control Panel</b>			Project Name: <i>INSERT PROJECT NAME</i>		Ref. Number: #N/A	
Document Name: <i>PXXX K Underpass Plant Control &amp; Monitoring, IO signals list</i>			Written by: <i>Insert name</i>		Checked by: <i>Insert name</i>	
Version	Date	Status	QA Approver: <i>Insert name</i>		Notes	
0	<i>INSERT DATE</i>	First Edition			<i>Draft for Ashghal review</i>	

HLD Issued By: \_\_\_\_\_

Signature: \_\_\_\_\_ *insert signature* Name: \_\_\_\_\_ *insert name* Date: \_\_\_\_\_ *insert date*

Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
181		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 8 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/008/KUN/6129				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
182		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 9 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/009/KUN/6129				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
183		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 10 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/010/KUN/6129				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
184		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 1 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+124	True/False	DZM/001/KUN/6124				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
185		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 2 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+124	True/False	DZM/002/KUN/6124				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
186		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 3 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+124	True/False	DZM/003/KUN/6124				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
187		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 4 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+124	True/False	DZM/004/KUN/6124				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
188		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 5 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+124	True/False	DZM/005/KUN/6124				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
189		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 6 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+129	True/False	DZM/006/KUN/6129				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
190		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 7 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+129	True/False	DZM/007/KUN/6129				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
191		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 8 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+129	True/False	DZM/008/KUN/6129				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
192		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 9 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+129	True/False	DZM/009/KUN/6129				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
193		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 10 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+129	True/False	DZM/010/KUN/6129				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
194		DIN	R		DB	Access Point, AP-60-1, Operating Condition	AP Operating Condition	NTCIP	6+246	Normal/Failure	DZA/003/KUS/6246				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, interface happens at Traffic Management server level	
195		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 1 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/011/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
196		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 2 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/012/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
197		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 3 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/013/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
198		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 4 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/014/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
199		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 5 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/015/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
200		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 6 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/016/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
201		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 7 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/017/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
202		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 8 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/018/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
203		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 9 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/019/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
204		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 10 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/020/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.	
205		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 1 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+251	True/False	DZM/001/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
206		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 2 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+251	True/False	DZM/002/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
207		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 3 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+251	True/False	DZM/003/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
208		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 4 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+251	True/False	DZM/004/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
209		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 5 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+251	True/False	DZM/005/KUS/6251				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
210		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 6 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+256	True/False	DZM/016/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
211		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 7 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+256	True/False	DZM/017/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
212		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 8 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+256	True/False	DZM/018/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
213		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 9 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+256	True/False	DZM/019/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
214		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 10 Vehicle Detected	DZ Vehicle Detected	Discrete IO	6+256	True/False	DZM/020/KUS/6256				PLC/002/ESC/808	Tunnel E Service Compound SMRCU			N/A	Not available through a hardwired I/O, the magnetometer interfaces with the Access Point	
215		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 73 - Door Access	Sign Door Open/Closed Status	Limit Switch	5+090	Open/Closed	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to limit switch
216		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 73, Operating Condition Temperature	Sign Operating Condition	Relay	5+090	Normal/Failure	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
217		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 73, Operating Condition Power Supply	Sign Operating Condition	Relay	5+090	Normal/Failure	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages
218		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 73, Normal operation/Emergency override	DMS Normal operation/Emergency override	Relay	5+090	Normal/Emergency	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to DMS I/O
219		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 73, Message 1 display check	DMS Emergency override	Relay	5+090	On/Off	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Message 1: TUNNEL CLOSED; Hardwired to DMS I/O
220		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 73, Message 2 display check	DMS Emergency override	Relay	5+090	On/Off	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Message 2: TUNNEL OPEN; Hardwired to DMS I/O
221		DIN	R		DB	Dynamic Message Sign, DMS 73, No message display check	DMS Emergency override	Discrete IO	5+090	On/Off	DMS/001/KUN/5090									N/A	
222		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 66 - Door Access	Sign Door Open/Closed Status	Limit Switch	7+230	Open/Closed	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to limit switch
223		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 66, Operating Condition Temperature	Sign Operating Condition	Relay	7+230	Normal/Failure	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
224		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 66, Operating Condition Power Supply	Sign Operating Condition	Relay	7+230	Normal/Failure	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages
225		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 66, Normal operation/Emergency override	DMS Normal operation/Emergency override	Relay	7+230	Normal/Emergency	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to DMS I/O
226		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 66, Message 1 display check	DMS Normal operation	Relay	7+230	On/Off	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Message 1: TUNNEL CLOSED; Hardwired to DMS I/O
227		DIN	R		PLC/RI0	Dynamic Message Sign, DMS 66, Message 2 display check	DMS Normal operation	Relay	7+230	On/Off	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66-PLC	PLC/002/ESC/808	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Message 2: TUNNEL OPEN; Hardwired to DMS I/O
228		DIN	R		DB	Dynamic Message Sign, DMS 66, No message display check	DMS Normal operation	Discrete IO	7+230	On/Off	DMS/002/KUS/7230									N/A	







TUNNEL MANAGEMENT SYSTEM EXAMPLE I/O LIST

Document Control Panel										Ref. Number: #N/A									
Project Name: INSERT PROJECT NAME										Document Name: PXXX Tunnel E Area EFA pump station plant control & monitoring, IO signals list									
Version	Date	Status								Written by	Checked by	QA Approver	Notes						
0	INSERT DATE	First Edition								Insert name	Insert name	Insert name	Draft for Ashghal review						

HLD Issued By: \_\_\_\_\_

Signature: \_\_\_\_\_ Insert signature \_\_\_\_\_ Name: \_\_\_\_\_ Insert name \_\_\_\_\_ Date: \_\_\_\_\_ Insert date \_\_\_\_\_

Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
86		DIN	R		BUS/COMM	Tunnel E Fire Alarm Panel Zone Loop 2 Fire Normal/Alarm	Fire Alarm Panel Zone Loop 2 Fire	Discrete IO	Tunnel E EFA Pump Station	Normal/Alarm	FCP/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
87		DIN	R		BUS/COMM	Tunnel E Fire Alarm Panel Zone Loop 2 Operating Condition	Fire Alarm Panel Zone Loop 2	Discrete IO	Tunnel E EFA Pump Station	Normal/Failure	FCP/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
88		DIN	R		BUS/COMM	Tunnel E Fire Alarm Panel Zone Loop 3 Fire Normal/Alarm	Fire Alarm Panel Zone Loop 3 Fire	Discrete IO	Tunnel E EFA Pump Station	Normal/Alarm	FCP/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
89		DIN	R		BUS/COMM	Tunnel E Fire Alarm Panel Zone Loop 3 Operating Condition	Fire Alarm Panel Zone Loop 3	Discrete IO	Tunnel E EFA Pump Station	Normal/Failure	FCP/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
90		DIN	R		BUS/COMM	Tunnel E Fire Alarm Panel Zone Loop 4 Fire Normal/Alarm	Fire Alarm Panel Zone Loop 4 Fire	Discrete IO	Tunnel E EFA Pump Station	Normal/Alarm	FCP/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
91		DIN	R		BUS/COMM	Tunnel E Fire Alarm Panel Zone Loop 4 Operating Condition	Fire Alarm Panel Zone Loop 4	Discrete IO	Tunnel E EFA Pump Station	Normal/Failure	FCP/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
92		DIN	R		BUS/COMM	Tunnel E Fire Alarm Panel Operating Condition	Fire Alarm Panel	Discrete IO	Tunnel E EFA Pump Station	Normal/Failure	FCP/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
Sump Pump-01, 02, 03																					
93		DIN	R		DB	Sump Drainage Pump 1 Available/Unavailable	Sump Drainage Pump 1	Discrete IO	Tunnel E EFA Pump Station	Available/Unavailable	PSW/003/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
94		DIN	R		PLC/RIQ	Sump Drainage Pump 1 Auto/Manual	Sump Drainage Pump 1	Relay	Tunnel E EFA Pump Station	Auto/Manual	PSW/003/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
95		DIN	R		DB	Sump Drainage Pump 1 Duty/Standby	Sump Drainage Pump 1 Duty/Standby	Discrete IO	Tunnel E EFA Pump Station	Duty/Standby	PSW/003/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
96		DIN	R		PLC/RIQ	Sump Drainage Pump 1 Running/Stopped	Sump Drainage Pump 1	Relay	Tunnel E EFA Pump Station	Running/Stopped	PSW/003/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired to a current limit relay
97		DIN	R		PLC/RIQ	Sump Drainage Pump 1 Operating Condition	Sump Drainage Pump 1	Relay	Tunnel E EFA Pump Station	Normal/Failure	PSW/003/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for Pt100 thermistors
98		DIN	R		DB	Sump Drainage Pump 2 Available/Unavailable	Sump Drainage Pump 2	Discrete IO	Tunnel E EFA Pump Station	Available/Unavailable	PSW/004/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
99		DIN	R		PLC/RIQ	Sump Drainage Pump 2 Auto/Manual	Sump Drainage Pump 2	Relay	Tunnel E EFA Pump Station	Auto/Manual	PSW/004/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
100		DIN	R		DB	Sump Drainage Pump 2 Duty/Standby	Sump Drainage Pump 2 Duty/Standby	Discrete IO	Tunnel E EFA Pump Station	Duty/Standby	PSW/004/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
101		DIN	R		PLC/RIQ	Sump Drainage Pump 2 Running/Stopped	Sump Drainage Pump 2	Relay	Tunnel E EFA Pump Station	Running/Stopped	PSW/004/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired to a current limit relay
102		DIN	R		PLC/RIQ	Sump Drainage Pump 2 Operating Condition	Sump Drainage Pump 2	Relay	Tunnel E EFA Pump Station	Normal/Failure	PSW/004/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for Pt100 thermistors
103		DIN	R		DB	Sump Drainage Pump 3 Available/Unavailable	Sump Drainage Pump 3	Discrete IO	Tunnel E EFA Pump Station	Available/Unavailable	PSW/005/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
104		DIN	R		PLC/RIQ	Sump Drainage Pump 3 Auto/Manual	Sump Drainage Pump 3	Relay	Tunnel E EFA Pump Station	Auto/Manual	PSW/005/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
105		DIN	R		DB	Sump Drainage Pump 3 Duty/Standby	Sump Drainage Pump 3 Duty/Standby	Discrete IO	Tunnel E EFA Pump Station	Duty/Standby	PSW/005/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
106		DIN	R		PLC/RIQ	Sump Drainage Pump 3 Running/Stopped	Sump Drainage Pump 3	Relay	Tunnel E EFA Pump Station	Running/Stopped	PSW/005/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired to a current limit relay
107		DIN	R		PLC/RIQ	Sump Drainage Pump 3 Operating Condition	Sump Drainage Pump 3	Relay	Tunnel E EFA Pump Station	Normal/Failure	PSW/005/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for Pt100 thermistors
108		DIN	R		PLC/RIQ	Drainage Pumps Sump Level Normal/High	Operations Drainage Pumps Sump Level	Sensor	Tunnel E EFA Pump Station	Normal/High	LEL/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
109		DIN	R		PLC/RIQ	Sump Gas Detector Level High Normal/Alarm	Sump Gas Detector Level High	Sensor	Tunnel E EFA Pump Station	Normal/High	RIQ/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
110		DIN	R		PLC/RIQ	Sump Ventilation Fan 1 Running/Stopped	Sump Ventilation Fan 1	Relay	Tunnel E EFA Pump Station	Running/Stopped	PN-/001/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired to a current limit relay
111		DIN	R		PLC/RIQ	Sump Ventilation Fan 1 Operating Condition	Sump Ventilation Fan 1	Relay	Tunnel E EFA Pump Station	Normal/Failure	PN-/001/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for Pt100 thermistors
112		DIN	R		DB	Sump Ventilation Fans Duty 1	Sump Ventilation Fans Duty 1	Discrete IO	Tunnel E EFA Pump Station	On/Off	PN-/001/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
113		DIN	R		PLC/RIQ	Plant Control & Monitoring PLC	Tunnel E Plant Control & Monitoring PLC	Watchdog Relay	Tunnel E EFA Pump Station	Normal/Failure	PN-/005/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
114		DOUT		W	PLC/RIQ	Sump Drainage Pump 1 Auto/Manual	Sump Drainage Pump 1	Relay	Tunnel E EFA Pump Station	Auto/Manual	PSW/003/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
115		DOUT		W	DB	Sump Drainage Pump 1 Duty/Standby	Sump Drainage Pump 1 Duty/Standby	Discrete IO	Tunnel E EFA Pump Station	Duty/Standby	PSW/003/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
116		DOUT		W	PLC/RIQ	Sump Drainage Pump 1 Start/Stop	Sump Drainage Pump 1	Relay	Tunnel E EFA Pump Station	Start/Stop	PSW/003/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
117		DOUT		W	PLC/RIQ	Sump Drainage Pump 2 Auto/Manual	Sump Drainage Pump 2	Relay	Tunnel E EFA Pump Station	Auto/Manual	PSW/004/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
118		DOUT		W	DB	Sump Drainage Pump 2 Duty/Standby	Sump Drainage Pump 2 Duty/Standby	Discrete IO	Tunnel E EFA Pump Station	Duty/Standby	PSW/004/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
119		DOUT		W	PLC/RIQ	Sump Drainage Pump 2 Start/Stop	Sump Drainage Pump 2	Relay	Tunnel E EFA Pump Station	Start/Stop	PSW/004/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
120		DOUT		W	PLC/RIQ	Sump Drainage Pump 3 Auto/Manual	Sump Drainage Pump 3	Relay	Tunnel E EFA Pump Station	Auto/Manual	PSW/005/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
121		DOUT		W	DB	Sump Drainage Pump 3 Duty/Standby	Sump Drainage Pump 3 Duty/Standby	Discrete IO	Tunnel E EFA Pump Station	Duty/Standby	PSW/005/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
122		DOUT		W	PLC/RIQ	Sump Drainage Pump 3 Start/Stop	Sump Drainage Pump 3	Relay	Tunnel E EFA Pump Station	Start/Stop	PSW/005/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
123		DOUT		W	PLC/RIQ	Sump Ventilation Fan 1 Start/Stop	Sump Ventilation Fan 1	Relay	Tunnel E EFA Pump Station	Start/Stop	PN-/001/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
124		DOUT		W	DB	Sump Ventilation Fan Duty 1	Sump Ventilation Fans Duty 1	Discrete IO	Tunnel E EFA Pump Station	On/Off	PN-/001/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
125		DOUT		W	PLC/RIQ	Ventilation Fan Auto/Manual	Ventilation Fans	Relay	Tunnel E EFA Pump Station	Auto/Manual	PN-/001/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	
126		DOUT		W	DB	Ventilation Fan Reset Status	Ventilation Fans	Discrete IO	Tunnel E EFA Pump Station	Reset	PN-/001/EFA/F01		Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
127		AIN	R		PLC/RIQ	Pressure transmitter PIT-01	Pressure transmitter PIT-01	Signal Converter	Tunnel E EFA Pump Station	Pressure	PIT/003/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm^2	
128		AIN	R		PLC/RIQ	Pressure transmitter PIT-02	Pressure transmitter PIT-02	Signal Converter	Tunnel E EFA Pump Station	Pressure	PIT/004/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm^2	
129		AIN	R		PLC/RIQ	Pressure transmitter PIT-03	Pressure transmitter PIT-03	Signal Converter	Tunnel E EFA Pump Station	Pressure	PIT/005/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-CSC 1.31 mm^2	
16A,SP Isolator for UPS fed from MCC-IAT-SP-2																					
130		DIN	R		BUS/COMM	Isolator 16A SP ISOL for UPS fed from MCC-IAT-SP-2 Opened/Closed	SP ISOL for UPS fed from MCC-IAT-SP-2	Circuit Breaker	Tunnel E EFA Pump Station	Opened/Closed	ISO/038/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
16A,SP Isolator for UPS-DB fed from UPS																					





TUNNEL MANAGEMENT SYSTEM EXAMPLE I/O LIST

<b>Document Control Panel</b>		Ref. Number: #N/A	
Project Name: INSERT PROJECT NAME			
Document Name: PXXX Tunnel E Area EFA pump station plant control & monitoring, IO signals list			
Version	Date	Status	Notes
0	INSERT DATE	First Edition	Draft for Ashghal review
Written by		Checked by	QA Approver
Insert name		Insert name	Insert name

HLD Issued By: \_\_\_\_\_  
Signature: .....insert signature .....Name.....Insert name .....Date.....insert date .....

Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
176		DIN	R		PLC/RIO	Control Panel Operating Condition Primary Power Supply	Panel Operating Condition	Relay	EFA Pump Station	Normal/Failure	CP-/002/EFA/F01	RIO/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired
177		DIN	R		PLC/RIO	Control Panel Operating Condition Backup Power Supply	Panel Operating Condition	Relay	EFA Pump Station	Normal/Failure	CP-/002/EFA/F01	RIO/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired
178		DIN	R		PLC/RIO	Control Panel Operating Condition Loss of Power	Panel Operating Condition	Relay	EFA Pump Station	Normal/Failure	CP-/002/EFA/F01	RIO/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired
179		DIN	R		PLC/RIO	Control Panel Operating Condition TVSS	Panel Operating Condition	Relay	EFA Pump Station	Normal/Failure	CP-/002/EFA/F01	RIO/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm*2	Hardwired



**ASHGHAL**

قطر تستحق الأفضل  
Qatar Deserves The Best

**I A**

**INFRASTRUCTURE AFFAIRS  
DESIGN DEPARTMENT-ROADS**

**SPECIMEN DESIGN FOR TUNNEL MANAGEMENT SYSTEM  
ALARM LISTS EXAMPLE**

**THIS SPECIMEN IS PROVIDED FOR GUIDANCE ONLY**

**THIS PACKAGE CONTAINS SPECIMEN LISTS OF VARIOUS CRITICAL  
INFRASTRUCTURES FOR A TYPICAL TUNNEL MANAGEMENT SYSTEM. THE  
INDIVIDUAL LISTS MAY NOT CORRELATE TO OTHER LISTS AND THEIR  
PURPOSE IS TO PROVIDE PRESENTATIONAL GUIDANCE ONLY.**

TUNNEL MANAGEMENT SYSTEM EXAMPLE ALARM LIST

Document Control Panel			Ref. Number: INSERT DOCUMENT REFERENCE NUMBER	
Project Name: INSERT PROJECT NAME				
Document Name: PXXX Tunnel E Plant Control & Monitoring, Alarm signals list				
Version	Date	Status	Written by	Checked by
0	INSERT	First Edition	Insert name	Insert name
HLD Issued By:			QA Approver	Notes
Signature.....Insert signature .....			Insert name	Draft for Ashahal review

Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
0		DIN	R		BUS/COMM	Emergency Generator Available/Unavailable	Emergency Generator	Discrete IO	Tunnel E Service Compound	Available/Unavailable	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	UnderFreq, GEN OverFreq, GEN UnderVolt, GEN OverVolt, GEN ReversePower, GEN LossOfField, GEN Over Excitation, GEN Removed, etc.
3		DIN	R		BUS/COMM	Emergency Generator Operating Condition	Emergency Generator	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
4		DIN	R		BUS/COMM	Emergency Generator Engine Low Fuel Normal/Alarm	Emergency Generator Low Fuel	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
5		DIN	R		BUS/COMM	Emergency Generator Engine Low Oil Pressure Normal/Alarm	Emergency Generator Low Oil	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
6		DIN	R		BUS/COMM	Emergency Generator Engine Low Battery Normal/Alarm	Emergency Generator Low Battery	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
7		DIN	R		BUS/COMM	Emergency Generator Engine Low Coolant Level Normal/Alarm	Emergency Generator Low Coolant Level	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
8		DIN	R		BUS/COMM	Emergency Generator Engine Over Temperature Normal/Alarm	Emergency Generator Over Temperature	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
9		DIN	R		BUS/COMM	Emergency Generator Engine Over Crank Normal/Alarm	Emergency Generator Over Crank	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
10		DIN	R		BUS/COMM	Emergency Generator Engine Over Speed Normal/Alarm	Emergency Generator Over Speed	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
12		DIN	R		BUS/COMM	Emergency Generator CB Fail to Open	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
13		DIN	R		BUS/COMM	Emergency Generator CB Fail to Close	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
17		DIN	R		BUS/COMM	Emergency Generator Available/Unavailable	Emergency Generator	Discrete IO	Tunnel E Service Compound	Available/Unavailable	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	UnderFreq, GEN OverFreq, GEN UnderVolt, GEN OverVolt, GEN ReversePower, GEN LossOfField, GEN Over Excitation, GEN Removed, etc.
20		DIN	R		BUS/COMM	Emergency Generator Operating Condition	Emergency Generator	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
21		DIN	R		BUS/COMM	Emergency Generator Engine Low Fuel Normal/Alarm	Emergency Generator Low Fuel	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
22		DIN	R		BUS/COMM	Emergency Generator Engine Low Oil Pressure Normal/Alarm	Emergency Generator Low Oil	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
23		DIN	R		BUS/COMM	Emergency Generator Engine Low Battery Normal/Alarm	Emergency Generator Low Battery	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
24		DIN	R		BUS/COMM	Emergency Generator Engine Low Coolant Level Normal/Alarm	Emergency Generator Low Coolant Level	Discrete IO	Tunnel E Service Compound	Normal/Low	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
25		DIN	R		BUS/COMM	Emergency Generator Engine Over Temperature Normal/Alarm	Emergency Generator Over Temperature	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
26		DIN	R		BUS/COMM	Emergency Generator Engine Over Crank Normal/Alarm	Emergency Generator Over Crank	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
27		DIN	R		BUS/COMM	Emergency Generator Engine Over Speed Normal/Alarm	Emergency Generator Over Speed	Discrete IO	Tunnel E Service Compound	Normal/High	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
29		DIN	R		BUS/COMM	Emergency Generator CB Fail to Open	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
30		DIN	R		BUS/COMM	Emergency Generator CB Fail to Close	Emergency Generator Auto C/O	Discrete IO	Tunnel E Service Compound	Normal/Failure	GEN/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
41		DIN	R		PLC/RIO	Control Panel Operating Condition Power Supply	Control Panel JWI-01 Operating Condition Status	Relay	Tunnel E Service Compound	Normal/Failure	CP-/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
42		DIN	R		PLC/RIO	Control Panel Operating Condition Temperature	Control Panel JWI-01 Operating Condition Status	Relay	Tunnel E Service Compound	Normal/Failure	CP-/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages in singlephase, two-wire circuits
46		DIN	R		PLC/RIO	Control Panel Operating Condition Power Supply	Control Panel PG1 Operating Condition Status	Relay	Tunnel E Service Compound	Normal/Failure	CP-/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to temperature sensor and/or enclosure fan control relay
47		DIN	R		PLC/RIO	Control Panel Operating Condition Temperature	Control Panel PG1 Operating Condition Status	Relay	Tunnel E Service Compound	Normal/Failure	CP-/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages in singlephase, two-wire circuits
53		DIN	R		PLC/RIO	Battery Operating Condition	Battery	Relay	Tunnel E Service Compound	Normal/Failure	BAT/001/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages in singlephase, two-wire circuits
58		DIN	R		PLC/RIO	Battery Operating Condition	Battery	Relay	Tunnel E Service Compound	Normal/Failure	BAT/002/ESC/E01	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	Hardwired to control relay: Monitor undervoltages, overvoltages in singlephase, two-wire circuits
67		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/High	Diesel Oil Day Tank Level	Sensor	Tunnel E Service Compound	Normal/High	LSW/001/ESC/E20	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
68		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/Low	Diesel Oil Day Tank Level	Sensor	Tunnel E Service Compound	Normal/Low	LSW/001/ESC/E20	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
69		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/High	Diesel Oil Day Tank Level	Sensor	Tunnel E Service Compound	Normal/High	LSW/002/ESC/E20	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
70		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/Low	Diesel Oil Day Tank Level	Sensor	Tunnel E Service Compound	Normal/Low	LSW/002/ESC/E20	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
71		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/High	Diesel Oil Storage Tank Level	Sensor	Tunnel E Service Compound	Normal/High	LSW/004/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
72		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/Low	Diesel Oil Storage Tank Level	Sensor	Tunnel E Service Compound	Normal/Low	LSW/004/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
73		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/High	Diesel Oil Storage Tank Level	Sensor	Tunnel E Service Compound	Normal/High	LSW/005/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
74		DIN	R		PLC/RIO	Fire Main Booster Pumps Water Storage Reservoir Level Normal/Low	Diesel Oil Storage Tank Level	Sensor	Tunnel E Service Compound	Normal/Low	LSW/005/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
75		DIN	R		PLC/RIO	Pressure sensor for fuel line 1 Level Normal/Low	Pressure sensor for fuel line 1 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	PID/001/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
76		DIN	R		PLC/RIO	Pressure sensor for fuel line 2 Level Normal/Low	Pressure sensor for fuel line 2 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	PID/002/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
77		DIN	R		PLC/RIO	Flow sensor for day Tank DT-00-01 Level Normal/Low	Flow sensor for day Tank DT-00-01 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	FLS/001/ESC/E20	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
78		DIN	R		PLC/RIO	Flow sensor for day Tank DT-00-02 Level Normal/Low	Flow sensor for day Tank DT-00-02 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	FLS/002/ESC/E20	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
79		DIN	R		PLC/RIO	Flow sensor for fuel line 1 Level Normal/Low	Flow sensor for fuel line 1 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	FLS/004/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
80		DIN	R		PLC/RIO	Flow sensor for fuel line 2 Level Normal/Low	Flow sensor for fuel line 2 Level Normal/Low	Sensor	Tunnel E Service Compound	Normal/Low	FLS/005/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	
81		DIN	R		DB	Fuel Pump 1 Available/Unavailable	Fuel Drainage Pump 1	Discrete IO	Tunnel E Service Compound	Available/Unavailable	POT/001/ESC/E21					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
85		DIN	R		PLC/RIO	Fuel Pump 1 Operating Condition	Fuel Pump 1	Relay	Tunnel E Service Compound	Normal/Failure	POT/001/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	-Monitor motor temperature probe, generally a PT100 (1 Relay contact) -Monitor overcurrent and undercurrent (2 relay contacts)
86		DIN	R		DB	Fuel Pump 2 Available/Unavailable	Fuel Pump 2	Discrete IO	Tunnel E Service Compound	Available/Unavailable	POT/002/ESC/E21					PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
90		DIN	R		PLC/RIO	Fuel Pump 2 Operating Condition	Fuel Pump 2	Relay	Tunnel E Service Compound	Normal/Failure	POT/002/ESC/E21	RI0/008/ESC/E01	Tunnel E Service Compound Plant Control & Monitoring - SMRIOU-8			PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	-Monitor motor temperature probe, generally a PT100 (1 Relay contact) -Monitor overcurrent and undercurrent (2 relay contacts)
104		DIN	R		PLC/RIO	Motor control center, MCC-IAT-SP-01 Mains Supply Operating Condition	MCC Mains Supply	Relay	Tunnel E Service Compound	Normal/Failure	MCC/001/ESC/E18	RI0/001/EU-/E19	Tunnel E Plant Control & Monitoring - SMRIOU		Tunnel E Plant Control & Monitoring - PLC	PLC/001/EU-/E19	Tunnel E Service Compound SMRCU			2-C 2.08 mm <sup>2</sup>	voltage asymmetry, phase-loss and phase-sequence in threephase, three-wire circuits















TUNNEL MANAGEMENT SYSTEM EXAMPLE ALARM LIST

<b>Document Control Panel</b>			<b>Project Name:</b> INSERT PROJECT NAME										<b>Ref. Number:</b> IA1011D0276_EXW_Pxx_XXX_Y_Z - ALARM K UNDERPASS.xlsx																													
<b>Document Name:</b> PXXX K Underpass Plant Control & Monitoring, Alarm signals list																																										
<b>Version</b>	<b>Date</b>	<b>Status</b>	<b>Written by</b>										<b>Checked by</b>										<b>QA Approver</b>										<b>Notes</b>									
0	INSERT	First Edition	Insert name										Insert name										Insert name										Draft for Ashqah review									

HLD Issued By: \_\_\_\_\_  
 Signature: \_\_\_\_\_ Insert signature \_\_\_\_\_ Name: \_\_\_\_\_ Insert name \_\_\_\_\_ Date: \_\_\_\_\_ insert date \_\_\_\_\_

Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
198		DIN	R		PLC/RIO	Sump Ventilation Fan 1 Operating Condition	Sump Ventilation Fan 1	Relay	K Underpass-Storm Water Pump Room	Normal/Failure	PFN/001/KU-/K01	RIO/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to a Thermistor Motor Protection Relay or RIO ready for PL100 thermistors
200		DIN	R		PLC/RIO	Plant Control & Monitoring PLC	K Underpass Plant Control & Monitoring PLC	Discrete IO	K Underpass-Storm Water Pump Room	Normal/Failure	PLC/005/KU-/K01	RIO/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIOU	PLC/005/KU-/K01	K Underpass Pump Plant Control & Monitoring PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	
2496		DIN	R		DB	Access Point, AP-77-1, Operating Condition	AP Operating Condition	NTCIP	6+132	Normal/Failure	DZA/002/KUN/6132					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Not available through a hardwired I/O, interface happens at Traffic Management server level
2497		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 1 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/001/KUN/6124					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2498		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 2 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/002/KUN/6124					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2499		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 3 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/003/KUN/6124					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2500		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 4 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/004/KUN/6124					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2501		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 5 Operating Condition	DZ Operating Condition	Discrete IO	6+124	Normal/Failure	DZM/005/KUN/6124					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2502		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 6 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/006/KUN/6129					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2503		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 7 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/007/KUN/6129					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2504		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 8 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/008/KUN/6129					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2505		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 9 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/009/KUN/6129					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2506		DIN	R		DB	Detection Zone, DZ 77-1, Magnetometer 10 Operating Condition	DZ Operating Condition	Discrete IO	6+129	Normal/Failure	DZM/010/KUN/6129					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2496		DIN	R		DB	Access Point, AP-60-1, Operating Condition	AP Operating Condition	NTCIP	6+246	Normal/Failure	DZA/003/KUS/6246					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Not available through a hardwired I/O, interface happens at Traffic Management server level
2497		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 1 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/011/KUS/6251					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2498		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 2 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/012/KUS/6251					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2499		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 3 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/013/KUS/6251					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2500		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 4 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/014/KUS/6251					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2501		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 5 Operating Condition	DZ Operating Condition	Discrete IO	6+251	Normal/Failure	DZM/015/KUS/6251					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2502		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 6 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/016/KUS/6256					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2503		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 7 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/017/KUS/6256					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2504		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 8 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/018/KUS/6256					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2505		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 9 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/019/KUS/6256					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2506		DIN	R		DB	Detection Zone, DZ 60-1, Magnetometer 10 Operating Condition	DZ Operating Condition	Discrete IO	6+256	Normal/Failure	DZM/020/KUS/6256					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Access Point Failure to successfully retrieve the Magnetometer information shall trigger alarm.
2524		DIN	R		PLC/RIO	Dynamic Message Sign, DMS 73, Operating Condition Temperature	Sign Operating Condition	Relay	5+090	Normal/Failure	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2525		DIN	R		PLC/RIO	Dynamic Message Sign, DMS 73, Operating Condition Power Supply	Sign Operating Condition	Relay	5+090	Normal/Failure	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2526		DIN	R		PLC/RIO	Dynamic Message Sign, DMS 73, Normal operation/Emergency override	DMS Normal operation/Emergency override	Relay	5+090	Normal/Emergency	DMS/001/KUN/5090			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2531		DIN	R		PLC/RIO	Dynamic Message Sign, DMS 66, Operating Condition Temperature	Sign Operating Condition	Relay	7+230	Normal/Failure	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2532		DIN	R		PLC/RIO	Dynamic Message Sign, DMS 66, Operating Condition Power Supply	Sign Operating Condition	Relay	7+230	Normal/Failure	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2533		DIN	R		PLC/RIO	Dynamic Message Sign, DMS 66, Normal operation/Emergency override	DMS Normal operation/Emergency override	Relay	7+230	Normal/Emergency	DMS/002/KUS/7230			PLC/002/KUS/7238	Ground Mounted Enclosure, ENC-66 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2538		DIN	R		PLC/RIO	Ground Mounted Enclosure, ENC-73, Operating Condition Temperature	Enclosure Operating Condition	Relay	5+079	Normal/Failure	GME/001/KUN/5079			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2539		DIN	R		PLC/RIO	Ground Mounted Enclosure, ENC-73, Operating Condition Power Supply	Enclosure Operating Condition	Relay	5+079	Normal/Failure	GME/001/KUN/5079			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2541		DIN	R		PLC/RIO	Ground Mounted Enclosure, ENC-66, Operating Condition Temperature	Enclosure Operating Condition	Relay	7+238	Normal/Failure	GME/002/KUS/7238			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2542		DIN	R		PLC/RIO	Ground Mounted Enclosure, ENC-66, Operating Condition Power Supply	Enclosure Operating Condition	Relay	7+238	Normal/Failure	GME/002/KUS/7238			PLC/001/KUN/5079	Ground Mounted Enclosure, ENC-73 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2544		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-1, Operating Condition Temperature	Sign Operating Condition	Relay	6+148	Normal/Failure	LCS/005/KUN/6148			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2545		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-1, Operating Condition Power Supply	Sign Operating Condition	Relay	6+148	Normal/Failure	LCS/005/KUN/6148			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2546		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-1, Normal operation/Emergency override	LCS Normal operation/Emergency override	Relay	6+148	Normal/Emergency	LCS/005/KUN/6148			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2553		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-2, Operating Condition Temperature	Sign Operating Condition	Relay	6+147	Normal/Failure	LCS/006/KUN/6147			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2554		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-2, Operating Condition Power Supply	Sign Operating Condition	Relay	6+147	Normal/Failure	LCS/006/KUN/6147			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2555		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-2, Normal operation/Emergency override	LCS Normal operation/Emergency override	Relay	6+147	Normal/Emergency	LCS/006/KUN/6147			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2562		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-3, Operating Condition Temperature	Sign Operating Condition	Relay	6+145	Normal/Failure	LCS/007/KUN/6145			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2563		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-3, Operating Condition Power Supply	Sign Operating Condition	Relay	6+145	Normal/Failure	LCS/007/KUN/6145			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2564		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-3, Normal operation/Emergency override	LCS Normal operation/Emergency override	Relay	6+145	Normal/Emergency	LCS/007/KUN/6145			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2571		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-4, Operating Condition Temperature	Sign Operating Condition	Relay	6+142	Normal/Failure	LCS/008/KUN/6142			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2572		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-4, Operating Condition Power Supply	Sign Operating Condition	Relay	6+142	Normal/Failure	LCS/008/KUN/6142			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2573		DIN	R		PLC/RIO	Lane Control Sign, LCS 77-4, Normal operation/Emergency override	LCS Normal operation/Emergency override	Relay	6+142	Normal/Emergency	LCS/008/KUN/6142			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2580		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-1, Operating Condition Temperature	Sign Operating Condition	Relay	6+234	Normal/Failure	LCS/009/KUS/6234			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60 - PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay

TUNNEL MANAGEMENT SYSTEM EXAMPLE ALARM LIST

<b>Document Control Panel</b>			<b>Project Name:</b> INSERT PROJECT NAME		<b>Ref. Number:</b> IA1011D027G_EXW_Pxx_XXX_Y_Z - ALARM K UNDERPASS.xlsx	
<b>Document Name:</b> PXXX K Underpass Plant Control & Monitoring, Alarm signals list						
<b>Version</b>	<b>Date</b>	<b>Status</b>	<b>Written by</b>	<b>Checked by</b>	<b>QA Approver</b>	<b>Notes</b>
0	INSERT	First Edition	Insert name	Insert name	Insert name	Draft for Ashqah review

HLD Issued By: \_\_\_\_\_

Signature: \_\_\_\_\_ Insert signature \_\_\_\_\_ Name: \_\_\_\_\_ Insert name \_\_\_\_\_ Date: \_\_\_\_\_ Insert date \_\_\_\_\_

Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
2581		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-1, Operating Condition Power Supply	Sign Operating Condition	Relay	6+234	Normal/Failure	LCS/009/KUS/6234			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2582		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-1, Normal operation/Emergency override	LCS Normal operation/Emergency override	Relay	6+234	Normal/Emergency	LCS/009/KUS/6234			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2589		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-2, Operating Condition Temperature	Sign Operating Condition	Relay	6+231	Normal/Failure	LCS/010/KUS/6231			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2590		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-2, Operating Condition Power Supply	Sign Operating Condition	Relay	6+231	Normal/Failure	LCS/010/KUS/6231			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2591		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-2, Normal operation/Emergency override	LCS Normal operation/Emergency override	Relay	6+231	Normal/Emergency	LCS/010/KUS/6231			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2598		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-3, Operating Condition Temperature	Sign Operating Condition	Relay	6+229	Normal/Failure	LCS/011/KUS/6229			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2599		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-3, Operating Condition Power Supply	Sign Operating Condition	Relay	6+229	Normal/Failure	LCS/011/KUS/6229			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2600		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-3, Normal operation/Emergency override	LCS Normal operation/Emergency override	Relay	6+229	Normal/Emergency	LCS/011/KUS/6229			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2607		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-4, Operating Condition Temperature	Sign Operating Condition	Relay	6+227	Normal/Failure	LCS/012/KUS/6227			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2608		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-4, Operating Condition Power Supply	Sign Operating Condition	Relay	6+227	Normal/Failure	LCS/012/KUS/6227			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2609		DIN	R		PLC/RIO	Lane Control Sign, LCS 60-4, Normal operation/Emergency override	LCS Normal operation/Emergency override	Relay	6+227	Normal/Emergency	LCS/012/KUS/6227			PLC/004/KUS/6240	Wall Mounted Enclosure, ENC-60-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to DMS I/O
2615		DIN	R		BUS/COMM	Pan tilt zoom CCTV camera, PTZ 77 Operating Condition	PTZ Operating Condition	TCP/IP	6+150	Normal/Failure	PTZ/001/KUN/6150					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Not available through a hardwired I/O, interface happens at Traffic Management server level through video server
2622		DIN	R		BUS/COMM	Pan tilt zoom CCTV camera, PTZ 60 Operating Condition	PTZ Operating Condition	TCP/IP	6+226	Normal/Failure	PTZ/002/KUS/6226					PLC/002/ESC/B08	East Industrial Service Compound SMRCU			N/A	Not available through a hardwired I/O, interface happens at Traffic Management server level through video server
2630		DIN	R		PLC/RIO	Wall Mounted Enclosure, ENC-77, Operating Condition Temperature	Enclosure Operating Condition	Relay	6+135	Normal/Failure	WME/001/KUN/6135			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2631		DIN	R		PLC/RIO	Wall Mounted Enclosure, ENC-77, Operating Condition Power Supply	Enclosure Operating Condition	Relay	6+135	Normal/Failure	WME/001/KUN/6135			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2633		DIN	R		PLC/RIO	Wall Mounted Enclosure, ENC-60, Operating Condition Temperature	Enclosure Operating Condition	Relay	6+240	Normal/Failure	WME/002/KUS/6240			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to temperature sensor and/or enclosure fan control relay
2634		DIN	R		PLC/RIO	Wall Mounted Enclosure, ENC-60, Operating Condition Power Supply	Enclosure Operating Condition	Relay	6+240	Normal/Failure	WME/002/KUS/6240			PLC/003/KUN/6135	Wall Mounted Enclosure, ENC-77-PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired to control relay. Monitor undervoltages, overvoltages
2697		DIN	R		PLC/RIO	Panel Normal operation / Emergency override operation Master Switch	EOP Normal operation/Emergency override	Relay		Normal/Emergency	CP-/015/ESC/E09	RIO/003/ESC/E09	K Underpass SCADA Override Panel - RIO			PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	KEYLOCK SWITCH SELECTOR
2698		DIN	R		PLC/RIO	Panel Door Switch	EOP Normal operation/Emergency override	Relay		Normal/Emergency	CP-/015/ESC/E09	RIO/003/ESC/E09	K Underpass SCADA Override Panel - RIO			PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	
2699		DIN	R		PLC/RIO	Panel Power Supply Failure	EOP Normal operation/Emergency override	Relay		Normal/Emergency	CP-/015/ESC/E09	RIO/003/ESC/E09	K Underpass SCADA Override Panel - RIO			PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	
2700		DIN	R		PLC/RIO	Storm Water Pump Normal operation / Emergency override operation	SWP Normal operation/Emergency override	Relay		Normal/Emergency	CP-/015/ESC/E09	RIO/003/ESC/E09	K Underpass SCADA Override Panel - RIO			PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	
2716		DIN	R		PLC/RIO	ITS Normal operation / Emergency override operation	ITS Normal operation/Emergency override	Relay		Normal/Emergency	CP-/016/ESC/E09	RIO/004/ESC/E09	K Underpass ITS Override Panel - RIO			PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	
2719		DIN	R		PLC/RIO	ITS Panel Door Switch	ITS Normal operation/Emergency override	Relay		Normal/Emergency	CP-/016/ESC/E09	RIO/004/ESC/E09	K Underpass ITS Override Panel - RIO			PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	
2720		DIN	R		PLC/RIO	ITS Panel Power Supply Failure	ITS Normal operation/Emergency override	Relay		Normal/Emergency	CP-/016/ESC/E09	RIO/004/ESC/E09	K Underpass ITS Override Panel - RIO			PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	
2768		DIN	R		PLC/RIO	Control Panel Operating Condition Primary Power Supply	Panel Operating Condition	Relay		Normal/Failure	CP-/002/KU-/K01	RIO/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIU	PLC/005/KU-/K01	K Underpass Plant Control & Monitoring PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired
2769		DIN	R		PLC/RIO	Control Panel Operating Condition Backup Power Supply	Panel Operating Condition	Relay		Normal/Failure	CP-/002/KU-/K01	RIO/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIU	PLC/005/KU-/K01	K Underpass Plant Control & Monitoring PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired
2770		DIN	R		PLC/RIO	Control Panel Operating Condition Loss of Power	Panel Operating Condition	Relay		Normal/Failure	CP-/002/KU-/K01	RIO/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIU	PLC/005/KU-/K01	K Underpass Plant Control & Monitoring PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired
2771		DIN	R		PLC/RIO	Control Panel Operating Condition TVSS	Panel Operating Condition	Relay		Normal/Failure	CP-/002/KU-/K01	RIO/005/KU-/K01	K Underpass Plant Control & Monitoring SMRIU	PLC/005/KU-/K01	K Underpass Plant Control & Monitoring PLC	PLC/002/ESC/B08	East Industrial Service Compound SMRCU			2-C 2.08 mm*2	Hardwired





TUNNEL MANAGEMENT SYSTEM EXAMPLE ALARM LIST

<b>Document Control Panel</b>			<b>Project Name:</b> INSERT PROJECT NAME												<b>Ref. Number:</b> IA1011D027G_EXW_Pxx_XXX_Y_Z - ALARM EFA PS.xlsx														
<b>Document Name:</b> PXXX Tunnel E Area EFA pump station plant control & monitoring, Alarm signals list																													
<b>Version</b>	<b>Date</b>	<b>Status</b>	<b>Written by</b>												<b>Checked by</b>					<b>QA Approver</b>					<b>Notes</b>				
0	INSERT	First Edition	Insert name												Insert name					Insert name					Draft for Ashahai review				

HLD Issued By: \_\_\_\_\_  
 Signature: .....insert signature .....Name.....insert name .....Date.....insert date .....

Signal count	Signal Tag	Data Type	Read	Write	I/O Assignment	Signal Description	Major	Minor	Signal pick up location	Signal	Equipment ID	Outstation ID	Outstation Name	Outstation PLC ID	Outstation PLC Name	Master PLC ID	Master PLC Name	Rack ID	Rack Name	Field Signal Conductors	Comments
155		DIN	R		BUS/COMM	Sump Gas Detector Level High Normal/Alarm	Sump Gas Detector Level High	Sensor	Tunnel E EFA Pump Station	Normal/High		RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
157		DIN	R		BUS/COMM	Sump Ventilation Fan 1 Operating Condition	Sump Ventilation Fan 1	Relay	Tunnel E EFA Pump Station	Normal/Failure	PN-/001/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	Hardwired to a Thermistor Motor Protection Relay or RIO ready for P1100 thermistors
159		DIN	R		BUS/COMM	Plant Control & Monitoring PLC	Tunnel E Plant Control & Monitoring PLC	Watchdog Relay	Tunnel E EFA Pump Station	Normal/Failure	PN-/005/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
180		DIN	R		BUS/COMM	Uninterrupted Power Supply, UPS 1 Operating Condition	UPS 1 Operating Condition	Discrete IO	Tunnel E EFA Pump Station	Normal/Failure	UPS/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
181		DIN	R		BUS/COMM	Uninterrupted Power Supply, UPS 1 Output Overload Normal/Alarm	UPS 1 Output Overload	Discrete IO	Tunnel E EFA Pump Station	Normal/Alarm	UPS/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
182		DIN	R		BUS/COMM	Uninterrupted Power Supply, UPS 1 Battery Operating Condition	UPS 1 Battery Operating Condition	Discrete IO	Tunnel E EFA Pump Station	Normal/Failure	UPS/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
187		DIN	R		BUS/COMM	Uninterrupted Power Supply, UPS 2 Operating Condition	UPS 2 Operating Condition	Discrete IO	Tunnel E EFA Pump Station	Normal/Failure	UPS/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
188		DIN	R		BUS/COMM	Uninterrupted Power Supply, UPS 2 Output Overload Normal/Alarm	UPS 2 Output Overload	Discrete IO	Tunnel E EFA Pump Station	Normal/Alarm	UPS/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
189		DIN	R		BUS/COMM	Uninterrupted Power Supply, UPS 2 Battery Operating Condition	UPS 2 Battery Operating Condition	Discrete IO	Tunnel E EFA Pump Station	Normal/Failure	UPS/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
194		DIN	R		BUS/COMM	Uninterrupted Power Supply, UPS-01 16A Duty UPS CB Trip Status	UPS-01 16A Duty UPS CB	Circuit Breaker	Tunnel E EFA Pump Station	Normal/Trip	UPS/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
197		DIN	R		BUS/COMM	Uninterrupted Power Supply, UPS-01 16A Standby UPS CB Trip Status	UPS-01 16A Standby UPS CB	Circuit Breaker	Tunnel E EFA Pump Station	Normal/Trip	UPS/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/E08	Tunnel E Service Compound SMRCU			N/A	
226		DIN	R		PLC/RIO	Control Panel Operating Condition Primary Power Supply	Panel Operating Condition	Relay	EFA Pump Station	Normal/Failure	CP-/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired
227		DIN	R		PLC/RIO	Control Panel Operating Condition Backup Power Supply	Panel Operating Condition	Relay	EFA Pump Station	Normal/Failure	CP-/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired
228		DIN	R		PLC/RIO	Control Panel Operating Condition Loss of Power	Panel Operating Condition	Relay	EFA Pump Station	Normal/Failure	CP-/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired
229		DIN	R		PLC/RIO	Control Panel Operating Condition TVSS	Panel Operating Condition	Relay	EFA Pump Station	Normal/Failure	CP-/002/EFA/F01	RIQ/002/EFA/F01	Tunnel E Plant Control & Monitoring - SMRIOU	PLC/002/EFA/F01	EFA Pump Station Control & Monitoring - PLC	PLC/002/ESC/B08	Tunnel E Service Compound SMRCU			2-C 2.08 mm^2	Hardwired